

**TECHNICAL MEMORANDUM**

**HYDROLOGIC CHARACTERISTICS OF THE  
KISSIMMEE RIVER FLOODPLAIN  
BONEY MARSH EXPERIMENTAL AREA**

**Ronald Mierau, Data Management Division  
Paul Trimble, Water Resources Division**

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**Resource Planning Department  
South Florida Water Management District**

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## EXECUTIVE SUMMARY

Channelization of the Kissimmee River in the mid and late 1960s for flood control and navigation caused broad areas of marsh in the former floodplain to drain much more rapidly. Concern over possible adverse environmental and water quality impacts prompted a study on the former floodplain to address the effects of reflooding the marsh areas, particularly in regard to revegetation characteristics and nutrient uptake of the developing marsh vegetation.

Hydrologic monitoring was established to support these objectives. An interdisciplinary approach was used to design the monitoring system. This design approach allowed significant conclusions to be drawn from the hydrologic data independent of this support function. This report documents the hydrologic and hydraulic operation of the project over the period 1976 to 1986 and presents conclusions that may be of significant impact to South Florida Water Management District operations and environmental restoration programs.

This work found the following hydrologic and hydraulic parameters to be appropriate for the study area:

- A) Flow equations - A standard submerged weir equation developed for sharp-crested weirs as presented in Handbook of Hydraulics (King & Brater, 1963) serves adequately when a weir coefficient of 3.0 is used even though the breadth of the weir in the flow direction departs significantly from the sharp-crested assumption.
- B) Evapotranspiration from marsh vegetation of this type under predominantly wet conditions can be represented by 0.70 times class A pan evaporation.
- C) Seepage through this type of floodplain material is quite low and can be represented in acre-feet as 0.06 times the head difference across the levee in feet times the number of miles of levee over which this head acts.

D) Net runoff defined as surplus rainfall that flows out of a catchment area is very low. In contrast to most areas within the District which yield runoff values in the range of 10 to 15 inches per year (including the Kissimmee Basins), runoff values from this area averaged -8 inches, a net difference of 18 to 23 inches of water that would otherwise be available for downstream uses. While part of this difference might be explained by rainfall values which were somewhat lower than normal, rainfall differences cannot explain this large a discrepancy.

Under natural drainage conditions, common throughout Florida, runoff is expected to be generated even under severely dry conditions. This is due to the timing of rainfall events. Usually at some time of the year the rainfall rate exceeds the capacity of local storage to trap the excess water. It is during these times that runoff occurs.

The major cause of the negative runoff values is probably the practice of artificially imposing water level fluctuations which do not reflect weather conditions. Under the regulation schedule used, water levels were held above the land surface except during part of May and June. Thus, through most of the dry season, the vegetation was not stressed by drought as is usually the case. In addition, in most years, May and June had adequate rainfall to supply the full evapotranspiration potential of the vegetation. Further, the extra storage provided in June due to the drawdown was capable of capturing part of the large rains which may be expected at this time of the year. A regulation schedule based on rainfall patterns such as that used for deliveries to Everglades National Park may have provided a more realistic runoff pattern (Neidrauer and Cooper, in publication 1988).

This study has important implications on several issues central to District objectives.

A) Water supply

Maintaining minimum water levels in a marsh system, regardless of local rainfall conditions, may change a marsh area from a net runoff producing area to a net consumer of water. This may well be true in marshes which form a part of a water supply system such as the City of West Palm Beach's catchment area, as well as restoration of flow-through marshes similar to those proposed for the Kissimmee River Valley. There is some evidence that this might also apply to a lesser degree to the use of marsh areas as detention or retention systems. The magnitude of the potential reduction in water supply capability is beyond the scope of this study as it is influenced by upstream and downstream storage capacity, local drainage characteristics, local rainfall intensity, seepage and vegetation characteristics.

B) Kissimmee River Demonstration Project

The Kissimmee River Demonstration Project is a program to restore a portion of the channelized Kissimmee River to a more natural flow pattern. Monitoring the test portion and the development of an extensive physical and mathematical model through the demonstration will provide valuable insight into detailed design and the effectiveness of a more general restoration.

The results of this study complement the objectives of the demonstration and may help in model calibration as well as interpretation of the model results. Of particular applicability is:

- a) Flow resistance changes over time.
- b) The possibility of utilizing rainfall based regulation schedules to provide required stage fluctuations concurrent with conserving water.

C) Flow Resistance

A nonlinear increase in resistance to flow offered by the marsh vegetation as it succeeded from overdrained to restored marsh communities was observed. This increase was quite substantial and should be considered in interpreting floodplain modeling results, if not in the actual model.

The absolute magnitude of the flow resistance parameters computed under this study are suspect as they are unreasonably high (on the order of two to five times expected values) in comparison with work by other researchers. This is attributed to highly unfavorable flow conditions for this type of analysis during the study period. The conditions of steady, uniform flow were only grossly approximated due to the pumping schedule imposed. An experiment is planned for the summer of 1988 to better refine parameters of flow resistance under current conditions.

Though the absolute magnitude of the flow resistance presented in this study is questionable, the conditions under which the measurements were made did not change appreciably except for vegetative changes throughout the duration of the project. The study results should provide a good approximation of changes in flow resistance over time. This is important because no information in the scientific literature provided insight into the magnitude or the rate of change which could be expected under marsh restoration conditions.

D) Error Analysis

More attention was paid to error analysis in the hydrologic water budget than is standard in this type of study. Of particular interest is the magnitude of the increase in expected error as the time interval of computation is decreased since this has significant impact on the design of

monitoring systems. A large portion of the errors in water budgets with time scales less than a year is due to an inability to reliably estimate changes in storage. This implies a more dense water level monitoring network than normal is required if reliable daily or monthly water budgets are desired.

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## ABSTRACT

Ten years of operation are documented for a controlled experiment to determine the environmental, hydrological, and water quality effects of marsh restorations in the Kissimmee River Floodplain. This paper uses a water budget to calibrate and then verify the key hydrologic parameters: rainfall, evapotranspiration, seepage, and flow. A unique design provided an unusual opportunity to quantify errors associated with flow, and rainfall/evapotranspiration largely independently.

Hydrologic control was quite good. This is reflected in an expected error of less than 2% of the annual flow leaving the area. This error increased dramatically as the time interval for analysis was reduced to a month or day basis. Uncertainty in storage fluctuations were the major source of errors.

A nonlinear increase in resistance to flow offered by the marsh vegetation as it adapted from overdrained to restored marsh conditions was observed. Although the absolute magnitude of the flow resistance term seems unreasonably high, the rate of increase over time seems reasonable.

Runoff values were extremely low during the study period. In fact, significantly more water was supplied as pumped inflow and rainfall than left the area as measured outflow. This probably resulted from a combination of forced inflow and strict water level fluctuations imposed based on historical fluctuations rather than on meteorological conditions.

## KEY WORDS

KISSIMMEE RIVER, FLOW, RAINFALL, MANNING'S N, SEEPAGE, ENVIRONMENTAL RESTORATION, CONSUMPTIVE USE OF MARSH VEGETATION.

## PREFACE - HISTORICAL PERSPECTIVE

Channelization of the Kissimmee River in the mid and late 1960s for the purposes of flood control and navigation caused broad areas of marsh in the former floodplain to drain much more rapidly than had occurred historically. This observation caused concern over possible adverse environmental and water quality impacts due to the channelization. It also raised questions as to what measures could be taken to reduce these impacts and how effective these measures would be.

By the mid 1970s these concerns had matured to the point where the Boney Dike Experimental Area was established by a parent agency of the South Florida Water Management District. The design of the area was constrained by the need to evaluate the effectiveness of restoration alternatives. Two alternatives for restoring environmental conditions in the floodplain marshes were evident at that time. The first was to raise pool elevations at the intermediate control structures S-65A, S-65B, S-65C, S-65D, and S-65E, either with a static or fluctuating regulation schedule which would allow flooding the marshes at the lower end of each of the intermediate river sections. The second alternative was to partially constrict or plug selected reaches of the new channel to cause a more spatially uniform raising of water levels during periods of moderate to high flow rates while allowing water levels to return to level pool conditions during periods of low flow. In addition to the obvious differences in areal extent of marshes which would be flooded and cost differences, a real question remained on possible differences in nutrient uptake and revegetation characteristics between the first option which was called "static pool" and the second option which was termed "flow through".

While evaluation of these alternatives primarily determined the size and configuration of the experimental area, an interdisciplinary approach was used to incorporate features which would prove useful in answering other basic questions without compromising the primary objectives. Consideration was given to

determining consumptive use of water by natural vegetation, obtaining detailed meteorological parameters for possible correlation with evapotranspiration, as well as evaluation of experimental instrumentation. Special emphasis was placed on design for cross verification of elusive water budget parameters such as seepage and evapotranspiration. Provisions were made for determining the resistance to overland flow provided by marsh vegetation although practical pumping schedules resulted in very poor conditions for this type of analysis.

An attempt was made to provide detailed meteorologic information including wind speed, wind direction, air temperature, relative humidity, pan evaporation, and rainfall for the purpose of basic research. This attempt was to a large degree unsuccessful due to the primitive state of automated instrumentation available in the mid 1970s. The result of this supplemental data collection is not presented in this paper.

This publication incorporates hydrologic analysis completed for the period 1976 to 1978 which was presented in preliminary form (Trimble and Mierau, 1980) with analysis of data for the period 1979 to 1986. Since data is still being collected, an addendum presenting the additional data will be published after the study area is dismantled.

This work is closely related to studies documented in two existing publications (Trimble and Mierau, 1980; Davis, 1981). Two publications scheduled for 1989, Boney Marsh Nutrient Budget and Emergent Vegetation in Boney Marsh, will also relate strongly to this work. Further work in refining flow resistance in this marsh area is scheduled for the summer of 1988.

## I. INTRODUCTION

An analysis of the water budget for the Boney Marsh experimental area has been completed for the period from March 26, 1976 through February 28, 1986. This marsh area is located in the floodplain along the west bank of the former Kissimmee River just north of structure S-65B (see Figure 1). The experimental area is a unique system of levees and discharge structures especially designed for a quantitative study of vegetation changes, nutrient uptake, and hydrological characteristics of a riverine marsh system. Levees divide the area into two separate reservoirs--the western and eastern marsh areas. During the first part of the study, stages in both these areas were fluctuated seasonally to approximate the average stage fluctuations in the Kissimmee River flood plain prior to channelization (Davis, 1981). Later portions of the study concentrated on the western area only. The western area was forced to experience large inflows and outflows while the eastern area had only the minimal inflows and outflows that were required to maintain the desired stage fluctuations.

A water budget approach was used as the primary technique for hydrologic analysis. The design of this project offered a unique opportunity to indirectly quantify parameters that are normally lumped into a residual error term in many water budget analyses. This allowed a very good quantification of flow, rainfall, seepage, and evapotranspiration. The index used for evapotranspiration should be transferable to vegetation of similar type. Seepage estimates were judged to be quite reliable for this project but may not be highly transferable due to very non-uniform soils. Loadings computed for the conservative parameters measured (Davis, 1981) provided further evidence of the quality of the computed parameters. Davis showed good agreement for chloride transport even when the seepage term was ignored. Inclusion of computed seepage in his analysis would have further improved the chloride budget.

# BONEY MARSH

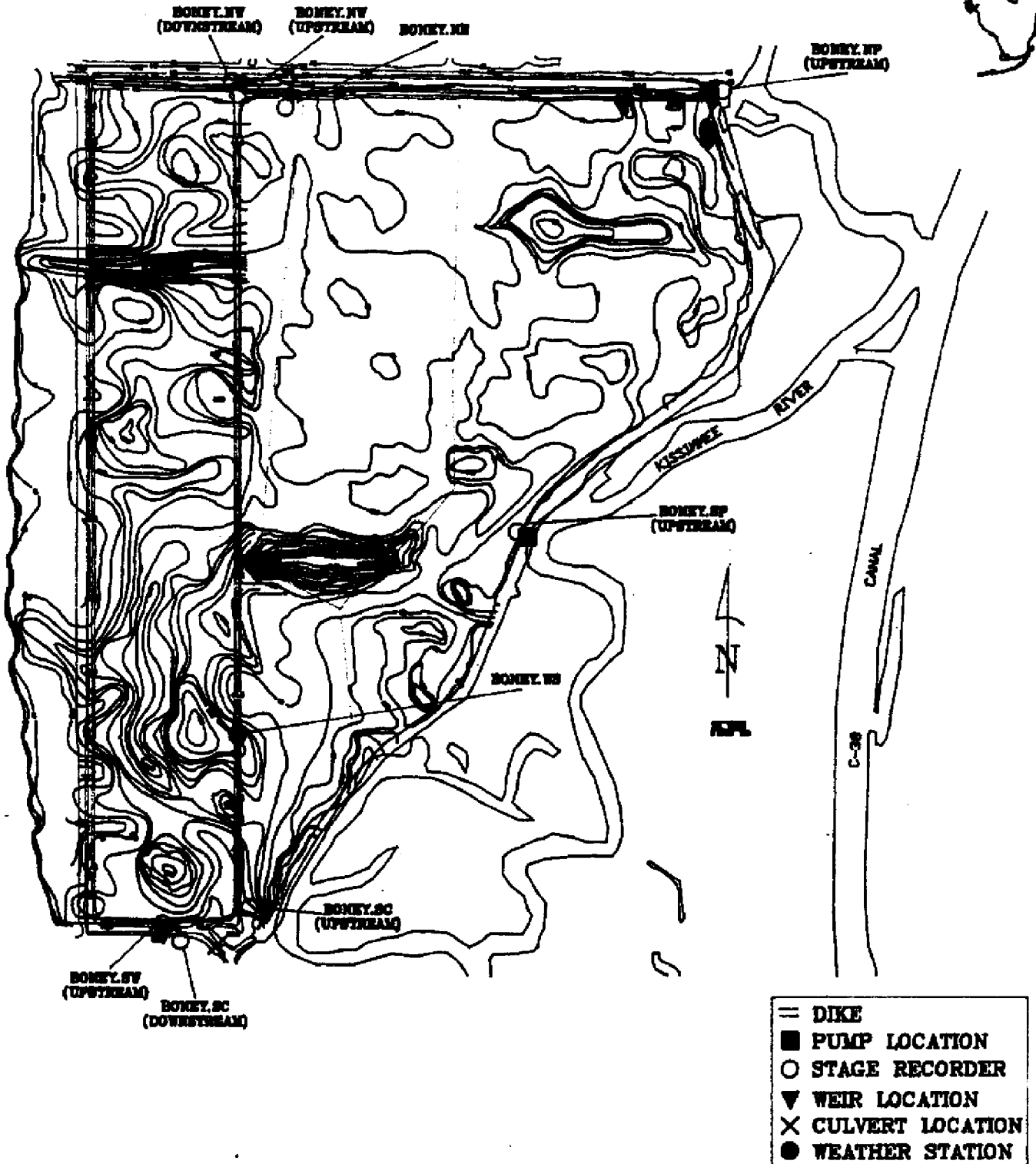


Figure 1.

A detailed analysis of errors associated with the water budget is presented in later sections of this report as well as the variation in errors which can be expected as a function of the time step required.

During phase 1 of this study, daily water budgets for these areas were determined to support analysis of the environmental and water quality impacts of flow-through marsh restoration versus non-flow (ponded) restoration of marshy areas in the Kissimmee River Valley under identical meteorological conditions. The magnitude of the different components of the water budget were determined through a calibration procedure using hydrologic data for the period from March 26, 1976 to December 31, 1978. The results of this study were originally documented as a memorandum report (Trimble and Mierau, 1980).

During the second phase of this study, only the western reservoir was modeled for the purpose of further evaluation of nutrient uptake under high flow conditions. This phase of the study was completed using hydrologic data for the period from March 1, 1979 to February 28, 1986. Phase 2 was also useful as a verification period for the hydrologic relationships derived in phase 1 of this study.

The purpose of this report is to present estimates of the inflows and outflows associated with the Boney Marsh water budget. Also included in this report is a description of the study area with an explanation of the methodology used to estimate the water budget. A third feature of this report is a preliminary estimate of resistance to flow provided by marsh vegetation in the Kissimmee River Valley.

## II. DESCRIPTION OF THE AREA

Approximately 4.6 miles of levees divide the marsh area into two separate reservoirs and a canal. The canal is located at the northern boundary of the marsh for the purpose of supplying water from the Kissimmee River channel to the western flow through area. The north pump is located at the eastern end of the canal to draw the water from the Kissimmee River into the canal while the north weir at the



western end regulates flow leaving the canal and entering the western flow through area. Prior to entering the flow-through area, water from the north weir passes through a distribution channel and spreader berm to distribute flow evenly over the northern portion of the marsh. This berm was designed to ensure that the water does not short circuit the marsh by flowing along the east levee towards the south weir. A prearranged pumping schedule is imposed on the north pump to provide the desired flow-through schedule based on environmental study criteria. The weir at the south end is adjusted frequently to impose a scheduled seasonal fluctuation of water levels irrespective of flow considerations.

The Boney Marsh climate is classified as a wet subtropical climate (Koeppen, 1931). This area receives on the average about 48 inches of rain per year. Hot humid tropical air dominates the region through the wet season months (May-October) during which rainfall is generated from local convective activity and by tropical disturbances that pass through the area. The wet season period accounts for approximately 36 inches of the total rainfall that the Boney marsh receives while the mean daily temperature averages 80° Fahrenheit from June through September. May and October are slightly cooler with mean daily temperatures ranging in the mid-seventies on the Fahrenheit scale.

The dry season months (November-April) are dominated by cooler drier air. Rainfall occurs mainly due to occasional frontal passages and averages 12 inches per year. The mean daily temperature varies more during the dry season months with the normal value for January being in the low 60s while April's mean daily temperature averages in the low 70s on the Fahrenheit scale (MacVicar, 1981).

Soils in the study area consist of sand and shell overlain by a variable layer of muck, peat and undecomposed organic matter. Pockets of sandy silt and clay are scattered throughout the area. Organic material is prevalent in the upper three feet of the soil profile in pockets at least two feet deep and in layers interspersed with

sand and other inorganic material. This type of soil profile is often found in floodplain with meandering river channels.

Rosen, 1974, describes two probable mechanisms for the formation of the upper three feet of this soil profile. Alternating layers of organic and inorganic soils were formed by the deposition of inorganic material during generalized flooding accompanied by flow velocities adequate to scour this material from upstream sources. This was followed by deposition of plant material from local sources or from less severe flood events carrying primarily organic material.

A second mechanism caused the formation of the pockets of organic material. The Kissimmee River was a dynamic river. Measured on a time scale of decades, the wide sweeping oxbows could be seen migrating downstream in a continuous process of erosion and deposition. At one time the active river channel was located well into the current flow-through marsh area. The river scoured the layered deposits in the process of channel migration leaving a well defined river channel. As the river channel continued to migrate in a manner characteristic of meandering rivers, these scoured areas were cut off from the main channel leaving quiescent pools in which organic material built up to greater depths.

The topography of the flow-through marsh is naturally quite regular with a slight slope to the south. Natural grades were not altered. Depth of water is fairly constant during steady flow conditions with a spatial variation of depth on the order of 6 inches. There is a slight tendency for increased depths to follow a meandering pattern through the area, although for the most part, they are irregularly distributed. The area of the flow-through portion is 120 acres.

The eastern area was designed to provide a control experiment for the effects of the artificially induced flow in the flow-through area. The design concept was to maintain identical water level fluctuations in both the flow-through and the control impoundment area. Operational strategy for the east area was to add or remove as

small a volume of water as possible consistent with meeting the regulation schedule. Water was added by the south pump and removed by the south culvert to meet these objectives. Surface area of the eastern area is 230 acres. Land elevations are not as uniform in this portion as they are in the western area. Variations from a plane surface are on the order of 1 to 1½ feet with the highest elevations occurring in the northwestern portion. Subsequent to completion of phase 1, the south pump was removed and operation of the south culvert was not well documented. The dike separating the eastern area from the Kissimmee River was also removed at a later date.

Vegetation at the time of project initiation could be classified as 'wet prairie'. Predominant species were grasses and sedges. Detailed records of the distribution of vegetative species on a spatial and time-series basis are maintained in the records of the Environmental Science Division, South Florida Water Management District.

This type of vegetation is characterized by a very dense cover near ground level which thins rapidly in the range of 6-12 inches above land surface to only isolated stems above 18 inches. Foliage is often quite lush near the ground surface, particularly when not subjected to drought conditions. This would tend to indicate moderate to relatively large transpiration characteristics. The evaporation component would not be suppressed by shading to the extent of some other taller marsh/slough vegetation types under flooding conditions; on the other hand, a larger portion of the leaf area would be submerged during flooding reducing the transpiration component. Resistance to flow is expected to be very large at shallow flow depths due to the vegetation density and decrease dramatically with increasing flow depths up to 12-18 inches. This type of vegetation is often found on sandy soils which are inundated for a significant portion of the year but also dry out regularly. It is common in the higher elevations of floodplain and poorly drained upland areas north of Lake Okeechobee.

Vegetation at the time of this report would, to the casual observer, be characterized by much the same type of vegetation as when the project was initiated with the major difference being the lushness and density of vegetation. A change in species composition from grasses and sedges toward broader leaved species such as Sagittaria and Pontederia was observed by District biologists. Substantial detritus buildup occurred resulting in a much denser tangle of old plants in various stages of decomposition than when the project was initiated. There is also more woody, brush type vegetation at the north end of the flow-through area and in the former nonflow-through area. Quantitative estimates of change in vegetation density with time and height above ground surface is not available at this time.

Stage-storage curves for both marshes and the canal appear in Figures 2, 3 and 4, respectively. The relationships for the eastern and western marshes were estimated from topographic maps at 0.5 foot contours while the stage-storage relationship for the canal was based on the original canal design.

### III. FLOW RESISTANCE CHARACTERISTICS OF THE MARSH AREA

Initial filling of the flow-through area in 1976 provided an opportunity to observe the flow characteristics of the marsh prior to any changes which might occur due to reflooding. Experimental difficulties prevented compiling reliable quantitative information. Qualitative observations, however, do shed some light on the hydraulic characteristics of this marsh area.

Quasi-steady state uniform flow was expected in the marsh during the filling operation. That is, a fairly uniform slope of the water surface was expected which would allow the computation of flow resistance at several flow depths. Six temporary supplemental water level stations were established along the flow profile in addition to the marsh ends to verify the uniformity of the hydraulic gradient. The water surface profile which developed during the filling operation was not at all like

# Boney Marsh High Flow Through Area

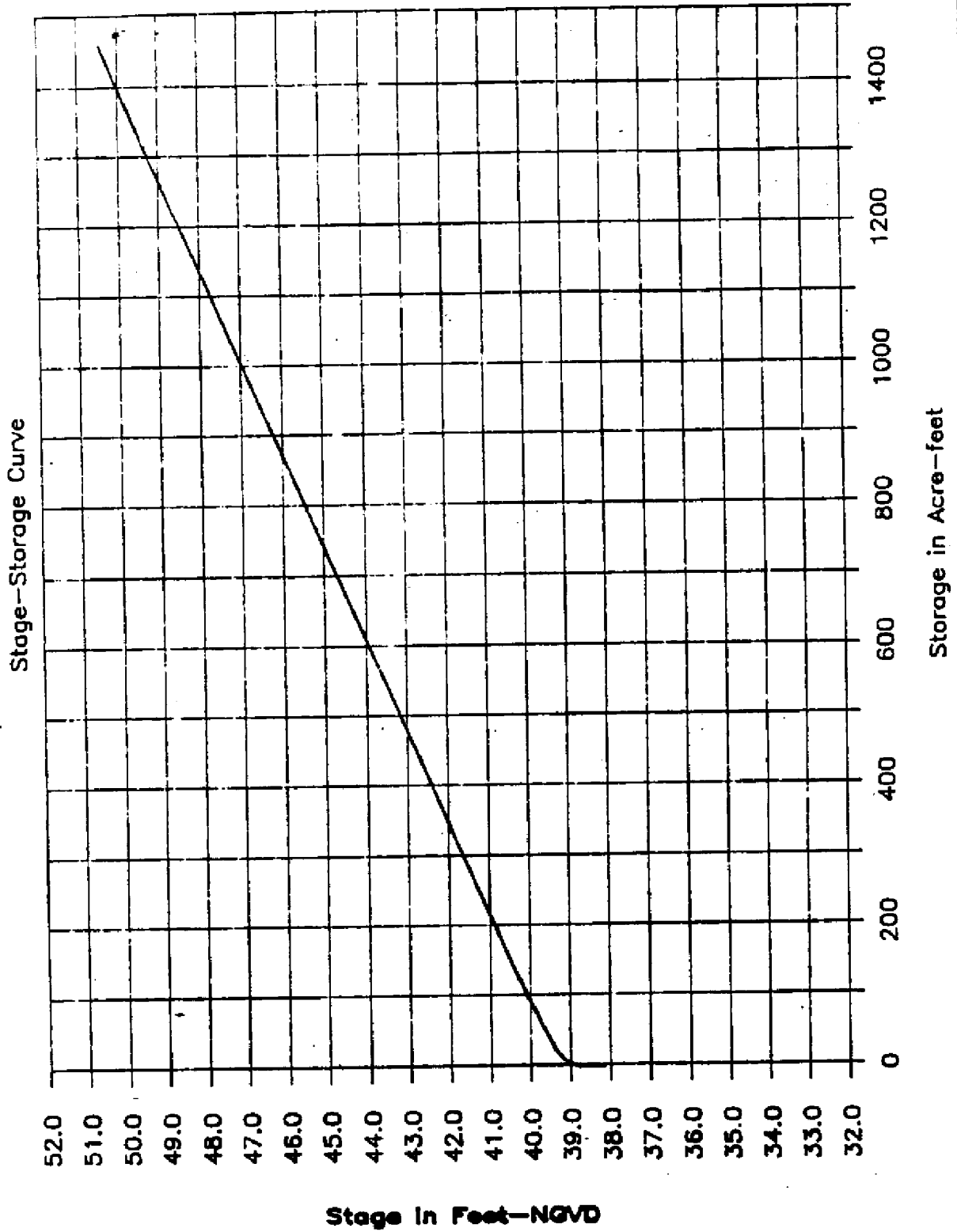


Figure 2. Stage-Storage Curve for the Western Marsh Area

# Boney Marsh Low Flow Through Area

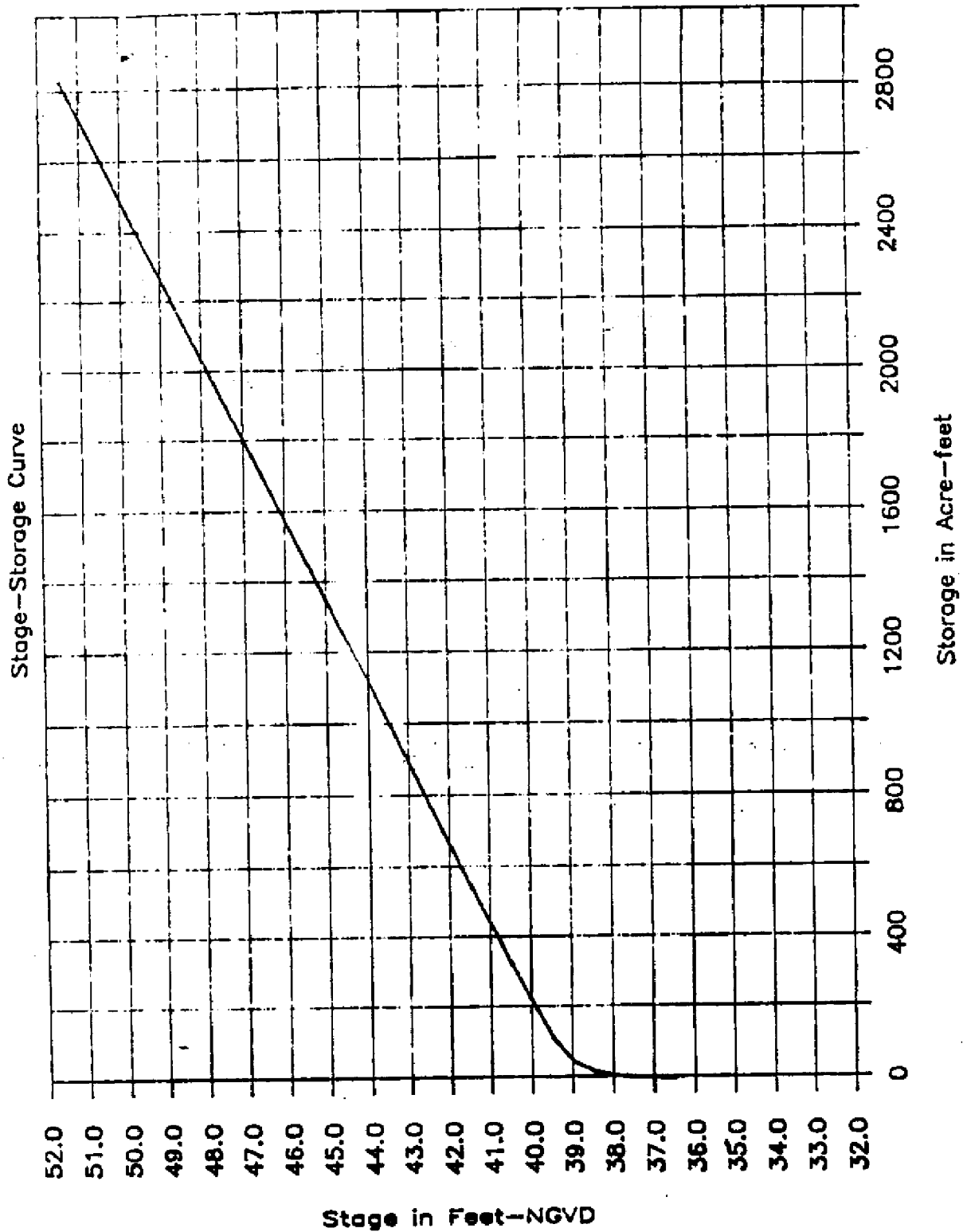


Figure 3. Stage-Storage Curve for Eastern Marsh Area

# Boney Marsh Canal

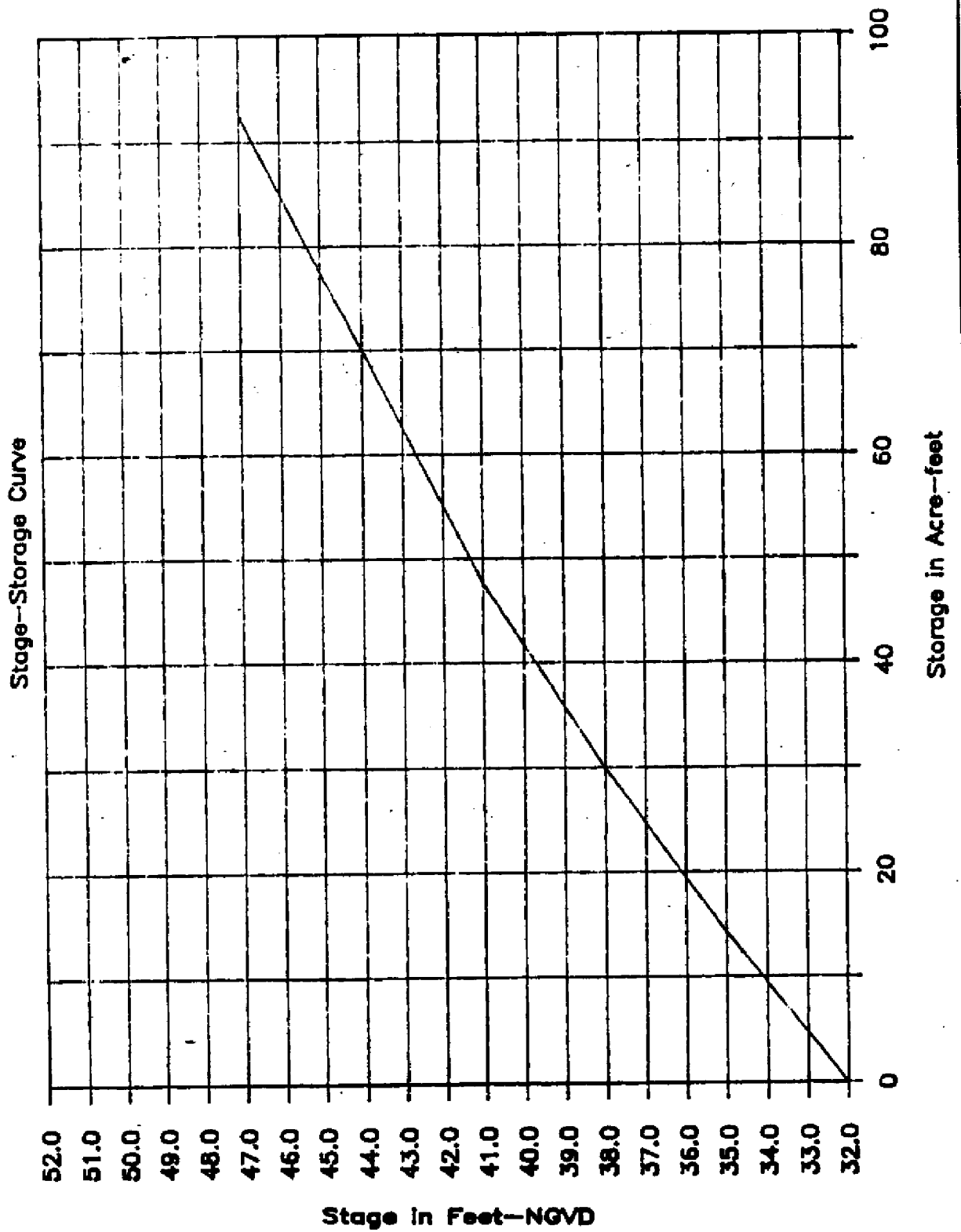


Figure 4. Stage-Storage Curve for the Canal

that expected. The temporary monitoring system was thus totally inadequate to describe the developing flow profile.

An abrupt wetting front developed which progressed uniformly, similar to a wave front, the length of the flow-through marsh. Water levels increased rapidly at the leading edge of this wave from zero to the range of 12-18 inches within approximately 100 feet of the leading edge of the wave. Water levels behind this transition zone were very flat. The monitoring system was not precise enough to quantify the slope behind the transition zone nor dense enough to describe the transition zone itself. The third order surveys which were used to provide reference elevations for the intermediate measuring stations were inadequate to provide reliable estimates of the slope of the apparently flat water surface. The measuring stations were inadvertently disturbed before it was possible to make precise datum adjustments. Quantitative estimates of this initial filling period are thus not available.

It has not been possible to implement a comprehensive test program to determine flow resistance characteristics subsequent to the initial filling without compromising the original long-term water quality and environmental objectives. These studies are now nearing completion. A monitoring program designed specifically to quantify the flow resistance characteristics should be implemented prior to dismantling the project.

There is a large set of stage and flow data which can be used to obtain approximate estimates of flow resistance. This information is not ideally suited to this type of analysis because true steady-state conditions were very rare during the operating period. In general, flow through the area was initiated by pumping approximately 8 hours per day with pumps off the rest of the day. This caused water levels to increase significantly during the time the pumps were on and decrease to a lower level during the portion of the day the pumps were off. This trend was more pronounced at the upstream end of the flow-through area than on the downstream



end and also more pronounced at smaller flow depths than at the higher end of the regulation schedule. This data, however, is the only information available to document changes in resistance with changes in vegetation due to reflooding.

The data was first divided into three equal sets based on dates of collection (the early, intermediate, and final time periods). These three sets were then screened to eliminate the most radical departures from steady flow conditions. The criteria used was the absolute value of difference in daily flow in and out could not exceed 20% of the average of these two daily flows. The data was further restricted by ensuring that the average daily upstream stage exceeded the average daily downstream stage, and by eliminating all missing or estimated data. Manning's n was computed for each of the qualifying average daily flow values with the depth based on the average of the daily upstream and downstream stages minus the average land elevation. The hydraulic gradient, S, was computed as the difference in average daily upstream and downstream stage divided by the distance between upstream and downstream gauges. The index to flow resistance (Manning's n) was computed using the formula:

$$n = \frac{1.48}{Q} w d^{5/3} S^{1/2}$$

where n is Manning's n

Q is average daily flow in CFS

w is the width of the area in feet

d is the average flow depth in feet

S is the hydraulic gradient (slope of the water surface)

The computed Manning's n values which ranged between 1 and 4 are generally much larger than those normally found in documentation. This can partially be explained by the very thick vegetation that is found in South Florida's marsh areas. In an earlier study, the value of the Manning's coefficient was estimated to range between .3 and 1.2 for the water conservation areas (Lin and Shih, 1979). The

Manning's  $n$  values computed for the Boney Marsh area were most likely overestimated due to non-steady flow conditions that existed in the experimental marsh due to the pumping schedule in operation and other irregularities that existed in the experimental area.

The computed values may still be used to explain trends in the resistance factor as illustrated in Figure 5. The  $n$  values generally increased during the first phase of the experiment due to the shift in type and density of the vegetation that existed in the experimental marsh. During the second phase of the study, the habitat appears to have reached an equilibrium so that there are only small fluctuations in the value of  $n$  due to short-term variations in climate affecting the vegetation.

Finally the computed  $n$  values showed no indication of being a function of the depth of water as would be expected from theoretical considerations and other research (Kadlec et al., 1981; Shih and Rahi, 1981). Computed Manning's  $n$  as a function of depth for phase 1 are illustrated in Figure 6. There is some evidence that Manning's equation may not be the most appropriate method of describing flow through this type of marsh vegetation (Hammer and Kadlec, 1986). Work currently in process by Robert Kadlec (personal communication) and others lends support to the possibility that a more appropriate description of flow resistance in marsh vegetation may be found.

#### IV. WATER BUDGET DATA

The period for which sufficient data are available for the Boney Marsh water budget analysis begins March 26, 1976. Areal distribution of water levels are determined from a network of stage recorders placed at key locations throughout the marsh. These stages are measured continuously throughout the day on graphic recorders and are archived in linear breakpoint form converted to fixed interval hourly data to compute flow on an hourly basis for the period of record. The names and locations of these stage recorders appear in Figure 1.

PHASE I AND PHASE II

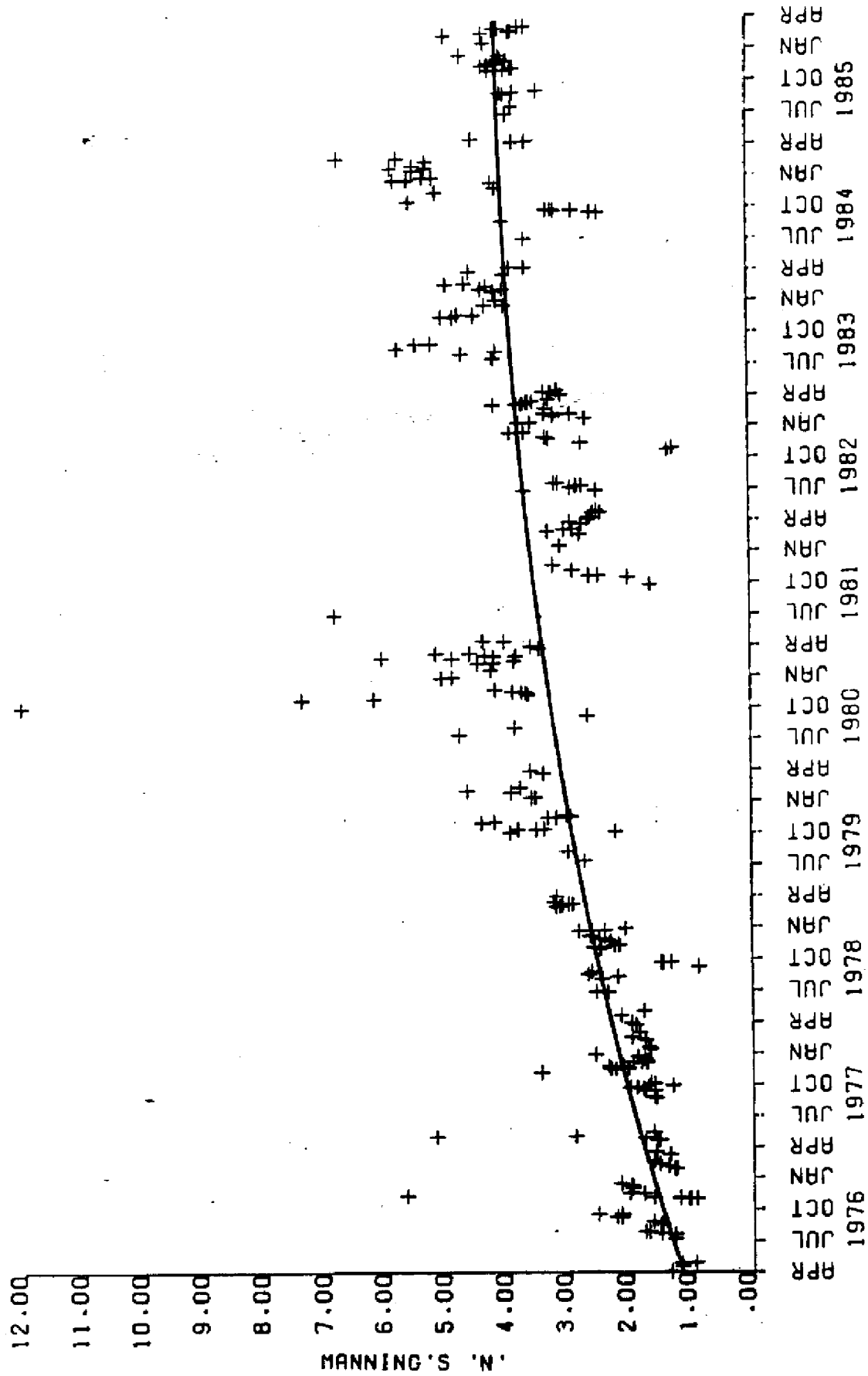


Figure 5. Manning's "N" Coefficient Versus Time

# Manning's N versus Depth

March 1976 - 1978

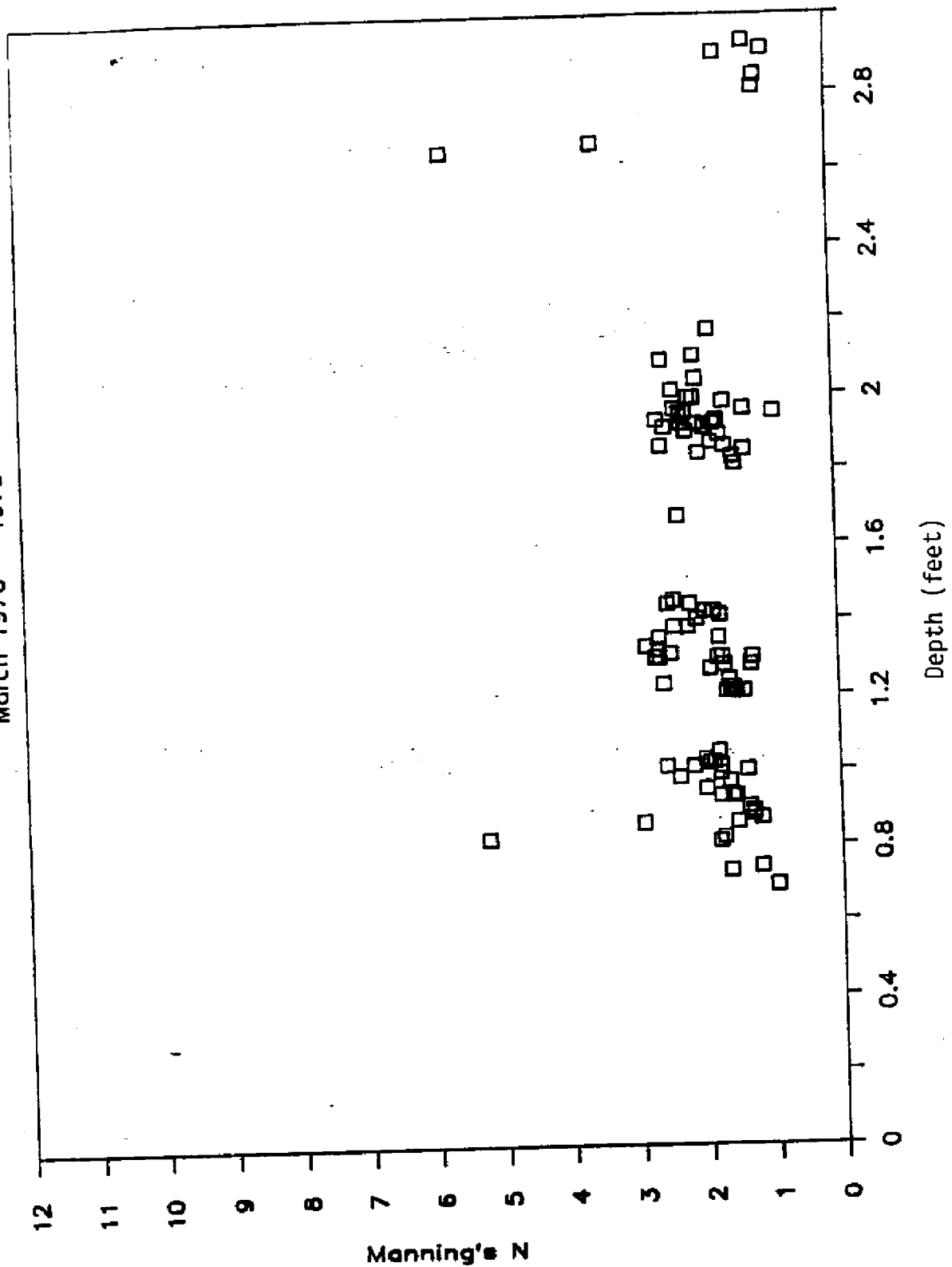


Figure 6. Manning's "N" Versus Depth of Water

The mean areal day-end stage was calculated from the stage recorders in each of the respective areas during phase 1. However, during phase 2, the north end impoundment and south pump downstream gauges were removed (March 1983 and January 1984, respectively). Therefore, a statistical analysis was completed to compute a relationship between the south culvert upstream stage and the average stage of the eastern marsh for the period when all three recorders were available. This relationship was then used to estimate the average stage in the eastern marsh for the period when the north end impoundment and the south pump stage recorders were removed. In phase 2, the average stage of the eastern area was only used to estimate seepages to the flow through area since a water budget was not completed on the eastern area during this phase. The estimated average stages for the western and eastern areas appear in Appendices A and B, respectively.

The daily rainfall measurements were recorded with a rain gauge located in the Boney Marsh. The pan evaporation measurements taken on site proved unreliable so the record available from S-65C was used instead. Early attempts at obtaining pan evaporation records without a daily human observer proved unsuccessful due to a combination of deficiencies inherent in float-driven recorders and difficulties in providing adequate water level control. Appendices C and D contain the daily rainfall and pan evaporation data for the entire study period. Operation logs for the pumps and weirs were also digitized for use in the model.

Periods of missing data exist due to malfunctioning recorders. Missing rainfall and pan evaporation data is estimated from nearby recorders and flagged as estimated in Appendices A and B, respectively. Periods of other types of missing data are summarized in Table 1. This missing data was filled in using a combination of regression analysis and best engineering judgment. For longer periods of missing record (for example, those that occurred in 1982), missing weir height data and stage data simply had to be chosen to minimize the overall error during a period.

Table 1. Periods of Missing Data\*

Recorder	<u>Beginning</u>			<u>End</u>		
	<u>Date</u>	<u>Hour</u>	<u>Min.</u>	<u>Date</u>	<u>Hour</u>	<u>Min.</u>
South Culvert Headwater	10/6/76	00	00	10/27/76	24	00
South Culvert Tailwater	11/30/84	11	16	11/30/84	12	29
North Weir Headwater	6/22/76	00	00	6/24/76	24	00
"	11/27/77	00	00	3/16/78	24	00
"	5/25/82	00	01	6/24/82	00	00
"	10/17/85	12	57	11/4/85	10	52
North Weir Tailwater	11/25/79	07	24	1/3/80	03	46
"	9/2/81	00	01	9/16/81	00	00
"	9/11/82	00	01	9/29/82	00	00
"	5/12/85	16	15	6/6/85	09	45
"	6/6/85	24	00	6/19/85	13	19
"	7/4/76	00	00	8/2/76	24	00
South Weir Headwater	7/27/82	00	01	10/8/82	00	00
"	9/20/83	11	48	9/27/83	09	40
"	9/27/83	10	40	10/25/83	10	18
"	9/26/76	00	00	10/27/76	24	00
South Weir Tailwater	11/29/84	11	16	11/29/84	12	29
South Weir Gate Height	7/27/82	10	41	10/7/82	10	57

\*Missing RF and ET measurements indicated in Tables 3 and 4.

However, short-term fluctuations during the period could not be estimated accurately; therefore, the root mean square error tends to be large for long intervals of missing record.

## V. WATER BUDGET PHASE 1

### A. Methodology

Phase 1 of this study was designed to compare the environmental and water quality effects of reestablishing overdrained marsh areas by flow through the area as opposed to ponding the area. This period was also used to calibrate the following hydrological relationships within the water budget model: 1) the weir discharge coefficient, 2) the pumping coefficient, 3) the evaporation coefficient, and 4) the seepage coefficient.

The north and south weir structures do not conform to standard specifications for flow measuring structures and thus have to be calibrated. Unfortunately, flow conditions near these structures do not lend themselves to direct calibration with standard flow measuring techniques. The north weir can be calibrated by a water budget approach given the stage-storage relationship for the canal connecting the weir with the pump station and the operating characteristics of the pump station. This is possible because ET and seepage loss are negligible in the canal in comparison to the flow and because the pulse type mode of operation of the pump provides an adequate range of head conditions at the weir. This flow equation can then be applied to other structures in the marsh area which have similar characteristics.

Likewise, the ET coefficient can be calibrated in the eastern marsh area where stage fluctuations are mainly due to the difference in ET and rainfall. This coefficient can then be applied to the entire region.

The seepage function is developed based on head differences across the levees. This function is assumed to be uniform for all the levees. The rate of seepage per foot of head across the levees must be determined by calibration.

Both pump stations use Couch axial flow pumps which were calibrated by the manufacturer based on model studies in their plant. The general form of the pump curves was verified by the South Florida Water Management District with flow measurements utilizing a Pitot tube arrangement in the discharge tube of both pumps after installation. The form of the discharge equation was found but some uncertainty still remained in the absolute magnitude of discharge. Thus, the pumping relationships also needed to be calibrated.

Essentially the calibration procedure minimizes the root mean square differences between the actual change in storage ( $\Delta S_a$ ) and the simulated change in storage ( $\Delta S_s$ ) by choosing the optimal value for the coefficients of each hydrologic process which best simulates the real system. An additional constraint of this procedure was conservation of mass.

The actual change in storage ( $\Delta S_a$ ) for a given day is estimated from the average of the stage recorders in a particular area at the beginning (0 hr) and at the end (24 hr) of that day and the stage-storage curve for the appropriate area.

The simulated change in storage was calculated based on the individual components of the water budgets for the area of concern. This change in storage can be expressed by:

$$\Delta S_s = Q_{in} - Q_{out} - \text{Seep} - ET + RF$$

where

- $\Delta S_s$  = simulated change in storage
- $Q_{in}$  = estimated structural inflows
- $Q_{out}$  = estimated structural outflows
- Seep = net seepage out of area



ET = evapotranspiration

RF = rainfall

(all terms expressed in units of acre-feet)

The discharges over the weirs were based on commonly used flow equations. If the weir is not submerged, the flow rate is based on the weir height and the upstream stage above the weir. If the weir is submerged, the downstream stage has to be taken into consideration in the calculations. The governing equation takes the form

$$Q = C_1 * W * H_1^{1.5} * [1 - (H_2/H_1)^{1.5}]^{.385}$$

where

Q = calculated discharge [CFS]

C<sub>1</sub> = coefficient to be optimized [feet<sup>3</sup>/sec]

W = weir width [feet]

H<sub>1</sub> = upstream stage above weir [feet]

H<sub>2</sub> = downstream stage above weir [feet]

(= 0 when weir is not submerged)

This equation appears in the Handbook of Hydraulics (King and Brater, 1963).

The pumping discharge equation takes the form of

$$Q = C_2 * FR * [54.56 - 10.91 * \text{SQRT}(46.45 - UP)] * \text{RPM}/1700$$

where

Q = calculated discharge [CFS]

UP = upstream stage [feet MSL]

FR = fraction of time pumping

RPM = pump speed [in revolutions per minute]

C<sub>2</sub> = coefficient that needs to be optimized for a given pump type  
[dimension less units]

The north pump was operated at approximately design discharge for 8-12 hours per day, 5 days per week, Monday through Friday.

In addition to the coefficients that needed to be optimized for the flow equations, there were also coefficients associated with evaporation and seepage rates.

The equation for evaporation is

$$EVAP = C_3 * PAN * Area$$

where

EVAP = the approximate volume of evapotranspiration [acre-feet]

PAN = pan evaporation [feet]

Area = surface area [square feet]

C<sub>3</sub> = coefficient to be optimized [dimensionless units]

A seasonal dependence was not found using calibration data from this study area.

and the seepage equation is

$$Seep = Miles * HD * C_4$$

where

Seep = seepage [in CFS]

Miles = length of levee [in miles]

HD = head differential across the levee [in feet]

C<sub>4</sub> = coefficient that needs to be optimized [CFS/foot-mile]

Initially the values of C<sub>1</sub>, C<sub>2</sub>, C<sub>3</sub> and C<sub>4</sub> are chosen based on best engineering judgment. Then the mass balance error and the root mean square error for each area is calculated on a daily, monthly and yearly basis. The mass balance error is defined as the sum of the differences between the actual change in storage ( $\Delta Sa$ ) and simulated change in storage ( $\Delta Ss$ ). Therefore

$$\varepsilon = \Delta Sa - \Delta Ss$$

where

$\varepsilon$  = error

The root mean square (RMS) error is calculated by

$$RMS = \sqrt{\left( \sum_{t=1}^N \epsilon_t^2 / N \right)}$$

where

RMS = root mean square error

$\Sigma$  = summation of  $\epsilon^2$  for N time increments

N = number of days or months over which the error is summed

Statistical tests (Kolmogouro-Smirnof) for the equivalence of sample distributions indicate that the values of  $\epsilon$  are approximately normally distributed.

RMS is identical to the standard deviation of the sample set, which is a good estimate of the standard deviation of the population of possible errors,  $\epsilon$ , when the sample size is sufficiently large. When the sample size is small, (N) in the equation for computation of RMS can be replaced by (N-1) to obtain an unbiased but less reliable estimate of the population standard deviation. The mean of the set of sample errors will be shown to be approximately zero which is a good estimate of the mean of the population of  $\epsilon$ . This allows use of known properties of the standardized normal variate to be used to make statistical inferences on the errors associated with the water budget. In particular, it allows an estimate to be made of the probability that an error of any magnitude will be exceeded if the value of RMS is known. For example, the probable error (exceeded 50% of the time) is 0.674 x RMS; the odds against an error larger than RMS is 2.15 to 1; and the odds against an error larger than 2.0 x RMS is 20.98 to 1 (Hodgman, 1962).

Once the errors are calculated, the coefficients are adjusted by a systematic process which minimizes the root mean square error while keeping the coefficients in an acceptable range. This process is subject to the constraint that the long-term mass balance error is negligible.

The steps of this process are as follows:

1. Optimize the pumping and discharge coefficients. Optimization is done with the north pump and north weir because there are large changes in stage in the canal throughout a given day mainly due to flow through the structures. Rainfall, seepage and ET are of smaller orders of magnitude.

Stages upstream of the north weir were measured continuously by a standard stage recorder. Stages were summarized on an hourly basis so that flow through the north weir could be computed hourly for the period of record. Hourly values were summed over 24 hours and compared to daily inflow from the pump and to the observed fluctuations in daily storage. The weir flow coefficient was adjusted until there was a mass balance over the entire period of record given a pump flow scaling coefficient. The pump scaling coefficient was then adjusted to minimize the root mean square error in the daily mass balance equation of the canal. The pumping and weir flow coefficients for these structures were then applied to other structures in the Boney Marsh experimental area because they are similar in nature.

2. Optimize the ET coefficient so that the RMS error is the smallest possible value. This is accomplished by minimizing the RMS error for the eastern area where ET has its largest effects relative to the other components of the water budget.

3. Determine the seepage coefficient which best leads to a mass balance and the lowest overall RMS error.

4. Repeat steps until coefficients stabilize.

The optimized coefficients appear in Table 2. Appendices E, F and G contain the computed daily discharges for the north weir, south weir and south culvert, respectively for the first phase of this study. Appendices H and I contain the north pump and south pump computed volume of daily flow for the same period.

## **B. Interpretation of Error**

There is mass balance for the three-year period to within 1% of the estimated inflows and outflows. The total error over the 350 acres of land was only -157 acre-

Table 2. Optimized Coefficients

- C<sub>1</sub> = weir discharge coefficient 3.0 [feet<sup>2</sup>/sec]
- C<sub>2</sub> = pumping coefficient .96
- C<sub>3</sub> = evapotranspiration coefficient .70
- C<sub>4</sub> = seepage coefficient .06 [CFS/foot-mile]

feet of water. This error is very small when it is considered that over this period more than 12,000 acre-feet of water flowed through the Boney Marsh experimental area, ET and rainfall accounted for another three to five thousand acre-feet of water entering and leaving the area, and there is a seepage function to consider.

The individual budgets of the marsh areas will shed more light on the error term and on the relative contribution by the separate hydrologic components.

A detailed error analysis for each area can be seen in Tables 3, 4 and 5. In Table 3 a negative error indicates that  $\Delta S_s$  is greater than  $\Delta S_a$  while a positive error indicates just the opposite.

Table 3. Mass Balance Errors (acre-feet)

<u>Year</u>	<u>Canal</u>	<u>Western (Flow) Area</u>	<u>Eastern (No-Flow) Area</u>
1976	72.3	-73.7	-47.7
1977	-65.5	61.4	-76.2
1978	2.2	90.0	-117.0
Total	9.0	77.7	-240.9

**i. Canal**

The error in the canal is mainly associated with the volume of flows entering and leaving the canal. ET, rainfall and seepage are much smaller than the measured inflows and outflows. The total flow passing through the canal for the

Table 4. Daily RMS Errors (acre-feet)

<u>Year</u>	<u>Canal</u>	<u>Western (Flow) Area</u>	<u>Eastern (No-Flow) Area</u>
1976	3.52	7.35	4.84
1977	3.03	6.05	5.30
1978	2.12	5.92	6.10

Table 5. Monthly RMS Errors (acre-feet)

<u>Year</u>	<u>Canal</u>	<u>Western (Flow) Area</u>	<u>Eastern (No-Flow) Area</u>
1976	19.13	38.61	42.75
1977	22.38	74.30	69.57
1978	25.81	69.39	62.05

three-year period was about 10,734 acre-feet. This averages out to be about 10.6 acre-feet per day. The average daily RMS error from Table 4 is about 27% of the actual flow. A noticeable trend illustrates that the RMS error dropped throughout the study period. During 1978 a total of 3,872 acre-feet of water flowed through the canal, an average of 10.6 acre-feet a day. However, the daily RMS error for this year was only 2.12 acre-feet or only about 20% of the daily flow. This improvement in results is associated with improved weir height data received as the study period progressed.

The average monthly flow is about 325 acre-feet. The monthly RMS error averages about 22 acre-feet, which amounts to about 6.7% of the monthly flow. This illustrates that most of the daily error compensates itself on a monthly basis.

On a yearly basis the largest mass balance error is 72 acre-feet. This is about 2% of the total flow that passed through the canal during this period. Over the three-year period, the mass balance error is nearly zero.

## **ii. Western Area**

The error in this area is due to a combination of all the components of the water budget. The daily RMS error is between 6 and 7 acre-feet over 120 acres. This error amounts to an error in change of average stage of about a half inch per day. This daily error is quite small when the error associated with flow estimations are taken into account. The stages measured at the north and south ends of the reservoir may not always reflect the average stage in the area. The distribution of water in this area varies depending on timing and magnitude of inflows that enter the area at the north weir. Also during periods of low stages the topography of the area becomes important in the distribution of water in this area. Therefore, a portion of the daily RMS error can be attributed to the estimation of the actual change in storage rather than the estimation of the change in storage calculated from the water budget. Errors in the estimation of the actual daily change in storage would be expected to cancel each other over long time periods.

The maximum monthly RMS error occurred in 1977. This error of 74.30 acre-feet is equivalent to about one-half a foot in stage per month. This indicates that about two-thirds of the daily error compensates itself over a month. The largest mass balance error for a given year is 90 acre-feet, while the mass balance error for the three-year period is 77.7 acre-feet. Over the longer periods the errors tend to compensate themselves indicating that a significant part of the daily RMS error was likely caused by the estimation of the actual change in storage.

## **iii. Eastern Area**

The daily RMS errors are slightly smaller for the eastern area than the western area and range between 5 and 6 acre-feet. Over an area of 230 acres, the error amounts to about a quarter of an inch in depth. The stage variation over the entire area at a given time varies more than this amount and the error again may be due to calculations of the actual change in storage rather than the estimated components of

the water budget. The largest monthly RMS value in any year was 70 acre-feet. This amounts to an error of about 3/10 foot per month, therefore, about half the daily error compensates itself over a month. After a three-year period, the stage difference due to this error would be approximately one foot with the total error being 240 acre-feet over an area of 230 acres.

### C. Discussion

A reasonable understanding of the magnitude of all the components of the Boney Dike experimental marsh water budget have been attained on a daily basis. Table 6 contains the computed annual water budget of the eastern marsh area, the western marsh area, and the canal. An interesting aspect of the water budget is that the net runoff is negative. This will be discussed in more detail in phase 2 and in the conclusion of the report. This water budget is presented graphically on a monthly basis in Appendix J. A substantial part of the error appears to be associated with poor weir height and pump log data. The data improved over the three-year period in the canal and western areas where RMS errors dropped substantially. No effort has been made to more accurately measure the weir at the eastern area.

During the three years, 10,734 acre-feet of water flowed into the canal through the north pump and 10,676 acre-feet flowed over the north weir. ET, rainfall and seepage had a negligible effect. Flow into the western area over the north weir was 10,676 acre-feet and 10,175 acre-feet flowed out over the south weir. The difference in these discharge volumes is due to an excess of evapo-transpiration over rainfall during this rather dry period. The eastern area had 1,923 acre-feet of inflow through the south pump and 991 acre-feet outflow through the south culvert. This again was mainly due more to evapo-transpiration than rainfall during the dry period. Seepage plays only a minor role in the budget because inward seepage along the eastern boundary of the marsh is approximately balanced by the outward seepage along the western boundary. Figure 7 (a-c) illustrates the relative magnitudes of



**Table 6. Annual Water Budget (acre-feet)**

**a. Canal**

Year	RF	ET	North Pump	North Weir	Seepage	Runoff
1976	15.0	18.8	2915.9	2946.9	29.2	60.2
1977	14.0	24.1	3943.7	3836.4	34.9	-72.4
1978	24.3	22.5	3872.0	3850.1	28.3	6.4
Total	53.3	65.4	10,731.6	10,633.4	92.4	-5.8

**b. Western Area**

Year	RF	ET	North Weir	South Weir	Seepage	Runoff
1976	334.6	420.8	2946.9	2708.5	-1.5	-239.9
1977	313.6	539.9	3836.4	3563.6	3.3	-269.5
1978	545.1	506.6	3850.1	3906.0	5.8	61.7
Total	1193.3	1467.3	10,633.4	10,178.1	7.6	-447.7

**c. Eastern Area**

Year	RF	ET	South Pump	South Culvert	Seepage	Runoff
1976	637.5	801.7	608.7	241.9	66.7	-300.1
1977	597.6	1029.5	835.5	309.5	86.6	-439.4
1978	1037.5	965.5	483.7	445.9	77.2	39.4
Total	2272.6	2796.7	1927.9	997.3	230.5	-700.1

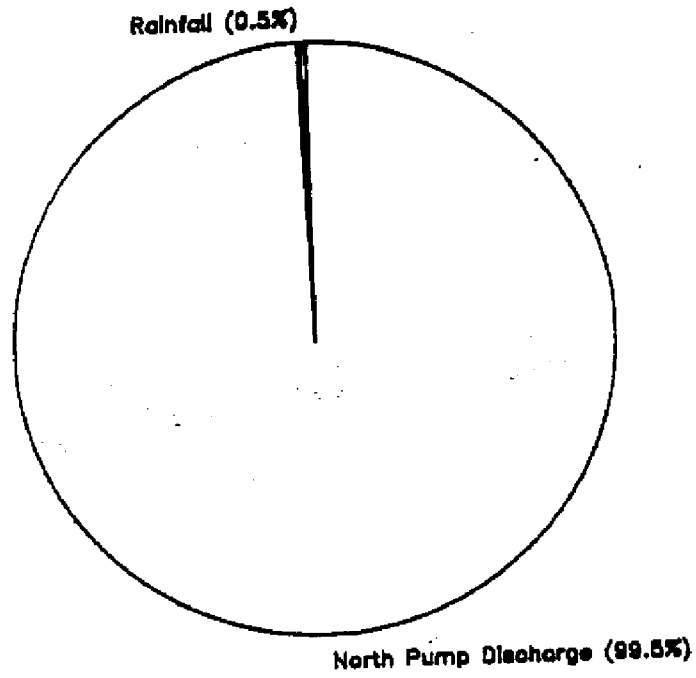
the different components of the water budget of the Boney Marsh.

**VI. WATER BUDGET PHASE 2**

**A. Methodology**

In phase 2 of this analysis, hydrologic relationships calibrated in phase 1 are used to determine the water budget of the western area of Boney Marsh for the period from March 1, 1979 through February 1986. The validity of using these relationships is tested by comparing the change in storage calculated from the water

Phase I - Canal Inflow



Phase I - Canal Outflow

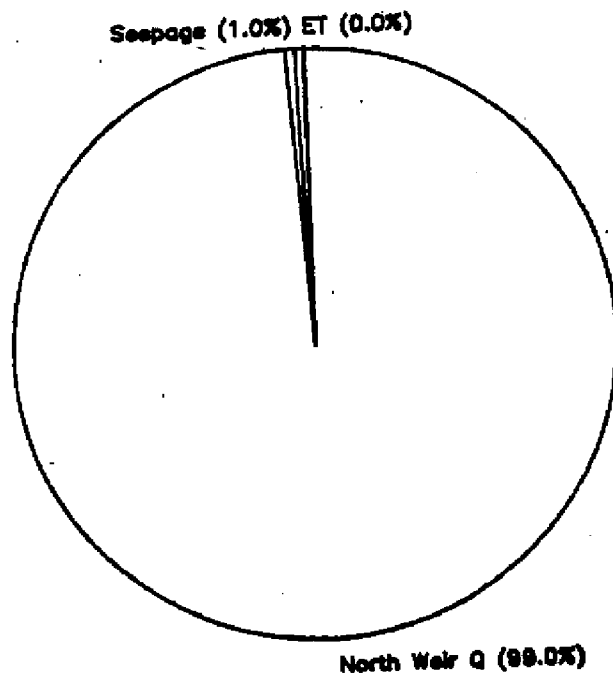
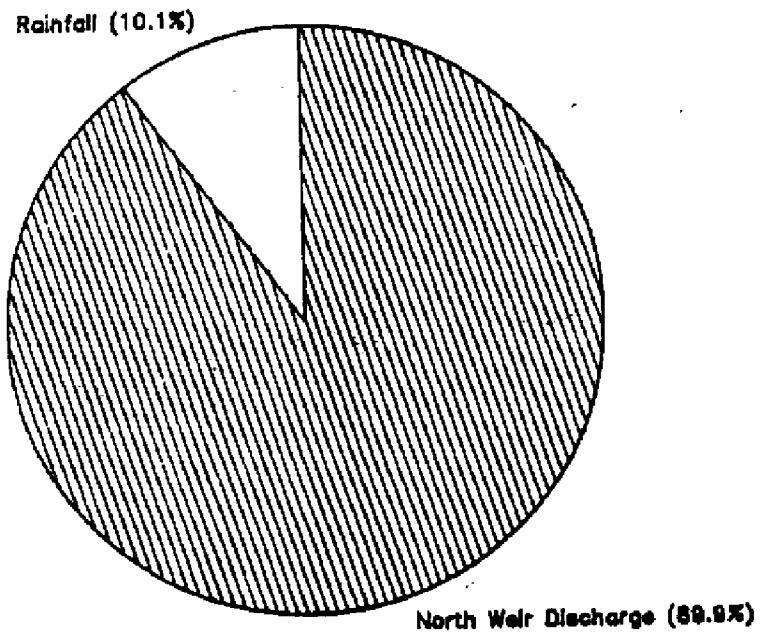


Figure 7a. Overall Water Budget (Phase 1)

Phase I - Western Area Inflow



Phase I - Western Area Outflow

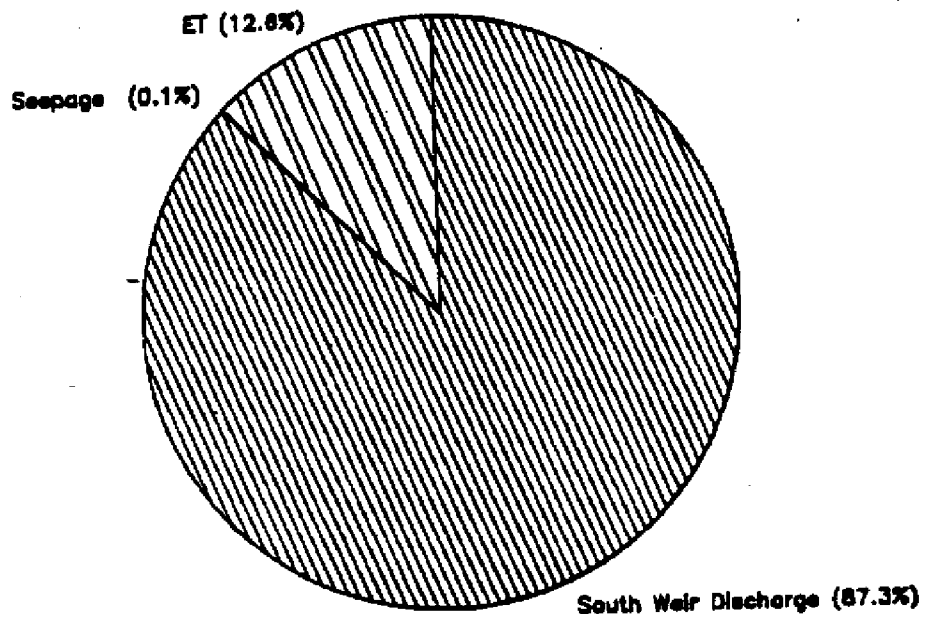
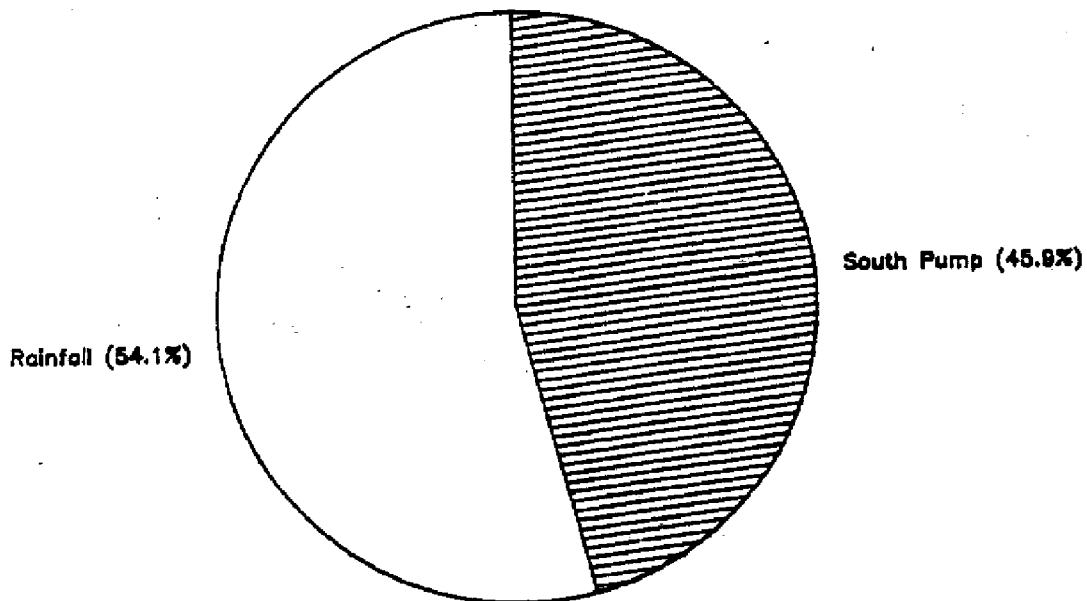


Figure 7b. Overall Water Budget (Phase 1)

Phase I - Eastern Area Inflow



Phase I - Eastern Area Outflow

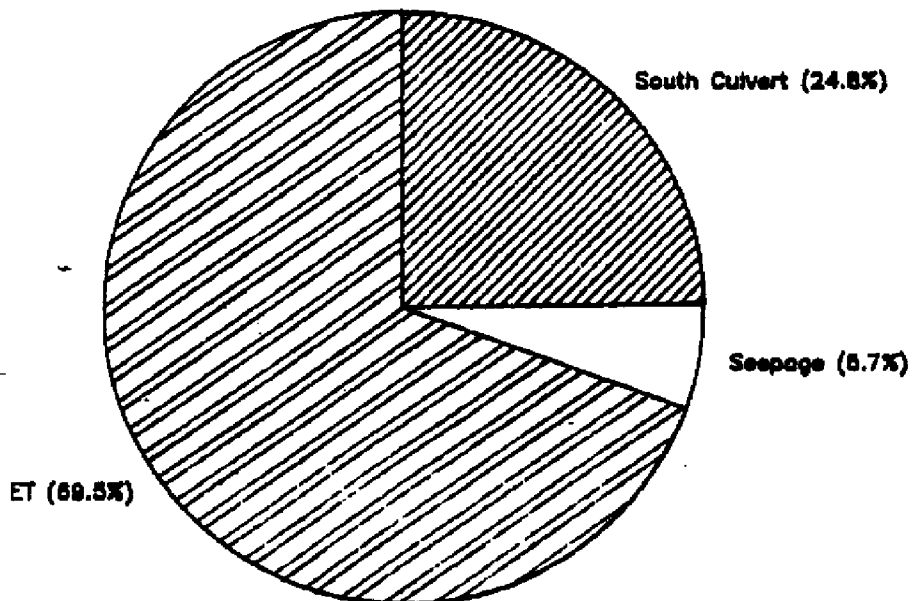


Figure 7c. Overall Water Budget (Phase 1)

budget approach ( $\Delta S_s$ ) to those estimated from the appropriate stage recorders ( $\Delta S_a$ ). The  $\Delta S_a$  is determined from the difference in average stage for the marsh area at the beginning (0:00 hr) and the end (24:00 hr) of the day, and the stage-storage curves developed for the area. The  $\Delta S_s$  is calculated as follows:

$$\Delta S_s = Q_{in} - Q_{out} - Seep - ET + RF$$

where

$\Delta S_s$  = simulated change in storage

$Q_{in}$  = inflow

$Q_{out}$  = outflow

Seep = seepage

ET = evapotranspiration

RF = rainfall

(all quantities expressed in acre-feet)

The different components of the water budget are computed with the relationships derived in phase 1. Computed discharges for the north weir and south weir appear in Appendices K and L.

The estimated mass balance error of the water budget is defined as the difference between the actual change in storage ( $\Delta S_a$ ) and the simulated change in storage ( $\Delta S_s$ ),

therefore,

$$\varepsilon = \Delta S_a - \Delta S_s$$

where

$\varepsilon$  = volume of error.

The root mean square error is calculated by:

$$RMS = \sqrt{\left( \sum_{i=1}^N \varepsilon_i^2 / N \right)}$$

where

$\Sigma$  = summation of  $\epsilon^2$  for N time increments

RMS = root mean square error

N = number of days or months error is summed over

The value of  $\epsilon$  along with the root mean square error is used to verify the seepage, ET and discharge coefficients derived in phase 1. It was shown in phase 1 that the errors,  $\epsilon$ , are normally distributed with a mean of zero and a standard deviation of RMS. Therefore, the expected value of the error is  $0.670 \times \text{RMS}$  and the probability of an error of any magnitude can be found from published tables of the standardized normal variate. These error estimates were also used in checking the input data.

#### **B. Interpretation of Error**

Table 7 includes an error analysis summary. The daily RMS errors of the water budget vary between 3.37 and 6.39 acre-feet for the western marsh area. This is equivalent to an error in the computed average stage of about .5 inch per day. The RMS error is quite small compared to the magnitudes of the flows leaving and entering the area. The daily RMS errors calculated in phase 2 are generally smaller than those calculated in phase 1 which varied between 5.92 and 7.35 acre-feet for the western marsh area. This reduction of the RMS error is most likely attributed to a recorder that was installed on the south weir to measure weir elevations rather than relying on unreliable manual readings. As explained in phase 1, part of the computed error is associated with the estimation of the actual change in the storage calculated from the stage recorders with the aid of the stage-storage curves and is not associated with the estimations of the water budget. Due to the variation in the distribution of water within the area which depends on the timing and magnitudes of the inflows and outflows, the two gauge average is not always completely representative of the actual storage changes.

Table 7. Annual Error Analysis

Year	Mass Balance [acre-feet]	Daily RMS Error [acre-feet]	% of Mean Daily Flow	Monthly RMS Error [acre-feet]	% of Mean Monthly Flow
1979*	-115	3.47	--	33.60	--
1980	+63	3.96	53	28.16	12
1981*	-213	4.90	66	44.11	19
1982	-162	6.08	81	35.09	15
1983	+216	5.34	71	34.16	15
1984	+243	5.22	70	54.03	24
1985	+139	6.39	86	44.79	20
1986**	-20	2.67	41	10.13	10
Mean			67		16

\*Includes only March to December.

\*\*Includes only January and February.

The maximum monthly RMS error of 54 acre-feet occurred in 1984. This error is equivalent to less than .5 foot in stage per month. The largest mass balance error for a given year was 243 acre-feet. This is less than 10% of the flow through the marsh area during that particular year. The mean RMS error as a percentage of mean outflow decreases with increasing time period. The respective daily, monthly and annual percentages are 67%, 16% and 7%. The flow traveling through the area is the overwhelming element in the yearly budget and thus provides a general idea (though probably high) of the error associated with the flow values. Table 8 illustrates the ratio of the annual error to that of the flow through the marsh area. Over the seven-year study period the mass balance error was approximately 200 acre-feet compared to nearly 20,000 acre-feet that flowed through the marsh. This 0.1% error is acceptably close to zero.

Table 8. Ratio of Error to Volume of Flow (acre-feet)

Year	Error	Computed Flow Out of the Area	Ratio
1979*	-115	2330	-0.04
1980	+ 63	2508	+ 0.02
1981	-213	1872	-0.09
1982	-162	3191	-0.05
1983	+ 316	3151	+ 0.07
1984	+ 243	2842	+ 0.09
1985	+ 139	2632	+ 0.05
1986**	-20	559	-0.03
Sum	+ 151	19,085	
Mean	22	2,726	

\*Includes only March to December.

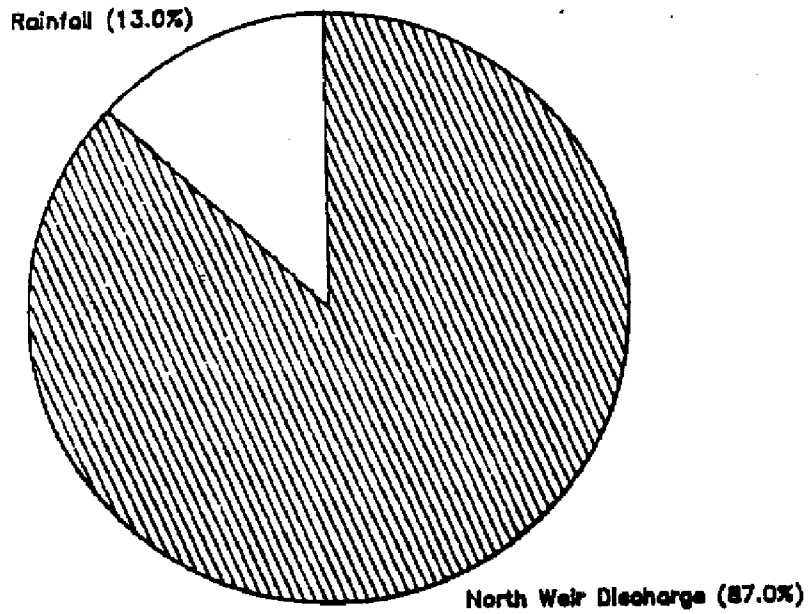
\*\*Includes only January and February.

### C. Discussion

Reasonable estimations of the components of the Boney Marsh flow through area water budget were updated through February 1986. In most cases, inflows and outflows through the structures were much larger than the components of the water budget associated with rainfall, evapotranspiration and seepage. The relative magnitude of the different components of the overall water budget are illustrated in Figure 8. Flow over the north weir accounted for 87% of the inflow, while rainfall accounted for the remainder of the inflow. 84% of the volume of water that left the area did so in the form of discharge over the south weir, while another 15% left in the form of evapotranspiration. Only 1% of the outflow was in the form of seepage. The volume of 19,746 acre-feet entered the area over the north weir during the study period, while 19,085 acre-feet left over the south weir. The difference between these two numbers was largely due to the effects of rainfall, ET, and seepage. A smaller



Phase II - Western Area Inflow



Phase II - Western Area Outflow

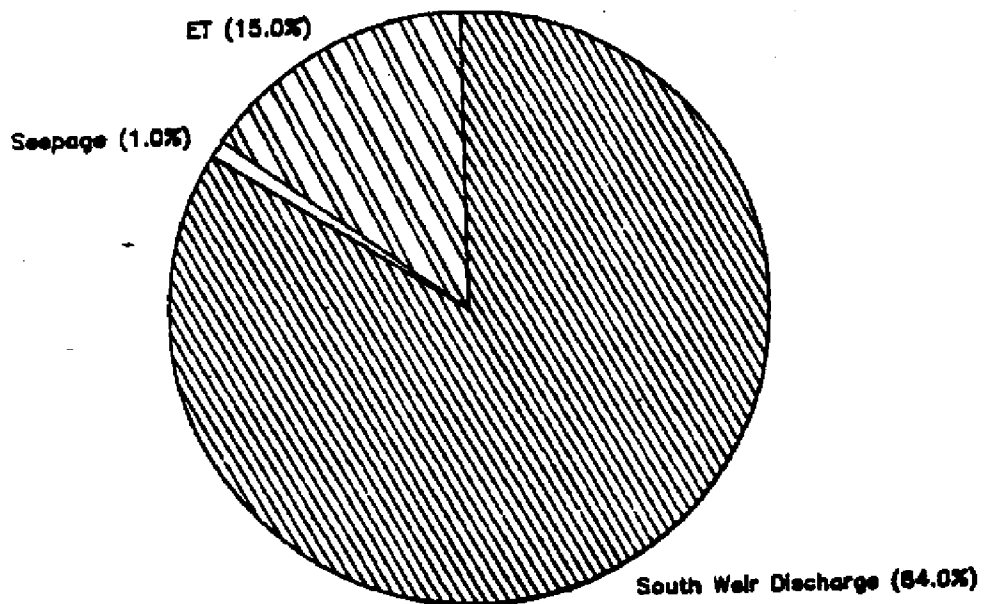


Figure 8. Overall Water Budget (Phase 2)

portion is due to the mass balance error which was 200 acre-feet. The error of computations associated with the annual water budget was less than 10% of the flows entering or leaving the area. Table 9 summarizes the annual water budget for the western marsh area during phase 2.

Table 9. Annual Water Budget (acre-feet)

Year	North Weir	South Weir	RF	ET	Seep.	$\Delta S_a$	Runoff (AF)
1979*	2,690	2,330	283	441	58	31.4	-302
1980	2,720	2,508	326	527	63	2.6	-149
1981	2,365	1,872	301	497	87	0.0	-406
1982	3,202	3,191	606	484	38	6.6	+ 27
1983	3,007	3,151	454	481	26	19.7	+ 170
1984	2,561	2,842	465	422	20	-46.7	+ 301
1985	2,654	2,632	388	481	9	21.5	-13
1986**	547	559	30	46	-13	-29.5	-1
Total	19,746	19,085	2,851	3,378	300	5.6	-361

\*Includes March through December only.

\*\*Includes January through February only.

NOTE: These values can be expressed in inches over the area by dividing by 10.0.

The monthly water budget appears in Appendix M. The monthly error terms associated with the water budget normally range between 10 and 20 percent of the monthly flow. However, during low flow months, or months with poor or missing data, the relative importance of the error in the water budget may be larger.

An interesting finding of this study was that the net runoff was negative. Unit runoff is normally defined as the amount of surplus rainfall which leaves a watershed in the form of liquid water. It is usually expressed in units of inches per year. Since the time periods are large, changes in storage are considered negligible. Depending on the type of information available, it is computed either as 1) water flowing out of an area minus water flowing into the area plus the net seepage out of

the area (if the boundaries of the area do not lie on the ground water divide), or as 2) rainfall-evapotranspiration. By method 1) the unit runoff for the period of record is -5.2 inches/year; by method 2) the unit runoff is -7.5 inches/year. The differences between methods of calculations arise from the net change in storage over the seven-year time period and the residual error in the water budget. In either case, the unit runoff is negative indicating that more water is consumed than is supplied by rainfall. This is likely to occur if water levels are maintained so that natural vegetation in this type of marsh is given access to an unlimited supply of water, particularly when a traditional regulation schedule is enforced. In addition, the water budgets for both the flow-through area and the nonflow-through area had net negative runoff for the period 1976 through 1979. These negative runoff values contrast sharply with unit runoff values typical for areas within the District which are subject to wet/dry cycles on upland vegetation. Unit runoff values are typically in the range of 12-15 inches. Table 10 illustrates some of the unit runoff values determined in earlier studies. These values were computed from the inflow and outflow from these watersheds. Also included in the table are values from Map Series 32 (Visher and Hughes). This map depicts the difference between rainfall and potential evapotranspiration in Florida. The values represent an approximation of the minimum amount of runoff that may be expected for a region based on climatic conditions only without consideration for local drainage characteristics.

The anomaly in the general rainfall patterns along the Kissimmee River or the recent dry period in this region may contribute to the negative runoff conditions. There is an apparent shadow effect in annual rainfall totals in the lower Kissimmee River basin which is downwind of the cool stable air of Lake Okeechobee when the prevailing southeasterly winds are dominating in south Florida. This rainfall anomaly is illustrated in Figure 9. The below average rainfall totals of recent years appear in Figure 10. However, as illustrated in Table 10, the yearly net runoff

Table 10. Typical Unit Runoff from South Florida

<u>Study Area</u>	<u>Unit Runoff (inches)</u>		<u>Source for Computed Runoff</u>
	<u>Com- puted</u>	<u>Map Series # 32</u>	
Indian Prairie Area	3	3	Memorandum Report on Surface Water Availability in Lake Istokpoga-Indian Prairie, July 1974, R.L. Mierau.
St. Lucie County Area	16	12	Memorandum Report on Surface Water Availability in the St. Lucie Area, July 1974, R.L. Mierau, W.V. Storch.
Everglades Agricultural Area	16	9	Memorandum Report on Surface Water Availability in the Calooshatchee, Sept. 1974, R.L. Mierau, R.E. Irons, W.V. Storch.
Calooshatchee River Basin Area	13	0	Same as above.
Martin County Area	14	12	Rainfall Drought Frequency and Availability of Surface Water in Martin County, Nov. 1985, A. Fan.
Upper Taylor Creek, Okeechobee County	13	7	Annual Report (1971), Agricultural Research Service, H.P. Wade, W.H. Speir, J.C. Stephens, E.H. Stewart.
Indian River Farms Drainage District, Indian River County	15	11	Same as above.
Monreve Ranch, Martin County	16	12	Same as above.
Upper Kissimmee River Basin	10	5	Based on historical records at S-65.
Lower Kissimmee River Basin (C-38)	15	5	Based on historical records at S-65 and S-65E.

estimates for the lower Kissimmee River basins are positive, even during drier than normal years. Therefore, although the abnormally low rainfall conditions of recent years enhance the net negative runoff totals, it must also be recognized that the management practice of maintaining water levels in the marsh areas will greatly

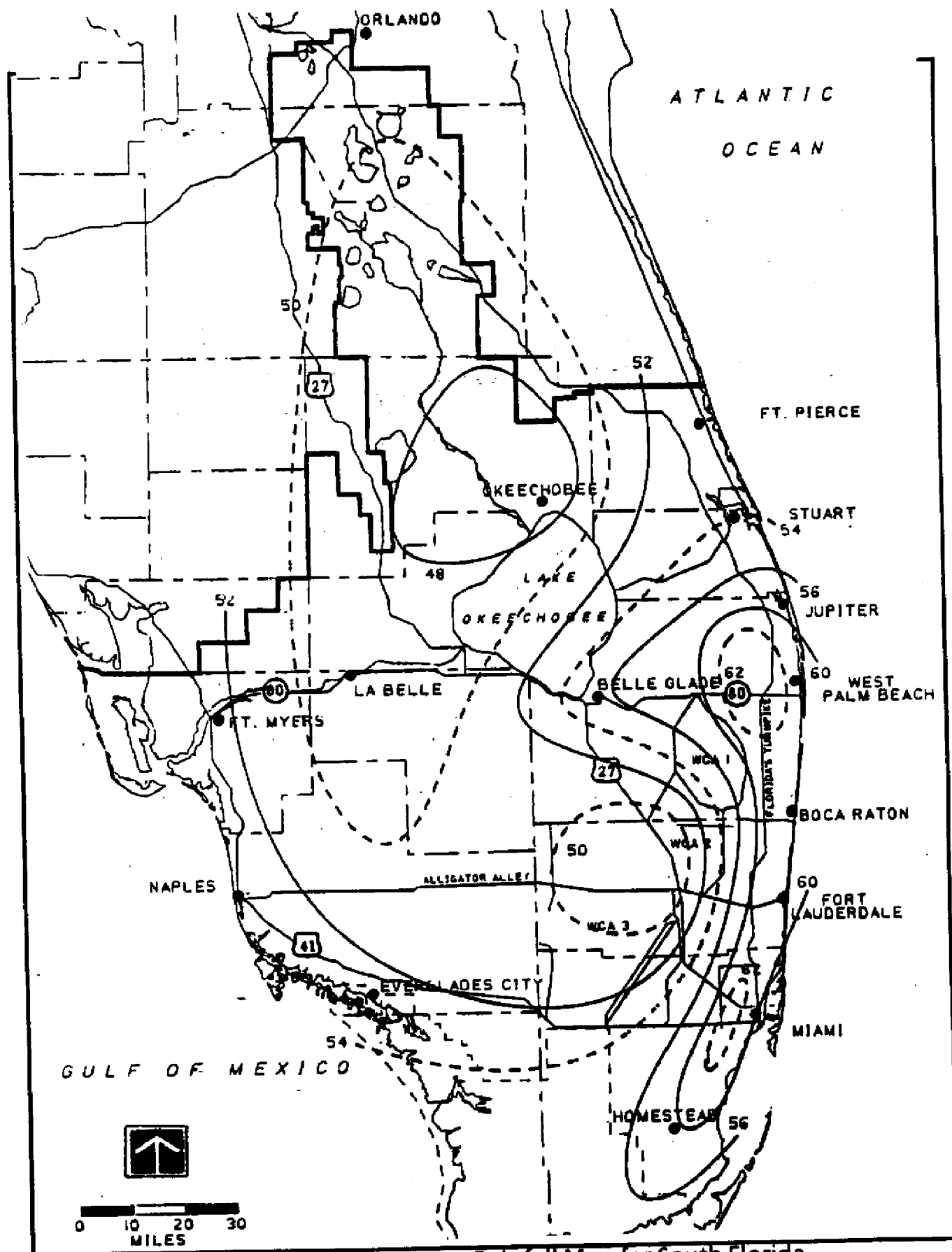


Figure 9. Annual Average Rainfall Map for South Florida

# Departure from Mean Annual Rainfall

Kissimmee River Basin

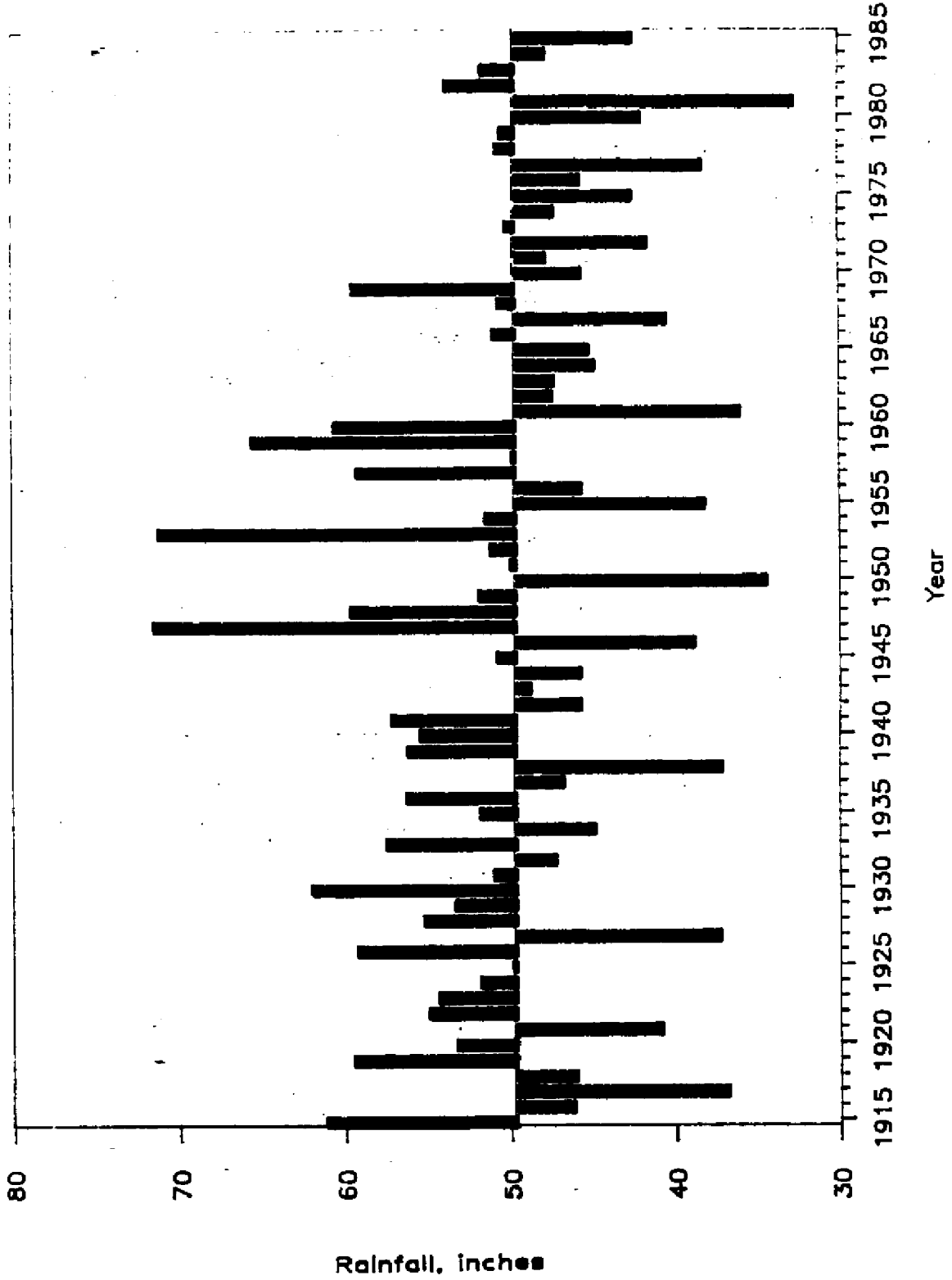


Figure 10. Annual Long Term Rainfall Bar Plot

increase evapotranspiration losses from the watershed, particularly during dry years. A net positive value for runoff can be expected when water levels are allowed to fluctuate normally even during extremely dry years. The timing of rainfall events is such that even during the driest of years, there is some time during the year when rainfall rates exceed the capacity of local storage to trap excess water. The excess water then leaves the area as runoff. Evapotranspiration rates decline unless supplemental water is added to compensate for the water lost to runoff.

Estimated evapotranspiration values for this marsh area averaged about 48 inches per year. This value is slightly less than the value calculated for marsh areas in the South Florida Water Management Model Documentation report (MacVicar, VanLent, Castro, 1984) when sufficient water is available. In another study, "Evapotranspiration Patterns in Florida" (Dohrenwend, 1977), a map of potential evapotranspiration patterns in Florida was presented. The potential evapotranspiration in this report was defined as "the theoretical quantity of water which would be given up to the atmosphere within a zonal climate and upon a zonal soil by the natural vegetation of the area, if sufficient but not excessive water were available throughout the growing season." This definition is very similar to the condition that existed in the Boney Marsh experimental area during this study period. The estimated potential evapotranspiration from this study and from the latest calibration of the South Florida Water Management model for the marsh areas that exist in the water conservation areas (personal communication with E.R. Santee, 1987) agree very closely with the values estimated by Dohrenwend. Dohrenwend also predicted that potential evapotranspiration values for the Water Conservation Areas would be higher than those for the Boney Marsh area based on temperature data from the two areas.

It is expected that the unit runoff values should be applicable to other areas within the Kissimmee River flood plain if and when these areas are subjected to

flow-through or raised pool elevations. These areas then would, too, become consumptive use areas during normal and dry rainfall periods. The pan evaporation coefficients may be a more applicable method of transferring this data to ungauged areas with similar vegetation and water conditions if the rainfall conditions are significantly different.

## VII. CONCLUSION

Portions of the Kissimmee River floodplain will likely become a net consumptive water use area rather than a runoff generating region if they are maintained at raised pool conditions. This was demonstrated for restored marsh environments subjected to flow-through conditions similar to those which might be expected from dechannelization of the Kissimmee River. Phase 1 studies provided some evidence that this would also be the case for marsh restoration options such as regulated pool fluctuations.

Extrapolating the results of this study to marsh restoration options for water quality improvement such as detention and retention areas on similar vegetation type indicates that increased consumptive use of water should be taken into account in computing the overall impacts of these alternatives. While the absolute magnitude of the increased consumptive use will vary depending on local site conditions such as intensity of drainage prior to modification, rainfall conditions, and specific design of modifications, the magnitude of these increases is likely to be quite substantial.

The technique of presenting a summary of residual errors in a format compatible with standard textbook statistical distributions provides valuable insight into the source of the error terms and the relationship between reliability of the data with increasing time resolution.

There is a tendency toward decreasing the time steps for modeling projects in an effort to provide more detail in the results. Several decades ago the majority of



work was concentrated on yearly time intervals. This was decreased to monthly intervals about 20 years ago. Current efforts are tending toward daily, hourly, or even finer time steps. There has been some concern during the last decade that these reduced time steps may not be justified without increasing the density of the monitoring network used to calibrate and/or drive the models. This point was clearly demonstrated for the case of a water budget analysis with a monitoring network density consistent with normal practice in studies of this type. Errors increased dramatically with decreasing time steps. Expected errors on a yearly basis were very good. These errors increased to marginally acceptable values on a monthly basis. On a daily basis the expected error was so large that the data could not be reliably used for many purposes.

Analysis of the variation in errors indicated that a substantial portion of the daily error term could be attributed to an inability to adequately describe storage changes. This translates to insufficient water level monitoring density. Undoubtedly areal distribution of rainfall and the inability of potential evaporation (as indexed by pan evaporation) to account for all variations in actual evapotranspiration on a daily basis had some effect on the error terms. The effect of spatial rainfall distribution and the expected deviation of evapotranspiration from potential evaporation over short time periods could not be evaluated with the existing monitoring network but the combined effect is not expected to be larger than 50% of the expected daily error.

Flow in and out of the flow-through area was computed using a standard equation for sharp-crested weirs as presented by King and Brater, 1963. Corrections for tailwater submergence were based on results by Villemonte, also presented by the above reference. A constant discharge coefficient of 3.0 was judged adequate by the calibration procedure used. The computed flows during the calibration period were further confirmed by a chloride budget analysis by Davis, 1981.

Rainfall was measured on site by a recording raingauge.

Evapotranspiration was computed by multiplying class A pan evaporation at S-65C, which is located approximately 10 miles southeast of the study site, by a constant coefficient of 0.70. The coefficient was developed through a calibration procedure described in the text. This procedure was judged adequate for yearly and monthly time scales. A constant coefficient on a monthly basis implies that climatic conditions, as represented by pan evaporation, are adequate to describe potential evapotranspiration from South Florida marshes without considering vegetation effects such as seasonal dormancy. There is evidence by other investigators that a constant coefficient applied to pan evaporation does not adequately describe potential evapotranspiration on a daily or shorter basis. This could not be verified in this study due to the large expected error in daily water balance. The procedure developed in this study should be transferable to similar vegetation subjected to an unlimited supply of water on a monthly or yearly basis.

Seepage was computed as 0.06 times the head difference across the levee times the number of miles of levee over which this head acts. The coefficient of 0.06 was obtained by the calibration procedure conducted during phase 1. It appears to represent seepage quite well at this location. The coefficient may not be readily transferable as it represents an average of soil conditions which vary quite abruptly in the upper soil layers as a result of soil profile formation in a floodplain developed from a meandering river.

## **BIBLIOGRAPHY**

- Davis, S.M. 1981. Mineral Flux in the Boney Marsh, Kissimmee River. South Florida Water Management District, Tech Publication 81-1.
- Dohrenwend, R.E. 1977. Evapotranspiration Patterns in Florida. Florida Scientist 40:184-192.
- Fan, A. 1985. Rainfall Drought Frequency and Availability of Surface Water in Martin County. South Florida Water Management District, Tech Memorandum. November 1985.
- Hammer, D.E. and Kadlec, R.H. 1986. A Model for Wetland Surface Water Dynamics. Water Resources Research 22,13:1951-1958.
- Hodgman, C.D. 1962. Mathematical Tables from Handbook of Chemistry and Physics, Chemical Rubber Publishing Co.
- Kadlec, R.H., Hammer, D.E., Nam, I.S., Wilkes, J.O. 1981. The Hydrology of Overland Flow in Wetlands. Chem. Eng. Commun. 9:331-334.
- King and Brater. 1963. Handbook of Hydraulics. McGraw-Hill, New York.
- Koepfen, W. 1931. Grundriss der Klimakunde. Walter de Gruyter Company, Berlin, Germany.
- Lin, S.T., and S.F. Shih. 1979. Modified Water Quantity Receiving Model for Florida Conservation Areas. Water Resources Bulletin 15:155-168.
- MacVicar, T. 1981. Frequency Analysis of Rainfall Maximums for Central and South Florida. South Florida Water Management District Tech. Publication 81-3.
- MacVicar, T., T. VanLent and A. Castro. 1984. South Florida Water Management Documentation Report. South Florida Water Management District Tech. Publication 84-3.

- Mierau, R.L. 1974. Memorandum Report on Surface Water Availability in Lake Istokpoga, Indian Prairie. South Florida Water Management District, Tech Memorandum. July 1974.
- Mierau, R.L. and W.V. Storch. 1974. Memorandum Report on Surface Water Availability in the St. Lucie Area. South Florida Water Management District, Tech Memorandum. July 1974.
- Mierau, R.L., R.E. Irons, and W.V. Storch. 1974. Surface Water Availability in the Calooshatchee. South Florida Water Management District, Tech Memorandum. September 1974.
- Neidrauer, C.J. and Cooper, R.M. In publication. A Two-Year Field Test of the Rainfall Plan. (South Florida Water Management District, technical publication in press.)
- Rosen, M. 1974. Memorandum. South Florida Water Management District.
- Sculley, S. 1986. Frequency Analysis of South Florida Water Management District Rainfall. South Florida Water Management District Tech. Publication 86-6.
- Shih, S.F. and Rahi, G.S. 1981. Seasonal Variations of Manning's Roughness Coefficient in a Subtropical Marsh. Transactions of the ASAE 25,1:116-119.
- Trimble, P. and R.L. Mierau. 1980. Memorandum Report on the Boney Marsh Water Budget. South Florida Water Management District, Tech Memorandum. July 1980.
- Visher, F.N. and G.H. Hughes. 1969. Interior Geological Survey Map Series 32. Bureau of Geology, Florida Dept. Nat. Resources, Tallahassee, Florida.
- Wade, H.D., W.H. Speir, J.C. Stephens, and E.H. Stewart. Determining the Water Balance from Climatic Data for Small Agricultural Watersheds in Peninsular Florida - Fla PL-25. In Annual Report U.S.D.A. Agricultural Research Service. Page 39.

# **APPENDIX A**

\*\*\*\*\* 1976 \*\*\*\*\*

MEAN STAGES IN FT. ABOVE M.S.L. FOR WESTERN MARSH AREA

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.00 N	.00 N	.00 N	40.13	39.93	39.59	40.08	40.01	40.54	41.33	41.93	41.30
2	.00 N	.00 N	.00 N	40.14	39.00	39.56	40.11	39.96	40.56	41.47	42.01	41.17
3	.00 N	.00 N	.00 N	40.18	39.85	39.67	40.10	40.02	40.81	41.48	42.02	41.07
4	.00 N	.00 N	.00 N	40.16	39.63	39.80	40.03	40.07	40.92	41.50	42.09	41.14
5	.00 N	.00 N	.00 N	40.04	39.68	39.96	39.96	40.13	40.87	41.67	42.10	41.06
6	.00 N	.00 N	.00 N	39.93	35.79	39.89	40.02	40.14	40.87	41.74	42.06	40.99
7	.00 N	.00 N	.00 N	39.91	35.67	39.87	40.08	40.14	41.02	41.83	41.90	41.19
8	.00 N	.00 N	.00 N	39.93	39.65	39.75	40.15	40.06	41.11	41.86	41.79	41.26
9	.00 N	.00 N	.00 N	39.91	39.61	39.73	40.14	39.97	41.15	41.90	41.85	41.28
10	.00 N	.00 N	.00 N	39.98	39.58	39.75	40.05	40.05	41.19	41.82	41.88	41.28
11	.00 N	.00 N	.00 N	39.93	39.57	39.65	39.96	40.14	41.20	41.84	41.86	41.25
12	.00 N	.00 N	.00 N	39.86	39.56	39.62	40.05	40.17	41.04	41.90	41.86	41.06
13	.00 N	.00 N	.00 N	39.96	39.56	39.61	40.08	40.16	40.98	41.99	41.82	40.92
14	.00 N	.00 N	.00 N	40.07	39.63	39.58	40.01	40.30	41.05	41.97	41.55	40.85
15	.00 N	.00 N	.00 N	40.11	39.58	39.59	40.04	40.25	40.97	42.03	41.42	40.87
16	.00 N	.00 N	.00 N	40.13	39.65	39.60	40.06	40.20	41.03	42.00	41.37	40.76
17	.00 N	.00 N	.00 N	40.13	39.71	39.57	40.16	40.38	41.10	41.97	41.41	40.69
18	.00 N	.00 N	.00 N	39.99	39.66	39.55	40.08	40.44	41.14	41.93	41.37	40.62
19	.00 N	.00 N	.00 N	39.90	39.61	39.54	40.00	40.52	41.24	41.99	41.32	40.42
20	.00 N	.00 N	.00 N	39.99	39.57	39.54	40.04	40.53	41.11	41.97	41.32	40.29
21	.00 N	.00 N	.00 N	40.06	39.55	39.55	40.10	40.53	41.13	41.96	41.16	40.41
22	.00 N	.00 N	.00 N	40.09	39.59	39.53	40.18	40.43	41.19	41.93	41.05	40.44
23	.00 N	.00 N	.00 N	40.11	39.68	39.67	40.15	40.32	41.22	41.98	41.19	40.34
24	.00 N	.00 N	.00 N	40.12	39.65	39.78	40.12	40.41	41.20	41.94	41.18	40.29
25	.00 N	.00 N	.00 N	39.99	39.62	39.82	40.01	40.46	41.21	41.94	41.23	40.27
26	.00 N	.00 N	40.16	39.91	39.60	39.86	39.94	40.47	41.07	41.91	41.25	40.22
27	.00 N	.00 N	40.09	39.99	35.56	39.76	40.02	40.51	40.99	41.97	41.31	40.24
28	.00 N	.00 N	40.00	40.00	39.57	39.69	40.06	40.51	41.05	42.14	41.16	40.20
29	.00 N	.00 N	39.91	39.89	39.59	39.74	40.09	40.38	41.15	42.17	41.05	40.20
30	.00 N	.00 N	40.01	39.92	39.61	39.82	40.09	40.32	41.18	42.19	41.14	40.21
31	.00 N	.00 N	40.07		39.60		40.10	40.38		42.04		40.20
AVG.	.00 N	.00 N	7.75 N	40.02	39.64	39.69	40.07	40.27	41.05	41.88	41.56	40.73

AVG. FOR YEAR 31.20

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED

N = RECORD NOT AVAILABLE

\*\*\*\*\* 1977 \*\*\*\*\*

MEAN STAGES IN FT. ABOVE M.S.L. FOR WESTERN MARSH AREA

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	40.21	40.43	40.08	40.19	40.05	39.52	40.14	40.00	40.54	41.21	42.04	41.14
2	40.20	40.32	40.15	40.22	39.98	39.51	40.16	40.13	40.60	41.07	42.09	41.08
3	40.18	40.41	40.21	40.09	40.05	39.50	40.10	40.21	40.75	40.97	42.14	41.02
4	40.20	40.47	40.21	39.99	40.10	39.54	40.02	40.27	40.81	41.07	42.25	40.82
5	40.29	40.52	40.21	40.10	40.14	39.57	40.10	40.34	40.78	41.11	42.21	40.69
6	40.36	40.38	40.04	40.15	40.29	39.54	40.14	40.35	40.97	41.12	41.90	40.67
7	40.47	40.28	40.01	40.17	40.24	39.52	40.15	40.25	41.06	41.18	41.82	40.66
8	40.53	40.40	40.10	40.18	40.09	39.49	40.15	40.18	41.12	41.32	41.85	40.69
9	40.41	40.46	40.15	40.19	40.00	39.48	40.04	40.32	41.02	41.30	41.83	40.63
10	40.32	40.50	40.18	40.05	39.96	39.45	39.96	40.39	41.08	41.26	41.76	40.64
11	40.43	40.48	40.30	39.99	39.96	39.44	39.94	40.42	41.00	41.45	41.66	40.46
12	40.53	40.44	40.26	40.06	40.12	39.42	39.91	40.46	40.94	41.57	41.57	40.33
13	40.56	40.28	40.10	40.14	40.16	39.41	39.86	40.49	41.04	41.65	41.39	40.46
14	40.58	40.20	40.02	40.18	40.17	39.42	39.88	40.39	41.14	41.62	41.27	40.55
15	40.63	40.24	40.08	40.19	40.06	39.39	39.86	40.44	41.19	41.60	41.33	40.56
16	40.47	40.25	40.14	40.18	39.97	39.35	39.87	40.35	41.27	41.58	41.16	40.58
17	40.36	40.24	40.18	40.05	40.07	39.35	39.84	40.43	41.27	41.55	41.19	40.62
18	40.45	40.23	40.20	39.98	40.12	39.32	39.88	40.46	41.11	41.52	41.21	40.44
19	40.34	40.28	40.20	40.07	40.10	39.30	39.86	40.48	41.00	41.52	41.23	40.33
20	40.41	40.17	40.08	40.13	40.12	39.26	40.05	40.51	41.09	41.50	41.11	40.46
21	40.50	40.10	40.00	40.18	40.05	39.43	40.10	40.39	41.11	41.68	41.01	40.51
22	40.45	40.13	40.09	40.20	39.95	39.46	40.12	40.31	41.13	41.84	41.07	40.55
23	40.34	40.19	40.14	40.21	39.73	39.54	40.15	40.41	41.18	42.04	41.11	40.55
24	40.52	40.11	40.18	40.07	39.69	39.87	40.06	40.51	41.16	42.16	41.22	40.55
25	40.52	40.16	40.06	39.99	39.65	39.88	39.99	40.52	41.04	42.09	41.25	40.39
26	40.52	40.19	40.11	40.10	39.61	39.92	40.09	40.52	40.94	42.03	41.22	40.33
27	40.53	40.09	40.03	40.17	39.58	39.97	40.13	40.54	41.03	42.10	41.07	40.44
28	40.59	40.01	39.97	40.19	39.56	40.03	40.17	40.42	41.12	42.16	40.95	40.49
29	40.59	40.20	40.03	40.20	39.57	40.08	40.17	40.37	41.16	42.16	41.00	40.50
30	40.42	40.09	40.09	40.19	39.59	40.12	40.18	40.48	41.19	42.03	41.17	40.54
31	40.30	40.15	40.15	40.15	39.55	40.07	40.07	40.53	41.19	41.94	41.17	40.55
AVG.	40.43	40.28	40.12	40.13	39.95	39.57	40.04	40.38	41.03	41.60	41.47	40.59

AVG. FOR YEAR 40.47

LETTERS FOLLOWING NUMBERS MEAN:

M - PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N - RECORD NOT AVAILABLE

\*\*\*\*\* 1978 \*\*\*\*\*

MEAN STAGES, IN FT. ABOVE M.S.L. FOR WESTERN MARSH AREA

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	40.40	40.15	40.12	40.29	40.07	39.49	40.34	40.64	40.78	41.97	41.33	40.66
2	40.32	40.11	40.22	40.12	40.18	39.46	40.18	40.57	40.91	41.94	41.14	40.73
3	40.43	40.11	40.25	40.03	40.26	39.47	40.14	40.55	40.88	42.01	41.18	40.52
4	40.46	40.16	40.29	40.16	40.34	39.48	40.35	40.59	41.02	42.09	41.20	40.41
5	40.51	40.05	40.11	40.22	40.29	39.47	40.19	40.61	41.12	42.13	41.08	40.55
6	40.52	39.96	40.01	40.26	40.03	39.71	40.26	40.44	41.12	42.16	40.99	40.60
7	40.45	39.99	40.12	40.27	39.94	39.73	40.31	40.36	41.16	42.16	41.08	40.57
8	40.34	40.06	40.20	40.28	39.86	39.73	40.42	40.48	41.19	42.03	41.29	40.65
9	40.27	40.19	40.23	40.12	39.80	39.76	40.23	40.56	41.19	41.93	41.19	40.45
10	40.43	40.25	40.30	40.03	39.74	39.75	40.25	40.59	41.08	42.01	41.17	40.34
11	40.48	40.24	40.20	40.15	39.70	39.73	40.27	40.61	40.99	41.92	41.20	40.28
12	40.51	40.07	40.10	40.07	39.67	39.75	40.31	40.66	41.05	42.09	41.07	40.49
13	40.57	40.08	40.01	40.05	39.65	39.90	40.34	40.46	41.11	42.20	40.98	40.57
14	40.57	40.04	40.12	40.00	39.63	39.84	40.34	40.37	41.17	42.20	41.01	40.60
15	40.41	40.11	40.19	40.12	39.56	40.17	40.26	40.50	41.21	42.07	41.09	40.64
16	40.32	40.15	40.23	40.04	39.53	40.26	40.21	40.53	41.23	41.96	41.13	40.65
17	40.43	40.20	40.26	39.97	39.51	40.34	40.25	40.56	41.08	42.02	41.12	40.47
18	40.50	40.21	40.28	40.12	39.67	40.20	40.25	40.57	40.97	42.06	41.11	40.38
19	40.54	40.09	40.09	40.20	39.65	40.15	40.43	40.58	41.05	42.07	40.93	40.57
20	40.67	39.99	40.00	40.25	39.63	40.26	40.37	40.49	41.08	42.07	40.82	40.60
21	40.62	40.12	40.13	40.28	39.62	40.33	40.35	40.35	41.08	41.93	40.92	40.61
22	40.62	40.19	40.21	40.27	39.58	40.33	40.28	40.47	41.11	41.84	40.92	40.63
23	40.32	40.22	40.25	40.10	39.56	40.34	40.26	40.51	41.35	41.76	40.89	40.65
24	40.46	40.20	40.29	39.99	39.55	40.40	40.27	40.53	41.11	41.86	40.71	40.47
25	40.37	40.21	40.28	40.13	39.54	40.27	40.26	40.56	41.09	41.87	40.80	40.41
26	40.45	40.06	40.10	40.20	39.53	40.18	40.34	40.57	41.16	41.70	40.64	40.35
27	40.48	40.01	40.00	40.24	39.51	40.24	40.31	40.38	41.31	41.58	40.57	40.52
28	40.44	40.10	40.14	40.24	39.52	40.30	40.37	40.28	41.49	41.59	40.70	40.61
29	40.28	40.19	40.19	40.05	39.51	40.31	40.60	40.47	41.80	41.46	40.74	40.68
30	40.21	40.25	40.25	40.19	39.50	40.32	40.61	40.57	41.97	41.33	40.74	40.64
31	40.25	40.28	40.28	40.28	39.50	40.32	40.63	40.66	41.97	41.33	40.74	40.66
AVG.	40.43	40.12	40.18	40.15	39.73	39.99	40.32	40.52	41.16	41.92	40.99	40.54

AVG. FOR YEAR 40.51

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE



\*\*\*\*\* 1979 \*\*\*\*\*

MEAN STAGES IN FT. ABOVE M.S.L. FOR WESTERN MARSH AREA

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	40.37	40.31	40.27	40.29	40.07	39.49	40.34	40.64	40.78	41.97	41.33	40.66
2	40.32	40.29	40.22	40.12	40.18	39.48	40.18	40.57	40.91	41.94	41.14	40.73
3	40.51	40.29	40.25	40.03	40.26	39.47	40.14	40.55	40.88	42.01	41.18	40.52
4	40.51	40.17	40.29	40.16	40.34	39.48	40.35	40.59	41.02	42.04	41.20	40.41
5	40.63	40.09	40.11	40.22	40.25	39.47	40.19	40.61	41.12	42.13	41.08	40.55
6	40.39	40.21	40.01	40.26	40.03	39.71	40.26	40.44	41.12	42.16	40.99	40.60
7	40.43	40.27	40.12	40.27	39.94	39.73	40.31	40.36	41.16	42.16	41.08	40.57
8	40.34	40.31	40.20	40.28	39.86	39.73	40.42	40.48	41.19	42.03	41.29	40.65
9	40.52	40.32	40.23	40.12	39.80	39.76	40.23	40.56	41.19	41.93	41.19	40.65
10	40.55	40.32	40.30	40.03	39.74	39.75	40.25	40.59	41.08	42.01	41.17	40.45
11	40.54	40.17	40.20	40.15	39.70	39.73	40.27	40.61	40.99	41.92	41.20	40.34
12	40.56	40.06	40.10	40.07	39.67	39.75	40.31	40.66	41.05	42.09	41.07	40.49
13	40.54	40.17	40.01	40.05	39.65	39.90	40.34	40.46	41.11	42.20	40.98	40.57
14	40.45	40.23	40.12	40.00	39.53	39.89	40.34	40.37	41.17	42.20	41.01	40.60
15	40.35	40.35	40.19	40.12	39.56	40.17	40.26	40.50	41.21	42.07	41.09	40.64
16	40.47	40.39	40.23	40.04	39.53	40.26	40.21	40.53	41.23	41.96	41.13	40.65
17	40.49	40.19	40.26	39.97	39.51	40.34	40.25	40.56	41.08	42.02	41.12	40.47
18	40.51	40.09	40.26	40.12	39.67	40.20	40.25	40.57	40.97	42.06	41.11	40.38
19	40.52	40.04	40.09	40.20	39.65	40.15	40.43	40.58	41.05	42.07	40.93	40.57
20	40.50	40.19	40.00	40.25	39.63	40.26	40.37	40.49	41.08	42.07	40.82	40.60
21	40.35	40.27	40.13	40.28	39.62	40.33	40.35	40.35	41.08	41.93	40.92	40.61
22	40.30	40.29	40.21	40.27	39.58	40.33	40.28	40.47	41.11	41.84	40.92	40.63
23	40.40	40.29	40.25	40.10	39.56	40.34	40.26	40.51	41.35	41.78	40.89	40.65
24	40.42	40.17	40.29	39.99	39.55	40.40	40.27	40.53	41.11	41.86	40.71	40.47
25	40.50	40.08	40.28	40.13	39.54	40.27	40.26	40.56	41.09	41.87	40.80	40.41
26	40.47	40.08	40.10	40.20	39.53	40.18	40.34	40.57	41.16	41.70	40.64	40.35
27	40.45	40.16	40.00	40.24	39.51	40.24	40.31	40.38	41.31	41.58	40.57	40.52
28	40.32	40.21	40.14	40.24	39.52	40.30	40.37	40.28	41.49	41.59	40.70	40.61
29	40.21	40.19	40.05	40.05	39.51	40.31	40.60	40.47	41.80	41.46	40.74	40.68
30	40.31	40.25	40.19	40.19	39.50	40.32	40.61	40.57	41.97	41.33	40.74	40.64
31	40.34	40.28	40.28	40.28	39.50	40.32	40.63	40.66	41.97	41.38	40.74	40.46
AVG.	40.44	40.21	40.18	40.15	39.73	39.99	40.32	40.52	41.16	41.92	40.99	40.54

AVG. FOR YEAR 40.52

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1950 \*\*\*\*\*

YEAR STAGES IN FT. ABOVE M.S.L. FOR WESTERN MARSH AREA

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	40.44	40.32	40.35	40.24	39.94	39.73	40.14	40.53	41.02	41.98	41.05	40.54
2	40.23	40.24	40.53	40.42	39.92	34.72	40.20	40.57	41.02	42.03	40.97	40.64
3	40.53	40.20	40.20	40.30	39.80	35.95	40.25	40.40	41.14	42.01	40.85	40.53
4	40.22	40.26	40.25	40.18	39.82	34.83	40.29	40.30	41.20	42.03	40.94	40.64
5	40.59	40.30	40.29	40.25	39.78	39.82	40.16	40.48	41.25	41.91	41.06	40.67
6	40.50	40.29	40.31	40.14	39.75	39.77	40.07	40.53	41.23	41.82	41.12	40.69
7	40.56	40.32	40.32	40.11	39.72	40.01	40.01	40.57	41.10	41.88	41.00	40.56
8	40.53	40.33	40.35	40.24	39.69	35.91	40.18	40.60	41.01	41.90	41.05	40.47
9	40.53	40.23	40.24	40.27	39.67	39.89	40.24	40.50	41.09	41.93	40.96	40.60
10	40.54	40.20	40.16	40.26	39.72	39.85	40.30	40.48	41.14	41.84	40.76	40.64
11	40.54	40.23	40.24	40.26	39.69	34.83	40.31	40.42	41.23	41.88	40.81	40.51
12	40.44	40.26	40.24	40.24	39.67	40.14	40.20	40.60	41.35	41.81	40.81	40.43
13	40.38	40.27	40.32	40.17	39.83	40.07	40.09	40.69	41.45	41.74	40.84	40.57
14	40.47	40.30	40.35	40.08	34.61	40.03	40.04	40.74	41.41	41.80	40.85	40.51
15	40.50	40.34	40.35	40.11	34.59	39.95	40.19	40.73	41.34	41.84	40.64	40.42
16	40.51	40.24	40.24	40.15	34.56	39.95	40.42	40.76	41.51	41.73	40.66	40.57
17	40.52	40.15	40.14	40.18	39.53	40.16	40.47	40.66	41.60	41.75	40.65	40.64
18	40.42	40.25	40.22	40.18	39.50	40.19	40.31	40.56	41.65	41.65	40.75	40.67
19	40.36	40.26	40.27	40.07	39.45	40.23	40.37	40.70	41.71	41.59	40.82	40.63
20	40.36	40.27	40.35	40.02	39.41	40.28	40.26	40.79	41.92	41.53	40.81	40.62
21	40.31	40.31	40.36	39.96	39.74	40.24	40.16	40.82	41.68	41.55	40.80	40.52
22	40.39	40.34	40.36	40.03	39.66	40.24	40.31	40.86	41.60	41.56	40.67	40.46
23	40.46	40.23	40.23	40.07	39.54	40.13	40.34	40.91	41.70	41.44	40.58	40.59
24	40.48	40.14	40.13	40.11	40.02	40.22	40.43	40.79	41.78	41.43	40.52	40.62
25	40.48	40.23	40.21	40.13	40.01	40.26	40.35	40.71	41.84	41.30	40.70	40.63
26	40.40	40.27	40.27	40.11	39.91	40.29	40.42	40.64	41.91	41.20	40.73	40.52
27	40.34	40.30	40.32	40.02	39.93	40.28	40.34	40.91	41.97	41.13	40.76	40.60
28	40.40	40.34	40.33	39.94	39.87	40.24	40.23	40.95	41.91	41.15	40.65	40.50
29	40.42	40.34	40.34	39.86	39.80	40.13	40.36	40.98	41.86	41.28	40.76	40.42
30	40.40	40.22	40.22	39.81	39.76	40.04	40.45	41.09	41.93	41.24	40.63	40.54
31	40.42	40.14	40.14	39.81	39.76	40.04	40.51	41.06	41.93	41.21	40.63	40.56
AVG.	40.47	40.26	40.27	40.13	39.73	40.05	40.27	40.70	41.49	41.65	40.81	40.56

AVG. FOR YEAR 40.54

LETTERS FOLLOWING NUMBERS MEAN:

N = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1981 \*\*\*\*\*

MEAN STAGES IN FT. ABOVE M.S.L. FOR WESTERN MARSH AREA

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	40.60	40.51	40.40	40.21	40.04	39.96	40.24	39.73	40.75	41.65	41.11	40.61
2	40.53	40.44	40.34	40.27	39.95	39.74	40.24	39.68	40.98	41.32	41.03	40.52
3	40.57	40.57	40.20	40.29	39.88	39.68	40.37	39.69	41.00	41.94	41.13	40.47
4	40.46	40.60	40.24	40.30	39.81	39.64	40.23	39.66	41.04	41.79	41.20	40.42
5	40.40	40.60	40.27	40.16	39.76	39.62	40.11	39.57	41.12	41.75	41.23	40.38
6	40.56	40.61	40.25	40.06	39.71	39.60	40.04	39.44	40.99	41.83	41.21	40.36
7	40.59	40.62	40.30	40.19	39.68	39.60	40.26	39.18	40.92	41.98	41.05	40.32
8	40.50	40.54	40.21	40.25	39.55	39.59	40.28	39.50	40.99	41.88	40.94	40.30
9	40.62	40.57	40.12	40.27	39.65	39.58	40.18	38.97	41.08	41.89	40.87	40.30
10	40.65	40.61	40.23	40.27	39.62	39.72	40.12	38.93	41.12	41.89	40.94	40.27
11	40.54	40.47	40.26	40.26	39.59	39.84	40.09	38.91	41.13	41.86	41.05	40.26
12	40.49	40.52	40.27	40.14	39.54	39.95	40.12	38.88	41.18	41.83	41.07	40.24
13	40.57	40.49	40.29	40.34	39.50	39.88	40.15	38.83	41.03	41.96	41.09	40.22
14	40.60	40.40	40.32	40.15	39.45	39.84	40.34	38.78	40.97	41.75	40.97	40.21
15	40.61	40.36	40.22	40.20	39.38	39.60	40.22	38.71	41.06	41.80	40.88	40.44
16	40.65	40.24	40.19	40.22	39.22	40.08	40.32	38.66	41.15	41.72	40.81	40.50
17	40.54	40.30	40.21	40.27	39.07	40.09	40.22	38.59	41.19	41.61	40.90	40.56
18	40.54	40.39	40.25	40.30	39.02	40.11	40.15	38.55	41.27	41.51	40.95	40.60
19	40.46	40.30	40.30	40.16	39.28	40.18	40.10	38.53	41.39	41.44	40.97	40.64
20	40.57	40.34	40.35	40.07	39.56	40.22	40.06	38.57	41.27	41.54	40.97	40.50
21	40.61	40.24	40.33	40.13	40.19	40.12	40.05	38.64	41.20	41.50	40.82	40.40
22	40.62	40.21	40.21	40.18	39.99	40.35	39.98	39.40	41.29	41.65	40.71	40.52
23	40.65	40.13	40.20	40.21	39.85	40.23	40.01	39.29	41.34	41.39	40.64	40.60
24	40.65	40.23	40.22	40.21	39.76	40.23	39.99	39.18	41.36	41.22	40.76	40.66
25	40.54	40.27	40.26	40.10	39.77	40.26	39.95	39.53	41.34	41.11	40.78	40.68
26	40.48	40.31	40.29	40.01	39.73	40.24	39.92	40.34	41.36	41.02	40.80	40.53
27	40.56	40.32	40.30	39.95	39.72	40.27	39.88	40.44	41.34	41.12	40.67	40.42
28	40.59	40.31	40.18	40.35	39.76	40.21	39.85	40.51	41.32	41.24	40.74	40.37
29	40.62	40.07	40.07	40.07	39.72	40.14	39.83	40.71	41.43	41.27	40.63	40.46
30	40.60	40.02	40.02	40.01	39.68	40.24	39.80	40.65	41.57	41.32	40.57	40.54
31	40.59	40.16	40.16	40.01	39.63	39.63	39.77	40.60	41.57	41.22	40.57	40.56
AVG.	40.57	40.42	40.22	40.17	39.66	39.96	40.09	39.37	41.17	41.58	40.92	40.45

AVG. FOR YEAR 40.38

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1962 \*\*\*\*\*

MEAN STAGES IN FT. ABOVE M.S.L. FOR WESTERN MANGH AREA

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	40.58	40.17	40.07	40.23	39.90	39.90	40.27	40.45	41.04	42.17	41.29	40.59
2	40.45	40.27	40.16	40.27	39.84	39.81	40.29	40.36	41.09	42.29	41.53	40.49
3	40.39	40.31	40.22	40.26	39.79	39.91	40.30	40.53	40.97	42.18	41.38	40.64
4	40.53	40.35	40.24	40.12	39.70	39.76	40.18	40.52	41.05	42.12	41.24	40.67
5	40.44	40.22	40.25	40.00	39.71	39.82	40.06	40.57	40.98	42.13	41.15	40.53
6	40.44	40.26	40.26	40.12	39.60	39.79	40.15	40.57	40.91	42.28	41.26	40.44
7	40.53	40.17	40.20	40.19	39.67	39.75	40.26	40.65	41.04	42.29	41.14	40.54
8	40.58	40.10	40.14	40.22	39.64	39.78	40.32	40.44	41.12	42.34	41.06	40.64
9	40.47	40.20	40.16	40.23	39.62	39.74	40.31	40.35	41.17	42.29	41.16	40.63
10	40.40	40.25	40.23	40.11	39.61	39.71	40.38	40.53	41.22	42.21	41.25	40.65
11	40.32	40.25	40.28	40.09	39.58	39.68	40.18	40.55	41.21	42.14	41.27	40.64
12	40.44	40.31	40.16	40.06	39.55	39.64	40.07	40.56	.00 M	42.22	41.13	40.52
13	40.46	40.34	40.18	40.07	39.52	39.52	40.22	40.59	.00 M	42.26	41.21	40.49
14	40.53	40.20	40.13	40.10	39.54	39.41	40.30	40.67	.00 M	42.29	41.10	40.59
15	40.55	40.06	40.03	40.14	39.46	39.66	40.35	40.50	.00 M	42.22	41.03	40.58
16	40.41	40.18	40.13	40.32	39.42	39.51	40.39	40.48	.00 M	42.06	41.14	40.60
17	40.52	40.24	40.25	40.11	39.34	40.21	40.41	40.54	.00 M	41.91	41.44	40.55
18	40.25	40.31	40.27	39.97	39.33	40.28	40.36	40.63	.00 M	41.84	41.41	40.56
19	40.39	40.17	40.28	39.91	39.80	40.32	40.24	40.77	.00 M	41.91	41.37	40.43
20	40.45	40.21	40.27	40.00	39.63	40.21	40.32	40.70	.00 M	41.91	41.16	40.40
21	40.48	40.13	40.15	40.08	39.78	40.17	40.33	40.62	.00 M	41.92	41.04	40.54
22	40.44	40.03	40.04	40.14	39.67	40.16	40.56	40.50	.00 M	41.91	40.95	40.52
23	40.36	40.16	40.13	40.15	39.81	40.20	40.54	40.53	.00 M	41.76	41.07	40.59
24	40.28	40.23	40.22	40.02	39.80	40.27	40.55	40.62	.00 M	41.66	41.06	40.61
25	40.22	40.26	40.26	39.92	39.73	40.35	40.44	40.62	.00 M	41.59	41.06	40.47
26	40.34	40.29	40.29	39.86	39.70	40.41	40.33	40.68	.00 M	41.66	40.90	40.40
27	40.37	40.33	40.28	40.03	39.82	40.27	40.42	40.77	.00 M	41.69	40.95	40.31
28	40.40	40.18	40.16	40.15	39.76	40.15	40.41	40.68	.00 M	41.69	40.80	40.45
29	40.42	40.23	40.23	40.15	39.70	40.16	40.75	40.59	.00 M	41.65	40.71	40.49
30	40.30	40.17	40.17	40.00	39.68	40.25	40.70	40.55	41.74	41.47	40.63	40.58
31	40.21	40.16	40.16	39.79	39.79	40.25	40.66	40.70		41.36		40.61
AVG.	40.41	40.23	40.19	40.10	39.67	39.72	40.36	40.57	41.07	41.98	41.12	40.54

AVG. FOR YEAR 40.52

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED

N = RECORD NOT AVAILABLE

\*\*\*\*\* 1963 \*\*\*\*\*

MEAN STAGES IN FT. ABOVE N.S.L. FOR WESTERN MARSH AREA

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	40.47	40.31	40.34	40.35	39.84	39.84	40.35	40.22	40.96	41.81	41.66	40.77
2	40.54	40.35	40.35	40.37	39.79	39.81	40.36	40.43	41.19	41.79	41.50	40.73
3	40.33	40.44	40.30	40.29	39.75	39.58	40.23	40.59	41.13	41.76	41.43	40.70
4	40.40	40.42	40.37	40.18	39.72	39.56	40.20	40.81	40.99	41.95	41.34	40.54
5	40.53	40.40	40.38	40.23	39.71	39.54	40.12	40.67	40.89	42.07	41.18	40.43
6	40.57	40.27	40.28	40.30	39.68	39.73	40.23	40.68	41.05	42.15	41.04	40.59
7	40.57	40.25	40.22	40.33	39.80	39.84	40.34	40.53	41.11	42.19	40.95	40.63
8	40.58	40.32	40.28	40.31	39.63	39.71	40.22	40.49	41.13	42.25	41.07	40.68
9	40.42	40.35	40.32	40.30	39.60	39.61	40.28	40.60	41.18	42.17	41.12	40.71
10	40.54	40.39	40.33	40.21	39.58	39.78	40.20	40.62	41.22	42.11	41.14	40.75
11	40.47	40.34	40.32	40.21	39.57	39.83	40.11	40.65	41.22	42.16	41.14	40.56
12	40.53	40.34	40.33	40.23	39.55	39.79	40.26	40.67	41.04	42.20	41.14	40.51
13	40.54	40.31	40.25	40.24	39.54	39.76	40.31	40.67	41.06	42.23	41.01	40.69
14	40.60	40.48	40.18	40.34	39.50	39.74	40.39	40.52	41.17	42.24	40.93	40.73
15	40.80	40.36	40.24	40.32	39.47	40.33	40.39	40.43	41.14	42.26	41.04	40.74
16	40.48	40.30	40.30	40.20	39.44	40.24	40.38	40.53	41.10	42.18	41.11	40.77
17	40.37	40.48	40.34	40.36	39.41	40.27	40.25	40.62	41.04	42.13	41.07	40.75
18	40.52	40.39	40.29	40.00	39.94	40.28	40.14	40.70	40.94	42.17	41.07	40.57
19	40.53	40.36	40.31	40.10	39.75	40.18	40.26	40.74	40.85	42.18	41.10	40.46
20	40.57	40.28	40.24	40.14	39.88	40.04	40.29	40.77	40.99	42.18	40.98	40.60
21	40.67	40.22	40.17	40.21	39.80	40.19	40.33	40.60	41.05	42.16	40.95	40.66
22	40.88	40.20	40.23	40.24	39.74	40.29	40.40	40.50	41.06	42.15	41.04	40.69
23	40.50	40.29	40.24	40.15	39.69	40.33	40.45	40.66	41.27	42.05	41.08	40.72
24	40.43	40.34	40.34	40.10	40.07	40.52	40.32	40.72	41.25	41.97	41.13	40.74
25	40.51	40.35	40.53	40.01	39.87	40.34	40.20	40.74	41.11	42.03	41.01	40.58
26	40.58	40.36	40.32	40.34	39.85	40.30	40.36	40.77	41.02	42.36	41.04	40.48
27	40.59	40.28	40.23	40.11	39.76	40.22	40.46	40.80	41.22	42.08	40.95	40.41
28	40.53	40.35	40.26	40.14	39.70	40.26	40.47	40.61	41.34	41.96	40.86	40.60
29	40.39	40.18	40.18	40.00	39.67	40.30	40.43	40.51	41.55	41.86	40.94	40.65
30	40.30	40.25	40.25	39.91	39.83	40.38	40.35	40.65	41.67	41.77	40.88	40.73
31	40.22	40.31	40.31	40.31	39.66	40.27	40.27	40.72	41.69	41.69	40.88	40.76
AVG.	40.50	40.34	40.24	40.19	39.69	40.01	40.30	40.61	41.13	42.06	41.10	40.64

AVG. FOR YEAR 40.57

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1954 \*\*\*\*\*

MEAN STAGES IN FT. ABOVE M.S.L. FOR WESTERN MARSH AREA

JAY	JAN	FEB	MAR	APK	MAY	JUN	JUL	AUG	SEP	UCT	NOV	DEC
1	40.01	40.01	40.13	40.35	40.14	39.91	40.37	40.23	40.69	41.54	41.69	40.86
2	40.51	40.50	40.00	40.21	40.24	39.00	40.20	40.27	40.80	41.54	41.58	40.66
3	40.44	40.58	40.04	40.11	40.19	39.83	40.09	40.37	40.73	41.70	41.39	40.64
4	40.61	40.41	40.02	40.23	40.14	39.77	40.26	40.30	40.67	41.35	41.17	40.54
5	40.07	40.29	40.00	40.29	39.98	39.74	40.41	40.38	40.82	41.97	41.02	40.64
6	40.70	40.21	39.90	40.38	39.91	39.70	40.33	40.30	40.97	42.05	40.88	40.68
7	40.74	40.11	39.70	40.30	39.08	39.66	40.45	40.23	41.09	42.11	40.91	40.71
8	40.59	40.30	40.20	40.37	39.84	39.66	40.32	40.17	41.23	42.00	40.92	40.67
9	40.49	40.35	40.23	40.23	39.82	35.63	40.10	40.23	41.29	42.02	40.94	40.65
10	40.64	40.42	40.23	40.13	39.81	39.01	40.27	40.29	41.22	42.09	40.95	40.52
11	40.67	40.42	40.44	40.25	39.77	39.57	40.19	40.33	41.16	42.16	40.96	40.43
12	40.73	40.27	40.32	40.29	39.75	39.55	39.97	40.35	41.25	42.18	40.86	40.55
13	40.70	40.17	40.22	40.34	39.72	39.47	40.07	40.26	41.30	42.20	40.60	40.61
14	40.70	40.30	40.54	40.37	39.09	39.61	40.25	40.16	41.38	42.21	40.81	40.68
15	40.62	40.33	40.41	40.45	39.66	39.66	40.30	40.27	41.40	42.14	40.75	40.67
16	40.52	40.33	40.42	40.35	39.66	40.22	40.16	40.32	41.37	42.07	40.94	40.68
17	40.63	40.37	40.39	40.24	39.64	40.12	40.09	40.30	41.20	42.11	40.93	40.58
18	40.68	40.36	40.40	40.14	39.02	40.02	40.13	40.40	41.10	42.13	40.98	40.49
19	40.71	40.26	40.26	40.24	39.59	39.93	40.20	40.41	41.15	42.06	40.94	40.61
20	40.74	40.10	40.10	40.30	39.54	40.12	40.16	40.36	41.19	42.03	40.92	40.62
21	40.76	40.28	40.27	40.34	39.50	40.21	40.17	40.24	41.22	41.99	41.03	40.66
22	40.60	40.32	40.33	40.35	39.45	40.25	40.15	40.31	41.22	41.96	41.09	40.68
23	40.51	40.40	40.30	40.25	39.40	40.16	40.10	40.36	41.23	41.94	41.25	40.69
24	40.65	40.27	40.30	40.15	39.44	40.34	40.07	40.39	41.10	41.92	41.24	40.57
25	40.68	40.18	40.27	40.28	39.53	40.22	40.11	40.52	41.01	41.90	41.17	40.38
26	40.72	40.12	40.12	40.32	39.50	40.21	40.09	40.54	41.09	41.95	41.09	40.30
27	40.74	40.06	40.08	40.36	39.84	40.20	40.10	40.54	41.16	42.00	41.05	40.24
28	40.75	40.18	40.02	40.37	39.92	40.44	40.09	40.46	41.24	42.07	41.13	40.40
29	40.54	40.18	40.18	40.39	39.94	40.47	40.07	40.49	41.46	41.98	41.12	40.44
30	40.54	40.25	40.25	40.24	39.94	40.60	40.05	40.59	41.54	41.91	40.96	40.46
31	40.62	40.33	40.33	40.24	39.97	40.03	40.03	40.65	41.54	41.88	40.96	40.39
AVG.	40.64	40.31	40.23	40.29	39.78	39.97	40.17	40.36	41.15	41.99	41.05	40.57

AVG. FOR YEAR 40.54

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1965 \*\*\*\*\*

MEAN STAGES IN FT. ABOVE M.S.L. FOR WESTERN MARSH AREA

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	40.31	40.00	40.24	40.23	40.13	39.31	40.28	40.33	40.42	41.77	41.20	40.67
2	40.24	40.51	40.32	40.12	40.06	39.72	40.19	40.37	40.37	41.90	41.24	40.67
3	40.20	40.43	40.32	40.23	39.95	39.50	40.27	40.37	40.42	42.00	41.30	40.59
4	40.35	40.35	40.25	40.31	39.93	39.61	40.31	40.50	40.35	42.07	41.13	40.71
5	40.40	40.30	40.16	40.33	39.90	39.40	40.36	40.39	40.35	42.28	41.07	40.72
6	40.54	40.42	40.28	40.34	39.88	39.27	40.27	40.24	40.48	42.24	41.13	40.75
7	40.42	40.42	40.28	40.35	39.83	39.26	40.33	40.30	40.48	42.07	41.16	40.77
8	40.37	40.40	40.24	40.22	39.80	39.20	40.30	40.35	40.43	41.95	41.16	40.71
9	40.45	40.40	40.30	40.12	39.77	39.15	40.19	40.42	40.34	42.04	41.17	40.45
10	40.55	40.31	40.29	40.23	39.74	39.13	40.27	40.42	40.39	42.08	41.19	40.29
11	40.50	40.23	40.25	40.26	39.71	39.20	40.32	40.35	40.42	41.97	41.01	40.36
12	40.64	40.16	40.21	40.30	39.68	39.55	40.35	40.24	40.21	41.86	40.91	40.35
13	40.51	40.30	40.24	40.33	39.71	39.37	40.39	40.17	40.24	41.69	41.09	40.40
14	40.52	40.31	40.24	40.36	39.66	40.36	40.40	40.25	40.78	41.55	41.13	40.41
15	40.44	40.33	40.22	40.30	39.62	40.42	40.29	40.34	40.68	41.92	41.13	40.43
16	40.55	40.33	40.14	40.20	39.55	40.23	40.17	40.60	40.82	41.30	41.15	40.42
17	40.60	40.33	40.27	40.24	39.67	40.12	40.26	40.41	40.78	41.21	40.99	40.41
18	40.64	40.25	40.26	40.24	39.39	40.05	40.33	40.41	41.12	41.18	40.88	40.40
19	40.60	40.19	40.26	40.16	39.35	40.09	40.37	40.30	41.31	41.03	40.82	40.40
20	40.68	40.27	40.31	40.20	39.31	40.24	40.49	40.19	41.44	40.93	40.97	40.40
21	40.55	40.23	40.36	40.20	39.24	40.36	40.36	40.25	41.61	40.85	41.08	40.50
22	40.48	40.27	40.39	40.18	39.27	40.33	40.24	40.37	41.66	40.81	41.14	40.54
23	40.60	40.30	40.47	40.15	39.35	40.30	40.15	40.40	41.59	40.93	41.16	40.54
24	40.63	40.32	40.34	40.17	39.30	40.20	40.23	40.42	41.51	41.03	41.18	40.50
25	40.66	40.25	40.21	40.09	39.54	40.09	40.29	40.42	41.66	41.11	41.01	40.59
26	40.68	40.18	40.12	39.99	39.37	40.19	40.34	40.34	41.75	41.13	40.69	40.66
27	40.68	40.27	40.22	40.12	39.96	40.25	40.36	40.25	41.87	41.17	41.04	40.61
28	40.55	40.27	40.24	40.11	39.93	40.32	40.37	40.30	41.83	41.04	41.09	40.68
29	40.47	40.27	40.33	40.09	39.94	40.34	40.31	40.43	41.88	40.97	41.06	40.72
30	40.59	40.35	40.35	40.06	39.90	40.41	40.25	40.49	41.82	41.10	40.84	40.63
31	40.63	40.36	40.36	40.06	39.86	40.41	40.26	40.37	41.82	41.18	40.84	40.57
AVG.	40.53	40.33	40.28	40.21	39.71	39.89	40.30	40.35	40.99	41.48	41.08	40.55

AVG. FOR YEAR 40.47

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1980 \*\*\*\*\*

MEAN STAGES IN FT. ABOVE M.S.L. FOR WESTERN MARSH AREA

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	40.66	40.70										
2	40.71	40.55										
3	40.61	40.37										
4	40.61	40.30										
5	40.62	40.30										
6	40.53	40.38										
7	40.50	40.41										
8	40.53	40.44										
9	40.60	40.45										
10	40.69	40.37										
11	40.72	40.27										
12	40.75	40.29										
13	40.82	40.37										
14	40.53	40.39										
15	40.61	40.40										
16	40.68	40.41										
17	40.74	40.28										
18	40.77	40.19										
19	40.53	40.13										
20	40.55	40.25										
21	40.49	40.31										
22	40.58	40.35										
23	40.66	40.36										
24	40.69	40.26										
25	40.72	40.20										
26	40.73	40.24										
27	40.80	40.29										
28	40.56	40.32										
29	40.61											
30	40.65											
31	40.69											
AVG.	40.63	40.34										

AVG. FOR YEAR 40.48

LETTERS FOLLOWING NUMBERS MEAN:

M - PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N - RECORD NOT AVAILABLE



# **APPENDIX B**

\*\*\*\*\* 1976 \*\*\*\*\*

MEAN STAGES IN FT. ABOVE M.S.L. FOR EASTERN MARSH AREA

JAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.00 N	.00 N	.00 N	39.49	39.26	39.29	39.29	39.68	40.31	41.36	41.94	41.12
2	.00 N	.00 N	.00 N	39.49	39.25	39.30	39.30	39.66	40.30	41.45	41.91	41.11
3	.00 N	.00 N	.00 N	39.47	39.25	39.44	39.28	39.78	40.46	41.42	41.88	41.10
4	.00 N	.00 N	.00 N	39.45	39.25	39.68	39.27	39.85	40.52	41.41	41.93	41.09
5	.00 N	.00 N	.00 N	39.43	39.22	39.86	39.24	39.88	40.51	41.47	41.91	41.08
6	.00 N	.00 N	.00 N	39.45	39.21	39.85	39.21	39.88	40.51	41.55	41.88	41.08
7	.00 N	.00 N	.00 N	39.47	39.18	39.84	39.19	39.88	40.61	41.64	41.85	41.16
8	.00 N	.00 N	.00 N	39.51	39.14	39.80	39.17	39.87	40.69	41.69	41.82	41.17
9	.00 N	.00 N	.00 N	39.54	39.11	39.78	39.18	39.84	40.79	41.78	41.77	41.17
10	.00 N	.00 N	.00 N	39.53	39.08	39.79	39.17	39.83	40.88	41.77	41.72	41.14
11	.00 N	.00 N	.00 N	39.52	39.06	39.73	39.14	39.85	40.97	41.75	41.68	41.10
12	.00 N	.00 N	.00 N	39.51	39.05	39.63	39.18	39.88	40.98	41.87	41.66	41.02
13	.00 N	.00 N	.00 N	39.52	39.04	39.52	39.16	39.89	40.96	41.94	41.60	40.95
14	.00 N	.00 N	.00 N	39.52	39.10	39.42	39.15	39.99	41.05	41.93	41.54	40.86
15	.00 N	.00 N	.00 N	39.51	39.10	39.38	39.12	40.00	41.03	41.91	41.48	40.75
16	.00 N	.00 N	.00 N	39.51	39.18	39.36	39.09	39.98	41.01	41.92	41.40	40.62
17	.00 N	.00 N	.00 N	39.49	39.42	39.32	39.17	40.11	40.99	41.92	41.33	40.51
18	.00 N	.00 N	.00 N	39.48	39.45	39.30	39.24	40.18	40.98	41.92	41.27	40.43
19	.00 N	.00 N	.00 N	39.47	39.43	39.27	39.26	40.29	41.15	41.93	41.22	40.39
20	.00 N	.00 N	.00 N	39.45	39.39	39.27	39.25	40.35	41.13	41.93	41.19	40.36
21	.00 N	.00 N	.00 N	39.46	39.36	39.29	39.23	40.34	41.11	41.94	41.16	40.34
22	.00 N	.00 N	.00 N	39.45	39.38	39.28	39.34	40.38	41.15	41.94	41.14	40.34
23	.00 N	.00 N	.00 N	39.44	39.53	39.30	39.32	40.37	41.16	41.94	41.11	40.33
24	.00 N	.00 N	.00 N	39.42	39.55	39.45	39.32	40.35	41.14	41.95	41.09	40.34
25	.00 N	.00 N	.00 N	39.40	39.51	39.48	39.28	40.34	41.13	41.95	41.08	40.33
26	.00 N	.00 N	39.56	39.38	39.51	39.42	39.26	40.33	41.12	42.10	41.06	40.32
27	.00 N	.00 N	39.55	39.37	39.47	39.37	39.25	40.31	41.11	42.09	41.05	40.36
28	.00 N	.00 N	39.55	39.34	39.38	39.34	39.51	40.36	41.10	42.06	41.04	40.35
29	.00 N	.00 N	39.54	39.30	39.36	39.29	39.59	40.36	41.10	41.99	41.03	40.34
30	.00 N	.00 N	39.53	39.29	39.37	39.28	39.67	40.34	41.18	41.98	41.06	40.32
31	.00 N	.00 N	39.52	39.33	39.33	39.73	39.73	40.32	41.18	41.96	41.06	40.31
AVG.	.00 N	.00 N	7.65 N	39.45	39.29	39.48	39.28	40.08	40.90	41.82	41.46	40.71

AVG. FOR YEAR 30.99

LETTERS FOLLOWING NUMBERS MEAN:

F = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1977 \*\*\*\*\*

MEAN STAGES, IN FT. ABOVE M.S.L. FOR EASTERN MARSH AREA

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	40.36	40.23	39.76	39.94	40.00	39.24	39.60	39.86	40.56	41.23	42.12	41.25
2	40.34	40.22	39.74	39.93	39.99	39.23	39.70	39.85	40.54	41.21	42.20	41.16
3	40.33	40.22	39.73	39.92	40.00	39.21	39.70	39.95	40.66	41.19	42.19	41.06
4	40.37	40.22	39.72	39.91	39.98	39.36	39.68	40.02	40.73	41.27	42.28	40.94
5	40.39	40.23	39.71	39.90	39.97	39.32	39.78	40.11	40.72	41.24	42.31	40.85
6	40.38	40.23	39.73	39.90	40.10	39.27	39.90	40.19	40.89	41.21	42.20	40.74
7	40.36	40.22	39.72	39.89	40.10	39.25	39.94	40.18	40.97	41.28	42.11	40.74
8	40.35	40.21	39.72	39.94	40.11	39.20	39.98	40.15	41.05	41.35	41.99	40.58
9	40.33	40.21	39.70	39.92	40.09	39.20	39.95	40.23	41.03	41.35	41.89	40.55
10	40.32	40.20	39.69	39.92	40.10	39.18	39.93	40.34	41.12	41.32	41.83	40.56
11	40.33	40.18	39.80	39.90	40.13	39.16	39.96	40.39	41.10	41.46	41.71	40.55
12	40.31	40.14	39.80	39.90	40.13	39.14	39.94	40.45	41.08	41.57	41.60	40.53
13	40.30	40.09	39.79	39.88	40.12	39.14	39.92	40.46	41.17	41.65	41.50	40.52
14	40.29	40.04	39.79	39.88	40.11	39.14	39.94	40.46	41.15	41.73	41.42	40.51
15	40.28	39.95	39.78	39.87	40.07	39.13	39.94	40.43	41.20	41.83	41.37	40.51
16	40.30	39.91	39.77	39.92	40.08	39.11	39.95	40.42	41.25	41.81	41.31	40.52
17	40.31	39.88	39.77	39.91	40.06	39.10	39.95	40.40	41.26	41.78	41.27	40.58
18	40.30	39.81	39.76	39.89	40.05	39.09	40.00	40.39	41.23	41.84	41.24	40.59
19	40.30	39.78	39.76	39.88	40.03	39.07	39.99	40.38	41.20	41.82	41.23	40.58
20	40.28	39.76	39.74	39.86	39.97	39.05	40.02	40.45	41.22	41.78	41.21	40.57
21	40.26	39.77	39.73	39.93	39.90	39.20	40.01	40.44	41.20	41.83	41.20	40.55
22	40.26	39.75	39.71	40.00	39.86	39.31	39.98	40.42	41.19	41.90	41.19	40.56
23	40.26	39.73	39.71	40.07	39.72	39.28	39.96	40.51	41.22	41.99	41.18	40.55
24	40.25	39.72	39.69	40.05	39.55	39.44	39.95	40.54	41.20	42.07	41.24	40.53
25	40.25	39.79	39.68	40.04	39.41	39.40	39.94	40.53	41.19	42.09	41.24	40.53
26	40.25	39.77	39.74	40.01	39.32	39.38	39.92	40.51	41.17	42.08	41.22	40.56
27	40.25	39.78	39.77	40.02	39.34	39.36	39.90	40.51	41.19	42.15	41.21	40.55
28	40.25	39.78	39.79	40.00	39.33	39.58	39.88	40.51	41.18	42.14	41.19	40.55
29	40.23	39.76	39.95	39.99	39.32	39.50	39.86	40.52	41.16	42.19	41.17	40.54
30	40.22	39.99	39.99	40.03	39.35	39.47	39.93	40.58	41.13	42.17	41.28	40.53
31	40.21	39.96	39.96	39.96	39.28	39.67	39.90	40.59	41.13	42.15	41.28	40.53
AVG.	40.30	39.99	39.76	39.94	39.86	39.25	39.90	40.35	41.07	41.70	41.57	40.64

AVG. FOR YEAR 40.36

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1976 \*\*\*\*\*

MEAN STAGES IN FT. ABOVE M.S.L. FOR EASTERN MARSH AREA

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	40.53	40.15	39.91	39.57	39.82	39.22	40.05	40.57	40.74	42.04	41.34	40.62
2	40.51	40.06	39.91	39.87	39.80	39.24	40.01	40.62	40.89	42.08	41.28	40.64
3	40.50	39.94	39.91	39.86	39.92	39.24	40.03	40.62	40.87	42.11	41.25	40.62
4	40.49	39.86	40.01	39.85	39.97	39.26	40.17	40.64	41.05	42.13	41.21	40.60
5	40.48	39.79	40.00	39.88	39.97	39.26	40.14	40.62	41.23	42.08	41.19	40.56
6	40.48	39.75	39.98	39.89	39.84	39.60	40.11	40.62	41.27	42.14	41.17	40.57
7	40.47	39.72	39.98	39.88	39.77	39.60	40.07	40.62	41.25	42.13	41.16	40.54
8	40.47	39.72	39.96	39.88	39.66	39.56	40.12	40.61	41.23	42.12	41.36	40.54
9	40.47	39.76	39.95	39.87	39.48	39.57	40.09	40.59	41.21	42.09	41.34	40.52
10	40.49	39.68	40.08	39.86	39.35	39.53	40.06	40.56	41.19	42.13	41.31	40.50
11	40.48	39.88	39.94	39.86	39.28	39.53	40.03	40.53	41.16	42.14	41.27	40.49
12	40.47	39.88	39.92	39.85	39.24	39.57	40.00	40.58	41.14	42.16	41.27	40.47
13	40.46	39.86	39.91	39.85	39.20	39.57	39.96	40.58	41.22	42.22	41.24	40.48
14	40.47	39.87	39.90	39.85	39.17	39.55	39.94	40.59	41.20	42.19	41.23	40.47
15	40.46	39.87	39.88	39.86	39.16	39.75	39.92	40.58	41.17	42.19	41.21	40.46
16	40.46	39.87	39.88	39.85	39.14	39.87	39.94	40.55	41.30	42.16	41.19	40.54
17	40.46	39.91	39.87	39.82	39.11	39.87	39.94	40.54	41.27	42.13	41.17	40.53
18	40.46	39.91	39.86	39.80	39.32	39.93	39.95	40.52	41.24	42.09	41.15	40.51
19	40.47	39.97	39.86	39.93	39.41	39.91	40.17	40.50	41.22	42.06	41.12	40.52
20	40.61	39.97	39.85	39.89	39.35	39.90	40.26	40.59	41.20	42.07	41.10	40.50
21	40.61	39.98	39.84	39.88	39.27	39.89	40.22	40.57	41.17	42.03	41.09	40.50
22	40.61	39.97	39.84	39.85	39.26	39.90	40.17	40.55	41.16	42.01	41.03	40.49
23	40.60	39.95	39.85	39.83	39.25	39.96	40.17	40.53	41.39	41.98	40.96	40.47
24	40.59	39.95	39.85	39.83	39.23	40.09	40.13	40.52	41.37	41.94	40.90	40.48
25	40.59	39.93	39.84	39.95	39.21	40.19	40.09	40.53	41.47	41.86	40.81	40.49
26	40.59	39.91	39.84	39.91	39.20	40.19	40.10	40.51	41.45	41.78	40.75	40.49
27	40.58	39.92	39.83	39.89	39.19	40.16	40.06	40.48	41.52	41.68	40.70	40.48
28	40.53	39.91	39.83	39.88	39.25	40.16	40.20	40.47	41.59	41.62	40.66	40.53
29	40.46		39.86	39.86	39.25	40.12	40.37	40.44	41.75	41.59	40.65	40.66
30	40.41		39.88	39.84	39.26	40.07	40.48	40.52	41.84	41.50	40.63	40.63
31	40.28		39.84		39.24	40.47	40.47	40.60		41.40		40.59
AVG.	40.50	39.90	39.90	39.87	39.61	39.75	40.11	40.56	41.26	42.00	41.09	40.53

AVG. FOR YEAR 40.41

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1979 \*\*\*\*\*

MEAN STAGES, IN FT. ABOVE M.S.L. FOR EASTERN MARSH AREA

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	40.56	40.03	39.89	39.87	39.82	39.22	40.05	40.57	40.74	42.04	41.34	40.62
2	40.53	40.00	39.91	39.87	39.80	39.24	40.01	40.62	40.89	42.08	41.28	40.64
3	40.53	39.99	39.91	39.86	39.92	39.24	40.03	40.65	40.87	42.11	41.25	40.62
4	40.50	39.97	40.01	39.85	39.97	39.26	40.17	40.64	41.05	42.13	41.21	40.60
5	40.49	39.97	40.00	39.88	39.97	39.26	40.14	40.62	41.23	42.08	41.19	40.58
6	40.47	39.96	39.98	39.89	39.84	39.60	40.11	40.62	41.27	42.14	41.17	40.57
7	40.45	39.94	39.94	39.88	39.77	39.60	40.07	40.62	41.25	42.13	41.16	40.54
8	40.44	39.95	39.96	39.88	39.66	39.56	40.12	40.61	41.23	42.12	41.36	40.54
9	40.43	39.94	39.95	39.87	39.48	39.57	40.09	40.59	41.21	42.09	41.34	40.52
10	40.40	39.94	40.06	39.86	39.35	39.53	40.06	40.56	41.19	42.13	41.31	40.50
11	40.38	39.93	39.94	39.86	39.28	39.53	40.03	40.53	41.16	42.14	41.27	40.49
12	40.37	39.92	39.92	39.85	39.24	39.57	40.00	40.58	41.14	42.16	41.27	40.47
13	40.61	39.91	39.91	39.85	39.20	39.57	39.96	40.58	41.22	42.22	41.24	40.47
14	40.63	39.90	39.90	39.85	39.17	39.55	39.94	40.59	41.20	42.19	41.23	40.47
15	40.57	39.90	39.88	39.86	39.16	39.75	39.92	40.58	41.17	42.19	41.21	40.46
16	40.47	39.68	39.88	39.85	39.14	39.87	39.94	40.55	41.30	42.16	41.19	40.54
17	40.39	39.88	39.87	39.82	39.11	39.97	39.94	40.54	41.27	42.13	41.17	40.53
18	40.33	39.88	39.86	39.80	39.32	39.93	39.95	40.52	41.24	42.09	41.15	40.51
19	40.28	39.88	39.86	39.93	39.41	39.91	40.17	40.50	41.22	42.06	41.12	40.52
20	40.25	39.88	39.85	39.89	39.35	39.90	40.26	40.59	41.20	42.07	41.10	40.50
21	40.25	39.88	39.84	39.88	39.27	39.89	40.22	40.57	41.17	42.03	41.09	40.50
22	40.27	39.87	39.84	39.85	39.26	39.90	40.17	40.55	41.16	42.01	41.03	40.49
23	40.24	39.87	39.85	39.83	39.25	39.96	40.17	40.53	41.39	41.98	40.96	40.47
24	40.19	39.85	39.85	39.83	39.23	40.09	40.13	40.52	41.37	41.94	40.90	40.48
25	40.26	39.86	39.84	39.95	39.21	40.19	40.09	40.53	41.47	41.88	40.81	40.49
26	40.15	39.90	39.84	39.91	39.20	40.19	40.10	40.51	41.45	41.78	40.75	40.49
27	40.12	39.90	39.83	39.89	39.19	40.16	40.06	40.48	41.52	41.68	40.70	40.46
28	40.11	39.89	39.83	39.88	39.25	40.16	40.20	40.47	41.59	41.62	40.66	40.53
29	40.08	39.86	39.86	39.86	39.25	40.12	40.37	40.44	41.75	41.59	40.65	40.66
30	40.06	39.88	39.88	39.84	39.26	40.07	40.48	40.52	41.84	41.50	40.63	40.63
31	40.04	39.88	39.88	39.24	39.24	40.07	40.47	40.60	41.40	41.40	40.59	40.59
AVG.	40.35	39.92	39.90	39.87	39.41	39.75	40.11	40.56	41.26	42.00	41.09	40.53

AVG. FOR YEAR 40.40

LETTERS FOLLOWING NUMBERS MEANI  
M • PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
N • RECORD NOT AVAILABLE

\*\*\*\*\* 1930 \*\*\*\*\*

MEAN STAGES, IN FT. ABOVE M.S.L., FOR EASTERN MARSH AREA

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	46.92	40.69	40.29	40.47	40.04	39.99	40.52	40.99	41.34	42.11	41.52	41.02
2	46.92	40.63	40.58	40.60	40.02	39.96	40.50	41.00	41.37	42.11	41.52	41.01
3	40.90	40.63	40.58	40.65	40.00	40.16	40.56	40.99	41.45	42.09	41.47	40.99
4	40.69	40.62	40.56	40.63	39.99	40.11	40.56	40.96	41.46	42.08	41.45	40.98
5	40.69	40.61	40.55	40.60	39.96	40.07	40.56	40.96	41.45	42.06	41.42	40.97
6	40.68	40.59	40.53	40.58	39.94	40.03	40.52	40.95	41.42	42.06	41.39	40.96
7	40.68	40.59	40.53	40.54	39.91	40.22	40.50	40.92	41.41	42.03	41.37	40.95
8	40.68	40.57	40.52	40.61	39.89	40.16	40.60	40.97	41.39	42.01	41.36	40.94
9	40.85	40.50	40.51	40.55	40.14	40.12	40.57	41.05	41.43	41.95	41.35	40.92
10	40.84	40.63	40.50	40.52	40.12	40.09	40.55	41.04	41.50	41.94	41.34	40.92
11	40.83	40.60	40.49	40.47	40.11	40.09	40.62	41.04	41.54	41.92	41.31	40.91
12	40.82	40.57	40.49	40.45	40.07	40.30	40.59	41.03	41.64	41.90	41.30	40.89
13	40.84	40.57	40.47	40.41	40.05	40.24	40.57	41.13	41.68	41.68	41.28	40.88
14	40.84	40.50	40.48	40.36	40.02	40.21	40.55	41.13	41.68	41.65	41.26	40.87
15	40.84	40.57	40.47	40.31	39.99	40.18	40.54	41.12	41.66	41.83	41.23	40.85
16	40.83	40.55	40.46	40.27	39.96	40.14	40.80	41.10	41.63	41.80	41.27	40.84
17	40.81	40.55	40.44	40.23	39.93	40.27	40.90	41.09	41.63	41.79	41.31	40.87
18	40.78	40.57	40.44	40.23	39.91	40.35	40.88	41.08	41.74	41.76	41.31	40.86
19	40.77	40.62	40.52	40.22	39.88	40.39	40.90	41.05	41.80	41.75	41.25	40.86
20	40.76	40.62	40.52	40.25	39.85	40.41	40.89	41.13	41.85	41.74	41.19	40.85
21	40.75	40.59	40.50	40.25	40.15	40.47	40.89	41.13	41.82	41.73	41.16	40.83
22	40.73	40.58	40.49	40.22	40.09	40.47	40.87	41.11	41.82	41.72	41.16	40.84
23	40.76	40.57	40.47	40.17	40.09	40.44	40.86	41.18	41.86	41.71	41.14	40.85
24	40.73	40.55	40.47	40.17	40.13	40.42	40.91	41.17	41.92	41.67	41.13	40.84
25	40.72	40.57	40.45	40.15	40.09	40.49	40.94	41.16	42.00	41.67	41.12	40.84
26	40.72	40.56	40.43	40.13	40.08	40.45	40.94	41.23	42.07	41.63	41.10	40.84
27	40.73	40.54	40.42	40.12	40.13	40.44	40.92	41.21	42.11	41.62	41.08	40.81
28	40.70	40.53	40.52	40.10	40.10	40.41	40.90	41.26	42.09	41.61	41.07	40.80
29	40.68	40.49	40.49	40.09	40.08	40.41	40.88	41.24	42.08	41.58	41.09	40.79
30	40.65	40.50	40.50	40.07	40.05	40.39	40.95	41.31	42.13	41.55	41.06	40.76
31	40.65	40.50	40.50	40.07	40.02	40.02	40.94	41.34	42.13	41.54	41.06	40.76
AVG.	40.80	40.58	40.50	40.35	40.03	40.26	40.73	41.10	41.70	41.93	41.27	40.88

AVG. FOR YEAR 40.84

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1961 \*\*\*\*\*

MEAN STAGES IN FT. ABOVE M.S.L. FOR EASTERN MARSH AREA

JAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	40.77	40.51	40.37	40.19	39.68	39.54	39.76	39.69	39.96	40.08	40.09	39.98
2	40.73	40.49	40.33	40.14	39.67	39.62	39.94	39.67	39.96	40.16	40.08	39.98
3	40.73	40.54	40.34	40.13	39.67	39.65	39.91	39.68	39.94	40.16	40.08	39.98
4	40.72	40.52	40.32	40.11	39.65	39.67	39.90	39.67	39.94	40.16	40.06	40.08
5	40.70	40.51	40.33	40.10	39.64	39.69	39.87	39.65	39.92	40.15	40.07	40.07
6	40.70	40.50	40.33	40.08	39.61	39.70	39.85	39.62	39.93	40.15	40.09	40.07
7	40.68	40.48	40.32	40.05	39.59	39.72	39.81	39.60	39.91	40.14	40.09	40.06
8	40.68	40.47	40.31	40.01	39.57	39.73	39.80	39.58	40.04	40.13	40.08	40.05
9	40.68	40.60	40.50	39.99	39.57	39.75	39.80	39.56	40.05	40.16	40.06	40.05
10	40.57	40.60	40.26	39.96	39.54	39.86	39.78	39.54	40.07	40.15	40.05	40.05
11	40.65	40.58	40.27	39.95	39.51	39.99	39.75	39.53	40.05	40.12	40.07	40.04
12	40.64	40.57	40.26	39.94	39.49	40.12	39.68	39.50	40.04	40.12	40.07	40.04
13	40.64	40.54	40.25	39.91	39.46	40.12	39.99	39.49	40.04	40.11	40.06	40.03
14	40.63	40.52	40.24	39.91	39.48	40.12	39.99	39.46	40.04	40.10	40.05	40.03
15	40.62	40.52	40.22	39.90	39.43	40.10	39.97	39.43	40.04	40.10	40.04	40.03
16	40.61	40.50	40.22	39.87	39.42	40.06	39.95	39.40	40.04	40.10	40.04	40.04
17	40.62	40.50	40.20	39.87	39.36	40.04	39.91	39.37	40.03	40.07	40.02	40.04
18	40.61	40.49	40.21	39.87	39.37	40.01	39.88	39.36	40.07	40.07	40.02	40.04
19	40.60	40.48	40.22	39.85	39.35	39.97	39.85	39.35	40.17	40.07	40.02	40.04
20	40.58	40.47	40.22	39.82	39.33	39.94	39.82	39.39	40.17	40.06	40.02	40.05
21	40.58	40.46	40.19	39.81	39.35	39.92	39.80	39.44	40.15	40.06	40.02	40.05
22	40.57	40.44	40.19	39.80	39.43	39.89	39.83	39.46	40.15	40.05	40.00	40.05
23	40.57	40.44	40.23	39.78	39.43	39.93	39.86	39.46	40.14	40.04	40.00	40.05
24	40.56	40.44	40.25	39.77	39.42	39.91	39.86	39.46	40.14	40.04	40.03	40.06
25	40.56	40.41	40.23	39.75	39.41	39.94	39.83	39.65	40.14	40.03	40.00	40.06
26	40.56	40.40	40.24	39.74	39.40	39.91	39.74	39.78	40.13	40.02	40.00	40.06
27	40.55	40.39	40.21	39.73	39.38	39.88	39.78	39.88	40.12	40.05	40.00	40.06
28	40.55	40.38	40.20	39.72	39.47	39.99	39.77	39.91	40.11	40.07	39.99	40.06
29	40.53	40.19	40.19	39.70	39.47	39.99	39.75	39.96	40.10	40.07	39.99	40.06
30	40.52	40.16	40.16	39.70	39.40	39.99	39.73	39.96	40.09	40.06	39.99	40.06
31	40.52	40.18	40.18	39.70	39.46	39.99	39.72	39.96	40.09	40.10	39.99	40.06
AVG.	40.62	40.49	40.25	39.90	39.49	39.89	39.85	39.60	40.06	40.10	40.04	40.04

AVG. FOR YEAR 40.02

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1962 \*\*\*\*\*

MEAN STAGES IN FT. ABOVE M.S.L. FOR EASTERN MARSH AREA

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	40.06	40.10	40.23	40.46	40.60	40.43	40.73	40.97	41.02	41.03	40.82	40.86
2	40.04	40.12	40.22	40.46	40.50	40.45	40.70	40.95	41.02	41.12	40.82	40.86
3	40.05	40.12	40.21	40.45	40.50	40.45	40.70	40.94	41.02	41.11	40.85	40.84
4	40.05	40.12	40.21	40.43	40.56	40.47	40.70	40.93	40.98	41.08	40.86	40.84
5	40.05	40.12	40.20	40.42	40.54	40.47	40.68	40.91	40.97	41.07	40.85	40.84
6	40.04	40.12	40.20	40.41	40.52	40.40	40.65	40.92	40.96	41.14	40.85	40.83
7	40.04	40.11	40.20	40.39	40.50	40.44	40.71	40.91	40.99	41.14	40.84	40.83
8	40.04	40.12	40.32	40.39	40.49	40.43	40.74	40.94	40.98	41.14	40.83	40.86
9	40.04	40.14	40.32	40.37	40.48	40.41	40.73	40.92	41.02	41.07	40.82	40.86
10	40.03	40.14	40.31	40.37	40.47	40.40	40.78	40.92	41.01	41.05	40.81	40.86
11	40.03	40.14	40.31	40.44	40.45	40.41	40.78	40.92	41.00	41.04	40.81	40.86
12	40.02	40.13	40.31	40.50	40.42	40.37	40.76	40.91	41.00	41.03	40.81	40.86
13	40.02	40.13	40.31	40.49	40.41	40.36	40.76	40.92	41.00	41.02	40.80	40.86
14	40.05	40.14	40.31	40.52	40.38	40.35	40.76	41.00	40.96	41.00	40.80	40.86
15	40.12	40.13	40.30	40.51	40.35	40.36	40.74	41.04	40.94	40.99	40.80	40.84
16	40.12	40.12	40.29	40.53	40.33	40.33	40.73	41.10	40.92	40.98	40.79	40.84
17	40.11	40.18	40.32	40.51	40.32	40.31	40.74	41.10	40.91	40.96	41.00	40.85
18	40.11	40.26	40.32	40.60	40.31	40.42	40.80	41.14	40.91	40.95	40.99	40.84
19	40.10	40.26	40.31	40.60	40.31	40.64	40.78	41.15	40.92	40.94	40.97	40.83
20	40.10	40.26	40.31	40.57	40.29	40.63	40.80	41.15	40.92	40.92	40.96	40.81
21	40.11	40.27	40.20	40.56	40.27	40.70	40.86	41.13	40.90	40.91	40.90	40.80
22	40.11	40.27	40.20	40.57	40.25	40.68	40.83	41.18	40.99	40.89	40.93	40.81
23	40.11	40.27	40.26	40.55	40.23	40.66	40.81	41.21	41.01	40.98	40.92	40.81
24	40.10	40.26	40.27	40.54	40.25	40.70	40.80	41.16	41.00	40.88	40.92	40.81
25	40.10	40.24	40.24	40.54	40.25	40.72	40.80	41.14	40.99	40.87	40.92	40.81
26	40.09	40.24	40.25	40.53	40.25	40.76	40.78	41.17	40.99	40.86	40.90	40.81
27	40.10	40.24	40.25	40.61	40.33	40.79	40.76	41.13	41.06	40.86	40.89	40.80
28	40.10	40.23	40.24	40.65	40.33	40.78	40.83	41.10	41.04	40.84	40.88	40.79
29	40.10	40.23	40.35	40.63	40.31	40.76	40.81	41.07	41.02	40.84	40.87	40.78
30	40.10	40.46	40.46	40.63	40.32	40.76	41.00	41.04	41.01	40.94	40.87	40.78
31	40.08	40.47	40.47	40.63	40.41	40.98	40.98	41.02	41.01	40.93	40.87	40.77
AVG.	40.07	40.18	40.29	40.51	40.39	40.53	40.78	41.04	40.98	40.98	40.87	40.83

AVG. FOR YEAR 40.62

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE



\*\*\*\*\* 1703 \*\*\*\*\*

MEAN STAGES, IN FT. ABOVE M.S.L. FOR EASTERN MARSH AREA

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	40.78	40.79	41.06	40.43	39.86	39.62	40.63	40.39	40.32	40.42	40.36	40.31
2	40.76	40.78	41.02	40.34	39.50	39.60	40.81	40.39	40.36	40.43	40.36	40.30
3	40.76	40.80	41.02	40.31	39.85	39.59	40.59	40.44	40.42	40.44	40.36	40.29
4	40.74	40.80	41.00	40.27	39.83	39.57	40.63	40.47	40.41	40.43	40.36	40.28
5	40.74	40.85	40.94	40.23	39.84	39.57	40.63	40.46	40.41	40.42	40.35	40.28
6	40.74	40.84	40.86	40.20	39.32	39.78	40.60	40.45	40.39	40.41	40.35	40.27
7	40.78	40.87	40.81	40.16	39.80	39.80	40.63	40.44	40.38	40.40	40.34	40.27
8	40.74	40.88	40.82	40.14	39.78	39.86	40.60	40.46	40.37	40.39	40.38	40.27
9	40.74	40.86	40.78	40.12	39.77	39.97	40.56	40.47	40.36	40.39	40.38	40.26
10	40.73	40.88	40.73	40.15	39.76	40.02	40.57	40.48	40.35	40.39	40.37	40.26
11	40.73	40.89	40.70	40.23	39.75	40.02	40.55	40.47	40.34	40.38	40.36	40.26
12	40.74	40.89	40.67	40.20	39.73	40.01	40.53	40.46	40.33	40.37	40.36	40.26
13	40.74	40.92	40.83	40.15	39.72	39.99	40.51	40.45	40.32	40.37	40.36	40.36
14	40.73	41.02	40.60	40.12	39.72	39.98	40.49	40.44	40.32	40.37	40.35	40.36
15	40.73	41.00	40.57	40.10	39.71	40.05	40.49	40.44	40.35	40.38	40.34	40.36
16	40.72	41.00	40.57	40.09	39.70	40.15	40.47	40.45	40.34	40.38	40.34	40.41
17	40.71	41.10	40.56	40.07	39.68	40.22	40.46	40.44	40.33	40.39	40.34	40.41
18	40.70	41.10	40.58	40.05	39.67	40.24	40.44	40.43	40.33	40.38	40.33	40.40
19	40.69	41.05	40.55	40.03	39.66	40.25	40.42	40.42	40.31	40.39	40.32	40.39
20	40.70	41.05	40.52	40.02	39.65	40.24	40.41	40.41	40.31	40.38	40.31	40.39
21	40.82	41.04	40.50	40.01	39.64	40.25	40.40	40.39	40.30	40.38	40.33	40.41
22	40.83	41.04	40.49	39.96	39.65	40.27	40.39	40.38	40.30	40.37	40.35	40.40
23	40.83	41.02	40.47	39.94	39.62	40.28	40.36	40.36	40.47	40.37	40.34	40.40
24	40.84	41.00	40.45	39.95	39.62	40.50	40.34	40.35	40.47	40.39	40.33	40.39
25	40.81	40.99	40.50	39.94	39.61	40.57	40.33	40.36	40.47	40.40	40.33	40.39
26	40.81	40.98	40.49	39.92	39.59	40.65	40.31	40.39	40.46	40.39	40.33	40.39
27	40.80	40.97	40.47	39.90	39.57	40.68	40.29	40.38	40.44	40.39	40.32	40.39
28	40.80	41.08	40.53	39.89	39.55	40.68	40.28	40.37	40.45	40.38	40.32	40.38
29	40.78		40.52	39.88	39.55	40.65	40.27	40.38	40.44	40.37	40.31	40.34
30	40.78		40.49	39.87	39.54	40.63	40.23	40.35	40.43	40.37	40.31	40.45
31	40.78		40.46		39.60		40.36	40.33		40.36		40.47
AVG.	40.76	40.95	40.66	40.99	39.70	40.12	40.47	40.42	40.38	40.39	40.34	40.35

AVG. FOR YEAR 40.38

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1934 \*\*\*\*\*

MEAN STAGES IN FT. ABOVE M.S.L. FOR EASTERN MARSH AREA

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	40.40	40.44	40.57	40.47	40.44	40.52	40.49	40.40	40.41	40.31	40.16	40.40
2	40.44	40.44	40.57	40.46	40.60	40.45	40.47	40.39	40.40	40.33	40.17	40.41
3	40.45	40.43	40.50	40.44	40.39	40.39	40.45	40.38	40.39	40.33	40.16	40.47
4	40.48	40.43	40.52	40.44	40.33	40.34	40.43	40.30	40.37	40.32	40.21	40.46
5	40.48	40.42	40.53	40.43	40.33	40.29	40.49	40.35	40.36	40.31	40.33	40.47
6	40.47	40.41	40.52	40.49	40.31	40.24	40.47	40.33	40.36	40.31	40.33	40.47
7	40.47	40.41	40.52	40.43	40.31	40.20	40.54	40.33	40.36	40.31	40.32	40.47
8	40.47	40.41	40.51	40.47	40.29	40.18	40.50	40.31	40.37	40.30	40.31	40.46
9	40.47	40.40	40.51	40.47	40.20	40.15	40.47	40.31	40.36	40.28	40.29	40.46
10	40.47	40.40	40.50	40.46	40.27	40.12	40.55	40.29	40.36	40.26	40.28	40.45
11	40.47	40.39	40.50	40.45	40.27	40.10	40.52	40.27	40.35	40.27	40.28	40.45
12	40.45	40.39	40.49	40.44	40.25	40.09	40.48	40.27	40.34	40.25	40.27	40.44
13	40.45	40.39	40.49	40.43	40.23	40.07	40.44	40.25	40.33	40.25	40.25	40.44
14	40.45	40.43	40.57	40.42	40.21	40.07	40.41	40.25	40.32	40.25	40.24	40.45
15	40.42	40.44	40.59	40.47	40.19	40.04	40.40	40.23	40.31	40.23	40.23	40.44
16	40.44	40.44	40.57	40.52	40.17	40.11	40.39	40.21	40.30	40.23	40.22	40.44
17	40.44	40.44	40.50	40.54	40.15	40.12	40.39	40.23	40.28	40.22	40.21	40.44
18	40.44	40.44	40.55	40.53	40.12	40.12	40.38	40.22	40.28	40.21	40.20	40.43
19	40.44	40.44	40.54	40.52	40.10	40.10	40.41	40.20	40.27	40.20	40.19	40.42
20	40.44	40.43	40.52	40.51	40.08	40.10	40.40	40.26	40.27	40.20	40.19	40.42
21	40.45	40.44	40.52	40.49	40.07	40.07	40.39	40.26	40.27	40.19	40.19	40.41
22	40.45	40.44	40.50	40.48	40.04	40.05	40.39	40.27	40.26	40.18	40.20	40.41
23	40.45	40.53	40.49	40.47	40.03	40.04	40.39	40.26	40.26	40.18	40.29	40.41
24	40.45	40.53	40.48	40.46	40.09	40.27	40.39	40.27	40.25	40.16	40.39	40.41
25	40.45	40.52	40.53	40.43	40.12	40.32	40.39	40.29	40.24	40.15	40.42	40.41
26	40.45	40.52	40.52	40.47	40.17	40.42	40.39	40.29	40.23	40.15	40.43	40.41
27	40.45	40.52	40.52	40.47	40.45	40.51	40.40	40.39	40.21	40.15	40.42	40.41
28	40.45	40.50	40.51	40.45	40.51	40.58	40.41	40.44	40.21	40.18	40.42	40.41
29	40.45	40.44	40.49	40.44	40.55	40.57	40.40	40.44	40.32	40.19	40.41	40.41
30	40.45	40.44	40.49	40.42	40.57	40.53	40.39	40.43	40.32	40.18	40.41	40.41
31	40.44	40.40	40.40	40.42	40.56	40.37	40.37	40.41	40.32	40.18	40.41	40.40
AVG.	40.46	40.45	40.52	40.47	40.27	40.24	40.43	40.31	40.31	40.24	40.29	40.43

AVG. FOR YEAR 40.37

LETTERS FOLLOWING NUMBERS MEANS

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1965 \*\*\*\*\*

MEAN STAGES, IN FT., ABOVE M.S.L. FOR EASTERN MARSH AREA

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	40.40	40.31	40.10	40.12	40.35	40.12	40.42	40.69	41.56	40.75	40.94	41.61
2	40.34	40.31	40.10	40.12	40.41	40.10	40.43	40.70	41.51	40.75	40.92	41.65
3	40.39	40.30	40.06	40.10	40.20	40.07	40.41	40.68	41.75	40.72	41.02	41.65
4	40.39	40.30	40.07	40.17	40.47	40.04	40.40	40.77	41.43	40.77	41.07	41.74
5	40.44	40.29	40.07	40.17	40.44	40.01	40.39	40.72	41.65	40.91	41.15	41.74
6	40.45	40.28	40.05	40.15	40.42	39.96	40.38	40.65	41.40	40.92	41.26	41.74
7	40.44	40.28	40.04	40.15	40.40	39.95	40.41	40.65	41.53	40.91	41.31	41.76
8	40.44	40.28	40.03	40.14	40.38	39.92	40.41	40.65	41.84	40.90	41.33	41.74
9	40.43	40.28	40.00	40.13	40.38	39.89	40.40	40.72	41.98	40.79	41.35	41.76
10	40.42	40.28	39.99	40.12	40.35	39.87	40.39	40.86	41.99	40.73	41.39	41.77
11	40.41	40.26	39.93	40.11	40.33	40.16	40.37	40.85	42.37	40.73	41.45	41.79
12	40.42	40.25	39.98	40.10	40.31	40.25	40.35	40.80	41.88	40.64	41.49	41.78
13	40.41	40.27	39.95	40.10	40.33	40.26	40.36	40.73	41.16	40.65	41.52	41.79
14	40.40	40.25	39.94	40.12	40.32	40.36	40.39	40.65	40.81	40.64	41.52	41.74
15	40.39	40.25	39.92	40.12	40.29	40.68	40.38	40.68	40.72	40.70	41.53	41.79
16	40.37	40.24	39.92	40.11	40.28	40.72	40.36	40.73	40.66	40.70	41.54	41.81
17	40.37	40.23	39.94	40.16	40.26	40.65	40.41	40.66	40.62	40.56	41.55	41.80
18	40.36	40.21	39.95	40.19	40.24	40.50	40.63	40.64	40.58	40.65	41.56	41.78
19	40.36	40.20	40.04	40.19	40.21	40.52	40.78	40.60	40.63	40.69	41.58	41.75
20	40.36	40.20	40.04	40.17	40.19	40.51	40.77	40.58	40.63	40.71	41.58	41.65
21	40.36	40.16	40.04	40.15	40.18	40.51	40.74	40.64	40.76	40.56	41.59	41.55
22	40.35	40.18	40.04	40.15	40.14	40.46	40.65	40.63	40.72	40.65	41.59	41.54
23	40.34	40.16	40.16	40.13	40.12	40.47	40.60	40.73	40.74	40.54	41.58	41.54
24	40.33	40.15	40.15	40.13	40.09	40.45	40.59	40.77	40.70	40.64	41.61	41.53
25	40.33	40.14	40.18	40.15	40.29	40.44	40.57	41.04	40.76	40.65	41.63	41.53
26	40.32	40.13	40.18	40.20	40.25	40.42	40.56	41.16	41.11	40.66	41.63	41.53
27	40.32	40.12	40.17	40.18	40.24	40.40	40.56	41.49	41.30	40.73	41.63	41.52
28	40.32	40.11	40.15	40.18	40.23	40.39	40.57	42.07	41.33	40.78	41.62	41.51
29	40.31	40.11	40.15	40.29	40.21	40.37	40.60	41.67	41.05	40.84	41.62	41.51
30	40.31	40.15	40.15	40.40	40.18	40.44	40.67	41.65	40.79	40.89	41.62	41.50
31	40.31	40.13	40.13	40.15	40.15	40.15	40.68	41.70	40.79	40.92	41.62	41.50
AVG.	40.38	40.23	40.05	40.16	40.29	40.30	40.50	40.89	41.21	40.74	41.44	41.67

AVG. FOR YEAR 40.66

LETTERS FOLLOWING NUMBERS MEAN:

M - PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N - RECORD NOT AVAILABLE

\*\*\*\*\* 1986 \*\*\*\*\*

MEAN STAGES IN FT. ABOVE M.S.L. FOR EASTERN MARSH AREA

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	41.20	41.23										
2	41.50	41.14										
3	41.53	41.09										
4	41.54	41.10										
5	41.49	41.13										
6	41.45	41.15										
7	41.49	41.18										
8	41.50	41.10										
9	41.44	41.08										
10	41.36	41.17										
11	41.42	41.16										
12	41.53	41.14										
13	41.52	41.16										
14	41.61	41.18										
15	41.81	41.21										
16	41.59	41.18										
17	41.55	41.16										
18	41.55	41.15										
19	41.54	41.13										
20	41.51	41.10										
21	41.45	41.13										
22	41.42	41.13										
23	41.42	41.12										
24	41.43	41.09										
25	41.38	41.08										
26	41.38	41.06										
27	41.40	41.03										
28	41.41	41.01										
29	41.37											
30	41.34											
31	41.33											
AVG.	41.47	41.13										

AVG. FOR YEAR 41.30

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

# APPENDIX C

\*\*\*\*\* 1976 \*\*\*\*\*

RAINFALL, IN INCHES, RONEY DIKE

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.00 N	.00 N	.00 N	.00 N	.00 M	.05 M	.07	.18	.00	.00	.00	.00
2	.00 N	.00 N	.00 N	.00 M	.09	.70 M	.00	.00	1.12	.00	.02	.00
3	.00 N	.00 N	.00 N	.00 M	.01	1.09 M	.00	.05	.00	.00	.00	.00
4	.00 N	.00 N	.00 N	.00 M	.00	1.92 M	.00	.75	.00	.00	.00	.00
5	.00 N	.00 N	.00 N	.00 M	.00	.00 M	.00	.06	.13	.00	.00	.00
6	.00 N	.00 N	.00 N	.38 M	.00	.80 M	.01	.21	.16	.00	.00	1.00
7	.00 N	.00 N	.00 N	.33 M	.00	.00 M	.21	.00	.50	.00	.00	.04
8	.00 N	.00 N	.00 N	.27 M	.00	.17	.20	.01	.00	.45	.00	.07
9	.00 N	.00 N	.00 N	.00 M	.00	.43	.00	.03	.00	.00	.00	.00
10	.00 N	.00 N	.00 N	.00 M	.00	.40	.00	.32	.00	.00	.00	.00
11	.00 N	.00 N	.00 N	.00 M	.00	.29	.49	.44	.20	.14	.00	.00
12	.00 N	.00 N	.00 N	.00 M	.12	.00	.00	.23	.00	.00	.00	.00
13	.00 N	.00 N	.00 N	.00 M	.65	.00	.14	.14	.00	.00	.00	.00
14	.00 N	.00 N	.00 N	.00 M	.00	.00	.37	.00	.00	.00	.00	.00
15	.00 N	.00 N	.00 N	.00 M	.65	.08	.00	.00	.00	.00	.00	.00
16	.00 N	.00 N	.00 N	.00 M	1.57	.00	.92	.24	.00	.00	.00	.00
17	.00 N	.00 N	.00 N	.00 M	.28	.00	.19	.07	.00	.00	.00	.00
18	.00 N	.00 N	.00 N	.00 M	.00	.00	.00	.12	1.16	.00	.00	.00
19	.00 N	.00 N	.00 N	.00 M	.00	.13	.00	.00	.00	.00	.00	.00
20	.00 N	.00 N	.00 N	.00 M	.00	.37	.00	.00	.00	.11	.00	.00
21	.00 N	.00 N	.00 N	.00 M	.31	.00	.65	.61	.74	.00	.00	.00
22	.00 N	.00 N	.00 N	.00 M	1.56	.27	.00	.00	.23	.00	.00	.00
23	.00 N	.00 N	.00 N	.00 M	.13	1.32	.00	.00	.00	.00	.00	.13
24	.00 N	.00 N	.00 N	.00 M	.00	.48	.00	.00	.00	.00	.00	.01
25	.00 N	.00 N	.00 N	.00 M	.00	.00	.00	.00	.00	.00	.00	.00
26	.00 N	.00 N	.00 N	.00 M	.47 M	.00	.03	.00	.00	.00	.00	.43
27	.00 N	.00 N	.00 N	.00 M	.00	.00	.00	.00	.00	.00	.00	.00
28	.00 N	.00 N	.00 N	.00 M	.12 M	.11	.00	.04	.13	.00	.00	.00
29	.00 N	.00 N	.00 N	.00 M	.00 M	.20	.00	.00	.04	.00	.05	.00
30	.00 N	.00 N	.00 N	.00 M	.05 M	.00	.00	.00	.93	.00	.66	.00
31	.00 N	.00 N	.00 N	.00 M	.00 M	.00	.00	.04	.00	.00	.00	.73
TOTAL	.00 N	.00 N	.00 N	.98 M	6.01 M	8.89 M	3.04	4.09	5.46	.80	1.63	2.47

TOTAL FOR YEAR 33.37

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1977 \*\*\*\*\*

RAINFALL, IN INCHES, FROM BONEY DIKE

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.00	.00	.00	.00	.00	.15	.01	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.01	.42	.00	.00	.00
3	.32	.00	.00	.00	.00	1.04	.07	.00	.84	.00	.00	.28
4	.00	.16	.00	.00	.06	.08	.00	.00	.09	.00	1.50	.00
5	.00	.00	.13	.06	1.76	.02	.55	.07	1.16	.00	.00	.00
6	.00	.00	.02	.00	.03	.04	.00	.09	.00	.00	.00	.00
7	.00	.00	.09	.00	.00	.00	.00	.00	.00	.00	.00	.44
8	.00	.00	.00	.00	.00	.15	.00	.09	.01	.00	.00	.00
9	.00	.00	.00	.00	.20	.00	.00	.23	.00	.00	.00	.24
10	.11	.00	.85	.09	.36	.00	.49	.03	.00	.61	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.06	.00	.29	.00	.00
12	.00	.00	.00	.00	.00	.17	.00	.75	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.22	.21	.15	.00	.00	.00	.01
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01
15	.11	.00	.00	.00	.00	.00	.59	.67	.41	.00	.00	.18
16	.15	.00	.00	.00	.00	.07	.05	.00	.40	.00	.00	.61
17	.00	.00	.00	.00	.00	.00	.48	.00	.00	.00	.00	.10
18	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.05	.52	.11	.35	.00	.00	.00
20	.00	.12	.00	.00	.00	1.41	.00	.05	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.63	.00	.00	.01	.00	.00	.03
22	.00	.00	.00	.00	.00	.00	.00	.07	.59	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.01	.51	.00	.00	.93	.00
24	.00	.59	.00	.00	.00	.00	.00	.07	.00	.22	.02	.00
25	.00	.00	.07	.00	.00	.26	.17	.00	.00	.00	.00	.41
26	.00	.04	.00	.00	.59	.00	.02	.17	.46	.01	.00	.00
27	.06	.01	.00	.00	.13	.00	.00	.03	.01	.00	.00	.00
28	.00	.04	.00	.00	.29	.00	.00	.27	.00	.00	.00	.00
29	.00	.00	.00	.00	.48	.00	.00	.92	.00	.00	1.42	.00
30	.00	.00	.00	.00	.00	.00	.00	.11	.00	.00	.10	.01
31	.16	.00	.00	.00	.00	.00	.03	.02	.00	.00	.00	.00
TOTAL	.92	.96	1.16	.06	3.87	4.29	3.44	3.38	4.80	1.04	5.05	2.32

TOTAL FOR YEAR 31.29

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1978 \*\*\*\*\*

RAINFALL IN INCHES, BONEY DIKE

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.00	.00	.00	.00	.00	.41	.00	.66	.15	.00	.00	.30
2	.00	.06	.00	.00	.00	.00	.39	.32	.00	.01	.00	.00
3	.02	.00	1.04	.00	.00	.25	1.61	.00	.00	.00	.00	.00
4	.00	.01	.00	.00	.41	.02	.00	.00	.06	.00	.00	.00
5	.00	.00	.00	.00	.00	2.79	.04	.47	.95	.31	.00	.00
6	.00	.00	.00	.00	.45	.05	.00	.24	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1.36	.00
8	.27	.34	.02	.00	.00	.57	.00	.04	.00	.00	.00	.00
9	.04	1.16	2.00	.00	.04	.03	.01	.01	.01	.00	.00	.00
10	.00	.00	.00	.00	.00	.09	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.62	.00	.00	.00	.03	.00	.00
12	.00	.00	.00	.00	.00	.08	.00	.81	.00	.02	.00	.00
13	.13	.00	.00	.00	.00	.00	.00	.06	.00	.53	.00	.00
14	.00	.00	.00	.00	.00	.00	.04	.48	.00	.02	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.08	.04	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.59	.00	.00	.00
17	.14	.02	.00	.00	.00	.00	.07	.02	.00	.00	.00	.00
18	.00	.67	.00	.00	1.46	.00	.34	.00	.00	.00	.00	.00
19	1.48	.00	.00	.00	.65	.00	2.29	.02	.00	.00	.00	.00
20	.00	.14	.00	.00	.00	.11	1.14	1.20	.00	.00	.00	.00
21	.00	.03	.00	.00	.00	.00	.18	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.18	.00	.00	.00	.00	.15	.00
23	.00	.00	.00	.00	.00	.75	.35	.00	2.88	.00	.00	.00
24	.00	.00	.00	.00	.00	1.35	.07	.02	.00	.00	.00	.00
25	.16	.00	.00	.00	.00	.99	.02	.22	1.34	.00	.00	.78
26	.01	.00	.00	.00	.00	.20	.43	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.02	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.63	.46	1.64	.00	.00	.00	.00	.54
29	.00	.00	.00	.00	.00	.00	1.93	.00	.00	.43	.00	1.36
30	.00	.00	.00	.00	.19	.00	1.26	.00	.00	.00	.00	.00
31	.00	.00	.00	.00	.00	.00	.02	.00	.64	.03	.00	.00
					.00		1.71	.00		.14		.00
TOTAL	2.25	2.91	3.06	.00	4.64	8.96	14.63	4.52	6.73	2.60	1.55	2.48

TOTAL FOR YEAR 54.33

LETTERS FOLLOWING NUMBERS MEAN:

M - PART OF RECORD IS MISSING AND THUS ESTIMATED  
 N - RECORD NOT AVAILABLE



\*\*\*\*\* 1970 \*\*\*\*\*

RAINFALL, IN INCHES, BONEY DIKE

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.00	.00	.00	.00	.00	.25	.00	.01	.13	.00	.67	.00
2	.46	.00	.00	.00	.00	.00	.00	.00	.02	.00	.97	.00
3	.00	.00	.00	.00	.00	.05	.00	.23	3.37	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.21	.00	.00	.00
5	.00	.00	.08	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.10	.48	.00	.23	.00	.23	.40	.00	.00	.00	.84
7	.00	.00	.12	.00	.47	.00	.00	.56	.00	.00	.00	.19
8	.28	.00	.02	.00	.01	.00	.00	.00	.00	.00	.00	.04
9	.00	.00	.00	.00	1.24	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.03	.00	.00	1.31	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	2.84	.00	.00	.00	.00	.00	.00	.13	1.24	.00	.00	.00
13	.75	.00	.00	.00	.22	.00	.00	.00	.42	.00	.05	.00
14	.00	.00	.00	.00	.13	.00	.00	.00	2.51	.00	.00	.00
15	.00	.00	.00	.00	.00	.05	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.02	.00	.01	.00	.02	.00	.11
17	.00	.00	.00	.00	.03	.00	.00	.00	.00	.00	.00	.03
18	.02	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.04	.00	.06	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.05	.00	.00
21	.42	.00	.00	.16	.00	.02	.00	.00	.22	.00	.00	.00
22	.00	.00	.00	.00	.00	1.09	.00	.00	.00	.00	.00	.00
23	.00	.32	.00	.00	.00	.04	.00	.00	.00	.00	.00	.00
24	1.70	.58	.02	.57	.37	.00	.00	.14	.00	.00	.00	.00
25	.00	.00	.00	2.41	.00	.00	.00	.00	.00	.01	.15	.03
26	.00	.00	.00	.00	.00	.00	.52	.00	.00	.00	.00	.00
27	.02	.00	.00	.00	.00	2.30	.00	.13	.20	.00	.00	.00
28	.00	.00	.00	.00	.00	.22	.00	.00	.10	.00	.02	.00
29	.00	.00	.00	.18	.46	.00	.00	.02	.31	.00	.00	.00
30	.00	.00	.00	.12	.09	.00	.00	.18	.10	.00	.00	.00
31	.04	.00	.00	.00	.00	.00	.00	.02	.00	.00	.00	.00
TOTAL	6.55	1.00	1.39	3.44	3.28	4.04	.75	3.1P	8.91	.08	1.66	1.24

TOTAL FOR YEAR 35.72

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1980 \*\*\*\*\*

RAINFALLS IN INCHES, BONEY DIKE

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.00	.00	.00	.03	.00	.00	.76	.31	.39	.00	.00	.00
2	.00	.00	.99	2.44	.00	.00	.01	.00	.82	.00	.00	.00
3	.00	.01	.00	.27	.00	.00	.02	.00	.74	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.24	.07	.37	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.03	.00	.00	1.69	.00	.00	.00	.00
10	.00	.83	.00	.00	.69	.00	.00	.61	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.26	.00	.05	.12	.00	.00	.00
12	.32	.00	.01	.00	.00	.13	.00	.00	.42	.00	.00	.00
13	.03	.02	.00	.00	.00	.00	.00	.62	.00	.00	.00	.00
14	.02	.02	.20	.00	.00	.00	.00	.05	.00	.31	.00	.00
15	.00	.23	.00	.02	.00	.00	.09	.00	.06	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	2.89	.00	.04	.00	.93	.00
17	.00	.12	.00	.00	.00	.00	1.27	.27	.03	.00	.82	.64
18	.00	.11	.00	.00	.00	.00	.00	.00	.00	.00	.48	.03
19	.00	1.12	.00	.00	.00	.00	.00	.00	.00	.10	.00	.00
20	.00	.47	.00	.49	.00	.42	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.46	.00	.00	.00	.23	.00	.00
22	.00	.00	.01	.00	.00	.36	.00	.00	.00	.00	.00	.14
23	.63	.00	.00	.00	.22	.00	.00	.00	.00	.00	.00	.14
24	.00	.00	.00	.00	.66	.23	.52	.13	.00	.00	.00	.00
25	.00	.39	.00	.00	.00	.00	.52	.23	.02	.00	.07	.00
26	.07	.00	.00	.00	.10	.00	.01	.00	.00	.00	.00	.03
27	.40	.00	.02	.00	.99	.00	.01	.00	.00	.00	.06	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.07	.00
29	.00	.00	.00	.00	.00	.10	.00	.04	.00	.00	.62	.00
30	.00	.00	.46	.00	.00	.16	.00	.00	.00	.00	.00	.00
31	.04	.00	.02	.00	.00	.04	.00	.58	.00	.00	.00	.00
TOTAL	1.51	3.32	1.71	3.25	2.69	2.12	5.88	4.28	3.04	.64	3.08	.98

TOTAL FOR YEAR 32.50

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1981 \*\*\*\*\*

RAINFALL, IN INCHES, BONEY PIKE

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.00	.00	.00	.00	.00	2.47	.00	.05	.00	.00	.14	.00
2	.00	.00	.00	.00	.00	.00	.01	.00	.00	.29	.00	.00
3	.00	.58	.00	.00	.00	.00	.09	.40	.00	.00	.00	.05
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.20	.00	.00	.07	.00	.10	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.21	.00
7	.00	.00	.00	.00	.00	.75	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.37	.00	1.44	.00	.00	.00
9	.00	1.87	.00	.00	.00	.10	.01	.04	.05	.00	.00	.00
10	.00	.00	.00	.00	.00	1.54	.00	.00	.06	.00	.00	.00
11	.00	.00	.00	.00	.00	1.26	.00	.09	.07	.00	.24	.00
12	.00	.01	.00	.00	.00	1.35	1.47	.12	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.63	.00	.00	.00	.00	.00
14	.00	.02	.00	.00	.00	.02	.00	.00	.18	.00	.00	.00
15	.00	.22	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.02	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01
17	.00	.00	.07	.06	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.17	.00	.00	.00	.00	.00	.02	.54	.00	.02	.00
19	.00	.00	.00	.00	.00	.00	.00	.11	1.01	.00	.00	.00
20	.00	.00	.14	.00	.00	.02	.00	.69	.00	.00	.00	.00
21	.09	.00	.00	.00	1.20	.06	.00	.56	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.11	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.85	.73	.00	.05	.00	.00	.00
24	.07	.00	.73	.00	.00	.00	.01	.02	.00	.00	.00	.00
25	.07	.00	.00	.00	.00	.36	.00	1.36	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.02	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.44	.00	.07	.00	.00	.51	.00	.00
28	.00	.00	.00	.00	.77	1.43	.05	.00	.00	.06	.00	.00
29	.00	.00	.00	.00	.00	.09	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.05	.00	.00	.06	.00	.00	.00	.00	.00
31	.00	.00	.00	.00	.00	.00	.00	.00	.00	.50	.00	.00
TOTAL	.23	2.89	1.14	.12	2.41	10.52	3.50	3.57	3.51	1.36	.71	.06

TOTAL FOR YEAR 30.02

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1982 \*\*\*\*\*

PAINFALL IN INCHES, RONEY DIKE

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.00	.26	.00	.00	.00	.26	.00	.00	.24	.45	.00	.00
2	.00	.29	.00	.00	.00	.73	.02	.23	.23	1.82	.00	.00
3	.10	.00	.00	.00	.14	.20	.00	.43	.00	.00	.57	.00
4	.00	.00	.00	.00	.00	.00	.00	.60	.00	.00	.00	.00
5	.07	.00	.00	.00	.00	.16	.01	.00	.00	.00	.07	.00
6	.00	.00	.07	.00	.00	.00	.62	.33	.10	.76	.05	.00
7	.00	.05	1.16	.00	.01	.00	.54	.15	.53	.00	.00	.00
8	.00	.00	.19	.00	.00	.60	.60	.04	.25	.00	.00	.00
9	.00	.29	.00	.00	.00	.00	.00	2.35	.54	.00	.00	.00
10	.00	.00	.00	.44	.00	.00	.00	.01	.03	.00	.00	.00
11	.00	.12	.00	.73	.00	.00	1.11	.06	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.01	.00	.07	.05	.19	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.05	.00	.00	.00
14	.27	.00	.00	.00	.00	.00	.00	.00	.11	.00	.00	.00
15	.70	.00	.00	.00	.00	.00	.13	.00	.00	.00	.00	.00
16	.00	.00	.00	.02	.00	.30	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	1.73	.00	.00	.01	.00	.00	.00	.00	.00
18	.00	.93	.00	.00	.00	.00	.74	.00	.00	.02	.01	.00
19	.00	1.00	.00	.00	.00	1.59	1.39	.95	.00	.00	3.01	.00
20	.00	.00	.00	.01	.00	2.73	.00	.80	.00	.00	.00	.00
21	.00	.00	.00	.01	.00	.07	.33	.08	.46	.00	.00	.00
22	.00	.00	.00	.00	.00	.95	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.34	.00	.01	.00	.00	.01	.00	.00	.00
24	.00	.00	.00	.00	.00	.04	.00	1.26	1.30	.00	.00	.00
25	.04	.00	.24	.00	.47	.34	2.69	.90	.63	.00	.00	.00
26	.00	.00	.00	.00	.03	.59	.00	.00	.00	.03	.00	.00
27	.00	.00	.33	.01	.30	.84	2.82	.00	.00	.00	.00	.05
28	.00	.00	.00	1.03	1.18	.51	.00	1.06	.03	.00	.00	.00
29	.00	.00	.00	.43	.04	.00	.00	.00	1.39	.00	.00	.00
30	.00	1.81	.00	.00	.06	.00	.00	.00	.00	.00	.00	.00
31	.00	.87	.00	.00	.14	.00	.00	.02	.00	.06	.00	.00
		.00	.00	.00	1.42	.00	.00	.00	.02	.00	.00	.02
TOTAL	1.18	2.96	5.27	4.75 M	3.79	9.35	9.91	9.96	6.21	3.29	3.75	.07

TOTAL FOR YEAR 60.49

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1983 \*\*\*\*\*

RAINFALL IN INCHES, RONEY DIVE

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.00	.00	.11	.17	.00	.08	.20	.19	.02	.00	.00	.00
2	.02	.00	.00	.00	.00	.00	.00	.09	.52	.23	.00	.00
3	.06	1.31	.00	.32	.00	.00	.00	.72	.95	.00	.00	.00
4	.00	.00	.00	.00	.00	.04	.98	.26	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.19	.00	.00	.00	.00	1.68	.00	.00	.00	.00	.03	.00
7	.00	.75	.00	.00	.00	.00	.96	.12	.00	.00	.00	.12
8	.00	.21	1.00	.00	.00	.52	.06	.17	.00	.17	.41	.00
9	.00	.00	.79	.00	.00	.30	.00	.70	.00	.00	.18	.00
10	.00	.00	.00	.33	.00	.00	.00	.08	.44	.11	.00	.00
11	.13	.00	.10	.34	.00	.00	.00	.00	.02	.05	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.02	.00	.00	.00	.14
13	.00	.45	.00	.00	.00	.00	.00	.14	.00	.17	.00	1.13
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	1.53	.00	.00	.00	.00	.00	.00	.69	.05	.00	.00
16	.00	.00	.36	.00	.00	.00	.00	.00	.01	.13	.00	.00
17	.00	.00	.06	.07	.00	.00	.00	.33	.02	.00	.00	.63
18	.00	1.52	.00	.00	.00	.00	.00	.03	.00	.00	.15	.00
19	.00	.02	.70	.00	.00	.00	.00	.00	.00	.10	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.01	.15	.00	.00
21	1.72	.00	.00	.00	.00	.00	.00	.00	.02	.00	.00	.00
22	.00	.06	.00	.00	.00	.00	.00	.02	.00	.00	.50	.16
23	.00	.04	.07	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.08	.00	.02	.55	.00	2.61	.00	.00	1.50	.10	.00	.00
25	.00	.00	.08	.00	.00	3.07	.00	.01	.00	.17	.00	.00
26	.00	.00	1.08	.00	.00	.36	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	1.46	.00	.59	.00	.00	.03	.00
28	.00	1.60	.95	.00	.00	.39	.00	.00	.00	.00	.00	.00
29	.00	.00	.05	.00	.00	.00	.05	.00	.01	.00	.00	.00
30	.00	.00	.00	.00	.00	.00	.04	.00	.00	.00	.00	.00
31	.00	.00	.00	.00	.65	.03	.81	.00	.00	.00	.00	1.05
TOTAL	2.20	7.49	4.79	1.80	.78	11.00	3.52	3.66	3.83	1.45	1.30	3.45

TOTAL FOR YEAR 45.27

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED

N = RECORD NOT AVAILABLE

\*\*\*\*\* 1984 \*\*\*\*\*

PAINFALL IN INCHES, BONEY DIVE

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.09	.00	.04	.00	.00	.01	.00	.71 M	.12	.00	.00	.12
2	.03	.00	.00	.00	.00	.00	.00	.00 M	.00	.25	.02	.7F
3	.00	.00	.00	.00	.00	.00	.00	.00 M	.00	.00	.00	.32
4	.00	.00	.00	.00	.00	.00	.00	.00 M	.02	.00	.53	.00
5	.00	.00	.00	.00	.00	.00	.00	.00 M	.00	.00	1.28	.00
6	.00	.00	.00	.75	.00	.04	.00	.00 M	.16	.00	.00	.00
7	.00	.00	.00	.00	.20	.00	5.97	.00 M	.02	.00	.00	.00
8	.00	.00	.12	.00	.00	.00	.00	.00 M	.18	.00	.00	.00
9	.00	.00	.02	.00	.00	.00	.07	.00 M	.00	.00	.00	.00
10	.00	.00	.00	.00	.08	.00	1.39	.00 M	.00	.00	.00	.00
11	.05	.00	.00	.12	.01	.00	.00	.00 M	.05	.00	.00	.00
12	.00	.00	.00	.02	.00	.00	.00	.19	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00 M	.00	.00	.00	.00
14	.00	.66	1.30	.00	.00	.00	.00	.00 M	.00	.00	.00	.00
15	.00	.00	.19	.68	.00	.00	.00	.00 M	.00	.00	.00	.00
16	.00	.00	.00	.54	.00	.53	.00	.00 M	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.25	.00 M	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00 M	.00	.00	.00	.01
19	.00	.00	.00	.00	.00	.00	.55	.50 M	.00	.00	.00	.01
20	.05	.03	.00	.00	.00	.00	.02	.91 M	.06	.00	.00	.00
21	.21	.03	.00	.00	.00	.00	.00	.57 M	.01	.00	.00	.00
22	.01	.00	.01	.00	.00	.00	.23	.00 M	.00	.00	.00	.00
23	.00	1.47	.00	.00	.00	.00	.00	.19 M	.06	.00	.05	.00
24	.00	.02	.00	.00	.91	2.11	.00	.00 M	.04	.00	1.07	.00
25	.00	.00	.76	.55	.42	.49	.04 M	1.00 M	.00	.00	.35	.00
26	.00	.00	.00	.00	.57	.70	.28 M	.10 M	.00	.00	.00	.00
27	.00	.00	.00	.00	4.02	.23	.99 M	.40 M	.00	.00	.00	.00
28	.03	1.23	.00	.00	.61	.00	.00 M	.15 M	.00	.36	.00	.15
29	.00	.00	.00	.00	.69	.00	.03 M	.00 M	1.49	.05	.00	.00
30	.00	.00	.07	.00	.72	.00	.00 M	.00 M	.00	.00	.00	.00
31	.00	.00	.00	.00	.66	.00	.00 M	.00 M	.00	.00	.00	.00
TOTAL	.44	3.51	2.51	2.66	8.89	4.47	9.82 M	5.59 M	2.21	.75	4.20	1.39

TOTAL FOR YEAR 46.44

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1985 \*\*\*\*\*

RAINFALL, IN INCHES, BONEY DIKE

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.03	.00	.00
2	.00	.00	.00	.00	.00	.00	.42	.00	.12	.04	.09	.87
3	.00	.00	.00	.00	.00	.00	.10	.00	.97	.00	.40	.08
4	.00	.00	.00	.76	.00	.00	.00	2.47	.05	.07	.00	.06
5	.76	.00	.00	.00	.00	.00	.00	.85	.00	.95	.77	.00
6	.07	.00	.00	.00	.00	.06	.00	.00	1.33	.00	.10	.09
7	.00	.00	.00	.00	.00	.00	.66	.14	.20	.00	.00	.77
8	.00	.10	.00	.00	.00	.00	.28	.00	.00	.00	.00	.01
9	.00	.00	.00	.00	.00	.00	.00	.86	.00	.00	.00	.00
10	.00	.09	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.32	.93	.00	.02	.00	.00	.03	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.10	.02	.00	.47	.09	.34	.00	.00	.00	.46	.00
14	.00	.01	.00	.36	.00	1.15	.69	.00	.93	.00	.00	.00
15	.00	.00	.00	.00	.00	2.34	.00	.15	.00	.55	.01	.00
16	.00	.00	.00	.00	.00	.00	.04	.19	.12	.01	.00	.09
17	.00	.04	.14	.68	.00	.00	.52	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.16	.00	.00	.00	.00	.01
19	.04	.00	.81	.00	.10	.00	.00	.00	.22	.00	.00	.04
20	.08	.00	.00	.00	.00	.00	1.52	.00	2.20	.00	.01	.00
21	.04	.00	.00	.00	.00	.00	.46	.08	.70	.05	.11	.00
22	.00	.00	.00	.00	.06	.03	.09	.41	.10	.01	.02	.00
23	.00	.00	1.29	.00	.00	.19	.05	.00	.00	.00	.09	.00
24	.00	.00	.00	.00	.00	.05	.00	.00	.00	.00	.02	.00
25	.00	.00	.00	.00	1.50	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.46	.00	.00	.00	.00
27	.03	.00	.00	.00	.03	.00	.00	.00	.00	.00	.00	.03
28	.00	.00	.00	.00	.10	.00	.05	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	.00	.00	.28	.10	.16	.00	.00	.00
30	.05	.00	.00	.00	.00	1.06	.34	.09	.00	.14	.00	.00
31	.00	.00	.00	.00	.00	.00	.00	.05	.00	.04	.00	.00
TOTAL	1.07	.34	2.26	1.89	2.48	5.81	5.81	5.99	7.10	1.84	2.11	1.96

TOTAL FOR YEAR 38.66

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1986 \*\*\*\*\*

RAINFALL IN INCHES, BONEY DIKE

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.00	.00										
2	.00	.00										
3	.55	.00										
4	.08	.00										
5	.00	.00										
6	.00	.00										
7	.38	.00										
8	.00	.00										
9	.00	.00										
10	.00	.00										
11	.00	.00										
12	.00	.00										
13	.00	.00										
14	.00	.00										
15	.00	.00										
16	.00	.00										
17	.00	.00										
18	.00	.00										
19	.00	.00										
20	.00	1.65										
21	.00	.00										
22	.00	.00										
23	.00	.00										
24	.00	.00										
25	.00	.28										
26	.00	.00										
27	.00	.00										
28	.00	.00										
29	.00	.00										
30	.00	.00										
31	.00	.00										
TOTAL	1.01	1.93										

TOTAL FOR YEAR 2.94

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE



# **APPENDIX D**

\*\*\*\*\* 1976 \*\*\*\*\*

PAN EVAPORATION, IN INCHES, FROM STATION S-65C

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.00 N	.00 N	.00 N	.22	.30	.22	.28	.25	.24	.10	.20	.09
2	.00 N	.00 N	.00 N	.23	.20	.27	.18	.21	.20	.20	.16	.03
3	.00 N	.00 N	.00 N	.27	.22	.22	.19	.28	.31	.17	.14	.06
4	.00 N	.00 N	.00 N	.30	.26	.21	.23	.21	.22 M	.22	.18	.11
5	.00 N	.00 N	.00 N	.30	.25	.22 M	.25	.20	.20	.20	.20	.14
6	.00 N	.00 N	.00 N	.20	.24	.20	.31	.25	.20	.20	.17	.15
7	.00 N	.00 N	.00 N	.15	.30	.24	.28	.25	.20	.20	.15	.12
8	.00 N	.00 N	.00 N	.13	.27	.24	.25 M	.25	.20	.20	.15	.12
9	.00 N	.00 N	.00 N	.22 M	.28	.20	.26	.22	.25	.20	.20	.14
10	.00 N	.00 N	.00 N	.30	.28	.25 M	.23	.24	.20	.16	.20	.10
11	.00 N	.00 N	.00 N	.36	.30	.25 M	.24 M	.24	.20	.19	.20	.13
12	.00 N	.00 N	.00 N	.24	.25	.20	.24 M	.24	.20	.12	.19	.10
13	.00 N	.00 N	.00 N	.22	.30	.30	.24	.22	.21	.25	.18	.11
14	.00 N	.00 N	.00 N	.20	.26	.32	.24	.22	.21 M	.18	.16	.10
15	.00 N	.00 N	.00 N	.18	.28	.32	.24	.22	.20	.20	.15	.11
16	.00 N	.00 N	.00 N	.28	.23	.35	.32	.22	.20	.20	.17	.10
17	.00 N	.00 N	.00 N	.26	.26 M	.35	.35	.22 M	.23	.20	.17	.10
18	.00 N	.00 N	.00 N	.26	.20	.35	.28	.22 M	.24	.13	.20	.10
19	.00 N	.00 N	.00 N	.27	.25	.30	.28	.22 M	.24	.10	.22	.10
20	.00 N	.00 N	.00 N	.32	.27	.30	.27	.22 M	.25	.17	.18	.09
21	.00 N	.00 N	.00 N	.28	.30	.16	.20	.20	.15	.21	.16	.11
22	.00 N	.00 N	.00 N	.20	.28	.16	.25	.20	.17	.18	.13	.10
23	.00 N	.00 N	.00 N	.30	.28	.25	.22	.21	.16	.22	.10	.08
24	.00 N	.00 N	.00 N	.28	.26 M	.24 M	.24	.24	.16	.22	.10	.12
25	.00 N	.00 N	.00 N	.22	.26 M	.24 M	.22	.18	.18	.21	.18	.08
26	.00 N	.00 N	.00 N	.27	.25	.30	.27	.19	.20	.16	.16	.12
27	.00 N	.00 N	.00 N	.23	.25	.30	.31	.20	.20	.12	.14	.12
28	.00 N	.00 N	.00 N	.37	.26	.25	.30	.26	.20	.25	.10	.10
29	.00 N	.00 N	.00 N	.29	.30	.25	.30	.22	.20	.23	.10	.10
30	.00 N	.00 N	.00 N	.34	.22	.30	.27 M	.25	.25	.20	.10	.15
31	.00 N	.00 N	.00 N	.26	.20	.30	.30	.30	.20	.20	.16	.14
TOTAL	.00 N	.00 N	1.10 N	7.71 M	8.07 M	7.63 M	8.17 M	7.18 M	6.76 M	5.80	4.80	3.26

TOTAL FOR YEAR 59.98

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1977 \*\*\*\*\*

PAN EVAPORATION, IN INCHES, FROM STATION S-65C

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.08	.18	.12	.22	.35	.25	.26 M	.15	.25	.25	.20	.10
2	.12	.16	.23	.24	.40	.27	.26 M	.30	.20	.29	.18	.12
3	.05	.16	.23	.35	.31	.16	.26 M	.27	.06	.21	.15	.12
4	.13	.13	.20	.20	.32	.25 M	.26 M	.30	.19 M	.24	.13	.12
5	.05	.13	.22	.30	.30	.25 M	.26 M	.30	.17	.27	.14	.15
6	.05	.19	.20	.40	.15	.23	.26 M	.30	.14	.23	.14	.13 M
7	.07	.15	.21	.30	.30	.17	.26 M	.30	.18	.22	.16	.13 M
8	.12	.16	.15	.30	.35	.30	.26 M	.30	.20	.24	.14	.13
9	.09	.17	.17	.30	.30	.25	.26 M	.30	.30	.20	.14	.11
10	.10	.18	.20 M	.34	.35	.27	.26 M	.20	.20	.22	.18	.11
11	.10	.21	.19 M	.40	.18	.30	.26 M	.15	.30	.20	.22	.10
12	.10	.20	.18	.40	.20	.20	.26 M	.20	.23	.24	.15	.16
13	.13	.18	.19	.30	.20	.22	.26 M	.15	.25	.24	.15	.10
14	.10	.10	.25	.33	.30	.28	.26 M	.23 M	.22	.22	.17	.10
15	.13	.10	.13	.20	.30	.33	.26 M	.30	.24	.18	.16	.11 M
16	.12 M	.11	.22	.30	.30	.30	.26 M	.28	.23	.20	.17	.14
17	.14	.16	.15	.36	.30	.30	.26 M	.17	.23	.20	.13	.11 M
18	.14	.13	.20	.32	.30	.30	.26 M	.20	.23	.20	.15	.10
19	.09	.12	.27	.32	.30	.28 M	.26 M	.20	.17	.17	.13	.10
20	.09	.16	.20	.36	.30	.28 M	.26 M	.25	.11	.16	.20	.10
21	.09	.20	.26	.32	.30	.22	.26	.20	.21	.20	.19	.12
22	.09	.18	.30	.30	.40	.21	.24	.25	.13	.20	.14	.10
23	.09	.17	.30	.27	.36	.25	.25	.08	.08	.23	.20	.06
24	.10	.15	.30	.30	.30	.27	.20	.15	.23	.20	.11	.07
25	.17	.22	.20	.36	.24	.26	.23	.21	.20	.20	.15	.10
26	.18	.25	.14	.30	.35	.30	.22	.21	.20	.20	.15	.10
27	.10	.23	.29	.20	.34	.30	.30	.20	.20 M	.15	.10	.07
28	.11	.28	.26	.38	.29	.32	.30	.20	.20	.15	.10	.10
29	.10	.28	.27	.34	.29	.28	.32	.17	.20	.15	.14	.10
30	.10	.28	.28	.35	.37	.30	.28	.17	.20	.15	.16	.11
31	.16	.26	.26	.35	.22	.30	.30	.15	.25	.20	.13 M	.12
TOTAL	3.36 M	4.80	6.77 M	9.34	9.28	7.90 M	8.12 M	6.88 M	6.02 M	6.42	4.66 M	3.39 M

TOTAL FOR YEAR 76.94

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1978 \*\*\*\*\*

PAN EVAPORATION, IN INCHES, FROM STATION S-65C

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.04	.14	.10	.25	.25	.25	.20	.16	.17	.14	.16 M	.16 M
2	.07	.10	.10	.20	.25	.22	.21	.20	.20	.20	.16 M	.11
3	.13	.16	.10	.25	.28	.22	.29	.20	.22	.18	.16 M	.14
4	.10	.14	.15 M	.27	.19	.20	.25	.26	.20	.16	.16 M	.12
5	.10	.08	.17	.26	.25	.25	.31	.24	.20	.20	.16 M	.15
6	.12	.10	.16	.27	.25 M	.26 M	.24	.24	.30	.20	.16 M	.13
7	.08	.15	.17	.23	.25	.25	.18	.26	.20	.24	.16 M	.10
8	.12	.11	.20	.17	.30	.26	.13	.21	.20	.22	.16 M	.13
9	.10	.15	.20 M	.27	.30	.35	.22	.23	.20	.24	.16 M	.14
10	.16	.13	.20 M	.28	.26	.34	.25	.24	.17	.20	.16 M	.13
11	.12	.12	.20	.30	.30	.27	.30	.18	.25	.15	.16 M	.10
12	.11	.13	.20	.32	.31	.24	.20	.25	.25	.12	.16 M	.11
13	.13	.15	.20	.31	.31	.30	.20	.29	.25	.15	.16 M	.10
14	.10	.20	.22	.32	.40	.30	.20	.21	.20	.13	.16 M	.10
15	.13	.17	.24	.28	.36	.30	.20	.24	.20	.17	.16 M	.12
16	.10	.13	.24	.25	.32	.26	.30	.24	.20	.24	.16 M	.10
17	.10	.09	.20	.30	.28	.30	.19	.20	.20	.24	.16 M	.10
18	.08	.10	.20	.30	.15	.30	.22	.26	.20	.24	.16 M	.10
19	.10	.06	.20	.20	.20	.20	.22 M	.22	.20	.17	.16 M	.10
20	.13	.10	.16	.25	.20	.23	.25	.24	.20	.15	.16 M	.10
21	.15	.07	.20	.40	.28	.17	.29	.23	.23	.15	.16 M	.10
22	.10	.10	.24	.26	.33	.23 M	.23	.26	.20	.17	.16 M	.10
23	.10	.05	.20	.32	.32	.13	.22	.18	.20	.20	.16 M	.06
24	.12	.15	.21	.40	.23	.17	.20	.26	.17	.22	.16 M	.10
25	.13	.15	.20	.36	.24	.20	.26	.28	.15	.22	.16 M	.11
26	.10	.15	.23	.36	.26	.20	.30	.20	.18	.20	.16 M	.10
27	.15	.18	.22 M	.30	.18	.25	.23 M	.26	.16	.22	.16 M	.10
28	.12	.15	.20	.30	.25	.25	.23 M	.26	.20	.21	.16 M	.10 M
29	.16	.12	.23	.30	.24	.25	.22	.28	.20	.14	.16 M	.10
30	.12	.12	.20	.25	.25	.25	.20	.28	.20	.20	.16 M	.12
31	.14	.14	.20	.25	.30	.25	.22 M	.30	.22	.18	.16 M	.16
TOTAL	3.51	3.51	5.96 M	8.63	8.27 M	7.40 M	7.16 M	7.55 M	6.17	5.76	4.80 M	3.49 M

TOTAL FOR YEAR 72.21

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OF ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1979 \*\*\*\*\*

PAN EVAPORATION, IN INCHES, FROM STATION S-65C

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.23	.16	.14	.26	.09	.22	.28	.20 M	.11	.18 M	.27	.13
2	.12	.12	.17	.30	.10	.33	.26	.20 M	.35	.12	.21	.02
3	.12	.14	.19	.29	.26	.20	.29	.20 M	.17	.21	.15 M	.25
4	.14	.16	.18	.28	.40	.28	.24	.20 M	.12 M	.21	.14	.13
5	.11	.16	.18	.29	.22	.21	.15	.20 M	.21	.19	.13	.11
6	.11	.18	.13	.30	.23	.31	.20	.20 M	.25	.21	.18	.07
7	.15	.14	.18	.32	.12	.29	.30	.20 M	.20	.16	.13	.16
8	.14	.10	.17	.32	.11	.29	.22	.20 M	.35	.20	.15	.00
9	.12	.10	.15	.24	.23 M	.28	.22	.20 M	.15	.18 M	.12	.11
10	.16	.10	.20	.24	.18	.22	.28	.20 M	.27	.11	.15	.14
11	.12	.12	.11	.28	.29	.28	.23	.20 M	.21	.26	.13	.13
12	.14 M	.13	.16	.28	.26	.24	.27	.20 M	.10	.16	.30	.12
13	.10	.14	.18	.25	.27	.21	.27	.20 M	.18	.17	.03	.12
14	.12	.14	.18	.26	.23	.27	.24 M	.20 M	.21	.04	.10	.07
15	.17	.17	.24	.27	.25	.41	.25	.20 M	.14	.20	.19	.10
16	.18	.17	.28	.30	.18	.06	.16	.20 M	.21	.18	.14	.07
17	.15	.18	.23	.22	.32	.39	.14	.20 M	.21	.14	.14	.06
18	.15	.17	.23	.38	.25	.23	.20	.20 M	.28	.19	.10	.13
19	.11	.17	.23	.30	.34	.20	.26	.20 M	.21	.15	.10	.10
20	.15	.15	.23	.30	.11	.38	.30	.20 M	.25	.22	.19	.10
21	.15	.17	.21	.14	.42	.35	.21	.20 M	.27	.18	.20	.08
22	.10	.18	.15	.31	.10	.22	.27	.20 M	.17	.23	.10	.12
23	.13	.15	.15	.27	.23	.33	.23	.20 M	.27	.29	.19	.08
24	.16	.16	.20	.06	.24	.19	.18	.20 M	.21	.15	.11	.12
25	.17	.14	.29	.11	.23 M	.30	.15	.20 M	.22	.19	.16	.17
26	.19	.14	.23	.29	.24	.24	.30	.20 M	.28	.17	.09	.17
27	.12	.14	.24	.30	.26 M	.26 M	.29	.20 M	.22	.22	.15	.09
28	.12	.10	.26	.25	.20	.22	.28	.20 M	.18	.24	.09	.08
29	.14	.14	.27	.53	.33	.22	.22	.20 M	.17	.22	.11	.07
30	.20	.25	.25	.27 M	.17	.25	.30	.20 M	.10	.22	.19	.07
31	.16	.27	.27	.16	.16	.25	.25	.20 M	.10	.10	.19	.12
TOTAL	4.43 M	4.14	6.28	8.23 M	7.02 M	7.88 M	7.53 M	6.20 M	6.22 M	5.69 M	4.46 M	3.29

TOTAL FOR YEAR 71.37

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1960 \*\*\*\*\*

PAN EVAPORATION, IN INCHES, FROM STATION S-65C

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.12	.21	.16	.18	.28	.30 M	.24	.25	.11	.23	.18	.10
2	.07	.10	.20	.13	.24	.35	.18	.25	.20 M	.21	.13 M	.12
3	.09	.17	.22 M	.25 M	.21	.38	.28	.25	.38	.20	.10	.12
4	.08	.07	.15	.13	.19	.36	.27 M	.31	.13	.19	.20	.36
5	.05	.13	.11	.16	.22	.38	.30	.21	.06	.04	.20	.15
6	.13	.12	.16	.27	.22	.30	.32	.26	.23	.17	.10	.11
7	.10	.18	.16	.21	.39	.21	.31	.27	.29	.11	.20	.18
8	.10	.12	.18	.17	.32	.34	.34	.33	.13	.16	.16	.13
9	.11	.14	.20	.19	.33	.30	.29	.27	.20	.15	.14	.13
10	.11	.14	.19	.19	.19	.32	.19	.16	.24	.18	.10	.12
11	.13	.28	.23	.27	.14	.28	.29	.10	.25	.24	.11	.10
12	.05	.09	.23	.34	.26	.34	.34	.36	.20	.38	.05	.06
13	.19	.14	.19	.24	.36	.28	.25	.12	.22	.21	.11	.10
14	.11	.12	.26	.21	.40	.30	.30	.23	.05	.22	.21	.25
15	.14	.04	.30	.32	.27	.31 M	.27 M	.09	.12	.19	.22	.18
16	.10	.03	.24	.10	.30	.36	.36	.22	.14	.21	.11	.15
17	.14	.11	.20	.23	.30 M	.36	.27 M	.29	.32	.16	.10	.11
18	.14	.12	.35	.27	.30	.36	.18	.21	.23	.20	.16	.12
19	.05	.15 M	.28	.22	.31	.34	.27 M	.26	.20	.18	.14	.12
20	.12	.18	.26	.20	.28	.34	.30	.23	.22	.13	.18	.11
21	.12	.15	.15	.45	.41	.31 M	.24	.11	.27	.27	.11	.12
22	.13	.19	.26	.26	.38	.29	.20	.23	.27	.15	.09	.08
23	.16	.06	.26	.39	.30 M	.16	.30	.24	.23	.15	.11	.03
24	.13	.24	.19	.27	.30	.17	.17	.24	.14	.16	.11	.06
25	.13	.18	.27	.26	.33	.24	.23	.22	.19	.17	.13	.08
26	.11	.15	.25	.31	.46	.33	.26	.12	.12	.15	.08	.06
27	.21	.30	.18	.23	.23	.37	.23	.22	.21	.14	.06	.06
28	.01	.17	.19	.32	.32	.37	.27 M	.33	.23	.14	.18	.11
29	.13		.26	.26	.35	.16	.30	.16	.22	.15	.13 M	.12
30	.17		.27	.34	.33	.33	.28	.25	.18	.18	.07	.04
31	.11		.16	.35	.35	.28	.28	.25	.18	.16	.07	.08
TOTAL	3.54	4.14 M	6.83 M	7.37 M	9.27 M	9.26 M	8.31 M	7.00	5.98 M	5.58	3.97 M	3.65

TOTAL FOR YEAR 74.90

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1951 \*\*\*\*\*

PAV EVAPORATION, IN INCHES, FROM STATION S-65C

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.12	.13	.11	.12	.25	.26	.30	.25	.21	.16 M	.16	.11
2	.10	.25	.12	.13	.26	.22	.41	.21	.18 M	.16	.09	.13
3	.10	.17	.15 M	.15	.23	.23	.27	.24	.18 M	.16	.30	.13
4	.06	.20	.12	.30	.20	.23	.16	.15	.18 M	.21	.25	.16
5	.10	.21	.11	.30	.21	.36	.27	.20	.16 M	.25	.19	.19
6	.16	.16	.12	.29	.20	.39	.16	.15	.18 M	.22	.10	.22
7	.04	.17	.10	.23 M	.41	.24	.40	.23	.18 M	.21	.09	.11
8	.07	.14	.09	.27	.23	.26	.13	.25	.18 M	.23	.20	.11
9	.12	.17	.08	.27	.24	.33	.36	.24	.18 M	.28	.16	.12
10	.05	.01	.10	.29	.24	.12	.28	.27	.16 M	.13	.14	.15
11	.16	.35	.09	.20	.25	.20	.30	.27	.18 M	.20	.09	.17
12	.06	.30	.10	.31	.25	.26	.16	.11	.18 M	.22	.15	.18
13	.06	.06	.16	.26	.25	.29	.27 M	.14	.18 M	.39	.15	.12
14	.10	.11	.17	.30	.20	.27	.22	.26	.18 M	.24	.19	.15
15	.10	.16	.10	.29	.24	.30	.22	.14	.18 M	.19 M	.13	.13
16	.15	.18	.31	.30	.33	.33	.31	.25	.18 M	.32	.15	.14
17	.24	.24	.17	.26	.27	.30	.30	.24	.18 M	.17	.14	.17
18	.09	.12	.36	.27	.29	.33	.27	.21	.18 M	.19	.15	.14
19	.14	.26	.24	.31	.23	.33	.45	.11	.18 M	.19	.20	.12
20	.11	.25	.16	.28	.23	.31	.23	.01	.18 M	.12	.14	.15
21	.10	.26	.20	.31	.22	.27 M	.27	.11	.18 M	.15	.13	.18
22	.17	.20	.17	.28	.19	.25	.25	.07	.18 M	.22	.08	.14
23	.14	.15	.10	.29	.23	.12	.24	.09	.18 M	.20	.26	.16
24	.14	.20	.23	.31	.20	.19	.27	.21	.18 M	.17	.15	.15
25	.15	.04	.20	.32	.19	.20	.26	.26	.18 M	.19	.17	.11
26	.08	.10	.13	.30	.20	.33	.26	.16	.18 M	.17	.17	.17
27	.14	.16	.16	.25	.23 M	.17	.27	.21	.18 M	.14	.15	.21
28	.10	.15	.11	.25	.18	.26	.26	.10	.18 M	.18	.15	.15 M
29	.13	.13	.15	.24	.20	.27 M	.26	.25	.18 M	.12	.13	.06
30	.12	.12	.10	.25	.24	.22	.24	.12	.18 M	.09	.14	.12
31	.12	.16	.16	.23	.23	.22	.24	.19	.18 M	.11	.14	.10
TOTAL	3.49	4.92	4.67 M	6.03 M	7.05 M	8.04 M	8.31 M	5.70	5.43 M	6.00 M	4.65	4.45 M

TOTAL FOR YEAR 70.74

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1982 \*\*\*\*\*

PAN EVAPORATION, IN INCHES, FROM STATION S-55C

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.17	.14	.20	.14	.19	.00	.23	.20	.20	.21	.06	.15
2	.16	.25	.18	.25	.24	.20	.21	.22 M	.20	.20	.06	.10
3	.14	.04	.13	.28	.28	.18	.21	.25	.19 M	.14	.12	.11
4	.16	.21	.04	.28	.20	.15	.20	.24	.21	.20	.07	.16
5	.18	.15	.15	.20	.20	.18	.23	.25	.20	.18	.14	.14
6	.15	.16	.20	.30	.26	.22	.22	.23	.21	.16	.14	.15
7	.29	.20	.19 M	.28	.32	.30	.20 H	.22	.19	.16	.12	.11
8	.17	.14	.12	.25	.33	.25	.20 H	.16	.20	.17	.15	.11
9	.13	.16	.19 M	.14	.22	.22	.20	.20	.20	.23	.12	.07
10	.13	.13	.22	.25 M	.22	.24	.20	.22	.22	.24	.16	.12
11	.20	.15	.25	.30	.22	.30	.21	.21	.20	.23	.13	.09
12	.14	.28	.20	.23	.23	.24	.20	.23	.21	.22	.15	.07
13	.17 M	.13	.13	.27	.11	.22 M	.21	.20	.22	.28	.13 M	.12
14	.05	.16	.15	.21	.21	.27	.22	.25	.18	.10	.14	.13
15	.10	.15	.19	.19	.20	.30	.19	.20	.20	.19	.25	.12
16	.17 M	.13	.25	.23	.24	.22	.20	.22	.17	.20	.11	.09
17	.13	.24	.20	.40	.22	.21	.18	.22 M	.19	.17 M	.07	.11
18	.11	.37	.20	.25	.24	.18	.17	.21	.19	.13	.13	.13
19	.20	.29	.17	.30	.20	.22 M	.20	.15	.23	.16	.16	.18
20	.16	.16	.21	.29	.23	.22 M	.21	.20	.21	.21	.12	.13
21	.17	.16	.17	.30	.20	.17	.20	.14	.22	.20	.16	.20
22	.16	.23	.14	.21	.22	.22	.22	.20	.18	.15	.14	.15
23	.18	.18	.21	.42	.22 M	.22	.21	.25	.15	.20	.15	.10
24	.18	.10	.21	.23	.21	.22 M	.20 M	.29	.18	.21	.13	.12
25	.26	.10	.21	.24	.22 M	.22 M	.19	.20	.17	.08	.13	.16
26	.10	.13	.28	.05	.22 M	.22 M	.23	.27	.16	.09	.12	.13
27	.23	.15	.24	.25 M	.22	.18	.20	.23	.15	.07	.15	.15
28	.25	.15	.28	.25 M	.22 M	.21	.21	.20	.18	.15	.07	.16
29	.23	.23	.25	.22	.20	.19	.17	.20	.19 M	.18	.12	.11
30	.20	.19 M	.19 M	.22	.18	.22	.16	.23	.20	.12	.13	.10
31	.27	.17	.17	.23	.20	.22	.22	.20	.20	.11	.13	.10
TOTAL	5.34 M	4.96	6.08 M	7.50 M	6.88 M	6.37 M	6.34 M	6.69 M	5.80 M	5.34 M	3.80 M	3.95

TOTAL FOR YEAR 69.05

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE



\*\*\*\*\* 1983 \*\*\*\*\*

PAN EVAPORATION, IN INCHES, FROM STATION S-65C

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.09	.19	.15 M	.23	.22	.18	.27	.20	.16	.23	.18	.10
2	.16	.10	.24	.20	.36	.16	.25	.16	.14	.19	.17	.07
3	.10	.17	.20	.29	.23	.30	.25	.26	.10	.10	.24	.10
4	.10	.12 M	.23	.14	.22	.28	.25	.21	.08	.18	.09	.12
5	.12	.22	.14	.26	.30	.26	.21	.18	.15	.15	.16	.07
6	.07	.11	.24	.20	.16	.32	.27	.19	.19	.10	.12	.11
7	.05	.13	.21	.21	.24	.26	.28	.15	.18	.21	.16	.10
8	.11	.15 M	.22	.21	.34	.21	.32	.18	.22	.19	.14	.21
9	.04	.15	.23	.22	.30	.30	.22	.13	.16	.17	.00	.11
10	.10	.11	.12	.24	.28	.02	.17	.15	.10	.19	.08	.11
11	.06	.12	.27	.24 M	.26	.19	.26	.20	.17	.16	.11	.11
12	.10	.08	.12	.24	.34	.42	.23	.17	.18	.18	.11	.09
13	.07	.15 M	.12	.23	.36	.26	.30	.18	.21	.15	.10	.10
14	.16	.15 M	.22	.16	.27	.25	.28	.18	.18	.13	.07	.19
15	.17	.21	.17	.28	.29	.20	.26	.24	.05	.06	.09	.08
16	.11	.19	.11	.26	.31	.27	.24	.21	.17	.15	.14	.14
17	.18	.12	.05	.23	.20	.25	.25	.21	.13	.18	.14	.11
18	.11	.15 M	.11	.22	.30	.26	.21	.15	.13	.15	.22	.05
19	.17	.20	.24	.25	.30	.30	.25	.20	.13	.09	.11	.07
20	.15	.12	.23	.32	.32	.30	.24	.16	.13	.29	.13	.07
21	.16	.11	.20	.22	.31	.27	.25	.16	.14	.18	.11	.10 M
22	.12 M	.23	.32	.24	.32	.04	.20	.17	.18	.15	.14	.05
23	.09	.12	.30	.24 M	.37	.23	.20	.20	.23	.15	.14	.08
24	.10	.13	.19	.26	.29	.19	.24	.24	.16	.16	.14	.05
25	.10	.20	.18	.24 M	.75	.24 M	.19	.18	.17 M	.17	.14	.03
26	.12	.17	.40	.39	.31 M	.16	.26	.17	.26	.10	.10	.17
27	.12	.14	.19	.28	.33	.24	.29	.18	.27	.15	.15	.10 M
28	.09	.23	.20	.24	.38	.24	.34	.15	.21	.16	.19	.07
29	.12 M	.09	.10	.28	.26	.24	.35	.20	.21	.13	.07	.13
30	.09	.10	.19	.29	.36	.25	.25	.22	.17	.20	.11	.07
31	.14	.19	.21	.16	.44	.26	.25 M	.19	.19	.14	.13	.08
					.22		.14	.20	.19	.18		.16
TOTAL	3.47 M	4.30 M	6.33 M	7.21 M	9.69 M	7.09 M	7.77 M	5.84 M	4.98 M	5.01	3.77	3.13 M

TOTAL FOR YEAR 68.59

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED

N = RECORD NOT AVAILABLE

\*\*\*\*\* 1964 \*\*\*\*\*

PAN EVAPORATION, IN INCHES, FROM STATION S-65C

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.03	.12 M	.27	.26	.13	.20	.11	.11	.19 M	.16	.16	.14
2	.09	.13	.19	.20	.30	.23 M	.16	.16	.19 M	.05	.19	.11
3	.09	.13	.13	.24	.28	.24	.24	.19	.16	.16	.19	.08
4	.10	.10	.14	.24	.25	.22	.22	.21	.19	.17	.19	.01
5	.13	.14	.15	.20	.34	.19 M	.19	.27	.20	.17	.07	.09
6	.08	.14	.25	.17	.32	.25	.15	.19	.24	.19	.09	.08
7	.09	.15	.14	.23	.27	.11	.11	.18	.14	.16	.12	.09
8	.12	.12	.22	.19	.26	.23 M	.22	.24	.06	.20	.16	.15
9	.12	.10	.18	.10	.30	.22	.22	.22	.27	.19	.19	.16
10	.10	.10	.16	.25	.30	.16	.16	.22	.13	.21	.14	.09
11	.06	.16	.17	.07	.14	.27	.24	.23	.14	.13	.11	.06
12	.07	.16	.16	.23	.29	.31	.21	.20	.18	.18	.12	.06
13	.14	.03	.12	.15	.23	.23	.23	.16	.20	.16	.13	.10
14	.04	.16 M	.25	.15	.24	.26	.23	.16	.20	.16	.14	.05
15	.08	.11	.15	.21 M	.24	.27	.17	.20	.17	.18	.12	.10
16	.10	.20	.23	.19	.23	.16	.19	.14	.23	.15	.11	.07
17	.03	.15	.25	.00	.28	.28	.15	.19 M	.21	.15	.13	.15
18	.11	.17	.17	.20	.29	.02	.23	.20	.18	.17	.11	.11
19	.09	.19	.16	.21	.31	.14	.21	.17	.15	.17	.09	.12
20	.12	.16	.22	.26	.30	.21	.22	.22	.17 M	.17	.18	.13
21	.10	.15	.18	.20	.27	.27	.26	.22	.11	.18	.12	.09
22	.02	.08	.20	.24	.27	.25	.15	.15	.15	.14	.12	.09
23	.04	.16 M	.23	.24	.32	.26	.11	.12	.19	.16	.04	.08
24	.11	.20	.20	.24	.26	.17	.18	.10	.27	.19	.12	.10
25	.16	.16	.04	.20	.12	.13	.16	.17	.14	.23	.12 M	.10
26	.17	.14	.15	.28	.25	.16	.22	.20	.34	.20	.01	.11
27	.11	.19	.22	.23	.25	.25	.17	.23	.25	.17 M	.12	.12
28	.39	.27	.20	.26	.26 M	.24	.16	.19	.22	.14	.12	.09
29	.12 M		.25	.25	.26	.26	.18	.24	.06	.12	.12	.07
30	.16		.37	.25	.26 M	.21	.23	.21	.11	.17	.09	.15
31	.44		.43	.16	.16	.26	.26	.21	.11	.13	.12	.12
TOTAL	3.61 M	4.12 M	6.20	6.16 M	8.05 M	6.84 M	6.15 M	5.90 M	5.40 M	5.14 M	3.72 M	3.11

TOTAL FOR YEAR 64.38

LETTERS FOLLOWING NUMBERS MEAN:

M - PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N - RECORD NOT AVAILABLE

\*\*\*\*\* 1985 \*\*\*\*\*

PAN EVAPORATION, IN INCHES, FROM STATION S-65C

JAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.08	.13	.16	.24	.30	.29	.36	.23	.19	.14	.08	.06
2	.14	.14	.22	.28	.23	.27	.36	.20	.14	.13	.19	.11
3	.13	.19	.16	.21	.25	.30	.33	.22	.13	.15	.19	.56
4	.13	.18	.22	.30	.22	.36	.20	.25	.19	.12	.24	.10
5	.12	.20	.14	.04	.25	.32	.21	.29	.28	.25	.02	.17
6	.08	.09	.22	.21	.19	.31	.24	.22	.23	.11	.12	.09
7	.12	.12	.21	.24	.21	.26	.30	.15	.19	.08	.02	.22
8	.10	.17	.16	.28	.30	.38	.26	.23	.19	.18	.28	.69
9	.10	.26	.28	.15	.28	.20	.20	.27	.15	.19	.06	.09
10	.08	.14	.24	.17	.30	.27	.27	.18	.22	.14	.29	.03
11	.10	.09	.23	.24	.25	.26	.26	.15	.22	.15	.07	.10
12	.11	.17	.17	.29	.29	.26	.16	.08	.22	.18	.18	.11
13	.10	.18	.20	.27	.25	.26	.30	.21	.21	.13	.01	.15
14	.13	.13	.20	.27	.27	.24	.15	.22	.17	.15	.09	.10
15	.13	.19	.20	.08	.32	.25	.22	.25	.18	.11	.02	.10
16	.10	.17	.22	.19	.30	.25	.17	.14	.21	.24	.24	.13
17	.12	.15	.20	.22	.32	.12	.13	.16	.11	.17	.07	.14
18	.15	.01	.19	.04	.27	.10	.19	.21	.27	.17	.19	.06
19	.10	.13	.11	.26	.42	.18	.27	.22	.26	.10	.17	.11
20	.14	.18	.21	.29	.40	.27	.24	.23	.17	.15	.14	.14
21	.04	.15	.20	.26	.32	.24	.19	.20	.19	.14	.06	.01
22	.13	.21	.21	.23	.18	.13	.18	.21	.15	.15	.10	.22
23	.14	.21	.27	.19	.28	.22	.22	.23	.19	.08	.10	.02
24	.11	.27	.02	.29	.24	.17	.28	.16	.12	.18	.18	.10
25	.11	.23	.27	.32	.17	.25	.22	.20	.18	.17	.06	.03
26	.09	.17	.23	.23	.24	.25	.11	.22	.21	.15	.08	.06
27	.15	.24	.25	.20	.19	.24	.15	.29	.20	.19	.11	.02
28	.06	.15	.26	.26	.17	.24	.23	.11	.18	.15	.04	.07
29	.18	.29	.29	.28	.19	.14	.22	.31	.19	.15	.11	.18
30	.11	.22	.22	.27	.28	.25	.22	.30	.15	.17	.27	.04
31	.09	.18	.18	.27	.26	.25	.27	.04	.15	.10	.07	.07
TOTAL	3.47 M	4.68	6.36	6.84	6.20 M	7.35 M	7.11 M	6.35	5.69 M	4.67	3.65 M	4.08 M

TOTAL FOR YEAR 68.45

LETTERS FOLLOWING NUMBERS MEAN:

M - PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N - RECORD NOT AVAILABLE

\*\*\*\*\* 1986 \*\*\*\*\*

PAN EVAPORATION, IN INCHES, FROM STATION S-65C

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.13	.02	.14	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N
2	.08	.09	.13	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N
3	.03	.03	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N
4	.16	.12	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N
5	.02	.08	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N
6	.16	.17	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N
7	.02	.12	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N
8	.09 M	.22	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N
9	.06	.14	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N
10	.17	.10	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N
11	.07	.04	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N
12	.06	.10	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N
13	.01	.15	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N
14	.24	.11	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N
15	.11	.14	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N
16	.10	.07	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N
17	.06	.19	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N
18	.09	.13	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N
19	.11	.10	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N
20	.03	.15	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N
21	.16	.16	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N
22	.03	.10	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N
23	.12	.17	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N
24	.10	.20	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N
25	.08	.21	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N
26	.09	.13 M	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N
27	.08	.11	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N
28	.05	.17	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N
29	.01		.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N
30	.14		.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N
31	.10		.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N
TOTAL	2.78 N	3.64 M	.27 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N	.00 N

TOTAL FOR YEAR 6.69

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

# **APPENDIX E**

\*\*\*\*\* 1970 \*\*\*\*\*

DISCHARGE, IN ACRES-FEET OVER NORTH WEIR

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.00 N	.00 N	.00 N	18.38	1.08	.00	16.44	.41	19.07	24.17	21.77	.04
2	.00 N	.00 N	.00 N	20.38	16.23	.00	9.24	16.68	17.33	13.16	21.13	.00
3	.00 N	.00 N	.00 N	15.12	1.09	.64	2.01	15.40	15.61	12.83	22.73	15.90
4	.00 N	.00 N	.00 N	1.24	19.47	3.21	.40	14.83	2.34	24.14	27.01	1.92
5	.00 N	.00 N	.00 N	.14	13.77	8.02	11.88	16.57	1.15	14.87	23.23	.91
6	.00 N	.00 N	.00 N	.03	1.41	7.80	21.59	17.75	17.08	15.33	12.57	16.35
7	.00 N	.00 N	.00 N	.13	.20	4.48	19.61	1.94	14.45	17.27	12.14	18.53
8	.00 N	.00 N	.00 N	.37	.00	.95	14.00	.61	17.97	16.17	9.15	18.34
9	.00 N	.00 N	.00 N	15.17	.00	.60	1.97	18.96	20.57	11.08	6.27	17.75
10	.00 N	.00 N	.00 N	1.52	.00	.78	.41	16.62	18.56	6.02	7.88	18.99
11	.00 N	.00 N	.00 N	.15	.00	.86	13.07	16.66	2.61	16.42	7.88	1.84
12	.00 N	.00 N	.00 N	17.25	.00	.42	19.11	14.14	.87	16.29	7.93	.78
13	.00 N	.00 N	.00 N	24.58	.00	.08	1.52	18.16	14.68	17.95	6.93	16.44
14	.00 N	.00 N	.00 N	20.22	.00	.00	15.27	1.87	2.14	16.78	1.71	18.32
15	.00 N	.00 N	.00 N	23.93	.00	.00	16.09	.86	15.10	15.81	15.22	18.24
16	.00 N	.00 N	.00 N	20.58	.00	.00	17.79	.86	16.15	10.16	21.88	18.40
17	.00 N	.00 N	.00 N	1.27	.00	.00	2.37	16.78	17.84	7.65	18.17	17.55
18	.00 N	.00 N	.00 N	.14	.00	.00	1.04	22.50	18.44	13.33	15.86	1.88
19	.00 N	.00 N	.00 N	18.01	.00	.00	19.36	19.43	3.31	16.47	19.64	.52
20	.00 N	.00 N	.00 N	19.95	.00	.00	19.05	15.41	18.37	15.94	2.02	18.73
21	.00 N	.00 N	.00 N	18.37	.00	.00	19.19	2.28	17.94	15.69	.91	14.71
22	.00 N	.00 N	.00 N	21.17	.00	15.28	16.08	1.22	20.12	15.81	18.31	1.77
23	.00 N	.00 N	.00 N	17.58	.00	16.91	14.50	16.78	17.43	9.52	16.81	.78
24	.00 N	.00 N	.00 N	1.81	.00	16.76	1.63	19.60	19.22	7.55	16.90	.44
25	.00 N	.00 N	.00 N	.20	.00	21.21	.32	16.94	3.02	14.99	19.61	.05
26	.00 N	.00 N	.00 N	18.49	.00	2.12	19.42	19.43	1.44	14.80	19.96	.12
27	.00 N	.00 N	.00 N	18.32	.00	.49	18.16	18.51	16.61	17.02	2.23	.01
28	.00 N	.00 N	.00 N	18.96	.00	15.36	14.57	2.34	20.46	18.14	.98	.00
29	.00 N	.00 N	.00 N	20.35	.00	16.94	13.50	.82	25.23	18.71	14.95	.00
30	.00 N	.00 N	.00 N	20.63	.00	15.45	16.00	14.73	25.27	9.76	23.97	.00
31	.00 N	.00 N	.00 N	18.98	.00		1.15	25.40		7.17		.00
TOTAL	.00 N	.00 N	57.79 N	374.30	55.10	146.36	364.61	412.61	422.39	455.00	417.75	239.31

TOTAL FOR YEAR 2947.24

LETTERS FOLLOWING NUMBERS MEAN:

N = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1977 \*\*\*\*\*

DISCHARGE IN ACRES-Feet OVER NORTH WEIR

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.00	1.91	19.21	23.08	.00	.00	15.24	15.62	15.71	2.30	12.45	18.71
2	.00	14.97	23.22	2.71	1.77	.00	2.68	16.51	15.12	.58	12.42	19.53
3	.00	15.83	19.25	1.30	4.33	.00	.84	19.87	2.06	18.43	10.58	1.95
4	8.22	17.95	17.95	20.30	8.45	.00	12.34	19.63	.70	20.32	8.38	.16
5	15.58	2.11	2.75	18.25	11.91	.00	13.84	16.27	14.39	15.84	.00	17.99
6	18.43	.44	1.40	17.54	9.05	.00	15.00	2.78	17.22	17.51	.00	19.26
7	16.60	17.80	21.08	13.24	.00	.00	13.78	.76	22.00	20.95	15.07	24.63
8	2.98	16.52	16.59	18.60	.00	.00	2.94	13.95	1.93	.39	14.32	20.22
9	.41	17.00	18.72	2.82	.00	.00	1.17	17.62	15.54	.00	13.71	22.15
10	14.93	15.92	24.55	1.12	7.41	.00	.51	14.95	1.64	15.82	14.08	2.31
11	18.88	15.83	19.50	15.24	8.78	.00	.45	15.41	.39	20.11	14.38	.18
12	17.26	1.73	2.81	22.09	6.97	.00	.04	14.42	16.23	5.93	.00	17.20
13	16.42	.30	1.24	18.15	7.61	.00	.02	1.52	20.88	.10	.04	24.65
14	21.69	16.74	13.00	18.34	.00	.00	.00	14.50	17.16	.24	19.95	19.53
15	2.03	20.60	20.39	18.52	9.55	.00	.00	2.22	18.76	.00	2.69	19.38
16	.63	17.15	14.04	2.52	30.54	.00	.00	17.29	15.10	.00	17.48	19.22
17	16.97	17.28	16.42	1.00	32.52	.00	.00	15.20	1.55	2.41	17.83	1.66
18	2.07	19.70	17.61	16.81	33.85	.00	.00	14.19	.47	.32	19.24	.17
19	15.20	2.03	2.23	18.25	29.97	.00	.00	15.05	14.28	.30	2.37	19.64
20	10.85	.74	1.16	20.27	11.22	.00	16.13	1.94	16.70	17.06	.96	21.44
21	16.70	15.20	15.18	18.46	5.59	.00	14.98	.48	15.66	15.55	16.20	21.76
22	1.14	21.84	18.45	17.86	4.11	.00	16.96	13.28	17.62	16.41	17.92	20.30
23	12.44	3.37	20.15	2.53	2.69	5.39	2.48	17.40	15.06	14.66	20.64	19.22
24	27.36	17.92	2.67	.97	1.79	15.73	.76	14.46	2.10	5.24	22.39	1.91
25	15.71	19.60	18.97	20.31	.76	2.42	17.46	16.87	.90	5.77	19.49	.24
26	16.95	3.05	2.54	17.79	.27	1.08	17.98	15.90	14.63	12.25	2.14	15.96
27	21.41	1.47	.74	18.14	.00	14.78	18.47	1.68	21.28	18.34	.48	20.36
28	17.61	15.60	13.15	14.42	.00	16.58	16.94	.65	19.84	11.93	.08	18.75
29	2.02		19.13	3.44	.00	15.95	18.12	13.71	21.13	.00	.07	13.09
30	.41		20.32	.00	.00	14.47	2.69	15.23	20.47	.00	.18	26.10
31	17.03		19.42	.00	.00		.84	17.35	16.66	16.66		3.82
TOTAL	347.76	332.69	432.52	388.97	231.39	86.44	238.87	376.31	376.52	275.90	295.55	451.73

TOTAL FOR YEAR 3834.65

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1976 \*\*\*\*\*

DISCHARGE, IN ACRE-FEET OVER NORTH WEIR

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	UCT	NOV	DEC
1	.23	.32	22.17	2.19	20.99	.00	1.94	5.32	14.56	6.26	.04	16.10
2	16.12	18.26	20.64	.62	20.56	.00	.69	3.76	1.40	12.18	15.15	1.54
3	16.50	20.62	21.20	16.36	21.26	.00	16.37	21.05	15.89	14.04	13.54	.51
4	20.43	2.03	1.78	20.35	21.23	.00	2.30	16.46	14.44	17.31	1.46	13.98
5	20.19	.15	.13	16.22	2.24	.00	15.86	1.61	1.84	17.61	.36	17.43
6	20.03	16.63	19.42	20.01	.68	.00	16.04	.75	15.64	17.57	16.37	15.12
7	17.38	20.35	23.07	20.54	.51	.00	17.36	14.45	14.67	1.65	18.58	20.04
8	1.08	20.01	23.71	2.24	.19	.00	2.43	18.62	14.52	3.46	1.50	1.52
9	.20	21.02	20.61	.54	.00	.00	.83	18.10	1.57	20.83	14.44	.35
10	17.38	21.93	20.98	19.54	.00	.00	17.06	19.06	.45	5.29	16.60	.09
11	19.97	2.21	1.72	2.24	.00	.00	17.03	17.94	13.55	16.03	1.55	17.50
12	23.93	16.73	.12	.60	.00	.00	17.48	1.28	15.10	13.10	.41	18.20
13	19.79	2.04	19.67	.18	.00	.00	20.20	.36	15.98	14.44	8.67	17.12
14	1.65	17.92	21.40	21.39	.00	15.19	15.47	16.28	17.76	.00	15.64	17.86
15	.16	16.90	20.13	2.04	.00	17.60	1.27	15.30	13.76	.00	15.05	16.86
16	17.96	19.65	24.76	.25	.00	17.72	.86	15.21	1.06	9.91	14.26	1.64
17	19.60	18.44	20.82	17.97	.00	1.49	15.92	15.47	.19	10.10	18.75	.30
18	14.79	1.69	2.45	18.26	.00	.05	18.21	15.34	14.67	9.74	1.40	16.03
19	20.70	.23	.75	20.30	.00	16.04	16.50	1.93	15.54	11.44	.38	16.75
20	20.12	16.17	20.15	22.21	.00	16.36	2.12	.55	15.03	.00	15.34	14.03
21	1.76	19.12	21.05	18.11	.00	15.94	20.53	13.86	18.63	.00	15.76	15.84
22	.17	19.69	21.30	1.32	.00	19.07	2.59	15.96	17.75	.00	14.57	17.01
23	16.25	14.66	24.24	.35	.00	17.69	2.11	16.11	1.42	11.08	1.33	1.10
24	3.21	19.61	20.73	19.26	.00	2.02	18.47	16.30	1.05	10.69	16.24	.36
25	17.46	2.03	2.93	18.76	.00	.82	15.16	16.02	20.17	.00	1.20	.24
26	19.63	.14	1.17	19.14	.00	15.91	16.79	.85	16.63	.00	.19	13.16
27	1.82	18.06	16.65	18.59	.00	15.40	3.75	.20	16.48	10.86	14.21	15.40
28	.16	20.22	24.04	1.60	.00	14.58	16.44	14.17	26.36	.00	16.72	17.91
29	.01	20.79	18.29	18.29	.00	15.01	6.86	16.46	17.59	.00	16.94	14.36
30	14.28	23.69	23.69	2.35	.00	16.29	6.57	14.18	5.14	17.44	15.80	1.20
31	2.90	20.70	20.70	.00	.00	.00	18.56	13.92	13.08	13.08	.57	.57
TOTAL	375.12	369.69	503.75	341.36	38.10	217.24	344.53	301.60	361.13	264.11	302.66	320.16

TOTAL FOR YEAR 3849.67

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE



\*\*\*\*\* 1979 \*\*\*\*\*

DISCHARGE, IN ACRE-FEET OVER NORTH WEIR

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.23	.35	22.17	2.19	20.99	.00	1.94	5.32	14.56	6.26	.04	16.10
2	15.12	13.26	20.84	.52	20.58	.00	.59	3.75	1.40	12.18	15.15	1.54
3	16.50	20.62	21.26	15.35	21.58	.00	16.57	21.06	15.89	14.04	13.54	.51
4	20.43	2.03	1.77	20.05	21.23	.00	2.33	18.40	14.49	17.31	1.46	13.96
5	20.19	.15	.15	16.22	2.24	.00	15.68	1.61	1.84	17.61	.36	17.43
6	20.03	16.63	17.42	20.01	.66	.00	16.04	.75	15.64	17.57	16.37	15.12
7	17.36	20.33	23.07	20.34	.31	.00	17.86	14.45	14.67	1.65	16.58	20.04
8	1.68	20.01	23.71	2.24	.14	.00	2.43	18.62	14.52	3.46	1.50	1.52
9	.20	21.02	20.61	.64	.00	.00	.83	18.10	1.57	20.83	14.44	.35
10	17.36	21.93	20.96	19.54	.00	.00	17.08	19.08	.45	5.29	16.60	.09
11	19.97	2.21	1.72	2.24	.00	.00	17.03	17.94	13.55	16.03	1.56	17.50
12	23.93	15.73	.12	.60	.00	.00	17.48	1.28	15.10	13.10	.41	18.20
13	19.79	2.04	19.67	.18	.00	.00	20.20	.36	15.98	14.44	8.67	17.12
14	1.65	17.92	21.43	21.39	.00	15.19	15.47	18.28	17.73	.00	15.84	17.66
15	.16	18.90	20.15	2.04	.00	17.66	1.27	15.30	13.76	.00	15.05	16.86
16	17.46	19.66	24.76	.25	.00	17.72	.66	15.21	1.06	9.91	14.26	1.64
17	19.60	18.44	20.82	17.97	.00	1.49	15.92	15.97	.19	10.10	16.75	.30
18	15.79	1.89	2.45	18.26	.00	.05	18.21	15.34	14.67	9.74	1.40	16.03
19	20.46	.23	.75	20.90	.00	16.04	16.50	1.93	15.54	11.44	.38	16.79
20	20.12	15.17	20.13	22.21	.00	16.36	2.12	.55	15.03	.00	15.34	14.03
21	1.96	19.12	21.05	16.11	.00	15.94	20.53	13.86	16.83	.00	15.76	15.64
22	.17	17.63	21.30	1.32	.00	19.07	2.59	15.96	17.75	.00	14.57	17.01
23	16.25	14.86	24.34	.35	.00	17.69	2.11	16.11	1.42	11.06	1.33	1.10
24	3.21	19.81	20.73	18.28	.00	2.02	18.47	16.30	1.05	10.59	16.24	.36
25	17.46	2.03	2.93	18.76	.00	.82	15.16	16.02	20.17	.00	1.20	.24
26	19.53	.14	1.17	19.14	.00	15.91	16.79	.85	16.63	.00	.19	13.16
27	1.82	16.36	16.65	18.69	.00	15.40	3.75	.20	18.48	10.86	14.21	15.40
28	.16	20.22	24.04	1.60	.00	14.56	16.44	14.17	26.36	.00	16.72	17.91
29	.01	20.79	20.79	18.29	.00	15.01	6.86	16.46	17.59	.00	16.94	14.36
30	14.28	23.89	23.89	2.35	.00	16.29	6.57	14.18	5.14	17.44	15.80	1.20
31	2.90	20.70	20.70	.00	.00	18.56	18.56	13.92	13.92	13.06	.57	.57
TOTAL	375.12	369.89	503.75	341.36	96.10	217.24	344.53	361.60	361.13	264.11	302.66	320.16

TOTAL FOR YEAR 3849.67

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1979 \*\*\*\*\*

DISCHARGE IN ACRE-FEET OVER NORTH WEIR

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1			13.95	.02	10.74	.00	.00	12.31	1.91	14.64	12.95	1.09
2			14.00	13.93	12.14	.00	14.70	16.04	1.12	12.23	.05	.07
3			.84	13.03	4.53	.00	12.58	13.75	3.14	11.00	.07	14.85
4			.42	14.10	.72	4.40	12.45	.81	2.81	12.20	.28	15.82
5			10.71	11.52	.02	20.66	16.72	.04	2.98	14.18	11.68	15.73
6			13.70	12.95	.00	31.03	16.59	15.61	16.88	2.55	14.24	14.79
7			13.31	1.15	.00	1.36	1.24	15.50	19.02	1.34	1.35	13.30
8			13.05	.01	.00	10.88	.02	15.32	3.91	15.32	15.38	.76
9			12.44	13.02	.01	.65	13.18	15.62	6.12	13.88	15.15	.15
10			.80	14.21	.02	.00	16.73	15.53	16.80	14.21	1.69	14.45
11			.04	13.23	.00	12.77	16.63	1.24	15.62	11.46	.68	14.46
12			17.22	14.36	.00	1.03	19.08	.09	18.40	12.63	12.36	16.92
13			13.90	14.04	.00	12.04	14.26	11.76	3.41	.23	13.56	13.83
14			12.42	.75	.00	15.80	1.42	13.05	6.13	2.42	11.46	12.31
15			15.90	.30	.00	.62	.71	14.89	6.97	12.01	13.03	1.30
16			15.14	11.62	.00	.00	11.82	13.70	6.50	3.61	14.15	.22
17			.67	11.50	.00	.00	15.91	13.97	20.76	15.21	1.13	13.58
18			.01	10.54	.00	15.23	12.73	1.23	20.72	4.57	.21	13.95
19			14.64	11.45	.00	14.26	14.74	.25	15.92	13.98	13.84	15.05
20			12.14	1.02	.00	17.14	18.20	14.10	4.27	3.61	15.67	15.25
21			14.26	.32	.00	16.09	1.07	14.22	21.82	.14	15.01	14.33
22			15.24	.00	.00	16.16	.12	14.66	6.09	14.25	1.32	1.04
23			16.42	10.10	8.76	.98	13.65	15.33	6.12	1.87	14.54	.19
24			.84	12.15	1.13	.02	15.45	14.14	16.59	12.35	1.03	13.27
25			.02	11.32	.27	15.24	14.21	1.16	19.16	10.72	.47	1.12
26			16.42	.97	.00	16.04	11.25	.24	16.00	.00	12.21	14.12
27			16.87	.04	.00	14.44	17.04	15.46	5.87	.73	15.47	15.40
28			15.79	.00	.00	.75	1.00	16.20	16.36	.76	15.20	14.14
29			16.92	.00	.00	14.11	.06	16.08	.99	12.31	1.33	1.13
30			14.34	9.48	.00	.88	16.98	18.76	1.32	11.26	12.16	.17
31			.94		.00		16.75	12.11		11.40		11.98
TOTAL			344.33	229.13	43.57	257.47	343.36	346.93	305.73	267.42	257.71	295.31

TOTAL FOR YEAR 2690.96

LETTERS FOLLOWING NUMBERS MEAN:

M - PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N - RECORD NOT AVAILABLE

\*\*\*\*\* 1980 \*\*\*\*\*

DISCHARGE IN ACRE-FEET OVER NORTH WEIR

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.92	.57	14.44	14.04	11.23	.00	12.05	11.21	.60	6.46	.46	.00
2	14.44	.00	1.14	15.91	.67	.00	12.50	15.13	.89	7.44	.00	13.19
3	13.59	.00	.21	1.15	.03	11.02	10.06	1.10	12.44	6.93	.00	.49
4	1.00	13.47	12.43	.14	.00	.50	11.54	.04	12.47	6.24	13.60	16.47
5	13.05	13.07	12.44	14.37	.00	.00	.29	13.11	14.85	.00	15.01	13.62
6	.83	13.23	11.74	1.01	.00	.00	.00	13.49	13.03	.00	14.22	22.75
7	14.20	12.63	12.42	.01	.06	10.52	.00	13.21	.66	7.18	.37	.35
8	12.29	12.72	14.08	12.91	.00	.68	12.20	14.24	.01	7.92	12.30	.00
9	14.84	.64	.95	10.66	.00	.00	11.52	1.13	13.10	7.40	.33	19.94
10	13.52	.57	.08	11.36	.00	.00	13.14	.38	14.31	.00	.00	2.72
11	14.50	11.73	13.60	12.95	.00	.00	8.27	.03	12.50	8.04	13.36	.00
12	1.07	7.11	14.38	14.23	.00	12.24	.34	15.43	14.60	.00	13.67	.00
13	.48	14.42	14.37	4.33	.00	.63	.00	15.22	13.02	.00	14.50	13.15
14	12.44	13.72	13.04	1.52	.00	.00	.00	14.82	1.19	9.76	13.58	.21
15	13.42	15.30	14.84	16.16	.00	.00	14.14	11.29	1.28	9.71	.17	.00
16	12.50	.96	.70	14.11	.00	.00	13.64	12.93	13.79	.00	.00	13.19
17	13.72	.74	.00	16.69	.00	12.50	12.73	.71	12.83	9.51	.01	9.46
18	13.99	12.91	14.91	18.98	.00	10.86	.52	.04	10.92	.00	10.32	11.85
19	.70	1.24	14.64	2.07	.00	13.94	14.75	12.35	13.35	.00	16.49	7.39
20	.02	13.78	16.04	1.00	.00	7.18	.48	13.92	9.40	.00	10.71	7.56
21	.00	14.45	15.19	.53	7.30	11.77	.00	13.04	1.89	9.69	9.66	.04
22	12.12	13.58	14.75	13.27	.65	.79	8.04	15.57	.40	10.31	.19	.00
23	12.58	.89	.62	15.85	16.42	.03	15.57	16.14	11.15	.00	.00	12.65
24	13.11	.06	.00	15.03	17.14	10.35	15.46	.52	12.64	11.49	.00	9.79
25	12.86	11.87	12.23	12.80	1.33	11.19	1.04	.01	10.96	.00	16.81	11.47
26	.74	13.20	14.56	11.74	.00	14.73	14.85	13.27	13.41	.21	11.27	.24
27	.12	15.04	15.00	1.37	.00	13.31	1.09	15.64	10.90	.00	14.92	6.99
28	12.53	13.90	13.84	.12	.00	10.64	.00	13.27	6.68	8.60	.35	.29
29	12.55	.00	13.52	.00	.00	.54	14.37	14.74	5.27	10.09	14.03	.00
30	9.89	.99	.99	.00	.00	.00	17.21	16.07	10.93	11.07	.34	9.02
31	11.23	.04	.04	.00	.00	.00	17.11	.81	10.93	12.35	.00	9.24
TOTAL	284.16	244.74	299.36	255.89	55.04	153.72	253.07	299.26	269.75	162.40	216.67	214.23

TOTAL FOR YEAR 2708.36

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1961 \*\*\*\*\*

DISCHARGE, IN-ACRE-FEET OVER NORTH WEIR

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	11.72	.62	.10	12.01	11.13	.00	6.93	.00	13.31	16.13	1.37	10.29
2	.43	.00	.00	13.50	.32	.00	13.04	.00	11.32	12.53	1.02	1.14
3	5.44	14.16	10.00	13.74	.00	.00	17.16	.00	15.17	13.69	15.87	.60
4	.33	11.73	10.40	12.15	.00	.00	2.51	.00	12.67	8.27	16.94	.17
5	.00	10.17	9.10	.24	.00	.00	.00	.00	14.34	6.59	15.53	.02
6	12.30	11.00	7.40	.00	.00	.00	.00	.00	.57	16.74	12.78	.00
7	12.30	10.41	13.30	15.30	.00	.00	6.56	.00	.00	16.52	.57	.00
8	10.26	.24	.49	11.35	.00	.00	7.33	.00	.00	21.25	.01	.00
9	11.45	.20	.00	10.93	.00	.00	.26	.00	14.19	18.71	.00	.00
10	12.59	13.47	11.76	10.36	.00	.00	.00	.00	12.39	10.30	10.96	.00
11	.42	.31	3.44	8.74	.00	.00	.00	.00	14.02	1.02	13.88	.00
12	.00	10.45	10.51	.20	.00	.00	.00	.00	15.43	.00	14.20	.00
13	12.65	11.33	11.92	.00	.00	.00	.00	.00	.64	15.11	13.47	.00
14	12.04	.25	12.03	7.69	.00	.00	6.65	.00	.00	7.02	.74	.00
15	11.77	.00	.20	13.42	.00	.00	.12	.00	12.27	18.60	.15	15.57
16	14.45	.00	.00	10.26	.00	3.31	5.48	.00	14.45	12.20	.00	12.69
17	10.17	19.70	13.38	13.51	.00	6.91	.15	.00	12.42	5.72	12.95	13.97
18	.31	32.54	13.40	12.40	.00	7.26	.00	.00	16.36	3.51	14.23	15.56
19	.00	7.21	13.04	.39	.00	7.98	.00	.00	10.22	2.98	13.69	15.17
20	13.61	32.70	14.14	.00	22.50	8.40	.00	.00	2.66	15.19	13.53	.96
21	10.00	5.90	12.01	10.74	18.04	.25	.00	.00	3.17	12.02	.96	.04
22	12.00	.18	.31	11.63	.26	6.03	.00	3.33	16.73	13.88	.16	14.06
23	12.27	.00	.04	11.30	.00	6.97	.00	9.64	14.50	12.39	.02	16.26
24	12.10	15.27	13.70	10.90	.00	7.30	.00	.04	17.85	1.70	15.95	17.84
25	.51	15.35	13.45	.30	.00	6.77	.00	18.69	16.32	.85	13.78	15.89
26	.00	10.52	13.95	.00	.00	5.41	.00	12.43	15.78	.45	15.17	1.15
27	10.37	11.90	12.17	.00	.00	6.93	.00	11.07	2.73	11.24	.94	.04
28	13.00	8.94	.31	11.24	.00	.36	.00	10.24	2.52	18.81	14.36	.00
29	12.54	.00	.00	11.73	.00	.05	.00	18.76	14.82	14.72	.97	11.68
30	6.25	.00	.00	.49	.00	7.06	.00	.62	14.79	17.17	.35	13.63
31	6.39	12.60	12.60	.00	.00	.00	.00	.00	1.70	1.70	1.70	12.58
TOTAL	252.50	261.63	241.04	236.18	51.30	81.33	71.91	64.62	320.29	326.21	235.13	189.56

TOTAL FOR YEAR 2363.92

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1932 \*\*\*\*\*

DISCHARGE IN ACRE-FEET OVER NORTH WEIR

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	14.00	.04	.04	17.99	.01	.00	16.93	1.33	15.78	18.04	2.78	.35
2	.01	14.47	17.47	19.23	.00	.00	16.85	1.46	12.97	18.03	16.07	.52
3	.09	13.24	15.30	16.35	.00	.00	14.36	19.28	.79	12.35	11.28	15.55
4	.05	13.99	12.89	.52	.00	.00	1.15	12.80	14.28	10.33	2.39	16.05
5	12.45	1.10	13.48	.04	.00	.00	.24	15.69	.54	16.33	2.16	.69
6	7.04	12.97	15.12	17.98	.00	.00	14.10	15.02	.00	17.54	16.26	.10
7	14.21	.78	1.01	16.72	.00	.00	17.84	17.83	13.86	21.24	.69	13.10
8	15.05	.29	.43	16.23	.00	.00	16.76	1.15	12.04	14.28	.16	16.34
9	1.16	12.71	14.97	15.34	.00	.00	15.72	.78	14.02	12.87	14.77	13.09
10	.30	15.19	17.75	.72	.00	.00	15.62	15.18	5.09	5.09	16.33	15.57
11	.03	15.10	16.70	.49	.00	.00	1.22	12.74	12.49	.00	13.94	14.03
12	11.90	15.11	.93	.34	.00	.00	.47	13.22	.39	7.53	1.23	.78
13	11.95	15.37	16.05	11.78	.00	.00	14.59	12.35	.07	12.09	14.26	.19
14	14.12	.75	.34	15.01	.00	.00	10.31	13.47	12.54	14.56	.90	13.80
15	13.21	.02	.04	15.24	.00	26.00	12.94	1.25	12.88	17.82	.19	12.48
16	.61	13.46	17.96	17.15	.00	14.30	14.13	.99	11.65	7.77	12.97	15.97
17	.04	14.90	17.64	1.13	.00	14.50	15.46	11.30	12.61	7.27	14.51	14.72
18	.00	13.80	16.20	.10	.00	9.40	.78	13.67	4.78	9.31	15.67	12.87
19	13.71	.67	17.30	.31	13.76	.00	.18	14.59	.00	18.19	15.31	.60
20	13.94	15.98	14.34	16.54	14.05	.00	13.27	12.05	.00	17.76	1.64	.07
21	15.48	.61	.65	17.22	5.14	.00	13.46	11.87	13.76	16.62	.64	12.75
22	13.14	.05	.02	13.45	.22	11.00	13.25	1.70	11.67	19.68	.60	12.55
23	.95	15.84	13.82	16.08	.01	10.60	14.02	1.28	13.53	10.07	16.45	16.76
24	.28	18.06	16.54	.78	.00	11.00	14.12	13.72	14.31	7.52	15.09	14.82
25	.12	12.08	14.79	.03	.00	13.50	.87	14.69	14.97	6.32	14.78	1.23
26	13.58	15.76	12.92	.00	.00	15.56	.26	10.30	9.97	14.69	1.11	.47
27	13.45	17.91	13.09	15.35	.00	1.27	15.00	15.19	11.02	15.69	13.34	.15
28	16.36	1.00	.96	16.66	.00	1.33	15.31	12.27	20.96	15.07	1.21	12.69
29	15.19	.52	.52	13.39	.00	15.41	13.17	.76	23.66	13.64	.64	14.45
30	.94	1.15	1.15	.56	.00	16.79	22.95	.13	25.40	4.57	.35	15.04
31	.09	16.26	16.26	.00	.00	.00	1.42	13.00	3.24	3.24	.00	15.59
TOTAL	234.22	275.16	324.76	293.46	37.43	160.26	340.43	301.31	330.19	365.83	237.72	293.89

TOTAL FOR YEAR 3215.72

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1983 \*\*\*\*\*

DISCHARGE, IN ACRE-FEET OVER NORTH WEIR

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.90	13.65	10.74	15.44	.00	.00	8.29	.49	14.74	12.25	12.65	11.33
2	.18	12.44	13.30	15.24	.00	.00	16.44	13.85	28.60	4.26	13.00	12.85
3	.08	14.51	12.26	1.27	.00	.00	.55	17.39	10.73	4.06	13.53	11.13
4	13.40	14.40	11.53	.20	.00	.00	.45	15.81	.08	13.00	11.53	.89
5	14.44	13.04	11.74	13.45	.00	.00	.75	14.11	.00	13.12	7.26	.01
6	13.30	.50	.42	18.28	.00	.00	11.47	13.19	14.54	12.92	1.12	11.32
7	10.33	.37	.14	14.31	.00	.00	15.48	.85	12.54	11.57	.15	10.64
8	12.76	13.27	11.93	12.75	.00	.00	.67	.20	10.63	13.13	12.57	13.07
9	.41	17.32	13.07	12.13	.00	.00	14.19	14.48	12.73	5.73	13.58	14.39
10	15.26	17.53	11.53	.66	.00	.00	.45	12.70	12.94	8.11	13.85	15.65
11	1.26	1.95	11.64	.85	.00	.00	.00	11.35	.72	13.44	12.51	1.14
12	14.87	14.74	12.52	14.22	.00	.00	17.19	13.24	.01	13.75	10.85	.07
13	13.61	1.10	.37	14.23	.00	.00	13.92	4.92	10.89	11.56	.92	14.02
14	16.52	1.70	.29	18.28	.00	.00	17.08	.55	13.11	12.31	.35	14.74
15	13.22	1.14	12.44	14.33	.00	17.14	11.74	.05	12.72	12.34	10.03	14.12
16	.78	15.95	13.30	.49	.00	18.42	14.03	6.01	13.94	4.40	11.54	13.31
17	.05	13.11	14.59	.17	.00	15.41	.83	15.16	12.40	.00	9.51	15.68
18	14.67	1.50	1.54	.00	16.16	12.82	.05	17.18	.42	8.73	7.23	1.00
19	12.25	14.55	13.90	5.47	12.32	.37	13.42	14.56	.00	7.06	11.04	.08
20	13.85	1.04	1.02	14.37	.24	.00	8.36	14.86	19.43	11.47	.56	12.39
21	13.27	1.47	.42	13.53	.00	14.02	10.31	.75	15.19	11.73	.02	12.80
22	16.67	1.84	12.50	13.95	.00	13.44	15.39	.00	11.27	11.29	10.19	14.20
23	1.17	16.81	15.80	1.39	.00	16.87	14.49	13.13	15.14	.34	10.85	15.74
24	.53	14.05	15.44	.29	11.82	16.51	1.22	11.14	12.94	1.82	12.16	14.84
25	14.33	11.47	7.72	.26	10.97	7.55	.17	10.98	.78	11.19	.85	.86
26	13.04	12.06	13.60	15.20	.13	4.71	17.45	4.96	.07	13.44	12.37	.00
27	15.94	1.20	.23	14.73	.00	4.46	19.23	10.25	12.89	16.82	.89	.00
28	12.73	1.11	.44	12.36	.00	21.63	10.54	.57	11.68	9.47	.01	13.34
29	.63	.43	.43	.77	.00	12.06	4.04	.02	12.13	7.95	13.50	14.27
30	.18	15.15	15.15	.04	.00	17.73	.97	11.32	12.73	6.40	12.56	12.83
31	.06	14.94	14.94	.00	.00	.42	.42	11.44		3.74		15.29
TOTAL	271.51	254.15	275.24	261.25	54.71	193.97	260.22	286.64	311.37	288.50	245.86	303.10

TOTAL FOR YEAR 3006.52

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1984 \*\*\*\*\*

DISCHARGE, IN ACRE-FeET OVER NORTH WEIR

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.75	14.46	.00	13.95	.00	.93	14.90	17.63	12.15	1.25	6.46	12.26
2	.02	14.19	.00	.43	12.01	.82	.74	14.14	13.75	1.78	6.74	.54
3	.00	15.44	.00	.00	13.55	.47	.00	13.17	.59	13.42	6.79	.17
4	12.90	.00	.00	12.95	.38	.04	13.11	5.42	.00	11.63	7.98	.01
5	15.00	.00	.00	13.61	.00	.00	14.98	11.61	12.08	10.67	.93	12.16
6	12.71	.00	.00	10.37	.00	.00	14.52	.50	12.75	12.14	.13	13.44
7	15.51	.00	.00	14.81	.00	.00	16.56	.00	12.69	18.90	6.81	14.46
8	.93	13.43	4.25	13.79	.00	.00	16.16	.00	12.25	10.59	6.82	12.77
9	.08	14.55	14.35	.66	.00	.00	.92	12.28	10.58	1.12	7.33	12.73
10	14.35	15.67	37.00	.08	.00	.00	.86	12.30	.14	12.08	8.00	.63
11	13.42	13.51	30.28	13.01	.00	.00	.59	10.98	.02	11.18	7.63	.00
12	16.54	.28	1.08	14.03	.00	.00	.44	13.51	11.07	11.75	.42	11.62
13	15.45	.00	.04	13.71	.00	.00	15.40	.57	14.15	10.34	.00	12.68
14	16.77	11.27	25.78	15.42	.00	17.93	14.58	.00	11.52	9.35	1.11	13.46
15	1.05	10.73	15.37	16.60	.00	21.12	17.71	11.83	12.06	1.58	.01	4.75
16	.02	14.62	14.22	.99	.00	15.74	.56	12.78	11.60	6.41	5.60	10.81
17	11.63	11.62	13.88	.19	.00	.63	.26	13.29	.83	9.06	7.72	.40
18	15.54	11.94	15.11	.32	.00	.03	7.61	13.04	.11	10.13	7.90	.00
19	13.52	.29	.51	13.71	.00	.00	.48	14.14	10.65	1.27	.57	10.15
20	14.93	.00	.00	15.06	.00	22.28	.32	1.18	11.78	.00	.01	4.83
21	15.51	11.33	13.25	14.16	.00	13.82	.07	.30	12.58	.00	12.51	11.83
22	1.05	12.70	13.83	14.74	.00	13.44	.00	12.34	12.83	.00	9.33	12.05
23	.04	8.44	15.33	1.31	.00	.44	.00	13.16	11.42	.10	12.90	10.36
24	13.00	.27	10.33	.08	.00	12.56	.00	13.55	.62	1.52	.69	.29
25	14.25	.00	.36	14.62	.00	.22	.00	13.62	.00	1.47	.27	.00
26	14.70	.00	.00	13.33	.00	.10	.00	14.11	11.03	6.94	.00	.00
27	13.95	.00	.00	13.56	.22	11.74	.00	1.49	11.57	7.46	.00	.00
28	15.16	.01	.00	13.55	.86	14.05	.00	.97	12.08	8.48	10.47	11.77
29	.42	13.66	13.66	15.27	.83	13.89	.00	11.94	10.74	4.18	10.81	11.51
30	.02	15.12	15.12	.42	.68	17.00	.00	13.58	10.90	6.59	12.34	11.14
31	14.62	14.77	14.77	1.23	1.23	.00	.00	12.15	.42	10.84	.42	.42
TOTAL	295.40	191.70	275.90	291.48	29.73	177.60	150.87	285.60	264.97	213.51	158.08	227.04

TOTAL FOR YEAR 2561.94

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1985 \*\*\*\*\*

DISCHARGE IN ACRE-FeET OVER NORTH WEIR

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.00	3.97	1.71	.37	12.21	.00	.40	13.81	15.83	.47	11.90	.00
2	.00	11.24	.90	.00	.52	.00	.04	15.02	.39	11.86	12.90	.00
3	.00	.00	1.29	10.88	.00	.00	11.52	14.02	.03	12.96	13.00	.00
4	4.38	.00	.00	11.52	.00	.02	13.44	12.05	.00	12.05	.00	16.21
5	11.40	.00	.00	11.55	.00	.00	14.41	1.02	15.40	16.48	.00	15.84
6	11.44	10.33	7.24	11.73	.00	.00	.40	.04	17.92	15.16	13.00	16.44
7	.43	10.57	18.89	13.21	.00	.00	14.23	13.02	15.55	.67	15.02	14.73
8	.00	3.63	18.27	.30	.00	.00	.54	15.03	.71	.12	14.41	15.05
9	9.59	3.54	20.02	.30	.00	.00	.00	15.18	.05	11.75	14.35	.44
10	10.04	.37	18.32	11.06	.00	.00	14.45	14.51	.02	9.65	15.19	.00
11	10.32	.00	7.12	11.02	.00	.00	13.35	.71	10.79	.00	.41	.00
12	13.24	.00	.32	10.00	.00	.00	15.87	.01	.40	2.47	.00	.00
13	10.91	13.59	4.13	29.09	.00	16.91	15.05	.00	23.55	4.88	15.29	.00
14	.37	7.74	8.12	32.42	.00	12.21	13.37	14.50	20.39	2.88	15.13	.00
15	.00	9.10	9.24	.00	.00	.61	.06	14.50	11.52	1.11	12.21	.00
16	10.84	8.40	4.00	.00	.00	.03	12.58	15.38	.16	.75	15.37	.00
17	10.56	8.42	23.43	.00	5.33	.00	.00	13.93	.00	11.30	.35	.00
18	10.52	.00	3.63	.00	.08	.00	17.85	13.93	18.31	10.35	.00	.00
19	10.02	.00	23.43	.00	2.46	10.54	16.99	.48	24.54	.00	.00	.00
20	11.14	8.98	.00	.00	.35	11.29	17.35	.00	1.64	.00	14.80	.00
21	.48	6.55	17.21	22.37	.00	14.72	.83	13.62	13.49	.00	16.22	7.37
22	.00	11.07	15.48	23.70	.00	10.82	.01	15.48	10.35	.00	16.64	10.51
23	9.95	11.69	26.95	13.59	.16	8.85	.00	13.21	.10	.00	15.15	.36
24	11.24	13.33	4.29	6.28	.18	.13	13.44	15.54	.08	12.70	14.83	.06
25	11.76	.00	.02	.11	.03	.00	13.04	14.11	11.67	12.80	.34	13.16
26	11.50	.00	.00	.01	.34	10.62	14.28	.31	10.06	9.90	.00	12.62
27	9.40	2.95	18.07	0.65	.00	11.69	15.35	.00	14.12	12.70	14.93	.30
28	.46	1.27	21.23	11.33	.00	11.55	14.87	19.22	5.92	.00	14.46	15.39
29	.00	.00	14.77	.67	.00	12.32	.78	18.64	9.35	.00	15.52	13.25
30	8.80	.00	13.82	.00	.00	14.16	.04	17.92	.20	12.70	.26	.37
31	12.45	.00	11.30	.00	.00	13.93	.46	.46	.00	13.60	.00	.05
TOTAL	216.30	160.47	306.13	253.75	24.08	167.94	291.07	316.99	252.76	196.44	291.69	153.21

TOTAL FOR YEAR 2625.43

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE



# **APPENDIX F**

\*\*\*\*\* 1975 \*\*\*\*\*

DISCHARGES IN ACRE-FOOT OVER SOUTH WEIR

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.00 N	.00 N	.00 N	13.99	18.19	.04	8.35	9.78	1.96	.00	19.80	24.60
2	.00 N	.00 N	.00 N	13.54	16.95	.75	12.85	7.32	1.93	.00	22.30	16.16
3	.00 N	.00 N	.00 N	17.53	15.15	.00	10.81	9.01	12.44	.00	27.63	13.50
4	.00 N	.00 N	.00 N	15.10	3.31	1.98	7.23	4.51	15.16	.86	28.87	15.20
5	.00 N	.00 N	.00 N	10.46	9.46	10.66	4.37	8.71	14.54	.33	26.43	10.72
6	.00 N	.00 N	.00 N	7.59	13.03	.86	5.31	7.41	16.55	1.95	20.05	10.68
7	.00 N	.00 N	.00 N	4.72	.11	.59	13.09	6.45	25.47	2.57	11.24	22.44
8	.00 N	.00 N	.00 N	1.51	1.06	3.76	18.10	2.51	14.74	2.26	9.69	24.44
9	.00 N	.00 N	.00 N	.32	.49	3.79	17.53	.61	17.87	1.69	12.66	21.37
10	.00 N	.00 N	.00 N	.86	.22	8.50	10.05	2.46	19.44	7.28	11.91	27.24
11	.00 N	.00 N	.00 N	2.84	.18	4.14	6.20	8.22	18.55	6.95	11.47	20.41
12	.00 N	.00 N	.00 N	4.09	.97	3.61	8.96	6.00	11.29	14.52	9.45	10.07
13	.00 N	.00 N	.00 N	7.54	.29	3.24	12.10	.73	8.88	11.73	2.12	5.94
14	.00 N	.00 N	.00 N	18.53	.38	.00	7.62	5.06	10.64	18.55	1.06	31.21
15	.00 N	.00 N	.00 N	16.50	.20	.00	8.68	4.37	8.52	14.16	19.71	25.84
16	.00 N	.00 N	.00 N	18.83	1.76	.00	8.17	4.01	11.13	18.60	16.58	16.46
17	.00 N	.00 N	.00 N	15.82	2.53	.00	13.42	10.88	15.13	20.09	17.85	12.37
18	.00 N	.00 N	.00 N	8.34	.53	.00	7.73	15.60	18.71	21.56	14.45	7.33
19	.00 N	.00 N	.00 N	4.13	.36	.00	3.50	18.21	16.78	14.83	12.86	1.41
20	.00 N	.00 N	.00 N	8.51	.00	.00	7.26	18.89	12.46	11.17	9.96	.86
21	.00 N	.00 N	.00 N	14.98	.13	.00	19.90	17.91	14.32	7.97	3.87	3.40
22	.00 N	.00 N	.00 N	17.50	1.08	.00	22.89	12.90	14.33	13.33	2.13	3.58
23	.00 N	.00 N	.00 N	15.00	2.63	.61	18.08	8.52	13.90	15.93	4.99	1.30
24	.00 N	.00 N	.00 N	14.65	1.22	5.06	14.69	10.86	13.72	21.47	7.20	.37
25	.00 N	.00 N	.00 N	5.91	.67	5.84	8.02	13.91	10.78	13.54	8.59	.00
26	.00 N	.00 N	11.66	4.12	.41	6.54	5.64	15.36	7.23	13.41	25.92	.01
27	.00 N	.00 N	11.46	17.09	.15	2.11	9.40	16.99	6.92	19.60	25.48	.10
28	.00 N	.00 N	5.86	23.43	.07	.42	13.33	16.19	13.32	34.53	16.40	.00
29	.00 N	.00 N	4.23	15.79	.17	1.59	12.94	12.08	.00	37.20	13.28	.00
30	.00 N	.00 N	6.11	17.49	.25	6.22	13.14	8.73	.00	31.41	20.49	.00
31	.00 N	.00 N	4.66		.03		14.87	11.09	.00	20.90		.00
TOTAL	.00 N	.00 N	49.02 N	339.01	82.13	70.36	344.53	293.30	367.71	398.41	434.23	327.23

TOTAL FOR YEAR 2708.93

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OF ALL OF RECORD IS MISSING AND THIS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1977 \*\*\*\*\*

DISCHARGE, IN ACKER-FEET OVER SOUTH WEIR

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.00	10.24	5.01	15.78	8.58	.00	10.73	.00	.00	18.94	14.72	25.36
2	.00	7.35	4.63	17.07	5.00	.00	13.70	.00	.19	11.57	18.63	27.53
3	.00	11.58	13.74	9.04	4.94	.00	10.50	.00	1.88	9.42	22.53	23.07
4	.01	12.28	14.41	4.34	8.83	.00	7.27	.70	2.52	13.54	40.54	13.21
5	.67	14.90	12.84	9.19	18.24	.00	7.66	2.37	4.04	15.40	31.80	21.35
6	4.91	7.98	7.13	12.29	25.21	.00	10.71	2.83	9.31	16.03	17.25	23.74
7	9.43	5.83	3.48	13.23	19.64	.00	10.34	.52	13.20	.68	18.42	21.16
8	10.39	10.51	5.98	14.29	10.54	.00	8.76	.21	13.42	1.84	26.85	25.37
9	5.82	13.94	10.32	14.16	6.11	.00	4.77	2.62	11.20	1.03	31.78	22.26
10	4.43	14.92	14.68	7.88	4.13	.00	3.98	6.04	11.57	.03	35.30	17.21
11	7.90	10.85	21.14	4.44	7.26	.00	3.39	8.08	8.00	.38	31.64	9.27
12	12.44	7.58	6.56	6.82	11.63	.00	3.56	10.04	8.36	.00	22.95	5.52
13	13.46	1.00	4.41	12.20	14.38	.00	3.01	9.19	13.67	.00	11.48	10.01
14	15.21	.26	2.17	13.73	14.22	.00	2.46	6.88	18.20	.00	16.43	13.93
15	15.90	1.11	2.17	14.47	8.58	.00	2.20	7.71	22.35	.00	19.41	16.10
16	8.21	24.75	12.54	13.72	4.83	.00	2.11	5.58	24.46	.00	14.54	19.68
17	4.88	22.14	14.77	7.28	6.90	.00	2.36	8.23	20.63	.00	15.34	19.26
18	6.32	18.23	15.86	4.17	11.02	.00	2.05	10.26	12.25	.00	17.77	11.01
19	3.93	20.84	13.80	5.73	12.44	.00	2.05	11.03	9.72	.00	13.24	6.24
20	5.13	14.23	8.87	11.24	8.54	.00	4.55	11.25	13.78	.00	8.82	10.79
21	8.48	7.44	5.14	15.87	3.91	.00	8.17	6.75	15.14	1.08	9.36	14.22
22	6.74	7.80	6.96	18.85	.62	.00	9.73	5.05	17.41	6.57	13.34	15.75
23	3.00	11.64	10.90	15.58	.00	.00	11.23	8.80	18.24	16.30	17.48	16.96
24	10.52	7.79	12.16	9.31	.00	.00	7.56	12.64	15.36	18.09	21.86	14.89
25	10.27	9.79	7.36	5.36	.00	1.06	4.83	12.95	7.72	9.18	22.33	7.97
26	11.46	10.94	4.08	9.33	.00	4.11	7.29	13.57	7.05	10.00	18.19	6.80
27	19.35	5.54	5.41	13.91	.00	2.31	10.71	12.19	11.86	13.79	10.03	9.43
28	21.42	2.98	2.75	15.74	.00	2.62	12.70	7.93	15.79	18.13	10.57	12.02
29	18.88	4.11	4.11	16.85	.00	6.93	13.66	6.95	18.36	17.39	17.64	13.30
30	9.42	9.31	9.31	15.25	.00	9.52	13.97	12.44	21.24	10.39	23.64	15.05
31	7.34	13.22	13.22		.00		7.19	12.59		11.51		15.48
TOTAL	256.62	296.51	307.15	347.18	215.58	27.55	229.66	215.18	366.92	221.34	594.08	484.99

TOTAL FOR YEAR 3562.76

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1978 \*\*\*\*\*

DISCHARGES IN ACRL-FEET OVER SOUTH WEIR

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	10.01	2.32	4.22	15.30	4.93	.00	13.36	19.94	.78	3.31	20.36	22.29
2	7.02	3.02	12.40	9.40	9.66	.00	7.89	13.90	.16	4.14	14.85	19.95
3	10.33	7.52	14.10	4.25	14.77	.00	6.09	19.20	.77	8.72	14.07	12.05
4	15.00	12.14	15.42	7.96	23.73	.00	13.24	15.99	4.15	13.43	11.97	10.75
5	15.25	2.37	9.24	12.02	24.27	.64	7.56	11.61	6.25	15.63	6.62	13.97
6	13.91	3.43	4.84	12.54	12.21	.76	10.82	7.64	7.93	21.05	5.47	16.10
7	10.49	0.23	6.20	14.20	7.32	.02	14.73	4.99	11.09	16.22	11.32	16.10
8	6.51	3.78	13.17	14.20	4.82	.37	19.13	7.53	13.01	9.11	15.74	15.50
9	5.52	20.40	26.96	7.53	3.84	.06	10.39	11.54	11.54	9.59	14.04	9.29
10	10.14	18.49	27.14	3.92	3.10	.00	7.56	14.11	6.25	6.89	14.77	2.08
11	14.06	10.18	15.25	5.31	2.54	.00	9.83	18.03	4.76	10.57	13.14	2.68
12	16.15	7.69	8.48	2.47	1.87	.00	13.58	18.37	7.11	22.17	8.47	5.19
13	10.88	9.57	4.20	.93	1.24	.00	16.25	8.71	9.90	26.31	5.89	9.43
14	17.76	5.94	8.30	1.14	.33	.00	16.32	7.24	13.95	20.33	8.07	12.28
15	10.40	8.63	13.41	3.22	.00	.00	15.54	10.47	19.53	12.73	11.90	14.00
16	7.10	13.02	14.94	2.23	.00	3.37	8.49	12.16	16.68	12.92	18.83	13.35
17	11.31	16.03	15.88	1.35	.32	6.53	5.10	12.87	4.47	17.47	23.66	6.83
18	15.27	17.20	15.03	2.86	1.06	3.48	13.76	13.73	7.26	20.46	21.63	5.69
19	19.22	9.37	6.72	7.72	.84	2.47	28.19	12.90	13.87	21.72	12.72	9.69
20	24.52	4.50	4.25	13.14	.40	5.52	26.50	9.72	17.54	17.29	10.68	12.51
21	19.57	7.24	6.23	16.40	.13	9.74	15.86	5.91	18.63	10.97	18.61	13.53
22	11.03	10.62	13.52	14.41	.00	15.69	17.05	7.53	27.39	6.98	23.13	15.57
23	7.56	11.56	15.40	7.26	.00	23.89	6.72	10.24	30.50	10.53	19.43	12.11
24	6.73	10.72	18.25	3.53	.00	27.77	5.70	12.87	19.23	21.44	13.22	7.78
25	7.18	12.09	14.94	7.18	.00	17.29	10.43	13.68	13.82	21.84	11.96	5.16
26	9.87	6.34	7.57	11.59	.00	9.91	13.37	12.82	3.70	15.13	7.86	3.47
27	14.24	3.01	4.23	14.48	.00	15.67	15.78	6.95	.00	20.57	9.62	7.13
28	16.33	2.98	6.43	14.47	.00	19.03	8.19	1.52	.00	20.88	15.49	18.91
29	9.29	12.20	12.20	6.18	.00	15.43	14.19	1.94	3.77	16.42	19.04	24.36
30	7.57	16.00	16.00	7.59	.00	13.36	11.88	.82	3.89	16.77	21.54	18.82
31	6.57	17.26	17.26	7.59	.00	13.36	16.35	.60		24.35		13.64
TOTAL	378.67	267.48	392.98	246.95	118.09	190.73	404.68	321.59	303.33	484.94	424.10	373.45

TOTAL FOR YEAR 3906.79

LETTERS FOLLOWING NUMBERS MEAN:

M - PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N - RECORD NOT AVAILABLE

\*\*\*\*\* 1979 \*\*\*\*\*

DISCHARGES IN ACRES-FEET OVER SOUTH WEIR

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	10.61	5.32	9.55	16.30	4.93	.00	13.86	19.94	.76	3.31	20.36	22.29
2	7.02	3.62	15.40	9.43	9.60	.00	7.89	13.90	.16	4.14	14.85	19.99
3	10.33	7.52	19.10	4.05	14.77	.00	6.09	15.20	.77	8.72	14.07	12.05
4	13.00	12.14	10.45	7.98	23.74	.00	13.24	15.99	4.15	19.63	11.97	10.75
5	15.26	5.37	9.54	12.02	24.57	.64	7.56	11.61	6.55	13.43	6.62	13.97
6	13.91	3.43	4.04	12.74	12.51	.76	10.82	7.64	7.93	21.05	5.47	16.10
7	10.47	0.23	6.56	14.20	7.35	.02	14.73	4.99	11.04	16.22	11.32	16.10
8	6.51	3.78	13.17	14.20	4.82	.07	19.13	7.53	13.01	9.11	15.74	15.50
9	5.52	20.40	26.96	7.53	3.04	.00	10.39	11.54	11.54	9.59	14.04	9.29
10	10.19	18.49	27.19	3.42	3.10	.00	7.56	14.11	6.25	9.89	14.77	5.08
11	14.08	16.15	16.56	5.31	2.54	.00	9.83	10.03	4.76	10.57	13.14	2.68
12	16.15	7.89	8.48	2.47	1.87	.00	13.56	16.37	7.11	22.17	8.47	5.15
13	18.88	9.57	4.20	.93	1.24	.00	18.25	8.71	9.90	26.31	5.89	4.43
14	17.76	5.94	5.30	1.14	.35	.00	18.35	7.29	13.95	20.33	8.07	12.28
15	10.40	8.63	13.41	3.02	.00	.00	15.64	10.47	19.53	12.73	11.90	14.00
16	7.10	13.02	14.94	2.23	.00	3.37	8.44	12.16	16.68	12.92	18.83	13.35
17	11.31	15.03	15.88	1.05	.32	0.53	5.10	12.67	9.47	17.47	23.60	6.83
18	15.37	17.26	15.03	2.86	1.06	3.45	13.76	13.73	7.26	20.46	21.63	5.69
19	14.22	9.37	0.72	7.72	.84	3.47	28.19	12.90	13.87	21.72	12.72	9.89
20	24.52	4.50	4.25	13.19	.40	5.52	26.50	9.72	17.54	17.29	10.68	12.51
21	14.57	7.24	9.23	16.40	.13	9.79	15.86	5.91	18.63	10.97	18.61	13.53
22	11.03	10.82	13.32	14.41	.00	15.69	17.05	7.53	27.39	6.78	23.13	15.57
23	7.26	11.26	15.40	7.26	.00	23.89	8.72	10.24	30.60	10.53	19.43	12.11
24	8.73	10.72	15.25	3.63	.00	27.77	5.70	12.87	19.23	21.44	13.22	7.78
25	7.18	12.09	14.94	7.18	.00	17.29	10.43	13.68	13.82	21.84	11.96	5.16
26	9.67	0.34	7.27	11.59	.00	9.91	13.37	12.82	3.70	15.13	7.86	3.47
27	14.54	3.01	4.23	14.48	.00	15.67	15.78	6.95	.00	20.57	9.62	7.13
28	16.33	5.98	0.43	14.17	.00	19.03	8.19	1.52	.00	20.88	15.49	18.91
29	4.29	12.20	16.00	6.18	.00	15.43	14.19	1.94	3.77	16.42	19.04	24.36
30	7.57	16.00	16.00	7.59	.00	13.36	11.88	.82	3.89	18.77	21.54	18.82
31	8.57	17.56	17.56		.00		16.35	.60		24.35		13.64
TOTAL	376.07	267.48	392.98	246.95	118.09	190.73	404.48	321.59	303.33	484.94	424.10	373.45

TOTAL FOR YEAR 3706.79

\*\*\*\*\* 1979 \*\*\*\*\*

DISCHARGED IN ACRE-FEET OVER SOUTH WEIR

JAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1			11.80	8.00	3.55	.00	4.61	4.91	7.21	6.37	17.75	8.80
2			12.40	4.11	2.51	.00	2.06	5.74	4.71	12.50	17.24	8.63
3			12.12	5.25	7.19	.00	3.82	8.30	7.96	16.03	12.61	5.12
4			8.56	7.54	7.30	.00	6.84	7.50	12.65	16.60	9.74	8.02
5			6.87	9.15	2.52	.00	8.84	4.57	8.44	17.11	9.41	11.16
6			7.77	3.43	4.03	2.72	10.33	3.57	8.50	13.19	9.85	12.95
7			13.70	7.37	3.31	12.60	11.31	8.43	11.36	6.84	9.37	16.10
8			12.93	2.21	3.22	8.57	6.05	11.77	11.01	8.46	8.50	14.01
9			13.72	3.56	3.21	5.16	3.30	13.43	9.00	10.99	11.00	9.09
10			13.57	4.29	3.73	3.50	3.60	14.04	4.66	12.54	10.04	6.70
11			8.73	6.33	2.85	1.47	7.26	15.80	12.92	13.80	6.45	8.41
12			6.32	7.84	2.20	2.14	3.97	10.09	16.32	11.94	6.70	10.32
13			5.32	9.16	1.43	2.14	13.44	7.29	17.91	10.13	9.61	11.39
14			13.14	9.33	1.35	3.13	12.30	7.30	14.98	7.21	12.07	10.66
15			12.13	8.25	1.13	6.10	9.23	8.91	14.83	7.29	12.23	9.19
16			12.50	3.62	.72	4.13	5.75	10.08	10.02	7.13	12.89	8.46
17			12.19	4.22	.22	2.10	5.19	8.38	2.89	8.23	12.58	4.94
18			6.12	8.21	.45	1.24	9.01	7.40	3.31	9.03	7.91	6.62
19			4.70	7.22	.16	2.56	8.99	4.92	4.01	8.87	6.75	8.31
20			8.15	7.75	.05	8.14	10.54	3.34	4.15	9.09	11.05	10.15
21			4.22	5.68	.02	9.26	12.97	5.21	2.69	6.97	13.82	9.91
22			10.05	4.13	.00	11.02	7.69	8.92	5.23	7.99	13.04	9.13
23			10.22	3.18	.00	14.66	4.61	7.24	4.31	7.79	9.91	5.90
24			11.79	3.77	.00	7.58	6.76	4.99	5.69	15.66	10.09	4.18
25			7.34	12.19	.00	3.72	9.30	4.05	6.65	22.07	7.20	5.52
26			4.21	15.85	.07	5.16	9.37	2.76	12.04	16.93	7.47	4.40
27			8.90	8.55	.08	14.16	6.88	1.23	7.63	10.72	10.21	6.33
28			10.22	5.20	.00	12.94	7.39	1.86	4.01	6.96	11.48	8.10
29			11.57	3.59	.00	7.43	4.46	3.21	5.30	6.38	9.32	8.62
30			12.09	3.01	.00	6.96	1.20	3.32	4.52	9.60	8.56	6.14
31			11.13		.00	2.86		8.21		13.49		5.17
TOTAL			313.35	198.79	58.52	154.07	228.90	209.85	254.50	340.48	315.38	258.35

TOTAL FOR YEAR 2330.19

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1980 \*\*\*\*\*

DISCHARGE, IN ACRE-FEET OVER SOUTH WEIR

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	6.52	9.35	12.04	5.07	2.42	.00	3.19	9.71	5.47	3.50	15.21	9.17
2	5.05	9.69	13.10	11.24	2.49	.00	4.40	8.80	4.89	5.97	10.30	7.50
3	8.69	4.74	10.38	16.52	2.94	.00	7.66	9.11	6.27	7.30	6.97	8.32
4	8.13	3.74	6.25	9.97	2.53	.00	9.58	5.90	9.19	6.39	5.69	7.40
5	6.29	4.49	6.28	5.97	2.03	.00	10.69	4.24	10.60	7.68	9.14	10.03
6	7.06	7.67	9.87	6.88	1.40	.01	6.91	4.88	11.94	4.61	12.14	13.03
7	7.21	9.39	9.81	5.43	1.05	.00	4.09	6.95	10.35	3.28	12.19	12.57
8	10.80	13.77	11.00	4.50	.67	.00	1.88	7.90	6.83	4.39	9.77	9.34
9	11.99	13.87	11.03	7.49	.45	.09	2.85	10.31	4.11	5.55	9.89	6.82
10	12.76	3.89	7.51	8.46	.67	.04	6.17	5.19	6.23	4.91	15.15	10.05
11	12.77	5.62	4.94	9.33	.91	.02	8.13	2.71	8.54	4.80	16.76	11.13
12	12.47	5.49	6.17	9.54	.53	.00	7.75	1.61	7.88	5.08	16.44	8.20
13	9.41	5.91	9.22	9.16	.38	.18	5.06	4.64	3.15	3.07	13.97	5.42
14	6.87	7.88	11.07	5.98	.23	.66	3.12	7.92	2.76	3.13	12.93	6.03
15	7.86	10.31	11.86	4.24	.16	.46	1.78	8.93	1.39	6.92	12.43	5.10
16	9.71	11.99	11.74	5.20	.08	.18	6.32	7.94	1.51	7.73	8.81	3.92
17	10.64	7.86	7.72	8.80	.32	.03	18.12	7.21	3.61	5.62	7.08	6.65
18	11.30	5.16	4.91	10.97	.00	.16	19.08	5.06	5.68	6.06	7.35	9.52
19	11.69	11.10	5.90	11.86	.00	2.00	11.49	3.28	7.48	3.59	9.82	11.45
20	8.26	8.09	9.39	7.72	.00	4.31	12.29	5.73	7.93	2.26	12.23	10.73
21	5.08	8.50	11.61	5.62	.00	5.68	8.22	8.00	6.74	4.92	12.19	9.50
22	4.34	11.05	12.83	3.62	.00	7.35	4.62	9.43	4.46	8.64	10.50	6.77
23	7.14	11.17	12.40	4.34	.00	5.25	4.66	10.32	3.04	8.14	7.49	6.09
24	9.41	7.50	7.51	7.46	.04	2.85	9.06	9.91	5.35	9.67	5.05	6.38
25	10.82	4.82	4.98	8.90	6.06	3.23	12.67	6.42	6.65	10.03	4.17	9.57
26	10.74	5.71	5.40	9.52	4.53	4.80	8.55	3.64	6.55	6.06	8.00	9.86
27	8.55	8.19	6.43	9.48	4.50	7.52	7.99	6.06	4.53	3.63	10.98	7.52
28	6.46	11.20	11.00	6.49	2.77	8.78	5.57	8.13	3.89	3.78	11.73	7.71
29	7.40	11.56	11.56	4.21	1.45	8.32	3.05	9.53	2.92	9.35	11.06	6.13
30	9.52	12.23	12.23	2.96	.74	5.20	4.19	6.01	2.74	16.47	12.96	4.65
31	9.40	7.77	7.77	.21	.21	7.57	7.57	6.45	17.77	17.77	17.77	5.58
TOTAL	273.36	224.15	285.15	226.65	39.23	67.12	226.73	211.92	172.08	202.30	318.40	254.19

TOTAL FOR YEAR 2501.28

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1951 \*\*\*\*\*

DISCHARGE IN AKKE-FLET OVER SOUTH WEIR

JAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	7.36	7.12	7.60	3.45	5.85	.52	2.44	.00	.00	2.66	8.95	5.40
2	8.17	5.75	8.53	7.26	5.71	2.27	2.94	.00	.00	3.66	6.14	5.03
3	8.51	5.48	4.33	9.49	4.60	1.14	1.30	.00	.21	3.42	5.25	4.09
4	6.70	8.15	4.74	10.03	3.25	.40	1.64	.00	2.50	2.32	9.42	3.09
5	5.34	9.55	7.04	4.37	2.37	.45	1.24	.00	5.43	2.20	13.13	2.15
6	5.22	9.93	3.17	6.03	1.74	.37	.16	.00	6.40	1.76	14.35	1.78
7	6.08	10.42	8.85	3.82	1.31	.25	.00	.00	3.60	2.36	13.06	1.38
8	7.41	10.14	10.10	5.47	1.05	.25	.00	.00	2.72	3.50	7.94	.85
9	6.54	10.15	7.38	9.74	.24	.18	.41	.00	4.80	3.93	5.27	.65
10	9.50	8.59	4.90	9.12	.08	.41	.22	.00	6.82	3.62	4.43	.10
11	9.74	13.51	5.84	7.16	.02	1.45	.00	.00	5.49	3.36	6.60	.06
12	7.22	9.70	7.57	7.34	.00	2.11	.08	.00	9.20	3.14	9.90	.01
13	2.35	12.03	8.10	3.44	.00	2.44	.79	.00	9.03	6.49	10.94	.00
14	6.82	12.00	4.71	3.24	.00	1.07	.34	.00	5.44	10.90	10.16	.40
15	9.64	9.04	10.87	3.24	.00	.36	.36	.00	4.64	12.57	6.53	.66
16	9.63	8.93	7.24	5.32	.00	.03	.19	.00	6.57	14.99	4.12	2.89
17	10.52	5.34	4.75	8.20	.00	.00	.12	.00	8.61	10.52	4.29	5.08
18	4.54	6.34	5.65	10.00	.00	.00	.11	.00	10.94	6.80	7.61	7.92
19	6.63	8.90	7.85	9.48	.00	.74	.00	.00	13.95	4.19	10.49	10.27
20	4.70	5.93	10.50	8.31	.00	2.25	.00	.00	12.94	5.51	12.40	10.76
21	6.45	7.14	11.53	3.86	1.98	3.80	.00	.00	9.15	15.05	12.16	7.17
22	8.01	6.46	11.05	4.34	11.32	3.25	.00	.00	7.89	16.59	7.85	5.31
23	8.82	4.26	7.74	6.78	2.78	2.46	.00	.00	10.24	17.84	5.19	7.62
24	4.87	3.25	6.24	7.81	3.13	3.04	.00	.00	16.25	15.35	5.04	10.67
25	4.62	3.95	7.14	7.56	1.31	3.74	.00	.00	14.66	9.71	8.36	13.10
26	6.79	3.23	4.47	4.99	.59	4.59	.00	.43	11.64	6.29	9.50	12.91
27	5.44	10.08	10.64	3.13	.21	4.24	.00	.82	3.11	5.27	9.55	8.66
28	6.83	10.29	10.60	2.59	.95	4.94	.00	.22	2.49	6.38	6.84	5.97
29	8.65		6.78	3.31	.40	6.17	.00	.00	1.63	11.37	7.60	4.45
30	9.88		4.03	7.01	.13	3.67	.00	.14	.41	12.07	5.35	5.76
31	6.56		2.72		.00		.00	.00		13.16		7.67
TOTAL	237.77	230.74	237.46	194.80	52.00	56.69	13.24	1.61	205.26	240.40	248.54	152.88

TOTAL FOR YEAR 1871.24

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE



\*\*\*\*\* 1952 \*\*\*\*\*

DISCHARGE, IN ACRE-FEET OVER SOUTH WEIR

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	8.46	5.72	9.54	9.54	3.98	4.31	10.23	4.46	1.18	2.00	8.56	7.64
2	8.69	5.14	7.62	13.31	6.28	3.65	12.20	3.66	1.31	11.74	12.12	6.50
3	6.26	5.17	7.31	15.25	4.62	3.31	13.13	4.07	.85	11.95	15.60	5.55
4	4.28	9.09	11.30	12.88	3.03	2.83	11.97	5.96	.61	9.12	13.98	10.58
5	3.35	10.28	12.15	10.62	2.87	1.53	8.06	6.45	.67	9.12	9.42	12.14
6	4.28	8.12	11.98	7.00	2.28	1.09	4.64	7.12	.09	11.73	8.81	6.14
7	5.12	7.97	15.97	8.55	1.52	.91	5.01	6.19	.34	13.67	9.93	7.13
8	5.37	6.42	11.41	13.18	1.36	.30	12.80	6.52	1.50	14.47	7.04	8.99
9	8.26	4.64	8.97	14.54	1.17	.23	15.29	3.01	2.53	10.27	7.25	12.20
10	6.09	5.71	7.73	15.09	.99	.09	15.83	3.96	3.30	10.18	10.82	12.86
11	4.12	9.22	12.09	13.87	.88	.00	16.10	6.28	4.03	7.02	12.70	12.81
12	3.30	10.92	14.36	11.98	.71	.00	10.84	5.61	3.27	7.46	12.52	12.24
13	5.01	11.93	4.32	7.63	.70	.00	5.25	7.30	2.11	10.37	9.88	11.65
14	7.35	12.29	9.82	8.13	.42	.03	7.15	8.90	3.17	16.17	10.88	13.94
15	11.45	8.21	7.07	12.93	.12	.03	10.21	7.85	6.12	24.03	7.36	10.49
16	11.63	5.20	4.67	18.00	.00	.00	13.13	7.03	7.88	19.38	6.68	10.25
17	7.98	6.50	7.62	23.18	.00	7.23	14.23	6.40	9.54	12.57	13.48	9.71
18	5.37	14.73	12.79	12.50	.00	11.16	16.57	8.16	9.87	8.86	20.96	9.11
19	4.54	13.64	13.57	7.63	.00	20.44	13.08	12.65	7.94	8.38	21.44	6.56
20	6.06	3.71	14.65	5.30	.00	13.46	6.84	14.16	5.05	14.50	20.94	8.08
21	8.30	8.77	13.43	6.77	.00	8.44	7.32	11.26	5.14	15.75	13.23	7.55
22	10.22	6.65	8.23	14.04	4.39	6.64	10.12	7.13	10.60	19.15	8.85	7.09
23	10.55	4.61	5.27	14.92	5.17	6.67	10.88	7.29	16.16	17.04	9.32	9.39
24	8.26	5.65	5.61	14.99	4.48	9.34	11.24	8.43	15.57	11.74	14.07	11.19
25	5.68	13.80	10.90	10.32	3.40	12.13	9.64	8.53	14.50	8.06	15.72	11.55
26	4.91	11.51	12.81	6.84	2.35	18.13	6.55	10.28	13.13	9.80	14.20	8.38
27	6.40	12.14	11.92	7.03	2.95	16.58	4.52	11.43	15.29	13.34	12.28	5.93
28	6.11	13.57	12.85	10.24	4.10	9.09	4.30	12.12	18.29	17.69	13.94	4.08
29	10.54		10.30	15.40	2.85	5.28	7.98	9.02	19.97	20.70	8.93	5.41
30	10.69		13.80	14.39	1.89	6.78	13.58	7.13	.00	19.28	6.57	8.26
31	8.07		8.69		2.61		13.59	8.14		11.65		10.80
TOTAL	220.98	244.84	319.69	355.81	70.60	169.56	325.30	239.52	200.24	397.21	357.28	285.25

TOTAL FOR YEAR 3186.30

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1965 \*\*\*\*\*

DISCHARGES IN ACRE-FEET OVER SOUTH WEIR

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	12.63	2.74	4.20	12.55	0.24	1.80	11.71	5.88	3.13	4.77	14.01	19.96
2	8.00	2.84	4.04	14.03	4.84	1.48	12.38	2.10	4.92	4.04	24.17	16.51
3	0.03	12.00	11.37	15.93	3.04	1.24	9.72	2.46	13.95	4.16	22.44	13.23
4	4.92	16.33	12.20	11.94	3.19	.91	8.65	8.11	10.64	4.81	19.37	13.03
5	5.17	14.90	12.64	8.15	2.66	.80	8.00	12.23	6.40	7.31	17.41	4.09
6	5.31	13.43	12.02	8.24	2.43	1.93	3.90	8.91	4.21	9.31	12.24	5.33
7	11.24	9.83	9.44	13.50	2.36	2.68	4.34	4.78	6.00	11.04	7.87	5.04
8	11.29	3.14	7.00	15.13	2.05	2.24	8.97	7.07	8.06	12.87	5.87	6.00
9	11.22	7.11	10.41	14.23	1.27	3.40	6.28	6.03	8.71	12.58	6.24	6.21
10	8.50	11.60	12.63	13.24	1.36	3.75	5.87	6.85	10.54	10.28	10.43	10.44
11	4.53	14.03	12.31	13.23	1.33	2.16	5.30	8.32	10.41	10.08	11.10	11.95
12	6.24	11.00	12.74	8.32	1.22	1.40	3.33	8.11	7.25	11.51	9.72	3.57
13	9.30	13.59	12.02	8.63	.47	.88	4.35	8.91	5.97	13.01	9.02	9.25
14	10.63	13.95	10.02	11.24	.83	.57	8.14	8.95	7.25	13.67	6.11	4.04
15	12.17	14.56	7.36	15.53	.30	.44	11.18	6.31	13.60	14.13	4.64	10.74
16	13.52	4.96	7.55	15.47	.10	.99	10.33	3.70	19.71	13.02	6.74	13.59
17	4.51	11.90	12.05	10.37	.00	8.63	9.78	3.18	14.19	11.12	9.05	13.35
18	0.34	17.72	12.85	6.87	.00	9.88	7.02	5.84	10.76	11.31	6.33	13.31
19	7.11	12.37	12.10	5.16	.00	9.53	4.68	3.07	6.79	12.87	8.76	11.20
20	4.06	10.50	11.35	4.42	2.11	5.74	4.50	10.77	4.36	14.59	9.44	8.05
21	13.43	7.80	9.23	5.51	5.48	3.28	5.83	11.07	2.95	16.26	7.09	8.67
22	17.06	5.30	0.92	11.05	4.01	5.73	6.09	7.34	2.42	15.37	6.90	9.04
23	15.77	4.31	0.11	12.37	3.07	10.19	8.93	3.63	4.82	13.92	6.71	10.33
24	10.54	5.46	10.22	9.16	2.57	13.69	10.09	5.24	7.02	13.10	10.01	11.87
25	7.69	3.66	17.44	7.10	1.58	20.34	6.93	7.34	4.48	10.69	10.67	12.43
26	8.55	8.73	15.84	2.65	4.97	12.99	3.95	9.55	2.21	10.96	9.26	8.67
27	10.06	4.02	15.25	6.33	4.17	10.65	5.01	10.91	2.63	12.17	11.72	8.22
28	15.49	8.89	10.74	10.91	2.65	6.51	9.83	10.28	2.75	11.22	8.47	4.62
29	15.56	8.89	9.21	12.48	2.00	8.44	9.84	7.03	1.89	8.67	10.50	6.09
30	10.80	6.47	6.47	8.83	1.84	8.77	7.62	4.72	2.56	7.74	17.27	4.79
31	7.07	7.67	7.67	1.75	1.75	6.42	6.42	4.42	6.42	8.18	12.79	12.79
TOTAL	319.96	293.47	339.11	317.98	71.62	161.46	228.12	224.74	210.23	333.41	326.61	323.76

TOTAL FOR YEAR 3150.49

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1954 \*\*\*\*\*

DISCHARGE IN ACRE-FEET OVER SOUTH WEIR

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	13.92	10.20	5.25	10.25	7.91	7.91	11.72	.61	7.46	.00	17.44	30.91
2	4.06	12.62	2.00	10.22	4.06	6.99	15.21	.66	3.86	.00	17.04	24.41
3	0.07	14.20	1.07	6.72	5.02	5.44	9.50	2.40	2.82	.49	20.31	15.01
4	4.52	15.28	1.50	4.29	15.11	4.23	5.36	9.70	2.83	1.99	28.64	11.46
5	6.17	11.35	1.10	4.76	9.24	3.58	7.34	7.58	.48	3.01	21.59	8.26
6	9.03	7.29	.97	10.72	3.91	3.00	9.77	7.25	.26	4.60	17.77	9.03
7	10.60	5.24	.74	13.25	5.92	2.40	13.56	6.29	1.37	7.01	12.74	11.60
8	11.97	3.21	.55	12.34	6.59	1.92	17.59	4.61	3.77	7.04	10.26	12.49
9	0.67	4.34	.64	11.22	5.20	1.74	16.52	3.32	6.81	5.48	9.37	16.89
10	6.23	8.26	3.04	5.92	4.69	1.67	10.62	4.04	7.42	4.34	9.86	12.60
11	7.24	11.40	11.22	4.39	4.56	1.16	.82	7.04	5.43	6.33	10.62	9.46
12	10.14	12.70	13.45	5.09	4.28	.44	.43	8.65	5.47	7.54	10.57	5.40
13	12.25	8.76	0.29	0.35	4.21	.07	2.43	10.06	8.73	8.56	8.56	4.35
14	13.09	0.30	5.20	10.31	5.75	.00	3.32	7.63	11.74	6.57	6.42	6.97
15	13.56	7.20	0.60	12.31	3.65	.00	5.48	2.12	13.53	6.02	4.12	9.36
16	9.96	4.23	11.30	15.38	2.64	12.07	13.67	4.76	17.92	5.87	3.19	9.87
17	5.90	10.27	11.82	10.29	2.51	22.44	6.14	6.95	17.81	6.65	4.19	9.85
18	7.34	10.30	11.06	0.27	2.40	16.35	3.43	11.51	12.66	9.84	5.61	7.49
19	10.01	11.13	11.71	4.01	1.58	11.56	3.83	11.76	10.24	7.61	6.12	4.76
20	11.31	0.33	7.64	4.12	1.20	6.97	3.94	13.00	12.21	3.74	5.49	6.05
21	12.43	2.71	4.71	0.15	.22	.66	2.34	11.42	13.80	3.05	4.97	9.38
22	12.70	3.65	5.04	4.98	.00	3.90	1.71	7.24	14.61	1.96	6.11	10.19
23	4.20	14.60	0.62	10.53	.00	4.70	1.36	6.88	14.77	1.73	11.49	10.74
24	6.75	12.87	10.92	5.70	.00	4.86	.83	10.29	13.45	1.04	15.42	9.75
25	7.25	3.39	11.47	4.97	.07	8.02	1.13	12.74	9.38	.54	15.00	10.93
26	9.75	5.13	7.65	7.34	1.07	5.24	1.51	11.52	7.04	1.67	11.35	9.76
27	11.50	3.76	4.40	4.73	7.12	3.56	1.32	12.48	6.70	4.38	9.00	6.38
28	12.84	3.25	3.12	11.19	10.23	7.35	1.25	12.63	6.05	7.60	8.31	4.90
29	13.16		2.00	11.53	8.54	12.63	1.28	7.50	6.60	12.67	15.97	4.85
30	9.11		2.43	11.97	6.97	12.48	1.17	6.32	4.68	9.28	32.22	8.16
31	7.37		7.25		0.24		.92	7.35		15.41		10.48
TOTAL	302.62	245.58	186.66	263.07	141.01	175.63	175.70	245.61	250.00	167.14	361.77	325.26

TOTAL FOR YEAR 2840.47

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1985 \*\*\*\*\*

DISCHARGE, IN ACRE-FEET OVER SOUTH WEIR

JAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	8.36	7.43	5.24	14.38	4.27	.01	14.53	6.50	8.64	3.28	13.05	12.57
2	5.93	7.13	7.13	10.35	5.15	.00	9.38	9.86	10.16	4.00	13.77	4.20
3	4.46	13.01	7.70	8.56	4.95	.00	5.85	11.52	7.89	13.42	16.07	2.86
4	3.04	7.22	7.77	7.21	3.03	.00	5.34	12.73	2.19	11.01	16.23	1.58
5	3.29	6.37	8.53	14.15	3.03	.00	5.94	19.00	.00	15.31	11.03	5.64
6	5.07	4.20	5.10	14.98	2.32	.00	11.61	11.95	7.33	20.06	10.86	10.54
7	7.34	2.54	4.34	15.25	1.42	.00	8.14	7.05	15.95	15.27	12.07	12.88
8	6.34	9.37	4.02	15.73	1.39	.00	10.25	8.93	17.50	9.25	12.82	16.70
9	4.03	11.08	4.72	15.89	1.06	.00	7.88	10.97	10.52	8.40	13.35	14.95
10	3.50	11.17	2.13	7.51	.03	.00	4.87	11.98	2.48	10.74	13.55	5.63
11	5.40	4.08	4.42	7.08	.41	.00	4.95	11.35	1.13	9.26	13.25	3.55
12	7.64	5.43	4.33	10.73	.80	.00	8.40	6.62	4.77	7.98	8.23	2.77
13	9.24	4.63	3.57	12.90	.74	.00	10.47	2.76	3.64	16.44	6.71	1.34
14	4.96	4.07	3.43	12.04	.43	9.28	12.07	1.66	4.21	12.33	10.30	.40
15	7.10	5.83	3.04	16.80	.67	21.10	12.21	3.35	1.90	8.53	11.93	.05
16	2.77	7.43	2.75	11.32	.33	18.42	7.56	9.39	1.99	16.56	12.84	.00
17	2.14	6.35	2.90	7.99	.00	10.32	4.54	11.60	1.61	18.17	12.78	.00
18	6.88	8.43	3.80	8.71	.00	8.11	5.87	12.42	.31	14.72	6.11	.00
19	6.21	7.56	7.91	8.04	.00	3.83	10.90	12.07	1.18	12.50	4.96	.00
20	9.24	5.27	5.77	6.14	.00	3.60	15.24	9.28	4.39	8.32	3.90	.00
21	10.11	4.51	5.97	4.52	.00	8.13	18.58	4.88	8.09	4.91	6.80	.00
22	7.29	4.47	10.23	3.87	.00	12.37	10.48	6.81	6.17	3.31	11.32	.04
23	5.21	4.80	15.88	4.17	.00	12.88	5.55	12.85	6.21	2.73	13.73	1.50
24	5.20	5.00	17.57	3.54	.00	11.25	3.28	13.01	3.92	5.09	14.43	2.05
25	7.30	7.72	12.07	2.97	.00	7.47	3.93	14.43	2.91	8.31	13.55	1.52
26	9.14	7.43	7.88	2.51	1.02	4.12	8.04	14.74	3.67	10.56	8.58	3.49
27	9.87	5.48	5.56	2.76	1.27	4.60	10.35	11.09	6.59	11.53	6.50	6.49
28	9.53	4.46	4.84	2.06	.65	8.00	11.37	6.88	7.93	11.21	9.21	5.03
29	6.68	10.10	10.10	4.06	.68	9.58	11.68	9.55	6.48	7.85	15.12	6.72
30	4.76	12.43	12.43	5.63	.43	11.55	8.12	15.58	4.88	6.08	17.20	7.98
31	5.15	14.93	14.93	.15	.15	5.45	15.31	15.31	4.88	9.78	17.20	5.64
TOTAL	206.74	194.01	214.10	257.16	37.08	162.62	278.63	312.70	166.64	318.20	342.34	137.42

TOTAL FOR YEAR 2038.64

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1966 \*\*\*\*\*

DISCHARGE IN ACRE-FeET OVER SOUTH WEIR

JAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	3.74	10.63										
2	5.74	13.05										
3	11.48	12.74										
4	8.24	7.69										
5	8.22	4.75										
6	7.25	3.77										
7	6.07	5.65										
8	4.42	10.75										
9	5.48	12.81										
10	6.14	12.77										
11	10.43	3.55										
12	12.73	5.24										
13	13.04	5.56										
14	6.25	11.45										
15	5.30	12.82										
16	7.43	13.50										
17	10.82	13.80										
18	13.09	8.80										
19	14.16	5.74										
20	9.27	4.76										
21	8.16	5.11										
22	3.86	11.52										
23	2.64	13.24										
24	5.20	13.43										
25	11.74	9.80										
26	12.93	7.04										
27	12.84	7.95										
28	8.64	12.71										
29	5.82											
30	6.69											
31	8.38											
TOTAL	268.75	267.66										

TOTAL FOR YEAR 538.41

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

# **APPENDIX G**

\*\*\*\*\* 1976 \*\*\*\*\*

DISCHARGE IN ACRE-FEET FROM SOUTH CULVERT

JAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.00 N	.00 N	.00 N	.00	.00	.00	.12	.00	.00	.00	.00	.02
2	.00 N	.00 N	.00 N	.00	.00	.00	.18	.31	.00	.00	.00	.02
3	.00 N	.00 N	.00 N	.00	.00	.00	.04	1.34	.00	.00	.00	.00
4	.00 N	.00 N	.00 N	.00	.00	.77	.00	1.12	.00	.00	.00	.00
5	.00 N	.00 N	.00 N	.00	.00	2.86	.00	.00	.00	.00	.00	.00
6	.00 N	.00 N	.00 N	.00	.00	2.30	.00	.00	.00	.00	.00	.00
7	.00 N	.00 N	.00 N	.00	.00	1.78	.00	.00	.00	.00	.00	.41
8	.00 N	.00 N	.00 N	.00	.00	1.07	.00	.00	.00	.00	.00	.52
9	.00 N	.00 N	.00 N	.00	.00	.85	.00	.00	.00	.00	.00	.47
10	.00 N	.00 N	.00 N	.00	.00	.72	.00	.00	.00	.00	.00	5.47
11	.00 N	.00 N	.00 N	.00	.00	7.10	.00	.00	.00	.00	.00	8.28
12	.00 N	.00 N	.00 N	.00	.00	6.29	.00	.00	.00	.00	.00	7.34
13	.00 N	.00 N	.00 N	.00	.00	3.06	.00	.00	.00	.00	.00	11.03
14	.00 N	.00 N	.00 N	.00	.00	1.51	.00	.00	.00	.00	.00	11.38
15	.00 N	.00 N	.00 N	.00	.00	.95	.00	.00	.00	.00	.00	9.38
16	.00 N	.00 N	.00 N	.00	.00	.54	.00	.00	.00	.00	.00	7.59
17	.00 N	.00 N	.00 N	.00	.00	.19	.00	.00	.00	.00	.00	5.45
18	.00 N	.00 N	.00 N	.00	.00	.02	.01	.00	.00	.00	.00	3.38
19	.00 N	.00 N	.00 N	.00	.00	.01	.00	.00	.00	.00	.00	1.97
20	.00 N	.00 N	.00 N	.00	.00	.02	.00	.00	.00	.00	.00	1.18
21	.00 N	.00 N	.00 N	.00	.00	.10	.00	.00	.00	.00	.00	.80
22	.00 N	.00 N	.00 N	1.57	.00	.09	.22	.00	.00	.00	.00	.42
23	.00 N	.00 N	.00 N	2.33	.00	1.46	.55	.00	.00	.00	.00	.25
24	.00 N	.00 N	.00 N	2.42	.00	3.63	.35	.00	.00	.00	.00	.05
25	.00 N	.00 N	.00 N	2.00	.00	2.46	.25	.00	.00	.00	.00	.00
26	.00 N	.00 N	.00 N	1.46	.00	1.45	.01	.00	.00	.00	.00	.00
27	.00 N	.00 N	.00 N	1.27	.00	.65	.00	.00	.00	.00	.00	.00
28	.00 N	.00 N	.00 N	1.13	.00	.22	.00	.00	.00	.00	.00	.00
29	.00 N	.00 N	.00 N	.72	.00	.02	.00	.00	.00	.00	.00	.00
30	.00 N	.00 N	.00 N	.35	.00	.02	.01	.00	.00	.00	.00	.00
31	.00 N	.00 N	.00 N	.13	.00	.01	.23	.00	.00	.00	.02	.00
							.02	.00	.00	.00	.00	.00
TOTAL	.00 N	.00 N	.00 N	13.98	.00	40.13	1.99	2.77	.00	.00	84.08	99.00

TOTAL FOR YEAR 241.65

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1977 \*\*\*\*\*

DISCHARGES IN ACRE-FEET FROM SOUTH CULVERT

JAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.00	.00	.00	.00	.00	.19	.00	1.16	1.21	.00	.00	3.58
2	.00	.00	.00	.00	.00	.11	.00	2.29	.34	.00	.00	10.77
3	.00	.00	.00	.00	.00	1.01	.00	4.42	.00	.04	.00	13.69
4	.00	.00	.00	.00	.00	1.89	.14	1.42	.00	.00	.00	9.67
5	.00	.00	.00	.00	.32	1.00	.99	.00	.00	.00	11.58	6.36
6	.00	.00	.00	.00	.74	.49	2.21	.00	.00	.00	22.99	4.05
7	.00	.00	.00	.00	.62	.06	3.38	.00	.00	.00	16.87	1.71
8	.00	.00	.00	.00	.54	.02	3.03	.00	.00	.00	13.06	.99
9	.00	.00	.00	.00	.43	.00	2.24	.00	.00	.00	10.87	.82
10	.00	.00	.00	.00	.57	.00	2.08	.00	.00	.00	8.68	.94
11	.00	.00	.01	.00	1.01	.00	2.08	.01	.00	.00	4.71	.63
12	.00	.00	.01	.00	.88	.00	2.22	.02	.00	.00	2.24	.46
13	.00	.00	.00	.00	.72	.00	2.65	.04	.00	.00	.39	.46
14	.00	.00	.00	.00	.51	.00	2.50	.03	.00	.00	.01	.37
15	.00	.00	.00	.00	.30	.00	2.51	.00	.00	.00	.00	.39
16	.00	.00	.00	.00	.17	.00	2.68	.00	.01	.00	.00	.86
17	.00	.00	.00	.00	.09	.00	3.20	.00	.00	.00	.00	1.59
18	.00	.02	.00	.00	.02	.00	3.97	.00	.00	.00	.00	1.53
19	.00	.00	.00	.00	2.52	.00	3.84	.01	.00	.00	.00	1.30
20	.00	.00	.00	.00	4.64	.00	4.54	.01	.00	.00	.00	1.10
21	.00	.00	.00	.00	3.12	.00	4.10	.00	.00	.00	.00	1.03
22	.00	.00	.00	.15	10.79	.00	3.51	.32	.00	.00	.00	.76
23	.00	.00	.00	.12	10.00	.00	2.87	.67	.00	.09	.00	.35
24	.00	.01	.00	.05	4.75	.00	2.71	.99	.00	.30	.00	.25
25	.00	.00	.00	.00	1.90	.00	2.09	.67	.00	.00	.00	.40
26	.00	.00	.00	.01	1.02	.00	2.22	.55	.00	.00	.00	.58
27	.00	.00	.00	.00	1.73	.18	1.54	.66	.00	.00	.00	.52
28	.00	.00	.00	.00	1.40	.03	1.30	.69	.00	.00	.00	.46
29	.00	.00	.00	.02	1.70	.00	2.15	.85	.00	.00	.00	.39
30	.00	.00	.00	.00	1.54	.00	2.23	2.04	.00	.00	.00	.26
31	.00	.00	.00	.00	.66	1.38	1.69	1.69	.00	.00	.00	.25
TOTAL	.00	1.68	.02	.35	52.89	5.08	70.96	16.61	1.56	.43	91.40	66.54

TOTAL FOR YEAR 309.52

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE



\*\*\*\*\* 1978 \*\*\*\*\*

DISCHARGE, IN ACRE-FEET FROM SOUTH CULVERT

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.24	.00	.00	.00	.00	.00	.00	.53	.00	.00	.00	.94
2	.03	.00	.02	.00	.00	.00	.00	1.75	.00	.00	.00	.83
3	.01	.00	.02	.00	.00	.00	.14	1.94	.00	.00	.00	.61
4	.00	.00	1.35	.00	.00	.00	.60	1.44	.00	.00	.00	.26
5	.00	.00	1.00	.00	15.73	.00	.33	1.28	.00	.00	.00	.18
6	.00	.00	.00	.00	19.01	.16	.04	1.29	.00	.00	.00	.12
7	.00	.00	.77	.00	14.74	.00	.00	1.22	.00	.00	.00	.04
8	.00	.00	.25	.00	11.07	.00	.13	1.14	.00	.00	.00	.01
9	.00	.00	2.55	.00	7.23	.00	.02	.92	.00	.00	.00	.00
10	.00	.00	1.32	.00	2.26	.00	.00	.36	.00	.00	.00	.00
11	.00	.00	.06	.00	1.58	.00	.00	.38	.00	.00	.00	.00
12	.00	.00	.01	.00	.69	.00	.00	.59	.00	.00	.00	.00
13	.00	.00	.00	.00	.13	.00	.00	.60	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.75	.00	.00	.00	.00
15	.00	.00	.00	.00	.01	.00	.00	.45	.00	3.41	16.88	.14
16	.00	.00	.00	.00	.00	.00	.00	.33	.00	4.86	15.57	.03
17	.00	.00	.00	.00	.00	.00	.00	.18	.00	3.36	15.16	.02
18	.00	.00	.00	.13	.00	.00	.07	.14	.00	2.70	14.33	.00
19	.32	.00	.00	.01	.00	.00	.60	.48	.00	2.21	13.29	.00
20	1.01	.00	.00	.00	.00	.00	1.45	1.10	.00	2.25	14.66	.00
21	1.10	.00	.00	.00	.00	.00	.73	.86	.00	1.63	14.44	.00
22	1.09	.00	.00	.00	.00	.39	.51	.51	.00	1.14	10.79	.00
23	1.01	.00	.00	.00	.00	.15	.36	.36	.00	10.04	8.96	.00
24	.97	.00	.00	.33	.00	.52	.03	.37	.12	11.82	6.77	.00
25	.53	.00	.00	.06	.00	1.27	.00	.28	.43	8.99	4.38	.00
26	.71	.00	.00	.02	.00	.82	.00	.11	.83	5.69	2.80	.00
27	.55	.00	.00	.00	.00	.53	.00	.01	1.78	3.31	1.83	.00
28	.04	.00	.00	.00	.00	.33	.00	.00	.79	2.38	1.02	.98
29	.00	.00	.00	.00	.00	.06	.00	.00	.00	1.12	.86	1.22
30	.00	.00	.00	.00	.00	.00	.00	.00	.00	.13	.75	.87
31	.00	.00	.00	.00	.00	.12	.12	.00	.00	.00	.00	4.23
TOTAL	7.64	.00	6.85	.55	70.89	3.70	5.08	19.68	3.95	65.04	249.94	10.48

TOTAL FOR YEAR 445.80

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1979 \*\*\*\*\*

DISCHARGE, IN ACRE-FEET FROM SOUTH CULVERT

JAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.24	.00	.00	.00	.00	.00	.00	.83	.00	.00	.00	.94
2	.03	.00	.02	.00	.00	.00	.00	1.76	.00	.00	.00	.83
3	.01	.00	.62	.00	.00	.00	.14	1.94	.00	.00	.00	.61
4	.00	.00	1.35	.00	.00	.00	.60	1.44	.00	.00	.00	.26
5	.00	.00	1.05	.00	15.73	.00	.33	1.28	.00	.00	.00	.18
6	.00	.00	.86	.00	19.01	.16	.04	1.29	.00	.00	.00	.12
7	.00	.00	.75	.00	14.79	.00	.05	1.22	.00	.00	.00	.04
8	.00	.00	.25	.00	11.07	.00	.13	1.14	.00	.00	.00	.01
9	.00	.00	2.56	.00	5.23	.00	.02	.92	.00	.00	.00	.00
10	.00	.00	1.32	.00	2.56	.00	.00	.36	.00	.00	12.14	.00
11	.00	.00	.00	.00	1.58	.00	.00	.38	.00	.00	20.66	.00
12	.00	.00	.01	.00	.69	.00	.00	.59	.00	.00	20.09	.00
13	.00	.00	.00	.00	.13	.00	.00	.59	.00	.00	16.79	.00
14	.00	.00	.00	.00	.07	.00	.00	.75	.00	.00	18.15	.00
15	.00	.00	.00	.00	.01	.00	.00	.45	.00	3.41	17.62	.00
16	.00	.00	.00	.00	.00	.00	.00	.33	.00	4.86	16.68	.14
17	.00	.00	.00	.00	.00	.00	.00	.18	.00	3.36	15.57	.03
18	.00	.00	.00	.13	.00	.00	.07	.14	.00	2.70	15.16	.02
19	.35	.00	.00	.01	.00	.00	.80	.48	.00	2.21	14.33	.00
20	1.01	.00	.00	.00	.00	.00	1.48	1.10	.00	2.25	14.66	.00
21	1.10	.00	.00	.00	.00	.00	.73	.86	.00	1.63	14.44	.00
22	1.09	.00	.00	.00	.00	.00	.39	.51	.00	1.14	10.79	.00
23	1.01	.00	.00	.00	.00	.01	.15	.36	.00	10.04	8.96	.00
24	.97	.00	.00	.33	.00	.52	.03	.37	.12	11.82	6.77	.00
25	.53	.00	.00	.06	.00	1.27	.00	.28	.43	8.99	4.36	.00
26	.71	.00	.00	.02	.00	.82	.00	.11	.83	5.69	2.80	.00
27	.55	.00	.00	.00	.00	.53	.00	.01	1.78	3.31	1.83	.00
28	.04	.00	.00	.00	.00	.33	.00	.00	.79	2.38	1.02	.98
29	.00	.00	.00	.00	.00	.06	.00	.00	.00	1.12	.86	1.22
30	.00	.00	.00	.00	.00	.00	.00	.00	.00	.13	.75	.67
31	.00	.00	.00	.00	.00	.12	.12	.00	.00	.30	4.23	4.23
TOTAL	7.64	.00	6.65	.55	70.89	3.70	5.08	19.68	3.95	65.04	249.94	10.48

TOTAL FOR YEAR \$45.80

LETTERS FOLLOWING NUMBERS MEAN:

M - PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N - RECORD NOT AVAILABLE

# **APPENDIX H**

\*\*\*\*\* 1976 \*\*\*\*\*

DISCHARGE, IN ACRES-FLEET FROM NORTH PUMP

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.00 N	.00 N	.00 N	19.65	.00	.00	17.32	.00	17.47	26.76	23.03	.00
2	.00 N	.00 N	.00 N	20.50	16.75	.00	8.82	16.45	17.50	.00	23.43	.00
3	.00 N	.00 N	.00 N	17.30	.00	.00	.00	16.34	16.99	.00	18.22	18.90
4	.00 N	.00 N	.00 N	.00	20.48	.00	.00	17.31	.00	18.99	19.77	.00
5	.00 N	.00 N	.00 N	.00	15.73	.00	15.94	16.01	.00	24.52	22.45	.00
6	.00 N	.00 N	.00 N	.00	.00	.00	24.74	16.51	19.84	19.47	.00	18.18
7	.00 N	.00 N	.00 N	.00	.00	.00	20.70	.00	14.71	20.59	.00	18.80
8	.00 N	.00 N	.00 N	.00	.00	.00	22.44	.00	18.78	20.91	20.00	19.10
9	.00 N	.00 N	.00 N	14.57	.00	.00	.00	21.87	22.70	.00	19.06	17.52
10	.00 N	.00 N	.00 N	.00	.00	.00	.00	19.09	19.55	.00	20.52	19.29
11	.00 N	.00 N	.00 N	.00	.00	.00	.00	16.55	.00	19.17	19.74	.00
12	.00 N	.00 N	.00 N	18.97	.00	.00	20.02	12.76	.00	29.94	26.94	.00
13	.00 N	.00 N	.00 N	25.00	.00	.00	.00	17.19	18.25	20.74	.00	17.66
14	.00 N	.00 N	.00 N	14.57	.00	.00	16.89	.00	.00	11.24	.00	21.36
15	.00 N	.00 N	.00 N	24.55	.00	.00	16.15	.00	17.09	18.36	13.88	18.96
16	.00 N	.00 N	.00 N	19.39	.00	.00	18.81	20.60	17.52	.00	25.02	19.50
17	.00 N	.00 N	.00 N	.00	.00	.00	.00	17.94	19.97	.00	18.52	19.11
18	.00 N	.00 N	.00 N	.00	.00	.00	.00	22.91	18.65	18.94	16.82	.00
19	.00 N	.00 N	.00 N	20.13	.00	.00	19.33	23.58	.00	20.98	21.33	.00
20	.00 N	.00 N	.00 N	18.51	.00	.00	17.92	18.59	18.80	20.70	.00	19.96
21	.00 N	.00 N	.00 N	18.74	.00	.00	19.14	.00	16.85	21.45	.00	12.91
22	.00 N	.00 N	.00 N	22.24	.00	18.42	19.74	.00	17.89	18.52	21.20	.00
23	.00 N	.00 N	.00 N	19.92	.00	15.85	25.41	17.45	15.02	.00	19.95	.00
24	.00 N	.00 N	.00 N	.00	.00	15.36	.00	18.52	17.02	.00	17.50	.00
25	.00 N	.00 N	.00 N	.00	.00	21.42	.00	16.48	.00	19.56	21.47	.00
26	.00 N	.00 N	15.30	17.44	.00	.00	21.30	18.31	.00	20.44	22.02	.00
27	.00 N	.00 N	.00	17.26	.00	.00	18.60	18.23	18.20	23.11	.00	.00
28	.00 N	.00 N	.00	18.38	.00	16.72	15.71	.00	17.87	21.85	.00	.00
29	.00 N	.00 N	13.26	19.55	.00	16.70	14.26	.00	22.24	18.51	14.96	.00
30	.00 N	.00 N	18.52	18.82	.00	15.92	16.71	16.49	20.93	.00	23.37	.00
31	.00 N	.00 N	15.91	.00	.00	.00	.00	26.81	.00	.00	.00	.00
TOTAL	.00 N	.00 N	66.41 N	374.10	51.47	120.39	370.51	409.90	403.87	428.67	449.26	241.25

TOTAL FOR YEAR 2015-83

LETTERS FOLLOWING NUMBERS MEAN:

N = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1977 \*\*\*\*\*

DISCHARGE IN ACRE-FEET FROM WURTH PUMP

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.00	.00	19.64	25.35	.00	.00	15.50	15.74	14.66	.00	22.26	20.46
2	.00	15.93	23.77	.00	11.41	.00	.00	16.15	15.47	.00	21.11	19.58
3	.00	17.52	19.40	.00	18.71	.00	.00	16.16	.00	19.57	19.53	.00
4	10.63	19.63	17.38	22.92	17.92	.00	17.09	19.69	.00	20.13	12.03	.00
5	16.74	.00	.00	18.47	21.45	.00	15.82	17.72	16.46	15.71	.00	20.00
6	18.09	.00	.00	17.13	19.82	.00	13.74	.00	18.47	17.78	.00	19.72
7	16.37	18.03	18.14	18.72	.00	.00	15.46	.00	18.34	19.80	19.82	25.23
8	.00	17.90	16.47	18.62	.00	.00	.00	16.23	.00	.00	20.41	20.05
9	.00	18.07	15.63	.00	.00	.00	.00	16.77	16.72	.00	18.58	22.66
10	20.03	15.82	23.47	.00	10.40	.00	.00	6.19	.00	18.82	18.46	.00
11	21.01	18.37	18.60	17.89	17.98	.00	.00	19.45	.00	23.11	17.98	.00
12	16.68	.00	.00	23.92	17.83	.00	.00	14.68	18.85	7.23	.00	19.63
13	17.94	.00	.00	20.15	18.70	.00	.00	.00	21.39	.00	.00	25.23
14	24.24	19.96	14.17	18.26	.00	.00	.00	16.61	17.68	.00	23.22	19.31
15	.00	22.67	19.64	16.50	.00	.00	.00	.00	19.32	.00	.00	19.70
16	.00	17.13	17.04	.00	19.57	.00	.00	16.45	15.75	.00	13.73	18.96
17	21.28	18.47	19.48	.00	16.36	.00	.00	15.33	.00	.00	19.28	.00
18	.00	20.14	18.41	20.47	17.99	.00	.00	16.07	.00	.00	18.74	.00
19	17.96	.00	.00	19.54	15.24	.00	18.99	15.15	15.76	.00	.00	22.50
20	18.53	.00	.00	21.47	.00	.00	15.56	.00	16.16	22.22	.00	21.46
21	17.26	17.74	17.76	19.94	.00	.00	14.59	.00	17.79	22.60	18.65	22.12
22	.00	24.70	16.19	19.53	.00	.00	17.98	16.10	18.71	23.80	18.28	19.85
23	16.77	.00	19.53	.00	.00	9.00	.00	17.63	15.30	21.09	19.48	19.64
24	22.45	17.39	.00	.00	.00	15.24	.00	16.34	.00	.00	22.67	.00
25	20.68	19.03	16.76	25.36	.00	.00	16.95	17.23	.00	.00	20.60	.00
26	20.19	.00	.00	19.62	.00	.00	16.03	17.18	14.67	17.63	.00	18.61
27	21.49	.00	.00	19.91	.00	18.22	15.59	.00	21.75	19.69	.00	20.38
28	19.70	16.45	15.04	11.60	.00	17.46	14.71	.00	21.50	16.99	.00	18.66
29	.00	.00	19.75	15.07	.00	16.26	15.00	16.16	22.26	.00	.00	12.59
30	.00	.00	19.54	.00	.00	14.56	.00	16.55	22.05	.00	.00	29.13
31	17.95	19.35	19.35	.00	.00	.00	.00	17.52	.00	22.70	.00	.00
TOTAL	380.59	335.12	414.31	412.57	224.68	90.76	223.06	372.90	379.31	308.87	345.03	455.79

TOTAL FOR YEAR 3942.99

LETTERS FOLLOWING NUMBERS MEAN:

M • PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N • RECORD NOT AVAILABLE

\*\*\*\*\* 1975 \*\*\*\*\*

DISCHARGE, IN ACRE-FEET FROM NORTH PUMP

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.00	.00	22.34	.00	16.76	.00	.00	.00	15.95	.00	.00	16.57
2	16.36	20.69	20.94	.00	16.46	.00	.00	.00	.00	11.54	17.58	.00
3	18.75	20.67	21.06	18.81	17.13	.00	18.15	22.81	17.99	16.16	15.99	.00
4	20.93	.00	.00	19.70	17.57	.00	.00	21.23	15.51	16.62	.00	16.36
5	20.28	.00	.00	14.73	.00	.00	18.26	.00	.00	17.33	.00	18.68
6	20.15	19.33	21.89	19.17	.00	.00	16.93	.00	17.73	18.12	16.56	17.98
7	17.29	20.60	23.66	19.31	.00	.00	17.07	17.04	17.32	.00	19.44	19.56
8	.00	20.02	23.91	.00	.00	.00	.00	21.44	15.99	.00	.00	.00
9	.00	20.48	19.94	.00	.00	.00	.00	21.85	.00	20.06	15.68	.00
10	19.64	22.79	20.95	19.02	.00	.00	21.67	22.50	.00	.00	20.00	.00
11	20.25	.00	.00	.00	.00	.00	15.96	20.17	15.82	19.98	.00	.00
12	24.70	19.17	.00	.00	.00	.00	18.90	.00	16.94	16.44	.00	21.35
13	19.27	.00	22.24	.00	.00	.00	22.93	.00	18.26	19.61	.00	21.22
14	.00	20.23	21.61	20.82	.00	19.81	15.73	.00	21.63	18.26	9.84	18.15
15	.00	19.06	20.27	.00	.00	18.05	.00	18.64	14.26	.00	18.86	17.08
16	19.96	20.05	20.10	.00	.00	18.70	.00	17.69	14.26	.00	15.65	17.42
17	19.72	18.42	19.13	18.23	.00	.00	.00	17.92	.00	17.84	14.95	.00
18	20.03	.00	.00	17.26	.00	.00	18.43	16.72	.00	16.68	20.11	.00
19	20.09	.00	.00	21.68	.00	18.54	17.54	16.72	17.59	15.69	.00	16.57
20	20.25	18.43	21.12	20.50	.00	17.65	17.35	.00	16.65	15.35	.00	17.08
21	.00	19.46	18.65	16.72	.00	17.16	.00	.00	15.91	.00	17.81	16.74
22	.00	19.99	20.77	.00	.00	16.07	18.71	17.49	18.96	.00	16.18	16.74
23	20.83	14.43	23.37	.00	.00	17.47	.00	18.82	18.57	.00	15.48	18.68
24	1.55	20.84	17.16	18.59	.00	.00	.00	16.82	.00	16.68	.00	.00
25	19.15	.00	.00	17.25	.00	17.47	.00	18.03	.00	16.51	17.62	.00
26	19.84	.00	.00	17.00	.00	15.34	16.89	17.64	16.19	.00	.00	.00
27	.00	20.75	18.49	15.18	.00	20.20	.00	.00	14.86	.00	.00	16.95
28	.00	20.43	18.52	.00	.00	16.53	.00	.00	17.36	15.76	17.08	16.95
29	.00	.00	18.58	17.73	.00	17.11	14.94	18.39	16.26	.00	18.66	17.25
30	16.49	21.32	21.32	.00	.00	17.25	.00	17.67	.00	.00	17.81	13.35
31	1.72	19.79	19.79	.00	.00	18.89	.00	15.60	.00	22.75	17.62	.00
TOTAL	379.45	376.44	475.86	312.10	70.04	233.41	321.28	392.82	339.75	314.12	322.92	334.70

TOTAL FOR YEAR 3872.89

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1979 \*\*\*\*\*

DISCHARGE IN ACRES-FEET FROM NORTH PUMP

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.00	.00	22.34	.00	18.78	.00	.00	.00	15.95	.00	.00	16.57
2	16.36	20.89	20.94	.00	16.45	.00	.00	.00	.00	11.54	17.53	.00
3	16.72	20.87	21.05	18.31	17.15	.00	18.15	22.61	17.49	16.16	15.99	.00
4	20.93	.00	.00	19.70	17.67	.00	.00	21.23	15.51	16.62	.00	16.38
5	20.28	.00	.00	14.73	.00	.00	18.26	.00	.00	17.33	.00	18.68
6	20.15	19.33	21.89	19.17	.00	.00	16.93	.00	17.73	18.12	16.55	17.98
7	17.29	20.80	23.68	19.31	.00	.00	17.07	17.04	17.32	.00	19.44	19.56
8	.00	20.02	23.91	.00	.00	.00	.00	21.44	15.99	.00	.00	.00
9	.00	20.48	19.94	.00	.00	.00	.00	21.65	.00	20.06	15.68	.00
10	14.84	22.79	20.95	19.02	.00	.00	21.67	22.50	.00	.00	20.00	.00
11	20.25	.00	.00	.00	.00	.00	15.96	20.17	15.82	19.98	.00	21.35
12	24.70	19.17	.00	.00	.00	.00	18.90	.00	16.94	18.44	.00	21.22
13	19.27	.00	22.24	.00	.00	.00	22.93	.00	18.26	19.61	9.84	18.15
14	.00	20.23	21.61	20.82	.00	19.81	15.73	18.64	21.53	.00	18.86	17.06
15	.00	19.09	20.27	.00	.00	18.05	.00	17.08	14.26	.00	15.65	17.42
16	19.98	20.05	20.10	.00	.00	18.70	.00	17.69	.00	17.84	14.95	.00
17	19.72	18.42	19.13	18.23	.00	.00	18.43	17.92	.00	16.69	20.11	.00
18	20.03	.00	.00	17.26	.00	.00	17.54	16.72	17.59	15.69	.00	16.57
19	20.09	.00	.00	21.58	.00	18.94	17.35	.00	16.65	15.35	.00	17.08
20	20.25	18.43	21.12	20.50	.00	17.63	.00	.00	15.91	.00	17.81	15.74
21	.00	19.48	18.65	18.92	.00	17.16	16.71	17.49	18.96	.00	16.18	16.74
22	.00	19.99	20.77	.00	.00	18.07	.00	18.82	18.57	.00	15.48	18.68
23	20.83	14.43	23.37	.00	.00	17.47	.00	18.62	.00	16.68	.00	.00
24	1.53	20.84	17.18	18.59	.00	.00	19.89	18.03	.00	16.51	17.62	.00
25	19.75	.00	.00	17.25	.00	.00	15.36	16.03	.00	16.51	.00	.00
26	16.84	.00	.00	17.00	.00	20.20	16.89	17.64	16.19	.00	.00	.00
27	.00	20.75	18.48	15.18	.00	16.53	.00	.00	14.86	.00	.00	16.95
28	.00	20.43	18.52	.00	.00	17.11	14.94	16.39	17.36	15.78	17.08	16.95
29	.00	.00	18.58	17.73	.00	17.25	.00	17.67	16.26	.00	18.66	17.25
30	16.49	.00	21.32	.00	.00	18.89	.00	15.60	.00	.00	17.81	13.35
31	1.72	19.79	19.79	.00	.00	16.59	15.27	15.27	.00	22.75	17.62	.00
TOTAL	379.45	376.44	475.86	312.10	70.04	233.41	321.28	392.82	339.75	314.12	322.92	334.70

TOTAL FOR YEAR 3872.89

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

# **APPENDIX I**



\*\*\*\*\* 1970 \*\*\*\*\*

DISCHARGE, IN ACRE-FEET FROM SOUTH PUMP

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.00 N	.00 N	.00 N	.30	.00	.00	.00	.00	.00	20.27	.00	.00
2	.00 N	.00 N	.00 N	.00	.00	.00	.00	17.92	17.13	.00	.00	.00
3	.00 N	.00 N	.00 N	.00	.00	.00	.00	15.83	17.57	.00	.00	.00
4	.00 N	.00 N	.00 N	.00	.00	.00	.00	.00	.00	18.04	.00	.00
5	.00 N	.00 N	.00 N	.00	.00	.00	.00	.00	.00	25.56	.00	.00
6	.00 N	.00 N	.00 N	.00	.00	.00	.00	.00	19.44	18.44	.00	.00
7	.00 N	.00 N	.00 N	.00	.00	.00	.00	.00	14.71	16.79	.00	.00
8	.00 N	.00 N	.00 N	.00	.00	.00	.00	.00	17.17	18.31	.00	.00
9	.00 N	.00 N	.00 N	.00	.00	.00	.00	.00	22.70	.00	.00	.00
10	.00 N	.00 N	.00 N	.00	.00	.00	.00	.00	19.16	.00	.00	.00
11	.00 N	.00 N	.00 N	.00	.00	.00	.00	.00	.00	21.35	.00	.00
12	.00 N	.00 N	.00 N	.00	.00	.00	.00	.00	.00	13.51	.00	.00
13	.00 N	.00 N	.00 N	.00	.00	.00	.00	16.86	17.44	10.15	.00	.00
14	.00 N	.00 N	.00 N	.00	.00	.00	.00	.00	.00	19.23	.00	.00
15	.00 N	.00 N	.00 N	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00 N	.00 N	.00 N	.00	.00	.00	.00	12.57	.00	.00	.00	.00
17	.00 N	.00 N	.00 N	.00	.00	.00	.00	16.85	.00	.00	.00	.00
18	.00 N	.00 N	.00 N	.00	.00	.00	.00	21.48	18.32	.00	.00	.00
19	.00 N	.00 N	.00 N	.00	.00	.00	.00	22.46	.00	.00	.00	.00
20	.00 N	.00 N	.00 N	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00 N	.00 N	.00 N	.00	.00	.00	.00	.00	.00	17.17	.00	.00
22	.00 N	.00 N	.00 N	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00 N	.00 N	.00 N	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00 N	.00 N	.00 N	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00 N	.00 N	.00 N	.00	.00	.00	.00	.00	.00	18.02	.00	.00
26	.00 N	.00 N	.00 N	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00 N	.00 N	.00 N	.00	.00	.00	18.65	.00	.00	.00	.00	.00
28	.00 N	.00 N	.00 N	.00	.00	.00	15.80	.00	.00	.00	.00	.00
29	.00 N	.00 N	.00 N	.00	.00	.00	14.57	.00	19.25	.00	.00	.00
30	.00 N	.00 N	.00 N	.00	.00	.00	15.70	.00	19.55	.00	.00	.00
31	.00 N	.00 N	.00 N	.00	.00	.00	.00	.00	.00	.00	.00	.00
TOTAL	.00 N	.00 N	.00 N	.00	.00	.00	64.72	124.15	202.59	216.84	.00	.00

TOTAL FOR YEAR 608.30

LETTERS FOLLOWING NUMBERS MEAN:

N - PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N - RECORD NOT AVAILABLE

\*\*\*\*\* 1977 \*\*\*\*\*

DISCHARGE IN ACRE-FEET FROM SOUTH PUMP

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.00	.00	.00	.00	.00	.00	16.04	.00	.00	.00	19.41	.00
2	.00	.00	.00	.00	.00	.00	.00	15.09	15.81	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	15.05	.00	19.77	.00	.00
4	10.84	.00	.00	.00	.00	.00	16.77	22.28	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	15.01	18.04	16.32	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	13.35	.00	18.60	17.78	.00	.00
7	.00	.00	.00	9.18	.00	.00	15.52	.00	.00	19.62	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	17.55	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	17.10	19.21	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	13.43	.00	19.21	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	14.52	.00	24.25	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	19.02	17.68	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	23.24	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	17.72	21.61	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	14.32	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	15.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	10.16	.00	.00
22	.00	.00	.00	13.57	.00	.00	.00	.00	.00	18.79	.00	.00
23	.00	.00	.00	13.30	.00	.00	.00	16.25	.00	24.16	.00	.00
24	.00	.00	.00	.00	.00	10.67	.00	.00	.00	20.53	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	2.60	.00	.00	.00	.00	.00	16.23	.00	.00
28	.00	.00	16.31	.00	.83	18.69	.00	.00	.00	.00	.00	.00
29	.00	.00	24.26	5.69	.00	.00	.00	.00	.00	18.55	.00	.00
30	.00	.00	.00	.00	.00	14.66	15.85	.00	.00	.00	.00	.00
31	.00	.00	.00	.00	.00	.00	.00	.00	21.87	.00	.00	.00
TOTAL	10.84	.00	42.57	44.44	.83	44.02	92.54	164.31	128.55	287.90	19.41	.00

TOTAL FOR YEAR 835.41

LETTERS FOLLOWING NUMBERS MEAN:

M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

\*\*\*\*\* 1978 \*\*\*\*\*

DISCHARGE, IN ACRES-FEET FROM SOUTH PUMP

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.00	.00	.00	.00	.00	.00	.00	.00	33.97	.00	.00	.00
2	.00	.00	.00	.00	16.65	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	32.84	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	35.34	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	17.62	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	18.35	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	16.42	.00	.00	.00
14	.00	.00	.00	.00	.00	19.60	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	18.77	.00	.00	15.31	.00	.00	27.76
16	.00	.00	.00	.00	.00	17.65	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	16.39	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	18.44	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	16.28	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	18.26	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	32.32	.00	.00	.00
29	.00	.00	.00	.00	.00	.00	.00	18.73	24.95	.00	.00	.00
30	.00	.00	.00	.00	.00	.00	.00	17.55	21.67	.00	.00	.00
31	.00	.00	.00	.00	.00	.00	.00	28.59	.00	.00	.00	.00
TOTAL	.00	.00	.00	32.33	16.65	56.02	.00	64.87	247.36	35.97	.00	27.76

TOTAL FOR YEAR 463.96

LETTERS FOLLOWING NUMBERS MEAN:

M \* PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N \* RECORD NOT AVAILABLE

\*\*\*\*\* 1974 \*\*\*\*\*

DISCHARGES IN ACRE-FEET FROM SOUTH PUMP

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.00	.00	.00	.00	.00	.00	.00	.00	33.97	.00	.00	.00
2	.00	.00	.00	.00	15.32	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	32.84	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	35.34	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	17.52	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	18.35	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	16.42	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	19.60	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	18.77	.00	.00	15.31	.00	.00	27.76
16	.00	.00	.00	.00	.00	17.65	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	10.87	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	18.44	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	16.28	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	18.26	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	32.32	.00	.00	.00
29	.00	.00	.00	.00	.00	.00	.00	18.73	24.95	.00	.00	.00
30	.00	.00	.00	.00	.00	.00	.00	17.55	21.67	.00	.00	.00
31	.00	.00	.00	.00	.00	.00	.00	28.59	.00	.00	.00	.00
TOTAL	.00	.00	.00	35.33	16.05	56.02	.00	64.87	247.36	35.97	.00	27.76

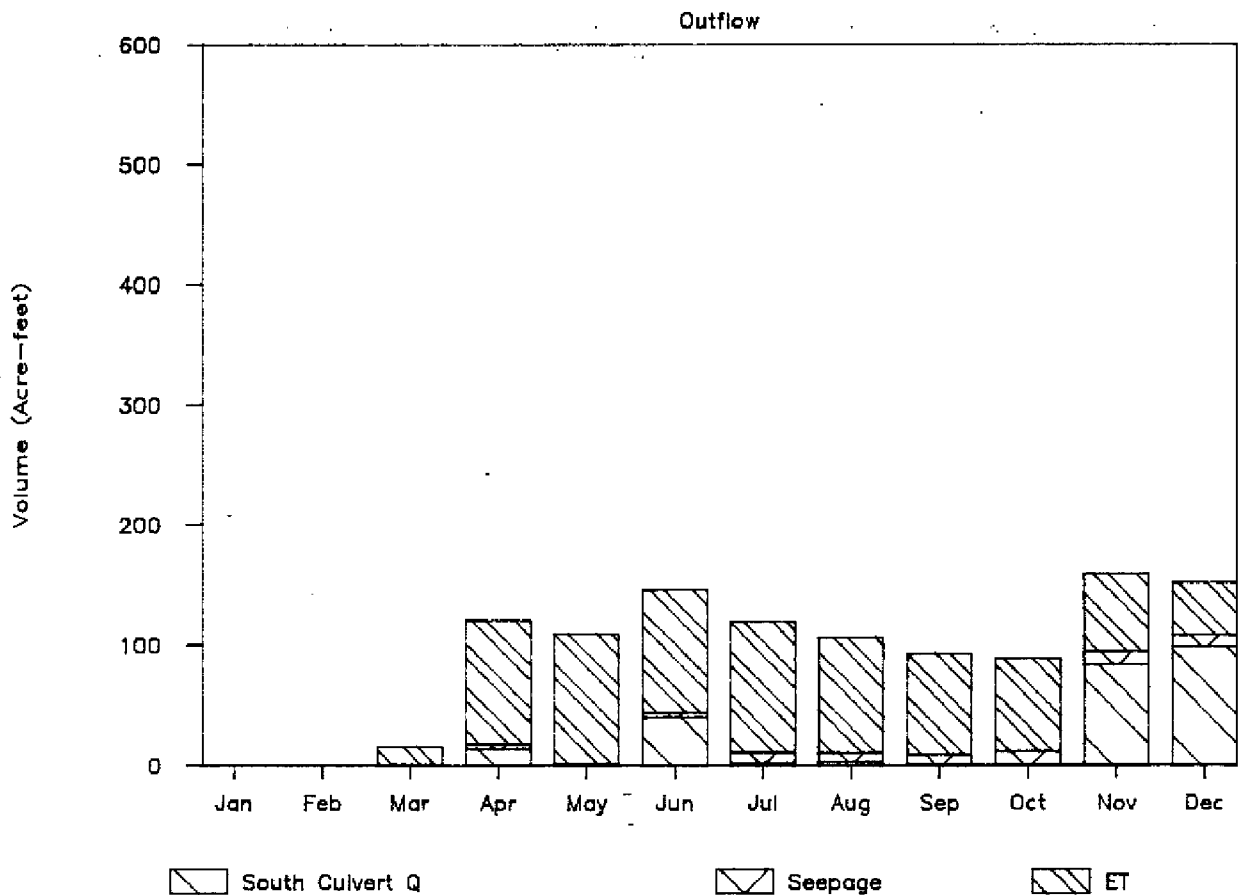
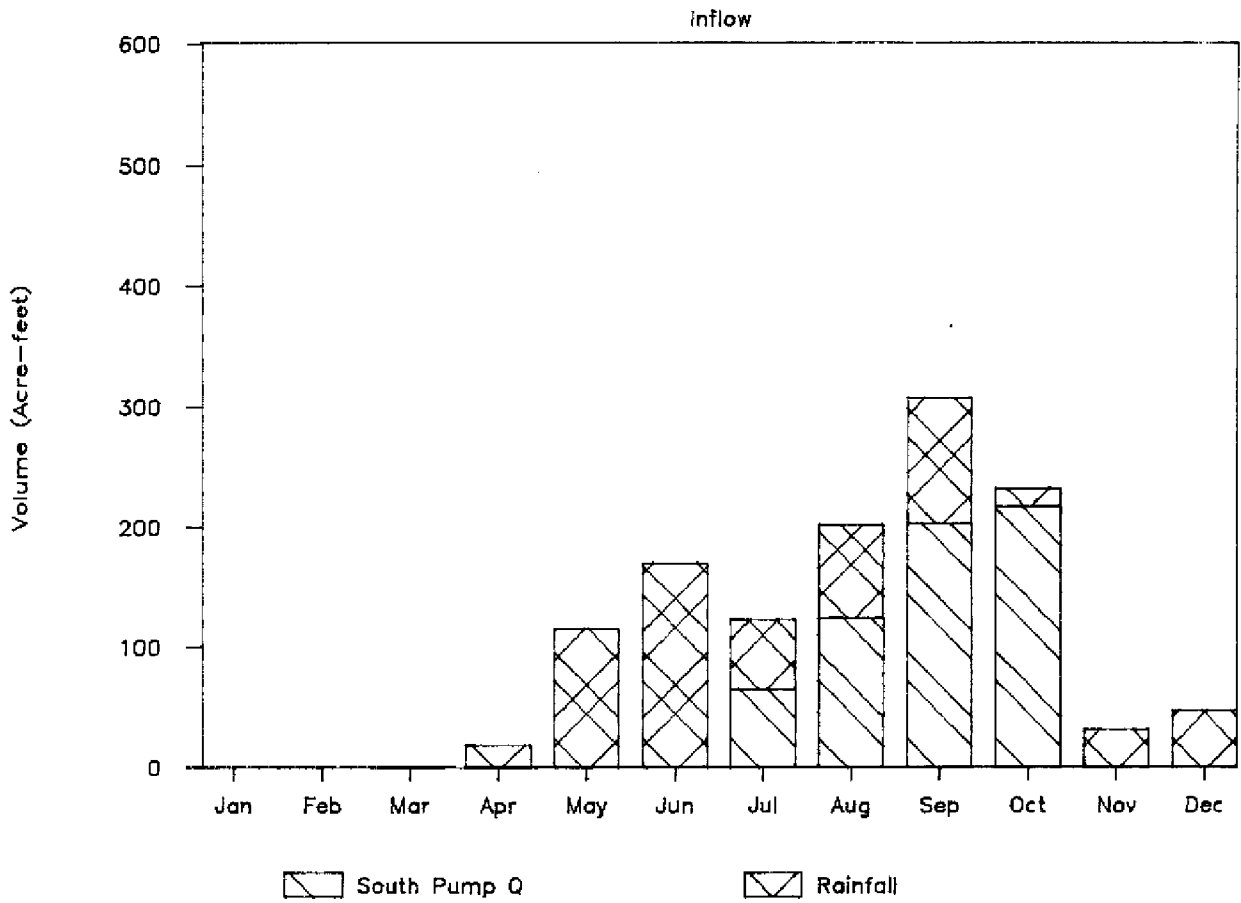
TOTAL FOR YEAR 483.96

LETTERS FOLLOWING NUMBERS MEANS:

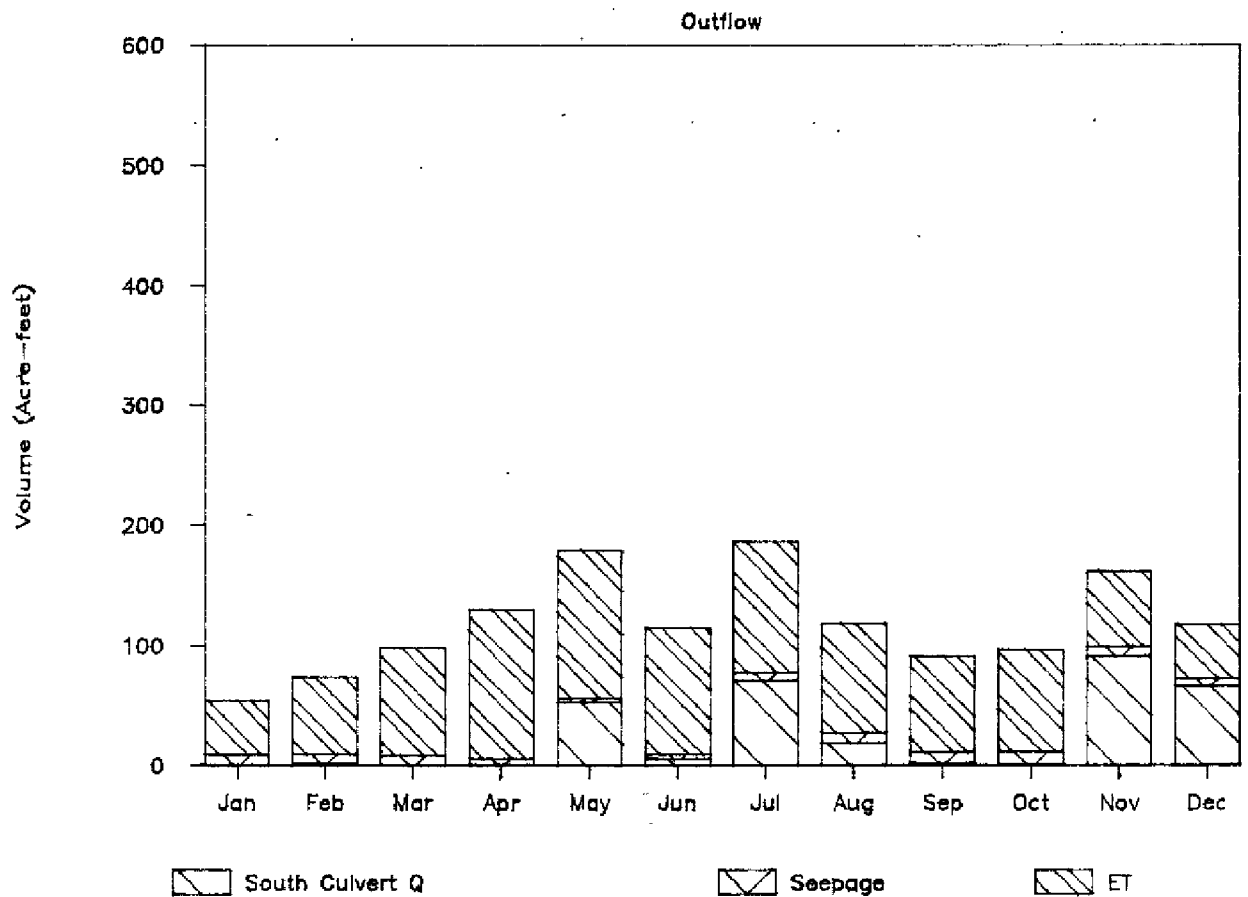
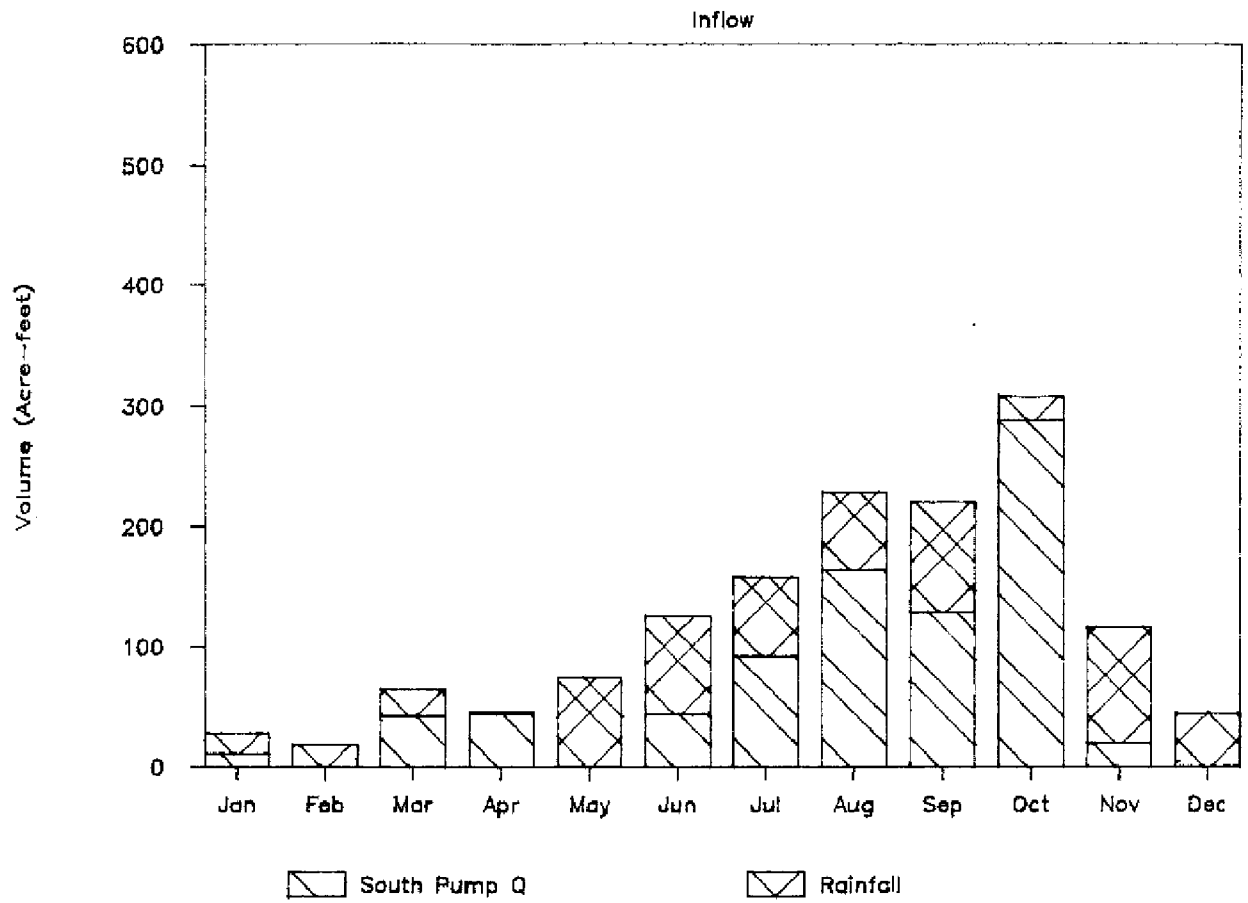
M = PART OR ALL OF RECORD IS MISSING AND THUS ESTIMATED  
 N = RECORD NOT AVAILABLE

# **APPENDIX J**

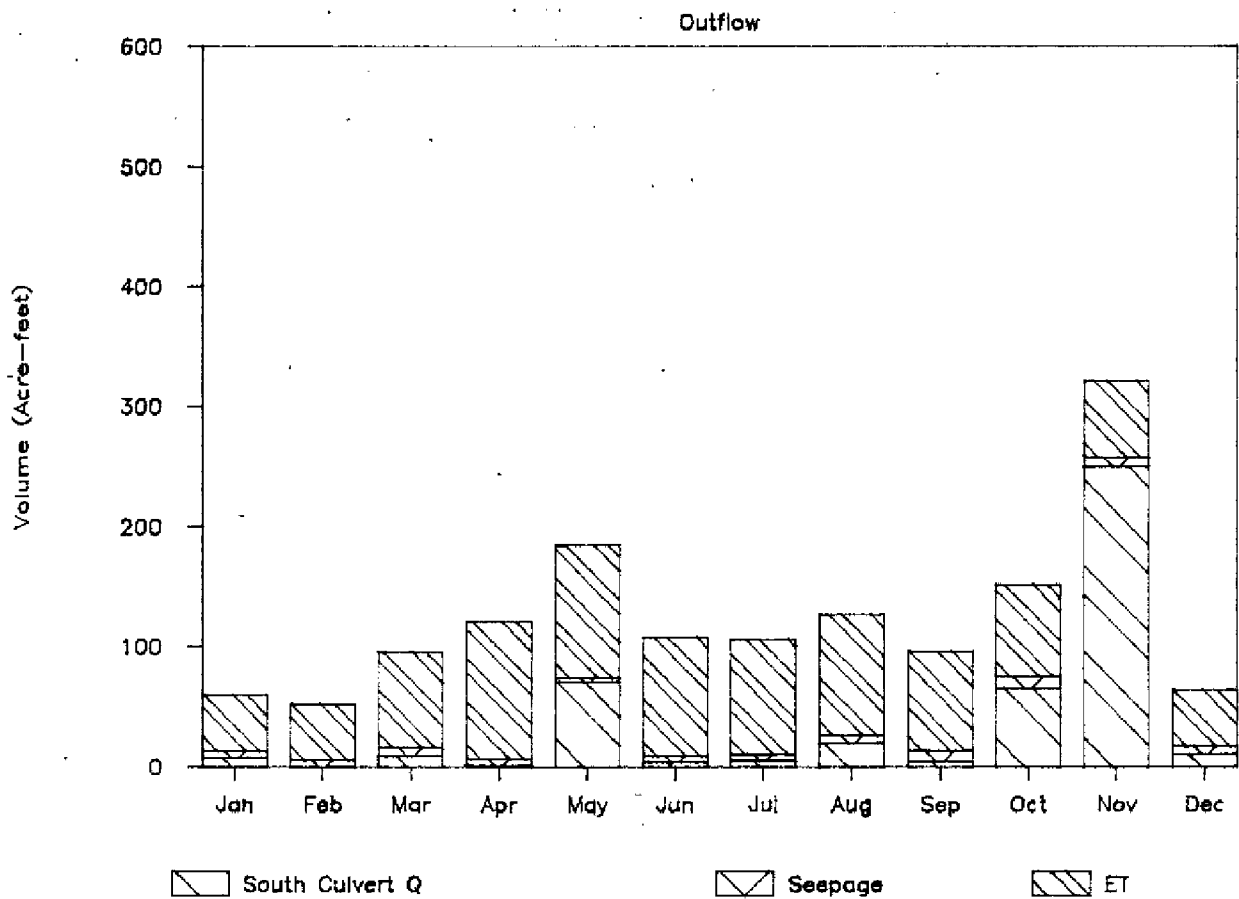
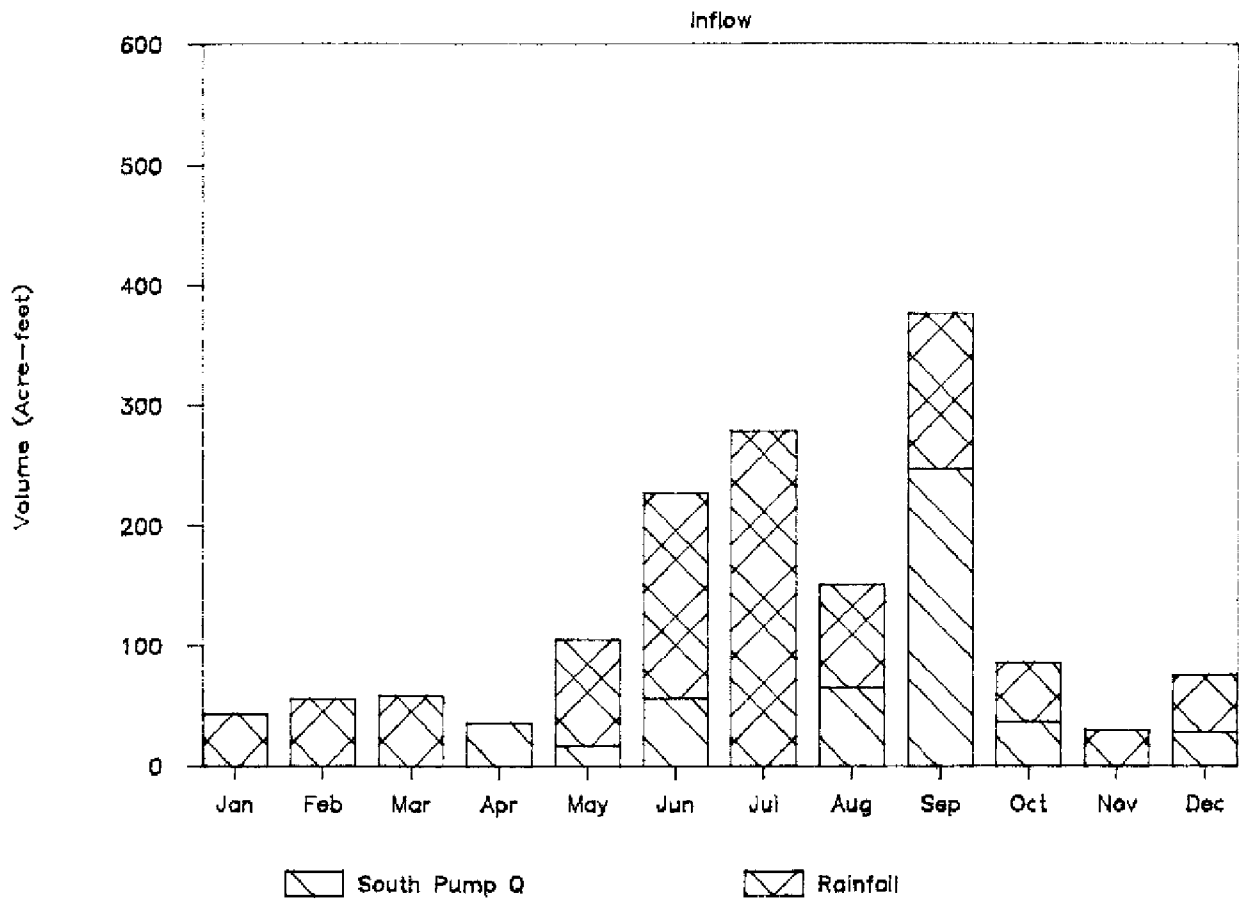
# Eastern Marsh Water Budget for 1976



# Eastern Marsh Water Budget for 1977

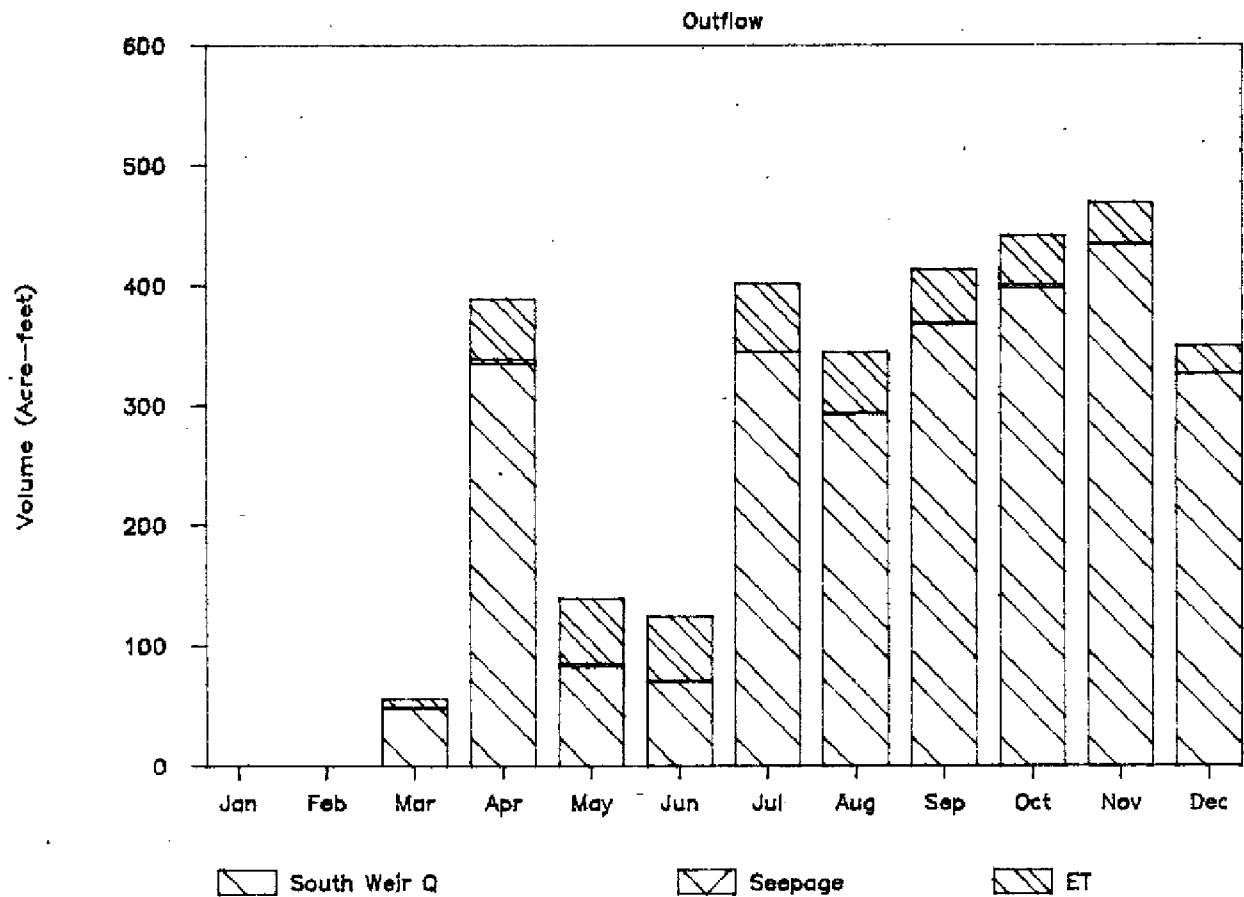
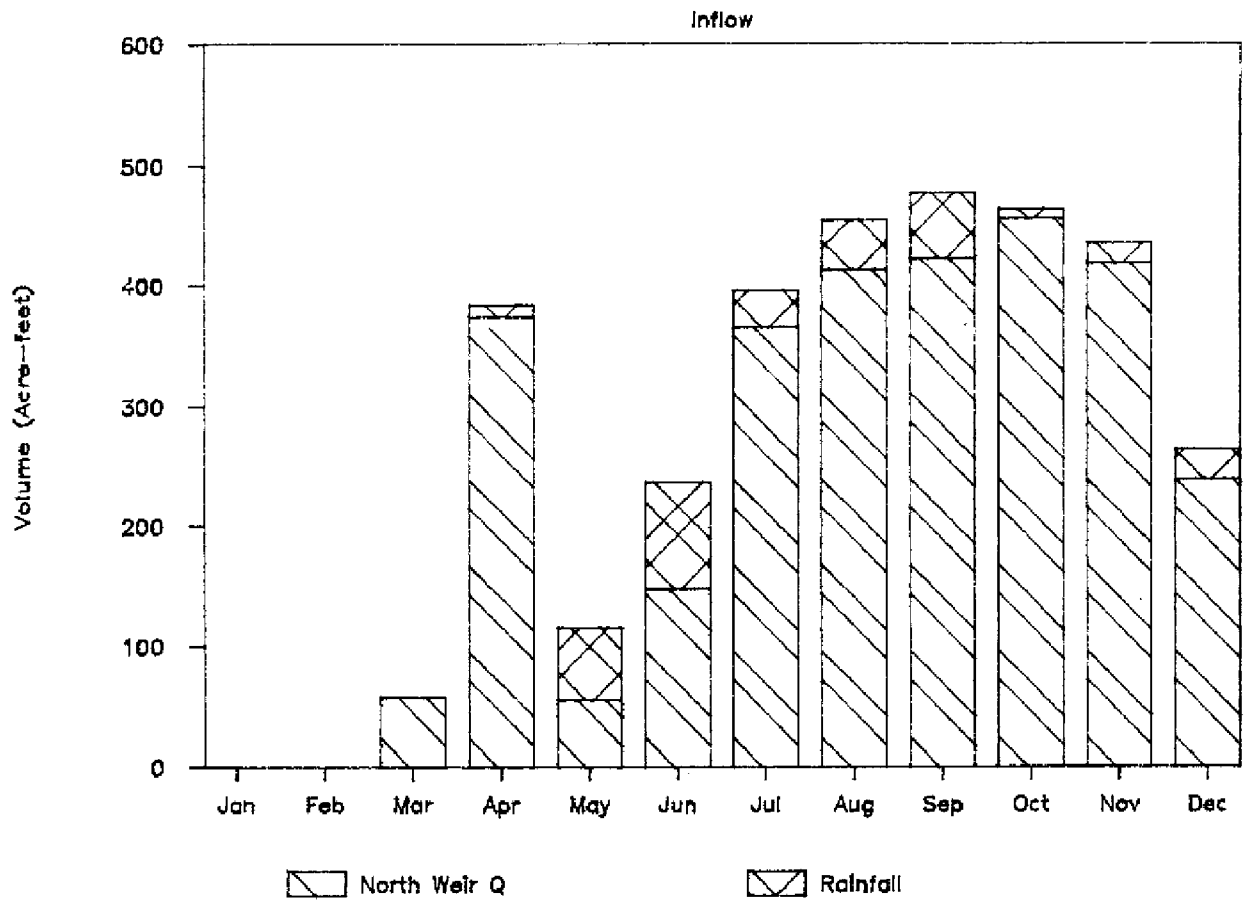


# Eastern Marsh Water Budget for 1978

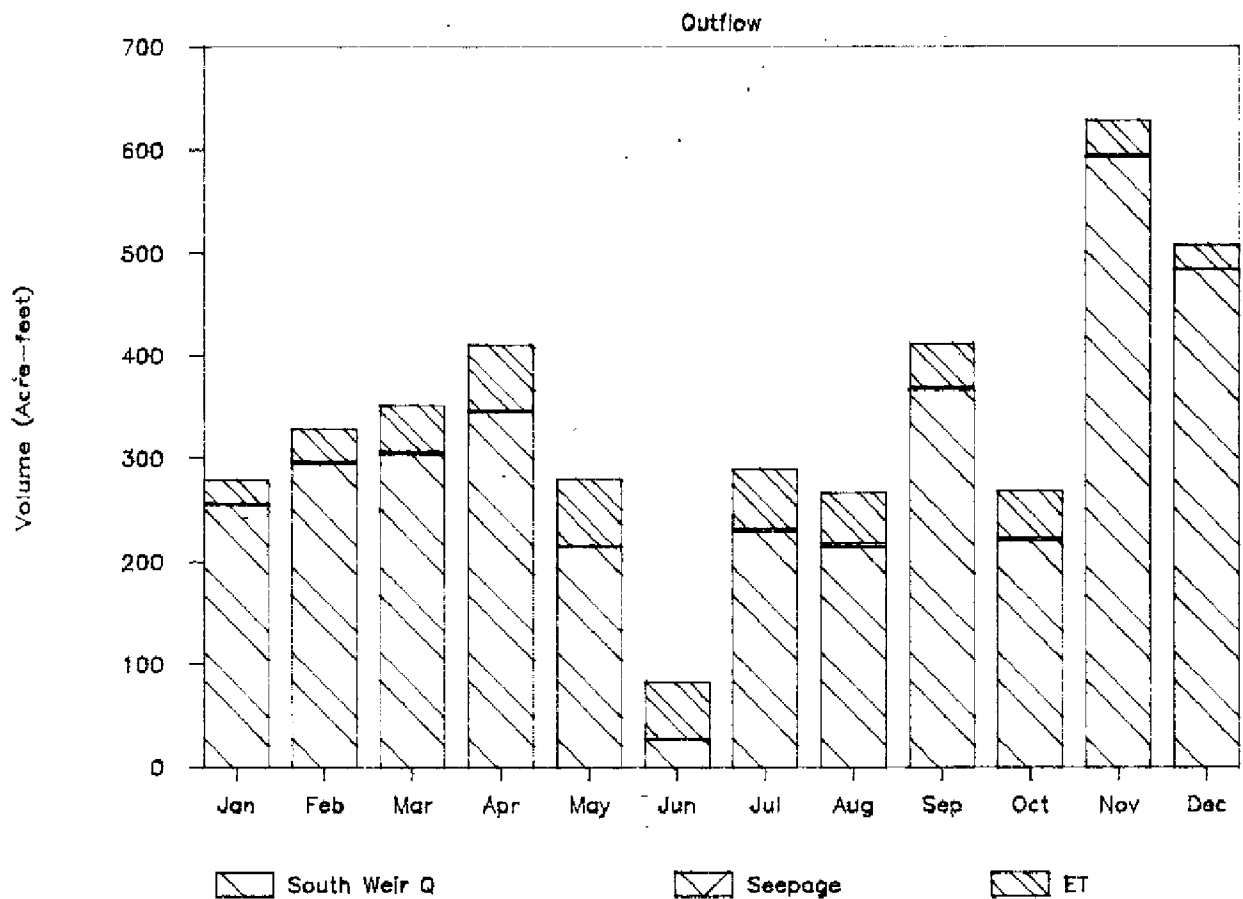
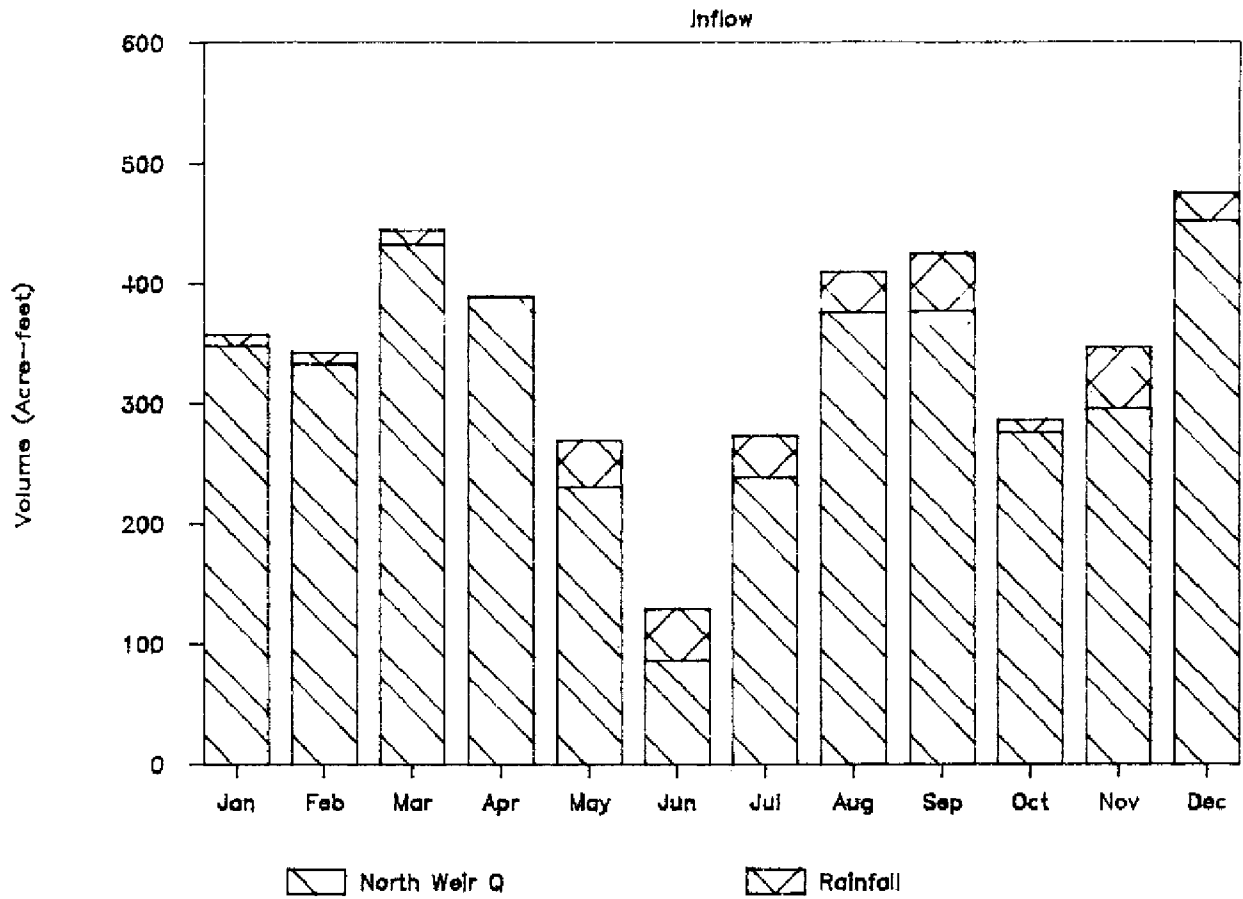




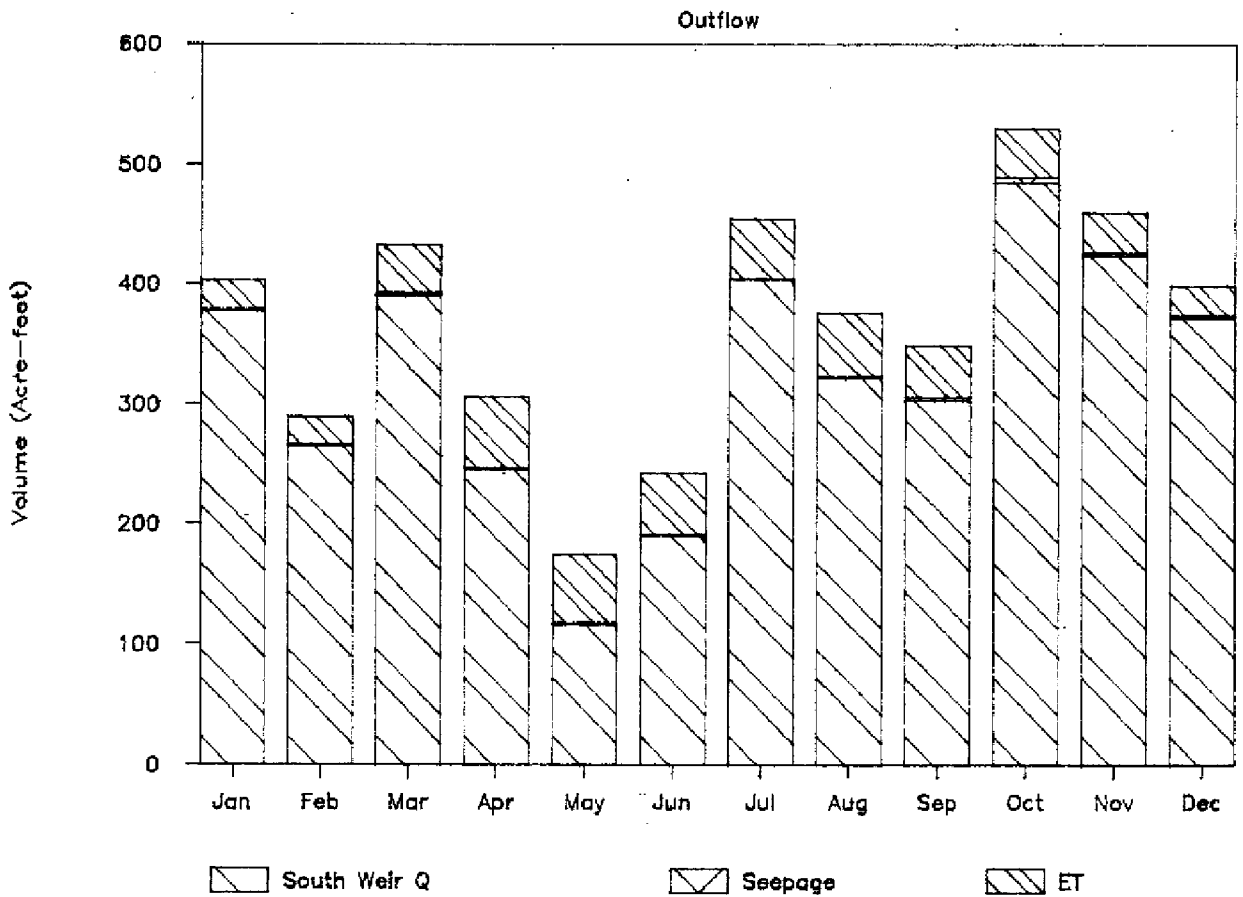
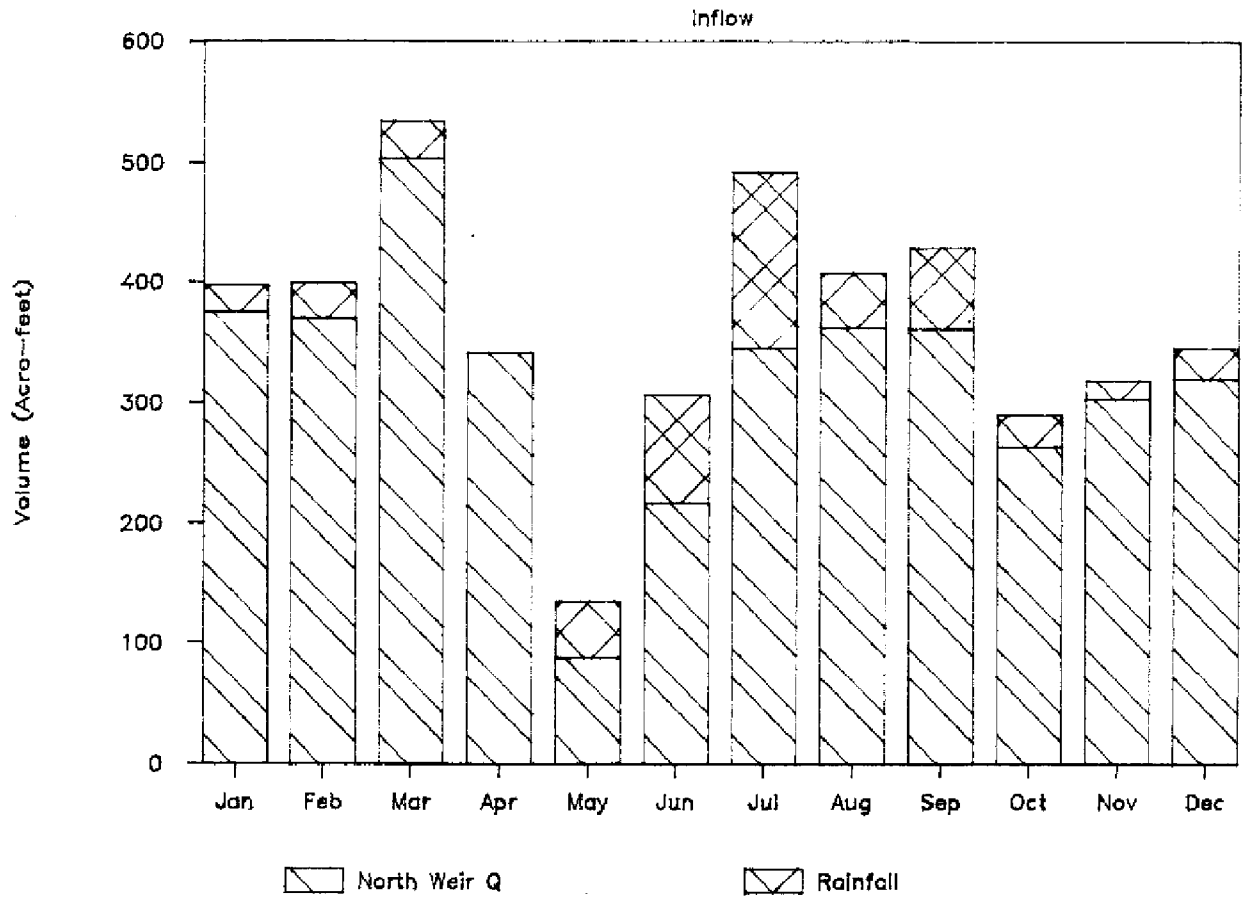
# Western Marsh Water Budget for 1976



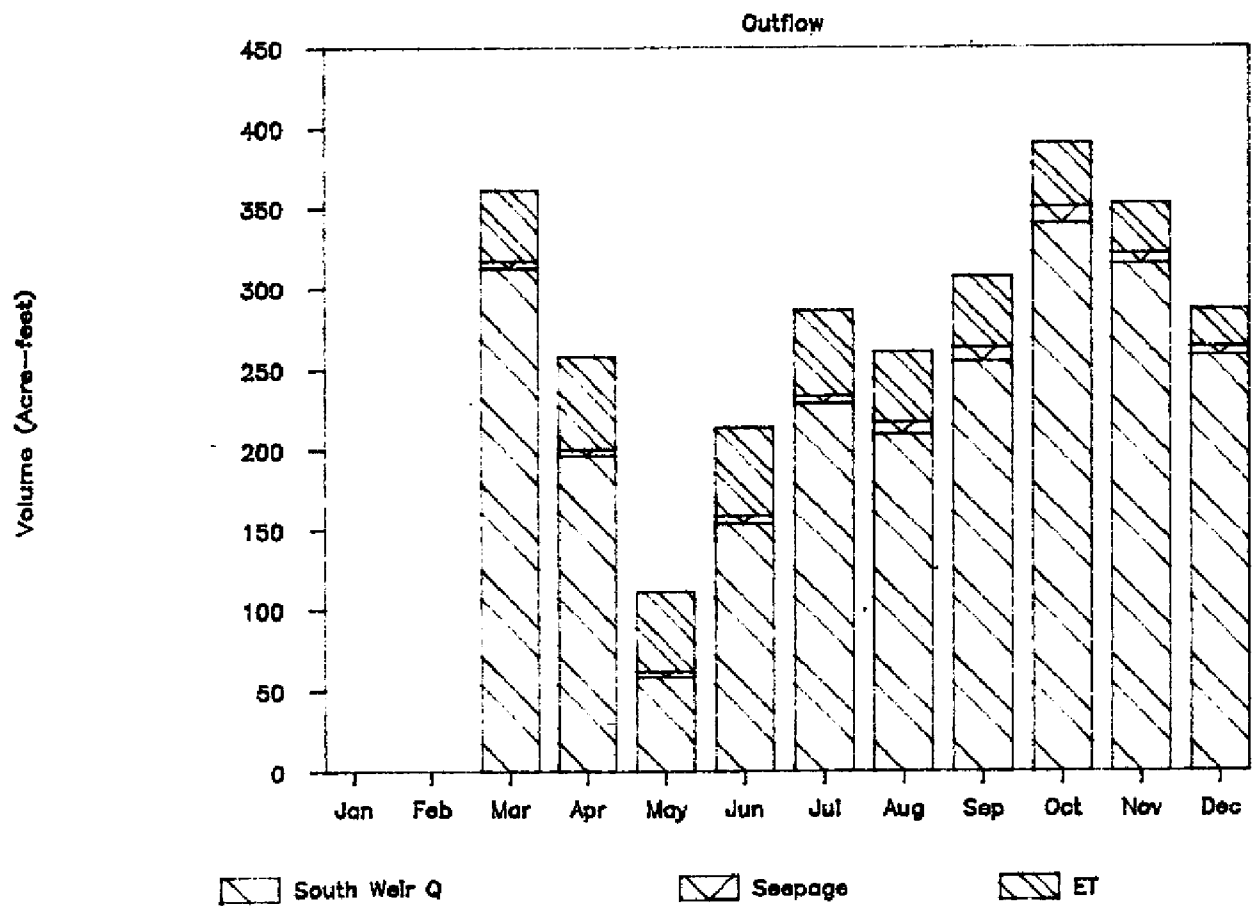
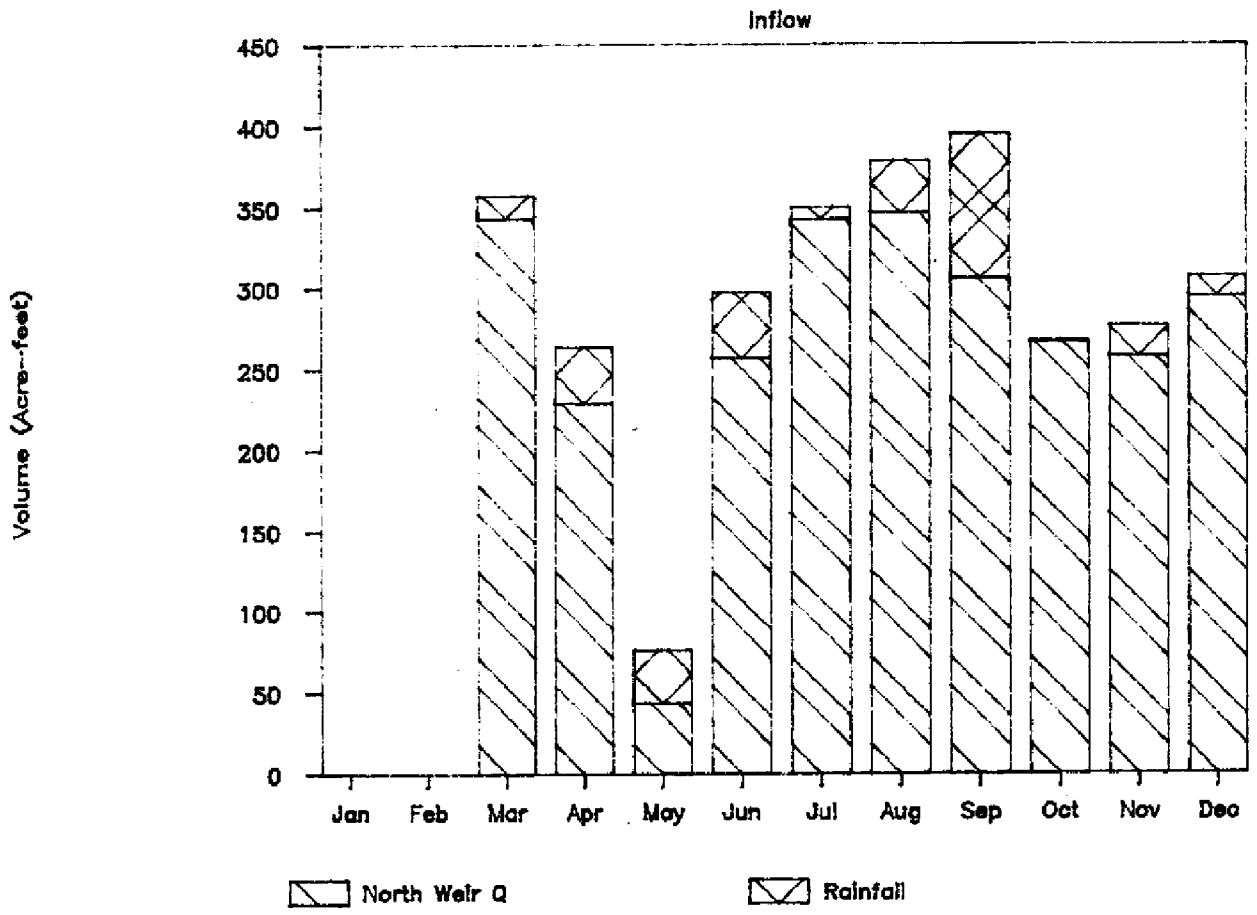
# Western Marsh Water Budget for 1977



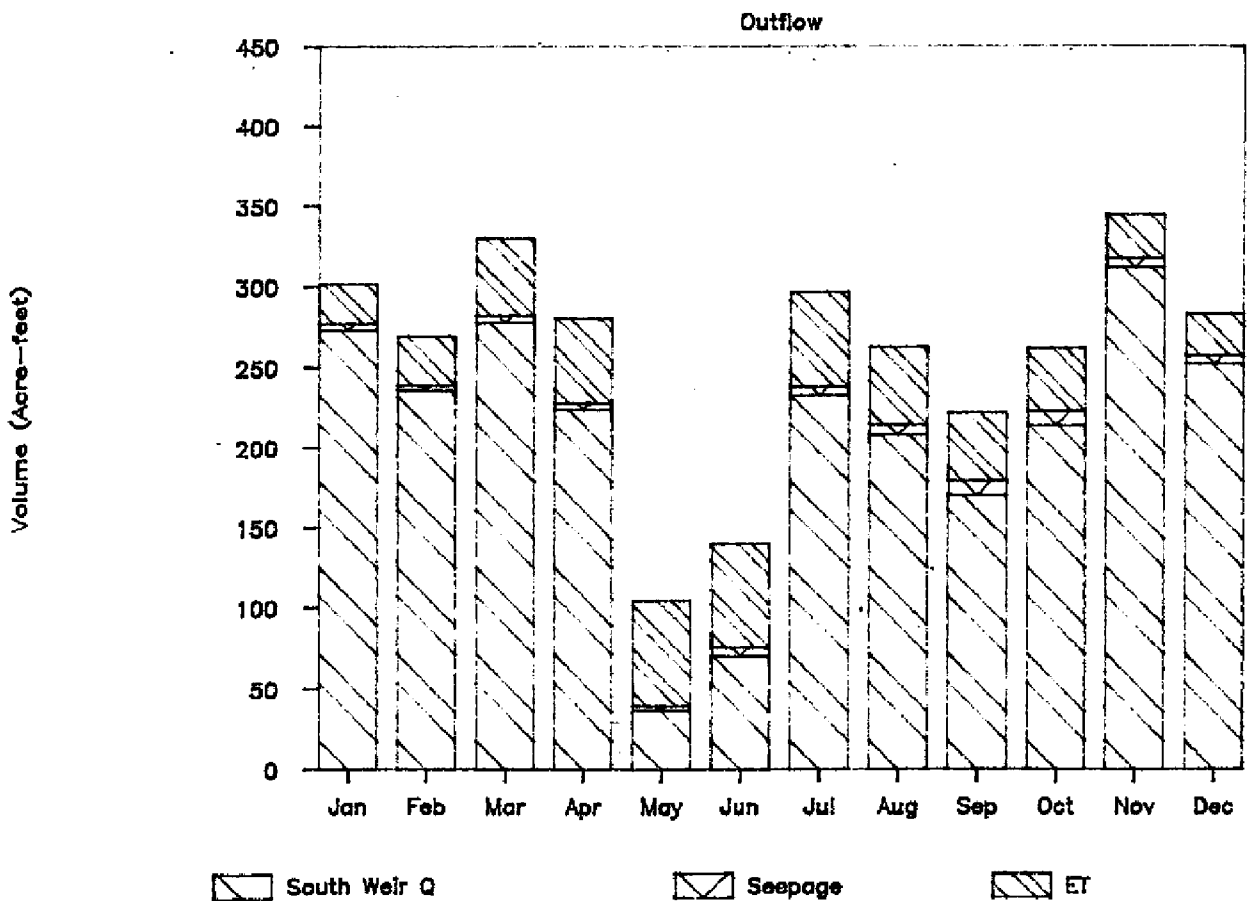
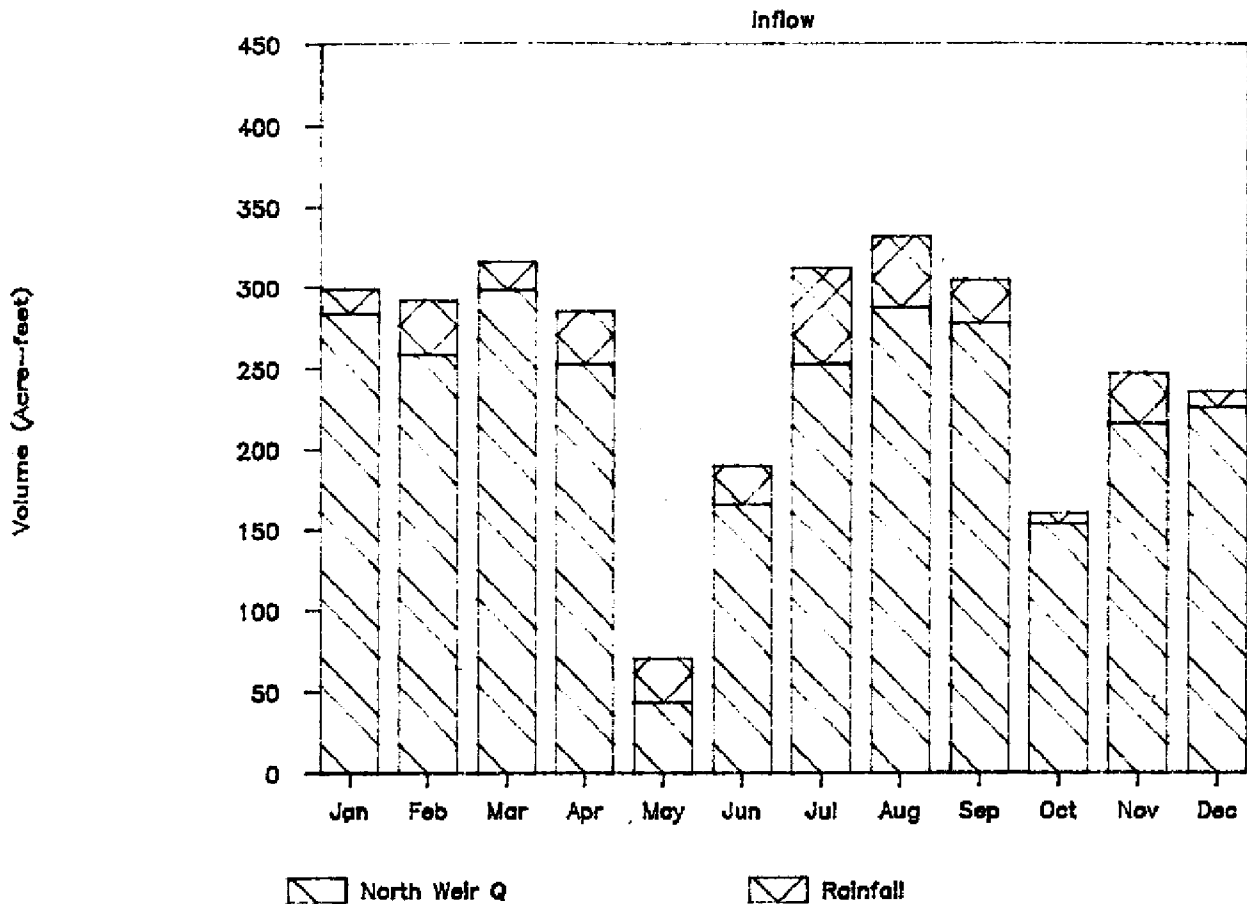
# Western Marsh Water Budget for 1978



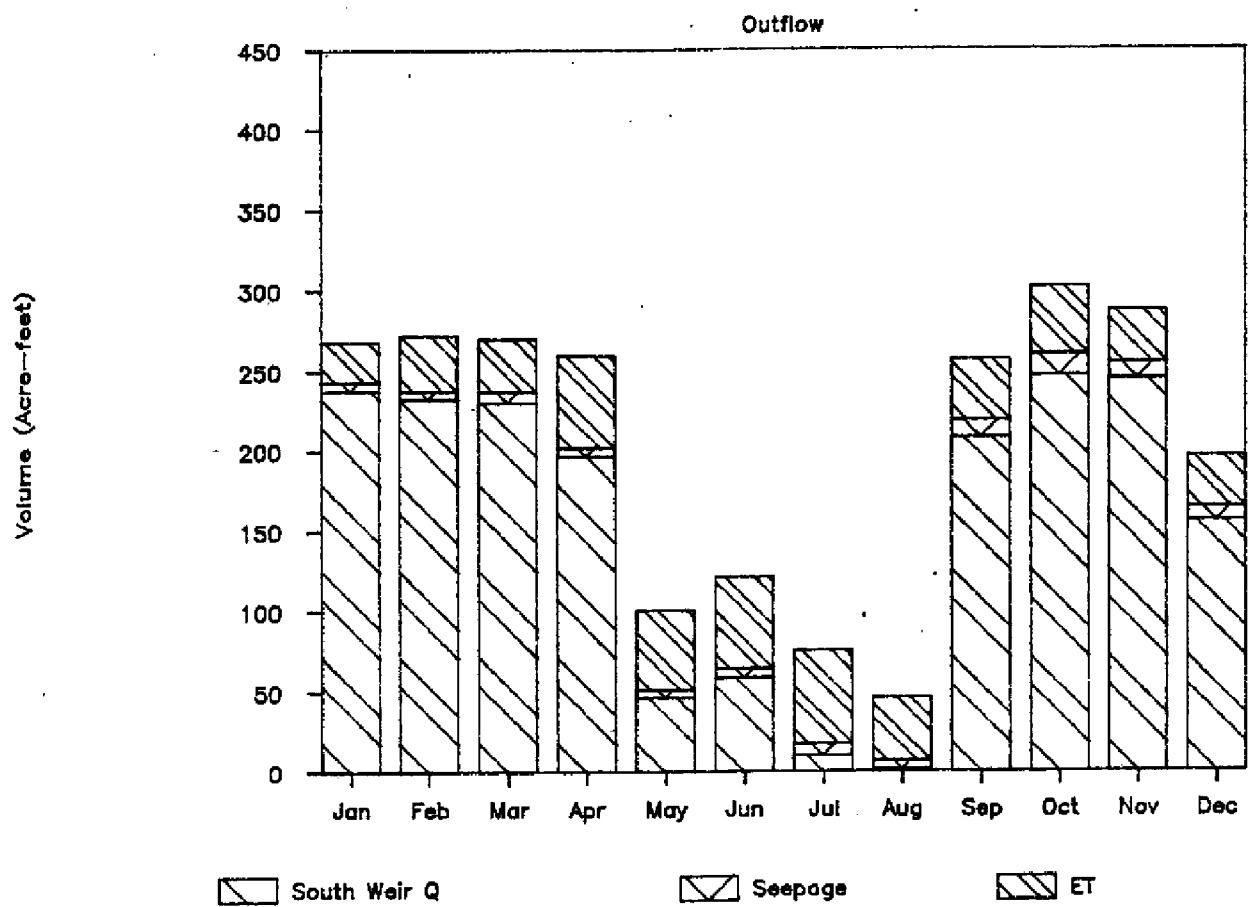
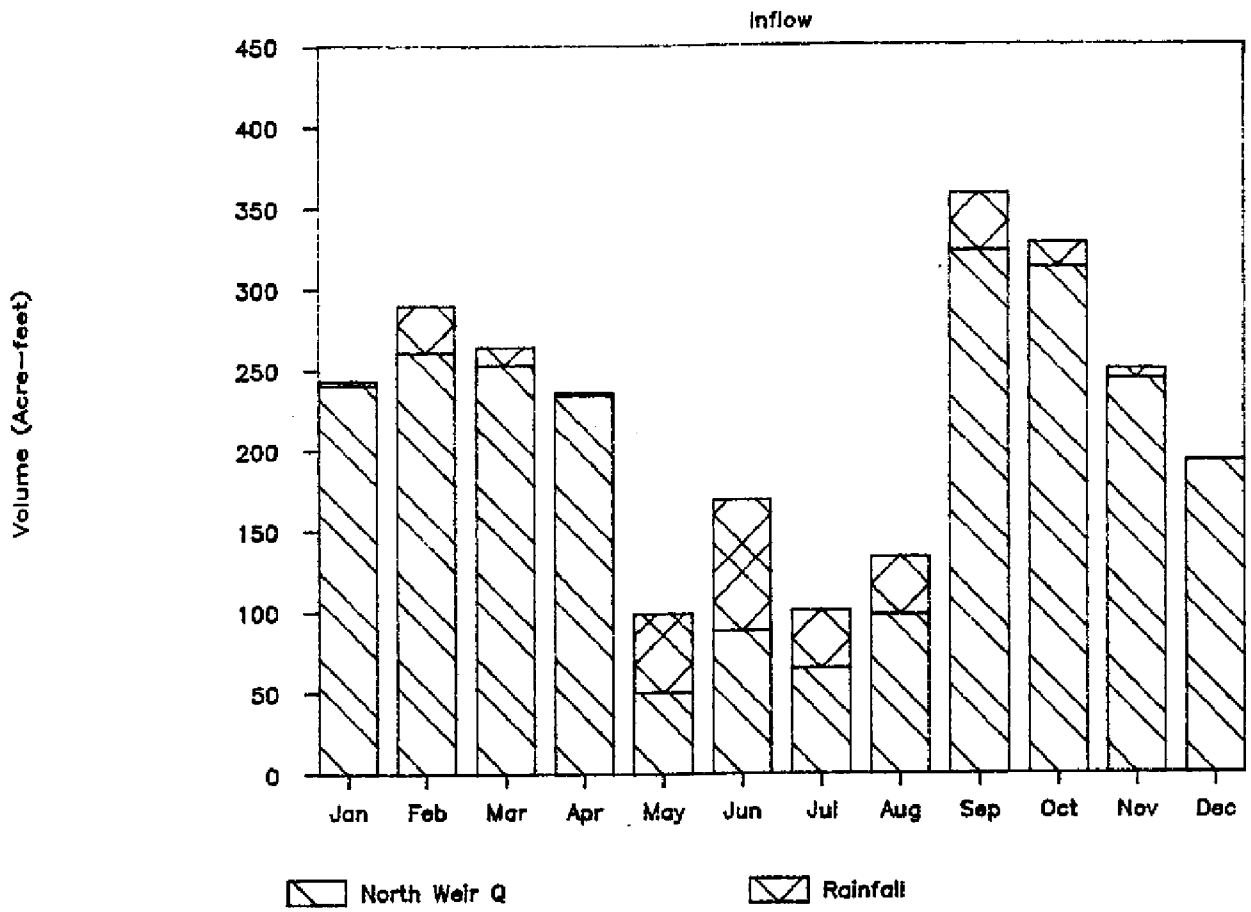
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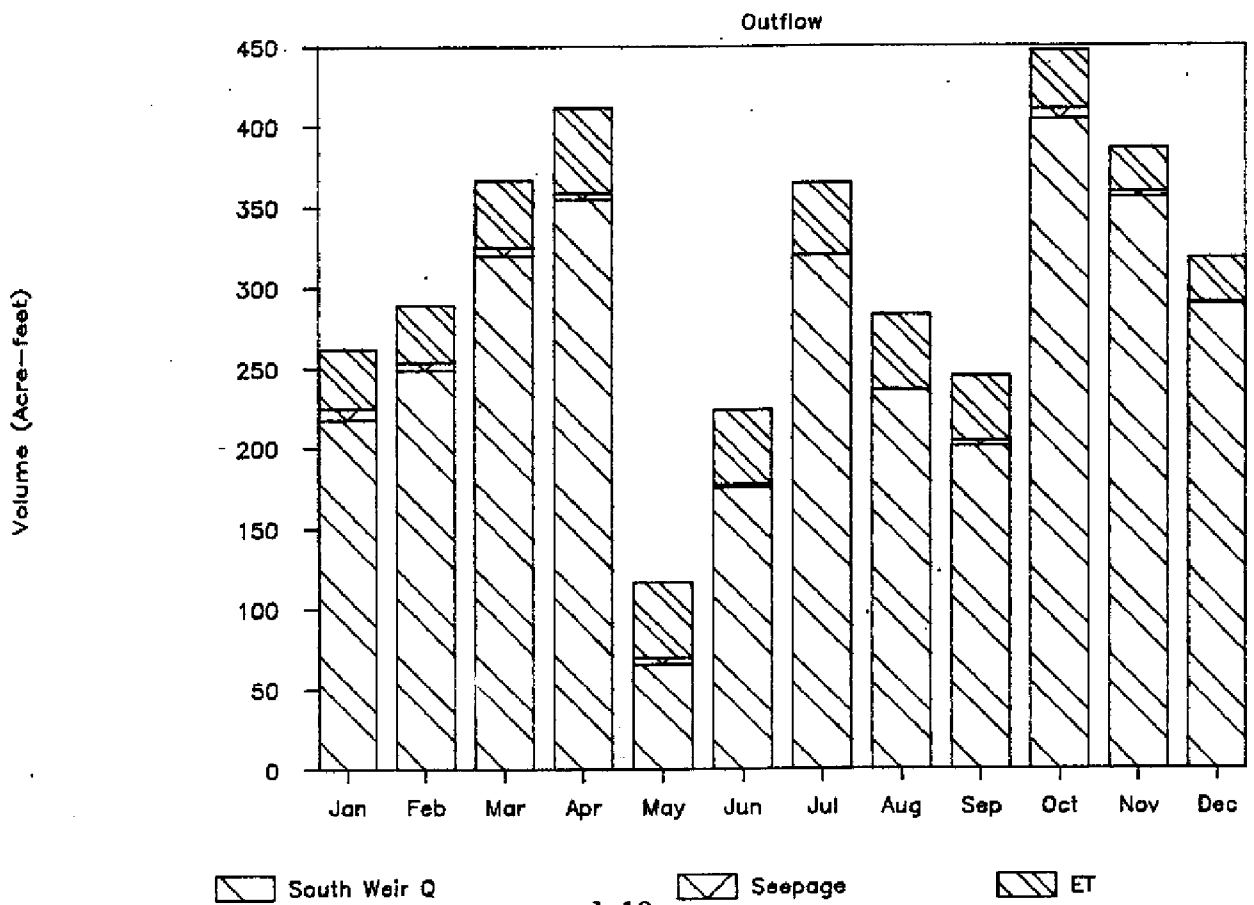
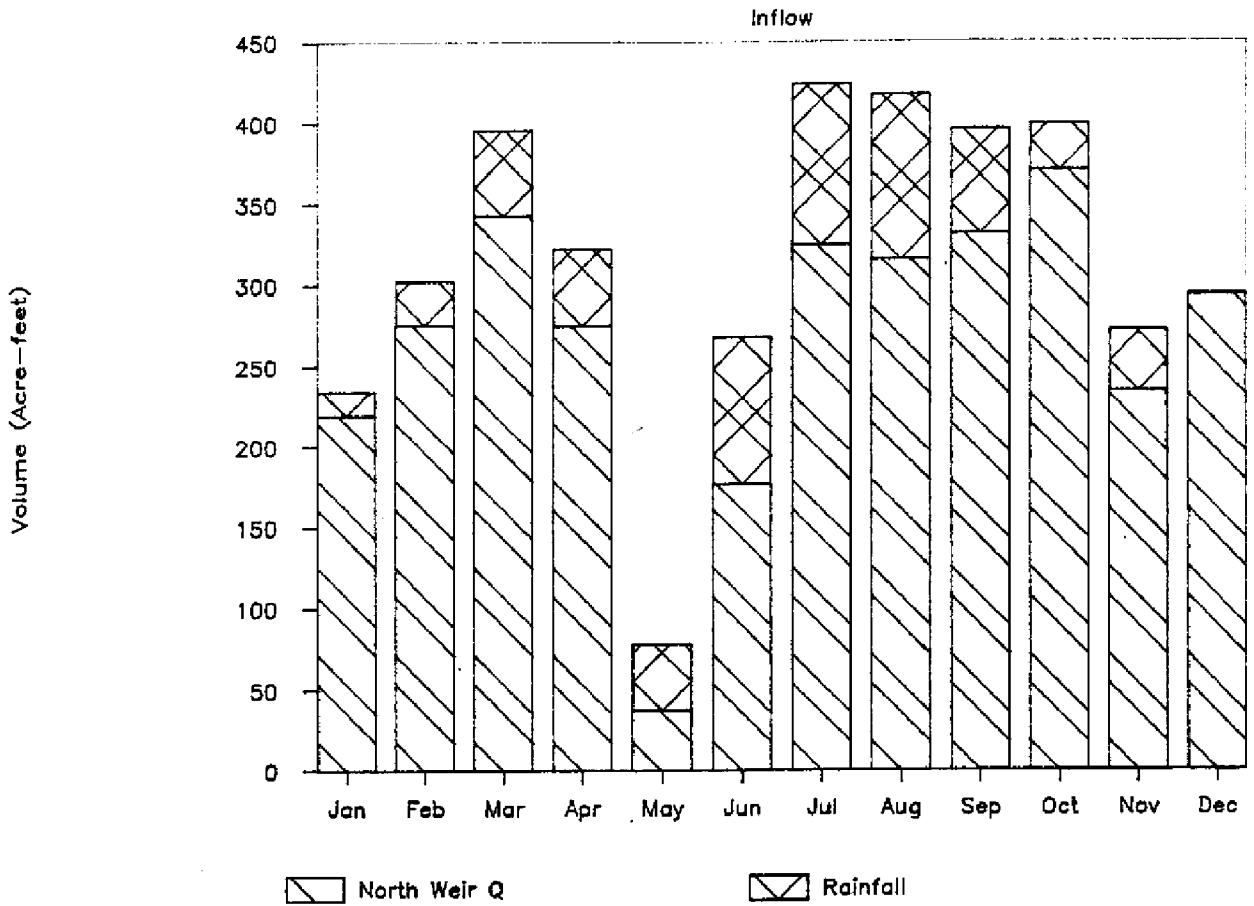
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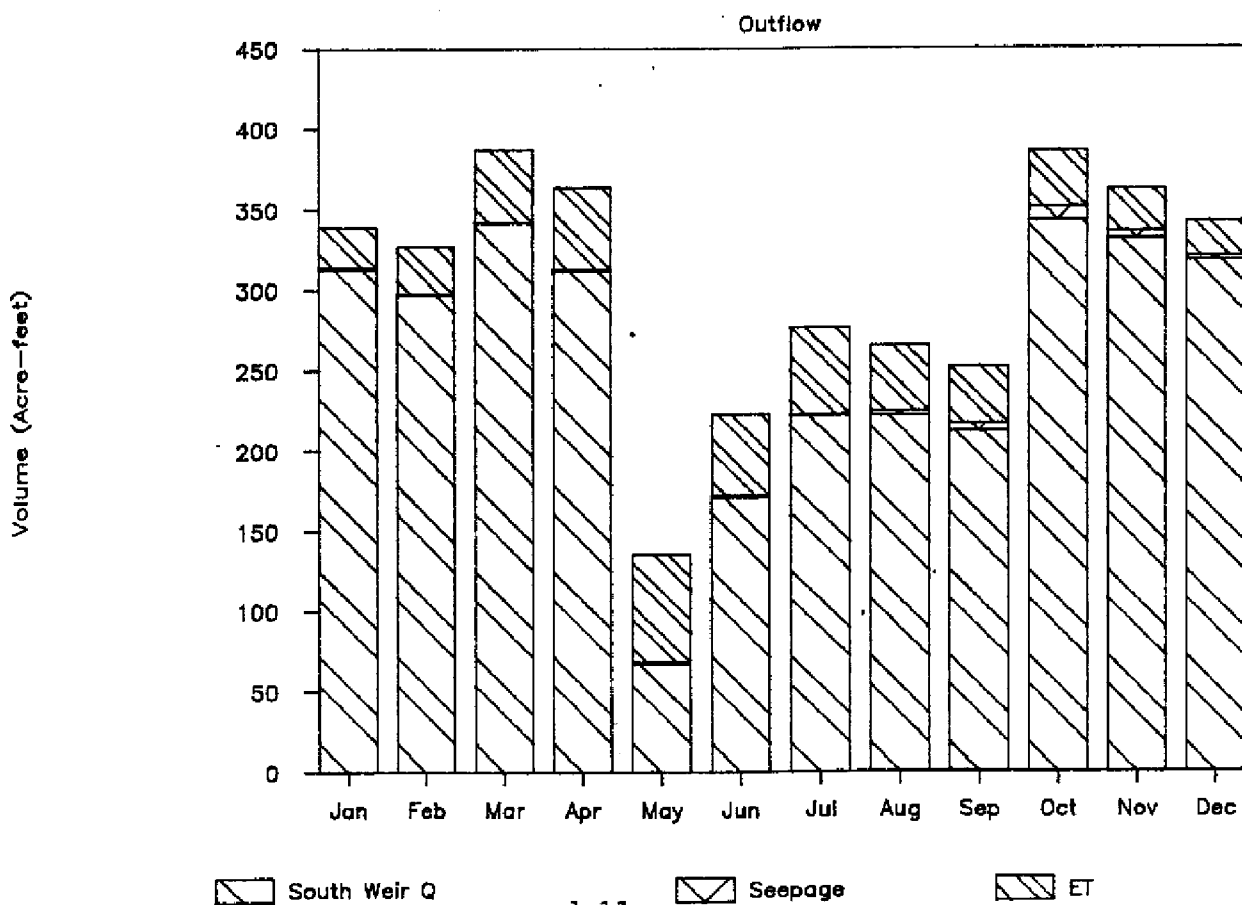
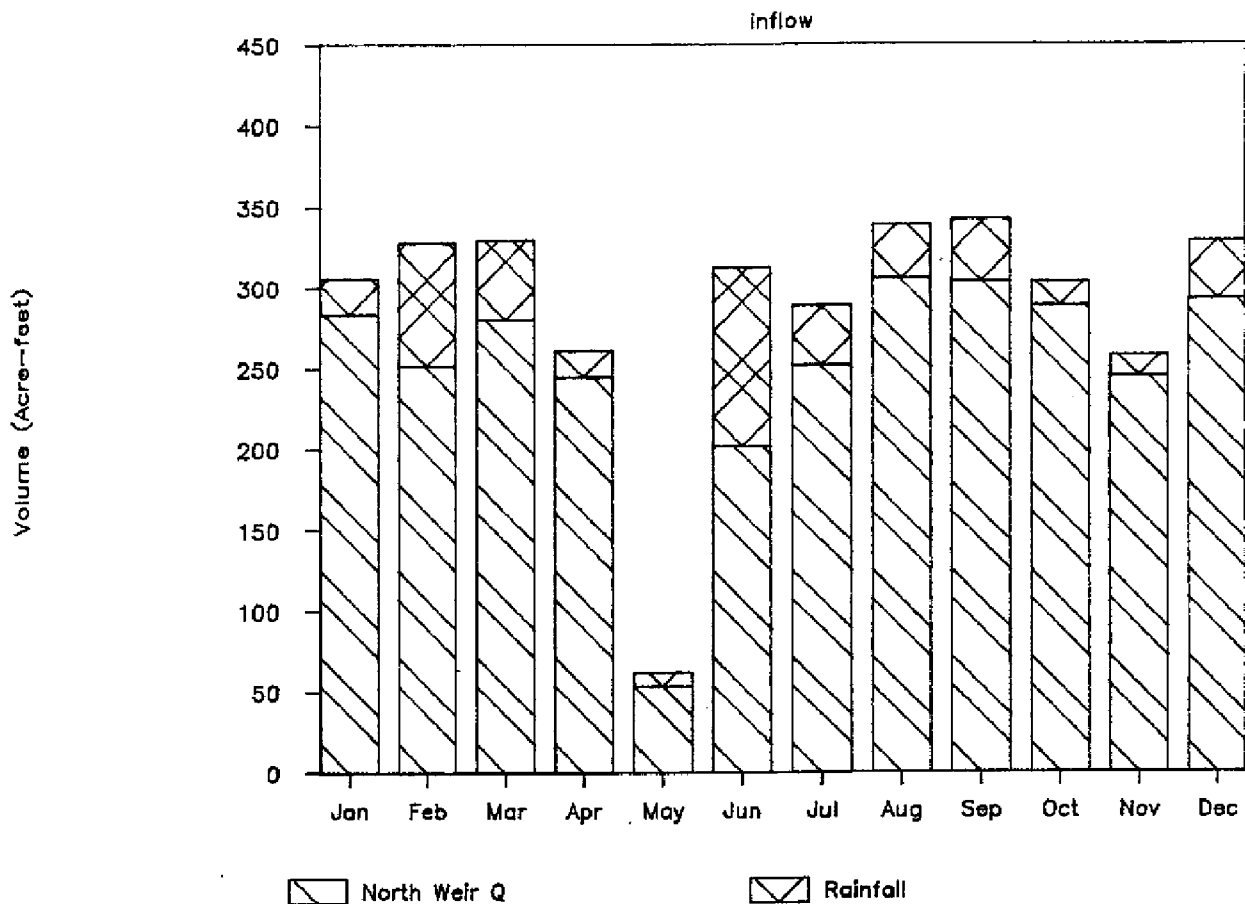
# Western Marsh Water Budget for 1981



# Western Marsh Water Budget for 1982

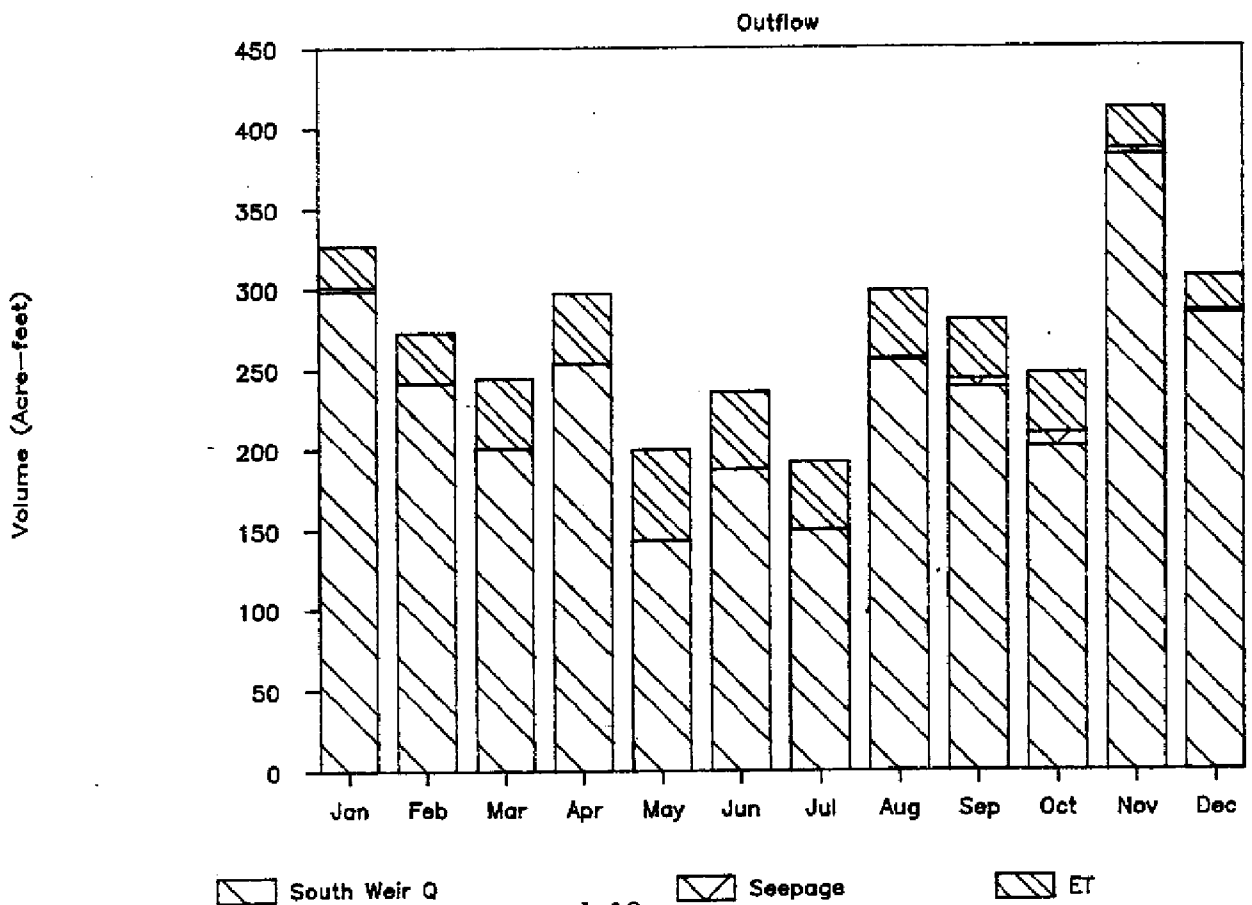
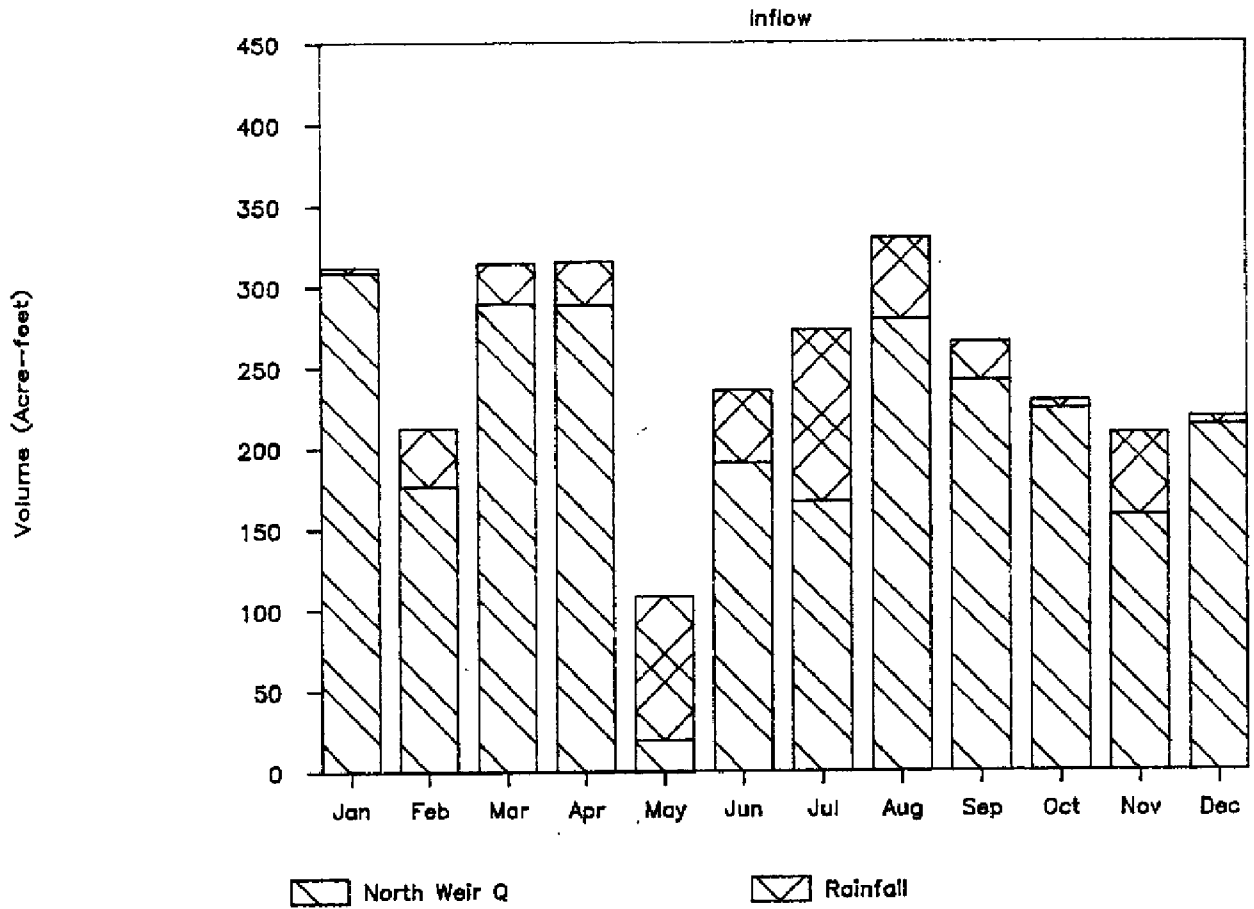


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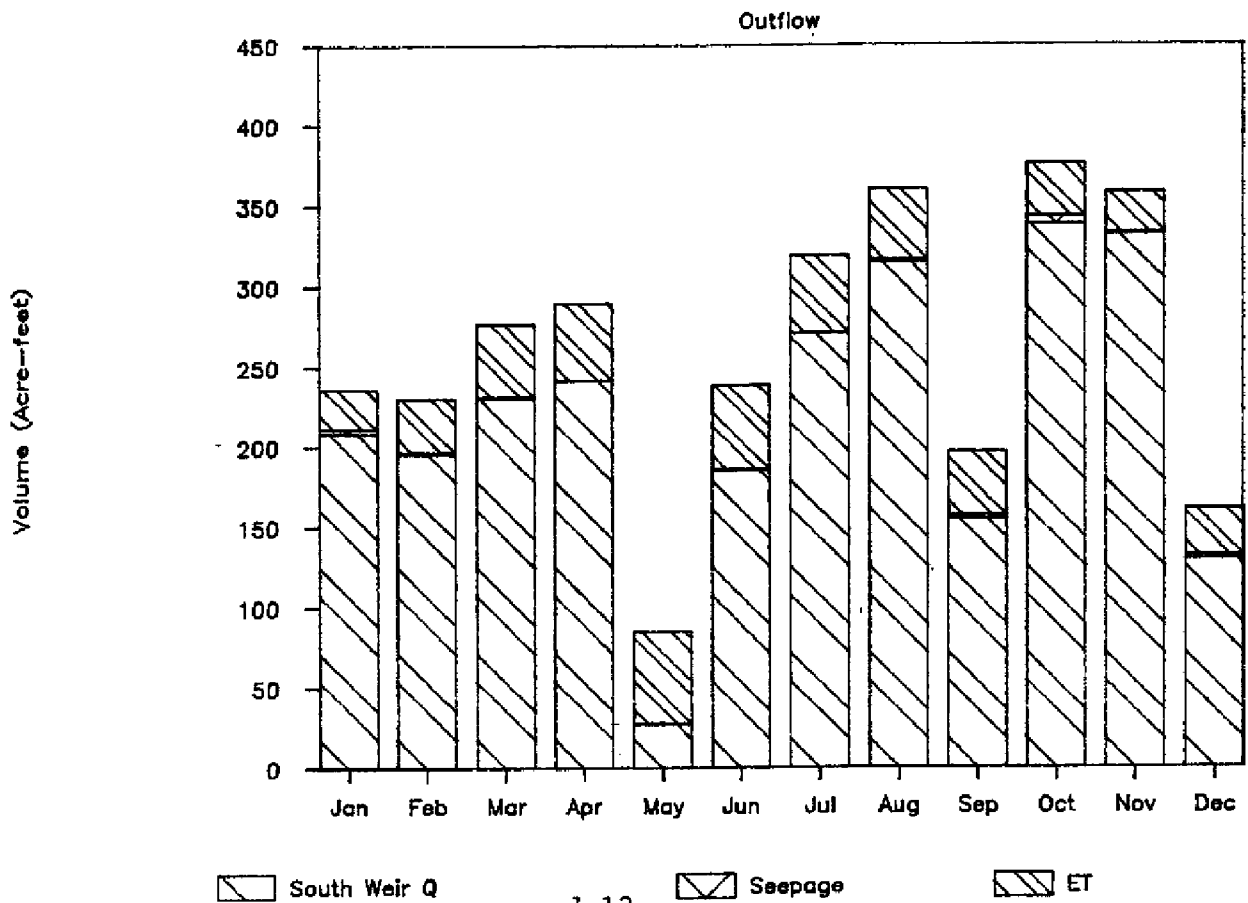
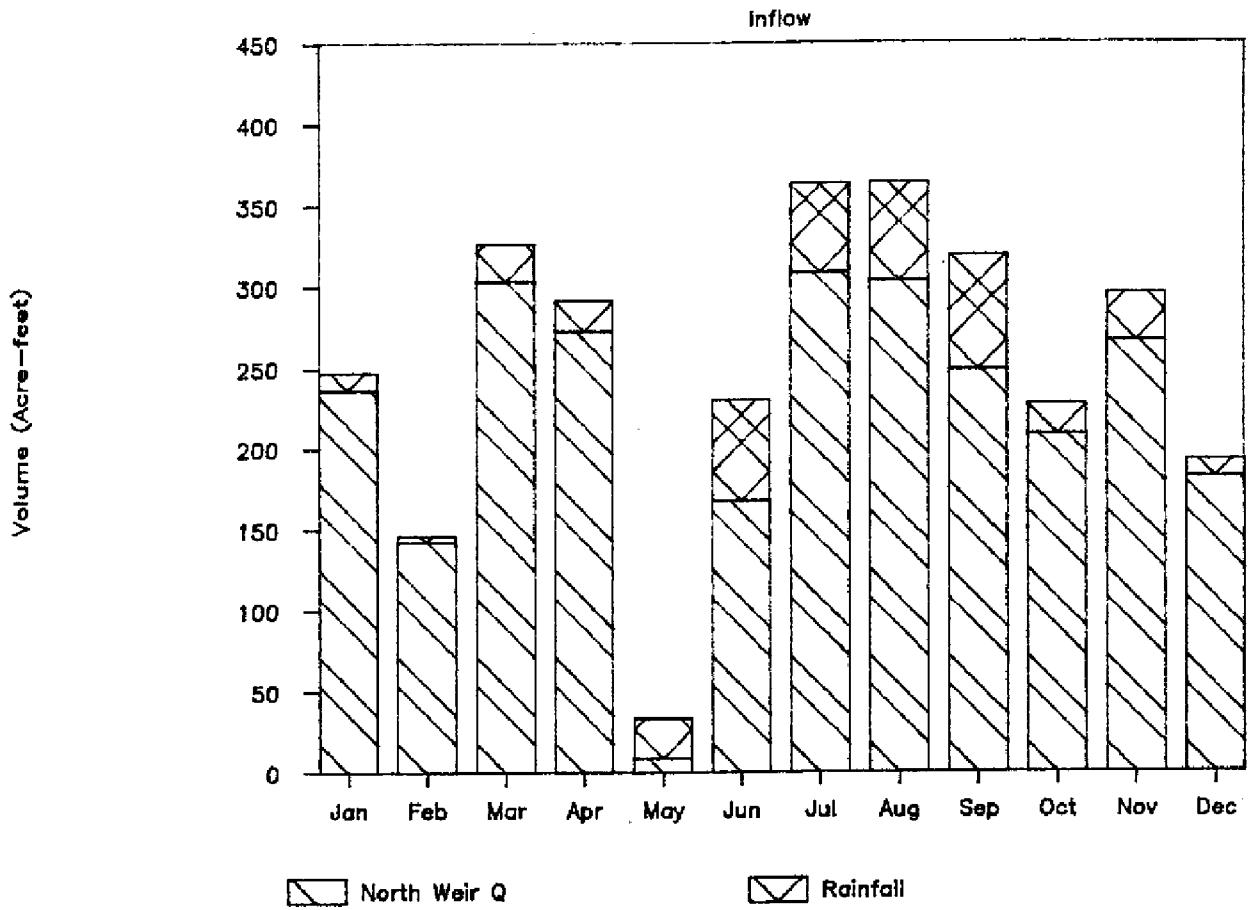




# Western Marsh Water Budget for 1984



# Western Marsh Water Budget for 1985



# Western Marsh Water Budget for 1986

