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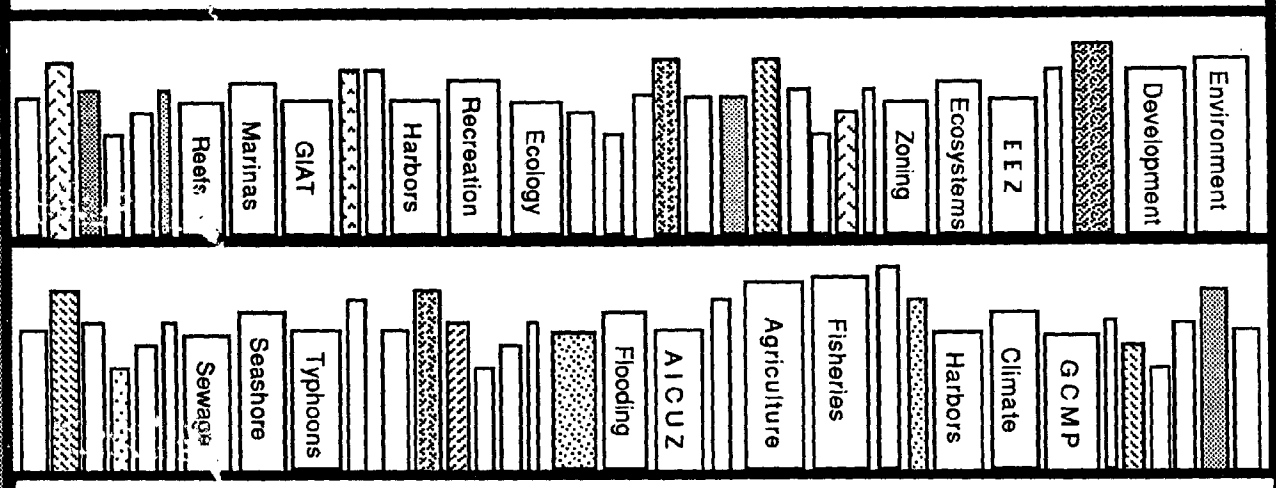

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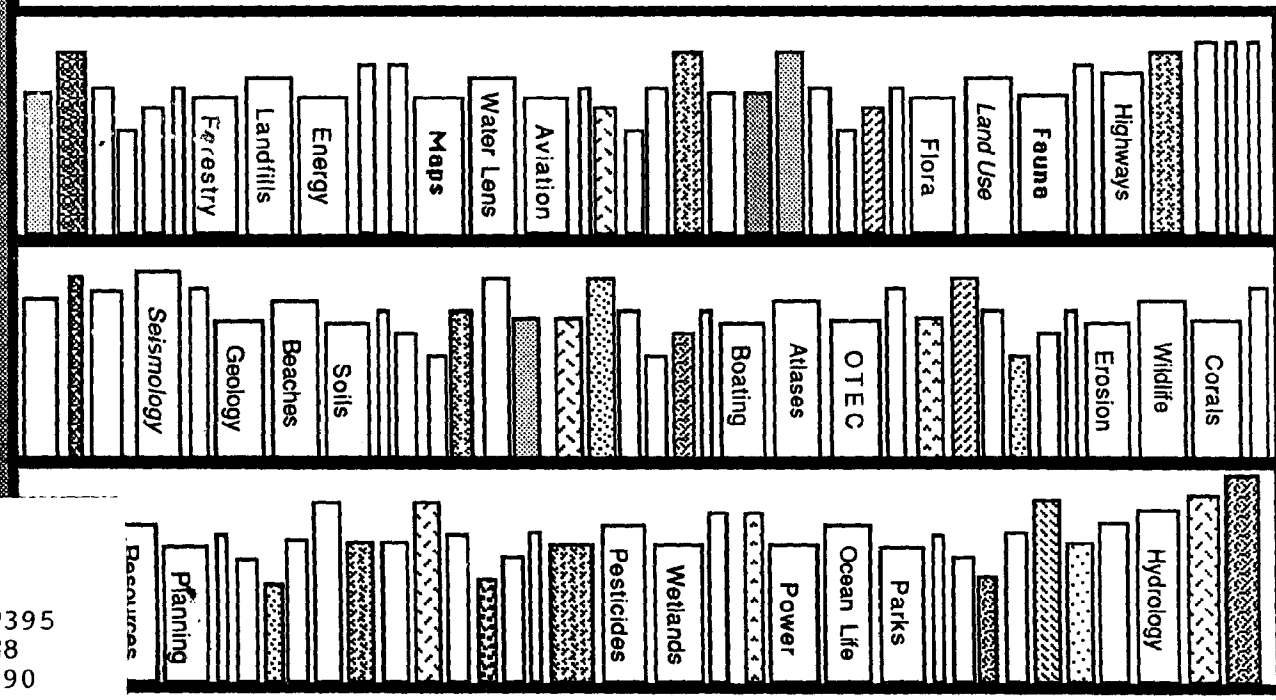
Inventory Of Planning Information

Volume II: Physical and Environmental Planning

Bureau of Planning
1990



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INTRODUCTION

This Fourth Edition, Second Volume, of the Guam Inventory of Planning Information is an annotated bibliography of documents containing planning information for Guam. The First Volume, published in 1989, contains social and economic planning information. The present volume contains environmental and physical planning information. Master plans, reports, and surveys are covered, as well as information sources available within Government of Guam agencies. The major time period covered is 1975 through 1990, but annotations for some reports and information available before 1975 are included if their contents are still valid or useful.

Methodology

This bibliography of environmental and physical data sources was completed following a search of the Bureau of Planning's reference library, the Micronesian Area Research Center, the Nieves Flores Library, and federal and Government of Guam agencies and departments who produce data or studies. In all cases, it was verified that each document is accessible for reference use and a notation is made as to where the document can be located. The Inventory only includes those references that have been physically located. The emphasis of this document is on readily available planning information. Some time was spent searching for reports, but if the source agency no longer had a copy and we could not locate the report in one of Guam's planning libraries, it was not included. It is also inevitable that some studies have been overlooked or were discovered too late to be included.

It is anticipated that this will be the last cumulative bibliography that will be produced by the Bureau of Planning. The number of planning documents has become so great since the first Inventory was published in 1976, that future releases will include only the most current documents. Therefore, you are encouraged to obtain both Volumes I and II from the Bureau of Planning and keep them as permanent reference.

If you have specific document needs, we maintain a bibliographic data base of Guam planning aid research from which document searches can be made.

Format

Annotations are listed chronologically within each subject area. Those citations which do no indicate a date are entered at the beginning of each subject area. Citations with multiple dates are listed as the latest publication date.

For each citation that is included under a subject area, the title, author or source agency, and date of writing or publication are given. There is a brief summary of the information content, usually including the topics and issues discussed, any unique data that is presented, and possibly the history or status of the document.

For each document, there is an availability statement which indicates where the document is accessible to users.

Each document is located only once in the Inventory; however, many could have been included in more than one of the subject areas. Because of this, a topical index was prepared to show the subject area in which each topic was included. The topical index is at the back, and covers both Volumes.

Major Subject Areas:

VOLUME I: Social and Economic Planning

ECN - Economics, Business, and Government

EDU - Education

HTH - Health

HIS - Historic and Cultural Resources

HSG - Housing

POP - Population

REF - Reference

SAF - Safety and Defense

SOC - Social Welfare

VOLUME II: Physical and Environmental Planning

AGR - Agriculture and Fisheries

BIO - Biological Resources

ENR - Energy

ENV - Environment

GEO - Geology, Soil, and Water Resources

LND - Land Use

MAP - Mapping

PRK - Parks and Recreation

TRN - Transportation

AGRICULTURE AND FISHERIES

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BIBLIOGRAPHIES

Select Bibliography of South Pacific Commission Fisheries Publications; James Crossland, South Pacific Commission; December 1979. A bibliography of selected SPC fisheries articles, reports, handbooks, occasional papers, and working papers presented at fisheries meetings between May 1952 and October 1979.
Available: Bureau of Planning Library.

A Selectively Annotated Bibliography of Social, Cultural and Economic Material Related to Fishery Development in Hawaii, American Samoa, and Micronesia; Hawaii Department of Planning and Economic Development; 1980.
Available: Micronesian Area Research Center Pacific Collection.

Checklist of Documents and Publications on Agriculture in Micronesia; Micronesian Area Data Base Center (MADBC), University of Guam; 1984. A checklist of the accessions of the MADBC Library. The database references hundreds of published and unpublished documents concerning agriculture, agroforestry, aquaculture, and related topics in Guam and Micronesia.
Available: Bureau of Planning Library.

Tuna Fisheries in the Pacific Island Region: A Bibliography; Kent E. Carpenter and David J. Doulman; 1985. A bibliography on material relating to tuna in the Pacific islands region. The bibliography contains information from each island entity where available, subject areas related to tuna, and an institutional list.
Available: Micronesian Area Research Center Pacific Collection.

Forests and Forestry - A Checklist of Titles; Micronesian Area Bibliographic Data Base (MABDB), University of Guam; 1986. A list of references on forests and forestry, and related topics such as forest birds.
Available: Micronesian Area Research Center Pacific Collection.

Bibliographies of the Marine Laboratory of the University of Guam; 1984-1988. Includes a listing of contributions, technical reports, environmental survey reports, miscellaneous reports, and M.S. theses. Emphasis is on marine life: aquaculture, mariculture, and fisheries.
Available: Marine Laboratory, University of Guam.

Aquaculture and Related Topics; Micronesian Area Bibliographic Data Base (MABDB), University of Guam; 1987. A list of references relating to aquaculture on Guam.
Available: Micronesian Area Research Center Pacific Collection.

AGRICULTURE PRODUCTION DATA

Guam Composition and Characteristics of the Population, Number of Farms, Acreage, Production, and Livestock; Bureau of the Census, U.S. Department of Commerce. Presents results of the 1930 U.S. Census of population and agriculture for Guam. Agriculture data available includes copra exports 1915-1930, number of trees, farms, acreage, production, and livestock.
Available: Bureau of Planning Library.

Guam Agricultural and Related Statistics; Thao Khamoui, Agricultural Experiment Station, College of Agriculture and Life Sciences, University of Guam; 1984. A compilation of 96 statistical tables under the headings: general, crops, and livestock and fisheries. There is no analysis.
Available: Bureau of Planning Library.

Local Fruits and Vegetables FY 1986; Department of Agriculture; 1986, updated periodically. A statistical summary report on local crop producers by poundage and type of crop produced or imported. Data also includes produce sold at local flea markets and roadside stands, and foreign imports.
Available: Bureau of Planning Library.

Food and Agriculture Organization of the United Nations Yearbook 1987; United Nations; 1988. A statistical summary of world food commodities and production/yield. Includes Guam and Oceania.
Available: Bureau of Planning Library.

1987 Census of Agriculture, Volume 1 Geographic Area Series, Part 53: Guam; Bureau of the Census, U.S. Department of Commerce; March 1989. Compiles data on farms and their production. Detailed tables are presented on number of livestock and poultry on the day of enumeration; crop and livestock production, sales, and expense data for the calendar year; and size of farms. Past censuses were taken on Guam in 1964, 1969, 1974, 1978, and 1982. Future censuses will be taken on years ending in a "2" and "7". A farm is defined as a place from which $100 or more of agricultural products were sold or normally would have been sold during the census year. This differs from the definition of farm used in previous censuses: a place where any crop, vegetable, or fruit was harvested or gathered during the year, or on which there was any livestock or 15 or more poultry at the time of enumeration.
Available: Bureau of Planning Library.

Guam Agricultural Experiment Station, Annual Reports; annually. College of Agriculture and Life Sciences, University of Guam. Describes research experiments conducted during each year on soil fertility, horticulture-vegetable crops, entomology, plant pathology, agriculture engineering, agricultural economics, land use, aquaculture, etc.
Available: Bureau of Planning Library.

Crop and Market Price Report; Cooperative Extension Service, College of Agriculture and Life Sciences, University of Guam; Updated periodically. A statistical summary of crops, acres planted, estimated harvest and market report. The market report includes prices as well as supply.
Available: Cooperative Extension Service, University of Guam.

Crop Forecast and Market news; Released bi-weekly by the Agricultural Development Services, Department of Agriculture, and the Cooperative Extension Service, University of Guam. Reports total acres planted, new plantings, and expected harvesting of acres and pounds for the next two weeks by crop. Retail prices are reported as of two days before release date, and comments on market stability, supply and demand for two dozen local crops are given.
Available: Agricultural Development Services, Department of Agriculture.

I Lina'chok (Life from the Roots); College of Agriculture and Life Sciences, University of Guam; 1988 to present. A bimonthly newsletter on topics related to agricultural research on Guam, extension education and other related topics, and news from the College of Agriculture and Life Sciences.
Available: Cooperative Extension Service, University of Guam.

Guam Annual Economic Review; Department of Commerce; Annually. Contains an annual compilation of Department of Agriculture data for quantity and value of agricultural products, distribution of local fruits and vegetables by outlets in pounds and dollars, livestock population, and production of primary crops in pounds.
Available: Bureau of Planning Library.

FOREST MANAGEMENT

Forestry Potentials and Recommendations for Guam; Robert E. Nelson and Craig D. Whitesell, U.S. Forest Service; August 1969. A program outline including fire protection, reforestation, type-of-vegetation conversion, forestry inventory, and notes on program implementation.
Available: Bureau of Planning Library.

Review of Forestry Potentials for Guam; John D. Beebe and Harry W. Camp, U.S. Forest Service; February 1970. The purpose of this visit was to examine experimental plantings, evaluate forestry aspects of land use programs, and confer on fire control and other forestry programs. The recommendations are presented.
Available: Bureau of Planning Library.

Forest Fires on Guam; Carl L. Hawkes, Territorial Forester, U.S. Forest Service; May 1973. Reports on the causes and damages of fires and existing laws regarding fire. Presents recommendations on fire prevention, increased law enforcement, and interagency cooperation.
Available: Division of Forestry and Soil Resources, Department of Agriculture.

Management of the Forest Land of Guam Under a Program of Multiple Use; Division of Forestry and Soil Resources, Department of Agriculture; June 1973. Includes a discussion of each use for forest land; presents an organizational chart for a department to carry out the program; and includes fire, forestation, and recreation plans.
Available: Bureau of Planning Library.

Fire Action Plan for Guam; Department of Agriculture; revised 1976. The plan outlines: the procedures for fire detection and crew dispatching, the fire suppression techniques to be utilized (such as night work, firebreaks, etc.), the chain of command, agency responsibilities and coordination. Also included are inventories of manpower and equipment. The plan even specifies details such as radio frequencies to be used.
Available: Division of Forestry and Soil Resources, Department of Agriculture.

Evaluation of Andersen Air Force Base Forest Resources for a Potential Management Plan; October 27, 1977. Evaluates Andersen Air Force Base forest reserves for its potential to support a forest management program. Conclusions were based on findings by the Division of Forestry and Soil Resources of the Guam Department of Agriculture (attached to the plan) and the U.S. Navy.
Available: Bureau of Planning Library.

A Policy for the Management of Guam's Forest and Soil Resources, Territory of Guam; Division of Forestry and Soil Resources, Department of Agriculture; 1979. This brochure states goals and recommendations for management of forest and soil resources on Guam: watershed management, multiple purpose management, fire management, research, recreation, noxious weed control and insect and disease protection, wildlife habitat, and energy.
Available: Bureau of Planning Library.

Forestry and Environment in the South Pacific - South Pacific Commission Topic Review No. 8; S.D. Richardson, South Pacific Commission; 1981. An overview of forestry issues in the region, including logging exports, reforestation, appropriate harvesting and processing technologies, agriculture-supportive forestry, and non-timber forest industries. Presents an overall background to forestry and the environment in the region with regard to conservation/management.
Available: Micronesian Area Research Center Pacific Collection.

Forest Pests and Problems on Guam; Vincent Russo, University of Guam, unpublished paper; 1984.
Available: Micronesian Area Research Center Pacific Collection.

Regional Guide for the Pacific Southwest Region Covering the Forest Service Programs That Affect California, Guam, Hawaii, and the Trust Territories; U.S. Forest Service, Department of Agriculture; August 1984. Addresses national and regional issues and management concerns for land and resource management planning efforts. This guide provides the direction to be followed in the preparation of Guam's Forestry Resources Program Plan, (below).
Available: Bureau of Planning Library.

Forestry Resources Program Plan; Division of Forestry and Soil Resources, Department of Agriculture; 1988. Provides Territorial program guidance in the use and management of Guam's total forest resources, regardless of land ownership. This comprehensive plan includes an overview of the Territory's forest and related resources and conditions, describes the role of Guam's forestry division, and assesses forest resources. Volume II and appendices present detailed program information, and financial and output data summaries. This plan is updated every five years.
Available: Bureau of Planning Library.

AGRICULTURE PLANS AND NEEDS

The Agricultural Needs of Guam; U.S. Department of Agriculture; 1957. Outlines Guam's agriculture, including soils, climate, relevant government activities, federal laws on agriculture applicable and not applicable to Guam, crops, livestock, credit, and marketing. 1950 Census of Agriculture data on farm size, harvests, rainfall, and pests are presented.
Available: Micronesian Area Research Center Pacific Collection.

Problems in Tropical Agriculture: A Case Study from Guam; David Lee; 1971. Examines the conditions of agriculture on Guam, and analyzes agricultural problems on the island. This report discusses soils, the slope of the land, climate, vegetation, land tenure, labor, markets, alternate land uses, and competition from other crop producing areas.
Available: Bureau of Planning Library.

Regulations for Importing Plants and Plant Products into the Territory of Guam, Executive Order No. 72-5; February 10, 1972. Discusses import permits, certificates, general shipping requirements, plant material subject to inspection and disposal, living insects and plant diseases, packing materials, construction materials, stored dried products, enterable fruits and vegetables, exceptions, unlawful acts, and penalties.
Available: Bureau of Planning Library.

Trends in Agriculture Development in Guam and Micronesia; W.P. Leon Guerrero, R. Muniappan, Jack Ishida, Victor Artero, for the United Nations Economic and Social Commission for Asia and the Pacific; 1975. Evaluates data on the state of agricultural development in Guam and Micronesia. This report discusses geography and climate; geology and vegetation; population and economy; agriculture; and potentials of fruit, vegetable, poultry, pork and fishery production. Future projects and/or programs are proposed. An appendix contains statistical tables on production and imports of selected commodities for various years until 1974.
Available: Bureau of Planning Library.

Agriculture on Guam; Frank W.K. Chan, University of Guam Special Project; October 1975. Evaluates economic problems in agriculture development and the role of various government agencies in promoting further development.
Available: Robert F. Kennedy Library, Special Project File, University of Guam.

Growth Policy: Agriculture; Bureau of Planning; January 1977. Presents four growth options to aid the development of agriculture and fishery: conventional agriculture, hydroponic farming, mariculture, and livestock farming. Discusses the potentials and constraints that need to be considered in developing agriculture and fisheries. Conclusions and recommendations are given, although development plans are beyond the scope of this study.
Available: Bureau of Planning Library.

Agriculture in Guam: Observations on Problems and Research Needs; Dr. Te'o Ian Fairbairn, Occasional Paper No.1, South Pacific Commission; March 1977. Gives the general impressions of the overall agricultural situation and associated problems observed during a visit from September 24 to October 4, 1976. This report examines the current agricultural situation, support services for farmers, some gaps in current agricultural services, and economic research in agriculture, with suggestion and recommendations.
Available: Bureau of Planning Library.

Guam Public Market Feasibility Study, The Prospect of Agriculture on Guam U.S.A.; Hong K. Sohn, for the Guam Department of Commerce; July 1977. Examines the number and types of producers, capital and labor constraints, and potential for future output. Demand for public market commodities was projected through 1979. Possible location, design, methods of operation, and other specific aspects of implementation are discussed.
Available: Bureau of Planning Library.

The Organization and Management of the Guam Farmer's Cooperative Association; Jesus A. Manibusan, University of Guam Special Project; 1978.
Available: Robert F. Kennedy Library, Special Project File, University of Guam.

Agricultural Development Plan for the Territory of Guam; College of Agriculture and Business, University of Guam, for the Bureau of Planning; 1978. Presents guidelines for the development of farming and livestock farming. This plan includes a brief status report on field farming and livestock farming with a review of various support services and programs affecting them. The study is intended as a sequel to the agricultural growth policy study of 1977 (above).
Available: Bureau of Planning Library.

Guam Agricultural Land Use: A Study of Its Changes; Bruce G. Karolle, for the Department of Parks and Recreation; June 1978. Examines individual agricultural operations and their relation to known pre-historic and historic sites where an agricultural land-use previously existed. A survey of existing farmers and ranchers of the selected sites was conducted to provide data on land use, settlement patterns, resource distribution, and a variety of other statistical data. Factors assessed include location of ranches by fields and residence, size of landholding, genealogy of land ownership, traditional practices, farm land value, farm site physiography, crops and animals by acreage and enumeration, diet of farm household, labor use, investment, expenditures and improvements, land use by individual farm, and archaeological record.
Available: Bureau of Planning Library.

Changing Agricultural Patterns of Guam (Part 1); Bruce G. Karolle, Agricultural Experiment Station, College of Agriculture and Life Sciences, Technical Report No. 2, University of Guam; September 1978. Presents the results of field interviews administered to practicing farmers to assess present agricultural resources.
Available: Bureau of Planning Library.

The Effects of Economic, Political and Social Change on Agriculture in Talofofo, Guam 1962-1978; James Ellison Lightfoot, University of California, Riverside, Masters Thesis; December 1979. Summarizes agricultural land use in Talofofo. This report focuses on the causes of change in agriculture during a 17-year period. The history of the area from the pre-contact era to 1962 is presented. 135 p.
Available: Bureau of Planning Library.

A Pre-Design Feasibility Study of a Cannery and Fumigation Plant on Guam; Hari P. Marhatta, University of Guam; March 20, 1980. Evaluates the economic feasibility of building and operating a cannery and fumigation plant. This report concludes that it is not desirable at this time.
Available: Bureau of Planning Library.

Changing Agricultural Patterns of Guam (Part 2); Bruce G. Karolle, Agricultural Experiment Station, College of Agriculture and Life Sciences, Technical Report No. 8, University of Guam; August 1980. Analyzes the hypothesis that the major population growth areas on the island are near identified farms.
Available: Bureau of Planning Library.

Socio-Economic Criteria for Scientific Research to Improve Tropical Food Production Systems (with Particular Reference to American-Affiliated Pacific Islands); Hawaii Institute of Tropical Agriculture and Human Resources, University of Hawaii; 1982. Addresses the environments in which agriculture functions in the Pacific islands. This report provides a brief account of the cultural, political, and economic development and information on island location, climate, geology, and topography; and covers population trends, distribution and other demographic characteristics; income and welfare; family structure; land tenure; and food preferences and consumption. Data is presented on principal economic activities, external trade, labor force, prices, tax system, credit and capital markets, and physical infrastructure, including land, ocean and air transportation systems, energy resources and costs, and communications systems.
Available: Micronesian Area Research Center Pacific Collection.

Strategy Outline for Accelerated Agricultural Development of American-Affiliated Pacific Islands; Shelley M. Mark and Bruce S. Plasch, Hawaii Institute of Tropical Agriculture and Human Resources, University of Hawaii; April 1982. Presents a strategy outline to assist in solving agricultural problems typical of the American-affiliated islands of the Pacific (including Guam), and includes guidelines on appropriate research. This report focuses on the typical problems or constraints which restrict agricultural development; key factors commonly judged to be necessary for developing an economically healthy agricultural industry; agricultural development approaches which should be favored because of past successes, and those which experience shows should be avoided because of past failures; and typical impacts which accompany successful agricultural development. 83 p.
Available: Bureau of Planning Library.

Development of the Agricultural Sector in the American-Affiliated Pacific Islands; Shelly M. Mark, Hawaii Institute of Tropical Agriculture and Human Resource, University of Hawaii; October 1982. Sets forth the premise that agricultural development may be the best means by which islands can realize their goals of progressing economically in a manner consistent with their cultural heritage and social environments. This report provides information on historical and political background, agricultural activities and constraints, federal and local government policies affecting agriculture, promising activities and opportunities, and policy implications for developing a more productive agricultural sector in the American-affiliated Pacific islands of Guam, American Samoa, and Micronesia. 100 p.
Available: Bureau of Planning Library.

Agriculture, Municipal, and Industrial Water Demand and Benefit Parameters on Guam; Decision Analysts Hawaii, Inc., for U.S. Army Corps of Engineers, Pacific Ocean Division; August 1983. Provides a brief assessment of Guam's agricultural industry and the potential for agricultural development based on import substitution and exports. The assessment focuses on those crops for which there is a potential for both market expansion and profitability. 53 tables. A rebuttal prepared by the University of Guam is annotated below.
Available: Bureau of Planning Library.

South Pacific Workshop on Agricultural Extension; Food and Agriculture Organization of the United Nations; 1984. Summary of proceedings addressing agricultural extension concerns and issues in the region. Includes recommendations and descriptions of various agricultural extension systems.
Available: Micronesian Area Research Center Pacific Collection.

Market Potential for Guam Produce; Thao Khamoui, Agricultural Experiment Station, College of Agriculture and Life Sciences, Publication No. 43, University of Guam; 1984. Analyzes the island's potential to expand the production of some selected crops and increase the market share of local produce. This report is largely a rebuttal to a 1983 study prepared for the U.S. Army Corps of Engineers titled "Agriculture, Municipal, and Industrial Water Demand and Benefit Parameters on Guam", above. 40 p., 16 tables.
Available: Bureau of Planning Library.

An Economic Assessment of the Market Structure of the Food Industry on Guam; Thao Khamoui, Agricultural Experiment Station, College of Agriculture and Life Sciences, University of Guam; 1984. Examines the marketing of agricultural products and explores ways of improving the market structures of selected industries. This report assesses the effects of the gross receipts tax on the market structure of the food industry; and examines some basic reasons for vertical integration and barriers to entry in some sectors of the agricultural industry. Agricultural cooperatives and the egg industry are selected for vertical integration analysis.
Available: Bureau of Planning Library.

Roadside Marketing of Agricultural Products on Guam; Lawrence F. Kasperbauer, Thao Khamoui, Richard N. Prelosky, Cooperative Extension Service, University of Guam; June 1984. Summarizes characteristics and market operations of roadside stands. This report includes a consumer survey of people buying produce from roadside stands. Problems, recommendations, and suggestions regarding present and potential marketing are reviewed.
Available: Bureau of Planning Library.

Agricultural Production Constraints on Guam; Thao Khamoui, Agricultural Experiment Station, College of Agriculture and Life Sciences, Publication No. 48, University of Guam; 1985. Reviews constraints affecting agricultural development on Guam. This report focusses on the constraints which affect crop production, including physical constraints (underdevelopment of agricultural resources, infrastructure, access roads, irrigation, and storage facilities); institutional constraints (land tenure systems); and lack of supporting services (production and marketing information, financing, farm workers, transportation, production specialization, and market coordination). Suggestions are made regarding these various restrictions to agriculture development.
Available: Bureau of Planning Library.

Strengthening Plant Protection and Root Crops Development in the South Pacific; South Pacific Commission, and the Food and Agricultural Organization of the United Nations; 1985. Outlines the development of effective quarantine capabilities for the Micronesian region as presented in the workshop. This document reports on the principles of plant quarantine; pests, disease status and surveys, and pest distribution in the region; plant quarantine measures, facilities and needs; and problems.
Available: Bureau of Planning Library.

Agroclimatic Atlas of Guam; Chu-Tak Tseng, and Rangaswamy Muniappan, Agricultural Experiment Station, College of Agriculture and Life Sciences, University of Guam; 1986.
Available: Cooperative Extension Service, University of Guam.

American Pacific Initiative for Development of Land-Grant Pacific Islands: A Framework and Guideline for Comprehensive Planning; American Pacific Land-Grant Directors; 1987. Presents a framework for agricultural development in the Pacific region, addressed on a regionally coordinated basis (represented by American Samoa, Northern Mariana Islands, Federated States of Micronesia, Guam and Hawaii). This extensive planning document covers the planning process, procedural steps, priorities, implementation, monitoring, and evaluation systems. Additionally, requirements for agricultural development, detailed program elements, and constraints are discussed.
Available: Bureau of Planning Library.

Regional Technical Meeting Reports on Plant Protection; South Pacific Commission; 1980 through 1987. Summarizes working papers on plant protection issues in the region.
Available: Micronesian Area Research Center Pacific Collection.

Agricultural Development in the American Pacific (ADAP) - Manual for Extension Program Development in the Pacific Basin; Randall L. Workman, Theodore M. Iyechad and Bernadita Camacho Dungca; 1989. A course manual designed to provide people with an understanding of the philosophy, history, structure, community involvement, and methods of cooperative extension programs in the Pacific Basin area. The extension program areas are agriculture, 4-H and youth, home economics, and community development. Topic areas related to programs include nonformal teaching, program planning, volunteers, and advisory groups.
Available: Cooperative Extension Service, University of Guam.

The Development of the Cooperative Extension System in the Pacific Basin; Randall L. Workman and Ann M. Workman, University of Guam course requirement for "Extension Program Development in the Pacific Basin"; 1989. Presents a history of the development of Guam's Cooperative Extension program relative to Guam's agriculture system, and regional expansion of the program in recent years.
Available: Bureau of Planning Library.

GROWING FRUITS AND VEGETABLES

Coconut Industry Feasibility Survey for Guam, M.I.; Coproducts Corporation, for Sixth Guam Legislature; August 1961. Data collected includes quantity, quality, variety, and use of existing coconut production; effects of the existing palm disease and pests on present and future production; suitability of climate and soil conditions; and economic studies.
Available: Bureau of Planning Library.

Guam Planting Calendar; Cooperative Extension Service, College of Agriculture and Life Sciences, University of Guam; revised December 1977. Lists planting dates, amount of seed, spacing between rows in feet and between plants in inches, and number of days to harvest for specified varieties of selected crops.
Available: Bureau of Planning Library.

Performance of Selected Eggplant Cultivars in Guam; Chin-Tian Lee, Agricultural Experiment Station, College of Agriculture and Life Sciences, Technical Report No. 3, University of Guam; July 1980. Presents results of field experiments conducted to determine the effect of environmental factors on the production of nine cultivars of eggplant.
Available: Bureau of Planning Library.

Performance Studies on AVRDC Selections and Commercial Cultivars of Tomatoes in Guam; Chin-Tian Lee, Agricultural Experiment Station, College of Agriculture and Life Sciences, Technical Report No. 9, University of Guam; September 1980. Evaluates the effect of environmental conditions on tomato yield through field experiments.
Available: Bureau of Planning Library.

Vegetable Minigardens; Charles B. Frear, Cooperative Extension Service Circular No.1, University of Guam; not dated. Presents information for the home gardener. This guide discusses containers, the growing medium, seeds, suggested standard and miniature varieties for production on Guam, starting plants, crop replacement, companion cropping, drainage, watering, fertilizing, cultivation, insects and diseases, and snail and rodent control. 27 p.
Available: Bureau of Planning Library.

Going, Going, Gone; Cooperative Extension Service, University of Guam; August 1980. This pamphlet discusses bunchy top banana virus, methods of transmittal, and eradication procedures.
Available: Bureau of Planning Library.

When and How to Harvest Vegetables; Chin-Tian Lee, Agricultural Experiment Station, College of Agriculture and Life Sciences, University of Guam; April 1981. Suggests the best stage at which vegetables should be harvested based on product appearance, texture, flavor, and yield. Selected vegetables are organized by type of crop. Illustrated with 16 black and white photographs. 11 p.
Available: Bureau of Planning Library.

An Economic Assessment of Producing and Marketing Fresh Pineapples on Guam; Jeff Barcinas, Thao Khamoui, Bonifacio de Guzman, et.al., College of Agriculture and Life Sciences, University of Guam; June 1982. A financial and market analysis of growing pineapple on Guam. Provides estimated cost and returns of locally grown pineapples, and factors influencing consumption.
Available: Bureau of Planning Library.

Growing Tomatoes on Guam; Chin-Tian Lee, Cooperative Extension Service, University of Guam; 1983. A concise guide for growing tomatoes on Guam, for both farmers and home gardeners. Extensive information of varieties, soil, care of seedlings, insects, diseases, and harvesting tomatoes.
Available: Cooperative Extension Service, University of Guam.

Taro Cultivation in the South Pacific; South Pacific Commission; 1982, 1984. An information guidebook on agricultural practices relative to taro cultivation in the region.
Available: Guam Environmental Protection Agency Library.

A Guide to Growing Bananas on Guam; Brian T. Scully and Robert Bevacqua, Cooperative Extensive Service, University of Guam; Not dated, but around 1984. This booklet explains all aspects of banana production, including site selection, land preparation, propagation material, planting, plantation management, pruning, diseases and pests, and harvesting and handling.
Available: Bureau of Planning Library.

Cassava Feed on Guam: Review and Analysis; Thao Khamoui, Agricultural Experiment Station, College of Agriculture and Life Sciences, Publication No. 33, University of Guam; 1984. This study examines the economic feasibility of producing cassava for hog feed on Guam. 36 p., 8 tables.
Available: Bureau of Planning Library.

An Economic Assessment of Growing Bell Peppers on Guam; Thao Khamoui and Vincent M. Russo, Agricultural Experiment Station, College of Agriculture and Life Sciences, Technical Report No. 31, University of Guam; 1984. A financial and marketing analysis of locally grown bell peppers. Presents the results of field experiments conducted to compare the yield in the wet and dry seasons under different plant spacings and other treatment. 14 p., 7 tables.
Available: Bureau of Planning Library.

The Effect of Various Planting Trays on Seedling Vigor and Subsequent Yield and Dry Matter; M. E. Ford and V. M. Russo, Agricultural Experiment Station, College of Agriculture and Life Sciences, Technical Report No. 37, University of Guam; 1984. A summary of experiments on the vigor of seedlings, subsequent yield, and dry matter, based upon three types of planting trays used to propagate seedlings.
Available: Bureau of Planning Library.

Growing Pineapples in Guam; Robert Bevacqua, College of Agriculture and Life Sciences, Bulletin No. 5, University of Guam; 1984. A beginners guide to growing pineapple on Guam. It explains the basic cycle of a pineapple planting and describes, step-by-step, the techniques for growing a one-acre field using a backpack sprayer to apply fertilizers and pesticides.
Available: Bureau of Planning Library.

Relating Weight Variables to Total Number, and Number of Marketable and Unmarketable Fruit in Bell Pepper; Vincent M. Russo, Agricultural Experiment Station, College of Agriculture and Life Sciences, Technical Report No. 38, University of Guam; 1984. A summary report on an experiment with bell pepper varieties which specifically examines the correlation of number parameters for fruit harvested and parameters for weight.
Available: Bureau of Planning Library.

Horticulture - Vegetable Crops; Chin-Tian Lee, Agricultural Experiment Station, College of Agriculture and Life Sciences, University of Guam; 1985.
Available: Cooperative Extension Service, University of Guam.

Assessing Alternate Sources for Commercial Inorganic Nitrogen Fertilizers on Guam; J.L. Demeterio, Agricultural Experiment Station, College of Agriculture and Life Sciences, Technical Report No. 59, University of Guam; 1987. A study done to assess how to lessen dependence upon commercial inorganic nitrogen fertilizers. Several alternate sources were evaluated over a five-year period.
Available: Bureau of Planning Library.

Costs and Returns of Producing Bananas on Guam; Margarita Weidman, Bonifacio de Guzman and Ramaswamy Rajendran, Agricultural Experiment Station, College of Agriculture and Life Sciences, University of Guam; 1987.
Available: Cooperative Extension Service, University of Guam.

Home Gardening on Guam; Victor Artero, Jeff Barcinas, Karen Carpenter, Bonifacio de Guzman and Vincent Santos, College of Agriculture and Life Sciences, Cooperative Extension Service, University of Guam; 1988. A booklet about home gardening.
Available: Cooperative Extension Service, University of Guam.

Achiote: A Natural Food Color and Dye; R. Rajendran, Agricultural Experiment Station, College of Agriculture and Life Sciences, Technical Report No. 73, University of Guam; 1989. A report summary on the achiote/achote plant, including descriptions, planting and propagation techniques, harvesting, chemical action of the dye, uses, and other information.
Available: Bureau of Planning Library.

INSECT PESTS

Termites and Their Control; Claron Bjork, Cooperative Extension Service, University of Guam; Not dated. Three page public information brochure discussing the control of termites in structures.
Available: Bureau of Planning Library.

Insect Pests of Cucurbitaceous Crops and Their Control on Guam; College of Agriculture and Life Sciences, Technical Report No. 6, University of Guam; Not dated. Pest management control for melons, squashes, gourds, pumpkins, etc. Gives a description of each pest, their biology, natural enemies, and control. Illustrated with color photographs.
Available: Bureau of Planning Library.

Insects of Cruciferous Crops and Their Control on Guam; College of Agriculture and Life Sciences, University of Guam; Not dated. Presents pest control information for such crops as Chinese cabbage, radish, cauliflower, kohlrabi, Brussels sprouts, turnip, and collard. This booklet describes 10 insects with a brief life history, type of damage, and appropriate control measures. Includes 5 color photographs.
Available: Bureau of Planning Library.

"Biological Control of Insects"; R. Muniappan and Larry M. Stevens, College of Agriculture and Business, University of Guam, reprinted from South Pacific Bulletin, (1st Quarter 1978). Discusses the use of natural enemies in insect control. 2 p.
Available: Bureau of Planning Library.

Accidental Introductions of Insect Pests to Guam, 1945-1985; Ilse Schreiner and Donald Nafus, Agricultural Experiment Station, College of Agriculture and Life Sciences, University of Guam; 1984.
Available: Cooperative Extension Service, University of Guam.

Mango Shoot Caterpillar Control on Mango Flowers; Ilse Schreiner, University of Guam; 1985.
Available: Micronesian Area Research Center Pacific Collection.

Plant Pathogens and Associated Hosts on Guam; V. Russo, G. Beaver, F. Cruz and H. Rubin, Agricultural Experiment Station, College of Agriculture and Life Sciences, Technical Report No. 46, University of Guam; 1985. A report on plant pathogens (mainly fungi) and their plant hosts found on Guam to date.
Available: Bureau of Planning Library.

Disease Control Guide for Vegetable Growers; Claron Bjork, Cooperative Extension Service, College of Agriculture and Life Sciences, University of Guam; 1986.
Available: Cooperative Extension Service, University of Guam.

Fungicide Guide for Vegetable Growers; Claron Bjork, Cooperative Extension Service, College of Agriculture and Life Sciences, University of Guam; 1986.
Available: Cooperative Extension Service, University of Guam.

Insects and Related Topics - A Checklist of Titles; Micronesian Area Bibliographic Data Base, University of Guam; 1986. A list of references on insects and related topics, particularly agriculture and pesticides.
Available: Micronesian Area Research Center Pacific Collection.

Insect Pests of Economic Significance Affecting Major Crops of the Countries in Asia and the Pacific Region; Technical Report No. 135, Asia and Pacific Plant Protection Commission, United Nation, Food and Agricultural Organization; 1987. A list of insects by scientific and common names, the areas in the region where they are found, and the types of crops affected.
Available: Micronesian Area Research Center Pacific Collection.

Bacterial Blight of Mendioka; G.C. Wall and V.M. Santos, Cooperative Extension Service, College of Agriculture and Life Sciences, University of Guam; 1988. A summary of the problems of cassava blight, symptoms and disease cycle, results of a survey on Guam, and methods which can be used to control the disease.
Available: Bureau of Planning Library.

Guam Pest Series; Cooperative Extension Service, College of Agriculture and Life Sciences, University of Guam; periodically since 1988. Compiles information on agricultural and other pests which damage crops, ornamental plants, and fruit trees. Each pest series shows photographs and/or diagrams of the pest; common, scientific, and local names; a description of the pest and its activities; and methods of control.
Available: Cooperative Extension Service, University of Guam.

PESTICIDES

Guam Pesticides Profile; Guam Environmental Protection Agency; March 1975. The topics covered include: soils characteristics, local agricultural production, patterns of pesticides use, existing regulatory authority, training programs, and support facilities. The report includes a listing and description of domestic and agricultural pests; a listing of government agencies and private firms showing the number of applicators employed and the pesticides they use; an inventory of pesticides retailers and the pesticides they have registered to sell; and a listing of the domestic and foreign manufacturers whose products are sold on Guam.
Available: Bureau of Planning Library.

Guam Supplement for Commercial Pesticide Applicators; Cooperative Extension Service, College of Agriculture and Life Sciences, University of Guam; January 1977. Provides supplemental information to the USDA-EPA manual, "Apply Pesticides Correctly - A Guide for Commercial Applicators." This manual is to be studied to prepare for pesticide applicator certification. This report gives the local and federal pesticide laws and regulations.
Available: Bureau of Planning Library.

Pesticide Use Survey in Agriculture, 1977 Report; Guam Environmental Protection Agency; 1977. The data presented in this report provide current information on farming operations on Guam relating to the use of pesticides. Agricultural farms were classified and identified based on the information collected during the survey.
Available: Guam Environmental Protection Agency.

Comments on Pest and Pesticide Control; K.M. Harrow, South Pacific Commission; 1981. A topic review on pests and pesticides relative to agriculture and the food supply. Discusses environmental issues related to pesticides, biological controls, integrated controls, and controls of pesticides.
Available: Micronesian Area Research Center Pacific Collection.

Standard Operating Procedures for Ordering, Receiving, Storing, and Disposing of Pesticides; Guam Environmental Protection Agency; Approximately 1982. This booklet provides information on safe handling of pesticides during receipt and storage, and safe disposal of pesticides and containers.
Available: Guam Environmental Protection Agency.

Safe Use of Pesticides - Protect Yourself; Guam Environmental Protection Agency; Not dated, but approximately 1982. This brochure provides information designed to protect pesticide users from poisoning and to provide guidelines for safe use.
Available: Bureau of Planning Library.

Pesticide Use in the South Pacific; UNEP; 1988. An extensive compilation of information to assist in and help ensure safe and efficient use of pesticides in the region. Provides background and information on the current situation in Pacific countries. This report lists pesticides in use, quantities, distributors, type of use, and gives recommendations. Banned and restricted pesticides are included, and problems of pesticides to humans and wildlife are discussed. Includes summaries of residue and toxicity studies. International publications on pesticide legislation and registrations are listed.
Available: Micronesian Area Research Center Pacific Collection.

The Occurrence of Certain Pesticides in Ground and Surface Waters Associated with Ordot Landfill in the Pago River Basin, Guam, Mariana Islands; Harold R. Wood, Water and Energy Research Institute, Technical Report 72, University of Guam; 1989. Assesses the occurrence of certain pesticides in the Pago River watershed created by small farming activities and the Ordot solid waste landfill. This technical and research based report focusses its concern on contamination of the food chain and adverse effects on organisms and their reproductive capacity. The document cites previous studies, describes the site and its history, gives sampling methods and analytical procedures used, presents results and discussions, and suggests future studies.
Available: Bureau of Planning Library.

Pesticide Applicator Training Plan; Guam Environmental Protection Agency; 1990. This plan presents information on the applicator training program, including how many will be trained, training materials to be used, training methods and subject areas, and information on funding sources and amounts.
Available: Guam Environmental Protection Agency.

Plan for the Certification of Pesticide Applicators; Guam Environmental Protection Agency; 1990. The plan outlines agencies responsible and their roles, the legal authorities for action, the position title and function of personnel carrying out the plan, the applicable Federal standards for certification, and proposed GEPA regulations.
Available: Guam Environmental Protection Agency.

Application for Importation and Notice of Arrival of Pesticides and Devices. This form must be submitted to GEPA for every shipment of pesticides and pesticide devices, and must be approved before the shipment is released by Guam Customs authorities.
Available: Guam Environmental Protection Agency.

Application for Pesticide Dealers License; Guam Environmental Protection Agency. Any person engaged in the distribution and sale of restricted pesticides are required by law (P.L. 14-22) to obtain a yearly license from GEPA which expires December 31 of each year.
Available: Guam Environmental Protection Agency.

Compilation of Restricted Use Pesticides (RUP's) Data; Guam Environmental Protection Agency; Annually. The data presented in this report provides a brief summary of the type and volume of restricted use pesticides applied, by geographical site.
Available: Guam Environmental Protection Agency.

RAISING LIVESTOCK

Slaughterhouse Feasibility Study; Samuel A. Lee and Jack T. Ishida, for Department of Commerce; April 1980. Reviews and analyzes the "Proposed Slaughterhouse Facility, Guam, U.S.A.: A Study of Feasibility" by Slaughterhouse Inc., Agana, Guam. This study assesses the economic feasibility of constructing a slaughterhouse for all livestock, including cattle, hogs, and poultry.
Available: Bureau of Planning Library.

Swine Management, Special Requirements for Sows; Agricultural Experiment Station, College of Agriculture and Life Sciences, Publication No.5, University of Guam; Undated pamphlet. Discusses gilt replacement, breeding, gestation, farrowing, lactation, young pigs, and feed requirement.
Available: Bureau of Planning Library.

Effect of Graded Levels of Coconut Meal on Performance of Growing Pigs; Anastacio L. Palafox, Agricultural Experiment Station, College of Agriculture and Life Sciences, Technical Report No. 23, University of Guam; 1984. A report summary of experiments to determine the effect of dietary coconut meal on body weight, feed consumption, and efficiency of growing pigs.
Available: Bureau of Planning Library.

Slaughterhouse Technical Report; Granja Blanca (Piggery) Inc.; 1984. A report on the economic feasibility of setting up a small level slaughtering facility on Guam.
Available: Bureau of Planning Library.

Cost and Returns of Hog Production on Guam; Margaret Weidman and Manuel Dugvies, Agricultural Experiment Station, College of Agriculture and Life Sciences, University of Guam; 1987.
Available: Cooperative Extension Service, University of Guam.

AQUACULTURE AND MARICULTURE PLANS

A Study to Determine the Aquaculture Potentials of Guam; William J. Fitzgerald, Jr., Aquatic and Wildlife Resources, Department of Agriculture; July 1975. Discusses the construction and management of three earthen fish ponds, the stocking and harvesting dates and poundage, and the problems encountered in production. Eels, shrimp, oysters, and carp were grown and harvested.
Available: Bureau of Planning Library.

Aquaculture and Its Potential Environmental Impact on Guam's Coastal Waters; William J. Fitzgerald, for the Guam Coastal Management Program, Bureau of Planning; 1977. An analysis of the potential for various kinds of aquaculture development with discussion of developable species, environmental impact, and necessary water controls. Areas for potential aquaculture development are mapped.
Available: Bureau of Planning Library.

General Feasibility Analysis: Prawn Aquaculture on Guam; Aquatic Farms, Ltd., for the Department of Commerce; September 1978. Market analysis, hatchery requirements, and production economics are discussed. Grow-out sites are reviewed and recommendations made.
Available: Bureau of Planning Library.

Multiple-Use Options for a Prawn Hatchery in Guam; Aquatic Farms Ltd., for the Department of Commerce; August 1979. An expansion of the above report to evaluate other aquaculture species suitable for rearing at the proposed prawn hatchery facility, and to develop plans for a multi-species hatchery.
Available: Bureau of Planning Library.

Evaluation of Seaweed Mariculture Potential on Guam: 1. Ammonium Uptake By, and Growth of, Two Species of Graciliaria (Rhodophyta); Marine Laboratory, Technical Report No. 61, University of Guam; January 1980. An evaluation of the mariculture potential of seaweeds.
Available: Bureau of Planning Library.

Recommendations for an Aquaculture Financing Program for the Territory of Guam; Dr. C. Warner, for Department of Commerce; February 25, 1980. An identification and evaluation of various programs (federal, state, and local) for the financing of individual private aquaculture operations of 10 acres or less.
Available: Bureau of Planning Library.

The Potential Market for Aquaculture Products Produced on Guam; William J. Fitzgerald, Jr., for Department of Commerce; 1981. Analyzes the potential market for aquaculture products produced on Guam. This report briefly discusses the local market, the military market, and the foreign market separately. 11 p.
Available: Bureau of Planning Library.

An Introduction to Aquaculture on Guam: Prospects, Permits, and Assistance; William J. Fitzgerald, Department of Commerce, for Bureau of Planning; 1982. This informational brochure explains aquaculture prospects and opportunities, permits, and assistance available from agencies and associations involved in aquaculture on Guam.
Available: Bureau of Planning Library.

Aquaculture Development Plan for the Territory of Guam; William J. Fitzgerald, Department of Commerce; June 1982. Assesses aquaculture potential, identifies constraints and needs, and recommends government action to assist development of the industry. This plan addresses: the history and potential benefits from aquaculture development; local and federal aquaculture programs, including legislation regarding aquaculture; major development needs of the industry and the constraints to its development; and how the industry should be organized, including scenarios for the development of the industry.
Available: Bureau of Planning Library.

Potential and Procedure for Marketing Aquaculture and Fishery Products to the Military; William Fitzgerald and Ann Marie Punzal, Department of Commerce; 1983. An assessment of the potential market for aquaculture and other fishery products to the military installations on Guam.
Available: Bureau of Planning Library.

A Review of Aquaculture Activities in the Pacific Islands Region; Pacific Islands Development Program, University of Hawaii; 1984. An extensive review of aquaculture activities in the Pacific region by political entity. This report reviews aquaculture activities on Guam, including a general overview of past and recent activities, and a summary of seventeen species activities.
Available: Micronesian Area Research Center Pacific Collection.

An Assessment of the Production and Marketing of Aquaculture Products in the Western Region of the United States; West Coast Aquaculture Foundation; March 1984. Assesses the potential for establishment of aquaculture as a major industry in the Pacific and particularly in the regions which include California, Oregon, Washington, Hawaii and the United States-affiliated Pacific islands. Major constraints and recommendations for both marine and freshwater species for each region, state, or Territory is presented.
Available: Bureau of Planning Library.

Aquaculture Assessment Report (Final Report); K. Roger Uwate, Pacific Islands Development Program, University of Hawaii; 1984. Presents results of an extensive project on aquaculture. This report documents aquaculture-related activities in the region, provides case study examples of two projects, and examines extension and training activities. Advantages and disadvantages in the Pacific island region are discussed and general findings summarized. Recommendations are made based on extensive analysis of projects and their success rate.
Available: Micronesian Area Research Center Pacific Collection.

Production of Aquaculture Seed for Commercial Farms in Guam and the Western Pacific Region: Phase II; William Fitzgerald and Stephen Nelson, for the Center For Tropical and Subtropical Aquaculture; 1988. The proposed program would expand the aquaculture industry by producing seed stock to supply Guam aquaculture farms and the Western Pacific and diversify the aquaculture products available to the markets in the region.
Available: Bureau of Planning Library.

The Second International Symposium on Tilapia in Aquaculture; Pullin, Bhukaswan, Tonguthai, and MacClean (Eds.), Department of Fisheries, Thailand, and the International Center for Living Aquatic Resources Management P.I.; 1988. Summarizes research on tilapia and aquaculture management. Includes research on tilapia culture systems, management and production; tilapia genetics and reproduction, nutrition, physiology, biology and ecology, and the economics and socio-economics of tilapia farming.
Available: Micronesian Area Research Center Pacific Collection.

"Development of Aquaculture in the U.S.-Affiliated Islands of Micronesia"; Stephen G. Nelson, in Topic Reviews in Insular Resource Development and Management in the Pacific U.S.-Affiliated Islands, Barry Smith (Ed.), Marine Laboratory, University of Guam, (May 1988). Presents one of five papers on the study of renewable resource management for United States Insular Areas of the Pacific and Caribbean.
Available: Micronesian Area Research Center Pacific Collection

A Regional Survey of the Aquaculture Sector in the Pacific; Stephen Nelson, for the United Nations Development Programme, and Food and Agricultural Organization of the United Nations; 1989. Summarizes information on aquaculture in the Pacific region. This report includes a compilation of information on: the consumption of fish and shellfish and the regional markets; production of fish and shellfish in the region; local infrastructure; national infrastructure; national sector management policy and issues; regional sector management policy and issues; and references.
Available: Micronesian Area Research Center Pacific Collection.

Analysis of Financial Return from Aquaculture Under Different Culture Systems in Guam: A Decision Making Tool for Management; William Fitzgerald, Jr., Marine Laboratory, Technical Report No. 91, University of Guam; January 1989. Addresses the economics of aquaculture production on Guam, and illustrates the major components of information needed by a farmer to make rational decisions in the operation of an aquaculture farm.
Available: Bureau of Planning Library.

FISHERY MANAGEMENT AND DEVELOPMENT

Information Statement to Guam Economic Development Authority Concerning Deep-Water Shrimp Fishery; Michael Wilder, Marine Laboratory, University of Guam; February 1976. Presents the results of a feasibility study for trapping deep-water shrimp. This report briefly discusses species trapped, depth in feet, number of sets, total catch in pounds, and average catch per trap in pounds. 7 p.
Available: Bureau of Planning Library.

The Extent of Coral, Shell, and Algal Harvesting in Guam Waters; Steven E. Hedlund, Marine Laboratory, Technical Report No. 37, University of Guam, for the Guam Coastal Management Program, Bureau of Planning; July 1977. The scope of work for this report includes determining which species are being harvested and to what degree, locating and mapping where harvesting is being done, a review of existing laws and their enforcement, and recommendations regarding the protection of certain species. The report is divided into four sections: coral, shells, algae, and laws and their enforcement.
Available: Bureau of Planning Library.

Characteristics of Coral and Coral Dredging; B.R. Schlapak and John B. Herbich, for National Oceanic and Atmospheric Administration; June 1978. Evaluates coral dredging and its use as a construction material. This report evaluates eighteen kinds of coral in terms of engineering data, excavation data, coral reef formation, and distribution.
Available: Micronesian Area Research Center Pacific Collection.

Some Factors Affecting Household Consumption of Seafood and Fish Products on Guam; Dr. Paul Callaghan, College of Agriculture and Business, University of Guam, for Bureau of Planning; 1978. Consumer preference and behavior, ethnic differences in fish and seafood consumption, and some factors affecting household spending for fish and seafood products are analyzed.
Available: Bureau of Planning Library.

Marine Fisheries Development and Management on Guam: Its Current Status; Guam Coastal Management Program, Bureau of Planning; February 1979. A compilation of data regarding the current status of marine fishery-related interests, projects, and agency functions. Contains a review of policies related to fisheries development and the objectives of numerous agencies, commissions, and special interest groups.
Available: Bureau of Planning Library.

Fishing Rights in Guam: An Impact Report; Daljit Singh, Division of Business Research and Service, College of Business and Public Administration, Monograph Series No. 2, University of Guam; November 1979. Analyzes federal laws in regard to coastwise trade and the foreign fishing industry, and how those laws affect fisheries.
Available: Bureau of Planning Library.

Preliminary Summary of the Management and Development of Harvesting Sea Urchins on Guam; Bureau of Planning, for the Guam Marine Fisheries Advisory Council; December 1979. Addresses the feasibility of harvesting sea urchins commercially. 5 p.
Available: Bureau of Planning Library.

Economic Factors Associated With Tuna Transshipment at Guam Commercial Port; Barbara Simmons; University of Guam Special Project; 1980.
Available: Robert F. Kennedy Library, Special Project File, University of Guam

Overall Fishery Development and Management Program; Pacific Basin Development Conference; 1980. Outlines a plan to foster balanced fishery development in Guam and the Commonwealth of the Northern Mariana Islands. The plan lists more than 20 study and survey proposals to be conducted over a period of from 1 to 4 years. The outline for each states the problem, plan of action, end product, benefits, schedule, estimated cost, constraints, and lead agency. Proposals include tuna transshipment, tuna cannery, tuna longlining, aerial surveys of tuna movement, seamount groundfish exploration, bottom fish survey, production of mollies for pole-and-line bait, innovative small boat fishing methods, fish drying and smoking, study of routes carrier and freight structures for importation of U.S. hulls, survey of Guam black corals, research on mollusks, aquaculture master plan for Guam, Japanese market analysis, and others.
Available: Bureau of Planning Library.

Preliminary Summary of the Management and Development of Harvesting Reef Fish on Guam; Bureau of Planning, for Guam Marine Fisheries Advisory Council; February 1980. Recommends guidelines and policies for the preservation of reef fish. 19 p.
Available: Bureau of Planning Library.

Management and Development Aspects of the Spiny Lobster Fishery on Guam, Preliminary; Bureau of Planning, for the Guam Marine Fisheries Advisory Council; February 1980. Discusses the feasibility of commercially developing the spiny lobster fishery. Addresses concerns and suggests policies.
Available: Bureau of Planning Library.

Preliminary Summary of the Management and Development of Harvesting Aquarium Fish on Guam; Guam Coastal Management Program, Bureau of Planning, for the Guam Marine Fisheries Advisory Council; March 1980. Investigates the harvesting of the smaller species of reef fish by commercial and private aquarium interests. This report discusses current harvesting practices and legal regulations, recommends management policy, and proposes revised regulations. 23 p.
Available: Bureau of Planning Library.

An Analysis of Tuna Transshipment at the Commercial Port of Guam; Paul Callaghan and Barbara Simmons, Marine Laboratory, Technical Report No. 65, University of Guam; May 1980. Presents economic data on transshipment of frozen tuna from U.S. and foreign flag vessels in Apra Harbor. Primary economic benefits accruing to the island from transshipment, evaluation of tuna transshipment efficiency under existing procedures, and recommendations to improve and encourage the growth of tuna transshipment were determined from analysis of the data.
Available: Bureau of Planning Library.

A Marine Biological Assessment of the Tagachan Point Rimmed-Terrace Pools as a Prerequisite to Controlled Field Chlorination Experiment to Evaluate the Effects of Chlorine on Some Tropical Marine Organisms; Bruce R. Best; August 1980. This is a project proposal to do research on the effect of chlorine on tropical reef organisms. The focus of the report is directed toward the effects of the illegal use of chlorine bleach on reef-flat organisms.
Available: Guam Environmental Protection Agency Library.

Recommended Institutional Arrangements to Improve United States Participation in the Development of Pacific Basin Fisheries Resources; John P. Harville, Pacific Marine Fisheries Commission; October 17, 1980. Recommendations address the structure and function of institutional organizations at the national, local, and regional levels. Field investigations and interviews were held in Hawaii, American Samoa, Guam, and the Commonwealth of the Northern Mariana Islands.
Available: Bureau of Planning Library.

Fisheries Development and Management Plan; Steven S. Amesbury and Paul Callaghan, for the Guam Marine Fisheries Advisory Council; May 1981. Addresses reef fisheries, small boat fisheries, large-scale harvesting, and transshipment and processing activities. This report discusses management objectives, constraints, recommendations, and program implementation. The introduction consists of a history of fisheries on Guam and the current level of fisheries activity. Data was obtained to determine the cultural and economic importance of fisheries: specifically, that related to estimated household and commercial consumption, and estimated number, type and value of full-time commercial fishing vessels.
Available: Bureau of Planning Library.

Source Document for the Final Fishery Management Plan of the Spiny Lobster Fisheries of the Western Pacific Region; Western Pacific Regional Fishery Management Council; May 1981. Contains technical discussion, tables and appendices not found in the April 1982 Final Combined Fishery Management Plan, below. This document includes statutory and administrative requirements, the NMFS Biological Opinions for the Draft FMP, and comments and responses to the draft FMP.
Available: Bureau of Planning Library.

Final Fishery Management Plan for Pacific Billfish Fisheries of the Western Pacific Region; Western Pacific Regional Fishery Management Council; August 1981. Proposes a conservation and management program for harvesting billfish in the U.S. fishery conservation zone of the Central and Western Pacific Ocean. This voluminous plan presents management measures and reporting requirements to regulate the take of billfish by foreign longline vessels in the fishery conservation zone surrounding Hawaii, Guam, and American Samoa. This plan was disapproved by the National Marine Fisheries Service in January 1982. A revised draft was submitted in April 1985. 474 p., tables.
Available: Bureau of Planning Library.

Methods Used by the South Pacific Commission for the Survey and Assessment of Skipjack and Baitfish Resources; R.E. Kearney, South Pacific Commission Tuna and Billfish Assessment Programme; 1982. An extensive summary of the largest research undertaking in the world, designed specifically to study skipjack and baitfish resource: the Skipjack Survey and Assessment Programme (1977-1981). This report examines the various methods used to produce skipjack and baitfish resource assessments, to be used to provide development and management options for various governments of the region.
Available: Micronesian Area Research Center Pacific Collection.

The Pacific Tuna Development Foundation 1974-1985; Pacific Tuna Development Foundation; 1982. A summary of past and proposed projects related to development of tuna and other latent fish resources in the region. Programs of research, exploration, development, marketing and training are discussed. Several projects on Guam tuna fisheries are in this document.
Available: Micronesian Area Research Center Pacific Collection.

Analysis of an Exemption from the Liquid Fuel Tax for Tuna Vessels Home Porting in Guam; William J. Fitzgerald, Department of Commerce; March 1982. Analyzes waiving or decreasing the liquid fuel tax as a possible incentive to fishing fleets to use Guam as a tuna transshipping base.
Available: Bureau of Planning Library.

Final Combined Fishery Management Plan, Environmental Impact Statement, Regulatory Analysis and Draft Regulations for the Spiny Lobster Fisheries of the Western Pacific Region; Western Pacific Regional Fishery Management Council; April 1982. Creates a management system for spiny lobster fisheries in the Fishery Conservation Zone of the Western Pacific Region between 3 and 200 nautical miles off the Hawaiian Islands, American Samoa, and Guam. This plan includes biological, economic, environmental and social information on the lobster stocks involved, their environment, and the fishing industry that harvests them. Most technical information and analyses are located in the May 1981 source document, above.
Available: Bureau of Planning Library.

Review of the Fishery Conservation and Management Act and the Shipping Laws (Title 46 U.S. Code); U.S. Department of the Interior; June 28, 1982. Presents a series of memoranda concerning the application of the Fishery Conservation and Management Act and the Shipping Laws to the U.S. Territories and the Trust Territory of the Pacific Islands. This report discusses each law separately, stating the subject (law name and number), purpose of the law, Territorial application, recommendation, and discussion. Of special interest to Guam is the Fishery Conservation and Management Act, Vessel Documentation, and the Coastwise Laws (including the Jones Act).
Available: Bureau of Planning Library.

Evaluation of Insurance and Loan Programs Available to the Guam Fisheries; William Fitzgerald, Department of Commerce; December 1982. Reviews the loan programs currently available to commercial fishermen for the purchase of vessels and equipment. The availability of vessel insurance is also discussed. Recommendations and alternatives are provided.
Available: Bureau of Planning Library.

A Summary of Guam's Fishing Laws and Regulations; Division of Aquatic and Wildlife Resources, Department of Agriculture, for the Bureau of Planning; 1983. This brochure outlines laws and regulations pertaining to the various fishing methods and the taking of specific marine resources, including coral and coconut crabs.
Available: Bureau of Planning Library.

Central and Western Pacific Regional Fisheries Development Plan, Vol. 4: Regional Plan; AECOS, Inc./Oceanic Resources, Inc., for Pacific Basin Development Council; May 1983. Recommends a series of actions, projected budgets, and approximate timetables for implementation of fisheries development in American Samoa, Guam, Northern Mariana Islands, and Hawaii. This plan evaluates factors restricting fisheries development and recommends action programs to overcome these constraints.
Available: Bureau of Planning Library.

Central and Western Pacific Regional Fisheries Development Plan, Vol. 2: Guam; AECOS, Inc./Oceanic Resources, Inc., for Pacific Basin Development Council; July 1983. Discusses the current status and potential of Guam's fisheries resources. This plan includes the benefits of and constraints to fisheries development, and recommends actions to remove constraints. Tables and figures are provided.
Available: Bureau of Planning Library.

Assessment of the Skipjack and Baitfish Resources in the Central and Western Tropical Pacific Ocean: A Summary of Skipjack Survey and Assessment Programme; R.E. Kearney, South Pacific Commission; 1983. A concise research and data summary on the Skipjack Survey and Assessment Programme (1977-1981). The development and objections of the program are outlined, along with methods used, results, field activities, expenditures and detailed findings (migration of skipjack, population, assessment of resources, growth) and overall conclusions of this program.
Available: Micronesian Area Research Center Pacific Collection.

Assessment of the Bottomfish Fisheries of the Western Pacific Region; Western Pacific Regional Fishery Management Council; January 1983. Assesses the need for a bottomfish management plan. This study assesses the risk of bottomfish stock reductions in the context of present and potential development opportunities; evaluates whether the fishery needs management through regulations; considers the extent to which the social and economic benefits of the fishery are or may be jeopardized by over-fishing; and considers the distribution of bottomfish habitat with respect to the island government jurisdictions in Territorial waters and federal jurisdiction within the U.S. Fishery Conservation Zone. 246 p.
Available: Micronesian Area Research Center Pacific Collection.

Market for Fresh or Frozen Whole Fish on Guam; Robert F. Myers, Paul Callaghan and William J. Fitzgerald, Marine Laboratory, Technical Report No. 84, University of Guam; June 1983. Develops baseline data on the marketing structure of whole fish on Guam. This study estimates the species, quantity, and value of imported fish. An enumeration of major import, wholesale, and retail firms is presented, along with a brief description of marketing channels. Subjects which deserve further study are noted, and recommendations are made regarding procedures for continued data collection and monitoring of the whole fish market. 50 p.
Available: Bureau of Planning Library.

An Assessment of Skipjack Resources in the Central and Western Pacific by Estimating Standing Stock and Components of Population Turnover from Tagging Data; Kleiber, Argue and Kearney, South Pacific Commission; 1983. This document assesses the population and dynamics of skipjack resources relative to increased surface fisheries in the Central and Western Pacific region. The assessment program uses tagging and tagging recovery methods, and analyzes the resources via a tagging attrition model. Extensive analysis done. Good reference regarding fishing potential and renewable resources.
Available: Micronesian Area Research Center Pacific Collection.

Summary of Environmental and Fishing Information on Guam and the Commonwealth of the Northern Marianas Islands: A Review of Plankton Communities and Fishery Resources; Richard N. Uchida, National Oceanic and Atmospheric Administration, Southwest Fisheries Center; November 1983. A summary of a research investigation addressing the problem of determining the potential for development of crustacean, bottomfish, seamount groundfish, benthopelagic and pelagic resources over the inner and outer shelves, shelf edge, reefs and slope zones of the Mariana islands, and adjacent seamounts. Provides a comprehensive overview of the environmental and fishery information published to-date. This study discusses historical fishery development in the pre- and post-World War II eras and presents an overview of the status of the stocks of fish, shellfish, corals and algae with respect to their development potential. This study also incorporates discussions on unique and endangered species, and ciguatera poisoning.
Available: Micronesian Area Research Center Pacific Collection.

An Assessment of the Skipjack and Baitfish Resources of Northern Mariana Islands, Guam, Palau, Federated States of Micronesia, and Marshall Islands; South Pacific Commission; 1984. As part of a Pacific-wide Skipjack Survey and Assessment Program, this plan asses-ses the resources of Micronesian island areas for skipjack fisheries economic development. Report includes extensive analysis regarding abundance of skipjack tuna in the region and possibilities for fisher-ies management strategies.
Available: Bureau of Planning Library.

Status of Fisheries and Assessment of Development and Management Needs for Selected Crustacean Species in the Western Pacific Region - Final Report; Western Pacific Regional Fishery Management Council; 1984. An assessment of slipper lobsters, deepwater crabs and deepwater shrimps which may have commercial potential. The assessment is designed to guide research and development activities toward issues which are critical to achievement of optimal yield, while avoiding over-fishing. Each species is examined in detail regarding biological data, resource distribution and potential, habitat protection, fishery development potential, and an overall summary of critical issues and information needs (management/ development).
Available: Micronesian Area Research Center Pacific Collection.

A Parameter for Estimating Potential Interaction Between Fisheries for Skipjack Tuna (Katsuwonus Pelamis) in the Western Pacific; South Pacific Commission Tuna and Billfish Assessment Programme; 1984. A study which examines the potential for interaction between fisheries resulting from rapid changes in the nature and intensity of fisheries in the region. This report provides resource managers with methods (mainly tag recapture) to evaluate these interactions in light of various resource management techniques.
Available: Micronesian Area Research Center Pacific Collection.

Results of the Resource Assessment Investigation of the Mariana Archipelago; National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southwest Fisheries Center; 1985. A report summary of a five-year program to qualify the distribution and sustainable yield of insular fishery resources with commercial potential in the Mariana archipelago. Extensive data analysis and tabular information provided.
Available: Micronesian Area Research Center Pacific Collection.

Summary of Draft Fishery Management Plan for the Fisheries for Billfish and Associated Species in the United States Fishery Conservation Zone of the Western Pacific Region; Western Pacific Regional Fishery Management Council; 1985. A plan to establish conservation and management measures applicable to domestic and foreign fishing for billfish, mahimahi, wahoo, and oceanic sharks in the fishery conservation zone in United States-affiliated Pacific islands.
Available: Bureau of Planning Library.

Magnuson Fishery Conservation and Management Act (MFCMA) Operations Handbook; National Oceanic and Atmospheric Administration, National Marine Fisheries Service, U.S. Department of Commerce; March 1985. A working manual for regional fisheries management councils regarding implementation of the MFCMA in terms of fishery policy.
Available: Bureau of Planning Library.

Revised Draft Fishery Management Plan - For the Fisheries for Billfish and Associated Species in the U.S. Fishery Conservation Zone of the Western Pacific Region; Western Pacific Regional Fishery Management Council; April 1985. A plan for conservation and management measures applicable to domestic and foreign fishing for billfish, mahimahi, wahoo, and oceanic sharks in the fishery conservation zone (FCZ) around Pacific U.S.-affiliated areas. Extensive analysis and tabular summaries. The plan proposes strengthening of State and Territorial reporting requirements and data analysis and sampling methods to better monitor domestic (local) participation in local fisheries relative to conservation and species management. An earlier version of a FMP was submitted to the National Marine Fisheries Service in August 1981 and was disapproved in January 1982.
Available: Micronesian Area Research Center Pacific Collection.

Options for U.S. Fisheries Investment in the Pacific Islands; David J. Doulman, East-West Center, Pacific Islands Development Program; 1986. An assessment of how U.S. investors might participate in fisheries joint-venture or other investment arrangements. A review of fisheries resources and patterns of exploitation is included, along with investment options.
Available: Micronesian Area Research Center Pacific Collection.

The Domestic Tuna Industry in the Pacific Islands Region; David J. Doulman and Robert E. Kearney, East-West Center, Honolulu, Hawaii, Pacific Islands Development Program; 1986. A comprehensive study of the tuna industry in the Pacific islands region focusing on regional and international issues affecting the industry from the perspective of all island countries. Presents an overview of tuna resources and the domestic tuna fishery and industry in the region. Includes status of tuna stocks, artisanal production, historical presentation of aggregated commercial catch data, fleets by gear types, transhipment and tuna processing facilities, and multinational operations.
Available: Micronesian Area Research Center Pacific Collection.

Fisheries Development Priorities and Three-Year Program for the Central, Western and South Pacific; Pacific Fisheries Development Foundation; 1986. A plan describing the background of the Pacific Fisheries Development Foundation, the partnership approach to fisheries development, the need for development priorities, how these were established, their funding, and the ranking of priorities by projects funded in the region. Project descriptions are included as part of this updated three-year plan.
Available: Micronesian Area Research Center Pacific Collection.

Fisheries Research Needs in the South Pacific - Information Required for Effective Management and Development of the Fisheries of Island States of the South Pacific; Semisi T. Fakahau and Michael P. Shepard; 1986. Describes a fisheries research activities conducted in the South Pacific on a national and regional basis. This study explores requirements for additional research (indicating priorities), and identifies requirements for assistance to carry out such research.
Available: Micronesian Area Research Center Pacific Collection.

Combined Fishery Management Plan, Environmental Assessment and Regulatory Impact Review for the Bottomfish and Seamount Groundfish Fisheries of the Western Pacific Region; Western Pacific Regional Management Council; February 1986. Comprehensive study designed to establish a framework for managing the bottomfish fisheries within the U.S. Fishery Conservation Zone around Hawaii, American Samoa, and Guam, and the seamount groundfish fisheries of the Hawaiian Islands. This plan addresses fish stocks and harvesting and marketing practices of bottomfish fishery.
Available: Micronesian Area Research Center Pacific Collection.

Feasibility of a Fish Canning Operation to Supply Regional Consumer Needs in the Western Pacific Island States; Paul H. Paterson and Charles J. Pecknam; December 1986. A feasibility study which assesses tuna resources, market review, infrastructure, the tuna canning process, productivity expectations, plant requirements, and economics of establishing and operating canneries.
Available: Bureau of Planning Library.

Non-Commercial Production and Distribution in the Guam Fishery, Final Report; Kenneth E. Knudsen, Micronesian Area Research Center, University of Guam; May 1987. Analyzes non-commercial and concomitantly commercial fishing on Guam. This detailed lengthy and descriptive report overviews historic patterns of fishing on Guam, and examines the off-shore and inshore fisheries. Extensive reviews of the Guam fishery include detailed examinations of seasonal variation, work activities, comparative activities, off-shore and inshore yields, and catch analyses. A summary overview and socio-economics of the overall Guam fishery is provided, including socio-economic characteristics of fishermen and their patterns of activities relative to indigenous fishing practices, commercial vs. non-commercial fishing, and other factors. Numerous tables and figures are provided.
Available: Bureau of Planning Library.

(Draft) Amendment 1 and Environment Assessment for the Management Plan for the Precious Coral Fisheries of the Western Pacific Region; Western Pacific Regional Fishery Management Council; 1988. A report on management, policy, and environmental issues relative to harvesting of deep water precious corals. Describes the species of concern and their characteristics, summarizes their distribution in the Exclusive Economic Zone, and lists existing management measures. Indigenous fishing rights are also discussed.
Available: Micronesian Area Research Center Pacific Collection.

"Feasibility Study for the Establishment of Marine Conservation Areas"; Division of Aquatic and Wildlife Resources, Job Progress Report, Department Agriculture, in Aquatic and Wildlife Resources Annual Report, (1988). Studies the feasibility of establishing Marine Conservation Areas to provide a refuge for over-exploited recreationally important fish.
Available: Bureau of Planning Library.

Fisheries: A Key Link in the Pacific Island Chains; Pacific Fisheries Development Foundation; 1988. A statistical summary of activities, projects, and goals of the Pacific Fisheries Development Council, which is a council formed by the Western Pacific Regional Fishery Management Council created by the Magnuson Fishery Conservation and Management Act (MFCMA) of 1976. The MFCMA established exclusive United States jurisdiction over fish (except migratory species) in federal waters of the Exclusive Economic Zone). The Council governs the Exclusive Economic Zone around American Samoa, Guam, Hawaii, and the Northern Marianas.
Available: Bureau of Planning Library.

Topic Reviews in Insular Resource Development and Management in the Pacific U.S.-Affiliated Islands; Barry Smith (Ed.), Marine Laboratory, University of Guam; May 1988. Five review papers on the study of renewable resource management for United States Insular Areas of the Pacific and Caribbean. Topics include:

"The Role of Marine Resource Tenure Systems (TURFs) in Sustainable Nearshore Marine Resource Development and Management in U.S.- Affiliated Tropical Pacific Islands"; Robert E. Johannes.

"The Development and Management of Nearshore Fisheries in the U.S.-Affiliated Pacific Islands"; Paul Callaghan.

"Development of Aquaculture in the U.S.-Affiliated Islands of Micronesia"; Stephen G. Nelson.

"Development and Management of Nonfood Marine Resources in the U.S.- Affiliated Islands of the Pacific"; Barry D. Smith.

"Case Studies of the Impacts of Introduced Animal Species on Renewable Resources in the U.S.-Affiliated Pacific Islands"; Lucius G. Eldredge.

Available: Micronesian Area Research Center Pacific Collection.

First South Pacific Albacore Research Workshop (1989) and Second South Pacific Albacore Research Workshop (1979); South Pacific Commission; 1986,1989. Reviews existing albacore fisheries of the South Pacific region and identifies types and availability of albacore fishery statistics. This report examines research and findings on albacore tuna, identifies and assigns priorities for future research on albacore, and provides for coordination of research on albacore tuna fish and fisheries in the region.
Available: Micronesian Area Research Center Pacific Collection.

Workshop on Pacific Inshore Fishery Resources; South Pacific Commission, Inshore Fisheries Research Project; 1988. A report on workshop activities to support and strengthen the capacities of South Pacific Commission countries to collect and interpret data relevant to the management of their inshore fishery resources. Summaries of discussions of presentations are provided. Topics include research mainly on coastal inshore fish, crustaceans, mollusks, and other reef dwellers, but information on various species and coastal management is provided.
Available: Micronesian Area Research Center Pacific Collection.

Pacific Fisheries Development Foundation - Proceedings of the 6th Annual Fishery Officers Workshop, Updates on Current Projects, October 1988. A summary of project updates from each regional office.
Available: Bureau of Planning Library.

The Marketing of Marine Products from the South Pacific; University of the South Pacific; 1989. A compilation of research articles on the development of marine products exports. An overview is provided along with a summary of the current status of marine products marketing. Articles include tuna related topics; miscellaneous marine products (clams, coral, beche-de-mer, shells, aquarium fish, pearl shell); and overall chilled fish and marketing strategies/information.
Available: Micronesian Area Research Center Pacific Collection.

South Pacific Albacore Observer Programme 1988-1989; John Hampton, Talbot Murray and Peter Sharples, South Pacific Commission Tuna and Billfish Assessment Programme; 1989. This technical study provides information on background on albacore fisheries; the objectives of the observer program; an operational summary of the two observer cruises undertaken; and the results and conclusions of the observations relative to albacore fisheries.
Available: Micronesian Area Research Center Pacific Collection.

Fresh Tuna Longline Transshipment Study: Phase I Fishery Description; Kevin Williams; April-May 1989. Describes the tuna fishery industry in Guam. This study includes the organizational structure of the industry, legal and regulatory statutes that pertain to off-loading, catch composition/landings/disposition, and the operations at the port on entry and exit.
Available: Bureau of Planning Library.

Native Fishing Rights and Limited Entry in Guam; Judith Amesbury and Rosalind Hunter-Anderson, for the Western Pacific Regional Fishery Management Council; September 1989. Presents the results of a study to collect, catalog, and authenticate evidence which could provide a basis for giving preferential treatment or privileged status to fishermen who are descendants of the original inhabitants of Guam. This report explores the advantages and disadvantages of limited entry compared to more traditional management measures. This study provides a brief overview of the prehistory and history of Guam, facts gathered for the four evidence areas with interpretation and evaluation, and a brief summary of answers to questions posed in each evidence area.
Available: Bureau of Planning Library.

Annual Report: Bottomfish and Seamount Groundfish Fisheries of the Western Pacific Region; Western Pacific Regional Fishery Management Council; Annually, latest June 1989. Addresses bottomfish and seamount groundfish fisheries in the Western Pacific, including Hawaii, American Samoa, Guam, and Commonwealth of the Northern Mariana Islands. This study documents changes and problems in the fishery, examines solutions to existing or potential problems, and develops recommendations for action. Tables and figures are included.
Available: Bureau of Planning Library.

Job Progress Reports, FY 1982-FY 1988; Division of Aquatic and Wildlife Resources, Department of Agriculture; Annually. Reports on the progress of many Guam fisheries investigations and fisheries development projects. Studies include inshore and offshore fishery censuses; reef fish population investigation; studies of recreational important reef fish; pelagic fish feeding study; Masso River development; and the construction of a fish aggregating device.
Available: Bureau of Planning Library.

"Fisheries Surveys"; Division of Aquatic and Wildlife Resources, Department of Agriculture, in Aquatic and Wildlife Resources Annual Report, (annually). An offshore fisheries survey is conducted on four randomly selected days per month. A standard census form is used to collect the following data: boat number, date, landing, fishing area, time spent fishing, number of fishermen, gear (trolling, bottom fishing, spear fishing), total number of fish, total weight, number of species, wind direction, wind speed, wave direction, wave height, weather description, and names of species of fish caught by number and weight. This form has been computerized. Data is tabulated monthly. Inshore fishery surveys are done in selected areas for all inshore fishing methods, including hook and line fishing, cast netting, gill netting, surround netting, and spear fishing. Data is tabulated by participation, effort, catch per unit effort, and catch for the five methods by year. Aerial surveys are conducted monthly in order to evaluate inshore fishing activity for the whole island. The surveys yield data on fishermen participation, fishing methods employed, and locations used for fishing. Additional data is taken by aerial surveys on offshore fishing activity, the numbers of porpoises, sharks and turtles observed in the near-shore surface waters just beyond the reef, and on coastal non-fishing activities.
Available: Division of Aquatic and Wildlife Resources, Department of Agriculture.

Regional Tuna Bulletin; South Pacific Commission Tuna and Billfish Assessment Programme; 1988 to present. A quarterly bulletin presenting information on tuna fisheries in the region. Specifically, the most recent available data on catch rates, and catch and effort logsheet data provided by local fishing companies and associations in the region.
Available: Micronesian Area Research Center Pacific Collection.

BIOLOGICAL RESOURCES

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AQUATIC AND WILDLIFE RESOURCES MANAGEMENT

Literature Review and Synthesis of Information on Pacific Islands Ecosystems; Fish and Wildlife Service, U.S. Department of the Interior; October 1979. A collection of ten papers describing and synthesizing facets of extant ecological knowledge about Pacific islands under U.S. jurisdiction. The papers cover topics of interest and relevance to wildlife management and protection of endangered species: wildlife refuges and endangered species; terrestrial botany; birds; freshwater macrofauna; marine plants; coral reefs; marine macroinvertebrates, excluding corals and reef building organisms; reef and shore fishes; harvested marine resources; and socio-economics of Pacific islands. The study includes a large (15,000 citations) indexed and computerized reference system to natural resource literature pertaining to Hawaii, Guam, American Samoa, and the Trust Territory. The data base is available for public use. Information about access can be obtained from the Fish and Wildlife Service Regional Office in Portland, Oregon; Attention: Biological Services.
Available: Micronesian Area Research Center Pacific Collection.

Man-Wildlife Relationship on Guam; Michael E. Wheeler; 1980. A paper presented at the Western Section meeting of the Wildlife Society. A good overview of the problems facing wildlife on Guam. Includes habitat types, historical perspective, status of deer and carabao, the impact of predation and pesticides on wildlife, the status of wetland species, the impact of habitat destruction by clearing and fire, and management actions taken to protect vanishing species.
Available: Bureau of Planning Library.

Making Better Use of Existing Knowledge in Managing Pacific Island Reef and Lagoon Ecosystems - South Pacific Commission Topic Review No. 4; Robert Johannes, South Pacific Commission; 1981. Presents a review of the management of reef and lagoon resources in the region, with recommendations for improvements in both planning for and devising action strategies.
Available: Micronesian Area Research Center Pacific Collection.

Mangrove Resources and Their Management in the South Pacific - South Pacific Commission Topic Review No. 5; Graham Baines, South Pacific Commission; 1981. Presents an overview of mangrove ecosystems in the region, the use of mangroves, and threats to these ecosystems (overexploitation, pollution, reclamation).
Available: Micronesian Area Research Center Pacific Collection.

Area Strategy Plan: Central-Western Pacific Islands; U.S. Fish and Wildlife Service; April 1982, draft. A strategy plan for the conservation of the fish and wildlife resources of the Pacific islands, including Guam. Chapters on migratory birds, endangered species, and fisheries resources discuss their status and distribution, Fish and Wildlife Service policy, area priorities, area objectives, problems affecting objective attainment, and strategies.
Available: Bureau of Planning Library.

Coral Reef Researchers: Pacific; Compiled and edited by L.G. Eldredge, Marine Laboratory, University of Guam, for the United Nations Environmental Programme; 1984. Compiles information on Pacific coral reef researchers. This directory lists the names, addresses, and details of the researchers' interest, in alphabetical order by name. It also has indexes for specific interest, taxonomic group, geographic area of concern, and residence area.
Available: Micronesian Area Research Center Pacific Collection.

"Guam: Paradise Lost for Wildlife"; Julie A. Savidge, Biological Conservation, XXX (1984), 305-317. Discusses wildlife problems on the island of Guam. This article cites over-exploitation of native natural resources; introduced plants, mammals, reptiles, and possibly disease; intensive coral and shell collecting; and habitat destruction. Recommendations are made for improving monitoring, legal protection, and public awareness.
Available: Bureau of Planning Library.

Ecological Interactions Between Tropical Coastal Ecosystems; United Nations Environmental Programme; 1985. A summary of information on ecological interactions between tropical coastal ecosystems, and a review of management of and policies for research and management of tropical coastal ecosystems. Ecological interactions between mangrove, seagrass beds and coral reefs are examined and management issues are discussed.
Available: Micronesian Area Research Center Pacific Collection.

"Case Studies of the Impacts of Introduced Animal Species on Renewable Resources in the U.S.-Affiliated Pacific Islands;" Lucius G. Eldredge, in Topic Reviews in Insular Resource Development and Management in the Pacific U.S.-Affiliated Islands, Barry Smith (Ed.), University of Guam, (1988). Presents one of five papers on renewable resource management for the U.S. Insular Areas of the Pacific and Caribbean
Available: Micronesian Area Research Center Pacific Collection.

"Coordination of Guam's Fish and Wildlife Programs"; Division of Aquatic and Wildlife Resources, Department of Agriculture, in Aquatic and Wildlife Resources Annual Report, (1988). Reports on the efforts of the Division to plan, coordinate, supervise, and administer all fish and wildlife restoration programs.
Available: Bureau of Planning Library.

"Technical Guidance to Projects Affecting Guam's Fish and Wildlife Resources"; Division of Aquatic and Wildlife Resources, Department of Agriculture, in Aquatic and Wildlife Resources Annual Report, (1988). The rapid development of Guam's economy has placed increasing demands upon Guam's natural resources. To help minimize long term adverse impacts of urbanization, the Division of Aquatic and Wildlife Resources (DAWR) has taken an active role in the area of technical guidance. Numerous development plans, impact statements, and permit applications have been submitted to DAWR for review. Field investigations have been conducted in many cases as a part of the review process. Specific technical assistance activities are included in this report.
Available: Bureau of Planning Library.

Division of Aquatic and Wildlife Resources Annual Report; Department of Agriculture; Annually since 1976. A summary of the Division's programs, including fisheries studies and investigations, aquaculture, wildlife investigations and studies, and endangered species. Law enforcement activities regarding permits and compliance with fish and wildlife protective laws are also summarized.
Available: Division of Aquatic and Wildlife Resources, Department of Agriculture.

WILDLIFE

Summary of the Insects and Flora of Guam; Samuel Beller; August 1948. Summary listing of ferns and flowering plants of Guam, insects of economic importance associated with these plants, and other insect hosts. Provides a systematic arrangement of plants and animals under the respective order, family, and genus.
Available: Micronesian Area Research Center Pacific Collection.

Animal and Plant Names of the Mariana Islands; Fannie C. Goo and Albert H. Banner; August 1963. Glossary of native and scientific names of plants and animals in the Mariana Islands.
Available: Micronesian Area Research Center Pacific Collection.

"List of Endangered and Threatened Wildlife and Plants"; Federal Register, XLIV:12 (January 17, 1979), 3637-3654. A list of all endangered and threatened animal species up to 1979. Includes common and scientific names, known distribution, portion of range threatened, status, and the year each animal was listed.
Available: Division of Aquatic and Wildlife Resources, Department of Agriculture.

"Endangered and Threatened Wildlife and Plants"; Federal Register, XLIV:98 (May 18, 1979), 29128-29130. A review of the status of ten birds and two mammals from Guam.
Available: Division of Aquatic and Wildlife Resources, Department of Agriculture.

The Fauna of Guam; Division of Aquatic and Wildlife Resources, Department of Agriculture; 1981. Compiles data on Guam's fauna. This report includes a checklist of terrestrial vertebrates and selected terrestrial invertebrates of Guam. Selected species of rare or endangered species are discussed individually: distinguishing characteristics, present distribution, former distribution, status, estimated numbers, breeding rate in the wild, reasons for decline, protective measures already taken, measures proposed, number in captivity, breeding potential in captivity, and references.
Available: Department of Parks and Recreation Library.

Endangered Flora of Guam; Author not stated; Not dated. Describes two endangered plants: Heritiera and Tree-Fern. This report discusses their distinguishing characteristics, present distribution, former distribution, status, estimated numbers, natural regeneration, reasons for decline, protective measures already taken, measures proposed, remarks, and references.
Available: Department of Parks and Recreation Library.

"Management of Feral and Exotic Game Species on Guam"; Paul J. Conry, 1988 Transactions of the Western Section of the Wildlife Society, XXIV (1988). Discusses the activities of six introduced species on Guam relative to recreational hunting and forest resource management. This article summarizes the habits and habitats of feral pigs, sombar deer, feral water buffalo, feral goats, Black Francolin, and the Philippine Turtle Dove.
Available: Bureau of Planning Library.

TERRESTRIAL WILDLIFE

The Biology of the Guam Deer; Division of Aquatic and Wildlife Resources, Technical Report No. 3, Department of Agriculture; June 1979. This study analyzes data from eighteen years of research on the Guam deer (1961-1978). Data is included on morphology, aging, reproduction, food habits, and behavior.
Available: Bureau of Planning Library.

Biological Studies on the Coconut Crab Birgus latro in the Mariana Islands; Steven S. Amesbury, Marine Laboratory, Technical Report No. 66, University of Guam; 1980.
Available: Marine Laboratory, University of Guam.

"Determination of Diet Quality of Guam Deer"; Division of Aquatic and Wildlife Resources, Department of Agriculture, in Aquatic and Wildlife Resources Annual Report, (1987). Presents the results of a study of diet quality of the Guam Deer. Establishes baseline data seasonally and between years; investigates seasonal variation in the nutrient quality of key deer forage plants; and investigates variation in the nutrient quality of individual deer diets. Body measurements and biological data are compiled for male and for female deer.
Available: Bureau of Planning Library.

"Population Size and Distribution of Wild Pigs on Guam"; Division of Aquatic and Wildlife Resources, Department of Agriculture, in Aquatic and Wildlife Resources Annual Report, (1988). Presents the results of a study to determine current population size and distribution of wild pigs on Guam, and to monitor trends. Hunter questionnaires provide estimates of total harvest and hunter effort.
Available: Bureau of Planning Library.

"Determination of Current Population Size and Distribution of Guam Deer"; Division of Aquatic and Wildlife Resources, Department of Agriculture, in Aquatic and Wildlife Resources Annual Report, (1988). Presents results of a study to determine the current size and distribution of the population of deer on Guam and to monitor population trends. Includes hunting statistics on deer and water buffalo.
Available: Bureau of Planning Library.

Ecology of the Wild (Feral) Pig (Sus Scrofa) on Guam; Paul Conry, Division of Aquatic and Wildlife Resources, Technical Report No. 7, Department of Agriculture; June 1989. Presents results of extensive research on the ecological characteristics of the wild (feral) pig on Guam. This report includes historical background, taxonomy and physical description, reproductive biology, behavior and social interaction, population characteristics, food habits, ecological impacts, and abundance estimates of pigs. A management strategy relative to hunting and protection of native flora and fauna and agricultural resources is provided.
Available: Bureau of Planning Library.

FRUIT BATS

The Current Status and Distribution of the Marianas Fruit Bat on Guam; Michael E. Wheeler and Celestino F. Aguon, Division of Aquatic and Wildlife Resources, Technical Report No. 1, Department of Agriculture, for the Guam Coastal Management Program, Bureau of Planning; September 1978. A study of the ecology and population of fruit bats with mapping of critical habitats. Data include flight speeds, sex ratio, color variation, foraging behavior, flight activity, roosting trees, and observations of the fruit bat colony.
Available: Bureau of Planning Library.

A Bibliography of the Fruit Bat Genus Pteropus; Michael E. Wheeler, Division of Aquatic and Wildlife Resources, Technical Report No. 4, Department of Agriculture; November 1979. Documents are arranged by subject: general, ecology and behavior, distribution, taxonomy and collections, physiology and reproduction, anatomy, biochemical studies, and diseases and parasites. Included is a key to the bats imported to Guam for food.
Available: Bureau of Planning Library.

"Movement Patterns and Habitat Utilization of Marianas Fruit Bats"; Division of Aquatic and Wildlife Resources, Department of Agriculture, in Aquatic and Wildlife Resources Annual Report, (1984). Presents the results of a study of the movement patterns and habitat utilization of the Marianas Fruit Bat.
Available: Bureau of Planning Library.

Current Research and Future Management of Marianas Fruit Bats (Chiroptera: Pteropodidae) on Guam; Gary J. Wiles, Division of Aquatic and Wildlife Resources, Department of Agriculture; 1986. Summarizes research regarding two species of fruit bats on Guam relative to conservation, management, and predation.
Available: Bureau of Planning Library.

Recovery Plan for the Marianas Fruit Bat and Little Marianas Fruit Bat; U.S. Fish and Wildlife Service; 1986. A recovery plan for two species of fruit bats native to Guam and the Mariana Islands. Describes both species, and discusses past and present status, habitat requirements, reasons for decline, and conservation measures already taken. A concise recovery plan is outlined.
Available: Bureau of Planning Library.

The Trade of Fruit Bats Pteropus spp. on Guam and Other Pacific Islands; Gary J. Wiles and Nicholas H. Payne; 1986. Describes the import trade in fruit bats on Guam, and documents the origin and number of bats shipped to the island for consumption. This paper discusses recent declines in some Pacific islands, and the negative impact that large scale commercial exploitation may have on fruit bat populations.
Available: Bureau of Planning Library.

"The Status of Fruit Bats on Guam"; Gary J. Wiles, Pacific Science, XLI:1-4, (1987). Presents research on the status of two species of fruit bats on Guam. Population decline is of primary concern. Historic and present abundance of these species is discussed, along with conservation recommendations.
Available: Bureau of Planning Library.

"Natural History, Biology, and Habitat Protection for the Marianas Fruit Bats"; Division of Aquatic and Wildlife Resources, Department of Agriculture, in Aquatic and Wildlife Resources Annual Report, (1988). Presents survey results and natural history studies of fruit bats on Guam and Rota, investigates illegal hunting of fruit bats on Guam, and provides information on bat colonies and fruit bat imports to Guam from other islands in Micronesia and the Pacific.
Available: Bureau of Planning Library.

"Population Estimates of Fruit Bats (Pteropus mariannus) in the Mariana Islands"; Gary J. Wiles, Thomas O. Lemke, Nicholas H. Payne, Conservation Biology, III:1 (March 1989). Presents results of a survey on the population status of fruit bats in the Marianas. This research estimates fruit bat populations, and makes conservation and other recommendations.
Available: Bureau of Planning Library.

REPTILES

"Impact of Boiga irregularis and Other Predators on Native Bird Populations"; Division of Aquatic and Wildlife Resources, Department of Agriculture, in Aquatic and Wildlife Resources Annual Report, (1983). Studies the impact of predation on Guam's air fauna. The study is concentrated on the brown tree snake, Boiga irregularis, the only predator found on Guam.
Available: Bureau of Planning Library.

"Investigation into the Biology of the Monitor Lizard and the Philippine Rat Snake"; Division of Aquatic and Wildlife Resources, Department of Agriculture, in Aquatic and Wildlife Resources Annual Report, (1984). Studies the biology, life history, feeding habits, and activity patterns of the monitor lizard (Varanus indicus) and brown tree snake (Boiga irregularis).
Available: Bureau of Planning Library.

"Activity of the Arboreal Brown Tree Snake (Boiga irregularis) on Guam As Determined by Electrical Outages"; Thomas H. Fritts, Norman J. Scott, Jr., Julie A Savidge, The Snake, XIX (1987). Examines the activities of the brown tree snake on Guam by analyzing eight years of data on power outages caused by snakes. Conclusions support that Guam's Boiga irregularis population is mainly nocturnal, and that the peak in seasonal activity occurs with the beginning of the rainy season.
Available: Bureau of Planning Library.

"The Ecological and Economic Impacts of an Introduced Snake on Guam and Its Threat to Other Pacific Islands"; Julie A. Savidge, PLES III (1987). A brief paper on the biology of Boiga irregularis (brown tree snake), its ecological and economic impacts on Guam, its threat to other islands in the Pacific, and possible means for its control.
Available: Bureau of Planning Library.

"Extinction of an Island Forest Avifauna by an Introduced Snake"; Julie A. Savidge, Ecology, LXVIII:3 (1987). Describes Boiga irregularis (brown tree snake) as an agent of extinction in the decline of native bird populations of Guam. This article lists resident birds and their status on Guam, and provides an extensive examination of the role of the brown tree snake in the decline of native avifauna.
Available: Bureau of Planning Library.

"Movements of Snakes Via Cargo in the Pacific Region"; Thomas Fritts, Elepais, XLVII:2 (February 1987). Discusses the colonization and arrival of the brown tree snake in the Pacific islands as a result of civilian and military traffic between islands.
Available: Bureau of Planning Library.

"Biology of the Brown Tree Snake"; Division of Aquatic and Wildlife Resources, Job Progress Report, Department of Agriculture, in Aquatic and Wildlife Resources Annual Report, (1988). Presents studies on the impact of the brown tree snake, Boiga irregularis, on Guam's avifauna. This report includes analysis of population structure, sex ratios, age and growth, and reproduction.
Available: Bureau of Planning Library.

The Brown Tree Snake, Boiga irregulars, A Threat to Pacific Islands; Thomas H. Fritts, Fish and Wildlife Service, U.S. Department of the Interior; 1988. An extensive research report about the brown tree snake and the threats it poses to the ecology, economy, and general quality of life on Guam. Other Pacific islands are vulnerable to similar problems if this snake is intentionally or passively introduced. Describes the snake, its native range, introduction to Guam, and ensuing problems. The threat of dispersal to other islands is discussed, along with future actions required of responsible Pacific government agencies to control this dispersal.
Available: Bureau of Planning Library.

"Food Habits of Boiga irregularis: An Introduced Predator on Guam"; Julie A. Savidge, Journal of Herpetology, XXII: 3 (1988). Examines brown tree snakes (Boiga irregularis), an introduced predator, for prey remains. This study attempts to determine how the snake has maintained its population despite the over exploitation or extinction of its more vulnerable prey, principally birds and small mammals.
Available: Bureau of Planning Library.

"High Nest Predation by Brown Tree Snakes on Guam"; Paul J. Conry, The Condor, XC (1988). Presents results of a study of the nesting success of the Philippine Turtle Dove in forest and urban habitats of Guam, given predation of Guam's avifauna by brown tree snakes. This study concludes that severe nest predation by snakes appears to be having a devastating impact on the open-nesting wild bird population on Guam.
Available: Bureau of Planning Library.

BIRDS

"Notes on the Breeding Season of Guam Rails (Rallus owstoni)"; Gerald S. A. Perez, Micronesica, IV:1 (1968). This report summarizes five years of roadside brood counts of Guam rails and observations about their breeding season.
Available: Bureau of Planning Library.

Studies of the Birds of Guam; Division of Aquatic and Wildlife Resources, Department of Agriculture; 1978. Studies include periodic bird counts conducted through roadside counts, a shorebird survey, and a forest bird station-count census. Field notes made on the ecology, life history, and habitat utilization through observations of native birds are available.
Available: Division of Aquatic and Wildlife Resources, Department of Agriculture.

"Two New Bird Records for Guam;" J. Mark Jenkins, Micronesica, XIV:2 (December 1979), 361. Description of the siting of the Black-Headed Gull and Black-Tailed Godwit on Guam.
Available: Division of Aquatic and Wildlife Resources, Department of Agriculture.

"Natural History of the Guam Rail"; J. Mark Jenkins, Condor 81, (1979), pp. 404-408.
Available: Bureau of Planning Library.

Ornithological Survey of Wetlands in Guam, Saipan, Tinian and Pagan; Juan Tenorio and Associates, for the U.S. Army Corps of Engineers, Pacific Ocean Division; August 1979. A good inventory of wetland birds and certain wetland sites. This study evaluates the current condition of the sites and compiles relevant biological data. Aerial maps with overlays are included. 202 p.
Available: Bureau of Planning Library.

Check List of the Birds of Guam; Anne F. Maben and J. Mark Jenkins, for Division of Aquatic and Wildlife Resources, Department of Agriculture; revised December 1980. Lists eighty-seven birds by family and scientific name, common name, and status (i.e., endemic to Guam, endemic to Marianas, native to Guam, introduced resident, migratory, common, uncommon, rare, accidental, and extirpated). Date indicates when first reported from Guam. Status of pelagic seabirds includes waters from zero to twenty miles offshore.
Available: Bureau of Planning Library.

List of Rare and Extirpated Bird Species on Guam; Anne F. Maben, Division of Aquatic and Wildlife Resources, Department of Agriculture. A list of twelve birds by family and scientific names, common name, status (indigenous residents, endemic to Marianas, endemic to Guam, or extirpated), Micronesian distribution, and Guam distribution.
Available: Division of Aquatic and Wildlife Resources, Department of Agriculture.

Distribution and Abundance of the Forest Birds of Guam: Results of a 1981 Survey; John Engbring and Fred Ramsey, for Fish and Wildlife Service, U.S. Department of Interior; 1981. Presents results of a survey conducted to determine habitat availability and classification for each bird species on Guam. Discusses factors contributing to the decline of Guam's native forest birds.
Available: Micronesian Area Research Center Pacific Collection.

"Gallinule Habitat Survey and Protection"; Division of Aquatic and Wildlife Resources, Department of Agriculture, in Aquatic and Wildlife Resources Annual Report, (1983). Presents the means to identify, set aside, and protect Guam Gallinule habitat using existing legal authorities. This study determines the present population of Gallinule on Guam and develops management and recovery programs. Some wetland survey work was done in conjunction with the inventory and mapping activity of the National Wetlands Inventory.
Available: Bureau of Planning Library.

"Identification and Acquisition of Land Useful as Guam Rail Habitat"; Division of Aquatic and Wildlife Resources, Department of Agriculture, in Aquatic and Wildlife Resources Annual Report, (1983). Identifies useful land for acquisition as Guam Rail habitat.
Available: Bureau of Planning Library.

The Native Forest Birds of Guam; J. Mark Jenkins, Division of Aquatic and Wildlife Resources, Department of Agriculture; 1983. Discusses the ecology and behavior of Guam's native land birds, except the Guam Rail. This study includes information on habitats, behavior, food habits, nesting, distribution, and status of each species.
Available: Bureau of Planning Library.

"Preparation of a Status Report and Species Management Plan for the Native Doves of Guam"; Division of Aquatic and Wildlife Resources, Department of Agriculture, in Aquatic and Wildlife Resources Annual Report, (1983). Presents separate status reports of the three Dove species on Guam, including a species management plan.
Available: Bureau of Planning Library.

"Preparation of a Status Report and Species Management Plan for the Vanikoro swiftlet"; Division of Aquatic and Wildlife Resources, Department of Agriculture, in Aquatic and Wildlife Resources Annual Report, (1983). Presents a status report and management plan for the Vanikoro swiftlet on Guam based upon a synthesis of all available data, including updated status and distribution surveys.
Available: Bureau of Planning Library.

Birds of Micronesia; Harvey G. Segal; Not dated, but after 1984. Describes the birds of Micronesia and Guam, including scientific and local name, characteristics, and origin. Illustrations are included.
Available: Bureau of Planning Library.

Bird Conservation in the Pacific Islands - South Pacific Commission Topic Review No. 25; Rod Hay, South Pacific Commission; 1985. Examines the current status of knowledge of birds of the region. This study focuses on the species most at risk and habitats requiring protection, and outlines projects and action plans for bird conservation in the region. Includes bird species of Guam and the Marianas Archipelago.
Available: Micronesian Area Research Center Pacific Collection.

Endangered Native Forest Birds of Guam and Rota of Mariana Islands Recovery Plan: Final Draft; U.S. Fish and Wildlife Service; Not dated but after 1986. A recovery plan for five species of native Guam and Rota birds listed on the Federal Endangered Species List. A species description is provided for each bird, the possible causes of the decline in numbers, conservation measures already taken, and a concise guide for recovery and implementation of the plan.
Available: Bureau of Planning Library.

"Impact of Avian Disease on Guam's Native Bird Population"; Division of Aquatic and Wildlife Resources, Department of Agriculture, in Aquatic and Wildlife Resources Annual Report, (1986). Presents partial results of a study to determine the presence and impact of avian disease on Guam's bird populations. Lab tests of the samples were not completed; however, there was no obvious disease discovered during the field phases capable of extirpating species.
Available: Bureau of Planning Library.

Death on an Island; Julie A. Savidge; 1987. Discusses the growing bird decline on Guam, the factors involved, and the effects of the brown tree snake on the endangered bird species.
Available: Bureau of Planning Library.

"New Bird Records for Guam, Yap, Saipan, and Tinian"; Gary Wiles et al., Journal of the Hawaii Audubon Society, XLVII:4 (1987). This paper documents new bird records for the islands of Guam, Yap, Saipan and Tinian.
Available: Bureau of Planning Library.

"Survey and Inventory of Native Land Birds on Guam"; Division of Aquatic and Wildlife Resources, Department of Agriculture, in Aquatic and Wildlife Resources Annual Report, (1987). Presents population trends of the native land birds on Guam. This study has indicated that there is a continuation of the rapid decline of Guam's native forest birds based on the transect count and roadside counts. Included are tables which indicate the average number of birds per 100 Km observed each month on the North roadside, North-Central roadside, Northwest Field roadside, and results of all counts.
Available: Bureau of Planning Library.

Ecology of the Philippine Turtle Dove on Guam; Paul Conry, Division of Aquatic and Wildlife Resources, Technical Report No. 6, Department of Agriculture; July 1987. Presents an extensive and detailed study of the Philippine Turtle Dove. An introduced bird, it is considered an important game bird. This report gives a detailed description of the population, habitat, and reproduction; and discusses management implications. A valuable ecological study.
Available: Bureau of Planning Library.

"Captive Breeding of Endangered Native Birds"; Division of Aquatic and Wildlife Resources, Department of Agriculture, in Aquatic and Wildlife Resources Annual Report, (1988). Presents results of a study in the management of a captive breeding program for the Guam Rail and other endangered endemic birds in facilities on Guam and at zoos in the U.S. mainland.
Available: Bureau of Planning Library.

"Development of an Experimental Population of Guam Rails on Cocos Island or the Commonwealth of the Northern Mariana Islands"; Division of Aquatic and Wildlife Resources, Job Progress Report, Department of Agriculture, in Aquatic and Wildlife Resources Annual Report, (1988). Presents results of a survey of Guam Rails and procedures for introducing the Rail to Rota.
Available: Bureau of Planning Library.

"Population Numbers and Distribution of Philippine Turtle Doves"; Division of Aquatic and Wildlife Resources, Department of Agriculture, in Aquatic and Wildlife Resources Annual Report, (1988). Presents results of a study to determine present population trends. Results of a hunter questionnaire are given.
Available: Bureau of Planning Library.

"Population Size and Distribution of Black Francolin on Guam"; Division of Aquatic and Wildlife Resources, Department of Agriculture, in Aquatic and Wildlife Resources Annual Report, (1988). Presents results of a study of the relative abundance and current distribution of the Black Francolin on Guam and to monitor population trends and hunter harvest.
Available: Bureau of Planning Library.

The following articles appeared in Endangered Species Technical Bulletin, XIV:7 (1989):

"Establishment of an Experimental Population Proposed for the Guam Rail";
"Impacts of the Brown Tree Snake on the Native Birds of Guam";
"Advances in Captive Propagation of the Guam Micronesian Kingfisher".

Available: Bureau of Planning Library.

VEGETATION

Useful Plants of the Island of Guam: An Introductory Account of Physical Features and Natural History of the Island, of the Character and History of Its People, and of Their Agriculture; William E. Safford, U.S. National Museum, Washington, contributions from the U.S. National Herbarium Vol. IX; 1905. Includes climate, rainfall, physical geography, harbors, and vegetation for all areas, swamps, rivers, beaches, etc. Illustrated, maps, 416 p.
Available: Micronesian Area Research Center Pacific Collection.

"Vegetation"; F.R. Fosberg, in Military Geology of Guam, Mariana Islands, (1959), pp. 167-217. Summary of military aspects of vegetation. Gives detailed descriptions of vegetation types and special features of military significance, including construction timber, emergency food plants, and poisonous plants. An accompanying map includes nine units which represent either predominating vegetation types, or complexes of type which occur in small patches, at a scale of 1:50,000.
Available: Bureau of Planning Library.

Plants of Guam; E.H. Bryan, Jr., Pacific Daily News; a series of 144 newspaper articles appearing in the Pacific Daily News from November 13, 1956 to October 13, 1960. The series was originally published in the Guam Recorder based on studies the author made of island plants during 1936. The manuscripts were revised by the author for reprinting in the PDN, with corrections and additions. Descriptions of plants are arranged by plant families. Line drawings are included.
Available: Bureau of Planning Library.

Checklist of the Seed Plants of Guam; F.R. Fosberg, Military Geology Branch, U.S. Geological Survey; January 1, 1960. An alphabetical listing by botanical name under families which are arranged according to a modified Engler order, designed to group related plants together. Guamanian names are given when known to the author. An attempt was made to indicate for each species whether it is native, post-European, or of aboriginal introduction. For each introduced species, a note was added as to whether it is planted, established, or naturalized.
Available: Department of Parks and Recreation Library.

Native Plants of Guam; Benjamin C. Stone, College of Guam; 1961. Mimeographed.
Available: Micronesian Area Research Center Pacific Collection.

"Poisonous Plants on Guam"; Paul Souder, in Venomous and Poisonous Animals and Noxious Plants of the Pacific Area, (1963), pp. 15-29.
Available: Bureau of Planning Library.

A Dictionary of Chamorro Plant Names; Benjamin C. Stone, College of Guam; 1964. Mimeographed.
Available: Micronesian Area Research Center Pacific Collection.

Plants of Guam; Paul B. Souder; July 1968. Lists useful and ornamental species and non-ornamental species by Latin and common names.
Available: Bureau of Planning Library.

"The Flora of Guam"; Benjamin C. Stone, Micronesica, VI (July 1970). A descriptive, often illustrated, manual of the vascular plants, with keys. Emphasis is on the indigenous and widespread naturalized species. Cultivated plants, both crops and ornamental, are also included.
Available: Division of Aquatic and Wildlife Resources, Department of Agriculture.

Wastewater Facilities Plan, Island of Guam: Terrestrial Flora and Terrestrial Fauna; Gillham, Koebig and Koebig; April 1976. Overview of terrestrial flora based on the nine vegetation units of Fosberg (1959) and checklists of terrestrial fauna, with brief notes as to habitats.
Available: Bureau of Planning Library.

A Folk Botany of Guam; John D. Mood, Jr.; 1976.
Available: Micronesian Area Research Center Pacific Collection.

"A Guide to the Medicinal Plants of Guam"; Patrick D. McMakin and Philip H. Moore, for the Bureau of Planning, in Guam Coastal Management Program Technical Reports Volume III, (1977). An inventory of plants used in traditional medicine practices. Includes a photograph of each plant, a botanical description, and the range of the species and specific comments pertaining to the function, use, or method of preparation.
Available: Bureau of Planning Library.

Plant Biogeography of Guam; Lynn Raulerson, editor, Marine Laboratory, Technical Report No. 69, University of Guam; March 1981. An anthology compiled as a University of Guam course requirement.

1. "The Vegetation of an Islet in Tumon Bay, Guam"; David Gardner.
2. "The Vegetation of Upper Togcha Valley"; James Kodama.
3. "The Vegetation of Cocos Island"; Clifford P. Neubauer and Debbie R. Neubauer.
4. "Survey of Plant Species and the Qualitative Assessment of Vegetation Distribution on Anae Island, Guam"; Roy N. Tsutsui.
5. "*Bikkia tetrandra* (L.f.) A. Rich and *Spathoglottis plicata* Bl."; Jacinto W. Caceres.
6. "*Cycas circinalis* (L)."; Peter J. Chargualaf.
7. "*Angiopteris durvilleanae* de Vriese and *Cyathea lunulata* (Forst.) Copeland"; James Kodama.
8. "*Ceiba pentandra* (L.) Gaert. (Atgedon de Manila) and *Terminalia catappa* L. (Talisai)"; Anthony P. Pangelinan and Jeanne M. Belanger.
9. "*Nypa fruticans*"; Anthony Ramirez.
10. "A survey of *Intsia bijuga* in the Northern Guam Limestone Forest"; Celestino F. Aguon.
11. "The Distribution of *Leucaena leucocephala* (Lam.) deWit in an Area of Northern Guam"; Linda J. Dunn and Debra J. Van Sciver.
12. "A Comparison of the Vegetation on Disturbed and Undisturbed Hard Limestone"; James Kodama.
13. "*Dimeria* Grasslands Along Guam's Southern Cuesta Summit"; David E. Pendleton.
14. "A Study of Vegetation Patterns in Guam's Savannas"; Charles J. Romeo.
15. "A Supplement to the Flora of Guam: Forestry and Fruit Spe cies"; Brian T. Scully.

Available: Bureau of Planning Library.

Common Weeds of Guam; Chin-Tian Lee, Agricultural Experiment Station, University of Guam; 1985. Over 50 weeds are described and illustrated in this report. Includes family name, scientific name, common name, general description, propagation, and local occurrence.
Available: Bureau of Planning Library.

MARINE AND COASTAL RESOURCES

Exploratory Fishing Survey of the Inshore Fisheries Resources of Guam; Isaac Ikehara, Harry Kami, Richard Sakamoto, for Fish and Wildlife Division, Department of Agriculture; 1970. This report, part of the proceedings of the 2nd CSK Symposium in Tokyo (1970), covers the fishing methods and gear used and gives results for mackerel and seventeen other important fish species caught. The survey was conducted from January 1967 to June 1969.
Available: Bureau of Planning Library.

The Pristipomoides (Pisces: Lutjanidae) of Guam With Notes on Their Biology; Harry T. Kami; July 1973. Provides taxonomic data as well as information on the biology of four species of deep water snappers. This study is based primarily on 1,213 Guam specimens collected by the crew of the Division of Fish and Wildlife exploratory commercial fishing vessel.
Available: Bureau of Planning Library.

A Key to the Families of Fishes as Recorded from Guam; Robert S. Jones and Helen K. Larson, Marine Laboratory, Technical Report No. 10, University of Guam; May 1974. Provides a key to ninety families of fishes recorded from Guam and nine families believed to be found here.
Available: Bureau of Planning Library.

The Commercial Potential of Precious Corals in Micronesia: Part 1. The Mariana Islands; Richard W. Grigg and Lucius G. Eldredge, Marine Laboratory, Technical Report No. 18, University of Guam; May 1975. Presents the results of an exploratory survey for precious coral in the Mariana Islands. This report contains data from a survey designed primarily to locate pink coral between Guam and Saipan.
Available: Department of Parks and Recreation Library.

"A Checklist of Chamorro Names of Marine Fish, Shellfish, and Crustaceans"; Patrick D. McMakin, for Bureau of Planning, in Guam Coastal Management Program Technical Reports Volume II, (October 1977). The list gives Latin, English, and Chamorro names.
Available: Bureau of Planning Library.

Studies on the Biology of the Reef Fishes of Guam; Steven S. Amesbury, Marine Laboratory, Technical Report No. 49, University of Guam; July 1978. A two-part study of the distribution of fish and other marine life at selected sites.
Available: Bureau of Planning Library.

Survey of Edible Marine Shellfish and Sea Urchins on the Reefs of Guam; J.O. Stojkovich and B.D. Smith, Division of Aquatic and Wildlife Resources, Technical Report No. 2, Department of Agriculture; September 1978. A study of the ecology, populations and distribution of shellfish and sea urchins utilized for home consumption.
Available: Bureau of Planning Library.

National Marine Recreational Fishery Survey; Division of Aquatic and Wildlife Resources, Department of Agriculture; December 1978. Data was collected on participation, catch, and effort for finfish and selected species of shellfish. Inshore, offshore, and household interviews were conducted.
Available: Division of Aquatic and Wildlife Resources, Department of Agriculture.

Sport Fishing in Hawaii, Guam and American Samoa; James L. Squire and Susan E. Smith; 1979. A handbook to sport fishing in the Hawaiian Islands, American Samoa and Guam with associated fishing ground charts and guide to marine game fishes.
Available: Micronesian Area Research Center Pacific Collection.

Mollusks of the Southern Marianas Islands; Capt. Alexander Roth Jr.; October 1980. Revises the "Preliminary Checklist of the Gastropods of Guam," University of Guam Marine Laboratory Technical Report No. 27. This report contains a list of shells found, or reasonably expected to be found, around the island of Guam. Each family listed is briefly described and general habitat noted. Names of shells are listed in alphabetical order by species. On the right-hand column of each shell listing is shown where the information came from with regards to the shell's presence on Guam.
Available: Department of Parks and Recreation Library.

The Derby Fishes; Rob Myers; 1981. Overviews the 1981 Marianas Fishing Derby. This report lists the biology of each of the species that qualified for the Derby, and summarizes Derby participation, catch, fishing areas, and stomach contents.
Available: Bureau of Planning Library.

Fishing Effort and Catch by the Longline Fleets of Japan (1962-77) and Taiwan (1967-77) Within 200 Miles of the Countries in the Area of the South Pacific; Skipjack Programme, Technical Report No. 3, South Pacific Commission; March 1981. Contains tables (16) showing Japanese longliner catch per effort within the Guam Fishing Zones. Tables are yearly and monthly, 1962 through 1977. Data include hooks per 1000: Blue Fin, Albacore, Big Eye, Yellowfin, Broadbill, Striped Marlin, Blue Marlin, Black Marlin, Sailfish, Skipjack, and Small Tunas.
Available: Bureau of Planning Library.

A Working List of Marine Organisms from Guam; First Edition; Marine Laboratory, Technical Report No. 70, University of Guam; April 1981. Lists species of marine organisms that have been thoroughly studied on Guam and that are represented by specimens in the UOG Marine Laboratory Reference Collection and/or in the published scientific literature.
Available: Bureau of Planning Library.

Reef Fish Population Investigations Through the Use of Permanent Transect; Division of Aquatic and Wildlife Resources, Department of Agriculture; October 1, 1981 to September 30, 1982. This study documents the patterns of seasonal and annual variability within the conspicuous upper reef-slope fish community over a 15-month period.
Available: Bureau of Planning Library.

Estimates of the Catch and Effort by Japanese Longliners and Baitboats in the Fishery Conservation Zone Around the Mariana Archipelago; National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southwest Fisheries Center; 1983. A report presenting historical Japanese tuna catch and effort data, and an analysis of the magnitude, species composition, and general location of the Japanese catches in the Marianas archipelago. Extensive tables and data analysis are provided.
Available: Micronesian Area Research Center Pacific Collection.

Guide to the Coastal Resources of Guam; Marine Laboratory, University of Guam; 1982, 1983, 1986.

- Volume I: The Fishes; Steven S. Amesbury and Robert F. Myers; 1982. An extensive guide to the most interesting and important components of the marine communities on Guam, the fishes. Extensive photographs and reference materials.

- Volume II: The Corals; Richard H. Randall and Robert F. Myers; 1983. An illustrated reference source for over 200 species of corals in various reef habitats around Guam. Extensive photograph with an annotated key.

- Volume III: Fishing on Guam; Steven S. Amesbury, Frank A. Cushing and Richard K. Sakamoto; 1986. An extensive pictorial account of past and present fishing practices on Guam. Extensive photographs and narrative of cultural practices.

Available: Bureau of Planning Library.

"Studies of Recreationally Important Reef Fish"; Division of Aquatic and Wildlife Resources, Job Progress Report, Department of Agriculture, in Aquatic and Wildlife Resources Annual Report, (1988). Presents results of investigations of selected recreationally important reef fish species. These studies will be used to evaluate the need for stock management.
Available: Bureau of Planning Library.

Annotated Checklist of the Inshore Fishes of the Mariana Islands; Robert F. Myers, Department of Agriculture; December 1988. Lists a total of 871 species of inshore and epipelagic fishes in 105 families from the Mariana Islands. Genera and species are listed alphabetically within their respective families.
Available: Bureau of Planning Library.

Micronesian Reef Fishes - A Practical Guide to the Identification of Tropical Reef Fishes of the Tropical Central and Western Pacific; Robert F. Myers; 1989. An extensive guidebook for identification of reef fishes found in the region. Photographs and detailed drawings are included, along with descriptions and characteristics of various fishes. A valuable pictorial guide for divers, fishermen and others interested in reef fishes.
Available: Bureau of Planning Library.

ENERGY

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ENERGY PRODUCTION, CONSUMPTION AND CONSERVATION

Survey of Electric Supply for the Government of Guam; EBASCO Services, Inc.; 1952. A survey of civilian electric power requirements relative to agreements between the Navy and Government of Guam for power supply. Appendices include the Agreement Between Department of Navy and Department of Interior with respect to the Transfer of Responsibility for the Administration of the Government of Guam.
Available: Micronesian Area Research Center Pacific Collection.

Report on the Island-Wide Power System, Guam, Mariana Islands; Rogers Engineering Co., Inc. for U.S. Navy, Bureau of Yards and Docks; 1955. Includes predictions of load growth used for planning future construction.
Available: Public Works Center Library.

Power System Planning Report, Island-Wide Power System, Guam, M.I.; Rogers Engineering Co., Inc.; August 1965. Comprehensive report on the island-wide system. Projects load growths to the year 1980.
Available: Public Works Center Library.

Guam Power Authority Act of 1968; P.L. 9-189, Ninth Guam Legislature; May 8, 1968. Establishes the Guam Power Authority as a public corporation and autonomous instrumentality of the Government of Guam.
Available: Bureau of Planning Library.

Revenue Bond Financing by the Guam Power Authority; Stone and Youngberg; April 21, 1969. Outlines the basic principles of revenue bonds and how this method of financing may be used by GPA. This study uses the Rogers Engineering Reports of 1968 for estimates of future revenues and expenditures.
Available: Micronesian Area Research Center Pacific Collection.

Preliminary Power System Planning Report for Guam Power Authority; Rogers Engineering Co., Inc.; October 1970. Long-term requirements for expansion of the Guam Power Authority power system. Based on the requirement for meeting the total island power loads consistent with the planned acquisition (1972-1973) of the Navy System and assumption by Guam Power Authority of responsibility for the total island power supply. The report discusses load projections, generation, transmission lines and substations, fuel oil supply, and load data.
Available: Bureau of Planning Library.

Operations Review and Improvement Plan for Administrative and Fiscal Services: Report to Guam Power Authority; Peat, Marwick, Mitchell and Co.; August 1973. Describes detailed recommendations for improvement of specific problems relating to GPA's organizational structure, data processing equipment, and accounting and reporting systems.
Available: Bureau of Planning Library.

Power Pool Agreement, Including Amendments; by and between the United States of America (the Navy) and Guam Power Authority; signed October 1972. A contract between the Navy and Guam Power Authority to jointly operate the power system for the period October 1, 1972 until 1975. After 1975, Guam Power Authority was to assume island-wide power service. The provisions of the agreement cover the responsibilities of each party for its own facilities, the fixed and variable costs to be accounted for, and how the financial obligations of the parties will be computed and collected. The report outlines the costs to be shared and the metering, recording, and reporting of power consumption by the parties. The transfer of facilities to Guam Power Authority, the procedures, and the prerequisites to the transfer are included.
Available: Bureau of Planning Library, in the Guam Power Authority of the Territory of Guam, USA Official Statement Relating to $25,000,000 Revenue Bonds Series A 1972 Issue.

Historico-Financial Analysis of the Guam Power Authority; Author not stated; March 28, 1976. Presents an analysis of the reasons for the Guam Power Authority's 1976 financial condition and explains the need for financial assistance from the federal government. Attached are documents indicating GPA's ability to repay $40 million in long-term revenue bonds and the payment of interest for a short-term $36 million government loan.
Available: Bureau of Planning Library.

A Preliminary Management Study of the Guam Petroleum Storage System and the Feasibility of the Establishment of a Guam Petroleum Reserve; Geoffrey K. Burke, submitted to the Strategic Petroleum Reserve Office, Federal Energy Administration; December 15, 1976. A compilation of fuel import, inventory, consumption, and refinery output information as part of the development of a Strategic Petroleum Reserve Plan for the nation. Data was developed on a monthly basis for 1975, and represents the first such survey undertaken.
Available: Bureau of Planning.

Future Power Production and Transmission Alternative Plans, Guam, USA; Walter F. Pinckert and Associates, for the Guam Coastal Management Program, Bureau of Planning; July 1977. Annual projected increases in estimated KWH generation, fuel oil needs, fuel oil cost to consumers, fuel oil refinery capability, and other facets related to power production and future projection. Enclosures include thermal profiles of sea water temperatures showing the potential possibilities of developing solar sea power, and sketches of an ocean thermal power plant.
Available: Bureau of Planning Library.

Guam (State) Energy Conservation Plan, March 1977, and Supplemental Guam Energy Plan, July 1977; Guam Energy Office. Proposes a reduction of 5% or more in the total amount of energy consumed in the year 1980 from the projected energy consumption in 1980. The State Plan explains proposed programs, with the supplementary plan expanding its scope to enable residents to take advantage of technical expertise available from both federal and local governmental agencies for conservation of energy.
Available: Bureau of Planning Library.

Energy Management Plan for Apartment Complexes and Small Commercial Buildings; Guam Energy Office; June 1, 1978. A class energy audit for buildings of less than 10,000 square feet. Three energy survey forms are presented: gross energy survey; detailed energy survey (individual apartments); and detailed energy survey (apartment complex). Shows how to compute an Energy Utilization Index (EUI) for both BTU's and cost. This number can be used to directlv compare energy management between months or years.
Available: Bureau of Planning Library.

Planning for the Impacts of Guam Energy Facility Expansion, A Preliminary Assessment; Walter F. Pinckert and Associates, for the Guam Coastal Management Program; November 1978. Examines the need for major energy facility development, the means for achieving those needs, and the factors necessary to meet environmental, economic and social considerations. The regulatory framework relative to Guam's resources is discussed.
Available: Bureau of Planning Library.

Energy Conservation Activities and Goals for the Government of Guam; Pacific Energy Management Consultants, for the Guam Energy Office; May 24, 1979. A letter report to Guam Energy Office with comments and recommendations on short- and long-range goals appropriate to an energy program for Guam.
Available: Guam Energy Office.

A Position Paper for the Government of Guam Towards Transfer of Clear Title for the Island-Wide Power System from the Federal Government to the Government of Guam to Rectify Inequitable Payments Made by the Government of Guam to the Navy, and to Exempt Guam from Certain Sections of the Clean Air Act; Senator Kurt S. Moylan, Chairman, Committee of General Governmental Operations; Not dated, but around 1981. Discusses reasons why Navy management of the Island-Wide Power System should be phased out, and responsibility for operating and maintaining the system be transferred to the Guam Power Authority.
Available: Bureau of Planning Library.

Study to Determine Feasibility of Requesting Forgiveness of the $36 Million Debt to the Federal Government; Audrey Camba; February 1981. Briefly addresses the feasibility of requesting forgiveness of the $36 million debt and the feasibility of an alternative approach.
Available: Bureau of Planning Library.

U.S. Navy and Guam Power Authority Joint Coordinating Committee Electric Cost-of-Service Study, Final Report; Stone and Webster Management Consultant, Inc.; 1982. Compiles data on cost of service for electricity, with projections based upon several scenarios. This study provides a load forecast; an assessment of the combined system generation; an eight-year projection (with and without the Navy as a customer); a cost of service analysis (with the Navy as a customer); an operations evaluation; a summary of findings; and recommendations and proposed contractual provisions.
Available: Bureau of Planning Library.

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New Approaches to Development Co-operation with South Pacific Countries; Hanns J. Buchholz (Ed.); 1987. Analyzes structures and development problems in the Pacific region. This compendium includes documents and research on the German concepts for development cooperation in the region, a compilation of social structural planning data, and information on agriculture, industry, and fisheries.
Available: Micronesian Area Research Center Pacific Collection.

Report of the High Level Conferences to Adopt a Convention for the Protection of the Natural Resources and Environment of the South Pacific Region; South Pacific Commission; 1987. Presents series of country papers and meeting summaries as part of a conference to adopt a convention for protection of the environment. Issues discussed varied by country, but include pollution, nuclear testing and waste, hazardous substances, and other environmental issues. Of particular importance in this report is the agreements of information, reporting, operational measures, mutual assistance, subregional arrangements, and institutional arrangements relative to a protocol to ensure the protection of natural resources and the environment in the region.
Available: Bureau of Planning Library.

Guam Wetlands Priority Plan; Department of Parks and Recreation; 1988. Outlines potential protection strategies for Guam's wetlands. An addendum to the 1986 Guam Comprehensive Outdoor Recreation Plan, this plan contains detailed maps, a wetland inventory, and protection strategies.
Available: Bureau of Planning Library.

Integrated Renewable Resource Management for United States Insular Areas, Volumes I and II; U.S Office of Technology Assessment; 1988. Presents research on resource management and resource development in United States Insular areas. This extensive report includes agriculture, agroforestry, forestry, aquatic resources, and development planning considerations. The focus is on tropical island ecosystems, renewable resources management, and development. Excellent reference.
Available: Bureau of Planning Library.

Cooperation for Environmental Protection in the Pacific; United Nations Environment Program; 1988. Discusses the three Regional Seas Action Plans in the Pacific: South-East Pacific Action Plan, the East Asian Seas Action Plan, and the South Pacific Action Plan. Each action plan includes assessment, management, and supporting measures to control the consequences and causes of environmental deterioration through the management of marine and coastal areas.
Available: Micronesian Area Research Center Pacific Collection.

Environment and Pacific Women - From the Globe to the Village; University of the South Pacific; 1988. Includes a series of articles on environmental issues (such as the Green house effect) and the subsequent social and community impacts. This report gives suggestions for community involvement in addressing these problems.
Available: Micronesian Area Research Center Pacific Collection.

"Development and Management of Nonfood Marine Resources in the U.S.-Affiliated Islands of the Pacific"; Barry D. Smith, in Topic Reviews in Insular Resource Development and Management in the Pacific U.S.-Affiliated Islands, Marine Laboratory, University of Guam; May 1988. One of five papers on the study of renewable resource management for United States Insular Areas of the Pacific and Caribbean.
Available: Micronesian Area Research Center Pacific Collection.

Marine Parks and Reserves - Management for Coastal Environments in Southeast Asia; Alan T. White, Association of Southeast Asian Nations (ASEAN); 1988. Introduces marine parks and reserves as a means of management for coastal environments in the Southeast Asian region. The plight of coastal resource habitats is described, with discussions on why and how marine parks and reserves can serve as specific management and conservation approaches for these areas.
Available: Micronesian Area Research Center Pacific Collection.

"The Role of Marine Resource Tenure Systems (TURFs) in Sustainable Nearshore Marine Resource Development and Management in U.S.-Affiliated Tropical Pacific Islands"; Robert E. Johannes, in Topic Reviews in Insular Resource Development and Management in the Pacific U.S.-Affiliated Islands, Barry Smith (Ed.), Marine Laboratory, University of Guam; May 1988. One of five papers on the study of renewable resource management for United States Insular Areas of the Pacific and Caribbean.
Available: Micronesian Area Research Center Pacific Collection.

Natural Resources Management Plan, U.S. Naval Magazine, Guam, Draft; BioSystems Analysis, Inc., for the Department of the Navy; 1989. Presents a management plan for a multiple use program for the management, conservation, and protection of such renewable natural resources as wetlands, fish, wildlife, soil, water, forests, natural habitats, and other natural areas, in accordance with natural resource laws, regulations and policies. This plan includes an introduction, installation description, existing plans and policies, description of both manmade and natural environments, and constraints/problems associated with programs existing in the area.
Available: Bureau of Planning Library.

Natural Resources Management Plan: U.S. Naval Communications Area Master Plan, Guam, Draft; BioSystems Analysis, Inc., for the Department of the Navy; September 1989. Provides guidance for the management of natural resources at NAVCAMS. This Plan discusses undeveloped lands; soils; watersheds; forests; wetlands; fish and wildlife; endangered species; and cultural and recreational resources.
Available: Bureau of Planning Library.

Report of the Workshop on Customary Tenure, Traditional Resource Management and Nature Conservation; P.E.J. Thomas (Ed), South Pacific Commission; 1989. Contains a series of research papers on natural resource conservation based upon customs and traditions within the South Pacific region. This report presents several regional examples of wildlife management, native land, marine resource management, customary tenure, and protected area development. Policy (laws) and development, present and future, relative to these issues are discussed.
Available: Micronesian Area Research Center Pacific Collection.

Support to Pacific Territories and Freely Associated States; U.S. Army Corps of Engineers, Pacific Ocean Division; 1989. Summarizes the work of the U.S. Army Corps of Engineers in the Pacific. This narrative includes an overview of the Pacific Division, a description of organization and staffing, a summary of work projects, civil works, and operation and maintenance functions.
Available: Bureau of Planning Library.

Federal Manual for Identifying and Delineating Jurisdictional Wetlands; U.S. Fish and Wildlife Service, Environmental Protection Agency, Department of the Army, and the Soil Conservation Service; January 1989. A source and guidebook on wetlands delineation. This manual describes technical criteria, field indicators, and other sources of information. Methods for identifying and delineating jurisdictional wetlands in the United States are provided.
Available: Bureau of Planning Library.

Guam Environmental Protection Agency's Consolidated Grant Application; Guam Environmental Protection Agency; Annually. Presents GEPA's Environmental Management proposal for six programs: Water Pollution Control, Safe Drinking Water, Groundwater Management, Solid/Hazardous Waste Management, Air Pollution Control, and Pesticide Enforcement.
Available: Bureau of Planning Library.

Guam Environmental Protection Agency Annual Report; Annually since 1974. Contains the annual Environmental Quality Index of Guam's present water, air, and land environmental quality. Explains the role and function of the Guam Environmental Protection Agency's divisions. Each program and several major undertakings of the previous year are presented. Data generated by these activities supplement the narrative.
Available: Bureau of Planning Library.

Man, Land and Sea; Guam Coastal Zone Management Program, Bureau of Planning; Monthly, since 1989. A newsletter on current topics relative to environmental issues.
Available: Bureau of Planning Library.

EXCLUSIVE ECONOMIC ZONE

Collection and Interpretation of Marine Geologic Data from Guam and the Southern Part of the Northern Mariana Islands: A Preliminary Proposal for U.S. Geological Survey Assistance in Assessing Resources and Hazards in the Exclusive Economic Zone; Tracy L. Vallier, U.S. Geological Survey, Branch of Pacific Marine Geology; 1987. Outlines a five-year program for evaluating the marine resources and geologic hazards of Guam and part of the CNMI. This preliminary proposal is meant to aid in the development of a comprehensive resource management plan for Pacific islands that will effectively assess their potential marine resources and geologic hazards in the exclusive economic zone.
Available: Bureau of Planning Library.

Exclusive Economic Zone - Guam; Guam Coastal Management Program, Bureau of Planning; 1988. A summary of documents relative to the Exclusive Economic Zone as it relates to Guam, including federal laws, local legislation, and government agency regulations.
Available: Bureau of Planning Library.

Proceedings of Pacific Basin Management of the 200-Nautical Mile Limit Exclusive Economic Zone; sponsored by the Pacific Basin Development Council and Coastal Zone Management Programs of Hawaii, Guam, American Samoa, and the Commonwealth of the Northern Marianas; 1988. Proceedings relative to the Exclusive Economic Zone (EEZ) including (1) an overview of EEZ opportunities, issues, and problems; (2) EEZ legal/jurisdiction concerns and options; (3) the role of coastal zone management in managing the United States Pacific EEZ; (4) EEZ data information gathering, use, and dissemination; (5) seabed mining in the EEZ; (6) fishing within the EEZ; and (7) ocean incineration, and dumping of hazardous wastes.
Available: Bureau of Planning Library.

Pacific Basin Management of the 200-Nautical Mile Exclusive Economic Zone - Implications of the EEZ for the American Flag Pacific Islands (AFPI); sponsored by the Pacific Basin Development Council and Coastal Zone Management Programs of Guam, American Samoa, Hawaii, and the Commonwealth of the Northern Mariana Islands; 1989. A summary of issues relative to the EEZ among American Pacific Flag Islands. Issues such as the legal rights of AFPI Islands on the EEZ, their diverse political statuses, impact of existing federal laws, maps, and recommendations.
Available: Bureau of Planning Library.

ENVIRONMENTAL IMPACT REVIEW PROCESS

Environmental Management Study; Arizala-Constiniano-Villareal and Associates, and Barrett and Associates, for the Guam Environmental Protection Agency; 1978. Reviews activities and procedures of several Government of Guam agencies as they relate to the environmental aspects of issuing, monitoring, and enforcing permits, and to reviewing environmental impacts.
Available: Bureau of Planning Library.

A Guide to Environmental Assessments and Environmental Impact Statements; Guam Environmental Protection Agency; 1980. Provides guidelines for environmental assessments, impact statements, and impact reviews to assist government agencies comply with requirements for such documents. The legislative and legal guidelines of the National Environmental Impact Act are summarized, with discussion on how these guidelines apply to Guam. Detailed guidelines for assessing impacts of proposed projects on plans, alternatives, mitigation of adverse impacts, and indirect effects are included. Also available is an Environmental Protection Plan Guide, 1980, which outlines general and specific requirements of environmental protection plans to provide assurances that construction effects on the environment will be minimal.
Available: Guam Environmental Protection Agency.

Workshop - Environmental Impact Assessment Review Process and Techniques for Insular Environmental Management; sponsored by the U.S. Environmental Protection Agency, Guam Environmental Protection Agency, and University of Hawaii's Environmental Center; 1989. Includes workshop materials on the purpose of environmental assessment, types of projects and their impacts, what environmental impact assessment should do, techniques for impact evaluation, mitigative measures, local environmental laws, environmental review through networking, and building environmental networks.
Available: Guam Environmental Protection Agency Library.

Requirements for Environmental Impact Assessments for All Territorial Land-use Commission Actions, Executive Order 90-10; May 1990. This E.O. requires all Territorial Land-Use Commission (TLUC) applicants to submit an Environmental Impact Assessment to the Guam Environmental Protection Agency, to be approved by the Administrator of that agency before the TLUC can act upon any requested zone change or variance. The executive order outlines the requirements the applicant must meet in preparing the Environmental Impact Assessment, including description of project and setting, description of existing environment, estimate of the nature and magnitude of environmental changes caused by activities of the project, evaluation of impacts relevant to site sensitivity, and mitigative measures. Also authorizes the TLUC to revoke, suspend, or nullify any zone change or variance granted to an applicant if the application fails to meet the provisions of the Executive Order.
Available: Bureau of Planning Library.

ENVIRONMENTAL EDUCATION (See also Energy Education: ENR; and all sections of BIO)

South Pacific Commission Seminar on Conservation Education Reports; May 1973. Participants from American Samoa, Papau New Guinea, Trust Territories, and Guam.
Available: Bureau of Planning Library.

Life on Guam; 1976 and 1977. Explains class, lab, and field projects in ecology and social studies. This series of booklets are designed for Guam's junior and senior high schools, and are fully illustrated with drawings and photographs.

Beach Strand by Margie Cushing Falanruw
Coral Reef by Richard H. Randall and L.G. Eldredge
Farm and Garden by Richard H. Randall and L.G. Eldredge
Freshwater by Lynn Raulerson
Geology by Gail Elkins, Dave Hotaling, and Richard H. Randall
Human Impact by M.C. Falanruw
Limestone Forest by Larry Behrens
Mangrove Flat by Gaylord Diaz and Dave Hotaling
Savanna, Old Fields, Roadsides by M.C. Falanruw
Schoolyard Ecology by Jeffrey E. Shafer
Schoolyard Surveys by Magdalena T. Flores

Available: Bureau of Planning Library.

Guam's Endangered Wildlife; Department of Agriculture, prepared as part of the Teacher Information Sheets on endangered species, habitat and wildlife adaptation; 1980. A list of seventeen endangered species with the present range, distribution and habitat, estimated population, and reasons for decline.
Available: Division of Aquatic and Wildlife Resources, Department of Agriculture.

Sea Turtles; Division of Aquatic and Wildlife Resources, Department of Agriculture; 1980. A forty frame color slide show on the Hawksbill and green sea turtles. Includes habitats, life histories, habits of sea turtles above and below water. Causes for endangerment and poaching emphasized, and their role in the food chain discussed. Suitable for third grade and up.
Available for presentation by Division of Aquatic and Wildlife Resources, Department of Agriculture.

Wildlife on Guam; Department of Agriculture, for the Guam Coastal Management Program, Bureau of Planning; 1980. Twenty color photographs of terrestrial fauna. Each photograph is accompanied by a description of habitat, habits, and abundance.
Available: Division of Aquatic and Wildlife Resources, Department of Agriculture.

Endangered Animals of Guam; Division of Aquatic and Wildlife Resources, Department of Agriculture; 1981. An 80 frame color slide show on Guam's endangered and rare species. Includes fourteen species of birds, the fruit bat, and sea turtles. An in-depth program on habitats, life histories, habits, causes of endangerment, and management and research techniques. Suitable for third grade and up.
Available for presentation by Division of Aquatic and Wildlife Resources, Department of Agriculture.

Guam's Coral Reef; Division of Aquatic and Wildlife Resources, Department of Agriculture; 1981. An eighty-one frame color filmstrip prepared for elementary and junior high school use. Discusses the origin of coral reefs, biology of reef animals, and the impact of man on the reef. Includes a teacher's guide with complete English and Chamorro script, selected references and questions, and an accompanying cassette tape in English and Chamorro complete with beeps.
Available: Department of Agriculture, School and Public Libraries, Micronesian Area Research Center, University of Guam Marine Laboratory.

Pollution on Guam; Division of Aquatic and Wildlife Resources, Department of Agriculture; 1981. A seventy frame color slide show. Includes air, water pollution, littering, the effects of pollution, both natural and man-made, on the reef and its animals. Emphasizes man's impact and future recommendations. Suitable for third grade and up.
Available for presentation by Division of Aquatic and Wildlife Resources, Department of Agriculture.

Guam's Coral Reef; Division of Aquatic and Wildlife Resources, Department of Agriculture; 1981. A ninety-two frame color filmstrip prepared for junior high and high school use. Discusses in detail the origin of coral reefs, the life histories and manner of feeding of typical reef animals. Symbiosis, ocean food chains, predatory-prey relationships and the impact of natural and man-made pollution on the reef are included. The effects of dynamiting and chloroxing are demonstrated and discussed. English cassette and teacher's guide included.
Available: Department of Agriculture, School and Public Libraries, University of Guam, Micronesian Area Research Center, and University of Guam Marine Lab.

Marianas Fruit Bat; Division of Aquatic and Wildlife Resources, Department of Agriculture; 1981. A forty-five frame color slide show dealing with the natural history, status, and management of this endangered species. Includes the effect of poaching and over exploitation on other islands.
Available for presentation by Division of Aquatic and Wildlife Resources, Department of Agriculture.

The Reef and Its Inhabitants on Guam; Division of Aquatic and Wildlife Resources, Department of Agriculture; 1981. An eighty frame color slide show. Includes the origin of the reef, life histories, and habits of reef animals. Stresses interrelationships of reef animals and plants, man's impact, and management techniques. Totally different photography. To be used as reinforcement with filmstrip "Guam's Coral Reef". Suitable for grades three and up.
Available for presentation by Division of Aquatic and Wildlife Resources, Department of Agriculture.

Terrestrial Wildlife of Guam; Division of Aquatic and Wildlife Resources, Department of Agriculture; 1981. A forty-seven frame color slide show on Guam's most common and endangered animals. Includes habitats, brief life history and interesting habits of Guam's wildlife. Includes baby animals. Suitable for kindergarten through third grade. Available for presentation by Division of Aquatic and Wildlife Resources, Department of Agriculture.

Terrestrial Wildlife of Guam; Division of Aquatic and Wildlife Resources, Department of Agriculture; 1981. An eighty frame color slide show on Guam's most common and endangered animals. Includes habitats, selected land invertebrates, reptiles, amphibians, birds, and mammals. Discusses life histories, habits, causes for endangerment and management techniques. Suitable for grade four and up.
Available for presentation by Division of Aquatic and Wildlife Resources, Department of Agriculture.

Guam's Wildlife; Division of Aquatic and Wildlife, Department of Agriculture, for the Bureau of Planning; 1983. A series of forty single sheet descriptions of Guam's wildlife, each with a full color 5" x 7" picture of the bird or animal. Notes if it is threatened or endangered.
Available: Bureau of Planning Library.

Guahan: The Fragile Gift; Guam Coastal Management Program, Bureau of Planning; 1984. A pictorial guide to Guam's aquatic and wildlife resources.
Available: Bureau of Planning Library.

Environmental Education and Training in the South Pacific; University of the South Pacific, Environmental Studies Report No. 22; 1985. Reviews environmental education and training in the South Pacific region. This report presents an overview of the general status of environmental education at all schools, with emphasis on environmental education at secondary and postsecondary levels. The structure/mechanisms and constraints for the introduction of such education are discussed, and priorities summarized.
Available: Micronesian Area Research Center Pacific Collection.

Preliminary Annotated Bibliography of Pacific Environmental Education Materials; South Pacific Commission; 1985. This annotated reference guide is intended for educators and curriculum developers in the Pacific involved in environmental education. Materials include texts, workbooks, and audiovisual aids.
Available: Micronesian Area Research Center Pacific Collection.

An Environmental Education Journal for the South Pacific Region; South Pacific Commission; 1985-present. A periodic journal about environmental issues in the region.
Available: Micronesian Area Research Center Pacific Collection.

Guam's Hidden Treasure; Guam Environmental Protection Agency; 1987. This twenty-minute video presentation discusses Guam's groundwater and its importance as the essential source in acquiring freshwater. GEPA's role in maintaining the quality of freshwater is discussed: to oversee development and operation of wells, monitor the amount and rate that water is pumped out, inspect distribution, and test for pollution and contamination. This video also addresses sewage, pesticides, and man and animal wastes contributing to groundwater pollution.
Available: Guam Environmental Protection Agency.

Coral Reefs in the South Pacific; South Pacific Commission; 1988. A teaching handbook about coral reefs and the ecosystem of reefs.
Available: Guam Environmental Protection Agency Library.

ECOSYSTEM SURVEYS

A Naturalists Guide to Guam; Guam Science Teachers Association; 1968.
Available: Micronesian Area Research Center Pacific Collection.

Agana Springs Nature Reserve; Guam Science Teachers Association; 1971. Description of the flora and fauna in the area and field trip suggestions for teachers.
Available: Department of Parks and Recreation Library.

Coral Reef Recovery Following Extensive Damage by the "Crown-of-Thorns" Starfish, Acanthaster Planci (L.); Richard H. Randall; December 1973. A study of the Tanguisson Point fringing reef which was heavily infested by an Acanthaster planci population from June 1968 to September 1968. The infestation resulted in the death of more than 95 per cent of the reef building corals. This study is a distributional analysis of the state of the extant coral community, documenting the early stages of coral community recovery at Tanguisson Reef.
Available: Bureau of Planning Library.

Nearshore Currents and Coral Reef Ecology of the West Coast of Guam, Mariana Islands; H.D. Huddell, J.C. Willett and G. Marchand; January 1974. Nearshore currents at select locations on the West Coast of Guam are described. The plants and animals attached to the shallow coral reefs at eight stations, each ten meters by ten meters in area, are described and illustrated by photos and photo mosaics.
Available: Micronesian Area Research Center Pacific Collection.

Field Ecological Survey of the Agana-Chaot River Basin; Richard H. Randall, Roy T. Tsuda, Michael Gawel, Ramon Rechebei and Jennifer Chase, Marine Laboratory Technical Report No. 12, University of Guam; July 1974. A field ecological study of the Agana-Chaot River Basin including Agana Marsh and the zone of ocean water mixing (estuary) at the mouth of the Agana River. A study of historical and cultural sites as well as biological zones.
Available: Bureau of Planning Library.

Coastal Survey of Guam; Richard H. Randall and Jeanne Holloman, Marine Laboratory Technical Report No. 14, University of Guam; August 1974. A general assessment of the major structural elements comprising the environment of the coastal regions of Guam. In assessing these elements, specific items are included. These are major vegetation zones; rivers; estuaries; bays; beaches and other coastal areas of unconsolidated material; rocky coastlines; reef zones, water masses and circulation patterns; climatic zones; geology and soil types; development areas and use patterns; and areas of rare or unique animals or plants. These items are discussed in a systematic way around the island and are augmented by illustrations, maps, charts, tables, and photographs. In the assessment of the major structural elements, areas where knowledge is weak or lacking are pointed out. Special attention is given to the presence of rare or endangered species; unique botanical elements; wetlands habitats; fisheries; and culturally important areas--sanctuaries, park lands, cemeteries, and so forth. There are five reports in this series.
Available: Bureau of Planning Library.

Talofofo Bay Coastal Survey; Richard H. Randall, Marine Laboratory Technical Report No. 13, University of Guam; August 1974. A report on Talofofo Bay and its associated coastal region describing the major physical elements comprising the environment; the dominant biological elements comprising the marine, aquatic, and terrestrial ecosystems; and the unique environmental factors. Contains numerous photos, figures, and tables.
Available: Bureau of Planning Library.

Biological Study of the Geus River Basin; Harry T. Kami, Nick Drahos, Rufo J. Lujan, and John J. Jeffrey, Marine Laboratory Technical Report No. 16, University of Guam; November 1974. An inventory of aquatic inhabitants of the river and the flora and fauna in the watershed. Includes notes on the physical features of the river such as flow data, temperature, chemical analysis, geology and climatic factors having a bearing on the total complex ecosystem. The potential future use of the basin is discussed.
Available: Bureau of Planning Library.

Atlas of the Reefs and Beaches of Guam; R.H. Randall and L.G. Eldredge, for the Bureau of Planning; 1976. Provides baseline information on Guam's coastal region by detailed coastal mapping of the beaches, rocky shorelines, mangrove swamps, river mouth areas and upstream navigatable areas, and reef-flat platforms. Also maps the general distribution of corals, sea grasses, and sediments on the reef-flat platform. Contains an appendix on "Mangroves and Estuaries" by Wilder (1977). More intensive regional studies were conducted in later years and published as "Guam's Reefs and Beaches Part II", 1978, below.
Available: Bureau of Planning Library.

Report on the Coral Survey of the Agana Bay Reef Flat; Richard H. Randall, for U.S. Army Corps of Engineers, Pacific Ocean Division; March 14, 1976. Presents the results of a field reconnaissance survey of the reef flat platform in the vicinity of the Agana Channel. This report includes a checklist of coral species, a map of the region showing the location of pockets of flourishing coral growth in the study area and a discussion of the biological impact of the proposed breakwater structures.
Available: Bureau of Planning Library.

Environmental Impact Assessment of Typhoon Pamela; Guam Environmental Protection Agency; June 1976. A compilation of reports by various governmental agencies which assess the short- and long-term effects of Typhoon Pamela on the natural environment. The terrestrial assessment includes studies on the northern limestone forest, Agana Springs Nature Preserve, parks and recreation areas, wildlife, pesticides, and solid waste removal. The marine assessment includes surveys by the Marine Lab, GEPA, and the Division of Fish and Wildlife; a siltation survey; a sewer outfall survey; and an oil spill survey.
Available: Bureau of Planning Library.

Marine Environmental Baseline Report Commercial Port, Apra Harbor, Guam; Marine Laboratory Technical Report No. 34, University of Guam; April 1977. The study provides data and general information on the local water current patterns, water chemistry, substratum composition; and species composition, abundance and distribution of zooplankton, algae, corals, macroinvertebrates, and fishes. The information will be used to assess the probable environmental impact of several possible plans for future navigation and docking facilities in Apra Harbor.
Available: Bureau of Planning Library.

Inventory and Mapping of Wetland Vegetation in Guam, Tinian, and Saipan, Mariana Islands; Philip Moore, Lynn Raulerson, Mitchell Chernin, and Patrick McMakin, University of Guam; June 1977. A survey of 26 wetland sites: seven on Saipan, two on Tinian, and seventeen on Guam. The areas were photographed, mapped, and characterized by such ecological parameters as substrate type, groundwater type, and dominant vegetation. Species and relative abundance of each species were noted. There are drawings, maps, photos, glossary, and bibliography. 253 p.
Available: Bureau of Planning Library.

"An Ecological Survey of Pristine Terrestrial Communities on Guam"; Philip H. Moore, for the Bureau of Planning, in Guam Coastal Management Program Technical Reports Volume I; August 1977. Descriptions of five areas considered to be terrestrial pristine ecological communities: the Limestone forest, coastal strand, wetlands, savannah, and ravine forest. Lists flora and fauna found in each. Photographs include some of the most scenic views, area features, and vegetation. Identifies those areas that are essential for protection of endangered and threatened species.
Available: Bureau of Planning Library.

"Survey and Species Inventory of Representative Pristine Marine Communities on Guam"; Jeanine O. Stojkovich, Marine Laboratory Technical Report No. 40, University of Guam, for the Guam Coastal Management Program, Bureau of Planning, in Guam Coastal Management Program Technical Reports Volume II; October 1977. A survey of twelve areas that are essential for the protection of endangered and threatened species or are relatively untouched representatives of characteristic marine ecological communities. Includes a brief description of the areas, their character, and the presence of endangered or threatened species. Species lists for fish, macroinvertebrates, corals and benthic algae, plus maps and field sketches.
Available: Bureau of Planning Library.

Environmental Survey of a Proposed Fill Site in Agana Swamp; Barry D. Smith and Steven E. Hedlund, Marine Laboratory Environmental Survey Report No. 18, University of Guam, submitted to Jones and Guerrero, Inc.; February 1978. Entails reviews of existing knowledge about the swamp, species checklists of the flora and fauna, quantitative estimates of dominant plant species, estimates of relative abundance of species of organisms in the area, and analysis of dissolved chemical components of the standing waters of the area.
Available: Bureau of Planning Library.

Biological Study of the Potential Ugum Dam Site, Guam; Lynn Raulerson, Mitchell Chernin and Philip Moore, University of Guam, for U.S. Army Corps of Engineers; May 1978. In general, this study discusses the total ecosystem complex of the potential Ugum dam site. Topics addressed in this report include an inventory of the aquatic organisms and the terrestrial flora and fauna near the potential Ugam Dam site; a discussion of the physical features such as geology, climate, river flow data, water temperature and chemical analyses; a description and mapping of the major species, communities and habitats; an identification and discussion of potential environmental problems or concerns related to the aquatic and terrestrial flora and fauna; an identification, mapping, and discussion of rare and endangered species or unique elements or habitats; and a collection, analysis, summarization and incorporation of pertinent extant biological and associated physical data.
Available: Bureau of Planning Library.

Guam's Reefs and Beaches Part II: Transect Studies; Marine Laboratory Technical Report No. 48, University of Guam, for the Bureau of Planning; July 1978. A continuation of the investigation of Guam's reefs and beaches initiated in May 1976 and published as an "Atlas of Reefs and Beaches of Guam". The transect studies constitute the first part of a second phase of reef investigations which encompass more intensive regional studies. This report provides general information on the coastal region, including mangrove swamps, river mouths, and estuaries. Data were collected from transects in five bays (Tumon, Agana, Agat, Fouha, and Ylig), and consists of the quantitative distribution and community structure analyses of benthic organisms, including corals, algae, and other macroinvertebrates.
Available: Bureau of Planning Library.

Guam's Reefs and Beaches Part II: Sedimentation Studies at Fouha Bay and Ylig Bay; Richard H. Randall and Charles Birkeland, Marine Laboratory Technical Report No. 47, University of Guam; August 1978. Analyzes the results of sedimentation studies conducted at the mouths of two rivers. Assesses the impact of terrestrial run-off sedimentation on the diversity of corals within offshore reef communities. Develops data that can be used to establish performance standards for allowable sedimentation rates in reef environments.
Available: Bureau of Planning Library.

Limnological Survey of the Major Streams and Rivers in Guam; Division of Aquatic and Wildlife Resources, Department of Agriculture; 1979. Monthly collection of water temperatures and flow rates in the Geus River from June 1978 to March 1979. Also includes preliminary biological surveys on the Inarajan River, Agana Swamp, N.C.S. Pool, and two small watersheds in the Fena system.
Available: Department of Agriculture.

Background Materials and Discussion on the Environmental Features, Historic Values and Land-Use Controls Affecting: Luminoa Reef; Western and Jade Shoals; Piti Channel, Tidal Flats, and Islets; Sasa Bay; SMS Cormoran; Guam Coastal Management Program, Bureau of Planning; June 1979. A review of literature and field studies of the natural areas of the northern half of Apra Harbor, Glass Breakwater, Cabras Island, Sasa Bay and Drydock Island. Existing land-use controls which manage these areas are also outlined. 87 p.
Available: Bureau of Planning Library.

Terrestrial and Freshwater Organisms Within and Limnology and Hydrology of the Guam Seashore Study Area and the War in the Pacific National Historical Park; Lynn Raulerson, Department of Biology, University of Guam; October 1979. A brief overview of the biology, limnology, and hydrology of the study areas, using existing sources and limited field investigation. It includes a list of commonly found plant and animal species; a list of rare and endangered or threatened species; and hydrology data (geological formations, rivers, stream data, freshwater sources, and climatological data). Measures needed to protect fragile resources in the War in the Pacific National Historical Park and the National Seashore Park are discussed.
Available: Bureau of Planning Library.

Marine Biological Resources Within the Guam Seashore Study Area and the War in the Pacific National Historical Park; L.G. Eldredge, Marine Laboratory Technical Report No. 57, University of Guam; November 1979. Summary of physiography, biotic communities, and resources and recreation for the Asan unit, the Agat unit, and the Seashore Study Area. The body of the report consists of lists of marine plants, corals, gastropods, bivalves, crustaceans, echinoderms, and fishes. Twenty-seven sketch maps illustrate various shoreline and reef-flat platform features.
Available: Bureau of Planning Library.

Regional Ecosystems Survey of the South Pacific Area; Arthur L. Dahl, South Pacific Commission; 1980. Summarizes a regional ecosystem survey of the South Pacific islands region, including Guam and the Marianas. This extensive summary describes each ecosystem in terms of government, island geological type, habitat data (such as forests, marshes, savannahs), conservation interest, rare or endemic species (birds, plants, reptiles, mammals and others), legislation for conservation, reserves, and references. The types of conservation plans are described and a regional reserve network is proposed. Good reference guide regarding ecology and conservation in the region.
Available: Bureau of Planning Library.

Long-Term Recovery Process of a Coral Community After a Catastrophic Disturbance; Mitchell W. Colgan, Marine Laboratory Technical Report No. 76, University of Guam; December 1981. This study documents the ability of coral communities to recover from natural catastrophic disturbances. The Tanguisson Reef area was chosen as the study site because of extensive damage to the reef by Acanthaster planci during 1968 and 1969, which was documented in earlier studies.
Available: Bureau of Planning Library.

Vegetative and Aquatic Communities: Four Watersheds in South Guam; U.S. Army Corps of Engineers, Honolulu District; August 1983. Presents the results of a reconnaissance survey of the Pago, Ylig, Ugum and Inarajan watersheds conducted to assist in identifying potential locations for reservoirs to irrigate arable lands in the areas under study. The report characterizes the vegetative and aquatic communities within the study areas, determines their ecological significance, and identifies threatened and endangered species.
Available: Bureau of Planning Library.

Baseline Marine Environmental Surveys for the East and West Agana Bays and Piti Bay, Guam; Pacific Basin Environmental Consultants, Inc., for William A. Brewer and Associates; July 1986. Describes the marine resources of East and West Agana Bay and Piti Bay. This report includes site description of the beaches and shoreline, reef-flat platform, currents, flora, fauna, and fishing and harvesting.
Available: Bureau of Planning Library.

AIR QUALITY

Guam Air Quality Implementation Plan; adopted by the Guam Air Pollution Control Commission, January 13, 1972; revised by the Guam Environmental Protection Agency, May 1984. Includes: the legal authority of GEPA, an emissions inventory control strategy air quality surveillance network, and reprinting of laws and regulations.
Available: Guam Environmental Protection Agency Library.

Power Plant Contingency Plan; Guam Air Pollution Control Commission; February 12, 1973. Presents an emergency episode plan for the U.S. Navy Public Works Center and the Guam Power Authority in compliance with federal regulations as outlined in the Federal register of May 31, 1972. The Plan is implemented on a regular basis based on adverse weather/wind conditions. Also included in this report are Compliance Schedules from the Guam Power Authority and U.S. Navy Public Works Center.
Available: Bureau of Planning Library.

Annual Reports on the Guam Air Quality Implementation Plan; Guam Environmental Protection Agency; reports have been prepared since July-December 1974. There is a short report on operating permits, compliance orders, variance requests, new construction permits, operating permit denials, and other activity during the time period. Each compliance schedule's progress is reported. Appendices contain correspondence, public hearing minutes, and progress report for major pollution control efforts. See below for discussion of NEDS data.
Available: Guam Environmental Protection Agency.

National Emission Data System (NEDS) Reports; Guam Environmental Protection Agency. For each point source of air pollution, the report includes monitoring data on the stacks, control equipment, control equipment efficiency, operating time, emissions estimates, emission standards, compliance schedules, and the content of the emissions. These reports are sent to USEPA. No reports or analyses are returned to Guam based on this data.
Available: Guam Environmental Protection Agency.

Island Air--Can Guam Keep It Clean?; Richard R. Justice, University of Oklahoma environmental research paper submitted for the requirement of PS-5990 Research Problems; January 28, 1977. A discussion of the origins, progress, and enforcement of clean air commitments, particularly by Congress, the Federal and Guam Environmental Protection Agencies, and the public.
Available: Guam Environmental Protection Agency.

Air Quality Monitoring. There are five air quality monitoring activities performed by the Guam Environmental Protection Agency Monitoring Division. All the data gathered is included in the Monitoring Division's Quarterly Report. For emissions, the data includes measurement of sulfur dioxide and particulate (dust). The first of these activities are the four permanent stationary monitoring stations located near major sources of air pollution. The data is collected as part of the State Implementation Plan (SIPS) and sent to the USEPA SAROAD data system. No reports or analyses are returned to Guam based on this data. The measurements are made every sixth day for 24 hours and are compared to maximum allowable emissions for 2-, 4-, 24-hour and other time periods. The second air quality monitoring activity is compliance monitoring. These tests, performed when necessary, are to ensure compliance with air quality regulations for particulate emissions point sources. The third monitoring activity, variance monitoring, is to measure the emissions of sources which have been granted a variance from the emissions regulations such as Guam Power Authority

and Guam Memorial Hospital. The fourth activity regards odors. However, the "Smellometer," as it is called, is rarely used in the field. The fifth and last air quality monitoring activity regards noise pollution.
Available: Guam Environmental Protection Agency.

Guam Power Authority Air Quality Management; Generation Department, Guam Power Authority. In addition to the Guam Environmental Protection Agency's sampling stations, Guam Power Authority maintains five temporary SO_2 sampling stations in various locations. Three sampling devices are strategically located within the Piti area for the purpose of monitoring SO_2 emission levels from Piti and Cabras Plants during adverse wind conditions. Two SO_2 sampling devices are located near the Tanguisson area in order to determine general background concentration levels of SO_2 and to record emission levels from the Tanguisson Power Plant during adverse wind conditions.
Available: Guam Power Authority.

Development of a Three-Dimension, Steady-State Air Quality Simulation Model Over Complex Terrain: Variational Optimization of Wind Field; Akio Wake, Water and Energy Research Institute of the Western Pacific, Technical Report No. 30, University of Guam; April 1982. Proposes an air quality simulation model. This report is devoted to the model development stage and was not field tested.
Available: Bureau of Planning Library.

Guam Air Pollution Control Standards and Regulations; Guam Environmental Protection Agency; adopted November 18, 1971, amended November 7, 1986. Ambient air quality standards, permits, monitoring, records and reporting, sampling and testing methods, control of open burning, control of particulate emission from process industries, control of fugitive dust, control of particulate emission from incinerators, control of visible emission of particulate from stationary sources, control of odors in ambient air, air pollution emergencies, control of sulfur dioxide emissions, motor vehicle pollution control, appeal procedures, circumvention, severability, and effective date.
Available: Bureau of Planning Library.

AIR TERMINAL ENVIRONMENTAL IMPACT ASSESSMENTS

Environmental Impact Assessment Report for the Proposed Development of the Guam International Air Terminal at the Naval Air Station, Agana, Guam; Richardson Associates, for Mackinlay, Winnacker, McNeil and Associates, for Department of Commerce; April 1975, revised November 1975.
Available: Bureau of Planning Library.

Guam General Aviation Environmental Impact Assessment Report 90% Review; Department of Commerce; January 6, 1976. An evaluation and assessment of the environmental impact of the general aviation facility developments proposed by the Guam General Aviation Master Plan. The study includes a description of the proposed action, probable impact on the natural and human environment, and alternatives to the proposed action.
Available: Bureau of Planning Library.

Environmental Impact Statement, Guam International Air Terminal, Guam Mariana Islands, Final; Federal Aviation Administration, U.S. Department of Transportation; October 1976. An evaluation of the potential environmental impact of the proposed acquisition of land and expansion of the terminal facilities at GIAT. This development is part of the GIAT Master Plan. The report covers the description, location, and purpose of the proposed project; existing conditions; and probable impact on air quality, utilities, surrounding land-use, access, noise, economics, and other factors.
Available: Bureau of Planning Library.

AMMUNITION WHARF STUDIES

Feasibility Study for Ammunition Handling Facility for the U.S. Naval Magazine Guam Mariana Islands; Christopher J. Foster, consulting engineer for Urbahn-Grad-Wall; April 1968. A study of several possible site locations for an ammunition handling facility: Pago Bay, Merizo, Sella Bay, Chii Point, and Achugoa Point. General environmental conditions such as weather, wave heights and directions, wave periods, winds, typhoons, currents, tides, surges, and seiches which may influence design, construction and utilization of any pier wherever constructed are first established for the island as a whole. This is followed by discussions of the environmental influences specifically for Pago Bay, Port Merizo, and three locations in Sella Bay. The final section summarizes the rationale for selecting Sella Bay as the most desirable from an environmental point of view, and the disadvantages of utilizing the other prospective locations.
Available: Bureau of Planning Library.

Environmental Analyses, Sub-Bottom Investigations and Wharf Orientation Recommendations for Sella Bay Area, Guam; Ocean Science and Engineering, Inc. for Naval Facilities Engineering Command, Pacific Division; 1969.
Available: Micronesian Area Research Center Pacific Collection.

An Assessment of the Biological Implications of an Ammunition Pier at Sella Bay, Guam; R. Caperon, R. Johannes, J. Maragos, for Commander Pacific Division, Naval Facilities Engineering Command; September 29, 1971. Contains ecological descriptions of the terrestrial and marine environments at Sella Bay. Discusses effects of burning and consequent erosion, interactions between land and marine environments, and the likely impact of the proposed access road and ammunition pier.
Available: Micronesian Area Research Center Pacific Collection.

Environmental Impact Statement Ammunition Pier, P-500 Sella Bay, Guam, Mariana Islands, Final; Department of The Navy; June 1972. An environmental impact statement of the proposed relocation of ammunition ship loading/unloading from Apra Harbor to Sella Bay for purposes of explosive safety. Relocation involves the construction of a pier with navigational aids, shoreside support facilities and a 1.5 mile access road plus acquisition of land as an explosive safety zone. Typescript.
Available: Micronesian Area Research Center Pacific Collection.

An Assessment of the Biological Implications of an Ammunition Pier at Achugao Point, Guam; Robert Johannes, John Caperon, James Maragos; 1973. This report on the marine and terrestrial environment and the associated biological community at Achugao Point lists corals and benthic plants; assesses the environmental effects of sedimentation, sediment transport, oil discharge, and sewage discharge; and compares the environments of Achugao Point and Sella Bay.
Available: Marine Laboratory (Dr. Eldredge Files).

Environmental Impact Statement for the Ammunition Port Facility, Orote Point, Guam, Mariana Islands, Draft; U.S. Department of the Navy; March 1977. Analyzes the potential environmental impact of the construction of the ammunition port facility at Orote. Analysis is limited to the wharf and adjacent supporting facilities such as a breakwater, wave dissipators, access roads, bridge, dredging, and improvements.
Available: Bureau of Planning Library.

Environmental Impact Statement for an Ammunition Wharf in Outer Apra Harbor, Guam, Mariana Islands, Final; VTN Pacific, for Pacific Division Naval Facilities Engineering Command, Hawaii; December 1983. Describes a proposed ammunition wharf in Outer Apra Harbor which would replace Hotel Wharf. This EIS examines two primary alternatives: a site on Orote Peninsula at Adotgan Point (preferred), and a site near the end of the Glass Breakwater. Other alternatives including no action, other locations on Guam, and various wharf designs, are also evaluated.
Available: Bureau of Planning Library.

COCOS ISLAND ENVIRONMENT

Marine Biological Survey of the Cocos Barrier Reefs and Enclosed Lagoon; Richard H. Randall, Roy T. Tsuda, Robert S. Jones, Michael J. Gawel, Jennifer A. Chase, and Ramon Rechebei, Marine Laboratory Technical Report No. 17, University of Guam; August 1975. A general assessment of Cocos Lagoon including maps showing the major elements of the study area; an assessment of the major elements, specifying instances where knowledge is weak or lacking; an inventory of the physical environment, flora and fauna, and unique environmental elements, especially rare or endangered species and fisheries; and evidence of stability or stress on the ecosystem or population.
Available: Bureau of Planning Library.

A Limited Current, Sediment, and Marine Biological Survey Near the Merizo Shores Docking Facility, Cocos Island, Guam; Steven E. Hedlund, Michael E. Molina and Russel V. Clayshulte, submitted to Merizo Shores Corporation; April 1977. An evaluation of the potential environmental impact caused by the proposed construction of a docking facility at Cocos Island. The report includes descriptions of water currents and sediment distribution, and a survey of dominant marine organisms found in the vicinity.
Available: Guam Environmental Protection Agency Library.

Environmental Assessment for a Merizo Wharf and Boat Channel for Cocos Lagoon Development Corporation; Pacific Basin Environmental Consultants, for CE Services, Inc.; April 14, 1981. Describes a proposed project at Merizo to construct a wharf for passengers going to and from Cocos Island by boat, and to dredge a channel through the fringing reef to Mamaon Channel. The study assesses the environmental setting without the project and briefly assesses the environmental impact of the proposed project. Appendix A is titled A Study of the Possible Impacts to the Marine Fishes in an Area of Merizo Where Wharf Construction and Channel Dredging are Planned, by Michael E. Molina, April 3, 1981.
Available: Bureau of Planning Library.

Resurvey of Cocos Lagoon, Guam, Territory of Guam; Richard H. Randall and Timothy S. Sherwood, Marine Laboratory Technical Report No. 80, University of Guam, for the U.S. Army Corps of Engineers; September 1982. Updates the "Marine Biological Survey of the Cocos Barrier Reefs and Enclosed Lagoon" done by the Marine Lab in 1975. The purpose of this survey was to ascertain if any changes in hard and soft coral, fish, algae, seagrass and other macroinvertebrates occurred since 1975; determine if increased tourist traffic and housing development affected the marine communities in the lagoon area; and measure currents in the lagoon. 104 p.
Available: Micronesian Area Research Center Pacific Collection.

Planning Considerations for Use and Development of Cocos Lagoon and Merizo Shore, Guam; U.S. Army Corps of Engineers, Honolulu Engineer District, for the Guam Comprehensive Study, Honolulu District; February 1983. A description of the environment of Cocos Lagoon and the adjacent Merizo shoreline is presented, based on a review of existing information. Discusses historic sites; population; current patterns; littoral materials and movements; soils and erosion; water quality; boating, recreation and water safety; marine life, terrestrial organisms, and endangered species. The report also reviews current land-use planning, water use planning, and infrastructure planning for the area. A companion document, Phase II: Impacts of Development on Cocos Lagoon/Merizo (Draft), January 1984, provides alternative approaches and addresses economic, physical, and biological impacts relevant to the study.
Available: Bureau of Planning Library.

Environmental Protection Plan - Utility Renovation - Cocos Island, Guam; Pacific Basin Environmental Consultants, Inc., Winzler and Kelly Consulting Engineers; 1989. Outlines details of construction operations for utilities renovation on Cocos Island relative to compliance with Guam Environmental Protection Agency regulations.
Available: Guam Environmental Protection Agency Library.

FEDERAL LANDS ENVIRONMENTAL IMPACT STUDIES

A Candidate Marine Environmental Impact Survey for the Potential Development of the Uruno Point Reef Area on Guam, Mariana Islands; Richard E. Dickinson and Roy T. Tsuda, Marine Laboratory Technical Report No. 19, University of Guam; April 1975. An evaluation of the potential environmental impact of the proposed development of the Uruno Beach area. The report includes a biological survey of the impact of construction of three swimming pools on the reef flat, a marina, and a sewage outfall for discharge of secondary treated effluent at 60 feet. Two eight-hour current studies were also conducted.
Available: Department of Parks and Recreation Library.

Environmental Statement, Access Easement Across U.S. Air Force Lands to Seibu Leisure (Guam), Inc. for Proposed Development of Lot 10080, Draft; U.S. Air Force; May 1976. Addresses tentative impacts of the Uruno Beach Development, which was a proposed resort/recreational/residential development ultimately including six hotels with 2500 rooms, 1250 housing units, a marina, restaurants, shops, botanical gardens, two sewage treatment plants, and other facilities. Access through U.S. Air Force land is necessary to open the private lands in North-West Guam to development. The area, at this time, is still undeveloped.
Available: Bureau of Planning Library.

Environmental Impact Statement of Gilan Beach Development, Tanguisson Point, Guam, Final; Department of Parks and Recreation; August 1976. This report was completed as part of the U.S. Department of Defense's requirements for obtaining a 25-year lease for the proposed development of 70 acres of Air Force land into a public beach park. It contains an evaluation of the potential environmental impact of the proposed development which includes trails, paved parking areas and roadways, restroom and shower facilities, and cleared areas for picnic and play.
Available: Guam Environmental Protection Agency Library.

Environmental Assessment General Management Plan War in the Pacific National Historical Park, Guam; National Park Service, U.S. Department of the Interior; March 1983. Evaluates feasible alternatives for boundaries, development, and management that were considered during development of the General Management Plan, March 1983. This environmental assessment addresses the affected environment; special influences on management; description of the proposal; environmental consequences of the proposal; relationship of the proposal to other proposals, plans, and applicable legislation; and alternatives considered and their environmental consequences.
Available: Bureau of Planning Library.

Environmental Assessment (EA) for Electronic Installations on Tinian and Guam, Draft; Department of the Navy; June 1987. An environmental impact assessment relative to the construction and operation of electronic installations on Tinian and Guam.
Available: Bureau of Planning Library.

Preliminary Environmental Assessment (PEA) for NSD Milcon P-116, Data Processing Service Center; U.S. Department of the Navy; November 1987. Assesses the environmental impact of constructing a one-story permanent concrete Data Processing Service Center building for ADP support services to all fleet and shore units. This report discusses existing environment of the proposed project, environmental consequences, and alternatives. Includes maps of the project site.
Available: Bureau of Planning Library.

Preliminary Draft Environmental Assessment Conventional Enhanced Release Training (CERT) Andersen AFB, Guam; Andersen Air Force Base; March 1988. Addresses the potential environmental affects of implementing CERT training. The proposed CERT is a program for releasing inert, nonexplosive, ten pound training devices on a designated target from B-52 aircraft. The Assessment includes brief discussions of the affected environment and expected impacts and mitigations. (However, Guam's B-52 43rd Bombardment Wing was deactivated in 1990.)
Available: Bureau of Planning Library.

Final Environmental Impact Statement - Clean Up of Uruno Beach Guam; U.S. Department of the Air Force; April 1988. This report was prepared to fulfill the House Armed Services Committee directive to respond to the need to clean up debris on the private (Artero family) property at Uruno Beach, Guam, by the military during and after World War II. The report outlines impacts of the proposed action and alternatives on the natural and human environments relative to impacts created by the various clean-up methods.
Available: Bureau of Planning Library.

Department of Agriculture Briefing Paper on Critical Habitat and the Navy Relocatable Over-the-Horizon Radar Project (ROTHR); Department of Agriculture; April 1989. Presents the Department of Agriculture's position on the Navy's proposal to build a ROTHR project in Northwest Field. This paper addresses the need for critical habitat designation, projects affected by critical habitat, and how protection of critical habitat is applied. In particular, possible adverse impact on the Guam Micronesian Kingfisher and the breeding habitat of the Mariana Crow are discussed. A copy of the Endangered Species Act of 1973 and a list of possible alternative sites for the Navy ROTHR project are included.
Available: Bureau of Planning Library.

Final Environmental Impact Statement for Electronic Installations in the Western Pacific; U.S. Department of the Navy; June 1990. Addresses the environmental consequences of the Relocatable Over-the-Horizon Radar program in the Western Pacific, and means for mitigating potentially adverse effects. This report outlines the project to construct and operate up to three electronic installations in Tinian, Commonwealth of the Northern Marianas, and Guam which will provide long-range detection and early warning of approaching naval and airborne threats.
Available: Bureau of Planning Library.

Relocatable Over-the-Horizon Radar Northwest Field, Guam, Federal Consistency Determination with the Guam Coastal Management Program; U.S. Department of the Navy; June 1990. Lists Guam Coastal Management Program policies, summarizing the consistency of the proposed project for each policy. This report contains a detailed description of the proposed Relocatable Over-the-Horizon Radar (ROTHR) project, to construct and operate a stand-alone ROTHR system. The system would consist of a transmitter on Tinian, and a receiver and operational control center located near the receiver on Guam.
Available: Bureau of Planning Library.

GOLF COURSE ENVIRONMENTAL IMPACT

Baseline Environmental Survey and Preliminary Draft Environmental Impact Assessment for Guam First Green Golf Course (Pulantat, Guam); Pacific Basin Environmental Consultants, for Taniguichi-Ruth; 1989. Describes the project, the environmental setting, the environmental impact of the proposed project, alternatives to the proposed project, and a summary of protective mitigation measures.
Available: Guam Environmental Protection Agency Library.

Environmental Protection Plan for the Grading of the Lake Agat Golf Course; Winzler and Kelly, Consulting Engineers, for MACS Corporation of Guam; 1989. Outlines details of the Lake Agat Golf Course project including a project description, measures to ensure protection of natural resources, erosion and sediment control, control and disposal of solid/sanitary wastes, fire control, air and water pollution control, noise control and public safety protection. An environmental assessment and an archaeological inventory survey final report are also provided.
Available: Guam Environmental Protection Agency Library.

Final Environmental Impact Assessment for Talafofo Golf Course; Pacific Basin Environmental Consultants, Inc., for Pricia, Inc.; 1989. Describes the project, the environmental setting without the project, the environmental impact of the proposed project, alternatives, and mitigation measures.
Available: Guam Environmental Protection Agency Library.

HARBORS, MARINAS, AND DREDGING

Environmental Impact Statement, Paradise Pier; Juan C. Tenorio and Associates; February 28, 1972. A short statement of the general impact of construction of the pier on Mamaon Channel, Merizo.
Available: Division of Aquatic and Wildlife Resources, Department of Agriculture.

A Marine Environmental Impact Survey for the Proposed Merizo Pier; R.H.Randall, Robert S. Jones, Marine Laboratory Environmental Survey Report No. 1, University of Guam; April 13, 1972. An evaluation of the potential environmental effect of construction of a pier, adjacent access channel, seawall backfill, and boat ramp at Mamoan Channel in Merizo. The survey includes a geographic description of the study area, biological studies, and current studies.
Available: Bureau of Planning Library.

Environmental Statement Proposed Improvements to the Agana Boat Basin; Robert Cruz, Parks and Recreation Resources Division, Department of Commerce; 1973. A proposed project involving the renovation of the existing basin areas and improvements is described, and the predicted environmental impacts are presented.
Available: Bureau of Planning Library.

Agana Harbor for Light-Draft Vessels, Detailed Project Report; U.S. Army Corps of Engineers; February 1973. Final environment statement. Describes alternate plans for construction of a larger boat harbor at Agana, involving dredging of some reef flat area while filling in to form land area on the adjacent surrounding reef flat. Impacts of this construction on the environment are discussed.
Available: Bureau of Planning Library.

A Marine Survey for the Proposed Merizo Marina; Robert S. Jones and Richard H. Randall, Marine Laboratory Environmental Survey Report No. 6, University of Guam; February 15, 1973. An evaluation of the potential environmental impact of the proposed offshore development of the Merizo Marina Boat Basin at the mouth of the Geus River in Merizo. Includes a description of the study area, a compilation of all the organisms observed in the study area, and a limited study of current patterns.
Available: Bureau of Planning Library.

Environmental Assessment Statement, Guam Hilton Hotel Dredging Project; Hotels of the Marianas, Inc.; March 9, 1973. Describes a project to dredge the shallow reef-flat in front of the Hilton Hotel to make it deep enough for swimming.
Available: Bureau of Planning Library.

A Marine Survey for the Proposed Hilton Hotel Dredging Project; R.H. Randall and Robert S. Jones, Marine Laboratory Environmental Survey Report No. 7, University of Guam; March 1973. An evaluation of the potential environmental effects of dredging a swimming area from submerged lands adjacent to the Guam Hilton Hotel. The survey includes a description of the study area, a study of current patterns, and biological studies.
Available: Bureau of Planning Library.

A Marine Survey for the Achang Bay Marina; R.H. Randall, T.L. Tansy and H.K. Larson, Marine Laboratory Environmental Survey Report No. 10, University of Guam; August 21, 1973. This report describes the terrestrial and marine environments in the area of dredging and filling at the head of Manell Channel and mouth of Tochog Creek. Currents in the immediate area are described. Marine plants, corals, other invertebrates, and fishes are listed, and impacts of the project on the environment are discussed.
Available: Bureau of Planning Library.

Marine Survey, Part I, and a Current Survey, Part II, for the Proposed Guam Marine Marina (Temporary Boating Facility); R. H. Randall and L.G. Eldredge, Marine Laboratory Environmental Survey Report No. 13, University of Guam; September 1, 1973 and December 1, 1973. Part I is an environmental survey report describing the proposed construction of a temporary boating facility adjacent to Cocos Lagoon, the environmental setting without the project, and the environmental impact of the proposed project. Part II is a 24-hour current and wind study in Mamaon Channel.
Available: Bureau of Planning Library.

Environmental Impact Statement, Achang Bay Channel and Boat Basin; Hugh Fawcett; 1974. Describes the dredging and filling project at the head of Manell Channel, Merizo, to provide small boat launching and berthing facilities while channelizing the creek flow over the reef flat area. The plan calls for enhancing the mangrove area at the project site.
Available: Bureau of Planning Library.

A Marine Survey for the Sleepy Lagoon Marina; R.H. Randall and L.G. Eldredge, Marine Laboratory Environmental Survey Report No. 14, University of Guam; January 1974. An evaluation of potential environmental impact caused by the proposed construction of a small boat basin at Sleepy Lagoon with dredging and construction of a causeway. The survey includes a description of the proposed project, the environmental setting without the project, and a reef-flat platform and off-shore current study.
Available: Bureau of Planning Library.

Marine Survey for the Proposed Dredging at the Cabras Island Terminal of Mobil Petroleum; L.G. Eldredge, R.H. Randall, and R.S. Jones, Marine Laboratory Environmental Survey Report No. 16, University of Guam; August 5, 1974. An evaluation of the potential environmental impact of the proposed dredging and deepening of the existing pier facility at Cabras Island. Includes a catalog of the major marine organisms of the study area and a preliminary 24-hour current study.
Available: Bureau of Planning Library.

Supplement to Final Environmental Statement Agana Small Boat Harbor, Agana, Guam; U.S. Army Corps of Engineers, Pacific Ocean Division; August 1975 and March 1976. These reports are supplements to the final environmental statement Agana Harbor for Light-Draft Vessels, Detailed Project Report, February 1973.
Available: Bureau of Planning Library (August 1975 only).

Marine Survey of Agat Bay; edited by L.G. Eldredge, R. Dickinson, and S. Moras, Marine Laboratory Technical Report No. 31, University of Guam, for Guam Oil and Refinery Co., Inc.; January 1977. Includes a catalog of marine organisms, an annual ocean currents study, an evaluation of the potential environmental impact of the proposed construction and operation of a sea-island mooring facility to accommodate tankers of at least 250,000 DWT, and an evaluation of the potential environmental impact of operational emergencies and the use of sea water for industrial cooling. Tables, illustrations, 23 p.
Available: Bureau of Planning Library.

Harbor of Refuge, Apra Harbor Guam--Reconnaissance Report; U.S. Army Corps of Engineers, Pacific Ocean Division; September 20, 1977. Addresses the potential needs and justification for a harbor of refuge for small boats at Apra Harbor, and recommends preparation of a detailed project report.
Available: Department of Parks and Recreation Library.

Marine Reconnaissance Survey of Proposed Sites for a Small Boat Harbor in Agat Bay, Guam; Mitchell I. Chernin, Dennis R. Lassuy, Richard E. Dickinson, and John W. Shepard, Marine Laboratory Technical Report No. 39, University of Guam, for the U.S. Army Corps of Engineers; September 1977. An underwater and surface reconnaissance survey and mapping of three study areas (Bangi Point, Nimitz Beach, and the Teleyfac River areas) considered as possible construction sites for a small boat basin. Scope of work includes preliminary mapping and delineating of marine habitats; descriptions of the qualitative conditions of the marine environment; discussion of the dominant coral, fish, algae, and invertebrate species; and qualitative observations on water currents, water quality, and local fishing activities. The report recommends that a detailed study be undertaken to determine the need and feasibility of providing a small boat harbor in the Agat area.
Available: Bureau of Planning Library.

Draft Detailed Project Report and Environmental Statement Harbor of Refuge, Guam; U.S. Army Engineer District, Honolulu, Hawaii; February 1979. Identifies and evaluates the problems and needs of providing refuge facilities in Apra Harbor to protect small boats during storms. This report was modified in a September 1984 study (below).
Available: Bureau of Planning Library.

Final and Interim Report--Harbors and Rivers in the Territory of Guam (With Draft Environmental Statement) at Apra Harbor, Guam; U.S. Army Engineer District, Honolulu, Hawaii; 1977 and 1980. A study of the feasibility of the expansion of existing port facilities and the evaluation of commercial navigation and related land resource problems in the Apra Harbor complex.
Available: Interim Report - Bureau of Planning Library.
Final Report - Port Authority of Guam.

Agat Small Boat Harbor, Territory of Guam, Final Detailed Project Report and Environmental Statement; U.S. Army Corps of Engineers; May 1981. A plan for developing a small-boat harbor at Nimitz Beach. Previous draft reports for a small boat harbor at Gaan Point were prepared in 1977 and 1978. The report is divided into plan formulation; description of the public involvement program; information on the recreation, social, and cultural-archaeological resources; information on natural resources; engineering analyses and data relative to the design of the general navigation improvements; and economic background information, data and analysis for determining the project benefits and costs.
Available: Bureau of Planning Library.

Apra Harbor - Interim Survey Report and Environmental Statement; U.S. Army Corps of Engineers; 1983. Determines the feasibility of providing navigational improvements for the Commercial Port at Apra Harbor. The scope of the report includes identification of navigational problems, examination of alternative plans; and evaluation of plans in terms of technical, economic, environmental, and social acceptability.
Available: Micronesian Area Research Center Pacific Collection.

A Two Dimensional Depth-Integrated Finite Element Coastal Circulation Model; Akio Wake, Water and Energy Research Institute of the Western Pacific, Technical Report No. 42, University of Guam; September 1983. A vertically integrated shallow-water model to address coastal circulation problems is developed in this report. The partial results of a sample computer run for Apra Harbor are given.
Available: Bureau of Planning Library.

Merizo Small Boat Harbor, Territory of Guam: Detailed Project Report and Environmental Impact Statement, Draft; U.S. Army Corps of Engineers, Honolulu District; September 1983. Identifies and evaluates the problems and needs associated with providing light draft navigational improvements in the Merizo coastal area and the impacts upon the overall environmental, economic, social, cultural, and recreational resources of the area. Includes site investigations; archaeological cultural studies; hydrographic and topographic surveys; geologic, foundations and material investigations; fish and wildlife studies; oceanographic and meteorological studies; engineering designs; economic evaluations; and environmental assessment. Assesses and evaluates possible alternatives and develops a plan.
Available: Bureau of Planning Library.

Addendum to the Detailed Project Report and Environmental Statement Harbor of Refuge, Apra Harbor, Guam; Pacific Basin Environmental Consultants Inc., for Port Authority of Guam; September 1984. Updates the 1979 "Draft Detailed Project Report and Environmental Statement, Harbor of Refuge, Apra Harbor, Guam". This study was necessitated by a change in the original proposed location of the dredged basin because of buried oil pipelines that cut directly across the Piti Channel.
Available: Bureau of Planning Library.

Environmental Impact Statement, Agana Deep-Draft Harbor and Reclamation Project, Agana, Guam; Port Authority of Guam; July 1986. Presents the benefits and consequences of the proposed development of a cruise ship harbor, passenger terminal, resort, condominium, and commercial center complex at Agana. In conjunction with the proposed 70-acre deep-draft harbor, 210 acres of filled land would be constructed of dredged materials on the East Agana Bay reef-flat. This report includes an economic impact study, marine environmental studies, marine archaeological studies, planning and design considerations for the proposed fill area, and geotechnical investigations.
Available: Bureau of Planning Library.

Draft Preliminary Environmental Impact Assessment for Microdredging Tumon Bay, Guam; Barrett Consulting Group, Inc.; 1988. Describes a proposed microdredging project in Tumon. This study provides basic information about the project, along with physical and biological characteristics of the site, and anticipated impacts on the environment as a result of the project.
Available: Guam Environmental Protection Agency Library.

Sunset Beach Hotel Dredging and Final Environmental Impact Statement; Pacific Basin Environmental Consultants Inc., for First Living Service, U.S.A., Inc.; March 1989. Final environmental impact statement for a hotel/development project. Report assesses the environmental setting without the project, the environmental impact of the project, alternatives to the project, and environmental protection and mitigation measures.
Available: Bureau of Planning Library.

OCEAN THERMAL ENERGY CONVERSION DEVELOPMENT AND THE MARINE ENVIRONMENT

Environmental Impact Report, Projected OTEC Development for the Territory of Guam; Dames and Moore, for Bureau of Planning; October 1979. Overall economic, social and environmental consequences of constructing and operating an OTEC plant on Guam. The study relies on existing work on Guam and on general OTEC literature. Both a small-scale (10 MW) land-based plant and a large-scale (100 MW) sea-based plant are discussed. Contains a bibliography of existing studies on Guam and of general OTEC literature.
Available: Bureau of Planning Library.

Ocean Thermal Energy Conversion: Draft Environmental Impact Statement; U.S. Department of Commerce; March 1981. Identifies and assesses the effects that commercial OTEC development would have on human activities and the atmospheric, marine, and territorial environments. Evaluates alternate regulatory approaches for mitigating adverse environmental impacts associated with siting, design, and operation of commercial OTEC plants, and identifies the preferred regulatory alternative. Guam is identified as one of five candidate sites representing typical environments in which the construction of land-based OTEC plants is most likely to occur.
Available: Bureau of Planning Library.

OIL, HAZARDOUS SUBSTANCES AND NUCLEAR WASTE

Apra Harbor Pollution Study; U.S. Navy Public Works Center; September 1971. Identifies every source of pollution of Apra Harbor. After a general discussion of major facilities at the harbor, the study identifies 20 military, three Government of Guam, and seven local commercial sources of pollution. For each of these 30 items, there is a description of the facility or activity, each type of discharge, the agency responsible for operations, and the cost of proposed corrective measures. Maps locating these sources and corrective measures are in the Appendix.
Available: Micronesian Area Research Center Pacific Collection.

Disposal and Handling of Infectious Solid Wastes on Guam; Carol Pastic, University of Guam; May 1975. This study includes an overview of hospital and health clinic waste. The practices of Guam Memorial Hospital, including incineration and landfill disposal and the contents of the waste, are examined. Survey data was recorded for eight Public Health centers and is available at GEPA offices.
Available: Guam Environmental Protection Agency Library.

208 Plan for Navy Activities on Guam; U.S. Navy; February 1978. This is the comprehensive environmental management program for Navy activities on Guam. The report identifies point and non-point sources of pollution, including the wastewater treatment plant, shipboard waste, hazardous wastes, and oil spillage.
Available: Guam Environmental Protection Agency Library.

Hazardous Waste Management: Problem Assessment and Strategy Formulation; Garretson, Elmendorf, Zinov, Reibin, Architect and Engineers of San Francisco, California; April 1978. Results of a survey of industrial military waste generation and management practices in the Pacific Basin. The survey was conducted by mail covering relevant public agencies and private enterprises. The study covers twelve Pacific Basin islands including the State of Hawaii, Guam, American Samoa, Northern Marianas, and the Trust Territory.
Available: Guam Environmental Protection Agency Library.

Region IX Coastal Oil and Hazardous Substances Pollution Contingency Plan; Twelfth Coast Guard District; April 1977, revised July 1978. Concerned primarily with oil spills, this document includes: statement of policy, agency responsibility, elements on planning, response, operations, and coordination. Information is provided on legal authorities to act, funding arrangements, oil spill treatment, and technical data.
Available: Bureau of Planning Library (April 1977)
Army Corps of Engineers Office (July 1978).

Environmental Monitoring and Disposal of Radioactive Wastes from U.S. Naval Nuclear Powered Ships and Their Support Facilities; Naval Sea Systems Command, Department of the Navy; March 1980. Contains the environmental monitoring activities conducted in harbors where nuclear powered ships are overhauled or based. Apra Harbor is included in this monitoring.
Available: Guam Environmental Protection Agency Library.

Nuclear Dumping in the Pacific: Position Paper Submitted to the Association of Chief Executives of the Pacific Basin; Governor Paul Calvo; August 14-15, 1980. Summarizes the Government of Guam's position on the proposed experimental disposal of low-level wastes in the Pacific Ocean by the Japanese government.
Available: Bureau of Planning Library.

Biological Effects of the GORCO Oil Spill on the Laguas Mangrove Community; Guam Environmental Protection Agency; September 1980. A report on the June 4, 1980 spill of marine diesel fuel into an ecologically important mangrove habitat. This was considered to be the most significant spill recorded on Guam. The report consists of a biological field survey and laboratory support studies.
Available: Guam Environmental Protection Agency Library.

Nuclear Dumping in the Western Pacific; Marianas Alliance Against Nuclear Dumping in the Pacific; 1981. States the position of the Marianas Alliance against nuclear dumping and storage of low-level nuclear waste in the Pacific Ocean.
Available: Bureau of Planning Library.

The Proposed Japanese Oceanic Nuclear Waste Disposal Program: A Scientific Analysis; W. Jackson Davis, University of California at Santa Cruz; May 1, 1981. Documents the potential environmental and health hazards of radioactive waste disposal in the Pacific Ocean by the Japanese government. This report presents data that suggest that a study by the Japanese Nuclear Safety Bureau contains scientific errors and omissions, resulting in a serious underestimation of the danger of the program to the people of Japan and Micronesia.
Available: Bureau of Planning Library.

Review of Report on Proposed Japanese Oceanic Disposal Program; D.R. Andersen, Seabed Programs Division, Sandia Laboratories; August 20, 1981. Reviews the above document on the proposed Japanese oceanic nuclear waste disposal program. These comments from various scientists in the U.S. refute the conclusions of Dr. Davis as to the danger of low-level nuclear waste disposal in the Pacific. Specific comments are listed by page number of the Davis report and are limited to the data presented. No recommendations are given on the advisability of ocean nuclear waste disposal.
Available: Bureau of Planning Library.

Restoration of a Mangrove Habitat Following An Oil Spill in Sasa Bay, Apra Harbor, Guam; Pacific Basin Environmental Consultants; 1981, 1982.
Available: Guam Environmental Protection Agency Library.

An Assessment of Sewage Sludge Management on Guam; Guam Environmental Protection Agency; February 1983. Assesses present methods of sludge disposal on Guam with regard to potential environmental impact, recommends alternative methods of sludge management, and suggests guidelines for land application of sewage sludge.
Available: Bureau of Planning Library.

Hazardous Waste Storage and Disposal in the South Pacific; United Nations Environmental Programme; 1984. Overviews the storage and disposal of hazardous wastes, excluding radioactive wastes, in the South Pacific region. Data is presented on the types of substances stored or disposed of in the region (past, present and planned for); amounts of substances stored or disposed of, their source and country of origin; environmental effects (observed or potential); and an evaluation of the hazardous waste problem in the region in the context of other environmental problems facing the South Pacific region. Includes an outline of an action plan for managing the environment.
Available: Micronesian Area Research Center Pacific Collection.

Hazardous Waste Management: A Case Study; William Zucker; Not dated, but after 1984. Presents a brief discussion on the sources of hazardous waste, off-island hazardous waste disposal, hazardous discharges, and the Ordot Landfill.
Available: Bureau of Planning Library.

Defense Environmental Restoration Program, Guam; Bruce G. Karolle and Thomas B. McGrath, Micronesian Area Research Center, University of Guam; 1985. Presents the results of investigations of all land parcels formerly held by different Department of Defense agencies on Guam from the year 1898 for toxic waste, debris, or ordnance. This report contains notes and maps of each site location and some photos. 91 p.
Available: Bureau of Planning Library.

Pacific Regional Workshop on Marine Pollution Prevention, Control and Response; T.M. Hayes and W.H. Zucker (Eds.), South Pacific Commission; 1985. Focusses on major marine pollution incidents in the past 20 years around the globe, particularly oil spill response and cleanup. These technical papers contain specific reference to effects and mitigation in marine environments.
Available: Micronesian Area Research Center Pacific Collection.

Proceedings of the Workshop on the Fate and Impact of Marine Debris; R.S. Shomura and H.O. Yoshida (Eds.), National Oceanic and Atmospheric Administration, U.S. Department of Commerce; 1985. A lengthy series of technical and research papers on the subject of the increased volume of marine debris relative to the impact on marine mammals, fishes and other marine wildlife. Reviews the state of knowledge on the fate and impact of marine debris to determine the extent of the problem. Discusses the identification of and recommendations for possible mitigating actions and future research needs.
Available: Micronesian Area Research Center Pacific Collection.

Hazardous Waste - Abandoned Disposal Sites May Be Affecting Guam's Water Supply; U.S. General Accounting Office; April 1987. Assessment report on Department of Defense efforts to identify and clean up abandoned hazardous waste disposal sites on AAFB and Naval Station. Special attention is given to the water supply and contamination of Guam's northern lens aquifer.
Available: Micronesian Area Research Center Pacific Collection.

Hazardous Waste - DOD Installations in Guam Having Difficulty Complying with Regulations; U.S General Accounting Office; April 1987. Documents the non-compliance of DOD installations with the Resource Conservation and Recovery Act of 1976. This assessment pays special attention to addressing the causes of non-compliance and improvement of hazardous waste management.
Available: Micronesian Area Research Center Pacific Collection.

Pacific Regional Workshop on Oil Spill Response; T.M. Hayes and D. Brodie (Eds.), Department of Transport and Communications, Brisbane, Australia; 1988. A compilation of manuscripts from a workshop on the prevention of marine pollution incidents, particularly accidental oil spills. Reports cover prevention, safe handling, transport and storage of dangerous chemicals and oil. Of particular interest are contingency plans for response and recovery of accidental oil spills.
Available: Micronesian Area Research Center Pacific Collection.

Guam Hazardous Waste Transfer Facility - Operation and Maintenance Manual; GMP Associates, Inc., for the Guam Environmental Protection Agency; 1989. A manual for operations of the hazardous waste transfer facility. The facility is described and procedures are outlined for receiving and identifying wastes, shipping and manifesting, inspections, preparedness and prevention, and personnel training requirements. A contingency plan and emergency procedures are given.
Available: Guam Environmental Protection Agency.

Interim Report on Field Applications of the APEG Process for Treating Wastes Contaminated with Chlorinated Hydrocarbons, Draft; PEI Associates, Inc.; May 1989. Provides detailed information on treating Polychlorinated Biphenyl (PCB) contaminated soils and herbicide wastes with a Potassium Polyethylene Glycol (KPEG) process. A site was selected at the U.S. Navy Public Works Center because of soil contamination found in a nearby storm drainage ditch resulting from leaks from a transformer rework building. This interim report includes site description, soil preparation for treatment, field-scale KPEG system design operation, storage of treated soil, analytical procedures, and results.
Available: Bureau of Planning Library.

Final Report on Evaluation of Processes to Chemically Treat PCB's and Hazardous Materials; R.E. Hinchee, G.B. Wickramanayake, B.C. Kim, and Herm Nack; June 1989. Provides analysis and evaluation of selected hazardous waste sites in the United States in treating PCB contaminated soils and chemical residues. This report contains field tests and provides specific recommendations employing the KPEG process to treat PCB at the U.S. Navy Public Works Center in Guam.
Available: Bureau of Planning Library.

Hazardous Waste Management Regulations; Guam Environmental Protection Agency; adopted May 1981, amended November 1989. Cites federal and state regulations pursuant to 10 GCA Section 51103, hazardous waste management. Topics include identification and listing of hazardous waste; standards applicable to generators and transporters or hazardous waste; standards applicable for owners and operators of hazardous waste treatment, storage and disposal facilities; land disposal restrictions; hazardous waste permit program; procedures for permit administration; compliance evaluations; and severability.
Available: Bureau of Planning Library.

Oil Pollution Prevention; Federal Register, Volume 38, No. 227; December 11, 1973. Title 40 Part 112 of the law requires that all above ground storage tanks of over 1200 gallons be covered by a Spill Prevention Control and Countermeasure (SPCC) Plan. The plan's purpose is to identify spill prevention control and clean-up methods in the event of a spill. The law also specifies that an Inspection Report be completed by the Environmental Protection Agency in order to ensure SPCC compliance. GEPA has assumed the responsibility of the inspection since there is no federal EPA office on Guam.
Available: Individual Wastewater Division, Guam Environmental Protection Agency.

Oil Spills Reported; Guam Environmental Protection Agency; 1976 to present. GEPA is responsible for monitoring oil spills. Yearly tabulations are available on the number of spills (ship fuel, jet fuel, fuel oil and other), total gallons spilled and total gallons recovered. This table is published in GEPA's annual report.
Available: Individual Wastewater Division, Guam Environmental Protection Agency.

POWER PLANTS AND THE MARINE ENVIRONMENT

A Study of Ecological Succession Following Natural and Man Induced Changes on a Tropical Reef; Robert S. Jones; February 23, 1971. A progress report on studies underway to investigate the effect on marine ecology of the Tanguisson Power Plant.
Available: University of Guam Marine Laboratory.

A Marine Environmental Survey of Piti Bay and Piti Channel, Guam; James A. Marsh, Jr. and Gregory D. Gordon, Marine Laboratory Environmental Survey Report No. 3, University of Guam; June 1972. Evaluates potential environmental impact caused by the construction of a steam power plant at Cabras Island. General biological surveys of the immediate areas to be affected and a study of water movements were conducted.
Available: Bureau of Planning Library.

Algal Succession on Artificial Reefs in a Marine Lagoon Environment in Guam; Roy T. Tsuda and Harry T. Kami; 1973. This paper presents quantitative and qualitative information on the algae communities present on two artificial reefs studied over a 26 month period (January 1970 to February 1972) in Merizo Lagoon.
Available: Bureau of Planning Library.

Environmental Impact Survey for the Proposed Steam Power Plant at Cabras Island; Fish and Wildlife Division, Department of Agriculture; June 1973. Cursory discussion of the project to dredge a channel and fill a reef flat area as a site for the Cabras Power Plant.
Available: Bureau of Planning Library.

A Thermal Study of Piti Channel, Guam, and Adjacent Areas, and the Influence of Power Plant Operations on the Marine Environment; J.A. Marsh and Gregory D. Gordon, Marine Laboratory Technical Report No. 6, University of Guam; June 1973. A study of the ecological effects of heated water from the Piti Power Plant entering Piti channel and adjacent tidal flats and the Government of Guam area of the Commercial Port. Assesses potential effects of additional inputs of heated water into the area from the Cabras Island Power Plant, then under construction. Studies were conducted from January 1972 through April 1973 of major thermal patterns under a wide range of conditions--time of day, stage of the tidal cycle, weather, season of the year, and variable plant loading.
Available: Bureau of Planning Library.

A Study of Biological Impact Caused by Natural and Man-Induced Changes on a Tropical Reef; Robert S. Jones, Richard H. Randall, Marine Laboratory Technical Report No. 7, University of Guam; July 1973. Evaluates biological effects of the Tanguisson Power Plant No. 1. Studies the condition of a section of coral reef at Tanguisson Point prior to the completion of the plant, and re-evaluates the reef after the plant became operational. Catalogs the induced environmental changes, monitors heavy metals, and conducts thermal stress experiments in the laboratory. A survey of the effect of the coral feeding crown-of-thorns starfish was also conducted in order to help assess causes of change found in the reef.
Available: Bureau of Planning Library.

Marine Environmental Effects of Dredging and Power Plant Construction in Piti Bay and Piti Channel, Guam; James A. Marsh, Jr., and Gregory D. Gordon, Marine Laboratory Technical Report No. 8, University of Guam; May 1974. Reports environmental effects of construction activities in Tepungan Channel and the adjacent reef flats of Piti Bay. Discusses water turbidity, water circulation, bulldozer damage to live coral, biological recovery of the reef flat and channel after dredging, and natural stresses due to freshwater run-off, silt deposits and low tides.
Available: Bureau of Planning Library.

Power Plants and the Marine Environment: Additional Observations in Piti Bay and Piti Channel, Guam; James A. Marsh, Jr. and James E. Doty, Marine Laboratory Technical Report No. 21, University of Guam; July 1975. Includes information on biological communities, temperature observations, and water currents.
Available: Bureau of Planning Library.

Effects of Thermal Effluent on the Coral Reef Community at Tanguisson; S. Neudecker, Marine Laboratory Technical Report No. 30, University of Guam; 1976. Annual report submitted to Guam Power Authority. A supplement to previous studies that outline the extent of coral kill zones caused by thermal discharge onto adjacent coral reef from the power plant facility.
Available: University of Guam Marine Laboratory.

Biological Impact Caused by Changes on a Tropical Reef; Jones, Randall and Wilder, U.S. Environmental Protection Agency Ecological Research Series; April 1976. This study evaluates the biological condition of the receiving waters prior to and after the operation of the Tanguisson Power Plant units. It includes a laboratory approach by thermal simulation experiments on various coral species to determine lethal and sublethal temperatures to these species. The significance of this study was to document existing coral damage by Acanthaster predation and thus avoid possible confusion with effects of the plant's thermal effluent. The study focused mostly on bottom dwelling organisms. 209 p.
Available: Bureau of Planning Library.

The Influence of Power Plant Operations on the Marine Environment in Piti Channel, Guam: 1975-1976 Observations; James A. Marsh, Jr., and James E. Doty, Marine Laboratory Technical Report No. 26, University of Guam; April 1976. The fifth in a continuing series of reports concerning the impact of power plant construction and operation on shallow marine environments in the Piti area. The focus of this report is on thermal conditions as they are actually affected by full-scale operations of the Cabras Power Plant.
Available: Bureau of Planning Library.

Thermal Simulation Experiments, Biological Impact Caused by Changes on a Tropical Reef; Jones, Randall, and Wilder, Marine Laboratory, University of Guam; April 1976. Results of a study to provide information on upper thermal tolerance limits of various coral species on Guam.
Available: Guam Energy Office.

Final Report to EPA on Section 316(a) Type I Demonstration for Piti Power Plant Guam; Pacific Division, Naval Facilities Engineering Command, principal investigator Robert M. Moncrief; 1977. Attached are all known existing reports concerning the effects of Piti Power Plant thermal discharge on the marine biota in the discharge zone.
Available: Guam Environmental Protection Agency Library.

Power Plants and the Marine Environment in Piti Bay and Piti Channel, Guam: 1976-1977 Observations and General Summary; J.A. Marsh, Jr., Mitchell I. Chernin, and James E. Doty, Marine Laboratory Technical Report No. 38, University of Guam, submitted to Guam Power Authority; 1977. A description of the general temperatures observed in the study area, current patterns and channels profile elevation including the tidal flats. This study also includes biological observations comparing the occurrence and abundance of fish species and macrobenthic species before and after the Cabras Power Plant operation. Also included is the University's summary and recommendations stemming from their findings over the entire study period, 1971-1977.
Available: University of Guam Marine Laboratory.

Guam Power Authority Section 316(a) Type I Demonstration Cabras Power Plant; Marine Laboratory, University of Guam, for the Guam Power Authority and the U.S. Environmental Protection Agency; September 27, 1977. Presents the results of five years of continuous environmental studies conducted by the UOG Marine Lab in Piti Channel and Apra Harbor. The four sections in the report include temperature data, biological data, engineering and hydrological information, and water quality data.
Available: Guam Environmental Protection Agency Library.

Development and Environmental Quality of Coral Reef Communities Near the Tanguisson Power Plant; S. Neudecker, Marine Laboratory Technical Report No. 41, University of Guam; October 1977. This is a continuation of previous studies. It compares the standing crop of biomass accumulation and species diversity on the upper and bottom surface of the thermal discharge zone and the zone unaffected by the thermal discharge. Also included is the University's summary and conclusions based on their findings over the 1975-1977 study period.
Available: Guam Environmental Protection Agency Library.

Section 316(a) Type I Demonstration Tanguisson Power Plant; Marine Laboratory, University of Guam, for the Guam Power Authority; February 1978. A review of Tanguisson Power Plant monitoring data, which includes temperature data, biological data, current patterns and water quality data. Three previous studies constitute the base data and are reproduced in this report.
Available: Guam Environmental Protection Agency Library.

Piti Power Plant Intake Survey; J.G. Groohoug, for Naval Facilities Engineering Command, Pacific Division; September 15, 1978. A marine environmental field survey conducted during November 1977 at Piti Power Plant. Descriptive data were obtained for benthic, nektonic, and planktonic components of the resident ecosystem. Tabulations of data collected, checklists of organisms identified, and detailed descriptions of marine environmental survey techniques used during the survey are presented in the text and appendices of the report.
Available: Guam Environmental Protection Agency Library.

Three Methods of Coral Transplantation for the Purpose of Reestablishing a Coral Community in the Thermal Effluent Area at the Tanguisson Power Plant; Charles Birkeland, Richard H. Randall and Gretchen Grimm, Marine Laboratory Technical Report No. 60, University of Guam; November 1979. A project to determine whether a coral reef community could be re-established in a thermal effluent area. Three methods of coral transplantation were used. The methods were compared in terms of their relative reliabilities for successful transplant results and in terms of their relative costs. The results were then analyzed in terms of the comparative cost-benefit ratio of the three methods.
Available: Bureau of Planning Library.

Toxicity Bioassays for the Piti Power Plant, Guam, on the Effects of Total Residue Chlorine on the Early Life Stages of Selected Tropical Marine Species; Bruce R. Best, Daniel B. Matlock, James A. Marsh, Jr. and Richard D. Braley, Marine Laboratory Technical Report No. 68, University of Guam; 1981. Investigates the effects of chlorine on selected tropical marine organisms.
Available: Bureau of Planning Library.

SEWAGE TREATMENT PLANTS AND THE MARINE ENVIRONMENT

An Annual Cycle Study of Biological, Chemical and Oceanographic Phenomena Associated with the Agana Ocean Outfall; Robert S. Jones and Richard H. Randall, Marine Laboratory Technical Report No. 1, University of Guam; June 6, 1971. Evaluates the effectiveness of the existing Agana outfall. This study projects how the extension and/or change in depth of the outfall will affect the dilution and travel pattern of sewage.
Available: Bureau of Planning Library.

A Preliminary Study on the Effect of an Ocean Sewage Outfall on Benthic Algae Community on Guam; R. T. Tsuda; June 1971. This appendix to the University of Guam Marine Laboratory Technical Report No. 1 further evaluates the effectiveness of the existing Agana outfall. It studies the effects of the discharge of raw sewage on the marine flora and explores the possibility of identifying an indicator organism.
Available: Guam Environmental Protection Agency Library.

Preliminary Marine Survey for the Northern District Sewage System; R.H. Randall and Robert S. Jones, Marine Laboratory Environmental Survey Report No. 8, University of Guam; 1973. Evaluates the potential environmental impact of the proposed sewage treatment plant in the Tanguisson/Hilaan area. The survey includes current studies, underwater investigations of the outfall site, a report on findings to be used in connection with U.S. Environmental Protection Agency and Water Pollution Control Commission approval, and consultation regarding wave action at the outfall site with emphasis on predicted underwater effects on buried or on-the-bottom outfall pipe.
Available: Bureau of Planning Library.

An Investigation of the Biological and Oceanographic Suitability of Toguan Bay, Guam, as a Potential Site for an Ocean Outfall; Robert S. Jones, Richard H. Randall, and Ronald D. Strong, Marine Laboratory Technical Report No. 11, University of Guam; June 1974. A 12 month current study of the 60-foot contour line opposite the Toguan River, including one 24 hour current study per month. A general bathymetric survey out to the 60-foot contour line. A biological study containing a list of dominant marine organisms in the area likely to be affected by effluent.
Available: Bureau of Planning Library.

A Marine Biological Survey at the Proposed Umatac Sewer Outfall Site; Richard H. Randall and Michael Gawel, Marine Laboratory Environmental Survey Report No. 15, University of Guam; July 1974. A biological survey along the proposed outfall route and in the immediate area of the outfall diffuser, including a zonal analysis of the reef corals, fishes, benthic algae, and dominant macroinvertebrates, and a quantitative evaluation of the percent of substrate covered by reef corals and density values for the dominant coral species. It provides a vertical depth and zonation profile along the proposed outfall route to the 60 foot depth level. A statement is given as to the probable effect of the sewage effluent on the biological environment.
Available: Guam Environmental Protection Agency Library.

Environmental Impact Assessment Northern Link and Wastewater Treatment Plant, Northern Integrated Wastewater System, Guam, Marianas Islands, Final; Austin, Smith and Associates, Inc.; March 17, 1975. An evaluation of the environmental and human impact of the proposed centralized wastewater treatment facility with open-ocean disposal of primary treated effluent for Northern Guam civilian and military populations.
Available: Bureau of Planning Library.

Agat Sewage Treatment Plant: Impact of Secondary Treated Effluent on Guam Coastal Waters; Roy T. Tsuda and Deborah A. Grosenbaugh, Water Resources Research Center Technical Report No. 3, and Marine Laboratory Technical Report No. 42, University of Guam; October 1977. A study to obtain long-term information on the impact of a secondarily treated sewage effluent on Guam's shallow coastal waters. This study will be used to base future depth requirements on scientific observations of an existing sewage outfall.
Available: Bureau of Planning Library.

Ecological Impacts of Sewage Discharges on Coral Reef Communities; U.S. Environmental Protection Agency; 1983. A synthesis of current information on the ecological impact of sewage discharges on coral reefs. Three major components of sewage pollution are addressed.
Available: Guam Environmental Agency Library.

Third Annual Report on the Marine Benthic Algae and Coral Communities at Biological Monitoring Stations Around Guam; Dana Rowley Bultitude, Guam Environmental Protection Agency; 1984 (First annual report October 1981, Second annual report February 1983). These reports provide yearly data on the benthic algae and coral communities in a variety of coral reef zones around Guam, with comparisons of previous years for change in cover and frequency. Monitoring the percent of surface cover and frequency of occurrence of algae and coral is used to identify subtle changes in the environment caused by man induced pollution. Significant changes were found near sewage outfalls and facilities. Intensive biological monitoring recommended.
Available: Bureau of Planning Library.

Environmental Impact of Sewage Effluent at the Marine Outfall - Northern District Sewage Treatment Plan, Guam; Melvin B. Borja and Harold R. Wood, Guam Environmental Protection Agency; 1986. An evaluation of the environmental impact of the primary treated effluent from the Northern District sewage treatment plant marine outfall using three separate methods.
Available: Micronesian Area Research Center Pacific Collection.

SOLID WASTE (TRASH)

Report of Observations on Solid Waste Management Practices; Donald M. Keagy and Jack DeMarco, U.S. Department of Health, Education, and Welfare; November 1968. Presents the findings, both general and specific, of Government of Guam solid waste management practices including storage, collection, and disposal. The Naval Air Station and Andersen Air Force Base are also covered. The recommendations are very extensive.
Available as Appendix A to the Harry R. Little Report (below).

Solid Waste Management in Guam; Harry R. Little, U.S. Department of Health, Education and Welfare; 1969. "Basic Data Survey" conducted by the Bureau of Solid Waste Management to document existing conditions and recommend changes. Solid waste generator by 11 sources (tables of data). Solid waste storage, collection, and disposal. Management of collection and disposal (organization, manpower, legislation, budget). Management on military bases.
Available: Bureau of Planning Library.

Operational Plan for Solid Waste Management; Greenleaf/Telesca-Ahn; December 1970. A twenty-year plan for solid waste collection and disposal with projections to 1990 for population, collection equipment, and sanitary landfill disposal. Reviews present solid waste management practices and costs by the civilian government and provides an overview of military practices. Presents alternative methods of disposal including, disposal at sea, composting, incineration, compaction, shredding, sanitary landfill (five sites). Detailed discussion of the five landfill sites and landfill design. Presents an operational plan for the Division of Solid Waste Management, including districting routes, fees, and equipment.
Available: Bureau of Planning Library.

Guam Master Plan Study--Infrastructure-Solid Waste; Greenleaf/Talesca-Ahn; September 1971. Topics include: solid waste management by the military and Government of Guam, projected refuse production, refuse collection, and sanitary landfill operation. Based on previous studies.
Available: Bureau of Planning Library.

Bulky Metallic Wastes Management Plan; Dames and Moore, for Department of Public Works; February 1974. This report includes a survey which estimates that there were 8,900 abandoned vehicles and 1,800 tons of other bulky metallic wastes. The existing collection and disposal systems are described. The responsibilities and practices of government agencies carrying out solid waste management are presented. Future volume of bulky metallic wastes projected in various ways. Alternative disposal concepts are discussed and a solution for Guam is presented which includes operational procedures.
Available: Bureau of Planning Library.

The Beverage Container Problem; Guam Environmental Protection Agency; May 1974. The role of beer cans and soda bottles in the littering problem. Clean-up, health, and energy costs. History of beverage container legislation. The beverage industry on Guam (including number and weight of containers sold and cost data on containers). Presents the results of litter surveys by University of Guam students. Comparison of litter rates with other communities. A chart outlines a number of alternatives with advantages and disadvantages. A collection of Guam's litter laws and a proposed comprehensive littering law.
Available: Bureau of Planning Library.

Solid Waste Status Report; Guam Environmental Protection Agency; Updated January 1975. This report assesses the solid waste situation on Guam. Estimates include generation rates and cost per ton for collection. The data collected and presented include garbage truck repair records, work force, the number of stops and containers per area, private equipment and staff, the Solid Waste Division's budget, and piggery farm garbage collectors. Topics also include military practices, open dumping, resource recovery (recycling) practices, legislation, enforcement, and an analysis of the implementation of the 1970 Operational Plan (above). Existing and proposed legislation are reprinted, a suggested scope-of-services for litter collection presented, and Ordot Landfill inspection reports reprinted. Also included are the Government of Guam contract with ROC International and Bill No. 915, Twelfth Guam Legislature, appropriating money for disposal of abandoned vehicles and the purchase of dump trucks. Survey data collected for this study is available at GEPA.
Available: Bureau of Planning Library.

A Proposal to Control Open Dumping; Guam Environmental Protection Agency; March 1975. This proposal addresses the problem of open (illegal) dumping in various parts of the island and an examination of why, once cleaned, these dumps rarely remain clean. Four alternatives are presented and a modified alternative is proposed. Possible arrangements for servicing the proposed facilities are outlined and a sample agreement for this work is included. The design and layout of the facility and a construction cost estimate, a pilot project, and public education plan details are included.
Available: Bureau of Planning Library.

Final Report Third Regional Seminar on Environmental Pollution: Solid Waste Management, 2-9 February 1976; World Health Organization; April 1, 1976. A report of the findings and conclusions reached during a seminar in which Guam participated along with eleven other countries. The purpose of the seminar was to exchange experiences and ideas, and work out a plan of action in the field of solid waste management at regional and national levels. The seminar offered participants an opportunity to indicate how WHO technical assistance could best be used to solve the problems faced.
Available: Guam Environmental Protection Agency Library.

PWC Guam, Solid Waste Study; U.S. Navy, Pacific Division, Naval Facilities Engineering Command; April 30, 1976. Recommendations to the Navy Public Works Center on disposal of its solid waste for the next two years. Also addressed is the solid waste disposal problem at Andersen Air Force Base, and the Navy's Recovery and Reuse of Refuse Resources Program.
Available: Guam Environmental Protection Agency Library.

Solid Waste Disposal and Resource Recovery Study for the Island of Guam; Dames and Moore, for the Guam Environmental Protection Agency; 1978. Investigates Guam's solid waste management system and assesses the feasibility of implementing an integrated solid waste disposal and resources recovery system. Reclamation and use of existing proposed landfill sites at the end of their useful lives is discussed. Several sites for resources recovery and sanitary landfill activities are considered, including surrounding land-use and ownership of the selected sites. Examines waste generation through the year 2000 and the impact of these wastes on the environment. Costs for a resource recovery system are compared to continued use of sanitary landfills.
Available: Bureau of Planning Library.

Capital Improvement Strategy for Development of a Resource Recovery System; Guam Environmental Protection Agency; 1979. This is a long-range plan outlining the schedule and cost for improvements such as up-grading of the Ordot Landfill, procurement of waste processing equipment, and development of a resource recovery facility. The "1978 Solid Waste Disposal and Resource Recovery Feasibility Study" (above) was used as a guideline.
Available: Guam Environmental Protection Agency.

A Study of Guam's Recyclable Wastes; Rossi-Mayve Consulting Services, for the Department of Commerce; December 1980. This study is divided into three main components. One is the report on the generation rate and composition of solid waste on Guam. The second is recommendations for the management and recovery of useful material from waste generated. The last component is recommendations for the management and recovery of useful material from waste.
Available: Department of Commerce.

Guam Sanitary Landfill Plan, Final Report; GMP Associates, Inc.; June 1981. Presents a master engineering plan for the Ordot Sanitary Landfill and recommends changes in both the way the landfill is managed and the way the landfill is operated. This plan also recommends alternative ways that the site could be expanded and eventually closed, including capping and drainage control. The engineering plan explains physical planning data such as topography, zoning, and land ownership; criteria that distinguish between an open dump and an acceptable sanitary landfill; the site development plan; policy guidelines as to the types of wastes acceptable, uses, fees, and recycling; an operating plan; and capital and operating costs. Four appendices give engineering details.
Available: Bureau of Planning Library.

Guam Solid Waste Management Plan; Guam Environmental Protection Agency; 1982. This five-year plan identifies conditions and problems in solid waste management and provides recommendations for improvements as an initial step toward developing a waste management system which will include the recovery of valuable components in the waste stream.
Available: Bureau of Planning Library.

Ordot Landfill, Guam Remedial Investigation, Work Plan; Volume I: Technical Scope of Work; Camp, Dresser and McKee, Inc., for the U.S. Environmental Protection Agency; 1986. Presents a work plan for a remedial investigation of Guam's Ordot landfill relative to the hazard level of the landfill. The work would confirm the presence or absence of hazardous materials at the site. This document includes a site history and location, previous studies, and an extensive description of the geology and hydrology of the site.
Available: Bureau of Planning Library.

Naval Station Landfill Evaluation Report - Final Submittal; HNC Architects, Inc., for the Department of the Navy; 1989. This report investigates and evaluates the Naval Station landfill relative to wetlands boundaries and capacity. Includes other considerations such as possible alternatives and current methods for using the landfill.
Available: Guam Environmental Protection Agency Library.

Guam Solid Waste Weight and Composition Study - Statement of Qualifications for Engineering Services and Project Proposal; Barrett Consulting Group, for the Guam Environmental Protection Agency; January 1990. Proposes a project to conduct a weight and composition study of Guam's solid waste.
Available: Guam Environmental Protection Agency Library.

Monthly Evaluation of Guam's Three Main Landfills; Guam Environmental Protection Agency. Landfills at the Navy, Andersen Air Force Base and Ordot are inspected monthly by GEPA. A checklist is used for each specific practice which comprises the operation of a sanitary landfill.
Available: Guam Environmental Protection Agency.

Open Dump Inventory; Guam Environmental Protection Agency. This project consists of pinpointing illegal dumps and identifying the locations on a map of Guam.
Available: Guam Environmental Protection Agency.

STORM DRAINAGE, SHORE PROTECTION, AND SEA-LEVEL RISE

Storm Drainage Standards and Design Criteria; Austin, Smith and Associates, for Department of Public Works; June 1969. Presents the design criteria; design standards; design details based on runoff coefficients, rainfall intensity-duration and frequency curves, and gradient computations; and channel sizes, details and linings. Design charts for pipeflow are based on diameter. Specifications for plans to be submitted.
Available: Bureau of Planning Library.

Guam Master Plan Study--Infrastructure, Drain; Greenleaf/Telesca-Ahn; August 1971. Includes maps and descriptions of 49 drainage areas (acres), length of maximum travel (miles), average slope (%), reference interval (years), ultimate usage (% open space, % developed), runoff coefficient, time of concentration (minutes), rainfall intensity (includes per hour), design discharge (cubic-feet-per-second), channel type, length (feet), slope (%), bottom width (feet), side slope, depth of flow (feet), velocity (feet/second), right-of-way (feet). Outline of existing federal programs.
Available: Bureau of Planning Library.

Plan of Investigation for Navigation, Flood Control, and Related Water Resources; U.S. Army Corps of Engineers; April 1972. This report is essentially a scope-of-work for the flood hazard and boating studies later conducted. It includes discussions of improvements desired by local interests; objectives of investigation; the economic, environmental and engineering studies to be conducted; coordination with federal and local agencies; public meetings; the work schedule and cost estimates.
Available: Bureau of Planning Library.

Detailed Project Report for Flood Control: Namo River, Guam; U.S. Army Corps of Engineers; February 1973. Report topics include: the resources, economy, problems and needs of the study area; the selected plan, and its economics and implementation. Tables, figures, and plates present the plan.
Available: Bureau of Planning Library.

Environmental Statement, Shore Protection Talofofo Bay, Territory of Guam, Final; U.S. Army Corps of Engineers; December 1973. Describes impacts of constructing riprap protection on the beach and recreation area and road at Talofofo.
Available: Division of Aquatic and Wildlife Resources, Department of Agriculture.

Detailed Project Report Shore Protection, Talofofo Beach; U.S. Army Corps of Engineers; June 1974. Covers resources and economy of the study area, problems and needs, plan formulation, the selected plan and its economics, and plan implementation and recommendations.
Available: Bureau of Planning Library.

Environmental Statement, Flood Control Project, Namo River, Territory of Guam, Final; U.S. Army Corps of Engineers; September 1974. Describes a project to channelize and re-route the lower Namo River in Agat to protect low lands from flooding. Impacts on the natural and human environments, alternate plans, and costs are shown.
Available: Division of Aquatic and Wildlife Resources, Department of Agriculture.

Ponding Basin Design Standards and Procedures; Hydraulics Division, Department of Public Works; June 1975. This document specifies the requirements for designs submitted to DPW for approval. Included are conduit design flow; discharge computations; ponding basin capacity; inflow, outflow and volume specifications. Examples of proper computations and the seepage test procedure are presented.
Available: Bureau of Planning Library.

Storm Drainage Standards and Design Criteria for Planned Development Drainage; Hydraulics Division, Department of Public Works; June 1975. Document outlines the requirements for maps; runoff computations; storm drain inlets and conduits; disposal by rivers, natural channels, ocean outfall, existing storm drains, ponding basins, and onto adjacent property. Includes references of DPW-approved standards and criteria manuals.
Available: Bureau of Planning Library.

River Flood Hazard Studies; U.S. Army Corps of Engineers, Pacific Ocean Division; Various dates (mostly 1975 and 1976). Report formats are almost identical: scope of the study, basin description, flood history, flood problem, hydrology, flood outline. Plates include basin, frequency curve, basin or stream profiles, and hazard area map. Separate reports were prepared for Agana River, Geus River, Inarajan River, Masso River, Salinas River, Tamuning Area, Umatac River, Agat River, Asan Area, Pago River, and Ylig River. Some reports include information on tributaries.
Available: Bureau of Planning Library.

Environmental Statement Harbors and Rivers in the Territory of Guam, Final, Agana River, Guam; U.S. Army Engineer District; March 1977. Describes a proposed plan of flood control at Agana River and discusses possible environmental impacts. Post-authorization studies were conducted in 1985, and a supplement to this statement was prepared in July 1986, "General Design Memorandum and Draft Supplemental Environmental Impact Statement for Flood Control Improvements, Agana River," below.
Available: Bureau of Planning Library.

Shoreline Erosion on Guam: A Position Paper; Patrick D. McMakin, Guam Coastal Management Program, Bureau of Planning; June 1977. Addresses the extent of natural force and man-induced shoreline erosion on Guam. 4 p.
Available: Bureau of Planning Library.

"Recent Reefs and Shorelines of Guam"; W.H. Easton and R.H. Randall, Micronesica, XIV:1 (June, 1978), 1-11. This study dates relative changes of sea level on Guam and correlates them with those identified in Hawaii in order to differentiate tectonic movements and eustatic changes in sea level recorded by the island's shoreline deposits.
Available: Bureau of Planning Library.

Flooding and Drainage on Guam, A Handbook of Basic Information: A Technical Report from the Comprehensive Study of Guam's Water and Related Land Resources; U.S. Army Corps of Engineers; September 1980. This handbook assembles and analyzes existing information about flooding, flood damages, rainfall depth and duration, runoff, storm and storm wave inundation, drainage problems, and other pertinent facts about flooding and drainage in Guam. The specific presentation and tabulation of hydrologic data encompasses precipitation, streamflow, sediment transport, and infiltration. Watershed data characteristics are presented as stream travel length, slope, topography, geology, land-use, and peak discharge, among other useful parameters.
Available: Bureau of Planning Library.

Guam Storm Drainage Manual: A Technical Report from the Comprehensive Study of Guam's Water and Related Land Resources; U.S. Army Corps of Engineers; September 1980. A manual of policies, standards, and design criteria for storm drainage facilities. Much of the precipitation and streamflow data is presented in the report Flooding and Drainage on Guam - A Handbook of Basic Information (above). Chapters address comprehensive planning and drainage policies, drainage master planning, drainage laws and regulation, rainfall analysis, runoff, storm drains, streets, storm inlets, major drainage works, hydraulic structures, disposal, and flood proofing.
Available: Bureau of Planning Library.

Guam Comprehensive Study Shoreline Inventory; Sea Engineering Services, Inc., and R.M. Towill Corporation, for U.S. Army Engineer District, Honolulu; September 1980. Describes the physical characteristics of Guam's shoreline, with emphasis on the extent of coastal erosion problems and identification of specific areas in need of shore protection. The shoreline description gives general characteristics of each coastal sector, followed by a detailed description of each reach. A set of orthophotographs (scale 1"=400') prepared in 1975 and maps from the "Atlas of the Reefs and Beaches of Guam" were used for positioning and recording of field observation. These are included in the text. Shoreline erosion was evaluated from observation of the physical condition of the shoreline as of June 1980. A table summary of shoreline problem areas shows the location, problem, classification (minor, intermediate, severe, etc.), affected length in feet, and recommended action.
Available: Bureau of Planning Library.

Flood Control Reconnaissance Reports: Geus River, Merizo; Ylig River, Yona; and Inarajan River, Inarajan; U.S. Army Corps of Engineers, Pacific Ocean Division; March 26 and April 30, 1981. These investigations were conducted to determine if detailed studies are warranted with respect to flood control improvements. The investigations include a site inspection and an evaluation of available and collected information concerning the physical, economic, and environmental factors relevant to flood control improvements.
Available: Bureau of Planning Library.

The Effects of Land-Clearing on a Small Watershed in Southern Guam; Clifford Neubauer, Water and Energy Research Institute of the Western Pacific Technical Report No. 24, University of Guam; August 1981. Presents results of a study to determine the effects of land-clearing on the limnology and aquatic ecology of a small watershed on Guam. The data may be of use in the future planning and development of the land and water resources in Guam.
Available: Bureau of Planning Library.

Shoreline Investigations, Agana, Guam; Army Corps of Engineers; September 1981. Summarizes existing available information pertinent to the physical characteristics of the shoreline, including discussions of winds, waves, and currents. This report addresses problems and goals related to the physical condition of the shoreline and nearshore area, and flood and erosion hazards; and describes in general terms, ways to meet those goals. The goals and objectives of the Government of Guam for the Agana Waterfront, and ways of assisting the government in meeting its goals are also discussed.
Available: Army Corps of Engineers Office.

Detailed Project Report and Environmental Statement, Flood Control Study, Asan, Guam; U.S. Army Corps of Engineers, Honolulu District; July 1981 (revised March 1982). Analyzes flood problems in the Asan village area. This study describes detailed plans for alleviating flood problems. The investigation includes identification of the problems, descriptions of possible solutions, their assessment and evaluation with respect to engineering, economic, environmental and social/cultural criteria, and financial impacts on implementing institutions.
Available: Bureau of Planning Library.

Alternative Solutions for Flood Prone Areas in Guam; U.S. Army Corps of Engineers; November 1982. Provides alternative plans that evaluate the flooding problems of the Agat, Umatac, Merizo, Inarajan, and Agana areas. This study presents an outline of the past history of flood damage and drainage conditions, delineates major drainage basins, and reviews existing drainage and flood control reports, plans, and studies. A profile of land-use, population, and potential growth is included. The plan describes design criteria for drainage areas and offers suggestions for flood plain regulation. Upon completion of the area analysis, the report presents recommendations outlining an overall drainage plan for the area. Additional villages are discussed in a later study (below).
Available: Bureau of Planning Library.

Alternative Solutions for Flood Prone Areas in Guam; U.S. Army Corps of Engineers; December 1983. Investigates the resolutions of the flood problems in the communities of Santa Rita, Barrigada (including part of Mangilao), Yigo, and Dededo. A previously completed 1982 companion study is discussed above.
Available: Bureau of Planning Library.

Paseo de Susana Shore Protection, Territory of Guam, Final Detailed Project Report and Environmental Assessment; U.S. Army Corps of Engineers; November 1983. Identifies and evaluates the problems and needs associated with providing shore protection measures at the Paseo de Susana Park. This study discusses the impacts upon the overall environmental resources of the area including economic, social, cultural, and recreational. The report develops alternative plans, evaluates the costs and benefits associated with implementing them, and recommends one.
Available: Bureau of Planning Library.

Agana Bay Typhoon and Storm-Surge Protection Study, Technical Documentation, Draft; U.S. Army Corps of Engineers; January 1984. Identifies the problems, needs, and various measures available to reduce flood damage caused by storm surge in low-lying coastal areas in Agana Bay. This study provides detailed mapping of existing flood hazard zones and presents two specific plans with structural and nonstructural measures for mitigation of damage due to storm surge, storm waves, and erosion. The impacts of seawalls and revetments on public access, shoreline ecology, and aesthetics are assessed.
Available: Bureau of Planning Library.

Flood Insurance Study; Federal Emergency Management Agency; November 15, 1985. Investigates the existence of flood hazards in Guam. This study develops flood risk data for various areas of the island that were used to establish actuarial flood insurance rates. Hydrologic and hydraulic analyses were performed by the U.S. Army Corps of Engineers. A Flood Insurance Rate Map for the Territory of Guam is, for insurance purposes, the principle product of this study. This map contains the official delineation of flood insurance zones and base flood elevations. A Flood Boundary and Floodway Map was also prepared, which supercedes the Flood Hazard Boundary Map published in 1978. These maps are for flood insurance purposes only and do not necessarily show all areas subject to flooding or all planimetric features outside special flood hazard areas.
Available: Bureau of Planning Library.

Geus River Project - Damage Assessment Report; Soil Conservation Service, U.S. Department of Agriculture; 1986. A work request/report for the restoration of the Geus River to conditions prior to storm damage.
Available: Guam Environmental Protection Agency Library.

General Design Memorandum and Final Supplemental Environmental Impact Statement for Flood Control Improvements, Agana River, Agana, Territory of Guam; U.S. Army Engineer District; July 1985, revised July 1986. Describes in detail newly formulated plans to construct flood control improvements at the Agana River; and supplements the 1977 Final Environmental Statement, Agana River Flood Control. This report evaluates the impacts associated with the revised plans, and summarizes new environmental information considered pertinent to flood control at Agana River. This report also contains hydrologic studies, an economic evaluation, design and cost estimates, geology, compliance reports, U.S. Fish and Wildlife Service reports, and cultural and historic resources.
Available: Bureau of Planning Library.

Agana River Flood Control Project (Draft); U.S. Army Corps of Engineers; 1987. An engineering plan to prevent pollution and damage as a result of various construction operations. Detailed technical specifications are provided.
Available: Guam Environmental Protection Agency Library.

Agana Bayfront Area Typhoon and Storm Surge Protection Study Draft Feasibility Report and Environmental Impact Statement; U.S. Army Corps of Engineers; 1989. Presents a proposed project and EIS for typhoon and storm surge protection in the Agana Bayfront area. This report summarizes the purpose, need and justification for the project, alternatives, affected environment, environmental consequences, tentative plan, and other considerations.
Available: Bureau of Planning Library.

Water Resources Program in the Territory of Guam, the Commonwealth of the Northern Mariana Islands, and Republic of Palau; U.S. Army Corps of Engineers; March 1990. Outlines water resource management projects for flood control, harbor dock improvements, and shoreline protection in Guam. Includes map of project site, location, present status, and cost (Federal/nonfederal).
Available: Bureau of Planning Library.

East Agana, Guam Shore Protection Study Reconnaissance Report, Draft; U.S. Army Corps of Engineers; March 1990. Discusses the results of a study to determine if detailed studies for shore protection measures in East Agana are warranted. This report addresses natural forces, existing conditions, problem description, proposed plan of improvement, design criteria, estimated costs, economic analysis, and environmental consequences.
Available: Bureau of Planning Library.

SUBDIVISIONS AND DEVELOPMENT ENVIRONMENTAL IMPACT

Piti Community Development Project Environmental Impact Statement; Guam Housing and Urban Renewal Authority; October 8, 1975. A statement of the expected environmental impacts of a community development project in Piti which would acquire land, improve sites, relocate families and businesses, and rehabilitate structures.
Available: Guam Housing and Urban Renewal Authority Library.

Environmental Impact Assessment for Talofofo Bridge Reconstruction; Department of Public Works; October 1975. A description of the proposed construction of a new bridge over the mouth of the Talofofo River, with a realignment of the road. Effects on the environment and different alternatives to the planned construction are discussed.
Available: Division of Planning, Research and Programming, Department of Public Works.

Environmental Assessment Report for the Asan Community Redevelopment Project; Juan C. Tenorio and Associates, Inc., for the Guam Housing and Urban Renewal Authority; 1977. A description of the probable effects and impact on the environment caused by the redevelopment of the village of Asan. Measures recommended to mitigate probable adverse environmental effects of the project are presented and discussed.
Available: Department of Parks and Recreation Library.

Environmental Impact Assessment for the Proposed Astumbo Subdivision; Pacific Basin Environmental Consultants, for J.P. Carpio and Associates; January 29, 1979. The EIA for a proposed housing subdivision of approximately 485 lots. Appendix A contains a Botanical Survey of the Astumbo project site prepared by Philip H. Moore, December 22, 1978. Appendix D contains heavy metals analysis from Two Selected Storm Water Drains (GHURA 502 and Baza Gardens, January 8, 1979).
Available: Bureau of Planning Library.

Environmental Impact Assessment for Food Processing Facility at Ija; R. Muniappan, Agricultural Experiment Station, College of Agriculture and Life Sciences, University of Guam; January 1981. Describes a proposed food freezing and bottling plant in Inarajan and its anticipated environmental impact.
Available: Bureau of Planning Library.

Barrigada Park Subdivision Project Report and Environmental Assessment; John Duenas and Associates, Inc., for Mideast Cathay Corporation; October 1984.
Available: Bureau of Planning Library.

Proposal for a Planned Unit Development of Miyama Hills Project; Juan C. Tenorio and Associates, Inc., for Miyama Guam Inc.; 1988. Plan includes a description and justification of the project (includes townhouses, condominiums, a hotel, several pools, a golf course and other recreational facilities); preliminary engineering report; and an environmental report.
Available: Bureau of Planning Library.

Zone Change Application - United Light Industrial Park and Pacific Garden Development; United Pacific Investment and Development, Inc.; 1989. Request for a zone change for two lots in Sinajana. Includes an environmental baseline survey report, a traffic impact study, and an engineering report.
Available: Guam Environmental Protection Agency Library.

UGUM RIVER DEVELOPMENT ENVIRONMENTAL IMPACT

Ugum River Interim Report and Environmental Impact Statement, Harbors and Rivers Territory of Guam; U.S. Engineer District, Honolulu; June 1980. This final stage of study contains a summary of three implementable plans for surface water development in the South. These are a single purpose reservoir on Inarajan River, a single purpose reservoir on Ugum River, and a multi-purpose reservoir on Ugum River. Emphasis of the report is on impact assessment and alternative evaluation. Technical appendices present climatology and hydrology, design and cost estimates, engineering and geology, economics, water chemistry, and social and cultural resources.
Available: Bureau of Planning Library.

Ugum River Water Supply Development Project: Draft Environmental Impact Assessment; GMP Associates, Inc., for the U.S. Army Corps of Engineers; June 1989. Identifies the impacts which will result from the Ugum River water supply development. This study includes a project description, alternative development schemes, natural and man-made constraints, project impacts, energy supply and natural resources development, public involvement, required permits, clearances, and reviews. Provides water quality sample analysis, daily discharges, and cost analyses for the Ugum River project.
Available: Bureau of Planning Library.

THE WASTEWATER FACILITIES PLAN

Wastewater Facilities Plan for Guam; The Water Quality Planning process mandated by the Federal Water Pollution Control Act Amendments of 1972 integrates pollution, wastewater, basin protection, and numerous other planning efforts previously undertaken separately.

As part of this comprehensive water quality planning effort and to qualify for Federal construction grants for wastewater facilities the Government of Guam contracted with Gillham, Koebig and Koebig to produce a Wastewater Facilities Plan. The plan, completed in late 1979, incorporated all ongoing wastewater facilities construction projects as "existing" facilities.

The study examines existing information on pollution sources, waste loads and flows, and water quality; and determines the current waste loads and flows. Existing wastewater collection, treatment and disposal facilities, and environmental conditions are inventoried. Future waste loads and flows, based on Government of Guam population projections, and user charges are estimated. Alternative methods of wastewater collection, treatment, and disposal are developed and evaluated.

The studies divide the island into five drainage areas. The number of the Area expresses the priority ranking. Area I, Umatac and Merizo, has the highest priority. Area V, the northern half of the island, has better facilities, and therefore a lower priority for order of construction.

Available: Guam Environmental Protection Agency.

Rural Areas Island-Wide Wastewater Plan for the Public Utility Agency of Guam Pre-Final Engineering Report; Barrett, Harris and Associates, Inc.; April 1982. Assesses the current and future situation with respect to wastewater facilities in all non-urban areas which are not covered as part of the 1979 Facilities Plan. Investigates the use of innovative/alternative technologies for the collection, treatment and disposal of wastewater generated. Recommendations, cost estimates, and conceptual designs are provided.
Available: Bureau of Planning Library.

Island-Wide Wastewater Facilities Plan Summary Document: Final; Barrett, Harris and Associates, Inc., for Public Utility Agency of Guam; October 1983. Summarizes the wastewater facilities plans prepared for Guam to date. An overview of the existing wastewater facilities is included as part of this summary. A brief description of the eight existing wastewater treatment plants and their collection and disposal systems is provided, along with a discussion of existing on-site wastewater disposal practices in unsewered areas. The status of on-going wastewater facility projects is also addressed in this summary.
Available: Bureau of Planning Library.

Wastewater Facilities Plan Amendment Area IV, Volumes I and II; J.P. Duenas and Associates, Inc., and CH2M Hill, for Public Utility Agency of Guam; 1987. Volume I revises and updates the 1978 Area IV Island-wide Facilities Plan component to address the collection, treatment and disposal of wastewater from the civilian sector and the Naval facilities located in West-Central Guam (including a portion of Piti, Cabras Island, Apra Harbor, Naval Station, Santa Rita, and Agat). Volume II contains improvement plans and appendices.
Available: Bureau of Planning Library.

WASTEWATER REGULATORY ACTIVITIES

Sewer Connection Survey - Inspection Form; Guam Environmental Protection Agency; 1967 to present. This form is filed by an inspector upon completion of a sewer connection for verification of connection. If the connection is approved, a Clearance for Issuance of Occupancy Permit (below) is given. The form lists the owner's name, the lot location, the type of building (single-unit, multi-unit or commercial/institutional), the date sewer was available, the type of disposal system previously used and notes whether that system was disconnected when the sewer was connected. The PUAG account number and water meter number are noted.
Available: Individual Wastewater Division, Guam Environmental Protection Agency.

Sewer Connection Permit; Guam Environmental Protection Agency; 1967 to present. A sewer connection permit must be obtained as authorization to construct or remodel a building and connect to the public sewer. A permit card is completed which notes permit number, location, date, block number, lot number, owner, contractor, intended occupancy use, and number of persons to use the sewer. When construction is complete, PUAG inspects the sewer connection and at the same time verifies connection for GEPA on a Sewer Connection Survey - Inspection Form (see above). If a holding tank and pump must be utilized, GEPA inspects that portion. Permit cards are on file since 1967. Beginning is 1972, a plot plan and vicinity map are attached to the permit card. These are filed alphabetically by the name of the original owner.
Available: Individual Wastewater Division, Guam Environmental Protection Agency.

Clearance for Issuance of Occupancy Permit; Guam Environmental Protection Agency; 1967 to present. GEPA issues this clearance after an individual wastewater facility has been inspected and approved. The clearance authorizes issuance of an occupancy permit by the Department of Public Works. The form lists name, lot number, block number, location, permit number and date.
Available: Individual Wastewater Division, Guam Environmental Protection Agency.

Septic Tank Permit; Guam Environmental Protection Agency; 1967 to present. A septic tank permit must be obtained before a building which intends to use a septic tank and leaching field as the method of wastewater disposal can be constructed or remodeled. The permit shows GEPA permit number, district, area, date, tract number, block number, lot number, owner, address, designer, contractor, intended occupancy use, and number of persons using the septic tank. Other data noted includes soil characteristics, percolation test results, and design data such as flow, leaching field size and septic tank size. Three plans must be submitted with the permit card: a plot plan and vicinity map showing the location of the septic tank on the property; a septic tank, leaching field design plan; and a floor plan of the house. Final inspection is completed by GEPA for compliance to the plan on an Individual Sewage Disposal System Inspection Form (below). Permit cards are on file since 1967, with the three plans being attached to the card after 1972. These are filed in alphabetical order by the name of the original owner.
Available: Individual Wastewater Division, Guam Environmental Protection Agency.

Individual Sewage Disposal System - Inspection Form; Guam Environmental Protection Agency; 1976 to present. This form must be completed before a Clearance for Issuance of Occupancy Permit (above) can be authorized for a building with a septic tank, leaching field. The form lists GEPA permit number, building permit number, owner, lot number, block number, tract number, location, and contractor. Septic tank and leaching field construction design specifications are itemized and marked as passed or failed inspection.
Available: Individual Wastewater Division, Guam Environmental Protection Agency.

Rules and Regulations Governing Sewer Service to Consumers; Public Utility Agency of Guam; Not dated.
Available: Bureau of Planning Library, in Water Rate Study and Updating Design Standards Submittal 2.

Sewer Connection Survey; Guam Environmental Protection Agency; Ongoing. The purpose of this survey is to provide the baseline data necessary for the enforcement of the Toilet Facilities and Disposal Acts (now Title LXI, Chapter IV, Government Code of Guam). These Acts establish requirements for sewer connection and other wastewater facilities construction based on the existing system or facility, sewer availability and other criteria. Villages are surveyed as new sewage systems become available. Five years after sewer is first available, areas are resurveyed. The sewer connection survey form notes the owner's name, address, lot number, track number, block number, sewer availability, date sewer available, type of disposal system currently in use, and whether that system is functioning adequately. If the system is not adequate or if a public sewer has been available for 5 or more years, a notice of violation is given. A cumulative report is included in GEPA's annual report which lists the number of buildings surveyed, the number of buildings connected, the number of buildings not connected, the number complied after notice of violation, and the number pending legal action, all by village.
Available: Individual Wastewater Division, Guam Environmental Protection Agency.

Individual Wastewater Division Summary Reports; Guam Environmental Protection Agency; Monthly, quarterly, annually. Aggregated summaries of the number of permits issued, inspections conducted and clearances issued for sewer connections and for septic tanks and leaching fields.
Available: Individual Wastewater Division, Guam Environmental Protection Agency.

Individual Wastewater System Regulations; Guam Environmental Protection Agency; 1987. A booklet about onsite wastewater treatment and disposal regulations for residential septic tank and leaching systems as well as temporary toilet facilities. The purpose of the regulations is to (1) protect the health of the septic tank user and their neighbors, and (2) to establish minimum standards that will ensure that waste discharge does not pollute public or domestic water supplies, will not violate other laws or regulations.
Available: Guam Environmental Protection Agency Library.

WASTEWATER (SEWER) STUDIES AND PROJECT PLANS

Engineering Report on Sewerage and Sewage Disposal Facilities for Government of Guam, M.I., Engineering Report Volumes I and II; Metcalf and Eddy, for Bureau of Yards and Docks; February 1965 (Vol. I) and April 1965 (Vol. II). Presents an engineering study of existing sewerage facilities and develops a comprehensive master plan for sewerage facilities for the civilian communities of Guam and certain contiguous military communities. The report studies conditions and suitability for continued use of the existing system, population and land-use projections, sewage analysis, treatment analysis, construction plans and cost estimates, specifications for facilities, and financing of the system. This plan was used as a basis for the construction of two of Guam's earliest wastewater systems.
Available: Bureau of Planning Library.

Supplemental Engineering Report: Sewerage and Sewage Disposal Facilities for Government of Guam, Guam M.I.; Metcalf and Eddy, for Bureau of Yards and Docks, U.S. Navy; June 1966. Supplemental studies to the above report. Project A is concerned with the study of three alternate methods of disposing of wastes from a proposed hotel to be located adjacent to the Ypao Beach recreation area. Project B involves the study and evaluation of the existing and proposed Tumon and Dededo sewer system. Includes population projections for Tumon and Dededo to 1985, based on population estimates in the 1966 Territorial Master Plan. Project C investigates various methods of transmitting alarm signals from the remote pumping stations to the main pumping station in Agana.
Available: Bureau of Planning Library.

Sewerage and Sewage Disposal Facilities for Agat-Santa Rita District, Guam, M.I.; Metcalf and Eddy, for Bureau of Yards and Docks, U.S. Navy; February 1968, revised May 1968. Supplements Volumes I and II, above, as it pertains to the facilities for Agat and Santa Rita.
Available: Bureau of Planning Library.

A Plan for an Integrated Wastewater System; Department of Public Health and Social Services; Second Edition, February 1970. Discusses advantages of integrated systems, outlines existing facilities, and proposes establishing four sewerage districts.
Available: Bureau of Planning Library.

Storm Drainage Master Plan for Tamuning-Dededo, Agana, Asan, Piti, Merizo, Agat-Santa Rita; Esco International; August 1970. Project locations, lines, drainage tabulations and cost estimates for each of the six areas.
Available: Bureau of Planning Library.

Pre-Design Study for Agana Sewage Treatment Plant Guam, Mariana Islands; Metcalf and Eddy, for Department of the Navy; April 9, 1971. Scope of work includes degree of treatment required; sewage flow quantity and characteristics; type of sewage and sludge treatment facilities; selection of plant site; and construction cost estimates. Appendix A projects population growth projections through 1990.
Available: Bureau of Planning Library.

Guam Master Plan Study--Infrastructure, Sewers; Greenleaf/Telesca-Ahn; August 1971. The introduction contains notes on previous studies and plans from 1964, 1962, and 1951. The plan presented here was patterned after the 1965 Metcalf and Eddy plan and updates the sizes and facilities in accordance with past and projected growth. Comprehensive discussion of the Central Area, Agat-Santa Rita, Umatac, Merizo, Inarajan, Talofofo, Yona, Mangilao, and Yigo wastewater systems.
Available: Bureau of Planning Library.

Sewage Flow Analysis of the Northern District Sewer System Southern Interceptor Link (Dededo to Yigo); Arizala Costaniano Torres, Architects, for U.S. Navy Office-in-Charge of Construction (OICC); August 1972. The study was to verify the average daily flow at the point of connection to the Tamuning Interceptor. There are three sets of population and sewage flow estimates (exhibits D, E, F).
Available: Bureau of Planning Library.

Northern District Sewerage System Northern Link and Treatment Plant: Interim Report Basis of Design and Siting Plan; Austin, Smith and Associates, Inc., for Naval Facilities Engineering Command; March 1973. This is an engineering study to determine the feasibility of designing a gravity trunk sewer in the north and of discharging treated wastewater in the ocean in the Tanguisson Point area.
Available: Bureau of Planning Library.

Inflow/Infiltration Study on the Dededo Area of the Northern Sewer District; Ken Morphew, Guam Environmental Protection Agency, for Public Utility Agency of Guam; March 1975. The study involves measuring and charting the quantity of sewage flow. This flow data is compared to standard and historical daily use patterns and an attempt is made to correlate total flow for each day with the amount of rainfall the day before. If these correlate, infiltration has occurred. If the flow patterns are "normal" and no correlation exists between rainfall and flow, the system is sound.
Available: Guam Environmental Protection Agency Library.

Dairy Road Wastewater Facilities Plan; Barrett, Harris and Associates, Inc.; 1981. Addresses the need for collection facilities in the Dairy Road area which is expected to experience a dramatic increase in wastewater flows upon completion of the new penitentiary. This need was not evaluated as part of the 1979 Facilities Plan.
Available: Public Utility Agency of Guam, Wastewater CIP Library.

Talofofo Wastewater System; Austin, Tsutsumi and Associates, Inc., for Public Utility Agency of Guam; May 1982. Documents the results of an investigation to determine the most feasible method of treating and disposing of wastewater generated from the village of Talofofo.
Available: Bureau of Planning Library.

Agat and Agana Service Areas Sewer System Evaluation Survey (SSES) and Chemical Grouting Pilot Program; Maruyama and Associates, in association with Brown and Caldwell, for the Public Utility Agency of Guam; August 1985. Presents the results of a study of the infiltration/inflows of the Agat and Agana wastewater treatment plant tributary service areas. This study is a follow-up study to the findings of a previous sewer system infiltration analysis conducted in 1978 as part of the island-wide Guam 201 Facilities Plan. The objective of the current study was to substantiate or refute the previous work, and develop detailed recommendations to address the infiltration/inflow flows in an economically and environmentally effective manner. A pilot test field program was undertaken to test the effectiveness of rehabilitating the collection system through chemical grouting.
Available: Bureau of Planning Library.

Wastewater System Analysis of the Tamuning Area in Support of the Conditional Use Application for the Palace Hotel, Preliminary Study Report; Duenas and Swavely, Inc.; July 1987. Presents the results of a study to determine whether adequate reserve capacity exists in the Camp Watkins wastewater line to accommodate proposed projects in the area. This report analyzes existing wastewater flows and line capacities, provides land-use projections and future wastewater loadings, and formulates alternatives for existing and projected flows in the Tamuning area.
Available: Bureau of Planning Library.

OTHER ENVIRONMENTAL SURVEYS, STUDIES, AND ASSESSMENTS

An Environmental Assessment for the Proposed New Seawater Inlet for the University of Guam Marine Laboratory; Harry T. Kami and Rufo Lujan; 1972. Describes the environmental setting for construction of an intake pipe to provide seawater for use in scientific studies at the University of Guam.
Available: Division of Aquatic and Wildlife Resources, Department of Agriculture.

A Marine Environmental Survey for the Guam Oil Refinery Deballasting Facility Outfall, Cabras Island, Guam; John H. Rupp and Helen K. Larson, Marine Laboratory Environmental Survey Report No. 2, University of Guam; May 31, 1972. A statement of biological conditions and current patterns at the GORCO deballasting facility outfall (near the northwest end of Cabras Island) as they existed at the 20-foot depth during the sampling period prior to release of deballasting effluent.
Available: Bureau of Planning Library.

Environmental Assessment Information for Proposed Submarine Cable Landing at Guam American Telephone and Telegraph; 1974. Describes project of adding additional communication cables to existing ones crossing the reef flat just north of Tanguisson Power Plant.
Available: Division of Aquatic and Wildlife Resources, Department of Agriculture.

Final Environmental Impact Statement for the Pacific Southwest Regional Guide; Forest Service, U.S. Department of Agriculture; August 1984. Addresses national and regional issues and management concerns for land and forest resource management planning efforts in the Pacific Southwest region. This report examines proposed and alternative Regional standards and guidelines; and describes the environment that will be affected, and the potential environmental consequences of implementing the proposed standards and guidelines or alternatives.
Available: Bureau of Planning Library.

ENV 64

Environmental Protection Plan - Guam Underwater Observatory, Piti, Guam; Pacific Basin Environmental Consultants, for T&NN International, Inc.; 1989. Outlines details of construction operations relative to a proposed underwater observatory in Piti, and compliance with Guam Environmental Protection Agency requirements. Includes a project description, procedures to ensure protection of natural resources, operations at the site, prevention and pollution control, and public and work related safety activity.
Available: Guam Environmental Protection Agency Library.

GEOLOGY, SOIL, WATER RESOURCES

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GEOLOGY AND FRESH WATER RESOURCES DEVELOPMENT

Geology and Water Resources of Guam; Harold T. Sterns, U.S. Geological Survey; 1937. The first major hydrology study of Guam. Covers climate, occurrence of surface and groundwater, rocks and their water-bearing properties, geologic history, a water development plan for each village, and mineral resources of the island. Extensive data base includes: information on drilled wells, well logs, well water levels, stream and spring discharges, and rainfall each month, 1919-1937. All existing water supply facilities are indicated on a map.
Available: Micronesian Area Research Center Pacific Collection.

Historical Review of the Geology of Guam--with References; Pacific Islands Engineers, for U.S. Navy Bureau of Yards and Docks; April 1948. Comprehensive review and outline of available data and sources of information on the geology of Guam. All material in this report is taken from prior studies and, where appropriate, quoted in full. Reviews World War II military studies and the 1937 study by Stearns (Geology and Water Resources of Guam). There is a bibliography of 95 items on the historical and structural geology of the Mariana and Pacific Islands.
Available: Micronesian Area Research Center Pacific Collection.

Geology of Middle Guam, Island of Guam, Marianas Islands; in two volumes; Pacific Islands Engineers, for U.S. Department of the Navy, Bureau of Yards and Docks; April 1950. Extensive geological investigations and studies of rock formations comprising the part of the island in which most of the construction activities of the Navy were confined. Material for the geologic studies was obtained from field investigations and from examination of cores recovered from about 350 borings made at various locations. Included in this report are the results of detailed paleontological studies during which 11,000 fossils were examined and classified. Five separate sections comprise the body of the report: Southwest Coast Range, Talofofo Basin, Apra Heights, Mt. Tenjo, and Agana-Barrigada Provinces. Full scale geological maps and sections of the area under study accompany the report. Contains an extensive bibliography. Unpublished mimeograph.
Available: Bureau of Planning Library.

Report on Island-Wide Water Supply System, Guam, Mariana Islands; Engineering Office of Clyde C. Kennedy, for Department of the Navy, Bureau of Yards and Docks; 1955. A comprehensive plan for development of an island-wide water supply system. Topics covered include water consumption and demand, water sources, transmission and storage facilities, water treatment, descriptions of the existing and proposed water facilities, and a cost estimate. Part two is bound as a separate volume and contains the summarized technical data and discussions upon which the major conclusions and recommendations are based. A copy of that volume was not located.
Available: Division of Planning, Research and Programming Library, Department of Public Works. (Part 1 only)

The Submarine Geology of Pago Bay, Guam, Mariana Islands; Stuart Allan Keesling, unpublished Master of Science (Geology) Thesis, University of Southern California; January 1957. Describes the reef and associated features, discusses waves and currents, reef sediments, beach sediments, channel sediments, oceanography of the channel, and the factors which affect reef growth. 109 p.
Available: Micronesian Area Research Center Pacific Collection.

Military Geology of Guam, Mariana Islands: Part I. Description of Terrain and Environment and Part II. Engineering Aspects of Geology and Soils; J.I. Tracey, Jr., C.H. Stensland, D.B. Doan, H.G. May, S.O. Schlanger, and J.T. Stark, for U.S. Army; 1959. Includes basic data on geology, geography, oceanography and reefs, vegetation, and climate. Laboratory tests of rock and soil, and specific observations in the field furnish additional basic information, from which are evaluated the suitabilities for construction materials, road and airfield construction, and underground installations. Contains geology map (1:50,000).
Available: Bureau of Planning Library.

Surface Water Supply of Guam Mariana Islands 1951-1958; Geological Survey, U.S. Department of the Interior; August 1959. This volume contains records of daily streamflow at 13 gaging stations during the period 1951 to 1958.
Available: Bureau of Planning Library.

Water Resources Supplement to the Military Geology of Guam; Porter Ward and Joseph Brookhart, for U.S. Army Corps of Engineers and U.S. Geological Survey; 1962. Information on the location and development of water resources and the planning and management of water supply installations. Topics include the occurrence of groundwater, and rocks and their water-bearing properties. Extensive records of wells and stream-flow data with maps locating well and groundwater sources.
Available: Micronesian Area Research Center Pacific Collection.

Water Supply Study for Government of Guam; Kennedy Engineers, for U.S. Navy Bureau of Yards and Docks; June 1965. Part Five of the Master Plan adopted by the Territorial Planning Commission in April 1967. Topics include springs, wells, the Northern lens, surface water, existing military systems, water requirements, alternative water sources (by geographic area). Recommends a Water Supply Master Plan, summarizes water supply projects, and outlines present and scheduled construction.
Available: Bureau of Planning Library.

Geology and Hydrology of Guam; U.S. Geological Survey Professional Papers 403-B through 403-I; 1962-1966. The general description which follow are from the abstracts printed in each paper.

403-B: Marine Geology of Guam; Emery; 1962. A study of the topography and sediments of submerged terraces, fringing reefs, channels, the lagoon, and various shore features.

403-C: Petrology of the Volcanic Rocks of Guam; Stark; 1963. A study of the basaltic and andesitic volcanic rocks of Guam with comparisons for Saipan and Japan. Includes Trace Elements in the Volcanic Rocks of Guam; Tracey, Stark; 1963.

403-D: Petrology of the Limestones of Guam; Schlanger; 1964. Field and laboratory study of reef-associated limestones of the Pleistocene and Tertiary ages.

403-E: Tertiary Larger Foraminifera from Guam; Cole; 1963. Description, distribution, and occurrence of species ranging from the Eocene to the Pleistocene, and correlation with fauna of Saipan and other Pacific Islands.

403-F: Mineralogy of Selected Soils from Guam; Carroll, Hathaway; 1963. A mineralogical study of selected soil samples, including data on chemical composition, grain-size distribution, and comparisons with other areas; as well as description of soil profiles.

403-G: Fossil and Recent Calcareous Algae from Guam; Johnson; 1964. Stratigraphic distribution and correlation with Saipan floras of 82 species.

403-H: Hydrology of Guam; Ward, Hoffard, Davis; 1965. A description of representative streams and their runoff, the occurrence of groundwater in various types of rock, and information on the chemical composition of the water. Presents rainfall data and outlines the effects of rainfall on water resources. There are tables of data on 216 wells and springs which include: the name, USGS map location, altitude, depth, casing diameter, casing depth, the water-bearing rock, the water level (as height above sea level), maximum pumpage, maximum chlorides and remarks (such as "never used" or "dry hole"). There is a map showing the location of each well or spring.

403-I: Smaller Foraminifera From Guam; Todd; 1966. Four-hundred and fifty-three species, subspecies, and varieties (one species new) from upper Eocene, lower Oligocene, Miocene, and Recent deposits.

Available: Bureau of Planning Library.

Engineering Report Covering Water System Improvements for the Government of Guam, Agana, Guam, Marianas; Austin, Smith and Associates; June 22, 1966. Plan of construction based on the 1966 Territorial Master Plan. Outlines water usage and need for an improved distribution system, larger storage facilities, and increased supplies sufficient to meet population and industrial growth requirements for 20 years.
Available: Bureau of Planning Library.

A Report Covering the Surface Water Survey of Guam; Austin, Smith and Associates, for Public Utility Agency of Guam; June 1968. A comprehensive study of the availability of surface and underground water. Reviews economically developable surface water sources and springs, determines quantity and quality of water available from these sources and evaluates each source for domestic, recreational, agricultural, and fisheries uses. Delineates the drainage basin which contributes to each source. Reports the sources and amounts of pollution and contamination. Includes methods of protecting watershed areas, and development controls.
Available: Bureau of Planning Library.

Development of Groundwater in Guam; John F. Mink, the Earth Sciences Group, Inc.; not dated, but after 1968. Recommends groundwater development by means of wells. Discusses groundwater types - limestone and volcanic rocks. Areas of regional analysis are Dededo-Agafa Gumas, Barrigada-Marbo, Agana-Barrigada, Ylig, Talofofo, Malojloj, and Merizo.
Available: Bureau of Planning Library.

Groundwater Recharge in Northern Guam; John F. Mink, the Earth Sciences Group; 1970. Briefly discusses geology, groundwater occurrence, conservation and groundwater areas.
Available: Guam Environmental Protection Agency Library.

A Report Covering the Domestic and Agricultural Irrigation Water Supplies of the Island of Guam Which Indicates the Need for Conservation Areas; Austin, Smith and Associates, Inc., for the U.S. Geological Survey; 1970. An update on the growth factors which will affect freshwater usage in the near future. The report suggests no exploitation of agriculture in northern Guam, and suggests the need to establish watershed basins. There are maps, tables, and figures.
Available: Bureau of Planning Library.

Conservation Requirements for the Preservation of Guam Water Resources; Public Utility Agency of Guam; August 31, 1970. Presents conclusions and recommendations based on a comprehensive study of the availability and demands on the surface and underground water supplies of Guam. The detailed technical analyses and backup information can be found in two previous technical reports.
Available: Bureau of Planning Library.

Environmental Planning Considerations for the Famja Low Cost Housing Proposal; Territorial Planning Commission; October 31, 1973. Contains a preliminary geologic and engineering site evaluation of the general geologic conditions existing in the Chalan Pago-Ordot Groundwater Conservation Area by Dames and Moore. Also contains geohydrologic data, sections, and overlays developed by the Territorial Planning Commission.
Available: Bureau of Planning Library.

Irrigation Feasibility Study; Gillham, Koebig and Koebig, for Department of Agriculture; December 1973. Outlines the land and water resources relevant to large-scale irrigation and agricultural practices. This report includes potential yield and cost estimates for reservoirs to supply such a system. Maps of arable lands in Southern Guam are also included.
Available: Bureau of Planning Library.

Groundwater Resources of Guam: Occurrence and Development; John F. Mink, for Public Utility Agency of Guam; November 1974. This report reviews and critiques all available literature on the subject and relates the recommendations presented to the knowledge available at the time, and presents a thorough history of groundwater development. The data base included is very extensive, containing driller's logs for more than 30 wells, many chemical analyses, and rainfall data. Guides to the management of the lens include water level and salinity maps, the design for a water monitoring network, and proposed standards of development.
Available: Bureau of Planning Library.

The Socio-Economic Impact of Modern Technology Upon a Developing Insular Region; Guam, Volume III, Part V. Environmental Issues; University of Guam; 1975. These reports by various authors address topics including the geology of Guam as related to water resources, an environmental description of Guam's rivers, the human impact on freshwater resources, and water geochemistry and water quality.
Available: Bureau of Planning Library.

The Analysis of Small Water Distribution System; Water Resources Research Center, Technical Report No. 4, University of Guam; January 1978. Completion report for A Model of a Portion of the Public Utility Agency of Guam (PUAG) Water Distribution System. This report gives the theory and examples which illustrate a method of determining the flow of water lost per foot of pipe in situations involving pipes having leaks or illegal connections.
Available: Bureau of Planning Library.

Determination Headwaters of Streams, Guam, Tutuila (American Samoa), Babelthuap (Palau District), Ponape (Ponape District) and Kosrae (Kosrae District); R.M. Towell Corporation; September 1978. This study includes the determination, identification, and mapping of the headwaters of streams of the above five islands, completed for the U.S. Army Corps of Engineers.
Available: Bureau of Planning Library.

Geologic Features Within the Guam Seashore Study Area; Marine Laboratory, Technical Report No. 55, University of Guam, for U.S. National Park Service; November 1979. A summarization of past studies on the general geologic features within the proposed Guam Seashore Study Area, including the physical geography, geologic succession, structural geology, geologic history, and soils.
Available: Bureau of Planning Library.

Review of Techniques for Studying Freshwater/Seawater Relationships in Coastal and Island Groundwater Flow Systems; Dinshaw N. Contractor, Water Resources Research Center, Technical Report No. 11, University of Guam; May 1980. Project completion report for A Preliminary Study of the Dynamics of Guam's Northern Aquifer. This report reviews and summarizes the analytic and numeric methods available for the study of saltwater intrusion into freshwater aquifers in coastal and island situation. Also presents the advantages and limitation of all the methods.
Available: Bureau of Planning Library.

Determination of Elevation of Groundwater Production Sites; Juan C. Tenorio and Associates, for Guam Environmental Protection Agency; July 1980. A listing of observation and production wells on Guam. Data is tabulated by well number, map grid location, well site type, place name of well and/or location, elevation of benchmark established, description and location of benchmark, elevation of markers set, and location of marker set. Sketches of the well site types and a map of Guam (1:62,500) show groundwater production sites.
Available: Guam Environmental Protection Agency Library.

Inventory and Atlas of the Inland Aquatic Ecosystem of the Marianas Archipelago; Bruce R. Best and Caroline E. Davidson, Marine Laboratory, Technical Report No. 75, University of Guam, submitted to Seattle National Fishery Research Center, U.S. Fish and Wildlife Service; 1981. Inventories and maps the streams and tributaries formed by surface run-off in the volcanic southern sector of Guam, and water caves and freshwater ponds and springs which are named on the USGS quadrangle maps. The maps show waterfalls, springs, wetlands, mountain peaks, water caves, and USGS gauging stations. An accompanying data sheet for each map gives the coordinates, perennial channel length, elevation, approximate drainage area, average slope, and reported aquatic organisms.
Available: Bureau of Planning Library.

A One-Dimensional, Finite Element Salt Water Intrusion Model; Dinshaw N. Contractor, Water Resources Research Center, Technical Report No. 20, University of Guam; February 1981. Describes a one-dimensional, finite element saltwater intrusion model that simulates the dynamics of the saltwater wedge.
Available: Bureau of Planning Library.

Estimate of Recharge to the Freshwater Lens of Northern Guam; Jerry F. Ayers, Water Resources Research Center, Technical Report No. 21, University of Guam; March 1981. Estimates the annual rainfall recharge rate of the lens by analyzing chlorination concentration of rainwater and groundwater samples.
Available: Bureau of Planning Library.

Water Conservation for the Island of Guam; Army Corps of Engineers; September 1981. Covers the existing documentation on water consumption and production, a general water conservation plan, and the methodology for in-house water use metering. This report provides a work plan to guide the implementation of the water conservation element of the water supply component of the Guam Comprehensive Study for Water and Related Land Resources.
Available: Bureau of Planning Library.

A Two-Dimensional, Finite Element Model of Salt Water Intrusion in Groundwater System; Dinshaw N. Contractor, Water and Energy Research Institute, Technical Report No. 26, University of Guam; October 1981. Describes the development and use of a sharp interface model which simulates saltwater intrusion in groundwater systems. Includes the FORTRAN computer programs.
Available: Bureau of Planning Library.

A Preliminary Study of Natural Aquifer Discharge on Guam; William J. Zolan, Water and Energy Research Institute, Technical Report No. 34, University of Guam; August 1982. Presents data pertaining to the quality of groundwater seeps along the northern coast of Guam that was collected through sampling and water analyses over an eight-month period.
Available: Bureau of Planning Library.

Analyses of Socio-Cultural Components of Residential Water Consumption and Conservation for the Territory of Guam; Army Corps of Engineers; October 1982. Describes prewar customs and determines some of the cultural preferences for freshwater use. Develops survey instruments and sampling strategy to gather data to determine the social acceptability of potential freshwater conservation measures for the island. This report is part of the water conservation element of the water supply component of the Guam Comprehensive Study for Water and Related Land Resources.
Available: Army Corps of Engineers Office, Honolulu, Hawaii.

Water Supply Analysis; Army Corps of Engineers; October 1982. Analyzes five types of water supply alternative plans for public water use on Guam. This study was done in two parts: water distribution system analysis; and economic analysis of alternatives. The report provides technical assistance in carrying out the water supply portion of the Guam Comprehensive Study for Water and Related Land Resources.
Available: Army Corps of Engineers, Guam Office.

Agriculture, Municipal, and Industrial Water Demand and Benefit Parameters on Guam; Decision Analysts Hawaii, Inc., for U.S. Army Corps of Engineers, Pacific Ocean Division; August 1983. Provides a brief assessment of Guam's agricultural industry, the potential for agricultural development based on import substitution and exports, the amount of land and water required to meet these potentials, non-agricultural water requirements, and total water requirements versus the potential water supply. This assessment focuses on crops for which there is a potential for both market expansion and profitability. 53 tables.
Available: Bureau of Planning Library.

Conservation and Use Investigations of Municipal, Industrial and Agricultural Water on Guam; Tenorio, Duenas and Associates, Inc., for U.S. Army Corps of Engineers, Pacific Ocean Division; September 1983. This study investigates water conservation measures on Guam that can be derived by installing certain water conservation devices (faucet aerators, flow-restricting shower heads, toilet dams and pressure reducing dams), implementing operational improvements to the water systems, and utilizing water-efficient irrigation methods at local farms. 130 p.
Available: Bureau of Planning Library.

Feasibility Study of Developing Valley-Fill Aquifers for Village Water Supplies in Southern Guam; Jerry F. Ayers and Russell N. Clayshulte, Water and Energy Research Institute, Technical Report No. 41, University of Guam; September 1983. Presents the results of investigative activities conducted at a site near Inarajan village to determine the feasibility of developing the valley-fill aquifer to augment the local water supply of the village. This study is the first to apply seismic refraction profiling and earth resistivity sounding in groundwater studies in southern Guam.
Available: Bureau of Planning Library.

Hydrogeologic Investigation of Agana Swamp, Northern Guam; Jerry F. Ayers and Russell N. Clayshulte, Water and Energy Research Institute, Technical Report No. 40, University of Guam; September 1983. Describes the general geology and physiography of the Agana Swamp area, its drainage characteristics, and the occurrence of groundwater. Also suggests methods for obtaining additional information about the interrelation between the swamp and the groundwater-flow system.
Available: Bureau of Planning Library.

Agriculture Water Supply, Preliminary Technical Documentation, Territory of Guam, Mariana Islands; U.S. Army Corps of Engineers, Pacific Ocean Division; October 1983. Examines four sources of water supply for southeastern Guam: construction of major reservoirs on rivers in southeastern Guam; delivery of groundwater from the north via a pipeline; construction of small dams on local drainage areas; and construction of wells in southeastern Guam. Includes cost estimates. 16 p.
Available: Bureau of Planning Library.

Diagenesis and Pore-Space Evolution Within Recent and Pleistocene Carbonate Units of Orote Peninsula, Guam; Russell N. Clayshulte and Jerry F. Ayers, Water and Energy Research Institute, Technical Report No. 47, University of Guam; December 1983. Presents results of a study to determine by petrologic examination of core samples, how diagenesis has affected water-bearing properties of Guam limestone.
Available: Bureau of Planning Library.

Potential Water Resources Development, Guam: Planning Aid Document; Bureau of Reclamation; March 1984. Discusses preliminary data developed to date on the problems and needs of Guam with respect to water resources development. This planning aid document presents some potential solutions for public reaction.
Available: Bureau of Planning Library.

Preliminary Study of the Hydrogeology of Northern Guam; Jerry Ayers and Russell N. Clayshulte, Water and Energy Research Institute, Technical Report No. 56, University of Guam; September 1984. Presents a summary of work completed to interpret the geology of northern Guam with respect to groundwater hydrology. In particular, hydrogeologic conditions and boundaries needed for mathematical and other types of model studies were defined. Separate geophysical surveys and an exploratory drilling program were undertaken to assist in establishing the boundaries and features of the aquifers.
Available: Bureau of Planning Library.

Potential Water Resources Development: Working Document; Bureau of Reclamation; December 1984. Presents development goals, development stages, and the most viable alternative plans for reaching those goals. Gives the rationale based on public reaction received on the March 1984 Planning Aid Document (above).
Available: Bureau of Planning Library.

A Social Assessment of Public Reactions and Input to the Bureau of Reclamation's Guam Potential Water Resources Development Planning Study; Bureau of Reclamation, U.S. Department of the Interior, and the Cooperative Extension Service, University of Guam; May 1985. Presents the findings of social assessment relating to agricultural water resources and agricultural development. This report was used by the Bureau of Reclamation during their two-year planning study of options for agricultural irrigation and water resource development: Potential Water Resources Development on Guam: Special Report and Environmental Assessment (below). 73 p.
Available: Bureau of Planning Library.

Potential Water Resources Development, Guam: Special Report and Environmental Assessment; Bureau of Reclamation; December 1985. Presents the results of a comprehensive two-year investigation of the potential for water resources development on Guam. The focus of the study was improvement of the potable (municipal and industrial) water system and the further development of irrigation. Gives extensive analysis and presentation, including review of previous studies.
Available: Bureau of Planning Library.

Water Resources Development in Hawaii and Other Pacific Basin Areas; U.S. Army Corps of Engineers, Pacific Ocean Division; 1987. A summary of the scope and status of projects relative to water resource development by the Army Corps of Engineers in Hawaii, American Samoa, Guam, and the CNMI.
Available: Bureau of Planning Library.

Water, Land and People; Rebecca A. Stephenson, Micronesian Area Research Center, University of Guam; March 1987. A selection of studies on fresh water resources, including customs of rain water catchment and storage in Micronesia. Includes socio-cultural development of village water use on Guam.
Available: Micronesian Area Research Center Pacific Collection.

Indigenous Freshwater Management Technologies of Truk, Pohnpei and Kosrae, Eastern Caroline Islands and of Guam, Mariana Islands, Micronesia; Rosalind L. Hunter-Anderson, Water and Energy Research Institute, Technical Report No. 65, University of Guam; June 1987. Provides baseline information about variations in freshwater management systems in Micronesia, relative to the potential rapid population growth and developing economics of these islands. Intricate and detailed analysis.
Available: Bureau of Planning Library.

Plan of Work - Guam River Basin Study (Draft); Forest Service and Soil Conservation Service, U.S. Department of Agriculture, in cooperation with the Northern and Southern Guam Soil and Water Conservation Districts and the Government of Guam; 1988. This study provides an inventory of the agricultural water and related land resource problems on Guam.
Available: Bureau of Planning Library.

Calibration of a Saltwater Intrusion Model for the Northern Guam Lens Using a Microcomputer; Dinshaw N. Contractor and Rajesh Srivastava, Water and Energy Research Institute, University of Guam, Technical Report 69; May 1989. A technical report on a computer model applied to Guam's northern lens to predict sea water intrusion into the aquifer.
Available: Bureau of Planning Library.

Water Facilities Master Plan for the Guam Airport Authority; Barrett Consulting Group, Inc.; September 1989. A water facilities plan to address water service to the Guam Airport Authority (GAA) facilities. The plan investigates field conditions, develops water consumption forecasts, analyzes alternative systems of improvements, and provides recommendations.
Available: Bureau of Planning Library.

Water and Energy Research Institute (WERI) Newsletter; Water and Energy Research Institute, University of Guam; biannual. This newsletter discusses the important research findings of the Water and Energy Research Institute.
Available: Water and Energy Research Institute, University of Guam.

Water and Energy Research Institute (WERI) of the Western Pacific, University of Guam, Publications; Water and Energy Research Institute, University of Guam; periodically. A summary of the institute and a list of publications available, listed by title, author, and key word listing.
Available: Bureau of Planning Library.

Annual Reports, (1975 through 1988); Water and Energy Research Institute, University of Guam. Annual description and status report of current projects and activities. Originally established as the Water Resources Research Center of the University of Guam in 1975, the center changed its name to the Water and Energy Research Institute in 1981. Its purpose is to plan, initiate, and undertake research projects relating to the quantity and quality of freshwater that is available and potentially available to Guam and Micronesia. It is the only research agency of this type in the Western Pacific. General areas of research involve groundwater sources, surface water sources, coastal waters, and water distribution.
Available: Water and Energy Research Institute, University of Guam.

Water Resources Data for Hawaii and Other Pacific Areas; U.S. Geological Survey; Annually 1965-1979. Guam data in this statistical report include a map showing the location of gaging and partial-record stations, tables of stream flow and discharge data at 12 gaging stations, and periodic determinations of water temperature at gaging stations.
Available: Guam Environmental Protection Agency Library.

Water Resources Data, Hawaii and Other Pacific Areas, Water Year 1988: Volume 2. Guam, Northern Mariana Islands, Federated States of Micronesia, Palau and American Samoa; U.S. Geological Survey, Water-Data Report HI-88-2; 1988, annually. Contains extensive tables for Guam and other Pacific islands on hydrologic data gathered on surface and ground water. This annual report records ground water levels and water quality in wells, streamflow, and lakes and reservoirs.
Available: Guam Environmental Protection Agency Library.

Monthly Water Resources Memorandum; U.S. Geological Survey and Guam Environmental Protection Agency; Monthly. This report consists of tables on: rainfall in inches for each station; stream flow; groundwater levels; groundwater chloride concentration; water production; rainfall in 2-hour intervals; a map showing the measuring stations and water supply facilities; a map showing rainfall distribution. The exact format of this memorandum has changed on occasion over the past few years.
Available: Guam Environmental Protection Agency Library.

Drilling Logs; submitted to the Guam Environmental Protection Agency. The GEPA is the agency responsible for issuing well drilling permits. Drilling logs of borings and wells are requested from the drillers by GEPA and are kept on file since 1974.
Available: Guam Environmental Protection Agency.

FENA RESERVOIR STUDIES

Predicted Yield of Fena Reservoir Guam, M.I.; Stuart H. Hoffard, U.S. Geological Survey, Department of the Interior; October 1961. Fena Reservoir water production estimates. The basic data for this report consists primarily of five consecutive years of reconstructed natural flow, 1956 to 1960, and 13 years of rainfall records, 1948 to 1960, for the Fena Reservoir watershed.
Available: Bureau of Planning Library.

Sedimentation Survey of Fena Reservoir, Guam, Marianas Islands; U.S. Geological Survey and U.S. Department of the Navy; 1979. Presents the results of a sedimentation survey of Fena reservoir. This report consists of a topographic survey of the reservoir to determine the change in storage capacity caused by sediment accumulation.
Available: Micronesian Area Research Center Pacific Collection.

The Effects of Landclearing on a Small Watershed in Southern Guam; C.P. Neubauer, Water and Energy Research Institute, Technical Report No. 24, University of Guam; 1981. This paper contains information on the effects of landclearing on nutrient flux, water quality, and erosion. The study site is adjacent to Fena Lake.
Available: Micronesian Area Research Center Pacific Collection.

Survey of Fena Reservoir, Island of Guam - Limnological Reconnaissance; U.S. Geological Survey and U.S. Department of the Navy; 1985. A sedimentation and limnological reconnaissance survey report. The sedimentation survey reports on the results of a topographic survey conducted to determine change in storage caused by sediment accumulation. In conjunction with this, a limnological reconnaissance survey was conducted to obtain data on the water quality and sediment chemistry. Comparison of limnological data from a 1973 survey is included in this report.
Available: Micronesian Area Research Center Pacific Collection.

GUAM COMPREHENSIVE STUDY FOR WATER AND RELATED LAND RESOURCES

The Guam Comprehensive Study for Water and Related Land Resources is a comprehensive plan prepared by the U.S. Army Corps of Engineers at the request of the Governor of Guam to study Guam's water resource problems in detail and to provide a blueprint for their long-term solutions. Various elements studied between 1979 and 1984 include flooding and drainage, hydropower, water supply, windward small craft harbor, Agana typhoon and storm surge, and planning considerations for use and development of Cocos Lagoon/Merizo Shore and Tumon Bay. The following is a list of technical documentation from studies conducted.

Stage 1 Reconnaissance Report, Guam Comprehensive Study for Water and Related Land Resources; August 1979. This report identifies and discusses Guam's water resource problems, issues, and concerns. Sections are included on current water resource planning activities, and an analysis of the departments and offices having functions directly or indirectly related to water resources planning and management. 104 p. Available: Bureau of Planning Library.

Flooding and Drainage on Guam; September 1980.
See ENV 51

Guam Storm Drainage Manual; September 1980.
See ENV 51

Guam Comprehensive Study, Shoreline Inventory; September 1980.
See ENV 52

Preliminary Planning Considerations for Bay and Shoreline Development in Tumon Bay, Guam; March 1981.

Shoreline Investigations - Agana, Guam; September 1981.
See ENV 52

Water Conservation for the Island of Guam; September 1981.
See GEO 8

Guam Hydropower, Draft Reconnaissance Report; May 1982.
See ENR 10

Analysis of Sociocultural Components of Residential Water Consumption and Conservation for the Territory of Guam; October 1982.
See GEO 8

Water Supply Analysis for the Guam Comprehensive Study, Final Report; October 1982.
See GEO 8

Alternative Solutions for Flood Prone Areas in Guam; November 1982.
See ENV 53

Planning Considerations for Use and Development of Cocos Lagoon and Merizo Shore, Guam; February 1983.
See ENV 26

Guam Small Craft Assessment; July 1983.
See PRK 9

Agricultural, Municipal, and Industrial Water Demand and Benefit Parameters on Guam; August 1983.
See GEO 9

Vegetative and Aquatic Communities: Four Watersheds in South Guam; August 1983.
See ENV 20

Conservation and Use Investigations of Municipal, Industrial and Agricultural Water on Guam, Final; September 1983.
See GEO 9

Economic Base Study; September 1983.
See ECN 11

Agriculture Water Supply - Preliminary Technical Documentation, Territory of Guam, Mariana Islands; October 1983.
See GEO 9

Alternative Solutions for Floods Prone Areas in Guam; December 1983.
See ENV 53

Reconnaissance Study of Stream Sedimentation - South Guam; December 1983.
See GEO 27

Agana Bay Typhoon and Storm Surge Protection Study, Technical Documental (Draft); January 1984.
See ENV 53

Planning Considerations for Use and Development of Cocos Lagoon and Merizo Shore, Guam - Phase II (Draft); January 1984.
See ENV 26

NORTHERN GUAM LENS STUDY (NGLS)

The NGLS was undertaken to assess the amount of groundwater that could be developed reliably and safely from the northern aquifers. The principle objectives of the study were to obtain an accurate estimate of sustainable yield, to determine the most efficient methods of extracting the groundwater consistent with need and conservation, to set out a schedule for future water development and redevelopment, to establish a code of operational rules for management, and to recommend institutional and legal arrangements for protecting the water supply. This study was divided into two phases, one of which dealt chiefly with scientific and technical aspects of water resources development and the other with management issues.

Northern Guam Groundwater Lens: Aquifer Yield Report; Camp, Dresser and McKee, and Barrett, Harris and Associates, Inc., for the Guam Environmental Protection Agency; December 1982. Phase I of the investigation produced an Aquifer Yield Report describing aquifer boundaries, estimates of the quantity and distribution of groundwater flow, and behavior of the groundwater under natural and exploitation conditions. Mathematical modeling, both numerical and analytical, was extensively employed. The data obtained from geophysical surveys and exploratory drilling were integrated into Phase I interpretations. Available: Bureau of Planning Library.

Northern Guam Lens Study: Groundwater Management Alternatives; Barrett, Harris and Associates, Inc., and Camp, Dresser and McKee, Inc.; December 1982. Presents preliminary studies and background information for development of the Groundwater Management Program. Preliminary investigations included topographic and geophysical surveys, exploratory well drilling, and hydrogeologic analyses. The report also identifies management needs and alternative management plans to implement the findings of the Aquifer Yield Report.
Available: Bureau of Planning Library.

Northern Guam Lens Study: Groundwater Management Program; Barrett, Harris and Associates, Inc., and Camp, Dresser and McKee, Inc.; October 1982. The second phase of the Northern Guam Lens Study is described in this report. This phase of the study develops the recommended groundwater management alternatives into a comprehensive groundwater management program. The primary objectives of the program are: to develop a schedule for future groundwater development, to establish rules for managing the northern lens; and to recommend institutional arrangements for protecting and conserving Guam's groundwater resources.
Available: Bureau of Planning Library.

Aquifer Yield of the Northern Guam Ground-Water Lens: Summary Report; Camp, Dresser, and McKee, for the Guam Environmental Protection Agency; July 23, 1982. Summarizes the reevaluation of the sustainable yield of the Northern Lens and reviews the pertinent geology, hydrogeology, and hydrology that was used to estimate the sustained yield.
Available: Bureau of Planning Library.

Geophysical Investigations for the Northern Guam Lens Study, Appendix A and B; ECO Systems Management Associates; April 1980. Presents the results of a geophysical survey, consisting of seismic refraction and gravity measurements from which the subsurface boundaries of the aquifers could be determined. Appendix A contains refraction data. Appendix B contains principal facts of gravity stations.
Available: Guam Environmental Protection Agency.

Northern Guam Lens Study, Groundwater Management Program, Appendix A: Operation and Maintenance Manual; Barrett, Harris and Associates, Inc.; December 1982. This manual identifies and describes well operation and maintenance procedures for use by the Public Utility Agency of Guam. Data collection record forms needed to keep track of the condition of well facilities are provided.
Available: Bureau of Planning Library.

Northern Guam Lens Study, Groundwater Management Program, Appendix B: Well Operations Organizational Manual; Barrett, Harris and Associates, Inc., and Camp, Dresser and McKee, Inc., December 1982. Addresses the personnel requirements within the Public Utility Agency of Guam necessary to properly operate and maintain wells within the Northern Lens. The manual includes job descriptions for personnel assigned to well operation and maintenance activities, a transition plan for staffing, training program needs, and a funding strategy.
Available: Bureau of Planning Library.

Northern Guam Lens Study, Groundwater Management Program, Appendix C: Well Construction Manual; Barrett, Harris and Associates, Inc., and Camp, Dresser, and McKee, Inc.; December 1982. Provides guidelines for siting, designing, drilling and testing potable water wells in Northern Guam. This manual focuses on the design problems experienced with the construction, operation, and maintenance of existing PUAG well facilities.
Available: Bureau of Planning Library.

Northern Guam Lens Study, Groundwater Management Program, Appendix D: Laws, Regulations, and Agreements Manual; Barrett, Harris and Associates, Inc., and Camp, Dresser and McKee, Inc.; December 1982. This manual presents modifications to laws, regulations and interagency agreements that are needed to implement the Groundwater Management Program.
Available: Bureau of Planning Library.

Groundwater Management Program Annual Report; Guam Environmental Protection Agency; Annually. Discusses the activities of the Groundwater Management Program of GEPA and presents a detailed synopsis of all information collected by the program during the year. The appendices of this report present data on groundwater production records; monthly precipitation and evaporation; aquifer measurements; surface assessments of wells, feedlots, and surface impoundments; chemical analyses of production wells; and well drilling guidelines.
Available: Bureau of Planning Library.

UGUM RIVER STUDIES

Hydrological Study for Potential Water Supply Reservoir - Ugum River; Sunn, Low, Tom and Hara, Inc., for the U.S. Army Corps of Engineers; March 1977. A study to determine the availability of surface waters of the Ugum River to supply the needs of the southern districts of Yona, Talofofo, Inarajan, Merizo, Umatac and Agat in the year 2040. The scope of the study includes the selection of a dam site.
Available: Bureau of Planning Library.

Plan of Study, Ugum River, Territory of Guam; U.S. Army Corps of Engineers, Pacific Ocean Division; April 1977. A plan of study to determine the feasibility of developing, utilizing, and conserving the surface water and related resources within the Ugum River Basin for domestic and agricultural use.
Available: Bureau of Planning Library.

Preliminary Geological Engineering Services Dam Site Investigation, Ugum River, Territory of Guam; Dames and Moore, for the U.S. Army Corps of Engineers, Pacific Ocean Division; September 1977. Identifies the structural geologic features which can be expected to control design and construction costs for a dam and outlet works on the Ugum River between Talofofo Falls and confluence with Bubulao River. Elements include land form analysis (geomorphology), structural analysis, lithology, foundation, construction materials, site, dam and outlet works, and ground surface examination.
Available: Bureau of Planning Library.

Draft Economic Feasibility, Ugum River; Bill Hunt, Evaluation Section, Planning Branch, U.S. Army Corps of Engineers; January 1978. This report contains data on water consumption, 1980-2000, and water supply production requirements, 1980-2040.
Available: Guam Environmental Protection Agency Library.

WATER QUALITY REGULATIONS, STUDIES, AND MONITORING

Waterworks Ordinance: An Ordinance to Provide for and to Regulate a Supply of Water to the Island of Guam; World Health Organization; February 1974, 1975.
Available: Public Utility Agency of Guam.

Continuing Planning Process for Water Quality Management; Guam Environmental Protection Agency; 1977 (latest revision). Required by the Federal Water Pollution Control Act Amendments of 1972 Section 303(e). Sets forth the goals of the planning process, cites designated agencies, and lists 15 Basin Planning Areas. Planning methodology, plan content, schedule of implementation and reports, and the grant objectives are also included.
Available: Guam Environmental Protection Agency Library.

Water Monitoring Strategy for the Territory of Guam; Guam Environmental Protection Agency; 1977. Describes the function of the Monitoring Division of GEPA. Details methods for systematic collection of data from rivers, estuaries, and marine waters necessary to analyze water quality trends and conditions. Activities described are surface water monitoring network (physical-chemical monitoring, biological monitoring), drinking water distribution monitoring, NPDES monitoring program, and recreational water sampling program. Also includes an environmental description, general causes of water quality problems, quality assurance activities, costs, and reporting to the public.
Available: Bureau of Planning Library.

The Merizo Water System Sanitary Survey; Guam Environmental Protection Agency; February 1977. Inventory of water sources and storage reservoirs, and assessment of the condition of the system.
Available: Bureau of Planning Library.

Water Pollution Potential of Non-Point Sources: A Survey of Current Literature; Joan Cabreza, Guam Environmental Protection Agency; May 1977. Summary discussions of various potentials for water pollution as applicable to Guam. Chapters include urban runoff, sewerage, solid waste, feedlots, fertilizer, pesticides, erosion, and ground-water pollution from saltwater intrusion.
Available: Guam Environmental Protection Agency Library.

Groundwater Analysis by Tritium Technique: A Preliminary Evaluation; John F. Mink and L. Stephen Lau, Water Resources Research Center, Technical Report No. 2, University of Guam; October 1977. The first preliminary survey of groundwater ages. Utilizes tritium augmented by chemical water quality parameters.
Available: Bureau of Planning Library.

Non-Point Water Pollution and Recommended Control Strategies for the Island of Guam, Draft Report; Dames and Moore, for the Guam Environmental Protection Agency; 1978. Topics deal with urban runoff pollution, control, treatment, and ultimate disposal. Other chapters discuss the protection of groundwater supplies through land use control, the disposal of swine and poultry waste, lubricating oil wastes, and sewage treatment sludge. The report concludes with recommendations for appropriate abatement strategies.
Available: Bureau of Planning Library.

Urban Runoff Quality in Northern Guam; William J. Zolan, Russel N. Clayshulte, Stephen J. Winter, James A. Marsh, Jr., and Reginald H.F. Young, Water Resources Research Center, Technical Report No. 5, University of Guam; January 1978. Partial project completion report for Effects of Infiltration of Urban Runoff on Ground and Coastal Waters in Limestone Regions of Northern Guam. Runoff was collected over an 18-month period from ponding basins and storm drains, and analyzed for common water quality parameters, except metal concentration. Figures (101), tables (32), 168 p.
Available: Bureau of Planning Library.

Pre-final Report: Environmental, Social and Economic Impacts of Development Over the Northern Aquifer; Guam Environmental Protection Agency; February 1978. Investigates the problems and alternatives of allowing development to occur in the Northern Conservation Zone, which supplies groundwater to 70 percent of Guam's residents.
Available: Bureau of Planning Library.

Urban Runoff Pollutant Absorption and Filtering by Selected Northern Guam Soils and Limestone; William J. Zolan, R.N. Clayshulte, and S.J. Winter, Water Resources Research Center, Technical Report No. 6, University of Guam; March 1978. Partial project completion report for the Effects of Infiltration of Urban Runoff on Ground and Coastal Waters in Limestone Regions of Northern Guam. Examines the pollutant removal capacity of soils and limestone overlaying the northern aquifer area.
Available: Micronesian Area Research Center Pacific Collection.

Guam Basal Ground Water Monitoring Well System - Construction and Development; Charles J. Huxel and Stephen J. Winter, Water Resources Research Center, University of Guam; 1979. Describes the procedures used to construct and develop the monitoring well system.
Available: Micronesian Area Research Center Pacific Collection.

Role of the Blue-Green Alga Nostoc Muscorum as a Possible Nitrate Source to the Groundwater of Guam; Deborah A. Grosenbaugh and Roy T. Tsuda, Water Resources Research Center, Technical Report No. 9, University of Guam; July 1979. This study investigates the nitrofixing blue-green algae Nostoc muscorum Ag. as a possible contributor of nitrate to the groundwater.
Available: Bureau of Planning Library.

Surface Impoundment Assessment; Barrett, Harris, and Associates; September 1979. Locates, describes, and assesses the pollution potential of all types of surface depressions, natural or constructed, that could affect the waters of Guam.
Available: Bureau of Planning Library.

Filtering Capacity of Guam Soils and Substrates in Relation to Groundwater Recharge by Treated Sewage Effluent and Other Surface Waters; Stephen J. Winter, Water Resources Research Center, University of Guam; 1980. Studies the natural filtering and absorptive capacity of the substrates overlying the aquifer of northern Guam using various types of recharge waters.
Available: Water and Energy Research Institute, University of Guam.

Role of Leuceana Leucocephala (Lam.) Dewit as a Possible Nitrate Source to the Ground-Water of Guam; Oscar Levand, Water Resources Research Center, University of Guam; 1980. Studies to what extent Leuceana Leucocephala (Tangentangen) contributes to the concentration of nitrate in the groundwater.
Available: Water and Energy Research Institute, University of Guam.

The GHURA-Dededo Deep Monitoring Well: Planning and Design; Charles J. Huxel, Water Research Center Technical Report No. 15, University of Guam; May 1980. Project completion report for Guam Basal Groundwater Monitoring Well System--Construction and Development. This report briefly summarizes the planning and design history of Guam's first deep monitoring well.
Available: Bureau of Planning Library.

Water Quality Assessment for Agana Springs; Thomas L. Smalley and William J. Zolan, Water and Energy Research Institute, Technical Report No. 22, University of Guam; April 1981. An assessment of the potential of Agana Springs as a possible municipal water source. Data from water samples that were collected and analyzed for common water quality parameters are presented.
Available: Bureau of Planning Library.

Metal Concentrations in Guam Urban Runoff; William J. Zolan, University of Guam Water and Energy Research Institute, Technical Report No. 25; June 1981. Presents the results of a study to gather and analyze heavy metal data from five sampling sites. 27 p.
Available: Bureau of Planning Library.

Diatom Assemblages as Indicators of Water Quality of the Freshwater Habitats of Guam; James A. Marsh, Jr. and William J. Zolan, Water and Energy Research Institute, Technical Report No. 29, University of Guam; September 1981. This study involves the collection of periphytic and other attached diatom samples from five freshwater sites. Concurrent with the diatom sampling, physical and chemical parameters were measured to assess water quality. Work includes calculation of species diversity indices for the collected diatom samples.
Available: Bureau of Planning Library.

The Impact of Agricultural Activity on Guam's Water Quality; Guam Environmental Protection Agency; August 1983. This study revises and updates the portion of the Guam Water Quality Management Plan dealing with agriculture. It assesses the results of a survey of 135 farmers, concentrating on pesticides, fertilizers, animal wastes, and erosion.
Available: Bureau of Planning Library.

Coastal and Inland Water Quality in the South Pacific - South Pacific Commission Topic Review No. 16; J.E. Brodie and R.J. Morrison, South Pacific Commission; 1984. A review of existing information, monitoring program, monitoring facilities, and legislation related to water quality in the South Pacific Commission region. Listed by countries, including Guam.
Available: Micronesian Area Research Center Pacific Collection.

Mass Mortality of Oreochromis mossabicus (Pices, Cichlidae) in Fena Lake Guam Associated with a Pseudomonas Infection; ArDean G. Leith, Stephen G. Nelson, and Paul Gates, Marine Laboratory, Technical Report No. 85, University of Guam; October 1984. Presents the results of a study to discover the cause of the illness that killed over 2,300 Talapia in Fena Lake during early April 1984. This report describes the progression of the epizootic, discusses the causes of the mortalities, and recommends a program of management for the lake so as to avoid recurrences.
Available: Micronesian Area Research Center Pacific Collection.

Historical Water Quality of PUAG Production Water Wells; Russell N. Clayshulte, Water and Energy Research Institute, Technical Report No. 57, University of Guam; June 1985. Summarizes a study of water quality compiled by the Guam Environmental Protection Agency. This study compiles and analyzes historical water quality data generated by the Public Utility Agency of Guam water laboratory from production water wells. Extensive analyses and tables.
Available: Bureau of Planning Library.

Umatac Water Supply System Sanitary Survey, Final Report; Guam Environmental Protection Agency; 1986. Reports on water quality, pressure, capacity, and flow problems in the Umatac area. This survey report lists Umatac Water System existing facilities, and provides recommendations for improvements to the management, operation, and maintenance of the public water system. Includes tables and graphs.
Available: Bureau of Planning Library.

Concentrations of Aluminum, Manganese, Iron and Calcium in Four Southern Guam Rivers; William J. Zolan and Leigh Ellis-Neill, Water and Energy Research Institute, Technical Report No. 64, University of Guam; June 1986. This study investigates the extent to which the concentration of aluminum, manganese, iron, and calcium in Guam rivers is related to ALS/PD. Intensive water sampling of four southern Guam rivers was conducted to assess concentration and variability of these minerals.
Available: Water and Energy Research Institute, University of Guam.

Revised Guam Water Quality Standards; Guam Environmental Protection Agency; 1987. Presents updated and revised water quality standards. This report outlines and describes an overall statement of policy relative to conservation, protection, maintenance, and improvement of water quality. Describes categories of water (marine, groundwater, buffer zone, surface waters), water quality criteria, effluent limitations, and definitions of terms used. Updated as needed.
Available: Guam Environmental Protection Agency Library.

Revised 208 Guam Water Quality Management Plan; Guam Environmental Protection Agency; October 1987. Focusses on the control of non-point sources of water pollution. This plan was developed as a result of Section 208 of the Clean Water Act of 1977. It addresses environmental issues such as air pollution, solid waste management, hazardous waste management, waste oil management, pesticide control, sludge disposal, and underground injection control.
Available: Bureau of Planning Library.

Mangilao Water System Sanitary Survey: Final Report; Guam Environmental Protection Agency; December 1987. Documents the capability of the water system to meet present and future demands. This study evaluates and identifies existing and potential water-related risks in the Mangilao area. Recommendations for improvements to the system and its operation are provided. Topics include description and characteristics of the study area, water supply/demand relationships, water quality, system description and physical evaluation, and operational/maintenance practices and problems.
Available: Bureau of Planning Library.

Guam Safe Drinking Water Emergency Preparedness Plan; Guam Environmental Protection Agency; revised October 1988. Provides guidance for uniform action in preparing for and reacting to threats of emergency or disaster that may adversely affect and contaminate the water supply or resources in the Territory. The introductory section contains the purpose of the plan, authority of GEPA in water emergency preparedness, definitions, and a plan utilization scheme. The rest of the plan outlines pre-emergency contingency plans; emergency response activities; and post-emergency activities. Standard Operating Procedures for emergencies and other responses for low pressure or water outages.
Available: Bureau of Planning Library.

The Occurrence of Certain Pesticides in Ground and Surface Waters Associated with Ordot Landfill in the Pago River Basin, Guam, Mariana Islands; Harold R. Wood, Water and Energy Research Institute, Technical Report 72, University of Guam; 1989. Assesses the occurrence of certain pesticides in the Pago River watershed created by small farming activities and the Ordot solid waste landfill. This technical and research based report focusses its concern on contamination of the food chain and adverse affects on organisms and their reproductive capacity. The document cites previous studies, describes the site and its history, gives sampling methods and analytical procedures used, presents results and discussions, and suggests future studies.
Available: Bureau of Planning Library.

Andersen Air Force Base (AAFB) Water Supply System Sanitary Survey, FY 1988; Guam Environmental Protection Agency; January 1989. Reports on the AAFB water system facilities. This survey evaluates the present condition of the system; assesses the quality of water supplied by the system; identifies existing and potential sources of potable water contaminants; and presents conclusions, recommendations, and methods of correcting deficiencies.
Available: Bureau of Planning Library.

Guam's Public Water Supply System/Non-Community Water System Non-Compliance with GPSDWR Assessment Correction Plan; Guam Environmental Protection Agency; 1989. Provides data and chemical analyses on the four suppliers of community water systems (Public Utility Agency of Guam, U.S. Navy Public Works Center, Andersen Air Force Base, and Cocos Island Resort Hotel), and the seven non-community water systems utilized for industrial and commercial purposes. The purpose of the report is to provide for Guam Environmental Protection Agency review of water suppliers to ensure compliance with the Guam Primary and Secondary Safe Drinking Water Regulations in accordance with the Safe Drinking Water Act.
Available: Bureau of Planning Library.

Annual Assessments of Guam's Public Water Supply Systems and Water Quality of Drinking Water, FY 1989; Guam Environmental Protection Agency; 1990. Provides data and chemical analyses of the three major suppliers of potable water to the island: the Public Utility Agency of Guam, the U.S. Navy, and the U.S. Air Force. This document discusses the Guam Environmental Protection Agency's review and recommendations regarding the suppliers compliance with the Safe Drinking Water regulations. Areas of concern include identifying sources of water contamination, determining maximum contaminant level, monitoring and reporting heavy metal concentrations in the water systems, and sampling and analysis.
Available: Bureau of Planning Library.

Guam Primary Safe Drinking Water Regulations; Guam Environmental Protection Agency; adopted 1978, amended 1983, 1989, 1990. Details the prescribed rules and regulations to implement the Safe Drinking Water Act. These rules and regulations summarize the authority, definitions, coverage, and review procedures relative to the Safe Drinking water Act. Specific regulations and sampling procedures used regarding analysis of the water supply, monitoring of contaminant levels, and contingency procedures regarding contaminated water are included. A companion document, the Draft Revised Guam Primary and Secondary Water Regulations and Fact Sheet (1989) lists Guam's enabling regulations for enforcement of the regulations.
Available: Bureau of Planning Library.

U.S. Navy Water System Sanitary Survey, FY 1989; Guam Environmental Protection Agency; 1990. Examines the adequacy of the U.S. Navy water supply system. The purpose of this study is to determine the environmental impact of Navy facilities, to identify operation and maintenance problems, and to assess the existing condition and location of the water production, treatment, storage, transmission and distribution facilities. Recommendations and methods or correction for major deficiencies of potential sources of potable water contamination are provided. Includes tables and maps.
Available: Bureau of Planning Library.

Agricultural Survey; Guam Environmental Protection Agency; on-going. Survey of commercial farms. Particular attention will be paid to the possible impacts of agriculture and livestock farming on the northern aquifer and erosion problems in the south. Data includes the size of the farm; crops grown and animals raised; types and amounts of pesticides and fertilizers used; methods of disposal of unwanted pesticides, fertilizers, and empty containers; irrigation methods, frequency and volume; erosion problems; and volume of animal wastes and methods of disposal. The data will be compiled by northern, central and southern Guam and by the size of the farm - 1 to 7 acres, 8 to 12 acres, and over 12 acres.
Available: Guam Environmental Protection Agency.

Water Quality Report for the Territory of Guam, 305(b); Guam Environmental Protection Agency; annually 1975 to 1990. The annual assessment of Guam's water quality. Much of these reports present GEPA's water quality data by monitoring complex: river, reef flat, and marine stations. Also discusses the overall quality of Guam's rivers. Appendices contain Monitoring Strategy Maps that show the location of the sampling stations for each monitoring complex area and a Master Classification Map that delineates marine and surface water categories. Discusses GEPA's water pollution control programs and other information pertinent to the water quality monitoring functions of GEPA.
Available: Bureau of Planning Library.

Guam Environmental Protection Agency Annual Report; Guam Environmental Protection Agency; Annually. Report on the major on-going activities of the GEPA, and a summary by project.
Available: Bureau of Planning Library.

REPORTS OF THE GUAM ENVIRONMENTAL PROTECTION AGENCY: The Monitoring Division of the Guam Environmental Protection Agency performs regular tests of the groundwater (wells), recreational areas waters, surface (river) water, and pollutant discharge into water. The following reports are prepared.

Monthly Report of the Monitoring Division; Guam Environmental Protection Agency; Monthly. This report contains all the data gathered by the Monitoring Division for that month. The data is recorded on the forms described below.

Potable (Drinking) Water: Bacteriological and Chemical Examination Form; The drinking water distribution monitoring network is regulated by the Safe Drinking Water Act of 1977. It applies to all drinking water systems that serve at least 25 individuals daily or have at least 15 service connections. PUAG has primary monitoring responsibility for the distribution systems they service. PUAG samples distribution systems weekly; GEPA samplers accompany PUAG samplers monthly. Samples are split and run separately and results compared. Tests are performed at points along the main water lines to help isolate the particular problem. The report form notes: location description, time, chloride (ppm), and total coliform per 100 milliliters. Chemical analyses are conducted by membrane filter.

Groundwater Data Report; Tests are conducted quarterly on 94 of the wells on Guam. PUAG has the primary monitoring responsibility for the drinking water sources they manage, and sample all sources once a month. Data is submitted to GEPA for review. GEPA accompanies PUAG samplers to all sources quarterly, samples are split and results compared. For each well is recorded: the well number, site number, agency, date, time, pumping rate in gallons per min-ute, meter reading, previous meter reading and date, water pressure in PSI, chlorinator status (gas type, dry type, working or not); chlorinator flow (pounds/day), chlorinator tanks (net weight), and field quality of water (pH, temperature in Centigrade) and conductivity (umhos/cm at 25° C).

Surface Water Network; This information is gathered for use by Guam Environmental Protection Agency and the U.S. Environmental Protection Agency STORET data system. The program has been underway since early 1974. For each river, estuary and marine water location is recorded: date, tides, air temperature (°C), rainfall, percent relative humidity, weather observation, time, cloud type, percent cover, windspeed by Beaufort number, wind direction (Mag.), station name, depth sample taken (meters), time, visibility (meters) using Secchi Disc, and current (dye and drogue). Separate water samples are taken and labeled for water temperature, nutrients, bacteriological tests, dissolved oxygen, and residue. Lab analyses are conducted and results noted for dissolved oxygen (mg/1), fecal coliform, salinity (0/100), residue (mg/1), total nitrogen, nitrates and nitrites (mg/1) and turbidity (NTU). Sampling frequency for most parameters for rivers, estuaries, and marine waters is monthly. Fena Reservoir is monitored quarterly through the cooperation of the U.S. Navy.

National Pollutant Discharge Elimination System (NPDES) Discharge Monitoring Report Form; All permittees under the U.S. EPA's NPDES are monitored quarterly by GEPA for compliance with effluent limitations. There are 20 active NPDES permits in force, primarily for discharges from wastewater treatment plants and power plants. The report form specifies minimum, average, and maximum values for quantity and concentration for each parameter. Both the reported and the permit condition values are shown. The number of analyzed samples that exceed the maximum and/or minimum permit conditions are noted. Specifies frequency of analysis for each parameter and sample type.

Monitoring Division Lab Analysis Request Form; for lab analyses requested by Guam Environmental Protection Agency Division Heads. Space is provided on the form to describe the sample and to record: field analyses (temperature, salinity, etc.); sampling information (number of samples, how collected and preserved); type of analysis requested (physical, chemical, bacteriological); and laboratory analysis results and interpretation. A thorough record is kept of who performed each action, the date and time it was performed, and the methods used. This form is completed when a complaint regarding drinking water quality is received by GEPA.

Annual Assessment of All Class V Underground Injection Wells. Describes underground injection control class V well activities and assesses the activities' potential to contaminate present or future underground sources of drinking water in Guam. Topics include occurrence of groundwater, construction features of storm water drainage injection wells, nature of injected fluids, and assessment of class V wells. Provides illustrations and injection well monitoring results.

SOIL AND MINERAL RESOURCES AND MANAGEMENT

Annotated Bibliography of Geologic and Soils Literature of Western North Pacific Islands; U.S. Army Corps of Engineers; 1956. An 880-page bibliography, including material on Guam.
Available: Micronesian Area Research Center Pacific Collection.

403-F: Mineralogy of Selected Soils from Guam; Carroll, Hathaway; 1963. A mineralogical study of selected soil samples, including data on chemical composition, grain-size distribution, and comparisons with other areas; and a description of soil profiles.
Available: Bureau of Planning Library.

The Soil Units of Guam and Their Agricultural Capability; Dr. Albert A. Laplante, Division of Agriculture and Home Economics, Bulletin 2, College of Guam; October 1964. Describes the physical condition of soil in fairly technical terms and describes the relationship of soil to plant growth. Guam's soil is classified into 12 area units located on the 1959 Soil Unit Map (not included in the report) with a description of the agricultural capability of each unit. The description includes the name of the principal soil type, number of acres, general location of the unit, soil origin, soil description, agricultural characteristics, recommendations for managing the soil, and crops for maximum productivity.
Available: Bureau of Planning Library.

Geological Reconnaissance Potential Quarry Sites of Hard Volcanic Rock, M.I.; Harding-Lawson Associates, for Department of Public Works; June 10, 1975. Locates and maps potential quarry site areas for a source of hard volcanic rock to produce asphaltic concrete.
Available: Bureau of Planning Library.

"Resources and Projections: Availability of Sand as Fine Aggregate for Engineering Construction in Guam"; David B. Doan, for the Bureau of Planning, in Guam Coastal Management Program Technical Reports Volume II, (October 1, 1977). Results of an investigation of resources and requirements for fine aggregate in the local construction industry. Projections of the demand, availability, and cost are made to the year 2000.
Available: Bureau of Planning Library.

Soil Survey of Guam; Moo Eon Park, for Department of Commerce; Unpublished research conducted in 1978. Analyzes the island's soil productivity. Potential agricultural lands as designated by the Bureau of Planning are field surveyed in detail, with the remainder of the island being briefly surveyed to identify additional lands having high potential productivity. The distribution of soils is mapped at a scale of 1:25,000.
Available: Department of Commerce.

Soil Savers Handbook; Guam Environmental Protection Agency; 1979. A guide to soil conservation and erosion control on Guam.
Available: Bureau of Planning Library.

Soils of the South Pacific - Their Capabilities and Limitations -South Pacific Commission Topic Review No. 7; J.D. Cowie, South Pacific Commission; 1981. Overviews soils, soil surveys, and information related to plant production and land use studies. This general reference report includes different islands and soil types.
Available: Micronesian Area Research Center Pacific Collection.

Reconnaissance Study of Stream Sedimentation, Southern Guam; Patricia Shade, U.S. Geological Survey, in cooperation with the U.S. Army Corps of Engineers, Pacific Ocean Division; December 1983. Water-Resources Investigations Report 83-4212. Report of studies on the mean annual sediment yields from the Talofofo, Ylig and Ugum River basins. This data will be used in future water supply development.
Available: Bureau of Planning Library.

IX International Forum - Soil Taxonomy and Agrotechnology Transfer - The Role of Soil Survey in Agricultural Development; Agricultural Experiment Station, University of Guam; 1984. Conference proceedings with emphasis upon soil management, soil characteristics, soil surveys, soil conservation, and land use as it relates to agriculture and agrotechnology.
Available: Micronesian Area Research Center Pacific Collection.

Erosion Mitigation on Guam: Community Resource Development; Ann M. Pobutsky; 1984. A University of Guam research paper. Examines the lack of emphasis by the community on erosion as a potential hazard. This report suggests fostering an awareness in planners and other officials involved in public policy of the potential impact concerning erosion on land use and development planning.
Available: Bureau of Planning Library.

Taotao Guam; Soil Conservation Service, U.S. Department of Agriculture; 1984. A brochure describing the activities of the USDA-SCS, specifically a summary of how soil surveys help with land and water resources.
Available: Bureau of Planning Library.

List of Publications and Reports of the Committee for Coordination of Joint Prospecting for Mineral Resources in South Pacific Offshore Areas (CCOP/SOPAC); Compiled by R.M. Thompson; 1985. April 1975 - August 1985 time period.
Available: Micronesian Area Research Center Pacific Collection.

Guam Soil Erosion and Sediment Control Standards and Regulations; Guam Environmental Protection Agency; May 1985. Specifies the regulations requiring the development of erosion control plans prior to the issuance of clearing and/or grading permits.
Available: Guam Environmental Protection Agency Library.

Guam Soil Test Summary, 1975-1984; J.L. Demeterio, F.J. Young and M.B. Yamanaka, Agricultural Experiment Station, College of Agriculture and Life Sciences, Technical Report No. 58, University of Guam; 1986. A summary of soil samples from various locations on Guam with analyses. The report and the soil test survey from 1974-1985 was designed to examine soil fertility shifts and subsequent fertilizer strategies.
Available: Bureau of Planning Library.

Some Chemical and Physical Properties of the Agricultural Soils of Guam; J.L. Demeterio, D.D. Ventura, and F.J. Young, Agricultural Experiment Station, College of Agriculture and Life Sciences, Technical Report No. 56, University of Guam; 1986. An analysis of agricultural soils based upon plow depth samples. Soil analysis and subsequent recommendations for soil testing prior to agricultural pursuits are discussed.
Available: Bureau of Planning Library.

Guam Soil Erosion and Sedimentation Control Manual; GEO Engineering and Testing, Inc., with Duenas and Associates Inc., for the Guam Environmental Protection Agency; 1986. This technical guide provides methods and procedures for preparation of erosion control plans to minimize erosion and sedimentation problems.
Available: Bureau of Planning Library.

Terrigenous Material in Coastal Zone Sediments of Guam and Saipan; Ernest A. Matson, Water and Energy Research Institute, Technical Report No. 73, University of Guam; October 1986. Presents the results of a study to investigate methods to distinguish the terrestrial fraction in sediments of estuaries, moats, and lagoons, and to provide estimates of the existing levels of terrestrial materials. Five study sites were chosen: Cocos Island, Ipan Beach, the Ylig River Estuary, Tumon Bay, and San Roque (Saipan). The purpose of the study was to identify those coastal regions that have been naturally impacted by terrigenous material, and distinguish them from others that have been impacted by development in adjacent watersheds. Sediment chemistry data, chemical composition of sediments, statistical summaries, and conclusions and recommendations are given.
Available: Bureau of Planning Library.

Soil Survey of Territory of Guam; Soil Conservation Service, U.S. Department of Agriculture, in cooperation with the Guam Department of Commerce and the University of Guam; May 1988. An extensive soil survey containing information of value to land planning. Extensive map units of general and detailed soil units are provided. Soil properties, classification of soils, formation of soils, management, and characteristics are described.
Available: Bureau of Planning Library.

Proceedings of the Third International Soil Management Workshop of the Management and Utilization of Acid Soils of Oceania; Belau, February 1987; J.L. Demeterio and Bonnie De Guzman (Eds.), Agricultural Experiment Station, College of Agriculture and Life Sciences, University of Guam; October 1988. A series of papers on the acid soils in Oceania, management properties of acid soils, crop performance and management of acid soils, regional and international collaboration, and country papers for island nations/territories in Micronesia and the South Pacific.
Available: Bureau of Planning Library.

Committee for Coordination of Joint Prospecting (CCOP)/South Pacific Marine Prospecting Activities Commission (SOPAC) 18th Annual Session; compiled by the Bureau of Planning; October 2-3, 1989. Presents committee session proceedings for the coordination of investigations on mineral and other non-living resource potential in coastal, inshore, nearshore, and off-shore areas of the South Pacific oceanic region. This planning aid document reports the conclusions and planning recommendations of the inter-governmental committee, along with agenda, committee reports, and session documentation.
Available: Bureau of Planning Library.

Miscellaneous Erosion Control Plans; Submitted to the Guam Environmental Protection Agency; on-going. These plans, submitted in compliance with the above regulations, are reviewed and kept on file at GEPA. They describe the temporary and permanent measures that will be used to prevent erosion and subsequent water pollution caused by siltation.
Available: Guam Environmental Protection Agency Library.

GEOLOGIC HAZARDS: SEISMICITY

Historical Review of the Seismology of Guam--with References; Pacific Islands Engineers, for U.S. Navy Bureau of Yards and Docks; June 1948. Comprehensive review and outline of available data and sources of information on the seismology of Guam. All material in this report is taken from prior studies and includes reprinting of several sets of earthquake records (see below). There is a bibliography of 86 items related to earthquakes, faults, and geology.
Available: Bureau of Planning Library.

Seismograph Records Compiled from the Guam Recorder. For approximately 1800 earthquakes, these records include the date, local time (to the second), principle direction of the shocks, and whether or not they were perceptible on Guam.
Available: As Plate 4 of the Historical Review of the Seismology of Guam (see above).

"Catalogue of Earthquakes Felt in Guam"; William C. Repetti, Manila Observatory, Philippine Islands Weather Bureau, Seismological Bulletin, (January-June 1939). "Repetti's Catalogue," as it is known, is a list of earthquakes compiled from nine sources (one of which is Earthquake Records From Agana, below). The records for each earthquake include the date and time (to the minute), location where it was felt, a description of the strength and number and duration of the shocks, damage summaries (when available), and the source of the original report.
Available: as Plate 5 of the Historical Review of the Seismology of Guam (see above).

"Earthquake Records From Agana"; Cleveland Abbe, Jr., Terrestrial Magnetism and Atmospheric Electricity, IX:2 (June 1904). The data contained in this article was incorporated into the Catalogue of Earthquakes Felt in Guam (see above).

Guam Earthquake Records Compiled from Manila Observatory Bulletin 1909-1940. These bulletins were also titled the Monthly Bulletins during 1909-1925. In 1926, they were re-named the Seismological Bulletin. These records include, for each earthquake, the date and time (both Greenwich Mean Time and Guam local time), the intensity on the Rossi-Forel scale and miscellaneous notes and records.
Available: as Plate 6 of the Historical Review of the Seismology of Guam (see above).

Earthquakes in the Guam Region Reported Felt, 1966-1980; Geological Survey, U.S. Department of the Interior; 1981. Two listings of earthquakes: "Earthquakes in the Guam Region, 1966-1980"; and "Earthquakes in the Mariana Islands Region, 1979 and 1980". Each listing gives the date, time, geographic location by degrees latitude and longitude, magnitude, and depth.
Available: Bureau of Planning Library.

Seismographic Records; Guam Observatory. The Guam Observatory maintains the seismographic station on Guam, formerly called the Coast and Geodetic Survey, and originally the National Oceanic and Atmospheric Administration. Monthly tabulations of earthquake data are compiled and contain such information as the date, time, location, depth, and magnitude of the earthquake. The station has existed since 1958 and has access to data since 1825.
Available: Guam Observatory.

CLIMATE

Historical Review of the Meteorology of Guam With References; Pacific Islands Engineers, for the Department of the Navy, Bureau of Yards and Docks; May 14, 1948. A complete review of available prior meteorological material. Considerable data on the major air masses and wind circulation systems that affect the climate of Guam are included. Typhoons are discussed as regional meteorological phenomena, and from the standpoint of damage and frequency on Guam.
Available: Bureau of Planning Library.

"Climate"; David J. Blumenstock, Climatologist, Weather Bureau, U.S. Department of Commerce, in Military Geology of Guam, Marianas Islands, (1959). Aspects of climate of practical concern to the military. Stresses temperature conditions, wind, humidity, rainfall, and storms. Also considered, though more briefly, are air pressure, and illumination, insolation, cloudiness, ceilings, and visibility. In addition, such topics as deterioration of material and troop efficiency are considered from a climatological point of view.
Available: Bureau of Planning Library.

Typhoon Karen; Frank C. Stone, University of Guam; April 1970. This thesis for a Master's Degree in History reports on the practices and facilities for typhoon warning, forecasting and reconnaissance. The tracking of Karen, the preparations before and conditions during the strike, and damage assessment by village are also included. Federal aid and Guam's rebuilding are compared with the economy before Karen.
Available: Micronesian Area Research Center Pacific Collection.

Typhoons on Guam; Joint Typhoon Warning Center, U.S. Fleet Weather Central; May 1970. Summary of historical data on typhoons affecting Guam. Includes listings of over 70 typhoons since 1600, with data on wind speed and direction of movement, both in chronological order and by season. Discussion covers typhoon seasons and the 1968 typhoons.
Available: Micronesian Area Research Center Pacific Collection.

Terminal Forecast Reference File; Air Weather Service at Andersen Air Force Base; revised November 1971. This document presents highly technical weather forecasting information and aids of use to meteorologists.
Available: Micronesian Area Research Center Pacific Collection.

The Spinning Winds; Dorothy Fritzen; 1972. The layman's guide to typhoons. Topics include personal preparation for the storm, storm formation, tracking activities, seasonal incidence, past typhoons of Guam, the story of Typhoon Karen, and charts of typhoon tracks (paths) in the Pacific.
Available: Bureau of Planning Library.

Tropical Cyclones Affecting Guam; Capt. Charles R. Holliday, USAF, Fleet Weather Central/Joint Typhoon Warning Center, Guam, Mariana Islands; 1975. Presents a climatology of tropical storms passing within 180 miles of Guam for the period 1948-1975. This report reviews all typhoons affecting Guam back to 1800 and includes some noteworthy typhoons of the 1600's. The survey encompasses the frequency, behavior, meteorological effects and descriptive chronicles of Guam's tropical storms. The major emphasis is on the period since World War II.
Available: Bureau of Planning Library.

Super Typhoon Pamela After-Action Report, Guam 1976; Commander, U.S. Naval Forces Marianas; 1976. Reviews the effects of Typhoon Pamela on Guam's military facilities and assesses their readiness. This report discusses recommendations for improved disaster planning based on the experiences gained from Typhoon Pamela for the preparation phase, the recovery phase, and restoration, and future development. Areas of general interest concerning Typhoon Pamela include weather, logistics, communications, civilian community, and medical-dental.
Available: Bureau of Planning Library.

The U.S. Weather Services: Functions, Economic Impact, and Comparison of Guam and Puerto Rico; Thomas S. Yoshida, University of Guam Special Project; 1978.
Available: Robert F. Kennedy Library, Special Project File, University of Guam.

Forecast Verification and Reconnaissance Data for Southern Hemisphere Tropical Cyclones (July 1982 through June 1984); U.S. Naval Oceanographic Command Center, Joint Typhoon Warning Center, COMNAVMAR. A summary of tropical cyclones for the South Pacific and South Indian Oceans from 1982 to 1984. A summary of reconnaissance data and forecast verification is presented.
Available: Bureau of Planning Library.

The 1983 Drought in the Western Pacific; Otto Vander Brug, for the U.S. Geological Survey; 1986. This report documents the severity of the drought, its effect on water resources, and its impact on the people of island groups in the Western Pacific: the Mariana Islands, the Caroline Islands, and the Marshall Islands. Discusses the physical and cultural setting of the islands, rainfall, streamflow, and effects of drought on water supply and agriculture.
Available: Micronesian Area Research Center Pacific Collection.

Agroclimate Atlas of Guam - Wet and Dry Seasons and Rainfall Probabilities at U.S. Weather Stations - Part 1; Chu-Tek Tseng and R. Muniappan, Agricultural Experiment Station, University of Guam; 1986. A statistical and tabular summary of some of the long term rainfall patterns pertaining to agricultural management of the island.
Available: Micronesian Area Research Center Pacific Collection.

Report of the SPC/UNEP/ASPEI Intergovernmental Meeting on Climatic Change and Sea Level Rise in the South Pacific; South Pacific Commission; 1989. A compilation of agenda items and meeting reports on the impact of climatic changes and sea level rise on Pacific Islands. Impacts on marine and coastal terrestrial ecosystems are discussed, as well as the Greenhouse effect and climatic change, and how this may affect islands in the Pacific Basin.
Available: Micronesian Area Research Center Pacific Collection.

A Climate of Crisis - Global Warming and the Island South Pacific; Peter Hulm, for United Nations Environment Programme, and the Association of South Pacific Institutions; 1989. A summary of the impact of global warming on the islands in the Pacific. Includes introductory and general materials as well as specific impacts (physical, oceanic, climatic, health, natural resources) and overall ecological impacts on forestry, soil, coastal plains, and marine life. Policy implications and disaster mitigation strategies are discussed.
Available: Micronesian Area Research Center Pacific Collection.

Annual Tropical Cyclone Report; U.S. Fleet Weather Central, Joint Typhoon Warning Center; 1959-present (annually). Prior to 1980, this report was entitled the Annual Typhoon Report. The report outlines the activities and responsibilities of FWC/JTWC, presents data sources, forecasting techniques, procedures, reconnaissance, and research efforts. There is a summary of the typhoon activity and tracks for the year and a write-up on the history of each typhoon that year with its track (path). The forecasting and forecasting verification data for that year are presented.
Available: Bureau of Planning Library.

Local Climatological Data: Annual Summary with Comparative Data; Environmental Data Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce; annually. This report includes a description of Guam's climate and describes the location of the National Weather Service Station. The station was first installed in 1956. The body of the report consist of eight tables with historical weather information. The titles of the tables are: meteorological data for the current year; normals, means, and extremes; average temperature; precipitation; heating degree days; cooling degree days; snowfall; station location. The first two tables give the monthly data with an entry for the whole year. Both provide much the same data as the monthly summary, above. The station location table indicates: date opened, latitude and longitude, station height above sea level, height above ground (for wind instruments, extreme thermometers, psychrometer, tele-psychrometer, tipping bucket rain gage, weighing rain gage, 8" rain gage, sunshine switch), and height above sea level for the pyranometer. The other five tables provide data by the month and year for the time the station has been opened. As might be expected, the snowfall table is blank.
Available: Guam Environmental Protection Agency Library.

Local Climatological Data: Monthly Summary; Environmental Data Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce; monthly. This report consists of a table containing daily weather information including: temperature (maximum, minimum, average, departure from normal average), degree days, weather types (fog, storm, etc.), precipitation, wind speed and direction, minutes of sunshine, sky cover. There is also a table of hourly precipitation. The report includes a table of observations of three-hour intervals for: sky cover, cloud ceiling height, visibility, temperature, relative humidity, and wind speed and direction.
Available: Guam Environmental Protection Agency Library.

LAND USE

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LAND-USE PLANS AND STUDIES (See also Natural Resources Development and Management: ENV)

Territory of Guam Master Plan; Territorial Planning Commission; 1966. Most recent officially adopted land-use plan; summary of geology, soil type, vegetation. Discusses goals and requirements for the following types of land-use: residential, commercial, industrial, and recreation.
Available (original): Department of Land Management.
Available (maps reduced--xerox): Bureau of Planning Library.

Guam Master Plan, Phase I: Problems, Opportunities, and Alternatives, Land-Use Element; Greenleaf/Telesca-Ahn; June 1972. Sections include summary of existing zoning, capacity of existing land-use zoning, land suitability slope, civilian land-use analysis, and generalized land-use requirements for 1970 to 1990; never adopted.
Available: Bureau of Planning Library.

A Land Use Policy; Paul Souder; December 3, 1973. This article discusses land values, land-use policy and planning, urban sprawl, public land ownership, development and disposal of land, and urban land taxation.
Available: Bureau of Planning Library.

"Analysis of Results, CZM Land-Use Opinion Survey"; Bureau of Planning, in Guam Coastal Management Program Technical Reports; 1976. An analysis of the results obtained from a survey distributed to 931 residents. Attitudes examined concern seashore development, recreational facilities, property ownership, and citizen participation.
Available: Bureau of Planning Library.

Land Use on Guam; Jane Jenneson-Nolan, University of Guam Masters Thesis; 1976. Overviews current and historic land-use patterns and problems. This report summarizes land ownership, land valuation, construction costs, building permits and development, environmental limitations on land-use, zoning and land-use, and land taxation and recordation. Three community attitudinal surveys concerning land-use completed in the early 1970's are analyzed.
Available: University of Guam, Robert F. Kennedy Library, Masters Thesis File.

Land-Use Plan, Guam: 1977-2000; Bureau of Planning; 1977. Includes statements concerning the policy guidelines of the Bureau of Planning, physical and cultural considerations, and growth and change considerations. Identifies four land-use districts, as well as areas of particular concern to which either natural resource values, geologic constraints, or hazards play an important role in determining the suitability of the land for particular uses. Regulatory mechanisms are discussed, and further refinements and recommendations are given. This plan was revised in 1980 (below).
Available: Bureau of Planning Library.

"An Inventory of Present and Projected Coastal Land and Water Uses on Guam"; Alexander C. Chan, Bureau of Planning, in Guam Coastal Management Program Technical Reports; February 1977. Identifies existing and projected coastal land and water uses. The report tables and maps coastal water categories defined by the Water Pollution Control Act, existing coastal water uses, and existing land-uses adjacent to coastal water. Proposed seashore activities are listed.
Available: Bureau of Planning Library.

Community Design Plans, Guam: 1977-2000; Bureau of Planning; October 1977. Consists of Community Design maps with color-keyed land-use classifications, descriptions of the land-use classifications, and a synopsis of the significant features of each of the thirteen community areas.
Available: Bureau of Planning Library.

Land-Use Districting Plan: Guam (Draft); Bureau of Planning; 1980. This plan is a revision of the Land Use Plan, Guam: 1977-2000 (above). Land-use policies are stated for government processes, development, and resources utilization. These policies provide official guidelines for use during consideration of proposed developments and land-use actions such as zone changes, tract maps, variances, and conditional uses. A land-use districting map was prepared to provide a general idea of what uses would be compatible with each district. It is not an official zoning map.
Available: Bureau of Planning.

The Organization of Development Planning in the South Pacific; University of the South Pacific, Roman Dibsky; 1986. An excellence reference on the planning process, specifically as it relates to the South Pacific region. The study focuses on the organizational or administrative aspects of development planning. The study is descriptive in nature, and explores and identifies prevailing practices and problems in the organization of development planning in the region.
Available: Bureau of Planning Library.

Public Law 20-147: Territorial Planning Council; Guam Public Law 20-147 created the Territorial Planning Council (TPC) in 1990. This law mandates the purpose of the TPC: the preparation of a comprehensive development plan for Guam to provide for short- and long-range guidance for the social, economic, infrastructure, suprastructure, and physical development of Guam. The plan is to contain a statement of objectives for development, as well as standards and principles for the most desirable use of land within Guam. The TPC replaces the now defunct Central Planning Council formerly established by P.L. 12-200.
Available: Bureau of Planning Library.

LAND-USE LAWS, REGULATIONS, AND PERMITS

Planned Development Districts, Section 17605 of Title XVIII, Zoning Law; Government of Guam Code; Public Law 9-232, effective August 10, 1968. A planned development district or planned unit development (PUD) enables the unified development of land for multiple or mixed uses. The procedure for establishing a PUD is the same as that for a zone change, namely, approval of the Territorial Land-Use Commission.
Available: Bureau of Planning Library.

Planned Development Design Guidelines; Territorial Planning Commission; June 1973. This document presents guidelines (not regulations) for developers as to concerns and considerations of the former Territorial Planning Commission for a planned development district or planned unit development (PUD). It presents general design principles for PUD's and a discussion of the unique characteristics and needs of different types of areas: seashore, urban area, agricultural area, conservation, flood plains, and highway interchange and airport areas. Specific guidelines for each of the following types of PUD are included: residential, commercial, resort, and new community. It explains the land-use intensity rating system that is computed to measure the density permitted or desirable for a given development. A series of acceptable or permitted ratio of various land-uses (e.g. the ratios of open space area to living area) depending on the area's residential desirability are presented. The guidelines include a sample review of a proposed planned development.
Available: Bureau of Planning Library.

Planned Development Districts: Rules and Regulations; Division of Land Planning, Department of Land Management, and Territorial Planning Commission; November 1973. These rules and regulations were prepared to supplement and clarify Section 17605 of the Government of Guam Code. They include an introduction which presents the concept and purpose of a planned development district or planned unit development (PUD), the general standards to be followed, and a detailed description of the procedures involved. These rules and regulations were never adopted by the Territorial Planning Commission.
Available: Bureau of Planning Library.

HUD Minimum Property Standards for One- and Two-Family Dwellings; U.S. Department of Housing and Urban Development; 1973, revised 1974. Accepted and followed by the Government of Guam.
Available: Bureau of Planning Library.

Subdivision Rules and Regulations for the Territory of Guam; Territorial Planning Commission; April 1974. These rules and regulations, adopted by the former Territorial Planning Commission on April 18, 1974, clarify and supplement Title XIX of the Government of Guam Code. This publication includes the following chapters: design and layout of subdivisions, road classifications and standards, agricultural subdivisions, data and map requirements, other maps requiring recording, and improvement plans.
Available: Bureau of Planning Library.

Administrative Rules and Regulations of the Government of Guam; John A. Bohn; 1975. Chapters include Department of Land Management (subchapters include regulations for land surveys, manual of surveying practice (see below), leases and sales, and land-use permits), Land Transfer Board, Territorial Planning Commission (subchapter on subdivision rules and regulations), and Subdivision and Development Review Committee.
Available: Bureau of Planning Library.

Proposed Parks and Recreation Guidelines and Standards for Subdivisions and Planned Unit Developments (PUD) on Guam; Department of Parks and Recreation; August 30, 1975. General guidelines, standards for PUD's with 20 dwelling units or more, and standards for PUD's with less than 20 units. Because the Department of Parks and Recreation usually accepts responsibility for recreation areas in PUD's with 20 units or more, they have specific standards that must be met. Their written approval of the recreation facility is required if they are expected to assume responsibility for the park. These guidelines and standards have not been officially adopted by the Territorial Planning Commission.
Available: Bureau of Planning Library.

Improvement District Program--Procedure, Process, and Flow; Departments of Public Works and Land Management; 1976. Describes the procedures used in handling an improvement district request. If a group of land owners with adjacent properties wish to have improvements made to the area (e.g. street lighting, improved roads, sewer system, etc.), they can petition the government to form an improvement district. The government then goes through the lengthy process of preparation of cost estimates, Territorial Planning Commission and public hearings, final approval, construction of improvements, and assessment collected from the land owners. This document contains a detailed description of the process, including the responsibilities and actions to be taken by the various Government of Guam agencies involved. It includes a reprint of the Improvement District Law, passed August 7, 1968, and amended by Public Law 12-131, signed by the Governor on May 23, 1974. Copies of all forms used are also included.
Available: Engineering Division, Department of Public Works.

Mechanisms for Land-Use Control on Guam; Robert Gomez, Guam Coastal Zone Management Program, Bureau of Planning; 1977. Reviews zoning laws and major pieces of legislation which regulate development. Land-use permitting processes are discussed and flow charted in Appendix A to indicate the required procedures for land-use control legislation, the Guam legislative process, zone variance and zone change, subdivision approval, planned unit development, building permits, land-use permitting process, agricultural preserves, and the Corps of Engineers permit process. Appendix B contains actual copies of forms and schedules for zone changes and variances, subdivision and PUD, building and occupancy permits, land-use permits, agricultural lease, Corps of Engineers, and submerged land permits.
Available: Bureau of Planning Library.

Building for Disaster Mitigation: A Compilation of Current Practices and Recommendations for Improvements on Guam; Disaster Preparedness Planning Program, Bureau of Planning, Vulnerability Study Series Report No. IV; June 1978. A compilation of codes and regulations for building construction and design in relation to hazard mitigation for typhoons, earthquakes, and floods. Recommendations for improving the codes and regulations are derived from the 1972 National Workshop on Building Practices for Disaster Mitigation.
Available: Bureau of Planning Library.

"Summary Chart of Major Government of Guam Laws Related to Land Use"; Guam Coastal Zone Management Program, Bureau of Planning, in Guam Coastal Management Program Final Environmental Impact Statement, Volume I; July 1979. There are many different laws and Government of Guam agencies and commissions involved in planning and regulation of land-use. This chart is a summary by kind of land (coastline, subdivision, agricultural preserve, etc.), of the laws that have been passed and the agencies and commissions that have been authorized to act regarding the use of land on Guam. Each row of the chart refers to a particular kind of land. The columns contain the relevant sections of law and Government of Guam bodies involved in the planning and regulation of the land.
Available: Guam Coastal Zone Management Program, Bureau of Planning.

Review of the Building Law of Guam; Juan C. Tenorio and Associates, for Bureau of Planning; 1980. Identifies general problem areas of the laws and processes dealing with the construction of single family dwellings, makes recommendations and changes to specific problems, and suggests a simplified method for building permit application. Reviews the Building Law of Guam, Zoning Law, Subdivision Law, Uniform Building Code, Minimum Property Standards, Energy Codes, National Fire Codes, National Electric Code, Life Safety Code, Uniform Plumbing Code, and Uniform Mechanical Code.
Available: Bureau of Planning Library.

Procedures Guide for Achieving Federal Consistency with the Guam Coastal Management Program; Bureau of Planning; 1982. A guideline to procedures for federal consistency review to guide the use, protection, and development of land and ocean resources within Guam's coastal zone. The guide is designed to assist agencies and individuals to determine whether their proposed actions are subject to federal consistency review.
Available: Bureau of Planning Library.

Manual of Procedures - Government of Guam Permits; Duenas and Associates, for the Bureau of Planning, Coastal Zone Management Program; 1986. A flowchart reference guide to permits and procedures required for building, grading and clearing, zone variance, and other development requirements.
Available: Bureau of Planning Library.

Guidebook to Development Requirements on Guam; Guam Coastal Zone Management Program, Bureau of Planning; 1986. An extensive guide to acquaint the public with laws, regulations, permits, clearances, and other established guidelines for development on Guam, including construction, earthmoving, agriculture, and other types of land-use and water-oriented construction. Each type of requirement is delineated, summarized by purpose and nature of the requirement, Government agency authority for approval, and the application review process.
Available: Bureau of Planning Library.

Revisions to Guam's Land Use Laws and Regulations; Maraman and Taniguchi-Ruth Associates, for the Bureau of Planning; March 1986. A summary of revisions including zoning code amendments, subdivision Law amendments, administrative amendments, and regulation revisions for beach sand mining, flood damage control, and repeal of the Guam Territorial Seashore Protection Act and Ocean Beach Front Act.
Available: Bureau of Planning Library.

Uniform Building Code; International Conference of Building Officials; 1988. Adopted and followed by the Government of Guam.
Available: Building Permits Section, Department of Public Works.

Zoning Law from the Government Code of Guam; extract from the Government Code of Guam, Title XVIII, outlining the zoning law. 21 GCA Chapter 61, 1989.
Available: Bureau of Planning Library.

Subdivision Law; Title XIX, Government Code of Guam; Public Law 6-134, effective December 18, 1962; 21 GCA Chapter 62, 1989. A subdivision of land is the dividing up of any parcel of land into six or more lots. The subdivision law gives full responsibility to the former Territorial Planning Commission for the subdividing and subsequent development of land. The law includes agricultural subdivisions.
Available: Bureau of Planning Library.

Training and Reference Guide for Building Inspectors on Zoning and Land-Use Laws and Regulations; Guam Coastal Management Program, Bureau of Planning; 1989. Familiarizes building inspectors with the various land-use laws, rules, and regulations, and the role/responsibility of building inspectors in enforcing land-use ordinances. Land-use laws are summarized, including zoning laws, the Territorial Seashore Protection Act, Subdivision Law, and Hotel Zone Rules and Regulations. Review and inspection procedures for building permits, clearing and grading permits, and other permit types are detailed.
Available: Bureau of Planning Library.

Inspector's Fieldbook; Guam Coastal Management Program, Bureau of Planning; 1989. Companion fieldbook to the Training and Reference Guide for Building Inspectors on Zoning and Land-Use Laws and Regulations (above). This manual is designed to assist inspectors to cite specific sections of the law or regulations being violated and to identify what actions are necessary to secure compliance with the laws or regulations.
Available: Bureau of Planning Library.

Applications for Department of the Army Permit for Activities in Waterways; United States Army Corps of Engineers; on-going. Forms and instructions for filing with the Corps of Engineers in order to: build piers or docks, dredge sand or gravel, etc.
Available: Department of Land Management Planning Division Files.

TERRITORIAL LAND-USE COMMISSION (FORMERLY KNOWN AS THE TERRITORIAL PLANNING COMMISSION) AND DEVELOPMENT REVIEW COMMITTEE (FORMERLY KNOWN AS THE SUBDIVISION DEVELOPMENT REVIEW COMMITTEE) AND TERRITORIAL SEASHORE PROTECTION COMMISSION

Analysis of Guam Land Use Laws and the Role of the Territorial Planning Commission; Herman L. Skipper, for Department of Land Management; September 1980. Researches the express and implied authority of the former Territorial Planning Commission and the TSPC; land-use policies as stated in public laws and executive orders; considerations that the former SDRC and TPC make in deciding zoning, zone changes, and development within the seashore reserve; the open government law; recent legislation and executive orders; public lands and the Chamorro Land Trust Commission Act; Guam Housing and Urban Renewal Authority and the TPC; potential problem areas and solutions; factual problems and solutions; recommendations for TPC action by regulation; and other recommendations for legislation.
Available: Bureau of Planning Library.

Guide To Land-Use Decision Making For Territorial Planning Commission/ Territorial Seashore Protection Commission Members; Bureau of Planning, Coastal Zone Management Program; 1986. A guidebook designed to aid in the decision making process for members of the Territorial Land-Use Commission and the Territorial Seashore Protection Commission. The Guidebook is divided into sections and subsections for easy reference, and covers all areas related to land development laws, planning considerations, and legal aspects of zoning variances, changes, planned development districts, and hotel zones. Includes a summary of TLUC and TSPC rules and regulations and laws related to zoning, subdivisions, and other areas.
Available: Bureau of Planning Library.

Establishing the Development Review Committee (DRC), Executive Order 90-09 and Executive Order 90-15; May 1990. These Executive Orders abolish the Subdivision Development Review Committee (SDRC) and establish a Development Review Committee (DRC) for the purpose of providing for effective intergovernmental review and analysis of various development activities brought before the Territorial Land-Use Committee/Territorial Seashore Protection Commission. Executive Order 90-15 establishes the operating rules and regulations for the Development Review Committee.
Available: Bureau of Planning Library.

Requirements for Environmental Impact Assessments for All Territorial Land Use Commission Actions, Executive Order 90-10; May 1990. This E.O. requires all Territorial Land-Use Commission (TLUC) applicants to submit an Environmental Impact Assessment to the Guam Environmental Protection Agency, to be approved by the Administrator of that agency before the TLUC can act upon any requested zone change or variance. The executive order outlines the requirements the applicant must meet in preparing the Environmental Impact Assessment, including description of project and setting, description of existing environment, estimate of the nature and magnitude of environmental changes caused by activities of the project, evaluation of impacts relevant to site sensitivity, and mitigative measures. Also authorizes the TLUC to revoke, suspend, or nullify any zone change or variance granted to an applicant if the application fails to meet the provisions of the Executive Order.
Available: Bureau of Planning Library.

Territorial Land-Use Commission (TLUC) and Development Review Committee (DRC) Files and Forms; Department of Land Management Planning Division. Whenever an applicant requires a decision from the TLUC or TSPC, he must apply to DRC for review and TLUC for final approval. Minutes of the meetings of TLUC/TSPC/TPC and DRC/SDRC from 1975 forward are kept on file at Department of Land Management Planning Division. File organization before 1975--for each request that came before TPC prior to 1975, the maps and other information about the request are not filed centrally. Different files exist for different kinds of requests, and the organization of the file is maintained by the member of the staff at Department of Land Management who works in that type of request. More information about subdivision and PUD files is given below. TLUC/TSPC/ TPC and DRC/SDRC file organization after January 1975--Beginning January 1975, a separate folder was made

for each parcel of land that came before the TLUC/TPC, DRC/SDRC, or Territorial Seashore Protection Commission (TSPC). Each folder contains the application form, any maps or correspondence related to the request, and a copy of the minutes of meetings at which the request was considered. The folders are filled sequentially by municipality and lot number.
Available: Department of Land Management.

Files on Subdivision; Department of Land Management Planning Division. The files of subdivision (parcelling of a lot into six or more pieces) requests that have come before the TLUC/TPC are kept by tract number. Each file folder contains the map and any supporting documentation that was submitted.
Available: Department of Land Management.

Files on Planned Unit Developments; Department of Land Management Planning Division. A separate folder was made for each PUD that came before the TLUC/TPC since 1972. Each folder contains maps, correspondence, and the TLUC/TPC minutes related to the PUD. For years 1972 through 1974, the folders are in a separate file by municipality and lot number. Beginning January 1975, PUD folders are filed with all other TLUC/TPC, TSPC, and DRC/SDRC requests.
Available: Department of Land Managment.

Territorial Seashore Protection Commission (TSPC) Files and Forms; Department of Land Management Planning Division. Any development that lies within 10 meters of the shoreline out to the 10-fathom contour must receive approval from the SPC, which began hearings in August 1975. A chronological file of the minutes of each meeting is maintained. A separate folder is created for each case that is considered. The folder contains the application, maps and correspondence, and a copy of the relevant TSPC minutes. The folders are filed by municipality and lot number, along with TLUC/TPC and DRC/SDRC cases.
Available: Department of Land Management.

PUBLIC LAND AND BUILDINGS

Government Subdivisions; Paul Souder; undated. This article gives the history of Government of Guam's largely ineffective role in government subdivisions.
Available: Bureau of Planning Library.

Report on the Public Lands of Guam; Department of Land Management, Planning Division; July 1964. Consists of a chronological history of public lands since the Organic Act to 1964, relevant documentation from 1945 to 1964, a listing of individual government land parcels, and a series of 18 maps depicting the public lands and other government property.
Available: Bureau of Planning Library.

Public Land Zoned for Commercial and Industrial Uses; Department of Land Management; May 7, 1973. Series of maps showing public land zoned for commercial and industrial uses.
Available: Bureau of Planning Library.

Submerged Lands Legislation Affecting Guam, The Virgin Islands and American Samoa; June 1974. A compilation of the testimony submitted in a hearing before the Subcommittee on Territories and Insular Affairs of the United States Senate in June of 1974. Testimony consists of statements by U.S. government officials and representatives of the Territories.
Available: Bureau of Planning Library.

"Beach Access on Guam"; Robert Gomez, Bureau of Planning, Coastal Management Section, in Guam Coastal Management Program Technical Reports; October 1977. An inventory of beach strands showing the name, size, ownership, and inland access of each beach. Navy recreational facilities and public owned potential recreation areas are listed.
Available: Bureau of Planning Library.

Guam Public Land Use Plan; Guam Coastal Management Program, Bureau of Planning; 1984. A comprehensive inventory of Government of Guam owned lands, with designated appropriate use for each parcel. Three land-use designations are assigned: development, agriculture, and conservation. Background information is provided along with methodology used, maps and data sheets.
Available: Bureau of Planning Library.

Resource Management Agency Training Needs: Land Acquisition, Disposal, Management; United States Department of the Interior; October 1984. Evaluates the current land acquisition, disposal, and management situation in the various natural resource management agencies of the Government of Guam, and assesses training needs.
Available: Bureau of Planning Library.

Public Shoreline Access; Guam Coastal Management Program, Bureau of Planning; 1987. Provides information on public beaches and properties with access to the shoreline. This update of a 1977 study (above) includes the location of identified properties, type of facilities available, and recreational opportunities. Existing shoreline parks and improved government properties which have easy shoreline access are inventoried.
Available: Bureau of Planning Library.

Building Inventory; Department of Public Works, Property and Accounting Section; undated, but presumably current. List of all buildings on Guam owned by the Government of Guam. For each entry, the following information is included: quantity, description, physical location (municipality), condition (new, good, fair, or poor), floor area, and total construction cost.
Available: Bureau of Planning Library.

FEDERAL LANDS

Post-War Land Takings of Guam; Report of Special Committee on Federal Problems, Eleventh Guam Legislature; September 1972. Tables by municipality show the amount of compensation that was offered for the land, and the amount awarded for it. The dollar figures are per square meter, so that a comparison of the values can be made. The tables demonstrate that the amounts awarded by the military were totally inconsistent. Statements taken from the first 110 people interviewed by the staff of the Land Claims Investigation Office are reprinted.
Available: Bureau of Planning Library.

List of Real Property Owned by the United State; attached to letter from U.S. Department of Interior, Fish and Wildlife Service, Honolulu; March 15, 1976. Listing of property on Guam owned by the U.S. Government, excluding military holdings.
Available: Bureau of Planning Library.

A Summary of Major Federal Agency Land Holdings in the Territory of Guam; Bureau of Planning; January 1977. A listing of all federally owned or controlled lands on Guam. The listing is in table format which includes the following information: map code, document or drawing from which data was obtained, name of the installation, municipality where located, indication of which agency controls the subject area, size of parcel in square meters and acres, general description of the area's use, and number and remarks indicating method of acquisition.
Available: Bureau of Planning Library.

Guam Land Use Plan: A Plan for Department of Defense Real Estate on Guam; U.S. Department of the Navy, Pacific Division, Naval Facilities Engineering Command; September 1977. A review and comprehensive analysis of all Department of Defense landholding on Guam. This plan is based on projected requirements over the next eight years. Identifies necessary land acquisitions and exchanges, and summarizes recommendations for the release of certain landholding: acquisition of 900 acres in fee simple and 1,285 acres in restrictive easement rights, and release of 5,180 acres. The report includes maps and charts showing existing and planned land-use, necessary land acquisitions and releasable areas. Other studies relating to this plan are listed below.
Available: Bureau of Planning Library.

Acquiring Former Military Bases; Community Guide Manual III, President's Economic Adjustment, Office of the Secretary of Defense; October 1978. A community guide for acquiring military or other federal land or property no longer needed by the federal government. Specific guidelines include acquisition processes based on land-use, availability criteria, and descriptions of specific features of type and kinds of land. Criteria for disposition are presented. These guidelines apply to Guam.
Available: Bureau of Planning Library.

Preliminary Report on the "Guam Land Use Plan: A Plan for Department of Defense Real Estate on Guam"; Guam Coastal Management Program, Bureau of Planning; February 1979. A summary of the Guam Land Use Plan (above). Land release/acquisition summaries are presented in tabular form with preliminary comments and reactions to the Plan.
Available: Bureau of Planning Library.

Implementation Plan for the Guam Land Use Plan; Department of the Navy, Pacific Division, Naval Facilities Engineering Command; December 1979. As part of the joint study to determine landholding required to support Department of the Defense activities in Guam (see above), this plan was written to identify those land transactions which could be implemented at the current time. Section II delineates disposal actions. Section III discusses acquisition projects and reviews data on active acquisition projects. Section IV provides guidelines on necessary documentation required for disposal and acquisition actions, and a schedule for implementation of the plan after approval is received. Appendix A gives information about specific parcels.
Available: Bureau of Planning Library.

Status of the Navy's and Air Force's Implementation of the Guam Land Use Plan; letter report from the U.S. General Accounting Office, June 18, 1980. Discusses the Navy's and Air Force's efforts to implement the recommendations contained in the Guam Land Use Plan, above. Gives the status of releasable Navy land as of March 31, 1980, land which may not be released, land already released, and land to be deleted from releasable status. Similar information is given for the Air Force's efforts to release excess land. The GAO also identifies 1,000 additional acres of land that may be releasable. The status as of March 3, 1980 of lands identified for release is shown in table format: parcel identification number, revised acreage, and explanation of status.
Available: Bureau of Planning Library.

Local Use of Federal Lands; Bureau of Planning; August 1981. Identifies public uses for releasable and non-releasable military lands that the Navy has indicated are surplus. Contains location maps and describes the proposed use and justification for each site. See Guam Land Use Plan (above) for the review of federal land holdings by the Department of the Navy in 1977.
Available: Bureau of Planning Library.

Proposal for Zoning of Releasable Military Lands; Guam Coastal Management Program, Bureau of Planning; 1982. A zoning proposal for releasable federal lands. The first section provides background material for the zoning effort, actual zoning proposals along with general site descriptions, considerations and rationale for each site, and site location maps.
Available: Bureau of Planning Library.

Guam Land Claims Reports of September 23, 1986, Proposed Plan of Distribution; William C. Middlebrook, for Land and Natural Resources Division, U.S. Department of Justice; September 23, 1986. Proposes a "fair and equitable" distribution of the $39.5 million settlement fund among eligible claimants for payment for lands acquired by the federal government after WWII. This report, in 6 volumes, contains a narrative report discussing how the fair and equitable distribution was arrived at. The bulk of the report is a listing of each of the lots affected, including lot number, dollar share for the lot, and lot size in square meters.
Available: Senator Ted Nelson's Office - All 6 Volumes; and Bureau of Planning Library - Narrative Report.

CONSTRUCTION AND DEVELOPMENT PROJECTS (see also Land Development and Environmental Protection: ENV)

Agana Bay Urban Waterfront Redevelopment Plan; Guam Coastal Management Program, Bureau of Planning; 1981. This study examines land-uses in the low shoreline area of Agana Bay from Anigua to Tamuning. It identifies environmental, health, traffic, zoning, and other prevalent problems. Maps of the study area (scale 1"=400') are included. A survey of existing structure use lists and maps each building and shows existing land-use, zoning violations, building code violations, types of structure (wood frame or concrete), whether the structure is standard or substandard, and remarks. A plan for rezoning and relocation of incompatible uses is presented. Methods of funding, decision-making, and legal controls are discussed briefly as preliminary to the implementation of detailed actions.
Available: Bureau of Planning.

Guam - Micronesian Cultural Center and Hotel; Destination Development Corporation; 1983. This report contains a brief description on the Guam-Micronesian Cultural Center and Hotel property in the Agana area. The report provides a market overview and discusses potential economic impacts of the projects.
Available: Bureau of Planning Library.

Ylig Bay Resort Development - Volumes I and II; Destination Development Corporation; 1985. A detailed description and plan for a resort complex in Ylig, Yona. Summarizes plans for the proposed project along with statements and financial information.
Available: Bureau of Planning Library.

Guam Contractors License Board: Facts and Briefs; Guam Contractors License Board; August 1989. Describes the role and responsibility of the Contractors License Board, its powers and duties, and board operations. This manual also provides a consumer guide on residential construction for homeowners and what a contract should contain. Includes Contractors License Board and Guam Contractors Association supplement which summarizes the major achievements and activities involved in 1988, and cites consumer cases and complaints.
Available: Bureau of Planning Library.

Construction News Bulletin; Guam Contractors' Association; bimonthly. Lists construction projects and schedule of service and supply solicitations. Also includes bid invitations, construction project bid awards, and requests for proposals.
Available: Bureau of Planning Library.

LAND OWNERSHIP AND REGISTRATION

Manual of Instructions for the Survey of Lands and Preparation of Plans in the Territory of Guam; Charles A. Brister; 1966. History, laws and procedures related to surveying.
Available: Bureau of Planning Library.

A Study and Review of Laws Pertaining to Alien Investment on Guam, Volume I; Stanford Research Institute; September 1974. As part of their study of alien investment, these consultants analyzed land ownership patterns by the nationality of the owners. Since the information they required was not available, they developed their own data base by studying records at Land Management.
Available: Bureau of Planning Library.

A Study and Review of Laws Pertaining to Alien Investment on Guam, Volume II, Legal Analysis; Stanford Research Institute; September 1974. Includes a discussion of current laws concerning alien ownership of land on Guam, and presents legislative options for restricting alien interest in real property.
Available: Bureau of Planning Library.

Land Title and Survey; Paul Souder; after 1973. This article discusses the history and problems relating to land surveying on Guam.
Available: Bureau of Planning Library.

Customary Law Relating to the Environment; Mere Pulea and Associates, South Pacific Commission Topic Review No. 21; 1985. Overviews the role and scope of customary and traditional law and practices relevant to the environment, particularly in light of social, economic, and environmental change in the region. Guam customary law is included here, relative to historic customs and recent changes.
Available: Micronesian Area Research Center Pacific Collection.

Land Tenure and Conservation: Protected Areas in the South Pacific; Peter Eaton, South Pacific Commission - SPREP; 1985. Reviews the influence of land and marine tenure on the development of conservation areas in the South Pacific region. Distribution of protected areas are described for the region as a whole. The role of public land, parks and recreation reserves, and land-use and development controls are all discussed as they relate to this process.
Available: Micronesian Area Research Center Pacific Collection.

Land Tenure in the Pacific; University of the South Pacific; 1987, 3rd edition. A compilation of research papers on land tenure systems and change in all of the Pacific islands. Includes an article by Paul B. Souder entitled "Guam - Land Tenure in a Fortress".
Available: Micronesian Area Research Center Pacific Collection.

DEPARTMENT OF LAND MANAGEMENT RECORDS DIVISION

Files of Land Ownership; Land ownership records are kept at the Department of Land Management. When a document such as a deed of gift, warranty deed, or quit claim deed is brought into Land Management, a Document Number is issued, a notation is put in the Numerical Index by municipality and alphabetical index by grantee/grantor (see below), and the document is filed by the Document Number. Similarly, if a mortgage is presented, a Mortgage Number is issued, a notation put into the Numerical Index, and the mortgage is filed in the miscellaneous file. If Department of Land Management finds that the title to a piece of property is valid, a Certificate of Title, with a number, is issued by Land Management. A copy of the title is filed and a notation as to the owner is put in the Numerical Index.

Numerical Index; The Torren Act of Guam requires that all transactions affecting a parcel of land, except lands numbered by Tract (see Tracts book, below), must be shown in the Numerical Index. This Index is an ongoing record of ownership of each parcel of land. Whenever Department of Land Management is informed that the ownership of a parcel of land has changed, a new line of information is added showing the first entry of Possessory Title, any liens, encumbrances, or other transactions filed against the property, as well as the grantor, grantee, lot number, estate number, size of parcel, and book page. This system is computerized at Data Processing Division, Department of Administration, and is up-to-date since July 1980. Four computer listings are updated on a daily basis: consecutive documents number listing, municipality listing, grantor listing, and grantee listing. Prior to July 1980, the Index is organized in books by municipality, urban/suburban, block number, and lot number.

Tract Books; Track Books contain land ownership records for most of the land of Guam that is numbered by tract. The information is organized by tract number, block number (if any), and lot number. The information recorded in the tract book is the same as the Numerical Index. Some small tracts are kept in the Numerical Index.

Microfilm File; All land documents are being microfilmed from 1898 to the present. These are filed numerically by document number. Viewers are provided for public research. Use of a copier is available.

DEPARTMENT OF REVENUE AND TAXATION

Commercial Property Record and Appraisal Card; Farm and Residential Property Appraisal Card; Department of Revenue and Taxation. Files of appraisal forms are kept at Revenue and Taxation, based on a survey done every three years. The forms are filed by lot number, within municipality, and split into urban and suburban. Each form contains the computer-generated master directory reference number (see below).

Assessment Valuation Manual - 1987 Triennial Assessment; Department of Revenue and Taxation; 1987. Contains construction cost factors and other relevant data used in the 1987 revaluation of all taxable properties within the Territory of Guam.

Statistical and Revenue Analysis Report; Department of Revenue and Taxation; 1989. Contains detailed analysis of the Tax Roll such as total appraised land/building parcels and corresponding values and total land/building tax assessments. The implementation of the Real Property Tax computer system in 1989 enables the Division to generate reports including property master list by taxpayer name, taxpayer ID number, taxpayer account number, and parcel number; delinquent roll, letter, tax deed, delinquent roll by taxpayer name, by municipality; tax assessment roll, tax assessment roll home exemption by taxpayer name; tax statements by zip code and bank code.

1991 Reappraisal Plan; Department of Revenue and Taxation; 1990. The 1991 Reappraisal Plan is in compliance with Section 24306, chapter 24, Title 11, GCA. The plan includes the objective, scope, funding resources and time period necessary to complete the revaluation of all taxable properties within the Territory of Guam.

MAPPING

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MAP SELECTION FOR GUAM PLANNERS

Maps provide planners with an effective means of graphically displaying data for study and analysis through all stages of planning. In considering what maps to use for a planning program or selecting a single map for a short report, factors such as scale, content, accuracy, date of map and map sheet size are important. These factors, as they apply on Guam, are outlined here for the guidance of all who are involved in, or interested in, planning for Guam.

Map Scale

The map scale is one of its most important characteristics and affects nearly all other factors. Map scale is the relationship between a unit of distance on the map and the correspondence distance on the ground. This relationship is expressed as a representative fraction. For example:

$$\frac{1}{24{,}000} \quad \text{or} \quad 1{:}24{,}000 \quad \text{or} \quad 1/24{,}000$$

indicates that any linear unit of measurement on the map represents 24,000 such linear units on the ground. For example, one inch on the map represents 24,000 inches on the ground. In countries on the foot system, map scales are expressed by giving the foot ground equivalent of an inch unit distance on the map, such as 1 inch = 2,000 feet. The use of this system to derive map scales imposes restrictions and problems, as conversion to the metric system progresses. In Table I most scales of past, present and proposed mapping on Guam are given, including the ridiculous inch to meter ratio which is regrettably still in use.

Map Series and Sheets

Examination of Table I reveals the important direct relationship between scale and map sheet size. It is usually beneficial to a planner to have a very large scale so that more detail can be seen. When the entire island of Guam must be considered, the largest practical scale for convenient use in an office is about 1:25,000 (or 1:24,000). The largest scale maps (with the exception of architectural plot plans) are normally 1:500 (or 1:480) which could provide abundant detail but would require an area the size of a football field for the total island of Guam. Therefore, the larger scale maps are divided into a series of rectangular map sheets, each sheet covering a limited area. The characteristics of the various map series in use on Guam are shown in Table II. Sheet lines of the various series are shown on the map index sheets which follow.

Exceptions to a series of rectangular map sheets occasionally occur. Such maps, although drafted on a rectangular sheet of paper, show an area defined by lines such as political boundaries or other limits of particular concern. Coverage may be complete for all such areas on the island at one scale, or only portions of the island are shown, or different scales for different areas may be used. Examples are maps of municipalities and zoning maps as shown on the index maps.

Map Content

The content of maps may vary considerably, and full detail is beyond the scope of this introduction. Most mapping on Guam has been basic planimetric (showing structures, streets, etc.), topographic (showing land elevation), or cadastral (showing property lines), with other information superimposed by overprinting or overlaying. The use of an orthophoto (photo from the air corrected to proper scale) for a base map is being implemented by the Uniform Mapping System for Guam. Content of the base map is critical to the information to be added and can either enhance or detract from the effectiveness of the final map product. Content is also affected by the map scale as to how much detail can be actually shown and the accuracy of that data which is portrayed.

Map Accuracy

Accuracy in mapping is a very elusive factor. Topographic mapping accuracy is generally referenced to National Map Accuracy Standards which are fairly reliable standards at scales of 1:10,000 and smaller. At larger scales and on features other than plainly visible topography, a set standard does not apply to every case. The best approach to accuracy where critical values are concerned is to consider all map data with suspicion until the product can be examined, spot checked if necessary, and evaluated for the purpose for which the map is to be used.

Map Date

The date a map was compiled and any revision dates should be carefully noted. This should also include the date of the source material from which the map was compiled. As an example, a 1968 edition of a topographic map compiled from aerial photography taken in early 1967 is only as up-to-date as the time of the photography unless extensive field editing is completed just prior to publication.

Map Sheet Size

Common sheet sizes are 11" x 17", 18" x 24", 24" x 36", and 28" x 40" with the 24" x 36" size being the most common and convenient for general office use. The factor of map sheet size not only affects the convenience of the map user in handling the map but also is critical when reproduction techniques must be considered. The reproduction processes available on Guam are (1) Ozalid blueprints, (2) photography, (3) offset press, and (4) xerox. Each of these has advantages and disadvantages and provides different degrees of accuracy in reproduction and difference in economy, often depending on the quantity of maps to be reproduced.

Map Reproduction by Ozalid

For black and white maps, the most common method of reproduction is Ozalid blue line or black line copies. A transparent original is required, usually on clear tracing paper or a stable base polyester film such as "mylar". Intermediate reproducible on either mylar or sepia paper are possible at the same scale. Most prints produced are a dark blue line on white background, but a "black line" paper, printing a dark black on white, is also available. Maximum sheet sizes normally available are 30 x 42 inches while roll stock paper is available in widths up to 42 inches. Lengths up to about 8 feet can be processed through the printer with the maximum width of 42 inches. Due to unavoidable slippage between original and print, and due to distorted exposure of light rays on the circular drum of Ozalid printing equipment, strict scale accuracy of the print is not possible.

Map Reproduction by Photography

Photography is used in mapping primarily to provide accurate intermediate products in map compilation and can also be used to accurately reduce or enlarge most map products. Maximum film size of 40 x 40 inches square is available on Guam with 500% enlargement and 25% reduction possible. The cost of photography is higher for all products, but for reproduction requirements such as change of scale and rigid scale accuracy, it is necessary.

Map Reproduction by Offset Press

Offset press should be considered when more than 50 or 100 copies are needed. Maximum press size available on Guam is 22 x 34 inches, while most smaller presses are limited to 11 x 17 inches or 17 x 22 inches. Multi-color printing is possible when accurately registered color-separation originals are provided.

Map Reproduction by Xerox

Xerox reproduction has limited value except in small reports. Size is normally restricted to letter size (8 1/2 x 11 inches) or legal size (8 1/2 x 14 inches). Reduction of 14" x 18" originals to letter size is possible, but the scale is distorted by the odd reduction of the xerox camera.

Table I.

In this table, the most common scales are shown. Column one (1) is the representative fraction of map unit distance to corresponding ground unit distance. Column two (2) provides the relationship of one centimeter on the map to the equivalent ground distance in kilometers or meters. Column three (3) gives the relationship of one inch on the map to the equivalent ground distance in miles (approximate) or feet. Column four (4) indicates the size of a map which is needed to cover the entire island of Guam at the scale indicated. The left dimension is in centimeters or meters, while the right dimension is in inches or feet. The scales between 1:1,000,000 and 1:50,000 are possible on one map sheet, while the larger scales must be assembled by matching together several sheets.

Table II.

This tables tabulates the most common maps according to scale, sheet size, number of sheets required in the series for full island coverage and the agency responsible for the mapping.

TABLE I

Map Scale Representative (Fractions)	Equivalent Map to Ground Distance	Equivalent Map to Ground Distance	Map Size for Total Island of Guam (Meters)	(Feet)
1:1,000,000	1cm = 10K	1" = 16mi.	4cm x 5cm	1.6" x 2"
1:500,000	1cm = 5K	1" = 8mi.	8cm x 10cm	3.2" x 4"
1:250,000	1cm = 2.5K	1" = 4mi.	16cm x 20cm	6.5" x 8"
1:150,000	1cm = 1.5K	1" = 2.4mi	28cm x 34cm	11" x 13"
1:125,000	1cm = 1.25K	1" = 2mi.	32cm x 40cm	13" x 16"
1:75,000	1cm = 750M	1" = 1.2mi.	56cm x 67cm	22" x 26"
1:63,360		1" = 1.0mi.*		26" x 32"
1:62,500	1cm = 625M		64cm x 80cm	
1:50,000**	1cm = 500M	1" = 0.8mi.	80cm x 100cm	32" x 40"
1:25,000**	1cm = 250M	1" = 0.4mi.	1.6M x 2.0M	64" x 80"
1:24,000		1" = 2000*		5'6" x 7'
1:15,000	1cm = 150M		2.6M x 3.3M	
1:12,500**	1cm = 125M		3.2M x 4M	
1:12,000		1" = 1000'*		11' x 14'
1:10,000	1cm = 100M		4M x 5M	
1:5,000**	1cm = 50M		8M x 10M	
1:4,800		1" = 400'*		28' x 35'
1:3,937		1" = 100M		33' x 41'
1:2,500**	1cm = 25M		16M x 20M	
1:2,400		1" = 200'*		56' x 70'
1:2,000	1cm = 20M		20M x 25M	
1:1,250**	1cm = 12.5M		32M x 40M	
1:1,200		1" = 100'*		112' x 140'
1:1,000	1cm = 10M		40M x 50M	
1:787.4		1" = 20M		165' x 205'
1:600		1" = 50'		224' x 280'
1:500**	1cm = 5M		80M x 100M	
1:480		1" = 40'		275' x 340'

Notes:

* Indicates base twelve foot system scales most commonly used. The three small scales (1:63,360 - 1:24,000 - 1:12,000) are superseded by metric scales (1:50,000 - 1:25,000 - 1:12,500). The three large scales (1" = 400′ - 1" = 200′ - 1" = 100′) will be phased out as they are replaced by metric scales (1:5,000 - 1:2,500 - 1:1,250).

** Indicates base ten metric scales of the Uniform Mapping System. Reduction of maps at this scale to a smaller metric scale may sometimes be necessary for matching publication format sizes in planning reports.

TABLE II

NAME	SCALE	SHEET SIZE	NUMBER OF SHEETS	REMARKS
Land Use Districting Map	1:75,000	24" x 36"	1	Bureau of Planning
Outline Map	1:75,000	24" x 36"	1	Bureau of Planning
Base Maps	1:25,000	28" x 36"	4	Bureau of Planning
Quadrangle Maps	1:24,000	22" x 28"	9	Bureau of Planning (U.S. Geological Survey)
Official Street Atlas	1:12,500	15" x 18"	70	Bureau of Planning
Community Design Map	1:12,500	28" x 30"	13	Bureau of Planning
1000' Geological Survey Maps	1:12,000	36" x 36"	11	Land Management (U.S. Geological Survey)
400' Gelolgical Survey Maps	1:4,800	32" x 32"	77	Land Management (U.S. Geological Survey)
General Planning Map Series	1:4,800	28" x 40"	70	Bureau of Planning
AICUZ (Noise Level Contour)	1:4,800	42" x 30"	4	Bureau of Planning
Infrastructure Maps	1:4,800	36" x 42"	68	Bureau of Planning
Official Zoning Maps	1:4,800	36" x 42"	18	Land Managment
AICUZ (NAS Portion)	1:4,800	32" x 80"	1	Bureau of Planning
AICUZ (NAS Portion)	1:4,800	32" x 80"	1	Bureau of Planning
Land Square System Maps	1:3,937	28" x 40"	135	Revenue & Taxation
200' Street Address	1:2,400	20" x 20"	323	Public Works
AICUZ (Overall)	1:2,400	42" x 30"	1	Bureau of Planning

INDICES OF GUAM MAPS

Each series of maps that are compiled usually includes an index in some form. The index serves to locate the particular map sheet or sheets which provides coverage of the specific area of interest. Included on the following pages are the indexes to the base maps which are available for Guam. The limits of each maps sheet of the series are shown on an outline of the island with the name or number of the individual sheets. Further details of the map series and a general description of the contents of each series is provided in the following paragraphs.

Quadrangle Maps: Prepared by the U.S. Geological Survey on dates indicated. These are standard topographic maps of Guam at a scale of 1:50,000 and 1:24,000 (1"=2000'). The 1:50,000 scale map is a single sheet approximately 34" by 40" produced in Color. Coverage is the entire island and extends across 27 minutes of longitude and 22 minutes of latitude. The 1968 edition is no longer being printed and is not available. A new edition with planimetric data revised from 1975 aerial photography was published in 1978. Contour interval is 40 feet, and grid ticks for both the Guam Geodetic Coordinate System and the Universal Transverse Mercator as well as latitude and longitude are shown.

The 1:24,000 (1"=2000') scale maps are standard 7.5 minute quadrangle maps, but due to Guam's location near the equator, each sheet extends only 6 minutes in longitude so that sheet size of 22" x 28" is the same as in higher latitudes. The first edition was published in 1968 from aerial photos taken in 1967 and consists of a total of nine (9) sheets. These maps were revised in 1978 based on aerial photography taken in 1975 and are available in standard full-color sheets from map distribution centers of the U.S. Geological Survey. A set of mylar reproducible of the 1978 maps are on file at the Bureau of Planning, and arrangements for reproduction can be made. Contour interval is 20 feet, and grid ticks for both the Guam Geodetic Coordinate System and the Universal Transverse Mercator as well as latitude and longitude are shown. See Map 13.

1000' Geological Survey Maps: Prepared by the U.S. Geological Survey from the 1968 quadrangle maps. This series of maps, consisting of 11 sheets, was prepared from the compilation sheets of the standard topographic maps at a scale of 1:12,000 (1"=1000'). These maps consist of the planimetric detail with name data and contours combined on one mylar sheet. These are clearly marked "advance sheets subject to correction," and the final edit on these sheets was never completed. The format of the sheets follows the lines of the Guam Land Square System, each sheet extending 10,000 meters by 10,000 meters on the Guam Geodetic Coordinate System on a sheet size of 36" x 36". Originals are on file at the Department of Land Management. Contour interval is 20 feet, and full 1,000 meter Guam Geodetic Coordinate System grid lines are shown. See Map 14.

400' Geological Survey Maps: Prepared by the U.S. Geological Survey in 1968. These maps are a direct photographic enlargement of the 1:12,000 (1"=1000') maps to a scale of 1:4,800 (1"=400'). The original 1:12,000 sheets were divided into 9 equal parts, each new sheet extends 3,333 meters by 3,333 meters and covers a sheet size of about 32" x 32". Since this was a simple direct enlargement far beyond the reasonable limits of the original control and photography on which this map series was originally prepared, the accuracy of the maps at scale 1:4,800 does not meet national map accuracy standards. These map are on file at the Department of Land Management. See Map 15.

Land Square System Maps: Prepared by contract for the Government of Guam in 1953. These maps are a series of Tax Assessors Maps compiled from the land records of the Department of Land Management. The maps were drawn at a scale of 1:3,937 (1 inch equals 100 meters) and each sheet covers one of the Land Square Sections of 2,500 x 2,500 meters on a sheet size of 28" x 40". All properties are shown with parcel or lot number and the value per hectare for tax purposes. Sepias of the original maps are on file at the Department of Revenue and Taxation. See Map 16.

Official Zoning Maps: Prepared for the Department of Land Management in 1965. These maps, at a scale of 1:4,800 (1"=400'), are compiled on a topographic base derived from military maps of World War II and not reliable for accurate contours. Overlayed on the topography were the property lines of known lots and parcels and a 2,000 foot grid conversion of the basic metric Guam Geodetic Coordinate System. The series consists of eighteen (18) sheets which further development was expected. This is primarily the central part of the island and villages of the north and south areas only. Sepias of the original maps on 36" x 42" sheet size are on file at the Department of Land Management. Zoning information is maintained on the maps and periodic revisions are made as zoning amendments occur. Presently, the Department of Land Management is developing a new series of zoning maps at a scale of 1"=400' with updated property data. These maps are filed at the Department of Land Management. See Map 17.

Base Map: Prepared by the Bureau of Planning in 1975. This map was prepared as the initial step in the Uniform Mapping System and the currently available product is intended as an interim effort until a better base map is available. The eleven sheets of the 1:12,000 Geological Survey maps were reduced photographically to 1: 25,000 scale. The negatives were then cut and combined into a four sheet format each 28" x 36" and coverage of 19,000 by 16,000 meters per sheet. A positive of each sheet was then made and the Uniform Grid System 1,000 meter lines were enhanced for clarity and the grid column and row identifiers added. From aerial photography taken in the spring of 1975 at approximately the same scale, all new roads were traced to provide an update to the road system that had occurred since 1968. The map also shows the 3000 by 4000 meter limits of the larger scale Uniform Map System maps with column and row identifiers. Originals are on file at the Bureau of Planning, and arrangements for reproduction can be made. See Map 18.

Official Street Atlas: Prepared by the Bureau of Planning in 1975-1976. This Atlas consists of 70 map sheets and shows the location and all known names of roads and streets on Guam. It is an ink map on mylar at the scale of 1:12,500 with sheet size of 15" x 18". There is also a sheet on "Explanation of Map Symbols" and a sheet on "Explanation of Location System" and the cover sheet as shown in the map indexes. The Atlas also includes symbols to locate government buildings, schools, churches, etc., plus military boundaries and the boundaries of the municipal election districts. Presently, the Atlas is being revised to reflect any changes or additions to the Island's street patterns and street names. This function is being done as part of the Street Address Project. The original mylars are on file at the Department of Public Works, and arrangements for reproduction can be made. See Map 19.

General Planning Map Series: Prepared by a private contractor for the Government of Guam in 1976. This map series consists of 70 sheets plus an index sheet on mylar at the size of 28" x 40". The maps are at the scale of 1:4,800 (1"=400'), and each sheet covers an area of 3000 by 4000 meters. The maps were prepared by photogrametric processes from aerial photography taken during February through June 1975 and available in three styles: (1) Orthophoto image only with Uniform Grid System lines in meters, (2) 10 foot contour maps only with metric grid lines and foot grid ticks, and (3) combination orthophoto image and 10' contour. The maps are photo image and/or contours only, and no other symbols or lettering is included. The maps were prepared to National Map Accuracy Standards with normal caution of the orthophoto process which recognizes that objects not at ground level may be displaced from true position. Originals of these maps are on file at the Bureau of Planning and the Department of Public Works, and arrangements for reproduction may normally be made. See Map 20.

Reduced Planning Map Series: Prepared by private contract for the Government of Guam in 1976. This is a 38.4% reduction of the 1:4,800 General Planning Map series to scale of 1:12,500. The orthophoto only and orthophoto-contour combination are each available in either negative or positive form on a sheet size of 13" x 17". Inquiry should be made at the Bureau of Planning. See Map 20.

Outline Map (1:75,000) 24" x 36": Prepared by a private contractor for the Government of Guam in 1976. This map was prepared using the 1975 aerial photos as the data source. The map was designed primarily as a base map on which to collect general planning data and provide a graphical display. As an "outline map," only primary and secondary highways, place names, and municipal and military boundaries are shown. Grid lines of the Uniform Grid System are also incorporated on the map. This map is on file at the Bureau of Planning, and arrangements for reproduction can be made.

Areas of Particular Concern (APC) Maps: Prepared by the Bureau of Planning to reflect specific geographic areas where either natural resource values, geologic and manmade constraints or hazards play an important role in determining the capability or suitability of land for particular uses. The series of maps was prepared using data provided by various Government of Guam and Federal Government agencies which are incorporated into reproducible mylar prints of the 1:75,000 outline map or the 1: 25,000 base maps of Guam. Contents of these maps include areas of natural resource value such as aquifer recharge, soils, wetlands, limestone forests, etc.; Geologic and manmade constraints or hazards such as seismic fault zones, sound level zones, slide and erosion zones, Flood Hazard zones, etc. These maps are on file at the Bureau of Planning, and arrangements for reproduction can be made.

Community Design and Land Use Districting Maps: Prepared by the Bureau of Planning and produced in color by a private contractor in 1977. The Community Design series consists of 13 sheets at a size of 28" x 30" and are at the scale of 1:12,500 in meters. The Land Use Districting map is a single sheet of 24" x 36", and is at a scale of 1:75,000 in meters. These maps were prepared using the 1975 aerial photos as a background base, superimposing it with the color coded uses, place, names, river, municipal and highway designations. Contents of the maps reflect existing land use projections to the Year 2000 and proposed used for areas impacted by natural or manmade constraints. The Land Use Districting Maps are presently being considered by the Legislature for adoption and to date are not official. These maps are on file at the Bureau of Planning, and arrangements for acquisition can be made while the supply lasts.

200' Street Address Maps: Prepared by a private contractor for the Government of Guam in 1980. This map series consists of 323 reproducible mylar sheets at the size of 20" x 20" each covering an area of 1,000 x 1,000 meters at the scale of 1"=200'. These maps were prepared using the 1975 aerial photos as the data source. Contents of the maps include structures and roadways of developed areas on the island, including all military housing areas. Prints of these maps are on file at the Department of Public Works where reproduction of the original mylars can be obtained. These maps are regularly updated as development continues to facilitate the official street address and street name maps.

Air Installation Compatible Use Zone Maps (AICUZ): Prepared by the Navy Naval Facilities Engineering Command. Copies of which were provided to the Bureau of Planning in 1988 to be used as reference for planning purposes. A total of seven (7) sheets consist of the following maps:

1) Overall AICUZ map was drawn at a scale of 1:2,400 (1"=200') on a 42" x 30" sheet.

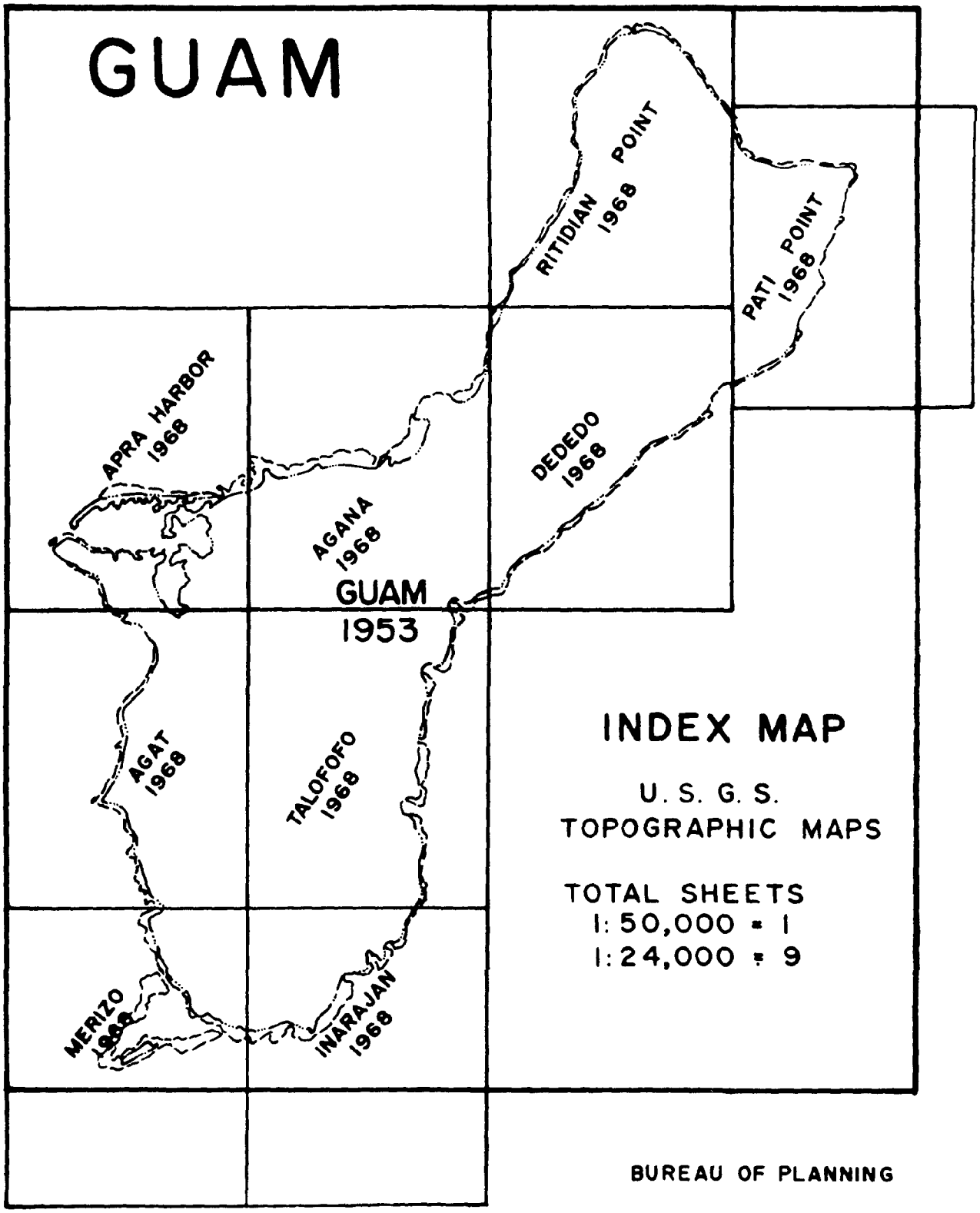
4) The Noise Level Contour maps for the US Naval Air Station Portion of Agana shows the portions of Harmon and Dededo, Agana, Asan, and Yigo drawn at a scale of 1:4,800 (1"=400') on a 42" x 30" sheet.

1) The AICUZ - US Naval Air Station - Portion of Tamuning, Agana, Sinajana, Harmon drawn at a scale of 1:4,800 (1"=400') on a 32" x 80" sheet.

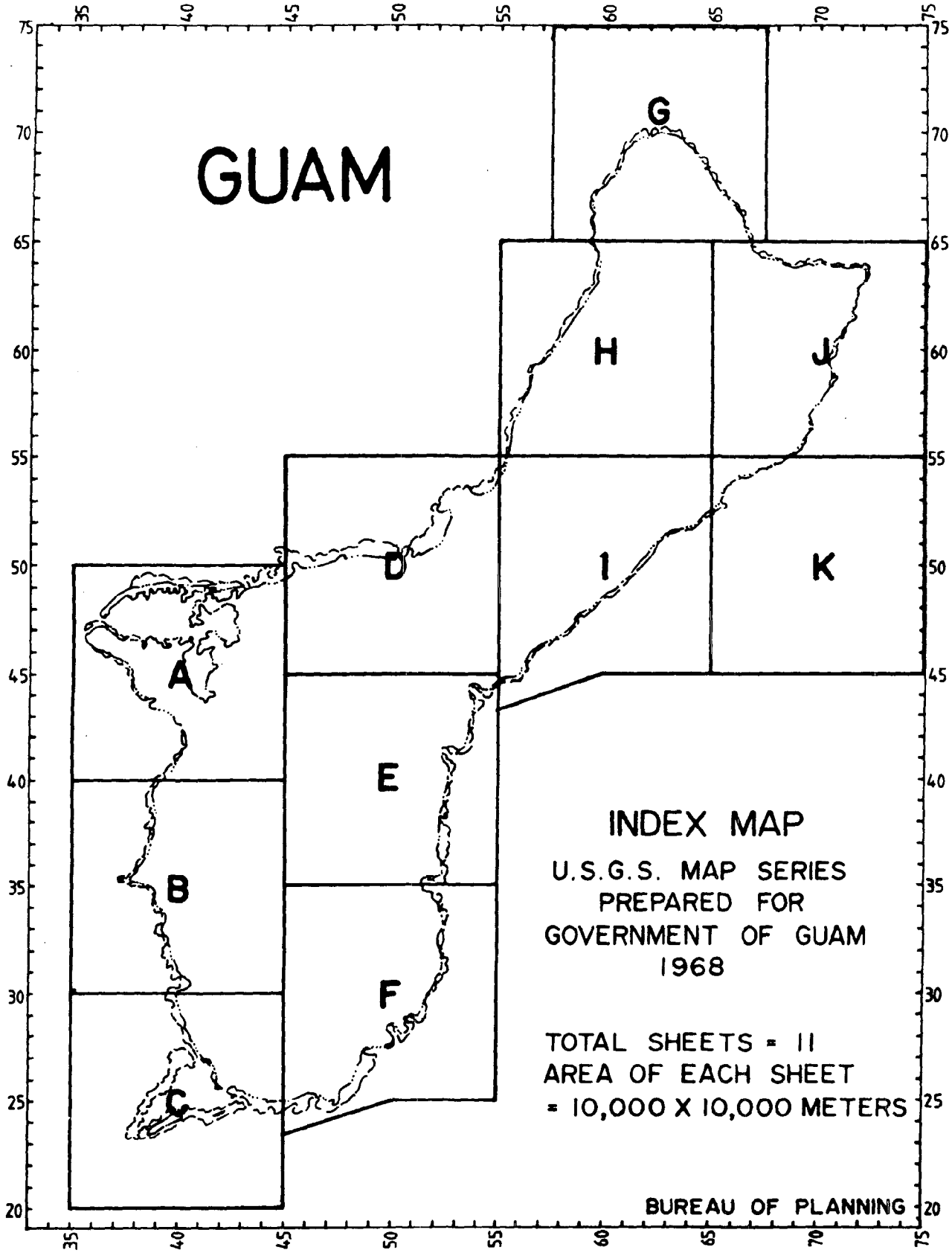
1) The AICUZ - US Naval Air Station - Portion of Barrigada, Dededo, Tamuning drawn at a scale of 1:4,800 (1"=400') on a 32" x 80" sheet.

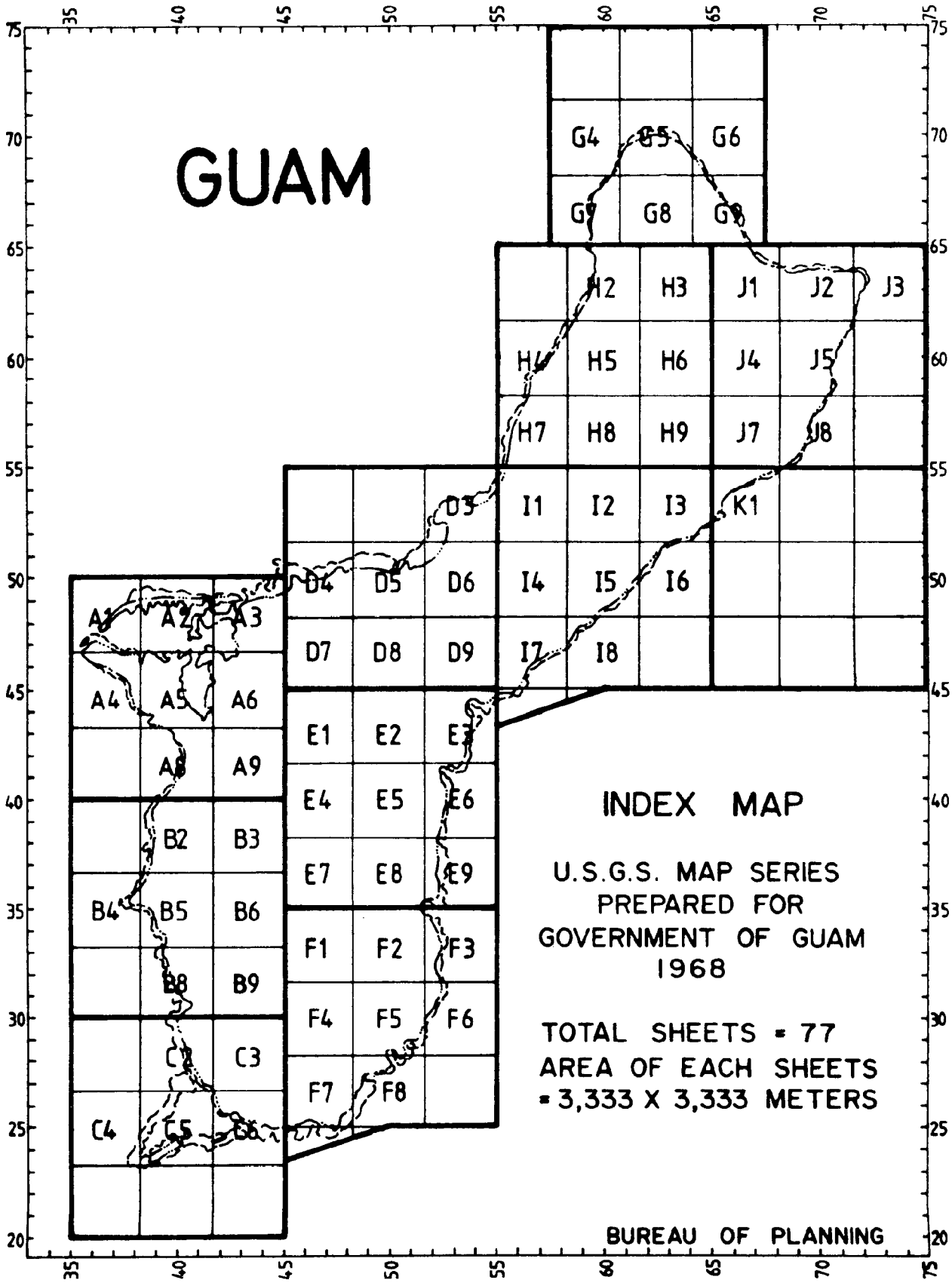
The AICUZ and the Noise Level Contours were overlayed on zoning maps showing the property lines of known lots and parcels. The AICUZ shows the Accident Potential Zones (APZ), there is a Clear Zone, an Accident Potential Zone I and Accident Potential Zone II. The Noise Zones are land areas that are affected by aircraft operations. For further information regarding AICUZ please contact The Commander, Naval Air Station, Agana, Guam.

Infrastructure Maps: Mylar overlays of existing water, sewer, power, and road facilities on zoning maps were prepared by Bureau of Planning in 1986 based on Existing Islandwide Water and Sewer Facilities Systems Maps from the Public Utility Agency of Guam, Guam Power Authority, and the Department of Public Works. Overlays were drawn at a scale of 1:4,800 (1"=400'). Originals are on file at the Bureau of Planning, and arrangements for reproduction can be made.

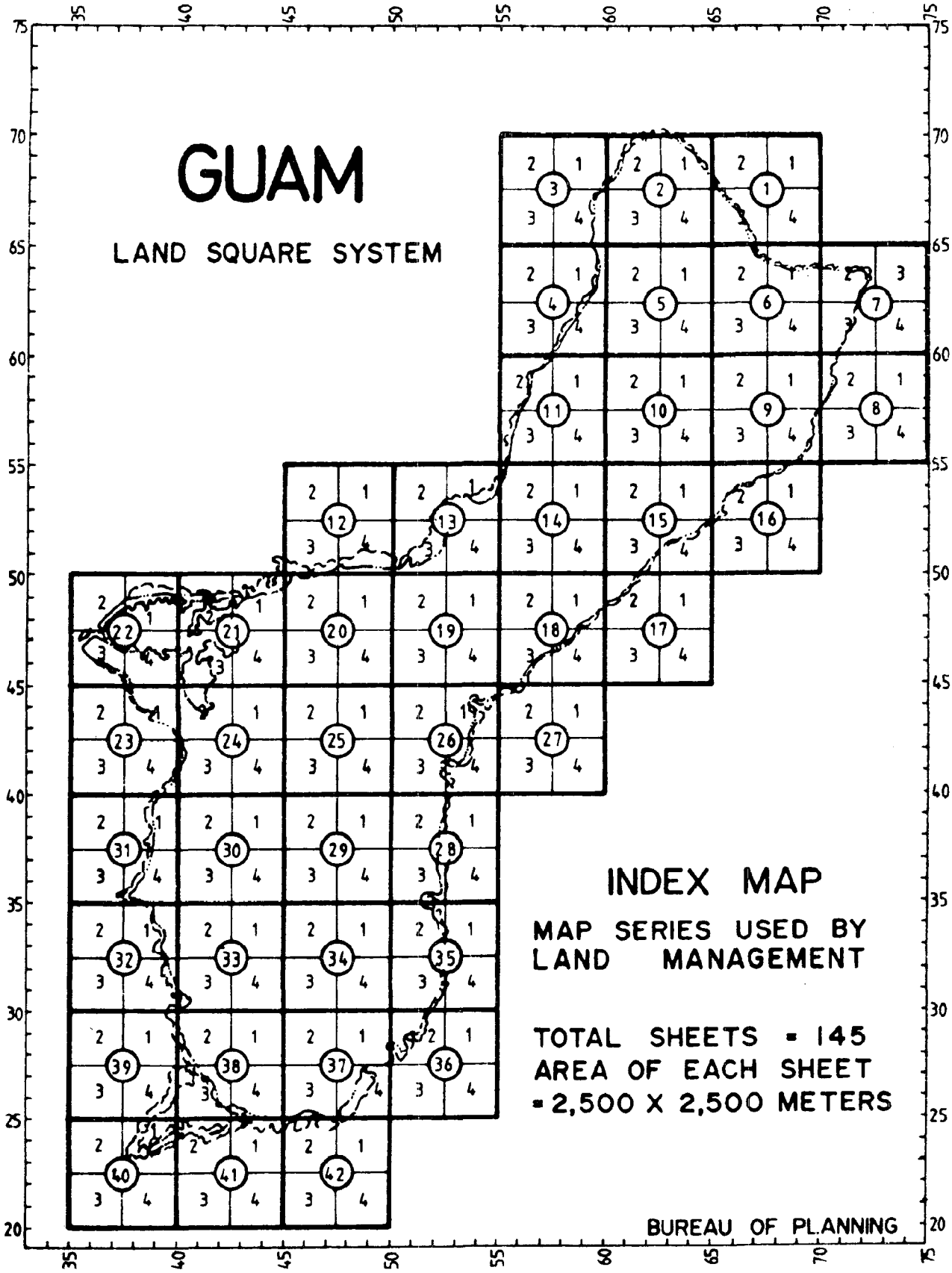

GUAM
RITIDIAN POINT 1968
PATI POINT 1968
APRA HARBOR 1968
DEDEDO 1968
AGANA 1968
GUAM 1953
AGAT 1968
TALOFOFO 1968
MERIZO 1968
INARAJAN 1968
INDEX MAP
U. S. G. S.
TOPOGRAPHIC MAPS
TOTAL SHEETS
1:50,000 = 1
1:24,000 = 9
BUREAU OF PLANNING

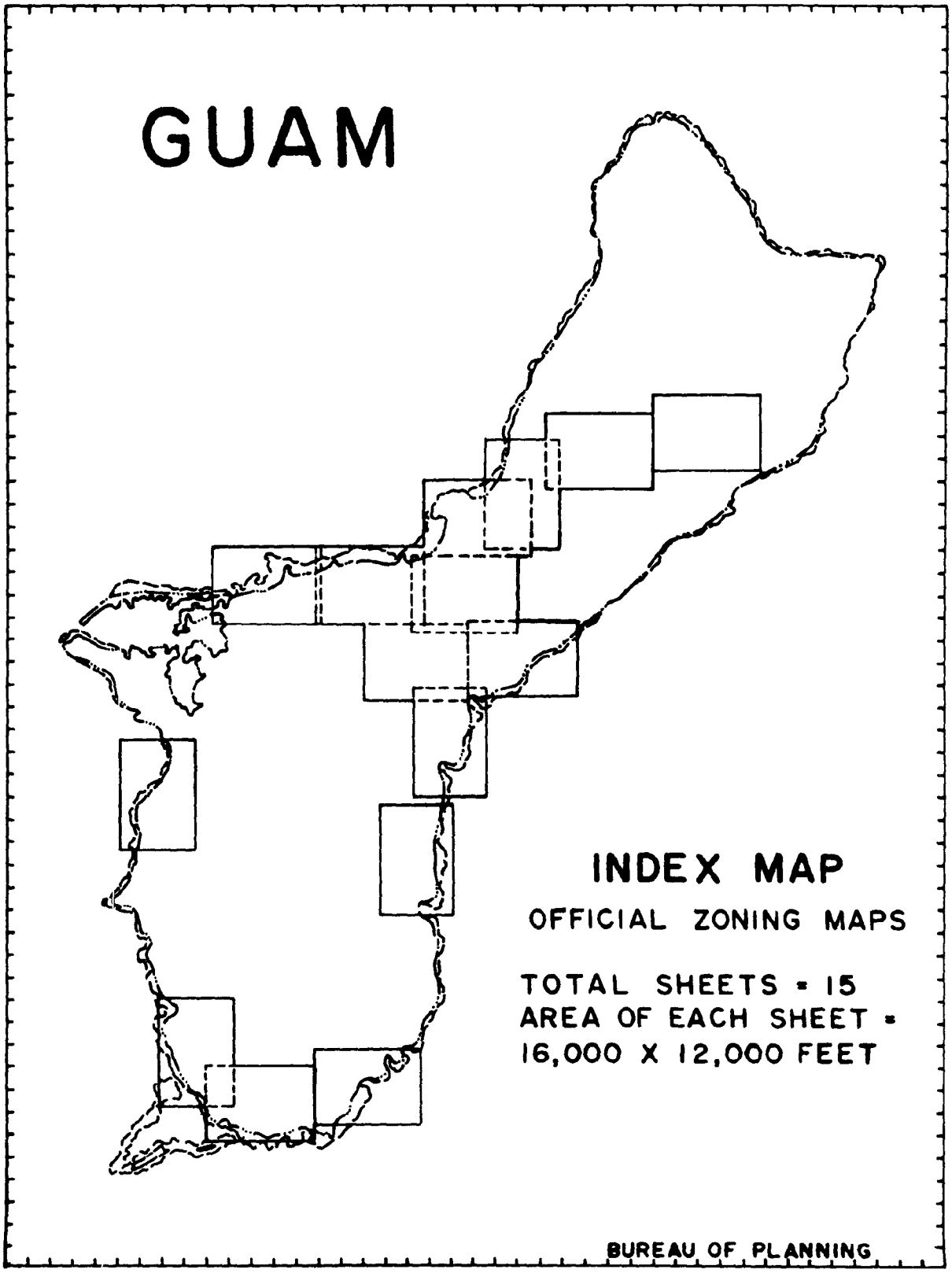
MAP 14


GUAM
A
B
C
D
E
F
G
H
I
J
K
INDEX MAP
U.S.G.S. MAP SERIES
PREPARED FOR
GOVERNMENT OF GUAM
1968
TOTAL SHEETS = 11
AREA OF EACH SHEET
= 10,000 X 10,000 METERS
BUREAU OF PLANNING

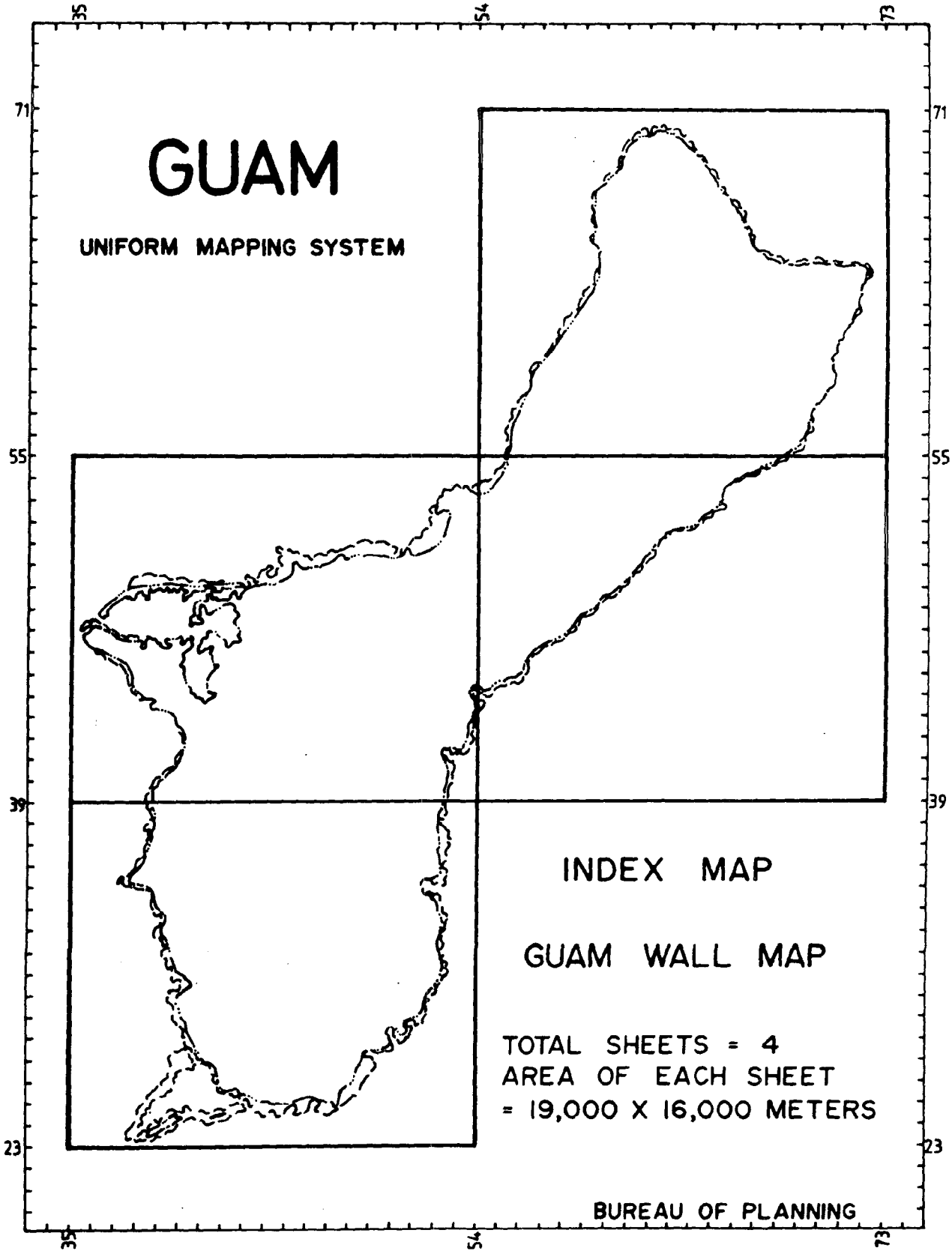

GUAM
INDEX MAP
U.S.G.S. MAP SERIES
PREPARED FOR
GOVERNMENT OF GUAM
1968
TOTAL SHEETS = 77
AREA OF EACH SHEETS
= 3,333 X 3,333 METERS
BUREAU OF PLANNING
G4 G5 G6
G7 G8 G9
H2 H3 J1 J2 J3
H4 H5 H6 J4 J5
H7 H8 H9 J7 J8
D3 I1 I2 I3 K1
D4 D5 D6 I4 I5 I6
D7 D8 D9 I7 I8
A1 A2 A3
A4 A5 A6
A8 A9
E1 E2 E3
E4 E5 E6
E7 E8 E9
B2 B3
B4 B5 B6
B8 B9
F1 F2 F3
F4 F5 F6
C3
F7 F8
C4 C5 C6

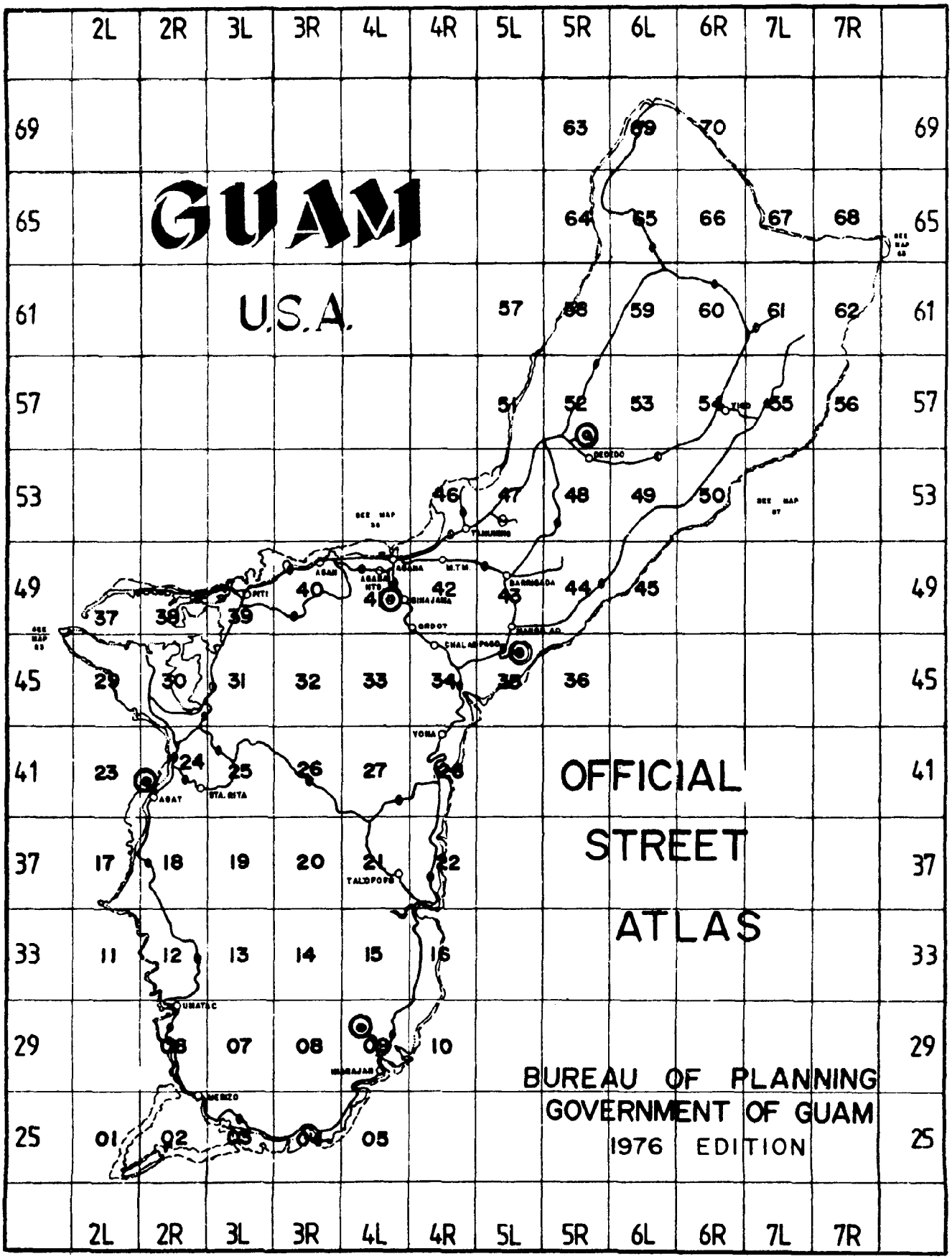
MAP 16


GUAM
LAND SQUARE SYSTEM
INDEX MAP
MAP SERIES USED BY
LAND MANAGEMENT
TOTAL SHEETS = 145
AREA OF EACH SHEET
= 2,500 X 2,500 METERS
BUREAU OF PLANNING

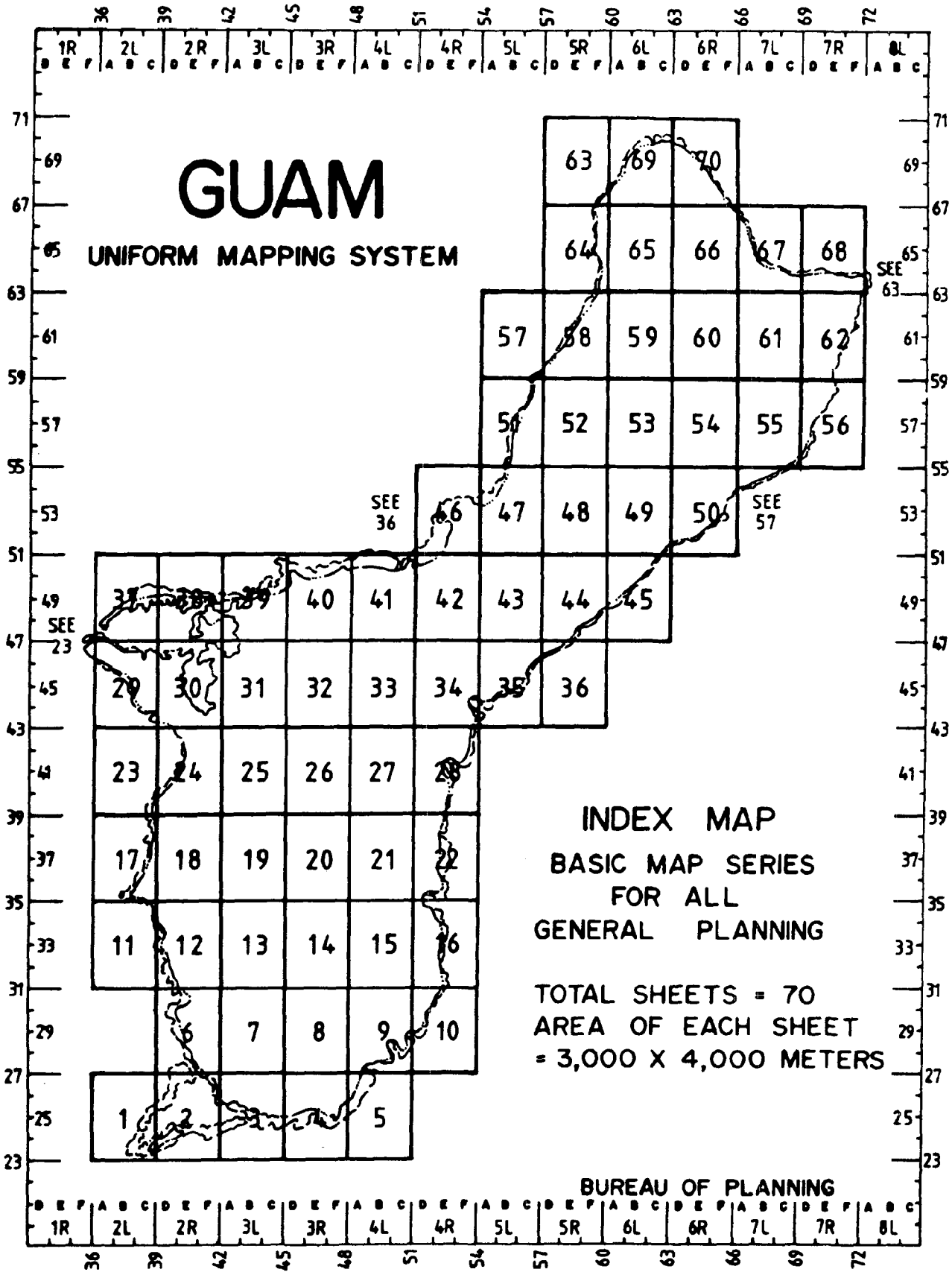

GUAM
INDEX MAP
OFFICIAL ZONING MAPS
TOTAL SHEETS = 15
AREA OF EACH SHEET =
16,000 X 12,000 FEET
BUREAU OF PLANNING

MAP 18


35
54
73
71
55
39
23
GUAM
UNIFORM MAPPING SYSTEM
INDEX MAP
GUAM WALL MAP
TOTAL SHEETS = 4
AREA OF EACH SHEET
= 19,000 X 16,000 METERS
BUREAU OF PLANNING


GUAM
U.S.A.
OFFICIAL
STREET
ATLAS
BUREAU OF PLANNING
GOVERNMENT OF GUAM
1976 EDITION
2L 2R 3L 3R 4L 4R 5L 5R 6L 6R 7L 7R
69 65 61 57 53 49 45 41 37 33 29 25
63 69 70
64 65 66 67 68
57 58 59 60 61 62
51 52 53 54 55 56
46 47 48 49 50
37 38 39 40 41 42 43 44 45
29 30 31 32 33 34 35 36
23 24 25 26 27 28
17 18 19 20 21 22
11 12 13 14 15 16
06 07 08 09 10
01 02 03 04 05
DEDEDO
TAMUNING
AGANA
M.T.M.
BARRIGADA
ASAN
PITI
GINAJAMA
ORDOT
CHALAMPAGO
YONA
AGAT
STA. RITA
TALOFOFO
UMATAC
MERIZO
MARAJAN

MAP 20


GUAM
UNIFORM MAPPING SYSTEM
INDEX MAP
BASIC MAP SERIES
FOR ALL
GENERAL PLANNING
TOTAL SHEETS = 70
AREA OF EACH SHEET
= 3,000 X 4,000 METERS
BUREAU OF PLANNING
SEE 23
SEE 36
SEE 57
SEE 63

PARKS AND RECREATION

CONTENTS:

Need Data and Plans	PRK 2
Guam Territorial Park System	PRK 3
National Park Service Studies	PRK 6
Recreational Boating	PRK 8

NEED DATA AND PLANS (see also Natural Resources Development and Management: ENV)

Park and Recreational Areas, Territory of Guam; Irving C. Root, National Park Service, U.S. Department of Interior; 1952. An early reconnaissance report recommending various land-use measures including the establishment of a park system, a revamping of school siting, reforestation, and historic preservation. Beach development is encouraged, as no developed public beach sites existed at the time of this report.
Available: Bureau of Planning Library.

Guam Recreational Needs Survey Report; Guam Recreation Commission; 1952. The Guam Recreational Commission was established by public law during the First Guam Legislature. The emphasis of the Commission's recommendations was that playground type facilities be available in each village, often including softball and baseball fields, a recreation club, and craft-hobby shop. The report also recommended that the Paseo de Susana be developed as a sports center with a large arena, amphitheater, athletic field, tennis courts, auto parking, bus terminal, taxi stand, and concessions.
Available: Bureau of Planning Library.

Outdoor Recreation on Guam; Johnsrud and Associates; 1968. (Also printed as preliminary reports A, B, C, D, E, F: also called Preliminary Volumes, I, II, III, and IV, 1966 and 1967.) Overall plan for outdoor recreation on Guam. Detailed study of needs in terms of facility requirement based on interviews with three kinds of users: indigenous residents, immigrants, and military. Survey of current facilities and potential sites for creation of new facilities to satisfy the unmet needs that are identified. An action program is presented containing priorities for immediate development and long-range plans to be completed by 1985.
Available: Bureau of Planning Library.

Outdoor Recreation on Guam, 1971 Revision; Departments of Commerce and Land Management; October 1, 1971. An updating of the 1968 plan that reconsiders previous priorities and recommends a more rapid implementation program. Forty-one projects are prioritized. For each one, there is a page containing a description, objective, plan, facilities needed and cost figures for each, and total cost for the project.
Available: Bureau of Planning Library.

Guam Master Plan, Phase I: Problems, Opportunities, and Alternatives; Greenleaf/Telesca-Ahn; June 1972. Parks and Recreation element. Summary and comments on the two plans listed above; no new data.
Available: Bureau of Planning Library.

Outdoor Recreation on Guam, 1973; Departments of Commerce and Land Management; October 24, 1973. Updating of previous plans in light of rapid population growth and expanding tourist population.
Available: Bureau of Planning Library.

Outdoor Recreation Survey; Department of Parks and Recreation; 1978. A component of the 1980 Comprehensive Outdoor Recreation Plan (below). Determines current demand of recreation opportunities by activity. Respondents were asked to indicate the activities they or household members had participated in during the week of the survey, as well as those activities in which the surveyed population desired to participate. The report contains five-year daily demand projections through the year 2000 for each activity. Current capacity and projected capacity needs are also tabulated for each activity.
Available: Department of Parks and Recreation.

Guam Comprehensive Outdoor Recreation Plan 1980; Department of Parks and Recreation; 1980. This plan describes the current and recommends future recreation facilities on Guam. An island-wide recreation inventory includes: a table on developed recreation sites/facilities by activity 1979 (excluding military property); detailed location maps and listings of recreation facilities, park and beach areas, water sports, hiking trails, camp sites, historic places, swimming holes, and swimming beaches; a listing of sites on the National Register of Historic Places, January 1976; and location maps and listings of caves, waterfalls, rivers, and the Territorial Seashore Park. The demand for outdoor recreation is discussed through the analysis of the Outdoor Recreation Survey conducted in the summer of 1978 (above).
Available: Bureau of Planning Library.

Guam Comprehensive Outdoor Recreation Plan, 1989; Department of Parks and Recreation; 1989. Provides information on Guam's recreational needs for the future. This report includes an inventory of recreational facilities, both public and private, including areas with potential as recreation facilities. Sections of this plan include discussions of the status of recreation on Guam, Guam characteristics, inventory, demand, need, and implementation.
Available: Bureau of Planning Library.

GUAM TERRITORIAL PARK SYSTEM

Guam Territorial Seashore Park, Master Plan; Department of Parks and Recreation; January 1979. A general management plan designed to meet the objectives of the Seashore Park. Chapters describe the resources of the area: ecological, geomorphological, hydrological, scenic, historical, and recreational. The Plan divides the park into seven management districts. A map of each district shows land ownership by lot number, size, village, place name, and owner. A profile of the residents of affected local communities is presented. Recreation development goals, staffing, operating budget, and legislation and federal assistance are briefly discussed.
Available: Bureau of Planning Library.

Contracting for the Maintenance of the Territorial Park System, Preliminary Report; Department of Parks and Recreation; November 1981. Addresses the possibility of contracting the maintenance of 108 park and recreational areas which comprise the Territorial Park System. This report identifies the cost of maintaining each park and recreation area and determines the cost of contracting for their maintenance. A summary work sheet identifying the positive and negative impacts of contracting is included.
Available: Department of Parks and Recreation Library.

Applications for Surplus Federal Real Property; Department of Parks and Recreation; various dates. Presents master plans for the use of surplus federal lands should they be released to the Government of Guam. Each report describes an area and discusses the need for the property, the suitability of the site for the use, the capability of the Department of Parks and Recreation to administer the land, and utilization of the land. So far, seven master plans have been prepared, and five parcels have been released:

1) Parcel 2, Apra Harbor
2) Nimitz Beach (released)
3) Hilaan Point
4) Tanguisson Beach (released)
5) Pedro C. Santos Memorial Park (released)
6) Incinerator Site, Agana Heights (released)
7) Cocos Island (released)

Available: Department of Parks and Recreation.

Maps of the Guam Territorial Park System Areas; Department of Parks and Recreation; 1985. Maps the location of Guam Territorial Park System areas by village. This report consists of small scale maps, one for each village, that indicate the location of each park area.
Available: Bureau of Planning Library.

Park Maintenance Management System, Final Project Report; De Leuw, Cather, and Company, for Department of Parks and Recreation; October 1987. Provides information for optimum maintenance of Guam's park system, including Territorial parks, recreational facilities, and historic sites. This report provides a comprehensive listing, by location, of the physical features requiring maintenance; provides a listing of resources available for the Department to utilize for park maintenance operation; a listing of maintenance activities; performance guidelines; and work order and work request forms.
Available: Bureau of Planning Library.

Park Vendor Rules and Regulations; Department of Parks and Recreation; December 1987. Outlines the regulations applicable to all soliciting, advertising, rentals, and sales in the Guam Territorial Park System.
Available: Bureau of Planning Library.

Parks and Recreation Rules and Regulations; Department of Parks and Recreation; 1987. Prescribes the use, management, government, protection, and maintenance of good order in all park and recreation areas.
Available: Department of Parks and Recreation.

Guam Territorial Park System; Department of Parks and Recreation; revised March 1987. Updates the inventory of parks first compiled in July 1974. This report contains summary tables showing: acres of land per park and ownership status (private, Government of Guam, or federal); recreation facilities that will be the Mayors' responsibility; and park lands that could be used for compatible non-recreational related purposes. Also includes a detailed description and map of each park.
Available: Department of Parks and Recreation Library.

Guam: A Guide to the War in the Pacific Sites; David T. Lotz, for the Guam Visitors Bureau; 1988. A concise guide to Guam's Word War II historic sites. This document updates a previous 1984 Guide, adding additional emphasis on shipwrecks.
Available: Department of Parks and Recreation Library.

Department of Parks and Recreation Electrical Facilities Inventory; Department of Parks and Recreation; 1989. Lists the meter number and account number of each park and recreational facility by park area and by village.
Available: Department of Parks and Recreation.

Administrative Manual; Maintenance Management System, for the Department of Parks and Recreation; 1989. This manual provides detailed information on the maintenance management system, including documentation of all system components including the operation of the system software programs.
Available: Department of Parks and Recreation Library.

Field Operations Manual; Maintenance Management System, for the Department of Parks and Recreation; 1989. Provides supervisory personnel with information necessary for daily maintenance management. This manual describes the system, work activity definitions, performance guidelines, scheduling procedures, and types of evaluations.
Available: Department of Parks and Recreation Library.

Guam Territorial Park Facilities Listing; Department of Parks and Recreation; 1989. Lists the type of facilities available at each park. This listing shows the number of each of 70 different types of parks and recreational facilities, including shelter and picnic facilities, comfort stations, electricity and pay phones, water and boating facilities, and so forth. This list also indicates park number, the park size in acres, lot number, location, and name of the area.
Available: Bureau of Planning Library.

Blueprint Directory; Department of Parks and Recreation; current since 1975. Lists the blueprints and specifications for each park area, proposed park area, archaeological area, and development area. The blueprints and specifications constitute a park development plan or master plan for the area.
Available: Department of Parks and Recreation.

Territorial Park System Chrono File; Department of Parks and Recreation. Consists of files on each park with all information about the park, including deeds and correspondence. These files are available for inspection by the public.
Available: Department of Parks and Recreation.

Department of Parks and Recreation Annual Report; Department of Parks and Recreation; annually. Presents a review of the general responsibilities and accomplishments of the Department of Parks and Recreation by division. Sections address the parks division, historic preservation, operational maintenance, Territorial Seashore Park, recreation division, youth center, organized recreation, pool and beach, community programs, and boxing.
Available: Department of Parks and Recreation Library.

Department of Parks and Recreation - Plaset Yan Huego; Newsletter of the Department of Parks and Recreation; available monthly since January 1990.
Available: Bureau of Planning Library.

Grant Application: Programs are funded by the Federal Government in the form of grants. These grants are normally awarded on a fiscal year basis, and each year a grant application must be prepared. If information about a program is needed and the program is partly or fully federally funded, looking at the grant application may be of value. A complete file of grant applications is available at the Bureau of Planning for three years or the Bureau of Budget and Management Research. Each federally funded program should also have copies of their specific application.

- Land and Water Conservation Fund; Department of Parks and Recreation; 1990. Funds for construction of vehicle barriers at Fort Santa Agueda Park, Agana Heights, and at the Dededo Buffer Strip to prevent vehicles from driving through the park.

- Land and Water Conservation Fund; Department of Parks and Recreation; 1991. Funds for the renovation/improvement of parks located at Tagachang Beach, Yona, and Ypan Beach, Talofofo.

NATIONAL PARK SERVICE STUDIES

National Park Service--Guam Study, June 1965; National Park Service, U.S. Department of Interior; June 1965. Results of a study to determine whether sites of national significance exist on Guam. The report recommends a national historical park relating to World War II in the Pacific and a national seashore park in Guam's southwest corner.
Available: Department of Parks and Recreation Library.

Master Plan--Proposed Guam National Seashore Park; National Park Service, U.S. Department of Interior; 1967, and reprinted September 1969. This plan for the creation of a national park along the southwest coast of Guam calls for the acquisition of substantial acreage, along with the development of recreational facilities in the area.
Available: Bureau of Planning Library.

Master Plan--Proposed War in the Pacific National Historical Park; National Park Service, U.S. Department of Interior; July 1967. Report recommending creation of a War in the Pacific National Historical Park for Guam, which would present World War II in the Pacific, from Pearl Harbor to the Japanese surrender, with particular emphasis on the capture and liberation of Guam.
Available: Bureau of Planning Library.

War in the Pacific National Historical Park, Guam: Revision of 1967 Proposal; National Park Service, U.S. Department of Interior; September 1977. A revised proposal resulting from a review of previous proposals, field investigations conducted between 1973 and 1976, and discussions with various Government of Guam agencies.
Available: Bureau of Planning Library.

Master Plan Proposed Guam National Seashore - Guam; National Park Service, U.S. Department of Interior; September 1977. This master plan is based on previous field investigations conducted in 1965 and 1967.
Available: Bureau of Planning, in War in the Pacific National Historical Park Guam, Revision of 1967 Proposal.

Land Acquisition Plan, War in the Pacific National Historical Park; National Park Service, U.S. Department of Interior; July 1981. Discusses private lands located within the Park. Tables (4) show the number of acres owned by the Department of Interior, U.S. Navy, Government of Guam, private interests, and unknown ownership. This plan was not implemented.
Available: Bureau of Planning Library.

Guam National Seashore: New Area Feasibility Study, Review Draft; National Park Service, U.S. Department of Interior; November 1981. Identifies options and discusses ways in which natural, cultural, and recreational resources can be protected. Maps are included.
Available: Bureau of Planning Library.

Natural and Cultural Resources Management Plan: An Addendum to the General Management Plan, War in the Pacific; National Park Service, U. S. Department of Interior; February 1982. Addresses the natural and cultural resource management problems and needs of the park. This plan formulates a five-year action program, including an outline of research projects, a problem statement, a description of work to be undertaken, alternatives, and cost estimates.
Available: Bureau of Planning Library.

General Management Plan, War in the Pacific National Historical Park, Guam; National Park Service, U.S. Department of Interior; March 1983. Contains specific proposals for the future preservation, management, development, and use of the park. This plan is basically a revision of the draft document dated September 1977. Chapters address the park's purpose and objectives, history, physical description, cultural resources, and potential recreation use.
Available: Bureau of Planning Library.

War in the Pacific National Historical Park Land Protection Plan; National Park Service, U.S. Department of Interior; September 1983. This plan identifies methods of assuring the protection of the natural, scenic, cultural, recreational, and other significant resources, while providing for adequate visitor use.
Available: Bureau of Planning Library.

Payments in Lieu of Taxes to be Received by GovGuam for the "War in the Pacific National Historical Park"; Bureau of Planning; April 20, 1983. Documents the amount of compensation to be provided by the Department of Interior to the Government of Guam upon full implementation of the plans for the War in the Pacific National Historical Park.
Available: Bureau of Planning Library.

Historic Resource Study - War in the Pacific National Historical Park; Erwin N. Thompson, for the National Park Service, U.S. Department of Interior; 1985. An extensive historical summary of the War in the Pacific National Historical Park. The bulk of the volume contains photographs, sketches, and maps, with descriptions and narrative about various aspects of the entire park.
Available: Micronesian Area Research Center Pacific Collection.

RECREATIONAL BOATING (see also Harbors, Marianas, and Dredging: ENV)

Boating Activity in the Territory of Guam; Gillham, Koebig and Koebig; 1974. Survey of private boat owners' needs, and existing and proposed harbor and launching facilities.
Available: Bureau of Planning Library.

Design of Agana Small-Boat Harbor, Territory of Guam, Hydraulic Model Investigation; Claude E. Chatham, Jr., U.S. Army Corps of Engineers, Pacific Ocean Division; January 1975. A 1:50-scale undistorted hydraulic model of Agana Harbor, the surrounding reef, and sufficient offshore area to permit generation of the required test waves was used to investigate the arrangement and design of proposed harbor improvements with respect to wave heights and wave-induced circulation conditions.
Available: Bureau of Planning Library.

Agana Marina Development Plan; Gillham, Koebig and Koebig, Inc.; November 1976. Contains findings and recommendations concerning oceanographic and engineering aspects of protective works proposed by the U.S. Army Corps of Engineers. This report includes the development of estimates of demands for boat storage, an overall plan for ultimate development of the harbor in increments, and a financial analysis pertaining to the recommended method of harbor operation.
Available: Bureau of Planning Library.

Harbor of Refuge, Apra Harbor Guam--Reconnaissance Report; U.S. Army Corps of Engineers, Pacific Ocean Division; September 20, 1977. This study addresses the potential needs and justification for a harbor of refuge for small boats at Apra Harbor, and recommends preparation of a detailed project report.
Available: Department of Parks and Recreation Library.

Guam Small Craft Assessment; U.S. Army Corps of Engineers, Pacific Ocean Division; July 1983. This assessment starts with an inventory of the existing facilities for small craft on Guam. This is followed by sections describing the current fleet trends and a discussion of the major boat-use groups.
Available: Bureau of Planning Library.

Request for Proposal - Management and Development of the Agana Marina Boat Basin; Port Authority of Guam; 1988. A proposal request to transfer the Agana Marina management and development to a private entity. Background information is provided along with proposal instructions, criteria for selection, local and federal regulations, and terms and conditions.
Available: Bureau of Planning Library.

Proposal to the Port Authority for Management and Development of the Agana Marina Boat Basin; International Design Consortium, Inc.; 1988. Proposal includes a narrative of the development plan for the Agana Marina, a conceptual master plan, rendering and typical floor plans, a work plan summary, benefits of project results, developer's statement, and proposed timetable.
Available: Guam Environmental Protection Agency Library.

Application for a Zone Change from "A" Rural to "PUD" Planned Unit Development - Proposed Agana Marina; International Design Consortium; 1989. An overall project plan for the Agana Marina development project. Although the intent of the document is to request a zone change for the development, the report is detailed and includes extensive planning documents, an overall planning scheme, and summary of impacts of the proposed project.
Available: Guam Environmental Protection Agency Library.

TRANSPORTATION

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LAND TRANSPORTATION - HIGHWAYS AND BRIDGES

Transportation Planning Manual; Daniel, Mann, Johnson and Mendenhall (DMJM), for Department of Public Works; March 1974. The first section of the report describes the model that was used to estimate future demand for highways on Guam based on an origin-destination study and other socio-economic variables. The following sections present procedures which are currently being used as guidelines for highway planning. However, some parts are being followed, while others have been revised or are not being used at all. The sections that have been implemented are Section 2: Procedure Manual for Road and Budget Inventory; Section 4: Procedure Manual for Vehicle Statistics; and Section 6: Procedure Manual for Traffic Data Inventory. Section 7: Procedure Manual for Highway Classification and Section 11: Work Program for Highway Needs Study have been revised in a draft form.
Available: Department of Public Works.

Guide for a Road Inventory Manual of Instructions; Department of Public Works; 1975. A procedure manual for developing a road inventory program. Contains the procedures for data collection, the inventory procedure, structures over and under the roads, mail and school bus routes, and special inventory procedures.
Available: Bureau of Planning Library.

Guam: Comprehensive Transportation Plan; Planning Division, Department of Public Works; April 1975. Recommends a combination of renovation and upgrading of existing highways, development of mass transit, and a minimum of new highway construction to meet forecasted traffic demand to 1990. Series of three five-year programs, including financial strategy for implementation. Does not include local circulation, bicycle or pedestrian elements. Twenty-one tables and 16 figures covering projected growth, current utilization, and financial information.
Available: Bureau of Planning Library.

Proposed Agana Circulation Plan; Planning Division, Department of Public Works; 1976. Circulation plan for Agana through 1980, including vehicles, pedestrians, and parking spaces. The proposed plan, given in three phases, includes new traffic signals, one-way streets, and parking meters. Phase III includes a bus system and bicycle paths.
Available: Department of Public Works.

A Bicycling Program for Guam; Department of Public Works; August 1976. A comprehensive bicycling plan to encourage safe bicycling on Guam. The overall program encompasses the education of the public, the enforcement of safe highway riding techniques, and the engineering of safe bikeways.
Available: Guam Environmental Protection Agency Library.

Street Atlas of Guam; Bureau of Planning; 1976, 2nd Edition revised 1980. The official reference map to all streets and government facilities throughout the island as of 1980. This Atlas consists of single sheet maps of the entire island, with lines of the Uniform Grid System and other map series. The Atlas locates streets and identifies emergency facility locations, hospitals, village commissioner offices and their telephone numbers, public school locations, and zip-code areas.
Available: Bureau of Planning Library.

Territorial Transportation System; Department of Public Works; 1979. Presents an overview of the three major components of the Territorial Transportation System: Land Surface, Transportation Highway, and Highway Reconstruction. Outlines the Road Reconstruction Program.
Available: Bureau of Planning Library.

Bridge Inventory Report; Department of Public Works; 1979. This report compiles a record of all bridges within the Territory that fall under the Federal Aid System. The report identifies the major characteristics associated with the 26 bridges under this classification and includes a short description of each bridge, shows dimensions and load capacities, horizontal and vertical clearances, and physical condition. Report also includes numerous photographs of each bridge.
Available: Bureau of Planning Library.

A Highway Construction Cost Index for Guam; Department of Public Works; 1979. A report to provide detailed and specific information pertaining to the costs of building highway facilities, and to establish highway construction costs applicable to the local economy. This project involved accumulating information on unit construction costs by work items and quantities of material for all highway or bridge projects under the Federal Aid Highway System and then analyzing the information. Price indexes were established for the years 1972 through 1977 for roadway excavation, surfacing, bitumens, and structures.
Available: Bureau of Planning Library.

Highway Planning Map Manual; Department of Public Works; 1980. The objective of this report is to provide guidelines for the initiation, implementation, and ongoing maintenance of an effective highway mapping program for Guam. Includes a methodology for preparing and maintaining maps appropriate for highway analysis, planning, construction, and maintenance efforts. Describes the Highway Map series, Municipal Map series, and Urban Map series. Establishes standards for map data collection and map drafting, estimates costs of map compilation, and gives examples of various types of maps.
Available: Bureau of Planning Library.

Photologging of the Arterial Streets; Department of Public Works; 1981. A series of videotaped pictures of all the arterial streets on Guam. Video-taping is used for an inventory of roadway segments, sign control, roadside obstacles, existing conditions on the roadway and other aspects of arterial streets.
Available: Department of Public Works.

Inventory of Physical Highway Plan; Department of Public Works; 1981. An enumeration of all primary and secondary roads on Guam. Guam's roadways are divided into control segments. This study inventories each control segment for the following information: length of roadway, number of lanes, width of roadway, power poles, width and length of sidewalk, location of sewers, traffic control devices, bus stops, fire hydrants, surface condition, surface type, and riding condition.
Available: Department of Public Works.

Parking Study; Department of Public Works; 1981. An inventory of parking facilities in Agana and portions of Tamuning. The study includes a physical inventory of spaces, curb usage and duration, and off-street usage and duration.
Available: Department of Public Works.

Alleviating the Transportation Problem on Guam; Augustin Duenas; 1981. A Special Project submitted to the University of Guam.
Available: Robert F. Kennedy Memorial Library, University of Guam.

Expressway: An Approach Concept to Economic Development Through Efficient Transportation (Draft); Peter Sablan; May 1984. Summarizes the advantages the expressway concept will provide Guam's economy; the estimated construction cost and funding prospects; the economic predictions during and after construction of the expressway, a five-year period); and presents a map of the expressway concept.
Available: Bureau of Planning Library.

Guam Highway and Bridge Program Plan Fiscal Year 1985-1989; Department of Public Works; October 1984. This study emphasizes the need for major reconstruction of selected highways and bridges throughout the island. Presents traffic statistics and trends, and presents schedules for implementation of highway and bridge projects.
Available: Bureau of Planning Library.

The Embracing Economy: Guam's Justification for Defense Funding for Highway Infrastructure Planning and Development, Division of Highways, Highway Planning Section, Department of Public Works; October 1988. An infrastructural plan for on-going projects relative to highway transportation between the Government of Guam and the United States military.
Available: Bureau of Planning Library.

Guam Local Roads and Streets - Coral Road Paving Program; Highway Planning Division, Department of Public Works; 1989. In cooperation with village mayors, the Department of Public Works has developed a plan to implement a coral road paving program as a sub-element of the road reconstruction component of the territorial highway program. This plan implements PL 14-27, and assists in the overall goal of PL 1-88, to coordinate the erection, maintenance, and repair or demolition of public roadways in cooperation with village mayors. Extensive maps of each village by project priority for local coral road paving are included.
Available: Highway Planning Division, Department of Public Works.

Reports Submitted to the Federal Highway Administration from the Department of Public Works; Department of Public Works; Annually. Each fiscal year the Department of Public Works must submit reports to the Federal Highway Administration outlining their accomplishments and progress on their Annual Work Program. The reports are generally financial in nature, but also show information such as motor-fuel tax collections, motor-fuel consumption, driver's license information, mileage reports, speed and traffic studies, mileage of surfaced highways, and other information.
Available: Department of Public Works.

Annual Work Program; Department of Public Works; Annually. Series of work programs composed annually which emphasize the need for major reconstruction of selected highways and bridges throughout the island.
Available: Department of Public Works.

Motor Vehicle Registration Statistics, Department of Revenue and Taxation, Motor Vehicle Division; updated annually. Statistical report on type and number of vehicles, licensed motor vehicles, and other information.
Available: Motor Vehicle Division, Department of Revenue and Taxation.

LAND TRANSPORTATION - HIGHWAY SAFETY

Highway Safety Plan; Office of Highway Safety, Department of Public Works; 1979 to present. An annual plan which summarizes Highway Safety Program costs and evaluates highway safety projects. These plans also include traffic-related data for each year.
Available: Bureau of Planning Library.

Accident Analysis Reports; Department of Public Works; Monthly in 1975 and yearly thereafter to date. These reports attempt to identify high accident locations and determine various causative factors contributing to the incidence of accidents at these locations. Reports consist of numerous graphs and tables showing fatality information, accident locations and intersections, driver-at-fault information, pedestrian-auto accidents, and other general information about accidents. Detailed records of traffic accidents can be produced upon request.
Available: Department of Public Works.

Annual Report: Office of Highway Safety; Office of Highway Safety, Department of Public Works; Annually. Addresses the highway safety activities of the Territory and presents an overview of accomplishments of Guam's Highway Safety Plan. This report also summarizes the overall progress of the highway safety effort and corrective actions relating to deficiencies identified through program and financial management review.
Available: Department of Public Works.

Grant Application: Programs are funded by the Federal Government in the form of grants. These grants are normally awarded on a fiscal year basis, and each year a grant application must be prepared. If information about a program is needed and the program is partly or fully federally funded, looking at the grant application may be of value. A complete file of grant applications is available at the Bureau of Planning for three years or the Bureau of Budget and Management Research. Each federally funded program should also have copies of their specific application.

- State and Community Highway Safety Program; Department of Public Works; 1985. Program focuses on public information and education on the hazardous effects of alcohol, merits of occupant restraints, police and emergency medical services, traffic records, and highway safety improvements.

- Motor Carrier Safety Assistance Program; Department of Public Works; 1991. Program is designed to implement a working plan to address the causes of truck and bus related accidents and hazardous material transportation incidents on Guam's roads.

LAND TRANSPORTATION - MASS TRANSIT

Land Use Planning with Reference to the Mass Transportation Plan; Territorial Planning Commission; 1974. Includes proposal to develop a bus transit system on Guam.
Available: Bureau of Planning Library.

Mass Transportation on Guam; Gilbert L. Lopez; 1975. A University of Guam Special Project.
Available: Robert F. Kennedy Memorial Library, University of Guam.

Proposed Strategy for Mass Transit on Guam; Planning Division and School Bus Operations Division, Department of Public Works; January 1975. Contains management and financial alternatives and recommended methods of establishing mass transit on Guam. Includes a section on determination of transit routes and patronage based on origin-destination data. Two appendices specifying commuter routes and headway routes.
Available: Bureau of Planning Library.

Survey Results - Know-How and Advice Regarding Operation of Guam's Route Bus, draft; Sagami Railway Co., Ltd; 1980. A report prepared by a Japanese transportation company on how to set up and manage a mass transit system on Guam. Part I outlines the various tasks and issues in setting up a bus system, including discussions on bus characteristics and utilization objectives, roles of bus systems, the operation of a bus system, and ideals of a bus system operation. Part II is concerned with mass transit on Guam. Various recommendations are made with respect to locations of facilities, fares, personnel, operations, and policy aspects. Also, there is a discussion of expenditures, income and profitability, and an outline of proposed bus routes.
Available: Bureau of Planning Library.

Guam Mass Transit Authority Annual Report - FY 1980; Guam Mass Transit Authority; 1981. This report gives an overview of the agency, goals, policies, and summarizes its programs.
Available: Bureau of Planning Library.

Guam Public Transit - Islandwide Service; Guam Mass Transit Authority; 1989. A schedule of routes and fares for mass transportation. Updated periodically.
Available: Bureau of Planning Library.

Grant Applications: Programs are funded by the Federal Government in the form of grants. These grants are normally awarded on a fiscal year basis, and each year a grant application must be prepared. If information about a program is needed, looking at the grant application may be of value. A complete file of grant applications is available at the Bureau of Planning for three years, or at the Bureau of Budget and Management Research. Also, each program should have copies of their specific application.

- Public Transportation for Non-Urbanized Areas; Guam Mass Transit Authority; 1981-1989. Funds will be used to pay operating expenses for the Guam Public Transit System.

- Consolidated Transportation Grant; Guam Mass Transit Authority; 1990. Consolidates three public mass transit grants:Elderly and Handicapped Transportation,; Rural Transportation, and Rural Transportation Assistance Program.

AIR TRANSPORTATION

Master Plan for Guam International Air Terminal; Mackinlay/Winnacker/McNeil and Associates, Richardson Associates, Austin Smith and Associates, Harding Miller Lawson and Associates; January 1971; 3 Volumes. Master Plan recommends new air terminal facilities to respond to projected passenger and cargo volumes. This report includes a background study of land use, road systems, environmental factors, topography, utilities and drainage, and soil conditions. Makes a range of forecasts of passengers, air cargo, and vehicle parking space to 1985.
Available: Bureau of Planning Library.

General Aviation Master Plan: Interim Report Airport Requirements; Ralph M. Parsons Company; January 1976. Proposed plan for development of general aviation. Presents an inventory of airmen, aircraft, and facilities, and estimates of demand.
Available: Bureau of Planning Library.

Air Installation Compatible Use Zone (AICUZ); Andersen Air Force Base; March 1976. The AICUZ concept, program and methodology are explained in this document, which includes several studies on the difficulties encountered where residential areas are in the immediate environs of an air field. These studies were: an operational change evaluation survey which concluded there would be no benefits to changing existing base procedures; an economic impact study which consists of a list of dollar benefits to Guam from Andersen Air Force Base; a study on proposed rezoning in view of accident potentials; a presentation of proposed building standards to reduce noise level and avoid discomfort; a study of heights and obstructions which interfere with base operations; and a guide to compatible land uses within the base operating area.
Available: Bureau of Planning Library.

'Open Skies' for Guam - A Position Statement of the Guam Chamber of Commerce Air Service Advisory Council; Lee M Holmes and Charles H. Troutman, Esq.; 1977. Two position papers proposing deregulation by the Civil Aeronautics Board of routes, carriers, fares, and air cargo rates for airlines serving Guam. One paper focuses on economic issues and one on legal issues. The position states that any U.S. carrier be allowed to service Guam without obtaining CAB approval.
Available: Bureau of Planning Library.

Guam International Air Terminal Master Plan Report; Parsons Corporation, for the Guam Airport Authority; October 1977. An airport terminal complex master plan for Guam. Contains a detailed plan for all stages of facility development, and includes future terminal plans.
Available: Guam Airport Authority.

Air Installation Compatible Use Zones, U.S. Naval Air Station, Agana, Guam, Mariana Islands, Final; CH2M Hill, for the U.S. Navy; April 1978. A major study whose purpose was to develop a plan for compatible growth around NAS Agana/GIAT at Guam, Mariana Islands. The AICUZ defines and maps zones and areas around NAS/GIAT that are considered appropriate land uses compatible with the airport. The report examines the operational goals, objectives, and alternatives for modifying AICUZ.
Available: Bureau of Planning Library.

Customs Inspections at the Guam International Airport; Patricia A. Roth; 1984. A University of Guam Masters Thesis in Public Administration.
Available: Robert F. Kennedy Library, University of Guam.

Joint Use Agreement Between the United States of America and Government of Guam, Territory of Guam, U.S.A.; July 1974, revised September 1984. The agreement between the Government of Guam and Naval Air Station that governs the joint use of the Guam International Airport. All stipulations, regulations, controls, and other conditions of joint use are specified. Contains maps showing area of joint use and joint use facilities.
Available: Bureau of Planning Library.

Essential Air Service in the American Pacific Islands, Staff Study; Pacific Basin Development Council; May 1985. This study is presented in multi-volume format. Part 1 provides a historical perspective of air service in the American Pacific. Part 2 is an analysis of the impact of airline deregulation and particularly its effects on service to small communities. Part 3 provides an assessment of the role of air service in the American Pacific Islands. Part 4 examines the economic questions of providing air service. Part 5 is a supplement of point specific data. It is divided into several parts: Regional Figures (Appendix A); Guam (Appendix B); Saipan, Northern Marianas (Appendix C); Honolulu, Hawaii (Appendix D); American Samoa (Appendix E); Majuro, Republic of the Marshall Islands (Appendix F); Koror, Republic of Belau (Appendix G); Ponape, Truk, and Yap, Federated States of Micronesia (Appendix H).
Available: Bureau of Planning Library.

Feasibility Study: Airport Industrial Park; Roque Castro; November 1985. Examines the feasibility of developing an airport industrial park at the Guam airport. This study contains an overview of the Guam Airport Authority, the role of industrial parks at airports, flourishing activity at Guam's industrial parks, constraints to development of an airport industrial park, and the free trade zone.
Available: Bureau of Planning Library.

Bilateral Aviation Agreements Affecting Guam; Author not stated; 1987. Compilation of Pacific/Asian bilateral agreements in providing international airline service to agreed routes. Also lists visa waivers affecting Guam.
Available: Bureau of Planning Library.

FAA Air Traffic Activity FY 1987; Federal Aviation Administration, U. S. Department of Transportation; 1987. A statistical summary of air traffic activities by region for airports with FAA Towers.
Available: Bureau of Planning Library.

An Analysis of the Impacts of Air Installation Compatible Use Zones on Guam; Bureau of Planning; October 1987. Identifies zones representing accident hazard areas and noise exposures, and develops recommended permissible activities within each zone. This analysis was developed in response to Air Installation Compatible Use Zones studies for NAS/Agana and Andersen Air Force Base. The report discusses potential impacts and liabilities and provides options for airport operations and development.
Available: Bureau of Planning Library.

General Aviation Master Plan Update; Leo A. Daly, for the Guam Airport Authority; 1989. This plan addresses existing conditions at the Guam International Air Terminal, forecast of demand, future demand and capacity, airport facility requirements, flight training, development options and site selection, airport plans, financial plan, and a development schedule.
Available: Bureau of Planning Library.

Aircraft Noise Survey for Naval Air Station; Harris, Miller, Miller and Hanson, Inc. for the U.S. Navy; July 1989. Presents the results of studies on noise exposure levels at the airport to help define Air Installation Compatible Use Zones used to protect these facilities from encroachment by incompatible land uses. This research survey examines both military and civilian components of total noise exposure due to the mixture of aircraft at Naval Air Station and the Guam International Air Terminal.
Available: Bureau of Planning Library.

Guam International Air Terminal Master Plan Update Report; Parsons Overseas Company, for the Guam Airport Authority; November 1989. Outlines measures for new and expanded facilities at GIAT to meet aviation demand to the year 2008. This comprehensive plan provides an overview of GIAT, existing facilities, aviation activity forecasts, and facilities requirements. Expansion requirements are summarized, and a staged development conceptual design (passenger and non-passenger terminal facilities) is recommended. The plan also identifies the use of federal land for operational and facility purposes, cost estimates, revised airport layout plan, and an overview of environmental impacts.
Available: Bureau of Planning Library.

The Recovery of Tiyan: The Closure and Consolidation of NAS, Agana, for the Benefit of Guam and the United States; Bureau of Planning; April 1990. Focuses on future aviation development in Guam through the transfer of NAS Agana, an area formerly known as Tiyan, to the Government of Guam. This report addresses the history of Guam and the airport; the status of military and civil air operations at NAS-Agana; and the need for the Tiyan area, including proposed Guam Airport Authority uses of NAS-Agana. Contains maps and drawings.
Available: Bureau of Planning Library.

Military Bases: Relocating the Naval Air Station Agana's Operations, Draft; U.S. General Accounting Office; July 1990. Addresses the feasibility of relocating the operations at the Naval Air Station to Andersen Air Force Base. This report includes estimated costs of such a relocation, the potential costs of making enough Navy land available to the Air Station to expand the air terminal without relocating all of the Navy's operations, and alternatives to total relocation. Includes tables and maps of expansion sites and major military installations on Guam.
Available: Bureau of Planning Library.

Guam Airport Authority - Annual Report; Guam International Airport Authority; Annually. Each year GIAA prepares an annual report covering the highlights of the previous year. Covers completion stages of the various capital improvement projects, aircraft and passenger statistics, and various operational aspects of GIAT.
Available: Guam Airport Authority.

Arrival Log, Air; Customs and Quarantine, Department of Commerce; 1976 to present. This log book is maintained for all arriving flights at the Guam International Air Terminal and Andersen Air Force Base. The airline, flight number, place of origin, time of arrival, number of terminating passengers, number of transiting passengers, and number of crew are recorded. The number of commercial aircraft landings is tabulated from this log.
Available: Department of Commerce.

Newsletter: The Airporter; Guam Airport Authority; Quarterly. This newsletter gives a brief overview of the agency's events and activities during the quarter.
Available: Guam Airport Authority.

SEA TRANSPORTATION

Study of Apra Harbor Military Reservation, Guam, M.I.; Tudor Engineering Company, for Bureau of Yards and Docks, Department of the Navy; 1964. A comprehensive set of documents, maps, and research pertaining to the use of facilities in Apra Harbor between the Navy and the Government of Guam. The research addresses the facility's use and potential as it relates to military, commercial, and economic development of Guam.
Available: Bureau of Planning Library.

Master Plan, Commercial Port of Guam, Phase I; Greenleaf/Telesca-Ahn; March 1972. Master Plan report outlining a five-year capital improvements program for Commercial Port. Estimates harbor needs to 1990 and presents a phased development program to meet these needs. Major conclusion is that the Commercial Port, although completed only two years prior, is straddled with inadequate facilities. Plan analyzes present harbor capabilities, the present general economy, population trends, recommended remedies in deficient areas, estimated costs, and timing of needed improvements.
Available: Bureau of Planning Library.

A Report on Ocean Freight Rates; Not dated but before 1974. This document was discovered without a title page and with no references to when it had been written or who had prepared it. It is included here as it treats the subject thoroughly, although the information is now dated. The report discusses the structure of ocean freight rates, both commercial and military. There are four main sections: The Economy--a discussion of Guam's general economy and factors affecting the economy; Trade and Development--Guam's economic development, Guam's external trade and ocean transportation services, commercial ocean freight rates; Defense Cargo and Rates--movement of defense cargo, principal moving commodities, comparison of military and commercial rates, comparison of commercial traffic rates to average revenue per ton, and common carrier operating results and rate increases between the West Coast and Guam; and Conclusions and Recommendations on commercial services and rates, and military cargo and rates.
Available: Bureau of Planning Library.

An Evaluation of Apra Harbor, Guam as a Typhoon Haven; Michael Brown and Samson Brand; 1975. The characteristics of Apra Harbor that were evaluated include: facilities available, wind and wave action, storm surge and the topographical effects of winds prior to and during passage of tropical cyclones, problems to be considered if a vessel remains in port, and possible evasion procedures.
Available: Bureau of Planning Library.

Program for Development of Apra Harbor; Overseas Bechtel, Inc.; October 1977. The conceptual plan for the development of Apra Harbor that identifies some proposed development programs, a description of the plan, a discussion of the current land uses around Apra Harbor, a discussion of the major industries that might require industrial sites, and a proposed development program for Apra Harbor and preliminary development schedule.
Available: Bureau of Planning Library.

Economic and Land-Use Plan for Cabras Island and Surrounding Area; Port Authority of Guam; July 1979. Focuses on the economic development potential of water oriented activities. This plan discusses the importance of Apra Harbor to the economy, development constraints, port development requirements, development requirements of water oriented activities, social and environmental considerations, and land use plan.
Available: Bureau of Planning Library.

Port Authority of Guam - Terminal Tariff Study; Peat, Marwick, Mitchell and Co.; 1980. Presents an analysis and suggestions for modifying the Port Authority of Guam's Terminal Tariff. This report contains the following subject chapters: Costs Allocation, Development of Tariff Charges, Suggested Modifications to the Chart of Accounts, Tariff Modification Process, and Operational Recommendations.
Available: Port Authority of Guam.

Commercial Port of Guam Master Plan; Maruyama Associates, Ltd. and Dravo Van Houten, Inc.; 1981. This study had the following main objectives: to estimate future waterborne commerce through the Port of Guam and analyze the ability of the existing facilities to handle it; to determine the feasibility of expanding the Port of Guam; to analyze the potential for establishing a fisheries center and fish processing facility on Guam; and to update the Land Use Plan for Cabras Island and surrounding area, including the 927 acres of fast land and submerged land recently transferred from the Navy to the Government of Guam. Consists of 14 major sections.
Available: Bureau of Planning Library.

Commercial Port Component; Port Authority of Guam; March 1981. Provides general cargo traffic forecast for imports, exports, and transshipment to the year 2000. This report also summarizes requirements for wharf, container yard, buildings, equipment, and manning of the Port to accommodate projected traffic.
Available: Bureau of Planning Library.

Port Building Inventory and Utilization; Port Authority of Guam; 1983. An assessment and use plan of all port buildings and related facilities including availability of water, power and sewer service.
Available: Bureau of Planning Library.

The Improvement and Expansion Plan, Commercial Port of Guam; Port Authority of Guam; March 1983. Identifies various improvement and expansion projects, including project summaries and cost figures. This plan is meant to be a reference for current and long-range policy planning in port management.
Available: Bureau of Planning Library.

Terminal Tariff Naming Rates, Charges, Rules and Regulations Applying at Apra Harbor, Port Authority of Guam; Port Authority of Guam; March 1984. A series of regulations concerning operations and tariffs at the Port Authority of Guam that were implemented in March 1983. Covers general rules and regulations, wharfage, dock and dockage, stevedoring and handling charges, equipment rental, free time, and demurrage.
Available: Bureau of Planning Library.

Special Transportation Problems of the American Pacific Islands; U. S. Department of Transportation; 1985. Discusses the special transportation concerns and needs of the island governments and their communities. This report includes air and water transportation, cargo, and other issues related to development planning.
Available: Bureau of Planning Library.

Essential Ocean Transportation Service; Port Authority of Guam; 1986. A summary of the PAG's activities for 1975 through 1986, including statistical tables on the Port's operations.
Available: Bureau of Planning Library.

Ocean Transportation Needs of the American Pacific Islands - Report to Congress; U.S. Department of Transportation; 1987. Discusses the ocean transportation needs of American Pacific islands, including port profiles and data, and special problems and/or needs (infrastructure, public policy, legal constraints). Takes into consideration the unique problems of the islands relative to ocean shipping.
Available: Bureau of Planning Library.

Study of Ocean Transportation in American Samoa, Guam, Northern Mariana Islands, and Hawaii; Pacific Basin Development Council; September 1987. Assesses the problems, needs, and issues of ocean transportation in the Pacific region. This report discusses the limited availability of current statistics on cargo information, and addresses infrastructure needs, public policy issues, and legal constraints.
Available: Bureau of Planning Library.

Evaluation of Commercial Port Docking Facility; CMH/TNH Consulting Engineers, for the Port Authority of Guam; April 1988. Reports on an evaluation and comprehensive inspection of the commercial port docking facility and the structural system which supports the rail mounted gantry cranes at the Port. Recommendations for improvement of facilities are made. Report includes extensive reporting, photographs, drawings, and maps.
Available: Bureau of Planning Library.

Commercial Port of Guam Master Plan (Draft Final Report); TAMS Consultant, and J. Agi and Associates, Inc., for the Port Authority of Guam; June 1990. Outlines a commercial port plan: its capabilities and projected expansion in the future. This extensive plan includes a summary and descriptive analysis of Guam's economy, Guam's Port traffic, the existing structure and facilities of the port, passenger and recreational craft forecasts, and land use on Cabras Island and its environs. Numerous data tables are provided.
Available: Bureau of Planning Library.

Port Authority of Guam Small Boat Harbor Regulations, Proposed; 1990. Contains proposed provisions to update the 1986 Port Authority of Guam Small Boat Harbor Regulations. This document provides rules and regulations for the effective control and management of the harbors, shores, shore waters, and navigable streams of the Territory of Guam. Addresses fire safety and vessel equipment requirements, boat operation, commercial activities, sanitation, maintenance and storage, motor vehicle regulations, and schedule of fees and charges.
Available: Bureau of Planning Library.

Port Authority of Guam: Annual Report; Port Authority of Guam; Annually. Annual summary of Commercial Port facilities and operations. Presents historical data on tonnage, transshipment levels, breakbulk vs. container tonnage, container volume, cruise vessel passenger distribution by national origin, vessel arrivals, gross tonnage, and financial statements.
Available: Port Authority of Guam.

Arrival Log, Sea; Customs and Quarantine, Department of Commerce; 1976 to present. This log is maintained on all arriving ships. Name of vessel, point of origin, number of crew and number of passengers are noted. Data is tabulated on number of surface craft landings by point of origin.
Available: Department of Commerce.

Fishing Vessel Log; Port Authority of Guam; Monthly. A monthly report specifying tuna transshipment tonnage. For each vessel, reported is weight of vessel, days in port, and vessel name.
Available: Port Authority of Guam.

Monthly Report of Vessel Arrivals; Port Authority of Guam; Monthly. A monthly report specifying the flag of vessel, number of days in port, name of vessel, and gross tonnage by classification of vessel.
Available: Billing Office, Port Authority of Guam.

Monthly Tonnage Report; Port Authority of Guam; Monthly. Monthly report specifying revenue tonnage by method of shipment, export, import and transshipment, container counts. This is broken down by domestic and foreign, which is then specified as breakbulk and containerized.
Available: Billing Office, Port Authority of Guam.

CUMULATIVE INDEX

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