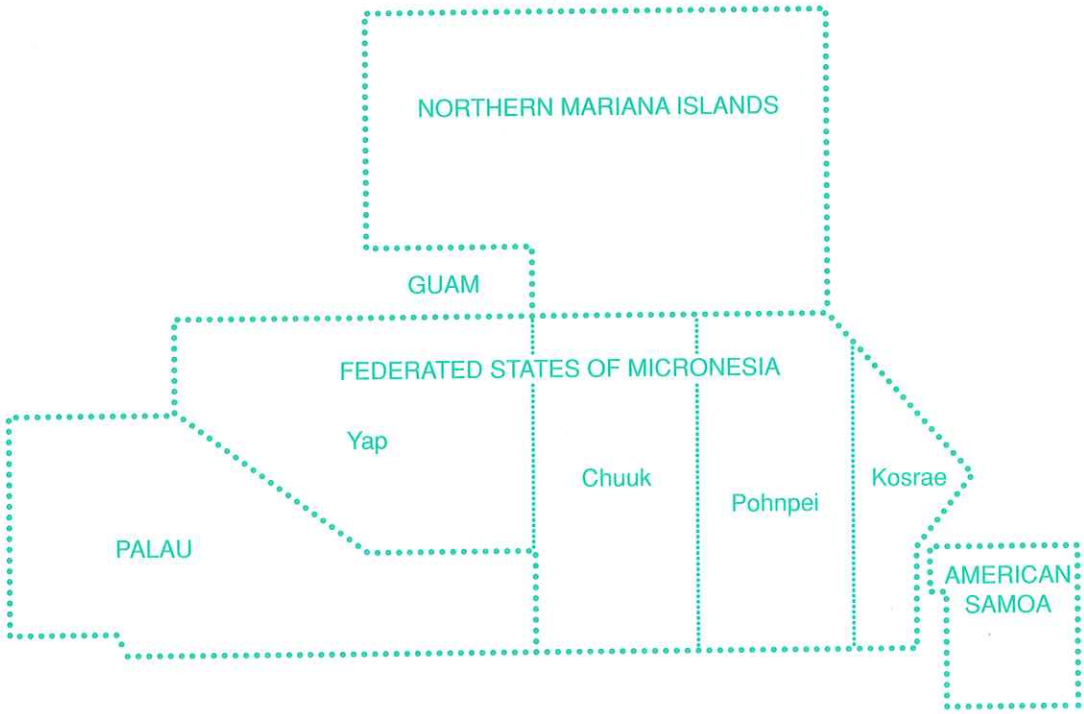
Water Resources Data Hawaii and other Pacific Areas Water Year 1990

Volume 2. Guam, Northern Mariana Islands, Federated States of Micronesia, Palau, and American Samoa

Water-Data Report HI-90-2



U.S. Department of the Interior
U.S. Geological Survey

Prepared in cooperation with the Governments of Guam, Northern Mariana Islands, Federated States of Micronesia, Palau, American Samoa, and with other agencies

CALENDAR FOR WATER YEAR 1990

1989

OCTOBER

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1990

JANUARY

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SEPTEMBER

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23	24	25	26	27	28	29
30						

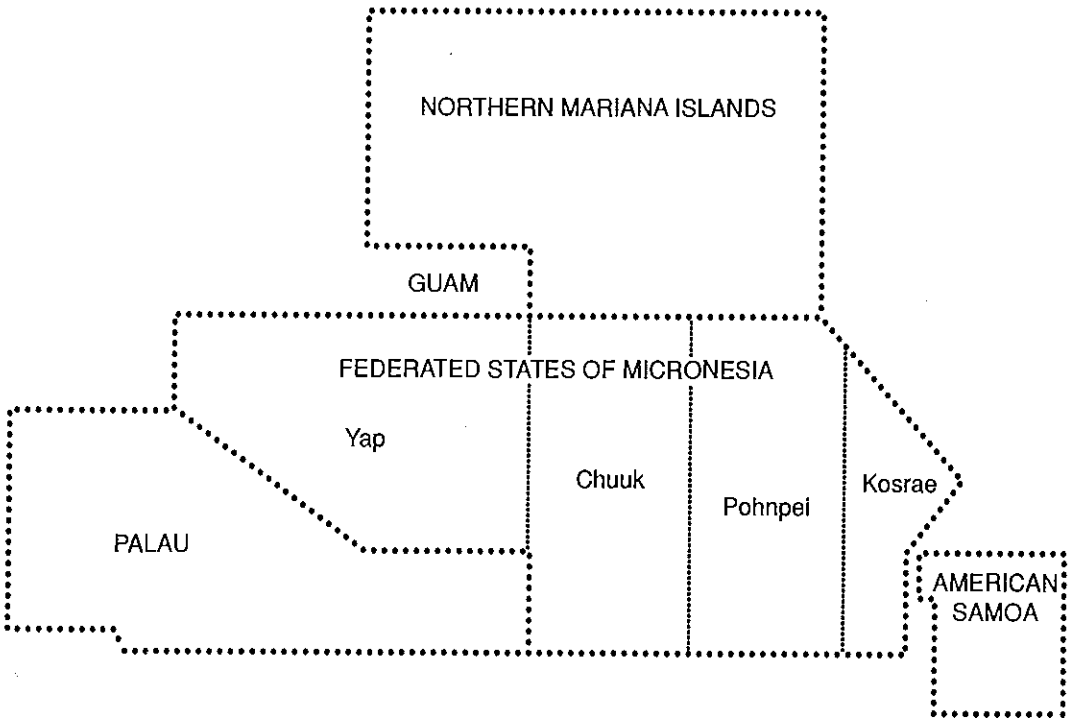
U.S. Department of the Interior
U.S. Geological Survey

Water Resources Data Hawaii and other Pacific Areas Water Year 1990

Volume 2. Guam, Northern Mariana Islands, Federated States of Micronesia, Palau, and American Samoa

By B.R. Hill and R.A. Fontaine

Water-Data Report HI-90-2



Prepared in cooperation with the Governments of Guam, Northern Mariana Islands, Federated States of Micronesia, Palau, American Samoa, and other agencies

UNITED STATES DEPARTMENT OF THE INTERIOR

BRUCE BABBITT, Secretary

U.S. GEOLOGICAL SURVEY

Charles G. Groat, Director

Prepared in cooperation with the
State, Territorial, and Federal agencies in the Pacific areas
as listed under cooperation

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Honolulu, Hawaii 96813

2000

PREFACE

This volume of the annual hydrologic data report of Hawaii and other Pacific Areas is one of a series of annual reports that document hydrologic data gathered from the U.S. Geological Survey's surface- and ground-water data-collection networks in each State, Puerto Rico, American Virgin Islands, selected islands in the Caribbean, Commonwealth of the Northern Mariana Islands, Guam, American Samoa, Republic of Palau, and selected islands in the Pacific. These records of streamflow, ground-water levels, and quality of water provide the hydrologic information needed by State, local, and Federal agencies, and the private sector for developing and managing our Nation's land and water resources. Hydrologic data for Hawaii and other Pacific Areas are contained in two volumes:

Volume 1. Hawaii
Volume 2. Guam, Northern Mariana Islands, Federated States of Micronesia, Palau, and American Samoa.

This report is the culmination of a concerted effort by personnel of the U.S. Geological Survey who collected, compiled, analyzed, verified, and organized the data, and who typed, edited, and assembled the report. In addition to the authors, who have primary responsibility for assuring that the information contained herein is accurate, complete, and adheres to U.S. Geological Survey policy and established guidelines, the Hawaii District water-quality and ground-water discipline specialists (Stephen Anthony and Stephen Gingerich) reviewed and verified the water-quality and ground-water data, and the following individuals contributed significantly to the collection, processing, and tabulation of the data:

Michael Enright
Gregg N. Ikehara
Thomas G. Kane III
Isao Yamashiro
Wayne Shibata
Roy Taogoshi
Jim Mullen
Luis E. Menoyo
Karen L. Fields-Poasa

Asomuamua Ito (American Samoa)
Frank Taotoai (American Samoa)
Winner Alik (Kosrae)
Rebeto Issac (Palau)
Waltick Panuel (Pohnpei)

This report was prepared in cooperation with the Governments of Guam, Northern Mariana Islands, Federated States of Micronesia, Palau, and American Samoa, and with other local and Federal agencies under the general supervision of Gordon Tribble, District Chief, Hawaii.

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13. ABSTRACT *(Maximum 200 words)*

Water resources data for the 1990 water year for other Pacific areas consist of records of discharge, and water quality of streams and stage of a lake and reservoir; springs; and water levels and quality of water wells.

- Water discharge for 20 gaging stations and stage only for 2 gaging stations.
- Discharge data for 11 low-flow partial-record stations.
- Tide stages for one tide gage station.
- Water-quality data for 3 gaging stations and 41 wells.
- Water levels for 7 observation wells.
- Rainfall data for 10 rainfall stations.

These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating Federal, State, and other local agencies in the Western and South Pacific areas.

14. SUBJECT TERMS
*Pacific area, *Hydrologic data, *Surface water, *Water quality, *Ground water, Gaging stations, Flow rate, Chemical analyses, Sediment, Water temperature, Sampling sites, Water analyses, and Rainfall accumulation.

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CONTENTS

ILLUSTRATIONS

SURFACE-WATER STATIONS, IN DOWNSTREAM ORDER, FOR WHICH RECORDS ARE PUBLISHED IN THIS VOLUME

NOTE.--Data for partial-record and miscellaneous sites are published in separate sections of the data report. See references at the end of this list of page numbers for these sections.

Letters after station name designate type of data: (d) discharge, (e) stage or gage height, (t) water temperature, and (c) chemical.

TIDE GAGE STATIONS FOR WHICH TIDE STAGE RECORDS ARE PUBLISHED

Letters after station name designate type of data:
(f) tide stage

GROUND-WATER STATIONS FOR WHICH WATER-LEVEL AND WATER-QUALITY RECORDS ARE PUBLISHED IN THIS VOLUME

Letters after station name designate type of data: (c) chemical, (t) water temperature, and (w) water level.

RAINFALL STATIONS FOR WHICH RECORDS ARE PUBLISHED IN THIS VOLUME

Letters after station name designate type of data: (r) recording, and (n) non-recording.

Volume 2

INTRODUCTION

Water resources data for the 1990 water year for Hawaii and other Pacific areas consist of records of stage, discharge, and water quality of streams, springs, lake, and reservoirs; water levels and water quality of wells; and rainfall. This report contains discharge records for 20 gaging stations; stage only records for 2 gaging stations; water quality for 3 gaging stations and 41 wells; water levels for 7 observation wells; and tide stages for one tide gage station. Also included are data for 11 low-flow partial-record stations and 10 accumulated rainfall stations. These data represent that part of the National Water Data System operated by the U.S. Geological Survey (USGS), in cooperation with State, Territorial, and Federal agencies in the Pacific areas.

Through September 30, 1960 (June 30, 1960, for Hawaii and other Pacific Areas), the records of discharge (or stage) of streams, and contents (or stage) of lakes and reservoirs were first published in an annual series of U.S. Geological Survey Water-Supply Papers under the title "Surface-Water Supply of Hawaii." Records for other Pacific areas were contained in one volume entitled, "Surface Water Supply of Mariana, Caroline, and Samoa Islands." For the 1961 through 1970 water years, the data were published in two 5-year reports. Data on chemical quality, temperature, and suspended sediment for the 1941 through 1970 water years were published annually under the title "Quality of Surface Waters of the United States," and water levels for the 1935 through 1974 water years were published under the title "Ground-Water Levels in the United States." These Water-Supply Papers may be consulted in the libraries of the principal cities in the United States, or if not out of print, may be purchased from the U.S. Geological Survey, Branch of Information Services, Box 25286, Denver, Colorado 80225-0286. For further ordering information, telephone (888) 275-8747.

Beginning with the 1961 water year (fiscal year for Hawaii) and continuing through water year 1974, streamflow data have been released by the USGS in annual reports on a state-boundary basis. Water-quality records beginning with the 1964 water year, and ground-water data since the 1971 water year have been similarly released either in separate reports or in conjunction with streamflow records.

Publications similar to this report are published annually by the U.S. Geological Survey for all states. These official Survey reports have an identification number consisting of the two-letter State abbreviation, the last two digits of the water year, and the volume number. For example, this report is identified as "U.S. Geological Survey Water-Data Report HI-90-2." For archiving and general distribution, the reports for 1971–74 water years also are identified as water-data reports. These water-data reports are for sale, in paper copy or in microfiche by the National Technical Information Service, U.S. Department of Commerce, Springfield, VA, 22161. For further ordering information, the Customer Inquires telephone number is (703) 487-4650.

In this volume, the spelling of names, drainage areas, and locations for most stations in Palau, Pohnpei, and Kosrae differ from those used in "Water Resources Data for Hawaii and other Pacific Areas," 1968 to 1980. These were based on 1954 U.S. Army Map Service series W856 maps with a scale of 1:25,000 and 10-meter contours (International spheroid). The revised names and figures were based on the 1981 USGS maps with 1:10,000 scale and 5-meter contours (Clarke spheroid of 1866).

COOPERATION

The U.S. Geological Survey had cooperative agreements for the systematic collection of streamflow records with the Government of Guam since 1953, with the Government of American Samoa since 1957, and with the other Pacific Islands since 1968 (fig. 1). Organizations that supplied data are acknowledged in station descriptions. Organizations that assisted in collecting data through cooperative agreement with the USGS are:

Government of Guam, Joseph F. Ada, Governor.

Government of Northern Mariana Islands, P.P. Tenorio, Governor.

Federated States of Micronesia, J. Haglelgam, President.
State of Pohnpei, Resio Moses, Governor.
State of Kosrae, Yosiwo George, Governor.

Republic of Palau, Ngtratkel Etpison, President.

Government of American Samoa, Peter Coleman, Governor.

Assistance in the form of funds or services was given by the Public Works, U.S. Navy, and the Corps of Engineers, U.S. Army.

SUMMARY OF HYDROLOGIC CONDITIONS

Annual mean streamflow during the 1990 water year was compared with long-term records (the first complete year of data collection through the 1989 water year) collected at five index streamgaging stations. The 1990 water year was relatively wet (in the upper 25 percent of the long-term record) at the Ylig River on Guam, relatively dry (in the lower 25 percent of the long-term record) at the Diongradid River on Babelthuap, Palau, and relatively normal (above 25 percent but below 75 percent of the long-term records) at the Nanpil River on Pohnpei, Federated States of Micronesia, the Melo River, Kosrae, Federated States of Micronesia, and at Aasu Stream, Tutuila, American Samoa.

Monthly mean streamflows at the Ylig River were above the long-term median monthly values for all months except June, and were in the upper 25 percent of the long-term record for October, January, August, and September (fig. 2). Annual mean runoff was 127 percent of the long-term median annual runoff. Typhoon Karyn passed over Guam and the Northern Mariana Islands on January 14, 1990. Typhoon Forrest passed over Saipan in the Northern Mariana Islands on October 24-25, 1989, but did not directly affect Guam.

Monthly mean streamflows at the Diongradid River were below the long-term median monthly values for all months except November and June (fig. 2). Monthly mean streamflows were in the lower 25 percent of the long-term record in December, January, February, May, and August. Annual mean runoff was 63 percent of the long-term median annual runoff. Typhoon Percy passed over Babelthuap June 24-26, 1990.

Monthly mean streamflows at the Nanpil River were quite variable (fig. 3). Monthly means were in the upper 25 percent of the long-term record in October, December, and September, and in the lower 25 percent of the long-term record in November, February, April, and July. Annual mean runoff was 101 percent of the long-term median annual runoff.

Monthly mean streamflows at the Melo River were mostly within the middle 50 percent of the long-term record (fig. 4). However, the monthly mean for November was in the upper 25 percent and the monthly mean for February was in the lower 25 percent of the long-term record. Annual mean runoff was 98 percent of the long-term median annual runoff.

Monthly mean streamflows at Aasu Stream were in the upper 25 percent of the long-term record in November and February and in the lower 25 percent of the long-term record in October (fig. 4). During the rest of the year, monthly mean streamflows were in the middle 50 percent of the long-term record. Annual mean runoff was 102 percent of the long-term median annual runoff. Cyclone Ofa passed over Tutuila in February 1990.

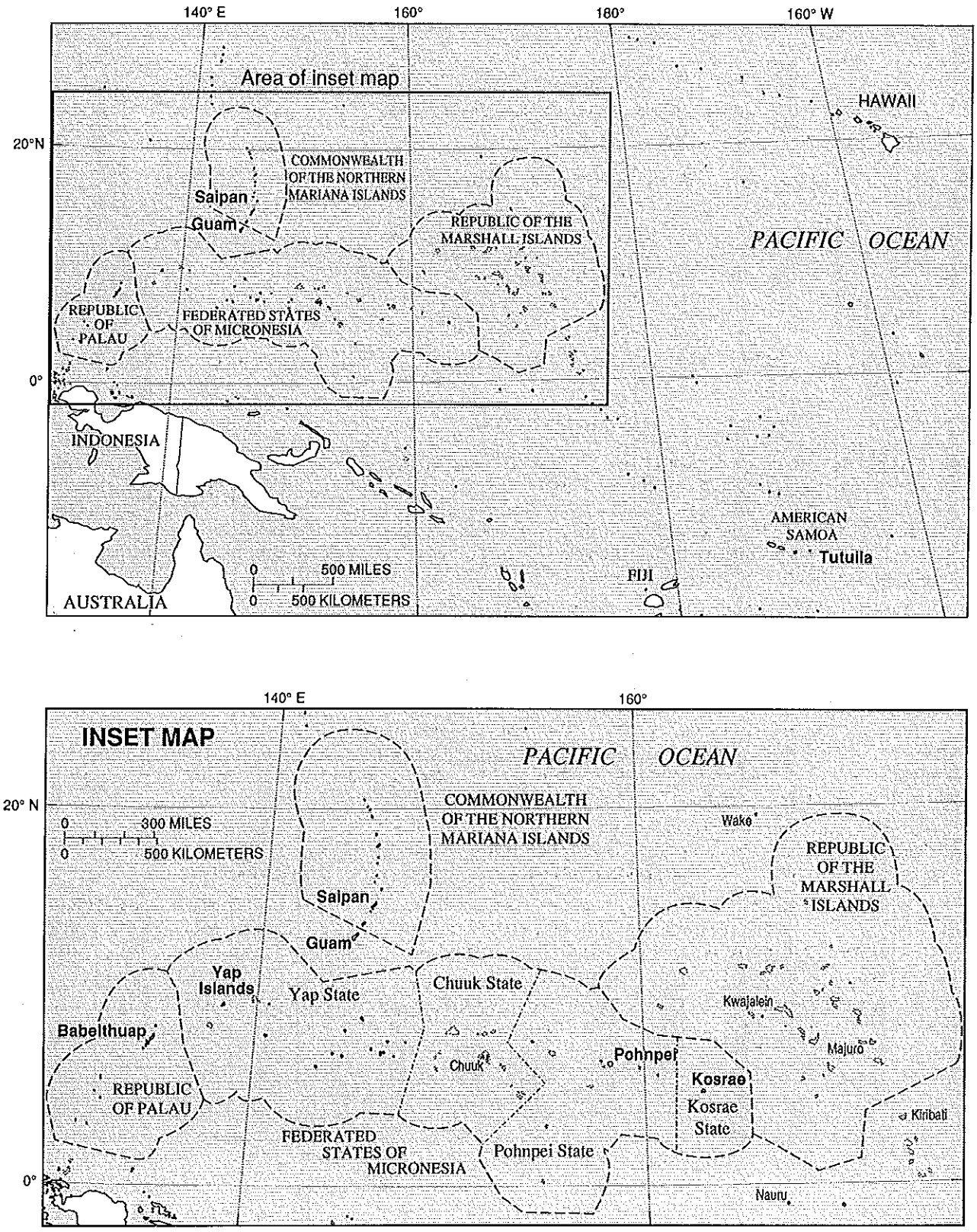


Figure 1. Locations of Western Pacific Islands.

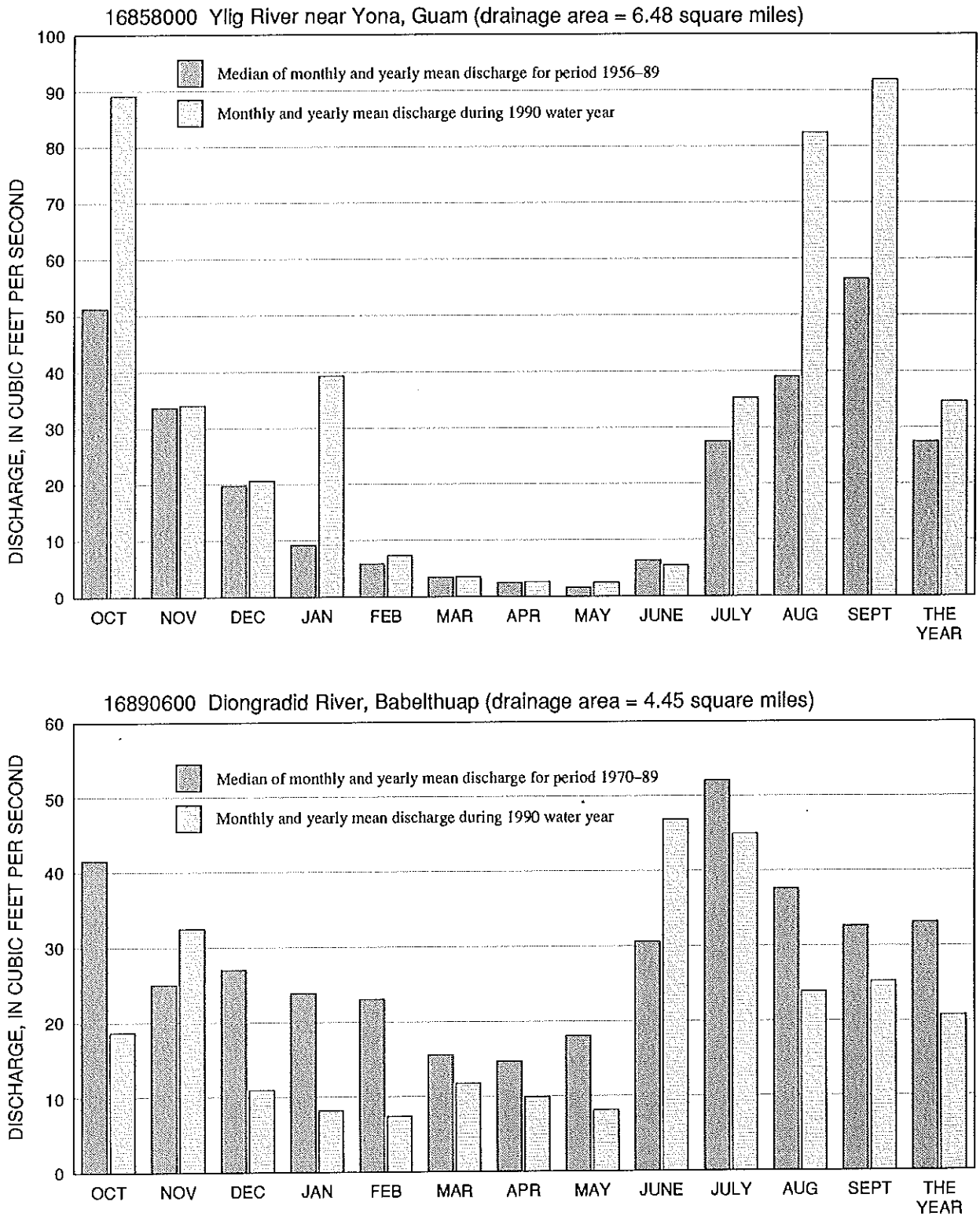


Figure 2. Discharge during 1990 water year compared with median discharge for representative streams on Guam and Babelthuap.

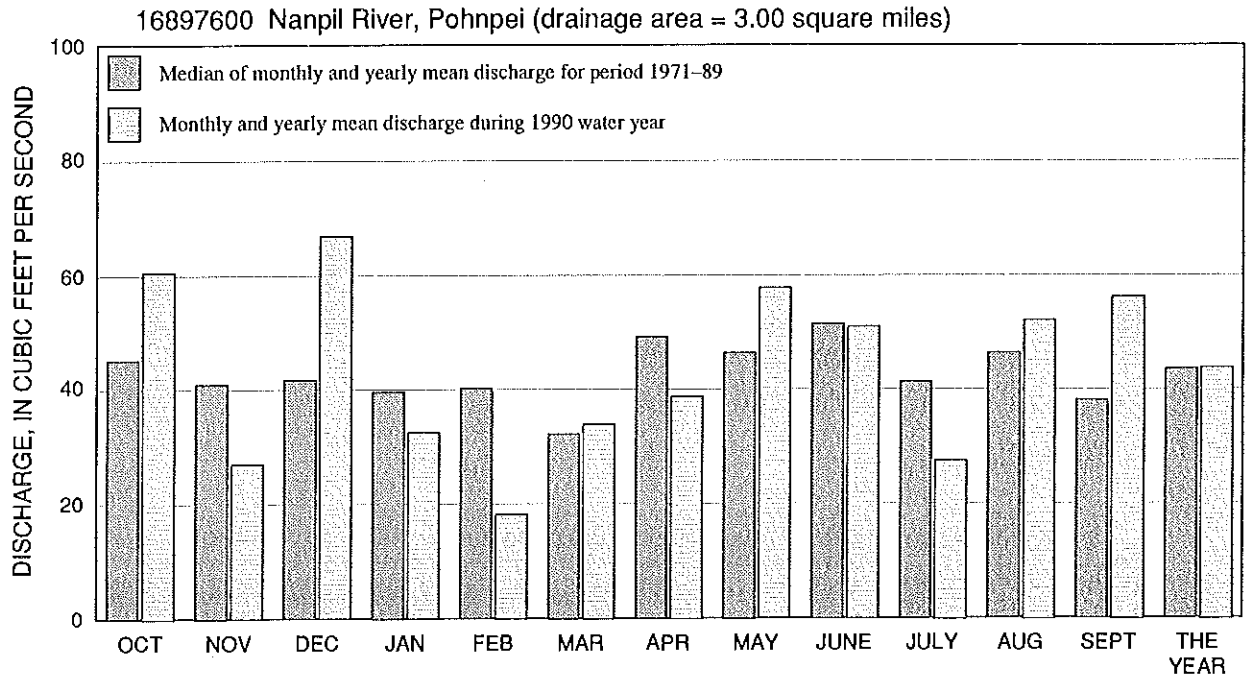


Figure 3. Discharge during 1990 water year compared with median discharge for a representative stream on Pohnpei.

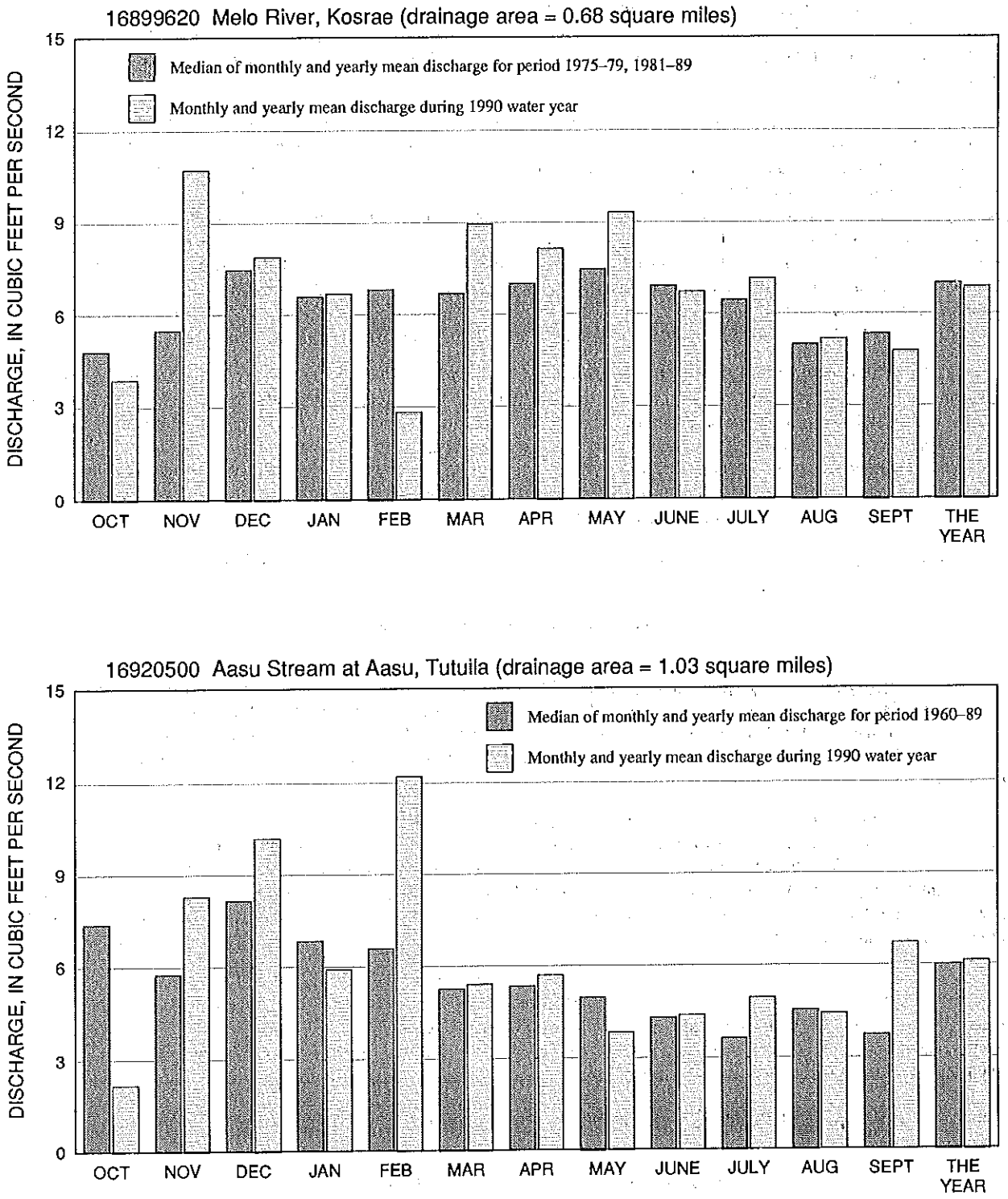


Figure 4. Discharge during 1990 water year compared with median discharge for representative streams on Kosrae and Tutuila.

SPECIAL NETWORKS AND PROGRAMS

Hydrologic Benchmark Network is a network of 50 sites in small drainage basins around the country whose purpose is to provide consistent data on the hydrology, including water quality, and related factors in representative undeveloped watersheds nationwide, and to provide analyses on a continuing basis to compare and contrast conditions observed in basins more obviously affected by human activities.

National Stream-Quality Accounting Network (NASQAN) monitors the water quality of large rivers within four of the Nation's largest river basins--the Mississippi, Columbia, Colorado, and Rio Grande. The network consists of 39 stations. Samples are collected with sufficient frequency that the flux of a wide range of constituents can be estimated. The objective of NASQAN is to characterize the water quality of these large rivers by measuring concentration and mass transport of a wide range of dissolved and suspended constituents, including nutrients, major ions, dissolved and sediment-bound heavy metals, common pesticides, and inorganic and organic forms of carbon. This information will be used (1) to describe the long-term trends and changes in concentration and transport of these constituents; (2) to test findings of the National Water-Quality Assessment Program (NAWQA); (3) to characterize processes unique to large-river systems such as storage and re-mobilization of sediments and associated contaminants; and (4) to refine existing estimates of off-continent transport of water, sediment, and chemicals for assessing human effects on the world's oceans and for determining global cycles of carbon, nutrients, and other chemicals.

The National Atmospheric Deposition Program/National Trends Network (NADP/NTN) provides continuous measurement and assessment of the chemical climate of precipitation throughout the United States. As the lead federal agency, the USGS works together with over 100 organizations to accomplish the following objectives; (1) Provide a long-term, spatial and temporal record of atmospheric deposition generated from a network of 191 precipitation chemistry monitoring sites. (2) Provide the mechanism to evaluate the effectiveness of the significant reduction in SO2 emissions that began in 1995 as implementation of the Clean Air Act Amendments (CAAA) occurred. (3) Provide the scientific basis and nationwide evaluation mechanism for implementation of the Phase II CAAA emission reductions for SO2 and NOx scheduled to begin in 2000.

Data from the network, as well as information about individual sites, are available through the world wide web at:

http://nadp.nrel.colostate.edu/NADP

The National Water-Quality Assessment (NAWQA) Program of the U.S. Geological Survey is a long-term program with goals to describe the status and trends of water-quality conditions for a large, representative part of the Nation's ground- and surface-water resources; provide an improved understanding of the primary natural and human factors affecting these observed conditions and trends; and provide information that supports development and evaluation of management, regulatory, and monitoring decisions by other agencies.

Assessment activities are being conducted in 53 study units (major watersheds and aquifer systems) that represent a wide range of environmental settings nationwide and that account for a large percentage of the Nation's water use. A wide array of chemical constituents will be measured in ground water, surface water, streambed sediments, and fish tissues. The coordinated application of comparative hydrologic studies at a wide range of spatial and temporal scales will provide information for decision making by water-resources managers and a foundation for aggregation and comparison of findings to address water-quality issues of regional and national interest.

Communication and coordination between USGS personnel and other local, State, and federal interests are critical components of the NAWQA Program. Each study unit has a local liaison committee consisting of representatives from key federal, State, and local water resources agencies, Indian nations, and universities in the study unit. Liaison committees typically meet semiannually to discuss their information needs, monitoring plans and progress, desired information products, and opportunities to collaborate efforts among the agencies.

Additional information about the NAWQA Program is available through the world wide web at:

http://wwwrvares.er.usgs.gov/nawqa/nawqa_home.html

EXPLANATION OF THE RECORDS

The surface-water and ground-water records published in this report are for the 1990 water year that began October 1, 1989, and ended September 30, 1990. A calendar of the water year is provided on the inside of the front cover. The records contain streamflow data, water-quality data for surface water, ground-water, and reservoirs, ground-water level data, and rainfall accumulation data. The locations of the stations and wells where the data were collected are shown in figures 5–12. The following sections of the introductory text are presented to provide users with a more detailed explanation of how the hydrologic data published in this report were collected, analyzed, computed, and arranged for presentation.

Station Identification Numbers

Each data station, whether a streamgage, well, or rain gage, in this report is assigned a unique identification number. This number is unique in that it applies specifically to a given station and to no other. The number usually is assigned when a station is first established and is retained for that station indefinitely. The systems used by the U.S. Geological Survey to assign identification numbers for surface-water stations and for ground-water wells differ, but both are based on geographic location. The "downstream order" system is used for regular surface-water stations and the "latitude-longitude" system is used for wells and, in Hawaii and other Pacific areas, for surface-water stations where only miscellaneous measurements are made, and for rainfall stations.

Downstream Order System

Since October 1, 1950, the order of listing hydrologic-station records in U.S. Geological Survey reports is in a downstream direction along the main stream. All stations on a tributary entering upstream from a mainstream station are listed before that station. A station on a tributary that enters between two mainstream stations is listed between them. A similar order is followed in listing stations on first rank, second rank, and other ranks of tributaries. The rank of any tributary with respect to the stream to which it is immediately tributary is indicated by an indention in the "List of Stations" in the front of this report. Each indention represents one rank. This downstream order and system of indention show which stations are on tributaries between any two stations and the rank of the tributary on which each station is situated.

The station-identification number is assigned according to downstream order. In assigning station numbers, no distinction is made between partial-record stations and other stations; therefore, the station number for a partial-record station indicates downstream-order position in a list made up of both types of stations. Gaps are left in the series of numbers to allow for new stations that may be established; hence, the numbers are not consecutive. The complete 8-digit number for each station, such as 16200000, which appears just to the left of the station name, includes the two-digit number "16" plus the six-digit downstream order number "200000."

Latitude-Longitude System

The identification numbers for wells, miscellaneous surface-water sites, and rainfall stations are assigned according to the grid system of latitude and longitude. The number consists of 15 digits. The first six digits denote the degrees, minutes, and seconds of latitude, the next seven digits denote degrees, minutes, and seconds of longitude, and the last two digits (assigned sequentially) identify the wells or other sites within a one-second grid. This site-identification number, once assigned, is a pure number, and has no locational significance. In the rare instance where the initial determination of latitude and longitude are found to be in error, the station will retain its initial identification number; however, its true latitude and longitude will be listed in the LOCATION paragraph of the station description (see figure 13).

Local Identifier Well-Numbering System

In addition to the latitude-longitude based site identification number, wells in the Western and South Pacific are assigned local well numbers. Beginning in 1971, the local well-numbering system was restructured to contain seven digits based on a non-arbitrary, unique one-minute grid system. One-minute parallel lines for both latitude and longitude are drawn on the map resulting in one-minute grids. Each grid is designated by a four-digit number. The first two digits represent minutes of latitude for the grid and the second two digits represent minutes of longitude for that grid. This establishes unique minute-grid numbers within each of the islands in the state except for the island of Hawaii where it encompasses an area more than one degree (60 minutes) of latitude and longitude. To establish unique minute-grid numbers for this island, 30 was added to the minutes of latitude in areas less than 19°00″ of latitude, and 60 was added to the minutes of latitude in areas more than 20°00″ of latitude. For the same reason, 30 was added to the minutes of longitude in areas less than 155°00″ of longitude, and 60 was added to the minutes of longitudes more than 156°00″ longitude (see figures 13 and 14).

To distinguish wells within a minute grid, two digits are added following the 4-digit minute-grid numbers with a dash separator. These two-digit numbers are assigned with the oldest well constructed within the grid as 01 and increase chronologically, with few exceptions, to the latest.

Since it is possible for wells on different islands to have the same 6-digit number, another digit distinguishing each of the islands is added in front of the 6-digit number with a dash separator.

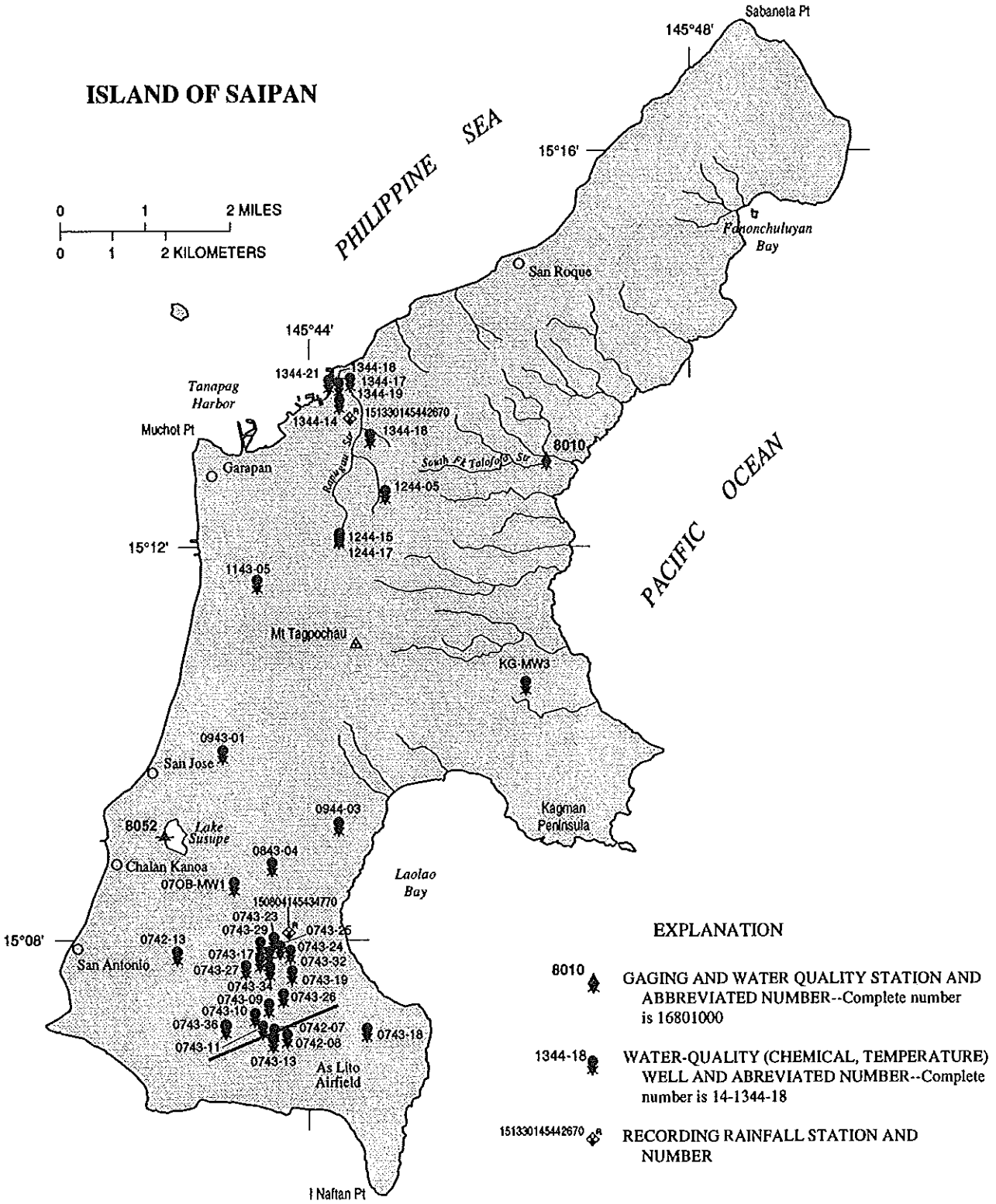


Figure 5. Locations of gaging and rainfall stations, and water-quality sampling sites on Saipan.

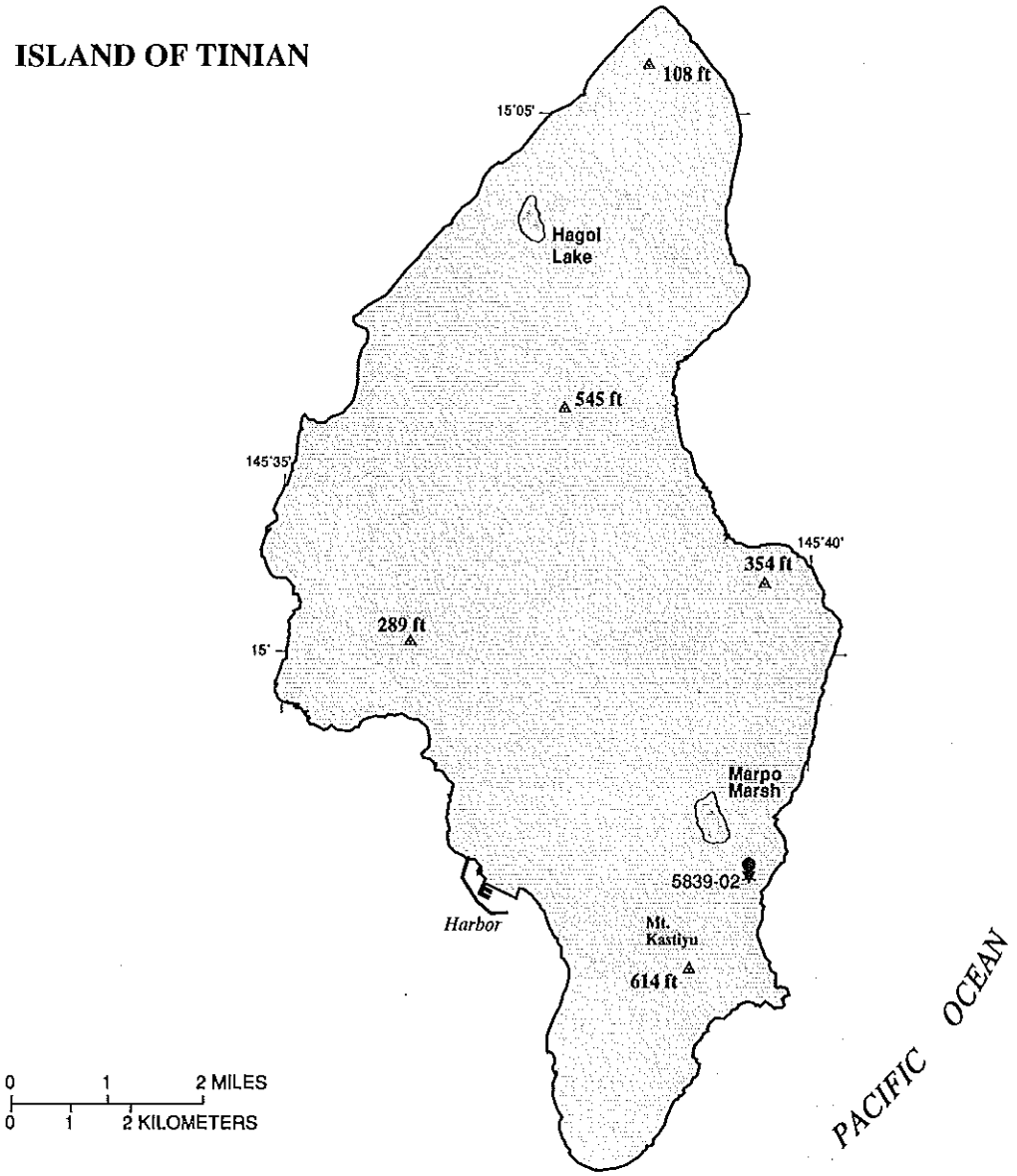


Figure 6. Location of water-quality sampling site on Tinian.

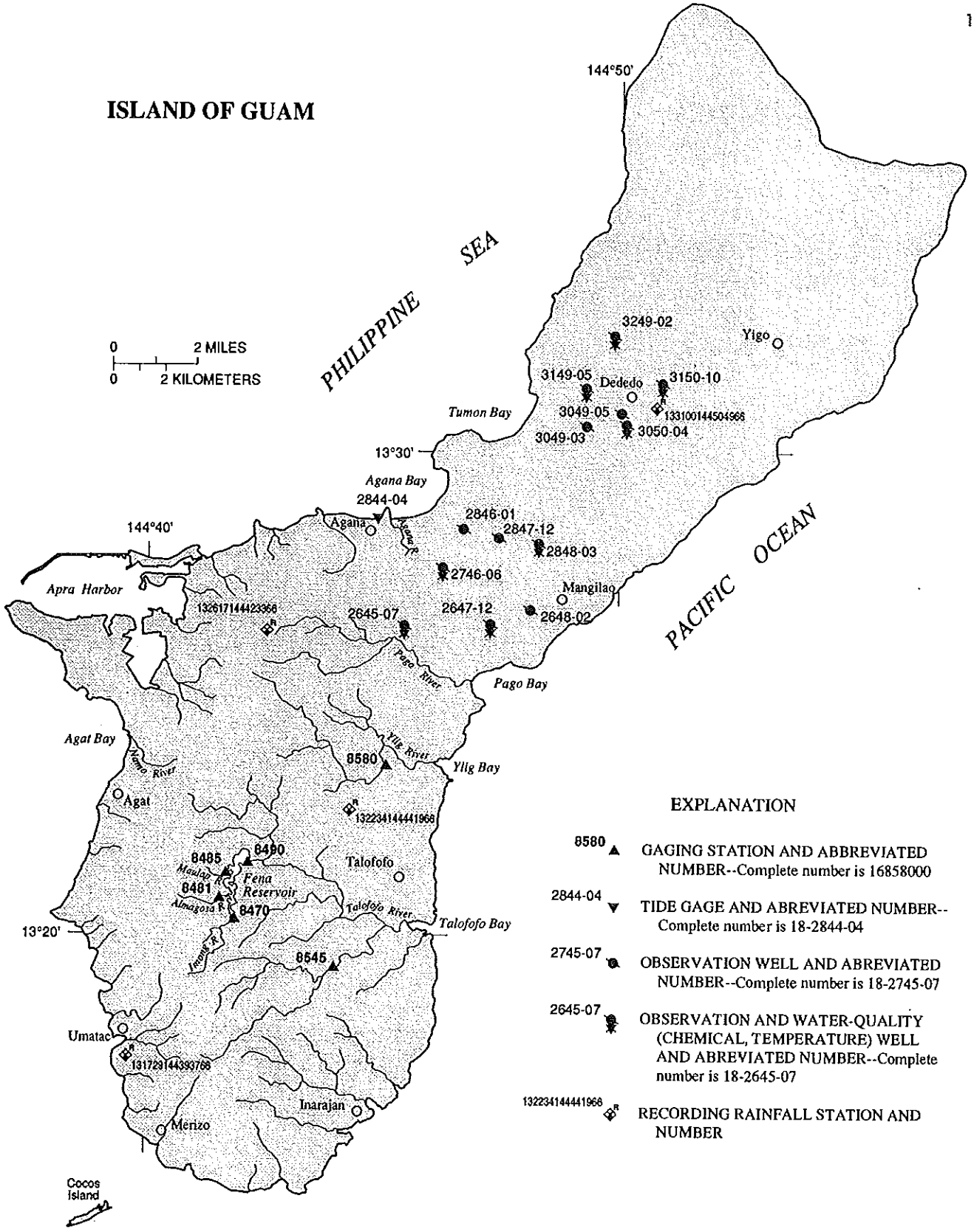


Figure 7. Locations of gaging stations, observation wells, and water-quality sampling sites on Guam.

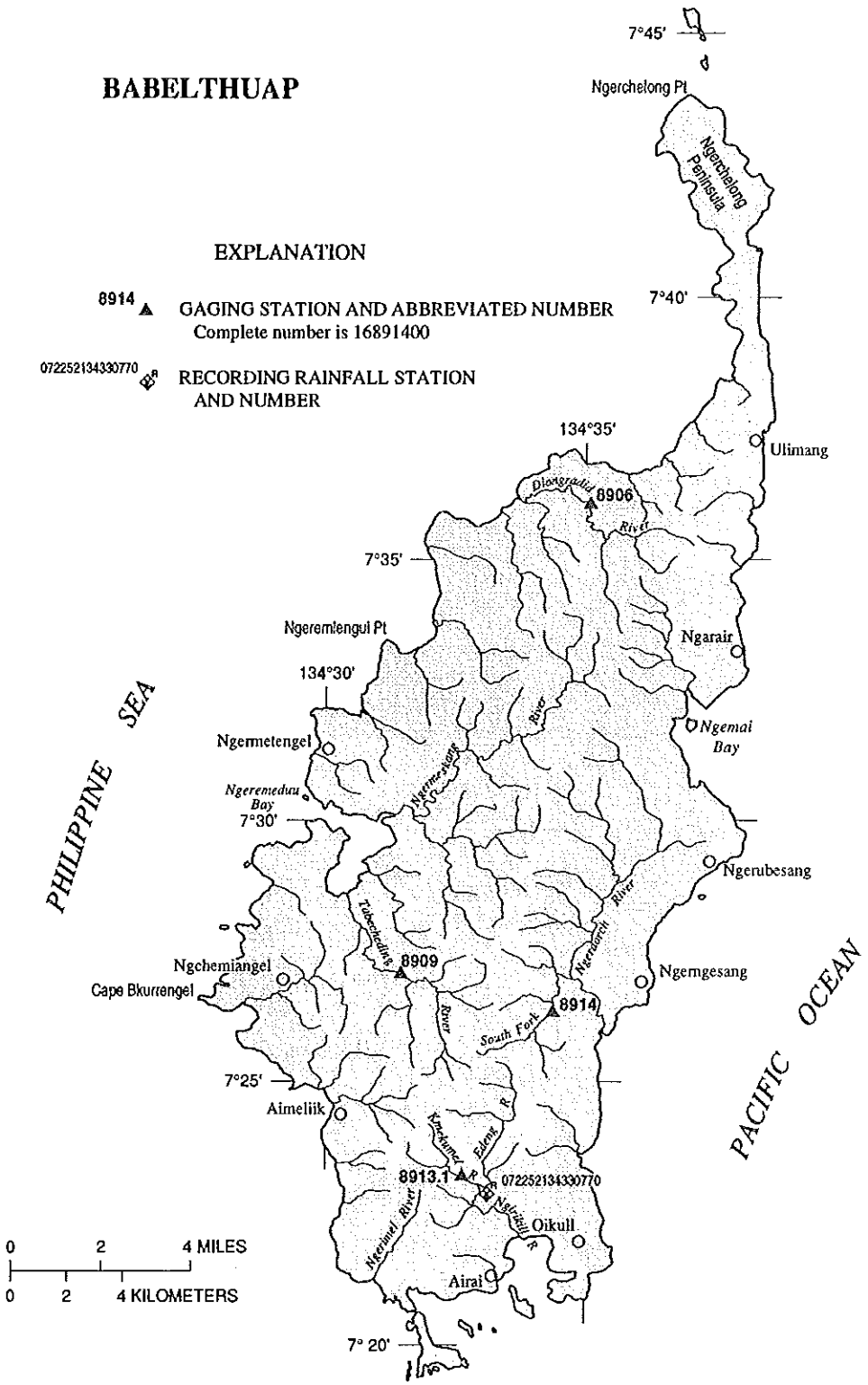


Figure 8. Locations of gaging and rainfall stations on Babelthuap.

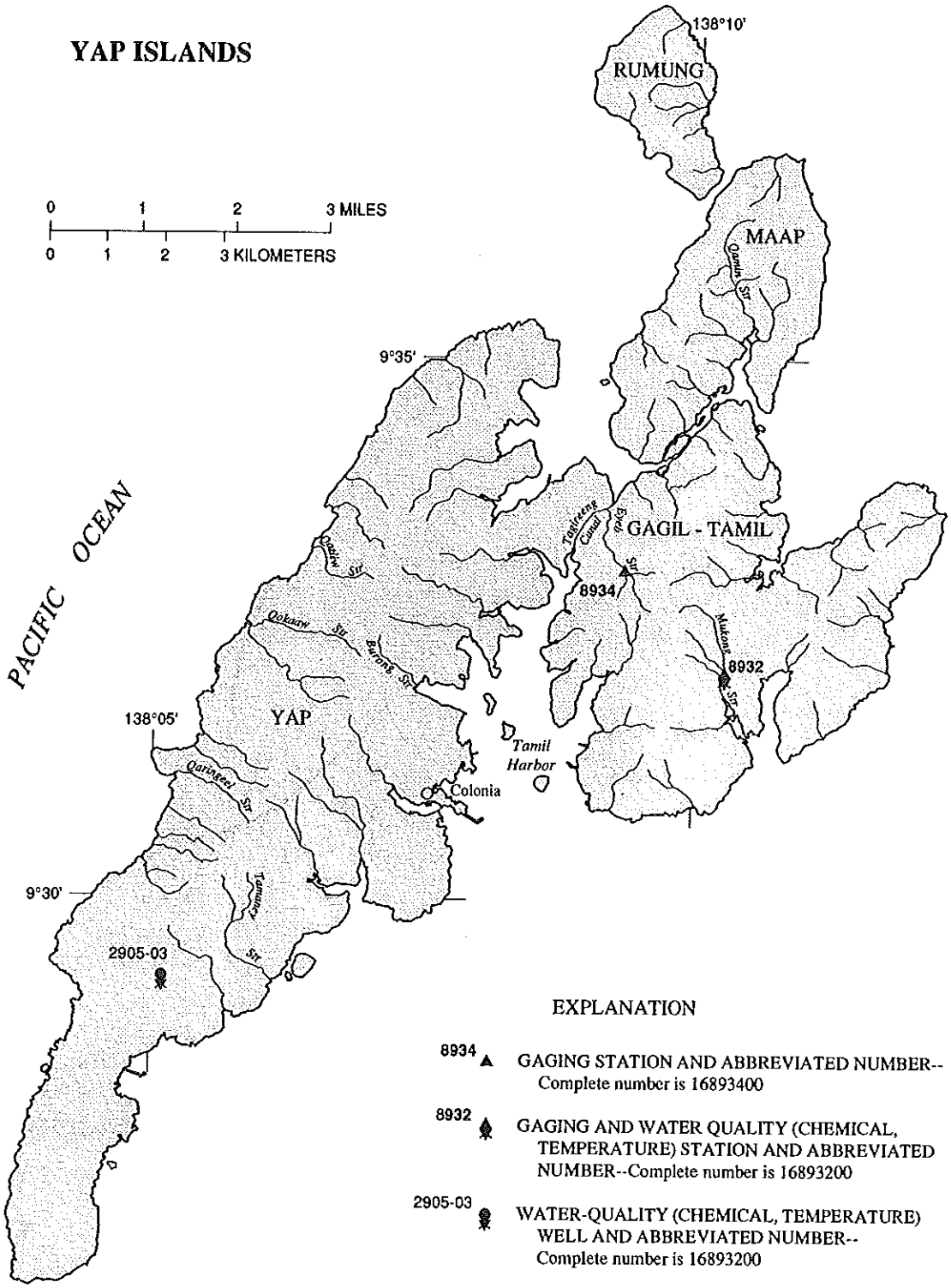


Figure 9. Locations of water-quality sampling sites on Yap Islands.

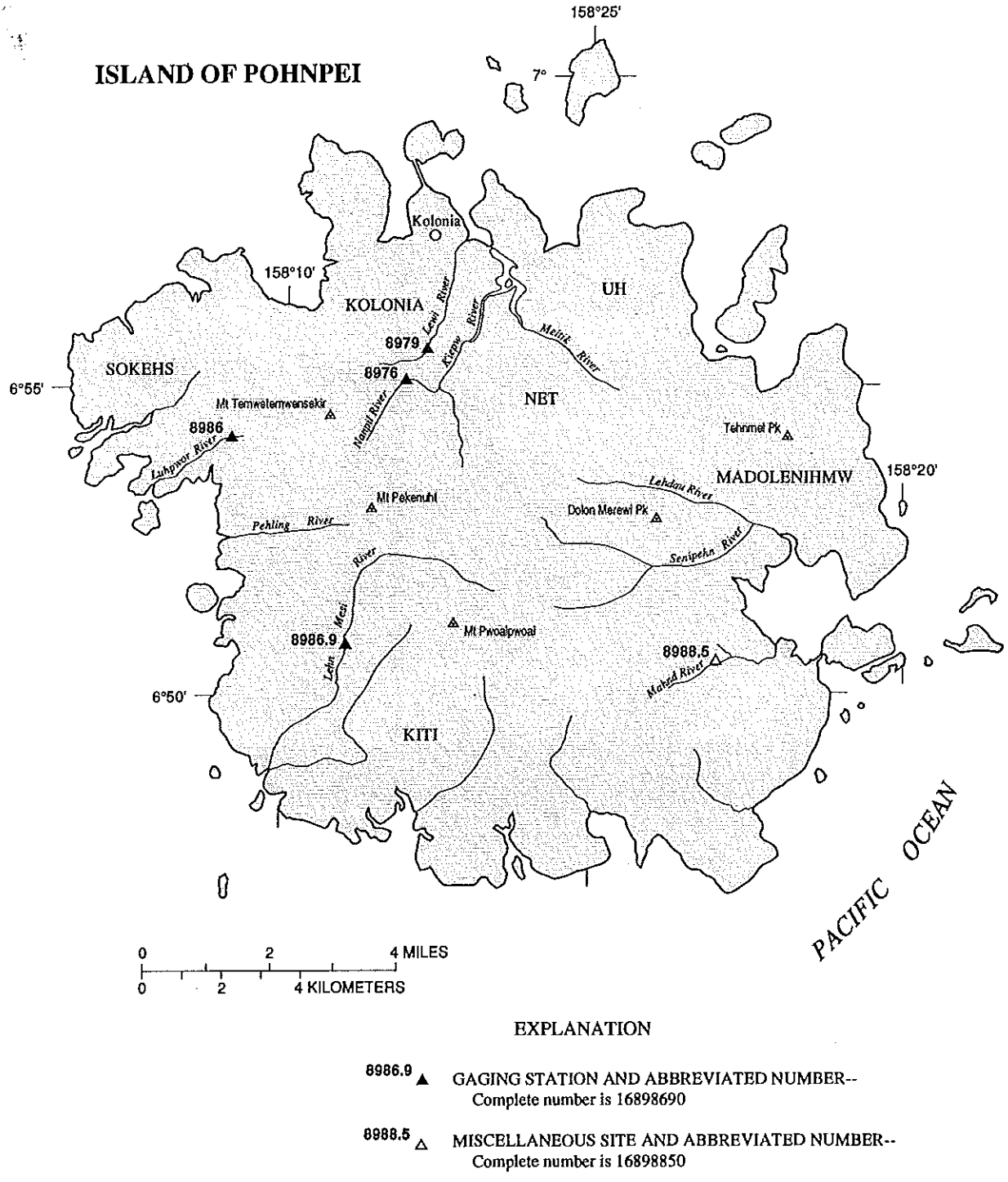


Figure 10. Locations of gaging stations and miscellaneous site on Pohnpei.

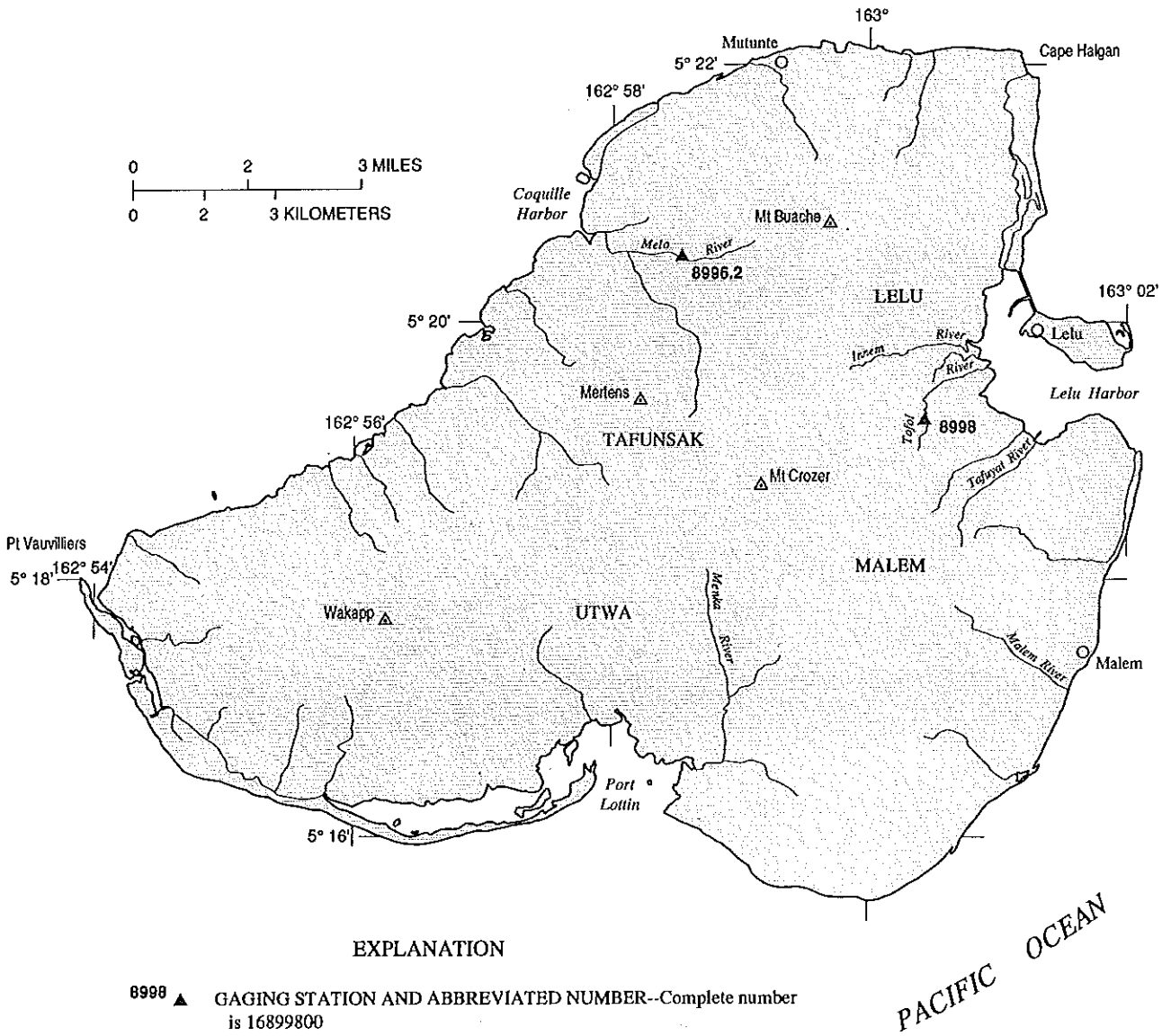


Figure 11. Locations of gaging stations on Kosrae.

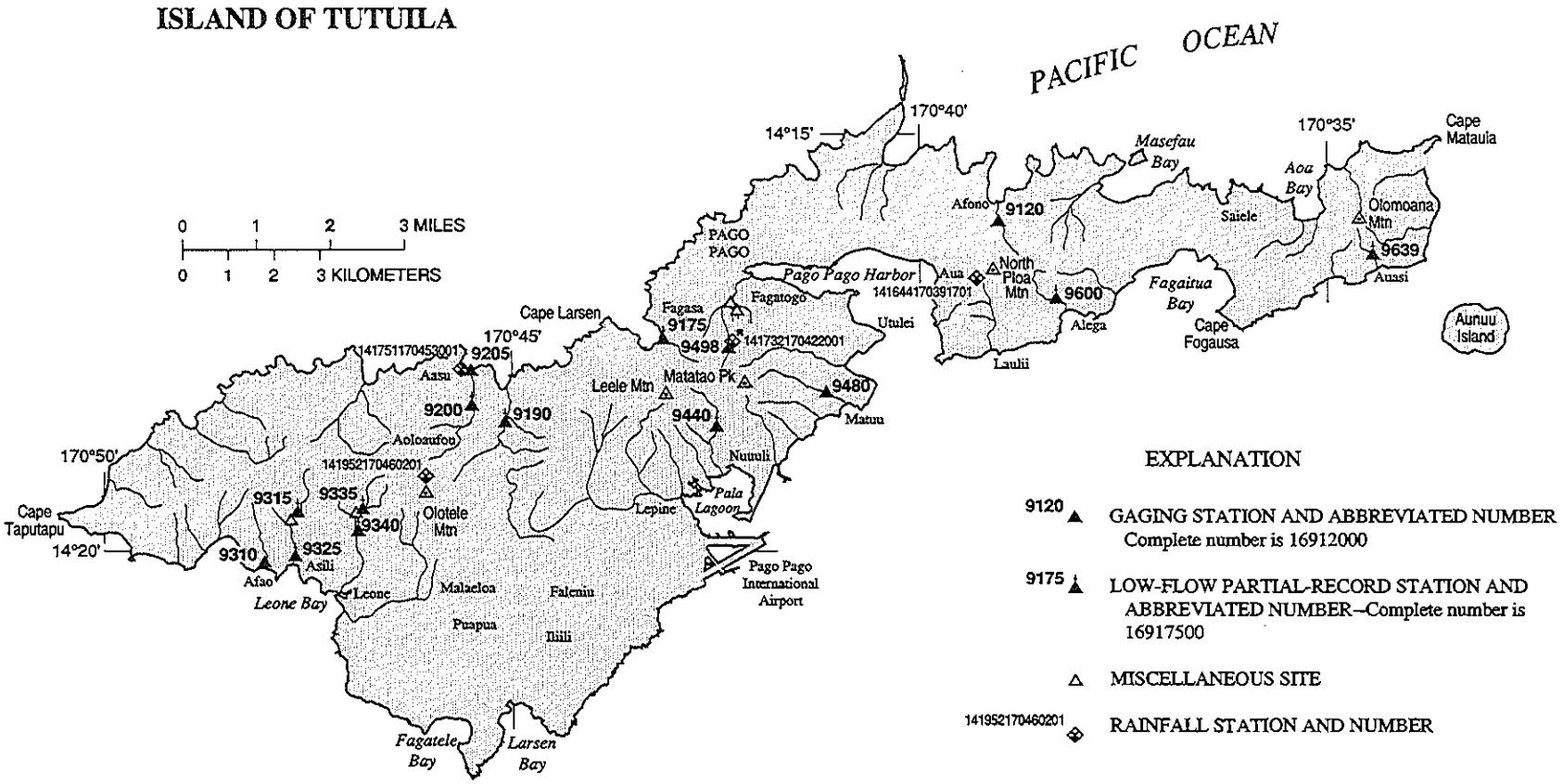


Figure 12. Locations of gaging, rainfall, and low-flow partial-record stations, and water-quality sampling sites on Tutuila.

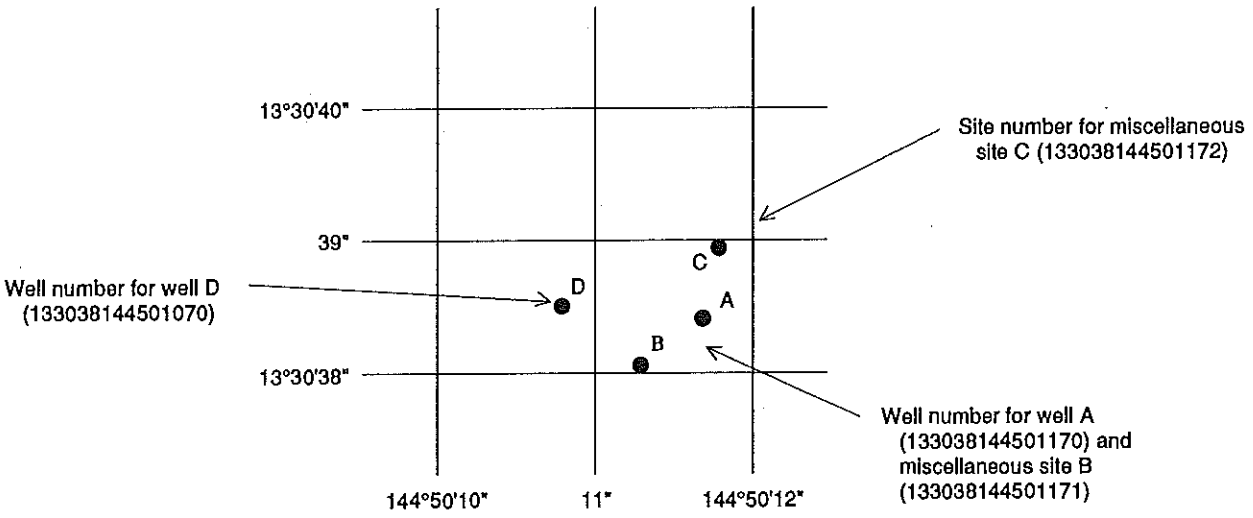


Figure 13. Sketch showing system for numbering wells and miscellaneous sites.

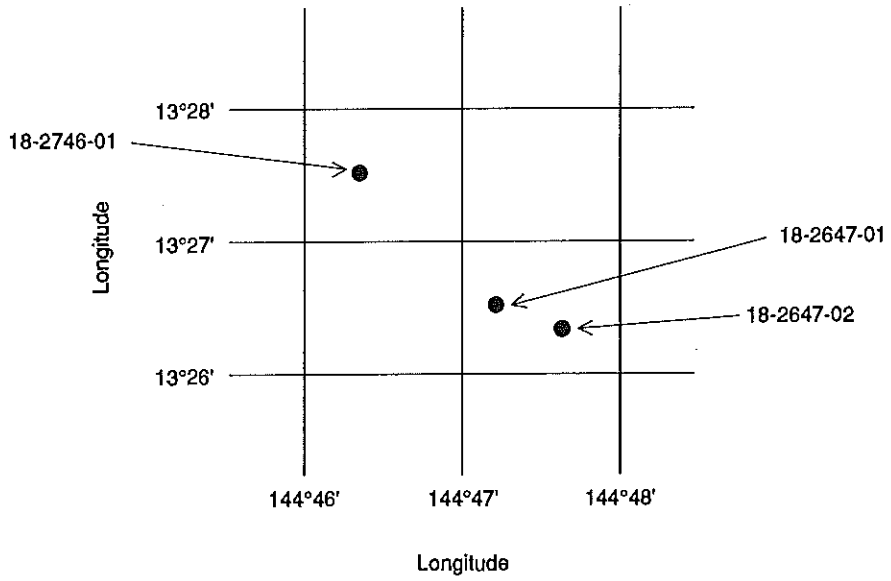


Figure 14. Sketch showing local well-numbering system.

AVERAGE DISCHARGE.--The discharge value given is the arithmetic average of the water-year mean discharges. Average discharge is computed only for stations having at least 5 water years of complete record; water years with incomplete record are not included in the computation. The mean-discharge value that uses all published data may differ from that given in the summary statistics data, which is based only on computer-stored data. The summary data do not include values of monthly or yearly data that were determined by various methods for the series of Water-Supply Papers entitled "Compilation of Records of Surface Water of the United States." The average-discharge value is not computed for stations where diversions, storage or other water-use practices cause the value to be meaningless. If water projects that significantly alter flow at a station are put into use after the station has been in operation for a period of years, the new average is computed as soon as 5 water years of record have accumulated after the project began.

EXTREMES FOR PERIOD OF RECORD.--Extremes may include maximum and minimum stages and maximum and minimum discharges or content. Unless otherwise qualified, the maximum discharge or content is the instantaneous maximum corresponding to the highest stage that occurred. The highest stage may have been obtained from a graphic or digital recorder, a crest-stage gage, or by direct observation of a nonrecording gage. If the maximum stage did not occur on the same day as the maximum discharge or content, it is given separately. Similarly, the minimum is the instantaneous minimum discharge, unless otherwise qualified, and was determined and is reported in the same manner as the maximum.

EXTREMES OUTSIDE PERIOD OF RECORD.--Included here is information concerning major floods or unusually low flows that occurred outside the stated period of record. The information may or may not have been obtained by the U.S. Geological Survey.

EXTREMES FOR CURRENT YEAR.--Extremes given here are similar to those for the period of record, except the peak discharge listing may include secondary peaks. For stations meeting certain criteria, all peak discharges and stages occurring during the water year and greater than a selected base discharge are presented under this heading. The peaks greater than the base discharge, excluding the highest one, are referred to as secondary peaks. Peak discharges are not published for any canals, ditches, drains, or streams for which the peaks are subject to substantial artificial control. The time of occurrence for peaks is expressed in 24-hour local standard time. For example, 12:30 a.m. is 0030, 1:30 p.m. is 1330. The minimum for the current water year appears below the table of peak data.

REVISIONS.--If a critical error in published records is discovered, a revision is included in the first report published following discovery of the error.

Although rare, occasionally the records of a discontinued gaging station may need revision. Because, for these stations, there would be no current or, possibly, future station manuscript published to document the revision in a "Revised Records" entry, users of data for these stations who obtained the record from previously published data reports may wish to contact the District Office (address given on the back of the title page of this report) to determine if the published records were ever revised after the station was discontinued. Of course, if the data were obtained by computer retrieval, the data would be current and there would be no need to check because any published revision of data is always accompanied by revision of the corresponding data in computer storage.

Manuscript information for lake or reservoir stations differs from that for stream stations in the nature of the "Remarks" and in the inclusion of a skeleton stage-capacity table when daily contents are given.

Data Table of Daily Mean Values

The daily table of discharge records for stream-gaging stations gives mean discharge for each day of the water year. In the monthly summary for the table, the line headed "TOTAL" gives the sum of the daily figures for each month. The line headed "MEAN" gives the average flow in cubic feet per second during the month, and the lines headed "MAX" and "MIN" give the maximum and minimum daily mean discharges, respectively, for the month. Discharge for the month also is usually expressed in acre-feet (line headed "AC-FT").

Statistics of Monthly Mean Data

A tabular summary of the mean (line headed "MEAN"), maximum (line headed "MAX"), and minimum (line headed "MIN") of monthly mean flows for each month for a designated period is provided below the mean values table. The water years of the first occurrence of the maximum and minimum monthly flows are provided immediately below those figures. The designated period will be expressed as "FOR WATER YEAR __-__, BY WATER YEAR (WY)," and will list the first and last water years of the range of years selected from the PERIOD OF RECORD paragraph in the station manuscript. It will consist of all of the station record within the specified water years, inclusive, including complete months of record for partial water years, if any, and may coincide with the period of record for the station. The water years for which the statistics are computed will be consecutive, unless a break in the station record is indicated in the manuscript.

Summary Statistics

A table titled "SUMMARY STATISTICS" follows the statistics of monthly mean data tabulation. This table consists of four columns, with the first column containing the line headings of the statistics being reported. The table provides a statistical summary of yearly, daily, and instantaneous flows, not only for the current water year but also for the previous calendar year and for a designated period, as appropriate. The designated period selected, "WATER YEARS __-__," will consist of all of the station record within the specified water years, inclusive, including months of record for partial water years, if any, and may coincide with the period of record for the station. The water years for which the statistics are computed will be consecutive, unless a break in the station record is indicated in the manuscript. All of the calculations for the statistical characteristics designated ANNUAL (See line headings below), except for the "ANNUAL 7-DAY MINIMUM" statistic, are calculated for the designated period using complete water years. The other statistical characteristics may be calculated using partial water years.

The date or water year, as appropriate, of the first occurrence of each statistic reporting extreme values of discharge is provided adjacent to the statistic. Repeated occurrences may be noted in the REMARKS paragraph of the manuscript or in footnotes. Because the designated period may not be the same as the station period of record published in the manuscript, occasionally the dates of occurrence listed for the daily and instantaneous extremes in the designated-period column may not be within the selected water years listed in the headings. When this occurs, it will be noted in the REMARKS paragraph or in footnotes. Selected streamflow duration curve statistics and runoff are also given. Runoff data may be omitted if there is extensive regulation or diversion of flow in the drainage basin.

The following summary statistics data, as appropriate, are provided with each continuous record of discharge. Comments to follow clarify information presented under the various line headings of the summary statistics table.

ANNUAL TOTAL.--The sum of the daily mean values of discharge for the year.

ANNUAL MEAN.--The arithmetic mean of the individual daily mean discharges for the year noted or for the designated period.

HIGHEST ANNUAL MEAN.--The maximum annual mean discharge occurring for the designated period.

LOWEST ANNUAL MEAN.--The minimum annual mean discharge occurring for the designated period.

HIGHEST DAILY MEAN.--The maximum daily mean discharge for the year or for the designated period.

LOWEST DAILY MEAN.--The minimum daily mean discharge for the year or for the designated period.

ANNUAL 7-DAY MINIMUM.--The lowest mean discharge for 7 consecutive days for a calendar year or a water year. Note that most low-flow frequency analyses of annual 7-day minimum flows use a climatic year (April 1 - March 31). The date shown in the summary statistics table is the initial date of the 7-day period. (This value should not be confused with the 7-day 10-year low-flow statistic.)

INSTANTANEOUS PEAK FLOW.--The maximum instantaneous discharge occurring for the water year or for the designated period. Note that secondary instantaneous peak discharges above a selected base discharge are stored in District computer files for stations meeting certain criteria. Those discharge values may be obtained by writing to the District Office. (see address on back title page of this report.)

INSTANTANEOUS PEAK STAGE.--The maximum instantaneous stage occurring for the water year or for the designated period. If the dates of occurrence for the instantaneous peak flow and instantaneous peak stage differ, the REMARKS paragraph in the manuscript or a footnote may be used to provide further information.

INSTANTANEOUS LOW FLOW.--The minimum instantaneous discharge occurring for the water year or for the designated period.

ANNUAL RUNOFF.--Indicates the total quantity of water in runoff for a drainage area for the year. Data reports may use any of the following units of measurement in presenting annual runoff data:

Acre-foot (AC-FT) is the quantity of water required to cover 1 acre to a depth of 1 foot and is equivalent to 43,560 cubic feet or about 326,000 gallons or 1,233 cubic meters.

Cubic feet per second per square mile (CFSM) is the average number of cubic feet of water flowing per second from each square mile area drained, assuming the runoff is distributed uniformly in time and area.

Inches (INCHES) indicates the depth to which the drainage area would be covered if all of the runoff for a given time period were uniformly distributed on it.

10 PERCENT EXCEEDS.--The discharge that has been exceeded 10 percent of the time for the designated period.

50 PERCENT EXCEEDS.--The discharge that has been exceeded 50 percent of the time for the designated period.

90 PERCENT EXCEEDS.--The discharge that has been exceeded 90 percent of the time for the designated period.

HYDROGRAPH.--The hydrograph gives a graphical presentation of the mean discharge for each day of the water year. Where possible, the same scale is used in order to facilitate visual comparison between gaging stations.

Data collected at miscellaneous sites are presented in a table following the information for continuous sites. This table summarizes discharge measurements made at sites other than continuous-record sites.

Water Temperature

Water temperatures are measured at most of the water-quality stations. In addition, water temperatures are frequently taken at the time discharge measurements are made for water-discharge stations. For stations where water temperatures are taken manually once or twice daily, the water temperatures are taken at about the same time each day. Large streams have a small diurnal temperature change; shallow streams may have a daily range of several degrees and may follow closely the changes in air temperature. Some streams may be affected by waste-heat discharges.

At stations where recording instruments are used, maximum, minimum, and mean temperatures for each day are published. Water temperatures measured at the time of water-discharge measurements are on file in the U.S. Geological Survey Hawaii District office.

Sediment

Suspended-sediment concentrations are determined from samples collected by one of the standard techniques discussed in TWRI, Book 3, Chapter C2, "Field methods for measurement of fluvial sediment," 1985 revision. Samples are obtained using standard depth- or point-integrating samplers, or by means of an approved pumping sampler. Mean concentrations for the sampled cross section are in turn determined from these samples.

For stations with daily suspended-sediment records, mean daily suspended-sediment concentrations and loads are computed and published for each day of the water year. During periods of unchanging flow and sediment concentration, daily suspended-sediment loads are computed as the product of daily mean streamflow, daily mean suspended-sediment concentrations, and 0.0027, a conversion factor. During periods of rapidly changing flow or rapidly changing suspended-sediment concentration, samples may have been collected more frequently (twice daily or, in some instances, hourly). The published sediment discharges for days of rapidly changing flow or concentration were computed by the subdivided-day method (time-discharge weighted average). Therefore, for those days when the published sediment discharge value differs from the value computed as the product of discharge times mean concentration times 0.0027, the reader can assume that the sediment discharge for that day was computed by the subdivided-day method. For periods when no samples were collected, daily discharges of suspended sediment were estimated on the basis of water discharge, sediment concentrations observed immediately before and after the periods, and suspended-sediment loads for other periods of similar discharge. Methods used in the computation of sediment records are described in the TWRI Book 3, Chapters C1 and C3. These methods are consistent with ASTM standards and generally follow ISO standards.

At other stations, suspended-sediment samples were collected periodically. Although data collected periodically may represent conditions only at the time of observations, such data are useful in establishing seasonal relations between quality and streamflow in predicting long-term sediment-discharge characteristics of the stream.

In addition to the records of suspended-sediment discharge, periodic measurements of the particle-size distributions for the suspended-sediment, bed-load, and bed-material samples are included for stations where samples were obtained to measure this parameter.

Laboratory Measurements

Sediment samples, samples for indicator bacteria, and daily samples for specific conductance and chloride are analyzed locally. All other samples are analyzed in the U.S. Geological Survey National Water-Quality Laboratory in Arvada, Colorado. Methods used to analyze sediment samples and to compute sediment records are described in the TWRI Book 5, Chapter C1. Methods used by the U.S. Geological Survey laboratories are given in TWRI Book 1, Chapter D2; Book 3, Chapter C2; and Book 5, Chapter A1, A3, A4, and A5. These methods are consistent with ASTM standards and generally follow ISO standards.

In March 1989, the National Water-Quality Laboratory discovered a bias in the turbidimetric method for sulfate analysis, indicating that values below 75 mg/L have a median positive bias of 2 mg/L above the true value for the period between 1982 and 1989. Sulfate values in this report have not been corrected for this bias.

Data Presentation

For continuing-record stations, information pertinent to the history of station operation is provided in descriptive headings preceding the tabular data. These descriptive headings give details regarding location, drainage area, period of record, type of data available, instrumentation, general remarks, cooperation, and extremes for parameters currently measured daily. Tables of chemical, physical, biological, radiochemical data, and so forth, obtained at a frequency less than daily are presented first. Tables of "daily values" of specific conductance, pH, water temperature, dissolved oxygen, and suspended sediment then follow in sequence.

In the descriptive headings, if the location is identical to that of the discharge gaging station, neither the LOCATION nor the DRAINAGE AREA statements are repeated. The following information, as appropriate, is provided with each continuous-record station. Comments that follow clarify information presented under the various headings of the station description.

LOCATION.--See Data Presentation under "Records of Stage and Water Discharge;" same comments apply.

DRAINAGE AREA.--See Data Presentation under "Records of Stage and Water Discharge;" same comments apply.

PERIOD OF RECORD.--This indicates the periods for which there are published water-quality records for the station. The periods are shown separately for records of parameters measured daily or continuously and those measured less than daily. For those measured daily or continuously, periods of record are given for the parameters individually.

INSTRUMENTATION.--Information on instrumentation is given only if a water-quality monitor, sediment pumping sampler, or other sampling device is in operation at a station.

REMARKS.--Remarks provide added information pertinent to the collection, analysis, or computation of the records.

COOPERATION.--Records provided by a cooperating organization or obtained for the Geological Survey by a cooperating organization are identified here.

EXTREMES FOR PERIOD OF RECORD.--Maximums and minimums are given only for parameters measured daily or more frequently. None are given for parameters measured weekly or less frequently, because the true maximums and minimums may not have been sampled. Extremes, when given, are provided for both the period of record and for the current water year.

REVISIONS.--If errors in published water-quality records are discovered after publication, appropriate updates are made to the Water-Quality File in the U.S. Geological Survey's computerized data system, NWIS, and subsequently by monthly transfer of update transactions to the U.S. Environmental Protection Agency's STORET system. Because the usual volume of updates makes it impractical to document individual changes in the State data-report series or elsewhere, potential users of U.S. Geological Survey water-quality data are encouraged to obtain all required data from the appropriate computer file.

The surface-water-quality records for partial-record stations and miscellaneous sampling sites are published in separate tables following the table of discharge measurements at miscellaneous sites. No descriptive statements are given to these records. Each station is published with its own station number and name in the regular downstream-order sequence.

Remark Codes

The following remark codes may appear with the surface-water-quality data in this report:

PRINTED OUTPUT	REMARK
E	Estimated value.
>	Actual value is known to be greater than the value shown.
<	Actual value is known to be less than the value shown.
K	Results based on colony count outside the acceptance range (non-ideal colony count).
L	Biological organism count less than 0.5 percent (organism may be observed rather than counted).
D	Biological organism count equal to or greater than 15 percent (dominant).
V	Analyte was detected in both the environmental sample and the associated blanks
&	Biological organism estimated as dominant.

Dissolved Trace-Element Concentrations

*NOTE.--Traditionally, dissolved trace-element concentrations have been reported at the microgram per liter (µg/L) level. Recent evidence, mostly from large rivers, indicates that actual dissolved-phase concentrations for a number of trace elements are within the range of 10's and 100's of nanograms per liter (ng/L). Data above the µg/L level should be viewed with caution. Such data may actually represent elevated environmental concentrations from natural or human causes; however, these data could reflect contamination introduced during sampling, processing, or analysis. To confidently produce dissolved trace-element data with insignificant contamination, the U.S. Geological Survey began using new trace-element protocols at some stations in water year 1994.

Change in National Trends Network Procedures

*NOTE.--Sample handling procedures at all National Trends Network stations were changed substantially on January 11, 1994, in order to reduce contamination from the sample shipping container. The data for samples before and after that date are different and not directly comparable. A tabular summary of the differences based on a special intercomparison study, is available from the NADP/NTN Coordination Office, Colorado State University, Fort Collins, CO 80532 (Telephone: 303-491-5643).

Records of Ground-Water Levels

Only water-level data from a basic network of observation wells are given in this report. This basic network contains observation wells so located that the most significant data are obtained from the fewest wells in the most important aquifers. Locations of the observation wells listed in this report are shown in figure 7.

Although, in this report, records of water levels are presented for fewer than 100 wells, records are obtained through cooperative efforts of many Federal, State, and local agencies for several thousand observation wells throughout Hawaii and are placed in computer storage, published in reports, or kept in files. Information about the availability of ground-water data may be obtained from the District Chief, Hawaii District, U.S. Geological Survey, 677 Ala Moana Blvd., Suite 415, Honolulu, Hawaii, 96813.

Data Collection and Computation

Measurements of water levels are made in many types of wells, under varying conditions, but the method of measurement are standardized to the extent possible. The equipment and measuring techniques used at each observation well ensure that measurements at each well are of consistent accuracy and reliability.

Most methods for collecting and analyzing water samples are described in the U.S. Geological Survey TWRI publications referred to in the "On-site Measurements and Sample Collection" and the "Laboratory Measurements" sections in this data report. In addition, the TWRI Book 1, Chapter D2, describes guidelines for the collection and field analysis of ground-water samples for selected constituents. The values reported in this report represent water-quality conditions at the time of sampling as much as possible, consistent with available sampling techniques and methods of analysis. These methods are consistent with ASTM standards and generally follow ISO standards. All samples were obtained by trained personnel. The wells sampled were pumped long enough to assure that the water collected came directly from the aquifer and had not stood for a long time in the well casing where it would have been exposed to the atmosphere and to the material, possibly metal, comprising the casings.

Tables of water-level data are presented by islands. The prime identification number for a given well is the 15-digit number that appears in the upper left corner of the table. The secondary identification number is the local well number, a 7-digit number based on the local identifier well-numbering system (page 15).

Water-level records are obtained from direct measurements with a steel or electrical tape or from the graph, digital record, or electronic record of a water-stage recorder. The water-level measurements in this report are given in feet with reference to either mean sea level (msl) or land-surface datum (lsd). Mean sea level is the datum plane on which the national network of precise levels is based; land-surface datum is a datum plane that is approximately at land surface at each well. If known, the altitude of the land-surface datum above mean sea level is given in the well description. The height of the measuring point (MP) above or below land-surface datum is given in each well description. Water levels in wells equipped with recording gages are reported every day. When complete water-level data for a day is not available, the day is noted with three dashes (---).

Water levels are reported to as many significant figures as can be justified by the local conditions. For example, in a measurement of a depth to water of several hundred feet, the error in determining the absolute value of the total depth to water may be a few tenths of a foot, whereas the error in determining the net change of water level between successive measurements may be only a hundredth or a few hundredths of a foot. For lesser depths to water, the accuracy is greater. Accordingly, most measurements are reported to a hundredth of a foot, but some are given only to a tenth of a foot or a larger unit.

Data Presentation

Each well record consists of three parts, the station description, the data table of mean daily water levels observed during the current water year, and a hydrograph of water levels observed during the past 5 years. The description of the well is presented first through use of descriptive headings preceding the tabular data. The comments to follow clarify information presented under the various headings.

LOCATION.--This paragraph follows the well-identification number and reports the latitude and longitude (given in degrees, minutes, and seconds); a landline location designation; the hydrologic unit number; the distance and direction from a geographic point of reference; and the owner's name.

AQUIFER.--This entry designates by name (if a name exists) and geologic age the aquifer(s) open to the well.

WELL CHARACTERISTICS.--This entry describes the well in terms of depth, diameter, casing depth and (or) screened interval, method of construction, use, and additional information such as casing breaks, collapsed screen, and other changes since construction.

INSTRUMENTATION.--This paragraph provides information on both the frequency of measurement and the collection method used, allowing the user to better evaluate the reported water-level extremes by knowing whether they are based on weekly, monthly, or some other frequency of measurement.

DATUM.--This entry describes the land-surface elevation at the well. The elevation of the land-surface datum is described is described in feet above (or below) mean sea level; it is reported with a precision depending on the method of determination.

REMARKS.--This entry describes factors that may influence the water level in a well or the measurement of the water level. It should identify wells that also are water-quality observation wells, and may be used to acknowledge the assistance of local (non-U.S. Geological Survey) observers.

PERIOD OF RECORD.--This entry indicates the period for which there are published records for the well. It reports the month and year of the start of publication of water-level records by the U.S. Geological Survey and the words "to current year" if the records are to be continued into the following year. Periods for which water-level records are available, but are not published by the U.S. Geological Survey, may be noted.

EXTREMES FOR PERIOD OF RECORD.--This entry contains the highest and lowest water levels of the period of published record, with respect to land-surface datum, and the dates of their occurrence.

A table of water levels follows the station description for each well. Water levels are reported in feet above mean sea level and all taped measurements of water levels are listed. For wells equipped with a recorder, only abbreviated tables are published; generally, only water-level lows are listed for every fifth day and at the end of the month (eom). Because all values are not published for wells with recorders, the extremes may be values that are not listed in the table. Missing records are indicated by dashes in place of the water level.

ACCESS TO USGS WATER DATA

The USGS provides near real-time stage and discharge data for many of the gaging stations equipped with the necessary telemetry and historic daily-mean and peak-flow discharge data for most current or discontinued gaging stations through the world wide web (WWW). These data may be accessed at:

http://www.water.usgs.gov

Some water-quality and ground-water data also are available through the WWW. In addition, data can be provided in various machine-readable formats on magnetic tape or 3-1/2 inch floppy disk. Information about the availability of specific types of data or products, and user charges, can be obtained locally from each of the Water Resources Division district offices (see address on the back of the title page).

DEFINITION OF TERMS

Terms related to streamflow, water-quality, and other hydrologic data, as used in this report, are defined below. See also table for converting English units to International System (SI) Units on the inside of the back cover.

Acid neutralizing capacity (ANC) is the equivalent sum of all bases or base-producing materials, solutes plus particulates, in an aqueous system that can be titrated with acid to an equivalence point.

Acre-foot (AC-FT, acre-ft) is the quantity of water required to cover 1 acre to a depth of 1 foot and is equivalent to 43,560 cubic feet or about 326,000 gallons or 1,233 cubic meters.

Adenosine triphosphate (ATP) is an organic, phosphate-rich, compound important in the transfer of energy in organisms. Its central role in living cells makes it an excellent indicator of the presence of living material in water. A measurement of ATP therefore provides a sensitive and rapid estimate of biomass. ATP is reported in micrograms per liter of the original water sample.

Algae are mostly aquatic single-celled, colonial, or multi-celled plants, containing chlorophyll and lacking roots, stems, and leaves.

Algal growth potential (AGP) is the maximum algal dry weight biomass that can be produced in a natural water sample under standardized laboratory conditions. The growth potential is the algal biomass present at stationary phase and is expressed as milligrams dry weight of algae produced per liter of sample.

Alkalinity is the capacity of solutes in an aqueous system to neutralize acid.

Aquifer is a geologic formation, group of formations, or part of a formation that contains sufficient saturated permeable material to yield significant quantities of water to wells and springs.

Artesian means confined and is used to describe a well in which the water level stands above the top of the aquifer tapped by the well. A flowing artesian well is one in which the water level is above the land surface.

Bacteria are microscopic unicellular organisms, typically spherical, rodlike, or spiral and threadlike in shape, often clumped into colonies. Some bacteria cause disease, while others perform an essential role in nature in the recycling of materials; for example, by decomposing organic matter into a form available for reuse by plants.

Total coliform bacteria are a particular group of bacteria that are used as indicators of possible sewage pollution. This group includes coliforms that inhabit the intestine of warm-blooded animals and those that inhabit soils. They are characterized as aerobic or facultative anaerobic, gram-negative, nonspore-forming, rod-shaped bacteria which ferment lactose with gas formation within 48 hours at 35°C. In the laboratory these bacteria are defined as all the organisms that produce colonies with a golden-green metallic sheen within 24 hours when incubated at 35° C plus or minus 1.0°C on M-Endo medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Fecal coliform bacteria are bacteria that are present in the intestine or feces of warm-blooded animals. They are often used as indicators of the sanitary quality of the water. In the laboratory they are defined as all organisms that produce blue colonies within 24 hours when incubated at 44.5° C± 0.2° C on M-FC medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Fecal streptococcal bacteria are bacteria found also in the intestine of warm-blooded animals. Their presence in water is considered to verify fecal pollution. They are characterized as Gram-positive, cocci bacteria which are capable of growth in brain-heart infusion broth. In the laboratory they are defined as all the organisms which produce red or pink colonies within 48 hours at 35° C±1.0° C on KF-streptococcus medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Enterococcus bacteria are commonly found in the feces of humans and other warm-blooded animals. Although some strains are ubiquitous and not related to fecal pollution, the presence of enterococci in water is an indication of fecal pollution and the possible presence of enteric pathogens. Enterococcus bacteria are those bacteria which produce pink to red colonies with black or reddish-brown precipitate after incubation at 41° C on mE agar and subsequent transfer to EIA medium. Enterococci include Streptococcus feacalis, Streptococcus feacium, Streptococcus avium, and their variants.

Bedload is the sediment which moves along in essentially continuous contact with the streambed by rolling, sliding, and making brief excursions into the flow a few diameters above the bed.

Bed material is the sediment mixture of which a streambed, lake, pond, reservoir, or estuary bottom is composed.

Benthic invertebrates are invertebrate animals inhabiting the bottoms of lakes, streams, and other water bodies. They are useful as indicators of water quality.

Biochemical oxygen demand (BOD) is a measure of the quantity of dissolved oxygen, in milligrams per liter, necessary for the decomposition of organic matter by micro-organisms, such as bacteria.

Biomass is the amount of living matter present at any given time, expressed as the mass per unit area or volume of habitat.

Ash mass is the mass or amount of residue present after the residue from the dry mass determination has been ashed in a muffle furnace at a temperature of 500°C for 1 hour. The ash mass values of zooplankton and phytoplankton are expressed in g/m^3 (grams per cubic meter), and periphyton and benthic organisms in g/in^2 (grams per square meter).

Dry mass refers to the mass of residue present after drying in an oven at 105°C for zooplankton and periphyton, until the mass remains unchanged. This mass represents the total organic matter, ash and sediment, in the sample. Dry-mass values are expressed in the same units as ash mass.

Organic mass or volatile mass of the living substance is the difference between the dry mass and ash mass and represents the actual mass of the living matter. The organic mass is expressed in the same units as for ash mass and dry mass.

Wet mass is the mass of living matter plus contained water.

Bottom material: See Bed material.

Cells/volume refers to the number of cells of any organism which is counted by using a microscope and grid or counting cell. Many planktonic organisms are multicelled and are counted according to the number of contained cells per sample, usually milliliters (mL) or liters (L).

Cfs-day is the volume of water represented by a flow of 1 cubic foot per second for 24 hours. It is equivalent to 86,400 cubic feet, approximately 1.9835 acre-feet, about 646,000 gallons, or 2,447 cubic meters.

Chemical oxygen demand (COD) is a measure of the chemically oxidizable material in the water and furnishes an approximation of the amount of organic and reducing material present. The determined value may correlate with BOD or with carbonaceous organic pollution from sewage or industrial wastes.

Chlorophyll refers to the green pigments of plants. Chlorophyll *a* and *b* are the two most common green pigments in plants.

Color unit is produced by one milligram per liter of platinum in the form of the chloroplatinate ion. Color is expressed in units of the platinum-cobalt scale.

Contents is the volume of water in a reservoir or lake. Unless otherwise indicated, volume is computed on the basis of a level pool and does not include bank storage.

Continuing-record station is a specified site which meets one or all conditions listed:

1. When chemical samples are collected daily or monthly for 10 or more months during the water year.
2. When water temperature records include observations taken one or more times daily.
3. When sediment discharge records include periods for which sediment loads are computed and are considered to be representative of the runoff for the water year.

Control designates a feature downstream from the gage that determines the stage-discharge relation at the gage. This feature may be a natural constriction of the channel, an artificial structure, or a uniform cross section over a long reach of the channel.

Cubic foot per second (FT3/S, ft^3/s) is the rate of discharge representing a volume of 1 cubic foot passing a given point during 1 second and is equivalent to approximately 7.48 gallons per second or 448.8 gallons per minute.

Discharge is the volume of water (or more broadly, volume of fluid plus suspended sediment), that passes a given point within a given period of time.

Mean discharge (MEAN) is the arithmetic mean of individual daily mean discharges during a specific period.

Instantaneous discharge is the discharge at a particular instant of time.

Annual 7-day minimum is the lowest mean discharge for 7 consecutive days for a calendar year or a water year. Note that most low-flow frequency analyses of annual 7-day minimum flows use a climatic year (April 1-March 31). The date shown in the summary statistics table is the initial date of the 7-day period. (This value should not be confused with the 7-day 10-year low-flow statistic.)

Dissolved refers to that material in a representative water sample which passes through a 0.45 µm membrane filter. This is a convenient operational definition used by Federal agencies that collect water data. Determinations of "dissolved" constituents are made on subsamples of the filtrate.

Dissolved-solids concentration of water is determined either analytically by the "residue-on-evaporation" method, or mathematically by totaling the concentrations of individual constituents reported in a comprehensive chemical analysis. During the analytical determination of dissolved solids, the bicarbonate (generally a major dissolved component of water) is converted to carbonate. Therefore, in the mathematical calculation of dissolved-solids concentration, the bicarbonate value, in milligrams per liter, is multiplied by 0.492 to reflect the change.

Drainage area of a stream at a specific location is that area, measured in a horizontal plane, enclosed by a topographic divide from which direct surface runoff from precipitation normally drains by gravity into the stream above the specified point. Figures of drainage area given herein include all closed basins, or noncontributing areas, within the area unless otherwise specified.

Drainage basin is a part of the surface of the earth that is occupied by a drainage system, which consists of a surface stream or a body of impounded surface water together with all tributary surface streams and bodies of impounded surface water.

Extractable organic halides (EOX) are organic compounds which contain halogen atoms such a chlorine. These organic compounds are semi-volatile and extractable by ethyl acetate from air-dried stream bottom sediments. The ethyl acetate extract is combusted, and the concentration is determined by microcoulometric determination of the halides formed. The concentration is reported as micrograms of chlorine per gram of the dry weight of the stream bottom sediments.

Gage height is the water-surface elevation referred to some arbitrary gage datum. Gage height is often used interchangeably with the more general term "stage," although gage height is more appropriate when used with a reading on a gage.

Gaging station is a particular site on a stream, canal, lake, or reservoir where systematic observations of hydrologic data are obtained.

Hardness of water is a physical-chemical characteristic that is commonly recognized by the increased quantity of soap required to produce lather. It is computed as the sum of equivalents of polyvalent cations and is expressed as the equivalent concentration of calcium carbonate ($CaCO_3$).

High tide is the maximum height reached by each rising tide.

Hydrologic Benchmark Network is a network of 50 sites in small drainage basins around the country whose purpose is to provide consistent data on the hydrology, including water quality, and related factors in representative undeveloped watersheds nationwide, and to provide analyses on a continuing basis to compare and contrast conditions observed in basins more obviously affected by human activities.

Hydrologic unit is a geographic area representing part or all of a surface drainage basin or distinct hydrologic feature as delineated by the Office of Water Data Coordination on the State Hydrologic Unit Maps; each hydrologic unit is identified by an 8-digit number.

Low tide is the minimum height reached by each falling tide.

Micrograms per gram (µg/g) is a unit expressing the concentration of a chemical constituent as the mass (micrograms) of the element per unit mass (gram) of material analyzed.

Micrograms per liter (UG/L, µ g/L) is a unit expressing the concentration of chemical constituents in solution as mass (micrograms) of solute per unit volume (liter) of water. One thousand micrograms per liter is equivalent to one milligram per liter.

Microsiemens per centimeter (µS/cm, US/CM) is a unit expressing the amount of electrical conductivity of a solution as measured between opposite faces of a centimeter cube of solution at a specified temperature. Siemens is the International System of units nomenclature. It is synonymous with mhos and is the reciprocal of resistance in ohms.

Milligrams per liter (MG/L, mg/L) is a unit for expressing the concentration of chemical constituents in solution. Milligrams per liter represents the mass of solute per unit volume (liter) of water. Concentration of suspended sediment also is expressed in mg/L and is based on the mass of dry sediment per liter of water-sediment mixture.

National Geodetic Vertical Datum of 1929 (NGVD of 1929) is a geodetic datum derived from a general adjustment of the first order level nets of both the United States and Canada. It was formerly called "Sea Level Datum of 1929" or "mean sea level" in this series of reports. Although the datum was derived from the average sea level over a period of many years at 26 tide stations along the Atlantic, Gulf of Mexico, and Pacific Coasts, it does not necessarily represent local mean sea level at any particular place.

National Stream-Quality Accounting Network (NASQAN) monitors the water quality of large rivers within four of the Nation's largest river basins--the Mississippi, Columbia, Colorado, and Rio Grande. The network consists of 39 stations. Samples are collected with sufficient frequency that the flux of a wide range of constituents can be estimated. The objective of NASQAN is to characterize the water quality of these large rivers by measuring concentration and mass transport of a wide range of dissolved and suspended constituents, including nutrients, major ions, dissolved and sediment-bound heavy metals, common pesticides, and inorganic and organic forms of carbon. This information will be used (1) to describe the long-term trends and changes in concentration and transport of these constituents; (2) to test findings of the National Water-Quality Assessment Program (NAWQA); (3) to characterize processes unique to large-river systems such as storage and re-mobilization of sediments and associated contaminants; and (4) to refine existing estimates of off-continent transport of water, sediment, and chemicals for assessing human effects on the world's oceans and for determining global cycles of carbon, nutrients, and other chemicals.

The National Atmospheric Deposition Program/ National Trends Network (NADP/NTN) provides continuous measurement and assessment of the chemical climate of precipitation throughout the United States. As the lead federal agency, the USGS works together with over 100 organizations to accomplish the following objectives; (1) Provide a long-term, spatial and temporal record of atmospheric deposition generated from a network of 191 precipitation chemistry monitoring sites. (2) Provide the mechanism to evaluate the effectiveness of the significant reduction in SO2 emissions that began in 1995 as implementation of the Clean Air Act Amendments (CAAA) occurred. (3) Provide the scientific basis and nationwide evaluation mechanism for implementation of the Phase II CAAA emission reductions for SO2 and NOx scheduled to begin in 2000.

The National Water-Quality Assessment (NAWQA) Program of the U.S. Geological Survey is a long-term program with goals to describe the status and trends of water-quality conditions for a large, representative part of the Nation's ground- and surface-water resources; provide an improved understanding of the primary natural and human factors affecting these observed conditions and trends; and provide information that supports development and evaluation of management, regulatory, and monitoring decisions by other agencies.

Organism is any living entity.

Parameter Code is a 5-digit number used in the U.S. Geological Survey computerized data system, National Water Information System (NWIS), to uniquely identify a specific constituent. The codes used in NWIS are the same as those used in the U.S. Environmental Protection Agency data system, STORET. The Environmental Protection Agency assigns and approves all requests for new codes.

Partial-record station is a particular site where limited streamflow and/or water-quality data are collected systematically over a period of years for use in hydrologic analyses.

Particle size is the diameter, in millimeters (mm), of a particle determined by either sieve or sedimentation methods. Sedimentation methods (pipet, bottom-withdrawal tube, visual-accumulation tube) determine fall diameter of particles in either distilled water (chemically dispersed) or in native water (the river water at the time and point of sampling).

Particle-size classification used in this report agrees with the recommendation made by the American Geophysical Union Subcommittee on Sediment Terminology. The classification is as follows:

Classification	Size (mm)	Method of analysis
Clay	0.00024–0.004	Sedimentation
Silt	0.004–0.062	Sedimentation
Sand	0.062–2.0	Sedimentation or sieve
Gravel	2.0–64.0	Sieve

The partial-size distributions given in this report are not necessarily representative of all particles in transport in the stream. Most of the organic matter is removed, and the sample is subjected to mechanical and chemical dispersion before analysis in distilled water. Chemical dispersion is not used for native-water analysis.

Percent composition is a unit for expressing the ratio of a particular part of a sample or population to the total sample or population, in terms of types, numbers, mass, or volume.

Periphyton is the assemblage of microorganisms attached to and living upon submerged solid surfaces. While primarily consisting of algae, they also include bacteria, fungi, protozoa, rotifers, and other small organisms.

Pesticides are chemical compounds used to control undesirable organisms. Major categories of pesticides include insecticides, miticides, fungicides, herbicides, and rodenticides.

Picocurie (PC, pCi) is one trillionth (1×10^{-12}) of the amount of radioactivity represented by a curie (Ci). A curie is the amount of radioactivity that yields 3.7×10^{10} radioactive disintegrations per second. A picocurie yields 2.22 dpm (disintegrations per minute).

Plankton is the community of suspended, floating, or weakly swimming organisms that live in the open water of lakes and rivers.

Phytoplankton is the plant part of the plankton. They are usually microscopic and their movement is subject to the water currents. Phytoplankton growth is dependent upon solar radiation and nutrient substances. Because they are able to incorporate as well as release materials to the surrounding water, the phytoplankton have a profound effect upon the quality of the water. They are the primary food producers in the aquatic environment and are commonly known as algae.

Blue-green algae are a group of phytoplankton organisms having a blue pigment, in addition to the green pigment called chlorophyll. Blue-green algae often cause nuisance conditions in water.

Diatoms are the unicellular or colonial algae having a siliceous shell. Their concentrations are expressed as number of cells per milliliter (cells/mL) of sample.

Green algae have chlorophyll pigments similar in color to those of higher green plants. Some forms produce algae mats or floating "moss" in lakes. Their concentrations are expressed as number of cells per milliliter (cells/mL) of sample.

Zooplankton is the animal part of the plankton. Zooplankton are capable of extensive movements within the water column and are often large enough to be seen with the unaided eye. Zooplankton are secondary consumers feeding upon bacteria, phytoplankton, and detritus. Because they are the grazers in the aquatic environment, the zooplankton are a vital part of the aquatic food web. The zooplankton community is dominated by small crustaceans and rotifers.

Polychlorinated biphenyls (PCB's) are industrial chemicals that are mixtures of chlorinated biphenyl compounds having various percentages of chlorine. They are similar in structure to organochlorine insecticides.

Sea level: In this report "sea level" refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)---a geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called Sea Level Datum of 1929.

Sediment is solid material that originates mostly from disintegrated rocks and is transported by, suspended in, or deposited from water; it includes chemical and biochemical precipitates and decomposed organic material, such as humus. The quantity, characteristics, and cause of the occurrence of sediment in streams are influenced by environmental factors. Some major factors are degree of slope, length of slope, soil characteristics, land usage, and quantity and intensity of precipitation.

Suspended sediment is the sediment that at any given time is maintained in suspension by the upward components of turbulent currents or that exists in suspension as a colloid.

Suspended-sediment concentration is the velocity-weighted concentration of suspended sediment in the sampled zone (from the water surface to a point approximately 0.3 ft above the bed) expressed as milligrams of dry sediment per liter of water-sediment mixture (mg/L). The entire sample is used for the analysis.

Mean concentration is the time-weighted concentration of suspended sediment passing a stream section during a 24-hour day.

Suspended-sediment discharge (tons/day) is the rate at which dry mass of sediment passes a section of a stream or is the quantity of sediment, as measured by dry mass or volume, that passes a section in a given time. It is calculated in units of tons per day as follows:

$$\text{concentration (mg/L)} \times \text{discharge (ft}^3\text{/s)} \times 0.0027.$$

Suspended-sediment load is a general term that refers to material in suspension. It is not synonymous with either discharge or concentration.

Total sediment discharge (tons/day) is the sum of the suspended-sediment discharge and the bed-load discharge. It is the total quantity of sediment, as measured by dry mass or volume, that passes a section during a given time.

Solute is any substance that is dissolved in water.

Specific conductance is a measure of the ability of a water to conduct an electrical current. It is expressed in microsiemens per centimeter at 25°C. Specific conductance is related to the type and concentration of ions in solution and can be used for approximating the dissolved-solids content of the water. Commonly, the concentration of dissolved solids (in milligrams per liter) is from 55 to 75 percent of the specific conductance (in microsiemens). This relation is not constant from stream to stream, and it may vary in the same source with changes in the composition of the water.

Stage-discharge relation is the relation between gage height (stage) and volume of water, per unit of time, flowing in a channel.

Streamflow is the discharge that occurs in a natural channel. Although the term "discharge" can be applied to the flow of a canal, the word "streamflow" uniquely describes the discharge in a surface stream course. The term "streamflow" is more general than "runoff" as streamflow may be applied to discharge whether or not it is affected by diversion or regulation.

Surface area of a lake is that area outlined on the latest USGS topographic map as the boundary of the lake and measured by a planimeter in acres. In localities not covered by topographic maps, the areas are computed from the best maps available at the time planimetered. All areas shown are those for the stage when the planimetered map was made.

Suspended (as used in tables of chemical analyses) refers to the amount (concentration) of undissolved material in a water-sediment mixture. It is associated with the material retained on a 0.45-µm filter.

Suspended, recoverable is the amount of a given constituent that is in solution after the part of a representative water-suspended sediment sample that is retained on a 0.45-µm membrane filter has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances. Complete dissolution of all the particulate matter is not achieved by the digestion treatment and thus the determination represents something less than the "total" amount (that is, less than 95 percent) of the constituent present in the sample. To achieve comparability of analytical data, equivalent digestion procedures are required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

Determinations of "suspended, recoverable" constituents are made either by analyzing portions of the material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total recoverable concentrations of the constituent.

Suspended, total is the total amount of a given constituent in the part of a representative water-suspended sediment sample that is retained on a 0.45-µm membrane filter. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent determined. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to determine when the results should be reported as "suspended, total."

Determinations of "suspended, total" constituents are made either by analyzing portions of the material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total concentrations of the constituent.

Synoptic Studies Short-term investigations of specific water-quality conditions during selected seasonal or hydrologic periods to provide improved spatial resolution for critical water-quality conditions. For the period and conditions sampled, they assess the spatial distribution of selected water-quality conditions in relation to causative factors, such as land use and contaminant sources.

Taxonomy is the division of biology concerned with the classification and naming of organisms. The classification of organisms is based upon a hierarchial scheme beginning with Kingdom and ending with Species at the base. The higher the classification level, the fewer features the organisms have in common. For example, the taxonomy of a particular mayfly, *Hexagenia limbata*, is the following:

Kingdom	Animal
Phylum	Arthropoda
Class	Insecta
Order	Ephemeroptera
Family	Ephemeridae
Genus	*Hexagenia*
Species	*Hexagenia limbata*

Time-weighted average is computed by multiplying the number of days in the sampling period by the concentrations of individual constituents for the corresponding period and dividing the sum of the products by the total number of days. A time-weighted average represents the composition of water that would be contained in a vessel or reservoir that had received equal quantities of water from the stream each day for the year.

Tons per acre-foot indicates the dry mass of dissolved solids in 1 acre-foot of water. It is computed by multiplying the concentration of the constituent, in milligrams per liter, by 0.00136.

Tons per day (T/DAY) is the quantity of a substance in solution or suspension that passes a stream section during a 24-hour period.

Total is the total amount of a given constituent in a representative water-suspended sediment sample, regardless of the constituent's physical or chemical form. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent present in both the dissolved and suspended phases of the sample. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to judge when the results should be reported as "total." (Note that the word "total" does double duty here, indicating both that the sample consists of a water-suspended sediment mixture and that the analytical method determined all of the constituent in the sample).

Total discharge is the total quantity of any individual constituent, as measured by dry mass or volume, that passes through a stream cross-section per unit of time. This term needs to be qualified, such as "total sediment discharge," "total chloride discharge," and so on.

Total, recoverable is the amount of a given constituent that is in solution after a representative water-suspended sediment sample has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances. Complete dissolution of all particulate matter is not achieved by the digestion treatment, and thus the determination represents something less than the "total" amount (that is, less than 95 percent) of the constituent present in the dissolved and suspended phases of the sample. To achieve comparability of analytical data, equivalent digestion procedures are required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

Tritium Network is a network of stations which has been established to provide baseline information on the occurrence of tritium in the Nation's surface waters. In addition to the surface-water stations in the network, tritium data are also obtained at a number of precipitation stations. The purpose of the precipitation stations is to provide an estimate sufficient for hydrologic studies of the tritium input to the United States.

Volatile Organic Compounds (VOCs) are organic compounds that can be isolated from the water phase of a sample by purging the water sample with inert gas, such as helium, and subsequently analyzed by gas chromatography. Many VOCs are man-made chemicals that are used and produced in the manufacture of paints, adhesives, petroleum products, pharmaceuticals, and refrigerants. They are often components of fuels, solvents, hydraulic fluids, paint thinners, and dry cleaning agents commonly used in urban settings. VOC contamination of drinking-water supplies is a human health concern because many are toxic and are known or suspected human carcinogens (U.S. Environmental Protection Agency, 1996).

Water year in U.S. Geological Survey reports dealing with surface-water supply is the 12-month period October 1 through September 30. The water year is designated by the calendar year in which it ends and which includes 9 of the 12 months. Thus, the year ending September 30, 1985, is called the "1985 water year."

WDR is used as an abbreviation for "Water-Data Report" in the REVISED RECORDS paragraph to refer to State annual hydrologic-data reports (WRD was used as an abbreviation for "Water-Resources Data" in reports published prior to 1976).

Weighted average is used in this report to indicate discharge-weighted average. It is computed by multiplying the discharge for a sampling period by the concentrations of individual constituents for the corresponding period and dividing the sum of the products by the sum of the discharges. A discharge-weighted average approximates the composition of water that would be found in a reservoir containing all the water passing a given location during the water year after thorough mixing in the reservoir.

WSP is used as an abbreviation for "Water-Supply Paper" in reference to previously published reports.

PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS

The U.S. Geological Survey publishes a series of manuals describing procedures for planning and conducting specialized work in water-resources investigations. The material is grouped under major subject headings called books and is further divided into sections and chapters. For example, Section A of Book 3 (Applications of Hydraulics) pertains to surface water. The chapter, the unit of publication, is limited to a narrow field of subject matter. This format permits flexibility in revision and publication as the need arises.

The reports listed below are for sale by the U.S. Geological Survey, Branch of Information Services, Box 25286, Federal Center, Denver, Colorado 80225 (authorized agent of the Superintendent of Documents, Government Printing Office). Prepayment is required. Remittance should be sent by check or money order payable to the U.S. Geological Survey. Prices are not included because they are subject to change. Current prices can be obtained by writing to the above address. When ordering or inquiring about prices for any of these publications, please give the title, book number, chapter number, and "U.S. Geological Survey Techniques of Water-Resources Investigations."

Book 1. Collection of Water Data by Direct Measurement

Section D. Water Quality

1-D1. *Water temperature--influential factors, field measurement, and data presentation*, by H.H. Stevens, Jr., J.F. Ficke, and G.F. Smoot: USGS--TWRI Book 1, Chapter D1. 1975. 65 pages.

1-D2. *Guidelines for collection and field analysis of ground-water samples for selected unstable constituents*, by W.W. Wood: USGS--TWRI Book 1, Chapter D2. 1976. 24 pages.

Book 2. Collection of Environmental Data

Section D. Surface Geophysical Methods

2-D1. *Application of surface geophysics to ground-water investigations*, by A.A.R. Zohdy, G.P. Eaton, and D.R. Mabey: USGS--TWRI Book 2, Chapter D1. 1974. 116 pages.

2-D2. *Application of seismic-refraction techniques to hydrologic studies*, by F.P. Haeni: USGS--TWRI Book 2, Chapter D2. 1988. 86 pages.

Section E. Subsurface Geophysical Methods

2-E1. *Application of borehole geophysics to water-resources investigations*, by W.S. Keys and L.M. MacCary: USGS--TWRI Book 2, Chapter E1. 1971. 126 pages.

2-E2. *Borehole geophysics applied to ground-water investigations*, by W.S. Keys: USGS--TWRI Book 2, Chapter E2. 1990. 150 pages.

Section F. Drilling and Sampling Methods

2-F1. *Application of drilling, coring, and sampling techniques to test holes and wells*, by Eugene Shuter and W.E. Teasdale: USGS--TWRI Book 2, Chapter F1. 1989. 97 pages.

Book 3. Applications of Hydraulics

Section A. Surface-Water Techniques

3-A1. *General field and office procedures for indirect discharge measurements*, by M.A. Benson and Tate Dalrymple: USGS--TWRI Book 3, Chapter A1. 1967. 30 pages.

3-A2. *Measurement of peak discharge by the slope-area method*, by Tate Dalrymple and M.A. Benson: USGS--TWRI Book 3, Chapter A2. 1967. 12 pages.

3-A3. *Measurement of peak discharge at culverts by indirect methods*, by G.L. Bodhaine: USGS--TWRI Book 3, Chapter A3. 1968. 60 pages.

3-A4. *Measurement of peak discharge at width contractions by indirect methods*, by H.F. Matthai: USGS-TWRI Book 3, Chapter A4. 1967. 44 pages.

3-A5. *Measurement of peak discharge at dams by indirect methods*, by Harry Hulsing: USGS--TWRI Book 3, Chapter A5. 1967. 29 pages.

PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS--Continued

3-A6. *General procedure for gaging streams*, by R.W. Carter and Jacob Davidian: USGS--TWRI Book 3, Chapter A6. 1968. 13 pages.

3-A7. *Stage measurement at gaging stations*, by T.J. Buchanan and W.P. Somers: USGS--TWRI Book 3, Chapter A7. 1968. 28 pages.

3-A8. *Discharge measurements at gaging stations*, by T.J. Buchanan and W.P. Somers: USGS--TWRI Book 3, Chapter A8. 1969. 65 pages.

3-A9. *Measurement of time of travel in streams by dye tracing*, by F.A. Kilpatrick and J.F. Wilson, Jr.: USGS--TWRI Book 3, Chapter A9. 1989. 27 pages.

3-A10. *Discharge ratings at gaging stations*, by E.J. Kennedy: USGS--TWRI Book 3, Chapter A10. 1984. 59 pages.

3-A11. *Measurement of discharge by the moving-boat method*, by G.F. Smoot and C.E. Novak: USGS--TWRI Book 3, Chapter A11. 1969. 22 pages.

3-A12. *Fluorometric procedures for dye tracing*, Revised, by J.F. Wilson, Jr., E.D. Cobb, and F.A. Kilpatrick: USGS- -TWRI Book 3, Chapter A12. 1986. 34 pages.

3-A13. *Computation of continuous records of streamflow*, by E. J. Kennedy: USGS--TWRI Book 3, Chapter A13. 1983. 53 pages.

3-A14. *Use of flumes in measuring discharge*, by F.A. Kilpatrick and V.R. Schneider: USGS--TWRI Book 3, Chapter A14. 1983. 46 pages.

3-A15. *Computation of water-surface profiles in open channels*, by Jacob Davidian: USGS--TWRI Book 3, Chapter A15. 1984. 48 pages.

3-A16. *Measurement of discharge using tracers*, by F.A. Kilpatrick and E.D. Cobb: USGS--TWRI Book 3, Chapter A16. 1985. 52 pages.

3-A17. *Acoustic velocity meter systems*, by Antonius Laenen: USGS--TWRI Book 3, Chapter A17. 1985. 38 pages.

3-A18. *Determination of stream reaeration coefficients by use of tracers*, by F.A. Kilpatrick, R.E. Rathbun, Nobuhiro Yotsukura, G.W. Parker, and L.L. DeLong: USGS--TWRI Book 3, Chapter A18. 1989. 52 pages.

3-A19. *Levels at streamflow gaging stations*, by E.J. Kennedy: USGS--TWRI Book 3, Chapter A19. 1990. 31 pages.

3-A20. *Simulation of soluble waste transport and buildup in surface waters using tracers*, by F.A. Kilpatrick: USGS--TWRI Book 3, Chapter A20. 1993. 38 pages.

3-A21. *Stream-gaging cableways*, by C. Russell Wagner: USGS--TWRI Book 3, Chapter A21. 1995. 56 pages.

Section B. Ground-Water Techniques

3-B1. *Aquifer-test design, observation, and data analysis*, by R.W. Stallman: USGS--TWRI Book 3, Chapter B1. 1971. 26 pages.

3-B2. *Introduction to ground-water hydraulics, a programed text for self-instruction*, by G.D. Bennett: USGS--TWRI Book 3, Chapter B2. 1976. 172 pages.

3-B3. *Type curves for selected problems of flow to wells in confined aquifers*, by J.E. Reed: USGS--TWRI Book 3, Chapter B3. 1980. 106 pages.

3-B4. *Regression modeling of ground-water flow*, by R.L. Cooley and R.L. Naff: USGS--TWRI Book 3, Chapter B4. 1990. 232 pages.

PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS--Continued

3-B4. *Supplement 1. Regression modeling of ground-water flow - Modifications to the computer code for nonlinear regression solution of steady-state ground-water flow problems*, by R.L. Cooley: USGS--TWRI Book 3, Chapter B4. 1993. 8 pages.

3-B5. *Definition of boundary and initial conditions in the analysis of saturated ground-water flow systems--An introduction*, by O.L. Franke, T.E. Reilly, and G.D. Bennett: USGS--TWRI Book 3, Chapter B5. 1987. 15 pages.

3-B6. *The principle of superposition and its application in ground-water hydraulics*, by T.E. Reilly, O.L. Franke, and G.D. Bennett: USGS--TWRI Book 3, Chapter B6. 1987. 28 pages.

3-B7. *Analytical solutions for one-, two-, and three-dimensional solute transport in ground-water systems with uniform flow*, by E.J. Wexler: USGS--TWRI Book 3, Chapter B7. 1992. 190 pages.

Section C. Sedimentation and Erosion Techniques

3-C1. *Fluvial sediment concepts*, by H.P. Guy: USGS--TWRI Book 3, Chapter C1. 1970. 55 pages.

3-C2. *Field methods for measurement of fluvial sediment*, by H.P. Guy and V.W. Norman: USGS--TWRI Book 3, Chapter C2. 1970. 59 pages.

3-C3. *Computation of fluvial-sediment discharge*, by George Porterfield: USGS--TWRI Book 3, Chapter C3. 1972. 66 pages.

Book 4. Hydrologic Analysis and Interpretation

Section A. Statistical Analysis

4-A1. *Some statistical tools in hydrology*, by H.C. Riggs: USGS--TWRI Book 4, Chapter A1. 1968. 39 pages.

4-A2. *Frequency curves*, by H.C. Riggs: USGS--TWRI Book 4, Chapter A2. 1968. 15 pages.

Section B. Surface Water

4-B1. *Low-flow investigations*, by H.C. Riggs: USGS--TWRI Book 4, Chapter B1. 1972. 18 pages.

4-B2. *Storage analyses for water supply*, by H.C. Riggs and C.H. Hardison: USGS--TWRI Book 4, Chapter B2. 1973. 20 pages.

4-B3. *Regional analyses of streamflow characteristics*, by H.C. Riggs: USGS--TWRI Book 4, Chapter B3. 1973. 15 pages.

Section D. Interrelated Phases of the Hydrologic Cycle

4-D1. *Computation of rate and volume of stream depletion by wells*, by C.T. Jenkins: USGS--TWRI Book 4, Chapter D1. 1970. 17 pages.

Book 5. Laboratory Analysis

Section A. Water Analysis

5-A1. *Methods for determination of inorganic substances in water and fluvial sediments*, by M.J. Fishman and L.C. Friedman, editors: USGS--TWRI Book 5, Chapter A1. 1989. 545 pages.

5-A2. *Determination of minor elements in water by emission spectroscopy*, by P.R. Barnett and E.C. Mallory, Jr.: USGS--TWRI Book 5, Chapter A2. 1971. 31 pages.

5-A3. *Methods for the determination of organic substances in water and fluvial sediments*, edited by R.L. Wershaw, M.J. Fishman, R.R. Grabbe, and L.E. Lowe: USGS--TWRI Book 5, Chapter A3. 1987. 80 pages.

5-A4. *Methods for collection and analysis of aquatic biological and microbiological samples*, by L.J. Britton and P.E. Greeson, editors: USGS--TWRI Book 5, Chapter A4. 1989. 363 pages.

PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS--Continued

5-A5. *Methods for determination of radioactive substances in water and fluvial sediments*, by L.L. Thatcher, V.J. Janzer, and K.W. Edwards: USGS--TWRI Book 5, Chapter A5. 1977. 95 pages.

5-A6. *Quality assurance practices for the chemical and biological analyses of water and fluvial sediments*, by L.C. Friedman and D.E. Erdmann: USGS--TWRI Book 5, Chapter A6. 1982. 181 pages.

Section C. Sediment Analysis

5-C1. *Laboratory theory and methods for sediment analysis*, by H.P. Guy: USGS--TWRI Book 5, Chapter C1. 1969. 58 pages.

Book 6. Modeling Techniques

Section A. Ground Water

6-A1. *A modular three-dimensional finite-difference ground-water flow model*, by M.G. McDonald and A.W. Harbaugh: USGS--TWRI Book 6, Chapter A1. 1988. 586 pages.

6-A2. *Documentation of a computer program to simulate aquifer-system compaction using the modular finite-difference ground-water flow model*, by S.A. Leake and D.E. Prudic: USGS--TWRI Book 6, Chapter A2. 1991. 68 pages.

6-A3. *A modular finite-element model (MODFE) for areal and axisymmetric ground-water-flow problems, Part 1: Model Description and User's Manual*, by L.J. Torak: USGS--TWRI Book 6, Chapter A3. 1993. 136 pages.

6-A4. *A modular finite-element model (MODFE) for areal and axisymmetric ground-water-flow problems, Part 2: Derivation of finite-element equations and comparisons with analytical solutions*, by R.L. Cooley: USGS--TWRI Book 6, Chapter A4. 1992. 108 pages.

6-A5. *A modular finite-element model (MODFE) for areal and axisymmetric ground-water-flow problems, Part 3: Design philosophy and programming details*, by L.J. Torak: USGS--TWRI Book 6, Chapter A5. 1993. 243 pages.

6-A6. *A coupled surface-water and ground-water flow model (MODBRANCH) for simulation of stream-aquifer interaction*, by Eric D. Swain and Eliezer J. Wexler: USGS--TWRI Book 6, Chapter A6. 1995. 125 pages.

Book 7. Automated Data Processing and Computations

Section C. Computer Programs

7-C1. *Finite difference model for aquifer simulation in two dimensions with results of numerical experiments*, by P.C. Trescott, G.F. Pinder, and S.P. Larson: USGS--TWRI Book 7, Chapter C1. 1976. 116 pages.

7-C2. *Computer model of two-dimensional solute transport and dispersion in ground water*, by L.F. Konikow and J.D. Bredehoeft: USGS--TWRI Book 7, Chapter C2. 1978. 90 pages.

7-C3. *A model for simulation of flow in singular and interconnected channels*, by R.W. Schaffranek, R.A. Baltzer, and D.E. Goldberg: USGS--TWRI Book 7, Chapter C3. 1981. 110 pages.

Book 8. Instrumentation

Section A. Instruments for Measurement of Water Level

8-A1. *Methods of measuring water levels in deep wells*, by M.S. Garber and F.C. Koopman: USGS--TWRI Book 8, Chapter A1. 1968. 23 pages.

8-A2. *Installation and service manual for U.S. Geological Survey manometers*, by J.D. Craig: USGS--TWRI Book 8, Chapter A2. 1983. 57 pages.

PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS--Continued

Section B. Instruments for Measurement of Discharge

8-B2. *Calibration and maintenance of vertical-axis type current meters*, by G.F. Smoot and C.E. Novak: USGS--TWRI Book 8, Chapter B2. 1968. 15 pages.

Book 9. Handbooks for Water-Resources Investigations

Section A. National Field Manual for the Collection of Water-Quality Data

9-A6. *National Field Manual for the Collection of Water-Quality Data: Field Measurements*, edited by F.D. Wilde and D.B. Radtke: USGS–TWRI Book 9, Chapter A6. 1998. Variously paginated.

9-A7. *National Field Manual for the Collection of Water-Quality Data: Biological Indicators*, by D.N. Myers and F.D. Wilde: USGS–TWRI Book 9, Chapter A7. 1997. 49 pages.

9-A8. *National Field Manual for the Collection of Water-Quality Data: Bottom-material samples*, by D.B. Radtke: USGS–TWRI Book 9, Chapter A8. 1998. 48 pages.

9-A9. *National Field Manual for the Collection of Water-Quality Data: Safety in Field Activities*, by S.L. Lane and R.G. Fay: USGS–TWRI Book 9, Chapter A9. 1998. 60 pages.

Surface-Water Gaging Station Records

GAGING STATION RECORDS

MARIANA ISLANDS, ISLAND OF SAIPAN

16801000 SOUTH FORK TALOFOFO STREAM

LOCATION.--Lat 15°12'48" N., long 145°46'17" E., Hydrologic Unit 20100006, on left bank 0.4 mi upstream from confluence with Middle and North Forks, 1.4 mi south of Ogso Dogas, and 2.2 mi southeast of Tanapag.

DRAINAGE AREA.--0.64 mi^2. Area at site used prior to March 31, 1971, 0.73 mi^2.

PERIOD OF RECORD.--October 1968 to November 1986, October 1987 to current year. Low-flow records not equivalent prior to March 31, 1971, due to undetermined amount of underflow between sites.

REVISED RECORDS.--WDR HI-78-2: 1976-77(M), WDR HI-82-2: Drainage area.

GAGE.--Water-stage recorder. Concrete control since March 31, 1971. Elevation of gage is 60 ft, from topographic map. Prior to March 31, 1971, at site 0.2 mi downstream at different datum.

REMARKS.--Records fair except for estimated daily discharges which are poor. No diversion upstream.

AVERAGE DISCHARGE.--18 years (water years 1972-86, 1988-90), 1.36 ft^3/s (985 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,100 ft^3/s, August 4, 1976, gage height, 8.15 ft, from rating curve extended above 59 ft^3/s, on basis of slope-area measurements at gage heights 7.30 and 8.15 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 400 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 15	0315	588	4.90	Aug. 16	1900	*1,540	*6.26

Minimum recorded discharge, 0.04 ft^3/s, several days in June and July.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e1.2	1.7	.50	.55	.52	.30	.11	.10	.07	.07	.12	e2.3
2	e2.3	1.5	.48	.36	.48	.27	.11	.12	.10	.06	.21	e8.6
3	e6.1	1.4	.46	.33	.52	.24	.13	.11	.07	.04	.09	25
4	e15	1.3	.44	.34	.47	.24	.12	.35	.07	.18	.12	5.6
5	e4.0	1.2	.53	.33	.42	.24	.11	.15	.11	.10	.21	4.2
6	e2.7	1.2	.46	.35	.40	.24	.11	.10	.13	.07	.17	4.0
7	1.9	1.2	.43	.31	.38	.24	.11	.09	.15	.06	.07	4.0
8	1.5	1.1	.42	.31	.42	.24	.11	.09	.15	.05	.06	e.40
9	1.3	1.0	.44	.28	.38	.24	.11	.07	.17	.04	.10	e2.7
10	1.2	1.0	.94	.36	.38	.24	.12	.06	.07	.06	.92	e1.9
11	1.1	.95	.75	.33	.36	.24	.13	.06	.12	.06	.35	1.5
12	1.6	e.92	.52	.35	.36	.23	.14	.06	.08	.05	.10	1.6
13	.96	e.75	.46	.36	.36	.21	.24	.06	.06	.05	.09	10
14	.97	e.70	.43	50	.36	.20	.15	.06	.06	.04	.15	5.7
15	.84	e.81	.45	53	.35	.19	.13	.06	.06	.04	3.5	3.1
16	.77	1.2	.43	8.6	.35	.20	.12	.07	.06	.04	78	2.3
17	.75	.79	.42	3.7	.35	.21	.12	.07	.07	.05	55	1.9
18	.72	.71	.44	2.3	.33	.24	.12	.08	.05	.05	12	2.5
19	.68	.66	.42	1.9	.33	.21	.11	.09	.17	.04	6.1	1.8
20	.64	.57	.40	1.7	.36	.24	.12	.07	.09	.06	4.7	1.6
21	.59	.54	.39	1.4	.33	.27	.11	.07	.05	.12	4.4	1.4
22	.55	.52	.37	1.2	.33	.13	.11	.07	.04	.14	4.4	3.3
23	1.2	.62	.38	1.0	.33	.12	.09	.06	.04	.14	5.6	2.2
24	14	.50	.39	.87	.33	.11	.10	.08	.04	.09	5.0	1.8
25	45	.57	.43	.90	.33	.12	.11	.14	.06	.13	5.9	1.5
26	9.5	.62	.42	.81	.31	.13	.09	.14	.10	.09	16	1.5
27	4.6	.62	.40	.75	.29	.13	.09	.07	.07	.12	7.8	2.9
28	3.2	.53	.45	.72	.36	.15	.08	.07	.14	.10	4.4	7.2
29	2.6	.50	.41	.67	---	.13	.11	.10	.10	.08	e3.8	2.7
30	2.2	.57	.42	.60	---	.12	.09	.07	.07	.08	e3.2	2.3
31	1.9	---	.43	.54	---	.12	---	.08	---	.07	e2.7	---
TOTAL	131.57	26.25	14.31	135.22	10.49	6.19	3.50	2.87	2.62	2.37	225.26	117.50
MEAN	4.24	.88	.46	4.36	.37	.20	.12	.093	.087	.076	7.27	3.92
MAX	45	1.7	.94	53	.52	.30	.24	.35	.17	.18	78	25
MIN	.55	.50	.37	.28	.29	.11	.08	.06	.04	.04	.06	.40
AC-FT	261	52	28	268	21	12	6.9	5.7	5.2	4.7	447	233

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1972 - 1990, BY WATER YEAR (WY)

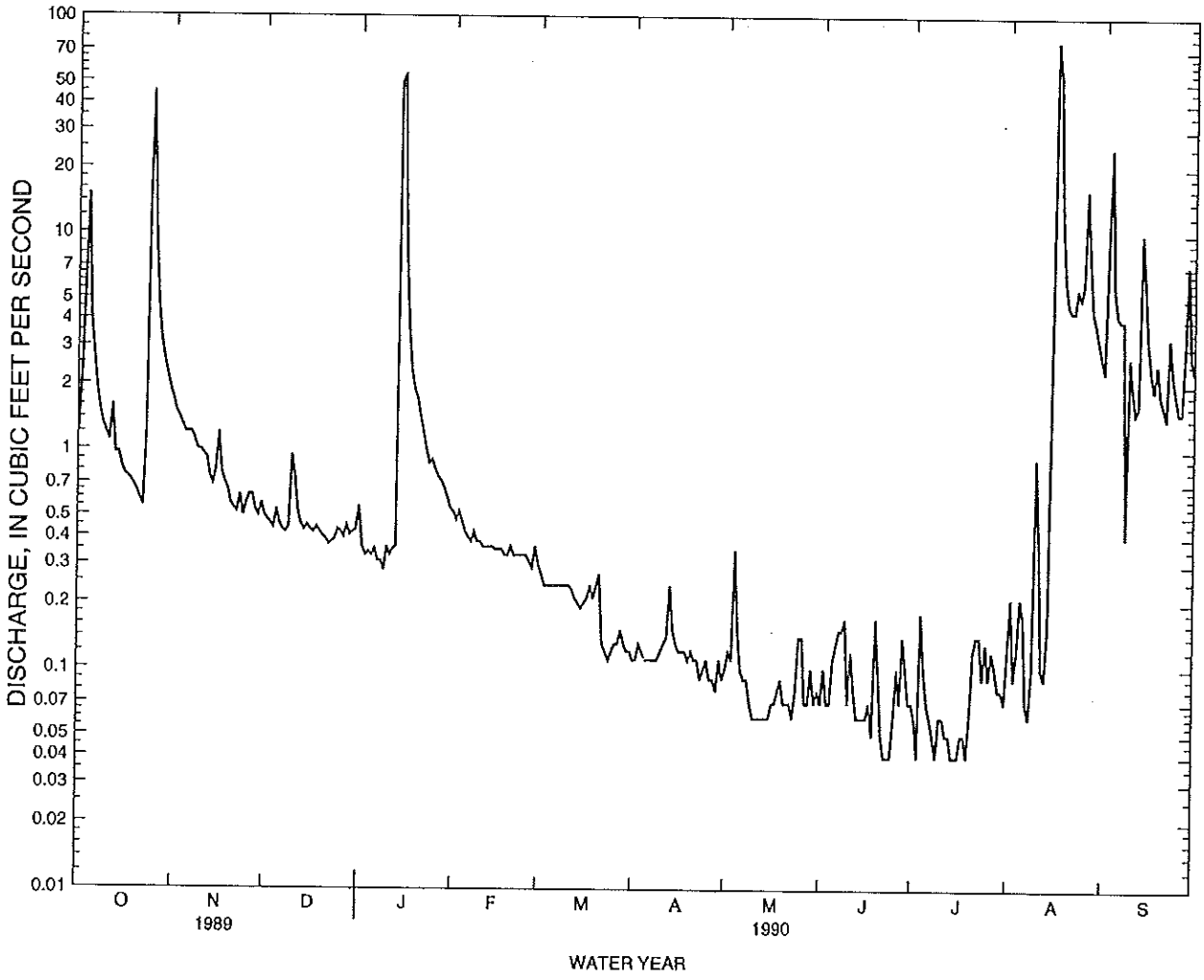
MEAN	2.44	2.25	.70	.62	.31	.14	.11	.35	.19	1.09	5.18	2.74
MAX	8.62	13.7	2.29	4.36	.97	.35	.29	2.32	.89	3.38	27.3	7.59
(WY)	1983	1979	1982	1990	1989	1982	1986	1976	1986	1989	1978	1980
MIN	.72	.19	.097	.049	.040	.017	.013	.026	.022	.016	.029	.21
(WY)	1977	1984	1974	1984	1984	1984	1984	1983	1983	1983	1977	1983

e Estimated

16801000 SOUTH FORK TALOFOFO STREAM--CONTINUED

SUMMARY STATISTICS	FOR 1989 CALENDAR YEAR		FOR 1990 WATER YEAR		WATER YEARS 1972 - 1990	
ANNUAL TOTAL	718.97		678.15			
ANNUAL MEAN	1.97		1.86		1.36	
HIGHEST ANNUAL MEAN					3.46	1978
LOWEST ANNUAL MEAN					.40	1973
HIGHEST DAILY MEAN	58	Aug 3	78	Aug 16	303	Aug 12 1978
LOWEST DAILY MEAN	.03	Jun 10	.04	Jun 22	.00	Jul 16 1977
ANNUAL SEVEN-DAY MINIMUM	.03	Jun 8	.04	Jul 13	.00	Apr 16 1984
ANNUAL RUNOFF (AC-FT)	1430		1350		982	
10 PERCENT EXCEEDS	3.9		3.2		2.1	
50 PERCENT EXCEEDS	.35		.35		.27	
90 PERCENT EXCEEDS	.09		.07		.05	

e Estimated



GAGING STATION RECORDS
MARIANA ISLANDS, ISLAND OF SAIPAN
16801000 SOUTH FORK TALOFOFO STREAM--CONTINUED

WATER-QUALITY DATA

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STANDARD UNITS) (00400)	PH WATER WHOLE LAB (STANDARD UNITS) (00403)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, DISSOLVED (MG/L AS NA) (00930)
JUN 1990										
13...	1738	--	.01	450	7.6	7.8	<.100	42	6.8	39
15...	1410	29.0	.06	--	7.2	7.7	<.100	62	12	48

DATE	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	IRON, DISSOLVED (UG/L AS FE) (01046)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	ANC UNFLTRD TIT 4.5 LAB (MG/L AS CACO3) (90410)
JUN 1990									
13...	1.6	50	7.0	<.10	44	9	13	429	143
15...	.6	70	14	.20	40	28	86	592	198

< ACTUAL VALUE IS KNOWN TO BE LESS THAN VALUE SHOWN

16805200 LAKE SUSUPE

LOCATION.--Lat 15°09'07" N., long 145°42'27" E., Hydrologic Unit 20100006, on west shore, at the end of Sugar Mill Road, 0.5 mi east of Mt. Carmel Church.

PERIOD OF RECORD.--February 1981 to current year.

REVISED RECORDS.--WDR HI-78-2: 1976-77(M), WDR HI-82-2: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is at mean sea level.

REMARKS.--Water-level records good, except for those estimated which are fair.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 4.89 ft, December 4, 1986; lowest, 0.70 ft, June 13, 1983.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of August 12, 1978, reached a stage of 7.6 ft, from floodmarks.

EXTREMES FOR CURRENT YEAR.--Highest water level, 3.68 ft, August 18; lowest, 1.15 ft, June 9.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.58	2.77	2.45	2.15	2.56	2.04	1.64	1.37	1.24	1.49	1.70	3.25
2	2.56	2.75	2.43	2.14	2.53	2.02	1.63	1.37	1.24	1.50	1.69	3.24
3	e2.55	2.72	2.42	2.13	2.51	2.01	1.62	1.38	1.22	1.49	1.69	3.46
4	e2.92	2.69	2.42	2.14	2.49	1.99	1.61	1.38	1.20	1.50	1.67	3.45
5	e2.92	2.67	2.41	2.12	2.47	1.97	1.59	1.39	1.20	1.54	1.67	3.39
6	e2.65	2.69	2.42	2.14	2.45	1.95	1.57	1.40	1.18	1.54	1.67	3.31
7	e2.65	2.66	2.41	2.14	2.42	1.93	1.56	1.40	1.17	1.54	1.66	3.26
8	e2.65	2.63	2.40	2.12	2.40	1.91	1.53	1.39	1.16	1.55	1.65	3.20
9	e2.64	2.61	2.39	2.10	2.39	1.90	1.54	1.38	1.16	1.54	1.64	3.15
10	e2.64	2.61	2.39	2.09	2.38	1.88	1.52	1.36	1.18	1.52	1.65	3.13
11	e2.63	2.62	2.42	2.08	2.36	1.89	1.52	1.36	1.19	1.51	1.70	3.05
12	e2.61	2.61	2.42	2.05	2.34	1.87	1.53	1.35	1.21	1.51	1.80	2.99
13	e2.60	2.61	2.41	2.04	2.31	1.86	1.53	1.33	1.21	1.52	1.80	3.04
14	e2.60	2.63	2.39	2.50	2.30	1.85	1.53	1.32	1.21	1.50	1.85	3.11
15	e2.60	2.65	2.38	3.41	2.28	1.83	1.51	1.30	1.22	1.49	2.05	3.06
16	e2.60	2.64	2.36	3.45	2.25	1.82	1.50	1.28	1.24	1.50	2.28	2.99
17	e2.60	2.62	2.34	3.35	2.24	1.80	1.49	1.26	1.25	1.53	3.42	2.96
18	e2.60	2.59	2.34	3.22	2.20	1.77	1.48	1.24	1.25	1.52	3.65	2.91
19	e2.60	2.56	2.33	3.11	2.18	1.75	1.47	1.24	1.26	1.54	3.66	2.89
20	e2.60	2.53	2.30	3.04	2.19	1.73	1.45	1.23	1.26	1.54	3.61	2.86
21	e2.60	2.50	2.29	2.96	2.19	1.77	1.44	1.21	1.26	1.57	3.55	2.83
22	e2.60	2.47	2.26	2.90	2.17	1.76	1.43	1.20	1.28	1.59	3.48	2.84
23	e2.60	2.47	2.24	2.84	2.15	1.74	1.42	1.19	1.30	1.64	3.44	2.84
24	e2.98	2.45	2.23	2.79	2.14	1.71	1.41	1.19	1.30	1.65	3.45	2.80
25	e3.11	2.45	2.23	2.75	2.12	1.69	1.39	1.24	1.31	1.65	3.44	2.77
26	e3.14	2.45	2.22	2.71	2.10	1.68	1.39	1.26	1.32	1.65	3.45	2.78
27	3.08	2.47	2.20	2.67	2.07	1.67	1.39	1.25	1.34	1.66	3.52	2.81
28	3.00	2.46	2.21	2.64	2.06	1.66	1.39	1.25	1.35	1.67	3.49	2.85
29	2.93	2.46	2.20	2.62	---	1.66	1.39	1.25	1.44	1.69	3.43	2.81
30	2.87	2.46	2.19	2.60	---	1.65	1.38	1.25	1.47	1.70	3.36	2.78
31	2.82	---	2.17	2.57	---	1.65	---	1.25	---	1.69	3.30	---
TOTAL	84.53	77.50	72.27	79.57	64.25	56.41	44.85	40.27	37.62	48.53	80.42	90.81
MEAN	2.73	2.58	2.33	2.57	2.29	1.82	1.50	1.30	1.25	1.57	2.59	3.03
MAX	3.14	2.77	2.45	3.45	2.56	2.04	1.64	1.40	1.47	1.70	3.66	3.46
MIN	2.55	2.45	2.17	2.04	2.06	1.65	1.38	1.19	1.16	1.49	1.64	2.77

e Estimated

GAGING STATION RECORDS
MARIANA ISLANDS, ISLAND OF SAIPAN
16805200 LAKE SUSUPE--CONTINUED
WATER-QUALITY DATA

DATE	TIME	SAMPLING DEPTH (FEET) (00003)	TEMPERATURE WATER (DEG C) (00010)	BAROMETRIC PRESSURE (MM OF HG) (00025)	GAGE HEIGHT (FEET) (00065)	TURBIDITY (NTU) (00076)	TRANSPARENCY (SECCHI DISK) (IN) (00077)	SPECIFIC CONDUCTANCE (US/CM) (00095)	OXYGEN, DISSOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STANDARD UNITS) (00400)	PH WATER WHOLE LAB (STANDARD UNITS) (00403)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)
JUN 1990												
16...	1300	2.0	32.0	760	1.24	2.5	49.0	4590	7.0	8.3	8.1	.190
16...	1301	5.0	31.5	758	--	--	--	4630	6.8	8.2	--	--

DATE	NITROGEN,NH4 TOTAL IN BOT. MAT. (MG/KG AS N) (00611)	NITROGEN, NITRITE TOTAL (MG/L AS N) (00615)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN,NH4 + ORG. TOT IN BOT MAT (MG/KG AS N) (00626)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, NO2+NO3 TOT. IN BOT MAT (MG/KG AS N) (00633)	PHOSPHORUS TOTAL (MG/L AS P) (00665)	PHOSPHORUS TOTAL IN BOT. MAT. (MG/KG AS P) (00668)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CARBON, INORG + ORGANIC TOT. IN BOT MAT (GM/KG AS C) (00693)
JUN 1990											
16...	450	.020	3.2	30000	<.100	.200	8.0	<.010	630	15	38
16...	--	--	--	--	--	--	--	--	--	--	--

DATE	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC TOTAL IN BOTTOM MATERIAL (UG/G AS AS) (01003)
JUN 1990											
16...	95	88	710	26	1200	170	<.10	5.1	<1	<1	<10
16...	--	--	--	--	--	--	--	--	--	--	--

DATE	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA) (01007)	BARIUM, RECOV. FM BOTTOM MATERIAL (UG/G AS BA) (01008)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE) (01012)	BERYLLIUM, RECOV. FM BOTTOM MATERIAL (UG/G) (01013)	BISMUTH TOTAL (UG/L AS BI) (01017)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CADMIUM WATER UNFLTRD TOTAL (UG/L AS CD) (01027)	CADMIUM RECOV. FM BOTTOM MATERIAL (UG/G AS CD) (01028)	CHROMIUM, RECOV. FM BOTTOM MATERIAL (UG/G) (01029)
JUN 1990											
16...	6	<100	10.0	<2	<10	<1.0	10.0	<3.0	<1	3	28
16...	--	--	--	--	--	--	--	--	--	--	--

DATE	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR) (01034)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COBALT, TOTAL RECOVERABLE (UG/L AS CO) (01037)	COBALT, RECOV. FM BOTTOM MATERIAL (UG/G AS CO) (01038)	COPPER, DISSOLVED (UG/L AS CU) (01040)	COPPER, TOTAL RECOVERABLE (UG/L AS CU) (01042)	COPPER, RECOV. FM BOTTOM MATERIAL (UG/G AS CU) (01043)	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)
JUN 1990											
16...	<1	<1	<9	<1	3	2	2	90	90	9.0	<1
16...	--	--	--	--	--	--	--	--	--	--	--

< ACTUAL VALUE IS KNOWN TO BE LESS THAN VALUE SHOWN

GAGING STATION RECORDS

MARIANA ISLANDS, ISLAND OF SAIPAN

16805200 LAKE SUSUPE--CONTINUED

WATER-QUALITY DATA--CONTINUED

DATE	LEAD, TOTAL RECOVERABLE (UG/L AS PB) (01051)	LEAD, RECOV. FM BOTTOM MATERIAL (UG/G AS PB) (01052)	MANGANESE, RECOV. FM BOTTOM MATERIAL (UG/G) (01053)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO) (01062)	MOLYBDENUM, RECOV. FM BOTTOM MATERIAL (UG/G) (01063)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI) (01067)	NICKEL, RECOV. FM BOTTOM MATERIAL (UG/G AS NI) (01068)
JUN 1990											
16...	<1	20	370	40	10	<30	2	5.0	<1	<1	9
16...	--	--	--	--	--	--	--	--	--	--	--

DATE	SILVER, DISSOLVED (UG/L AS AG) (01075)	SILVER, TOTAL RECOVERABLE (UG/L AS AG) (01077)	SILVER, RECOV. FM BOTTOM MATERIAL (UG/G AS AG) (01078)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	STRONTIUM, RECOV. FM BOTTOM MATERIAL (UG/G) (01083)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	VANADIUM, TOTAL IN BOTTOM MATERIAL (UG/G) (01088)	ZINC, DISSOLVED (UG/L AS ZN) (01090)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN) (01092)	ZINC, RECOV. FM BOTTOM MATERIAL (UG/G AS ZN) (01093)	TIN RECOV. FROM BOT.MAL (UG/KG AS SN) (01103)
JUN 1990											
16...	<1.0	<1	<2	870	380	<18	18	37	<10	130	<10
16...	--	--	--	--	--	--	--	--	--	--	--

DATE	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL) (01105)	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	CERIUM TOTAL (UG/L AS CE) (01112)	GALLIUM TOTAL (UG/L AS GA) (01122)	LITHIUM DISSOLVED (UG/L AS LI) (01130)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI) (01132)	LITHIUM IN BOTTOM MATERIAL (MG/KG AS LI) (01133)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SELENIUM, TOTAL (UG/L AS SE) (01147)	LANTHANUM TOTAL (UG/L AS LA) (01182)	YTTRIUM TOTAL (UG/L AS Y) (01203)
JUN 1990											
16...	70	70	<4	<4	20	<10	31000	<1	<1	2	6
16...	--	--	--	--	--	--	--	--	--	--	--

DATE	EUROPIUM, TOTAL (UG/L) (01236)	NEODYMIUM, TOTAL (UG/L) (01237)	NIOBIUM TOTAL (UG/L) (01239)	HOLMIUM TOTAL (UG/L) (01247)	URANIUM NATURAL TOTAL IN BOTTOM MATERIL (UG/G) (22707)	ALUMINUM SED. BEDMAT PERCENT (30220)	CALCIUM SED. BEDMAT PERCENT (30239)	CARBON INRGSED BEDMAT PERCENT (30241)	CARBON ORG.SED BEDMAT PERCENT (30243)	IRON SEDIMENT BEDMAT PERCENT (30268)	MAGNESIUM SEDIMENT BEDMAT PERCENT (30276)
JUN 1990											
16...	<2	<4	<4	<4	<100	.98	7.4	36	1.7	.99	.90
16...	--	--	--	--	--	--	--	--	--	--	--

DATE	PHOSPHORUS SEDIMENT BEDMAT PERCENT (30291)	POTASSIUM SEDIMENT BEDMAT PERCENT (30293)	SODIUM SEDIMENT BEDMAT PERCENT (30303)	TITANIUM SEDIMENT BEDMAT PERCENT (30316)	COLIFORM, TOTAL, IMMED. (COLS. PER 100 ML) (31501)	COLIFORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	PHOSPHORUS ORTHO TOTAL (MG/L AS P) (70507)	CHLOR-A PHYTOPLANKTON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTOPLANKTON CHROMO FLUOROM (UG/L) (70954)	MERCURY DISSOLVED (UG/L AS HG) (71890)
JUN 1990											
16...	.13	.16	2.0	.05	65	20	2760	<.010	12.0	<.4	.2
16...	--	--	--	--	--	--	--	--	8.2	<.3	--

DATE	MERCURY TOTAL RECOVERABLE (UG/L AS HG) (71900)	RESERVOIR DEPTH (FEET) (72025)	PLANKTON BIOMASS ASH WT (MG/L) (81353)	PLANKTON BIOMASS DRY WT (MG/L) (81354)	GOLD SEDIMENT SUSP. (UG/G) (82170)	YTTERBIUM BOT.MAT (UG/KG AS YB) (82311)	THORIUM BOT.MAT (UG/KG AS TH) (82313)	SCANDIUM BOT.MAT (UG/KG AS SC) (82317)	TANTALUM BOT.MAT (UG/KG AS TA) (82321)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	ANC UNFLTRD TIT 4.5 LAB (MG/L AS CACO3) (90410)
JUN 1990											
16...	<.10	5.50	8.9	81	<8	<1.0	5.0	3.0	<40	4520	183
16...	--	--	1.6	50	--	--	--	--	--	--	--

< ACTUAL VALUE IS KNOWN TO BE LESS THAN VALUE SHOWN

GAGING STATION RECORDS
MARIANA ISLANDS, ISLAND OF GUAM
16847000 IMONG RIVER NEAR AGAT

LOCATION.--Lat 13°20'17" N., long 144°41'55" E., Hydrologic Unit 20100003, on left bank 500 ft upstream from Fena Valley Reservoir, 1.4 mi south of Fena Dam spillway, and 4.1 mi southeast of Agat School.

DRAINAGE AREA.--1.95 mi^2.

PERIOD OF RECORD.--March 1960 to March 1971. October 1971 to current year.

REVISED RECORDS.--WSP 2137: Drainage area.

GAGE.--Water-stage recorders and concrete control. Elevation of gage is 120 ft, from topographic map.

REMARKS.--Records fair. No diversion upstream.

AVERAGE DISCHARGE.--29 years (water years 1961-70, 1972-90), 9.88 ft^3/s (7,160 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,100 ft^3/s, September 27, 1978, gage height, 11.3 ft, from outside floodmarks, and from rating curve extended above 58 ft^3/s on basis of slope-area measurement of peak flow; minimum, 0.37 ft^3/s, May 21, 22, 26, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,400 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 4	0300	*2,430	*7.25	Sep. 3	2150	1,610	5.85
Oct. 27	0930	2,330	7.08	Sep. 9	1450	1,830	6.24

Minimum recorded discharge, 1.4 ft^3/s, May 25-26, June 5-14.

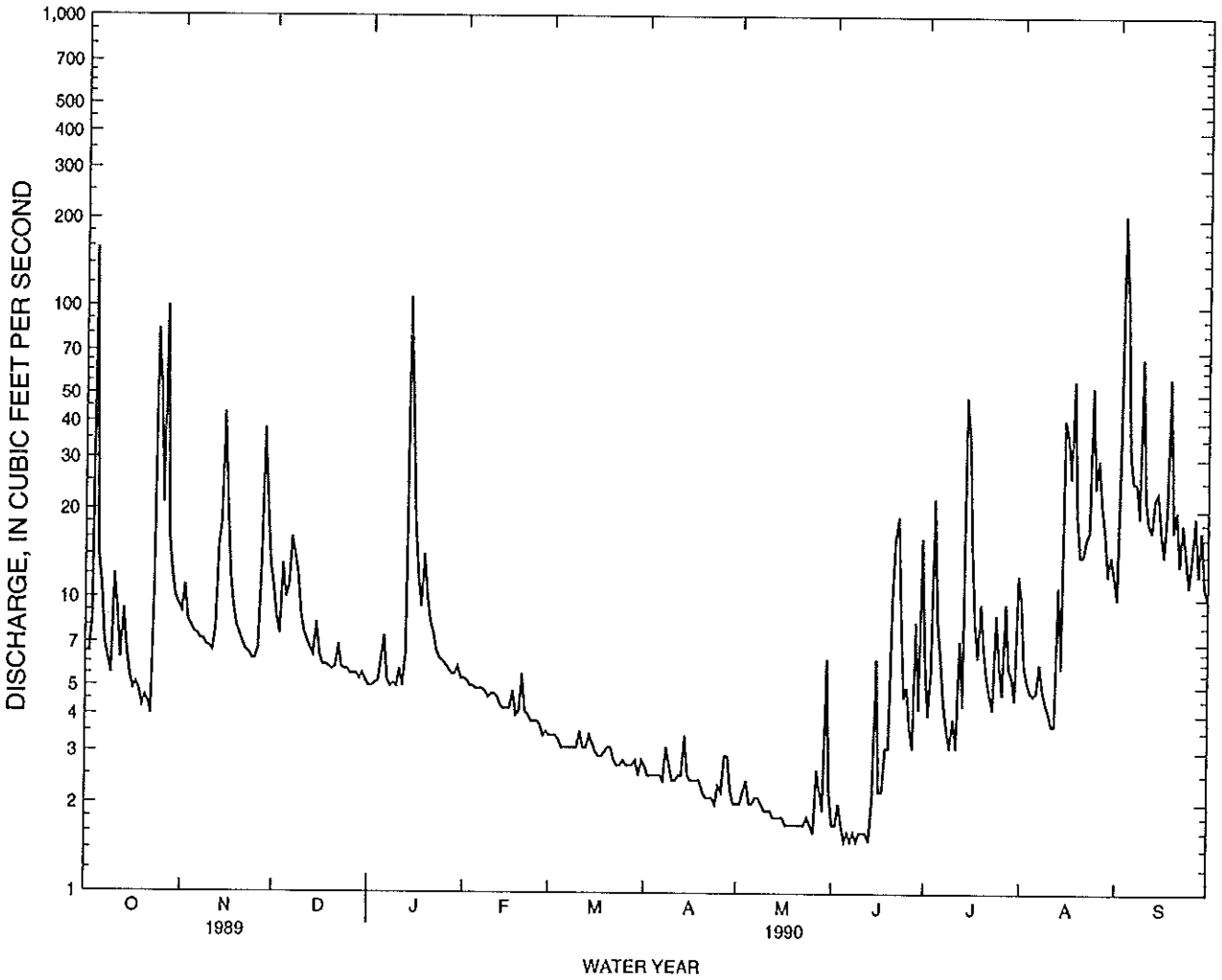
DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.5	9.0	11	5.0	5.3	3.4	2.7	2.0	1.7	6.3	10	10
2	6.5	11	8.6	5.0	5.2	3.4	2.5	2.0	1.7	4.0	5.9	35
3	8.4	8.4	7.5	5.1	5.0	3.4	2.5	2.2	2.0	5.6	5.2	208
4	158	8.0	13	5.2	5.0	3.3	2.5	2.4	1.7	22	4.8	106
5	14	7.6	10	6.1	4.9	3.1	2.5	2.0	1.5	8.5	4.7	31
6	11	7.5	11	7.4	4.9	3.1	2.5	2.0	1.6	6.3	4.8	25
7	7.0	7.2	16	5.2	4.9	3.1	2.4	2.1	1.5	4.4	6.0	25
8	6.2	7.2	14	5.0	4.8	3.1	3.1	2.1	1.6	3.6	4.9	19
9	5.5	6.9	12	5.1	4.6	3.1	2.7	2.0	1.5	3.1	4.4	67
10	12	6.8	8.8	5.0	4.7	3.1	2.4	1.9	1.6	3.9	4.1	22
11	9.2	6.6	7.6	5.7	4.7	3.5	2.4	1.9	1.6	3.1	3.7	18
12	6.2	7.8	7.1	5.0	4.6	3.1	2.5	1.9	1.6	7.2	3.7	17
13	9.1	15	6.7	6.5	4.3	3.1	2.5	1.8	1.5	4.3	11	22
14	6.5	18	6.4	107	4.2	3.4	3.4	1.8	2.1	49	5.8	23
15	5.4	43	8.2	44	4.2	3.2	2.5	1.8	6.2	37	41	17
16	4.9	21	6.4	18	4.2	3.0	2.4	1.8	2.2	15	36	14
17	5.1	12	5.9	12	4.8	2.9	2.4	1.7	2.2	8.3	26	20
18	4.8	9.3	5.9	9.3	4.0	2.9	2.4	1.7	3.1	6.3	56	57
19	4.3	8.0	5.8	14	4.1	3.0	2.4	1.7	3.1	9.6	19	17
20	4.6	7.5	5.7	10	5.5	3.1	2.2	1.7	10	6.8	14	20
21	4.4	7.0	5.8	8.3	4.1	3.1	2.1	1.7	16	5.4	14	13
22	4.0	6.6	6.9	7.6	4.0	2.8	2.1	1.7	19	4.7	16	18
23	11	6.5	5.8	6.6	3.8	2.7	2.1	1.7	8.3	4.2	17	14
24	83	6.2	5.7	6.2	3.8	2.7	2.0	1.8	4.6	8.8	53	11
25	53	6.2	5.7	6.1	3.8	2.8	2.3	1.7	5.0	6.0	24	14
26	21	6.7	5.5	5.9	3.7	2.7	2.2	1.6	3.6	4.7	30	19
27	100	13	5.5	5.7	3.4	2.7	2.9	2.6	3.1	9.6	21	12
28	16	38	5.5	5.5	3.5	2.7	2.9	2.2	8.3	5.8	17	17
29	12	21	5.3	5.5	---	2.8	2.2	1.9	4.2	5.4	12	11
30	10	13	5.5	5.8	---	2.5	2.0	6.2	16	4.5	14	10
31	9.5	---	5.2	5.3	---	2.8	---	2.2	---	12	12	---
TOTAL	619.1	352.0	240.0	354.1	124.0	93.6	73.7	63.8	138.1	285.4	501.0	912
MEAN	20.0	11.7	7.74	11.4	4.43	3.02	2.46	2.06	4.60	9.21	16.2	30.4
MAX	158	43	16	107	5.5	3.5	3.4	6.2	19	49	56	208
MIN	4.0	6.2	5.2	5.0	3.4	2.5	2.0	1.6	1.5	3.1	3.7	10
AC-FT	1230	698	476	702	246	186	146	127	274	566	994	1810

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1960 - 1990, BY WATER YEAR (WY)

MEAN	18.0	14.2	9.27	6.22	5.78	3.85	3.71	5.10	4.82	8.80	18.1	20.7
MAX	42.5	50.5	25.6	19.7	17.6	15.0	15.7	37.5	15.4	23.9	45.0	90.2
(WY)	1980	1976	1970	1976	1971	1971	1963	1976	1963	1980	1986	1967
MIN	5.86	5.69	3.40	2.10	1.62	1.39	1.00	.59	1.00	1.71	3.48	3.59
(WY)	1977	1966	1966	1966	1966	1966	1966	1966	1969	1966	1987	1969

SUMMARY STATISTICS	FOR 1989 CALENDAR YEAR		FOR 1990 WATER YEAR		WATER YEARS 1960 - 1990	
ANNUAL TOTAL	3444.9		3756.8			
ANNUAL MEAN	9.44		10.3		9.88	
HIGHEST ANNUAL MEAN					20.5	1967
LOWEST ANNUAL MEAN					3.92	1973
HIGHEST DAILY MEAN	158	Oct 4	208	Sep 3	498	Dec 19 1969
LOWEST DAILY MEAN	2.2	Jun 8	1.5	Jun 5	.42	May 21 1966
ANNUAL SEVEN-DAY MINIMUM	2.2	Jun 10	1.6	Jun 5	.47	May 20 1966
ANNUAL RUNOFF (AC-FT)	6830		7450		7160	
10 PERCENT EXCEEDS	16		19		19	
50 PERCENT EXCEEDS	5.1		5.4		4.7	
90 PERCENT EXCEEDS	2.7		2.0		1.8	



GAGING STATION RECORDS

MARIANA ISLANDS, ISLAND OF GUAM

16848100 ALMAGOSA RIVER NEAR AGAT

LOCATION.--Lat 13°20'43" N., long 144°41'36" E., Hydrologic Unit 20100003, on right bank 400 ft upstream from Fena Valley Reservoir, and 3.5 mi southeast of Agat.

DRAINAGE AREA.--1.32 mi^2.

PERIOD OF RECORD.--April 1972 to current year.

REVISED RECORD.--WDR HI-75-1: Drainage area. WDR HI-76-1: 1972(P), 1973(M), 1974-75(P).

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 155 ft, from topographic map.

REMARKS.--Records fair. Up to 3.9 ft^3/s diverted upstream for domestic use.

AVERAGE DISCHARGE.--18 years, 5.99 ft^3/s (4,340 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,650 ft^3/s, September 27, 1978, gage height, 7.78 ft, from rating curve extended above 46 ft^3/s on basis of slope-area measurement at gage height 7.32 ft; minimum, 0.13 ft^3/s, June 27, July 11, 12, 14, 16, 17, 1979, June 3-9, 1984, June 23, 24, 1987.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 700 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 4	0230	*1,340	*6.23	Oct. 27	0915	933	5.55

Minimum discharge, 0.23 ft^3/s, May 22-26.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY MEAN VALUES

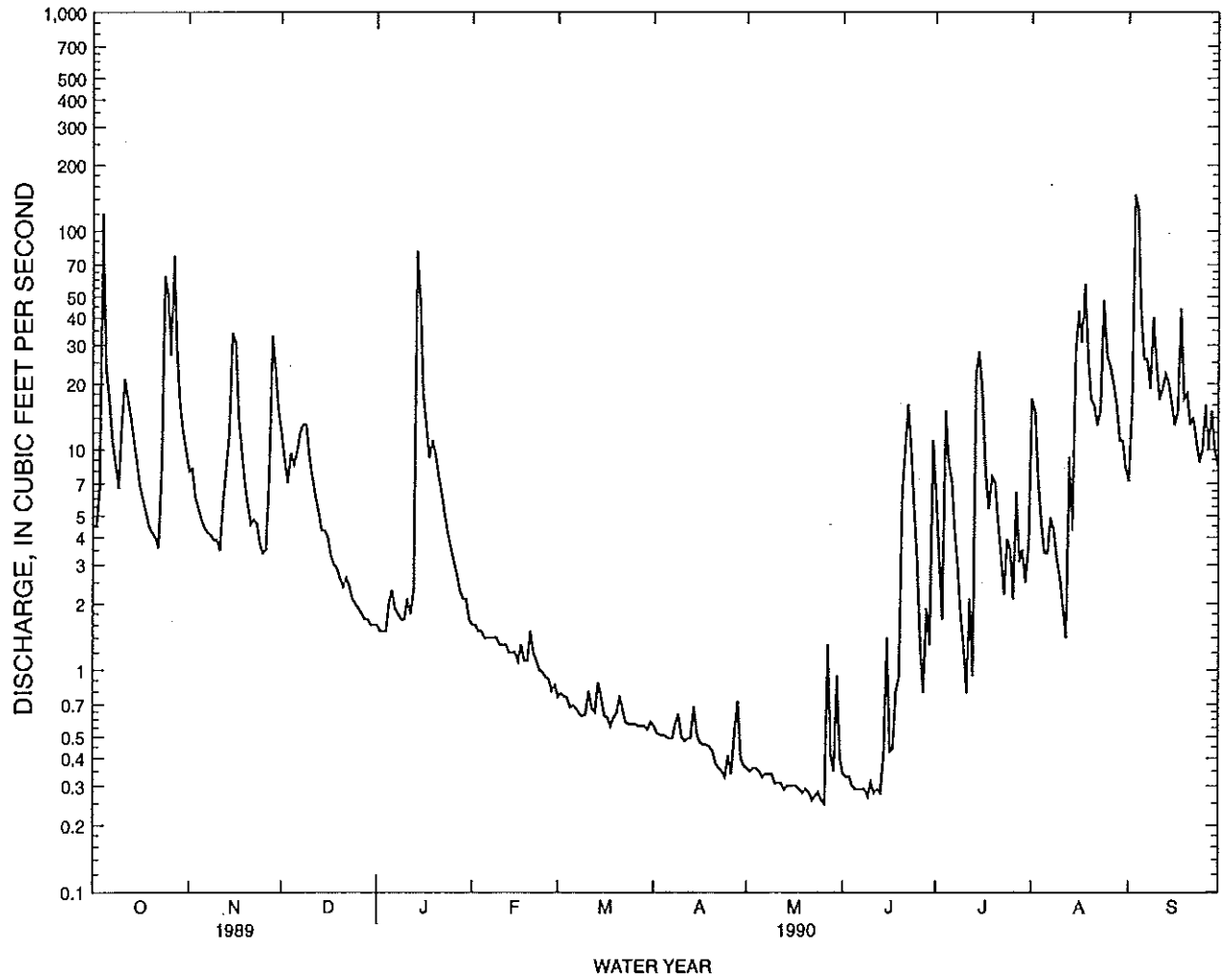
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.5	8.0	12	e1.6	1.6	.76	.56	.36	.34	6.1	17	7.2
2	4.5	8.2	9.1	e1.5	1.6	.78	.52	.35	.33	3.2	15	16
3	6.7	6.1	7.1	e1.5	1.5	.76	.51	.36	.33	1.7	7.2	146
4	120	5.4	9.6	e1.5	1.5	.75	.51	.36	.30	15	4.7	127
5	24	4.8	8.6	e2.0	1.4	.68	.50	.35	.29	8.7	3.4	42
6	17	4.4	9.8	e2.3	1.4	.69	.49	.33	.29	7.2	3.4	26
7	11	4.2	12	e1.9	1.4	.67	.49	.34	.29	4.3	4.9	26
8	8.6	4.1	13	e1.8	1.4	.63	.57	.34	.29	2.9	4.3	19
9	6.7	3.9	13	e1.7	1.4	.62	.63	.34	.27	1.8	3.2	40
10	13	3.9	9.2	e1.7	1.3	.63	.50	.31	.31	1.3	2.6	25
11	21	3.5	7.4	2.1	1.3	.80	.48	.31	.28	.79	1.9	17
12	17	5.8	6.1	1.8	1.3	.67	.49	.31	.29	2.1	1.4	19
13	14	8.5	5.2	2.3	1.2	.65	.49	.29	.28	.94	9.2	22
14	11	12	4.3	81	1.2	.87	.68	.30	.42	22	4.3	20
15	8.8	34	4.3	48	1.2	.76	.51	.30	1.4	28	28	16
16	6.9	31	4.0	18	1.1	.62	.47	.30	.43	18	43	13
17	6.0	14	3.3	13	1.3	.61	.46	.30	.44	7.9	31	15
18	5.2	9.8	3.0	9.2	1.1	.56	.46	.29	.80	5.4	57	44
19	4.5	7.0	2.9	11	1.1	.61	.45	.28	.93	7.5	27	17
20	4.2	5.6	2.6	9.5	1.5	.64	.43	.29	6.4	7.1	17	18
21	4.0	4.6	2.4	7.6	1.2	.76	.38	.28	9.9	4.7	16	13
22	3.6	4.8	2.6	6.4	1.1	.66	.36	.26	16	3.3	13	14
23	8.1	4.6	2.4	5.1	1.0	.58	.35	.27	10	2.2	15	11
24	62	3.7	2.1	4.2	.98	.57	.33	.28	5.4	3.9	48	8.8
25	51	3.4	e2.0	3.6	.93	.57	.41	.26	3.0	3.5	27	10
26	27	3.5	e1.9	3.1	.91	.57	.34	.25	1.3	2.1	24	16
27	77	7.9	e1.8	2.7	.81	.56	.52	1.3	.79	6.4	20	10
28	27	33	e1.7	2.3	.85	.56	.72	.41	1.9	3.1	16	15
29	16	23	e1.7	2.1	---	.56	.40	.35	1.3	3.5	11	10
30	12	15	e1.6	2.1	---	.54	.37	.94	11	2.5	11	8.5
31	9.8	---	e1.6	1.7	---	.58	---	.40	---	3.7	8.2	---
TOTAL	612.1	287.7	168.3	254.3	34.58	20.27	14.38	11.41	75.30	190.83	494.7	791.5
MEAN	19.7	9.59	5.43	8.20	1.24	.65	.48	.37	2.51	6.16	16.0	26.4
MAX	120	34	13	81	1.6	.87	.72	1.3	16	28	57	146
MIN	3.6	3.4	1.6	1.5	.81	.54	.33	.25	.27	.79	1.4	7.2
AC-FT	1210	571	334	504	69	40	29	23	149	379	981	1570

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1972 - 1990, BY WATER YEAR (WY)

MEAN	12.2	8.55	4.46	3.14	2.92	1.40	1.46	3.35	2.77	6.83	13.1	12.5
MAX	29.9	18.6	7.73	15.6	15.3	5.42	9.01	22.1	8.32	19.3	30.1	27.6
(WY)	1980	1976	1985	1976	1976	1974	1974	1976	1985	1972	1986	1980
MIN	2.55	3.30	1.36	.84	.51	.47	.27	.24	.20	.54	2.00	2.82
(WY)	1977	1973	1989	1983	1983	1984	1979	1988	1983	1983	1977	1988

e Estimated

SUMMARY STATISTICS	FOR 1989 CALENDAR YEAR		FOR 1990 WATER YEAR		WATER YEARS 1972 - 1990	
ANNUAL TOTAL	2829.55		2955.37			
ANNUAL MEAN	7.75		8.10		5.99	
HIGHEST ANNUAL MEAN					12.3	1976
LOWEST ANNUAL MEAN					2.47	1973
HIGHEST DAILY MEAN	120	Oct 4	146	Sep 3	290	May 21 1976
LOWEST DAILY MEAN	.76	Feb 10	.25	May 26	.13	Jun 4 1984
ANNUAL SEVEN-DAY MINIMUM	.81	Feb 4	.27	May 20	.14	Jun 3 1984
ANNUAL RUNOFF (AC-FT)	5610		5860		4340	
10 PERCENT EXCEEDS	19		19		14	
50 PERCENT EXCEEDS	3.4		2.6		1.9	
90 PERCENT EXCEEDS	.95		.35		.39	



GAGING STATION RECORDS
MARIANA ISLANDS, ISLAND OF GUAM
16848500 MAULAP RIVER NEAR AGAT

LOCATION.--Lat 13°21'14" N., long 144°41'44" E., Hydrologic Unit 20100003, on right bank 100 ft from Fena Valley Reservoir, and 3.2 mi southeast of Agat.

DRAINAGE AREA.--1.15 mi^2.

PERIOD OF RECORD.--January 1972 to current year.

REVISED RECORDS.--WRD Hawaii 1973: 1972. WRD HI-75-1: Drainage area.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 130 ft, from topographic map.

REMARKS.--Records fair. No diversion upstream.

AVERAGE DISCHARGE.--18 years, 5.17 ft^3/s (3,750 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,420 ft^3/s, September 27, 1978, gage height, 9.2 ft, from rating curve extended above 23 ft^3/s, on basis of slope-area measurements at gage heights 8.21 ft and 9.2 ft; minimum, 0.31 ft^3/s, June 28 to July 1, 1983.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 600 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 4	unknown	856	6.10	Sep. 3	2200	*1,040	*6.57
Oct. 27	0930	1,020	6.53				

Minimum discharge, 0.68 ft^3/s, July 11-12.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e3.9	4.5	7.9	2.5	2.4	1.4	1.1	e1.0	1.3	3.1	7.2	5.8
2	e3.8	5.0	7.9	2.5	2.2	1.4	1.1	e1.0	1.5	2.3	3.9	13
3	e5.0	4.0	5.3	2.6	2.1	1.4	1.0	e1.0	1.9	2.0	3.8	132
4	e120	3.8	7.8	2.6	2.0	1.4	1.0	e1.0	1.3	16	3.0	77
5	e8.5	3.6	6.8	2.7	1.9	1.4	.97	1.1	1.2	4.6	3.4	17
6	e7.2	3.5	8.1	2.6	2.0	1.4	.95	1.0	1.2	2.1	4.0	13
7	e5.0	3.4	6.5	2.3	1.9	1.3	.93	1.1	1.2	1.4	7.6	15
8	e4.7	3.4	7.9	2.3	1.9	1.3	1.0	1.3	1.5	1.1	3.7	10
9	e4.5	3.2	7.7	2.3	1.8	1.3	.97	1.3	1.2	.89	3.1	35
10	e9.0	3.2	5.5	2.2	1.9	1.4	.97	1.1	1.3	.91	2.8	11
11	e5.8	3.1	5.1	2.6	1.8	1.7	.97	1.1	1.3	.77	2.6	8.7
12	e4.1	7.0	4.8	2.2	1.7	1.3	.97	1.1	1.4	1.9	2.4	14
13	e6.0	8.1	4.7	2.8	1.7	1.5	e1.0	1.0	1.4	.87	7.1	16
14	e5.0	11	4.4	66	1.8	1.8	e1.4	1.0	2.0	19	3.5	13
15	e4.6	36	4.4	22	1.7	1.5	e1.2	1.0	1.8	7.9	27	7.5
16	e4.3	10	4.1	9.7	1.6	1.4	e1.1	1.0	1.4	5.4	20	6.7
17	e4.2	7.4	3.7	6.8	2.1	1.3	e1.0	.97	1.4	4.1	16	11
18	4.1	6.6	3.7	5.1	1.6	1.2	e1.0	.99	1.7	4.3	37	31
19	3.9	6.0	3.6	7.8	1.6	1.2	e1.0	.93	1.7	5.7	12	7.5
20	3.8	5.7	3.4	5.4	2.2	1.3	e.98	.93	5.8	3.8	11	9.4
21	3.7	5.6	3.2	4.5	1.8	1.4	e.97	.93	5.5	3.2	9.8	6.1
22	3.6	5.6	3.6	4.2	1.7	1.2	e.95	.88	8.1	2.8	9.2	8.4
23	8.9	4.7	3.2	3.7	1.6	1.1	e.95	.88	4.4	2.5	10	6.4
24	65	4.5	3.1	3.3	1.7	1.1	e.95	.88	2.7	6.0	29	5.5
25	39	4.5	3.1	3.2	1.5	1.1	e1.2	.85	3.6	3.1	13	5.7
26	13	4.5	3.0	2.8	1.6	1.1	e1.1	.82	4.5	2.4	15	10
27	60	5.3	3.0	2.7	1.5	1.1	e1.3	2.6	2.8	7.3	11	5.2
28	9.4	28	2.9	2.5	1.6	1.1	e1.6	1.2	2.7	2.8	8.7	16
29	6.9	16	2.7	2.5	---	1.1	e1.3	1.4	2.6	4.2	6.4	5.4
30	5.9	6.8	2.7	2.7	---	1.1	e1.1	1.3	6.4	2.6	7.5	5.0
31	5.1	---	2.6	2.4	---	1.1	---	1.2	---	3.2	5.7	---
TOTAL	437.9	224.0	146.4	189.5	50.9	40.4	32.03	33.86	76.8	128.24	306.4	527.3
MEAN	14.1	7.47	4.72	6.11	1.82	1.30	1.07	1.09	2.56	4.14	9.88	17.6
MAX	120	36	8.1	66	2.4	1.8	1.6	2.6	8.1	19	37	132
MIN	3.6	3.1	2.6	2.2	1.5	1.1	.93	.82	1.2	.77	2.4	5.0
AC-FT	869	444	290	376	101	80	64	67	152	254	608	1050

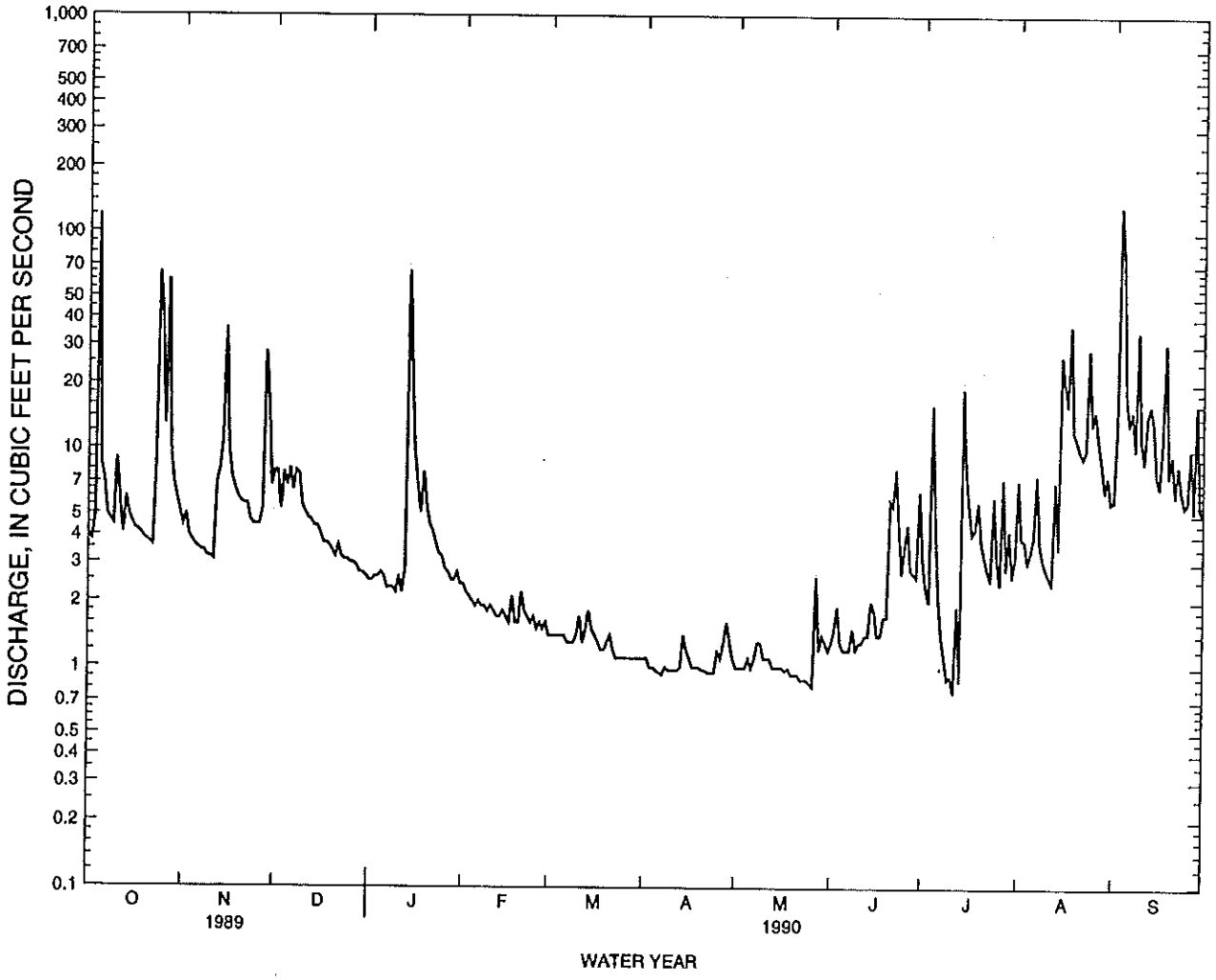
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1972 - 1990, BY WATER YEAR (WY)

MEAN	9.56	7.22	4.49	3.07	2.88	1.76	1.55	2.96	2.70	5.67	10.4	10.1
MAX	23.1	13.6	7.42	11.9	11.4	4.64	5.98	15.9	7.64	13.9	22.8	21.0
(WY)	1980	1976	1987	1976	1980	1974	1974	1976	1974	1986	1986	1980
MIN	3.40	3.16	2.62	1.56	.89	.78	.66	.51	.41	.87	1.75	3.35
(WY)	1977	1974	1989	1972	1972	1978	1984	1978	1983	1983	1977	1988

e Estimated

16848500 MAULAP RIVER NEAR AGAT--CONTINUED

SUMMARY STATISTICS	FOR 1989 CALENDAR YEAR		FOR 1990 WATER YEAR		WATER YEARS 1972 - 1990	
ANNUAL TOTAL	2265.0		2193.73			
ANNUAL MEAN	6.21		6.01		5.17	
HIGHEST ANNUAL MEAN					9.74	1976
LOWEST ANNUAL MEAN					2.32	1973
HIGHEST DAILY MEAN	120	Oct 4	132	Sep 3	249	Feb 26 1980
LOWEST DAILY MEAN	1.1	Apr 10	.77	Jul 11	.31	Jun 30 1983
ANNUAL SEVEN-DAY MINIMUM	1.2	Apr 7	.88	May 20	.34	Jun 24 1983
ANNUAL RUNOFF (AC-FT)	4490		4350		3750	
10 PERCENT EXCEEDS	10		11		9.9	
50 PERCENT EXCEEDS	3.1		2.8		2.4	
90 PERCENT EXCEEDS	1.4		1.0		.71	



GAGING STATION RECORDS
MARIANA ISLANDS, ISLAND OF GUAM
16849000 FENA DAM SPILLWAY NEAR AGAT

LOCATION.--Lat 13°21'28" N., long 144°42'12" E., Hydrologic Unit 20100003, on left bank 3.5 mi southeast of Agat and 5.8 mi southwest of Yona.

DRAINAGE AREA.--5.88 mi^2.

PERIOD OF RECORD.--September 1951 to July 1952, November 1952 to current year. Daily mean gage heights published since October 1973.

REVISED RECORDS.--WSP 2137: Drainage area. WDR HI-78-2: 1977 (M, m).

GAGE.--Water-stage recorder and concrete-dam control. Datum of gage is 111.35 ft above mean sea level (from U.S. Navy construction plans).

REMARKS.--Gage-height records good. Abont 14 ft^3/s is diverted from Fena Valley Reservoir and tributary springs for military and civilian use.

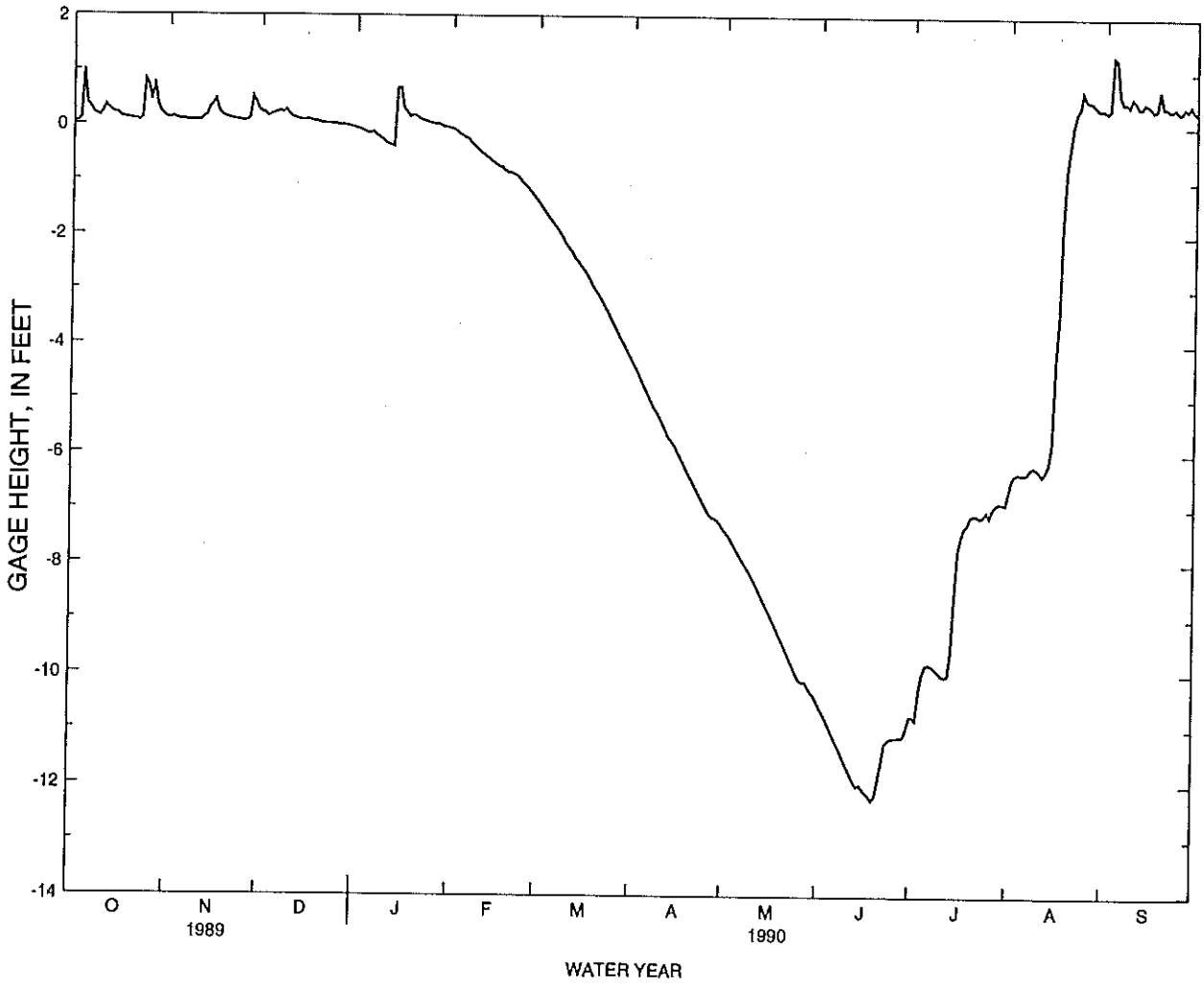
AVERAGE DISCHARGE.--20 years (1953-73), 17.9 ft^3/s (12,970 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, not determined, occurred October 15, 1953 (gage height, at least 4.5 ft); no flow for many days each year. Minimum recorded gage height, -21.86 ft, August 4, 1983.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 2.20 ft, October 4; minimum, -12.27 ft, June 19.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.05	.12	.23	-.06	-.06	-1.40	-4.32	-7.37	-10.50	-10.76	-6.67	.30
2	.05	.14	.22	-.08	-.10	-1.49	-4.43	-7.44	-10.61	-10.76	-6.43	.35
3	.11	.12	.16	-.11	-.15	-1.57	-4.54	-7.51	-10.72	-10.81	-6.36	1.31
4	1.00	.10	.19	-.14	-.18	-1.65	-4.67	-7.62	-10.83	-10.28	-6.34	1.26
5	.38	.10	.21	-.15	-.22	-1.73	-4.79	-7.72	-10.96	-9.98	-6.35	.61
6	.32	.09	.23	-.13	-.24	-1.81	-4.91	-7.82	-11.08	-9.83	-6.35	.47
7	.22	.08	.25	-.17	-.32	-1.88	-5.03	-7.92	-11.21	-9.81	-6.34	.47
8	.18	.07	.23	-.22	-.37	-1.97	-5.15	-8.01	-11.31	-9.84	-6.25	.42
9	.16	.08	.27	-.25	-.43	-2.06	-5.23	-8.10	-11.44	-9.89	-6.22	.55
10	.23	.08	.18	-.31	-.48	-2.17	-5.34	-8.21	-11.56	-9.94	-6.25	.50
11	.35	.08	.14	-.34	-.53	-2.25	-5.46	-8.31	-11.68	-10.01	-6.31	.39
12	.29	.14	.12	-.36	-.57	-2.32	-5.58	-8.42	-11.80	-10.03	-6.37	.38
13	.24	.17	.10	-.38	-.62	-2.43	-5.71	-8.54	-11.92	-10.01	-6.29	.46
14	.21	.31	.09	.68	-.66	-2.49	-5.77	-8.66	-12.01	-9.58	-6.16	.44
15	.20	.38	.09	.68	-.70	-2.57	-5.86	-8.78	-11.99	-8.55	-5.79	.38
16	.14	.46	.10	.32	-.75	-2.64	-5.98	-8.89	-12.06	-7.75	-4.30	.33
17	.13	.25	.08	.24	-.76	-2.73	-6.09	-9.01	-12.12	-7.49	-3.50	.35
18	.12	.18	.07	.16	-.82	-2.83	-6.20	-9.12	-12.18	-7.32	-1.78	.69
19	.11	.15	.06	.18	-.86	-2.95	-6.32	-9.25	-12.26	-7.27	-.79	.39
20	.10	.13	.04	.17	-.86	-3.04	-6.42	-9.36	-12.18	-7.13	-.36	.38
21	.10	.11	.03	.12	-.89	-3.12	-6.53	-9.48	-11.89	-7.10	.03	.34
22	.08	.10	.03	.10	-.92	-3.22	-6.65	-9.61	-11.60	-7.10	.28	.33
23	.12	.09	.03	.08	-.99	-3.33	-6.76	-9.73	-11.25	-7.14	.37	.37
24	.82	.08	.02	.06	-1.06	-3.44	-6.87	-9.85	-11.18	-7.12	.65	.30
25	.72	.07	.02	.04	-1.12	-3.56	-6.97	-9.98	-11.15	-7.04	.52	.30
26	.45	.08	.00	.03	-1.18	-3.67	-7.08	-10.09	-11.14	-7.12	.49	.38
27	.77	.12	.00	.03	-1.26	-3.78	-7.15	-10.13	-11.14	-6.98	.48	.34
28	.38	.51	.00	.01	-1.33	-3.90	-7.17	-10.13	-11.13	-6.91	.41	.42
29	.23	.42	-.01	-.03	---	-4.00	-7.21	-10.22	-11.12	-6.88	.35	.32
30	.18	.28	-.03	-.03	---	-4.11	-7.28	-10.32	-10.97	-6.89	.34	.28
31	.13	---	-.04	-.05	---	-4.22	---	-10.38	---	-6.90	.34	---
MEAN	.28	.17	.10	.00	-.66	-2.72	-5.92	-8.90	-11.43	-8.52	-3.26	.46
MAX	1.00	.51	.27	.68	-.06	-1.40	-4.32	-7.37	-10.50	-6.88	.65	1.31
MIN	.05	.07	-.04	-.38	-1.33	-4.22	-7.28	-10.38	-12.26	-10.81	-6.67	.28


GAGE HEIGHT, IN FEET
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WATER YEAR

GAGING STATION RECORDS

MARIANA ISLANDS, ISLAND OF GUAM

16854500 UGUM RIVER ABOVE TALOFOFO FALLS, NEAR TALOFOFO

LOCATION.--Lat 13°19'16" N., long 144°44'01" E., Hydrologic Unit 20100003, about 300 ft upstream from Talofofo Falls, 0.9 mi north of NASA Tracking Station, and 3.5 mi southwest of main intersection in Talofofo village.

DRAINAGE AREA.--5.76 mi^2.

PERIOD OF RECORD.--June 1977 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 130 ft, from topographic map.

REMARKS.--Records good except for periods of estimated discharge, which are poor. No diversion upstream.

AVERAGE DISCHARGE.--13 years, 24.9 ft^3/s (18,050 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,890 ft^3/s, February 26, 1980, gage height, 14.2 ft, from flood-marks, from rating curve extended above 350 ft^3/s on basis of slope-area measurement at gage height 14.2 ft; minimum, 3.4 ft^3/s, June 27, 1978, July 14, 18, 19, 1979.

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base discharge of 2,000 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 4	0345	*2,180	*9.00
Oct. 27	1030	2,150	8.94

Minimum discharge, 4.8 ft^3/s, June 13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	31	47	13	e15	12	7.8	6.6	e5.4	e7.0	24	39
2	24	36	30	13	e14	12	7.7	6.5	e5.4	e5.5	14	83
3	34	29	27	13	e14	12	7.7	8.3	e5.4	e5.0	13	576
4	368	27	29	13	e14	11	7.7	7.1	e5.4	e14	13	314
5	62	26	27	14	e14	11	7.7	7.5	e5.4	e10	12	99
6	46	25	27	21	e14	11	7.7	6.1	e5.4	e9.0	12	74
7	37	24	30	14	e15	11	7.2	6.7	e5.4	e8.0	14	67
8	34	24	29	13	e15	10	7.7	6.5	e5.9	e6.5	14	60
9	31	24	35	12	e14	11	8.3	6.3	e5.8	e5.5	12	57
10	61	22	24	13	e13	11	7.8	6.3	e5.7	e6.0	12	49
11	36	22	22	14	e14	12	7.4	6.3	e5.3	e5.0	11	52
12	31	35	22	13	e15	11	7.4	6.3	e5.0	e10	10	44
13	34	65	20	14	e14	11	7.5	6.3	e4.8	e20	22	69
14	28	80	19	301	e13	11	10	6.1	e5.6	e30	14	102
15	27	150	20	119	e15	12	8.4	6.2	e6.0	e20	117	58
16	25	63	20	43	e17	11	7.8	6.3	e5.5	e30	96	44
17	25	38	19	33	e16	11	7.4	6.0	e5.0	e40	75	61
18	26	31	18	26	e14	11	7.0	6.1	e5.5	33	115	94
19	25	27	17	31	e16	10	7.0	5.8	e6.5	36	53	48
20	24	25	17	27	e15	11	7.0	5.7	e5.7	22	53	55
21	26	24	16	22	14	11	7.0	5.7	e10	18	51	39
22	21	22	19	21	14	9.8	6.8	e5.7	e8.0	15	46	74
23	31	21	17	20	13	9.2	6.6	e5.7	e7.0	13	46	52
24	229	21	16	19	13	9.0	6.5	e5.7	e6.0	15	109	37
25	155	21	16	19	13	8.7	6.4	e5.7	e5.0	14	69	36
26	73	23	16	19	12	8.7	6.5	e5.4	e10	12	103	e62
27	208	39	15	18	12	8.7	7.8	e5.4	e8.0	29	80	e41
28	54	127	14	e20	12	8.7	7.2	e5.4	e6.0	28	62	e41
29	42	66	14	e18	---	8.7	6.8	e5.2	e5.0	21	49	e40
30	37	40	14	e16	---	8.6	6.1	e5.2	e6.0	15	53	e40
31	33	---	13	e15	---	8.3	---	e5.2	---	22	45	---
TOTAL	1910	1208	669	967	394	322.4	221.9	189.3	181.1	524.5	1419	2507
MEAN	61.6	40.3	21.6	31.2	14.1	10.4	7.40	6.11	6.04	16.9	45.8	83.6
MAX	368	150	47	301	17	12	10	8.3	10	40	117	576
MIN	21	21	13	12	12	8.3	6.1	5.2	4.8	5.0	10	36
AC-FT	3790	2400	1330	1920	781	639	440	375	359	1040	2810	4970

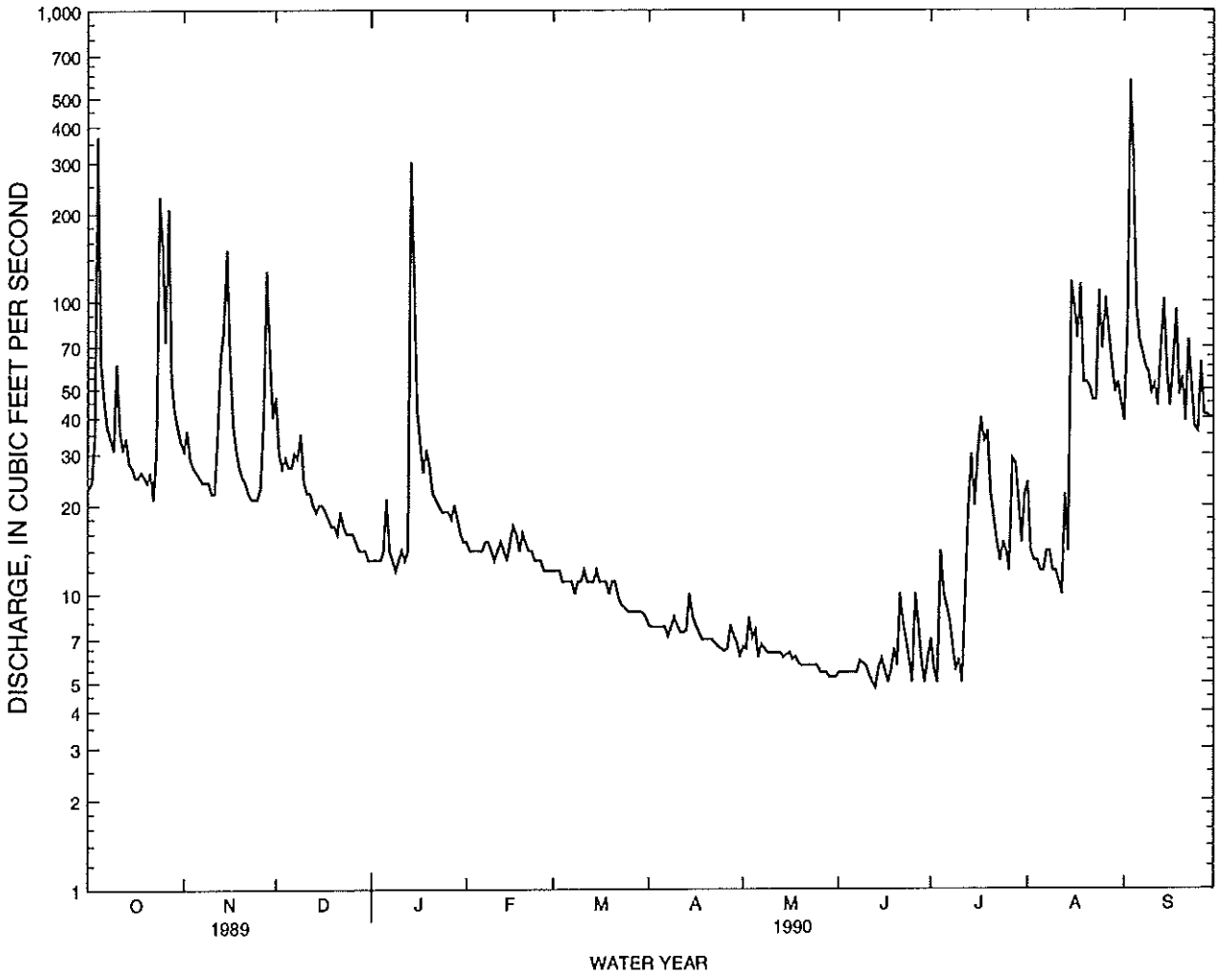
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1977 - 1990, BY WATER YEAR (WY)

MEAN	46.9	36.9	24.2	16.1	16.6	11.0	9.17	9.99	10.9	20.3	40.7	50.7
MAX	84.6	64.2	37.4	31.2	54.6	23.3	28.4	24.6	30.3	56.3	114	132
(WY)	1980	1985	1985	1990	1980	1986	1989	1986	1985	1986	1986	1980
MIN	23.2	20.3	12.0	10.7	8.48	6.51	5.53	4.37	4.00	5.59	6.92	20.8
(WY)	1988	1989	1989	1983	1983	1978	1978	1978	1983	1977	1977	1979

e Estimated

16854500 UGUM RIVER ABOVE TALOFOFO FALLS, NEAR TALOFOFO--CONTINUED

SUMMARY STATISTICS	FOR 1989 CALENDAR YEAR		FOR 1990 WATER YEAR		WATER YEARS 1977 - 1990	
ANNUAL TOTAL	11153.8		10513.2			
ANNUAL MEAN	30.6		28.8		24.9	
HIGHEST ANNUAL MEAN					40.9	1980
LOWEST ANNUAL MEAN					15.5	1983
HIGHEST DAILY MEAN	396	Feb 18	576	Sep 3	1000	Feb 26 1980
LOWEST DAILY MEAN	7.7	Feb 6	4.8	Jun 13	3.5	Jul 14 1979
ANNUAL SEVEN-DAY MINIMUM	7.8	Feb 3	5.3	May 26	3.5	Jun 22 1983
ANNUAL RUNOFF (AC-FT)	22120		20850		18050	
10 PERCENT EXCEEDS	55		60		48	
50 PERCENT EXCEEDS	18		14		14	
90 PERCENT EXCEEDS	10		5.9		5.2	



16858000 YLIG RIVER NEAR YONA

LOCATION.--Lat 13°23'28" N., long 144°45'06" E., Hydrologic Unit 20100003, on right bank 2.2 mi upstream from mouth, 1.9 mi southwest of Yona, and 5.6 mi south of Agana.

DRAINAGE AREA.--6.48 mi^2.

PERIOD OF RECORD.--June 1952 to March 1986, April 1987 to current year.

REVISED RECORDS.--WSP 1937: 1957-58. WSP 2137: Drainage area.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 20 ft, from topographic map.

REMARKS.--Records good up to 300 ft^3/s and poor for flows greater than 300 ft^3/s.

AVERAGE DISCHARGE.--36 years (water years 1953-85, 1988-90), 28.0 ft^3/s (20,310 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,900 ft^3/s, September 9, 1963, gage height, 19.77 ft, from floodmarks, from rating curve extended above 830 ft^3/s on basis of slope-area measurements at gage heights 11.24 ft and 15.87 ft; maximum gage height 22.80 ft, February 26, 1980; minimum, 0.07 ft^3/s, May 20, 1973, but may have been less during period of diversion from gage pool, May 15 to June 20, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base discharge of 2,000 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 4	0445	*2,940	*17.01	Sep. 3	2315	2,220	14.34
Aug. 20	1930	2,260	14.50				

Minimum discharge, 1.3 ft^3/s, June 8.

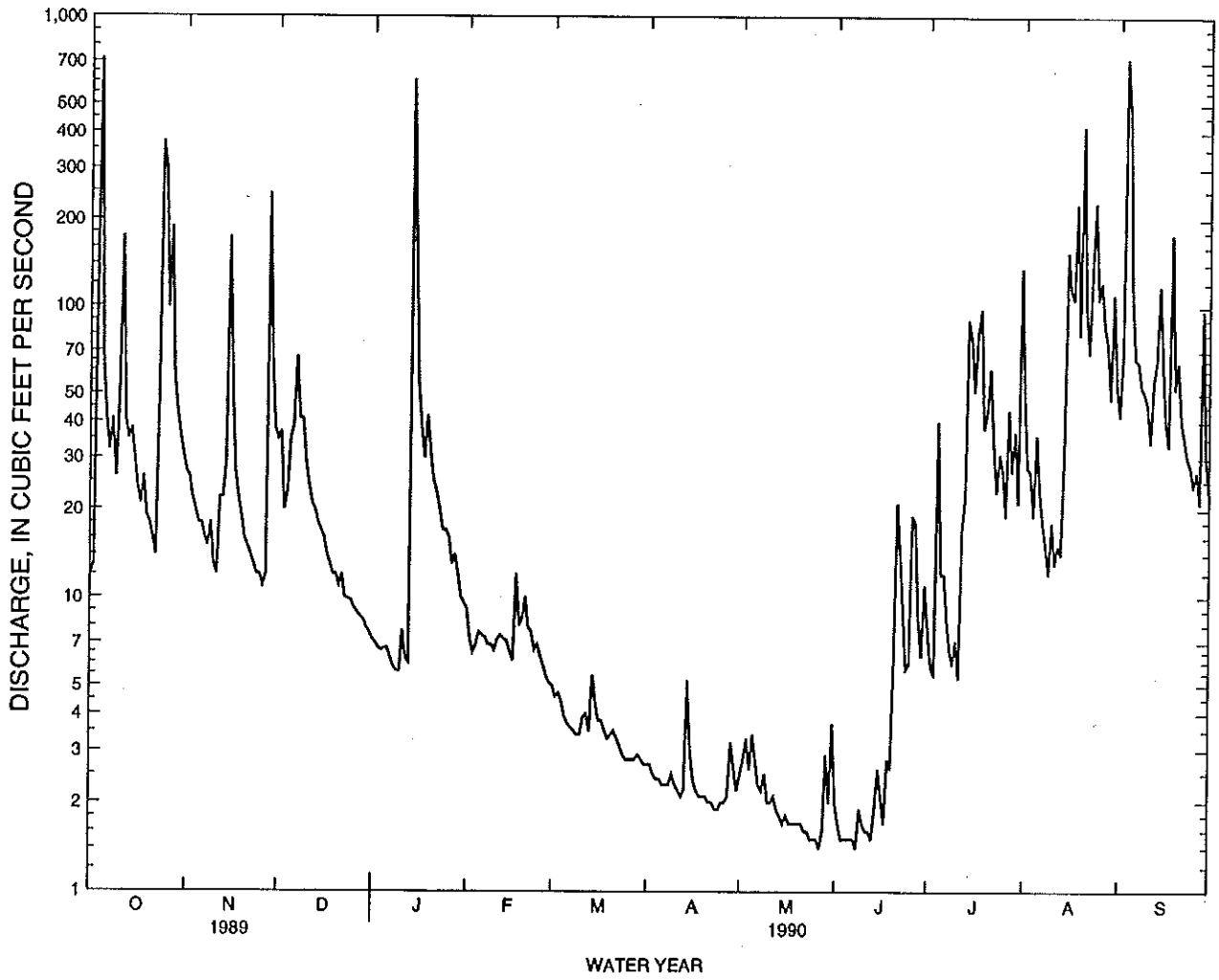
DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	27	35	7.2	9.1	5.0	2.7	2.5	2.0	7.6	50	42
2	13	26	37	7.0	7.2	4.6	2.7	2.8	1.7	5.8	28	69
3	133	22	20	6.7	6.5	4.7	2.5	3.3	1.5	5.4	27	723
4	716	20	23	6.6	6.9	4.4	2.4	2.6	1.5	40	19	480
5	64	18	35	6.7	7.6	3.9	2.4	3.4	1.5	12	36	108
6	41	18	39	6.7	7.4	3.7	2.3	2.8	1.5	12	23	66
7	32	16	67	6.2	7.3	3.6	2.3	2.3	1.5	8.3	18	64
8	41	15	41	5.8	6.9	3.5	2.3	2.2	1.4	6.6	15	53
9	26	18	41	5.6	6.9	3.4	2.5	2.5	1.9	5.9	12	50
10	50	13	29	5.6	6.6	3.4	2.3	2.0	1.7	7.1	18	46
11	175	12	24	7.7	7.2	3.9	2.2	2.0	1.6	5.3	13	34
12	41	22	21	6.2	7.4	4.0	2.1	2.1	1.6	17	15	55
13	35	22	20	6.0	7.2	3.5	2.2	1.9	1.5	22	14	65
14	38	29	18	606	7.1	5.4	5.2	1.8	1.9	90	31	118
15	30	173	17	157	6.5	4.4	3.0	1.7	2.6	78	154	62
16	24	52	16	54	6.1	3.8	2.4	1.8	2.1	51	113	40
17	21	27	14	39	12	3.8	2.2	1.7	1.7	81	106	33
18	26	22	13	30	8.0	3.5	2.1	1.7	2.8	98	226	178
19	19	19	12	42	8.5	3.3	2.1	1.7	2.6	38	80	52
20	18	16	12	31	10	3.4	2.1	1.7	6.7	43	420	64
21	16	15	11	25	7.9	3.5	2.0	1.7	21	61	101	40
22	14	14	12	23	7.6	3.3	2.0	1.6	14	34	69	35
23	51	13	10	20	6.6	3.1	1.9	1.6	9.1	23	136	30
24	371	12	9.9	17	6.9	2.9	1.9	1.5	5.7	31	229	28
25	305	12	9.8	17	6.3	2.8	2.0	1.5	5.9	27	106	24
26	99	11	9.2	16	5.9	2.8	2.0	1.5	19	19	121	27
27	188	12	8.9	13	5.4	2.8	2.1	1.4	18	44	85	21
28	58	245	8.6	14	5.1	2.8	3.2	1.6	8.7	27	74	97
29	44	66	8.4	12	---	2.9	2.6	2.9	6.3	37	48	30
30	36	38	7.9	10	---	2.8	2.2	2.0	11	21	110	23
31	31	---	7.6	9.6	---	2.7	---	3.7	---	136	54	---
TOTAL	2768	1025	637.3	1219.6	204.1	111.6	71.9	65.5	160.0	1094.0	2551	2757
MEAN	89.3	34.2	20.6	39.3	7.29	3.60	2.40	2.11	5.33	35.3	82.3	91.9
MAX	716	245	67	606	12	5.4	5.2	3.7	21	136	420	723
MIN	12	11	7.6	5.6	5.1	2.7	1.9	1.4	1.4	5.3	12	21
AC-FT	5490	2030	1260	2420	405	221	143	130	317	2170	5060	5470

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 1990, BY WATER YEAR (WY)

MEAN	58.6	39.4	23.4	16.9	12.8	7.18	6.39	13.6	11.2	28.6	51.8	61.3
MAX	151	100	72.4	102	71.6	42.0	46.8	106	57.0	93.6	116	190
(WY)	1954	1976	1963	1976	1976	1971	1974	1976	1963	1976	1981	1967
MIN	14.0	12.8	5.87	2.63	1.33	.71	.36	.15	.23	.73	10.6	14.6
(WY)	1977	1966	1966	1966	1966	1966	1966	1966	1983	1957	1957	1988

SUMMARY STATISTICS	FOR 1989 CALENDAR YEAR		FOR 1990 WATER YEAR		WATER YEARS 1952 - 1990	
ANNUAL TOTAL	11083.1		12665.0			
ANNUAL MEAN	30.4		34.7		28.0	
HIGHEST ANNUAL MEAN					62.3	1976
LOWEST ANNUAL MEAN					12.9	1973
HIGHEST DAILY MEAN	716	Oct 4	723	Sep 3	2050	Oct 15 1953
LOWEST DAILY MEAN	1.4	Apr 12	1.4	May 27	.10	May 15 1966
ANNUAL SEVEN-DAY MINIMUM	1.8	Apr 8	1.5	Jun 2	.10	May 15 1966
ANNUAL RUNOFF (AC-FT)	21980		25120		20310	
10 PERCENT EXCEEDS	57		71		54	
50 PERCENT EXCEEDS	13		12		11	
90 PERCENT EXCEEDS	3.0		2.0		1.1	



GAGING STATION RECORDS

CAROLINE ISLANDS, PALAU ISLANDS

16890600 DIONGRADID RIVER, BABELTHUAP

LOCATION.--Lat 07°36'04" N., long 134°35'02" E., Hydrologic Unit 20100006, on right bank 0.3 mi upstream from left-bank tributary, 0.9 mi southeast of Ngetbong village school, and 2.4 mi upstream from confluence with Ngerchetang River.

DRAINAGE AREA.--4.45 mi^2.

PERIOD OF RECORD.--October 1969 to current year. Prior to October 1980, published as Adeiddo River.

REVISED RECORDS.--WDR HI-75-1: 1970(M), 1972-73(P). WDR HI-81-2: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 15 ft, from topographic map.

REMARKS.--Records fair except for estimated daily discharges, which are poor. No diversion upstream.

AVERAGE DISCHARGE.--21 years, 31.4 ft^3/s (22,770 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,310 ft^3/s, January 22, 1975, gage height, 15.44 ft, from rating curve extended above 410 ft^3/s on basis of field estimate at gage height 15.44 ft; minimum, 2.1 ft^3/s, April 14-17, 1983.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 600 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 15	1730	1,760	13.08	June 23	unknown	*1,890	*13.75

Minimum daily discharge, 3.9 ft^3/s, October 6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	11	11	e9.0	e11	e4.0	e15	e7.0	9.9	e31	32	13
2	6.8	11	11	e9.0	e10	e4.5	e25	e8.0	10	e30	31	12
3	5.8	11	10	e11	e9.0	e5.0	e20	e6.0	9.7	e31	31	12
4	5.4	11	10	e13	e8.5	e5.5	e15	e5.5	7.9	e30	30	12
5	4.4	11	10	e16	e8.5	e5.0	e13	e5.0	7.2	e35	31	27
6	3.9	11	10	e11	e8.0	e4.5	e12	e4.8	6.8	e37	34	18
7	5.4	10	10	e12	e8.5	e4.2	e10	e4.5	e10	33	30	13
8	4.0	10	12	e10	e9.5	e4.2	e9.5	e4.5	e10	31	30	12
9	90	11	12	e9.0	e11	e4.5	e8.5	e4.5	7.4	77	29	19
10	20	11	11	e8.0	e10	e4.3	e8.0	e5.0	11	64	29	28
11	14	11	10	e7.5	e9.0	e4.5	e7.5	e7.0	e13	45	27	22
12	20	11	10	e7.0	e8.0	e6.0	e7.0	e9.0	e15	42	27	20
13	23	11	11	e6.5	e7.5	e8.0	e6.5	e12	e30	37	31	19
14	42	25	10	e6.0	e7.5	e15	e6.0	e8.1	e20	34	31	19
15	22	425	10	e5.5	e7.0	e28	e5.5	e15	e25	34	29	19
16	38	80	25	e5.5	e6.5	e15	e5.0	e12	e30	33	28	23
17	28	52	11	e5.5	e6.0	e8.0	e5.0	16	e25	31	24	25
18	25	39	10	e6.0	e5.5	e5.5	e8.0	11	e25	79	24	24
19	20	31	10	e6.0	e5.0	e5.0	e15	e9.7	e25	95	23	23
20	20	24	11	e6.0	e5.5	e4.8	e25	e11	e15	e56	21	21
21	20	26	10	e6.0	e7.0	e5.0	e15	e8.4	e14	e49	20	53
22	15	20	e11	e6.0	e7.0	e7.0	e10	e8.9	e13	43	19	42
23	13	16	e10	e7.0	e6.0	e10	e9.0	e7.4	e500	71	17	32
24	15	14	e12	e7.0	e5.5	e20	e8.0	7.9	e300	47	16	29
25	13	13	e13	e6.0	e5.5	e35	e7.0	8.9	e100	61	15	29
26	13	12	e13	e5.5	e5.0	e15	e6.0	e8.4	e35	47	15	28
27	21	15	e11	e6.0	e4.5	e35	e5.5	e7.4	e33	42	14	28
28	16	13	e9.5	e12	e4.0	e25	e5.2	e7.2	e30	39	14	43
29	16	11	e8.5	e9.0	---	e22	e5.0	7.0	e35	36	13	35
30	13	11	e8.5	e10	---	e22	e5.0	e9.1	e32	34	13	53
31	11	---	e8.5	e11	---	e20	---	9.1	---	32	13	---
TOTAL	578.7	968	340.0	255.0	206.0	361.5	302.2	255.3	1404.9	1386	741	753
MEAN	18.7	32.3	11.0	8.23	7.36	11.7	10.1	8.24	46.8	44.7	23.9	25.1
MAX	90	425	25	16	11	35	25	16	500	95	34	53
MIN	3.9	10	8.5	5.5	4.0	4.0	5.0	4.5	6.8	30	13	12
AC-FT	1150	1920	674	506	409	717	599	506	2790	2750	1470	1490

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1970 - 1990, BY WATER YEAR (WY)

MEAN	42.1	31.9	28.8	26.0	27.0	18.3	18.5	19.0	36.9	54.6	39.9	33.9
MAX	74.4	88.1	51.8	71.5	83.2	67.6	64.2	42.0	67.1	102	79.3	73.2
(WY)	1985	1987	1981	1975	1981	1972	1979	1978	1975	1977	1983	1973
MIN	14.8	11.3	9.40	8.23	5.29	3.52	3.36	3.10	13.0	24.0	16.1	11.3
(WY)	1977	1983	1985	1990	1983	1983	1983	1983	1983	1978	1982	1982

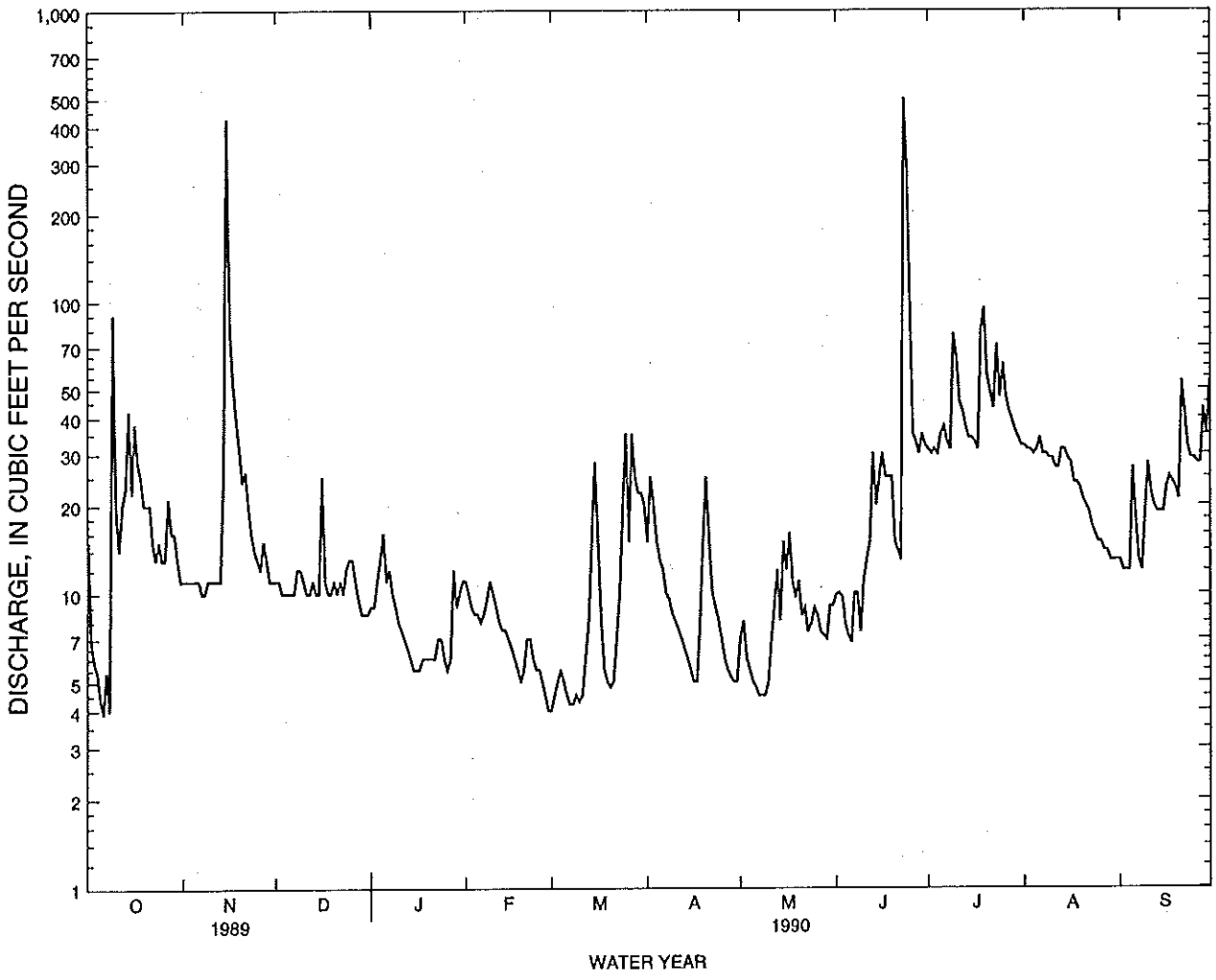
e Estimated

GAGING STATION RECORDS

CAROLINE ISLANDS, PALAU ISLANDS

16890600 DIONGRADID RIVER, BABELTHUAP--CONTINUED

SUMMARY STATISTICS	FOR 1989 CALENDAR YEAR		FOR 1990 WATER YEAR		WATER YEARS 1970 - 1990	
ANNUAL TOTAL	10764.7		7551.6			
ANNUAL MEAN	29.5		20.7		31.4	
HIGHEST ANNUAL MEAN					40.0	1975
LOWEST ANNUAL MEAN					20.7	1990
HIGHEST DAILY MEAN	425	Nov 15	500	Jun 23	1050	Nov 11 1986
LOWEST DAILY MEAN	3.9	Oct 6	3.9	Oct 6	2.1	Apr 14 1983
ANNUAL SEVEN-DAY MINIMUM	5.1	Oct 2	4.5	Mar 5	2.2	Apr 11 1983
ANNUAL RUNOFF (AC-FT)	21350		14980		22770	
10 PERCENT EXCEEDS	55		35		58	
50 PERCENT EXCEEDS	22		12		23	
90 PERCENT EXCEEDS	11		5.5		9.2	



GAGING STATION RECORDS

CAROLINE ISLANDS, PALAU ISLANDS

16890900 TABECHEDING RIVER, BABELTHUAP

LOCATION.--Lat 07°27'03" N., long 134°31'29" E., Hydrologic Unit 20100006, on left bank 0.2 mi downstream from waterfall, 1.5 mi upstream from boat landing, and 1.6 mi east of forestry station.

DRAINAGE AREA.--6.07 mi^2.

PERIOD OF RECORD.--October 1970 to current year. Prior to October 1980, published as Tabagaten River.

REVISED RECORDS.--WDR HI-81-2: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 20 ft, from topographic map.

REMARKS.--Records fair except for estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--20 years, 47.6 ft^3/s (34,500 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,580 ft^3/s, December 23, 1973, gage height, 8.79 ft, from rating curve extended above 290 ft^3/s; minimum, 0.57 ft^3/s, April 19, 1983.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 900 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 16	1200	*1,360	*6.83	Nov. 15	1700	1,060	6.23
Oct. 30	1200	914	5.86	June 23	unknown	unknown	unknown

Minimum discharge, 5.7 ft^3/s, March 8-13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	31	e46	22	16	e17	7.6	8.2	e6.3	e32	e47	31	e10
2	23	e42	21	17	e17	7.4	13	e11	e30	e54	31	e10
3	17	e72	18	16	e15	7.4	21	e9.0	e28	e57	27	e10
4	24	e44	17	e18	e13	18	12	e8.0	e27	37	23	e20
5	17	e37	16	e35	e13	e7.4	9.9	e7.0	e26	36	22	e80
6	15	e37	16	24	e12	e6.6	8.2	e6.5	e25	37	46	e40
7	16	e47	17	24	e12	e6.0	7.4	e6.2	e130	28	29	e20
8	15	e38	37	20	e12	5.7	7.1	e6.0	e60	24	23	e18
9	71	e33	53	18	e12	5.7	6.9	e6.2	e45	101	22	e25
10	22	e31	24	16	e17	5.7	6.6	e7.0	e37	68	84	e95
11	18	e26	20	16	e15	5.7	6.6	e20	e45	36	46	e45
12	26	e24	18	14	e14	5.7	6.9	e130	e55	28	31	e30
13	38	e23	17	e14	e12	5.7	6.4	e32	e110	24	29	e23
14	24	e139	19	e13	e11	6.4	6.4	e35	e65	23	31	e37
15	23	e382	16	e12	e12	37	6.9	e150	e100	24	22	e24
16	281	e170	77	e12	e11	42	6.1	e80	e110	22	19	e21
17	e95	e100	39	e12	e10	9.5	5.9	e55	e90	19	17	e22
18	e66	e80	24	e12	e9.5	6.9	5.9	e50	e95	85	16	e21
19	e46	e65	30	e12	e9.0	6.1	6.6	e45	e50	99	15	e20
20	e84	e52	23	e13	e8.8	5.9	53	e40	e30	42	15	e18
21	e110	e45	27	11	e8.7	5.9	20	e37	e26	33	14	e55
22	e48	e41	22	12	e8.7	5.9	12	e41	e30	31	13	e60
23	e41	37	25	e14	e11	11	8.7	e38	e750	71	12	e85
24	e54	32	28	e15	e10	10	e8.2	e35	e400	174	12	e45
25	e36	31	30	e14	e9.0	36	e7.7	e34	e140	236	11	e35
26	e48	28	27	e12	e8.2	17	e7.2	e32	e70	94	e11	e30
27	e39	48	20	e14	7.9	10	e6.8	e36	e50	71	e11	e30
28	e48	37	18	e24	7.6	35	e6.5	e32	e45	66	e11	e35
29	e40	28	17	e18	---	15	e6.4	e28	e43	48	e11	e34
30	e179	24	16	e14	---	12	e6.4	e28	e50	40	e10	e40
31	e64	---	16	e12	---	9.9	---	e35	---	36	e10	---
TOTAL	1659	1839	770	494	323.4	376.1	300.9	1086.2	2794	1791	705	1038
MEAN	53.5	61.3	24.8	15.9	11.6	12.1	10.0	35.0	93.1	57.8	22.7	34.6
MAX	281	382	77	35	17	42	53	150	750	236	84	95
MIN	15	23	16	11	7.6	5.7	5.9	6.0	25	19	10	10
AC-FT	3290	3650	1530	980	641	746	597	2150	5540	3550	1400	2060

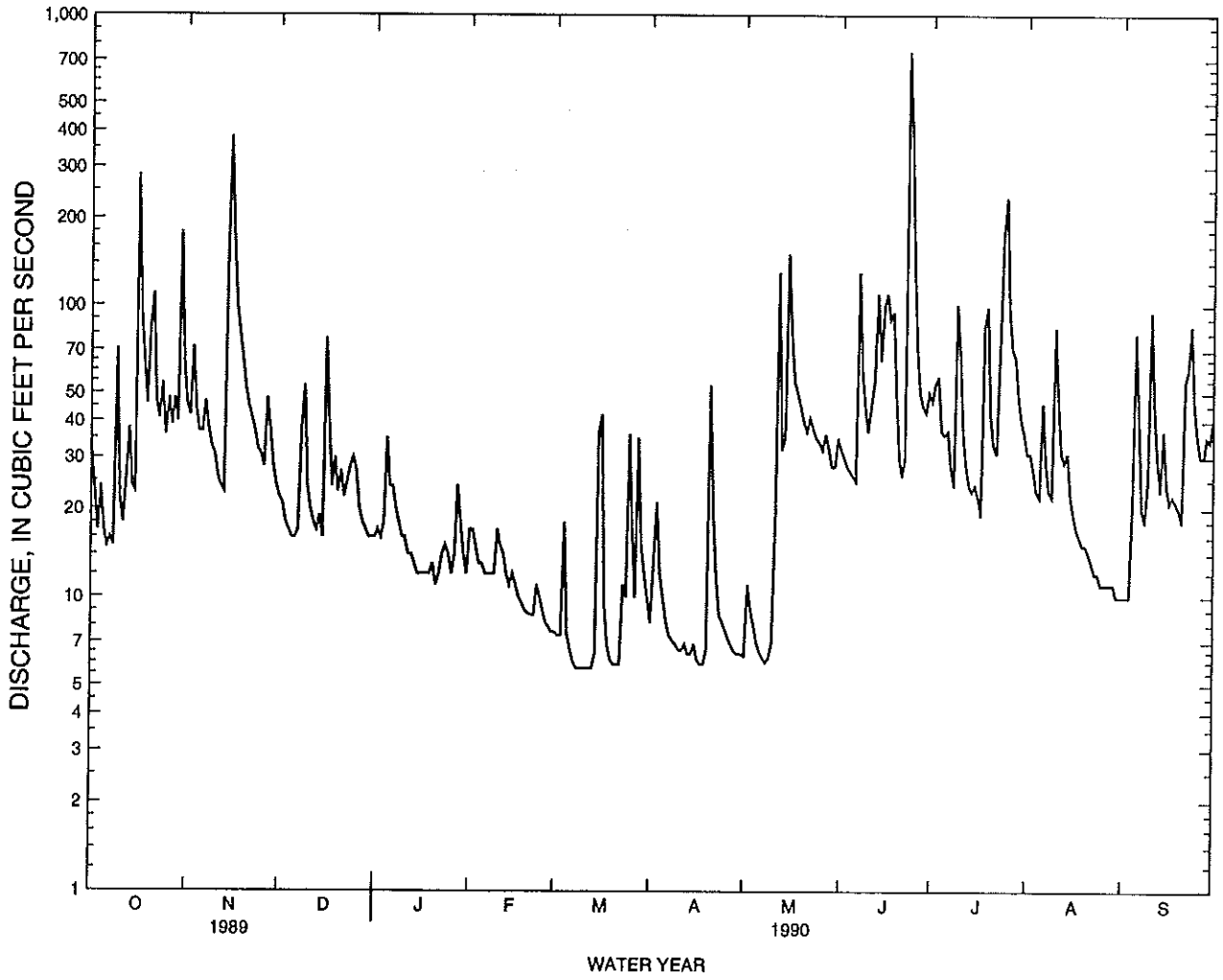
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1971 - 1990, BY WATER YEAR (WY)

MEAN	61.2	47.8	49.7	40.4	36.7	23.1	29.0	36.7	65.1	70.6	63.3	46.9
MAX	97.6	78.4	100	120	86.5	71.1	96.6	80.7	112	113	160	119
(WY)	1979	1975	1976	1974	1978	1972	1979	1989	1981	1986	1987	1985
MIN	16.5	20.7	22.9	6.67	2.67	1.60	3.98	4.43	22.2	28.0	22.7	17.4
(WY)	1988	1973	1978	1973	1973	1973	1983	1983	1983	1978	1990	1982

e Estimated

16890900 TABECHEDING RIVER, BABELTHUAP--CONTINUED

SUMMARY STATISTICS	FOR 1989 CALENDAR YEAR		FOR 1990 WATER YEAR		WATER YEARS 1971 - 1990	
ANNUAL TOTAL	17515		13176.6			
ANNUAL MEAN	48.0		36.1		47.6	
HIGHEST ANNUAL MEAN					58.8	1974
LOWEST ANNUAL MEAN					29.1	1973
HIGHEST DAILY MEAN	382	Nov 15	750	Jun 23	1280	Apr 13 1979
LOWEST DAILY MEAN	14	Sep 23	5.7	Mar 8	.68	Apr 18 1983
ANNUAL SEVEN-DAY MINIMUM	15	Sep 17	5.7	Mar 7	.82	Apr 13 1983
ANNUAL RUNOFF (AC-FT)	34740		26140		34500	
10 PERCENT EXCEEDS	81		71		97	
50 PERCENT EXCEEDS	36		23		31	
90 PERCENT EXCEEDS	18		7.1		11	



CAROLINE ISLANDS, PALAU ISLANDS

16891310 KMEKUMEL RIVER, BABELTHUAP

LOCATION.--Lat 07°23'14" N., long 134°32'42" E., Hydrologic Unit 20100006, 0.5 mi upstream from confluence with Edeng River and 1.1 mi north of Palau Mission Academy.

DRAINAGE AREA.--1.44 mi^2.

PERIOD OF RECORD.--September 1978 to current year. Low-flow partial-record station operated "at mouth" 1970-78. Prior to October 1980, published as Kumekumeyel River.

REVISED RECORDS.--WDR HI-81-2: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 96.44 ft, from stadia survey.

REMARKS.--Records fair except for estimated daily discharges, which are poor. No diversion upstream.

AVERAGE DISCHARGE.--12 years, 9.10 ft^3/s (6,590 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,880 ft^3/s, June 23, 1990, gage height, 11.42 ft, from rating curve extended above 106 ft^3/s on basis of slope-area measurement at gage height 10.53 ft; minimum, 0.18 ft^3/s, April 14-17, 1983.

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base discharge of 450 ft^3/s and maximum(*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 16	1100	861	8.23	June 23	unknown	*1,880	*11.42

Minimum daily, 0.91 ft^3/s, March 2, 3.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	5.2	3.9	2.2	1.9	.99	3.0	2.2	4.1	e7.4	4.5	2.2
2	7.5	5.0	3.9	2.2	2.0	.91	5.2	2.0	3.9	e7.5	5.2	2.2
3	5.5	11	3.6	2.2	1.7	.91	5.0	1.7	3.8	e7.5	4.4	2.1
4	13	5.7	3.4	2.4	1.6	1.7	4.5	1.7	3.5	e7.4	3.9	2.5
5	7.0	4.7	3.2	3.0	1.4	1.5	3.5	1.7	3.4	7.1	3.9	3.4
6	5.9	5.0	3.1	2.4	1.3	1.4	3.1	1.6	3.2	5.5	7.9	2.8
7	5.3	6.5	4.7	2.8	e1.3	e1.2	3.0	1.5	5.0	5.2	4.8	2.2
8	5.3	5.0	5.0	3.1	e1.3	1.1	2.8	1.5	4.2	4.5	3.9	2.6
9	6.4	4.7	8.1	2.5	e1.4	e1.0	2.6	e1.6	4.5	13	4.5	5.5
10	5.9	5.7	3.8	2.2	e1.9	e.95	2.5	e1.5	6.7	8.2	6.5	e18
11	5.3	9.3	3.4	2.0	e1.8	1.1	2.5	e2.5	5.7	5.5	6.3	e9.0
12	8.4	6.5	3.2	2.0	e1.5	.99	2.4	e16	5.9	4.8	5.3	e7.0
13	13	5.0	3.1	1.9	e1.2	1.2	2.2	e10	e13	4.5	9.6	e4.5
14	7.7	30	3.6	1.8	e1.3	1.3	2.2	e4.0	e10	4.2	7.1	e7.0
15	7.3	64	3.0	1.8	1.2	12	2.1	e19	e14	4.4	5.2	e5.5
16	104	30	14	1.7	1.1	4.4	2.0	12	e13	3.9	4.7	e4.0
17	49	18	4.7	1.7	1.1	2.0	1.9	6.5	e12	4.1	4.4	e4.0
18	21	12	3.6	1.7	1.2	1.7	2.0	6.9	e12	11	4.1	e4.2
19	12	10	3.5	1.7	1.2	1.5	2.4	5.5	e7.0	11	3.8	e3.7
20	28	8.2	3.4	1.7	1.1	1.4	4.7	5.3	e4.2	5.9	3.6	e3.5
21	17	7.5	3.4	1.7	1.1	1.5	3.5	4.8	e4.0	5.0	3.5	e10
22	9.1	6.7	3.1	1.7	1.1	2.0	2.5	4.8	e4.2	4.5	3.4	e11
23	7.3	5.9	2.9	2.1	1.9	3.9	2.3	4.7	e180	6.3	3.2	e16
24	7.1	5.3	2.8	2.0	1.2	2.9	2.1	4.5	e120	6.7	3.0	e10
25	6.7	5.2	2.6	1.6	1.1	5.5	2.0	4.8	e25	36	2.9	e7.0
26	6.5	4.8	2.6	1.6	1.1	3.4	1.9	4.7	e11	9.4	2.8	e6.0
27	6.3	8.0	2.4	1.7	1.1	2.9	1.9	4.5	e9.2	7.5	2.8	e5.6
28	11	5.3	2.3	3.4	.99	15	1.9	4.2	e8.5	6.5	2.6	e6.5
29	5.5	4.7	2.3	2.8	---	5.2	1.8	3.9	e8.5	5.7	2.5	e6.5
30	15	4.2	2.3	1.8	---	6.3	1.8	3.8	e8.0	5.3	2.5	e7.2
31	6.5	---	2.3	1.6	---	3.4	---	3.9	---	5.0	2.3	---
TOTAL	425.5	309.1	117.2	65.0	38.09	91.25	81.3	153.3	517.5	230.5	135.1	181.7
MEAN	13.7	10.3	3.78	2.10	1.36	2.94	2.71	4.95	17.2	7.44	4.36	6.06
MAX	104	64	14	3.4	2.0	15	5.2	19	180	36	9.6	18
MIN	5.3	4.2	2.3	1.6	.99	.91	1.8	1.5	3.2	3.9	2.3	2.1
AC-FT	844	613	232	129	76	181	161	304	1030	457	268	360

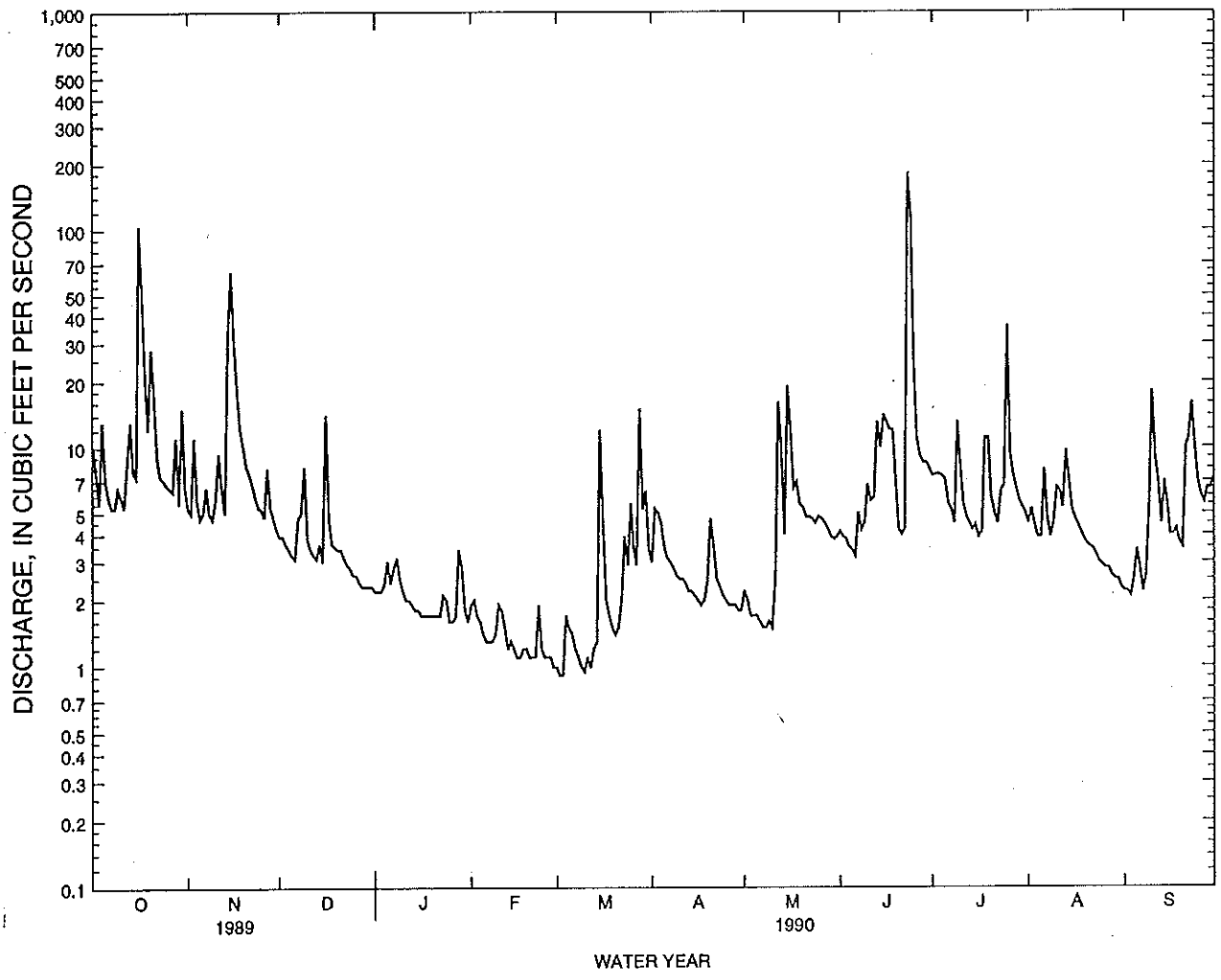
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 1990, BY WATER YEAR (WY)

MEAN	11.6	8.46	8.06	6.66	7.13	4.49	5.90	7.14	13.6	14.3	12.7	9.06
MAX	21.7	16.6	12.9	14.5	16.7	9.01	22.7	18.5	21.7	23.8	32.0	22.0
(WY)	1979	1987	1982	1985	1981	1984	1979	1989	1988	1987	1987	1985
MIN	4.29	2.80	3.78	2.10	.89	.50	.38	.46	1.92	7.44	4.36	4.61
(WY)	1988	1983	1990	1990	1983	1983	1983	1983	1983	1990	1990	1982

e Estimated

16891310 KMEKUMEL RIVER, BABELTHUAP--CONTINUED

SUMMARY STATISTICS	FOR 1989 CALENDAR YEAR		FOR 1990 WATER YEAR		WATER YEARS 1978 - 1990	
ANNUAL TOTAL	3801.1		2345.54			
ANNUAL MEAN	10.4		6.43		9.10	
HIGHEST ANNUAL MEAN					11.5	1989
LOWEST ANNUAL MEAN					5.15	1983
HIGHEST DAILY MEAN	104	Oct 16	180	Jun 23	397	Apr 13 1979
LOWEST DAILY MEAN	2.3	Dec 28	.91	Mar 2	.18	Apr 15 1983
ANNUAL SEVEN-DAY MINIMUM	2.4	Dec 25	1.0	Feb 25	.20	Apr 11 1983
ANNUAL RUNOFF (AC-FT)	7540		4650		6590	
10 PERCENT EXCEEDS	20		11		17	
50 PERCENT EXCEEDS	7.3		4.0		5.8	
90 PERCENT EXCEEDS	3.6		1.5		2.1	



GAGING STATION RECORDS

CAROLINE ISLANDS, PALAU ISLANDS

16891400 SOUTH FORK NGERDORCH RIVER, BABELTHUAP

LOCATION.--Lat 07°26'19" N., long 134°34'28" E., Hydrologic Unit 20100006, on right bank 0.3 mi from left-bank tributary, 1.3 mi west of Rrai village, and 1.5 mi upstream from confluence with North Fork Ngerdorch River.

DRAINAGE AREA.--2.44 mi^2.

PERIOD OF RECORD.--March 1971 to current year. Prior to October 1980, published as South Fork Ngardok River.

REVISED RECORDS.--WDR HI-75-1: 1971(M), 1972, 1973(P), 1974. WDR HI-81-2: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 25 ft, revised, from topographic map.

REMARKS.--Records fair except for estimated daily discharges, which are poor. No diversion upstream.

AVERAGE DISCHARGE.--19 years, 18.6 ft^3/s (13,510 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,750 ft^3/s, December 13, 1974, gage height, 9.19 ft, from rating curve extended above 65 ft^3/s on basis of field estimate at gage height 7.57 ft; minimum, 0.48 ft^3/s, April 16, 17, 1983.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 750 ft^3/s and maximum(*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 16	1300	1,520	5.20	June 23	unknown	*3,140	*6.98

Minimum daily discharge, 1.2 ft^3/s, March 1-3 and 8-10.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	14	7.3	6.1	4.1	1.2	7.3	3.0	13	e12	13	4.9
2	8.7	12	7.1	6.6	3.8	1.2	14	4.8	12	e13	17	4.7
3	6.8	12	6.5	6.1	3.1	1.2	16	3.6	11	e13	13	4.7
4	17	11	6.1	7.5	2.8	1.4	12	3.3	11	e12	11	9.4
5	12	9.9	5.9	12	2.8	1.8	8.6	3.2	11	e11	11	33
6	7.5	10	5.8	7.5	2.8	1.8	7.5	2.7	10	e10	26	11
7	8.6	12	6.1	8.6	2.6	1.4	6.2	2.7	51	e10	16	7.5
8	7.1	9.5	9.2	7.5	2.6	1.2	5.8	2.5	18	9.4	24	7.0
9	14	9.2	14	6.6	2.6	1.2	5.4	3.0	15	44	16	12
10	8.3	8.7	7.1	5.2	3.8	1.2	4.9	2.8	16	27	38	40
11	7.2	7.8	6.8	5.2	3.4	1.5	4.8	11	19	16	24	16
12	12	8.6	6.6	4.8	3.1	1.3	4.4	49	e25	13	18	11
13	9.3	7.4	5.7	4.8	2.3	1.7	3.8	12	e45	12	18	9.2
14	7.8	50	6.4	4.5	2.6	2.9	3.7	14	e25	21	17	16
15	8.1	111	5.6	4.1	2.3	e18	3.5	59	e40	15	14	10
16	140	58	22	3.8	2.3	17	3.3	27	e45	12	12	8.5
17	95	25	11	4.1	2.3	4.9	3.2	22	e36	11	11	9.2
18	46	20	7.5	4.1	2.0	3.3	3.0	20	e38	46	10	9.1
19	25	17	7.5	4.1	1.8	3.1	7.4	17	e20	51	9.5	8.2
20	21	15	7.0	4.5	1.6	3.2	16	16	e10	22	8.8	7.5
21	23	14	8.0	4.1	1.6	3.1	10	14	e11	18	9.0	23
22	16	12	7.0	4.1	1.6	3.7	6.1	17	e15	17	8.8	25
23	14	11	8.6	4.5	2.6	7.4	5.6	14	e300	29	7.8	37
24	15	10	9.1	5.6	1.8	9.5	5.0	14	e200	25	7.2	19
25	12	9.6	9.6	4.1	1.8	e25	4.6	14	e35	61	6.6	15
26	13	9.1	9.6	3.8	1.8	12	3.8	13	e17	25	6.5	13
27	12	11	6.6	4.1	1.6	9.4	3.9	15	e15	21	7.1	12
28	21	10	6.1	9.1	1.4	e25	3.4	12	e14	18	6.6	15
29	15	8.5	6.1	5.6	---	14	3.4	11	e15	17	5.9	14
30	46	7.8	6.1	3.8	---	14	3.3	11	e14	15	5.7	17
31	18	---	6.1	3.1	---	9.6	---	15	---	13	5.0	---
TOTAL	677.4	531.1	244.1	169.6	68.9	203.2	189.9	428.6	1107	639.4	403.5	428.9
MEAN	21.9	17.7	7.87	5.47	2.46	6.55	6.33	13.8	36.9	20.6	13.0	14.3
MAX	140	111	22	12	4.1	25	16	59	300	61	38	40
MIN	6.8	7.4	5.6	3.1	1.4	1.2	3.0	2.5	10	9.4	5.0	4.7
AC-FT	1340	1050	484	336	137	403	377	850	2200	1270	800	851

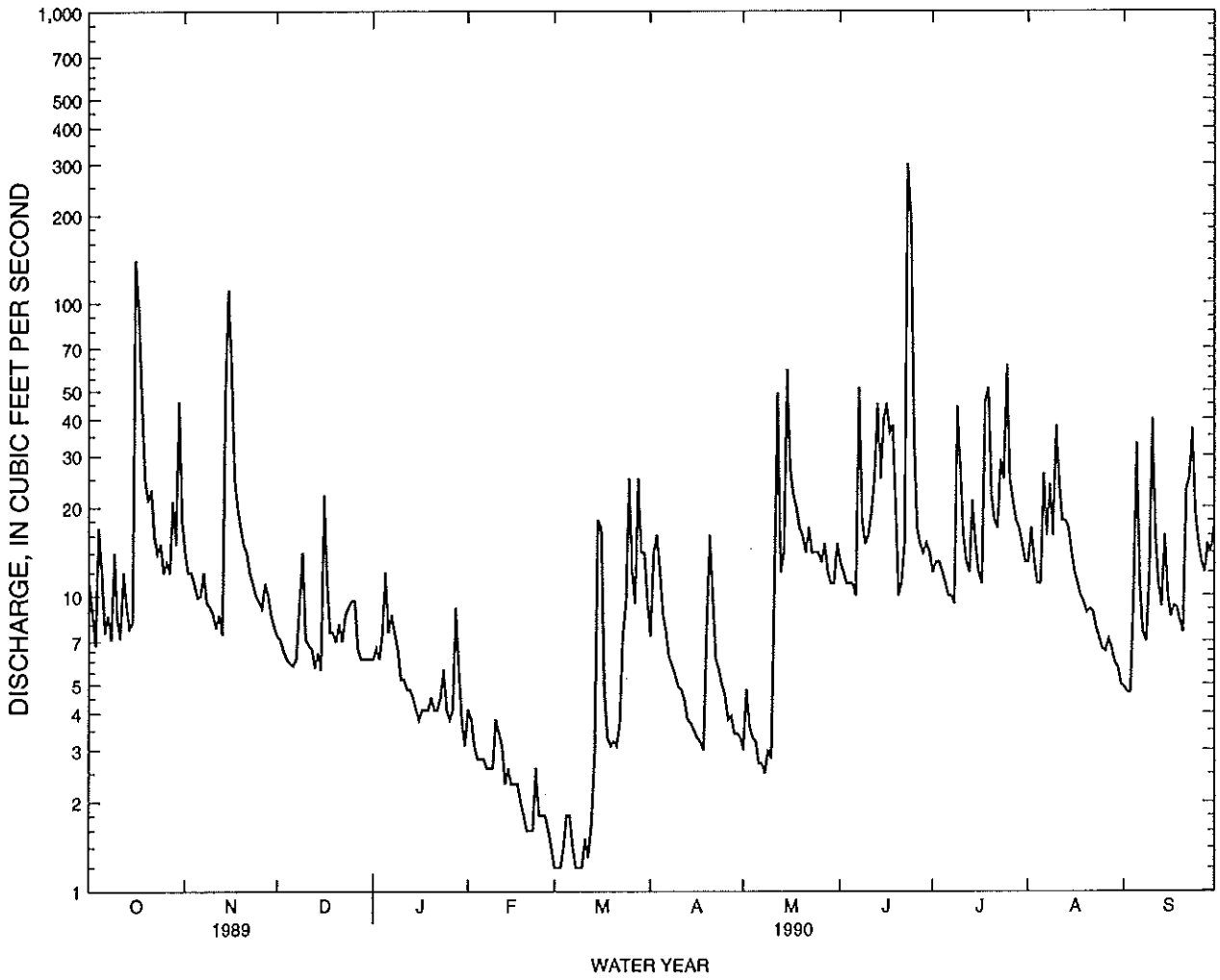
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1971 - 1990, BY WATER YEAR (WY)

MEAN	24.9	17.0	18.7	17.4	15.1	8.83	13.0	14.3	24.6	27.4	25.3	17.4
MAX	48.2	42.6	47.6	63.0	48.6	25.0	54.8	35.4	45.9	50.5	67.0	47.9
(WY)	1979	1987	1975	1974	1981	1972	1979	1989	1981	1981	1987	1985
MIN	6.23	5.73	7.15	3.17	1.42	.95	1.31	1.80	7.97	7.67	12.3	8.31
(WY)	1988	1977	1986	1973	1973	1973	1983	1983	1983	1978	1971	1982

e Estimated

16891400 SOUTH FORK NGERDORCH RIVER, BABELTHUAP--CONTINUED

SUMMARY STATISTICS	FOR 1989 CALENDAR YEAR		FOR 1990 WATER YEAR		WATER YEARS 1971 - 1990	
ANNUAL TOTAL	6657.1		5091.6			
ANNUAL MEAN	18.2		13.9		18.6	
HIGHEST ANNUAL MEAN					24.6	1975
LOWEST ANNUAL MEAN					11.0	1983
HIGHEST DAILY MEAN	159	Feb 21	300	Jun 23	923	Apr 13 1979
LOWEST DAILY MEAN	3.4	Sep 23	1.2	Mar 1	.60	Apr 14 1983
ANNUAL SEVEN-DAY MINIMUM	4.0	Sep 18	1.4	Mar 7	.66	Apr 11 1983
ANNUAL RUNOFF (AC-FT)	13200		10100		13510	
10 PERCENT EXCEEDS	37		25		36	
50 PERCENT EXCEEDS	12		9.4		11	
90 PERCENT EXCEEDS	6.1		2.8		4.0	



CAROLINE ISLANDS, YAP ISLANDS

16893200 MUKONG STREAM, GAGIL-TAMIL

LOCATION.--Lat 09°32'05" N., long 138°10'18" E., Hydrologic Unit 20100006, on right bank 0.2 mi upstream from mouth and 0.9 mi south of the U.S. Coast Guard LORAN station.

DRAINAGE AREA.--0.50 mi^2.

PERIOD OF STREAMFLOW RECORD.--Occasional low-flow measurements, water years 1972-75, December 1974 to June 1978, July to September 1978, stage-discharge relation indefinite due to blocked control. October 1978 to September 1989 (discontinued).

PERIOD OF WATER-QUALITY DATA.--October 1989.

WATER-QUALITY DATA

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH WATER WHOLE LAB (STANDARD UNITS) (00403)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, DISSOLVED (MG/L AS NA) (00930)
OCT 1989 02...	1145	26.5	2.16	58	7.2	<.100	5.8	2.4	4.0

DATE	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	IRON, DISSOLVED (UG/L AS FE) (01046)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	ANC UNFLTRD TIT 4.5 LAB (MG/L AS CACO3) (90410)
OCT 1989 02...	.20	4.7	<1.0	<.10	7.1	340	70	57	20

16893400 EYEB STREAM, GAGIL-TAMIL

LOCATION.--Lat 09°33'02" N., long 138°09'03" E., Hydrologic Unit 20100006, on left bank 0.6 mi southeast of the Tagireeng Canal bridge and 1.2 mi northwest of the U.S. Coast Guard LORAN station.

DRAINAGE AREA.--0.32 mi^2.

PERIOD OF STREAMFLOW RECORD.--January 1982 to September 1989 (discontinued).

PERIOD OF WATER-QUALITY DATA.--October 1989.

WATER-QUALITY DATA

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH WATER WHOLE LAB (STANDARD UNITS) (00403)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, DISSOLVED (MG/L AS NA) (00930)
OCT 1989									
02...	1000	26.0	1.90	49	7.4	<.100	2.5	1.7	3.9

DATE	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	IRON, DISSOLVED (UG/L AS FE) (01046)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	ANC UNFLTRD TIT 4.5 LAB (MG/L AS CACO3) (90410)
OCT 1989									
02...	.10	5.0	<1.0	.10	7.3	240	37	46	14

< ACTUAL VALUE IS KNOWN TO BE LESS THAN VALUE SHOWN

GAGING STATION RECORDS
CAROLINE ISLANDS, ISLAND OF POHNPEI
16897600 NANPIL RIVER

LOCATION.--Lat 06°55'09" N., long 158°11'59" E., Hydrologic Unit 20100006, on left bank 0.1 mi upstream from diversion dam and 1.3 mi upstream from Kiepw River.

DRAINAGE AREA.--3.00 mi^2.

PERIOD OF RECORD.--March 1970 to current year. Prior to October 1980, published as Nanepil River.

REVISED RECORDS.--WDR HI-76-1: 1970(M), 1971-72(P), 1973(M), 1974(P), 1975(M). WDR HI-81-2: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 370 ft, from topographic map.

REMARKS.--Records fair except for estimated daily discharges, which are poor. No diversion upstream.

AVERAGE DISCHARGE.--20 years, 45.0 ft^3/s (32,570 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,820 ft^3/s, August 4, 1976, gage height, 9.68 ft, from rating curve extended above 168 ft^3/s on basis of slope-area measurement at gage height 9.68 ft; minimum, 0.54 ft^3/s, April 19, 1983.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,200 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 24	--	unknown	unknown	Sep. 11	--	unknown	unknown
Jan. 12	0830	*3,760	*7.42				

Minimum discharge, 4.7 ft^3/s, April 14, 15.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.6	136	e30	12	19	24	18	e28	50	26	e17	e22
2	6.5	35	e91	11	9.3	31	32	e20	29	22	e16	e66
3	6.3	23	47	9.8	8.0	95	44	e11	30	16	e23	e32
4	e24	37	e129	9.6	9.8	226	29	25	22	14	28	e21
5	e20	24	38	13	11	88	16	76	16	15	13	e18
6	e30	15	18	12	14	32	11	30	12	38	12	e22
7	24	11	64	10	9.8	24	8.7	17	17	17	12	e42
8	16	10	24	e19	8.7	78	7.2	13	29	16	11	e26
9	50	15	17	e27	7.8	52	7.0	31	43	29	40	e35
10	52	21	e207	e47	7.4	22	6.1	40	54	20	52	e234
11	56	e64	65	e43	e171	27	5.4	95	36	12	e274	e474
12	26	28	26	397	52	14	5.9	94	34	18	e158	e51
13	13	18	16	40	18	11	5.9	85	80	23	e36	e41
14	10	14	14	21	11	15	5.0	93	44	33	e33	e141
15	8.5	11	14	82	7.8	12	12	63	25	168	e52	e46
16	8.0	11	40	24	7.0	9.5	53	53	22	23	e59	e22
17	28	11	16	68	6.5	9.1	22	82	19	18	48	e17
18	24	35	96	30	6.3	10	212	106	132	21	35	e29
19	16	26	57	19	6.1	16	26	74	117	15	22	e39
20	17	13	e201	14	6.1	9.3	14	55	40	13	21	e17
21	31	18	e218	11	6.1	7.8	108	69	24	11	94	e22
22	66	e107	e192	11	7.4	7.6	74	60	17	9.8	e166	e17
23	248	28	65	12	21	6.1	60	49	20	e11	e191	e46
24	e500	e20	80	11	10	5.4	122	36	14	e16	e50	e22
25	57	e17	59	8.8	7.2	25	40	256	e341	e16	e42	e14
26	31	e16	124	8.0	6.3	29	e23	61	43	e16	e30	e20
27	22	e15	32	7.8	8.9	20	e35	35	27	e60	e22	e22
28	31	e12	29	7.6	45	30	e50	42	18	e14	e17	e58
29	34	e10	22	7.4	---	51	e80	e34	136	e97	e16	e36
30	e269	e9.6	23	7.4	---	21	e30	e31	39	e29	e15	e38
31	e148	---	15	7.2	---	47	---	e28	---	e18	e14	---
TOTAL	1879.9	810.6	2069	1007.6	508.5	1054.8	1162.2	1792	1530	854.8	1619	1690
MEAN	60.6	27.0	66.7	32.5	18.2	34.0	38.7	57.8	51.0	27.6	52.2	56.3
MAX	500	136	218	397	171	226	212	256	341	168	274	474
MIN	6.3	9.6	14	7.2	6.1	5.4	5.0	11	12	9.8	11	14
AC-FT	3730	1610	4100	2000	1010	2090	2310	3550	3030	1700	3210	3350

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1970 - 1990, BY WATER YEAR (WY)

MEAN	48.3	40.6	45.4	36.4	34.0	38.7	53.2	51.6	50.5	47.1	47.5	43.9
MAX	71.5	63.7	96.2	71.1	64.7	103	102	117	75.3	148	102	173
(WY)	1975	1988	1976	1989	1974	1976	1973	1972	1987	1972	1976	1972
MIN	29.0	13.6	13.6	3.80	2.99	2.62	1.55	4.40	32.2	16.9	18.4	25.4
(WY)	1973	1981	1978	1983	1983	1983	1983	1983	1977	1984	1988	1977

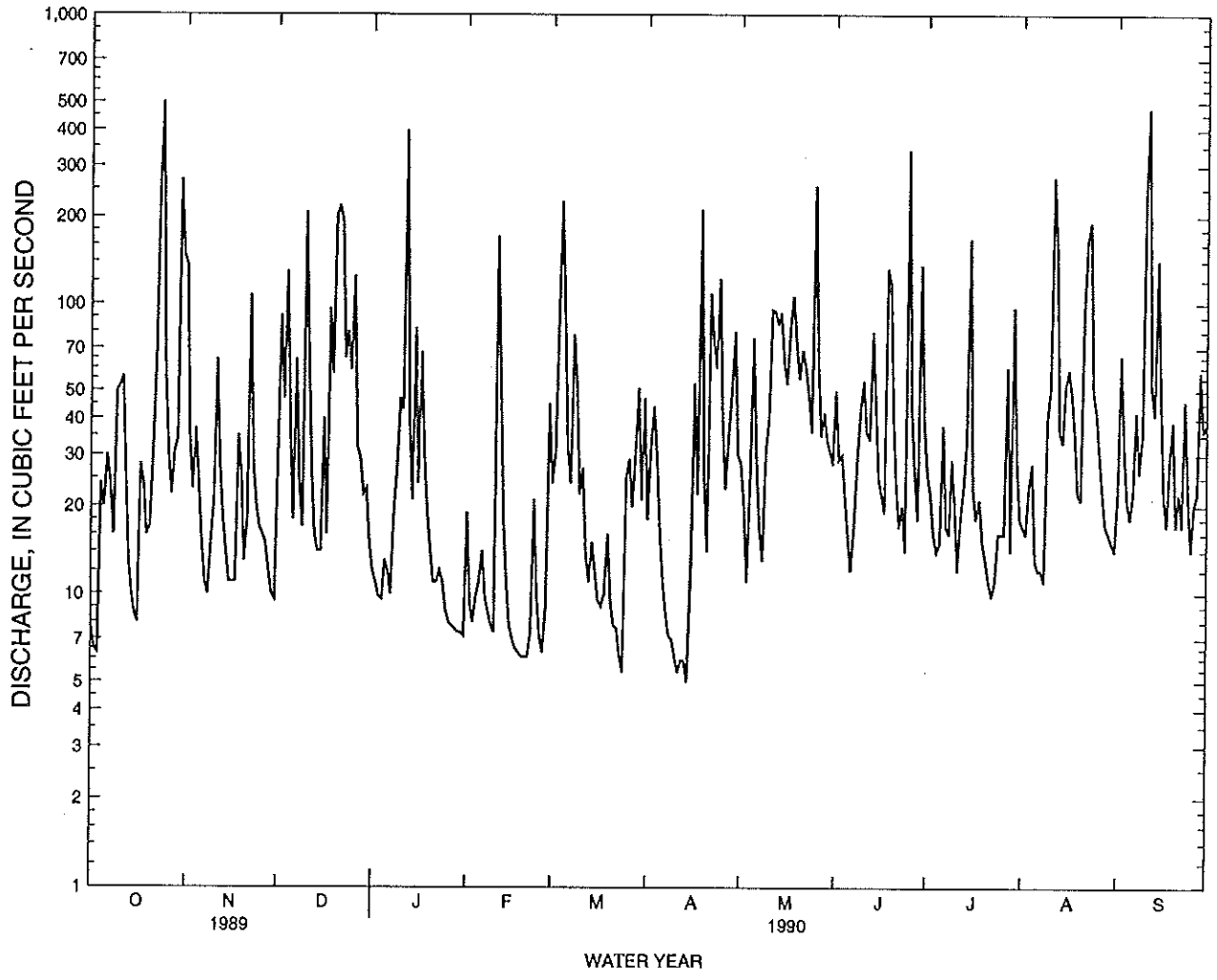
e Estimated

GAGING STATION RECORDS

CAROLINE ISLANDS, ISLAND OF POHNPEI

16897600 NANPIL RIVER--CONTINUED

SUMMARY STATISTICS	FOR 1989 CALENDAR YEAR		FOR 1990 WATER YEAR		WATER YEARS 1970 - 1990	
ANNUAL TOTAL	19967.0		15978.4			
ANNUAL MEAN	54.7		43.8		45.0	
HIGHEST ANNUAL MEAN					70.8	1972
LOWEST ANNUAL MEAN					23.8	1983
HIGHEST DAILY MEAN	565	Apr 4	500	Oct 24	1080	Sep 14 1972
LOWEST DAILY MEAN	6.3	Oct 3	5.0	Apr 14	.59	Apr 19 1983
ANNUAL SEVEN-DAY MINIMUM	11	Sep 27	6.1	Apr 8	.68	Apr 7 1983
ANNUAL RUNOFF (AC-FT)	39600		31690		32570	
10 PERCENT EXCEEDS	117		94		100	
50 PERCENT EXCEEDS	33		23		26	
90 PERCENT EXCEEDS	13		8.7		7.6	



GAGING STATION RECORDS
CAROLINE ISLANDS, ISLAND OF POHNPEI
16897900 LEWI RIVER

LOCATION.--Lat 06°55'32" N., long 158°12'18" E., Hydrologic Unit 20100006, on right bank at road and pipeline crossing, 300 ft upstream from right-bank tributary, and 2.4 mi upstream from mouth.

DRAINAGE AREA.--0.46 mi^2.

PERIOD OF RECORD.--March 1970 to current year. Prior to October 1980, published as Lui River.

REVISED RECORDS.--WDR HI-81-2: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 290 ft, from topographic map.

REMARKS.--Records fair. No diversion upstream.

AVERAGE DISCHARGE.--20 years, 5.24 ft^3/s (3,800 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,320 ft^3/s, July 24, 1986, gage height, 6.32 ft, from rating curve extended above 37 ft^3/s, on basis of slope-area measurement at gage height 5.92 ft; minimum, 0.02 ft^3/s, April 18, 19, 1983.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 23	1430	504	4.48	Jun. 25	0930	802	5.25
Oct. 24	1645	1,180	6.04	Aug. 11	0800	501	4.47
Oct. 31	2015	624	4.81	Sep. 11	1000	*1,200	*6.08
Dec. 2	1730	624	4.81				

Minimum discharge, 0.35 ft^3/s, February 21.

DISCHARGE. CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY MEAN VALUES

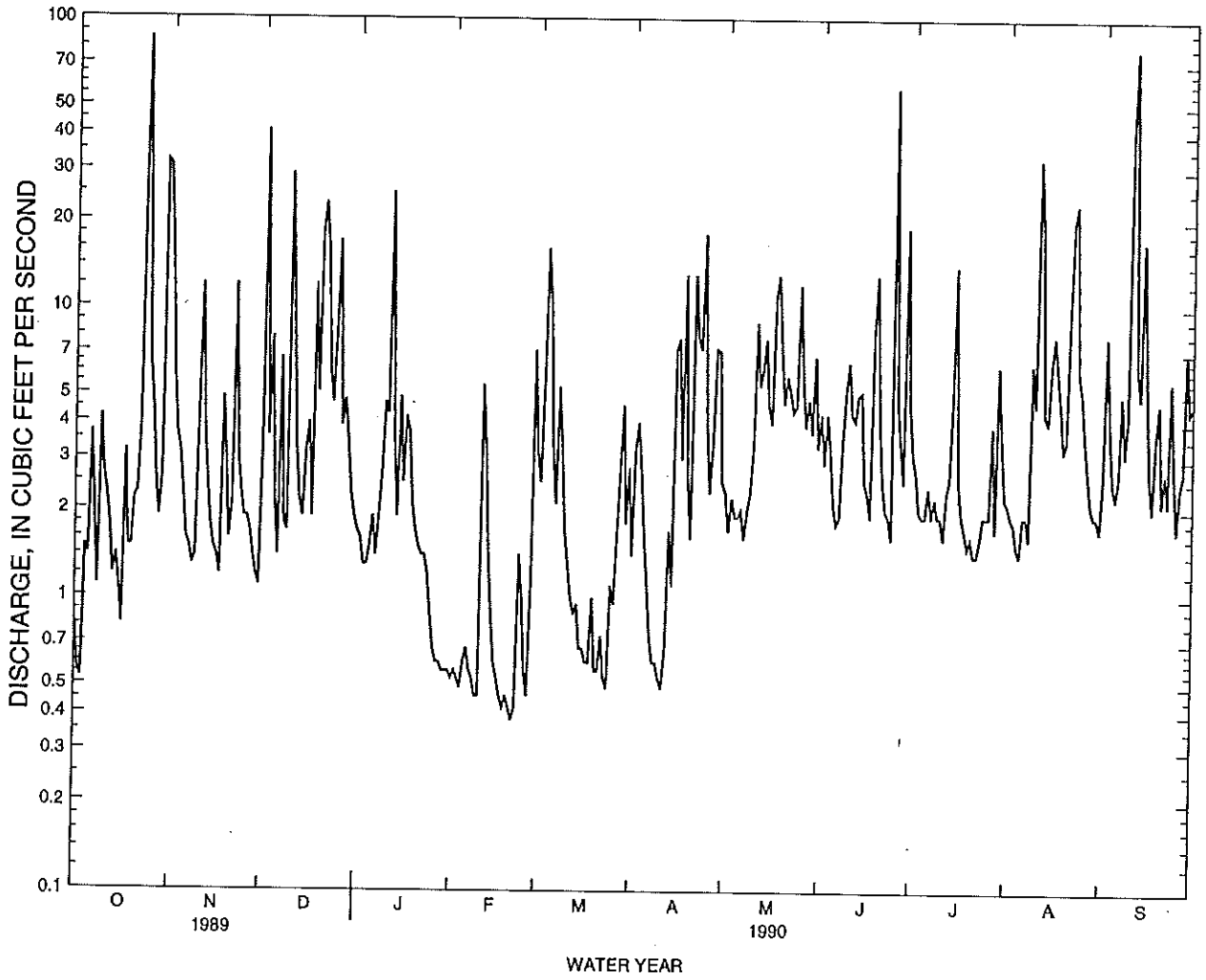
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.81	16	3.4	1.7	.53	3.2	1.4	2.3	4.3	3.1	2.1	2.6
2	.56	6.0	41	1.6	.56	2.5	3.2	1.7	2.9	2.7	e1.9	8.0
3	.53	3.7	3.6	1.3	.53	5.5	4.0	2.2	4.3	2.0	e1.8	3.8
4	1.5	3.2	7.9	1.3	.49	16	2.7	1.9	3.2	1.9	1.5	2.5
5	1.4	2.3	2.2	1.5	.60	10	1.6	1.9	2.1	1.9	1.4	2.2
6	3.7	1.6	1.4	1.9	.67	3.3	1.1	2.0	1.8	2.4	1.9	2.6
7	2.0	1.5	6.7	1.4	.56	2.1	.74	1.6	e1.9	1.9	1.9	5.0
8	1.1	1.3	1.8	1.9	.53	5.3	.60	2.0	e3.5	2.2	1.6	3.1
9	4.2	1.4	1.7	2.7	.46	3.3	.60	2.3	e5.2	1.9	6.4	4.2
10	2.7	4.5	29	4.7	.46	1.7	.53	3.3	e6.5	1.9	4.6	39
11	2.3	12	8.8	4.3	5.4	1.3	.49	8.9	e4.3	1.6	33	79
12	1.8	3.9	3.3	25	3.2	1.0	.67	5.4	e4.1	2.3	19	6.2
13	1.2	2.5	2.2	3.6	1.4	.88	1.7	6.1	e5.0	2.6	4.3	4.9
14	1.4	1.8	1.9	1.9	.88	.95	1.1	7.8	5.1	4.9	4.0	17
15	1.1	1.5	3.2	4.9	.60	.67	7.2	4.6	2.5	14	6.3	5.5
16	.81	1.4	4.0	2.5	.53	.67	7.8	4.0	2.3	2.5	8.0	2.7
17	3.2	1.2	1.9	e4.2	.46	.60	3.0	11	1.9	1.9	5.9	2.0
18	1.5	4.9	12	3.7	.42	.60	13	13	8.2	1.7	4.6	3.5
19	1.5	2.9	5.1	2.1	.46	1.0	2.6	7.3	13	1.5	3.2	4.7
20	2.2	1.6	18	1.7	.42	.56	1.6	4.7	4.1	1.6	3.5	2.1
21	2.3	2.1	23	1.5	.38	.56	13	5.8	2.5	1.4	9.7	2.7
22	3.9	12	16	1.4	.42	.74	7.9	5.1	2.0	1.4	20	2.1
23	26	3.1	6.0	1.4	1.4	.53	7.2	4.4	1.9	1.6	23	5.6
24	86	2.3	4.7	1.2	1.0	.49	18	4.6	1.6	1.9	6.0	2.7
25	6.6	1.9	8.2	.88	.56	1.1	4.0	12	58	1.9	5.1	1.7
26	4.6	1.9	17	.67	.46	.95	2.3	5.6	4.7	1.9	3.6	2.4
27	2.6	1.7	3.9	.60	1.1	1.6	3.5	3.9	3.4	3.9	2.7	2.7
28	1.9	1.4	4.8	.60	7.1	2.7	7.2	4.8	2.5	1.7	2.1	7.0
29	2.7	1.2	3.4	.56	---	4.6	7.1	3.7	19	6.3	1.9	4.4
30	32	1.1	2.3	.56	---	1.8	2.5	6.8	4.6	3.5	1.9	4.6
31	31	---	1.9	.56	---	2.8	---	3.3	---	2.2	1.7	---
TOTAL	235.11	103.9	250.3	83.83	31.58	79.00	128.33	154.0	186.4	84.2	194.6	236.5
MEAN	7.58	3.46	8.07	2.70	1.13	2.55	4.28	4.97	6.21	2.72	6.28	7.88
MAX	86	16	41	25	7.1	16	18	13	58	14	33	79
MIN	.53	1.1	1.4	.56	.38	.49	.49	1.6	1.6	1.4	1.4	1.7
AC-FT	466	206	496	166	63	157	255	305	370	167	386	469

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1970 - 1990, BY WATER YEAR (WY)

MEAN	5.76	5.01	5.23	3.97	3.41	3.93	5.81	6.48	6.39	5.76	5.67	5.08
MAX	9.22	8.14	11.2	7.95	6.80	9.96	10.1	14.4	11.6	14.6	11.6	12.8
(WY)	1976	1977	1976	1984	1980	1976	1979	1972	1982	1982	1976	1972
MIN	2.66	1.31	1.56	.40	.25	.091	.092	.11	2.43	1.69	2.49	1.81
(WY)	1973	1973	1978	1983	1983	1983	1983	1983	1983	1984	1988	1979

e Estimated

SUMMARY STATISTICS	FOR 1989 CALENDAR YEAR		FOR 1990 WATER YEAR		WATER YEARS 1970 - 1990	
ANNUAL TOTAL	2148.62		1767.75			
ANNUAL MEAN	5.89		4.84		5.24	
HIGHEST ANNUAL MEAN					7.81	1982
LOWEST ANNUAL MEAN					2.50	1983
HIGHEST DAILY MEAN	86	Oct 24	86	Oct 24	138	May 4 1972
LOWEST DAILY MEAN	.53	Oct 3	.38	Feb 21	.02	Apr 19 1983
ANNUAL SEVEN-DAY MINIMUM	1.1	Sep 27	.44	Feb 16	.03	Apr 13 1983
ANNUAL RUNOFF (AC-FT)	4260		3510		3800	
10 PERCENT EXCEEDS	12		8.8		12	
50 PERCENT EXCEEDS	3.3		2.5		3.0	
90 PERCENT EXCEEDS	1.4		.64		.66	



GAGING STATION RECORDS

CAROLINE ISLANDS, ISLAND OF POHNPEI

16898600 LUHPWOR RIVER

LOCATION.--Lat 06°54'15" N., long 158°09'45" E., Hydrologic Unit 20100006, on left bank about 300 ft upstream from 50-ft waterfall, 0.2 mi downstream from highway bridge, and 0.2 mi west of Pwakorokot Hill.

DRAINAGE AREA.--0.72 mi^2.

PERIOD OF RECORD.--September 1972 to current year. Prior to October 1980, published as Lupwor River.

REVISED RECORDS.--WDR HI-81-2: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 145 ft, from topographic map.

REMARKS.--Records fair. No diversion upstream.

AVERAGE DISCHARGE.--18 years, 8.82 ft^3/s (6,390 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,090 ft^3/s, August 4, 1976, gage height, 8.26 ft, from rating curve extended above 47 ft^3/s, on basis of estimate of peak flow; minimum, 0.13 ft^3/s, May 4, 5, 1983.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 750 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 24	1430	*1,070	*6.19	No other peaks greater than base discharge.			

Minimum discharge, 0.49 ft^3/s, March 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.7	25	4.7	3.6	2.6	3.6	3.7	3.3	12	9.2	6.7	3.5
2	2.4	9.7	11	3.4	1.9	4.2	4.9	3.0	6.7	7.3	5.2	12
3	2.3	6.8	8.4	2.9	1.5	8.4	6.6	3.5	5.9	5.6	6.3	5.1
4	3.6	6.2	6.5	2.7	1.4	20	4.3	7.3	4.9	4.9	6.4	3.8
5	13	5.0	6.2	2.9	1.7	22	3.3	19	4.1	4.6	5.0	4.4
6	6.5	4.1	4.5	2.6	1.9	9.0	2.8	6.8	3.5	5.1	7.5	5.0
7	4.3	3.7	5.4	2.5	1.4	6.2	2.4	4.4	3.5	4.1	5.3	4.8
8	3.7	3.2	4.1	3.2	1.3	9.0	2.1	3.7	4.0	3.7	4.2	4.1
9	5.8	3.0	3.6	5.0	1.0	8.4	1.9	6.6	6.0	3.8	12	8.2
10	6.3	3.5	24	5.8	.90	5.2	1.6	5.9	6.0	3.4	27	15
11	6.6	5.7	14	6.2	10	4.3	1.4	14	4.2	2.8	59	84
12	4.7	4.4	6.8	38	7.3	3.4	1.3	16	3.8	3.9	42	16
13	3.8	3.6	5.1	9.3	3.9	2.9	1.1	14	8.7	3.6	13	11
14	3.7	3.1	4.3	6.0	2.9	2.7	.90	19	6.8	3.7	38	12
15	3.2	2.7	4.0	9.3	2.4	2.2	1.1	12	5.0	23	21	8.5
16	2.7	2.6	5.0	5.8	2.1	2.0	6.1	10	4.6	5.8	13	6.2
17	3.5	3.2	3.4	8.6	1.8	1.8	3.4	15	3.9	7.2	16	5.0
18	3.0	3.6	8.4	6.0	1.5	1.5	22	23	24	5.3	13	4.9
19	3.0	3.8	10	4.7	1.4	2.5	4.9	14	25	4.1	8.5	5.4
20	3.2	2.7	27	3.9	1.2	1.3	3.5	13	7.8	3.7	6.2	4.3
21	6.8	3.9	35	3.7	.90	.98	22	13	5.8	3.4	14	5.2
22	15	11	34	3.5	.90	.84	16	12	4.8	3.1	78	5.0
23	45	5.2	18	3.3	2.6	.65	11	11	4.2	3.3	76	17
24	51	4.5	13	3.2	2.1	.57	13	8.2	3.7	3.9	20	6.3
25	17	4.6	10	2.5	1.5	2.0	6.4	28	47	3.5	12	5.2
26	8.2	4.5	26	2.3	1.0	2.5	4.8	20	8.8	3.8	8.4	5.6
27	6.0	4.1	8.8	2.1	1.3	2.2	6.1	10	8.1	6.7	6.1	5.0
28	8.2	3.2	8.2	2.0	4.3	4.0	4.8	8.3	7.5	4.3	4.9	14
29	7.0	2.8	6.2	1.8	---	5.3	4.8	7.8	45	23	4.1	7.7
30	44	2.7	5.2	1.7	---	3.7	3.5	12	12	13	4.3	9.9
31	23	---	4.2	1.7	---	7.4	---	6.4	---	7.1	3.9	---
TOTAL	319.2	152.1	335.0	160.2	64.70	150.74	171.70	350.2	297.3	189.9	547.0	304.1
MEAN	10.3	5.07	10.8	5.17	2.31	4.86	5.72	11.3	9.91	6.13	17.6	10.1
MAX	51	25	35	38	10	22	22	28	47	23	78	84
MIN	2.3	2.6	3.4	1.7	.90	.57	.90	3.0	3.5	2.8	3.9	3.5
AC-FT	633	302	664	318	128	299	341	695	590	377	1080	603

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1972 - 1990, BY WATER YEAR (WY)

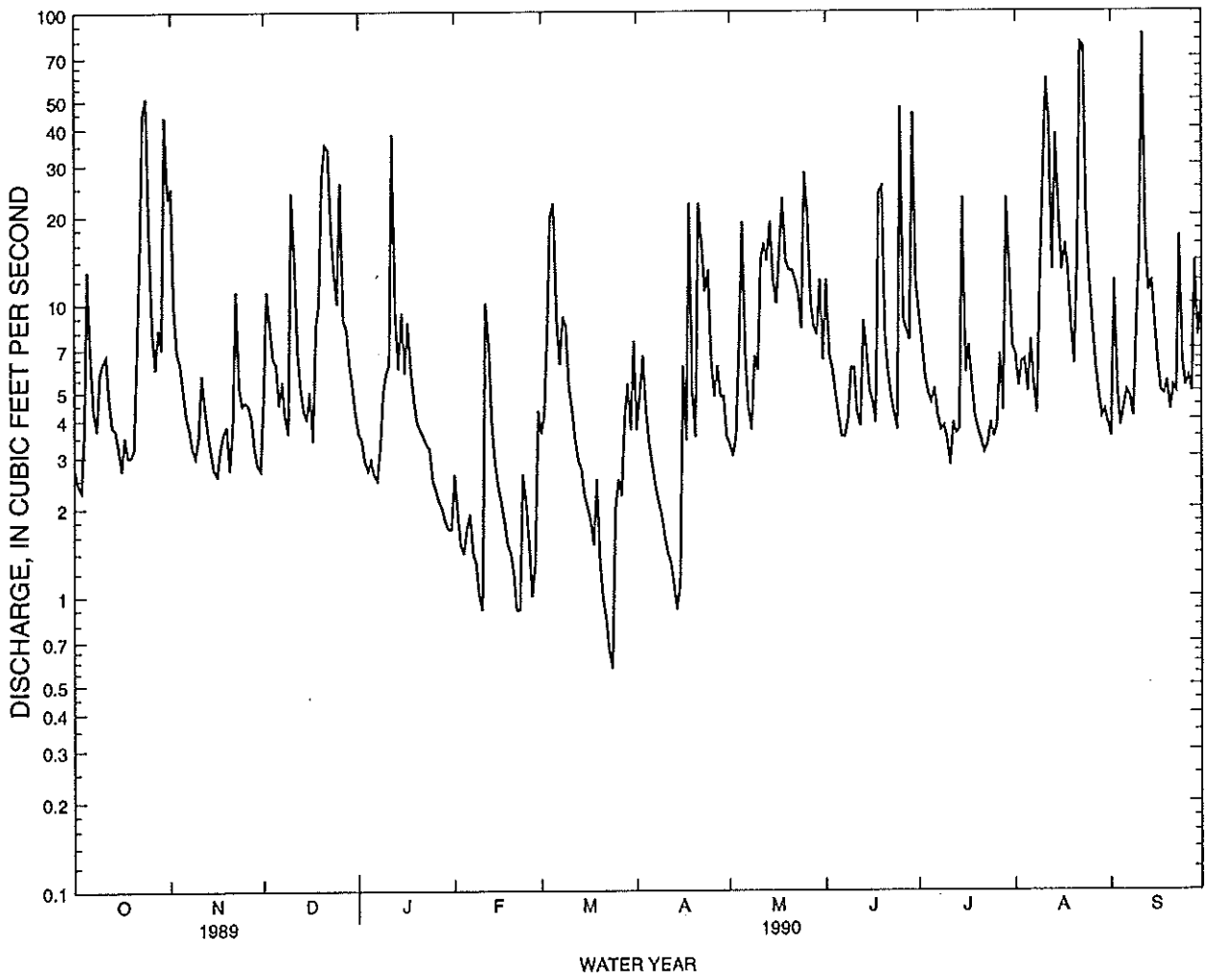
MEAN	9.67	8.55	8.60	6.61	5.79	6.34	9.18	9.40	10.3	9.46	12.7	9.78
MAX	14.5	14.8	16.6	13.7	9.44	17.9	14.4	20.8	17.7	15.4	32.1	22.8
(WY)	1985	1977	1976	1989	1980	1976	1979	1980	1980	1983	1976	1972
MIN	4.10	1.56	3.01	.97	.72	.46	.28	.29	3.35	3.17	4.45	5.37
(WY)	1973	1973	1973	1983	1983	1983	1983	1983	1983	1984	1988	1978

GAGING STATION RECORDS

CAROLINE ISLANDS, ISLAND OF POHNPEI

16898600 LUHPWOR RIVER--CONTINUED

SUMMARY STATISTICS	FOR 1989 CALENDAR YEAR		FOR 1990 WATER YEAR		WATER YEARS 1972 - 1990	
ANNUAL TOTAL	3614.6		3042.14			
ANNUAL MEAN	9.90		8.33		8.82	
HIGHEST ANNUAL MEAN					13.5	1976
LOWEST ANNUAL MEAN					4.68	1983
HIGHEST DAILY MEAN	76	Apr 4	84	Sep 11	282	Aug 4 1976
LOWEST DAILY MEAN	2.2	Mar 3	.57	Mar 24	.16	Apr 30 1983
ANNUAL SEVEN-DAY MINIMUM	2.7	Jun 25	1.2	Mar 18	.17	Apr 29 1983
ANNUAL RUNOFF (AC-FT)	7170		6030		6390	
10 PERCENT EXCEEDS	20		17		18	
50 PERCENT EXCEEDS	6.5		5.0		5.6	
90 PERCENT EXCEEDS	3.2		2.0		1.6	



GAGING STATION RECORDS

CAROLINE ISLANDS, ISLAND OF POHNPEI

16898690 LEHN MESI RIVER

LOCATION.--Lat 06°50'41" N., long 158°11'02" E., Hydrologic Unit 20100006, on left bank 3.2 mi upstream from mouth, 1.7 mi southwest of Mount Tolenpwoaipwoai, and 4.5 mi south of Mount Temwetemwensekir.

DRAINAGE AREA.--2.31 mi^2.

PERIOD OF RECORD.--November 1981 to current year.

REVISED RECORDS.--WDR HI-85-2: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 260 ft, from topographic map.

REMARKS.--Records fair.

AVERAGE DISCHARGE.--8 years (water years 1983-90) 85.2 ft^3/s (61,700 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,740 ft^3/s, May 8, 1982, gage height, 10.14 ft, from rating curve extended above 126 ft^3/s; minimum, 4.5 ft^3/s for several days in April and May 1983.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,000 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 11	0645	5,130	8.54	Aug. 22	0915	*5,890	*9.06
Aug. 11	0715	4,120	7.78				

Minimum discharge, 5.9 ft^3/s, April 14-15.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	34	227	93	41	97	e58	28	22	92	64	80	73
2	29	93	210	39	35	82	95	20	73	45	43	121
3	35	74	103	34	29	119	64	23	66	34	44	46
4	76	227	268	31	35	191	46	36	91	34	39	28
5	81	95	84	34	45	166	27	174	64	46	34	59
6	50	65	54	36	52	e88	18	80	49	90	29	103
7	45	55	52	32	30	e72	14	59	56	46	29	136
8	41	48	55	74	26	116	11	43	75	30	26	57
9	65	60	50	88	22	110	11	168	111	82	61	164
10	64	59	176	131	19	50	8.8	110	99	51	113	182
11	68	80	96	87	360	94	7.7	146	90	34	453	313
12	51	60	50	440	103	e57	7.6	152	80	96	257	100
13	34	74	37	90	e60	e54	7.8	178	107	103	90	91
14	30	56	32	77	e54	e53	6.6	157	82	100	147	79
15	28	45	32	103	e52	e50	20	129	60	307	95	57
16	27	41	124	65	e50	e49	78	123	62	67	80	34
17	52	47	46	74	e48	e48	36	175	66	62	64	26
18	65	75	108	72	e47	e47	144	156	194	79	59	32
19	45	73	96	65	e46	e52	33	131	145	50	46	40
20	49	46	270	47	e45	19	19	167	64	56	69	20
21	88	80	346	40	e43	16	123	180	50	41	346	37
22	150	162	315	48	e43	15	82	147	45	39	560	68
23	330	71	133	58	e5[illegible]	13	122	112	58	32	206	136
24	229	60	121	62	e50	10	207	129	38	31	113	62
25	107	52	130	36	e47	18	69	114	287	28	89	77
26	70	63	225	29	e44	75	52	178	71	35	74	80
27	62	54	81	25	e46	36	67	96	48	39	50	96
28	116	41	62	22	62	21	56	88	40	33	51	75
29	103	36	60	20	---	84	60	70	229	204	43	85
30	373	36	76	22	---	40	27	212	82	173	61	66
31	277	---	50	25	---	81	---	76	---	71	87	---
TOTAL	2874	2255	3635	2047	1643	1984	1547.5	3651	2674	2202	3538	2543
MEAN	92.7	75.2	117	66.0	58.7	64.0	51.6	118	89.1	71.0	114	84.8
MAX	373	227	346	440	360	191	207	212	287	307	560	313
MIN	27	36	32	20	19	10	6.6	20	38	28	26	20
AC-FT	5700	4470	7210	4060	3260	3940	3070	7240	5300	4370	7020	5040

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1982 - 1990, BY WATER YEAR (WY)

MEAN	93.6	94.4	92.5	81.6	66.7	72.2	85.1	86.0	98.2	93.2	93.9	87.2
MAX	116	139	122	135	94.6	115	155	165	140	139	127	134
(WY)	1988	1988	1988	1989	1989	1986	1989	1986	1987	1987	1989	1982
MIN	58.8	58.6	66.0	15.1	13.1	12.8	7.04	15.6	67.8	32.5	42.6	51.1
(WY)	1983	1983	1983	1983	1983	1983	1983	1983	1988	1984	1988	1985

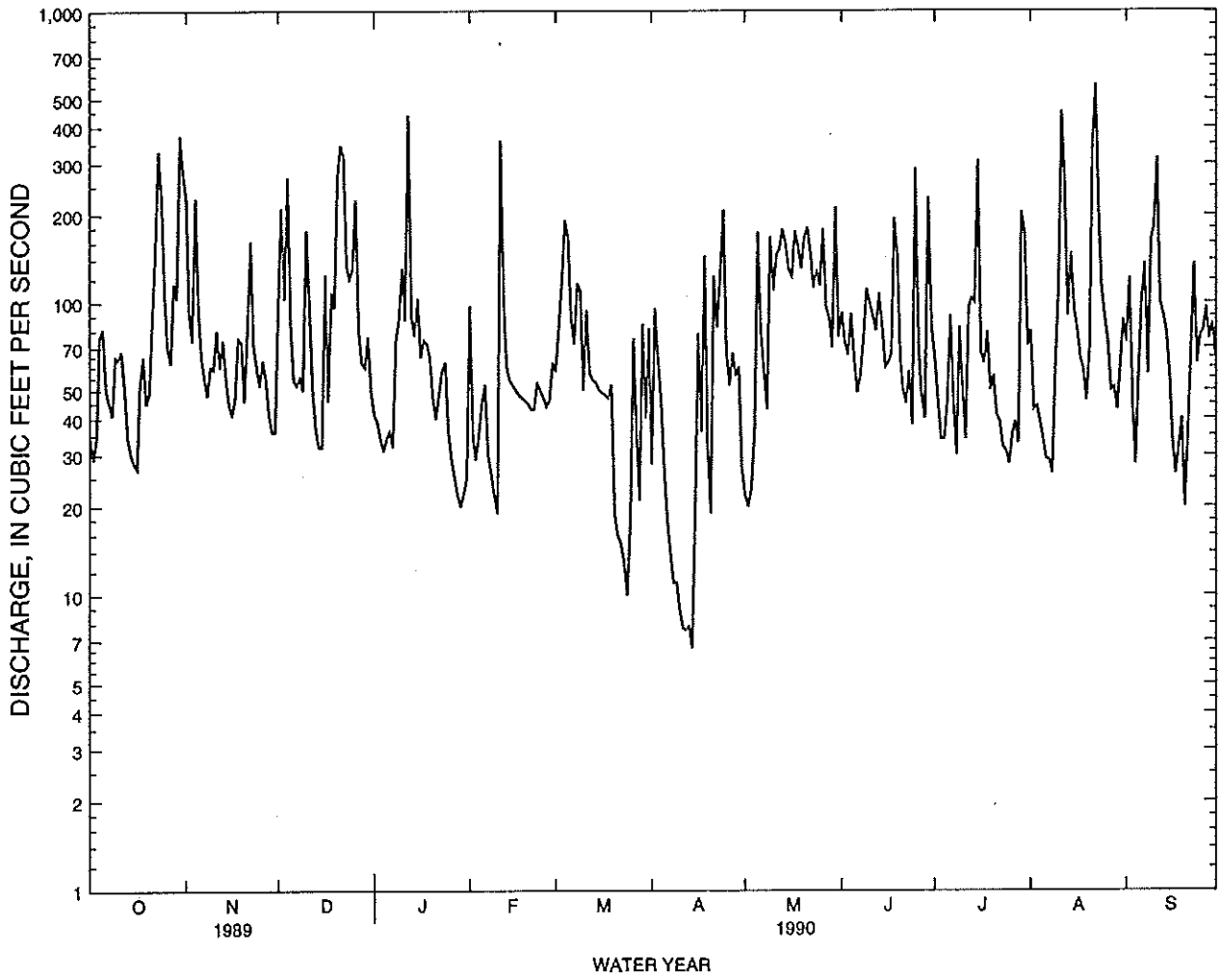
e Estimated

GAGING STATION RECORDS

CAROLINE ISLANDS, ISLAND OF POHNPEI

16898690 LEHN MESI RIVER--CONTINUED

SUMMARY STATISTICS	FOR 1989 CALENDAR YEAR		FOR 1990 WATER YEAR		WATER YEARS 1982 - 1990	
ANNUAL TOTAL	39091		30593.5			
ANNUAL MEAN	107		83.8		85.2	
HIGHEST ANNUAL MEAN					106	1989
LOWEST ANNUAL MEAN					47.5	1983
HIGHEST DAILY MEAN	513	Apr 4	560	Aug 22	969	Jul 23 1986
LOWEST DAILY MEAN	27	Oct 16	6.6	Apr 14	4.5	Apr 17 1983
ANNUAL SEVEN-DAY MINIMUM	35	Feb 26	8.6	Apr 8	4.8	Apr 15 1983
ANNUAL RUNOFF (AC-FT)	77540		60680		61700	
10 PERCENT EXCEEDS	205		170		177	
50 PERCENT EXCEEDS	84		62		65	
90 PERCENT EXCEEDS	43		28		23	



GAGING STATION RECORDS

CAROLINE ISLANDS, ISLAND OF KOSRAE

16899620 MELO RIVER

LOCATION.--Lat 05°20'30" N., long 162°58'33" E., Hydrologic Unit 20100006, on left bank 0.5 mi upstream from mouth and 1.3 mi southwest of Mount Mutunte.

DRAINAGE AREA.--0.68 mi^2.

PERIOD OF RECORD.--October 1974 to September 1979, June 1980 to current year.

REVISED RECORDS.--WRD HI-81-2: Drainage area.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 20 ft, from topographic map.

REMARKS.--Records fair except for estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--15 years (water years 1975-79, 1981-90), 6.74 ft^3/s (4,880 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 784 ft^3/s March 22, 1976, gage height, 5.78 ft, from rating curve extended above 17 ft^3/s; minimum, 0.11 ft^3/s for several days in April 1983.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 300 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 6	0230	*461	*4.27	Jan. 16	1900	300	3.55

Minimum discharge, 0.84 ft^3/s, February 11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY MEAN VALUES

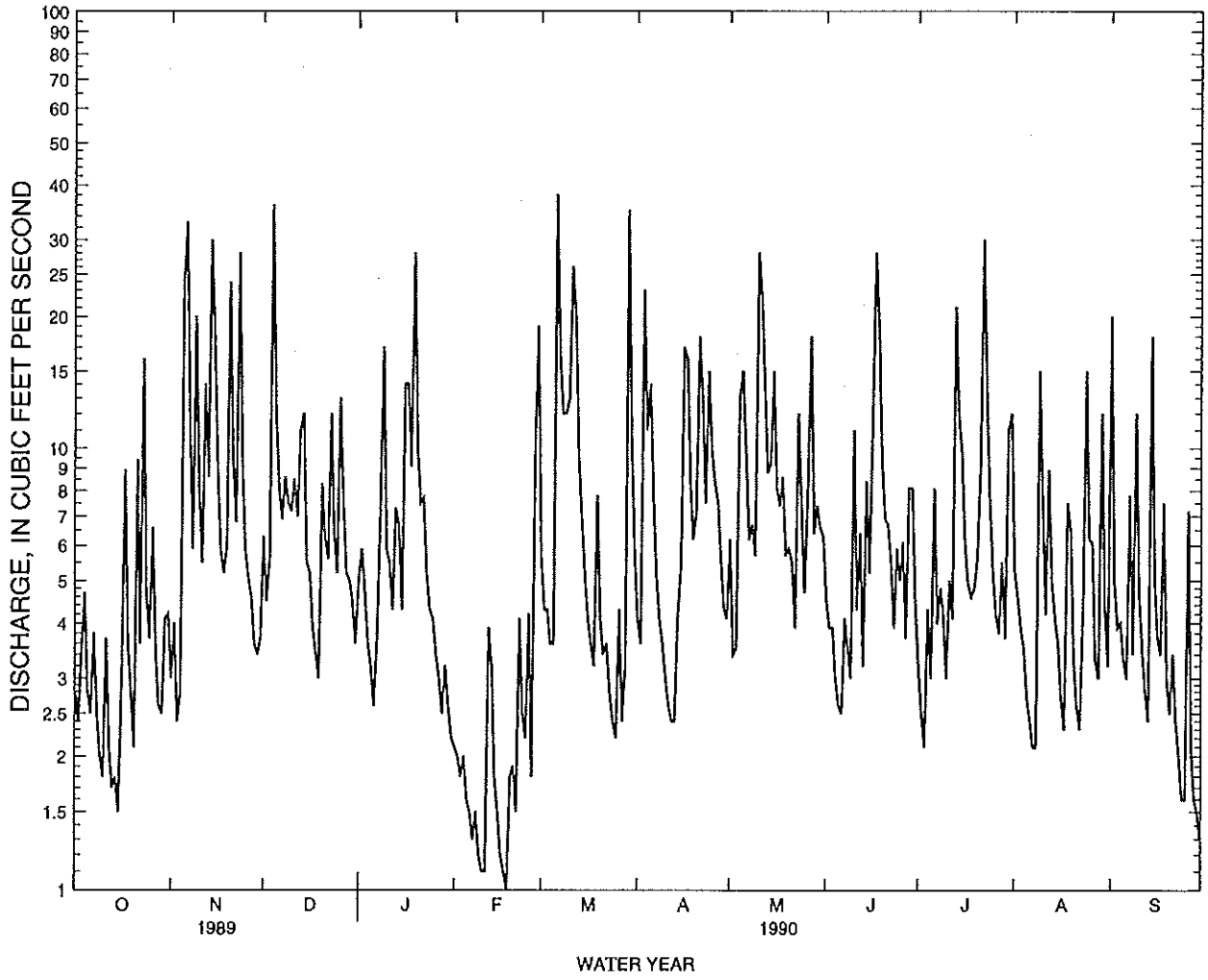
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.8	3.0	6.3	5.0	2.1	5.7	4.1	6.2	4.5	3.2	5.3	20
2	2.4	4.0	4.5	5.9	2.0	4.3	3.6	3.4	3.9	2.5	4.6	5.0
3	3.5	2.4	5.6	4.7	1.8	4.3	23	3.5	3.9	2.1	3.9	3.9
4	4.7	2.8	e36	3.6	2.0	3.6	11	13	3.0	4.3	3.5	4.0
5	2.8	24	12	3.2	1.6	3.6	14	15	2.6	3.0	2.7	3.3
6	2.5	33	8.1	2.6	1.5	38	7.8	9.9	2.5	8.1	2.4	3.0
7	3.8	11	6.9	3.7	1.3	16	5.2	6.2	4.1	4.0	2.1	7.8
8	2.5	5.9	8.6	e7.2	1.5	12	4.1	6.7	3.5	4.8	2.1	3.4
9	2.0	20	7.5	17	1.2	12	3.6	5.7	3.0	4.2	15	12
10	1.8	8.2	7.2	5.9	1.1	13	3.0	28	11	3.0	7.7	4.7
11	3.7	5.5	8.5	5.5	1.1	26	2.6	22	4.3	5.0	4.2	3.5
12	2.1	14	7.0	4.3	3.9	20	2.4	14	6.4	4.1	8.9	2.8
13	1.7	8.6	11	7.3	3.2	9.4	2.4	8.8	3.2	21	5.0	2.4
14	1.8	30	12	6.7	1.8	6.9	4.2	9.2	8.4	12	4.1	18
15	1.5	18	5.5	4.3	1.5	5.2	5.4	15	5.2	9.8	3.6	5.0
16	2.9	9.1	5.2	14	1.2	4.1	17	8.1	11	6.1	2.7	3.7
17	8.9	5.9	3.9	14	1.1	3.6	16	7.4	28	4.9	2.3	3.4
18	3.6	5.2	3.4	9.1	1.0	3.2	8.4	8.6	19	4.6	7.5	7.5
19	2.8	6.0	3.0	28	1.8	7.8	6.2	5.7	9.4	4.8	6.5	3.0
20	2.1	24	8.3	10	1.9	4.1	7.2	5.9	6.9	5.6	3.3	2.5
21	9.4	9.4	6.2	7.5	1.5	3.4	e18	5.5	6.7	9.1	2.6	3.4
22	3.6	6.8	5.6	7.7	4.1	3.6	13	3.9	5.5	30	2.3	2.4
23	16	28	e12	5.2	2.5	2.8	7.5	12	3.9	13	4.4	2.0
24	4.7	9.1	6.4	4.3	2.2	2.4	e15	7.3	5.9	7.5	15	1.6
25	3.7	5.9	5.2	4.1	4.2	2.2	10	4.7	5.0	5.2	6.2	1.6
26	6.6	5.1	13	3.4	1.8	4.3	8.3	8.0	6.1	4.2	6.1	7.2
27	3.4	4.6	7.5	3.0	9.9	2.4	7.5	18	3.7	3.8	3.3	2.1
28	2.6	3.6	5.2	2.5	19	3.2	5.5	6.4	8.1	5.5	3.0	1.6
29	2.5	3.4	5.0	3.2	---	35	4.3	7.4	8.1	3.7	12	1.5
30	4.1	3.7	4.5	2.6	---	10	4.1	6.6	4.5	11	4.4	1.3
31	4.2	---	3.6	2.2	---	5.7	---	6.3	---	12	3.2	---
TOTAL	120.7	320.2	244.7	207.7	79.8	277.8	244.4	288.4	201.3	222.1	159.9	143.6
MEAN	3.89	10.7	7.89	6.70	2.85	8.96	8.15	9.30	6.71	7.16	5.16	4.79
MAX	16	33	36	28	19	38	23	28	28	30	15	20
MIN	1.5	2.4	3.0	2.2	1.0	2.2	2.4	3.4	2.5	2.1	2.1	1.3
AC-FT	239	635	485	412	158	551	485	572	399	441	317	285

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1975 - 1990, BY WATER YEAR (WY)

MEAN	4.48	6.26	7.82	7.24	6.47	7.89	7.68	7.55	7.76	6.48	5.69	5.56
MAX	6.79	11.9	13.0	15.2	13.1	15.9	14.6	13.0	12.3	9.91	9.90	8.83
(WY)	1976	1982	1976	1986	1984	1979	1979	1989	1985	1982	1976	1983
MIN	1.50	2.44	1.69	.67	.44	.40	.59	1.45	2.47	3.15	2.81	1.74
(WY)	1981	1983	1983	1983	1983	1983	1983	1987	1988	1985	1986	1984

e Estimated

SUMMARY STATISTICS	FOR 1989 CALENDAR YEAR		FOR 1990 WATER YEAR		WATER YEARS 1975 - 1990	
ANNUAL TOTAL	2804.7		2510.6			
ANNUAL MEAN	7.68		6.88		6.74	
HIGHEST ANNUAL MEAN					9.13	1976
LOWEST ANNUAL MEAN					3.52	1983
HIGHEST DAILY MEAN	62	Jan 8	38	Mar 6	90	Apr 27 1981
LOWEST DAILY MEAN	1.5	Oct 15	1.0	Feb 18	.13	Apr 9 1983
ANNUAL SEVEN-DAY MINIMUM	2.0	Jun 24	1.3	Feb 5	.14	Apr 6 1983
ANNUAL RUNOFF (AC-FT)	5560		4980		4880	
10 PERCENT EXCEEDS	15		14		14	
50 PERCENT EXCEEDS	5.2		4.8		4.5	
90 PERCENT EXCEEDS	2.8		2.1		1.7	



CAROLINE ISLANDS, ISLAND OF KOSRAE

16899800 TOFOL RIVER

LOCATION.--Lat 05°19'10" N., long 163°00'24" E., Hydrologic Unit 20100006, on left bank 25 ft downstream from right-bank tributary, 0.9 mi upstream from mouth, and 1.3 mi northeast of Mount Finkol.

DRAINAGE AREA.--0.53 mi^2.

PERIOD OF RECORD.--June 1971 to September 1979, March 1980 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 98 ft, from stadia survey.

REMARKS.--Records fair. Water is diverted through 8-in. pipe from dam upstream for domestic use.

AVERAGE DISCHARGE.--18 years (1971-79, 1981-90), 5.22 ft^3/s (3,780 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,560 ft^3/s, Nov. 10, 1981, gage height, 5.97 ft, from rating curve extended above 79 ft^3/s; minimum, 0.01 ft^3/s, April 1, 1983.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 450 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 5	0630	*750	*4.74	Dec. 4	1100	675	4.59

Minimum discharge, 0.22 ft^3/s, February 17, 18.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.88	1.8	5.8	2.0	.30	1.3	1.7	12	1.5	1.1	1.5	15
2	.70	1.6	3.0	2.5	.30	1.0	1.3	5.4	4.2	.76	1.7	2.5
3	1.1	.70	7.0	1.6	.80	.82	13	3.7	2.8	.61	.85	1.7
4	3.2	2.5	43	1.1	.75	.54	6.8	19	1.6	2.7	1.7	1.3
5	1.2	52	7.0	.82	.58	1.6	14	6.5	1.1	1.7	.72	.99
6	1.9	34	4.2	.54	.68	37	4.8	16	.83	9.8	1.1	.79
7	.70	e8.0	3.2	.58	.68	13	3.3	5.1	4.2	2.9	.50	2.1
8	.58	e4.0	3.4	4.9	.57	6.4	2.5	6.1	1.9	1.5	1.4	1.0
9	.66	e10	4.8	11	.55	5.7	3.1	4.1	1.2	.92	20	e5.0
10	.58	e4.5	5.0	2.3	.58	9.0	1.8	28	5.0	.73	6.0	e2.0
11	1.0	e3.3	11	2.5	.60	18	1.3	11	2.2	3.4	2.3	e1.3
12	.66	e6.0	3.2	1.5	.56	15	1.1	8.2	2.6	2.3	2.2	e1.0
13	.60	e4.5	9.8	2.2	.50	6.2	.82	5.2	1.2	20	1.9	e.70
14	1.4	e10	9.1	2.6	.38	4.2	.77	6.9	3.5	8.1	1.6	e7.0
15	1.1	e6.0	4.9	1.6	.60	3.0	1.9	13	1.7	10	1.5	e2.0
16	2.3	e4.0	4.2	2.9	.46	2.2	7.8	5.8	5.5	3.8	.81	e1.1
17	9.0	e2.7	2.8	4.3	.49	1.7	8.1	5.7	21	2.7	.75	e.90
18	5.0	e2.4	2.2	2.1	.49	1.4	3.0	6.1	14	2.1	.63	e2.5
19	1.8	e2.8	2.0	15	.88	7.7	4.5	5.1	6.0	3.6	2.9	e1.0
20	1.2	e13	2.8	3.2	.50	3.2	3.4	4.7	3.9	3.6	2.1	e.70
21	2.7	e5.0	5.9	e2.2	.49	2.1	16	4.3	3.4	13	.95	e1.0
22	1.2	e4.0	3.4	e1.5	.86	1.6	10	3.6	2.3	20	.53	e.70
23	14	e15	9.3	e.80	2.3	1.1	4.3	5.1	2.0	11	.71	e.50
24	1.8	e5.6	2.9	e.50	1.1	.80	22	3.3	3.4	7.3	5.5	e.37
25	2.0	e4.0	2.3	e.40	.60	.62	8.7	2.3	1.9	4.5	5.9	e.34
26	3.5	e3.0	8.9	e.37	.26	1.6	5.8	1.9	1.8	3.4	3.3	e2.5
27	1.4	e2.4	3.6	e.36	3.3	.65	4.7	16	1.0	2.8	1.4	e1.0
28	.82	e2.2	2.3	e.35	7.8	1.1	3.3	3.9	7.7	3.1	1.1	e.50
29	.62	e1.9	2.1	e.40	---	21	2.6	3.0	5.9	2.2	9.5	e.40
30	1.6	1.6	1.9	e.34	---	4.9	2.9	2.3	1.6	2.7	2.3	e.35
31	.65	---	1.5	.34	---	2.5	---	1.9	---	2.4	1.3	---
TOTAL	65.85	218.50	182.5	72.80	27.96	176.93	165.29	225.2	116.93	154.72	84.65	58.24
MEAN	2.12	7.28	5.89	2.35	1.00	5.71	5.51	7.26	3.90	4.99	2.73	1.94
MAX	14	52	43	15	7.8	37	22	28	21	20	20	15
MIN	.58	.70	1.5	.34	.26	.54	.77	1.9	.83	.61	.50	.34
AC-FT	131	433	362	144	55	351	328	447	232	307	168	116

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1971 - 1990, BY WATER YEAR (WY)

MEAN	3.80	4.61	5.93	4.97	4.40	6.34	6.42	6.58	5.87	5.49	4.40	4.96
MAX	6.52	10.3	13.3	9.64	12.8	16.4	11.3	13.7	12.3	10.5	8.75	9.38
(WY)	1974	1982	1975	1982	1984	1976	1976	1980	1980	1972	1982	1972
MIN	2.12	1.15	1.32	.48	.17	.073	.13	.87	.91	2.49	.76	.88
(WY)	1990	1989	1989	1983	1983	1983	1983	1987	1988	1985	1988	1984

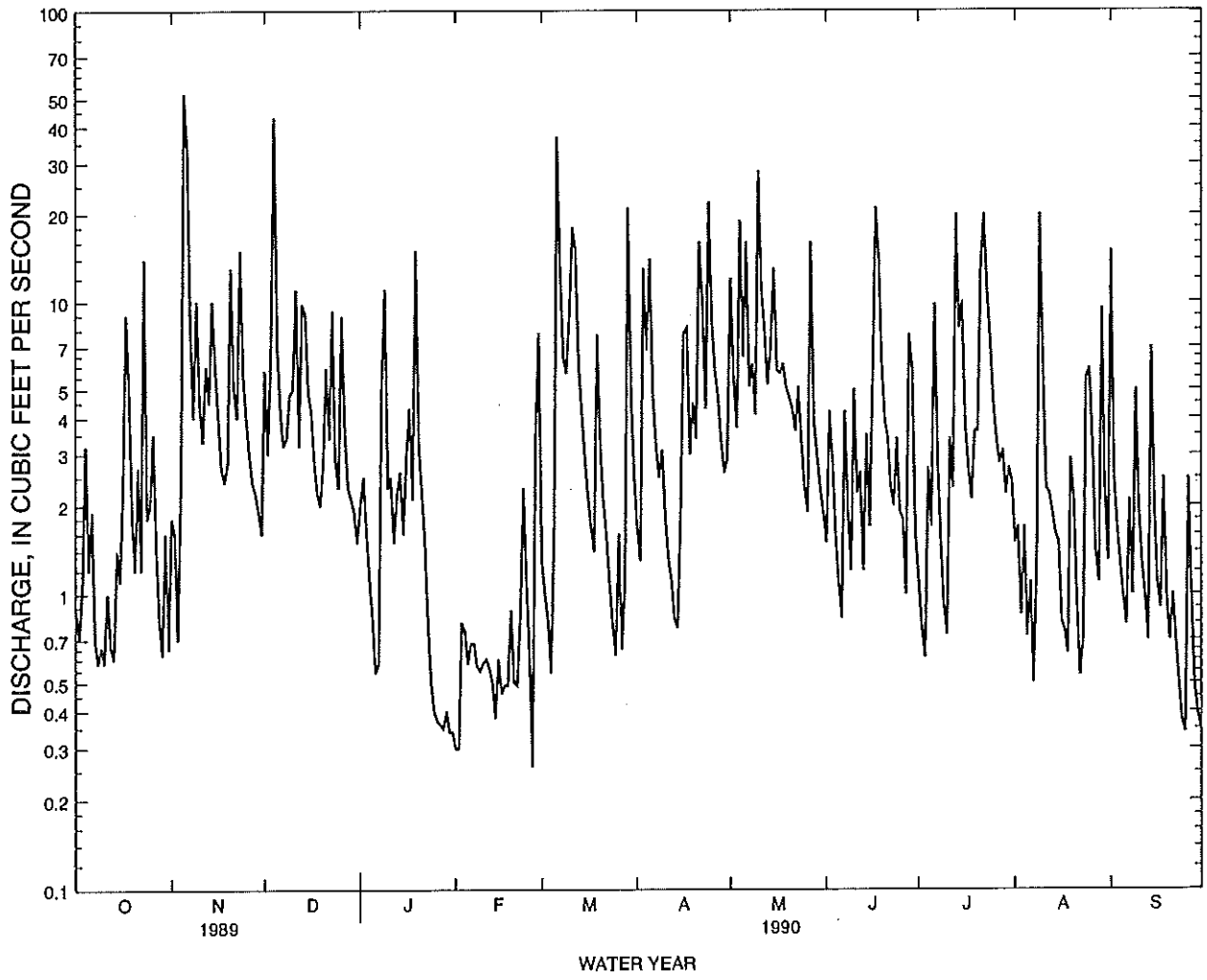
e Estimated

GAGING STATION RECORDS

CAROLINE ISLANDS, ISLAND OF KOSRAE

16899800 TOFOL RIVER--CONTINUED

SUMMARY STATISTICS	FOR 1989 CALENDAR YEAR		FOR 1990 WATER YEAR		WATER YEARS 1971 - 1990	
ANNUAL TOTAL	1778.75		1549.57			
ANNUAL MEAN	4.87		4.25		5.22	
HIGHEST ANNUAL MEAN					7.79	1976
LOWEST ANNUAL MEAN					2.45	1983
HIGHEST DAILY MEAN	52	Nov 5	52	Nov 5	122	Sep 8 1976
LOWEST DAILY MEAN	.24	Jan 4	.26	Feb 26	.02	Mar 18 1983
ANNUAL SEVEN-DAY MINIMUM	.53	Jun 24	.34	Jan 27	.03	Mar 27 1983
ANNUAL RUNOFF (AC-FT)	3530		3070		3780	
10 PERCENT EXCEEDS	11		10		12	
50 PERCENT EXCEEDS	2.6		2.3		3.3	
90 PERCENT EXCEEDS	.82		.59		.94	



GAGING STATION RECORDS
SAMOA ISLANDS, ISLAND OF TUTUILA
16912000 PAGO STREAM AT AFONO

LOCATION.--Lat 14°16'03" S., long 170°39'02" W., Hydrologic Unit 20100001, on left bank 0.2 mi south of Afono and 0.3 mi upstream from mouth.

DRAINAGE AREA.--0.60 mi^2.

PERIOD OF RECORD.--October 1958 to current year. Prior to July 1960, published as Afono Stream at Afono.

REVISED RECORDS.--WSP 1937: Drainage area.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 30 ft, from topographic map.

REMARKS.--Records good. About 0.06 ft^3/s is diverted upstream for domestic use in Afono.

AVERAGE DISCHARGE.--31 years (water years 1960-90), 3.38 ft^3/s (2,450 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,350 ft^3/s, July 5, 1969, gage height, 5.49 ft, from rating curve extended above 61 ft^3/s; minimum, 0.10 ft^3/s, Sept. 29, 1989.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 210 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 27	1030	249	3.43	Apr. 15	2330	*414	*3.91
Apr. 5	1800	218	3.31				

Minimum discharge, 0.11 ft^3/s, October 2.

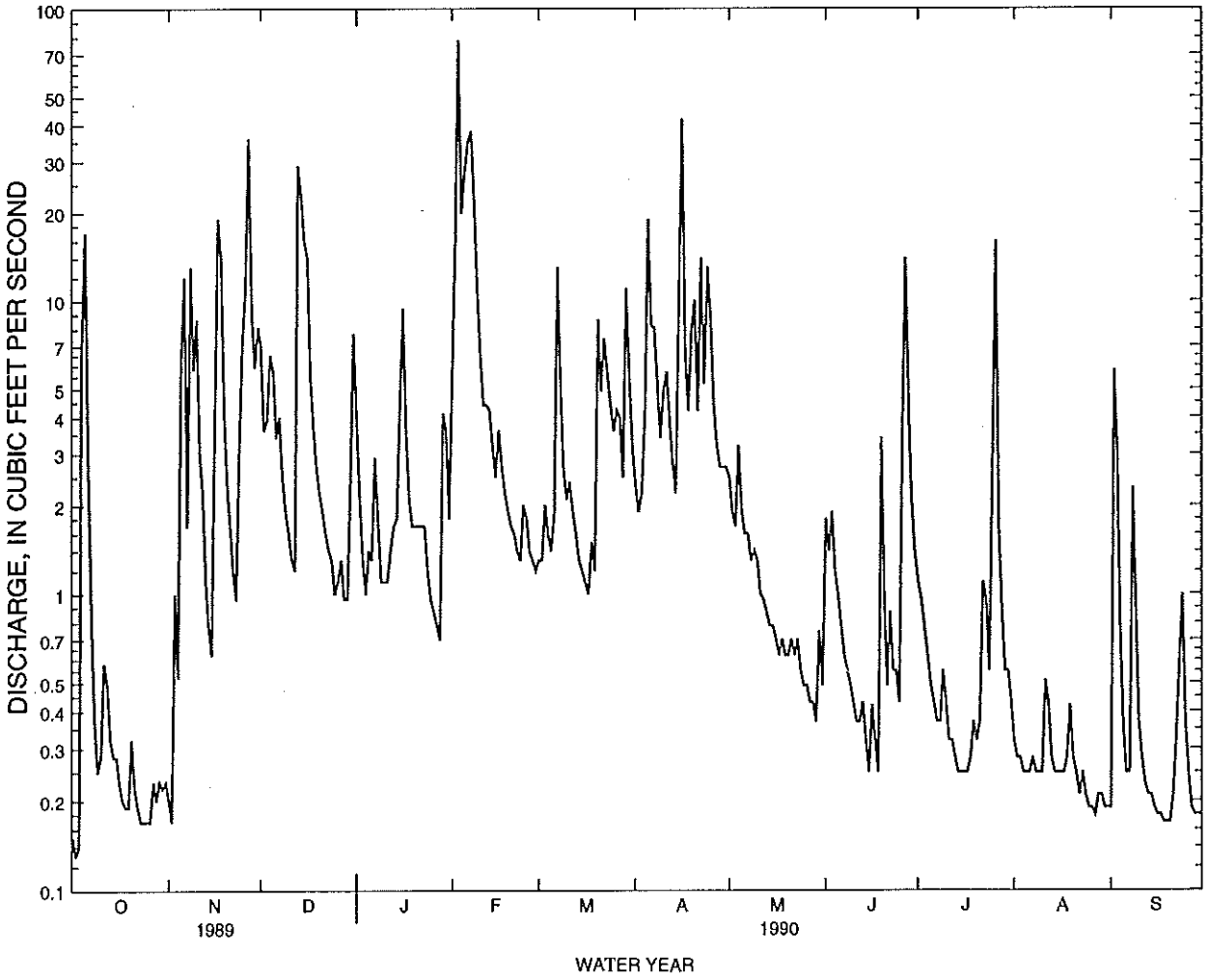
DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.15	.20	7.0	4.0	5.8	1.3	2.4	2.5	1.8	1.1	.32	.19
2	.13	.17	3.6	2.1	16	1.3	1.9	1.9	1.4	.96	.28	5.8
3	.14	1.0	3.9	1.3	78	2.0	2.2	1.7	1.9	.78	.28	3.1
4	6.6	.52	6.5	1.0	20	1.6	4.1	3.2	1.2	.62	.25	.78
5	17	6.2	5.7	1.4	28	1.4	19	1.9	1.0	.49	.25	.37
6	3.0	12	3.4	1.3	35	1.9	8.2	1.6	.78	.43	.25	.25
7	.87	1.7	4.0	2.9	38	13	8.1	1.6	.62	.37	.28	.25
8	.37	13	2.5	1.8	22	5.2	5.4	1.3	.55	.37	.25	2.3
9	.25	5.8	1.9	1.1	11	2.7	3.4	1.4	.49	.55	.25	.87
10	.28	8.6	1.6	1.1	6.5	2.1	4.9	1.3	.43	.43	.25	.37
11	.58	3.0	1.3	1.1	4.4	2.4	5.7	1.0	.37	.32	.51	.28
12	.49	2.2	1.2	1.4	4.4	1.9	3.8	.96	.37	.32	.43	.23
13	.32	1.1	29	1.7	4.2	1.6	2.8	.87	.43	.28	.28	.21
14	.28	.78	23	1.8	3.2	1.3	2.2	.78	.32	.25	.25	.21
15	.28	.62	16	4.4	2.5	1.2	10	.78	.25	.25	.25	.19
16	.23	3.9	14	9.4	3.6	1.1	42	.70	.42	.25	.25	.18
17	.20	19	5.4	3.6	2.7	1.0	6.7	.62	.32	.25	.25	.18
18	.19	14	3.6	2.1	2.2	1.5	4.2	.70	.25	.28	.28	.17
19	.19	4.2	2.7	1.7	1.9	1.2	7.8	.62	3.4	.37	.42	.17
20	.32	2.4	2.2	1.7	1.7	8.6	10	.62	.96	.32	.28	.17
21	.22	1.7	1.9	1.7	1.6	4.9	4.2	.70	.49	.37	.25	.21
22	.19	1.2	1.6	1.7	1.4	7.4	14	.62	.87	1.1	.21	.32
23	.17	.96	1.4	1.7	1.3	5.7	5.2	.70	.55	.96	.25	.57
24	.17	3.2	1.3	1.2	2.0	4.4	13	.55	.55	.55	.21	1.0
25	.17	7.1	1.0	.96	1.8	3.6	8.9	.49	.43	2.9	.19	.37
26	.17	11	1.1	.87	1.4	4.2	4.4	.49	3.6	16	.19	.25
27	.23	36	1.3	.78	1.3	4.0	3.2	.43	14	1.7	.18	.19
28	.20	9.1	.96	.70	1.2	2.5	2.7	.43	4.4	.87	.21	.18
29	.23	5.9	.96	4.1	---	11	2.7	.37	2.1	.55	.21	.18
30	.22	8.1	2.2	3.6	---	5.7	2.7	.75	1.4	.55	.19	.18
31	.23	---	7.7	1.8	---	3.2	---	.49	---	.43	.19	---
TOTAL	34.07	184.65	159.92	66.01	303.1	110.9	215.8	32.07	45.65	34.97	8.14	19.72
MEAN	1.10	6.15	5.16	2.13	10.8	3.58	7.19	1.03	1.52	1.13	.26	.66
MAX	17	36	29	9.4	78	13	42	3.2	14	16	.51	5.8
MIN	.13	.17	.96	.70	1.2	1.0	1.9	.37	.25	.25	.18	.17
AC-FT	68	366	317	131	601	220	428	64	91	69	16	39

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 1990, BY WATER YEAR (WY)

MEAN	3.62	3.51	5.00	4.34	4.64	3.73	3.42	3.21	2.20	2.26	2.38	2.13
MAX	11.5	18.5	11.6	14.3	11.9	14.3	8.09	12.4	5.79	7.82	7.07	9.04
(WY)	1964	1979	1968	1978	1982	1961	1961	1977	1970	1969	1967	1972
MIN	.29	.37	.52	1.15	1.32	.77	.80	.54	.35	.20	.22	.16
(WY)	1975	1988	1986	1988	1984	1983	1982	1988	1983	1983	1983	1989

SUMMARY STATISTICS	FOR 1989 CALENDAR YEAR		FOR 1990 WATER YEAR		WATER YEARS 1959 - 1990	
ANNUAL TOTAL	976.43		1215.00			
ANNUAL MEAN	2.68		3.33		3.38	
HIGHEST ANNUAL MEAN					5.55	1981
LOWEST ANNUAL MEAN					1.07	1983
HIGHEST DAILY MEAN	37	Jan 6	78	Feb 3	158	Dec 6 1967
LOWEST DAILY MEAN	.12	Sep 28	.13	Oct 2	.12	Sep 12 1983
ANNUAL SEVEN-DAY MINIMUM	.13	Sep 24	.18	Sep 14	.13	Sep 24 1989
ANNUAL RUNOFF (AC-FT)	1940		2410		2450	
10 PERCENT EXCEEDS	6.5		8.1		6.6	
50 PERCENT EXCEEDS	1.1		1.2		1.4	
90 PERCENT EXCEEDS	.17		.21		.42	



GAGING STATION RECORDS
SAMOA ISLANDS, ISLAND OF TUTUILA
16920500 AASU STREAM AT AASU

LOCATION.--Lat 14°17'51" S., long 170°45'30" W., Hydrologic Unit 20100001, on right bank at Aasu and 200 ft upstream from mouth.

DRAINAGE AREA.--1.03 mi^2.

PERIOD OF RECORD.--October 1958 to current year.

REVISED RECORDS.--WSP 1937: Drainage area. WSP 2137: 1959-60(P), 1961(M), 1962-65(P).

GAGE.--Water-stage recorder and concrete control until February 2, 1990. Elevation of gage is 5 ft, by hand levels from high-tide mark.

REMARKS.--Records fair except for estimated daily discharges and period of variable control conditions (April 3 to September 30), which are poor. Standard rain gage located at station.

AVERAGE DISCHARGE.--31 years (water years 1960-90), 6.10 ft^3/s (4,420 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 498 ft^3/s, September 7, 1972, gage height, 5.16 ft, from rating curve extended above 20 ft^3/s on basis of slope-area measurement at gage height 4.57 ft; minimum, 0.12 ft^3/s, October 21, 23, 24, 27, 1974.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 180 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 3	unknown	unknown	unknown

Minimum discharge, 0.57 ft^3/s, October 2-3.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.8	1.6	13	e10	e9.0	e4.4	e6.0	4.3	3.9	5.4	4.7	4.3
2	.74	1.8	8.4	e8.5	e20	e4.4	e5.5	4.3	3.7	5.4	4.7	15
3	.68	4.3	12	e8.0	e50	e4.4	5.0	4.2	3.6	5.1	4.6	13
4	2.9	2.8	12	e7.5	e25	e4.3	5.8	5.2	3.5	5.0	4.6	7.8
5	5.5	6.8	12	e9.0	e22	e5.0	5.3	4.3	3.8	4.9	4.5	6.8
6	4.0	10	10	e8.0	e25	e6.0	4.9	4.1	3.9	4.8	4.5	6.6
7	1.9	5.5	13	e6.0	e30	e7.0	5.2	4.2	5.6	4.6	4.6	6.6
8	1.5	8.5	e12	e5.0	e20	e5.5	4.9	4.1	4.0	4.6	4.5	7.4
9	1.2	6.4	e10	e4.0	e15	e5.0	4.6	4.1	3.7	4.6	4.4	6.8
10	1.6	13	e9.5	e3.5	e13	e4.7	5.4	3.9	3.5	4.4	4.4	6.6
11	1.8	9.2	e9.0	e3.3	e11	e5.0	4.9	3.9	3.4	4.3	5.6	6.4
12	1.9	8.1	e8.5	e3.2	e10	e5.0	4.6	3.9	3.4	4.2	5.2	6.2
13	1.5	7.4	e20	e5.0	e9.0	e4.5	4.5	3.9	3.4	4.2	4.7	6.0
14	1.3	6.4	e15	e7.0	e8.0	e4.0	4.4	3.8	3.3	4.2	4.5	5.9
15	1.1	5.8	e12	e10	e7.5	e4.0	10	3.7	3.4	4.0	4.4	5.8
16	5.1	7.2	e13	e11	e7.0	e4.5	11	3.7	3.5	4.0	4.2	5.7
17	4.6	12	e10	e8.0	e6.5	e5.0	6.7	3.6	3.4	4.0	4.4	5.6
18	2.5	12	e9.5	e6.0	e6.0	e5.5	6.0	3.7	3.3	4.3	4.4	5.6
19	1.9	12	e9.0	e5.0	e5.5	e5.5	5.9	3.5	3.6	4.2	4.4	5.4
20	2.1	8.8	e8.5	e5.5	e5.2	e6.0	5.7	3.8	3.4	4.0	4.2	5.4
21	1.8	8.1	e8.0	e5.0	e5.0	e6.0	5.2	3.7	3.3	5.1	4.2	6.2
22	3.1	7.4	e7.5	e4.5	e5.0	e6.5	8.3	3.6	5.8	7.5	4.1	6.9
23	2.1	7.4	e7.5	e4.0	e4.8	e6.0	5.7	4.0	4.6	6.2	4.4	7.3
24	1.8	9.3	e8.0	e3.5	e4.6	e5.5	5.9	3.6	5.8	5.9	4.1	7.3
25	1.7	9.7	e7.5	e3.3	e4.6	e5.0	5.6	3.5	5.0	6.3	4.1	5.8
26	1.7	13	e7.5	e3.2	e4.5	e6.0	5.1	3.4	5.3	6.2	4.0	5.6
27	2.4	9.8	e8.0	e3.0	e4.5	e5.5	4.8	3.3	9.4	5.5	4.0	5.6
28	1.7	9.5	e7.5	e3.5	e4.5	e5.0	4.7	3.3	7.3	5.1	4.0	5.6
29	1.9	9.8	e8.5	e8.0	---	e9.0	4.6	3.3	6.0	5.0	4.0	5.6
30	1.8	15	e9.0	e6.0	---	e7.0	4.5	3.3	5.6	4.9	4.0	5.6
31	1.7	---	e12	e5.0	---	e6.5	---	3.5	---	4.8	4.3	---
TOTAL	67.32	248.6	317.4	182.5	342.2	167.7	170.7	118.7	131.4	152.7	136.7	200.4
MEAN	2.17	8.29	10.2	5.89	12.2	5.41	5.69	3.83	4.38	4.93	4.41	6.68
MAX	5.5	15	20	11	50	9.0	11	5.2	9.4	7.5	5.6	15
MIN	.68	1.6	7.5	3.0	4.5	4.0	4.4	3.3	3.3	4.0	4.0	4.3
AC-FT	134	493	630	362	679	333	339	235	261	303	271	397

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 1990, BY WATER YEAR (WY)

MEAN	6.60	6.23	8.09	6.98	7.94	6.25	5.55	5.99	4.75	4.31	5.60	5.05
MAX	14.7	17.4	19.0	13.5	18.2	16.0	15.9	17.0	14.9	9.87	14.9	20.7
(WY)	1969	1979	1960	1973	1968	1981	1967	1977	1967	1969	1962	1972
MIN	.25	1.75	1.97	1.78	3.08	1.94	1.52	1.98	1.29	.76	.69	.30
(WY)	1975	1975	1983	1968	1983	1976	1976	1988	1983	1983	1974	1974

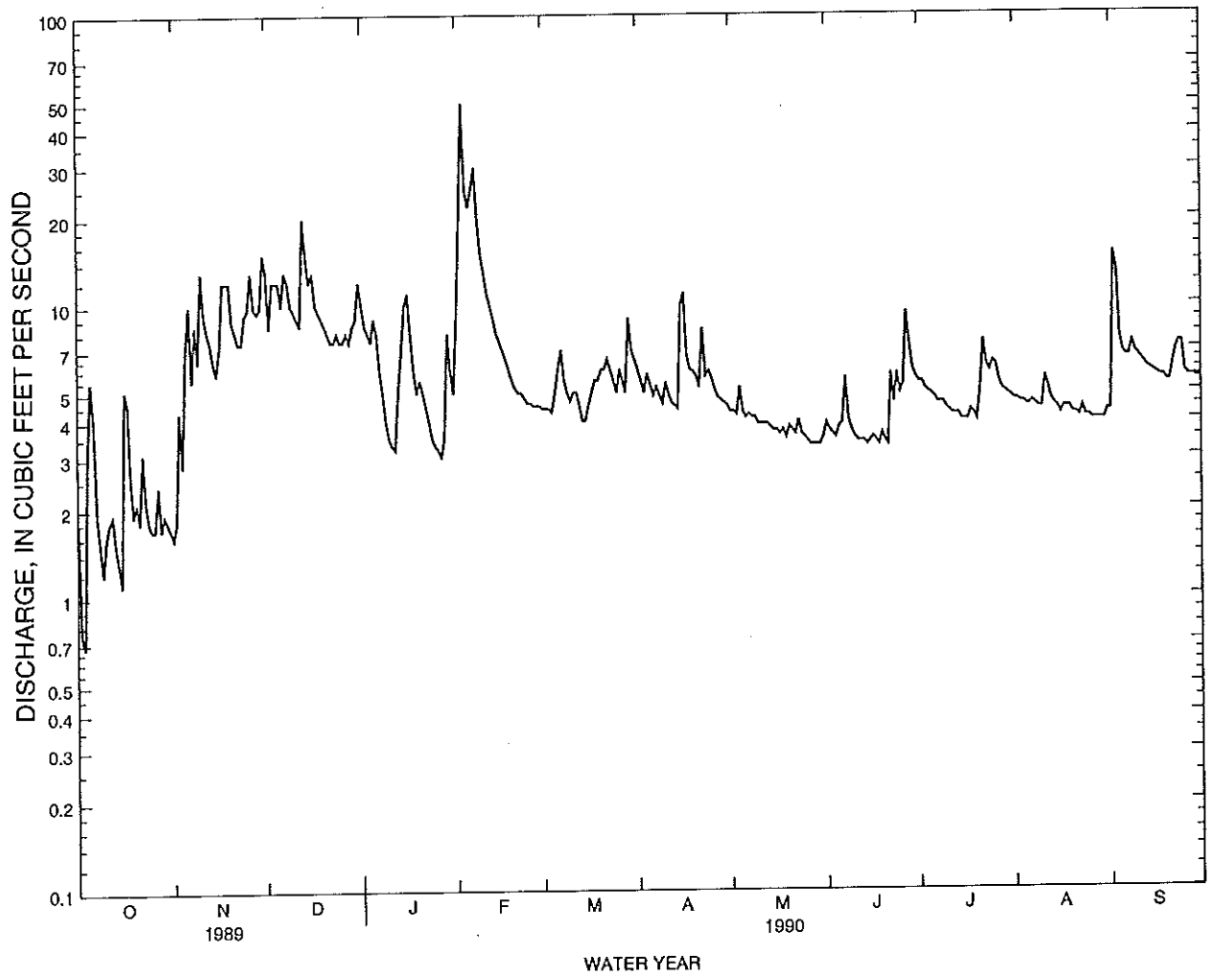
e Estimated

GAGING STATION RECORDS

SAMOA ISLANDS, ISLAND OF TUTUILA

16920500 AASU STREAM AT AASU--CONTINUED

SUMMARY STATISTICS	FOR 1989 CALENDAR YEAR		FOR 1990 WATER YEAR		WATER YEARS 1959 - 1990	
ANNUAL TOTAL	2260.17		2236.32			
ANNUAL MEAN	6.19		6.13		6.10	
HIGHEST ANNUAL MEAN					8.34	1981
LOWEST ANNUAL MEAN					3.40	1983
HIGHEST DAILY MEAN	54	Jan 6	50	Feb 3	157	Sep 8 1972
LOWEST DAILY MEAN	.38	Sep 29	.68	Oct 3	.12	Oct 21 1974
ANNUAL SEVEN-DAY MINIMUM	.44	Sep 23	1.5	Oct 9	.14	Oct 21 1974
ANNUAL RUNOFF (AC-FT)	4480		4440		4420	
10 PERCENT EXCEEDS	12		10		12	
50 PERCENT EXCEEDS	4.6		5.0		4.0	
90 PERCENT EXCEEDS	.98		3.3		1.4	



GAGING STATION RECORDS

SAMOA ISLANDS, ISLAND OF TUTUILA

16931000 ATAULOMA STREAM AT AFAO

LOCATION.--Lat 14°20'10" S., long 170°48'02" W., Hydrologic Unit 20100001, on left bank at Afao, 100 ft upstream from highway bridge, and 300 ft upstream from mouth.

DRAINAGE AREA.--0.24 mi^2.

PERIOD OF RECORD.--October 1958 to current year.

REVISED RECORDS.--WSP 1937: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 20 ft, by hand levels from high-tide mark.

REMARKS.--Records good. No diversion upstream.

AVERAGE DISCHARGE.--31 years (water years 1960-90), 1.45 ft^3/s (1,050 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 815 ft^3/s, October 28, 1979, gage height, 4.47 ft, from rating curve extended above 30 ft^3/s; minimum, 0.04 ft^3/s, October 24-26, 28-31, November 1, 1974.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 180 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 3	1730	*176	*2.60

Minimum discharge, 0.13 ft^3/s, October 9, 13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.49	.39	4.3	2.1	2.1	.56	1.0	.75	.58	.64	.32	.26
2	.18	.32	2.2	1.2	3.3	.58	.88	.69	.38	.63	.31	1.8
3	.18	.80	6.8	.94	36	.56	.82	.66	.37	.51	.28	.92
4	1.5	.60	4.1	.80	28	.56	1.0	.87	.33	.46	.27	.38
5	1.2	5.1	2.8	2.4	9.5	.79	.84	.63	.48	.42	.26	.29
6	.67	5.3	2.2	1.7	8.8	1.2	.75	.58	.60	.38	.23	.26
7	.20	1.1	3.0	1.5	11	1.1	1.0	.78	1.4	.36	.31	.24
8	.16	1.4	2.0	.98	8.9	.89	.83	.58	.54	.36	.23	1.3
9	.13	1.5	1.4	.80	4.2	.73	.69	.62	.39	.41	.22	.64
10	.13	9.4	1.2	.75	2.8	.65	2.1	.50	.34	.37	.22	.42
11	.17	1.8	.97	.75	2.1	.69	1.3	.44	.31	.32	.67	.35
12	.29	1.3	.91	.69	1.9	.71	.84	.46	.30	.31	.44	.28
13	.14	.95	15	1.1	1.6	.60	.70	.42	.29	.30	.28	.24
14	.15	.70	7.5	2.2	1.4	.53	.62	.40	.30	.30	.24	.22
15	.18	.64	5.4	3.1	1.3	.53	10	.39	.35	.28	.23	.22
16	3.5	1.4	2.6	2.4	1.1	.44	5.1	.42	.47	.27	.20	.21
17	.75	3.9	1.8	1.4	1.1	.78	2.1	.37	.38	.31	.30	.20
18	.34	3.4	1.4	1.1	.98	.74	1.4	.41	.38	.27	.27	.19
19	.25	3.7	1.2	.87	.89	.99	1.5	.44	3.8	.24	.23	.18
20	.21	2.2	1.0	.90	.86	9.3	1.3	1.0	.73	.23	.21	.20
21	.20	e1.3	.90	.74	.87	2.5	1.0	.73	.52	.95	.19	.35
22	.36	e1.0	.82	.74	.75	1.7	1.4	.53	1.8	1.4	.19	.39
23	.30	e.75	.77	.66	.70	1.4	.94	.46	.69	.71	.23	.51
24	.20	e3.5	1.8	.60	.71	1.5	2.0	.41	7.5	1.1	.18	.57
25	.55	2.5	1.0	.55	.70	1.3	1.5	.40	1.5	1.8	.17	.28
26	.36	3.1	.80	.51	.67	1.9	1.2	.37	1.5	1.5	.18	.23
27	.32	1.9	1.0	.47	.59	1.6	.98	.36	2.8	.68	.16	.20
28	.21	1.5	.75	.54	.55	1.2	1.0	.34	1.8	.49	.16	.19
29	6.3	3.7	.97	2.6	---	3.3	1.2	.33	.98	.42	.18	.19
30	1.5	12	1.2	1.3	---	2.1	.84	.33	.86	.37	.22	.19
31	.66	---	6.7	1.3	---	1.3	---	.37	---	.35	.22	---
TOTAL	21.78	77.15	84.49	37.69	133.37	42.73	46.83	16.04	32.67	17.14	7.80	11.90
MEAN	.70	2.57	2.73	1.22	4.76	1.38	1.56	.52	1.09	.55	.25	.40
MAX	6.3	12	15	3.1	36	9.3	10	1.0	7.5	1.8	.67	1.8
MIN	.13	.32	.75	.47	.55	.44	.62	.33	.29	.23	.16	.18
AC-FT	43	153	168	75	265	85	93	32	65	34	15	24

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 1990, BY WATER YEAR (WY)

MEAN	1.49	1.35	1.99	1.75	1.95	1.58	1.37	1.40	1.12	.94	1.30	1.07
MAX	4.23	4.35	5.92	4.06	5.85	4.47	4.11	5.30	3.45	2.82	4.46	5.88
(WY)	1981	1979	1985	1985	1982	1978	1985	1977	1967	1981	1978	1972
MIN	.079	.20	.30	.34	.51	.38	.31	.36	.28	.18	.10	.095
(WY)	1975	1988	1972	1988	1977	1976	1982	1983	1983	1987	1974	1974

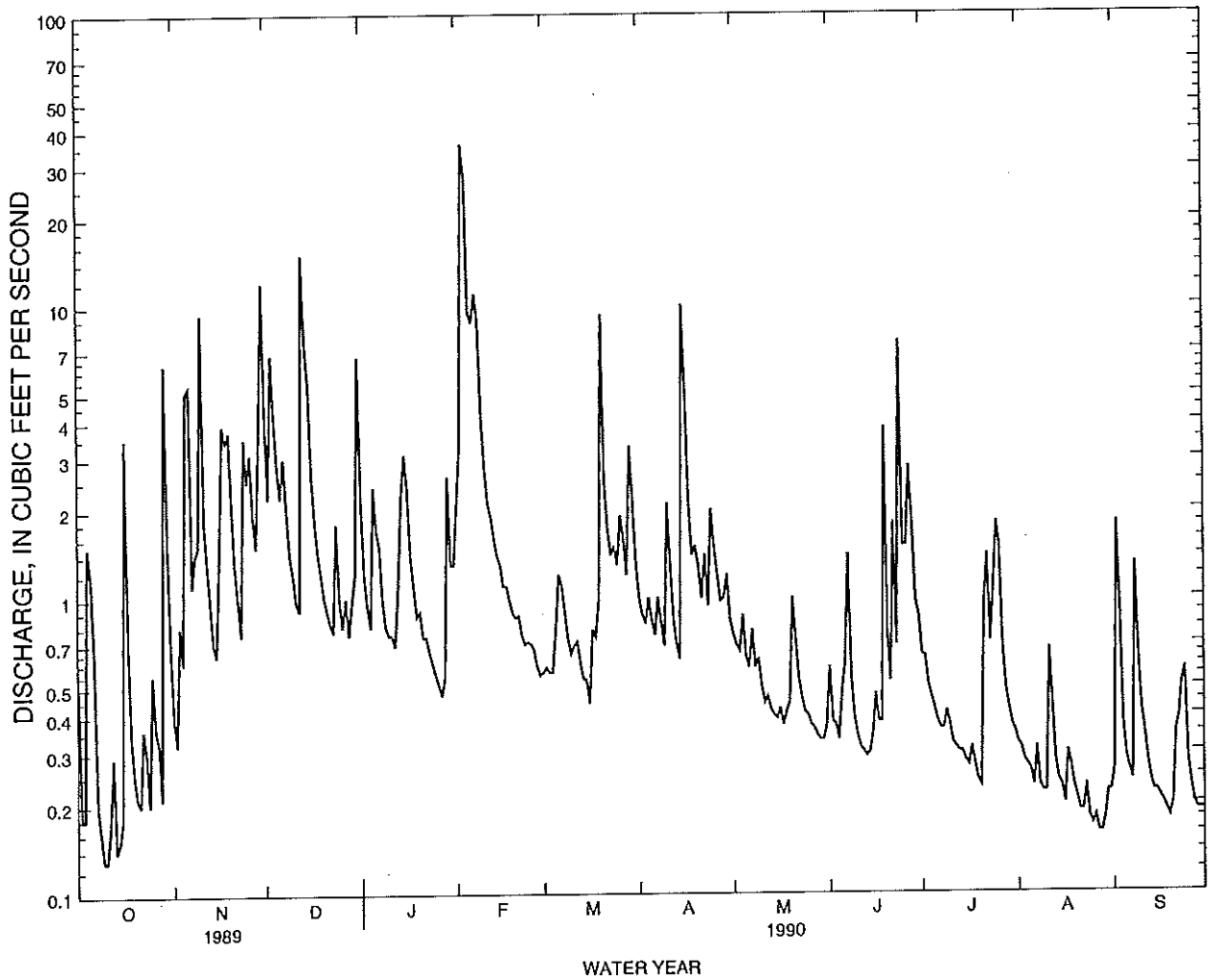
e Estimated

GAGING STATION RECORDS

SAMOA ISLANDS, ISLAND OF TUTUILA

16931000 ATAULOMA STREAM AT AFAO--CONTINUED

SUMMARY STATISTICS	FOR 1989 CALENDAR YEAR		FOR 1990 WATER YEAR		WATER YEARS 1959 - 1990	
ANNUAL TOTAL	571.24		529.59			
ANNUAL MEAN	1.57		1.45		1.45	
HIGHEST ANNUAL MEAN					2.40	1985
LOWEST ANNUAL MEAN					.80	1988
HIGHEST DAILY MEAN	42	Jan 6	36	Feb 3	73	Oct 28 1979
LOWEST DAILY MEAN	.11	Sep 20	.13	Oct 9	.04	Oct 24 1974
ANNUAL SEVEN-DAY MINIMUM	.11	Sep 20	.17	Oct 8	.04	Oct 22 1974
ANNUAL RUNOFF (AC-FT)	1130		1050		1050	
10 PERCENT EXCEEDS	3.7		2.8		2.9	
50 PERCENT EXCEEDS	.64		.70		.68	
90 PERCENT EXCEEDS	.16		.22		.23	



GAGING STATION RECORDS

SAMOA ISLANDS, ISLAND OF TUTUILA

16948000 AFUELO STREAM AT MATUU

LOCATION.--Lat 14°18'07" S., long 170°41'07" W., Hydrologic Unit 20100001, on left bank 0.2 mi northwest of Matuu and 0.3 mi upstream from mouth.

DRAINAGE AREA.--0.25 mi^2.

PERIOD OF RECORD.--March 1958 to current year. Prior to July 1960, published as Matuu Stream at Matuu.

REVISED RECORDS.--WSP 1937: Drainage area. WSP 2137: 1958-65.

GAGE.--Water-stage recorder. Elevation of gage is 80 ft, from topographic map.

REMARKS.--Records good. Small diversion upstream for domestic use since September 1972.

AVERAGE DISCHARGE.--32 years (water years 1959-90), 1.45 ft^3/s (1,050 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 535 ft^3/s, May 3, 1985, gage height, 4.70 ft, from rating curve extended above 26 ft^3/s on basis of slope-area measurement of peak flow; minimum, 0.01 ft^3/s, September 16, 17, 20-26, 28, 29, 1975, April 5-7, 1976 and September 17, 19-20, 27-28, 1990.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 160 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 14	1700	*139	*2.76

Minimum discharge, 0.01 ft^3/s, September 17, 19-20, 27-28.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.07	.17	2.5	2.8	4.1	.22	.55	.40	.36	.05	.06	.01
2	.05	.06	.80	.67	7.8	.14	.36	.30	.09	.11	.06	3.1
3	.06	2.0	.59	.35	39	.14	.63	.26	.09	.08	.05	.59
4	6.9	.37	1.4	.23	15	.13	6.6	.89	.08	.07	.05	.02
5	6.9	7.3	2.3	1.9	9.2	.21	11	.32	.08	.06	.03	.01
6	.99	5.8	1.5	1.0	12	1.3	3.1	.24	.09	.07	.03	.01
7	.14	.63	4.1	1.2	18	3.1	2.7	.18	2.6	.08	.04	.01
8	.05	5.9	1.2	.38	9.4	1.3	1.5	.17	.28	.28	.05	1.7
9	.04	1.2	.50	.23	3.4	.43	.65	.14	.15	.19	.05	.11
10	.08	2.3	.25	.17	1.5	.27	1.6	.15	.08	.10	.05	.02
11	.19	.56	.18	.17	.93	.29	1.4	.13	.07	.05	.14	.01
12	.10	.27	.27	.13	1.0	.16	.60	.11	.05	.05	.16	.01
13	.06	.20	19	.40	.82	.07	.40	.12	.07	.05	.05	.01
14	.06	.16	17	.95	.60	.06	.28	.11	.07	.05	.04	.01
15	.03	.11	7.9	2.7	.45	.07	11	.10	.08	.05	.03	.01
16	.04	8.9	6.2	3.2	.45	.08	15	.09	.15	.04	.02	.01
17	.03	10	1.5	.77	.29	.11	2.3	.08	.13	.06	.02	.01
18	.03	5.7	.83	.32	.24	1.1	.92	.07	.07	.07	.04	.01
19	.03	3.9	.48	.22	e.21	.73	5.6	.10	.32	.06	.04	.01
20	.54	1.5	.36	.35	e.21	4.3	3.2	.14	.15	.05	.02	.01
21	.14	.48	.31	.24	e.23	1.3	.70	.06	.11	.24	.02	.04
22	.16	.27	.24	.18	e.17	4.6	6.9	.06	.37	1.5	.02	.08
23	.19	.14	1.2	.15	e.16	1.6	1.4	.19	.10	.39	.02	.33
24	.07	2.9	.57	.12	e.17	1.5	4.5	.08	.42	.40	.01	.17
25	3.1	3.9	.30	.08	e.21	.83	3.5	.08	.20	2.1	.01	.02
26	.95	8.4	.45	.07	e.23	1.4	1.0	.09	.53	5.0	.02	.01
27	2.2	7.7	.80	.10	e.16	.99	.63	.09	3.1	.29	.02	.01
28	.25	3.8	.24	.10	e.10	.48	.61	.09	.89	.10	.01	.01
29	.24	1.6	1.2	2.2	---	11	1.2	.07	.18	.06	.01	.01
30	.28	3.9	1.0	.83	---	2.3	.51	.11	.07	.10	.01	.01
31	1.0	---	3.6	.62	---	.77	---	.08	---	.05	.01	---
TOTAL	24.97	90.12	78.77	22.83	126.03	40.98	90.34	5.10	11.03	11.85	1.19	6.37
MEAN	.81	3.00	2.54	.74	4.50	1.32	3.01	.16	.37	.38	.038	.21
MAX	6.9	10	19	3.2	39	11	15	.89	3.1	5.0	.16	3.1
MIN	.03	.06	.18	.07	.10	.06	.28	.06	.05	.04	.01	.01
AC-FT	50	179	156	45	250	81	179	10	22	24	2.4	13

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1958 - 1990, BY WATER YEAR (WY)

MEAN	1.54	1.49	2.14	1.82	1.97	1.54	1.45	1.52	1.02	.88	1.07	1.04
MAX	3.82	5.92	4.80	4.73	4.83	5.24	3.53	5.65	3.78	2.79	2.69	4.56
(WY)	1985	1979	1960	1978	1959	1961	1981	1977	1958	1962	1982	1972
MIN	.035	.16	.24	.39	.49	.10	.12	.16	.11	.043	.038	.024
(WY)	1976	1988	1986	1968	1984	1976	1982	1990	1983	1983	1990	1987

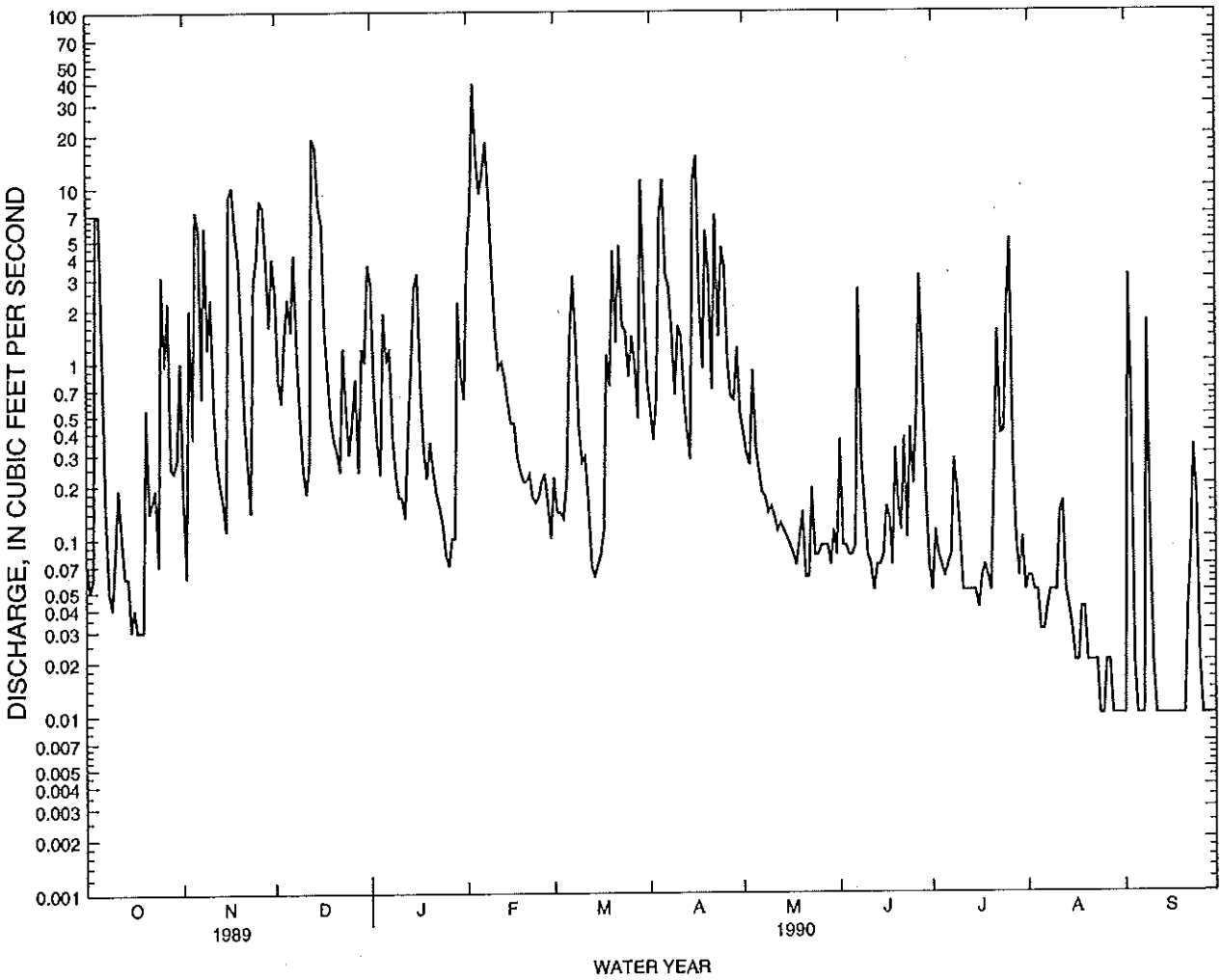
e Estimated

GAGING STATION RECORDS

SAMOA ISLANDS, ISLAND OF TUTUILA

16948000 AFUELO STREAM AT MATUU--CONTINUED

SUMMARY STATISTICS	FOR 1989 CALENDAR YEAR		FOR 1990 WATER YEAR		WATER YEARS 1958 - 1990	
ANNUAL TOTAL	556.92		509.58			
ANNUAL MEAN	1.53		1.40		1.45	
HIGHEST ANNUAL MEAN					2.06	1981
LOWEST ANNUAL MEAN					.51	1983
HIGHEST DAILY MEAN	40	Jan 6	39	Feb 3	48	Oct 9 1967
LOWEST DAILY MEAN	.03	Aug 21	.01	Aug 24	.01	Sep 16 1975
ANNUAL SEVEN-DAY MINIMUM	.03	Sep 21	.01	Sep 11	.01	Sep 20 1975
ANNUAL RUNOFF (AC-FT)	1100		1010		1050	
10 PERCENT EXCEEDS	4.2		3.9		3.3	
50 PERCENT EXCEEDS	.30		.22		.46	
90 PERCENT EXCEEDS	.04		.03		.09	



As the number of streams on which streamflow information is likely to be desired far exceeds the number of continuous-record stream-gaging stations feasible to operate at one time, the Geological Survey collects limited streamflow data at sites other than continuous-record stream-gaging stations. When limited streamflow data are collected on a systematic basis over a period of years for use in hydrologic analyses, the site at which the data are collected is called a partial-record station. Data collected at these partial-record stations are usable in low-flow or flood-flow analyses, depending on the type of data collected. In addition, discharge measurements are made at other sites not included in the partial-record program. These measurements are generally made in times of drought or flood to give better areal coverage to these events. Those measurements and others collected for some special reason are called measurements at miscellaneous sites.

Discharge measurements made at partial-record stations during water year 1990

Station number	Station name	Location	Drainage area (mi^2)	Period of record	Measurements	
					Date	Discharge (ft^3/s)
		Samoa Islands, Island of Tutuila				
16917500	Leele Stream at mouth, at Fagasa	Lat 14°17′28″ S., long 170°43′09″ W., at Fagasa and 200 ft upstream from mouth.	0.23	1966-76≠, 1977, 1981-90	07-19-90	0.17
16919000	Leaveave Stream near Aasu	Lat 14°18′28″ S., long 170°45′06″ W., 0.6 mi upstream from mouth and 0.9 mi southeast of Aasu.	0.60	1959-63, 1968, 1974-76, 1978-79, 1981, 1983, 1985-87, 1989-90	07-18-90	0.99
16920000	Aasu Stream near Aasu	Lat 14°18′16″ S., long 170°45′29″ W., 300 ft downstream from 100-ft waterfall, 0.5 mi south of Aasu, and 0.5 mi upstream from mouth.	0.82	1959-63, 1968, 1974-76, 1978-79, 1981, 1983, 1985-87, 1989-90	07-18-90 08-21-90	1.31 2.26
16931500	Asili Stream at alt. 330 ft, near Asili	Lat 14°19′34″ S., loug 170°47′38″ W., 1.3 mi northwest of Leone, 1.5 mi southwest of Aoloaufou, and 0.8 mi upstream from mouth.	0.32	1977-86≠, 1987-90	08-07-90	1.52
16932500	Asili Stream at Asili	Lat 14°20′04″ S., long 170°47′40″ W., 100 ft upstream from highway bridge at Asili and 0.1 mi upstream from mouth.	0.66	1958-59≠, 1960-61, 1963-65, 1967-69, 1974-77, 1981-85, 1987-90	08-07-90	1.32
16933500	Leafu Stream at alt. 370 ft, near Leone	Lat 14°19′31″ S., long 170°46′50″ W., 900 ft upstream from village stream intake, 1.0 mi southwest of Aoloaufou, and 1.1 mi north of Leone.	0.31	1977-86≠, 1987-90	08-07-90	1.58
16934000	Leafu Stream near Leone	Lat 14°19′47″ S., long 170°46′55″ W., 30 ft upstream from reservoir, 0.9 mi upstream from mouth, and 1.0 mi north of Leone.	0.69	1959-64, 1968-69, 1971-74, 1976-77, 1981-90	08-07-90	0.84
16944000	Papa Stream near Nuuuli	Lat 14°18′31″ S., long 170°42′29″ W., 0.3 mi upstream from Tauese Stream and 0.9 mi northwest of Nuuuli.	0.57	1959-61, 1963-64, 1967-68, 1974-76, 1983-90	08-30-90	0.58

≠ Operated as a continuous-record gaging station

Station number	Station name	Location	Drainage area (mi^2)	Period of record	Measurements	
					Date	Discharge (ft^3/s)
		Samoa Islands, Island of Tutuila--Continued				
16949800	Utumoa Stream near Pago Pago	Lat 14°17′35″ S., long 170°42′20″ W., 0.6 mi upstream from mouth and 1.1 mi south of Pago Pago above the Vaipito diversion intake system.	0.07	1960-61≠, 1963-65, 1967-71, 1974, 1983, 1986-87, 1989-90	09-23-90	0.20
16960000	Alega Stream at Alega	Lat 14°16′58″ S., long 170°38′19″ W., 300 ft upstream from left-bank tributary, 0.2 mi northwest of Alega, and 0.3 mi upstream from mouth.	0.19	1958-76≠, 1977-78, 1981-90	07-19-90	0.49
16963900	Leafu Stream near Auasi	Lat 14°16′27″ S., long 170°34′26″ W., 35 ft upstream from upper village intake, 0.1 mi north of Auasi, and 0.2 mi upstream from mouth.	0.11	1972-86≠, 1987-90	07-19-90	0.03

Previously unpublished discharge measurements made at a miscellaneous site during water year 1989

Stream	Tributary to	Location	Drainage area (mi^2)	Period of record	Measurements	
					Date	Discharge (ft^3/s)
		Caroline Islands, Island of Pohnpei				
16898850	Mahnd River	Lat 06°50′29″ N., long 158°16′57″ E., at community swimming hole, 0.2 mi upstream from bridge over the Mahnd River in the village of Mahnd.	--	1989	06-07-89	16
					08-08-89	10
					08-22-89	14
					09-02-89	9.9
					09-19-89	4.3

≠ Operated as a continuous-record gaging station

Discharge measurements made at miscellaneous sites during water year 1990

Stream	Tributary to	Location	Drainage area (mi^2)	Period of record	Measurements	
					Date	Discharge (ft^3/s)
Caroline Islands, Island of Pohnpei						
16898850	Mahnd River	Lat 06°50′29″ N., long 158°16′57″ E., at community swimming hole, 0.2 mi upstream from bridge over the Mahnd River in the village of Mahnd.	--	1989-90	10-05-89	7.6
					10-19-89	5.9
					11-09-89	5.2
					12-04-89	13
					12-28-89	11
					01-10-90	4.9
					02-20-90	3.3
					03-15-90	3.7
					04-18-90	30
					05-02-90	8.4
					05-29-90	22
					06-29-90	148
					06-29-90	134
					08-02-90	7.6
					08-15-90	13
					09-05-90	6.1
					09-26-90	10
Samoa Islands, Island of Tutuila						
16950300 Previously published as Utumoa Down Stream No. 2	Vaipito Stream	Lat 14°17′29″ S., long 170°42′21″ W., 0.50 mi upstream from confluence of Vaipito Stream and 0.37 mi northwest of Fagaalu Reservoir at alt. 400 ft.	0.12	1989-90	08-23-90	0.09
16950400 Previously published as Utumoa Down Stream No. 3	Vaipito Stream	Lat 14°17′28″ S., long 170°42′22″ W., 0.45 mi upstream from confluence of Vaipito Stream and 0.44 mi northwest of Fagaalu Reservoir at alt. 380 ft.	0.14	1989-90	08-23-90	0.07
Leafu Stream above 2nd unnamed tributary. Previously published as Leafu Stream No. 3	Pacific Ocean	Lat 14°19′35″ S., long 170°46′54″ W., 1,100 ft above village catchment and 1.3 mi northeast of Leone at alt. 365 ft.	0.50	1977, 1981-83, 1987, 1989-90	08-07-90	0.60
Unnamed tributary	Asili Stream	Lat 14°19′42″ S., long 170°47′46″ W., 200 ft above confluence with Asili Stream and 0.5 mi northwest of Asili.	0.17	1969, 1977-78, 1983, 1987-90	08-07-90	0.02
Asili Stream at alt. 190 ft	Asili Stream	Lat 14°19′41″ S., long 170°47′44″ W., at alt. 190 ft and 0.5 mi north of Asili.	0.35	1977, 1983, 1985, 1987, 1989-90	08-07-90	0.33

TIDE GAGE RECORDS

MARIANA ISLANDS, ISLAND OF GUAM

132833144445371. Local number, 18-2844-04 Tide gage of Agana.

LOCATION.--Lat 13°28'33" N., long 144°44'53" E., Hydrologic Unit 20100003, at Agana Boat Basin. Owner: Government of Guam.

WELL CHARACTERISTICS.--Twelve-inch PVC stilling well, 14 ft deep.

DATUM.--Altitude of land-surface datum is 6.40 ft. Measuring point: top of PVC pipe, 8.19 ft above mean sea level.

PERIOD OF RECORD.--Water-level recorder, April 1, 1983 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 4.07 ft above mean sea level, January 14, 1990; lowest, -3.00 ft, January 26, 1990.

TIDE STAGES, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.17	-.08	-.15	.06	-.36	.04	.18	.09	.38	-.04	.94	.40
2	.15	-.25	-.16	.07	-.30	.03	.18	.08	.31	-.03	.89	.31
3	.14	-.35	-.03	.04	-.33	.07	.20	.10	.33	-.08	.86	.36
4	-.04	-.45	.11	-.03	-.18	.12	.18	.24	.30	-.06	.81	.36
5	-.14	-.40	.13	-.05	-.21	.21	.14	.13	.23	-.09	.79	.35
6	-.21	-.36	.19	.13	-.15	.19	.20	-.04	.17	-.06	.77	.33
7	-.19	-.34	.16	.04	-.14	.23	.15	-.09	.15	-.13	.78	.29
8	-.22	-.31	.23	.01	-.08	.22	.24	-.13	.15	-.15	.79	.28
9	-.21	-.31	.24	-.01	-.08	.12	.13	-.13	.13	-.11	.75	.38
10	-.18	-.21	.12	.07	-.03	.19	.13	-.12	.11	-.05	.83	.26
11	-.06	-.10	.15	.05	-.01	.19	.08	-.16	.12	-.04	.83	.18
12	-.08	-.16	.18	-.03	-.03	.13	.05	-.20	.14	-.01	.87	.19
13	.01	-.09	.10	.04	-.03	.07	.03	.30	.16	.03	.91	.30
14	.06	-.13	.02	1.19	-.06	-.12	.02	.30	.09	.05	.88	.10
15	.10	-.25	-.05	1.46	-.09	-.20	.00	.29	.11	.04	.66	.02
16	-.07	-.35	-.09	-.03	.03	-.21	-.01	.85	.17	.09	.66	.08
17	-.13	-.35	-.09	-.46	.05	-.26	-.06	.90	.26	.17	.69	.07
18	-.13	-.30	.06	-.69	.05	-.32	-.02	.88	.30	.17	.52	.11
19	-.19	-.29	.08	-.44	.04	-.38	-.05	.93	.25	.09	.71	.07
20	-.17	-.25	-.01	-.46	.19	-.37	.03	.87	.21	.05	.75	.05
21	-.20	-.26	.02	-.64	.19	-.39	.07	.80	.11	.06	.74	.06
22	-.16	-.18	.07	-.74	.18	-.34	.13	.74	.24	.08	.69	.02
23	-.01	-.05	.19	-.76	.12	-.43	.07	.65	.18	.11	.74	-.12
24	.29	-.05	.15	-.75	.05	-.45	.09	.54	.19	.16	.76	-.14
25	.00	.06	.24	-.87	.11	-.45	.04	.49	.15	.14	.84	-.04
26	-.11	-.03	.20	-.81	.07	-.45	.06	.41	.16	.12	.77	-.10
27	-.16	-.01	.15	-.72	.03	-.51	.02	.39	.15	.17	.63	-.14
28	-.17	-.02	.18	-.58	.03	-.59	.04	.34	.12	.08	.45	---
29	-.17	.00	.07	-.64	---	.27	-.01	.37	.05	.05	.34	---
30	-.21	-.08	.00	-.54	---	.34	.02	.38	-.02	.01	.42	---
31	-.13	---	-.01	-.57	---	.24	---	.38	---	.09	.41	---
MEAN	-.08	-.20	.08	-.21	-.03	-.09	.08	.34	.18	.03	.73	---
MAX	.29	.06	.24	1.46	.19	.34	.24	.93	.38	.17	.94	---
MIN	-.22	-.45	-.16	-.87	-.36	-.59	-.06	-.20	-.02	-.15	.34	---

WTR YR 1990 MAX 4.07 Jan. 14 MIN -3.00 Jan. 26

132624144452771. Local number, 18-2645-07 Ordot Well A-20.

LOCATION.--Lat 13°26'24" N., long 144°45'27" E., Hydrologic Unit 20100003, at Ordot School, 1.4 mi west of junction of Routes 4 and 10, Ordot. Owner: Government of Guam.

AQUIFER.--Mariana Limestone and Alutom formation.

WELL CHARACTERISTICS.--Drilled water-table well, depth reported 120 ft, casing diameter 6 in.

DATUM.--Altitude of land-surface datum is 137 ft. Measuring point: top of casing, 141.74 ft above mean sea level.

PERIOD OF RECORD.--

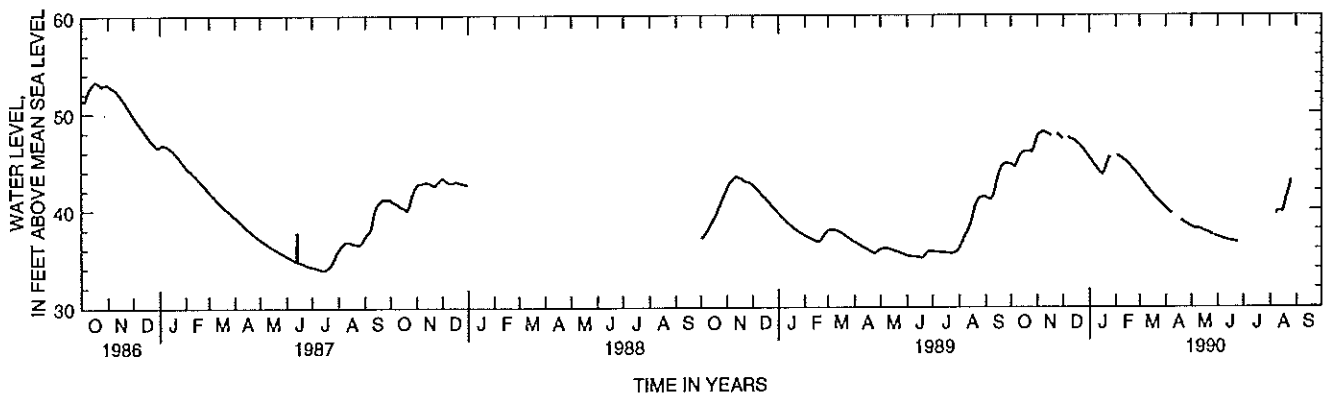
WATER LEVEL: Water-level recorder, January 1974 to current year.

WATER QUALITY: Water year 1989.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 54.03 ft above mean sea level, October 21, 1980; lowest, 32.76 ft above mean sea level, June 21, 22, 1984.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	44.66	47.63	---	45.29	---	43.32	40.15	38.22	37.18	---	---	---
2	44.62	47.71	---	45.15	45.56	43.21	40.09	38.18	37.16	---	---	---
3	44.57	47.79	---	45.06	45.54	43.10	40.02	38.12	37.14	---	---	---
4	44.50	47.85	---	44.93	45.52	42.99	39.93	38.08	37.11	---	---	---
5	44.46	47.92	---	44.79	45.47	42.87	39.84	38.06	37.08	---	---	---
6	44.53	47.97	---	44.66	45.40	42.74	39.76	38.04	37.04	---	---	---
7	44.73	47.99	47.46	44.55	45.35	42.63	39.69	38.05	37.00	---	---	---
8	44.97	47.98	47.38	44.43	45.30	42.51	39.59	38.04	36.97	---	39.58	---
9	45.19	48.00	47.33	44.31	45.23	42.37	---	38.03	36.94	---	39.72	---
10	45.41	47.95	47.28	44.20	45.15	42.25	---	38.02	36.91	---	39.80	---
11	45.56	47.91	47.25	44.08	45.08	42.15	---	37.99	36.89	---	39.82	---
12	45.67	47.87	47.22	44.00	45.02	42.05	---	37.96	36.86	---	39.84	---
13	45.76	47.84	47.17	43.88	44.93	41.96	---	37.91	36.85	---	39.84	---
14	45.85	47.81	47.12	43.80	44.84	41.83	---	37.87	36.82	---	39.80	---
15	45.91	47.72	47.04	43.71	44.76	41.72	---	37.81	36.79	---	39.79	---
16	45.95	47.66	46.96	43.68	44.67	41.62	---	37.77	36.78	---	39.84	---
17	45.96	47.65	46.86	43.76	44.56	41.53	---	37.74	36.77	---	40.09	---
18	45.98	---	46.80	43.91	44.46	41.38	---	37.71	36.75	---	40.39	---
19	45.99	---	46.72	44.14	44.35	41.34	38.87	37.68	36.74	---	40.82	---
20	46.00	---	46.62	44.44	44.25	41.23	38.80	37.65	36.72	---	41.16	---
21	46.00	---	46.53	44.70	44.16	41.14	38.75	37.61	36.69	---	41.44	---
22	46.00	---	46.42	44.96	44.06	41.04	38.71	37.56	36.68	---	41.75	---
23	46.01	---	46.32	45.16	43.98	40.97	38.64	37.52	36.68	---	42.08	---
24	46.04	47.73	46.22	45.31	43.87	40.84	38.59	37.49	36.67	---	42.34	---
25	45.98	47.71	46.12	45.40	43.77	40.76	38.54	37.45	36.67	---	42.66	---
26	46.08	47.63	46.03	---	43.66	40.69	38.50	37.39	---	---	42.99	---
27	46.28	47.58	45.89	---	43.57	40.57	38.42	---	---	---	---	---
28	46.60	47.47	45.76	---	43.46	40.47	38.36	37.31	---	---	---	---
29	46.90	47.40	45.64	---	---	40.39	38.30	37.27	---	---	---	---
30	47.17	47.35	45.55	---	---	40.28	38.26	37.24	---	---	---	---
31	47.41	---	45.42	---	---	40.21	---	37.22	---	---	---	---
MEAN	45.70	---	---	---	---	41.68	---	---	---	---	---	---
MAX	47.41	---	---	---	---	43.32	---	---	---	---	---	---
MIN	44.46	---	---	---	---	40.21	---	---	---	---	---	---



132644144480871. Local number, 18-2648-02 BPM Well 1.

LOCATION.--Lat 13°26'44" N., long 144°48'08" E., Hydrologic Unit 20100003, on lot number 2287, 0.2 mi southeast of junction of Routes 15 and 10, Mangilao. Owner: Ana P. Diaz.

AQUIFER.--Coralline Limestone, probably Miocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth reported 235 ft, casing diameter 12 in.

DATUM.--Altitude of land-surface datum is 210 ft. Measuring point: top of casing, 209.86 ft, revised, above mean sea level.

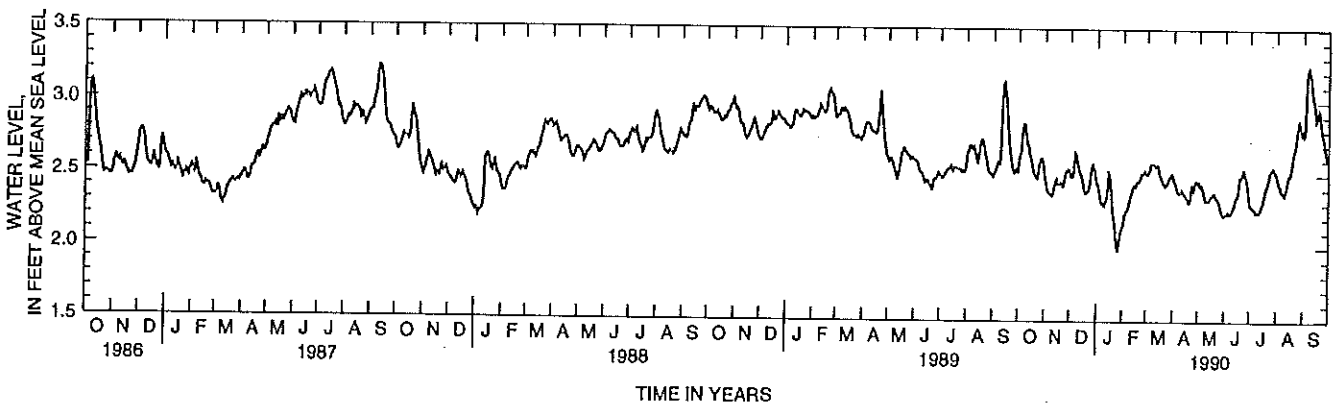
PERIOD OF RECORD.--Occasional measurements, February 1972 to December 1973.
Water level recorder, January 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 4.45 ft above mean sea level, May 22, 1976; lowest, 1.89 ft above mean sea level, February 11, 12, 1983.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.56	2.48	2.53	2.44	2.16	2.51	2.49	2.44	2.23	2.30	2.50	2.80
2	2.62	2.45	2.49	2.44	2.19	2.51	2.46	2.45	2.24	2.30	2.47	2.78
3	2.64	2.42	2.49	2.40	2.23	2.52	2.45	2.43	2.24	2.29	2.45	2.79
4	2.66	2.39	2.49	2.37	2.24	2.53	2.44	2.42	2.24	2.28	2.43	2.98
5	2.75	2.39	2.52	2.33	2.26	2.56	2.41	2.43	2.25	2.28	2.43	3.18
6	2.83	2.38	2.59	2.31	2.26	2.58	2.39	2.41	2.24	2.27	2.40	3.23
7	2.85	2.37	2.65	2.31	2.28	2.58	2.39	2.38	2.24	2.27	2.39	3.24
8	2.85	2.37	2.64	2.30	2.30	2.58	2.38	2.36	2.24	2.25	2.38	3.21
9	2.81	2.36	2.60	2.31	2.33	2.58	2.38	2.33	2.25	2.25	2.38	3.19
10	2.75	2.36	2.57	2.30	2.35	2.57	2.39	2.33	2.27	2.25	2.37	3.14
11	2.72	2.38	2.54	2.32	2.38	2.56	2.40	2.33	2.28	2.25	2.39	3.09
12	2.70	2.42	2.52	2.34	2.39	2.56	2.39	2.33	2.30	2.25	2.41	3.03
13	2.69	2.44	2.51	2.35	2.42	2.57	2.38	2.33	2.32	2.26	2.44	3.02
14	2.64	2.46	2.49	2.42	2.43	2.57	2.37	2.34	2.34	2.28	2.48	2.98
15	2.62	2.47	2.47	2.52	2.42	2.54	2.37	2.35	2.36	2.30	2.50	2.93
16	2.60	2.44	2.44	2.51	2.42	2.51	2.35	2.36	2.36	2.31	2.50	2.88
17	2.56	2.44	2.40	2.48	2.44	2.50	2.35	2.36	2.39	2.34	2.51	2.89
18	2.53	2.44	2.38	2.40	2.46	2.48	2.34	2.37	2.44	2.37	2.55	2.91
19	2.51	2.44	2.38	2.31	2.46	2.47	2.32	2.38	2.49	2.40	2.58	2.95
20	2.50	2.45	2.39	2.24	2.46	2.45	2.32	2.38	2.49	2.42	2.62	2.94
21	2.49	2.44	2.39	2.22	2.47	2.44	2.33	2.36	2.49	2.43	2.66	2.88
22	2.48	2.44	2.40	2.17	2.49	2.43	2.39	2.35	2.51	2.45	2.68	2.83
23	2.48	2.42	2.43	2.12	2.51	2.43	2.44	2.34	2.54	2.48	2.71	2.79
24	2.53	2.45	2.46	2.06	2.51	2.44	2.41	2.33	2.54	2.51	2.75	2.77
25	2.57	2.48	2.52	2.01	2.51	2.45	2.40	2.32	2.51	2.53	2.81	2.75
26	2.59	2.51	2.56	1.98	2.52	2.46	2.42	2.30	2.49	2.54	2.84	2.71
27	2.61	2.53	2.57	2.01	2.53	2.48	2.45	2.27	2.47	2.54	2.87	2.67
28	2.61	2.53	2.55	2.06	2.52	2.49	2.46	2.25	2.44	2.55	2.86	2.63
29	2.61	2.54	2.54	2.10	---	2.49	2.46	2.24	2.39	2.54	2.83	2.61
30	2.57	2.54	2.50	2.12	---	2.51	2.45	2.23	2.34	2.52	2.78	2.60
31	2.52	---	2.46	2.14	---	2.51	---	2.23	---	2.52	2.78	---
MEAN	2.63	2.44	2.50	2.27	2.39	2.51	2.40	2.35	2.36	2.37	2.57	2.91
MAX	2.85	2.54	2.65	2.52	2.53	2.58	2.49	2.45	2.54	2.55	2.87	3.24
MIN	2.48	2.36	2.38	1.98	2.16	2.43	2.32	2.23	2.23	2.25	2.37	2.60

WTR YR 1990 MAX 3.25 Sep. 6,7 MIN 1.94 Jan. 26



132824144464271. Local number, 18-2846-01 ACEORP Tunnel.

LOCATION.--Lat 13°28'54" N., long 144°46'42" E., Hydrologic Unit 20100003, behind Navy Telephone Exchange, 0.35 mi southwest of junction of Routes 1 and 14, Tamuning. Owner: U.S. Navy, Public Works Department.

AQUIFER.--Mariana Limestone.

WELL CHARACTERISTICS.--Dug basal water-table well consisting of an inclined shaft, three skimming tunnels, and a large pump room. Tunnels 1 and 2 are 150 ft each and tunnel 3 is 700 ft in length.

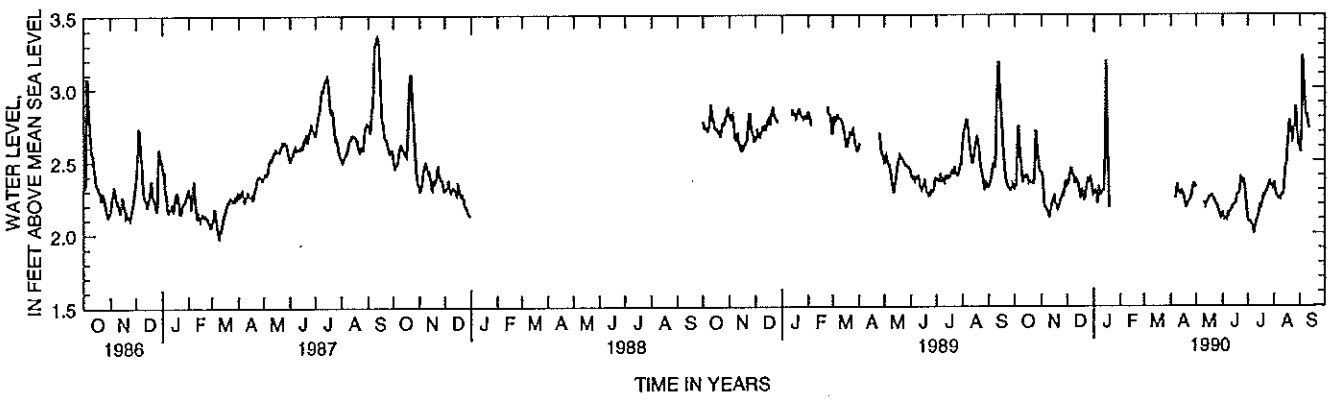
DATUM.--Altitude of land-surface datum is 180 ft. Measuring point: top of wooden recorder shelf, 9.28 ft above mean sea level.

PERIOD OF RECORD.--Water-level recorder, October 1954 to May 1965, March 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 4.95 ft above mean sea level, May 22, 1976; lowest, 1.70 ft above mean sea level, February 12, 1983.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.34	2.42	2.33	2.28	---	---	---	2.33	2.14	2.10	2.35	2.59
2	2.32	2.39	2.34	2.29	---	---	---	---	2.12	2.08	2.32	2.56
3	2.40	2.31	2.35	2.30	---	---	---	---	2.10	2.08	2.28	2.77
4	2.71	2.21	2.41	2.27	---	---	---	---	2.11	2.08	2.26	3.22
5	2.74	2.18	2.43	2.21	---	---	---	---	2.11	2.06	2.25	3.18
6	2.64	2.18	2.45	2.27	2.15	---	2.24	---	2.10	2.06	2.24	3.06
7	2.53	2.17	2.42	2.31	---	---	2.25	---	2.15	2.04	2.25	2.91
8	2.48	2.15	2.40	2.30	---	---	2.32	---	2.11	2.00	2.25	2.82
9	2.39	2.14	2.39	2.26	---	---	2.33	2.21	2.14	2.02	2.24	2.79
10	2.35	2.11	2.35	2.28	---	---	2.31	2.21	2.15	2.06	2.26	2.82
11	2.40	2.15	2.35	2.29	---	---	2.29	2.21	2.16	2.09	2.27	2.76
12	2.38	2.17	2.37	2.31	---	---	2.27	2.19	2.17	2.10	2.27	2.72
13	2.38	2.20	2.36	2.29	---	---	2.27	2.21	2.19	2.12	2.32	---
14	2.40	2.23	2.35	2.64	---	---	2.29	2.22	2.19	2.15	2.43	---
15	2.40	2.24	2.31	3.19	---	---	2.28	2.23	2.20	2.20	2.47	---
16	2.38	2.25	2.27	2.99	---	---	2.27	2.25	2.20	2.17	2.48	---
17	2.35	2.21	2.24	2.63	---	---	2.24	2.25	2.21	2.19	2.60	---
18	2.36	2.20	2.28	2.32	---	---	2.21	2.25	2.26	2.22	2.67	---
19	2.36	2.18	2.31	2.18	---	---	2.18	2.26	2.27	2.26	2.76	---
20	2.35	2.17	2.27	---	---	---	2.18	2.26	2.27	2.25	2.77	---
21	2.36	2.18	2.24	---	---	---	2.20	2.24	2.28	2.26	2.76	---
22	2.35	2.20	2.25	---	---	---	2.22	2.23	2.33	2.28	2.69	---
23	2.34	2.23	2.30	---	---	---	2.23	2.22	2.38	2.29	2.64	---
24	2.50	2.24	2.34	---	---	---	2.23	2.20	2.37	2.30	2.65	---
25	2.71	2.26	2.37	---	---	---	2.25	2.20	2.37	2.33	2.73	---
26	2.67	2.28	2.36	---	---	---	2.29	2.18	2.34	2.33	2.77	---
27	2.57	2.27	2.37	---	---	---	2.32	2.16	2.35	2.35	2.87	---
28	2.51	2.31	2.38	---	---	---	2.34	2.14	2.27	2.34	2.83	---
29	2.44	2.36	2.35	---	---	---	2.34	2.12	2.22	2.33	2.68	---
30	2.43	2.36	2.31	---	---	---	2.32	2.11	2.16	2.31	2.61	---
31	2.42	---	2.27	---	---	---	---	2.13	---	2.32	2.60	---
MEAN	2.45	2.23	2.34	---	---	---	---	---	2.21	2.19	2.50	---
MAX	2.74	2.42	2.45	---	---	---	---	---	2.38	2.35	2.87	---
MIN	2.32	2.11	2.24	---	---	---	---	---	2.10	2.00	2.24	---



132813144472771. Local number, 18-2847-12 (formerly 18-2847-06) Barrigada Well (A-16).

LOCATION.--Lat 13°28'13" N., long 144°47'27" E., Hydrologic Unit 20100003, at Carbullido School, 0.6 mi west of junction of Routes 8 and 10, Barrigada. Owner: Public Utility Agency of Guam.

AQUIFER.--Mariana Limestone, probably Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth reported 215 ft, diameter 12 in.

DATUM.--Altitude of land-surface datum is 207 ft. Measuring point: top of casing, 208.00 ft above mean sea level.

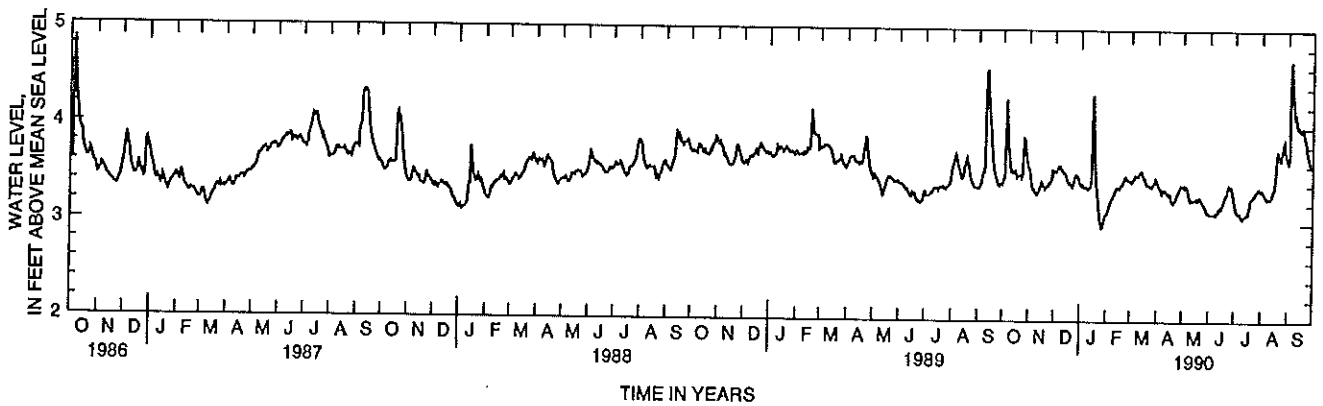
PERIOD OF RECORD.--Water-level recorder, June 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 6.71 ft above mean sea level, May 22, 1976; lowest, 2.83 ft above mean sea level, February 11, 12, 1983.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.44	3.58	3.55	3.41	3.11	3.45	3.43	3.39	3.12	3.22	3.36	3.66
2	3.47	3.55	3.54	3.40	3.14	3.44	3.40	3.40	3.11	3.16	3.36	3.63
3	3.49	3.49	3.54	3.41	3.17	3.45	3.39	3.38	3.11	3.14	3.33	3.69
4	3.96	3.41	3.56	3.40	3.20	3.47	3.37	3.40	3.11	3.12	3.32	4.55
5	4.28	3.37	3.57	3.38	3.23	3.48	3.37	3.40	3.11	3.12	3.30	4.69
6	4.03	3.36	3.60	3.38	3.25	3.51	3.32	3.39	3.11	3.12	3.28	4.46
7	3.83	3.36	3.60	3.39	3.27	3.51	3.32	3.34	3.11	3.12	3.27	4.34
8	3.72	3.33	3.60	3.39	3.28	3.50	3.34	3.31	3.12	3.09	3.28	4.21
9	3.62	3.32	3.57	3.37	3.31	3.50	3.36	3.26	3.11	3.08	3.27	4.09
10	3.55	3.31	3.56	3.37	3.32	3.50	3.36	3.25	3.13	3.07	3.27	4.15
11	3.56	3.32	3.54	3.38	3.36	3.53	3.34	3.26	3.13	3.08	3.27	4.10
12	3.54	3.33	3.53	3.39	3.37	3.54	3.33	3.25	3.16	3.09	3.28	4.03
13	3.53	3.36	3.53	3.39	3.38	3.55	3.31	3.25	3.17	3.10	3.30	4.00
14	3.54	3.38	3.52	3.47	3.38	3.54	3.31	3.26	3.18	3.10	3.33	4.01
15	3.55	3.41	3.49	4.28	3.37	3.49	3.32	3.26	3.17	3.11	3.36	4.00
16	3.53	3.43	3.46	4.33	3.37	3.49	3.31	3.26	3.19	3.11	3.37	3.97
17	3.49	3.40	3.43	3.99	3.39	3.49	3.27	3.27	3.22	3.15	3.46	3.97
18	3.50	3.41	3.42	3.65	3.41	3.45	3.24	3.25	3.24	3.20	3.56	4.00
19	3.50	3.39	3.43	3.44	3.41	3.42	3.24	3.25	3.27	3.26	3.72	4.00
20	3.50	3.37	3.42	3.38	3.43	3.41	3.23	3.28	3.30	3.27	3.75	3.95
21	3.51	3.38	3.40	3.29	3.47	3.41	3.24	3.28	3.31	3.27	3.74	3.90
22	3.50	3.39	3.39	3.19	3.48	3.41	3.26	3.26	3.32	3.29	3.69	3.88
23	3.48	3.40	3.42	3.12	3.49	3.41	3.28	3.25	3.38	3.30	3.69	3.81
24	3.51	3.40	3.45	3.04	3.48	3.39	3.31	3.23	3.40	3.31	3.66	3.75
25	3.77	3.43	3.49	3.00	3.46	3.39	3.33	3.21	3.39	3.33	3.73	3.71
26	3.88	3.43	3.51	2.97	3.46	3.39	3.34	3.19	3.38	3.35	3.78	3.68
27	3.87	3.44	3.51	2.98	3.46	3.41	3.37	3.18	3.39	3.35	3.84	3.64
28	3.78	3.47	3.50	3.02	3.45	3.42	3.39	3.16	3.35	3.36	3.86	3.61
29	3.69	3.56	3.49	3.06	---	3.45	3.40	3.13	3.31	3.37	3.79	3.60
30	3.63	3.56	3.45	3.10	---	3.47	3.39	3.13	3.26	3.36	3.70	3.59
31	3.59	---	3.42	3.10	---	3.46	---	3.12	---	3.35	3.69	---
MEAN	3.64	3.41	3.50	3.37	3.35	3.46	3.33	3.27	3.22	3.20	3.50	3.96
MAX	4.28	3.58	3.60	4.33	3.49	3.55	3.43	3.40	3.40	3.37	3.86	4.69
MIN	3.44	3.31	3.39	2.97	3.11	3.39	3.23	3.12	3.11	3.07	3.27	3.59

WTR YR 1990 MAX 4.76 Sep. 4,5 MIN 2.95 Jan. 26-27



133032144491871. Local number 18-3049-03 Harmon Loop School Well M-10A.

LOCATION.--Lat 13°30'32" N., long 144°49'18" E., Hydrologic Unit 20100003, at Harmon Loop School, Dededo. Owner: Public Utility Agency of Guam.

AQUIFER.--Barrigada Limestone.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth reported 288 ft, casing diameter 8 in.

DATUM.--Altitude of land-surface datum is 227 ft. Measuring point: top of casing, 228.62 ft above mean sea level.

REMARKS.--Well was abandoned in 1973 because of oil taste and high iron content.

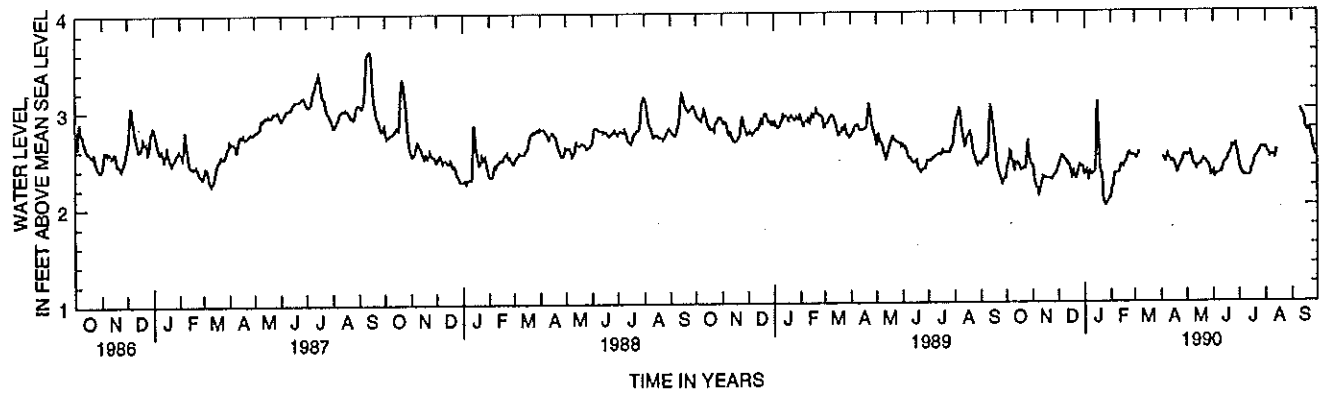
PERIOD OF RECORD.--Water-level recorder, January 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 4.61 ft above mean sea level, May 23, 1976; lowest, 1.94 ft above mean sea level, February 10-12, 1983.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.38	2.41	2.40	2.32	2.10	2.51	---	2.52	2.34	2.42	2.59	---
2	2.41	2.35	2.43	2.34	2.17	2.49	---	2.52	2.29	2.38	2.58	---
3	2.44	2.26	2.45	2.36	2.20	2.49	2.50	2.51	2.29	2.35	2.55	---
4	2.50	2.22	2.49	2.34	2.24	2.51	2.49	2.53	2.32	2.32	2.54	---
5	2.56	2.19	2.51	2.26	2.32	2.52	2.47	2.56	2.32	2.31	2.53	---
6	2.55	2.18	2.51	2.32	2.33	2.55	2.45	2.52	2.32	2.32	2.50	---
7	2.47	2.18	2.50	2.35	2.33	---	2.45	2.47	2.32	2.31	2.51	---
8	2.44	2.12	2.48	2.34	2.33	---	2.50	2.43	2.33	2.30	2.51	---
9	2.40	2.14	2.47	2.32	2.33	---	2.52	2.41	2.33	2.30	2.51	---
10	2.38	2.18	2.46	2.33	2.33	---	2.49	2.41	2.35	2.30	2.51	---
11	2.44	2.22	2.43	2.33	2.34	---	2.48	2.41	2.34	2.30	2.51	2.99
12	2.43	2.25	2.44	2.34	2.41	---	2.46	2.38	2.39	2.30	2.49	2.95
13	2.42	2.29	2.43	2.35	2.42	---	2.45	2.40	2.42	2.31	2.51	2.95
14	2.44	2.28	2.41	2.48	2.42	---	2.46	2.41	2.44	2.31	2.57	2.94
15	2.43	2.28	2.38	2.98	2.41	---	2.46	2.41	2.44	2.37	---	2.90
16	2.43	2.29	2.33	3.07	2.40	---	2.45	2.42	2.45	2.38	---	2.86
17	2.38	2.28	2.30	2.86	2.43	---	2.42	2.42	2.46	2.40	---	2.79
18	2.37	2.28	2.33	2.58	2.45	---	2.40	2.44	2.49	2.44	---	2.78
19	2.37	2.28	2.35	2.41	2.45	---	2.36	2.45	2.52	2.49	---	2.76
20	2.38	2.28	2.30	2.34	2.49	---	2.34	2.47	2.53	2.49	---	2.76
21	2.39	2.28	2.28	2.33	2.53	---	2.35	2.46	2.54	2.50	---	2.79
22	2.38	2.28	2.28	2.22	2.54	---	2.39	2.46	2.57	2.51	---	2.79
23	2.38	2.27	2.32	2.07	2.54	---	2.41	2.45	2.62	2.53	---	2.74
24	2.43	2.27	2.37	2.02	2.52	---	2.43	2.43	2.62	2.54	---	2.69
25	2.63	2.29	2.39	2.00	2.51	---	2.44	2.42	2.60	2.56	---	2.67
26	2.65	2.31	2.41	2.00	2.52	---	2.47	2.42	2.61	2.58	---	2.60
27	2.56	2.32	2.40	2.01	2.52	---	2.51	2.39	2.64	2.59	---	2.56
28	2.49	2.33	2.40	2.03	2.51	---	2.52	2.36	2.57	2.59	---	2.52
29	2.44	2.34	2.40	2.05	---	---	2.52	2.31	2.54	2.59	---	2.51
30	2.42	2.38	2.37	2.07	---	---	2.51	2.32	2.48	2.58	---	2.52
31	2.42	---	2.32	2.07	---	---	---	2.32	---	2.58	---	---
MEAN	2.45	2.27	2.40	2.32	2.40	---	---	2.43	2.45	2.43	---	---
MAX	2.65	2.41	2.51	3.07	2.54	---	---	2.56	2.64	2.59	---	---
MIN	2.37	2.12	2.28	2.00	2.10	---	---	2.31	2.29	2.30	---	---

WTR YR 1990 MAX 3.11 Jan. 15-16 MIN 1.98 Jan. 26



133047144500171. Local number, 18-3049-05 Well M-11.

LOCATION.--Lat 13°30'49" N., long 144°49'58" E., Hydrologic Unit 20100003, at intersection of Harmon Loop School Road and Route 1, Dededo. Owner: Public Utility Agency of Guam.

AQUIFER.--Barrigada Limestone.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth reported 325 ft, casing diameter 8 in.

DATUM.--Altitude of land-surface datum is 294 ft. Measuring point: top of casing, 295.82 ft above mean sea level.

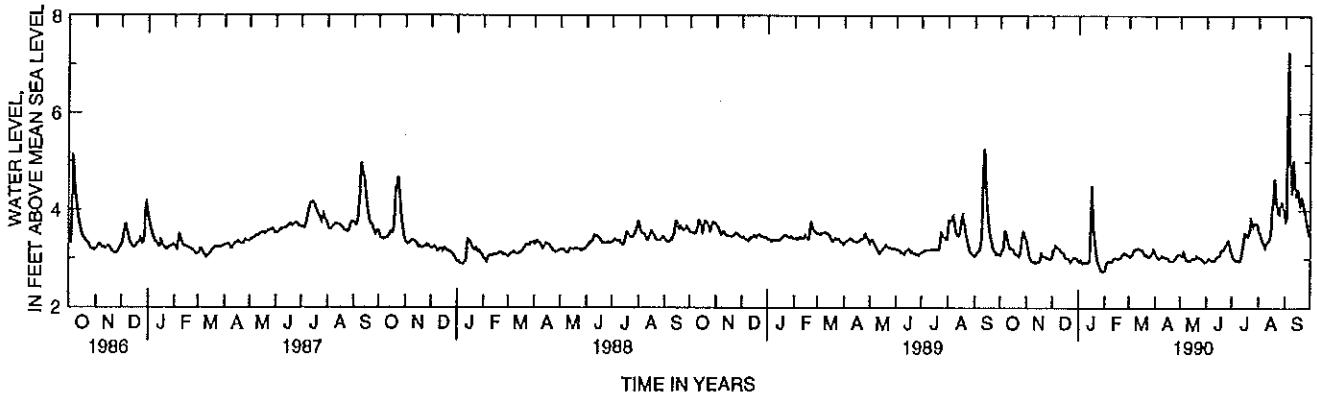
PERIOD OF RECORD.--Water-level recorder, July 1977 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 7.90 ft above mean sea level, Sept. 4-5, 1990; lowest, 2.46 ft above mean sea level, February 12, 1983.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.08	3.37	3.04	2.94	2.76	3.07	3.13	3.08	2.95	3.12	3.58	3.87
2	3.12	3.27	3.17	2.94	2.85	3.05	3.08	3.08	2.98	3.05	3.55	3.80
3	3.17	3.19	3.18	2.97	2.92	3.06	3.06	3.06	3.00	3.02	3.51	3.84
4	3.20	3.09	3.20	2.94	2.92	3.07	3.04	3.07	3.00	3.00	3.44	6.44
5	3.29	3.02	3.26	2.91	2.94	3.08	3.01	3.13	3.00	2.99	3.40	7.26
6	3.56	2.99	3.24	2.91	2.95	3.13	3.01	3.09	2.97	2.97	3.36	5.77
7	3.56	2.95	3.23	2.92	2.95	3.19	3.01	3.03	2.97	2.98	3.32	4.99
8	3.50	2.94	3.22	2.93	2.94	3.19	3.03	2.99	2.97	2.97	3.29	4.55
9	3.41	2.94	3.20	2.91	2.95	3.19	3.06	2.98	2.97	2.97	3.25	4.34
10	3.31	2.93	3.19	2.92	2.96	3.19	3.05	2.96	2.97	2.96	3.31	4.55
11	3.25	2.93	3.14	2.92	3.01	3.21	3.04	2.97	2.98	2.97	3.36	5.03
12	3.22	2.92	3.14	2.92	3.01	3.21	3.03	2.97	2.99	3.05	3.36	4.76
13	3.21	2.93	3.14	2.92	3.01	3.21	3.03	2.97	3.03	3.15	3.37	4.48
14	3.20	2.94	3.13	2.99	3.01	3.20	3.03	2.99	3.05	3.26	3.41	4.31
15	3.20	2.94	3.08	3.50	3.01	3.19	3.02	3.01	3.05	3.39	3.49	4.33
16	3.19	2.93	3.03	4.50	3.00	3.18	3.02	3.01	3.06	3.53	3.69	4.44
17	3.13	2.96	3.01	4.31	3.00	3.18	3.01	3.01	3.08	3.53	4.06	4.33
18	3.12	3.11	3.01	3.87	3.02	3.16	2.97	3.01	3.15	3.49	4.14	4.15
19	3.10	3.11	3.01	3.51	3.02	3.10	2.96	3.02	3.18	3.47	4.52	4.10
20	3.08	3.05	3.00	3.37	3.05	3.08	2.96	3.05	3.19	3.47	4.65	4.13
21	3.09	3.04	2.96	3.20	3.08	3.07	2.96	3.04	3.19	3.56	4.41	4.24
22	3.08	3.04	2.94	3.06	3.09	3.06	2.96	3.03	3.20	3.59	4.15	4.20
23	3.06	3.04	2.96	2.95	3.11	3.08	2.96	3.03	3.25	3.81	4.04	4.09
24	3.10	3.02	2.99	2.92	3.11	3.05	2.98	3.02	3.28	3.78	3.96	4.01
25	3.21	3.01	3.01	2.88	3.09	3.05	2.99	3.02	3.32	3.74	3.94	3.91
26	3.33	3.02	3.01	2.83	3.10	3.05	3.02	3.00	3.36	3.67	4.05	3.80
27	3.50	3.01	3.02	2.77	3.09	3.08	3.06	2.98	3.37	3.72	4.14	3.70
28	3.55	3.00	3.02	2.75	3.08	3.10	3.08	2.97	3.32	3.73	4.16	3.58
29	3.54	3.01	3.01	2.75	---	3.15	3.09	2.95	3.22	3.72	4.14	3.50
30	3.47	3.01	3.00	2.75	---	3.19	3.09	2.94	3.17	3.73	4.06	3.49
31	3.41	---	2.95	2.75	---	3.18	---	2.95	---	3.71	3.94	---
MEAN	3.27	3.02	3.08	3.09	3.00	3.13	3.02	3.01	3.11	3.36	3.78	4.40
MAX	3.56	3.37	3.26	4.50	3.11	3.21	3.13	3.13	3.37	3.81	4.65	7.26
MIN	3.06	2.92	2.94	2.75	2.76	3.05	2.96	2.94	2.95	2.96	3.25	3.49

WTR YR 1990 MAX 7.90 Sep. 4-5 MIN 2.74 Jan. 28



133119144491771. Local number, 18-3149-05 Wettengel Exploratory Well Ex-7.

LOCATION.--Lat 13°31'17" N., long 144°49'17" E., Hydrologic Unit 20100003, 200 ft east of junction of Routes 1 and 3, Wettengel. Owner: Government of Guam.

AQUIFER.--Barrigada Limestone.

WELL CHARACTERISTICS.--Drilled basal water-table well, sounded depth 698 ft, borehole diameter 8 in., casing diameter 6 in., cased to 10 ft.

DATUM.--Altitude of land-surface datum is 283 ft. Measuring point: top of 6-in. diameter surface casing, 283.31 ft above mean sea level.

PERIOD OF RECORD.--

WATER LEVEL: Occasional measurements, August 1981 to May 1983. Water-level recorder, June 1983 to current year.

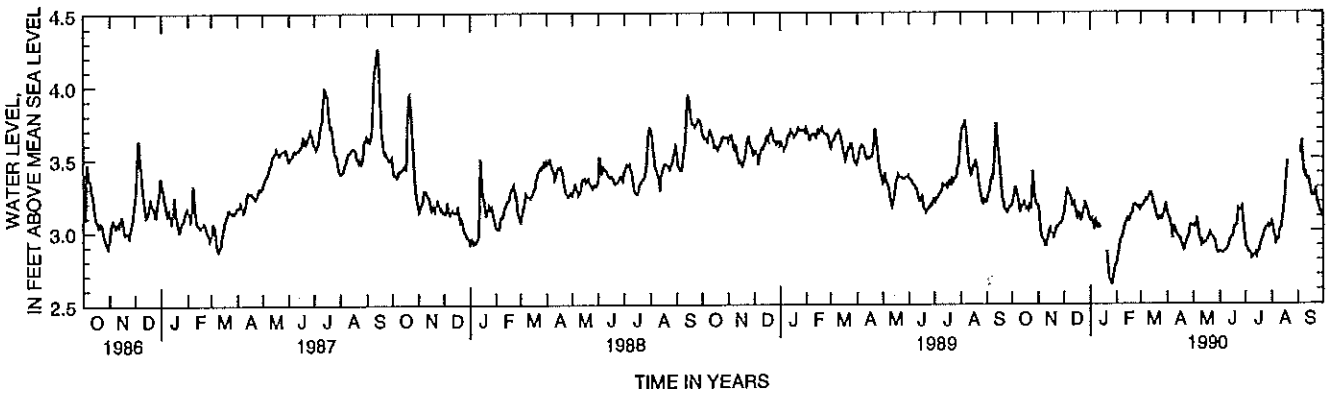
WATER QUALITY: 1981 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 4.26 ft above mean sea level, September 13, 1987; lowest, 2.57 ft above mean sea level, January 26, 1990.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.19	3.17	3.12	3.07	2.79	3.17	3.12	3.03	2.86	2.93	3.06	---
2	3.22	3.12	3.17	3.08	2.84	3.17	3.10	3.04	2.86	2.89	3.05	---
3	3.26	3.05	3.18	3.09	2.87	3.17	3.09	3.03	2.85	2.88	3.00	---
4	3.30	2.98	3.26	3.06	2.91	3.18	3.06	3.05	2.85	2.86	2.97	3.53
5	3.30	2.96	3.28	3.01	2.94	3.20	3.04	3.09	2.85	2.85	2.96	3.59
6	3.28	2.95	3.27	3.05	2.95	3.21	3.00	3.05	2.86	2.85	2.92	3.62
7	3.23	2.94	3.26	3.07	2.97	3.22	2.95	2.98	2.86	2.85	2.93	3.48
8	3.21	2.92	3.24	3.05	2.98	3.21	3.03	2.95	2.86	2.82	2.94	3.41
9	3.16	2.90	3.23	3.02	3.02	3.21	3.03	2.93	2.87	2.83	2.94	3.39
10	3.13	2.90	3.20	3.02	3.04	3.23	3.01	2.91	2.88	2.82	3.00	3.41
11	3.17	2.94	3.17	3.05	3.06	3.26	2.99	2.93	2.90	2.83	3.01	3.37
12	3.16	2.95	3.19	3.02	3.07	3.26	2.97	2.91	2.92	2.84	3.02	3.35
13	3.17	2.98	3.20	---	3.09	3.26	2.96	2.91	2.94	2.85	3.06	3.35
14	3.19	3.01	3.17	---	3.09	3.24	2.96	2.92	2.95	2.83	3.11	3.36
15	3.20	3.02	3.14	---	3.07	3.19	2.95	2.92	2.96	2.85	3.17	3.32
16	3.19	2.99	3.10	---	3.08	3.19	2.95	2.94	2.96	2.85	3.19	3.29
17	3.15	2.98	3.09	---	3.11	3.16	2.92	2.94	2.98	2.86	3.30	3.25
18	3.15	2.98	3.11	---	3.12	3.14	2.91	2.95	3.03	2.90	3.37	3.24
19	3.16	2.96	3.13	---	3.12	3.11	2.88	2.97	3.03	2.92	3.45	3.24
20	3.15	2.97	3.10	2.86	3.17	3.09	2.87	2.99	3.03	2.93	3.48	3.24
21	3.19	3.00	3.08	2.80	3.18	3.08	2.88	2.98	3.04	2.95	---	3.28
22	3.17	3.03	3.09	2.72	3.18	3.09	2.92	2.96	3.11	2.97	---	3.29
23	3.15	3.03	3.12	2.67	3.18	3.10	2.93	2.96	3.15	2.99	---	3.24
24	3.26	3.03	3.15	2.66	3.17	3.08	2.95	2.95	3.14	3.00	---	3.19
25	3.41	3.04	3.16	2.65	3.16	3.08	2.96	2.94	3.14	3.02	---	3.18
26	3.35	3.05	3.19	2.63	3.17	3.09	2.98	2.93	3.15	3.02	---	3.16
27	3.28	3.05	3.18	2.67	3.16	3.11	3.03	2.90	3.16	3.03	3.60	3.13
28	3.22	3.06	3.15	2.70	3.15	3.12	3.04	2.87	3.09	3.04	---	3.13
29	3.18	3.07	3.14	2.74	---	3.17	3.04	2.85	3.05	3.02	---	3.11
30	3.18	3.10	3.11	2.76	---	3.18	3.03	2.85	2.99	3.03	---	3.12
31	3.18	---	3.08	2.77	---	3.16	---	2.85	---	3.04	---	---
MEAN	3.21	3.00	3.16	---	3.06	3.17	2.99	2.95	2.98	2.91	---	---
MAX	3.41	3.17	3.28	---	3.18	3.26	3.12	3.09	3.16	3.04	---	---
MIN	3.13	2.90	3.08	---	2.79	3.08	2.87	2.85	2.85	2.82	---	---

WTR YR 1990 MAX 3.62 Aug. 27 MIN 2.57 Jan. 26



133224144495271. Local number, 18-3249-02 Finegayan Exploratory Well Ex-10.

LOCATION.--Lat 13°32'24" N., long 144°49'52" E., Hydrologic Unit 20100003, near NAVCAMS Housing area. Owner: Government of Guam.

AQUIFER.--Barrigada Limestone.

WELL CHARACTERISTICS.--Drilled basal water-table well, sounded depth 704.5 ft, uncased hole diameter 8 in.

DATUM.--Altitude of land-surface datum is 348 ft. Measuring point: top of surface casing, 348.54 ft above mean sea level.

PERIOD OF RECORD.--

WATER LEVEL: Occasional measurements, September 1981 to May 1984. Water-level recorder, June 1984 to current year.

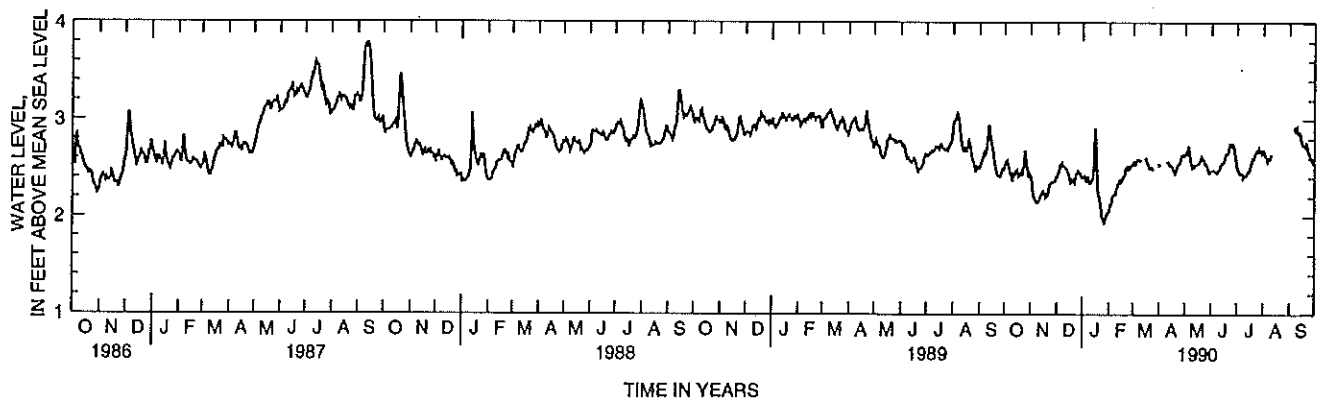
WATER QUALITY: 1982 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 3.78 ft above mean sea level, September 12, 13, 1987; lowest, 1.81 ft above mean sea level, January 26, 1990.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.54	2.42	2.41	2.40	2.08	2.56	2.52	2.64	2.48	2.52	2.69	---
2	2.56	2.37	2.44	2.41	2.13	2.57	---	2.66	2.48	2.48	2.68	---
3	2.55	2.28	2.46	2.42	2.14	2.54	---	2.65	2.48	2.47	2.64	---
4	2.57	2.22	2.53	2.40	2.18	2.54	---	2.70	2.48	2.45	2.62	---
5	2.53	2.20	2.54	2.36	2.22	2.57	---	2.73	2.47	2.45	2.61	---
6	2.50	2.18	2.52	2.40	2.22	2.59	---	2.66	2.47	2.45	2.58	---
7	2.45	2.16	2.55	2.41	2.23	2.59	---	2.59	2.46	2.45	2.61	2.93
8	2.45	2.15	2.53	2.39	2.23	2.59	---	2.55	2.46	2.41	2.61	2.89
9	2.40	2.16	2.52	2.35	2.29	2.58	---	2.52	2.48	2.43	2.60	2.90
10	2.37	2.16	2.52	2.35	2.30	2.59	2.57	2.54	2.48	2.42	2.63	2.92
11	2.44	2.19	2.50	2.37	2.34	---	2.56	2.54	2.50	2.42	2.64	2.87
12	2.43	2.21	2.50	2.39	2.35	---	2.56	2.52	2.52	2.43	---	2.86
13	2.43	2.24	2.48	2.38	2.38	---	2.53	2.54	2.55	2.46	---	2.87
14	2.47	2.24	2.45	2.53	2.38	---	2.53	2.54	2.55	2.47	---	2.87
15	2.47	2.26	2.44	2.91	2.36	2.59	2.53	2.54	2.56	2.47	---	2.79
16	2.48	2.24	2.39	2.82	2.38	2.60	2.52	2.55	2.57	2.49	---	2.76
17	2.42	2.21	2.34	2.59	2.41	2.57	2.49	2.55	2.60	2.52	---	2.74
18	2.43	2.23	2.39	2.33	2.42	2.55	2.48	2.56	2.64	2.56	---	2.74
19	2.45	2.21	2.39	2.23	2.43	2.52	2.45	2.59	2.65	2.60	---	2.73
20	2.42	2.22	2.39	2.21	2.50	2.50	2.46	2.62	2.66	2.59	---	2.72
21	2.47	2.27	2.36	2.15	2.51	2.50	2.49	2.61	2.66	2.60	---	2.76
22	2.45	2.33	2.35	2.08	2.52	2.51	2.53	2.60	2.72	2.64	---	2.75
23	2.43	2.34	2.40	2.01	2.52	2.51	2.54	2.58	2.75	2.66	---	2.69
24	2.57	2.35	2.44	1.98	2.49	2.49	2.55	2.55	2.74	2.67	---	2.66
25	2.68	2.36	2.45	1.96	2.50	2.49	2.56	2.55	2.73	2.70	---	2.64
26	2.63	2.36	2.47	1.93	2.53	---	2.59	2.53	2.75	2.66	---	2.62
27	2.55	2.36	2.46	1.97	2.53	---	2.63	2.52	2.74	2.70	---	2.59
28	2.48	2.36	2.45	2.01	2.53	---	2.64	2.48	2.67	2.68	---	2.57
29	2.43	2.39	2.45	2.03	---	---	2.64	2.46	2.64	2.68	---	2.56
30	2.45	2.41	2.42	2.04	---	---	2.63	2.46	2.58	2.66	---	2.57
31	2.43	---	2.40	2.05	---	2.55	---	2.47	---	2.69	---	---
MEAN	2.48	2.27	2.45	2.29	2.36	---	---	2.57	2.58	2.54	---	---
MAX	2.68	2.42	2.55	2.91	2.53	---	---	2.73	2.75	2.70	---	---
MIN	2.37	2.15	2.34	1.93	2.08	---	---	2.46	2.46	2.41	---	---

WTR YR 1990 MAX 2.96 Jan. 15 MIN 1.81 Jan. 26



133119144491771 - 18-3149-05 WETTENGEL EXP WELL EX-7, GUAM

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	SAMPLE DEPTH DISTANCE BELOW MSL FEET (78890)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
DEC 1989					
27...	1105	28.0	7	327	22
27...	1135	27.5	107	425	22
27...	1205	27.5	127	444	26
27...	1240	27.5	132	453	32
27...	1310	27.5	137	23400	7700
27...	1340	27.5	142	42900	15000
27...	1410	27.5	147	48200	17000
27...	1450	27.5	157	51500	19000
JUL 1990					
30...	1340	29.0	107	522	47
30...	1415	28.5	127	25400	8500
30...	1450	28.0	132	33800	11500
30...	1520	--	137	41200	14400
30...	1555	28.0	142	42800	15100
30...	1630	28.0	147	47800	17000

133224144495271 - 18-3249-02 FINEGAYAN EXP WELL EX-10, GUAM

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SAMPLE DEPTH DISTANCE BELOW MSL FEET (78890)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
DEC 1989						
21...	1130	28.5	468	16	253	22
21...	1205	28.0	513	51	458	34
21...	1240	28.0	539	81	489	43
21...	1315	28.0	4610	101	4740	1300
21...	1350	27.0	18900	111	19100	6200
21...	1425	27.0	36000	121	36600	13000
21...	1500	27.0	48200	131	48800	18000

132626144471771 - 18-2647-12 MANGILAO EX-4, GUAM

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SAMPLE DEPTH DISTANCE BELOW MSL FEET (78890)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
DEC 1989						
29...	0925	28.0	840	16	662	70
29...	0950	27.5	2370	186	2110	530
29...	1020	27.5	2880	196	2860	680
29...	1050	27.5	3170	206	3140	800
29...	1135	27.5	3240	216	3210	820
29...	1200	27.5	32300	226	32900	11000
29...	1225	27.5	42800	236	43500	15000

132736144461671 - 18-2746-06 CHOCHOGO EX-1 WELL NR AGANA SWAMP, GUAM

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SAMPLE DEPTH DISTANCE BELOW MSL FEET (78890)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
JAN 1990						
04...	0925	27.5	762	14	581	40
04...	0950	27.0	1550	154	1360	300
04...	1015	27.0	1760	174	1550	350
04...	1045	27.0	12900	204	13200	4000
04...	1115	27.0	21900	234	22300	7200
04...	1140	27.0	25900	244	26400	8700
04...	1205	27.0	28800	254	29500	11000
04...	1235	27.0	36000	279	37100	13000
04...	1300	27.0	34300	304	41000	14000
04...	1335	27.0	39800	354	48900	17000
04...	1410	27.0	40200	454	50500	18000

132806144481871 - 18-2848-03 BARRIGADA EX9, GUAM

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SAMPLE DEPTH DISTANCE BELOW MSL FEET (78890)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
DEC 1989						
20...	1015	28.5	1050	21	925	160
20...	1050	28.0	2540	101	2520	600
20...	1125	28.0	7620	106	7690	2300
20...	1155	28.0	14500	111	14500	4600
20...	1224	28.0	30300	121	30600	10000
20...	1255	28.0	43600	141	44100	16000
20...	1305	--	--	161	48500	17000
20...	1315	--	--	211	52300	19000

133034144500871 - 18-3050-04 MACHECHE EX-6, GUAM

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SAMPLE DEPTH DISTANCE BELOW MSL FEET (78890)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
JAN 1990						
05...	1125	27.0	439	21	396	23
05...	1210	26.5	433	121	408	19
05...	1250	26.5	2560	131	2910	750
05...	1330	26.5	40900	136	42000	15000
05...	1405	26.5	47100	141	48500	17000
05...	1445	26.5	50300	146	51000	18000

133120144505471 - 18-3150-10 DEDEDO MONITOR, GUAM

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	SAMPLE DEPTH DISTANCE BELOW MSL FEET (78890)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
JAN 1990					
08...	1115	27.0	5	474	32
08...	1155	27.0	105	506	49
08...	1235	27.0	115	753	130
08...	1345	26.5	135	27000	9200
08...	1425	26.5	145	51200	18000
08...	1500	26.5	155	53200	19000

150708145430670 - 14-0743-36 AIRPORT (10-04X), SAIPAN

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	FLOW RATE (G/M) (00059)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
OCT 1989						
05...	1350	28.5	79.0	1700	1660	430

150722145434570 - 14-0743-27 ISLEY FIELD 109, SAIPAN

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
AUG 1990					
20...	1435	28.0	1000	878	140

150728145431470 - 14-0743-10 KOBLER FIELD 15, SAIPAN

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
AUG 1990					
20...	1130	28.0	4750	5020	1300

150729145435570 - 14-0743-29 ISLEY FIELD 10-11, SAIPAN

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
AUG 1990					
20...	1525	28.0	5810	--	1600
SEP					
20...	1105	30.0	1350	1050	240
20...	1110	30.0	1490	1120	260
20...	1115	30.0	1700	1310	340
20...	1125	30.0	2170	1800	480
20...	1140	31.0	3520	3020	880
20...	1150	30.0	2580	2160	600
20...	1200	31.0	7400	7800	2500

150729145435870 - 14-0743-28 ISLEY FIELD 10-10, SAIPAN

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
AUG 1990					
20...	1510	28.0	5800	5940	1600

150730145431370 - 14-0743-11 KOBLER FIELD 111, SAIPAN

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
AUG 1990					
20...	1145	27.5	4800	4500	1300

150730145435270 - 14-0743-17 ISLEY FIELD 103, SAIPAN

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
AUG 1990					
20...	1410	28.0	1190	1060	220

150732145432070 - 14-0743-09 KOBLER FIELD 11, SAIPAN

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
AUG 1990 20...	1140	27.5	12800	3800

150733145435970 - 14-0743-26 ISLEY FIELD 108, SAIPAN

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	FLOW RATE (G/M) (00059)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
OCT 1989 05...	1335	28.0	90.0	2600	2770	760
AUG 1990 20...	1405	28.0	--	3100	3200	800

150735145434370 - 14-0743-34 ISLEY FIELD 10-15, SAIPAN

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
SEP 1990 24...	1100	3730	3740	1100
24...	1105	3760	3680	1000
24...	1120	4200	5320	1600
24...	1130	4400	5400	1600
27...	1050	3420	3700	1000

150736145425370 - 14-0742-13 KOBLER 116A, SAIPAN

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
FEB 1990 06...	1533	28.0	6800	7240	2200

150736145430070 - 14-0743-13 KOBLER FIELD 113, SAIPAN

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
AUG 1990 20...	1210	28.0	1000	946	160

150737145431070 - 14-0742-07 KOBLER FIELD 9, SAIPAN

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
FEB 1990					
06...	1552	28.0	1320	1490	300
AUG					
20...	1200	29.5	6900	7000	2000

150737145435170 - 14-0743-32 ISLEY FIELD 10-13, SAIPAN

DATE	TIME	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
OCT 1990			
01...	1110	1870	460
01...	1125	1700	400
01...	1134	1690	420
01...	1150	1940	480
01...	1202	2030	490
01...	1215	2630	700

150737145440670 - 14-0743-18 ISLEY FIELD 104, SAIPAN

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
AUG 1990					
20...	1515	28.0	3790	3860	1030

150738145435870 - 14-0743-23 ISLEY FIELD 102, SAIPAN

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
AUG 1990					
20...	1400	27.5	3050	3040	780

150740145435570 - 14-0743-25 ISLEY FIELD 107, SAIPAN

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
AUG 1990					
20...	1355	30.0	1800	1730	380

150743145435470 - 14-0743-24 ISLEY FIELD 106, SAIPAN

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
AUG 1990					
20...	1345	28.0	4710	4320	1200

150744145430370 - 14-0742-08 KOBLER FIELD 10, SAIPAN

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
AUG 1990					
20...	1220	28.0	4900	4950	1300

150749145434170 - 14-0743-19 ISLEY FIELD 105, SAIPAN

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
AUG 1990					
20...	1335	28.0	4400	4390	1200

150812145433570 - OB-MW1 Obyan Monitor Well 1, SAIPAN

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
FEB 1990					
06...	1648	28.0	1580	1700	380
AUG					
20...	1325	28.0	1590	1600	340

150843145434770 - 14-0843-04 DANDAN 7, SAIPAN

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
AUG 1990					
20...	1510	28.0	4400	4450	1200

150905145435670 - 14-0943-01 HOSPITAL 3, SAIPAN

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
AUG 1990					
20...	1605	28.0	3000	3000	720

150919145441170 - 14-0944-03 SAN VICENTE W8, SAIPAN

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
AUG 1990 20...	1620	27.5	900	862	140

151017145463801 - KG-MW3 Kagman Monitor Well 3, SAIPAN

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	FLOW RATE (G/M) (00059)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
OCT 1989 05...	1645	28.0	60.0	900	623	80

151127145434070 - 14-1143-05 GUALO RAI 154, SAIPAN

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
AUG 1990 20...	1020	30.5	1850	1890	430

151219145440770 - 14-1244-17 CALHOUN W2 AS RAPUGAO, SAIPAN

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	CHLORIDE, (MG/L AS CL) (99905)
AUG 1990 23...	1530	26.5	1750	360

151220145440770 - 14-1244-15 CALHOUN W1 AS RAPUGAO, SAIPAN

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	CHLORIDE, (MG/L AS CL) (99905)
AUG 1990 23...	1530	26.5	2600	640

151248145443470 - 14-1244-05 MAUI IV MAUI SHAFT, SAIPAN

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
AUG 1990 29...	1110	26	5850	1600

151302145443870 - 14-1344-21 SQ 7 AS RAPUGAO, SAIPAN

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
FEB 1990					
11...	1220	31.5	795	745	100
AUG					
22...	1715	27.0	4450	4180	1100
SEP					
12...	1200	--	1010	939	180
12...	1210	--	1020	1130	200
12...	1220	--	870	810	160
12...	1230	--	870	782	150
12...	1240	--	1000	920	170
12...	1250	--	890	823	160

151309145443370 - 14-1344-19 WELL 150 AS RAPUGAO, SAIPAN

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	CIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
AUG 1990					
22...	1650	27.0	1800	1990	430

151309145443870 - 14-1344-18 WELL 149 AS RAPUGAO, SAIPAN

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	FLOW RATE (G/M) (00059)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
OCT 1989					
05...	1105	27.5	80.0	2180	540
AUG 1990					
22...	1700	27.0	--	1490	320

151312145441570 - 14-1344-14 WELL 162 PUERTO RICO, SAIPAN

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
FEB 1990					
11...	1100	28.0	4200	4250	1100
AUG					
23...	1610	27.0	4220	--	1200

151312145443970 - 14-1344-17 WELL 148 AS RAPUGAO, SAIPAN

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	CHLORIDE, (MG/L AS CL) (99905)
AUG 1990					
20...	1640	27.5	1800	1780	390

QUALITY OF GROUND WATER--WELLS
WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

145826145390370 - 15-5839-02 MARPO AG WELL, 20 FEET, TINIAN

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	FLOW RATE (G/M) (00059)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STANDARD UNITS) (00400)	PH WATER WHOLE LAB (STANDARD UNITS) (00403)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	PHOSPHORUS TOTAL (MG/L AS P) (00665)	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)
FEB 1990												
03...	0900	28.0	520	1010	7.1	7.9	--	--	7.60	--	97	13
MAY												
07...	1015	28.0	560	1010	7.3	7.8	.40	7.20	7.50	.040	98	12
JUN												
28...	0930	--	580	--	--	--	--	--	--	--	--	--

DATE	SODIUM, DISSOLVED (MG/L AS NA) (00930)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	ARSENIC TOTAL (UG/L AS AS) (01002)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA) (01007)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE) (01012)	CADMIUM WATER UNFLTRD TOTAL (UG/L AS CD) (01027)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR) (01034)	COBALT, TOTAL RECOVERABLE (UG/L AS CO) (01037)
FEB 1990												
03...	83	3.2	150	18	.20	5.4	--	--	--	--	--	--
MAY												
07...	80	2.7	160	20	.20	5.9	<1	<100	<10	<1	3	<1
JUN												
28...	--	--	--	--	--	--	--	--	--	--	--	--

DATE	COPPER, TOTAL RECOVERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, TOTAL RECOVERABLE (UG/L AS PB) (01051)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO) (01062)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI) (01067)	SILVER, TOTAL RECOVERABLE (UG/L AS AG) (01077)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN) (01092)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL) (01105)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI) (01132)
FEB 1990												
03...	--	--	8	--	--	<1	--	--	--	--	--	--
MAY												
07...	5	20	14	1	<10	<1	1	<1	<1	<10	<10	<10
JUN												
28...	--	--	--	--	--	--	--	--	--	--	--	--

< ACTUAL VALUE IS KNOWN TO BE LESS THAN VALUE SHOWN

145826145390370 - 15-5839-02 MARPO AG WELL, 20 FEET, TINIAN--CONTINUED

DATE	SELENIUM, TOTAL (UG/L AS SE) (01147)	BROMACIL WATER WHLREC (UG/L) (30234)	BUTACHLOR WATER WHLREC (UG/L) (30235)	BUTYLATE WATER WHLREC (UG/L) (30236)	CARBOXIN WATER WHOLE RECOVERABLE (UG/L) (30245)	CYCLOATE WATER WHOLE RECOVERABLE (UG/L) (30254)	DIPHENAMID WATER WHOLE RECOVERABLE (UG/L) (30255)	HEXAZINONE WATER WHOLE RECOVERABLE (UG/L) (30264)	METHIOCARB WATER WHOLE RECOV. (UG/L) (30282)	PROPACHLOR WATER WHOLE RECOV. (UG/L) (30295)	PROPOXUR WATER WHOLE RECOV. (UG/L) (30296)	TERBACIL WATER WHOLE RECOV. (UG/L) (30311)
FEB 1990												
03...	--	--	--	--	--	--	--	--	--	--	--	--
MAY												
07...	<1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.5	<.1	<.5	<.1
JUN												
28...	--	--	--	--	--	--	--	--	--	--	--	--

DATE	VERNOLATE WATER WHOLE RECOV. (UG/L) (30324)	BROMODICHLOROMETHANE TOTAL (UG/L) (32101)	CARBON TETRACHLORIDE TOTAL (UG/L) (32102)	1,2-DICHLOROETHANE TOTAL (UG/L) (32103)	BROMOFORM TOTAL (UG/L) (32104)	CHLORODIBROMOMETHANE TOTAL (UG/L) (32105)	CHLOROFORM TOTAL (UG/L) (32106)	TOLUENE TOTAL (UG/L) (34010)	BENZENE TOTAL (UG/L) (34030)	CHLOROBENZENE TOTAL (UG/L) (34301)	CHLOROETHANE TOTAL (UG/L) (34311)	ETHYLBENZENE TOTAL (UG/L) (34371)
FEB 1990												
03...	--	--	--	--	--	--	--	--	--	--	--	--
MAY												
07...	<.1	--	--	--	--	--	--	--	--	--	--	--
JUN												
28...	--	.30	<.20	<.20	17	2.2	<.20	<.20	<.20	<.20	<.20	<.20

DATE	METHYLBROMIDE TOTAL (UG/L) (34413)	METHYLCHLORIDE TOTAL (UG/L) (34418)	METHYLENE CHLORIDE TOTAL (UG/L) (34423)	TETRACHLOROETHYLENE TOTAL (UG/L) (34475)	TRICHLOROFLUOROMETHANE TOTAL (UG/L) (34488)	1,1-DICHLOROETHANE TOTAL (UG/L) (34496)	1,1-DICHLOROETHYLENE TOTAL (UG/L) (34501)	1,1,1-TRICHLOROETHANE TOTAL (UG/L) (34506)	1,1,2-TRICHLOROETHANE TOTAL (UG/L) (34511)	ETHANE, 1,1,2,2 TETRACHLORO-WAT UNF REC (UG/L) (34516)	BENZENE O-DICHLORO-WATER UNFLTRD REC (UG/L) (34536)	1,2-DICHLOROPROPANE TOTAL (UG/L) (34541)
FEB 1990												
03...	--	--	--	--	--	--	--	--	--	--	--	--
MAY												
07...	--	--	--	--	--	--	--	--	--	--	--	--
JUN												
28...	<.20	<.20	<.20	<.20	<.20	<.20	<.20	<.20	<.20	<.20	<.20	<.20

DATE	TRANS-1,2-DICHLOROETHENE TOTAL (UG/L) (34546)	1,3-DICHLOROPROPENE TOTAL (UG/L) (34561)	BENZENE 1,3-DICHLORO-WATER UNFLTRD REC (UG/L) (34566)	BENZENE 1,4-DICHLORO-WATER UNFLTRD REC (UG/L) (34571)	2-CHLOROETHYL VINYL ETHER TOTAL (UG/L) (34576)	DICHLORODIFLUOROMETHANE TOTAL (UG/L) (34668)	TRANS-1,3-DICHLOROPROPENE TOTAL (UG/L) (34699)	CIS 1,3-DICHLOROPROPENE TOTAL (UG/L) (34704)	DISULFOTON UNFILT RECOVER (UG/L) (39011)	PHORATE TOTAL (UG/L) (39023)	PROPAZINE TOTAL (UG/L) (39024)	TRIFLURALIN TOTAL RECOVER (UG/L) (39030)
FEB 1990												
03...	--	--	--	--	--	--	--	--	--	--	--	--
MAY												
07...	--	--	--	--	--	--	--	--	--	<.01	<.10	<.10
JUN												
28...	<.20	<.20	<.20	<.20	<.20	<.20	<.20	<.20	<.01	<.01	--	--

DATE	PERTHANE TOTAL (UG/L) (39034)	DEF TOTAL (UG/L) (39040)	METHOMYL TOTAL (UG/L) (39051)	PROPHAM TOTAL (UG/L) (39052)	SIMETRYNE TOTAL (UG/L) (39054)	SIMAZINE TOTAL (UG/L) (39055)	PROMETONE TOTAL (UG/L) (39056)	PROMETRYNE TOTAL (UG/L) (39057)	VINYL CHLORIDE TOTAL (UG/L) (39175)	TRICHLOROETHYLENE TOTAL (UG/L) (39180)	PCNS UNFILT RECOVER (UG/L) (39250)	ALDRIN, TOTAL (UG/L) (39330)
FEB 1990												
03...	--	--	--	--	--	--	--	--	--	--	--	--
MAY												
07...	<.1	<.01	<.5	<.5	<.1	<.10	<.1	<.1	--	--	<.10	<.010
JUN												
28...	--	<.01	--	--	--	--	--	--	<.20	<.2	--	--

< ACTUAL VALUE IS KNOWN TO BE LESS THAN VALUE SHOWN

145826145390370 - 15-5839-02 MARPO AG WELL, 20 FEET, TINIAN--CONTINUED

DATE	LINDANE TOTAL (UG/L) (39340)	CHLORDANE, TECHNICAL TOTAL (UG/L) (39350)	P,P'-DDD UNFILT RECOVER (UG/L) (39360)	P,P'-DDE, TOTAL (UG/L) (39365)	P,P'-DDT UNFILT RECOVER (UG/L) (39370)	DIELDRIN TOTAL (UG/L) (39380)	ENDOSULFAN I TOTAL (UG/L) (39388)	ENDRIN WATER UNFLTRD REC (UG/L) (39390)	ETHION, TOTAL (UG/L) (39398)	TOXAPHENE, TOTAL (UG/L) (39400)	HEPTACHLOR, TOTAL (UG/L) (39410)	HEPTACHLOR EPOXIDE TOTAL (UG/L) (39420)
FEB 1990												
03...	--	--	--	--	--	--	--	--	--	--	--	--
MAY												
07...	<.010	<.1	<.010	<.010	<.010	<.010	<.010	<.010	<.01	<1.00	<.010	<.010
JUN												
28...	--	--	--	--	--	--	--	--	<.01	--	--	--

DATE	METHOXYCHLOR, TOTAL (UG/L) (39480)	PCB, TOTAL (UG/L) (39516)	MALATHION, TOTAL (UG/L) (39530)	PARATHION, TOTAL (UG/L) (39540)	DIAZINON, TOTAL (UG/L) (39570)	METHYL PARATHION, TOTAL (UG/L) (39600)	ATRAZINE WATER UNFLTRD REC (UG/L) (39630)	2,4-D, TOTAL (UG/L) (39730)	2,4,5-T TOTAL (UG/L) (39740)	CARBARYL UNFILT RECOVER (UG/L) (39750)	MIREX, TOTAL (UG/L) (39755)	SILVEX, TOTAL (UG/L) (39760)
FEB 1990												
03...	--	--	--	--	--	--	--	--	--	--	--	--
MAY												
07...	<.01	<.1	<.01	<.01	<.01	<.01	.20	--	--	<.50	<.01	--
JUN												
28...	--	--	<.01	<.01	<.01	<.01	--	<.01	<.01	--	--	<.01

DATE	TOTAL TRITHION (UG/L) (39786)	METHYL TRITHION, TOTAL (UG/L) (39790)	MERCURY TOTAL RECOVERABLE (UG/L AS HG) (71900)	STYRENE TOTAL (UG/L) (77128)	1-NAPHTHOL WATER WHOLE REC (UG/L) (77441)	1,2-DIBROMOETHANE WATER WHOLE TOTAL (UG/L) (77651)	ALACHLOR TOTAL RECOVER (UG/L) (77825)	XYLENE WATER UNFLTRD REC (UG/L) (81551)	CYANAZINE TOTAL (UG/L) (81757)	2,4-DP TOTAL (UG/L) (82183)	AMETRYNE TOTAL (UG/L) (82184)	3-HYDRX CARBOFURAN WATER WHOLE TOT.REC (UG/L) (82584)
FEB 1990												
03...	--	--	--	--	--	--	--	--	--	--	--	--
MAY												
07...	<.01	<.01	<.10	--	<.5	--	<.10	--	<.10	--	<.10	<.5
JUN												
28...	<.01	<.01	--	<.2	--	<.2	--	<.2	--	<.01	--	--

DATE	ALDICARSULFOXIDE WATER WHOLE TOT.REC (UG/L) (82586)	ALDICARB SULFONE WATER WHOLE TOT.REC (UG/L) (82587)	METRIBUZIN WATER WHOLE TOT.REC (UG/L) (82611)	METOLACHLOR WATER WHOLE TOT.REC (UG/L) (82612)	OXYAMYL WATER WHOLE TOT.REC (UG/L) (82613)	CARBOFURAN WATER WHOLE TOT.REC (UG/L) (82615)	DISULFOTON WATER WHOLE TOT.REC (UG/L) (82617)	CARBARYL WATER WHOLE TOT.REC (UG/L) (82618)	ALDICARB WATER WHOLE TOT.REC (UG/L) (82619)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	ANC UNFLTRD TIT 4.5 LAB (MG/L AS CACO3) (90410)
FEB 1990											
03...	--	--	--	--	--	--	--	--	--	1010	204
MAY											
07...	<.5	<.5	<.1	<.1	<.5	<.5	<.010	<.5	<.5	1020	221
JUN											
28...	--	--	--	--	--	--	--	--	--	--	--

< ACTUAL VALUE IS KNOWN TO BE LESS THAN VALUE SHOWN

092616138050670 - 25-2905-03 TIMLANG 3, YAP

DATE	TIME	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE LAB (STAND-ARD UNITS) (00403)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)
OCT 1989 02...	1520	29.0	118	6.70	.530	6.3	4.5	8.3	.30

DATE	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	ANC UNFLTRD TIT 4.5 LAB (MG/L AS CACO3) (90410)
OCT 1989 02...	8.7	4.0	<.10	28	54	8	103	30

151330145442670. Nine Million Gallon Reservoir near Garapan, Saipan.

LOCATION.--Lat 15°13'30" N., long 145°44'26" E. Approximately 2 mi northeast of Garapan, next to the nine million gallon reservoir in the Puerto Rico area.

PERIOD OF RECORD.--March 1973 to current year. Unpublished records, prior to October 1988, are in the files of the U.S. Geological Survey, Guam.

GAGE.--Standard 8-in. NWS rain collector attached to a standard 8-in. diameter, 3-ft high NWS collection can with float, counter weight, and recorder. Elevation of the gage is approximately 60 ft, from topographic map.

REMARKS.--Records for the year are considered poor. Rainfall recorded in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	---	.62	.01	.07	.00	.00	---	.01	>.00	.10
2	.14	.00	---	.01	.01	.08	.00	>.00	---	.00	---	2.35
3	1.12	.00	---	.01	.18	.01	.00	---	---	.01	---	1.94
4	2.82	.01	---	.26	.06	.01	.00	---	---	.76	---	.46
5	3.74	.04	a>.00	.17	.01	.01	.00	---	---	.19	---	.00
6	.14	.79	.08	.80	.00	.00	.00	---	---	.08	---	.16
7	.02	.60	.04	.19	.00	.01	.00	b>.00	---	.04	---	.25
8	.04	.02	.00	.00	.78	.00	.00	.04	c>.00	.04	---	.10
9	.00	.04	.62	.01	.00	.07	.18	.00	.00	.04	---	1.13
10	.00	.04	1.30	1.34	.36	.02	.02	.10	.00	.00	---	.17
11	.00	.08	1.10	.02	.04	.78	.02	.01	.64	.06	---	.25
12	.31	.53	.02	.00	.00	.04	.00	.00	.02	.00	---	.25
13	.11	1.03	.01	.55	.00	.02	.43	.02	.00	.01	---	2.60
14	.74	.32	.00	22.88	.00	.00	.00	.00	.04	.00	---	.23
15	.07	.08	.30	>5.20	.00	.00	.00	.05	.17	.00	---	.00
16	.08	1.45	.00	---	.00	.85	.00	.01	.00	.43	---	.32
17	.02	.06	.00	---	.00	.02	.00	.01	.28	.00	---	.06
18	.00	.00	.65	---	.00	.00	.00	.00	.08	.37	d>.01	>.43
19	.00	.00	.00	>.26	.53	.00	.00	.00	1.48	.11	.84	---
20	.00	.00	.00	.14	.54	.24	.00	.00	.18	.00	.01	---
21	.18	.00	.01	.00	.04	.35	.00	.00	.06	.23	.43	e>.00
22	.01	.00	.00	.00	.02	.00	.00	.00	.10	.58	.28	1.15
23	.89	.47	.00	.00	.04	.00	.00	.10	.01	.67	1.10	.04
24	10.73	>.00	.05	.04	.01	.00	.08	>.00	.02	.12	1.02	.08
25	11.21	---	.13	.90	.00	.00	.12	---	.02	.01	.61	.20
26	.08	---	.04	.12	.00	.00	.04	---	.23	.00	2.48	.12
27	.23	---	.25	.02	.04	.00	.12	---	.01	.25	.08	.37
28	.00	---	.23	.00	1.18	.08	.07	---	1.32	.11	.00	.79
29	.00	---	.02	.25	---	.18	.08	---	.06	.10	.01	.02
30	.00	---	.00	.06	---	.00	.00	---	.02	.02	.01	.01
31	.00	---	.00	.00	---	.02	---	---	---	.01	.28	---
TOTAL	32.68	---	---	---	3.85	2.86	1.16	---	---	4.25	---	---

> Actual value is known to be greater than the value shown
a Total accumulated rainfall from Nov. 24 (0001 hrs) to Dec. 5 (2400 hrs) is 2.12 inches
b Total accumulated rainfall from May 2 (0001 hrs) to May 7 (2400 hrs) is 0.71 inches
c Total accumulated rainfall from May 24 (0001 hrs) to Jun. 8 (2400 hrs) is 2.05 inches
d Total accumulated rainfall from Aug. 1 (0001 hrs) to Aug. 18 (1310 hrs) is 17.12 inches
e Total accumulated rainfall from Sep. 18 (0900 hrs) to Sep. 21 (2400 hrs) is 0.53 inches

131729144393766. Umatac rain gage at Umatac, Guam.

LOCATION.--Lat 13°17'29" N., long 144°39'37" E. Approximately 100 ft west of the Umatac Fire Station, off Route 4, 0.3 mi south of Umatac Bay.

PERIOD OF RECORD.--December 1978 to current year. Unpublished records, prior to October 1988, are in the files of the U.S. Geological Survey, Guam, filed under the name Umatac Fire Station Raingage.

GAGE.--Standard 8-in. National Weather Service (NWS) rain collector attached to a standard 8-in. diameter, 3-ft high NWS collection can with float, counter weight, and recorder. Elevation of gage is approximately 180 ft, from topographic map.

REMARKS.--Records good. Rainfall recorded in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.02	.00	.00	.00	.00	2.22	.01	.01	.01	---
2	.01	.11	.01	.00	.00	.17	.01	.04	.00	.00	.06	---
3	.25	.00	.01	.00	.00	.05	.00	.06	.08	.14	.13	---
4	3.50	.00	.25	.00	.00	.10	.00	.00	.06	.94	.20	---
5	.07	.02	.14	.48	.00	.00	.00	.00	.02	.23	.00	a--
6	.11	.00	.23	.25	.00	.00	.00	.25	.08	.12	.32	.12
7	.11	.00	.18	.12	.00	.00	.00	.19	.04	.01	.07	.34
8	.14	.06	.38	.00	.00	.00	.24	.07	.07	.00	.00	.02
9	.04	.22	.07	.10	.00	.24	.17	.01	.02	.04	.01	1.55
10	1.05	.14	.02	.01	.04	.05	.00	.00	.05	.84	.02	.00
11	.07	.24	.00	.30	.00	.29	.00	.01	.02	.00	.00	.06
12	.07	.66	.07	.00	.00	.01	.05	.00	.84	.60	.00	.46
13	.31	1.42	.00	.71	.00	.11	.07	.00	.12	.17	.48	1.16
14	.02	.50	.00	4.26	.05	.14	.89	.06	1.39	.78	.25	.28
15	.02	2.50	.61	.46	.02	.12	.00	.31	.31	.48	2.36	.01
16	.11	.17	.06	.08	.02	.12	.00	.07	.02	.52	.60	.50
17	.04	.07	.10	.11	.19	.20	.00	.04	.14	.24	.32	.48
18	.00	.01	.14	.07	.00	.00	.00	.02	.53	1.12	.96	.50
19	.22	.00	.00	.42	.01	.23	.00	.00	.44	.06	.67	.14
20	.13	.01	.01	.06	.30	.11	.00	.07	1.00	.00	.12	.94
21	.04	.02	.00	.12	.05	.16	.00	.38	.65	.00	.22	.00
22	.01	.00	.31	.02	.07	.00	.00	.00	1.15	.00	.24	.85
23	.89	.05	.00	.00	.07	.02	.00	.05	.40	.00	.20	.11
24	2.16	.00	.07	.00	.18	.00	.00	.04	.00	1.10	1.07	.00
25	1.14	.04	.04	.12	.00	.00	.05	.00	.31	.07	.34	.07
26	.43	.62	.02	.00	.00	.00	.12	.00	.13	.10	.78	.26
27	2.40	1.27	.04	.00	.00	.00	.41	.02	.17	.74	>.06	.05
28	.01	1.84	.00	.00	.18	.00	.22	.00	.29	.12	---	.49
29	.12	.25	.00	.00	---	.00	.01	.00	.29	.14	---	.00
30	.00	.35	.04	.01	---	.00	.01	.02	.67	.00	---	.28
31	.00	---	.00	.00	---	.05	---	.01	---	.02	---	---
TOTAL	13.47	10.57	2.82	7.70	1.18	2.17	2.25	3.94	9.30	8.59	---	---

WTR YR 1990 TOTAL 88.28

a Estimated total rainfall from Aug. 28 to Sep. 5 is 8.13 inches
> Actual value is known to be greater than the value shown

132234144441966. Windward Hills rain gage near Talofofo, Guam

LOCATION.--Lat 13°22'34" N., long 144°44'19" E. On Route 17 (Cross Island Road), approximately 0.5 mi northwest of the Route 4A intersection.

PERIOD OF RECORD.--February 1974 to current year. Unpublished records, prior to October 1988, are in the files of the U.S. Geological Survey, Guam.

GAGE.--Standard 8-in. National Weather Service (NWS) rain collector attached to a standard 8-in. diameter, 3-ft high NWS collection can with float, counter weight, and recorder. Elevation of gage is approximately 365 ft, from topographic map.

REMARKS.--Records for the year are considered good. Rainfall recorded in hundredths of an inch. Estimated totals were based on comparison with nearby rain gages.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.01	.00	.01	.00	.00	.00	.05	.52	---	.20	.10	.11
2	.61	.11	.70	.00	.00	.00	.00	---	---	.01	.00	1.52
3	1.76	.00	.00	.00	.00	.00	.00	a--	---	.70	.30	5.76
4	4.24	.00	.34	.00	.00	.05	.00	.02	c--	1.14	.00	---
5	.12	.00	.60	.29	.00	.00	.00	.74	.01	.24	.58	d--
6	.13	.00	.77	.00	.00	.00	.00	---	.12	.02	.19	.00
7	.05	.00	.17	.04	.00	.00	.00	---	.00	.00	.01	.25
8	.16	.02	.31	.00	.00	.01	.07	---	.30	.00	.01	.17
9	.10	.06	.23	.04	.00	.00	.00	---	.12	.22	.00	.06
10	1.15	.17	.00	.00	.00	.00	.00	---	.00	.44	.17	.07
11	.29	.04	.00	.29	.00	.40	.00	---	.06	.06	.00	.01
12	.02	.91	.00	.01	.00	.00	.00	---	.04	.80	.08	.96
13	.24	.42	.05	.66	.00	.07	.14	---	.00	.10	.66	1.28
14	.73	.34	.00	6.66	.00	.40	.88	---	.42	.24	.32	1.56
15	.05	3.01	.17	.94	.00	.11	.00	---	.24	.02	1.84	.02
16	.00	.02	.05	.17	.04	.08	.00	---	.11	1.96	.72	.05
17	.11	.01	.04	.23	.67	.04	.00	---	.30	.82	.56	.14
18	.26	.10	.04	.05	.01	.00	.00	---	.38	.06	1.73	1.38
19	.01	.00	.00	.54	.19	.04	.01	---	.18	.53	.13	.40
20	.23	.00	.00	.08	.48	.06	.00	---	.73	.06	1.63	.41
21	.00	.00	.00	.07	.13	.40	.00	---	1.01	.60	.13	.01
22	.00	.00	.14	.02	.12	.04	.00	---	.64	.01	.25	.18
23	1.38	.00	.00	.00	.07	.00	.00	---	.08	.00	1.37	.07
24	3.01	.00	.05	.00	.04	.00	.00	---	.16	.41	1.90	.19
25	1.43	.24	.01	.00	.00	.00	.35	---	.42	.00	.20	.04
26	.20	.31	.01	.00	.08	.00	.08	---	.24	.00	1.58	.01
27	1.03	.92	.04	.00	.00	.00	.10	---	.14	.70	.16	.19
28	.01	1.58	.00	.00	.00	.00	1.04	---	.28	.38	.41	1.02
29	.00	.55	.00	.00	---	.00	.05	---	.02	.44	.00	.07
30	.01	.14	.10	.00	---	.00	.00	b--	.50	.00	.64	.00
31	.01	---	.00	.00	---	.02	---	.00	---	1.74	.00	---
TOTAL	17.35	8.95	3.83	10.09	1.83	1.72	2.77	---	---	11.90	15.67	---

WTR YR 1990 Total 102.15 (estimated)

a Estimated rainfall total from May 2 (0001 hrs) to May 3 (2400 hrs) is 0.11 inches
b Estimated rainfall total from May 6 (0001 hrs) to May 30 (2400 hrs) is 1.74 inches
c Estimated rainfall total from June 1 (0001 hrs) to June 4 (2400 hrs) is 0.16 inches
d Estimated rainfall total from Sep. 4 (0001 hrs) to Sep. 5 (2400 hrs) is 1.84 inches

132617144423366. Mount Chachao rain gage near Piti, Guam

LOCATION.--Lat 13°26'17" N., long 144°42'33" E. Approximately 2 mi south of Route 6 (Spruance Road) on the Mt. Alutom access road.

PERIOD OF RECORD.--February 1973 to current year. Unpublished records, prior to October 1988, are in the files of the U.S. Geological Survey, Guam.

GAGE.--Standard 8-in. National Weather Service (NWS) rain collector attached to a standard 8-in. diameter, 3-ft high NWS collection can with float, counter weight, and recorder. Elevation of gage is approximately 830 ft, from topographic map.

REMARKS.--Records for the year are considered fair. Rainfall recorded in hundredths of an inch. Estimated totals were based on comparison with nearby rain gages.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	.00	.28	.00	.04	.00	.01	---	---	---	---	.38
2	a--	.00	.00	.00	.00	.06	.01	---	---	---	---	.98
3	1.06	.00	.08	.00	.00	.00	.00	---	---	---	---	7.03
4	7.61	.00	.37	.00	.00	.08	.00	---	---	---	---	---
5	.01	.00	.55	.00	.00	.00	---	---	---	---	---	---
6	.05	.77	.32	.00	.00	.01	---	---	---	---	---	---
7	.38	.00	.32	.00	.00	.00	---	---	---	---	---	---
8	.13	.00	.43	.00	.00	.00	---	---	---	---	---	---
9	.00	.00	.41	.00	.00	.00	---	---	---	---	---	---
10	.00	.12	.00	.00	.00	.00	---	---	---	---	---	---
11	.00	.17	.00	.36	.00	.12	---	---	---	---	---	---
12	.00	.56	.05	.00	.00	.00	---	---	---	---	---	---
13	.22	.73	.28	.83	.08	.08	---	---	---	---	---	---
14	.02	.32	.00	5.20	.00	.23	---	---	---	---	---	---
15	.01	1.66	.02	.54	.00	.01	---	---	---	---	---	---
16	.00	.02	.00	.28	.02	.08	---	---	---	---	---	---
17	.14	.01	.00	.30	.40	.04	---	---	---	---	---	---
18	.10	.00	.07	.07	.00	.00	---	---	---	---	---	---
19	.22	.00	.00	.52	.23	.01	---	---	---	---	b--	---
20	1.99	.01	.00	.01	.11	.12	---	---	---	---	5.57	---
21	.04	.00	.00	.04	.01	.02	---	---	---	---	.28	---
22	.00	.00	.55	.08	.00	.00	---	---	---	---	.31	---
23	1.72	.00	.00	.00	.02	.00	---	---	---	---	.47	---
24	3.92	.00	.08	.00	.01	.00	---	---	---	---	2.76	---
25	1.91	.10	.04	.32	.00	.00	---	---	---	---	.00	---
26	.50	.05	.06	.00	.01	.00	---	---	---	---	.00	---
27	1.97	.24	.00	.00	.00	.00	---	---	---	---	.00	---
28	.00	2.48	.00	.00	.04	.13	---	---	---	---	.00	---
29	.00	.80	.00	.08	---	.00	---	---	---	---	.01	---
30	.00	.35	.00	.04	---	.00	---	---	---	---	2.24	c--
31	.00	---	.00	.00	---	.00	---	---	---	---	.53	---
TOTAL	---	8.39	3.91	8.67	0.97	0.99	---	---	---	---	---	---

WTR YR 1990 Total 120.51 (estimated)

a Estimated total rainfall from Oct. 1 (0001 hrs) to Oct. 2 (2400 hrs) is 0.64 inches
b Estimated total rainfall from Apr. 5 (0001 hrs) to Aug. 19 (2400 hrs) is 45.36 inches
c Estimated total rainfall from Sep. 4 (0001 hrs) to Sep. 30 (2400 hrs) is 8.80 inches

133100144504966. Dededo rain gage at Dededo, Guam.

LOCATION.--Lat 13°31'00" N., long 144°50'49" E. Next to Public Utilities Agency of Guam well D-9, which is within the Guam Municipal Golf Course, approximately 0.5 mi east of Dededo.

PERIOD OF RECORD.--March 1987 to current year. Unpublished records, prior to October 1988, are in the files of the U.S. Geological Survey, Guam.

GAGE.--Standard 8-in. National Weather Service (NWS) rain collector attached to a standard 8-in. diameter, 3-ft high NWS collection can with float, counter weight, and recorder. Elevation of gage is approximately 375 ft, from topographic map.

REMARKS.--Records fair. Rainfall recorded in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	---	.00	.13	.00	.07	.01	.00	.32	.04	.24
2	.79	.19	---	---	.04	.14	.00	.01	.00	.01	.02	2.24
3	1.34	.00	---	---	.00	.00	.00	.82	.48	.04	.58	6.82
4	3.18	.00	---	---	.00	.18	.00	.14	.04	.66	.06	1.38
5	.00	.00	---	---	.00	.00	.00	.02	.00	.10	.31	.04
6	.10	.00	>.00	---	.00	.00	.00	.17	.06	.76	.64	.01
7	.00	.00	.00	---	.00	.00	.00	.17	.11	.00	.48	.23
8	.06	.10	.07	---	.00	.00	.06	.26	.04	.00	.02	1.02
9	.16	.04	.49	---	.00	.00	.06	.02	.32	.92	.01	1.57
10	.02	.19	.00	---	.12	.00	.00	.34	.14	1.22	.52	.08
11	.01	.07	.00	---	.05	.44	.02	.07	.10	.22	.16	.14
12	.00	1.09	.20	---	.01	.01	.04	.00	.00	.38	.14	.77
13	.00	.72	.14	---	.07	.02	.34	.00	.25	.52	1.10	1.00
14	.08	.41	.00	---	.07	.12	.26	.00	.35	.46	1.01	1.49
15	.01	1.93	.00	---	.04	.12	.01	.40	.26	.02	1.20	.04
16	.00	.22	.07	.37	.12	.16	.00	.07	.00	.43	.47	.18
17	.17	.00	.02	.12	.24	.13	.00	.00	.11	.01	.73	1.16
18	.35	.00	.24	.10	.00	.00	.00	.00	.37	2.34	.16	.52
19	.01	.00	.00	1.16	.16	.06	.00	.00	.19	1.57	.00	.49
20	.19	>.00	.00	.04	.41	.12	.00	.10	.32	.02	.01	.41
21	.02	---	.02	.02	.07	.12	.00	.04	.22	---	.17	.00
22	.12	---	.49	.12	.17	.01	.00	.00	1.02	---	.41	.96
23	.42	---	.00	.00	.02	.00	.00	.05	.08	---	.14	.13
24	3.41	---	.28	.00	.00	.00	.01	.06	.02	.41	1.33	.02
25	1.87	---	.41	.46	.00	.60	.01	.04	.26	.72	.25	.02
26	.10	---	.10	.00	.02	.10	.12	.00	.04	.01	1.45	.25
27	1.26	---	.07	.00	.00	.00	.47	.00	.00	1.04	.07	.00
28	.00	---	.02	.00	.12	.00	.32	.89	.61	.00	.54	.77
29	.00	---	.16	.06	---	.01	.14	.01	.00	.29	.00	.00
30	.00	---	.00	.08	---	.01	.00	1.07	.11	.00	.78	.00
31	.00	---	.00	.00	---	.02	---	.00	---	.01	.84	---
TOTAL	13.67	---	---	---	1.86	2.37	1.93	4.76	5.50	---	13.64	21.98

> Actual value is known to be greater than the value shown

072252134330770. Airai rain gage, Babelthuap, Palau.

LOCATION.--Lat 07°22'52" N., long 134°33'07" E. Approximately 2.5 mi north of the Palau International Airport and 1.0 mi downstream of the Kmekumel River gaging station.

PERIOD OF RECORD.--October 1978 to current year. Unpublished records, prior to October 1988, are in the files of the U.S. Geological Survey, Guam.

GAGE.--Standard 8-in. National Weather Service (NWS) rain collector attached to a standard NWS 8-in. diameter, 3-ft high collecting can with float, counter weight, and recorder. Elevation of gage is 65 ft, from topographic map.

REMARKS.--Records for the year are considered poor. Rainfall recorded in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.68	---	---	.00	.01	.00	.19	---	---	---	---	---
2	.29	---	---	.00	.20	.00	.98	---	---	d>.00	---	---
3	.24	---	---	.01	.04	.00	.64	---	---	.00	---	---
4	.28	---	b>.01	.50	>.12	1.25	.49	---	---	.36	---	---
5	.24	---	.01	.23	---	.00	.00	---	---	.24	---	---
6	.00	---	.02	.11	---	.04	.00	---	---	.20	---	---
7	.00	---	.86	.97	---	.02	.00	---	---	.04	---	---
8	.12	---	.67	.41	---	.04	.00	---	---	.00	---	---
9	1.09	---	.78	.13	---	.02	.00	---	---	1.80	---	---
10	.20	---	.05	.04	---	.01	.00	---	---	.05	---	---
11	.11	---	.04	.00	---	.00	.26	---	---	.02	---	---
12	1.12	---	.01	.00	---	.01	.05	---	---	.01	---	---
13	.80	---	.00	.12	---	.07	.00	---	---	.01	---	---
14	.32	---	.17	.10	c>.00	.31	.00	---	---	.30	---	---
15	.11	---	.00	.00	.01	2.29	.00	---	---	.54	---	---
16	5.83	---	1.48	.00	.00	.53	.00	---	---	.24	---	---
17	2.56	---	.14	.00	.00	.02	.00	---	---	.13	---	---
18	.06	---	.18	.00	.00	.00	.00	---	---	2.08	---	---
19	.17	---	.11	.00	.02	.01	.36	---	---	.26	---	---
20	.91	---	.04	.06	.00	.00	1.18	---	---	.30	---	---
21	.24	---	.22	.01	.01	.31	.26	---	---	.02	---	---
22	.00	a--	.29	.04	.01	.24	.02	---	---	.00	---	---
23	.00	---	.01	.31	1.36	.86	.01	---	---	1.34	---	---
24	.07	---	.04	.23	.24	.20	.01	---	---	.49	---	---
25	.19	---	.11	.02	.20	1.10	.01	---	---	>2.24	---	---
26	.25	---	.19	.02	.22	.05	.00	---	---	---	---	---
27	.56	---	.08	.23	.06	1.04	>.01	---	---	---	---	---
28	.48	---	.08	.89	.00	1.69	---	---	---	---	---	---
29	.37	---	.01	.37	---	1.10	---	---	---	---	---	---
30	>.59	---	.00	.01	---	.22	---	---	---	---	---	---
31	---	---	.00	.00	---	.00	---	---	---	---	---	---
TOTAL	---	---	---	4.81	---	11.43	---	---	---	---	---	---

> Actual value is known to be greater than the value shown
a Total accumulated rainfall from Oct. 30 (2100 hrs) to Nov. 22 (1000 hrs) is 9.65 inches
b Total accumulated rainfall from Nov. 22 (1000 hrs) to Dec. 04 (1215 hrs) is 1.40 inches
c Total accumulated rainfall from Feb. 04 (1100 hrs) to Feb. 14 (0930 hrs) is 1.18 inches
d Total accumulated rainfall from Apr. 27 (1330 hrs) to July 02 (1000 hrs) is 14.80 inches

141644170391701. Pioa rain gage near Afono, Tutuila.

LOCATION.--Lat 14°16'44" S., long 170°39'17" W., Hydrologic Unit 20100001, at the highest point of the road from Aoa to Afono, 2.1 miles northeast of Utulei High School.

PERIOD OF RECORD.--January 1, 1980 to current year. Unpublished records, prior to October 1988, are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service collector with 24-in. tall standard 8-in. can. Elevation of raincan is 840 ft from topographic map.

REMARKS.--Records fair. Rainfall recorded in hundredths of an inch. Data published by the National Weather Service.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.30	.00	.78	3.87	.09	.03	.00	.50	.58	.00	.00	.00
2	.00	.31	.00	.00	1.69	.07	.09	.00	.00	.00	.00	.00
3	.00	.97	.00	.00	.00	.00	.24	.00	.00	.00	.00	4.09
4	4.23	.00	1.23	.08	.00	.00	1.33	.95	.85	.00	.00	.00
5	2.10	.00	.52	.53	7.50	.41	.76	.00	.00	.00	.00	.00
6	1.70	3.55	.19	.00	1.90	.37	2.60	.00	.00	.00	.00	.00
7	.00	.02	.00	.00	2.67	.13	.70	.04	.04	.00	.00	.00
8	.00	2.50	.32	1.86	3.01	.00	.06	.13	.34	.00	.00	.00
9	.00	.01	.00	.00	1.68	.00	.00	.37	.00	.62	.00	.00
10	.02	.00	.00	.00	.10	.00	.34	.14	.00	.18	.00	1.20
11	.08	.00	.05	.02	.00	.00	.69	.00	.10	.00	.00	.05
12	.37	.00	1.83	.00	.00	1.85	.00	.00	.00	.00	3.21	.00
13	.03	2.56	2.05	.00	.00	.00	.00	.00	.00	.00	.02	.00
14	.00	.00	.00	.00	.00	.00	.00	.06	.08	.00	.00	.00
15	.00	.00	.57	3.00	.00	.00	.00	.18	.26	.00	.00	.00
16	.10	.00	.66	.52	.00	.00	4.20	.00	.00	.00	.00	.00
17	.00	2.98	.00	.00	.00	.00	.00	.00	.00	.00	.11	.00
18	.00	.00	.00	.00	.00	.00	1.00	.00	.08	.97	.00	.00
19	.00	.00	.00	.00	.00	1.03	.05	.00	.49	.00	.00	.00
20	.00	1.06	.00	.00	.00	.68	2.18	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	1.00	2.41	.00	.35	.00	.00	.00	.13
22	.00	.00	.00	1.34	.00	.00	.00	.00	.00	.00	.00	.00
23	.57	.00	.00	.37	.00	.00	2.30	.00	.00	2.86	.00	.00
24	.00	.00	.00	.00	.00	.00	1.31	.00	.00	.09	.00	3.00
25	.06	1.00	.00	.00	.00	.00	1.95	.00	.86	.23	.00	.00
26	.41	3.00	.87	.00	.48	.90	.00	.00	.00	.26	.00	.11
27	.19	2.58	.35	.00	.00	.00	.00	.00	5.00	.00	.00	.02
28	.00	.45	.00	.08	.02	.31	.00	.00	.82	.00	.38	.00
29	.00	.00	.22	1.00	---	.50	.00	.00	.00	.31	.03	.00
30	.89	.85	.00	1.87	---	.00	.50	.40	.00	.00	.20	.00
31	.68	---	.00	.98	---	.00	---	.00	---	.00	.27	---
TOTAL	11.73	21.84	9.64	15.52	20.14	8.69	20.30	3.12	9.50	5.52	4.22	8.60

WTR YR 1990 TOTAL 138.2

141732170422001. Vaipito diversion rain gage at Pago Pago, Tutuila.

LOCATION.--Lat 14°17'32" S., long 170°42'20" W., Hydrologic Unit 20100001, at diversion intake, on Utumoa Stream, 1.6 mi southwest of Utulei High School.

PERIOD OF RECORD.--1957 to current year. Unpublished records, prior to October 1988, are in the files of the U.S. Geological Survey.

GAGE.--3-in., 24-in. tall plastic rain gage. Elevation of raincan is 460 ft from topographic map.

REMARKS.--Records fair. Rainfall recorded in hundredths of an inch. Data published by the National Weather Service.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.10	.00	.51	.92	---	---	---	---	.60	.00	.00	.00
2	.00	.28	.00	.00	---	---	---	---	.00	.00	.00	.00
3	.00	.99	.00	.00	---	---	---	---	.00	.00	.00	2.75
4	2.05	.00	.98	.00	---	---	---	---	.90	.00	.00	.00
5	2.49	.00	.41	.16	---	---	---	---	.00	.00	.00	.00
6	1.30	.89	.13	.00	---	---	---	---	.00	.00	.00	.00
7	.00	.07	.00	.00	---	---	---	---	.02	.00	.00	.00
8	.00	1.72	.00	.53	---	---	---	---	.08	.00	.00	.00
9	.00	.61	.00	.00	---	---	---	---	.00	.36	.00	.00
10	.10	.00	.00	.00	---	---	---	---	.00	.08	.00	.98
11	.00	.00	.00	.01	---	---	---	---	.20	.00	.08	.07
12	.18	.00	.64	.00	---	---	---	---	.00	.00	2.00	.00
13	.00	.91	1.00	.00	---	---	---	---	.00	.00	.00	.00
14	.00	.00	.00	.00	---	---	---	---	.22	.00	.00	.00
15	.00	.00	.26	1.00	---	---	---	---	.00	.00	.00	.00
16	.15	.00	.65	.36	---	---	---	---	.00	.00	.00	.00
17	.00	1.67	.00	.00	---	---	---	---	.00	.00	.03	.00
18	.00	.00	.00	.00	---	---	---	---	.11	.58	.00	.00
19	.00	.00	.00	.00	---	---	---	---	.07	.00	.00	.00
20	.00	1.85	.00	.00	---	---	---	---	.00	.00	.00	.00
21	.00	.00	.00	.00	---	---	---	---	.00	.00	.00	.15
22	.00	.00	.00	1.79	---	---	---	---	.00	.00	.00	.00
23	.89	.00	.00	.27	---	---	---	---	.00	1.60	.00	.00
24	.00	.00	.00	.00	---	---	---	---	.00	.05	.00	.60
25	.08	.61	.00	.00	---	---	---	---	1.96	.13	.00	.00
26	.30	1.09	.37	.00	---	---	---	---	.00	.00	.00	.05
27	.17	2.79	.16	.00	---	---	---	---	1.71	.00	.00	.01
28	.00	1.30	.00	.00	---	---	---	---	.36	.00	.19	.00
29	.00	.00	.06	.66	---	---	---	---	.00	.11	.08	.00
30	.79	.70	.00	2.00	---	---	---	---	.00	.00	.10	.00
31	.68	---	.00	.77	---	---	---	---	---	.00	.09	---
TOTAL	9.28	15.48	5.17	8.47	---	---	---	---	6.23	2.91	2.57	4.61

141751170453001. Aasu rain gage at Aasu, Tutuila.

LOCATION.--Lat 14°17'51" S., long 170°45'30" W., Hydrologic Unit 20100001, in USGS stream-gaging station 16920500 at Aasu, and 200 ft upstream from mouth.

PERIOD OF RECORD.--October 10, 1960 to current year. Unpublished records, prior to October 1988, are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service collector with 24-in. tall standard 8-in. can. Elevation of gage is 5 ft by hand levels from high-tide mark.

REMARKS.--Records fair. Cumulative rainfall amounts read during each visit. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
INTERMITTENT READINGS

PERIOD	RAINFALL
Sep. 29 to Nov. 03	14.5
Nov. 03 to Dec. 08	28.0
Dec. 08 to Jan. 12	6.5
Jan. 12 to Apr. 03	20.5
Apr. 03 to May 09	15.8
May 09 to June 12	10.0
June 12 to July 18	9.5
July 18 to Aug. 21	9.0
Aug. 21 to Sep. 25	11.0
Sep. 25 to Oct. 31	16.5

141952170460201. Aasufou rain gage at Aoloaufou, Tutuila.

LOCATION.--Lat 14°19'52" S., long 170°46'02" W., Hydrologic Unit 20100001, at Aasufou Road, 1.8 mi northwest of Mapusaga High School.

PERIOD OF RECORD.--January 1, 1980 to current year. Unpublished records, prior to October 1988, are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service collector with 24-in. tall standard 8-in. can. Elevation of raincan is 1,340 ft from topographic map.

REMARKS.--Records fair. Rainfall recorded in hundredths of an inch. Data published by the National Weather Service.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.12	.05	1.23	4.60	.07	.10	.00	.25	1.10	.00	.00	.00
2	.00	.60	.00	.00	1.98	.07	.42	.00	.00	.36	.00	.00
3	.10	1.05	.00	.00	.00	.00	.15	.00	.00	.00	.00	4.53
4	3.30	.00	2.21	.03	.00	.00	1.20	.87	.65	.00	.00	.00
5	1.70	.00	.49	.26	13.49	.78	.40	.00	.05	.00	.02	.00
6	1.70	4.00	.49	.00	1.90	1.01	.20	.00	.50	.00	.00	.00
7	.00	.05	.00	.00	2.20	.18	1.06	.02	1.20	.00	.00	.13
8	.00	.55	.35	2.74	1.50	.00	.40	.08	.25	.00	.06	.00
9	.00	.97	.00	.00	1.99	.00	.00	1.00	.00	.40	.03	.00
10	.60	.00	.00	.00	.00	.00	.20	.50	.00	.28	.00	2.06
11	.33	.00	.08	.59	.00	.00	1.03	.00	.30	.00	.58	.23
12	1.15	.00	2.15	.00	.57	1.05	.00	.00	.00	.00	3.13	.00
13	.26	3.68	4.00	.00	.89	.00	.00	.00	.07	.00	.06	.00
14	.00	.00	.00	.00	.00	.00	.00	.25	.00	.00	.20	.00
15	.00	.00	.73	4.00	.00	.00	.00	.07	.55	.00	.00	.00
16	1.00	.00	.52	.20	.00	.00	5.70	.00	.00	.00	.00	.00
17	.92	1.95	.00	.00	.00	.00	.00	.25	.00	.00	.37	.00
18	.08	.00	.00	.00	.00	.00	.63	.18	.85	1.38	.00	.00
19	.10	.00	.00	.00	.00	1.48	.11	.00	1.05	.00	.00	.00
20	.10	3.70	.00	.00	.00	2.46	1.60	.00	.05	.00	.00	.00
21	.00	.00	.00	.00	.99	.70	.00	1.15	.03	.00	.00	.60
22	.00	.05	.00	1.45	.30	.00	.00	.49	.00	.00	.00	.00
23	1.50	.00	.00	.49	.00	.00	1.40	.51	.00	4.12	.00	.00
24	.00	.00	.00	.12	.00	.00	.60	.16	.00	.42	.00	2.65
25	.48	2.00	.00	.00	.00	.00	1.28	.00	2.65	.65	.00	.00
26	1.00	2.00	1.45	.00	.43	1.60	.00	.00	---	.37	.00	.03
27	.40	1.20	.69	.00	.07	.00	.00	.00	a4.00	.00	.00	.05
28	.00	1.03	.00	.37	.62	.21	.00	.00	.86	.00	.68	.00
29	.00	.00	.31	1.00	---	1.88	.00	.15	.00	.69	.08	.00
30	2.21	2.23	.00	2.15	---	1.42	1.40	.10	.00	.00	.30	.00
31	.57	---	.00	1.42	---	.00	---	.40	---	.00	.56	---
TOTAL	19.62	25.11	14.70	19.42	27.00	12.94	17.78	6.43	14.16	8.67	6.07	10.28

WTR YR 1990 TOTAL 182.18

a Total accumulated rainfall since the previous reading

INDEX

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CONVERSION FACTORS AND VERTICAL DATUM

Multiply	By	To obtain
	Length	
inch (in.)	2.54×10^{1}	millimeter
	2.54×10^{-2}	meter
foot (ft)	3.048×10^{-1}	meter
mile (mi)	1.609×10^{0}	kilometer
	Area	
acre	4.047×10^{3}	square meter
	4.047×10^{-1}	square hectometer
	4.047×10^{-3}	square kilometer
square mile (mi^2)	2.590×10^{0}	square kilometer
	Volume	
gallon (gal)	3.785×10^{0}	liter
	3.785×10^{0}	cubic decimeter
	3.785×10^{-3}	cubic meter
million gallons (Mgal)	3.785×10^{3}	cubic meter
	3.785×10^{-3}	cubic hectometer
cubic foot (ft^3)	2.832×10^{1}	cubic decimeter
	2.832×10^{-2}	cubic meter
cubic-foot-per-second day [(ft^3/s) d]	2.447×10^{3}	cubic meter
	2.447×10^{-3}	cubic hectometer
acre-foot (acre-ft)	1.233×10^{3}	cubic meter
	1.233×10^{-3}	cubic hectometer
	1.233×10^{-6}	cubic kilometer
	Flow	
cubic foot per second (ft^3/s)	2.832×10^{1}	liter per second
	2.832×10^{1}	cubic decimeter per second
	2.832×10^{-2}	cubic meter per second
gallon per minute (gal/min)	6.309×10^{-2}	liter per second
	6.309×10^{-2}	cubic decimeter per second
	6.309×10^{-5}	cubic meter per second
million gallons per day (Mgal/d)	4.381×10^{1}	cubic decimeter per second
	4.381×10^{-2}	cubic meter per second
	Mass	
ton (short)	9.072×10^{-1}	megagram or metric ton

Sea level: In this report "sea level" refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)—a geodetic datum derived from a general adjustment for the first-order level nets of both the United States and Canada, formerly called Sea Level Datum of 1929.

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