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A Surface Water Hydrologic Reconnaissance Upper Orange Creek Basin North-Central Florida

by

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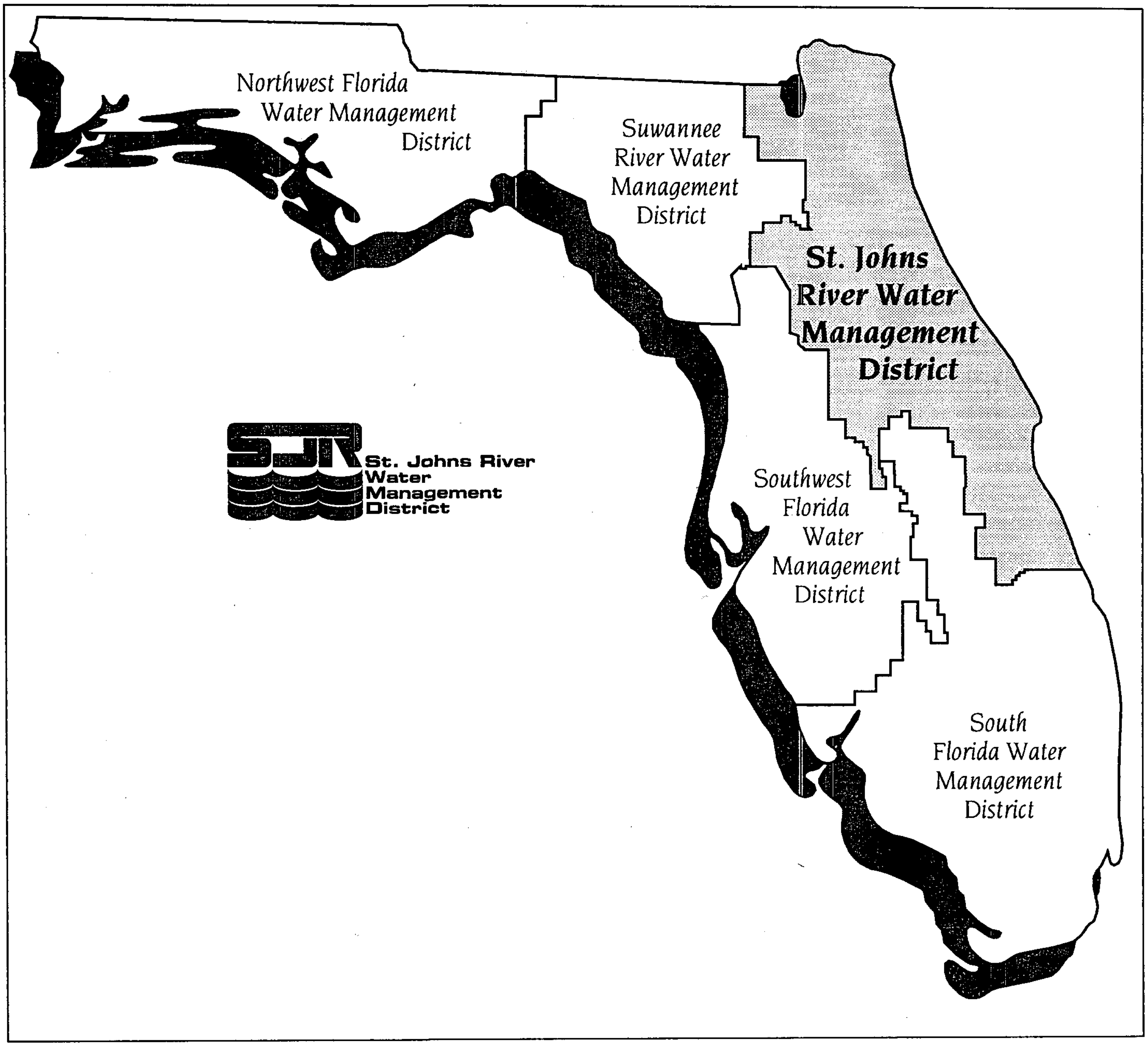

The **St. Johns River Water Management District** (SJRWMD) was created by the Florida Legislature in 1972 to be one of five water management districts in Florida. It includes all or part of 19 counties in northeast Florida. The mission of SJRWMD is to manage water resources to ensure their continued availability while maximizing environmental and economic benefits. It accomplishes its mission through regulation; applied research; assistance to federal, state, and local governments; operation and maintenance of water control works; and land acquisition and management.

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EXECUTIVE SUMMARY

Orange, Lochloosa, and Newnans lakes and Alachua Lake in Paynes Prairie are major surface water features in Alachua County in the St. Johns River Water Management District (Figure ES1). A 399-square-mile drainage area contributes runoff and baseflow to these lakes and to the prairie. These lakes make up 77.7% of the total open water area in the drainage basin.

Newnans, Lochloosa, and Orange lakes are large attractions for sportfishing. Paynes Prairie State Preserve and Cross Creek State Park are important cultural and historical resources.

This report describes the current hydrology of the Upper Orange Creek Basin (UOCB) and some hydrologic analyses. Water resources concerns are identified in order to initiate the development of an effective water management plan for the entire Orange Creek Basin.

Flow into and out of the lakes is controlled by a variety of water control structures. Newnans Lake outlet is controlled by a stoplog weir which allows the crest to be raised or lowered. In 1991, the boards were removed and as of April 1995 remain removed. Inflow into Paynes Prairie from Prairie Creek is controlled by gated culverts, and outflow from Alachua Lake into Alachua Sink is also controlled by gated culverts. Camps Canal directs the majority of Prairie Creek flow into Orange Lake. The outflow from Orange Lake is controlled by a fixed crest weir.

At Gainesville, the annual average rainfall from 1897 to 1992 is 51.00 inches (in.), although extended periods (40 years) of low average rainfall have occurred. June through September (the warm season) is generally wetter than December through March (the cold season). The warm season average rainfall is 26.38 in. compared to a cold season average of 13.28 in. The maximum 24-hour rainfall recorded at Gainesville is 7.55 in., on 25 August 1972.

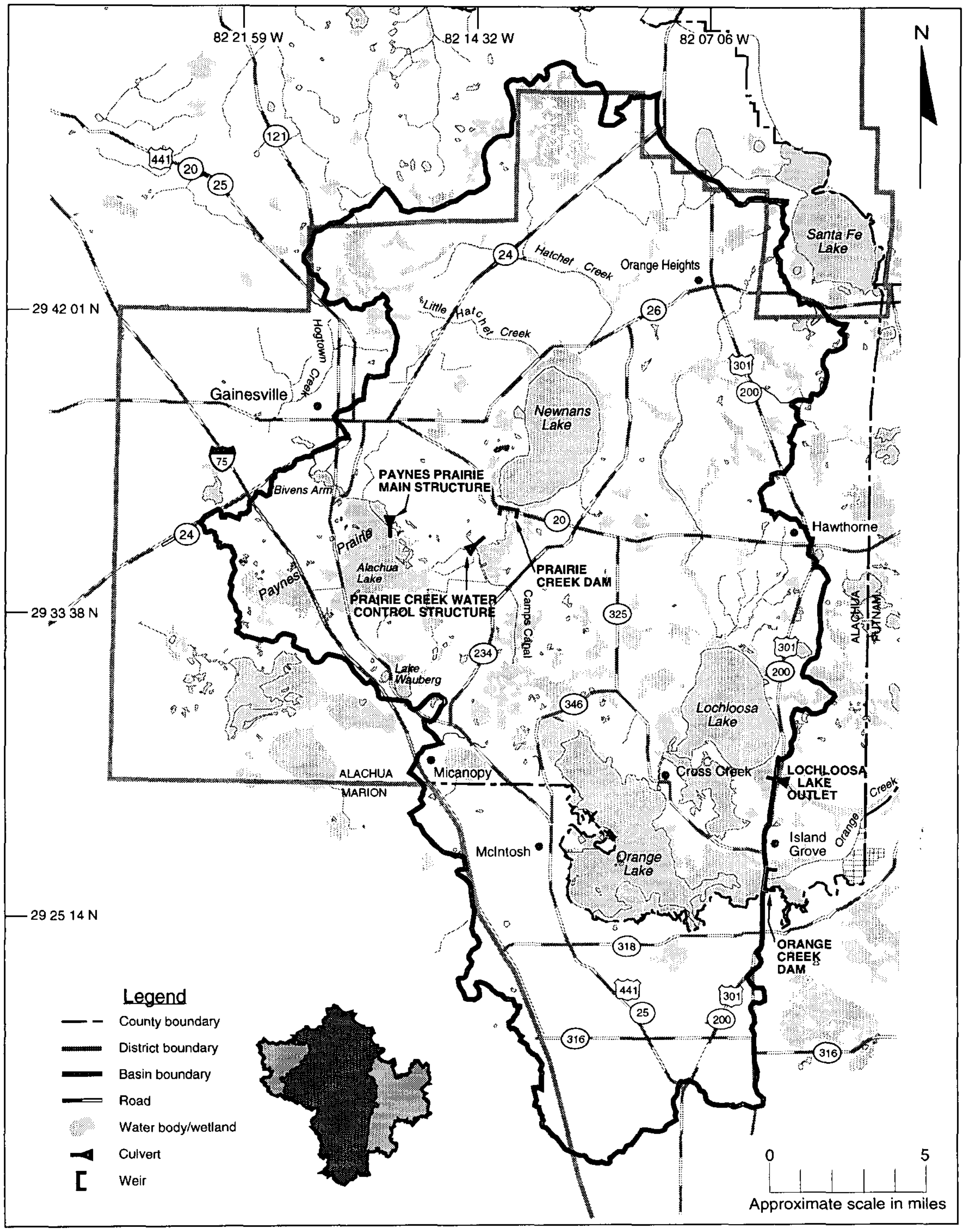

Figure ES1. Major surface water features of the Upper Orange Creek Basin

Over the period of recorded discharge, only a small portion of the rainfall (7%) resulted in surface water discharge. The average discharge for the period 1983–92 was 68.3 cubic feet per second (cfs) in Prairie Creek at State Road 20, 58.1 cfs in Camps Canal at County Road 234, 3.7 cfs in Lochloosa Slough at U.S. 301, and 50.0 cfs at the Orange Lake outlet.

Lake stage statistics are presented that characterize lake water levels in UOCB. Water level fluctuations are an important requirement for preservation and enhancement of water quality and the ecology of the lakes. Orange Lake has the largest range of water levels; Alachua Lake has the second largest (Table ES1). The range of water levels for Orange Lake is 2.40 ft greater than the water level range for Lochloosa Lake and 2.95 ft greater than the water level range for Newnans Lake. The middle range of water levels for Orange Lake is 0.14 ft greater than the middle range of Lochloosa Lake and 0.71 ft greater than the middle range of Newnans Lake. In contrast, the lower range of water levels for Orange Lake is 2.29 ft greater than the lower range of Lochloosa Lake and 3.74 ft greater than the lower range of Newnans Lake. This comparison indicates the severity of the lowest elevation reached in Orange Lake compared to the two other recreational lakes.

There are two primary water management concerns that need to be addressed:

- How to develop an ecosystem-based management plan for Orange, Lochloosa, and Newnans lakes so that ecological functions are restored and beneficial uses are maintained

- How to manage the surface waters affecting Paynes Prairie so that the management goals of the Florida Department of Environmental Protection (FDEP) can be met.

To restore ecological functions and to maintain the beneficial uses of Orange, Lochloosa, and Newnans lakes, many ecological components of the ecosystem must be considered. Sport fish are only one component of a complex aquatic and wetland ecosystem

Table ES1. Lake stages (in feet)

	Newnans Lake	Alachua Lake	Lochloosa Lake	Orange Lake
Pre-weir	1945–65		1942–62	1942–62
Maximum stage	71.21		61.94	61.21
Exceeds 20%	67.89		59.29	58.80
Exceeds 50%	66.56		58.21	57.65
Exceeds 80%	65.51		56.97	55.91
Minimum stage	63.87		54.23	50.38
Range (maximum to minimum)	7.34		7.71	10.83
Upper range (maximum to 50%)	4.65		3.73	3.56
Middle range (20% to 80%)	2.37		2.32	2.90
Lower range (50% to minimum)	2.69		3.98	7.27
Post-weir	1967–92	1979–91	1964–92	1964–92
Maximum stage	70.53	59.10	60.92	61.04
Exceeds 20%	67.41	57.56	58.72	58.76
Exceeds 50%	66.69	56.04	57.98	57.99
Exceeds 80%	65.81	53.49	56.56	56.46
Minimum stage	64.30	50.29	54.14	51.86
Range (maximum to minimum)	6.23	8.81	6.78	9.18
Upper range (maximum to 50%)	3.84	3.06	2.94	3.05
Middle range (20% to 80%)	1.59	4.06	2.16	2.30
Lower range (50% to minimum)	2.39	5.75	3.84	6.13

Alachua Lake, although it has control structures, cannot be characterized in a pre-weir/post-weir fashion.

Note: "Exceeds 20%, 50%, and 80%" refers to the elevation that is exceeded by the lake water level 20%, 50%, and 80% of the time.

that is constructed of many diverse abiotic elements and biotic communities. The use of these lakes depends on the health of the lake ecosystem. With this in mind, the management plan that will best restore and maintain a healthy lake ecosystem should be determined.

Paynes Prairie must be considered in the same manner as the lakes—it is an ecosystem. However, the concern is somewhat different. Past hydrologic modifications have altered the historic nature of Paynes Prairie. Primary management objectives of FDEP for Paynes Prairie are to restore and to maintain natural and cultural resources of the preserve as representative samples of Florida's original natural systems, that is, conditions that existed prior to the ecological disruptions caused by the arrival of Europeans in A.D. 1500. Surface water management alternatives directly affect the ability of FDEP to attain the overall management goals for Paynes Prairie.

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INTRODUCTION

The upper part of the Orange Creek Basin, known as the Upper Orange Creek Basin (UOCB), is located within the boundaries of the Ocklawaha River hydrologic unit (Figures 1–3). The Orange Lake and Paynes Prairie surface water subbasins located in southern Alachua County, north-central Florida (Figure 4), have recreational and cultural value and are of major ecologic significance to the local community. The drainage subbasins of Newnans, Lochloosa, and Orange lakes and Paynes Prairie comprise UOCB (Figure 4). These lakes annually attract sport fishermen, naturalists, tourists, and new residents. Cross Creek, connecting Lochloosa and Orange lakes, has cultural significance. UOCB also supports a large variety of natural species (mammals, birds, reptiles, and amphibians) that occur in inland north-central Florida.

The Paynes Prairie subbasin, over 18,000 acres in size, is mostly a state preserve administered by the Florida Department of Environmental Protection (FDEP). Other major areas in the subbasin include Lake Wauberg and Bivens Arm and the respective contributing streams and drainage areas. The subbasin has a complex pattern of varied and rapidly changing plant communities, abundant wildlife, and unique geological features (Gottgens and Montague 1988). Primary management objectives of FDEP for Paynes Prairie are to restore and to maintain natural and cultural resources of the preserve as representative samples of Florida's original natural systems, that is, conditions that existed prior to the ecological disruptions caused by the arrival of Europeans in A.D. 1500 (FDNR 1986).

The St. Johns River Water Management District (SJRWMD) contracted with the University of Florida to produce comprehensive reconnaissance reports for Orange, Lochloosa, and Newnans lakes (Gottgens and Montague 1987) and for the Paynes Prairie subbasin (Gottgens and Montague 1988). These reports primarily address water quality and biologic conditions of the

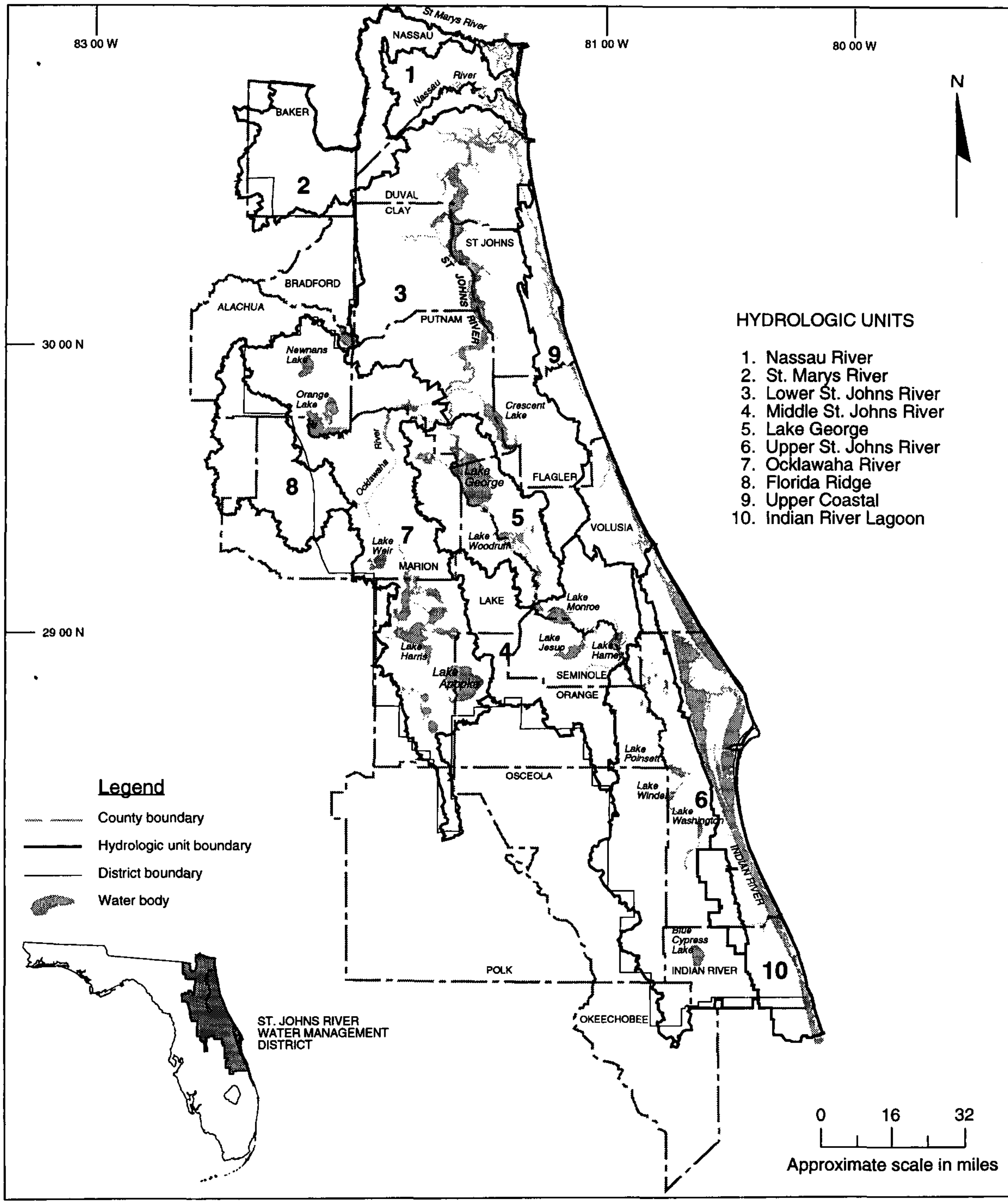

Figure 1. Major hydrologic units of the St. Johns River Water Management District

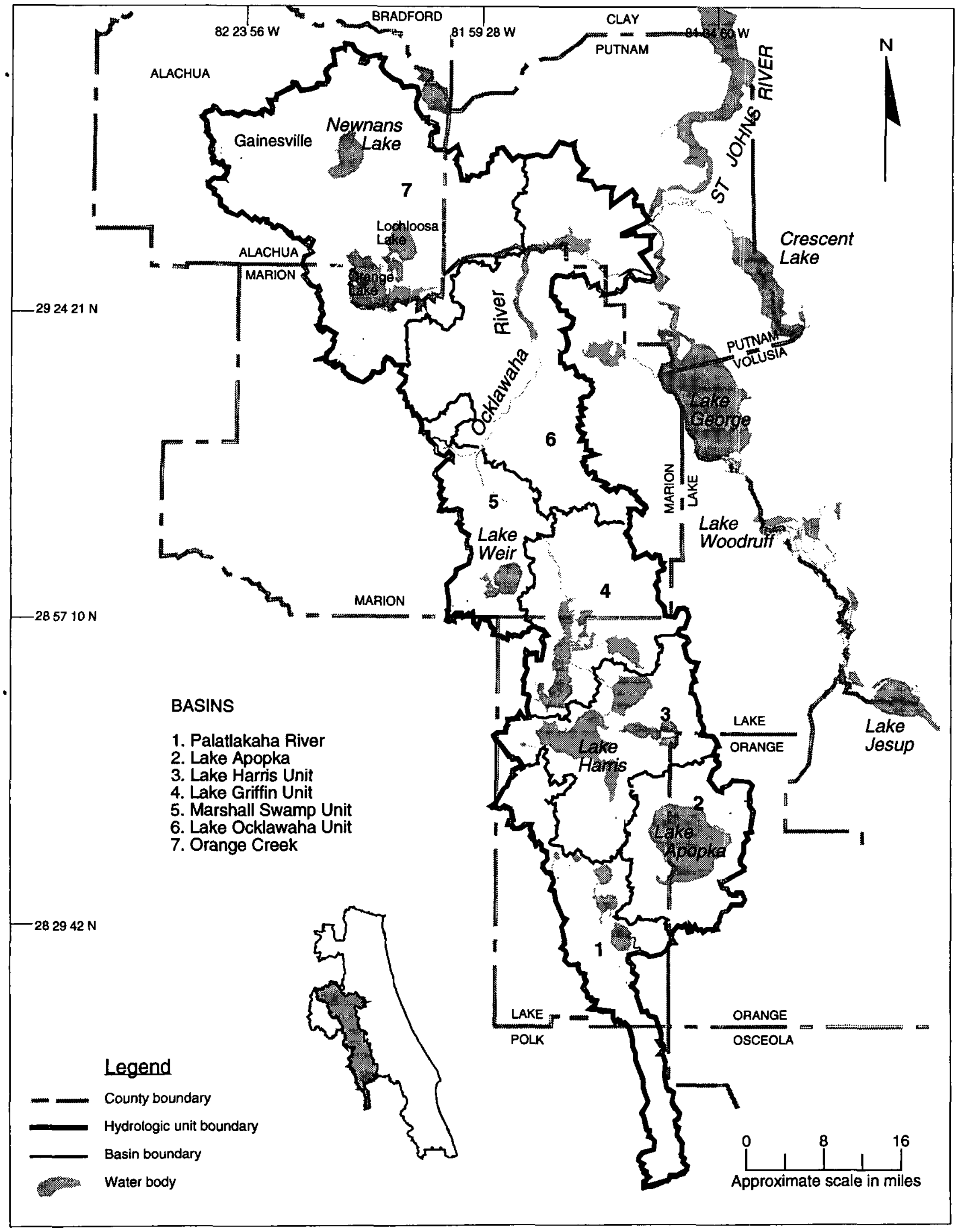

Figure 2. The Ocklawaha River hydrologic unit

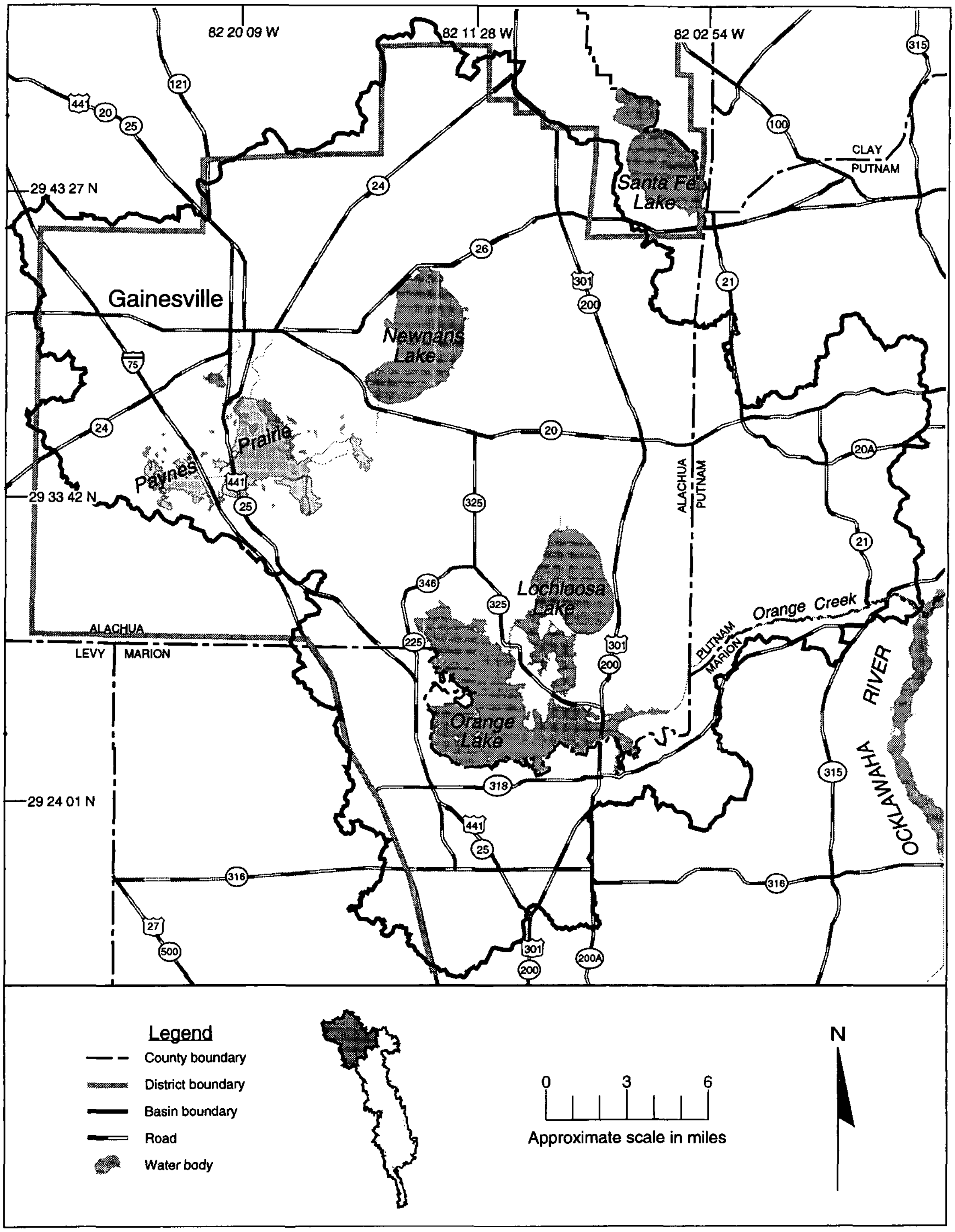

Figure 3. The Orange Creek Basin

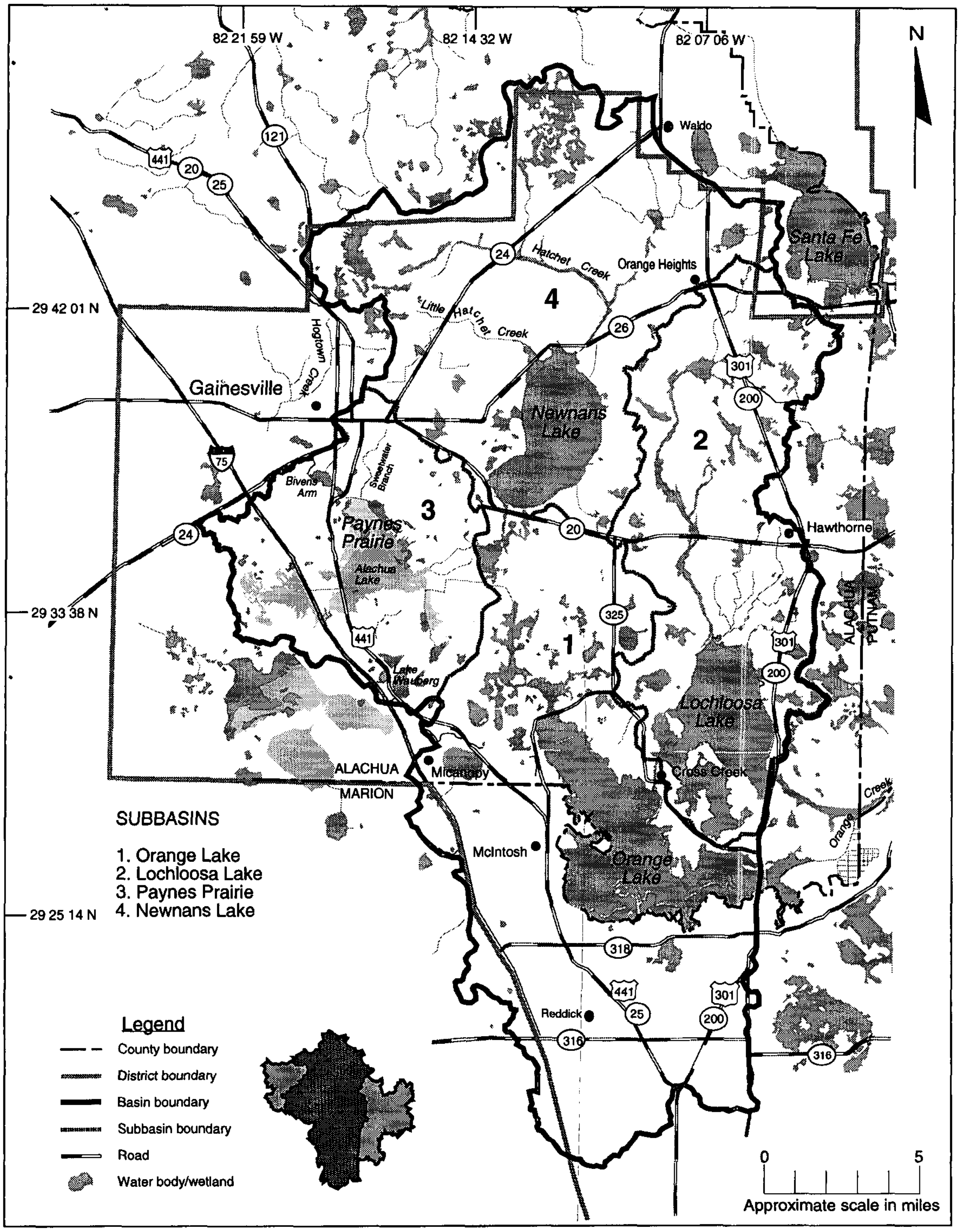

Figure 4. The Upper Orange Creek Basin, Alachua and Marion counties

lakes and provide preliminary interpretation of environmental research data.

Purpose and Scope

The primary objective of this study is to produce a comprehensive presentation of the surface water hydrology of UOCB using existing data. Existing literature was reviewed and existing data were inventoried to summarize and document available hydrologic information on Orange, Lochloosa, and Newnans lakes and Paynes Prairie. This report can serve as a major source of hydrologic information to interested citizens and governmental and private organizations. This information also can be used to assess existing and potential water resources management problems. In addition, the results of this reconnaissance can provide information on surface water conditions used to produce a provisional set of regulatory low flow and flood flow criteria. The report includes (1) basin description, (2) hydrology, and (3) water management concerns.

The methods used in evaluating and analyzing various pertinent data are standard procedures described in major hydrology textbooks (e.g., Linsley et al. 1982; Chow et al. 1988).

Further hydrologic analyses with a watershed model of UOCB have been conducted (Robison et al., draft). These analyses evaluated a number of alternative water management plans for the basin by using hydrologic simulations and by identifying optimal strategies for best management.

Summary of Previous Studies

Important studies which address the water resources of Orange, Newnans, and Lochloosa lakes and Paynes Prairie are summarized under the following subjects:

- Flood studies
- Drought studies

- Water resources developmental studies
- Environmental studies

Flood Studies

Floodplain studies for the subbasins within and around Gainesville have been conducted by Sverdrup & Parcel and Associates (1974). Also, flood insurance studies conducted by the Federal Emergency Management Agency provide information on flood elevations for selected areas in UOCB (FEMA 1978a, 1978b). In 1986, the City of Gainesville, in cooperation with Alachua County, updated the floodplain studies for the purpose of flood control planning (CH2M HILL 1986).

These flood studies primarily have focused on the populated areas around Gainesville. The drainage basins that are examined are Sweetwater Branch, Little Hatchet Creek, Hogtown Creek, and various basins that do not ultimately contribute flow to Orange Creek (Figure 4). Hogtown Creek and many closed basins are not part of the Orange Lake and Paynes Prairie subbasins.

Drought Studies

In the late 1950s, the engineering firm of Smith and McGriff completed a study to determine how to avoid a repeat of the 1956–58 drop in water surface elevations of Orange Lake. As a result of the study, a weir was constructed at the outlet of Orange Lake in 1963. In the early 1960s, Smith evaluated how best to control the outlet of Newnans Lake. As a result of this study, a weir was constructed at the outlet of Newnans Lake in 1966 (ACRWCCA 1966).

Water Resources Developmental Studies

No studies have been conducted that simply investigate surface waters for use in a management plan. A study by the North Central Florida Regional Planning Council (1975) on natural resources within Alachua County includes a chapter that identifies and describes the water resources in Alachua County. This report quantifies the amount of surface and ground water. The report discusses the water quality of streams and ground water and lists the trophic state of major lakes. Finally, the report identifies wetlands and floodplains in Alachua County as a water resources.

Environmental Studies

Various ecological and water quality studies on UOCB have been reviewed and summarized as separate reports by Gottgens and Montague (1987, 1988). They found that the eutrophic state of the lakes is due to the geomorphology of the Orange Creek Basin with its phosphate-rich sands, clays, and limestone. The hydrologic characteristics of generally poor drainage largely determine the mineral composition and trophic state of the lake waters in the Orange Creek Basin. The low oxygen condition and variable, but generally high, nutrient concentrations of Paynes Prairie are typical of seasonally inundated marshes with high rates of microbial decomposition. Gottgens and Montague (1988) also found that the wastewater effluent discharged into Sweetwater Branch created frequent periods of anoxia with persistent high nutrient concentrations. This condition led to considerable changes in the biological communities of Sweetwater Branch and its floodplain in northern Paynes Prairie. These changes were evident from the occurrence of nearly monoculture stands of cattail and coastal plain willow.

BASIN DESCRIPTION

For planning various water resources activities, SJRWMD has been divided into ten major hydrologic units (Figure 1), and each major unit is divided into a number of surface water basins. The study area is located in the Ocklawaha River hydrologic unit and the Orange Creek Basin (Figures 2 and 3). UOCB is part of the lower Ocklawaha River hydrologic unit. Orange Creek is a tributary to the Ocklawaha River. The drainage area of UOCB, including Paynes Prairie, is 399 square miles (mi^2), of which 326 mi^2 is located in Alachua County and the remainder in Marion County. The U.S. Geological Survey (USGS), however, gives the drainage area of the entire Orange Creek Basin as 1,119 mi^2. Much of this area lies in the Florida Ridge hydrologic unit (Figure 1) and does not contribute runoff into Alachua Lake in Paynes Prairie or into Orange Creek. The runoff ponds in local depressions and infiltrates into the aquifer.

Major hydrologic features in UOCB are Newnans, Lochloosa, and Orange lakes and Paynes Prairie. The 399-mi^2 watershed delineated for this study encompasses land that contributes runoff to the three lakes and the prairie. Also included in the study were non-contributing drainage areas within or in close proximity to the lakes if there is the possibility that they could contribute runoff during extreme events. Hydrologic features within the entire Orange Creek Basin not included in this reconnaissance study of UOCB include Hogtown Creek and Orange Creek proper (Figure 4).

The UOCB description includes three subsections:

- Subbasin delineation
- Physiography
- Socioeconomics

SUBBASIN DELINEATION

A surface water drainage system (e.g., basin or hydrologic unit) consists of a network of streams, several tributaries joining the mainstream, and several minor streams joining the tributaries. In general, a drainage network is dendritic. Each stream, regardless of its size, receives surface runoff from a more or less defined area, known as a catchment area. The boundary of the catchment area for a given stream is determined by the general topography of the vicinity. Various hydrologic characteristic features of a surface water basin can be conveniently described by subdividing the basin into a number of subbasins, that is, catchment areas of smaller streams and tributaries. In this report, the study area is divided into four major subbasins: Newnans Lake, Paynes Prairie, Lochloosa Lake, and Orange Lake (Figure 4). The general direction of flow within the Orange Creek Basin is from the Newnans Lake subbasin into the Paynes Prairie and Orange Lake subbasins and from the Lochloosa Lake subbasin into the Orange Lake subbasin. Flow leaves the Orange Lake subbasin via Orange Creek, which flows into the Ocklawaha River.

Newnans Lake Subbasin

The Newnans Lake subbasin has a drainage area of 114 mi^2 (Figures 4 and 5).

The two main sources of inflow into Newnans Lake are Hatchet Creek and Little Hatchet Creek. Hatchet Creek is 14.4 miles (mi) long and drains an area of 63.7 mi^2. Hatchet Creek has many tributaries and drains much undeveloped area such as Buck Bay, Austin Cary Memorial Forest, and Saluda Swamp.

Little Hatchet Creek is 4 mi long and drains an area of 7.7 mi^2. Little Hatchet Creek discharges into Newnans Lake by way of Gum Root Swamp and drains the area south of the Gainesville airport and a portion of northeast Gainesville.

The remainder of the subbasin drains directly into Newnans Lake.

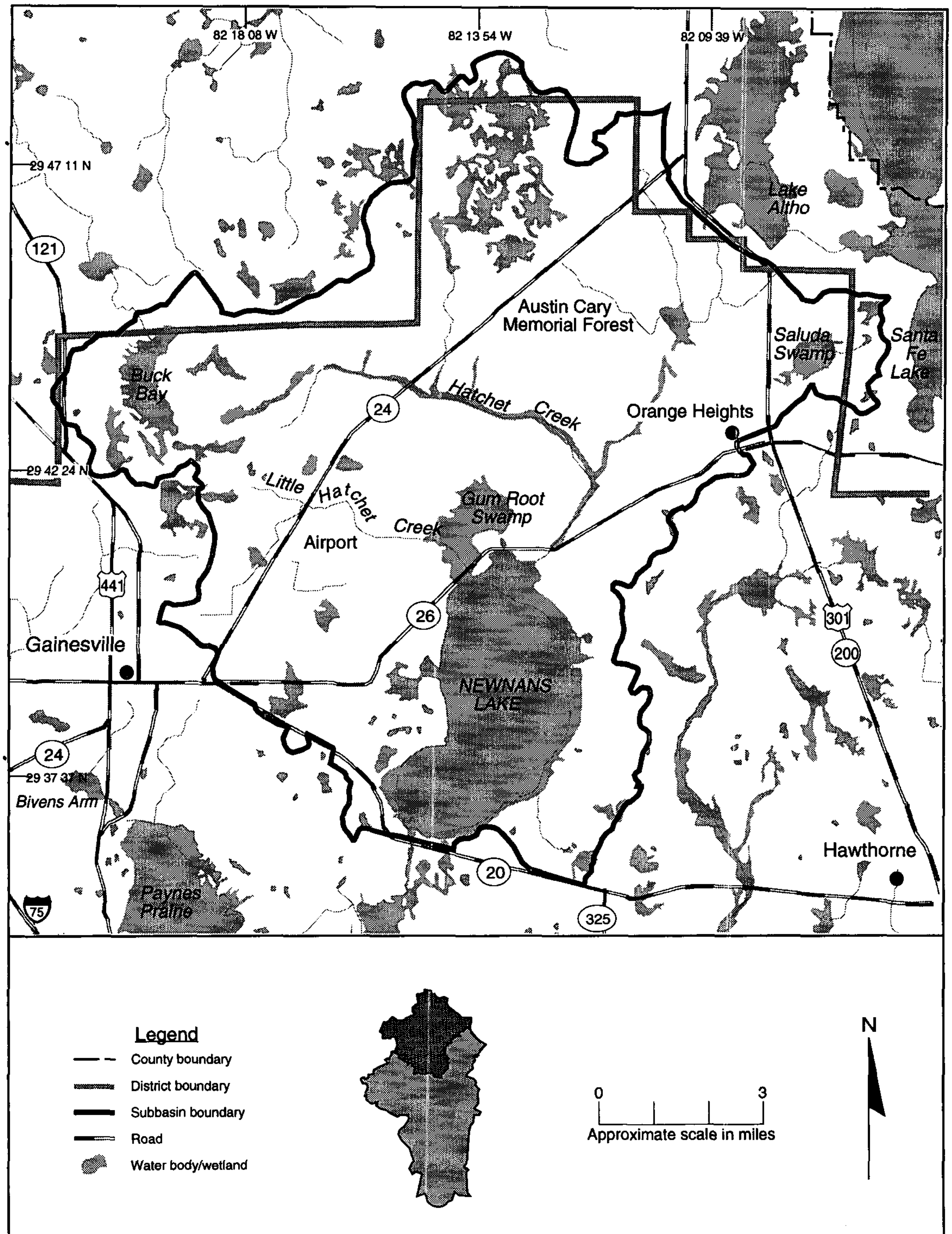

Figure 5. Newnans Lake subbasin

Paynes Prairie Subbasin

The Paynes Prairie subbasin has a drainage area of 56 mi^2 (Figure 6). Parts of this subbasin are self-contained or may only contribute flow into Paynes Prairie proper during extreme storm events.

The Paynes Prairie subbasin contains only minor streams. The subbasin receives runoff from urbanized areas in the north, which are characterized by little storage, resulting in high peak discharges. Bivens Arm drains parts of east and southeast Gainesville. Sweetwater Branch is 3.8 mi long and drains 2.6 mi^2 of East Gainesville. Sweetwater Branch receives treated wastewater effluent. The discharge from Sweetwater Branch is segregated from the main prairie by an earthen levee that confines Sweetwater Branch discharges to a small area of the prairie before going into Alachua Sink. Boulware Springs is in the Paynes Prairie subbasin (Rosenau et al. 1977), and its discharge is also segregated by this earthen levee.

Paynes Prairie receives partial flow from Prairie Creek through a gated culvert.

Although much of Paynes Prairie is wet and frequently inundated, a portion of the prairie is normally under water and is known as Alachua Lake. Most of this lake lies east of U.S. 441 and drains into Alachua Sink, which is a sinkhole that opens to the Floridan aquifer system. Alachua Sink is the only drainage outlet for the entire Paynes Prairie subbasin. Inflow into the sink from the prairie is regulated by a gated control structure operated by the FDEP park rangers.

Lochloosa Lake Subbasin

The Lochloosa Lake subbasin has an area of 88 mi^2 (Figure 7). The major drainage feature of the subbasin is Lochloosa Creek, which directs surface runoff into Lochloosa Lake.

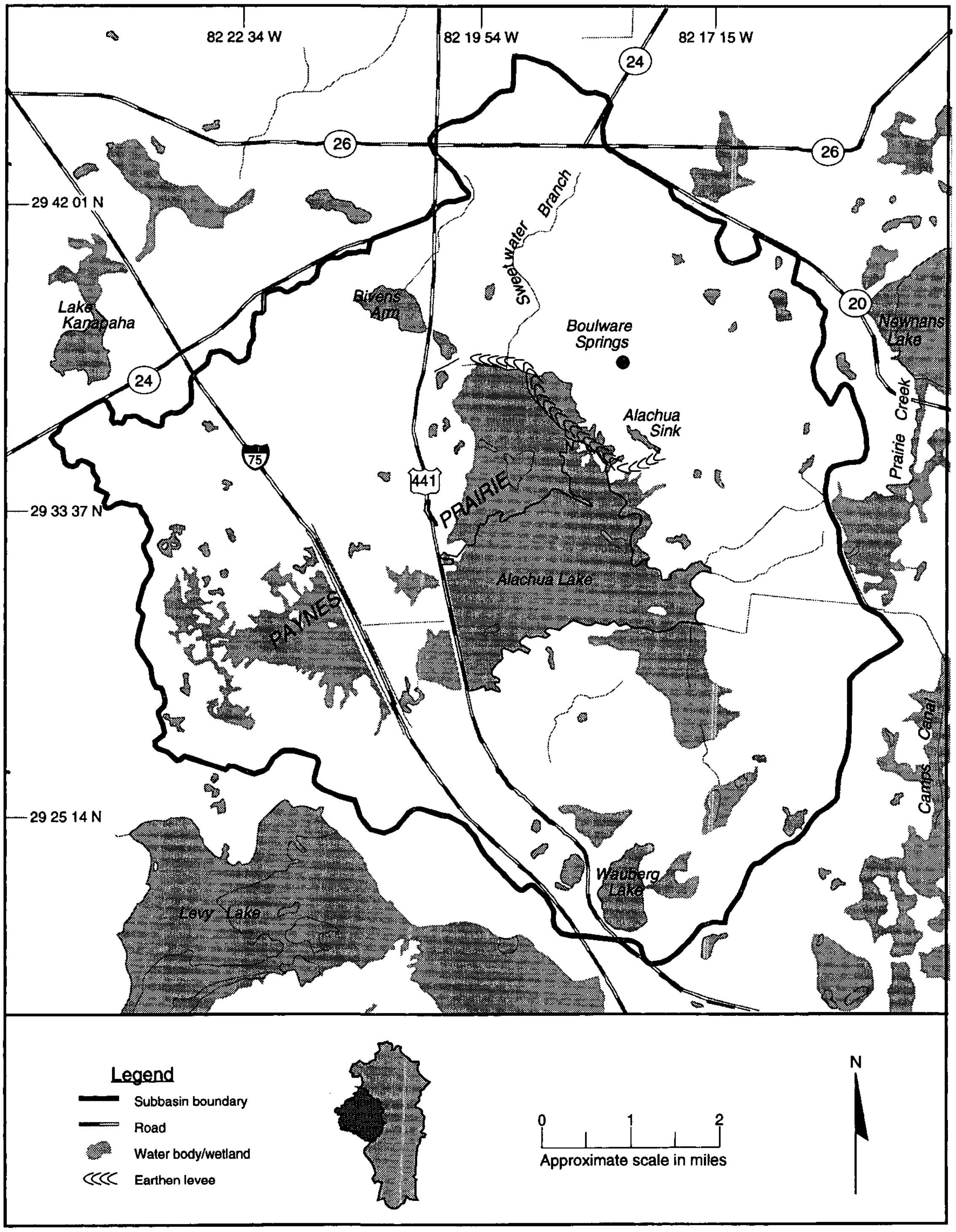

Figure 6. Paynes Prairie subbasin

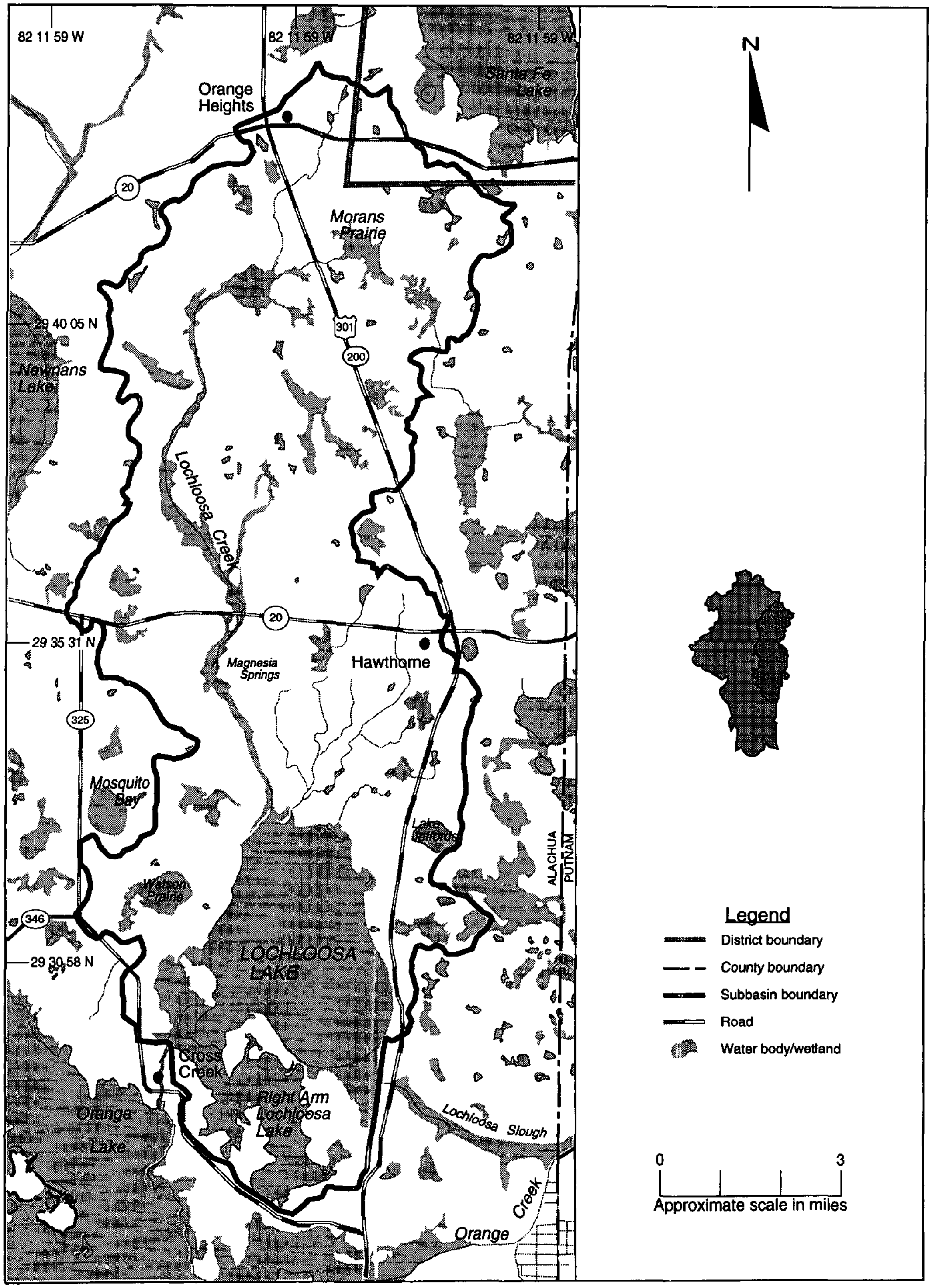

Figure 7. Lochloosa Lake subbasin

Lochloosa Creek is 14.5 mi long and drains 50.6 mi^2. It receives runoff from as far north as Orange Heights. Magnesia Spring flows into the creek (Clark et al. 1964; Rosenau et al. 1977).

To the east of Lochloosa Creek are many spring-fed streams, which receive runoff from Hawthorne and the area south along U.S. 301. Iron Spring and Sulphur Spring are within the city limits of Hawthorne (Rosenau et al. 1977).

Lochloosa Lake has two discharge outlets, Cross Creek and Lochloosa Slough. Cross Creek conveys discharge into Orange Lake. Lochloosa Slough passes under U.S. 301 and eventually discharges into Orange Creek. Lochloosa Slough discharges, however, only during high lake stages.

Orange Lake Subbasin

The Orange Lake Subbasin has a drainage area of 141 mi^2 (Figure 8). Some parts of the subbasin do not contribute runoff to Orange Lake.

Two major drainage features in the subbasin are Cross Creek and Prairie Creek-Camps Canal. Cross Creek connects Lochloosa Lake to Orange Lake. The differences between stages of Orange and Lochloosa lakes are usually small except during very low water periods. Prairie Creek-Camps Canal conveys flow from the Newnans Lake subbasin into Orange Lake by way of the River Styx. Finally, Orange Lake flows into Orange Creek (Figure 4).

Prairie Creek is within the Orange Lake subbasin, although the creek originally discharged into Paynes Prairie. In the 1920s, Camps Canal was dug and a levee was constructed to divert the water away from Paynes Prairie. In the 1970s, a culvert was placed in the levee to again allow Prairie Creek to discharge, at least partially, into Paynes Prairie.

Orange Lake has a sinkhole area near its southwestern shores, close to the community of Orange Lake. There is concern that water lost through the Orange Lake sinkholes exacerbates low

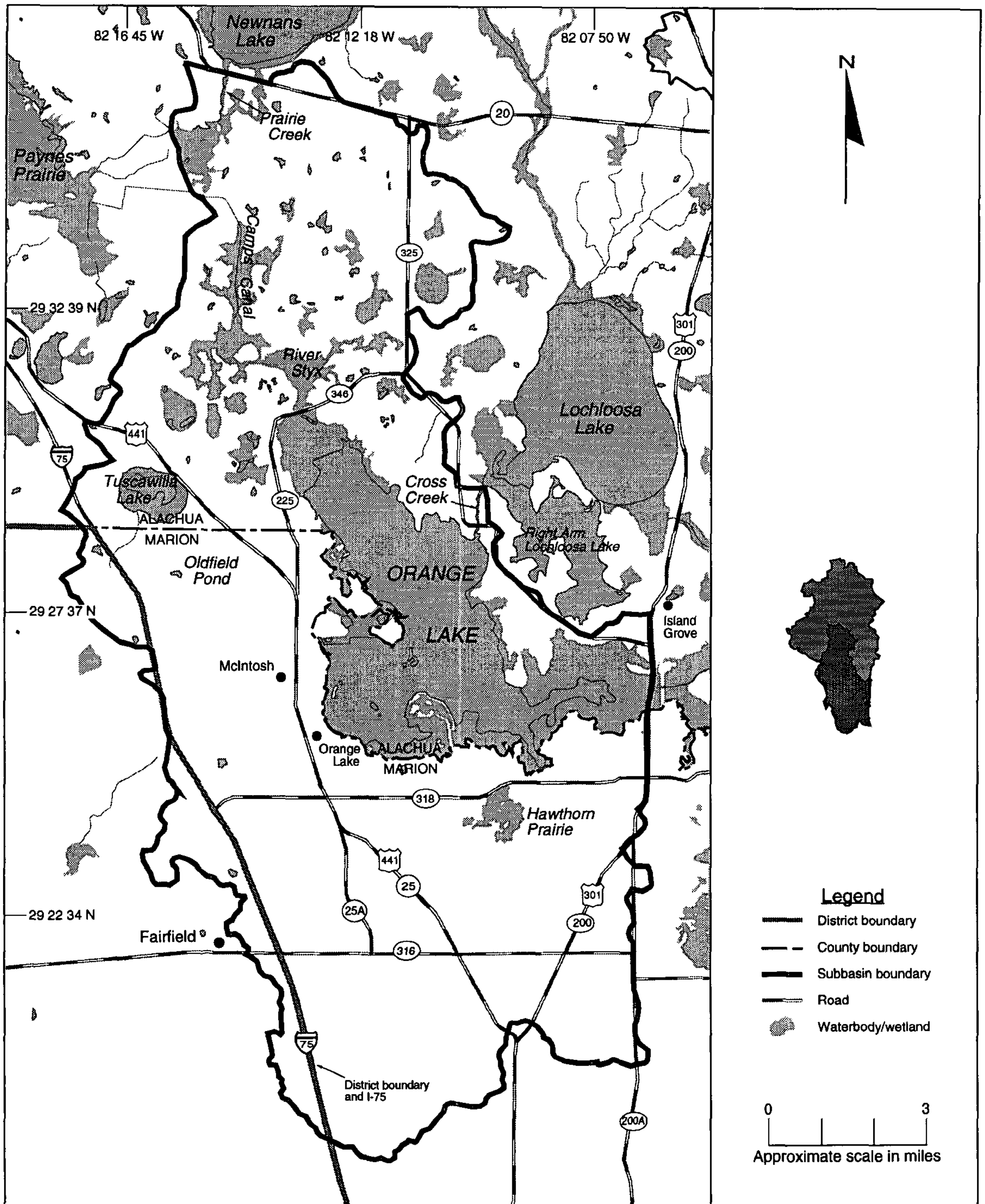

Figure 8. Orange Lake subbasin

water levels in the lake. On November 21, 1957, discharge into the sinkhole area was gaged as 12 million gallons per day or about 19 cubic feet per second (cfs) (Clark et al. 1964). Roland (1957) investigated the sink and searched for other sinkholes within Orange Lake. He concluded that the rest of the lake was sinkhole free. Roland suggested controlling the flow into the sinkhole area by constructing a levee around the sinkhole area with an overflow spillway. Carter (1980) reported that local fishing interests gathered together in 1963 and plugged the sinkhole. The plug consisted of at least 80 car bodies, 2 school buses, old appliances, junk, and concrete.

Areas that do not contribute water to the subbasin exist in the western and southern portions because this is an area of high recharge to the Floridan aquifer system. Drainage wells are used in some of these areas to control and dispose of surface water. There are two known drainage wells, one in Tuscawilla Lake and the other in Oldfield Pond. There are also some sinkholes or drainage wells near Fairfield.

PHYSIOGRAPHY

Physiographic information consists of a description of lakes, soil types, and land cover; topography; and hydraulic modifications made to the natural water bodies (i.e., streams and lakes). This information was collected by an inspection of various maps, by field surveys, and from investigations performed by other agencies.

Lakes

Lakes and other open water bodies make up 15.5% of the total area in UOCB. The major lakes in UOCB are Orange, Lochloosa, and Newnans. These lakes and Alachua Lake make up 77.7% of the total open water in UOCB. Tables A1 through A5 (Appendix A) list the lakes in the four major basins.

Lakes are categorized as follows (Shafer et al. 1986):

Type 1: Lakes with streams flowing into them
Type 2: Lakes with streams flowing out of them
Type 3: Lakes with streams flowing into and out of them
Type 4: Lakes that are landlocked

Type 3 lakes make up the largest part of the total lake area (Table 1). This is primarily because the three major lakes are of this type. The Orange Lake subbasin contains the most open water.

Table 1. Acreage of each lake type by subbasin

Subbasin	Lake Type				
	1	2	3	4	Total
Orange	196	347	13,292	1,324	15,159
Lochloosa	656	211	9,138	305	10,310
Newnans	422	12	7,427	359	8,220
Paynes	0	129	4,575	378	5,082
Total	1,274	699	34,432	2,366	38,771

Type 1: Lakes with streams flowing into them
Type 2: Lakes with streams flowing out of them
Type 3: Lakes with streams flowing into and out of them
Type 4: Lakes that are landlocked

Source: Shafer et al. 1986

Soil Types

Soil type and land cover influence the amount of runoff that is generated from any given rainfall event. The soils information for the study area has been collected from soil surveys of Alachua and Marion counties (SCS 1985) (Figure 9 and Table 2).

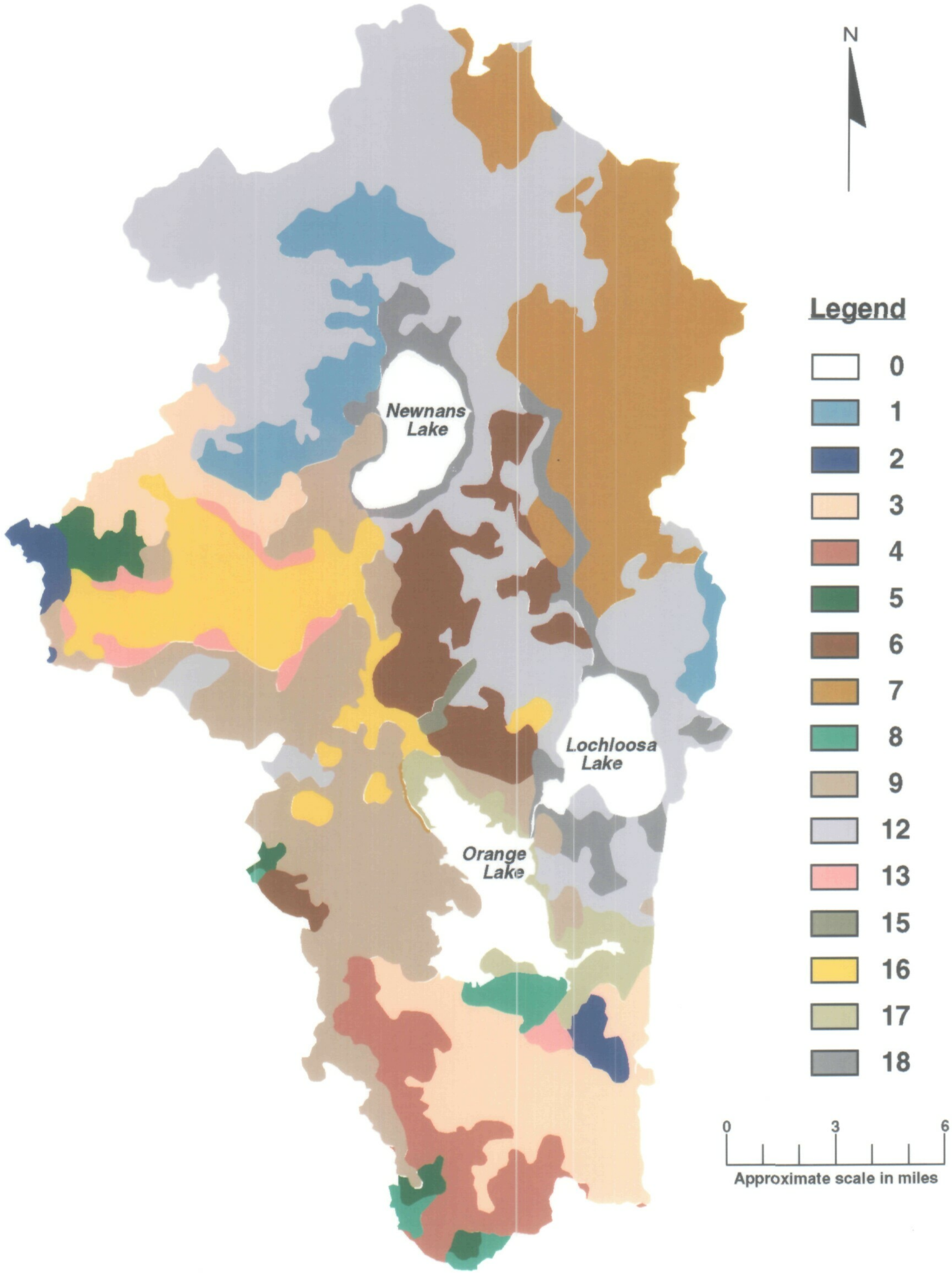

Figure 9. Location and extent of soil types in the Upper Orange Creek Basin.
(See Table 2 for identification of soil type by number in legend.)

Table 2. Soil types in the Upper Orange Creek Basin

Soil Group	Identification Number on Figure 9	Area (mi^2)	Percent
Water	0	30.47	7.63
Candler-Apopka	1	18.56	4.65
Jonesville-Chiefland-Archer	2	4.53	1.14
Arredondo-Zuber	3	36.56	9.16
Arredondo-Gainesville	4	15.54	3.89
Kendrick-Hague-Zuber	5	5.19	1.30
Tavares-Myakka-Basinger	6	21.61	5.41
Stilson-Pelham-Mascotte	7	49.07	12.30
Sparr-Lochloosa-Tavares	8	4.48	1.12
Blichton-Flemington-Kanapaha	9	52.00	13.03
Myakka-Wauchula-Placid	12	106.79	26.76
Meggett, variant-Wauchula-Placid	13	5.30	1.33
Plummer, variant-Rutlege, variant-Martel-Placid	15	0.94	0.24
Martel-Placid	16	25.67	6.43
Okeechobee-Terra Ceia-Tomoka	17	8.07	2.02
Freshwater Swamp	18	14.31	3.59
Total		399.09	100.00

Note: mi^2 = square mile

Source: SCS 1985

Soil groups 1 and 2 are areas generally dominated by sandy, droughty soils that are not subject to flooding. About 6% of the area consists of these types of soils, scattered throughout UOCB.

Soil groups 3–5 are the areas dominated by well-drained soils that are not subject to flooding. About 14% of the area is covered by these types of soils (predominantly Arredondo-Zuber), located mainly north in the Paynes Prairie subbasin and south in the Orange Lake subbasin.

Soil groups 6–13 are areas dominated by moderately well to poorly drained soils that are not subject to flooding. The majority of UOCB has soils in this category (about 60%). Stilson-Pelham-Mascotte, one of the moderately drained soils, makes up a majority of Lochloosa Lake subbasin. Blichton-Flemington-Kanapaha dominates the west and northwest area of Orange Lake subbasin. Myakka-Wauchula-Placid makes up a majority of the Newnans Lake subbasin and the southern area of Lochloosa Lake subbasin.

Soil groups 15–18 are areas dominated by poorly and very poorly drained soils that are subject to flooding. These types of soils make up about 12% of the soils of the area. The Martel-Placid soil type is the largest in this group (about 6%) and dominates Paynes Prairie subbasin. The other soil types are found exclusively around the lakes. Okeechobee-Terra Ceia-Tomoka is found around Orange Lake, and Freshwater Swamp is found around Newnans and Lochloosa lakes.

Land Cover

Land cover was interpreted from 1:24,000 black and white aerial photographs which were taken in 1988 over Alachua County and in 1989 over Marion County. About 19 mi^2 of UOCB land cover is unmapped because this area is outside SJRWMD boundaries. Land cover is divided into eight categories (Figure 10 and Table 3), according to a modified Florida Land Use Cover Classification Scheme.

Upland Areas. Upland forests are upland areas that support a tree canopy closure of 10% or more. Upland forest is the largest land cover area in UOCB, or about 39%.

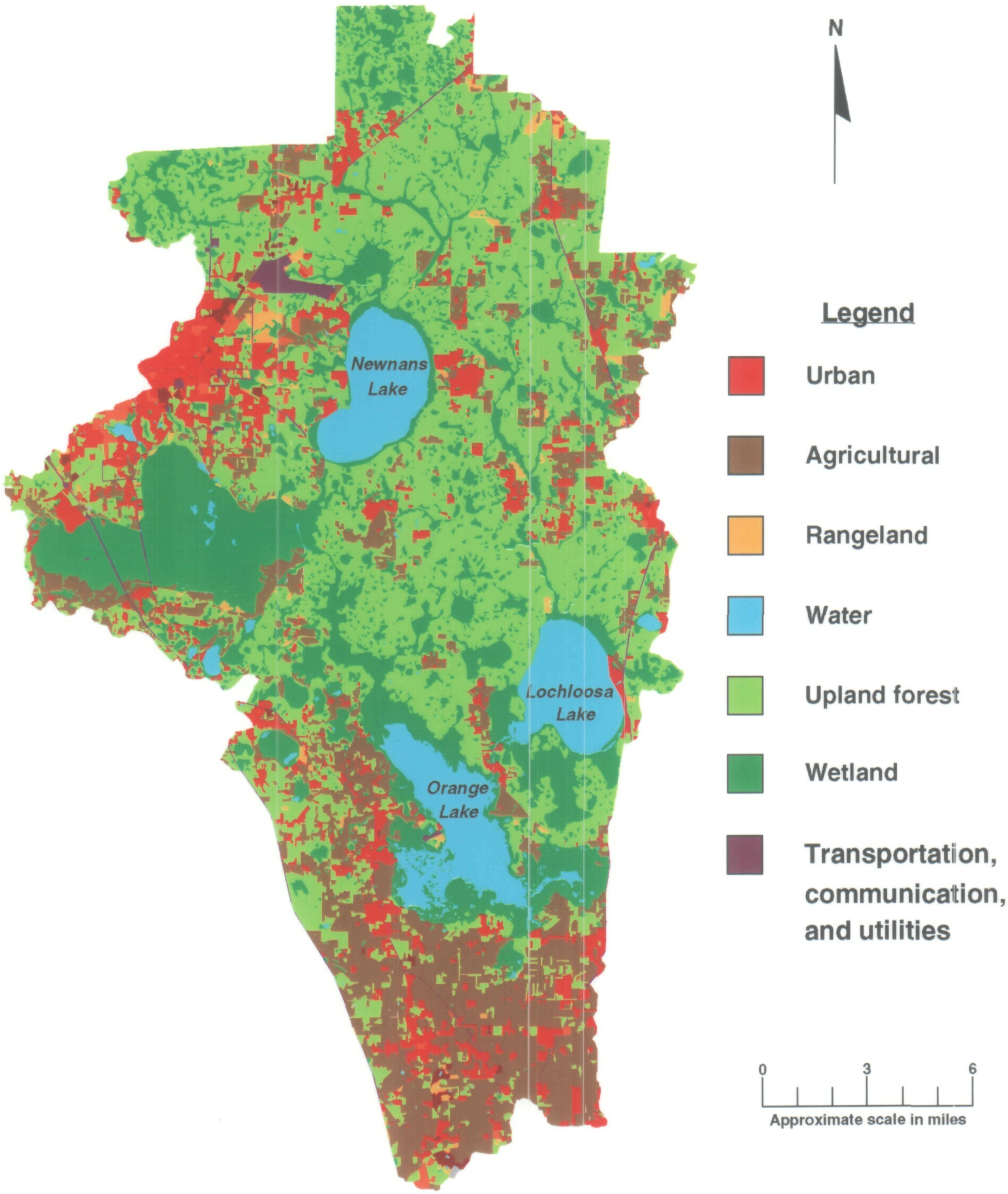

Figure 10. General land cover in the Upper Orange Creek Basin. *Data limited to within the boundary of St. Johns River Water Management District.*

Table 3. General land cover in the Upper Orange Creek Basin (in square miles)

Land Cover Type	Land Cover Code	Newnans Lake	Paynes Prairie	Lochloosa Lake	Orange Lake	Total
Urban and built-up	1000	11.27	9.62	4.31	14.22	39.42
Agricultural	2000	5.59	5.89	9.76	43.17	64.41
Rangeland	3000	1.83	0.24	0.70	0.61	3.38
Upland forest	4000	57.15	17.23	43.97	38.64	156.99
Water	5000	9.46	0.63	9.15	11.06	30.30
Wetland	6000	17.78	21.50	17.63	24.66	81.57
Barren land*	7000	0.00	0.02	0.02	0.07	0.11
Transportation, communication, and utilities	8000	2.22	0.84	0.65	0.95	4.66
Outside†		8.99	0.00	1.84	7.42	18.25
Total		114.29	55.97	88.03	140.80	399.09

*Not shown on corresponding Figure 10
†Areas outside the boundaries of the St. Johns River Water Management District

Wetlands. Wetlands are hydrologically sensitive areas which are identified as being inundated or saturated by surface or ground water with a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas (Section 40C-4.021(11), *Florida Administrative Code*; SJRWMD 1989). UOCB includes many locations that satisfy this definition.

Wetlands in the watershed comprise about 20% of the total area. Wetlands are the second largest land cover area in UOCB. Paynes Prairie is a wetland. Large areas of wetland are also associated with Newnans, Lochloosa, and Orange lakes. Other areas of wetlands in the basin are Buck Bay, the area north of Austin Cary Memorial Forest, Saluda Swamp, Gum Root Swamp, Morans Prairie, Mosquito Bay, River Styx, and Hawthorn Prairie. Each area contributes to the retention of surface water in the watershed.

Agricultural Areas. Agricultural lands are defined as those lands cultivated to produce food crops or for grazing of livestock. Agriculture is the third largest land cover area in UOCB, or about 16%. Most of the area is improved pasture, although in the Orange Lake subbasin, a large component is in field crops.

Urban Areas. Urban and built-up land (urban areas) are areas of intensive use with much of the land occupied by man-made structures. Urban areas constitute about 39 mi^2, or about 10% of UOCB (fourth largest land cover area). The City of Gainesville and its suburban sprawl constitute the largest portion of this area. Other smaller communities within the watershed include Micanopy, Hawthorne, Waldo, Orange Heights, Reddick, and McIntosh (Figure 4).

Topography

The topography in the northern part of UOCB is a nearly level plateau with elevations ranging from 150 to 200 feet (ft). The southwestern and southeastern areas of the basin are characterized by shallow flat-bottomed lakes, level prairies, disappearing streams, and erosional remnants of the plateau. The level bottoms of the prairies and shallow lakes in these areas occur at approximately 55 ft. This type of topography may be visualized as a transition stage in the reduction of the northern plateau area to the plains area to the west of the basin (Pirkle 1956).

Hydraulic Modifications

The hydraulic structures within UOCB can be grouped into four categories: bridges and culverts, water control structures, constructed levees, and excavated channels.

Bridges and Culverts. These types of structures are the most prevalent in UOCB. Bridges and culverts exist wherever a road must pass over a waterway or interrupt the natural direction of runoff. These structures can alter the flow of a natural channel.

Water Control Structures. These structures are used to control the amount of discharge through a channel or to control the elevation of a water body. There are four water control structures within the watershed: two weirs—one each at the outlets of Orange and Newnans lakes, a gated culvert between Prairie Creek and Paynes Prairie, and a gated culvert between Alachua Lake and Alachua Sink (Figure 11).

Under the authority of the Alachua County Recreation and Water Conservation and Control Authority (ACRWCCA) (1962), a weir was placed at the U.S. 301 bridge crossing of Orange Lake in 1963. The purpose of this structure was to retain water in Orange Lake, thus preventing the recurrence of the low lake levels that were prevalent during the middle and late 1950s. The weir consists of 24–inch (in.)-thick concrete-filled sheetpiles with a crest elevation of 58.0 ft. In the center of the weir is a 2-tier notch. The first tier is 4 ft wide and drops down 1 ft to 57.0 ft. The second tier is 2 ft wide and drops down another 1.5 ft to 55.5 ft.

Also under the authority of ACRWCCA (1966), a control weir was placed at the outlet of Newnans Lake in 1966. In 1976, ACRWCCA ceased to exist, and responsibility for operation of this outlet weir was transferred to the Florida Game and Fresh Water Fish Commission (FGFWFC). FGFWFC immediately modified the weir so that the crest of the weir could be adjusted by the placement or removal of stoplogs. At the same time, the lake was drawn down. In 1989, FGFWFC conducted another drawdown of the lake. The weir is constructed of 14 vertical metal columns placed at 4-ft intervals across the creek. Each column is slotted to hold a stack of 4-ft-wide boards. The elevation of the weir base from which the columns stand is 60.0 ft. Supported by columns, boards are stacked up to an elevation of 66.8 ft. Between the two center columns, a board

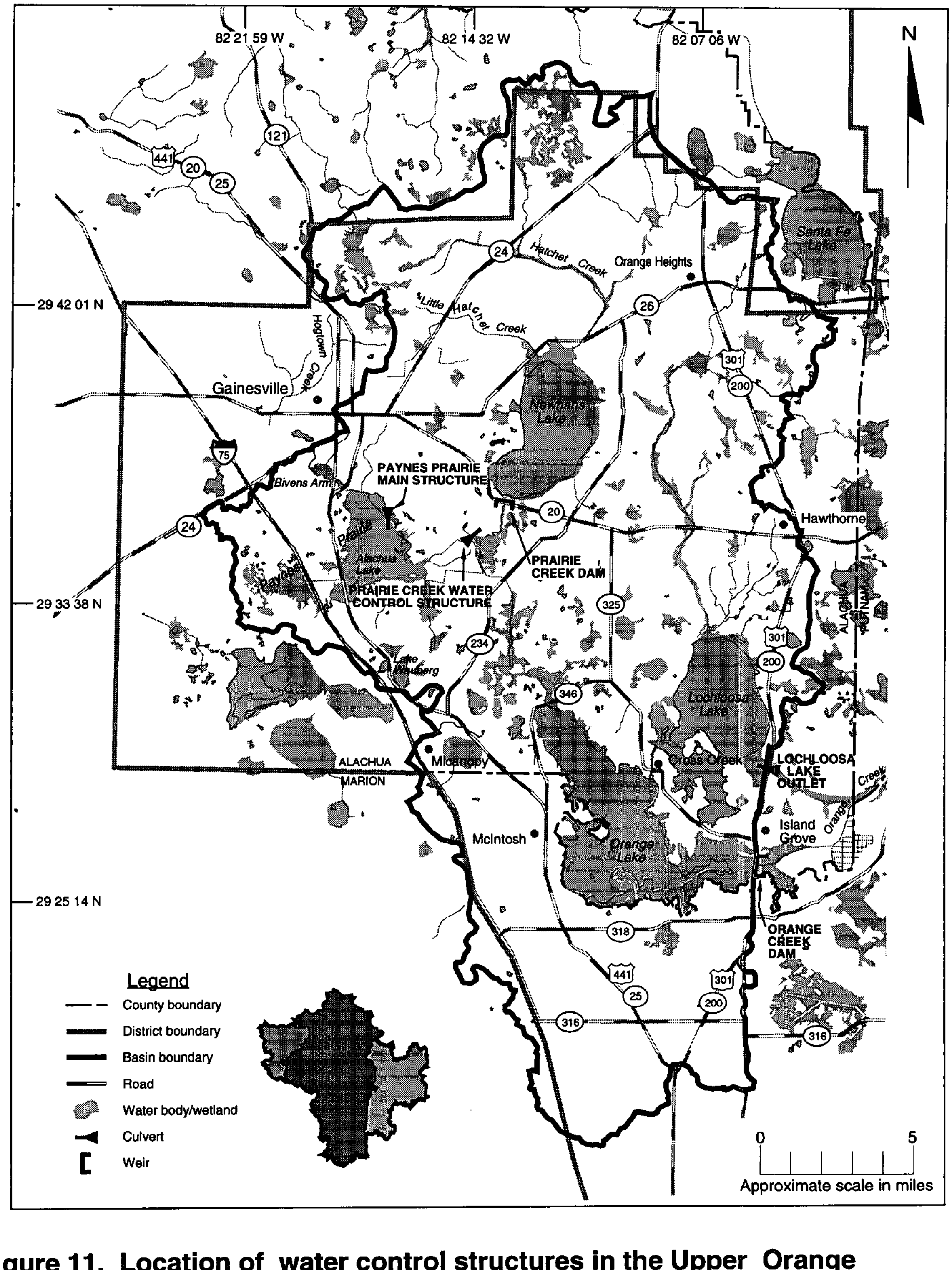

Figure 11. Location of water control structures in the Upper Orange Creek Basin

with a 2-ft gap is placed at the bottom to allow continuous flow through Prairie Creek. In 1991, FGFWFC removed the boards; as of April 1995, the boards remained removed.

In the mid-1970s, the State of Florida bought most of Paynes Prairie and FDEP began managing the land. FDEP placed gated culverts at the inlet of Alachua Sink to control the water level in the prairie. The control structure consists of four 48-in. corrugated metal pipes with lowering gates and invert elevations between 51 and 52 ft.

In 1976, in an effort to redivert some water from Prairie Creek back into Paynes Prairie, FDEP breached the levee separating the creek from the prairie. FDEP placed three 40- x 75-in. flashboarded culverts with invert elevations at approximately 59 ft. In 1988, FDEP replaced the flashboard with gates. These culverts control the amount of water coming from Prairie Creek into Paynes Prairie.

Levees and Excavated Channels. Levees and excavated channels redirect water in the desired direction. The most prominent channel-levee combination of this type is the Camps Canal diversion. In the late 1920s, Camps Canal was constructed to divert Prairie Creek from Paynes Prairie into the River Styx. This was done to maintain Paynes Prairie as rangeland. In 1994, Camps Canal still diverts water from Prairie Creek into the River Styx (Figure 8).

Within Paynes Prairie, channels and levees were constructed to convey runoff as quickly as possible to the Alachua Sink (Figure 6). These levees divide the land within the prairie and interrupt the natural flow of water in the prairie.

SOCIOECONOMICS

Socioeconomics defines how people live and their livelihoods. This section presents essential information on the history and culture of the people who have lived in this area, the present recreational opportunities, the income generated from these recreational opportunities, and the demographics of UOCB.

Historical and Cultural Perspectives

Paynes Prairie. Paynes Prairie has an anthropological history that dates back to 10,000 B.C. (FDNR 1986).

In the 1600s, the Spanish used Paynes Prairie for cattle ranching. This is mentioned by Bartram, who traveled through this area in the late 1700s (Van Doren 1955). Bartram described the prairie as "a level green plain, above fifteen miles over, fifty miles in circumference, and scarcely a tree or bush of any kind to be seen on it." He also discussed the abundant and varied wildlife on the prairie.

The description of Bartram's walk around the prairie to avoid the water and mud indicates that much of the prairie was wet. Also, his discourse indicated that the prairie periodically dried up, driving the fish to Alachua Sink where they were crowded together and made an easy feast for alligators and gar.

After the Seminole War (about 1836), the prairie was named Paynes Prairie after an old Seminole Chief (Dall and Harris 1892). The prairie continued as a place suitable for cattle ranching and farming. During the Civil War, large herds of cattle from south Florida were assembled on Paynes Prairie, and from there were driven north for use by the army (Hildreth and Cox 1981).

In the early 1870s, Alachua Sink did not drain, and the Prairie turned into a lake. The water was deep enough to allow small steamers to use the lake. The Savannah, Florida, and Western Railroad recorded the water level as 64 ft above sea level (Sellards 1910). In 1891, the lake gradually receded until the it practically disappeared. In 1891, the water level was photographed several feet lower than the elevation of 52.67 ft above sea level surveyed in October 1907 (Sellards 1908).

In the early 1900s, the prairie again was used as a cattle ranch by Camp Ranch. During this time, steps were taken to keep the prairie as dry as possible. Prairie Creek was diverted from Alachua Sink into the River Styx (Figures 6 and 8), and a network of canals for drainage within the prairie was established.

Cross Creek. The lakes that it connects, and the people who lived there, were the source of inspiration for two of Marjorie Kinnan Rawlings' books. Her house is an historic landmark which attracts tourists wishing to see the location that inspired her writing.

Recreation and Public Use

Paynes Prairie. FDEP operates Paynes Prairie Park. Visitors have many recreational opportunities including camping, picnicking, fishing, boating, hiking, swimming, horseback riding, and studying nature.

There are many ranger-led programs offered in the park. The wildlife walk consists of a guided observation walk on the prairie. The prairie-rim ramble is a hike of approximately 6 mi through a hardwood hammock, old fields, and other subbasin and rim communities. The overnight hike is a backpacking trip of approximately 11 mi with camping at Persimmon Point, a bluff overlooking the basin. Finally, a 7-mi horseback ride takes visitors from the northern boundary of the preserve to the southern section near Lake Wauberg.

Public use of the park is heaviest during the spring and summer months. Visitor tabulation is made as guests enter the visitor center. The number of visitors to the park ranged from 43,000 to 53,000 per year from 1981 to 1984 (FDNR 1986).

Orange, Lochloosa, and Newnans Lakes. These lakes are renowned for sportfishing. The state record speck, 3 pounds and 12 ounces, was caught in December 1964 in Newnans Lake (*Gainesville Sun*, February 12, 1989).

Milon et al. (1986) reported that Orange and Lochloosa lakes accounted for a large share of total resident and non-resident fishing trips during a survey conducted in 1985. Also, fishing successes at Orange and Lochloosa lakes were among the highest for any of the rivers and lakes included in the survey. They reported that gross expenditures by residents and by non-residents were $2.4 million and $3.2 million, respectively, for a total gross expenditure of $5.6 million. Milon then used an expenditure multiplier of 2.63 to account for non-local expenditures associated with sportfishing. He considered this multiplier to generate an estimate at the top of a range for a region as small as north-central Florida. Using this multiplier, the estimate of non-local expenditures was $8.4 million. This expenditure, plus the local resident expenditures, is the total economic contribution of Orange and Lochloosa lakes, $10.8 million, to the regional economy (Milon et al. 1986).

Demographics

Population is a reliable indicator of development trends in a region. Past and estimated population trends for Alachua and Marion counties are listed in Table 4. Approximately half of the population in Alachua County is associated with Gainesville, which had a population of 81,371 in 1980 and 82,882 in 1985 (Shoemyen and Floyd, ed., 1986). The growth of Gainesville to the east, north, and south can affect the hydrologic characteristics of UOCB.

Table 4. Past and projected population growth in Alachua and Marion counties

Year	Alachua County		Marion County	
	Population (thousands)	Percent Growth	Population (thousands)	Percent Growth
1970	104.8	—	69.0	—
1980	151.4	44.5	122.5	77.5
1985	172.9	14.2	157.9	28.9
1990	192.2	11.2	191.4	21.2
1995	208.8	8.6	223.9	17.0
2000	224.0	7.3	252.0	12.6
2005	239.3	6.8	280.3	11.2
2010	253.8	6.1	297.3	6.1
2020	280.7	10.6	328.8	10.6

Source: Shoemyen and Floyd (1986)

HYDROLOGY

The hydrology section incudes the following subsections:

- Data collection network
- Climatic data analyses
- Surface water discharge analyses
- Surface water stage analyses

DATA COLLECTION NETWORK

Long-term hydrologic data form a basis for greater understanding of hydrologic processes. The longer the period of record and the larger and more dense the network, the stronger the insight into the hydrologic phenomena occurring in a basin. The National Oceanic and Atmospheric Administration (NOAA) and USGS are the primary data collection agencies in the United States. NOAA collects atmospheric and climatic data, of which rainfall, evaporation, and temperature are of major interest to surface water hydrologists. USGS monitors streamflow (discharge) and stage data. Additionally, the Florida Department of Forestry, FDEP, and SJRWMD collect some hydrologic data.

This section presents locations of rainfall, stream flow, and lake stage stations and the lengths of records that are available.

Climatological and/or Rainfall Stations

There are 20 climatological data collection stations within and around UOCB (Table 5 and Figure 12). Most stations collect only rainfall data, but NOAA stations (at Gainesville) 3322, 3326, and 3316 also collect temperature. Station 3322 also collects pan evaporation and soil temperatures.

Table 5. Climatological stations in the Upper Orange Creek Basin and vicinity

Gage Name	Latitude	Longitude	Source	Record Length
Ft. McCoy Tower	292200	820225	FDOF	1981 to present
Island Grove 4327	292700	820600	NOAA	1955-80
Micanopy Tower	292920	821513	FDOF	1981 to present
Paynes Prairie Ranger Sta.	293110	821743	FDEP	1980 to present
Paynes Prairie Wauberg	293250	821752	FDEP	1981 to present
Paynes Prairie U.S. 441	293334	821953	FDEP	1988 to present
Paynes Prairie West	293342	822319	FDEP	1980 to present
Paynes Prairie Bridge	293526	821839	FDEP	1988 to present
Hawthorne Tower	293605	820425	FDOF	1981 to present
Paynes Prairie Dist. Office	293626	821807	FDEP	1980 to present
Gainesville 3326	294100	821600	NOAA	1960-69 1984 to present
Gainesville 3321/3322	293800/294100	822200/823000	NOAA	1953 to present
Levys Prairie	293824	820042	SJRWMD	1984 to present
Gainesville 3316	293900	822100	NOAA	1903-63
Gainesville	294026	821819	FDOF	1981 to present
Swan Lake	294313	820018	SJRWMD	1988 to present
Silver Lake	294758	820332	SJRWMD	1988 to present
Keystone Heights	295026	820114	FDOF	1981 to present
Santa Fe Tower	295050	820945	FDOF	1981 to present
La Crosse Tower	295120	822445	FDOF	1981 to present

NOAA = National Oceanic and Atmospheric Administration
FDOF = Florida Department of Forestry
FDEP = Florida Department of Environmental Protection (formerly Florida Department of Natural Resources)
SJRWMD = St. Johns River Water Management District

Note: All stations except several NOAA stations collect only rainfall data. NOAA stations 3326 and 3316 collect rainfall and temperature data. NOAA station 3322 collects rainfall, temperature, pan evaporation, and soil temperature data. (Station 3322 replaced station 3321 in January 1989.)

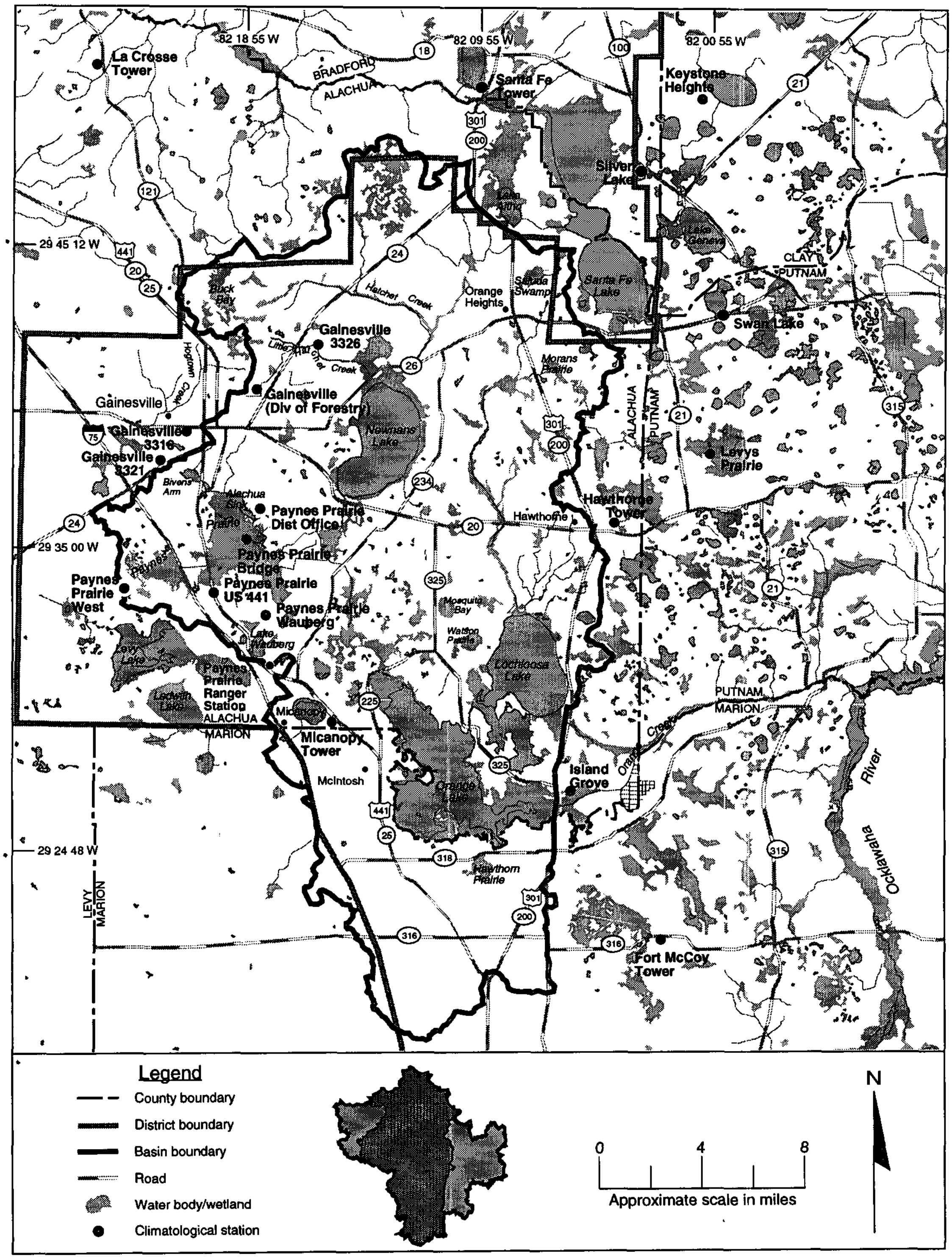

Figure 12. Climatological stations in the Upper Orange Creek Basin

Streamflow Stations

The primary discharge stations in UOCB are operated by USGS (Table 6 and Figure 13). Daily discharge is determined using stage-discharge relationships and continuous stage data. Peak discharges are determined with crest stage recorders. The information collected at these stations is available from the USGS Automated Data Processing System or from the USGS Water-Data Reports (USGS 1978–92).

Table 6. Stream flow stations in the Upper Orange Creek Basin

Gage Name	Latitude	Longitude	Source	Record Length
Prairie Creek	293641	821456	USGS 02240902	1947–48* 1956* 1965–67* Aug 1978 to present
Camps Canal	293433	821500	USGS 02241000	Mar 1948–Nov 1952* Aug 1957–Sep 1960† Mar 1978 to present
Orange Lake outlet	292630	820633	USGS 02242451	1941* 1957† 1960† Jan 1947–Sep 1955 Apr 1982 to present
Lochloosa Slough	292917	820607	USGS 02242500	Jan 1947–Sep 1955 Apr 1982 to present
Sweetwater Branch Tributary	293900	821914	USGS 02240984	1972–86**
Sweetwater Branch	293717	821925	USGS	Aug 1982–Sep 1983
Alachua Sink	293611	821810	USGS	Aug 1982–Sep 1983*
Lochloosa Creek	293600	820842	USGS 02241900	1958–82**

*Miscellaneous measurements taken
†Discharge only
**Crest stage recorder

Note: USGS = U.S. Geological Survey

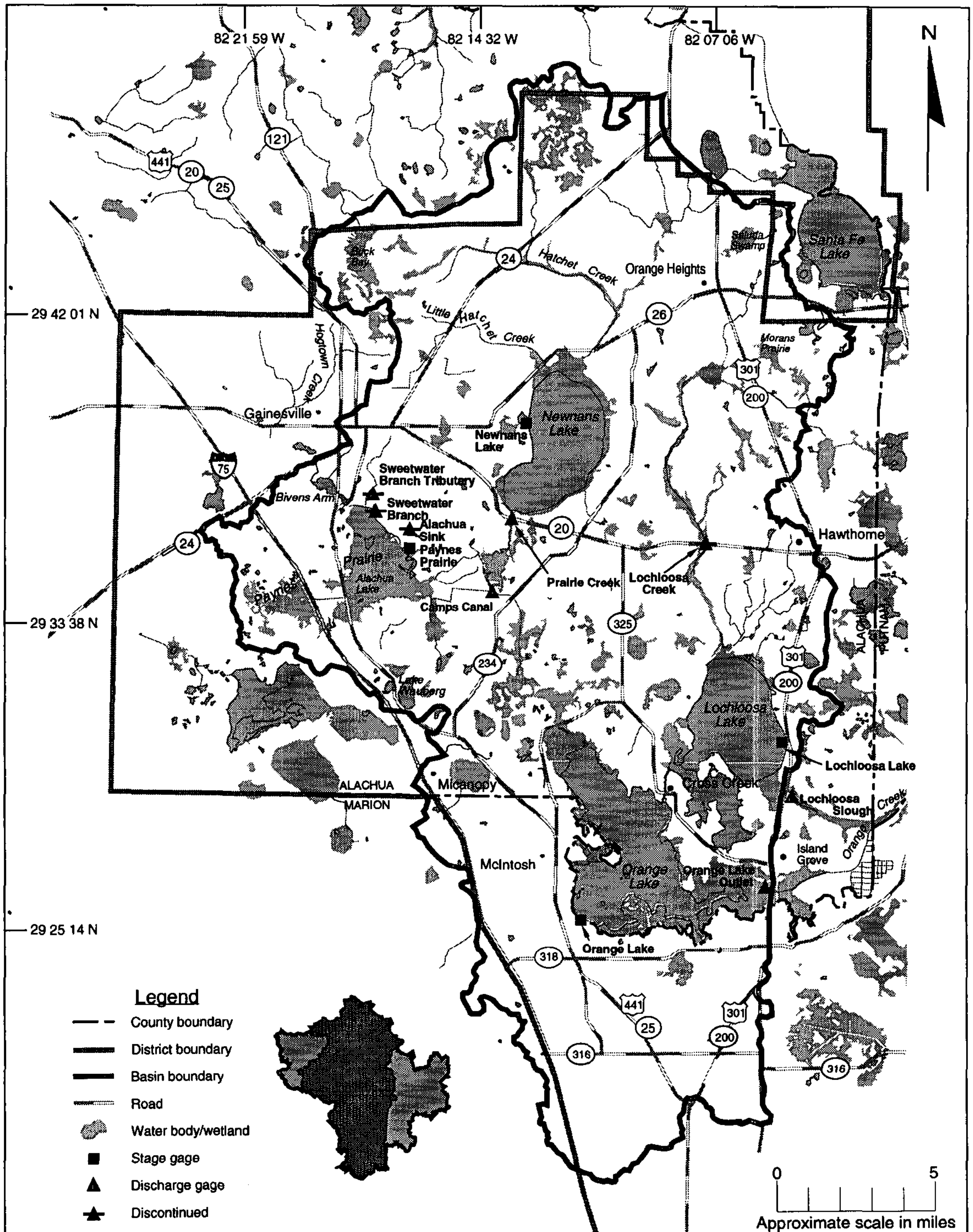

Figure 13. Location of stage and discharge gages in the Upper Orange Creek Basin

Prairie Creek discharge is measured just downstream of the Prairie Creek dam at State Road 20 (Figures 11 and 13). The discharge through Prairie Creek has been measured continuously from 1978 through the present (Figure 14 and Table 6). Miscellaneous measurements were taken in 1947–48, 1956, and 1965–67.

Camps Canal discharge is measured at County Road 234, which is approximately 3 mi downstream of the Prairie Creek discharge gage (Figure 13). The discharge has been measured from 1957 through 1960 and 1978 through the present (Figure 15 and Table 6). Miscellaneous discharge measurements were taken in 1948–52.

A comparison of Camps Canal and Prairie Creek discharge hydrographs for concurrent periods reveals close similarity (Figure 16). This similarity is expected because the two stations are not far apart and the channel between the two stations is fairly uniform. A reduction in discharge from Prairie Creek to Camps Canal may be attributed to flow into Paynes Prairie and the storage provided by some open wetlands along the creek. An increase in discharge from Prairie Creek to Camps Canal may be attributed to runoff from the area within the Orange Lake subbasin, which is between the two gage sites.

Discharge from Orange Lake is measured at U.S. 301 (Figure 13). The discharge is recorded from 1947 through 1955 and 1982 through the present (Figure 17 and Table 6). Miscellaneous measurements were taken in 1941, 1957, and 1960.

The Lochloosa Slough discharge is measured at U.S. 301 (Figure 13). Discharge has been recorded over two different periods, 1947 through 1955 and 1982 through the present (Figure 18 and Table 6).

Sweetwater Branch Tributary had a crest-stage partial-record station from 1972 to 1986. Peak discharges are summarized in Table 7. Sweetwater Branch also was gaged from August 1982 to September 1983 for the purpose of determining the effect of

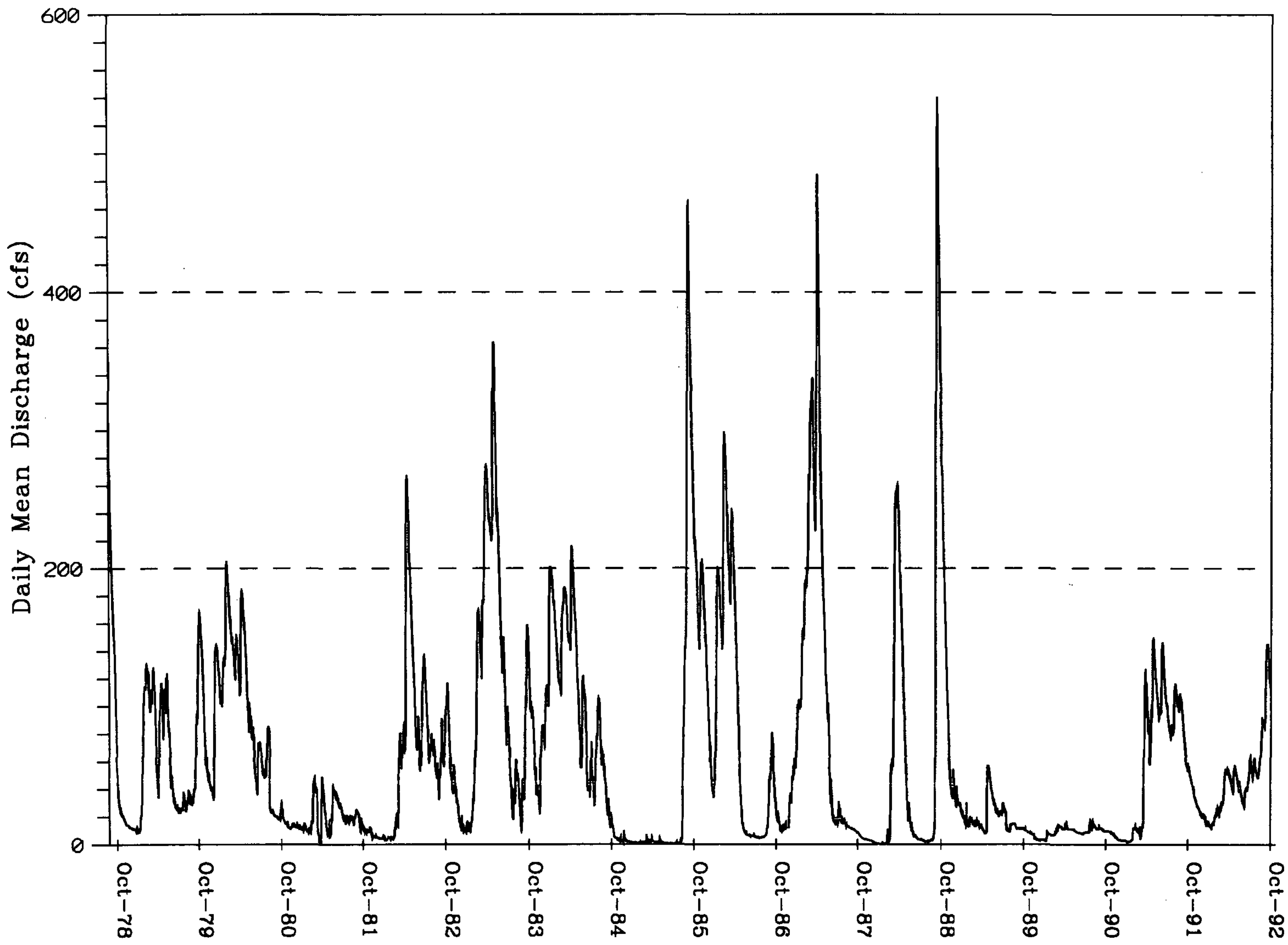

Figure 14. Discharge hydrograph for Prairie Creek at State Road 20 (U.S. Geological Survey

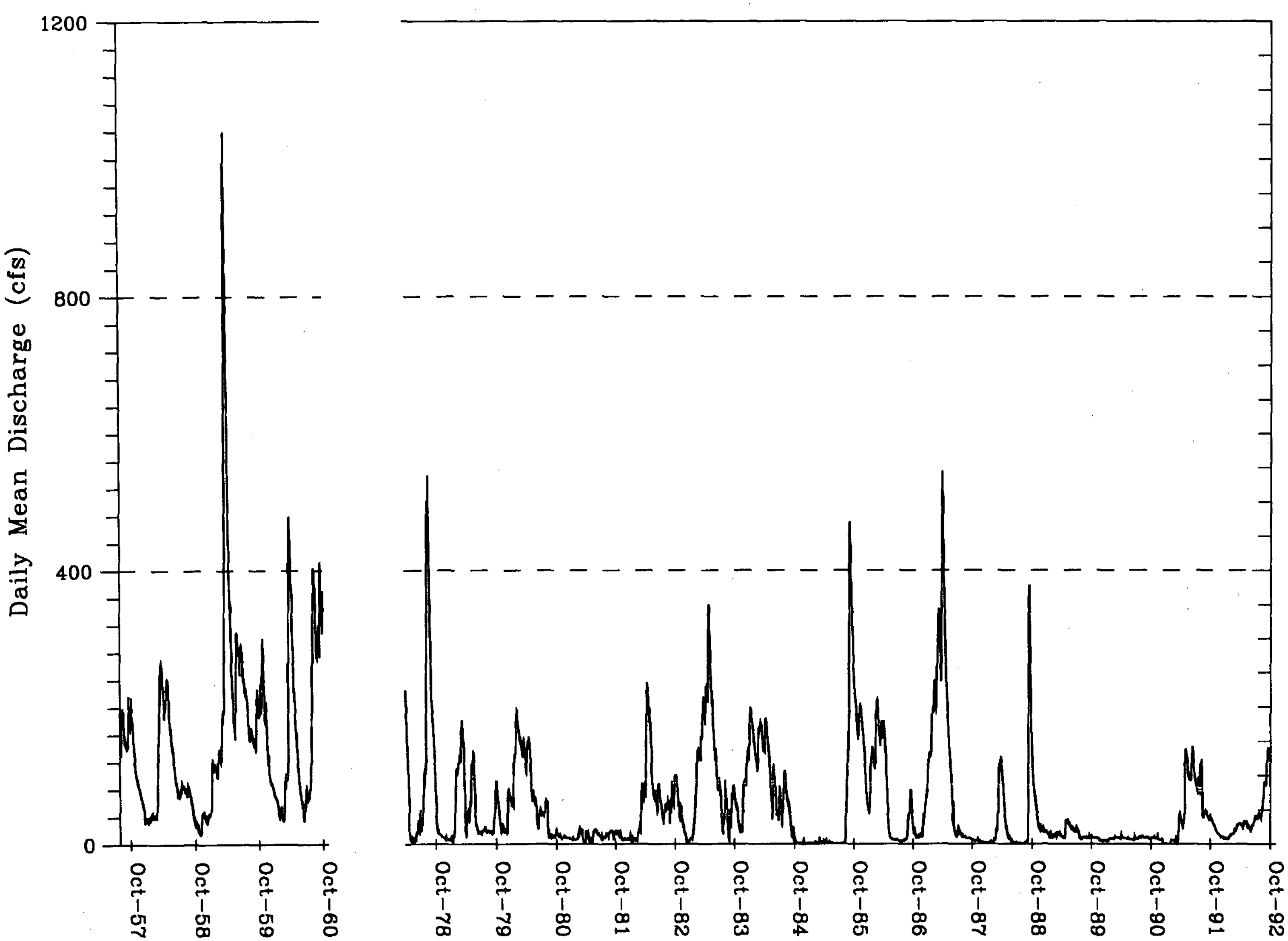

Figure 15. Discharge hydrograph for Camps Canal at County Road 234 (U.S. Geological Survey

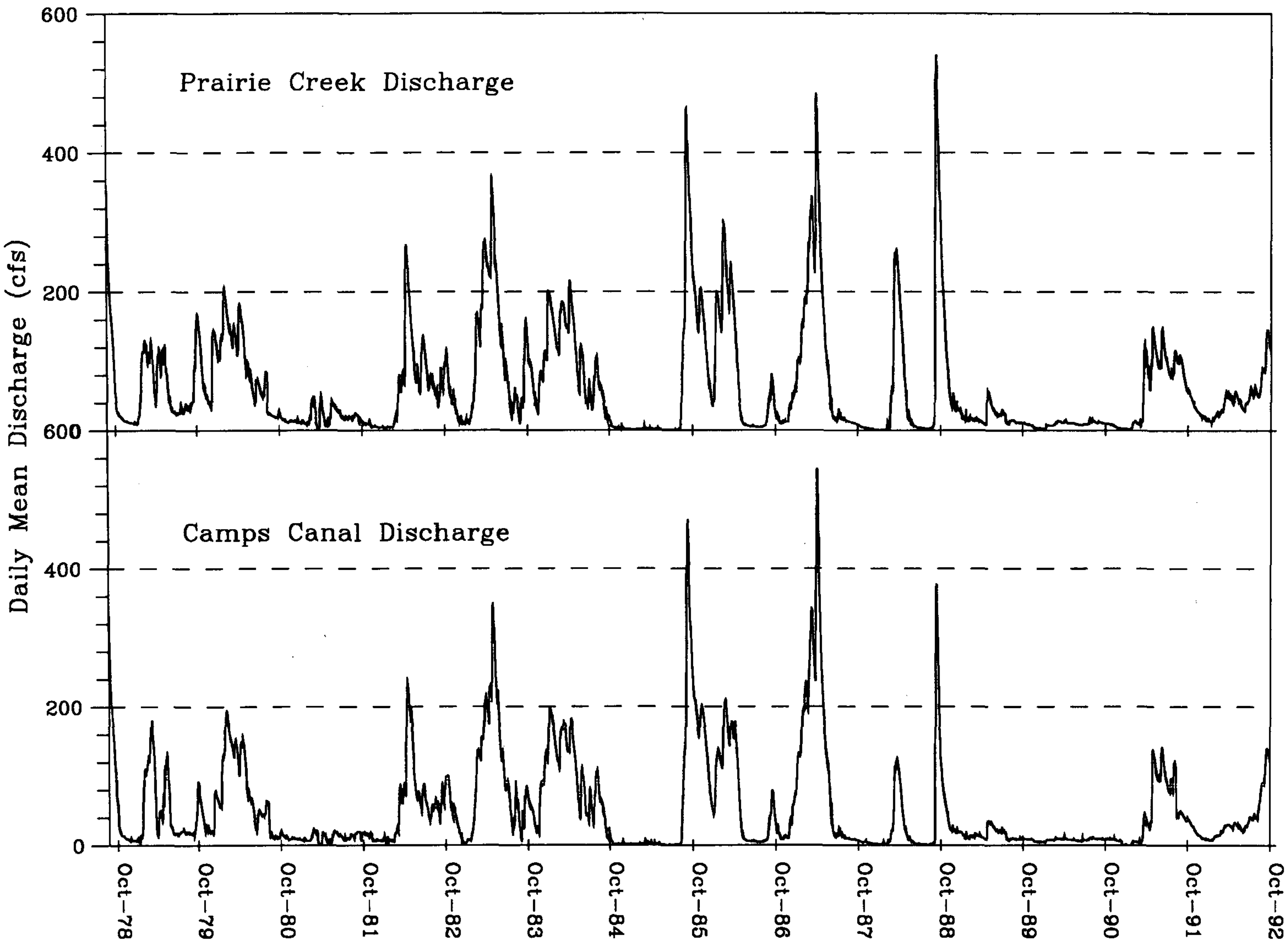

Figure 16. Discharge differences between Camps Canal and Prairie Creek

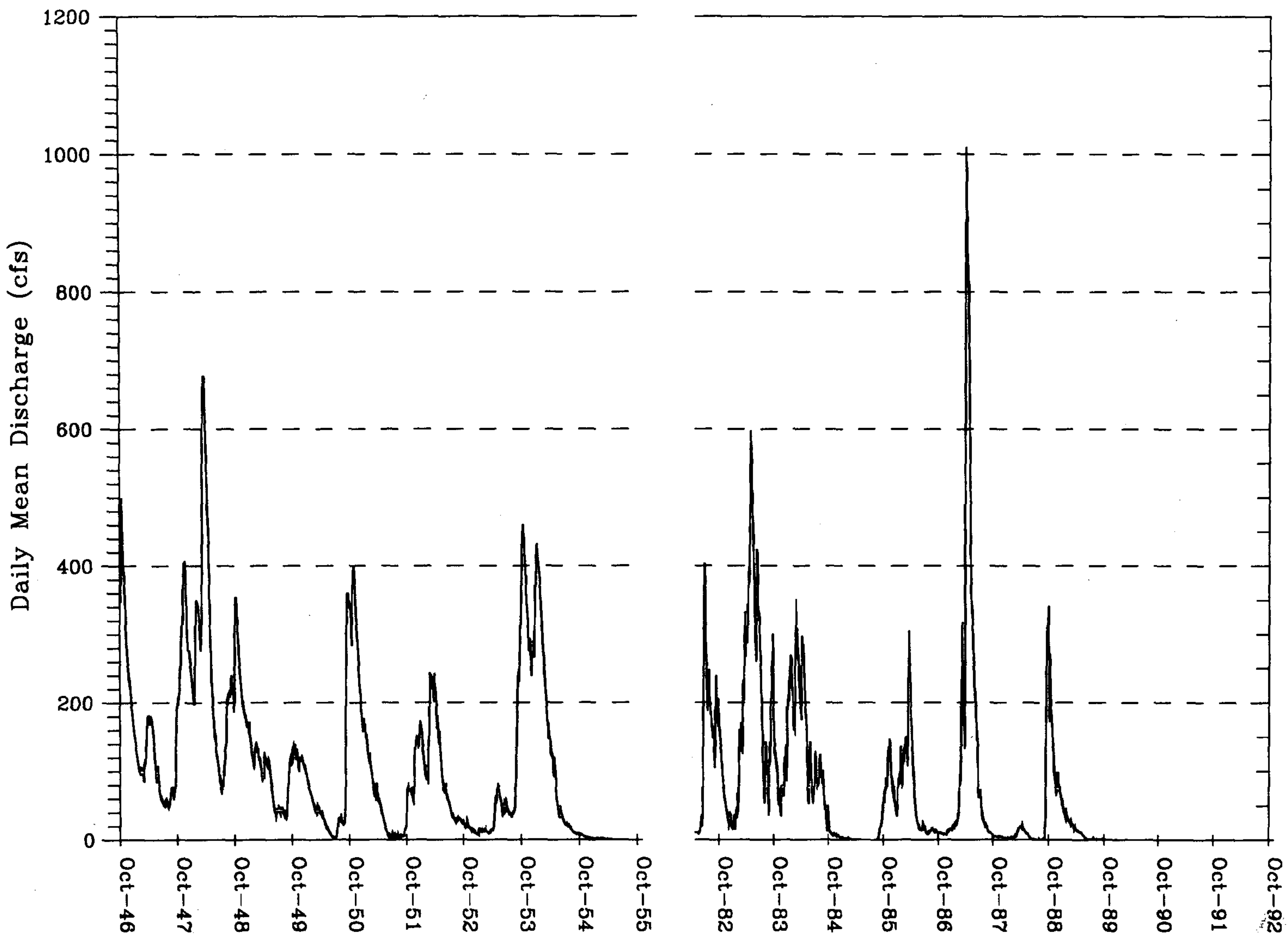

Figure 17. Discharge hydrograph for Orange Lake outlet at U.S. 301 (U.S. Geological Survey

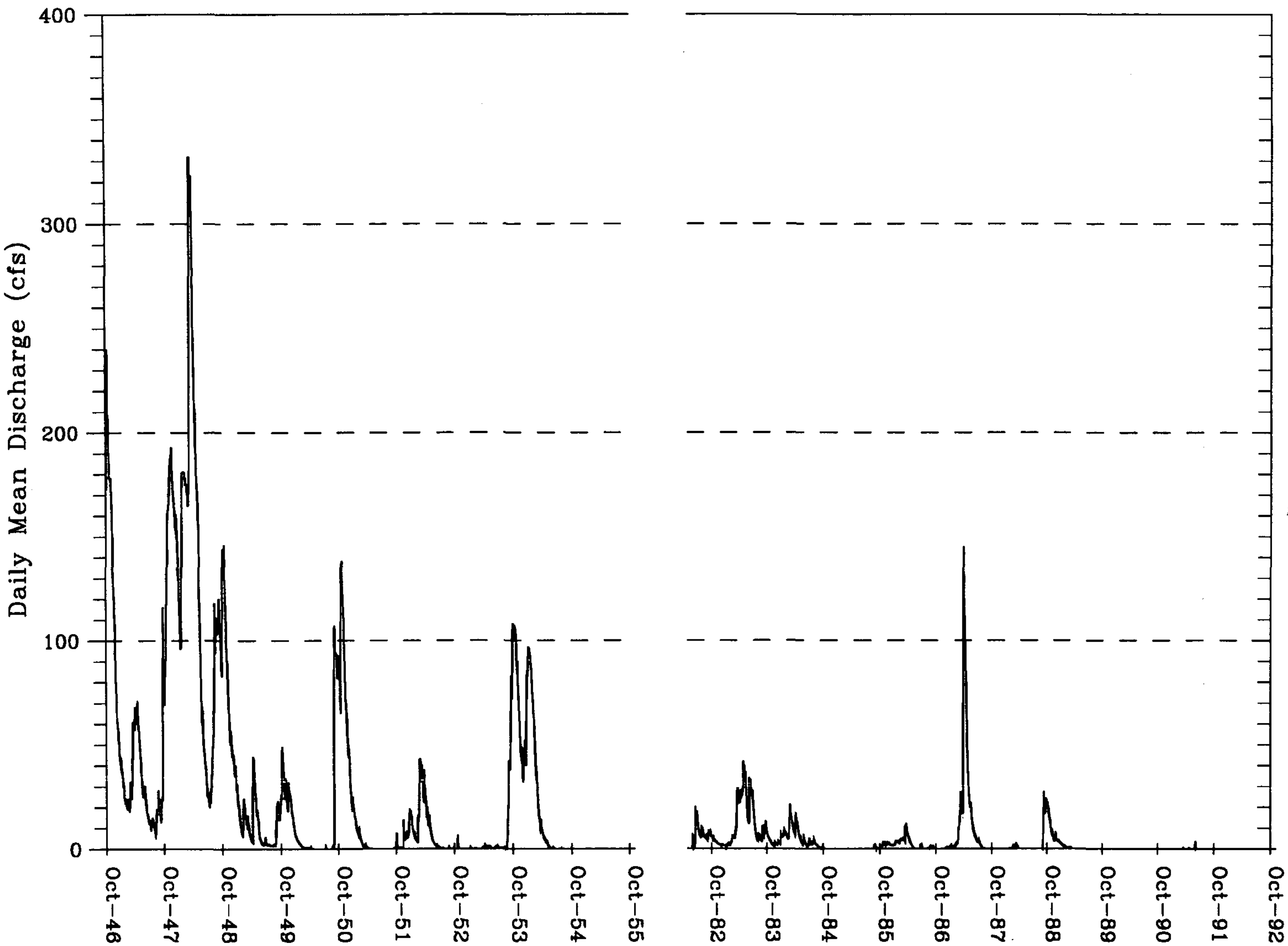

Figure 18. Discharge hydrograph for Lochloosa Slough at U.S. 301 (U.S. Geological Survey

Table 7. Peak discharges for Sweetwater Branch Tributary (U.S. Geological Survey 02240984)

Year	Date	Peak Discharge (cfs)	Gage Height (ft NGVD)
1972	06/25/72	440	8.36
1973	04/04/73	476	8.75
1974	05/12/74	384	7.74
1975	09/02/75	449	8.46
1976	06/22/76	581	10.04
1977	06/21/77	262	6.81
1978	06/07/78	374	7.64
1979	08/09/79	411	8.03
1980	09/29/80	495	8.97
1981	06/20/81	473	8.77
1982	06/19/82	505	9.09
1983	04/23/83	455	8.52
1984	04/15/84	471	8.70
1985	04/14/85	596	10.22
1986	07/05/86	577	9.99

Note: cfs = cubic feet per second
ft NGVD = feet, National Geodetic Vertical Datum

surface water runoff and treated wastewater recharge into the Floridan aquifer system (Phelps 1987).

Lochloosa Creek has a USGS crest-stage partial-record station at State Road 20 that recorded peak discharges from 1958 to 1982. Peak discharge data are summarized in Table 8.

Table 8. Peak discharges for Lochloosa Creek (U.S. Geological Survey 02241900)

Year	Date	Peak Discharge (cfs)	Gage Height (ft NGVD)
1958	03/03/58	187	5.68
1959	03/17/59	791	7.69
1960	03/18/60	920	7.90
1961	10/08/60	334	6.51
1962	09/08/62	319	6.44
1963	03/01/63	155	5.43
1964	09/12/64	1520	9.45
1965	07/14/65	547	7.11
1966	03/03/66	553	7.13
1967	09/04/67	1040	8.49
1968	09/02/68	351	6.35
1969	02/16/69	176	5.24
1970	02/04/70	1260	8.97
1971	08/17/71	157	5.68
1972	06/26/72	564	7.17
1973	04/04/73	814	7.94
1974	09/06/74	251	5.85
1975	00/00/75	150	5.25
1976	00/00/76	150	5.25
1977	00/00/77	150	5.25
1978	08/18/78	1530	9.47
1979	09/16/79	383	6.49
1980	12/07/79	345	6.32
1981	00/00/81	150	5.25
1982	04/11/82	351	6.87

Note: cfs = cubic feet per second
ft NGVD = feet, National Geodetic Vertical Datum

Lake Stage Stations

Water surface elevations are recorded at Newnans Lake; Paynes Prairie at the main structure, which gages stages in Alachua Lake and Alachua Sink; Lochloosa Lake; and Orange Lake (Table 9 and Figure 13). Orange Lake is monitored by a continuous gage recorder. Lochloosa and Newnans lakes and Paynes Prairie have staff gages, for which the manual observation intervals vary. Paynes Prairie has more frequent readings, approximately every other day. Lochloosa Lake has had irregular periods of observations in the past, but in April 1989, USGS installed a continuous gage recorder.

Table 9. Lake stage stations in the Upper Orange Creek Basin

Gage Name	Latitude	Longitude	Source	Record Length
Newnans Lake	293904	821422	USGS 02240900	Apr 1936 to present
Paynes Prairie			FDEP	
Alachua Lake	293606	821811		May 1979 to present
Alachua Sink	293622	821810		Oct 1987 to present
Lochloosa Lake	293007	820612	USGS 02242400	Jul 1942 to present
Orange Lake	292537	821226	USGS 02242450	May 1933 to present

Note: USGS = U.S. Geological Survey
FDEP = Florida Department of Environmental Protection, formerly the Florida Department of Natural Resources

Newnans Lake. The stage of Newnans Lake has been measured weekly from 1945 to present, with two significant missing periods (1952–57, 1962–64) (Figure 19). There are also monthly records from 1936 to 1945. The minimum and maximum recorded stages are 63.87 feet, National Geodetic Vertical Datum (ft NGVD) recorded on 19 March 1962 and 71.21 ft NGVD recorded on 12 March 1948. The stage may have dropped below this range

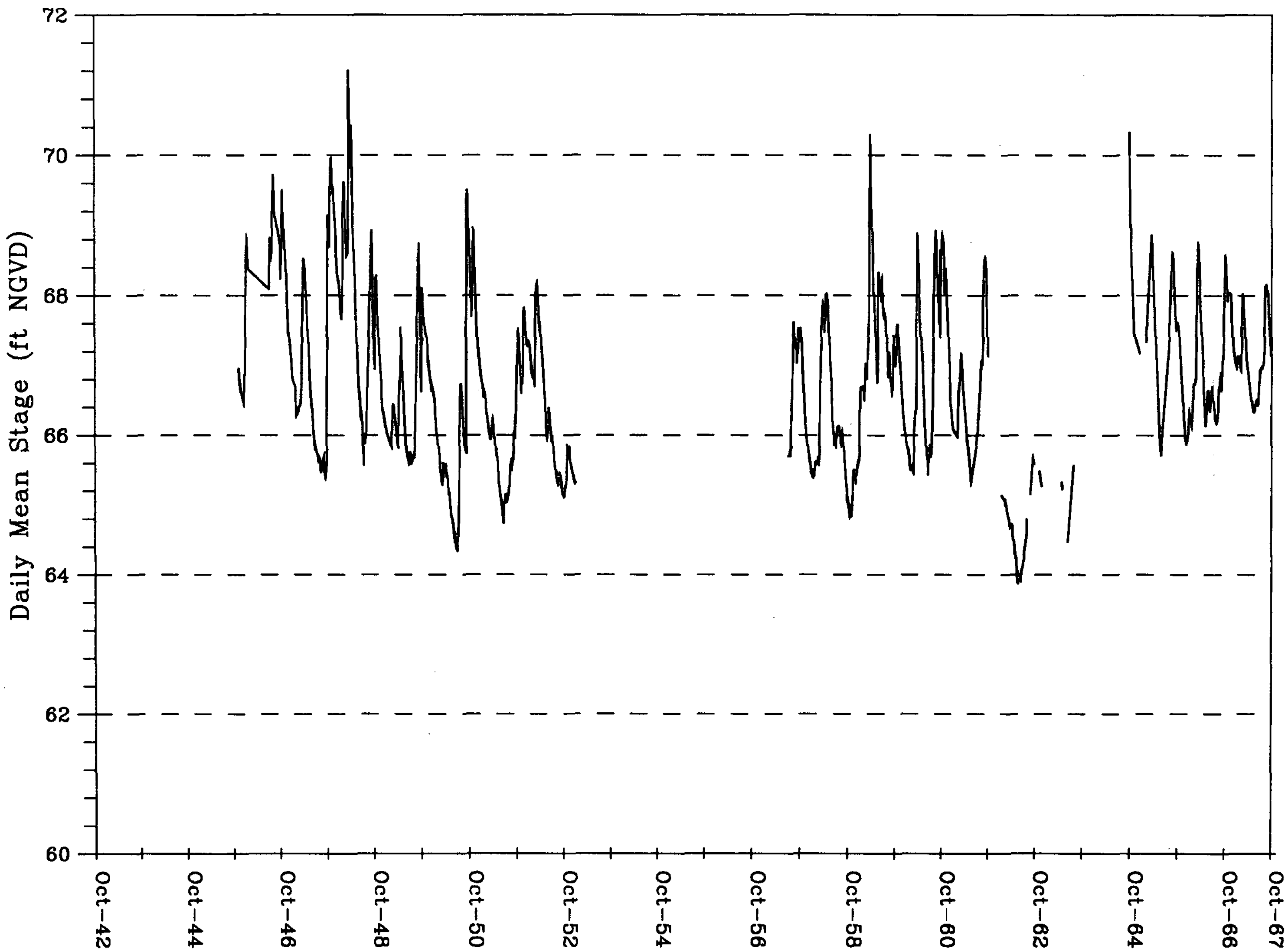

Figure 19. Stage hydrograph for Newnans Lake (U.S. Geological Survey 02240900)

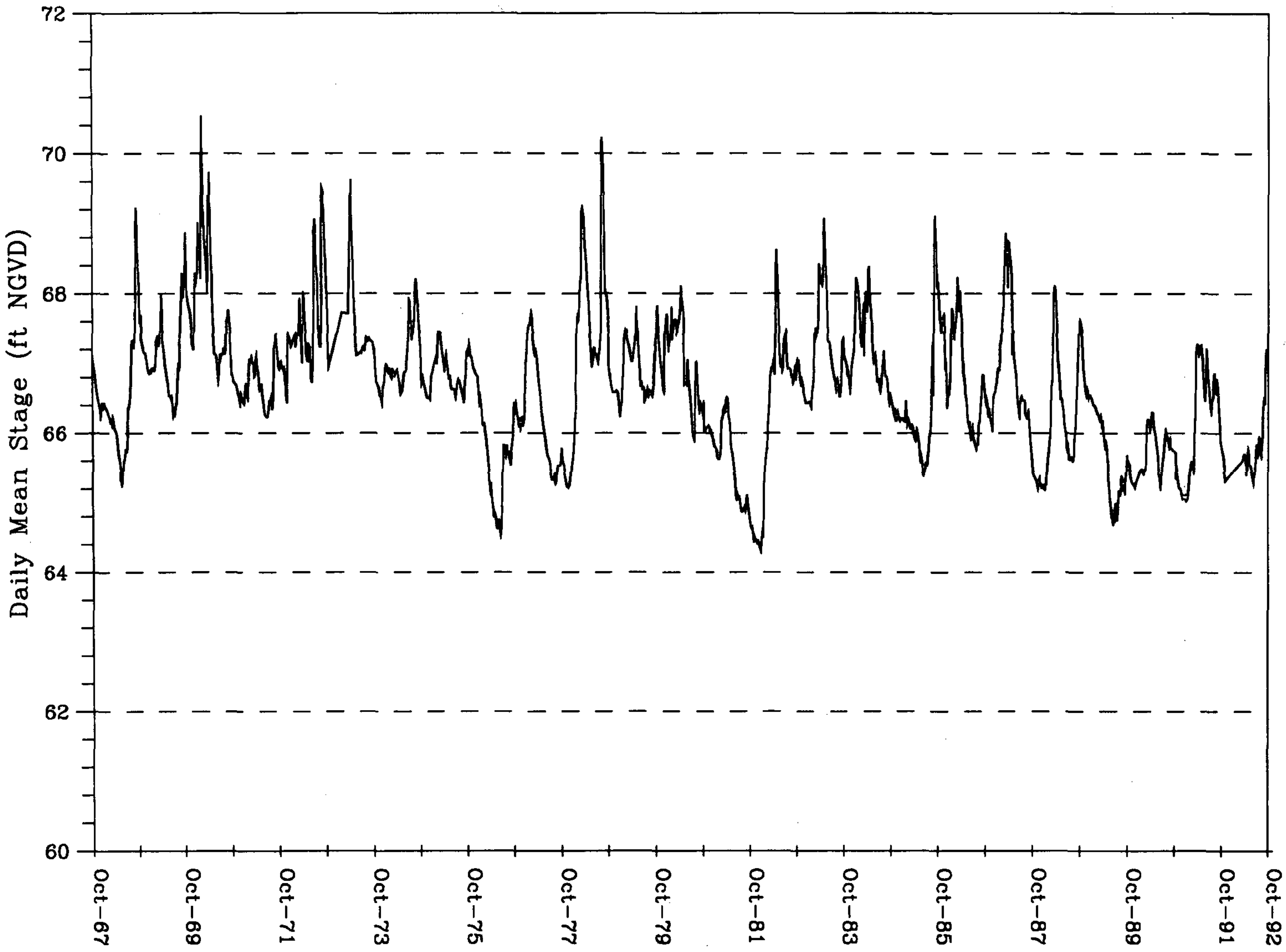

Figure 19—*Continued*

during the missing period 1952–57. During this time, a severe drought reduced the lake levels in all the lakes in the Orange Creek Basin. During the missing period 1962–64, the stage may have reached an estimated high of 70.30 ft, according to FGFWFC records.

Paynes Prairie. Park rangers have recorded the stage data for Alachua Lake from 1974 to present and Alachua Sink from 1987 to present (Figure 20). The elevation for Alachua Lake never drops below 50 ft, which is approximately the low ground elevation of the prairie. Once the water surface of Alachua Lake drops below 52 ft, flow does not continue to the sink because 52 ft is the invert elevation of the main structure culvert. Alachua Sink reaches much lower water elevations than Alachua Lake.

Lochloosa Lake. The stage of Lochloosa Lake has been measured weekly from 1942 to present (Figure 21), with two significant missing periods (1952–56 and 1963–66). These periods correspond closely to the missing periods from Newnans Lake. There are also two stage measurements taken in April and May 1936. The maximum and minimum recorded stages are 61.94 ft NGVD (16 March 1948) and 53.88 ft NGVD (18 August 1956). Although Lochloosa's extreme low may have occurred during the 1952–56 missing period, the recorded low of 53.90 ft NGVD occurred on 18 August 1956, seven days after the extreme low stage recorded for Orange Lake.

Orange Lake. The stage of Orange Lake has been measured daily from 1942 to present (Figure 22). There are no significant missing periods. There are also monthly records from 1933 to 1942. The maximum and minimum recorded stages are 61.95 ft NGVD (19 March 1948) and 50.38 ft NGVD (11 August 1956).

Under normal conditions, the difference in water levels between Orange and Lochloosa lakes is small (Figure 23). The periods of April 1956 to November 1957, November 1977 to January 1978, and October 1989 to October 1991 are exceptions. In the first period, the difference was as much as 4.9 ft, measured

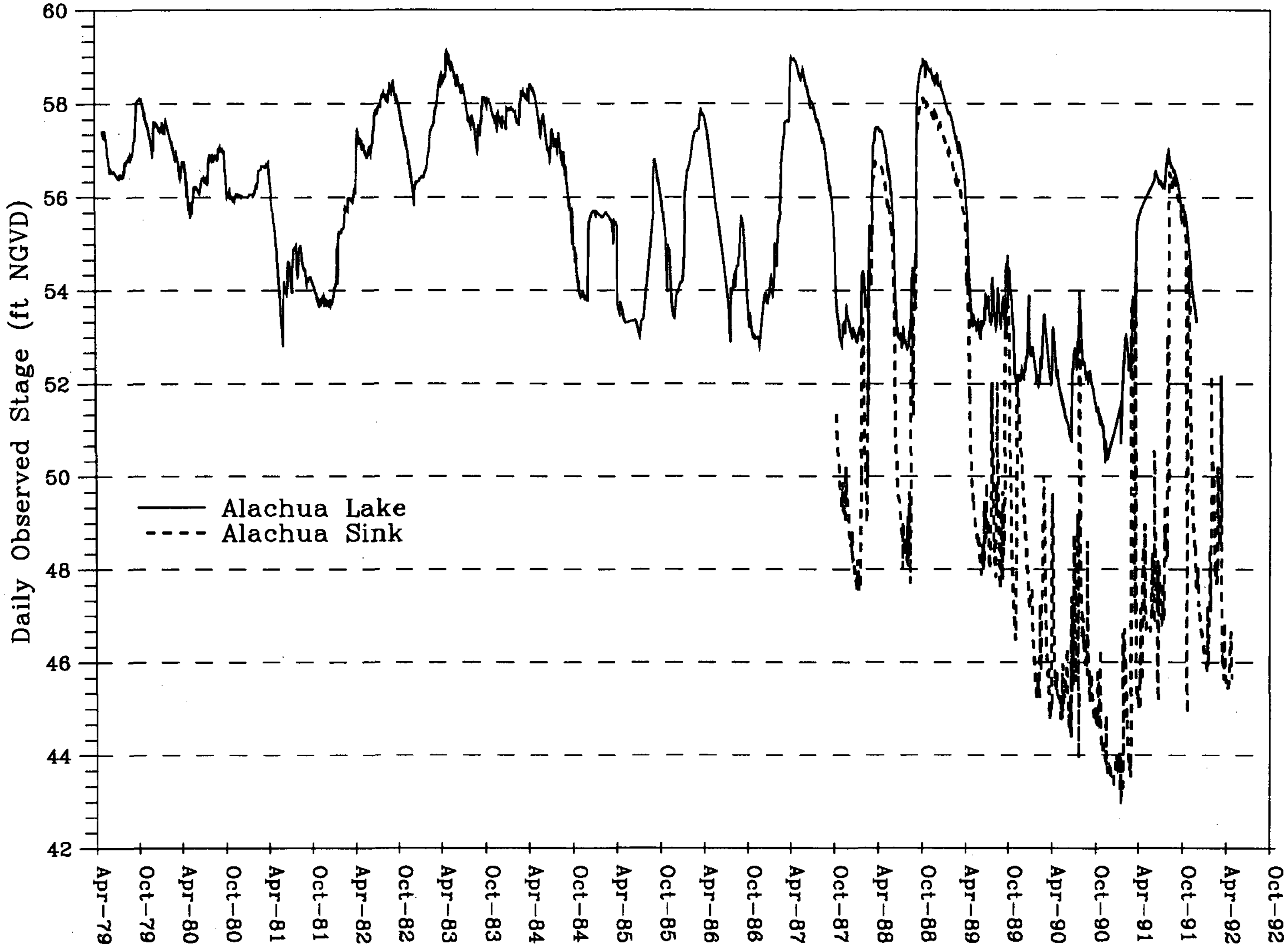

Figure 20. Stage hydrographs for Alachua Lake and Alachua Sink

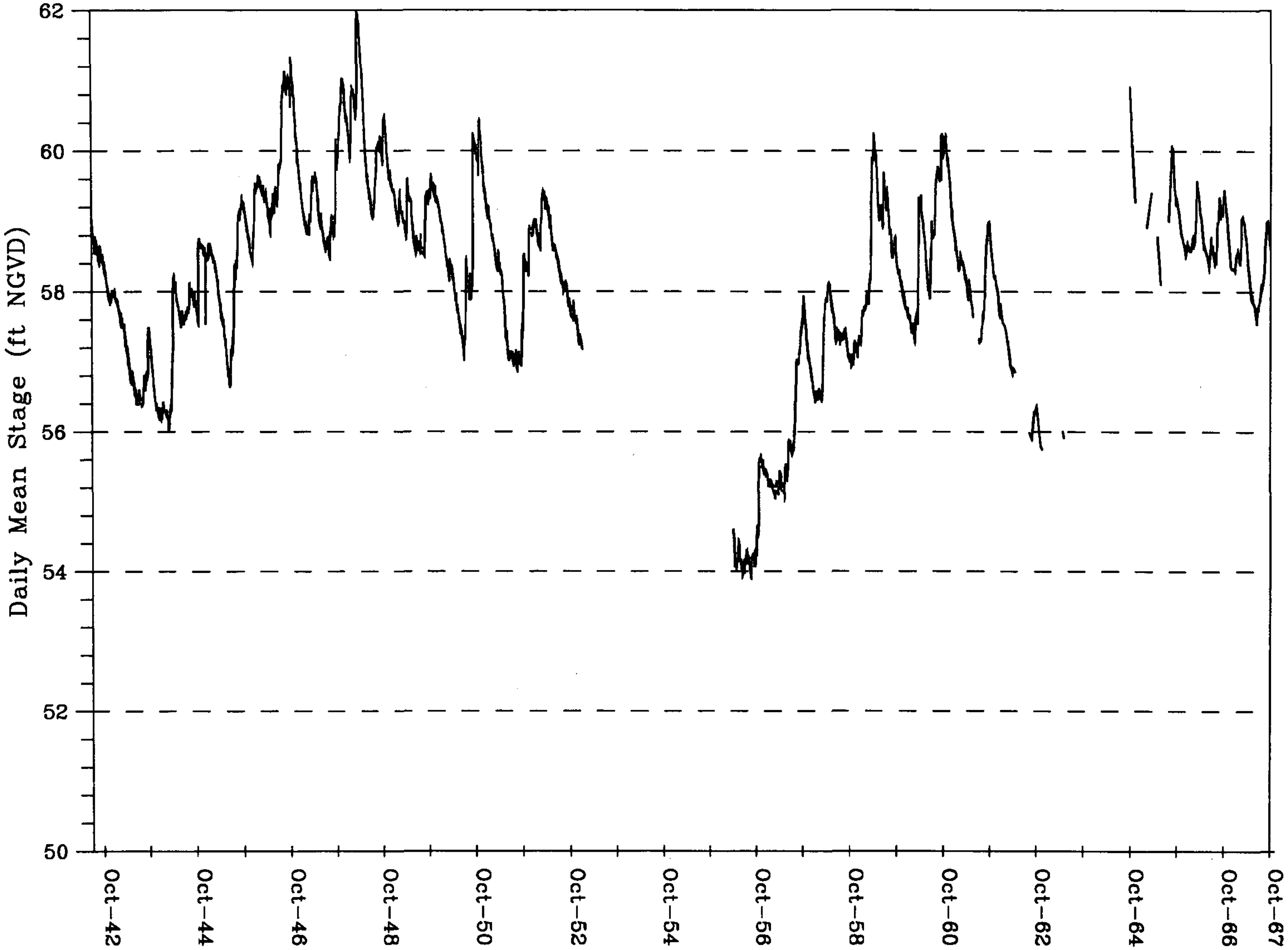

Figure 21. Stage hydrograph for Lochloosa Lake (U.S. Geological Survey 2242400)

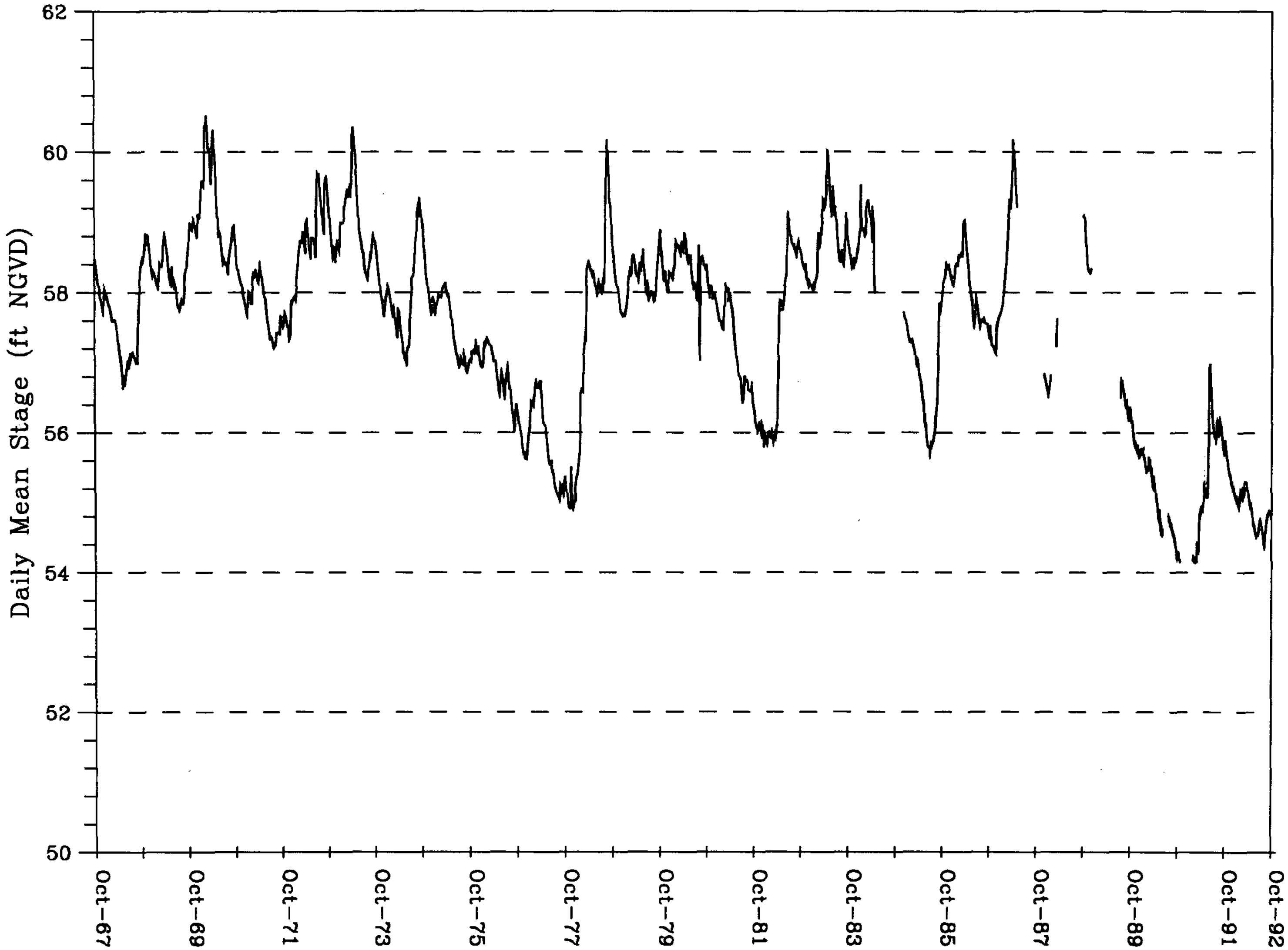

Figure 21—*Continued*

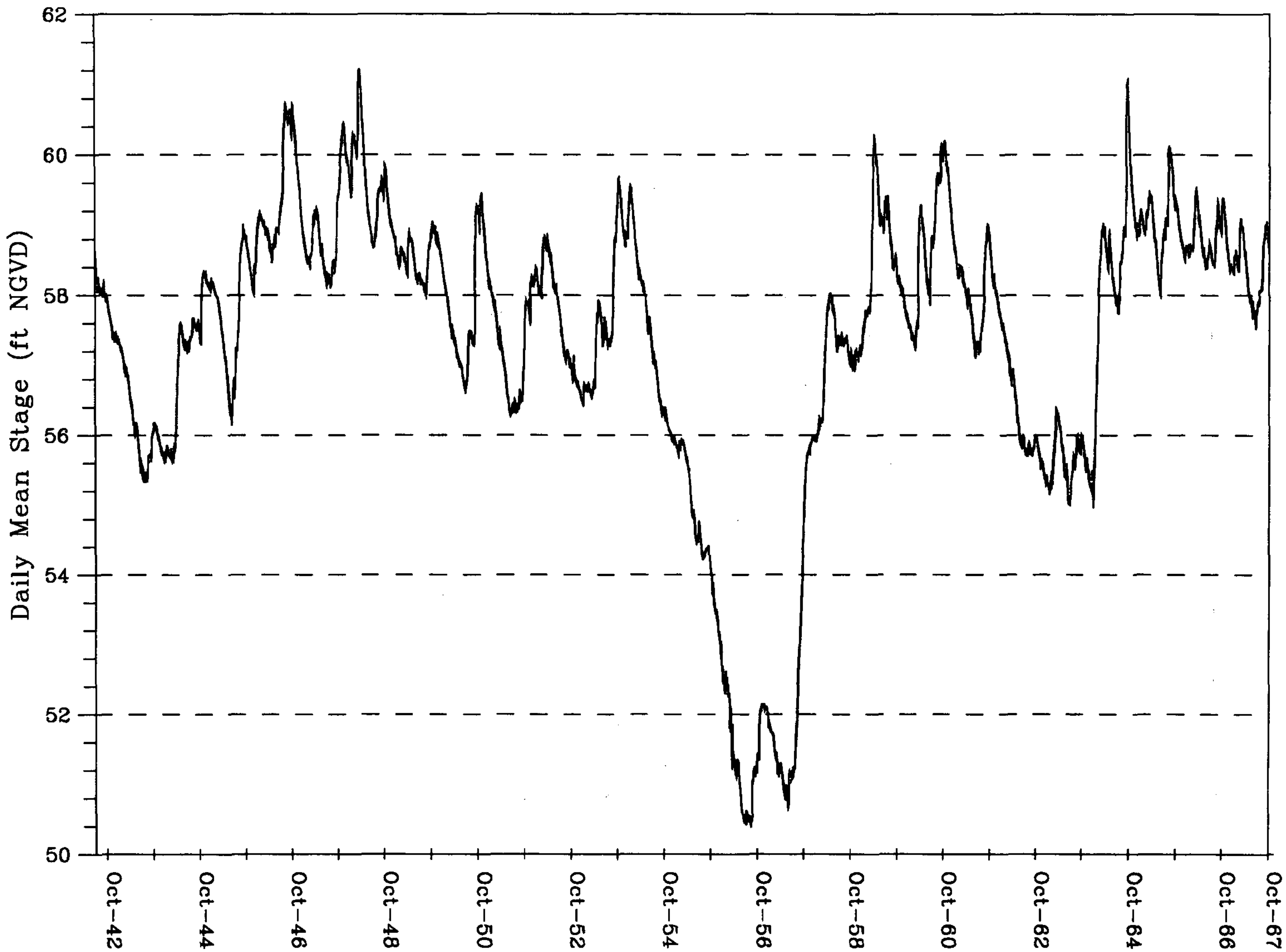

Figure 22. Stage hydrograph for Orange Lake (U.S. Geological Survey 02242450)

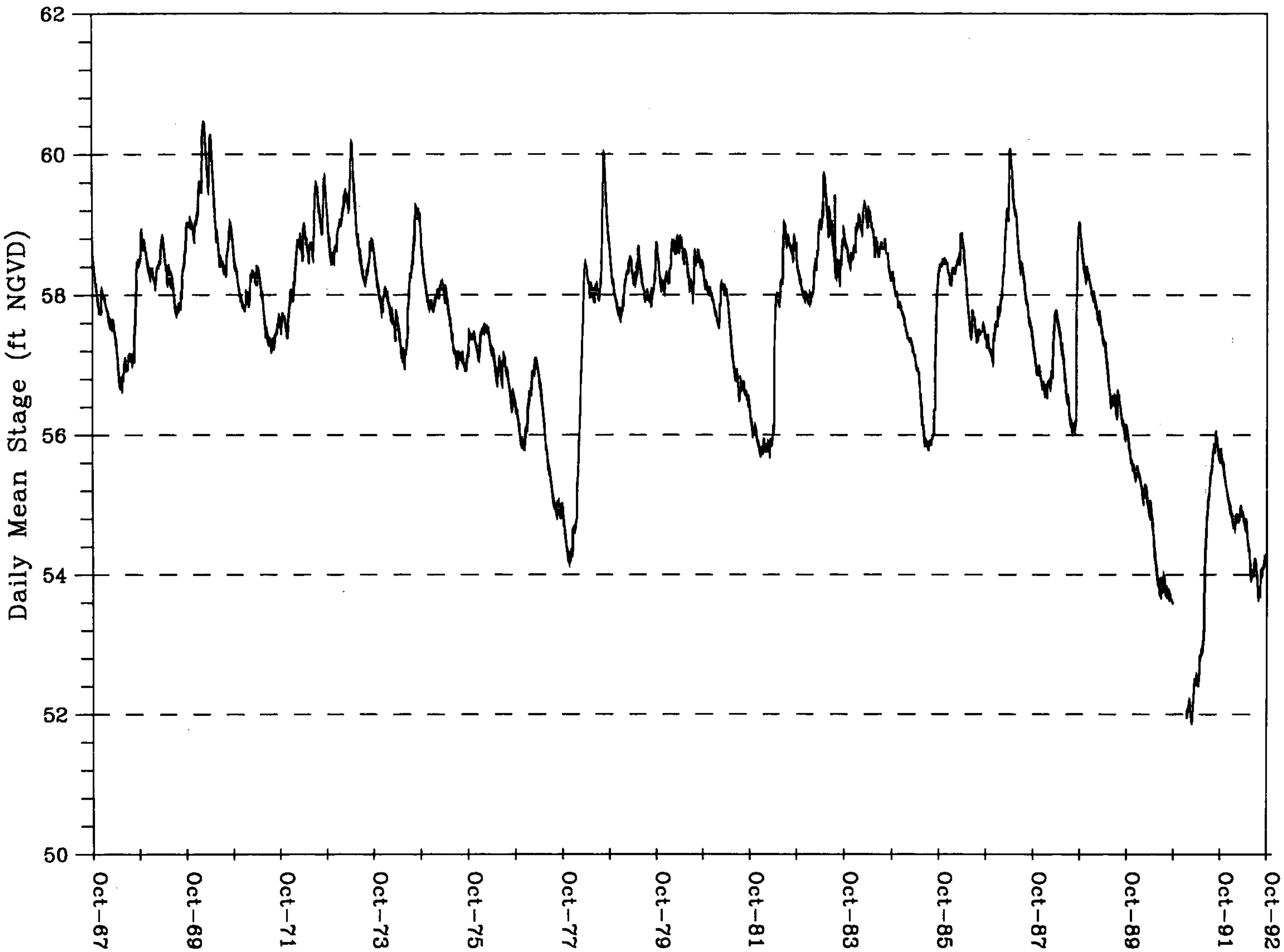

Figure 22—*Continued*

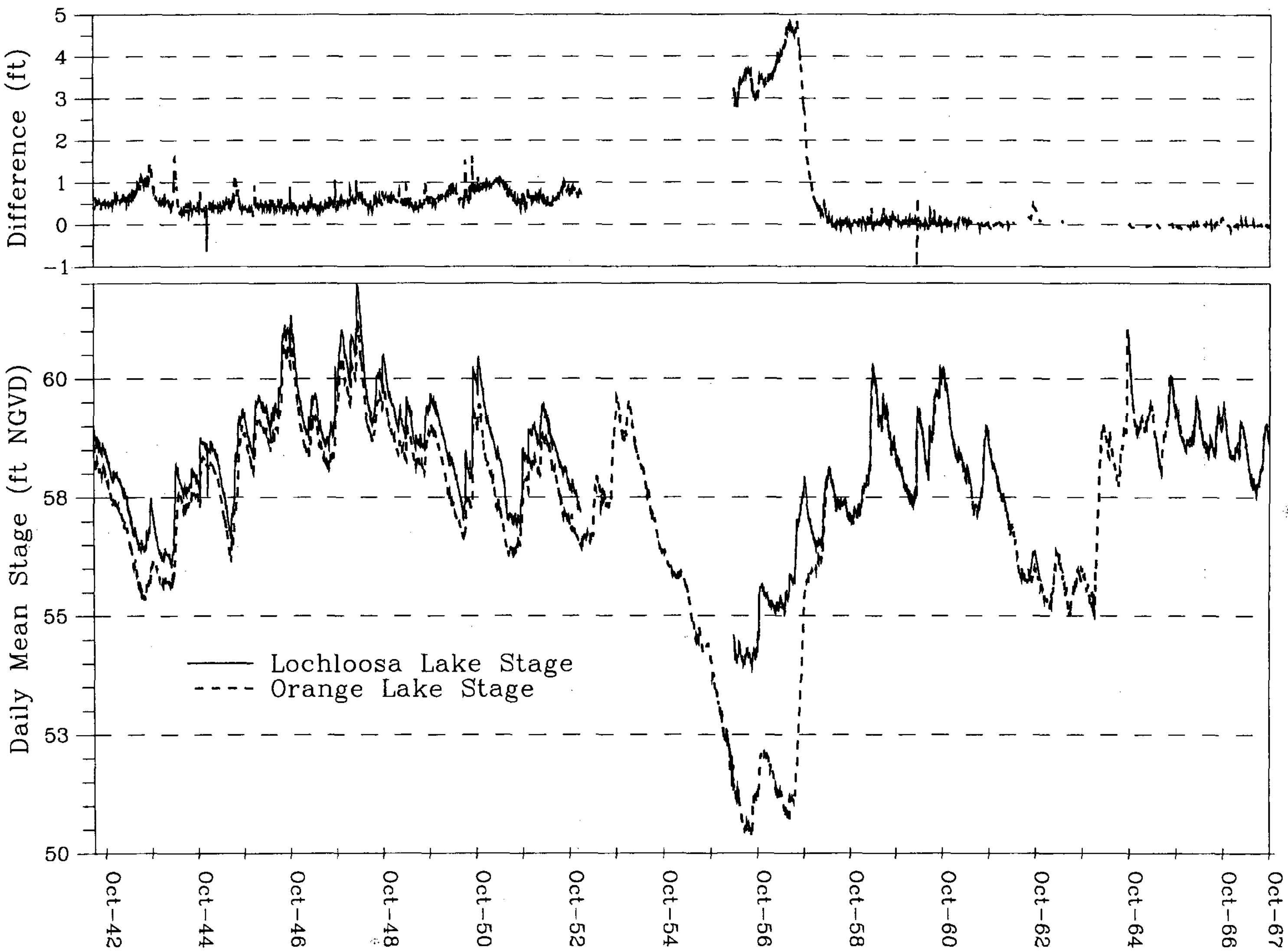

Figure 23. Stage differences between Lochloosa and Orange lakes

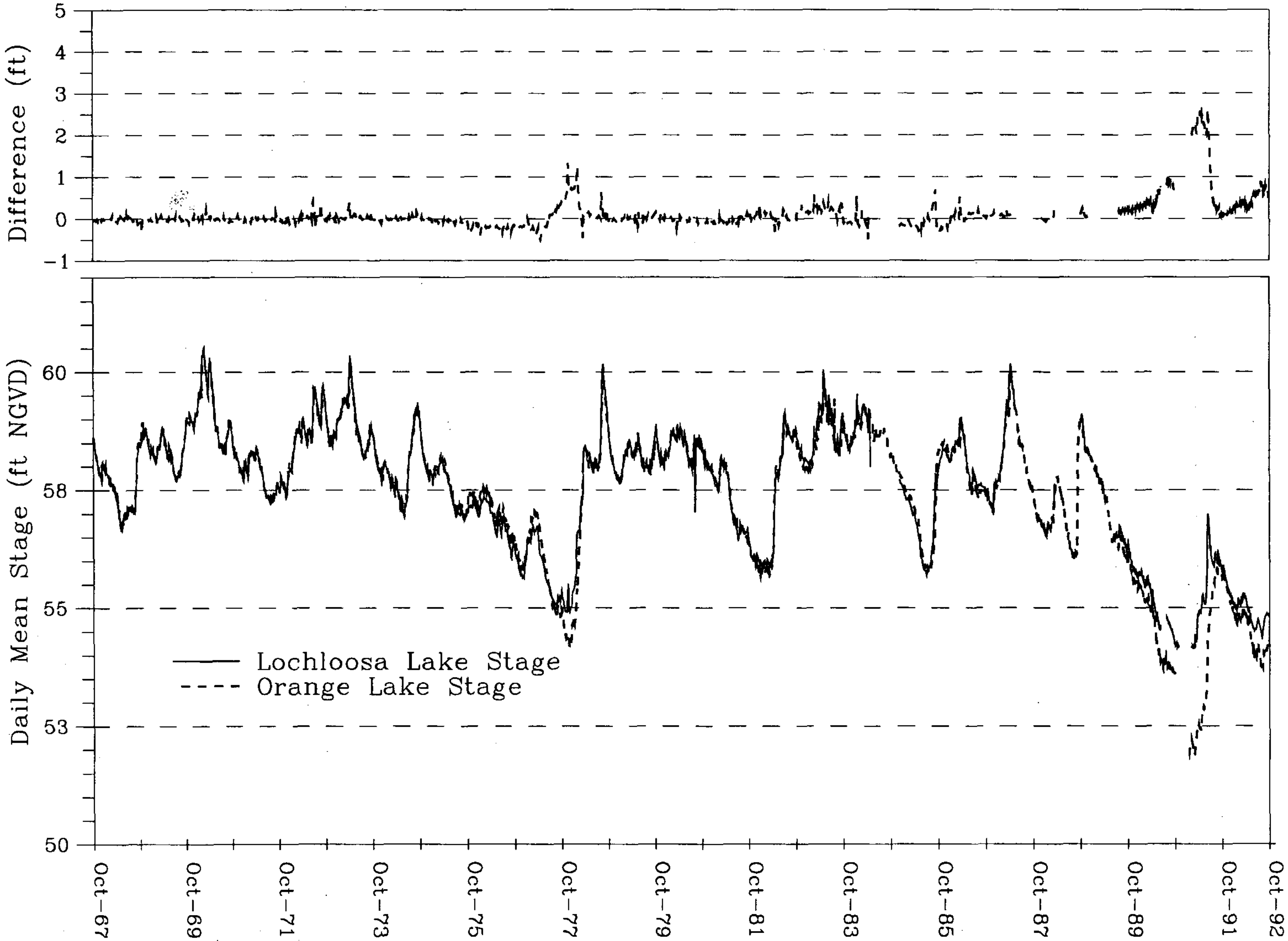

Figure 23—*Continued*

10 June 1957. In the second period, the difference reached 1.3 ft, measured 16 November 1977. The first period was the result of drought condition, which did not affect Lochloosa Lake as severely as it did Orange Lake because the invert elevation of Cross Creek (about 54 ft) controlled the outflow of water. In the third period, the differences reached 2.6 ft; again, this difference occurred when Lochloosa Lake did not drop below 54 ft, while Orange Lake continued to drop below 52 ft.

The period from October 1942 to December 1952 shows approximately a constant one-half foot difference. The density and length of vegetation in the southeast run of Orange Lake might have caused these stage differences. Cross Creek may have been dredged in the following year to improve access. The datum to which the stage was referenced before December 1952 may have been one-half foot higher than the Orange Lake gage datum. These three possible explanations are given to account for the consistent water level differences during the years from 1942 to 1952; however, no documentation is available to determine which explanation, if any, is true.

CLIMATIC DATA ANALYSES

Situated between 29°15′ and 29°50′ north latitude in the interior of north-central Florida, UOCB has a subtropical climate. Summers are long, warm, and relatively humid; winters, although marked by periodic cold spells, are typically mild because of the southern latitude and location on peninsular Florida. The average year can be divided into two seasons—a rainy summer season from June through September and a long, relatively dry season from October through May.

Climatic data analyses are used to evaluate the long-term trends and extremes of rainfall data and to present the normals, means, and extremes. Rainfall trends were discerned from annual and moving average rainfall graphs. Maximum rainfall values for return periods were estimated by frequency analysis (T = 10 year [yr], 25 yr, 100 yr for durations 24 hours [hr], 48 hr, and 96 hr).

The "normal" value for climatic variables is defined as the average of measurements taken over the previous three calendar decades (a decade being counted as 1981–90, 1971–80, etc.). For example, for the decade 1991–2000, the average of 1961–90 values would be the "normal." "Means" are the arithmetic average values for the period of record.

Rainfall

Rainfall data have been collected at Gainesville over the past 90 years from NOAA gages 3316 and 3321/3322 (Table B1, Appendix B). Analysis of rainfall in this report uses data from the Gainesville NOAA stations as reported in Rao and Clapp (1986) and Jenab et al. (1986) and 1985–92 data.

Normal and Average. The normal annual rainfall at Gainesville is 51.59 in., which is the average for 1961–90. The normal annual rainfall, which is revised every 10 years, is useful in comparing the rainfall at different stations. The current normal rainfall (51.59 in.) is less than in the previous 30-yr period (1951–80): 52.78 in. at Gainesville (Table 10) and less for several other stations.

A comparison of the Gainesville normal annual rainfall with rainfall at surrounding NOAA stations (Table 10) reveals that rainfall is 0.30 in. below the average of these stations. The 1951–80 normal rainfall is 1.78 in. greater than the annual long-term average and 1.19 in. greater than the 1961–90 normal rainfall at Gainesville. This indicates that 1951–80 years were wetter than is typical in Gainesville. This is shown by the 1-, 5-, and 10-yr moving average rainfall at Gainesville (Figure 24). Note that before 1946, the 10-yr average remained below the long-term average. After that, the 10-yr average remained above the long-term average until 1980. Although no future trend can be determined from this graph, the indication is that extended periods (40 years) of low or high rainfall are possible.

Table 10. Comparison of Gainesville rainfall (in inches) to rainfall at surrounding National Oceanic and Atmospheric Administration (NOAA) stations

Location	Years	Average Annual	1951–80 Normal Annual	1961–90 Normal Annual
Crescent City	1897–1992	52.05	53.58	51.02
Gainesville	1897–1992	51.00	52.78	51.59
High Springs	1945–1992	52.70	51.87	52.83
Lynne	1942–1984	52.54	51.66*	52.02*
Ocala	1891–1992	52.86	53.92	51.59
Palatka	1923–1984	52.59	51.50	†
Starke	1934–1984	51.44	52.20	52.27**
Average		52.17	52.50	51.89

*Calculated by St. Johns River Water Management District
†Station discontinued
**Estimated by NOAA

Monthly Extremes. The observed maximum, average, and minimum amounts of rainfall at Gainesville for 1897–1992 are presented at the bottom of Table B1 (Appendix B). The maximum recorded monthly rainfall was 16.41 in. and occurred in July 1909. The minimum recorded monthly rainfall was 0.00 in. and occurred in March 1945 and November 1978.

Seasonal. Rainfall during the four warmest months (June through September) is generally greater than rainfall during the four coldest months (December through March) (Figure 25; Table B2, Appendix B). The cold season average rainfall for Gainesville is 13.28 in., and the warm season average rainfall is 26.38 in. Rainfall received during the warm season is due primarily to convective storms as well as to occasional hurricanes, which contribute large amounts of rainfall. During the cold season, rainfall is due more to cyclonic storms associated with major weather fronts.

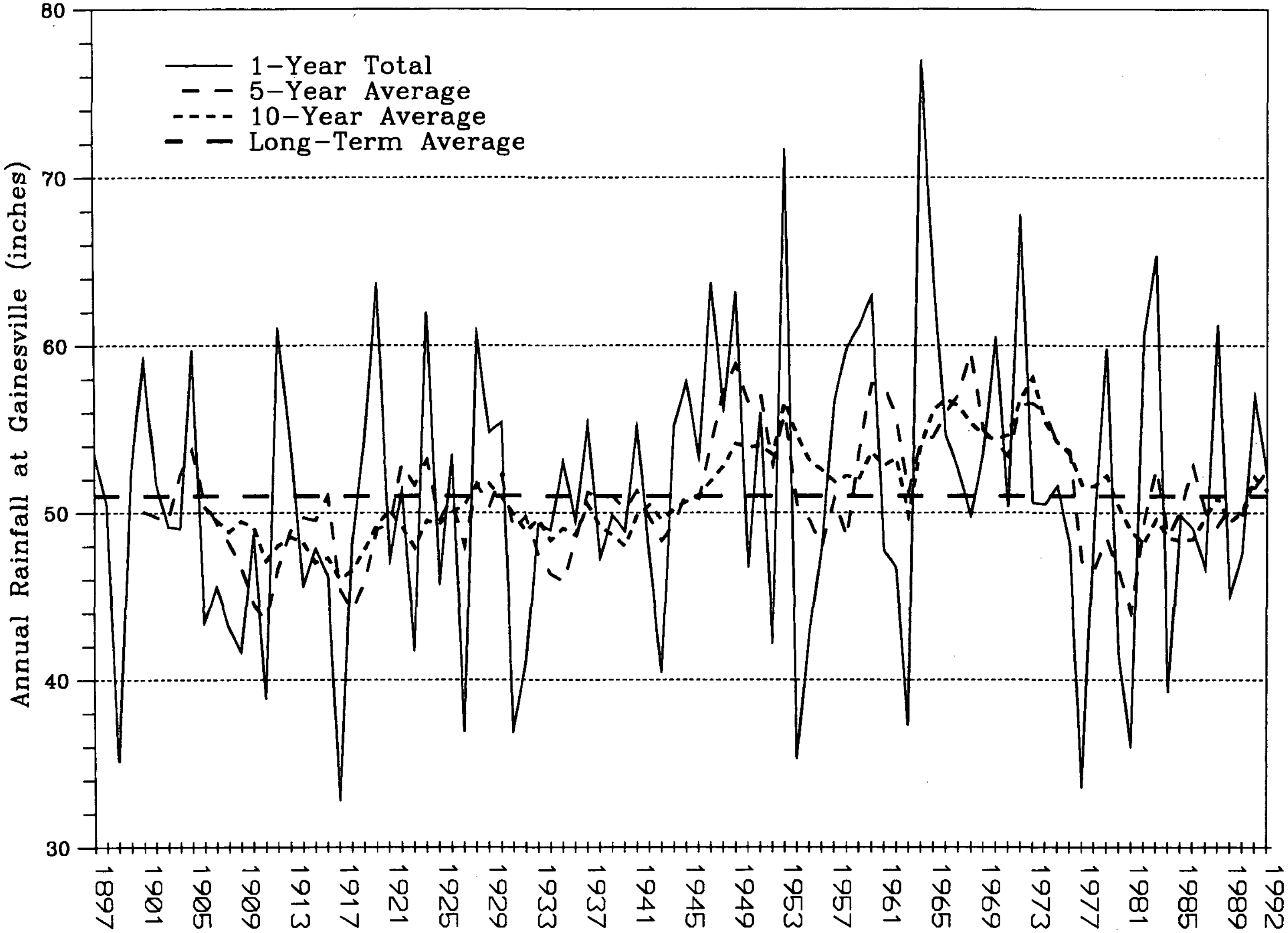

Figure 24. One-, 5-, and 10-year moving average rainfall at Gainesville

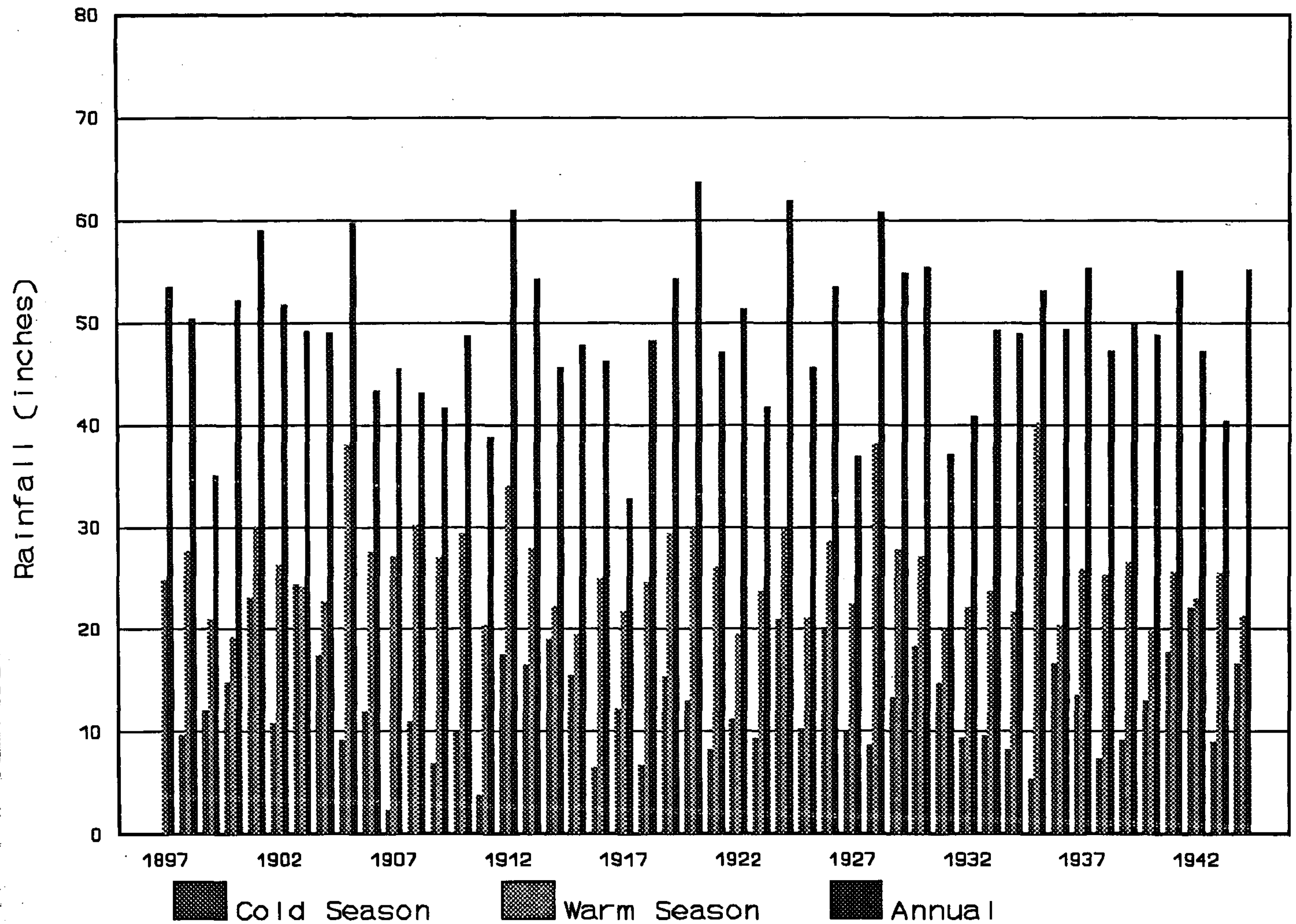

Figure 25. Annual, warm season, and cold season rainfall at Gainesville, 1897–1992

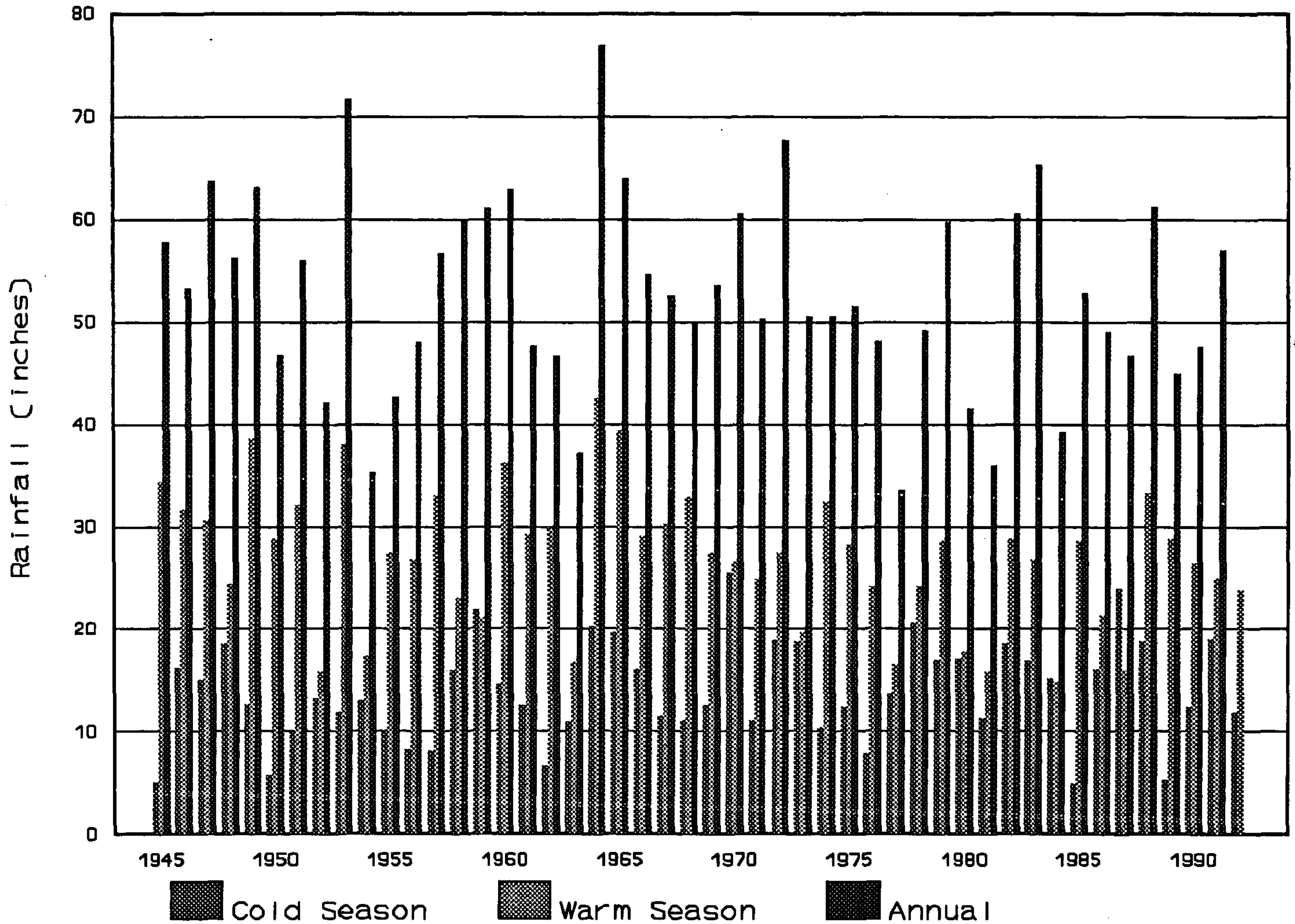

Figure 25—*Continued*

Storm. Large amounts of rainfall occur over relatively short periods during hurricanes, tropical storms, and other storms (Table B3, Appendix B). These storm events can produce major floods and give rise to high rates of discharge. Maximum rainfall amounts that occurred at Gainesville over the years of 1903 to 1992 for various durations and extreme rainfall amounts for various return periods are listed in Table 11.

Table 11. Maximum recorded and computed storm-event rainfall at Gainesville, 1903–92

Storm Duration	Rainfall Amount (inches)	Starting Date	Computed Rainfall (inches)		
			10-year	25-year	100-year
24 hours	7.55	25 August 1972	5.6	6.9	8.5
48 hours	9.82	10 September 1964	6.5	7.8	9.9
72 hours	10.92	10 September 1964	—	—	—
96 hours	11.22	4 September 1950	7.6	8.9	10.9
5 days	11.30	3 September 1950	—	—	—
10 days	12.73	3 September 1964	—	—	—

Note: — = no data available

Source: Rao (1988)

Evaporation

Near UOCB, Class A pan evaporation data have been collected at Gainesville since 1953 (Table B4, Appendix B). These data were collected at NOAA station 3321 (Figure 12). The average, maximum, and minimum values for each month and the annual totals are given in Table 12.

Multiplying the average annual pan evaporation (64.70 in.) by an adjustment coefficient for pan evaporation of 0.81 (Linsley et al.

1982), the average lake evaporation rate over a year is calculated as 52 in. This evaporation rate is approximately equal to the amount of normal rainfall (51.59 in.). Potentially, all of the rainfall that falls on the lakes can be lost as evaporation.

Table 12. Pan evaporation data (in inches), Gainesville, 1953–92

	Annual	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average	64.70	2.92	3.63	5.50	6.92	7.89	7.47	7.09	6.53	5.64	4.89	3.48	2.74
Maximum	73.63	3.65	4.38	6.54	8.55	9.89	9.63	8.14	8.45	6.82	5.86	4.38	3.42
Minimum	59.81	2.27	2.52	4.62	5.34	6.25	6.02	5.49	5.31	4.78	3.10	2.74	1.96

SURFACE WATER DISCHARGE ANALYSES

Streamflow (discharge) at a gaging station normally is reported as cubic feet per second. Streamflow is measured continuously, but expressed as an average value for each day. The average discharge over a long period indicates the magnitude of the surface water resource of the stream. An average discharge, however, does not disclose all of the pertinent information concerning the hydrology of the stream and the stream basin. The variations of streamflow about the average are of significant interest in different activities of water resources management. This section includes the following information:

- Rainfall-runoff relationships
- Average discharges
- Flow durations
- Peak flows

For evaluating annual low flows, the water year that is used by USGS, 1 October to 30 September, was used as the reference year. For evaluating annual maximum flows, a climate year ending 31 May was chosen, because maximum floods occur from June through October in this part of Florida. Using the USGS water year for annual maximum flows will divide the rainy season, which is not appropriate for this analysis.

Rainfall-Discharge Comparison

The discharge through Prairie Creek is the single surface water outflow for the Newnans Lake subbasin. This discharge can be compared to the annual rainfall measured at Gainesville to estimate the amount of rainfall that results in surface discharge from the Newnans Lake subbasin. Prairie Creek average annual discharge is converted from units of cubic feet per second to units of acre-inches per year. The acre-inches per year then is divided by the area of the Newnans Lake subbasin to obtain the discharge in inches per year. Comparing the yearly discharge to rainfall shows that, on average, 14% of rainfall results in surface water discharge (Table 13).

The discharges through Orange Creek and Lochloosa Slough summed together are the surface water outflow for UOCB. On average, 7% of rainfall over UOCB results in surface water discharge. The smaller percentage of discharge from UOCB indicates an increase in evapotranspiration and discharge of water into the ground. The period 1990–92 had zero surface discharge because the lake levels in Orange and Lochloosa lakes remained below the surface discharge outlets. The rain that fell on UOCB resulted only in evapotranspiration and discharge into the ground.

The conversion of UOCB surface discharge from acre-inches per year to inches per year did not include the area of Paynes Prairie subbasin. The Paynes Prairie subbasin was not included because water directed into Paynes Prairie and the rainfall that occurs over the subbasin do not result in surface discharge. The water is lost to both evapotranspiration and discharge into Alachua Sink.

Average Discharges

The monthly and annual average discharge data for Prairie Creek, Camps Canal, Lochloosa Slough, and Orange Lake outlet are

Table 13. Comparison of annual rainfall to annual average discharge

Year*	Rain (in/yr)	Newnans Lake Discharge (in/yr)	Percent	Orange Lake Discharge (in/yr)	Percent
1948	64.7	—	—	14.5	22
1949	53.7	—	—	8	15
1950	52.7	—	—	3	6
1951	49.8	—	—	6.2	12
1952	62.7	—	—	4	6
1953	44.1	—	—	1.2	3
1954	63.4	—	—	9.5	15
1955	34.8	—	—	0.3	1
1980	56.4	11	20	—	—
1981	33.4	3.1	9	—	—
1982	51.2	4.8	9	—	—
1983	59.9	12.6	21	7.5	13
1984	57.9	12.7	22	7.4	13
1985	32.6	2.5	8	1.2	4
1986	53.9	15.3	28	2.8	5
1987	57.2	11.7	20	5.5	10
1988	43.9	4.4	10	0.9	2
1989	46.2	7.1	15	2.3	5
1990	53.0	1.3	2	0	0
1991	60.1	3.3	5	0	0
1992	47.3	6.5	14	0	0
Mean	51.4	7.4	14	4.1	7
Maximum	64.7	15.3	28	14.5	22
Minimum	32.6	1.3	2	0	0

*Discharge data not collected from 1956 to 1979

Note: in/yr = inches per year
— = data not available

presented in Tables C1–C4 (Appendix C). Table 14 is a summary of discharge data.

Table 14. Summary of discharge data (in cubic feet per second), 1983–92

Station	Average for the Period of Record*	Range of the Average Annual Discharges	Range of the Average Monthly Discharges
Prairie Creek	66.4	9.1 - 114.0	0.6 - 355.4
Camps Canal	71.8	7.7 - 224.0	0.3 - 504.1
Lochloosa Slough	22.6	0 - 131.2	0 - 270.2
Orange Lake outlet	97.8	0 - 296.1	0 - 803.9

*See Table 6

For the period 1983–92, continuous discharge measurements are available for all four locations. For this 10-yr period, the average discharges for these locations are 68.3 cfs at Prairie Creek, 58.1 cfs at Camps Canal, 3.7 cfs at Lochloosa Slough, and 50.0 cfs at Orange Lake outlet. Note that although the watershed areas increase in size, there is no corresponding increase in discharge.

Flow Duration

A flow-duration curve represents the percent of time that specified discharges are equalled or exceeded during a given period of record. The construction of a weir influences discharges. The separation of the time periods into pre- and post-weir, however, is not meant to imply that the weir alone is responsible for the changes in the flow-duration relationship. For example, as indicated in the rainfall section (p. 57), since 1980 there has been less average rainfall.

The Prairie Creek flow-duration curve (Figure 26) was developed based on data from September 1978 through September 1992

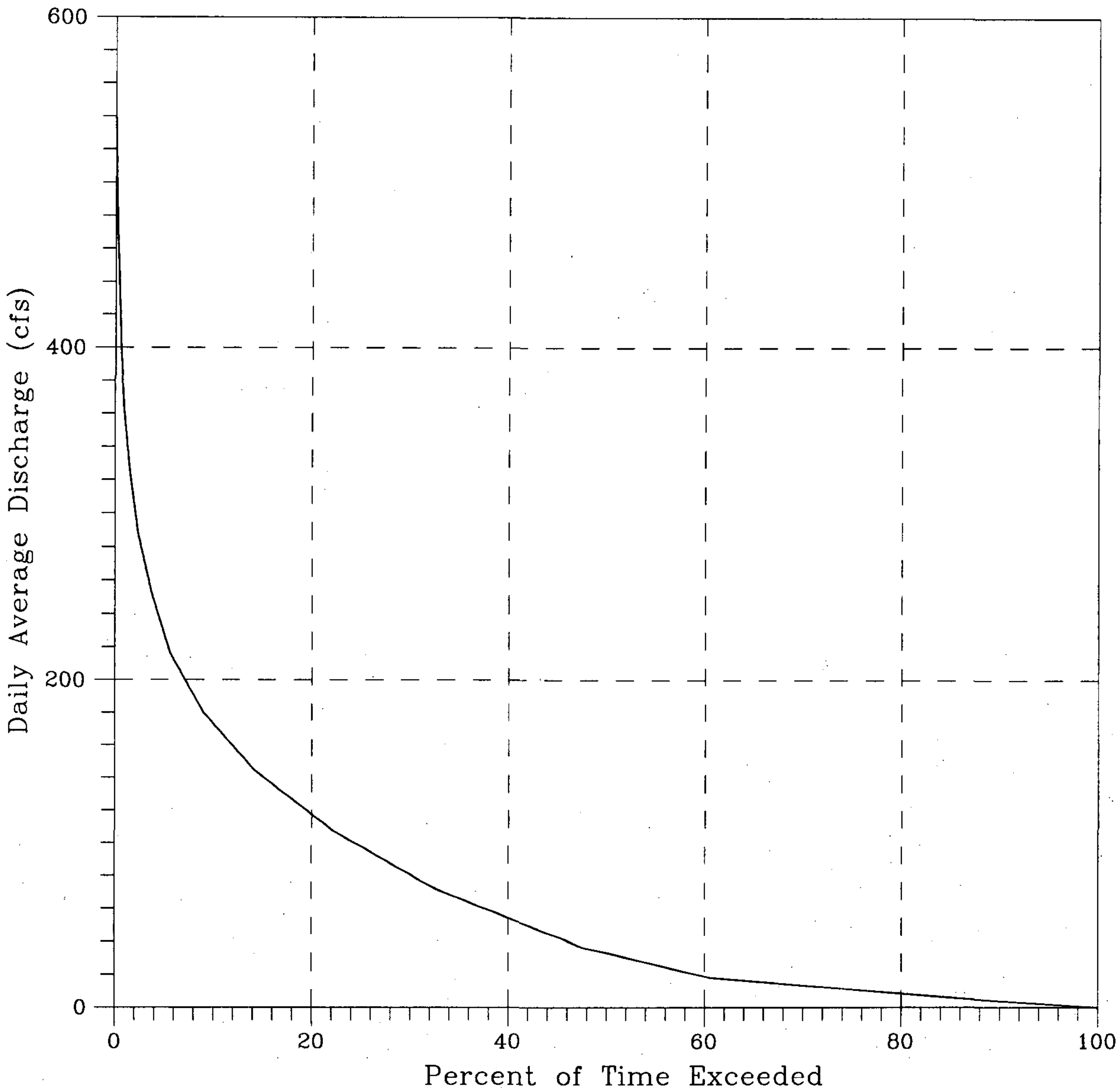

Figure 26. Flow-duration curve for Prairie Creek, 1978–92

(post-weir). During that period, 20% of the time the discharge exceeded 117 cfs, 50% of the time 33 cfs, and 80% of the time 9 cfs. The maximum discharge was 540 cfs.

The Camps Canal flow-duration curve (Figure 27) was developed based on data from April 1978 to September 1992 (post-weir). During that period, 20% of the time the discharge exceeded 102 cfs, 50% of the time 21 cfs, and 80% of the time 7 cfs. The maximum discharge was 544 cfs.

The Camps Canal flow-duration curve has about the same period of record as the Prairie Creek curve. The flow-duration curves are very similar except that the Camps Canal discharge (as expected) is lower because of flow directed into Paynes Prairie.

A comparison of Lochloosa Slough flow-duration curves (Figure 28) before (1947–55) and after (1983–92) the construction of the Orange Lake outlet dam and the modifications to the U.S. 301 culvert shows a dramatic change in discharge.

A comparison of the Orange Lake outlet flow-duration curves for 1947–55 (pre-weir) and 1983–92 (post-weir) reveals that the post-weir outflow is considerably less than the pre-weir (Figure 29). Over the pre-weir period, 20% of the time the discharge exceeded 211 cfs, 50% of the time 80 cfs, and 80% of the time 13 cfs. For the post-weir period, the corresponding discharge values were 107 cfs, 8 cfs, and 0 cfs, respectively.

Peak Flows

The 1-day high values (Tables C5–C8, Appendix C) are used for flood-flow frequency analysis. The frequency of flood flows were determined using USGS guidelines (1982). The Weibull plotting position formula (Haan 1977) is used for plotting data and comparing data with the computed probability curve (Figures 30–33). Frequency analyses of low discharges were not performed, but the annual low flows for different durations are listed in Tables C9–C12 (Appendix C).

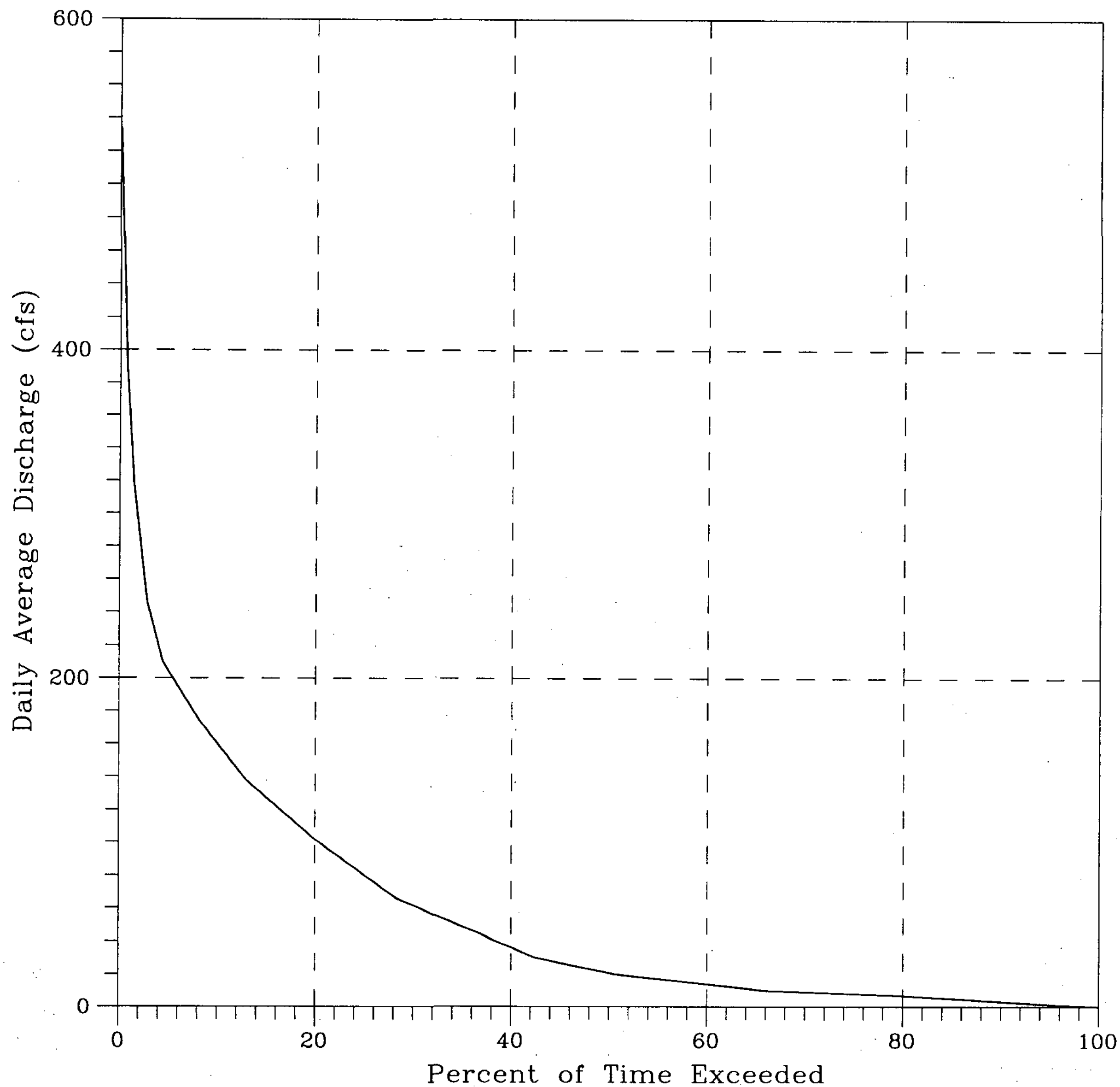

Figure 27. Flow-duration curve for Camps Canal, 1978–92

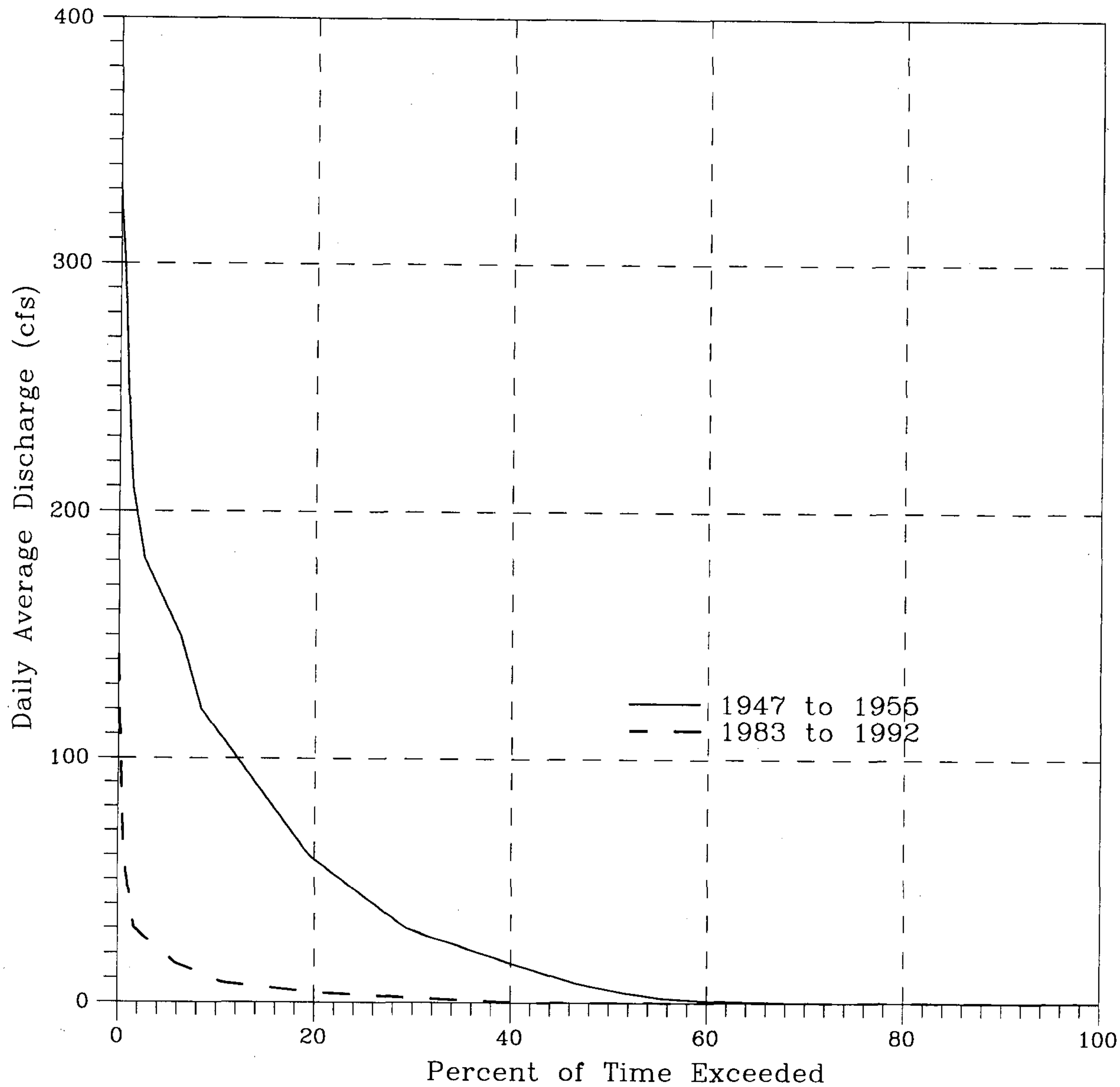

Figure 28. Flow-duration curves for Lochloosa Slough

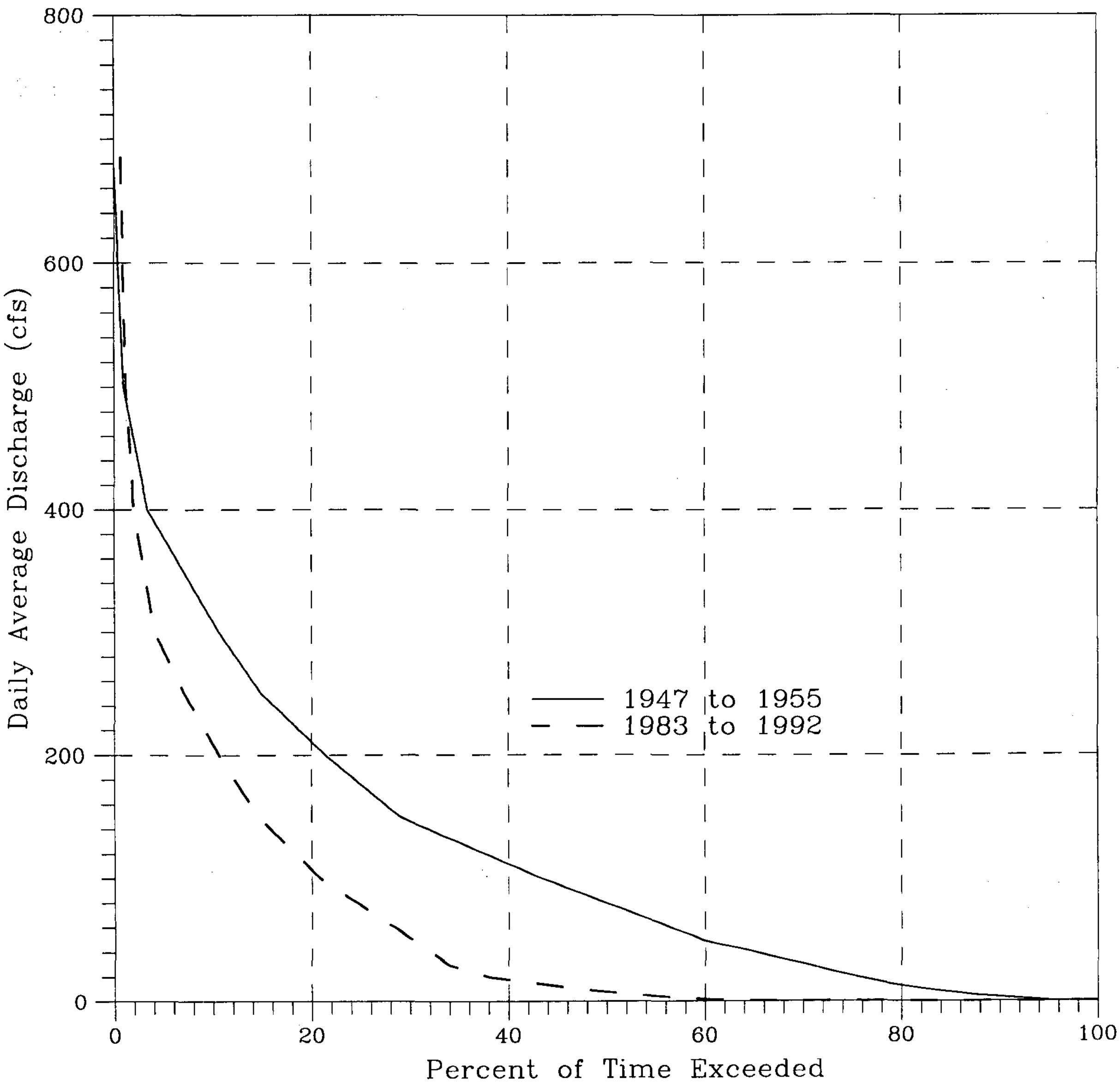

Figure 29. Flow-duration curves for Orange Lake outlet

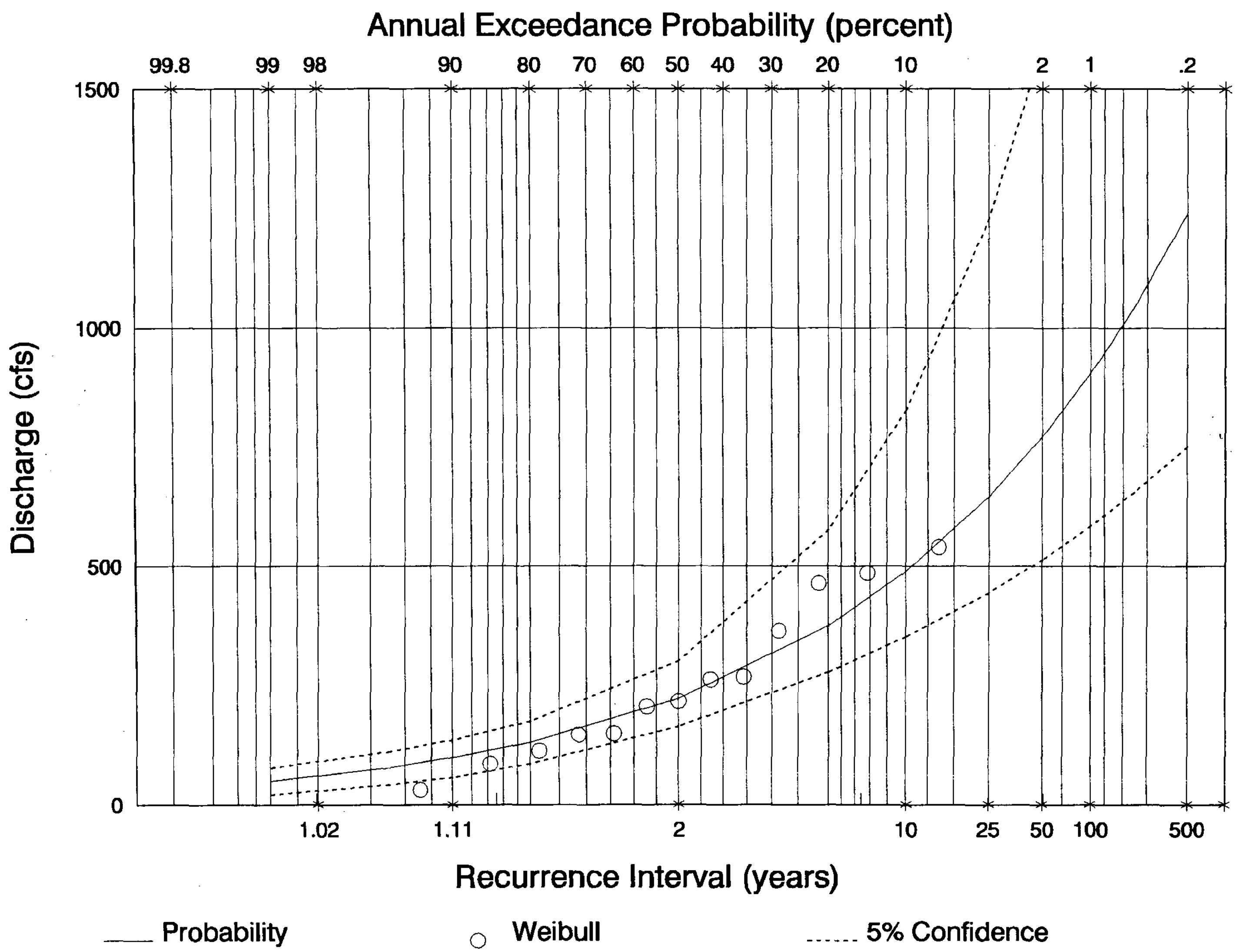

Figure 30. Probability plot of annual peak discharges for Prairie Creek

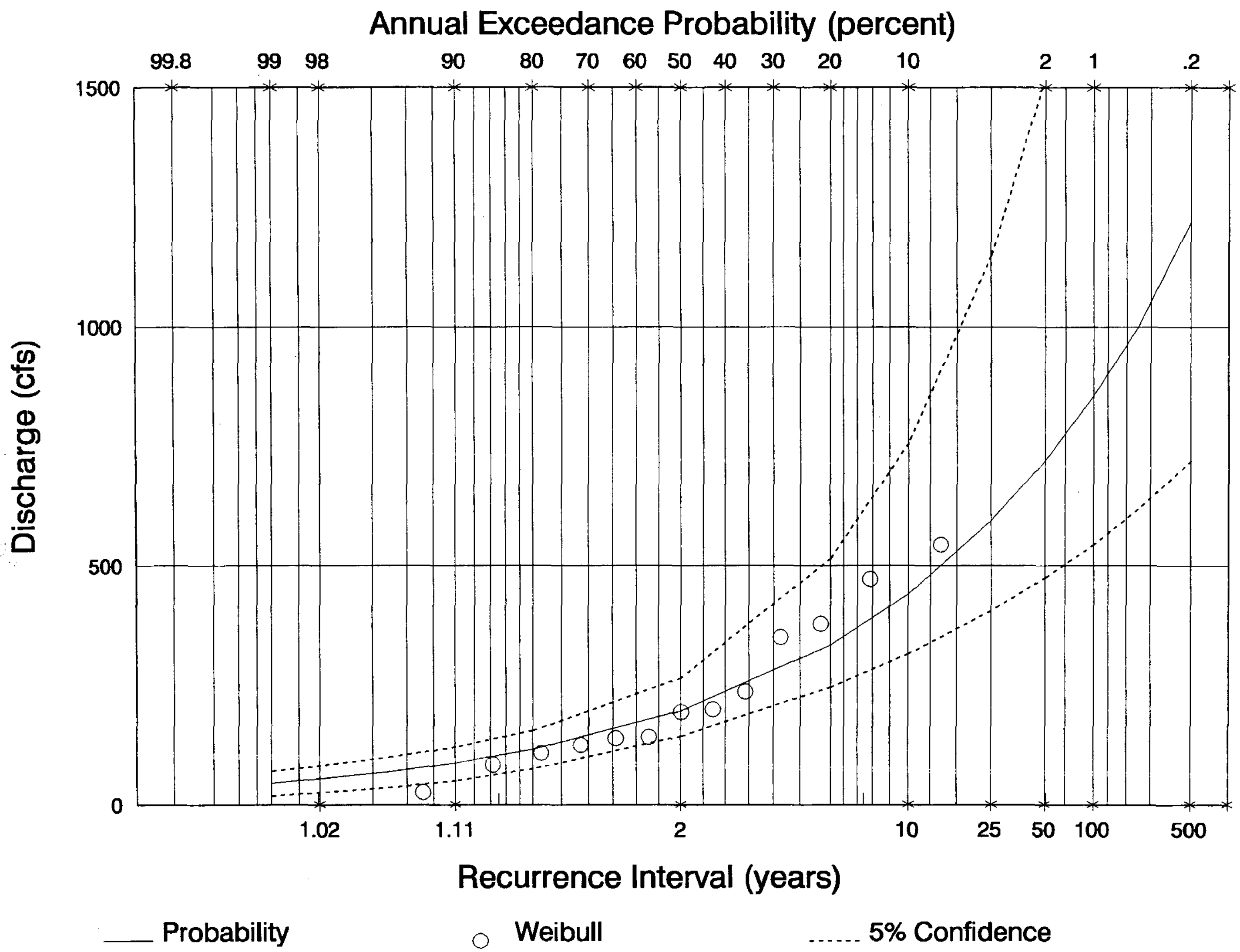

Figure 31. Probability plot of annual peak discharges for Camps Canal

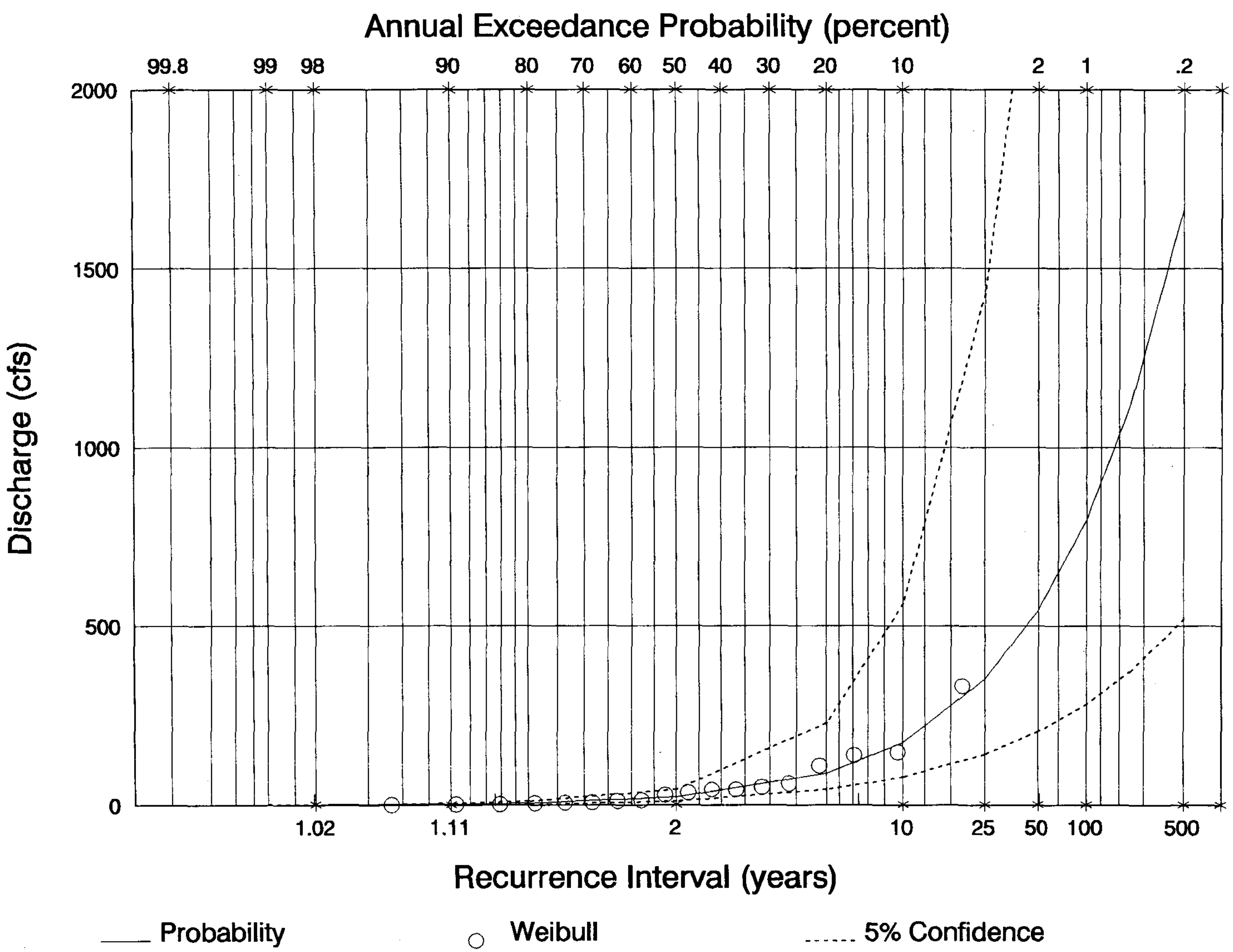

Figure 32. Probability plot of annual peak discharges for Lochloosa Slough

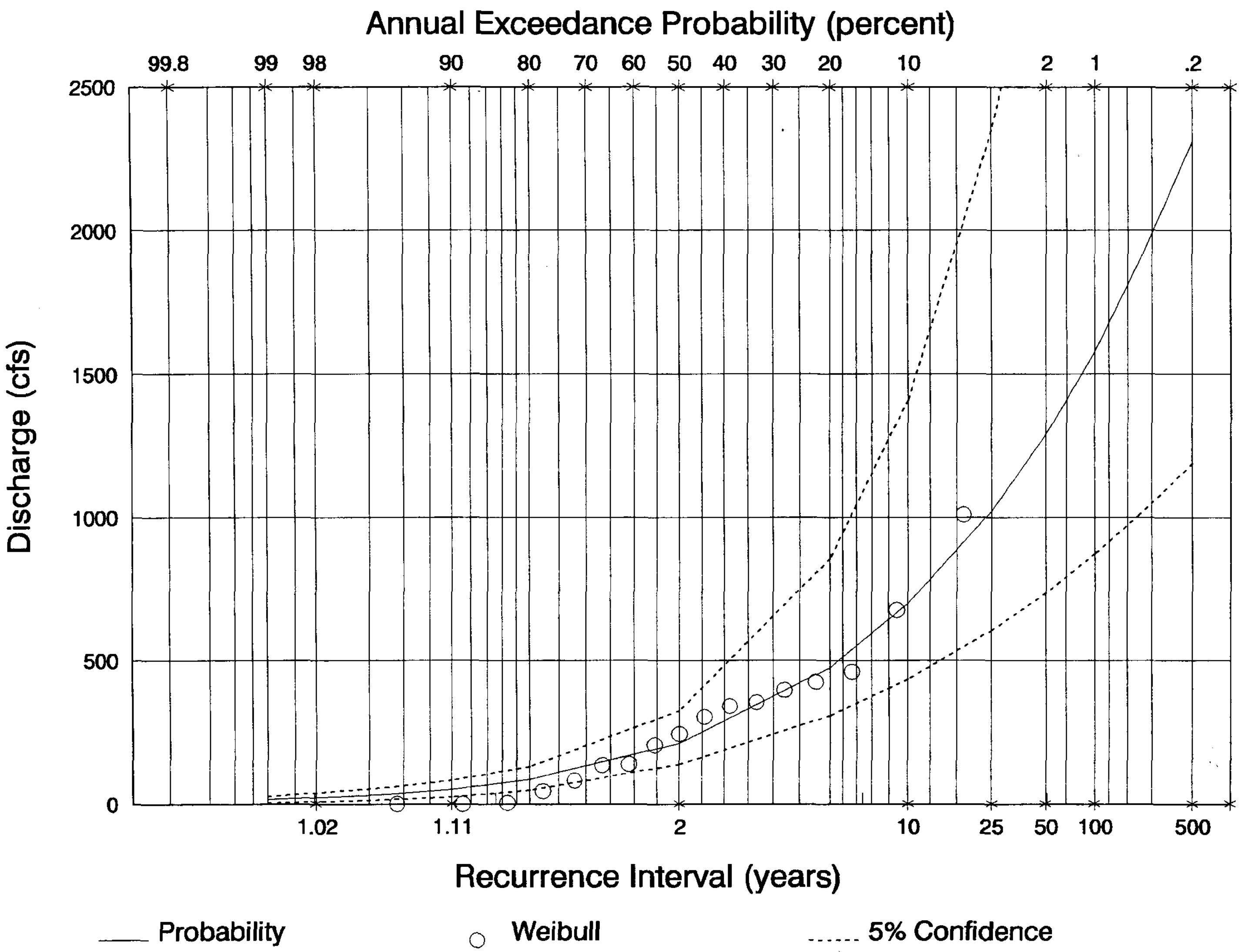

Figure 33. Probability plot of annual peak discharges for Orange Lake outlet

Frequency analysis of hydrologic data requires that the data be homogeneous. The restriction of homogeneity assures that all of the observations are from the same population (i.e., a stream gaging station has not been moved, a watershed has not become urbanized, or a structure has not been placed on the stream).

In the peak flow analysis, peak discharges before and after the construction of the control structures are grouped together, although this deviates from the above restriction. Even with grouping, some of the sample sizes remained small. Small samples tend to increase the chance that the sample is not representative of the population. Still, the analysis is useful for an initial characterization of the peak discharges. Table 15 is a summary of peak discharge estimates.

Table 15. Estimated peak flows for selected return periods (in cubic feet per second)

Location	Return Period (years)			
	10	25	50	100
Prairie Creek	488	645	771	904
Camps Canal	440	594	720	856
Lochloosa Slough	173	351	545	798
Orange Lake outlet	698	1,020	1,290	1,580

SURFACE WATER STAGE ANALYSES

Surface water stages for a lake or stream are measured either continuously or non-continuously, that is, once daily or at infrequent intervals. Data are expressed as gage heights (in feet) or elevations (in ft NGVD). When stages are measured continuously, a daily average value is given. When stages are measured in all other instances, the stage observed at the time of reading is given. This section includes the following:

- Monthly average stages
- Stage-duration analysis
- Peak-stage frequency analysis
- Low stage frequency analysis

Annual minimum and maximum stages were evaluated using the same reference years of data as used for discharge data (p. 63). Some records are incomplete. For short periods of missing data (less than 100 days), the values are determined by interpolation. For extended periods of missing data (more than 100 days), those periods are omitted from analysis.

Estimates of maximum and minimum lake water surface elevations for different return periods are determined using Rao (1980).

Average Stages

The monthly average stages for Newnans, Alachua, Lochloosa and Orange lakes are presented in Tables D1-D4 (Appendix D).

Stage Duration

A stage-duration curve represents the percent of time that specified stages are equalled or exceeded during a given period of record. The stage-duration curves are separated into pre-weir and post-weir curves. As mentioned for the discharge-duration curves (p. 66), this separation of time periods does not indicate that the weir alone is responsible for the changes in the stage-duration relationship. However, this separation does allow comparison of current conditions to conditions prior to the construction of the weirs. Although Alachua Lake has control structures, it cannot be characterized in this pre-weir/post-weir fashion.

The Newnans Lake stage-duration curves before and after the weir construction are shown in Figure 34. There was a small reduction in the maximum and an increase in the minimum water levels from prior to present conditions. The flat middle section of the post-weir curve (1967–92) indicates that the lake stage exceeded higher elevations (e.g., Newnans Lake at 68 ft) for less time and exceeded lower elevations (e.g., 65 ft) for more time than in the pre-weir curve (1945–65).

The middle section of the Alachua Lake stage-duration curve (Figure 35) is steeper than for the other lakes. This steeper slope indicates that the water levels exceeded higher elevations (e.g., Alachua Lake at 58 ft) more often and exceeded lower elevations (e.g., 52 ft) for less time than all other lakes.

The Lochloosa Lake stage-duration curves (Figure 36) show that there was a small reduction in the maximum water level from prior to present conditions but no reduction in the minimum water level. A comparison of the two curves (pre- and post-weir) shows that the present condition stages have not stayed as high as the prior condition stages for equal times of exceedance.

The Orange Lake stage-duration curves (Figure 37) show two things. First, the minimum stage for present conditions is higher than the minimum stage for prior conditions and the present condition stages are higher than the prior condition stages for equal times of exceedance until the 23% level. Second, the drop from the elevation exceeded 80% of the time to the minimum elevation is steep for both prior and present conditions. This drop indicates that the low elevations that occurred have a wide range. For example, for the pre-weir conditions, the elevations ranged from 50.38 to 55.91 ft NGVD (a range of 5.53 ft) over 20% of the time, while for 80% of the time the elevations ranged from 55.91 to 61.21 ft NGVD (a range of 5.30 ft).

Orange Lake, both pre- and post-weir, has the largest range of lake stages (Table 16); Alachua Lake has the second largest range of lake stages. Newnans Lake has the largest upper range. In contrast, the upper range of the other three lakes after the weirs

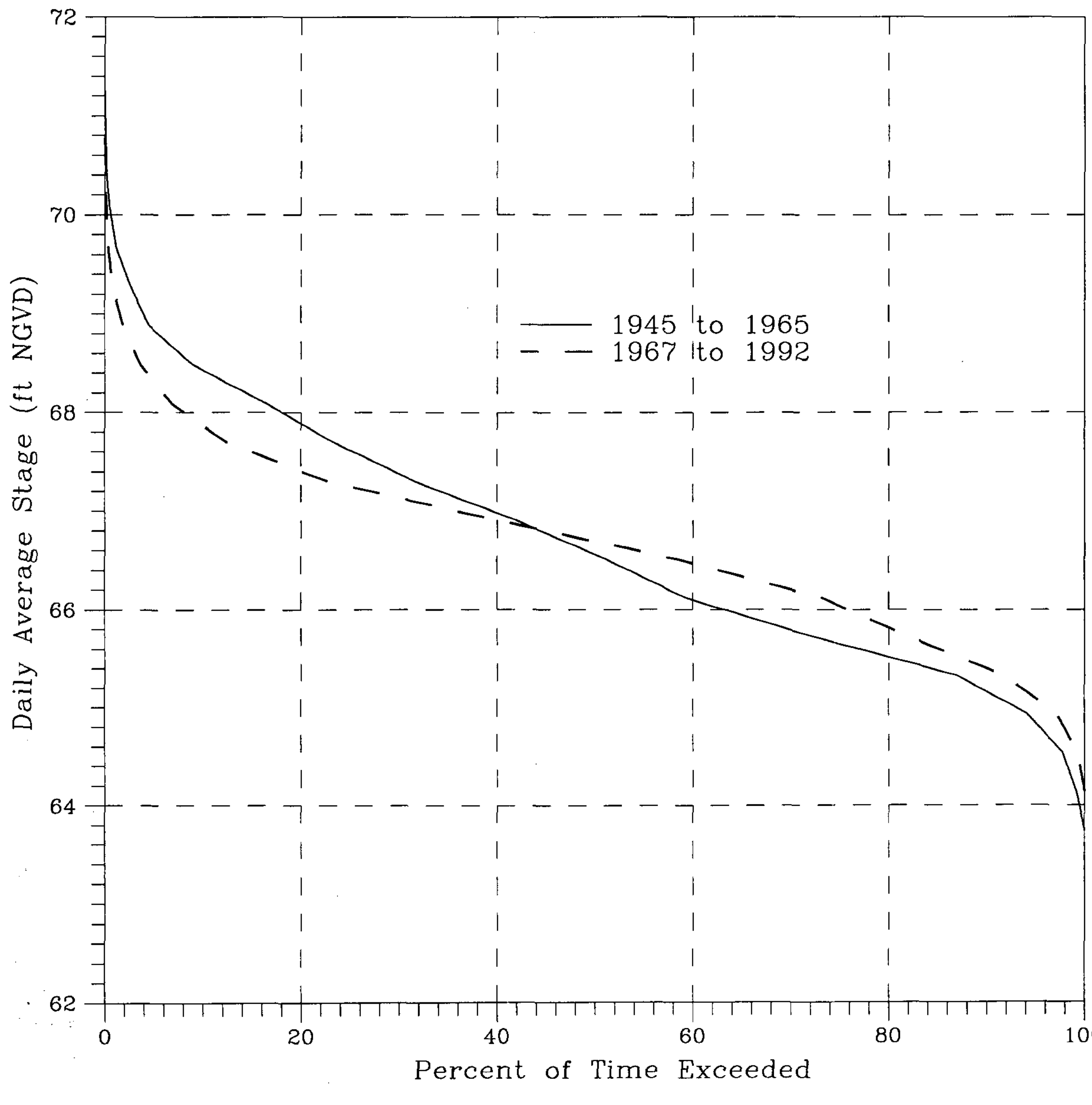

Figure 34. Stage-duration curves for Newnans Lake

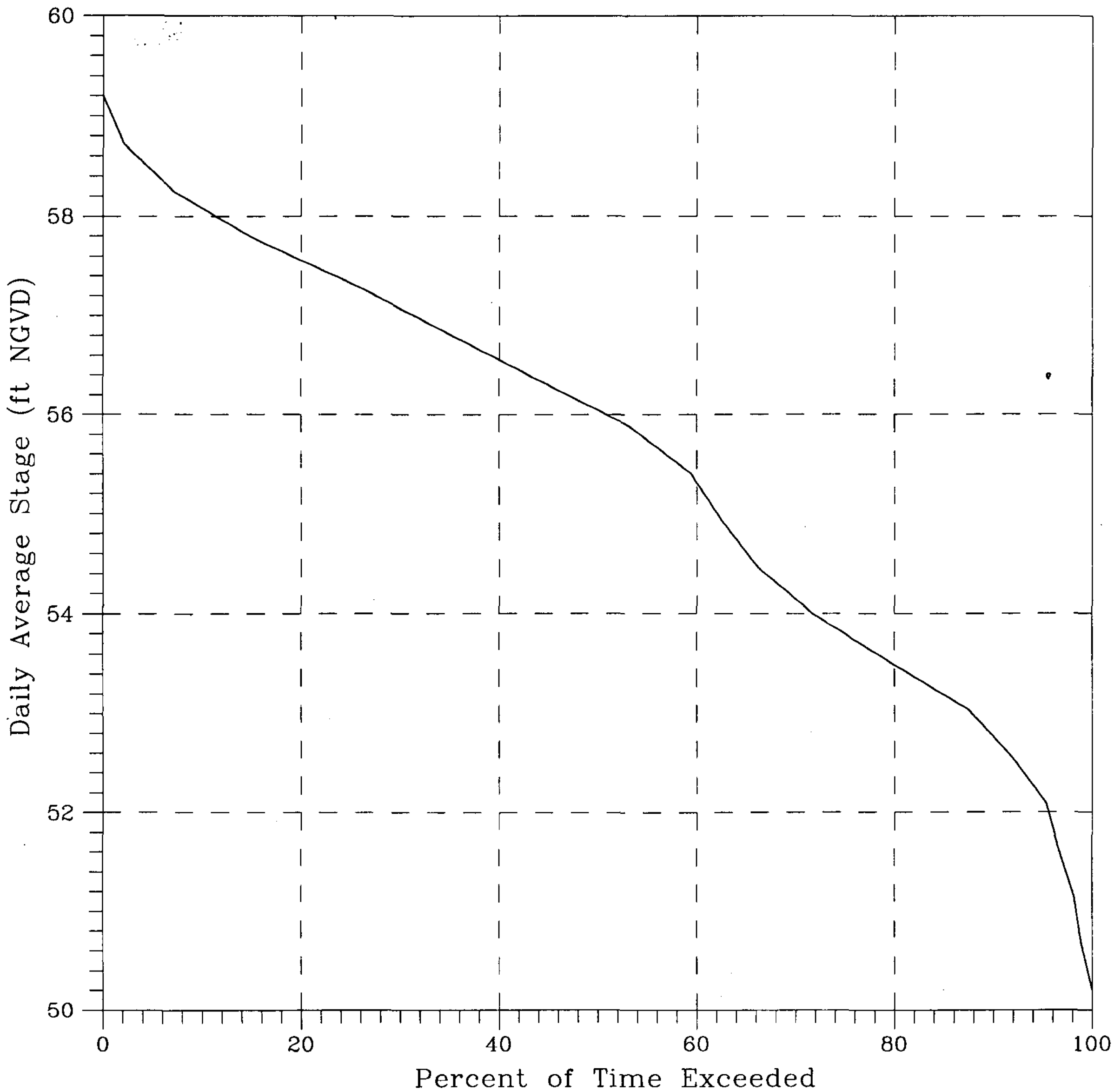

Figure 35. Stage-duration curve for Alachua Lake, 1979–91

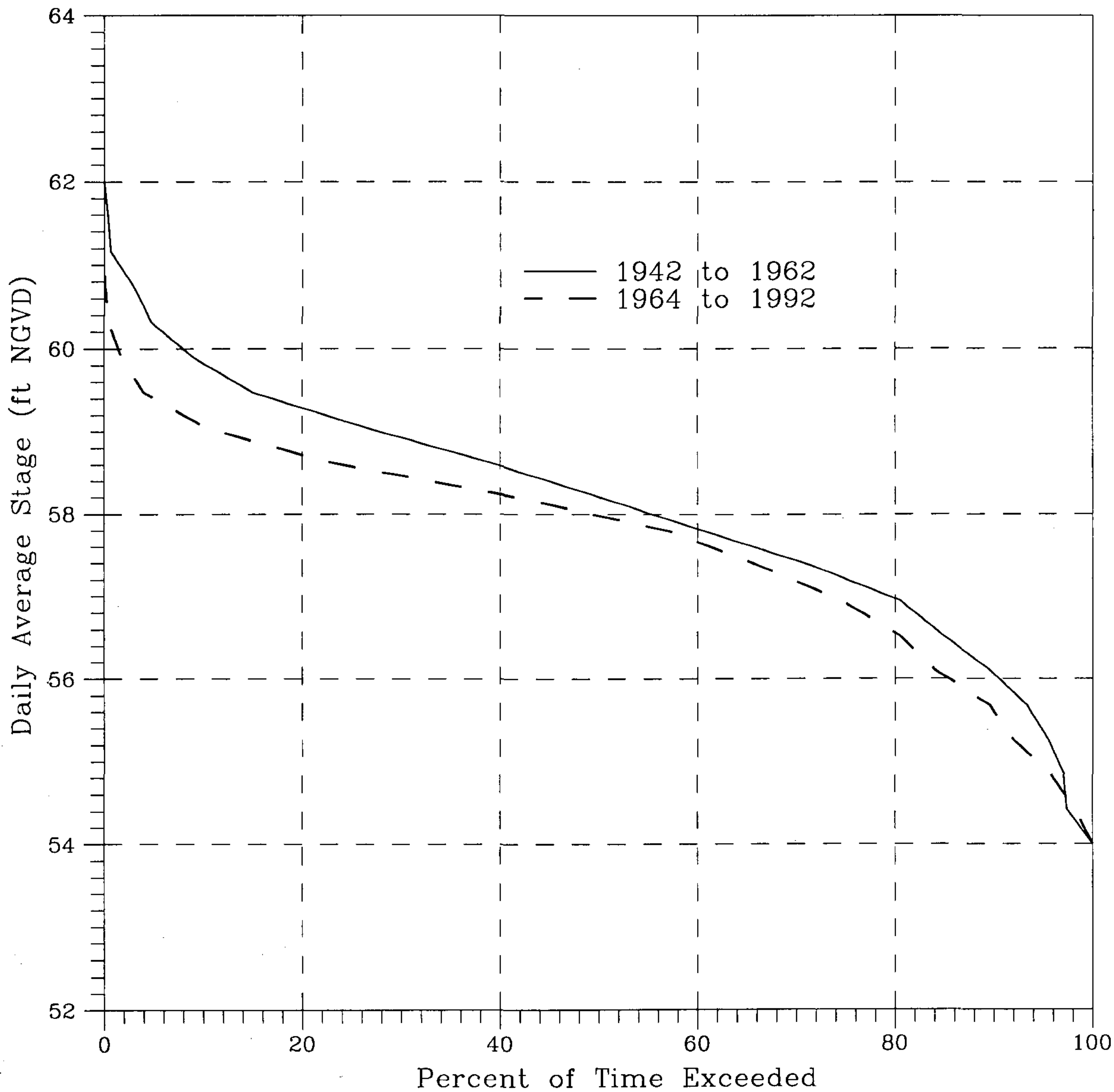

Figure 36. Stage-duration curves for Lochloosa Lake

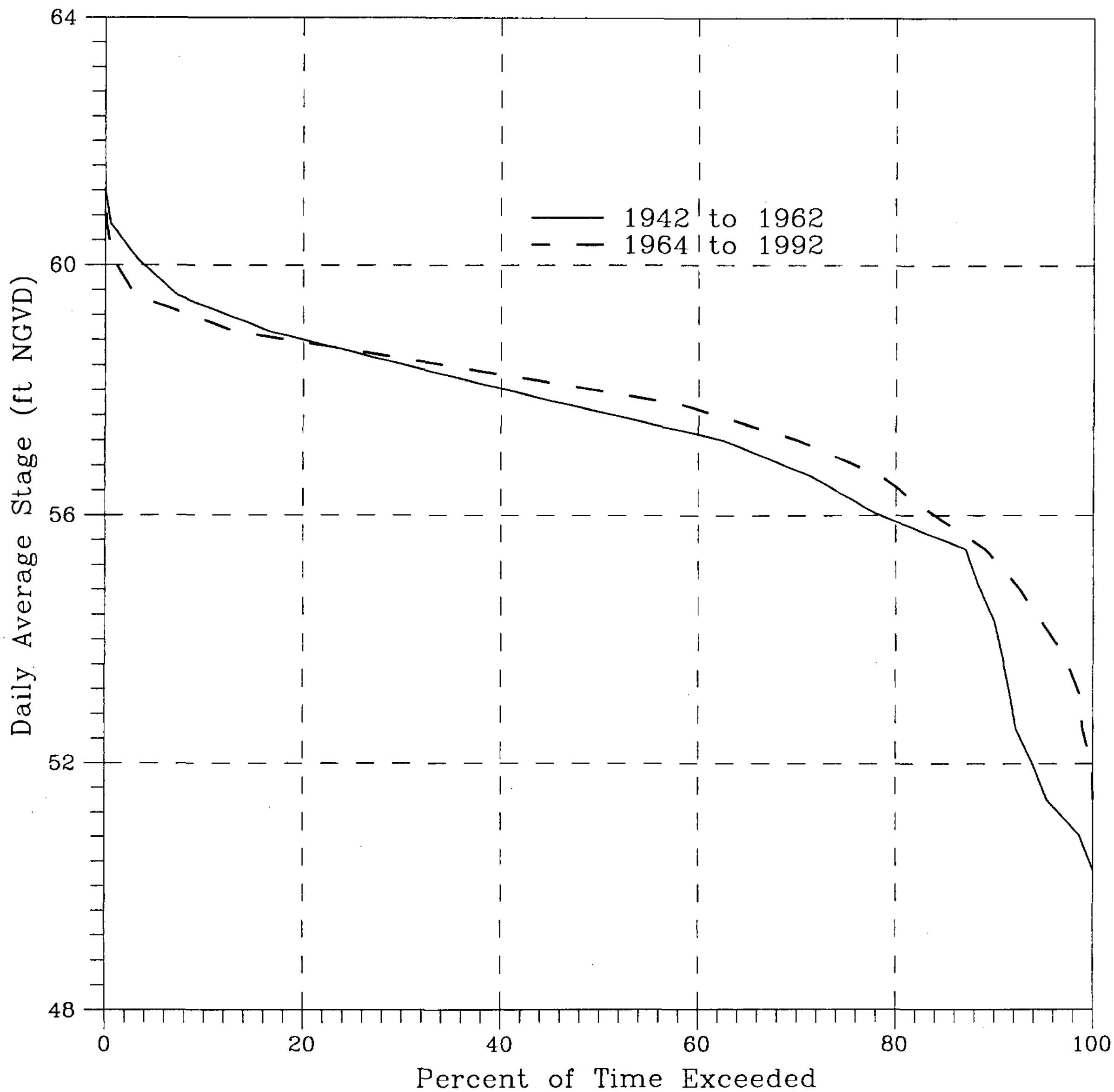

Figure 37. Stage-duration curves for Orange Lake

Table 16. Lake stages (in feet)

	Newnans Lake	Alachua Lake	Lochloosa Lake	Orange Lake
Pre-weir	1945–65		1942–62	1942–62
Maximum stage	71.21		61.94	61.21
Exceeds 20%	67.89		59.29	58.80
Exceeds 50%	66.56		58.21	57.65
Exceeds 80%	65.51		56.97	55.91
Minimum stage	63.87		54.23	50.38
Range (maximum to minimum)	7.34		7.71	10.83
Upper range (maximum to 50%)	4.65		3.73	3.56
Middle range (20% to 80%)	2.37		2.32	2.90
Lower range (50% to minimum)	2.69		3.98	7.27
Post-weir	1967–92	1979–91	1964–92	1964–92
Maximum stage	70.53	59.10	60.92	61.04
Exceeds 20%	67.41	57.56	58.72	58.76
Exceeds 50%	66.69	56.04	57.98	57.99
Exceeds 80%	65.81	53.49	56.56	56.46
Minimum stage	64.30	50.29	54.14	51.86
Range (maximum to minimum)	6.23	8.81	6.78	9.18
Upper range (maximum to 50%)	3.84	3.06	2.94	3.05
Middle range (20% to 80%)	1.59	4.06	2.16	2.30
Lower range (50% to minimum)	2.39	5.75	3.84	6.13

Alachua Lake, although it has control structures, cannot be characterized in a pre-weir/post-weir fashion.

Note: "Exceeds 20%, 50%, and 80%" refers to the elevation that is exceeded by the lake water level 20%, 50%, and 80% of the time.

were constructed are grouped close together. The middle range of Alachua Lake is much larger than the next largest middle range, Orange Lake. Orange Lake has the largest lower range; Alachua Lake has the second largest lower range.

The range of water levels for Orange Lake is 2.40 ft greater than the water level range for Lochloosa Lake and 2.95 ft greater than the water level range for Newnans Lake. The middle range of water levels for Orange Lake is 0.14 ft greater than the middle range of Lochloosa Lake and 0.71 ft greater than the middle range of Newnans Lake. In contrast, the lower range of water levels for Orange Lake is 2.29 ft greater than the lower range of Lochloosa Lake and 3.74 ft greater than the lower range of Newnans Lake. Comparison of the ranges of the three recreational lakes (Orange, Lochloosa, and Newnans), using the data in the second half of Table 16, indicates the severity of the lowest elevation reached in Orange Lake compared to the two other recreational lakes.

The Orange Lake water level range is 0.37 ft greater than Alachua Lake. In contrast, the middle water level range of Orange Lake is 1.76 ft less than Alachua Lake range. The lower water level range of Orange Lake is 0.38 ft greater than Alachua Lake range.

Peak Stages

As discussed previously in the peak flows section (p. 76), frequency analysis of hydrologic data requires that the data be homogeneous. The peak stages analysis is conducted on data grouped together from before and after the construction of the control structures. This grouping was done because the structures are designed to control low stages but not high stages. In general, high stages are not affected significantly, as is evident from the data (Tables D5–D8, Appendix D).

Figures 38-41 present the flood stage frequency analyses (Rao 1980). The Weibull plotting position formula (Haan 1977) is used for plotting data and comparing data with the computed probability curve (Rao 1980) for flood stages. in Newnans, Alachua, Lochloosa, and Orange lakes, respectively. The

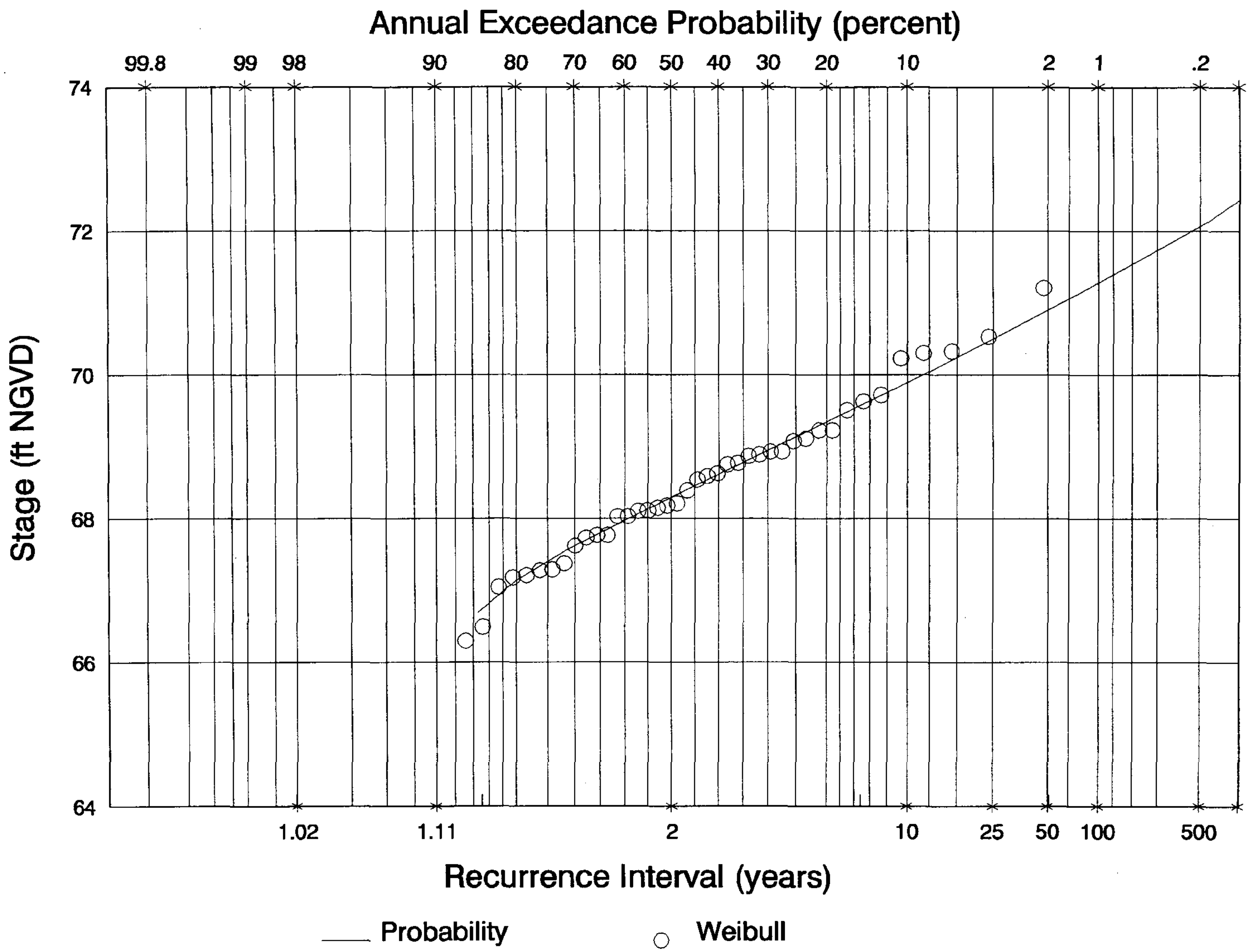

Figure 38. Probability plot of annual maximum stages for Newnans Lake

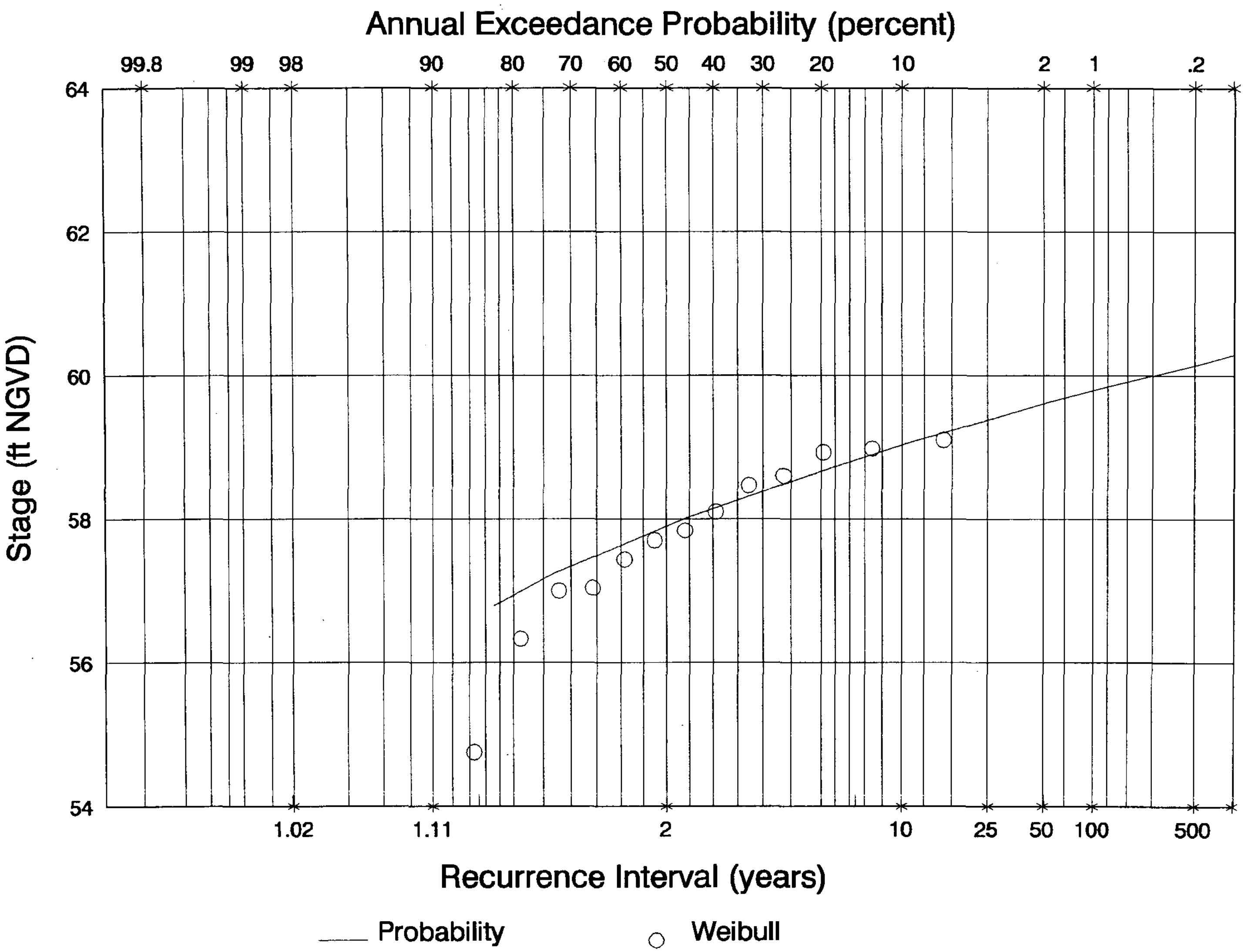

Figure 39. Probability plot of annual maximum stages for Alachua Lake

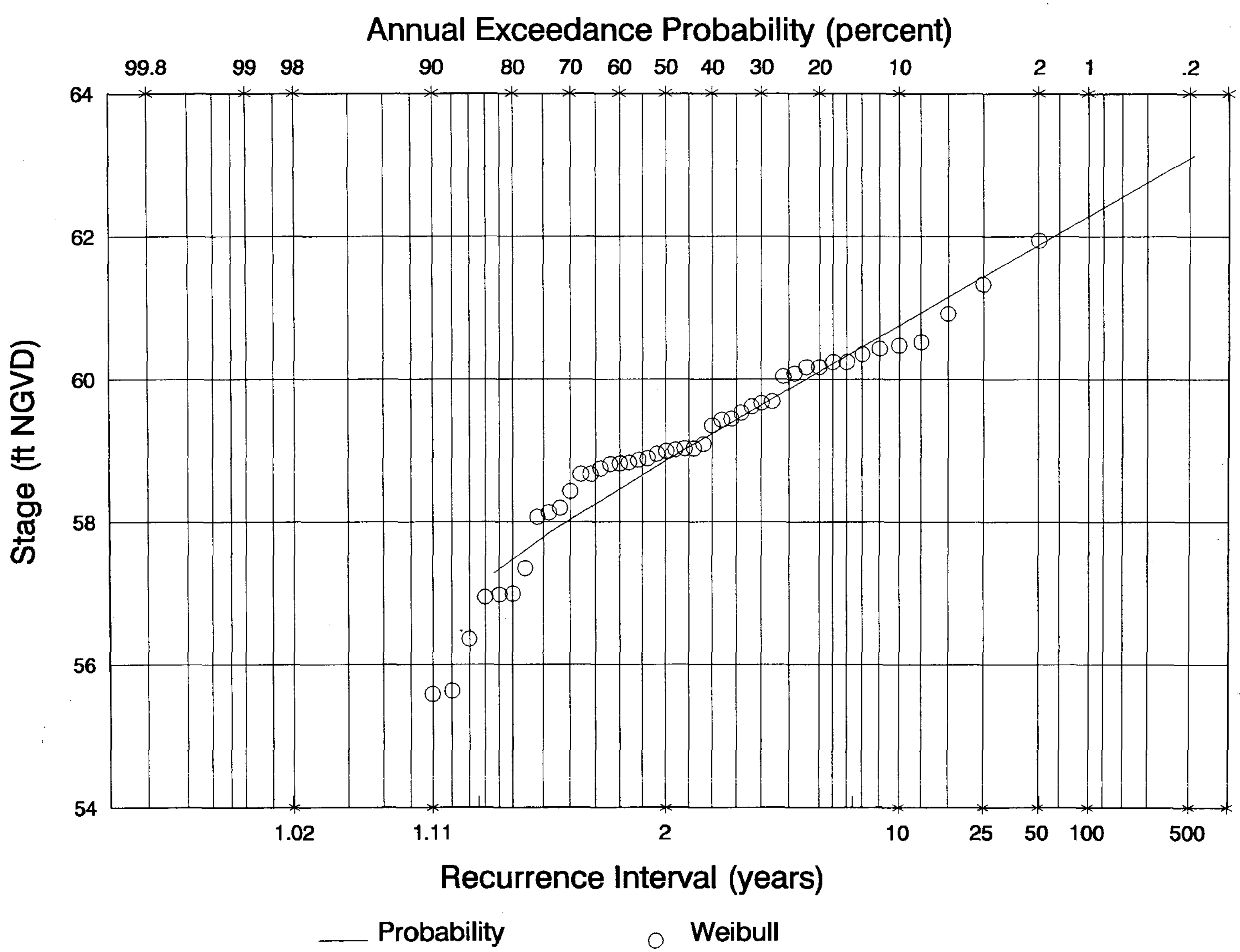

Figure 40. Probability plot of annual maximum stages for Lochloosa Lake

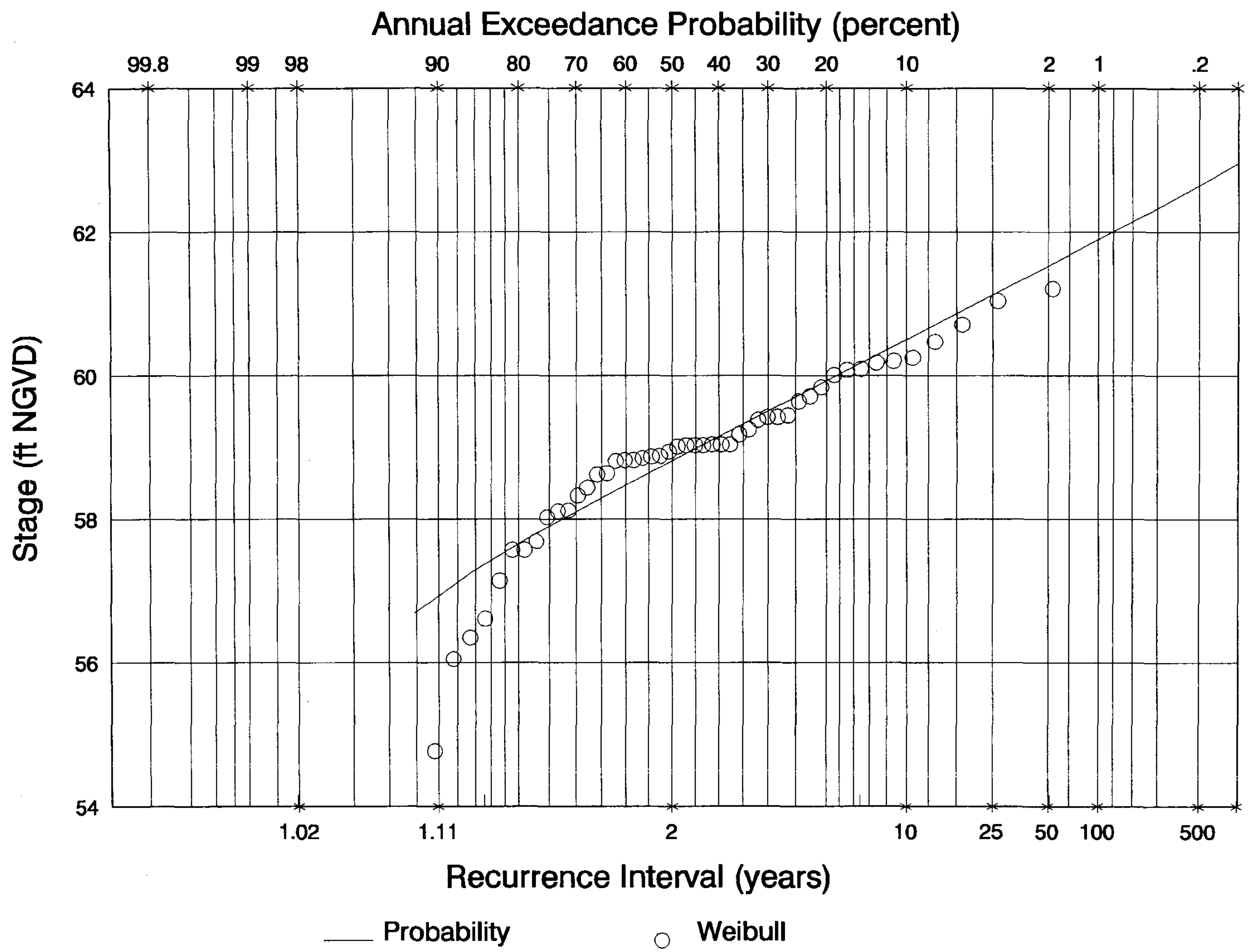

Figure 41. Probability plot of annual maximum stages for Orange Lake

estimated peak stages for different return periods are listed in Table 17.

Table 17. Estimated peak stages for selected return periods (in feet)

Lake	Return Period (years)			
	10	25	50	100
Newnans	69.9	70.6	71.0	71.3
Alachua	59.1	59.5	59.7	59.9
Lochloosa	60.7	61.5	61.9	62.3
Orange	60.5	61.2	61.6	61.9

Summary of peak stage data in Tables D5-D8 (Appendix D)

Low Stages

Low-stage frequency analysis is performed for 30-day durations. The results represent stages for short-term droughts. In the probability plots, the points are observed lows (Tables D9–D12, Appendix D). The data points were plotted using the Weibull formula and the curves were computed using the log Pearson frequency analysis (Rao 1980). Table 18 lists the estimates of low stages for various lakes in UOCB.

The pre-weir 30-day average low stages for Newnans Lake (Figure 42) are consistently lower than post-weir low stages. The frequency curves indicate that low stages in Newnans Lake are higher since construction of the Prairie Creek dam.

Figure 43 shows the frequency of 30-day low stages of Alachua Lake. For Alachua Lake, there is no pre- to post-structure comparison. A sample of 13 values may not accurately represent

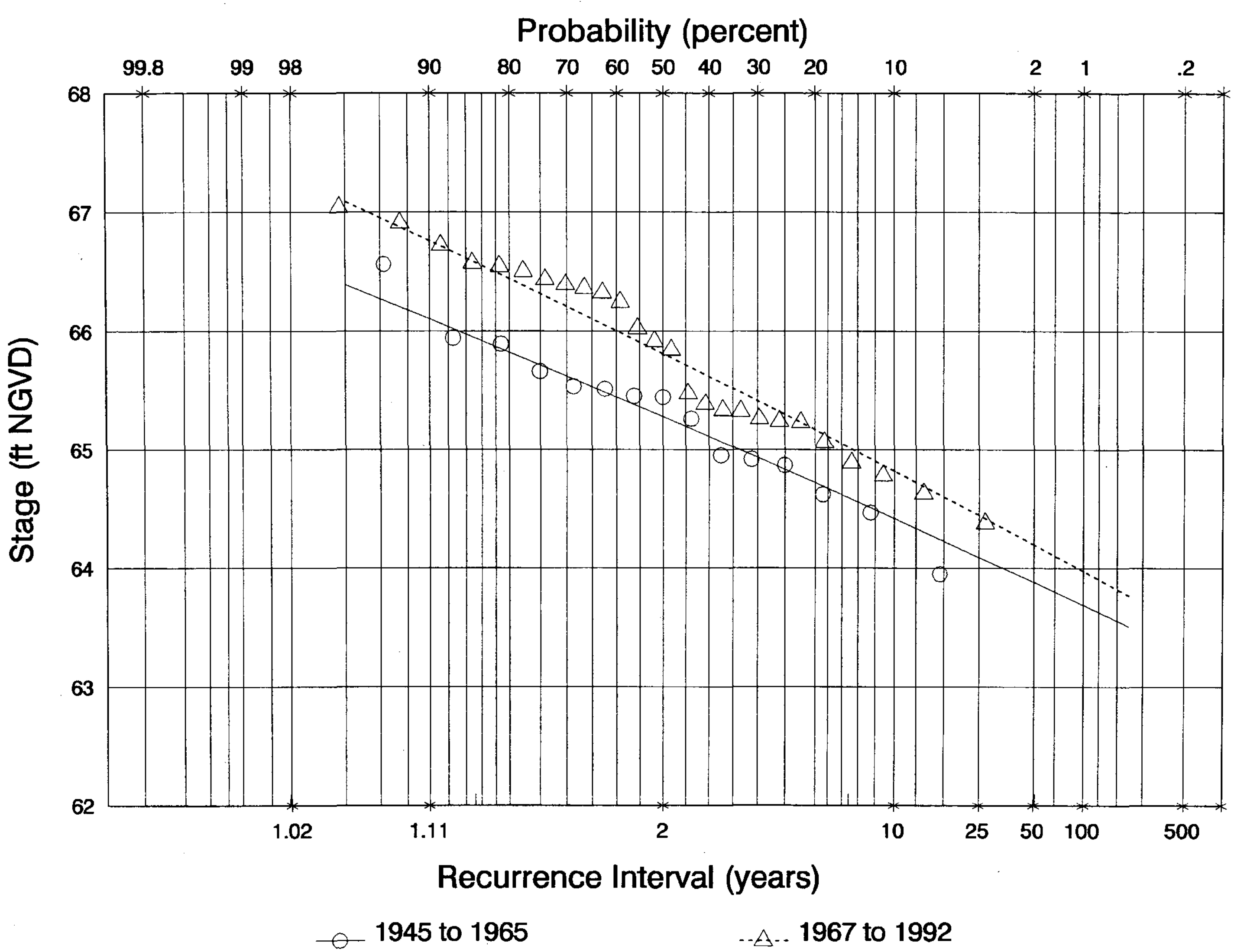

Figure 42. Probability plot of 30-day average low stages for Newnans Lake

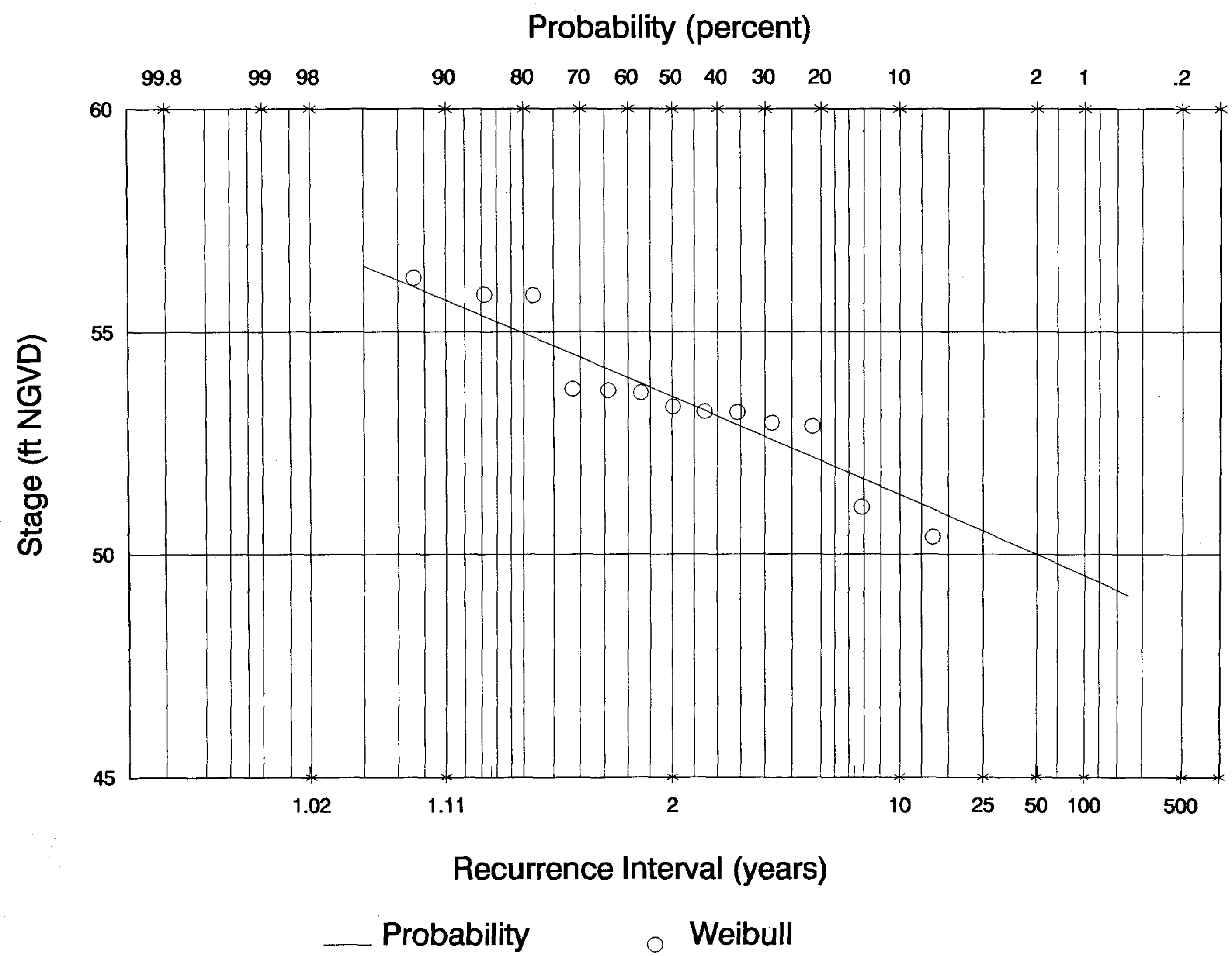

Figure 43. Probability plot of 30-day average low stages for Alachua Lake

Table 18. Estimated 30-day average low stages for selected return periods (in feet, National Geodetic Vertical Datum)

Lake	Return Period (years)	30-day Average for Stages	
		Pre-weir	Post-weir
Newnans	100	63.69	63.98
	50	63.88	64.20
	25	64.09	64.45
	10	64.42	64.82
	5	64.72	65.17
	2	65.28	65.81
Lochloosa	100	*	53.27
	50	*	53.76
	25	53.96	54.29
	10	55.00	55.06
	5	55.85	55.73
	2	57.25	56.89
Orange	100	48.87	51.57
	50	50.11	52.37
	25	51.41	53.21
	10	53.19	54.40
	5	54.62	55.38
	2	56.67	56.91
Alachua	100		49.53
	50		50.00
	25		50.53
	10		51.35
	5		52.11
	2		53.55

*The graphical curve was not extended beyond the 25-year return period

the population, but the analysis is shown as a preliminary evaluation of the data.

For Lochloosa Lake, low stages using the above referenced analyses appear to be higher before the construction of the Orange Lake weir (1963) than after construction (Figure 44). This unexpected result could be attributed to the fact that stage data from 1942 to 1952 (Figure 23) were approximately one-half foot

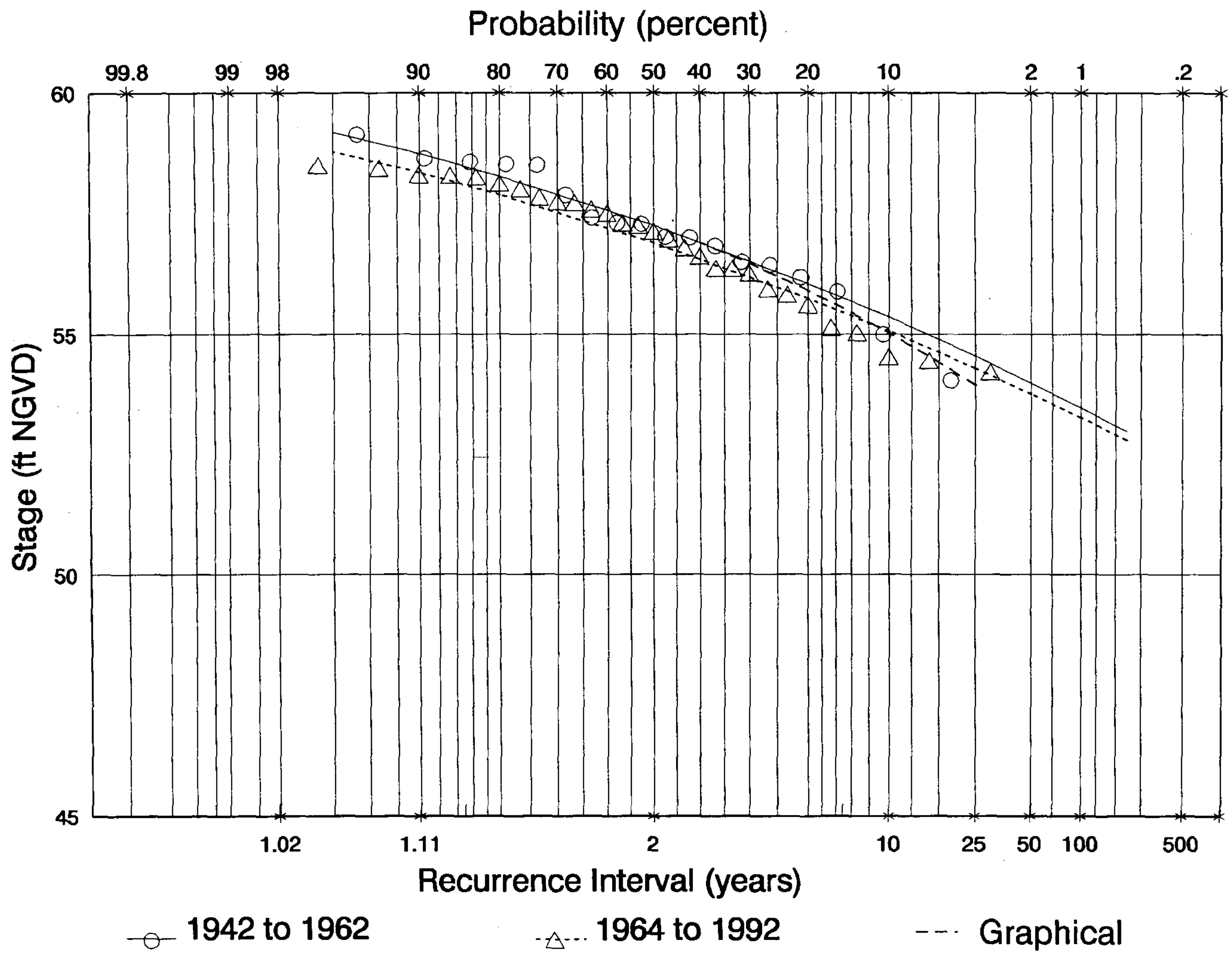

Figure 44. Probability plot of 30-day average low stages for Lochloosa Lake, excluding estimates of

higher than the Orange Lake stage compared to the post-weir period. In addition, low stage data were not available for 1953 through part of 1956. During this period, rainfall in the Orange Creek Basin was very low (Table B1, Appendix B). An alternative analysis of the data was performed by adjusting the frequency plot using Riggs (1972) (Figure 44). The results from this analysis more closely followed the Weibull plot such that the pre-weir low stages in Lochloosa Lake for extreme drought conditions were lower than the post-weir stages.

Orange Lake low stages were higher after the construction of the weir (Figure 45); for example, the post-weir 10-yr 30-day low stage is higher than the pre-weir 10-yr 30-day low stage by about 1.2 ft.

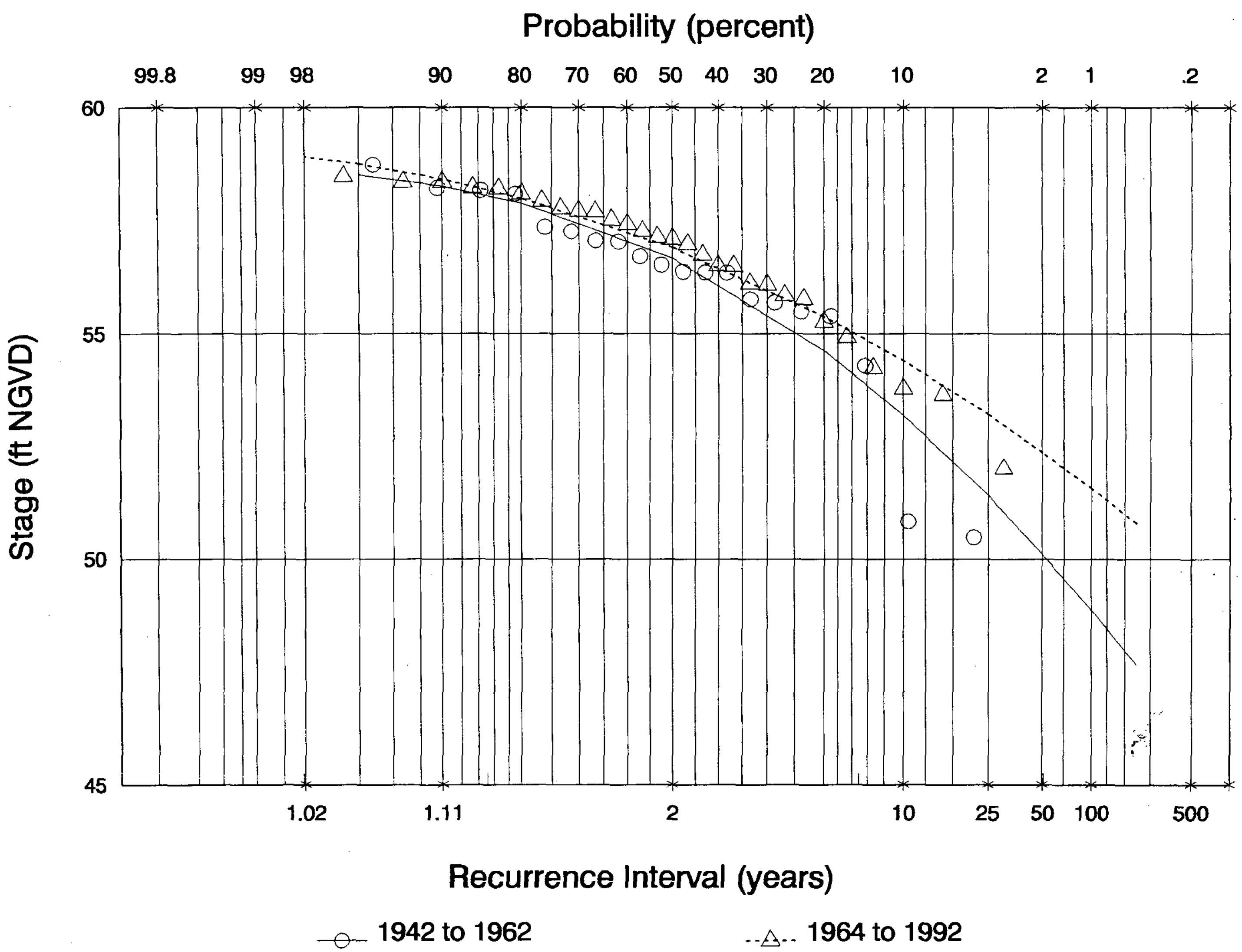

Figure 45. Probability plot of 30-day average low stages for Orange

WATER MANAGEMENT CONCERNS

The hydrology of Orange, Lochloosa, and Newnans lakes and Paynes Prairie has been modified with outlet weirs, levees, and canals and by attempts to plug the Orange Lake sinkhole. These hydrologic alterations were done in a time when environmental concerns were not addressed. At that time, Paynes Prairie was not considered a historical asset but land to be used for cattle ranching. As a result, the water and land resources were altered to maximize rangeland.

Two primary concerns need to be addressed: (1) how to develop an ecosystem-based management plan for Orange, Lochloosa, and Newnans lakes so that ecological functions are restored and beneficial uses are maintained and (2) how to manage the surface waters affecting Paynes Prairie so that the management goals of FDEP can be met.

To restore ecological functions and to maintain the beneficial uses of Orange, Lochloosa, and Newnans lakes, many ecological components of the ecosystem must be considered. Sport fish are only one component of a complex aquatic and wetland ecosystem which is constructed of many diverse abiotic elements and biotic communities. The use of these lakes depends on the health of the lake ecosystem. With this in mind, the management plan that will best restore and maintain a healthy lake ecosystem should be determined.

In taking steps to restore and to protect the existing ecosystem, care must be taken to control the growth of exotic plants which have invaded the lakes. Currently, through the coordinated effort of various agencies, aquatic weeds are treated with regular application of aquatic herbicides.

Paynes Prairie must be considered in the same manner as the lakes—it is an ecosystem. However, the concern is somewhat different. Past hydrologic modifications have altered the historic nature of Paynes Prairie. Primary management objectives of

FDEP for Paynes Prairie are to restore and to maintain natural and cultural resources of the preserve as representative samples of Florida's original natural systems, that is, conditions that existed prior to the ecological disruptions caused by the arrival of Europeans in A.D. 1500 (FDNR 1986). Surface water management alternatives directly affect the ability of FDEP to attain the overall management goals for Paynes Prairie.

In addressing all of these concerns, another important consideration must be recognized. The potential for flood damage must be mitigated. The threat of flood damage around the lakes and in the prairie is not severe, but future actions may increase the threat of flooding.

SUMMARY

This report presents results from hydrologic analyses based on existing data and basin information from other related reports that characterize the water resources of UOCB. Also, this report has identified social, economic, and cultural aspects of the area. Finally, water management concerns are identified.

The drainage area of UOCB, including Paynes Prairie, delineated for this reconnaissance is about 399 mi^2. The major hydrologic features in this watershed are Newnans, Lochloosa, and Orange lakes and Paynes Prairie. These lakes and Alachua Lake (in Paynes Prairie) make up 77.7% of the total open water in the watershed.

Flow into and out of these lakes is controlled by a variety of water control structures. Newnans Lake outlet is controlled by a stoplog weir that allows the crest to be raised or lowered. Inflow into Paynes Prairie from Prairie Creek is controlled by gated culverts and outflow from Alachua Lake into Alachua Sink also is controlled by gated culverts. Camps Canal directs the majority of Prairie Creek flow into Orange Lake. The outflow from Orange Lake is controlled by a fixed crest weir.

The water resources of this area should be managed wisely so that the prairie and the lake ecosystems are restored and protected for current and future generations to enjoy. Paynes Prairie is a state preserve with historical significance and is maintained by park officials as a natural resource for public use. Orange, Lochloosa, and Newnans lakes attract sports fishermen and water recreationalists, who contribute to the local economy.

The annual average rainfall from 1897 to 1992 is 51.00 in., although extended periods (40 years) of low average rainfall have occurred. June through September (warm season) is generally wetter than December through March (cold season). The warm season average rainfall is 26.38 in. compared to a cold season

average of 13.28 in. The maximum 24-hr rainfall recorded at Gainesville is 7.55 in. on 25 August 1972.

Over the period of recorded discharges, only a small portion of the rainfall (7%) results in surface water discharge. The average discharge for the period 1983–92 is 68.3 cfs in Prairie Creek at State Road 20, 58.1 cfs in Camps Canal at County Road 234, 3.7 cfs in Lochloosa Slough at U.S. 301, and 50.0 cfs at the Orange Lake outlet at U.S. 301.

Lake stage statistics are presented that characterize lake water levels in UOCB. Water level fluctuations are an important requirement for preservation and enhancement of water quality and the ecology of the lakes. Orange Lake has the largest range of water levels; Alachua Lake has the second largest (Table 16). The range of water levels for Orange Lake is 2.40 ft greater than the water level range for Lochloosa Lake and 2.95 ft greater than the water level range for Newnans Lake. The middle range of water levels for Orange Lake is 0.14 ft greater than the middle range of Lochloosa Lake and 0.71 ft greater than the middle range of Newnans Lake. In contrast, the lower range of water levels for Orange Lake is 2.29 ft greater than the lower range of Lochloosa Lake and 3.74 ft greater than the lower range of Newnans Lake. This comparison indicates the severity of the lowest elevation reached in Orange Lake compared to the two other recreational lakes.

There are two primary water management concerns that need to be addressed:

- How to develop an ecosystem-based management plan for Orange, Lochloosa, and Newnans lakes so that ecological functions are restored and beneficial uses are maintained

- How to manage the surface waters affecting Paynes Prairie so that the management goals of FDEP can be met.

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APPENDIX A—AREA, ELEVATION, AND TYPE OF LAKE

Table A1. Lakes within the Newnans Lake subbasin

Name	Area (acres)	Elevation (feet)	Lake Type	Latitude	Longitude
Saluda Swamp	326	148	4	294424	820746
Unnamed lake	12	159	2	294330	820701
Unnamed lake	14	153	4	294320	820648
Unnamed lake	25	112	1	294150	821011
Newnans Lake	7,427	66	3	293910	821306
Unnamed lake	397	101	1	294048	820842
Unnamed lake	19	83	4	293702	821543

Type 1: Lakes with streams flowing into them
Type 2: Lakes with streams flowing out of them
Type 3: Lakes with streams flowing into and out of them
Type 4: Lakes that are landlocked

Source: Shafer et al. 1986

Table A2. Lakes within the Paynes Prairie subbasin

Name	Area (acres)	Elevation (feet)	Lake Type	Latitude	Longitude
Calf Pond	14	78	4	293740	821712
Perch Lake	1	76	4		
Unnamed lake	31	78	4	293738	821627
Bivens Arm	189	63	3	293728	822038
Chacala Pond	129	62	2	293244	821701
Georges Pond	57	69	4	293200	821840
Sawgrass Pond	94	67	3	293152	821735
Unnamed lake	27	63	4	293118	821708
Wauberg Lake	248	67	4	293150	821806
Paynes Prairie Lake	4,292	56	3	293528	821848

Type 1: Lakes with streams flowing into them
Type 2: Lakes with streams flowing out of them
Type 3: Lakes with streams flowing into and out of them
Type 4: Lakes that are landlocked

Note: Blank cells indicate information not included in source document.

Source: Shafer et al. 1986

Table A3. Lakes within the Lochloosa Lake subbasin

Name	Area (acres)	Elevation (feet)	Lake Type	Latitude	Longitude
Elizabeth, Lake	115	128	2	294156	820536
Marans Prairie	251	113	3	294116	820643
Unnamed lake	11	118	1	294010	820552
Unnamed lake	12	144	1	294125	820427
Unnamed lake	160	115	1	294036	820547
Unnamed lake	22	107	2	294052	820710
Unnamed lake	11	163	3	294038	820457
Unnamed lake	12	133	3	294124	820514
Unnamed lake	16	158	4	294348	820634
Unnamed lake	12	159	3	294308	820716
Unnamed lake	19	128	4	294248	820828
Unnamed lake	48	128	4	294222	820817
Unnamed lake	24	98	4	294044	821029
Unnamed lake	15	107	2	293830	820808
Unnamed lake	13	104	3	293838	820523
Unnamed lake	15	121	4	293856	820610
Unnamed lake	92	120	1	293914	820632
Unnamed lake	10	118	2	293838	820628
Unnamed lake	53	90	3	293758	820816
Unnamed lake	109	107	3	293826	820659
Unnamed lake	73	87	4	293850	820935

Table A3—*Continued*

Name	Area (acres)	Elevation (feet)	Lake Type	Latitude	Longitude
Unnamed lake 1	48	98	7	293556	821040
Unnamed lake 2	52	98	4	293548	821040
Unnamed lake	27	141	2	293622	820636
Unnamed lake	11	103	3	293400	820525
Watson Prairie	381	67	1	293202	820953
Unnamed lake	10	63	4	293112	821337
Jeffords, Lake	162	82	3	293252	820523
Unnamed lake	22	83	2	293158	820514
Unnamed lake	157	70	3	293058	820516
Little Lochloosa Lake	2,642	58	3	292920	820822
Lochloosa Lake	5,705	58	3	293138	820826

Type 1: Lakes with streams flowing into them
Type 2: Lakes with streams flowing out of them
Type 3: Lakes with streams flowing into and out of them
Type 4: Lakes that are landlocked

Source: Shafer et al. 1986

Table A4. Lakes within the Orange Lake subbasin

Name	Area (acres)	Elevation (feet)	Lake Type	Latitude	Longitude
Unnamed lake	10	74	4	293518	821239
Unnamed lake	14	72	4	293512	821342
Unnamed lake	18	73	4	293608	821351
Unnamed lake	321	62	2	293514	821534
Fish Pond	102	63	4	293050	821451
Hay Lake	90	63	4	293010	821433
Hog Pond	29	63	4	293100	821540
Lowman Pond	196	63	1	293146	821520
Unnamed lake	25	60	4	293422	821415
Unnamed lake	14	66	4	293320	821427
Unnamed lake	31	60	4	293334	821400
River Styx	576	58	3	293156	821346
Unnamed lake	10	64	3	293134	821221
Unnamed lake	13	64	2	293142	821206
Unnamed lake	13	67	2	293118	821143
Orange Lake	12,706	58	3	292720	821020

Type 1: Lakes with streams flowing into them
Type 2: Lakes with streams flowing out of them
Type 3: Lakes with streams flowing into and out of them
Type 4: Lakes that are landlocked

Source: Shafer et al. 1986

Table A5. Lakes within the various closed subbasins

Name	Area (acres)	Elevation (feet)	Lake Type	Latitude	Longitude
Palatka Pond	12	74	4	293323	821217
Perry Pond	20	61	4	293426	821337
Tillmans Pond	39	73	4	293412	821255
Fish Prairie	194	63	4	293024	821415
Tuscawilla Lake	680	83	4	292942	821607
Unnamed lake	35		4	292938	821708
Oldfield Pond				292823	821544
Unnamed lake	11		4	292512	821442

Type 1: Lakes with streams flowing into them
Type 2: Lakes with streams flowing out of them
Type 3: Lakes with streams flowing into and out of them
Type 4: Lakes that are landlocked

Note: Blank cells indicate information not included in source document.

Source: Shafer et al. 1986

APPENDIX B—GAINESVILLE RAINFALL AND PAN EVAPORATION DATA

Table B1. Monthly and annual rainfall (in inches) at Gainesville, January 1897–October 1992

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
1897	2.05	8.78	0.96	4.89	2.18	4.41	7.18	5.99	7.29	4.31	1.08	4.35	53.47
1898	1.07	3.49	0.83	2.85	2.06	3.28	12.71	8.21	3.47	6.27	2.93	3.31	50.48
1899	3.81	4.15	0.80	0.14	1.75	2.43	6.89	7.69	3.98	1.76	0.57	1.15	35.12
1900	3.98	1.85	7.85	7.83	4.05	10.12	4.15	2.33	2.66	2.39	0.69	4.34	52.24
1901	2.69	9.20	6.97	1.60	2.03	8.66	7.76	9.54	4.08	3.30	0.27	2.97	59.07
1902	0.27	3.43	4.15	1.70	1.14	8.21	4.85	2.77	10.42	3.30	4.27	7.31	51.82
1903	5.15	5.29	6.68	0.37	5.05	5.71	5.72	8.63	4.12	0.70	0.25	1.49	49.16
1904	11.79	2.83	1.35	1.83	0.88	6.08	7.33	4.29	4.95	2.77	2.63	2.32	49.05
1905	0.94	3.29	2.64	1.54	4.27	8.82	8.30	14.90	5.99	2.95	0.46	5.63	59.73
1906	3.00	1.73	1.57	0.56	6.67	10.55	10.28	4.49	2.29	1.83	0.11	0.35	43.43
1907	0.81	0.87	0.32	3.08	3.91	4.35	6.78	5.55	10.39	2.57	2.38	4.54	45.55
1908	3.28	2.95	0.16	1.66	1.78	8.95	6.28	5.31	9.62	2.38	0.65	0.10	43.12
1909	3.15	1.71	1.88	1.02	1.83	4.28	16.41	4.84	1.48	1.00	0.30	3.77	41.67
1910	1.44	2.04	2.67	1.49	1.46	11.89	6.89	9.32	1.27	6.70	2.79	0.76	48.72
1911	1.84	0.13	1.09	1.23	4.45	2.91	3.45	8.16	5.87	1.50	4.53	3.68	38.84
1912	5.38	2.47	5.99	1.42	3.25	11.63	5.98	7.71	8.72	4.14	1.33	3.02	61.04
1913	2.94	4.83	5.79	0.63	2.67	4.07	9.39	7.93	6.50	2.53	0.29	6.70	54.27
1914	5.29	3.60	3.40	1.28	0.16	4.82	7.02	3.08	7.23	3.03	1.54	5.18	45.63
1915	3.00	2.98	4.39	0.88	2.43	5.02	3.81	5.32	5.34	7.21	2.59	4.88	47.85
1916	0.61	0.22	0.82	1.20	5.15	6.15	8.00	7.12	3.69	2.04	3.95	7.25	46.20
1917	0.98	2.53	1.40	2.34	0.88	2.70	6.73	5.74	6.60	0.55	0.72	1.62	32.79

Table B1—*Continued*

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
1918	2.90	0.25	1.98	5.11	2.72	4.61	4.36	10.21	5.46	3.81	3.39	3.46	48.26
1919	2.06	4.50	5.37	1.36	4.67	7.83	6.49	8.12	6.90	3.32	1.46	2.23	54.31
1920	3.19	6.61	1.01	8.24	5.52	5.99	7.00	5.73	11.36	0.34	4.86	3.86	63.71
1921	3.39	0.82	0.14	1.32	3.03	5.70	15.03	2.82	2.46	6.03	4.97	1.44	47.15
1922	3.03	3.45	3.25	2.16	7.59	3.93	5.09	6.25	4.26	7.86	0.17	4.29	51.33
1923	1.05	2.06	1.95	0.89	8.01	12.51	2.30	7.04	1.81	1.94	0.23	1.93	41.72
1924	5.53	3.56	9.97	5.15	0.84	5.66	14.45	3.20	6.50	5.53	0.39	1.18	61.96
1925	5.43	2.30	1.41	0.88	2.46	4.84	8.11	6.06	2.00	3.21	0.97	8.02	45.69
1926	5.59	1.42	4.93	4.51	1.60	8.85	7.03	7.00	5.69	0.88	4.39	1.60	53.49
1927	0.19	5.78	2.33	0.46	0.46	10.53	5.46	5.48	1.02	2.33	1.03	1.82	36.89
1928	1.26	2.73	2.91	8.52	4.50	7.64	9.23	11.91	9.38	1.41	0.22	1.03	60.74
1929	6.33	1.51	4.53	4.24	3.89	7.06	6.24	5.71	8.86	1.31	0.25	4.88	54.81
1930	3.87	3.11	6.49	2.12	4.99	12.03	3.10	3.40	8.64	1.08	1.68	4.90	55.41
1931	2.02	2.72	5.05	2.83	2.85	1.53	10.35	6.82	1.41	0.16	0.49	0.84	37.07
1932	1.41	1.90	5.26	1.61	1.21	10.00	3.89	4.78	3.44	1.15	5.89	0.37	40.91
1933	2.86	2.55	3.74	8.40	3.71	1.62	6.27	7.57	8.21	3.24	0.59	0.56	49.32
1934	0.44	4.65	2.58	6.03	6.52	8.57	6.33	5.01	1.68	5.75	0.52	0.86	48.94
1934	0.44	4.65	2.58	6.03	6.52	8.57	6.33	5.01	1.68	5.75	0.52	0.86	48.94
1935	1.74	2.05	0.69	2.72	2.67	5.83	11.18	12.15	11.03	0.40	0.67	1.97	53.10
1936	3.97	7.88	2.78	0.46	3.09	7.21	7.00	5.11	1.08	8.13	0.10	2.63	49.44
1937	3.32	4.60	3.03	5.81	2.68	2.74	4.72	13.92	4.49	4.40	3.88	1.76	55.35

Table B1—*Continued*

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
1938	1.90	2.24	1.38	0.68	5.34	9.63	5.11	5.95	4.61	9.19	0.74	0.53	47.30
1939	1.84	5.70	1.00	4.51	3.77	10.45	6.67	7.28	2.15	1.51	1.65	3.33	49.86
1940	2.65	4.17	2.89	6.91	3.34	5.77	5.86	5.47	2.70	0.09	0.32	8.72	48.89
1941	3.51	3.26	2.27	3.71	1.77	10.57	5.76	6.12	3.15	5.88	2.90	6.24	55.14
1942	4.09	4.54	7.25	0.52	0.54	9.31	2.79	5.08	5.88	2.21	0.39	4.70	47.30
1943	1.45	0.12	2.77	2.55	4.94	5.53	6.50	8.07	5.41	0.26	0.40	2.43	40.43
1944	4.02	1.59	8.57	6.44	1.80	2.22	9.32	7.16	2.66	10.00	0.31	1.13	55.22
1945	2.25	1.63	0.00	4.28	2.72	5.42	9.52	15.15	4.26	1.39	2.00	9.22	57.84
1946	1.95	2.74	2.26	1.70	7.00	11.58	10.25	5.67	4.13	4.57	1.28	0.19	53.32
1947	1.40	4.67	8.75	1.70	4.16	5.52	9.98	5.26	9.84	7.20	3.28	2.00	63.76
1948	6.19	1.83	8.51	2.06	2.99	3.31	7.94	9.82	3.35	5.96	1.20	3.10	56.26
1949	1.16	5.94	2.45	8.95	0.49	7.57	9.95	14.43	6.72	1.09	4.17	0.26	63.18
1950	0.11	0.54	4.75	2.16	0.92	2.80	12.63	1.45	11.99	6.35	0.24	2.79	46.73
1951	1.07	1.05	5.00	2.16	2.31	3.95	9.73	10.99	7.46	3.22	6.48	2.55	55.97
1952	1.04	7.32	2.33	3.20	4.44	3.31	3.85	3.99	4.66	4.73	0.88	2.39	42.14
1953	4.60	1.05	3.87	8.43	2.29	12.35	6.71	12.78	6.18	3.19	2.60	7.62	71.67
1954	1.12	1.64	2.58	3.05	3.54	3.81	3.75	5.02	4.79	2.70	1.44	1.80	35.24
1955	3.60	3.14	1.66	1.21	1.88	7.83	10.51	4.71	4.40	1.15	2.54	0.09	42.72
1956	3.14	4.19	0.84	2.78	4.51	9.67	7.24	6.81	3.05	5.57	0.16	0.02	47.98
1957	0.59	2.37	5.12	3.94	6.69	7.51	8.72	10.33	6.50	1.94	2.12	0.87	56.70
1958	4.10	3.80	7.15	5.68	5.54	4.91	7.62	8.98	1.56	3.91	3.36	3.25	59.86

Table B1—*Continued*

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
1959	3.72	4.37	10.48	4.12	9.25	4.44	4.00	7.33	5.25	5.65	1.69	0.84	61.14
1960	2.51	3.76	7.48	2.73	1.37	12.80	9.40	7.63	6.38	6.12	0.12	2.64	62.94
1961	2.50	6.15	1.27	3.54	1.07	4.14	9.10	12.83	3.15	0.77	2.35	0.88	47.75
1962	1.66	1.87	2.30	1.79	2.19	8.35	7.04	8.62	6.00	3.28	1.92	1.69	46.71
1963	2.21	4.52	2.56	1.30	3.51	3.57	6.83	3.21	3.14	0.26	3.25	2.91	37.27
1964	8.87	6.61	1.87	4.23	1.61	4.86	10.59	14.15	13.04	2.15	2.40	6.57	76.95
1965	2.51	5.80	4.82	1.78	2.21	15.74	10.86	7.62	5.16	1.54	1.55	4.41	64.00
1966	3.58	6.18	1.93	1.85	8.92	7.26	4.46	5.11	12.25	1.44	0.59	1.13	54.70
1967	3.55	5.52	1.33	0.39	4.35	9.31	10.16	7.74	3.03	0.29	0.99	5.88	52.54
1968	0.67	2.36	2.23	0.18	3.15	5.95	9.45	12.27	5.21	4.25	3.09	1.02	49.83
1969	1.51	4.59	5.42	0.91	2.97	2.77	6.55	8.48	9.64	1.27	3.70	5.74	53.55
1970	4.32	7.92	7.55	2.98	6.93	6.53	7.36	10.80	1.87	1.97	0.15	2.15	60.53
1971	3.00	3.85	2.08	2.99	3.75	3.59	5.47	12.73	3.10	4.46	2.22	3.10	50.34
1972	4.98	3.31	7.51	2.89	9.19	10.22	3.16	12.99	1.12	0.99	7.27	4.15	67.78
1973	4.16	4.33	6.14	5.74	3.97	6.72	6.29	2.93	3.84	0.51	0.84	5.13	50.60
1974	0.25	2.58	2.39	1.17	5.68	10.05	7.95	7.20	7.27	0.91	1.03	4.03	50.51
1975	3.11	4.25	0.99	2.21	5.01	4.87	6.45	4.41	12.55	3.01	1.05	3.69	51.60
1976	1.20	1.49	1.46	3.19	6.65	11.37	4.59	2.84	5.36	2.21	2.78	4.97	48.11
1977	3.35	4.16	1.22	0.83	0.46	2.26	1.44	7.10	5.72	0.13	1.95	4.94	33.56
1978	6.20	4.98	4.52	0.64	3.45	3.90	10.36	9.64	0.25	0.47	0.00	4.79	49.20
1979	8.69	2.34	1.17	8.18	3.36	4.55	4.39	7.39	12.23	0.11	1.32	6.09	59.82

Table B1—*Continued*

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
1980	6.20	1.88	2.97	4.18	5.08	2.29	8.66	3.18	3.71	1.70	1.43	0.28	41.56
1981	1.20	6.21	3.54	0.40	0.83	6.79	2.91	4.98	1.10	0.81	4.20	2.97	35.94
1982	5.21	5.00	5.42	8.73	3.11	8.74	6.76	6.18	7.10	1.21	1.65	1.47	60.58
1983	2.89	5.29	7.19	7.26	4.20	10.04	4.18	1.64	10.95	1.36	4.44	5.91	65.35
1984	1.19	4.76	3.24	3.26	6.92	2.88	6.15	3.36	2.40	1.79	2.86	0.44	39.25
1985	1.20	1.97	1.37	4.70	3.43	6.46	5.39	13.43	3.29	4.34	3.30	0.95	49.83
1986	6.27	5.35	3.55	0.63	0.98	2.97	6.74	8.54	3.10	3.29	3.96	3.65	49.03
1987	4.53	5.42	10.28	0.45	4.27	2.95	3.90	5.40	3.67	0.27	4.31	1.18	46.63
1988	5.11	4.75	7.78	1.35	3.24	3.30	3.85	14.88	11.16	1.26	3.20	1.33	61.21
1989	1.14	1.19	1.56	1.34	1.98	10.68	3.98	6.08	8.09	3.12	1.81	4.02	44.99
1990	1.88	2.86	3.62	3.67	3.18	5.71	10.43	8.10	2.14	3.51	1.07	1.39	47.56
1991	6.79	0.66	10.19	5.95	4.15	6.83	7.71	7.64	2.73	2.48	0.32	1.54	56.99
1992	5.69	0.66	3.98	3.59	4.15	6.83	5.21	9.63	2.14	6.70			
Maximum	11.79	9.20	10.48	8.95	9.25	15.74	16.41	15.15	13.04	10.00	7.27	9.22	76.95
Mean	3.09	3.47	3.69	3.00	3.51	6.59	7.10	7.33	5.36	2.93	1.91	3.05	51.00
Normal*	3.44	4.25	3.64	2.76	3.86	6.29	6.52	7.79	5.69	1.76	2.36	3.23	51.58
Minimum	0.11	0.12	0.00	0.14	0.16	1.53	1.44	1.45	0.25	0.09	0.00	0.02	32.79

*Normal = average for the period 1951–90

Table B2. Gainesville seasonal rainfall, 1897–1992

Year	Annual	Warm Season Jun-Sep	Cold Season Dec-Mar	Wet Season Jun-Oct	Dry Season Nov-May	Year	Annual	Warm Season Jun-Sep	Cold Season Dec-Mar	Wet Season Jun-Oct	Dry Season Nov-May
1897	53.47	24.87	*	29.18	*	1945	57.84	34.35	5.01	35.74	12.32
1898	50.48	27.67	9.74	33.94	15.73	1946	53.32	31.63	16.17	36.20	26.87
1899	35.12	20.99	12.07	22.75	16.89	1947	63.76	30.60	15.01	37.80	22.15
1900	52.24	19.26	14.83	21.65	27.28	1948	56.26	24.42	18.53	30.38	26.86
1901	59.07	30.04	23.20	33.34	27.52	1949	63.18	38.67	12.65	39.76	23.29
1902	51.82	26.25	10.82	29.55	13.93	1950	46.73	28.87	5.66	35.22	12.91
1903	49.16	24.18	24.43	24.88	34.12	1951	55.97	32.13	9.91	35.35	14.62
1904	49.05	22.65	17.46	25.42	20.42	1952	42.14	15.81	13.24	20.54	27.36
1905	59.73	38.01	9.19	40.96	17.63	1953	71.67	38.02	11.91	41.21	23.51
1906	43.43	27.61	11.93	29.44	19.62	1954	35.24	17.37	12.96	20.07	22.15
1907	45.55	27.07	2.35	29.64	9.45	1955	42.72	27.45	10.20	28.60	14.73
1908	43.12	30.16	10.93	32.54	16.75	1956	47.98	26.77	8.26	32.34	18.09
1909	41.67	27.01	6.84	28.01	10.34	1957	56.70	33.06	8.10	35.00	18.89
1910	48.72	29.37	9.92	36.07	13.17	1958	59.86	23.07	15.92	26.98	29.26
1911	38.84	20.39	3.82	21.89	12.29	1959	61.14	21.02	21.82	26.67	38.55
1912	61.04	34.04	17.52	38.18	26.72	1960	62.94	36.21	14.59	42.33	20.38
1913	54.27	27.89	16.58	30.42	21.21	1961	47.75	29.22	12.56	29.99	17.29
1914	45.63	22.15	18.99	25.18	20.72	1962	46.71	30.01	6.71	33.29	13.04
1915	47.85	19.49	15.55	26.70	20.40	1963	37.27	16.75	10.98	17.01	17.71
1916	46.20	24.96	6.53	27.00	15.47	1964	76.95	42.64	20.26	44.79	29.35
1917	32.79	21.77	12.16	22.32	19.33	1965	64.00	39.38	19.70	40.92	26.09

*Season began prior to recordkeeping.

Table B2—*Continued*

Year	Annual	Warm Season Jun-Sep	Cold Season Dec-Mar	Wet Season Jun-Oct	Dry Season Nov-May	Year	Annual	Warm Season Jun-Sep	Cold Season Dec-Mar	Wet Season Jun-Oct	Dry Season Nov-May
1918	48.26	24.64	6.75	28.45	15.30	1966	54.70	29.08	16.10	30.52	28.42
1919	54.31	29.34	15.39	32.66	24.81	1967	52.54	30.24	11.53	30.53	16.86
1920	63.71	30.08	13.04	30.42	28.26	1968	49.83	32.88	11.14	37.13	15.46
1921	47.15	26.01	8.21	32.04	17.42	1969	53.55	27.44	12.54	28.71	19.51
1922	51.33	19.53	11.17	27.39	25.89	1970	60.53	26.56	25.53	28.53	39.14
1923	41.72	23.66	9.35	25.60	18.42	1971	50.34	24.89	11.08	29.35	17.97
1924	61.96	29.81	20.99	35.34	27.21	1972	67.78	27.49	18.90	28.48	33.20
1925	45.69	21.01	10.32	24.22	14.05	1973	50.60	19.78	18.78	20.29	35.76
1926	53.49	28.57	19.96	29.45	27.04	1974	50.51	32.47	10.35	33.38	18.04
1927	36.89	22.49	9.90	24.82	15.21	1975	51.60	28.28	12.38	31.29	20.63
1928	60.74	38.16	8.72	39.57	22.77	1976	48.11	24.16	7.84	26.37	18.73
1929	54.81	27.87	13.40	29.18	21.75	1977	33.56	16.52	13.70	16.65	17.77
1930	55.41	27.17	18.35	28.25	25.71	1978	49.20	24.15	20.64	24.62	26.68
1931	37.07	20.11	14.69	20.27	22.05	1979	59.82	28.56	16.99	28.67	28.53
1932	40.91	22.11	9.41	23.26	12.72	1980	41.56	17.84	17.14	19.54	27.72
1933	49.32	23.67	9.52	26.91	27.52	1981	35.94	15.78	11.23	16.59	13.89
1934	48.94	21.59	8.23	27.34	21.37	1982	60.58	28.78	18.60	29.99	34.64
1935	53.10	40.19	5.34	40.59	11.25	1983	65.35	26.81	16.84	28.17	29.95
1936	49.44	20.40	16.60	28.53	20.82	1984	39.25	14.79	15.10	16.58	29.72
1937	55.35	25.87	13.58	30.27	22.17	1985	52.88	28.57	4.98	32.91	15.97
1938	47.30	25.30	7.28	34.49	17.18	1986	49.03	21.35	16.12	24.64	21.03

Table B2—*Continued*

Year	Annual	Warm Season Jun-Sep	Cold Season Dec-Mar	Wet Season Jun-Oct	Dry Season Nov-May	Year	Annual	Warm Season Jun-Sep	Cold Season Dec-Mar	Wet Season Jun-Oct	Dry Season Nov-May
1939	49.86	26.55	9.07	28.06	18.09	1987	46.63	15.92	23.88	16.19	32.56
1940	48.89	19.80	13.04	19.89	24.94	1988	61.21	33.19	18.82	34.45	27.72
1941	55.14	25.60	17.76	31.48	23.56	1989	44.99	28.83	5.22	31.95	11.74
1942	47.30	23.06	22.12	25.27	26.08	1990	47.56	26.38	12.38	29.89	21.04
1943	40.43	25.51	9.04	25.77	16.92	1991	56.99	24.91	19.03	27.39	30.20
1944	55.22	21.36	16.61	31.36	25.25	1992		23.81	11.87	30.51	19.93
						Max	76.95	42.64	25.53	44.79	39.14
						Mean	51.03	26.38	13.28	29.31	21.69
						Norm	51.68	26.29	14.60	28.05	23.54
						Min	32.79	14.79	2.35	16.19	9.45

Table B3. Maximum rainfall data for Gainesville (in inches), 1903–92

Year	24-hr	48-hr	72-hr	96-hr	5-day	10-day	Start Day (from January 1)					
1903	2.18	2.30	2.42	2.49	2.56	4.03	178	62	62	62	206	206
1904	4.83	4.86	4.86	4.86	5.26	6.15	10	10	9	8	6	20
1905	3.51	4.12	5.28	6.56	7.84	10.78	217	217	215	214	213	212
1906	3.17	4.38	5.47	5.82	7.25	8.94	193	163	191	190	159	155
1907	2.51	2.83	3.69	4.06	4.93	6.93	222	222	265	265	266	262
1908	3.21	3.21	4.63	4.98	5.51	5.86	249	248	249	249	249	245
1909	6.77	7.56	7.87	8.03	8.09	9.51	184	183	182	181	180	183
1910	4.01	4.13	4.40	4.88	5.27	8.44	292	292	290	162	161	158
1911	2.35	3.07	3.61	3.65	3.76	7.41	249	248	247	246	240	240
1912	2.75	3.76	4.29	5.80	6.69	7.68	72	159	159	160	159	154
1913	2.76	4.79	4.97	5.01	5.01	5.74	188	358	357	357	356	350
1914	3.15	3.79	3.99	4.06	4.14	5.21	24	24	24	23	22	268
1915	2.88	3.48	3.97	4.30	4.87	8.10	90	354	353	352	277	272
1916	3.99	5.16	5.66	6.16	6.26	6.50	219	356	355	354	353	352
1917	2.32	3.23	3.54	3.61	3.64	4.74	272	232	232	232	231	225
1918	2.61	3.56	3.62	3.64	3.64	6.54	135	240	240	240	239	232
1919	2.95	4.31	5.20	5.45	6.07	8.78	220	181	181	180	181	176
1920	5.29	5.40	5.42	5.43	5.55	7.56	274	274	273	272	271	266
1921	4.08	4.93	5.92	6.02	6.02	9.26	319	196	181	181	180	181
1922	3.96	4.27	4.51	5.55	5.88	7.92	149	149	149	146	146	146
1923	2.52	3.13	3.58	3.63	4.02	6.95	160	160	160	160	148	151
1924	3.48	4.85	6.14	6.62	8.97	11.69	189	91	187	187	185	183
1925	2.89	2.94	2.95	3.97	4.13	5.75	216	216	216	353	212	208

Table B3—*Continued*

Year	24-hr	48-hr	72-hr	96-hr	5-day	10-day	Start Day (from January 1)					
1926	2.64	3.56	3.56	3.83	4.22	5.91	93	209	208	209	89	85
1927	3.15	3.17	3.18	3.19	4.39	4.68	50	50	49	48	46	41
1928	5.03	5.47	5.63	5.72	5.76	10.33	223	222	222	221	221	215
1929	3.53	4.20	4.20	4.20	4.20	5.59	106	105	104	103	102	3
1930	3.52	4.32	4.82	5.89	6.66	8.20	170	169	168	167	166	164
1931	3.18	4.07	4.59	4.88	5.60	7.03	193	193	193	192	193	188
1932	2.65	3.11	4.06	4.64	4.85	6.87	167	166	165	164	164	164
1933	5.53	6.97	7.16	7.16	7.81	8.00	248	248	247	246	248	243
1934	3.70	4.76	5.18	6.06	6.38	6.82	165	165	164	165	164	160
1935	4.43	4.64	4.67	5.00	6.23	9.36	248	247	246	247	244	239
1936	5.22	6.80	7.41	7.45	7.48	8.07	285	284	283	282	281	281
1937	6.00	6.27	6.43	6.59	7.17	7.76	243	243	243	242	239	235
1938	7.54	7.63	7.63	7.63	7.63	7.77	297	297	296	295	294	289
1939	4.43	4.45	4.45	4.50	4.52	6.36	58	58	57	58	58	165
1940	4.74	5.24	5.25	6.17	6.69	8.15	99	358	358	356	355	355
1941	2.92	4.33	4.57	5.38	5.62	7.63	227	168	168	166	166	166
1942	2.97	3.67	3.83	3.94	3.94	4.88	179	271	270	269	268	174
1943	2.76	2.76	3.11	3.53	3.80	4.90	242	241	178	242	242	171
1944	7.50	9.10	9.10	9.10	9.10	9.22	293	293	292	291	290	285
1945	3.34	5.73	6.83	7.39	7.78	9.72	360	233	232	231	230	225
1946	4.02	6.65	7.24	7.24	7.24	7.38	281	154	153	152	151	146
1947	3.60	6.34	6.36	6.37	6.42	7.36	289	266	265	264	263	258
1948	2.26	4.07	4.70	5.15	5.65	8.21	24	70	70	69	68	64

Table B3—*Continued*

Year	24-hr	48-hr	72-hr	96-hr	5-day	10-day	Start Day (from January 1)					
1949	6.22	7.27	7.79	8.08	8.11	11.12	96	95	94	93	92	235
1950	6.93	8.93	10.55	11.22	11.30	12.13	249	248	248	247	246	241
1951	3.72	4.52	5.26	5.54	5.54	6.21	241	320	319	318	215	210
1952	3.64	3.98	3.98	3.98	3.99	6.05	47	47	46	45	44	47
1953	4.58	4.58	5.34	6.15	6.78	8.47	97	96	166	234	234	233
1954	4.32	4.32	4.34	4.35	4.65	5.81	241	240	239	238	241	147
1955	2.89	3.19	3.36	4.44	4.48	6.86	167	167	167	192	192	189
1956	3.34	4.31	4.34	4.34	4.89	7.61	163	235	234	233	177	172
1957	3.28	3.55	4.32	5.16	6.20	7.64	218	159	218	157	218	213
1958	3.46	3.88	3.88	3.88	4.58	5.99	141	141	140	139	193	222
1959	4.04	4.45	5.48	5.83	6.78	8.59	222	222	74	74	74	70
1960	3.90	4.42	5.50	5.88	5.88	7.55	170	170	75	75	74	170
1961	2.87	3.17	4.45	4.45	4.45	6.83	222	181	200	199	198	222
1962	2.44	3.53	3.64	3.74	3.80	5.07	219	234	233	232	231	228
1963*	3.37	4.07	4.07	4.86	5.44	9.94	176	183	182	183	176	175
1964	6.77	9.82	10.92	11.04	11.04	12.73	255	254	254	253	252	247
1965	3.40	4.49	5.30	5.83	6.64	10.41	178	162	211	210	159	159
1966	4.67	5.24	5.56	5.59	5.59	6.25	128	128	128	127	126	121
1967	4.11	4.15	4.23	4.27	4.59	5.21	345	344	343	342	40	171
1968	3.96	4.20	5.88	5.92	5.93	5.93	158	158	241	241	240	235
1969*	4.07	5.13	5.39	5.46	5.48	7.84	264	264	264	263	262	264
1970	6.36	6.43	6.43	6.55	6.63	7.41	34	33	32	31	30	86
1971	3.43	3.99	4.52	5.00	5.16	6.78	228	228	227	226	225	220

*Year supplemented with NOAA station 3326 information

Table B3—*Continued*

Year	24-hr	48-hr	72-hr	96-hr	5-day	10-day	Start Day (from January 1)					
1972	7.55	9.03	9.21	9.23	9.71	10.81	238	238	237	237	235	235
1973	3.19	3.34	4.12	4.65	4.67	7.35	94	93	92	91	90	85
1974	2.53	2.54	3.97	4.41	4.41	4.91	166	166	175	175	174	157
1975	3.33	3.35	3.73	3.84	4.56	6.71	267	266	250	250	263	244
1976	4.66	4.75	4.75	8.53	8.53	10.75	172	172	171	172	171	172
1977	3.25	3.50	3.60	3.60	4.23	5.26	260	260	260	259	260	226
1978	3.58	4.48	4.89	4.98	5.49	8.94	214	213	213	212	213	206
1979	4.89	5.31	5.31	5.31	5.31	6.01	341	340	339	338	337	265
1980	3.45	4.60	5.30	5.66	5.74	6.84	207	206	206	205	205	202
1981	3.13	3.48	3.64	3.65	3.65	4.69	50	49	48	47	46	162
1982	5.02	5.86	6.93	7.60	7.60	7.63	99	98	98	98	97	98
1983	3.42	4.67	4.97	5.29	5.39	8.54	363	261	261	261	261	256
1984	2.78	3.17	3.37	3.82	3.94	6.66	149	144	147	144	145	141
1985*	3.15	4.23	5.56	6.11	6.35	8.45	103	242	241	241	241	235
1986*	2.12	3.12	3.37	3.83	3.92	4.87	333	333	333	333	333	223
1987	3.61	4.09	5.50	6.31	6.87	7.24	222	86	87	86	86	85
1988	6.60	8.10	8.17	9.52	9.58	9.64	251	251	251	251	251	246
1989	2.22	3.44	3.53	4.47	4.49	6.50	181	173	172	171	170	167
1990	2.86	5.10	6.23	7.09	7.14	8.67	175	196	195	194	193	194
1991	5.15	5.15	5.15	5.15	5.15	5.42	63	62	61	60	59	60
1992	4.83	6.16	6.18	6.19	6.19	6.57	279	278	277	277	276	277
Max	7.55	9.82	10.92	11.22	11.30	12.73						

*Year supplemented with NOAA station 3326 information

Table B4. Pan evaporation data (in inches) for Gainesville, October 1953–September 1992

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1953										4.07	3.43	3.29	*
1954	3.36	4.38	5.48	5.34	8.64	8.87	7.30	8.45	5.15	5.26	4.08	3.15	69.46
1955	3.32	4.16	6.23	7.59	8.55	9.02	7.86	8.19	6.27	5.86	3.93	2.65	73.63
1956	3.46	4.14	6.14	7.16	8.46	8.46	7.78	7.57	6.09	4.03	4.12	3.42	70.83
1957	3.37	*	5.97	6.71	7.18	7.13	7.73	6.64	5.38	4.58	3.53	3.37	*
1958	2.89	4.21	4.83	6.79	7.73	7.98	7.44	7.26	6.44	4.83	3.68	2.16	66.24
1959	2.74	3.81	4.72	6.16	7.96	6.79	6.81	6.50	5.74	5.08	3.35	2.59	62.25
1960	3.04	3.93	5.99	7.71	8.09	7.50	6.91	7.06	5.24	5.03	3.69	*	*
1961	*	3.83	5.98	6.94	7.77	7.23	7.26	6.25	5.62	5.17	3.89	3.15	*
1962	2.60	4.08	5.34	7.44	9.03	7.45	7.24	7.01	5.42	5.63	3.30	2.37	66.91
1963	2.92	3.29	6.44	7.93	7.81	7.28	7.73	6.99	5.39	5.69	3.30	2.42	67.19
1964	2.66	3.81	5.88	7.13	8.14	9.63	6.80	6.22	6.82	4.92	3.22	2.89	68.12
1965	3.34	3.81	5.25	7.44	9.74	7.07	7.04	6.94	5.74	5.17	3.46	2.73	67.73
1966	2.51	3.43	5.63	7.85	7.00	7.71	7.28	6.87	6.35	4.86	4.23	2.62	66.34
1967	3.32	3.76	6.33	8.55	9.89	*	7.05	6.70	6.32	5.48	4.38	2.84	*
1968	2.73	3.66	5.84	7.80	8.76	7.58	6.93	7.50	6.18	4.76	3.45	3.33	68.52
1969	2.75	3.10	4.67	7.13	7.11	8.08	*	5.47	5.27	3.10	3.00	3.00	*
1970	2.27	3.06	5.03	6.16	7.77	7.15	6.41	5.88	5.88	5.22	3.39	3.01	61.23
1971	2.69	3.59	5.18	6.69	7.70	7.03	6.55	6.01	5.67	4.28	3.76	2.62	61.77
1972	2.91	3.36	6.54	7.21	6.76	7.54	7.84	6.62	6.29	4.84	2.91	2.65	65.47
1973	2.58	3.52	5.30	7.00	8.46	6.97	7.32	6.45	5.23	5.25	4.10	2.78	64.96
1974	3.17	4.14	5.69	7.55	7.92	7.01	6.44	7.75	5.60	5.48	3.76	3.00	65.51

Table B4—*Continued*

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1975	3.32	3.51	5.93	6.66	7.63	6.67	5.49	6.57	5.29	4.67	3.26	2.91	61.91
1976	2.79	4.18	5.48	6.65	6.25	6.46	7.02	6.10	5.06	4.95	2.81	2.19	59.94
1977	2.82	4.23	5.92	7.43	8.30	9.35	8.14	6.46	5.71	4.79	3.46	2.49	69.10
1978	*	2.58	4.84	7.87	7.83	7.02	6.73	6.30	5.86	5.03	3.82	3.02	*
1979	*	2.52	5.63	6.63	6.58	6.81	7.14	6.20	5.09	5.22	3.46	2.53	*
1980	2.57	3.27	5.17	6.31	6.33	7.10	7.81	6.78	5.47	4.53	2.87	2.88	61.09
1981	2.92	3.70	5.41	6.84	9.03	8.29	6.93	5.54	5.69	5.11	3.46	2.46	65.38
1982	3.65	3.40	4.62	5.87	7.04	7.01	6.52	5.74	5.06	4.50	3.38	3.02	59.81
1983	2.51	3.43	5.13	6.38	7.35	6.36	7.43	6.38	5.66	4.81	2.74	1.96	60.14
1984	2.32	4.00	5.10	5.60	7.75	7.18	5.83	6.63	5.76	5.07	3.13	2.49	60.86
1985	2.89	3.66	5.86	*	8.26	7.85	6.26	5.48	5.41	4.98	3.30	2.63	*
1986	3.29	3.22	5.45	7.97	8.37	6.88	7.35	5.80	5.81	4.32	3.01	2.58	64.05
1987	2.62	3.25	4.67	6.53	7.37	6.92	7.44	6.51	5.03	5.58	4.01	2.88	62.81
1988	2.49	3.28	5.68	6.20	7.67	7.15	6.86	6.44	5.03	4.87	3.40	2.30	61.37
1989	3.07	3.89	5.33	6.56	8.26	7.81	7.17	7.03	5.27	4.92	3.18	2.65	65.14
1990	3.62	3.89	5.60	6.68	8.39	7.94	7.72	6.68	6.22	5.11	3.49	2.53	67.87
1992	2.68	3.06	4.70	5.70	6.90	6.02	6.78	5.31	4.78				
Maximum	3.65	4.38	6.54	8.55	9.89	9.63	8.14	8.45	6.82	5.86	4.38	3.42	73.63
Mean	2.92	3.63	5.50	6.92	7.89	7.47	7.09	6.53	5.64	4.89	3.48	2.74	64.70
Minimum	2.27	2.52	4.62	5.34	6.25	6.02	5.49	5.31	4.78	3.10	2.74	1.96	59.81

*Indicates that all or part of the record is missing

APPENDIX C—DISCHARGE DATA

Discharge data for the following stations were based on information from the USGS Automated Data Processing System or from the USGS Water Data Reports (USGS 1978–92).

Table C1. Monthly streamflow data (in cubic feet per second) for Prairie Creek at State Road 20, August 1978–September 1992

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1978								[P]295.0	142.8	27.5	14.1	11.3	81.8
1979	37.4	114.4	93.2	91.8	87.7	31.3	27.7	31.6	72.8	121.8	47.2	110.7	72.3
1980	130.1	168.9	132.9	153.4	86.8	58.4	59.1	37.8	20.1	17.7	13.0	12.0	74.2
1981	10.8	23.5	19.2	22.9	23.7	29.7	18.2	18.7	18.0	10.7	6.8	4.8	17.3
1982	4.3	8.6	57.9	185.5	116.9	94.2	87.8	61.2	64.0	78.3	35.8	12.5	67.2
1983	16.2	114.4	204.3	262.5	241.5	113.0	46.3	38.0	93.0	88.7	49.6	100.8	114.0
1984	179.3	133.4	168.6	176.0	95.7	65.0	57.0	76.7	29.3	8.0	3.5	2.0	82.9
1985	1.1	1.3	2.3	1.7	1.5	0.7	0.7	79.2	355.4	188.6	170.2	65.8	72.4
1986	147.1	230.4	210.1	104.1	11.5	6.3	5.1	9.1	52.1	16.2	12.8	45.1	70.8
1987	111.5	199.4	295.6	323.2	112.1	23.1	19.8	13.4	10.3	5.7	3.2	1.4	93.2
1988	0.6	15.6	202.9	129.4	21.7	5.1	2.8	3.0	334.1	184.1	50.0	30.1	81.6
1989	18.0	15.4	14.8	19.7	38.7	22.8	19.0	13.8	11.6	9.6	5.8	3.2	16.0
1990	5.7	8.4	12.4	11.6	10.1	8.3	10.9	12.7	11.1	9.3	5.5	3.0	9.1
1991	2.7	10.9	52.5	96.6	111.2	116.9	84.8	105.6	76.9	47.5	27.5	18.6	62.6
1992	15.0	24.4	45.9	48.0	43.0	38.3	56.9	66.6	119.8				
Maximum	179.3	230.4	295.6	323.2	241.5	116.9	87.8	295.0	355.4	188.6	170.2	110.7	114.0
Mean	48.5	76.4	108.0	116.2	71.6	43.8	35.4	57.5	94.1	72.7	39.3	33.9	66.4
Minimum	0.6	1.3	2.3	1.7	1.5	0.7	0.7	3.0	10.3	5.7	3.2	1.4	9.1

[P]Partial record used to calculate the monthly average discharge

Table C2. Monthly streamflow data (in cubic feet per second) for Camps Canal at County Road 234, August 1957–September 1960 and March 1978—September 1992

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1957								163.5	163.9	154.8	82.5	47.5	122.4
1958	37.7	42.1	211.1	215.1	160.6	88.4	79.7	77.2	51.1	23.7	37.6	40.2	88.7
1959	106.9	121.5	504.1	425.9	221.4	276.3	220.9	161.1	173.6	231.7	158.7	86.0	224.0
1960	55.5	50.0	253.3	260.2	103.1	54.6	99.5	328.6	336.2				
1978			[P]215.0	94.3	6.5	24.5	63.2	384.7	153.9	23.2	9.1	7.4	89.3
1979	27.3	117.2	115.6	41.6	89.3	19.6	19.7	17.8	36.3	50.9	22.8	55.8	51.2
1980	107.2	168.4	134.0	136.6	68.6	38.2	47.9	27.4	11.4	13.6	9.1	8.5	64.2
1981	7.2	13.7	8.9	10.8	11.7	15.2	9.3	15.0	17.1	15.1	8.8	7.1	11.7
1982	7.1	12.1	61.9	170.5	113.0	71.9	49.4	56.4	63.1	76.8	36.8	6.2	60.4
1983	12.9	104.1	170.0	239.0	220.7	108.9	49.1	44.3	57.5	51.0	40.5	114.3	101.0
1984	177.7	134.1	160.6	155.4	82.6	63.7	59.3	79.1	24.4	3.8	1.9	1.5	78.7
1985	1.3	1.9	3.0	2.3	1.4	0.3	0.6	64.4	347.2	193.1	181.1	83.5	73.3
1986	106.3	165.7	165.7	118.2	11.7	5.8	4.7	8.1	54.4	16.1	11.7	52.9	60.1
1987	139.7	222.7	308.7	355.8	132.1	25.1	16.7	9.7	7.8	5.1	3.7	2.1	102.4
1988	1.7	8.2	90.9	52.7	9.4	2.2	1.1	1.2	201.4	78.7	25.8	19.4	41.1
1989	13.1	11.5	13.8	14.5	29.9	20.2	15.6	8.9	9.2	9.0	7.1	5.0	13.2
1990	6.4	8.0	9.0	8.6	7.3	6.5	8.4	9.6	9.0	8.9	7.5	3.1	7.7
1991	0.6	4.9	18.1	44.4	111.2	114.8	83.7	71.4	41.4	32.2	16.7	9.8	45.8
1992	8.7	15.3	26.0	28.6	27.6	26.7	39.8	63.3	120.1				
Maximum	177.7	222.7	504.1	425.9	221.4	276.3	220.9	384.7	347.2	231.7	181.1	114.3	224.0
Mean	48.1	70.7	137.2	131.9	78.2	53.5	48.3	83.8	98.9	67.5	43.7	33.1	71.8
Minimum	0.6	1.9	3.0	2.3	1.4	0.3	0.6	1.2	7.8	3.8	1.9	1.5	7.7

[P]Partial record used to calculate the monthly average discharge

Table C3. Monthly streamflow data (in cubic feet per second) for Lochloosa Slough at U.S. 301, October 1946–September 1955 and April 1982–September 1992

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1946										196.2	137.8	59.6	131.2
1947	32.3	21.3	44.0	62.2	34.5	17.6	11.9	16.6	39.4	110.9	178.6	154.1	60.3
1948	131.2	176.1	270.2	212.9	105.3	41.5	27.6	86.8	104.4	125.7	61.8	38.0	115.1
1949	14.9	16.6	8.4	26.1	9.2	2.8	2.0	2.5	17.3	33.2	26.0	14.3	14.4
1950	3.9	1.0	0.5	0.1	0.0	0.0	0.0	0.2	78.1	101.5	82.0	32.2	25.0
1951	14.4	5.5	1.2	0.2	0.0	0.0	0.0	0.0	0.0	1.2	3.3	10.0	3.0
1952	10.0	14.3	33.0	18.0	5.1	1.3	0.1	0.1	0.0	0.7	0.0	0.0	6.9
1953	0.1	0.0	0.1	1.0	0.6	0.4	0.2	2.8	54.0	99.4	55.2	53.7	22.3
1954	88.7	50.9	14.8	5.1	0.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	13.4
1955	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
1982				[P]0.1	0.4	8.1	9.0	6.2	6.4	4.6	2.3	1.7	3.9
1983	1.8	4.6	15.9	26.6	29.3	25.1	10.5	5.1	9.3	4.7	2.1	2.8	11.5
1984	6.6	8.2	11.7	10.7	3.9	2.2	2.9	2.2	0.5	0.1	0.0	0.0	4.1
1985	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	1.1	2.4	1.8	0.5
1986	3.1	4.0	7.2	3.9	0.3	0.2	0.1	0.2	0.3	0.0	0.0	0.4	1.6
1987	0.9	4.3	29.6	79.4	19.4	6.2	2.4	0.1	0.0	0.0	0.0	0.0	11.9
1988	0.0	0.4	0.8	0.0	0.0	0.0	0.0	0.0	17.0	15.2	5.5	3.8	3.6
1989	1.7	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2

[P]Partial record used to calculate the monthly average discharge

Table C3—*Continued*

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1990	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1991	0.0	0.0	0.1	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.1
1992	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Maximum	131.2	176.1	270.2	212.9	105.3	41.5	27.6	86.8	104.4	196.2	178.6	154.1	131.2
Mean	16.3	16.2	23.0	22.3	10.4	5.3	3.3	6.2	16.4	36.5	29.3	19.6	22.6
Minimum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

[P]Partial record used to calculate the monthly average discharge

Table C4. Monthly streamflow data (in cubic feet per second) for Orange Lake outlet at U.S. 301, October 1946–September 1955 and April 1982–December 1992

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1946										423.4	278.1	186.9	296.1
1947	124.8	97.0	139.1	173.3	111.3	68.9	53.3	60.8	96.3	236.1	368.9	274.6	150.4
1948	240.3	327.4	538.7	470.2	208.1	116.0	85.7	182.2	216.7	305.8	212.2	172.7	256.3
1949	128.7	130.8	103.7	113.1	89.2	43.6	43.0	38.8	102.4	127.7	113.9	107.6	95.2
1950	76.2	51.6	42.6	32.3	15.3	4.1	17.8	26.9	284.0	347.9	307.6	190.3	116.4
1951	146.6	104.0	70.4	49.5	20.4	5.5	5.9	4.4	10.9	70.2	96.7	151.1	61.3
1952	124.8	133.1	227.4	171.7	95.4	63.5	38.5	28.8	26.5	21.4	16.2	10.4	79.8
1953	12.4	13.7	11.2	41.3	65.8	45.2	39.9	56.2	257.7	418.0	302.0	297.0	130.0
1954	397.8	281.0	173.8	118.0	55.9	32.1	20.7	14.1	8.6	7.2	3.8	2.7	93.0
1955	1.8	2.3	1.4	0.4	0.0	0.0	0.0	0.0	0.0				
1982				11.0	10.5	148.8	252.8	170.8	178.6	126.3	52.3	27.3	97.8
1983	28.1	108.9	240.2	371.8	454.2	339.6	171.9	92.8	192.6	118.6	58.5	103.3	190.0
1984	230.3	212.5	252.9	246.9	124.3	80.8	97.3	96.7	34.5	13.2	7.1	4.2	116.7
1985	2.1	1.5	0.4	0.2	0.0	0.0	0.0	0.2	24.8	74.8	116.8	56.4	23.1
1986	81.0	117.2	194.9	127.2	27.5	16.7	11.5	13.8	13.4	9.5	8.0	13.9	52.9
1987	19.8	54.3	253.5	803.9	316.2	132.7	47.3	18.1	10.0	5.2	4.6	2.9	139.0
1988	2.8	4.2	13.5	16.1	8.1	1.6	0.7	0.7	187.3	190.5	90.1	69.5	48.7
1989	39.8	25.6	20.2	12.7	7.0	1.3	1.1	1.0	0.8	0.2	0.0	0.1	9.2

Table C4—*Continued*

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1990	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1991	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1992	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Maximum	397.8	327.4	538.7	803.9	454.2	339.6	252.8	182.2	284.0	423.4	368.9	297.0	296.1
Mean	87.2	87.6	120.2	138.0	80.4	55.0	44.4	40.3	82.3	124.8	101.8	83.5	97.8
Minimum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table C5. High flow data (in cubic feet per second) for Prairie Creek at State Road 20, 1980–92. *Highest mean values for the following number of consecutive days in reference year ending May 31.*

Year	1	7	14	30	60	120	183	274	365
1980	205.0	200.6	193.4	175.2	156.8	146.0	129.4	113.3	92.6
1981	85.0	84.3	78.2	63.7	62.2	44.2	34.4	28.1	26.5
1982	267.0	261.3	245.4	209.0	152.7	93.5	62.9	46.0	40.1
1983	364.0	353.4	332.4	286.0	267.7	207.5	141.0	114.1	105.9
1984	216.0	210.1	199.1	181.2	173.9	165.0	141.7	120.0	106.5
1985	112.0	107.6	97.6	82.6	67.4	57.8	40.0	27.2	20.9
1986	464.0	449.3	417.4	355.4	274.2	208.2	191.9	171.2	129.2
1987	485.0	462.9	420.3	345.8	317.8	240.5	180.4	129.5	98.8
1988	261.0	257.1	253.1	231.0	168.7	94.1	62.0	43.6	37.3
1989	540.0	515.1	468.6	383.1	266.6	151.5	105.0	78.1	59.6
1990	30.0	29.0	26.9	24.8	21.1	16.9	13.8	11.1	11.2
1991	148.0	143.6	136.6	120.4	107.9	69.0	46.2	33.8	28.0
1992	146.0	141.0	132.8	116.9	101.4	96.7	76.6	57.5	54.5

Table C6. High flow data (in cubic feet per second) for Camps Canal at County Road 234, 1959–60 and 1980–92. *Highest mean values for the following number of consecutive days in reference year ending May 31.*

Year	1	7	14	30	60	120	183	274	365
1959	1040.0	982.0	873.1	686.9	475.7	322.3	236.4	170.5	148.3
1960	478.0	463.1	435.5	369.7	268.3	208.0	203.8	160.2	169.5
1980	194.0	191.9	186.4	172.6	156.6	137.8	110.3	85.9	69.3
1981	83.0	62.4	61.4	52.5	46.7	31.6	24.7	19.7	17.4
1982	236.0	229.3	216.7	196.2	143.6	90.6	61.9	45.9	37.7
1983	350.0	336.4	314.6	268.9	237.4	185.0	124.6	103.0	92.1
1984	199.0	196.6	192.1	178.8	161.3	157.6	137.0	107.6	97.7
1985	107.0	104.9	99.6	84.0	69.8	57.4	38.8	26.4	20.4
1986	471.0	449.6	412.4	347.6	270.8	210.1	178.8	157.8	119.0
1987	544.0	517.1	469.4	379.8	336.5	262.0	199.8	142.5	108.5
1988	124.0	121.4	117.9	106.6	73.1	41.1	27.6	20.4	19.5
1989	378.0	344.6	302.4	222.3	143.5	82.4	58.3	45.2	34.3
1990	25.0	23.4	21.9	20.7	18.0	13.5	11.7	9.9	9.5
1991	138.0	135.6	130.3	115.4	79.0	45.7	30.6	23.3	19.5
1992	141.0	137.9	130.8	114.8	100.4	78.5	60.1	43.8	39.7

Table C7. High flow data (in cubic feet per second) for Lochloosa Slough at U.S. 301, 1948–55 and 1983–92. *Highest mean values for the following number of consecutive days in reference year ending May 31.*

Year	1	7	14	30	60	120	183	274	365
1948	332.0	325.6	323.6	296.9	243.3	200.5	187.1	152.6	118.4
1949	146.0	142.7	141.5	127.0	116.2	95.7	74.7	57.6	46.9
1950	49.0	46.6	41.9	34.3	29.8	23.0	16.2	11.5	8.7
1951	138.0	134.6	128.4	111.9	99.2	74.9	52.2	35.0	26.3
1952	43.0	41.6	38.5	33.9	28.2	19.0	15.1	10.4	7.8
1953	6.4	2.7	1.8	1.3	0.8	0.4	0.4	0.3	0.3
1954	108.0	105.7	105.1	100.4	85.4	74.7	67.0	47.1	35.4
1955	0.8	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0
1983	42.0	39.6	38.0	33.3	29.3	19.4	13.3	10.4	9.2
1984	34.0	32.3	30.4	26.8	17.9	12.5	9.4	8.3	8.3
1985	5.2	4.2	3.5	2.9	2.6	2.0	1.3	0.9	0.7
1986	12.0	11.1	10.0	7.7	6.1	4.6	3.7	2.7	2.0
1987	145.0	129.1	114.7	87.7	56.0	33.5	22.2	14.9	11.2
1988	10.0	9.1	7.9	6.2	4.3	2.2	1.4	1.0	0.8
1989	27.0	23.1	22.1	21.2	16.8	10.6	7.3	4.9	3.7
1990	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1991	1.1	0.4	0.2	0.1	0.1	0.0	0.0	0.0	0.0
1992	3.7	1.7	1.0	0.5	0.2	0.1	0.1	0.1	0.0

Table C8. High flow data (in cubic feet per second) for Orange Lake outlet at U.S. 301, 1948–55 and 1984–92. *Highest mean values for the following number of consecutive days in reference year ending May 31.*

Year	1	7	14	30	60	120	183	274	365
1948	677.0	677.0	668.0	625.9	509.1	399.0	369.7	305.7	244.7
1949	354.0	348.3	340.9	309.6	265.4	234.6	203.5	174.2	154.8
1950	139.0	138.3	136.3	128.7	121.4	114.5	96.8	78.4	66.3
1951	397.0	393.9	387.1	359.9	349.8	289.0	230.4	169.5	130.7
1952	244.0	236.6	234.4	227.8	207.8	165.7	154.3	119.5	91.0
1953	81.0	77.7	76.4	68.7	54.5	39.5	32.5	25.7	29.2
1954	460.0	449.6	443.3	419.8	370.6	354.2	326.6	257.0	203.2
1955	43.0	39.4	37.6	32.1	26.4	19.0	14.4	10.4	7.9
1984	424.0	414.7	385.9	341.5	258.0	235.2	193.1	169.7	177.7
1985	134.0	121.9	112.4	100.1	98.2	78.2	55.1	37.7	28.3
1986	304.0	272.4	257.6	215.6	173.3	130.6	115.8	90.6	68.0
1987	1010.0	962.6	920.6	822.5	588.7	360.8	242.4	165.3	127.6
1988	205.0	197.9	180.9	132.7	90.4	52.4	36.1	25.2	22.0
1989	341.0	318.4	307.0	262.6	205.6	138.7	101.2	71.4	53.8
1990	2.8	2.1	1.6	1.3	1.2	1.1	0.7	0.5	0.4
1991	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1992	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table C9. Low flow data (in cubic feet per second) for Prairie Creek at State Road 20, 1979–92. *Lowest mean values for the following number of consecutive days in reference year ending September 30.*

Year	1	7	14	30	60	120	183	274	365
1979	9.2	9.8	10.3	10.7	11.6	20.5	48.5	55.4	52.9
1980	18.0	18.7	18.8	19.7	28.2	43.7	69.2	93.7	93.7
1981	1.4	2.8	4.3	10.1	10.9	12.2	16.1	18.9	18.9
1982	2.7	2.8	3.3	4.2	4.5	5.6	16.1	54.8	58.7
1983	8.6	9.3	10.1	11.1	13.1	29.7	77.5	115.7	104.3
1984	12.0	15.6	20.1	29.3	52.6	56.3	83.2	109.0	101.5
1985	0.6	0.6	0.7	0.7	0.7	1.1	1.4	1.6	37.8
1986	4.2	4.5	4.7	5.0	5.4	7.6	31.0	84.5	99.1
1987	8.5	8.9	9.3	10.3	11.8	16.3	84.3	123.0	98.4
1988	0.3	0.3	0.3	0.6	0.7	2.1	38.7	42.6	60.1
1989	8.0	8.2	8.8	10.5	12.4	15.5	21.0	19.4	36.8
1990	2.2	2.4	2.8	3.0	3.5	5.6	7.5	8.2	9.2
1991	1.8	2.0	2.1	2.4	2.7	5.0	14.6	45.7	56.5
1992	11.0	12.7	13.4	14.4	16.7	21.1	29.2	34.3	45.9

Table C10. Low flow data (in cubic feet per second) for Camps Canal at County Road 234, 1958–60 and 1979–92. *Lowest mean values for the following number of consecutive days in reference year ending September 30.*

Year	1	7	14	30	60	120	183	274	365
1958	30.0	33.6	34.7	36.0	38.3	52.2	97.6	106.5	104.4
1959	14.0	16.1	17.5	21.1	30.5	50.8	142.8	195.8	193.0
1960	33.0	38.4	39.5	42.7	51.6	75.4	129.4	125.0	168.6
1979	4.9	5.8	6.3	6.6	7.3	14.9	35.6	48.6	43.3
1980	9.0	9.9	10.1	10.3	18.8	31.0	54.9	81.5	71.9
1981	0.6	0.8	1.2	5.5	7.1	8.7	9.4	10.4	11.6
1982	2.0	2.4	5.0	6.3	6.8	8.2	19.2	52.1	53.1
1983	2.5	2.7	3.0	4.3	8.3	28.7	68.1	104.8	93.6
1984	5.4	9.0	11.1	24.4	45.0	56.0	77.3	104.0	95.0
1985	0.0	0.0	0.1	0.3	0.4	1.1	1.6	1.6	35.5
1986	3.7	4.3	4.3	4.5	5.1	7.1	33.4	70.1	90.9
1987	6.9	7.2	7.5	7.8	8.7	14.2	90.6	134.3	107.4
1988	0.4	0.4	0.5	0.8	1.1	2.8	18.8	18.9	31.4
1989	6.3	6.6	7.4	8.5	8.6	12.5	16.4	15.2	21.9
1990	4.1	4.4	4.6	4.9	5.2	6.6	7.3	7.3	7.8
1991	0.0	0.0	0.0	0.3	1.5	3.4	7.4	35.2	42.7
1992	7.0	7.2	7.5	7.9	9.1	12.4	17.3	21.3	34.5

Table C11. Low flow data (in cubic feet per second) for Lochloosa Slough at U.S. 301, 1947–55 and 1983–92. *Lowest mean values for the following number of consecutive days in reference year ending September 30.*

Year	1	7	14	30	60	120	183	274	365
1947	7.1	8.4	9.6	11.1	12.3	16.7	28.6	29.7	56.3
1948	20.0	21.7	22.6	25.0	33.4	61.1	96.0	128.1	133.0
1949	1.4	1.6	1.6	1.7	1.9	3.6	8.4	11.1	27.2
1950	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.9	13.1
1951	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	19.9
1952	0.0	0.0	0.0	0.0	0.0	0.3	4.0	9.0	7.9
1953	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	4.9
1954	0.0	0.0	0.0	0.0	0.0	0.0	1.0	17.9	30.7
1955	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1983	1.3	1.4	1.4	1.5	1.7	2.3	5.3	12.5	11.4
1984	0.0	0.0	0.1	0.5	1.3	1.9	3.7	5.4	4.8
1985	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
1986	0.0	0.0	0.0	0.0	0.1	0.2	0.8	2.1	2.0
1987	0.0	0.0	0.0	0.0	0.0	0.3	6.7	15.5	11.9
1988	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	1.5
1989	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.3
1990	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1991	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
1992	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table C12. Low flow data (in cubic feet per second) for Orange Lake outlet at U.S. 301, 1947–55 and 1983–92. *Lowest mean values for the following number of consecutive days in reference year ending September 30.*

Year	1	7	14	30	60	120	183	274	365
1947	47.0	49.6	50.9	52.6	53.9	64.7	93.4	102.5	151.5
1948	71.0	75.0	76.9	82.6	97.9	142.6	212.2	264.4	271.5
1949	32.0	34.3	35.6	37.4	40.3	49.7	69.3	88.0	123.7
1950	1.3	1.9	2.2	2.9	6.4	15.7	23.1	40.4	74.8
1951	2.6	2.8	3.2	3.5	4.8	5.9	16.0	46.5	105.4
1952	23.0	23.9	24.3	26.5	27.7	38.8	70.5	100.8	101.9
1953	6.3	7.6	7.9	9.0	11.3	11.8	13.9	26.5	49.1
1954	7.7	8.0	8.0	8.6	11.3	18.5	41.4	122.5	176.4
1955	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7	1.6
1983	15.0	17.9	18.5	21.6	26.7	46.7	98.4	194.9	183.8
1984	13.0	14.3	20.1	34.4	65.3	76.7	113.2	152.3	137.4
1985	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.0	4.5
1986	7.7	8.1	8.2	9.8	12.2	13.8	34.7	66.5	70.6
1987	6.9	7.1	7.5	7.9	8.7	12.6	64.8	178.6	140.2
1988	0.3	0.3	0.4	0.5	0.6	2.2	5.5	5.6	20.4
1989	0.6	0.6	0.7	0.8	0.9	1.0	4.0	12.3	38.5
1990	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1991	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1992	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

APPENDIX D—STAGE DATA

Table D1. Monthly average stage (feet, National Geodetic Vertical Datum) for Newnans Lake, November 1945–December 1952 and July 1957–September 1992

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1945											[P]66.73	[P]67.04
1946	[P]68.63	[M]	[M]	[M]	[M]	[P]68.20	[P]68.80	[P]69.30	[P]68.42	[P]68.91	[P]68.09	[P]67.10
1947	[P]66.61	[P]66.36	[P]67.70	[P]68.13	[P]66.56	[P]65.94	[P]65.68	[P]65.57	[P]66.45	[P]69.35	[P]69.37	[P]68.36
1948	[P]68.37	[P]69.09	[P]69.99	[P]69.56	[P]67.35	[P]66.19	[P]65.91	[P]67.40	[P]68.01	[P]67.87	[P]66.87	[P]66.20
1949	[P]66.03	[P]66.20	[P]66.10	[P]66.98	[P]66.33	[P]65.68	[P]65.68	[P]65.84	[P]67.75	[P]67.63	[P]67.09	[P]66.66
1950	[P]66.13	[P]65.57	[P]65.50	[P]65.30	[P]64.84	[P]64.48	[P]66.02	[P]66.12	[P]68.56	[P]68.35	[P]67.90	[P]66.97
1951	[P]66.62	[P]66.22	[P]66.07	[P]65.83	[P]65.30	[P]64.96	[P]65.12	[P]65.58	[P]66.32	[P]67.16	[P]67.23	[P]67.35
1952	[P]67.05	[P]67.26	[P]67.82	[P]67.03	[P]66.20	[P]66.20	[P]65.69	[P]65.38	[P]65.26	[P]65.47	[P]65.68	[P]65.39
1957							65.83	67.29	67.29	67.15	66.15	65.63
1958	65.48	65.65	67.38	67.80	67.23	66.12	66.03	65.96	65.47	64.95	65.34	65.53
1959	66.56	66.81	68.51	68.37	67.44	68.09	67.66	67.02	67.00	67.29	66.81	66.13
1960	65.69	65.56	67.38	67.69	66.43	65.70	66.30	68.49	67.95	[P]68.54	[P]67.71	[P]66.36
1961	[M]	[P]66.69	[P]66.67	[M]	[P]65.33	[P]65.83	[P]66.08	[P]67.61	[P]67.94	[M]	[M]	[M]
1962	[P]65.14	[P]65.01	[P]64.78	[P]64.50	[P]64.04	[P]64.03	[P]64.48	[P]65.15	[P]65.63	[M]	[P]65.36	[M]
1963	[P]65.07	[M]	[P]66.49	[P]65.33	[P]65.22	[P]64.47	[P]65.57	[M]	[P]65.57	[P]65.13	[M]	[P]64.87
1964	[P]67.77	[M]	[P]67.77	[M]	[M]	[P]65.55	[M]	[P]65.83	[P]70.33	[P]68.59	[P]67.43	[P]67.17
1965	[M]	[P]67.33	[P]68.87	[P]66.91	[P]65.71	[M]	[P]67.27	[P]68.60	[P]67.77	[P]67.30	[P]66.07	[P]66.01
1966	[P]66.23	[P]67.00	[P]68.26	[P]66.91	[P]66.42	[P]66.51	[P]66.35	[P]66.53	[P]67.16	[P]68.19	[P]67.90	[P]67.14

[P]Partial record used to calculate the monthly average stage
[M]All daily stages are missing

Table D1—*Continued*

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1967	[P]67.06	[P]67.62	[P]67.20	[P]66.68	[P]66.40	[P]66.59	[P]66.94	[P]67.77	[P]67.53	[P]66.85	[P]66.42	[P]66.36
1968	[P]66.36	[P]66.19	[P]66.14	[P]65.83	[P]65.37	[P]65.69	[P]66.37	[P]67.27	[P]68.57	[P]67.47	[P]67.14	[P]66.91
1969	[P]66.90	[P]67.15	[P]67.61	[P]67.18	[P]66.73	[P]66.46	[P]66.35	[P]67.07	[P]68.11	[P]68.16	[P]67.57	[P]67.71
1970	[P]68.70	[P]69.36	[P]68.57	[P]68.89	[P]67.31	[P]66.94	[P]67.13	[P]67.45	[P]67.25	[P]66.75	[P]66.56	[P]66.50
1971	[P]66.58	[P]66.88	[P]66.95	[P]66.99	[P]66.57	[P]66.25	[P]66.38	[P]66.77	[P]67.18	[P]66.97	[P]66.76	[P]67.35
1972	[M]	[P]67.37	[P]67.37	[P]67.75	[P]67.16	[P]67.33	[P]68.43	[P]67.85	[P]69.44	[P]66.94	[M]	[P]67.33
1973	[P]67.73	[M]	[P]67.71	[P]68.77	[P]67.29	[P]67.17	[P]67.20	[P]67.35	[P]67.32	[P]66.95	[P]66.58	[P]66.71
1974	[P]66.93	[P]66.86	[P]66.88	[P]66.71	[P]66.68	[P]67.31	[P]67.57	[P]67.84	[P]67.65	[P]66.75	[P]66.56	[P]66.63
1975	[P]66.98	[P]67.21	[P]67.17	[P]67.00	[P]66.75	[P]66.58	[P]66.74	[P]66.59	[P]67.01	[P]67.18	[P]66.95	[P]66.67
1976	[P]66.31	[P]65.98	[P]65.37	[P]64.97	[P]64.72	[P]64.71	[P]65.78	[P]65.70	[P]66.14	[P]66.28	[P]66.18	[P]66.50
1977	[P]67.44	[P]67.50	[P]67.08	[P]66.56	[P]66.09	[P]65.64	[P]65.38	[P]65.39	[P]65.61	[P]65.50	[P]65.24	[P]65.51
1978	[P]66.87	[P]67.94	[P]69.07	[M]	[P]66.94	[P]67.17	[P]67.17	[P]69.83	[P]67.92	[P]66.76	[P]66.59	[P]66.47
1979	[P]66.75	[P]67.42	[P]67.17	[P]67.30	[P]67.29	[P]66.66	[P]66.52	[P]66.57	[P]66.82	[P]67.63	[P]66.85	[P]67.36
1980	[P]67.45	[P]67.51	[P]67.55	[P]67.91	[P]66.70	[P]66.77	[P]66.01	[P]66.71	[P]66.34	[P]66.14	[P]66.07	[P]65.91
1981	[P]65.69	[P]65.83	[P]66.37	[P]66.27	[P]65.64	[P]65.14	[P]64.98	[P]64.92	[P]64.93	[P]64.59	[P]64.47	[P]64.38
1982	[P]65.06	[P]65.98	[P]66.93	[P]67.80	[P]67.26	[P]67.06	[P]67.10	[P]66.82	[P]66.85	[P]66.92	[P]66.66	[P]66.45
1983	[P]66.47	[P]67.11	[P]67.93	[P]68.43	[P]68.04	[P]67.19	[P]66.75	[P]66.69	[P]67.02	[P]66.96	[P]66.75	[P]67.19
1984	[P]68.04	[P]67.47	[P]67.67	[P]68.07	[P]67.27	[P]66.88	[P]66.80	[P]66.93	[P]66.60	[P]66.35	[P]66.27	[P]66.20
1985	[P]66.22	[P]66.15	[P]66.06	[P]65.97	[P]65.77	[P]65.49	[P]65.72	[P]66.56	[P]68.66	[P]67.73	[P]67.46	[P]66.66

[P]Partial record used to calculate the monthly average stage
[M]All daily stages are missing

Table D1—*Continued*

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1986	[P]67.23	[P]67.67	[P]67.90	[P]67.00	[P]66.29	[P]66.02	[P]65.85	[P]66.19	[P]66.70	[P]66.40	[P]66.17	[P]66.56
1987	[P]66.94	[P]67.76	[P]68.56	[P]68.11	[P]67.13	[P]66.39	[P]66.48	[P]66.30	[M]	[P]65.46	[P]65.29	[P]65.24
1988	[P]65.35	[P]66.15	[P]67.70	[P]67.29	[P]66.44	[P]65.91	[P]65.63	[P]65.83	[P]66.30	[P]67.39	[P]66.67	[P]66.54
1989	[P]66.41	[P]66.28	[P]66.19	[P]65.84	[P]65.22	[P]64.78	[P]64.94	[P]65.26	[P]65.34	[P]65.56	[P]65.26	[P]65.36
1990	[P]65.46	[P]65.61	[P]66.13	[P]66.16	[P]65.71	[P]65.39	[P]65.86	[P]65.89	[P]65.76	[P]65.50	[P]65.20	[P]65.06
1991	[P]65.15	[P]65.52	[P]66.48	[P]67.21	[P]66.81	[P]66.91	[P]66.47	[P]66.71	[P]66.23	[P]65.60	[P]65.32	[M]
1992	[M]	[M]	[P]65.67	[P]65.60	[P]65.60	[P]65.47	[P]65.82	[P]66.08	[P]66.84			
Maximum	68.70	69.36	69.99	69.56	[P]68.04	68.20	68.80	69.83	70.33	69.35	69.37	68.36
Mean	66.62	66.79	67.19	67.02	66.34	66.14	66.31	66.71	67.07	66.95	66.58	66.43
Minimum	65.06	65.01	64.78	64.50	64.04	64.03	64.48	64.92	64.93	64.59	64.47	64.38

[P]Partial record used to calculate the monthly average stage
[M]All daily stages are missing

Table D2. Monthly average stage (feet, National Geodetic Vertical Datum) for Alachua Lake at the main structure, May 1979–September 1991

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1979					57.23	56.57	[P]56.42	56.70	57.13	58.01	57.44	57.37
1980	57.47	57.31	56.75	56.50	55.85	56.18	56.43	56.84	56.97	56.18	55.99	56.02
1981	56.03	[P]56.33	56.65	55.89	53.99	54.15	54.59	[P]54.63	[P]54.26	53.94	53.76	[P]53.73
1982	[P]54.58	[P]55.56	[P]55.96	[P]56.98	[P]56.97	57.28	[P]57.98	58.18	[P]58.25	57.64	56.84	[P]56.21
1983	[P]56.45	[P]57.25	[P]58.06	[P]58.67	[P]58.77	[P]58.42	[P]57.94	[P]57.43	[P]57.67	[P]57.99	[P]57.67	[P]57.61
1984	[P]57.87	[P]57.80	58.16	[P]58.27	[P]57.66	[P]57.14	[P]57.18	[P]56.93	[P]55.83	[P]54.45	[P]53.85	55.53
1985	55.63	[P]55.63	[P]55.44	[P]53.71	[P]53.33	[P]53.36	[P]53.28	[P]55.68	[P]56.53	[P]55.52	[P]54.04	[P]54.08
1986	[P]55.66	[P]57.14	[P]57.67	[P]57.48	[M]	[M]	[P]53.58	[P]54.40	[P]55.13	[P]53.26	[P]52.92	[P]53.86
1987	[P]54.25	[P]55.72	[P]57.67	[P]58.90	[P]58.60	[P]58.16	[P]57.74	[P]57.19	[P]56.14	[P]53.54	[P]53.25	[P]53.13
1988	[P]53.52	[P]54.32	[P]56.73	[P]57.34	[P]56.45	[P]53.89	[P]52.93	[P]53.75	[P]57.65	[P]58.82	[P]58.58	[P]58.36
1989	[P]57.85	[P]57.36	[P]56.80	[P]54.42	[P]53.31	[P]53.54	[P]53.72	[P]53.53	[P]53.91	[P]53.53	[P]52.14	[P]52.51
1990	[P]52.51	[P]52.65	[P]52.64	[P]52.59	[P]51.58	[P]51.30	[P]52.97	[P]52.37	[P]51.97	[P]51.32	[P]50.67	[M]
1991	[P]51.90	[P]52.60	[P]54.20	[M]	[M]	[P]56.42	[P]56.38	[P]56.72	[P]55.97			
Maximum	57.87	57.80	58.16	58.90	58.77	58.42	57.98	58.18	58.25	58.82	58.58	58.36
Mean	55.31	55.81	56.39	56.43	55.79	55.53	55.47	55.72	55.95	55.37	54.7	55.31
Minimum	51.90	52.60	52.64	52.59	51.58	51.30	52.93	52.37	51.97	51.32	50.67	52.51

[P]Partial record used to calculate the monthly average stage
[M]All daily stages are missing

Table D3. Monthly average stage (feet, National Geodetic Vertical Datum) for Lochloosa Lake, July 1942–December 1952 and April 1956–September 1992

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1942							58.79	58.57	58.52	58.29	57.96	57.96
1943	57.88	57.64	57.46	57.08	56.78	56.55	56.45	56.55	57.01	57.01	56.48	56.25
1944	56.30	56.25	56.35	57.98	57.77	57.60	57.67	57.93	57.89	58.11	58.63	58.49
1945	58.56	58.45	58.13	57.68	57.25	56.85	57.68	58.70	59.20	59.07	58.67	58.73
1946	59.52	59.49	59.37	59.10	59.17	59.33	59.84	60.91	60.96	60.94	60.29	59.57
1947	59.10	58.89	59.30	59.59	59.13	58.80	58.67	58.83	59.20	60.14	60.88	60.48
1948	60.27	60.74	61.48	61.09	59.99	59.38	59.16	59.89	60.03	60.31	59.72	59.45
1949	59.10	59.19	58.95	59.33	59.09	58.66	58.66	58.62	59.35	59.50	59.39	59.15
1950	58.83	58.45	58.31	58.04	57.68	57.31	57.99	58.01	59.76	60.08	59.84	59.26
1951	58.98	58.67	58.41	58.16	57.56	57.09	57.04	57.03	57.22	58.37	58.57	58.90
1952	58.85	58.90	59.32	59.10	58.72	58.53	58.23	58.07	57.89	57.74	57.57	57.30
1956				54.20	54.27	54.04	54.19	54.07	54.20	55.02	55.54	55.41
1957	55.26	55.15	55.19	55.27	55.32	55.69	55.80	56.87	57.40	57.67	57.05	56.66
1958	56.51	56.52	57.54	58.01	57.77	57.37	57.35	57.38	57.16	57.02	57.18	57.27
1959	57.68	57.85	58.96	59.98	59.24	59.24	59.29	58.80	58.62	58.28	58.02	57.74
1960	57.56	57.45	58.35	59.10	58.49	58.26	58.94	59.66	59.94	[P]60.04	[P]59.61	[P]58.91
1961	[P]58.46	[P]58.41	[P]58.19	[P]58.04	[P]57.76	[P]57.33	[P]57.38	[P]58.05	[P]58.86	[P]58.42	[P]58.09	[P]57.72
1962	[P]57.50	[P]57.25	[P]56.93	[P]56.86	[M]	[P]55.86	[M]	[P]55.94	[P]56.30	[M]	[P]55.77	[M]
1963	[P]55.59	[M]	[P]56.30	[P]56.01	[P]55.91	[P]55.52	[P]55.80	[M]	[P]55.80	[P]55.71	[M]	[P]55.55

[P]Partial record used to calculate the monthly average
[M]All daily stages are missing

Table D3—*Continued*

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1964	[P]57.33	[M]	[P]58.87	[M]	[M]	[P]58.07	[M]	[P]58.50	[P]60.92	[P]60.39	[P]59.27	[P]58.99
1965	[M]	[P]58.91	[P]59.41	[P]58.79	[P]58.10	[M]	[P]59.00	[P]60.00	[P]59.35	[P]59.10	[P]58.74	[P]58.59
1966	[P]58.61	[P]58.79	[P]59.41	[P]58.88	[P]58.56	[P]58.53	[P]58.52	[P]59.00	[P]59.16	[P]59.19	[P]58.52	[P]58.31
1967	[P]58.53	[P]58.82	[P]58.83	[P]58.23	[P]57.84	[P]57.69	[P]57.96	[P]58.60	[P]58.81	[P]58.33	[P]57.89	[P]57.94
1968	[P]57.85	[P]57.61	[P]57.54	[P]57.16	[P]56.75	[P]57.01	[P]57.10	[P]57.02	[P]58.11	[P]58.56	[P]58.73	[P]58.35
1969	[P]58.22	[P]58.29	[P]58.62	[P]58.57	[P]58.23	[P]58.09	[P]57.79	[P]57.88	[P]58.44	[P]58.92	[P]58.94	[P]58.99
1970	[P]59.54	[P]60.36	[P]59.82	[P]60.02	[P]59.03	[P]58.61	[P]58.42	[P]58.51	[P]58.83	[P]58.33	[P]58.09	[P]57.79
1971	[P]57.94	[P]58.13	[P]58.21	[P]58.28	[P]57.89	[P]57.46	[P]57.28	[P]57.34	[P]57.55	[P]57.60	[P]57.50	[P]57.79
1972	[P]58.08	[P]58.59	[P]58.75	[P]58.83	[P]58.69	[P]59.02	[P]59.52	[P]59.11	[P]59.49	[P]58.79	[P]58.55	[P]58.73
1973	[P]59.07	[P]59.36	[P]59.46	[P]60.12	[P]59.19	[P]58.63	[P]58.28	[P]58.38	[P]58.74	[P]58.45	[P]57.93	[P]57.85
1974	[P]57.98	[P]57.71	[P]57.56	[P]57.47	[P]57.09	[P]57.37	[P]58.22	[P]58.97	[P]59.15	[P]58.51	[M]	[P]57.80
1975	[P]57.83	[P]57.97	[P]58.08	[P]57.89	[P]57.51	[P]57.16	[P]56.99	[P]57.01	[P]56.97	[P]57.12	[P]57.21	[P]57.00
1976	[P]57.20	[P]57.31	[P]57.12	[P]56.85	[P]56.68	[P]56.68	[P]56.78	[P]56.41	[P]56.25	[P]56.00	[P]55.71	[P]55.87
1977	[P]56.40	[P]56.62	[P]56.66	[P]56.26	[P]55.84	[P]55.49	[P]55.22	[P]55.11	[P]55.22	[P]55.07	[P]55.04	[P]55.18
1978	[P]55.85	[P]56.72	[P]57.97	[P]58.31	[P]58.13	[P]58.08	[P]58.10	[P]59.65	[P]58.94	[P]58.31	[P]57.91	[P]57.67
1979	[P]57.95	[P]58.28	[P]58.44	[P]58.27	[P]58.42	[P]58.09	[P]57.96	[P]57.94	[M]	[P]58.59	[P]58.17	[P]58.20
1980	[P]58.37	[P]58.66	[P]58.62	[P]58.70	[P]58.50	[P]58.18	[P]58.13	[P]58.11	[P]58.39	[P]58.15	[P]57.98	[P]57.86
1981	[P]57.57	[P]57.80	[P]58.00	[P]57.69	[P]57.16	[P]56.79	[P]56.60	[P]56.67	[P]56.56	[P]56.13	[P]56.06	[P]55.97
1982	[P]55.92	[P]55.94	[P]55.97	[P]57.03	[P]57.84	[P]58.55	[P]58.81	[P]58.62	[P]58.66	[P]58.47	[P]58.25	[P]58.11

[P]Partial record used to calculate the monthly average stage
[M]All daily stages are missing

Table D3—*Continued*

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1983	[P]58.09	[P]58.51	[P]59.01	[P]59.42	[P]59.57	[P]59.25	[P]58.70	[P]58.46	[P]58.87	[P]58.58	[P]58.41	[P]58.63
1984	[P]59.05	[P]58.93	[P]59.18	[P]58.84	[M]	[P]58.67	[P]58.59	[M]	[M]	[P]58.23	[M]	[P]57.64
1985	[P]57.37	[P]57.32	[P]57.03	[P]56.72	[P]56.27	[P]55.81	[P]55.83	[P]56.20	[P]57.82	[P]58.13	[P]58.34	[P]58.16
1986	[P]58.32	[P]58.47	[P]58.76	[P]58.53	[P]57.92	[P]57.69	[P]57.66	[P]57.60	[P]57.50	[P]57.36	[P]57.18	[P]57.61
1987	[P]57.91	[P]58.58	[P]59.26	[P]60.17	[P]59.21	[P]58.43	[M]	[P]58.00	[M]	[P]57.20	[M]	[P]56.84
1988	[P]56.66	[M]	[P]57.43	[M]	[P]57.41	[P]56.59	[M]	[P]56.23	[M]	[P]58.89	[P]58.33	[P]58.33
1989	[M]	[P]57.97	[M]	[P]57.57	[M]	[M]	[P]56.67	56.56	56.31	56.13	55.83	55.72
1990	55.65	55.50	55.42	55.16	54.78	[P]54.56	[P]54.78	54.65	54.40	[P]54.21	[M]	[M]
1991	[P]54.18	[P]54.17	[P]54.57	55.01	55.18	56.51	55.99	56.09	55.92	55.73	55.40	55.16
1992	55.01	55.11	55.22	54.99	54.72	54.58	54.65	54.55	54.85			
Maximum	60.27	60.74	61.48	61.09	59.99	59.38	59.84	60.91	60.96	60.94	60.88	60.48
Mean	57.69	57.90	58.04	57.96	57.64	57.44	57.56	57.72	57.97	58.00	57.89	57.74
Minimum	54.18	54.17	54.57	54.20	54.27	54.04	54.19	54.07	54.20	54.21	55.04	55.16

[P]Partial record used to calculate the monthly average stage
[M]All daily stages are missing

Table D4. Monthly average stage (feet, National Geodetic Vertical Datum) for Orange Lake, July 1942–September 1992

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1942							58.28	58.07	58.04	57.80	57.49	57.39
1943	57.29	57.05	56.85	56.46	56.09	55.72	55.43	55.52	55.81	56.12	55.90	55.72
1944	55.75	55.71	55.83	56.93	57.47	57.28	57.33	57.57	57.56	57.65	58.29	58.16
1945	58.14	58.02	57.73	57.26	56.79	56.38	56.91	57.95	58.82	58.70	58.34	58.29
1946	59.04	59.05	58.94	58.72	58.71	58.93	59.36	60.53	60.55	60.49	59.90	59.21
1947	58.70	58.47	58.81	59.14	58.76	58.42	58.23	58.32	58.64	59.67	60.32	59.94
1948	59.69	60.18	60.77	60.45	59.47	58.95	58.76	59.33	59.52	59.66	59.13	58.84
1949	58.54	58.60	58.45	58.72	58.61	58.26	58.22	58.10	58.64	58.94	58.81	58.54
1950	58.18	57.73	57.46	57.22	57.01	56.74	57.14	57.36	58.83	59.20	58.99	58.33
1951	58.05	57.71	57.37	57.11	56.64	56.34	56.40	56.45	56.72	57.84	57.96	58.25
1952	58.19	58.25	58.74	58.59	58.23	57.94	57.51	57.16	57.06	56.91	56.75	56.56
1953	56.63	56.68	56.63	57.34	57.76	57.47	57.37	57.56	58.87	59.47	58.95	58.93
1954	59.37	58.86	58.40	58.15	57.77	57.46	57.06	56.70	56.37	56.29	56.04	55.92
1955	55.81	55.88	55.73	55.41	54.89	54.52	54.55	54.29	54.32	53.85	53.42	52.99
1956	52.51	52.28	51.68	51.25	51.04	50.55	50.53	50.64	51.19	51.69	52.12	52.02
1957	51.78	51.49	51.25	51.12	50.87	50.97	51.22	52.38	53.96	55.50	55.83	55.96
1958	56.07	56.21	57.19	57.94	57.78	57.35	57.36	57.36	57.16	57.05	57.13	57.20
1959	57.60	57.78	58.85	59.99	59.21	59.12	59.25	58.69	58.47	58.21	58.00	57.70

Table D4—*Continued*

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1960	57.50	57.37	58.27	59.09	58.46	58.22	58.85	59.62	59.92	60.03	59.56	58.88
1961	58.45	58.35	58.15	57.98	57.61	57.26	57.32	58.01	58.87	58.44	58.09	57.75
1962	57.50	57.23	56.90	56.73	56.16	55.89	55.77	55.79	55.87	55.86	55.60	55.39
1963	55.26	55.55	56.23	56.03	55.60	55.20	55.42	55.74	55.86	55.80	55.50	55.30
1964	56.00	58.06	58.91	58.59	58.57	58.05	58.01	58.71	60.13	59.93	59.10	58.95
1965	59.06	59.08	59.37	58.94	58.37	58.43	58.97	59.93	59.48	59.16	58.78	58.62
1966	58.64	58.82	59.37	58.91	58.55	58.57	58.53	58.93	59.02	59.21	58.58	58.37
1967	58.50	58.77	58.80	58.26	57.85	57.70	57.97	58.54	58.89	58.35	57.92	57.93
1968	57.87	57.64	57.54	57.17	56.75	56.97	57.07	57.12	58.12	58.65	58.70	58.39
1969	58.28	58.28	58.57	58.62	58.28	58.13	57.78	57.88	58.45	58.97	58.97	58.96
1970	59.47	60.23	59.80	60.01	59.10	58.61	58.40	58.53	58.90	58.43	58.10	57.87
1971	57.95	58.17	58.26	58.26	57.95	57.48	57.31	57.34	57.57	57.62	57.53	57.83
1972	58.13	58.70	58.71	58.84	58.64	58.78	59.44	59.03	59.47	58.81	58.52	58.76
1973	59.04	59.35	59.36	59.95	59.12	58.62	58.27	58.37	58.71	58.44	57.99	57.90
1974	57.99	57.73	57.59	57.48	57.11	57.32	58.22	58.89	59.12	58.52	58.02	57.85
1975	57.88	58.02	58.13	57.98	57.60	57.23	57.09	57.10	57.01	57.38	57.37	57.18
1976	57.45	57.52	57.35	57.08	56.89	56.92	56.98	56.62	56.50	56.24	55.90	55.95
1977	56.52	56.89	57.00	56.60	56.01	55.54	55.12	54.95	54.91	54.65	54.26	54.48
1978	55.02	56.49	58.09	58.22	58.04	58.06	58.09	59.61	58.98	58.33	57.95	57.72

Table D4—*Continued*

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1979	57.93	58.30	58.43	58.24	58.46	58.15	57.98	57.94	58.26	58.50	58.15	58.21
1980	58.37	58.70	58.68	58.71	58.54	58.22	58.18	58.54	58.46	58.22	58.07	57.92
1981	57.67	57.86	58.08	57.84	57.20	56.85	56.63	56.67	56.50	56.14	56.00	55.79
1982	55.83	55.81	55.90	57.30	57.95	58.48	58.82	58.66	58.68	58.31	58.06	57.97
1983	57.96	58.26	58.73	59.20	59.31	59.00	58.58	58.35	58.61	58.70	58.49	58.63
1984	59.02	59.01	59.17	59.10	58.78	58.66	58.68	58.66	58.35	58.17	57.93	57.78
1985	57.53	57.36	57.20	56.95	56.45	55.93	55.87	56.03	57.70	58.42	58.48	58.31
1986	58.29	58.42	58.67	58.56	57.85	57.56	57.48	57.46	57.49	P57.34	57.15	57.53
1987	57.82	58.38	59.17	59.85	59.16	58.56	58.29	57.84	57.54	57.10	56.91	56.72
1988	56.65	56.78	57.45	57.58	57.22	56.69	56.28	56.08	58.16	58.74	58.32	58.21
1989	57.98	57.74	57.59	57.26	56.77	56.49	56.44	56.37	56.11	55.92	55.59	55.46
1990	55.36	55.17	55.05	54.84	54.23	53.82	53.89	53.74	53.64	M	M	M
1991	P52.03	P52.02	P52.34	P52.56	52.97	54.50	55.34	55.83	55.80	55.64	55.29	54.99
1992	54.74	54.81	54.89	54.72	54.32	54.05	53.97	53.90	54.18			
Maximum	59.69	60.23	60.77	60.45	59.47	59.12	59.44	60.53	60.55	60.49	60.32	59.94
Mean	57.30	57.42	57.57	57.59	57.26	57.05	57.10	57.27	57.56	57.69	57.48	57.35
Minimum	51.78	51.49	51.25	51.12	50.87	50.55	50.53	50.64	51.19	51.69	52.12	52.02

PPartial record used to calculate the monthly average stage
MAll daily stages are missing

Table D5. High stage data (feet, National Geodetic Vertical Datum) for Newnans Lake, 1947–52 and 1958–92. *Highest mean values for the following number of consecutive days in reference year ending May 31.*

Year	1	7	14	30	60	120	183	274	365
1947	69.72	69.65	69.56	69.34	69.13	68.95	68.67	68.02	67.88
1948	71.21	70.88	70.51	70.25	69.54	69.04	69.08	68.53	67.83
1949	68.93	68.89	68.72	68.32	68.02	67.56	67.07	66.84	66.67
1950	68.75	68.62	68.44	67.99	67.79	67.44	67.03	66.57	66.23
1951	69.51	69.42	69.26	68.83	68.59	67.96	67.43	67.01	66.52
1952	68.18	68.16	68.11	67.94	67.64	67.38	67.30	67.04	66.58
1958	68.03	68.02	67.97	67.82	67.75	67.04	66.57	66.68	66.55
1959	70.30	70.06	69.79	69.27	68.49	67.80	67.19	66.55	66.42
1960	68.89	68.81	68.67	68.31	67.88	67.44	67.31	66.81	66.90
1961	68.93	68.85	68.82	68.59	68.32	68.22	67.58	67.22	66.83
1962	68.54	68.53	68.50	68.35	67.82	67.47	67.19	66.56	66.03
1963	66.49	66.46	66.41	66.31	66.13	65.76	65.61	65.54	65.26
1964	67.77	67.77	67.77	67.77	67.77	67.63	66.93	66.37	66.07
1965	70.33	70.20	70.02	69.60	68.95	68.16	67.92	67.82	67.31
1966	68.77	68.72	68.64	68.39	68.04	67.62	67.18	67.18	67.00
1967	68.59	68.53	68.45	68.24	68.11	67.65	67.56	67.28	67.06
1968	68.15	68.14	68.13	68.05	67.71	67.32	67.03	66.79	66.53
1969	69.23	69.19	69.09	68.70	68.14	67.67	67.41	67.37	67.10
1970	70.53	70.26	69.93	69.40	69.04	68.88	68.47	68.28	67.86
1971	67.77	67.74	67.69	67.62	67.41	67.20	67.01	66.90	66.88
1972	68.03	67.99	67.92	67.69	67.56	67.47	67.38	67.24	67.05
1973	69.63	69.50	69.42	69.09	68.48	68.24	67.87	67.87	67.83
1974	67.37	67.36	67.36	67.35	67.33	67.26	67.08	67.00	66.94
1975	68.21	68.17	68.12	67.99	67.74	67.57	67.25	67.18	67.12
1976	67.29	67.27	67.24	67.20	67.12	66.94	66.84	66.66	66.25

Table D5—*Continued*

Year	1	7	14	30	60	120	183	274	365
1977	67.73	67.71	67.68	67.63	67.50	67.21	66.87	66.62	66.32
1978	69.23	69.21	69.20	69.03	68.67	68.14	67.42	66.77	66.44
1979	70.23	70.18	70.11	69.66	68.78	67.96	67.52	67.32	67.28
1980	68.11	68.06	67.98	67.87	67.71	67.60	67.43	67.31	67.13
1981	67.05	67.02	66.98	66.78	66.57	66.44	66.32	66.16	66.14
1982	68.63	68.50	68.37	68.06	67.56	67.03	66.24	65.72	65.54
1983	69.08	68.97	68.82	68.55	68.38	67.88	67.39	67.20	67.15
1984	68.39	68.32	68.21	68.02	67.86	67.80	67.58	67.36	67.24
1985	67.18	67.13	67.07	66.97	66.86	66.79	66.62	66.48	66.34
1986	69.11	69.04	68.94	68.66	68.20	67.70	67.59	67.46	67.04
1987	68.87	68.82	68.74	68.56	68.54	67.98	67.55	67.18	66.89
1988	68.10	68.09	68.08	67.93	67.48	66.89	66.35	66.08	66.16
1989	67.62	67.61	67.58	67.49	67.21	66.89	66.70	66.45	66.24
1990	66.30	66.30	66.28	66.19	66.17	65.93	65.74	65.62	65.46
1991	67.28	67.28	67.26	67.21	67.16	66.56	66.07	65.88	65.83
1992	67.21	67.16	67.09	66.91	66.68	66.59	66.21	65.98	65.88

Table D6. High stage data (feet, National Geodetic Vertical Datum) for Alachua Lake at the main structure, 1980–92. *Highest mean values for the following number of consecutive days in reference year ending May 31.*

Year	1	7	14	30	60	120	183	274	365
1980	58.10	58.10	58.08	58.02	57.79	57.59	57.46	57.20	56.96
1981	57.04	57.03	57.02	56.97	56.90	56.64	56.43	56.38	56.12
1982	57.44	57.39	57.30	57.21	56.97	56.36	55.60	55.07	54.92
1983	59.10	59.06	58.99	58.89	58.72	58.20	57.70	57.57	57.63
1984	58.60	58.54	58.47	58.41	58.21	58.02	57.90	57.86	57.87
1985	57.70	57.58	57.43	57.20	57.18	56.81	55.92	55.81	55.39
1986	57.84	57.81	57.79	57.72	57.56	57.15	56.32	55.97	55.44
1987	58.98	58.95	58.94	58.90	58.76	57.79	56.50	55.58	55.27
1988	58.47	58.40	58.33	58.17	57.96	57.30	55.97	55.18	55.60
1989	58.93	58.91	58.87	58.82	58.74	58.55	58.19	57.08	56.13
1990	54.75	54.56	54.42	54.17	53.86	53.74	53.35	53.10	52.87
1991	56.33	56.29	56.25	56.16	55.99	54.76	53.48	52.75	52.62
1992	57.00	56.95	56.86	56.77	56.59	56.42			

Table D7. High stage data (feet, National Geodetic Vertical Datum) for Lochloosa Lake, 1944–52 and 1957–92. *Highest mean values for the following number of consecutive days in reference year ending May 31.*

Year	1	7	14	30	60	120	183	274	365
1944	58.20	58.14	58.09	58.05	57.89	57.10	56.82	56.82	56.74
1945	58.75	58.74	58.70	58.67	58.60	58.57	58.39	58.21	58.03
1946	59.62	59.61	59.59	59.55	59.50	59.39	59.22	59.14	58.79
1947	61.33	61.24	61.13	60.99	60.98	60.81	60.42	59.99	59.82
1948	61.94	61.93	61.90	61.73	61.30	60.92	60.82	60.47	60.04
1949	60.48	60.47	60.44	60.32	60.18	60.00	59.77	59.58	59.47
1950	59.67	59.65	59.60	59.53	59.46	59.35	59.14	58.96	58.72
1951	60.43	60.39	60.32	60.15	60.09	59.78	59.44	59.03	58.67
1952	59.43	59.38	59.37	59.33	59.26	59.05	58.98	58.66	58.26
1957	55.63	55.61	55.61	55.58	55.51	55.39	55.33	55.15	54.92
1958	58.13	58.08	58.08	58.02	57.93	57.48	57.17	57.24	56.96
1959	60.24	60.20	60.13	60.02	59.78	59.03	58.49	58.04	57.87
1960	59.69	59.60	59.52	59.39	59.27	59.00	58.71	58.34	58.41
1961	60.24	60.18	60.13	60.10	60.02	59.82	59.51	59.15	58.84
1962	58.99	58.98	58.95	58.85	58.68	58.36	58.10	57.85	57.54
1963	56.36	56.35	56.33	56.30	56.18	56.06	55.98	55.98	55.95
1964	58.87	58.85	58.83	58.76	58.65	58.36	57.70	57.04	56.71
1965	60.92	60.86	60.78	60.60	60.25	59.73	59.46	59.33	59.07
1966	60.08	60.04	60.02	59.88	59.62	59.32	59.09	59.06	58.94
1967	59.45	59.42	59.37	59.27	59.23	58.99	58.82	58.76	58.62
1968	59.01	59.00	58.99	58.92	58.75	58.44	58.25	58.07	57.84
1969	58.83	58.82	58.79	58.75	58.65	58.49	58.47	58.39	58.06
1970	60.52	60.46	60.40	60.30	60.07	59.93	59.63	59.33	58.98
1971	58.95	58.94	58.92	58.85	58.71	58.59	58.47	58.30	58.26

Table D7—*Continued*

Year	1	7	14	30	60	120	183	274	365
1972	59.03	59.02	58.99	58.87	58.80	58.72	58.46	58.15	57.95
1973	60.35	60.31	60.25	60.10	59.81	59.55	59.31	59.20	59.18
1974	58.82	58.79	58.77	58.73	58.63	58.51	58.41	58.22	58.01
1975	59.35	59.30	59.23	59.19	59.06	58.72	58.43	58.27	58.10
1976	57.35	57.34	57.33	57.30	57.27	57.17	57.16	57.10	57.05
1977	56.95	56.93	56.89	56.81	56.73	56.53	56.30	56.30	56.28
1978	58.43	58.42	58.40	58.37	58.32	57.85	57.05	56.41	56.13
1979	60.17	60.10	60.01	59.82	59.44	58.84	58.55	58.41	58.36
1980	58.89	58.84	58.80	58.72	58.67	58.62	58.50	58.46	58.35
1981	58.67	58.50	58.49	58.46	58.40	58.21	58.15	58.02	57.92
1982	58.07	57.98	57.92	57.87	57.55	56.76	56.48	56.41	56.48
1983	60.04	59.99	59.93	59.74	59.50	59.14	58.78	58.68	58.67
1984	59.53	59.46	59.39	59.27	59.13	59.03	58.84	58.78	58.76
1985	58.67	58.67	58.66	58.65	58.63	58.52	58.34	58.04	57.69
1986	59.03	59.02	59.01	58.89	58.72	58.55	58.45	58.28	57.71
1987	60.17	60.12	60.05	59.89	59.62	59.20	58.70	58.26	58.11
1988	58.81	58.76	58.71	58.58	58.39	58.04	57.70	57.42	57.41
1989	59.09	59.08	59.07	58.95	58.70	58.47	58.28	57.99	57.62
1990	56.99	56.96	56.92	56.84	56.73	56.58	56.38	56.13	55.88
1991	55.59	55.28	55.24	55.18	55.10	54.74	54.54	54.45	54.50
1992	56.98	56.94	56.85	56.57	56.27	56.13	55.94	55.66	55.49

Table D8. High stage data (feet, National Geodetic Vertical Datum) for Orange Lake, 1943–92. *Highest mean values for the following number of consecutive days in reference year ending May 31.*

Year	1	7	14	30	60	120	183	274	365
1943	58.62	58.62	58.62	58.62	58.45	58.25	58.05	57.78	57.45
1944	57.57	57.54	57.53	57.50	57.22	56.50	56.24	56.14	55.99
1945	58.33	58.32	58.31	58.29	58.23	58.16	58.00	57.83	57.65
1946	59.18	59.16	59.15	59.11	59.06	58.94	58.78	58.73	58.32
1947	60.71	60.70	60.65	60.58	60.56	60.39	60.01	59.57	59.41
1948	61.21	61.19	61.16	61.00	60.62	60.29	60.22	59.90	59.50
1949	59.84	59.83	59.81	59.67	59.60	59.42	59.23	59.04	58.93
1950	59.04	59.03	59.01	58.96	58.89	58.74	58.55	58.38	58.09
1951	59.45	59.43	59.40	59.26	59.21	58.88	58.52	58.13	57.79
1952	58.82	58.79	58.78	58.75	58.69	58.45	58.38	58.08	57.66
1953	58.11	58.07	58.04	57.94	57.73	57.42	57.22	57.02	57.08
1954	59.64	59.60	59.57	59.48	59.28	59.18	59.08	58.76	58.43
1955	57.69	57.63	57.60	57.46	57.26	56.91	56.65	56.39	56.13
1956	54.77	54.75	54.71	54.61	54.54	54.43	54.16	53.64	53.06
1957	52.14	52.14	52.14	52.13	52.10	51.94	51.72	51.51	51.27
1958	58.03	58.02	58.00	57.96	57.87	57.30	56.86	56.26	55.08
1959	60.25	60.22	60.17	60.05	59.75	58.98	58.43	58.00	57.84
1960	59.42	59.37	59.33	59.29	59.19	58.89	58.63	58.26	58.35
1961	60.20	60.19	60.15	60.09	60.00	59.79	59.48	59.11	58.80
1962	59.01	58.98	58.95	58.87	58.71	58.38	58.11	57.83	57.52
1963	56.35	56.34	56.31	56.28	56.14	55.86	55.80	55.73	55.74
1964	59.03	58.97	58.95	58.91	58.76	58.54	57.54	56.94	56.57
1965	61.04	61.00	60.93	60.65	60.10	59.55	59.40	59.25	58.97
1966	60.09	60.08	60.06	59.98	59.71	59.40	59.16	59.10	58.97

Table D8—*Continued*

Year	1	7	14	30	60	120	183	274	365
1967	59.38	59.37	59.35	59.24	59.16	58.95	58.81	58.75	58.61
1968	59.03	59.01	59.00	58.93	58.78	58.46	58.27	58.09	57.86
1969	58.94	58.88	58.84	58.79	58.68	58.53	58.50	58.43	58.08
1970	60.47	60.44	60.39	60.28	60.02	59.88	59.58	59.32	58.97
1971	59.04	59.02	58.99	58.91	58.77	58.61	58.50	58.33	58.28
1972	59.03	58.96	58.94	58.85	58.78	58.72	58.46	58.17	57.97
1973	60.18	60.16	60.12	59.95	59.67	59.47	59.25	59.16	59.13
1974	58.87	58.79	58.74	58.72	58.62	58.48	58.40	58.22	58.02
1975	59.25	59.20	59.17	59.16	59.04	58.71	58.44	58.30	58.13
1976	57.57	57.55	57.54	57.52	57.49	57.38	57.37	57.28	57.22
1977	57.14	57.12	57.09	57.02	56.95	56.76	56.53	56.51	56.51
1978	58.44	58.43	58.42	58.36	58.24	57.74	56.70	56.01	55.81
1979	60.01	59.99	59.92	59.69	59.31	58.78	58.50	58.39	58.34
1980	58.82	58.80	58.78	58.73	58.71	58.67	58.53	58.45	58.35
1981	58.64	58.61	58.57	58.55	58.52	58.36	58.28	58.13	58.02
1982	58.12	58.02	58.00	57.96	57.66	56.76	56.46	56.36	56.45
1983	59.71	59.67	59.63	59.47	59.27	58.88	58.57	58.50	58.54
1984	59.42	59.28	59.27	59.22	59.16	59.07	58.95	58.83	58.78
1985	58.81	58.79	58.74	58.69	58.67	58.59	58.41	58.13	57.81
1986	58.88	58.88	58.87	58.79	58.64	58.49	58.46	58.29	57.70
1987	60.08	60.07	60.02	59.88	59.56	59.15	58.64	58.20	58.03
1988	58.85	58.78	58.69	58.56	58.43	58.07	57.71	57.38	57.39
1989	59.04	58.99	58.97	58.90	58.71	58.46	58.24	57.86	57.48
1990	56.61	56.56	56.54	56.51	56.47	56.36	56.16	55.88	55.59
1991	53.99	53.98	53.97	53.90	53.86	53.78	53.71	53.33	53.16
1992	56.05	56.02	55.95	55.90	55.82	55.68	55.49	55.26	55.07

Table D9. Low stage data (feet, National Geodetic Vertical Datum) for Newnans Lake, 1946–52 and 1958–92. *Lowest mean values for the following number of consecutive days in reference year ending September 30.*

Year	1	7	14	30	60	120	183	274	365
1946	66.46	66.48	66.50	66.56	66.72	67.29	67.64	67.81	68.10
1947	65.39	65.41	65.44	65.53	65.55	65.74	66.36	66.50	66.93
1948	65.56	65.74	65.86	65.89	66.09	66.68	67.30	67.88	68.16
1949	65.61	65.62	65.64	65.66	65.67	66.05	66.13	66.15	66.53
1950	64.33	64.37	64.39	64.47	64.61	64.97	65.22	65.61	66.16
1951	64.73	64.78	64.86	64.95	65.02	65.22	65.46	65.76	66.26
1952	65.15	65.17	65.18	65.26	65.32	65.59	65.93	66.41	66.62
1958	65.07	65.19	65.26	65.45	65.52	65.72	66.26	66.35	66.34
1959	64.83	64.87	64.90	64.92	65.14	65.57	66.30	66.84	66.94
1960	65.43	65.46	65.49	65.51	65.62	65.95	66.41	66.41	66.79
1961	65.33	65.35	65.38	65.44	65.56	65.84	66.09	66.26	66.75
1962	63.87	63.90	63.94	63.95	64.03	64.25	64.46	64.73	65.33
1963	64.47	64.50	64.53	64.62	64.78	65.09	65.26	65.39	65.43
1964	64.87	64.87	64.87	64.87	64.92	65.66	66.39	66.38	66.62
1965	65.71	65.75	65.81	65.94	66.18	66.67	67.14	67.22	67.45
1966	65.88	65.89	65.90	65.95	66.08	66.35	66.65	66.67	66.77
1967	66.33	66.33	66.34	66.39	66.43	66.63	66.88	67.01	67.25
1968	65.23	65.26	65.29	65.38	65.51	65.74	65.92	66.09	66.47
1969	66.25	66.28	66.29	66.32	66.40	66.61	66.89	66.91	67.10
1970	66.73	66.76	66.80	66.91	67.01	67.18	67.51	67.95	67.92
1971	66.23	66.23	66.23	66.24	66.32	66.45	66.64	66.62	66.69
1972	66.43	66.47	66.54	66.72	66.84	67.09	67.20	67.27	67.54
1973	66.94	66.96	66.98	67.04	67.14	67.23	67.53	67.60	67.54
1974	66.43	66.46	66.49	66.54	66.62	66.76	66.78	66.84	67.05
1975	66.43	66.46	66.50	66.50	66.58	66.64	66.75	66.85	66.83

Table D9—*Continued*

Year	1	7	14	30	60	120	183	274	365
1976	64.53	64.55	64.58	64.63	64.69	64.94	65.21	65.51	65.87
1977	65.28	65.29	65.31	65.33	65.37	65.49	65.75	66.28	66.29
1978	65.21	65.22	65.22	65.24	65.33	65.73	66.67	66.94	67.26
1979	66.23	66.23	66.27	66.36	66.48	66.62	66.85	66.90	66.86
1980	65.87	65.92	65.93	66.02	66.32	66.43	66.72	66.99	67.05
1981	64.72	64.76	64.81	64.89	64.92	64.99	65.31	65.54	65.65
1982	64.30	64.32	64.34	64.38	64.42	64.61	65.24	65.96	66.20
1983	66.37	66.39	66.41	66.43	66.45	66.59	66.91	67.23	67.13
1984	66.43	66.45	66.48	66.57	66.75	66.78	67.05	67.28	67.20
1985	65.40	65.41	65.42	65.47	65.54	65.72	65.85	65.97	66.29
1986	65.78	65.80	65.81	65.84	65.91	66.07	66.34	66.75	66.90
1987	65.53	65.61	65.70	65.91	66.09	66.26	66.75	67.09	66.91
1988	65.19	65.19	65.22	65.23	65.26	65.32	65.87	66.08	66.10
1989	64.68	64.72	64.76	64.78	64.84	65.03	65.23	65.58	65.90
1990	65.18	65.22	65.24	65.26	65.29	65.37	65.56	65.62	65.67
1991	65.04	65.05	65.05	65.06	65.08	65.21	65.53	66.01	66.12
1992	65.28	65.30	65.32	65.32	65.32	65.44	65.50	65.52	65.71

Table D10. Low stage data (feet, National Geodetic Vertical Datum) for Alachua Lake at the main structure, 1980–92. *Lowest mean values for the following number of consecutive days in reference year ending September 30.*

Year	1	7	14	30	60	120	183	274	365
1980	55.54	55.69	55.70	55.82	55.99	56.22	56.42	56.70	56.93
1981	52.80	53.00	53.23	53.64	53.95	54.29	54.58	55.16	55.39
1982	53.64	53.68	53.71	53.72	53.74	53.98	54.58	55.41	56.09
1983	55.81	55.98	56.09	56.21	56.31	56.65	57.08	57.59	57.61
1984	54.98	55.25	55.48	55.84	56.38	56.78	57.18	57.43	57.51
1985	53.00	53.04	53.09	53.21	53.27	53.39	53.99	54.41	54.62
1986	52.89	53.24	53.48	53.69	53.97	54.48	55.24	55.60	55.43
1987	52.80	52.87	52.93	52.96	53.10	53.56	54.65	55.94	56.20
1988	52.75	52.79	52.82	52.89	52.98	53.28	54.06	54.57	54.67
1989	52.95	53.03	53.15	53.20	53.29	53.47	53.72	54.93	55.84
1990	50.77	50.84	50.91	51.07	51.40	51.94	52.11	52.27	52.38
1991	50.29	50.40	50.40	50.40	50.46	50.96	51.83	53.26	54.04
1992	53.32	53.32	53.32	53.32					

Table D11. Low stage data (feet, National Geodetic Vertical Datum) for Lochloosa Lake, 1943–52 and 1956–92. *Lowest mean values for the following number of consecutive days in reference year ending September 30.*

Year	1	7	14	30	60	120	183	274	365
1943	56.39	56.41	56.42	56.43	56.45	56.57	56.73	57.04	57.30
1944	56.03	56.06	56.11	56.18	56.24	56.26	56.44	56.89	57.12
1945	56.64	56.70	56.72	56.83	57.00	57.32	57.66	57.95	58.14
1946	58.40	58.44	58.46	58.52	58.65	58.98	59.14	59.16	59.51
1947	58.50	58.57	58.62	58.65	58.68	58.81	59.01	59.04	59.36
1948	59.03	59.08	59.09	59.13	59.26	59.57	59.92	60.22	60.29
1949	58.49	58.53	58.55	58.57	58.61	58.74	58.88	58.99	59.20
1950	57.01	57.15	57.21	57.28	57.43	57.73	57.89	58.18	58.53
1951	56.89	56.91	56.96	57.00	57.01	57.07	57.35	57.79	58.28
1952	57.79	57.81	57.82	57.90	57.98	58.17	58.42	58.62	58.62
1956	53.88	53.94	53.97	54.04	54.11	54.12	—	—	—
1957	54.23	54.44	54.50	55.00	55.17	55.21	55.26	55.32	55.66
1958	56.41	56.44	56.49	56.50	56.51	56.67	57.00	57.20	57.25
1959	56.94	56.96	57.00	57.02	57.10	57.27	57.67	58.27	58.43
1960	57.30	57.34	57.38	57.42	57.50	57.62	57.90	58.14	58.48
1961	57.27	57.27	57.28	57.31	57.38	57.57	57.78	58.04	58.41
1962	55.86	55.86	55.87	55.89	55.92	55.98	56.17	56.52	56.91
1963	55.52	55.53	55.54	55.57	55.63	55.71	55.78	55.85	55.86
1964	55.55	55.55	55.55	55.55	55.59	56.03	56.76	57.30	57.81
1965	58.10	58.12	58.16	58.23	58.37	58.63	58.81	58.89	59.10
1966	58.33	58.36	58.39	58.45	58.52	58.58	58.77	58.73	58.82
1967	57.53	57.56	57.60	57.67	57.75	57.90	58.18	58.28	58.44
1968	56.63	56.67	56.73	56.74	56.85	56.96	57.09	57.32	57.52
1969	57.75	57.76	57.78	57.79	57.83	57.99	58.16	58.21	58.31

Note: — = data not available

Table D11—*Continued*

Year	1	7	14	30	60	120	183	274	365
1970	58.25	58.30	58.35	58.38	58.42	58.59	58.91	59.23	59.16
1971	57.21	57.22	57.23	57.25	57.30	57.41	57.64	57.79	57.86
1972	57.33	57.35	57.37	57.45	57.53	57.72	58.05	58.31	58.57
1973	58.18	58.19	58.20	58.24	58.33	58.51	58.88	59.02	58.94
1974	56.95	56.98	57.02	57.07	57.15	57.35	57.52	57.68	57.97
1975	56.86	56.87	56.88	56.92	56.97	57.02	57.26	57.49	57.64
1976	56.01	56.06	56.12	56.21	56.31	56.52	56.61	56.81	56.88
1977	55.03	55.05	55.06	55.09	55.14	55.26	55.50	55.85	55.86
1978	54.91	54.91	54.91	54.97	55.03	55.28	56.02	56.73	57.30
1979	57.65	57.65	57.65	57.67	57.73	57.92	58.07	58.11	58.14
1980	57.03	57.35	57.77	57.95	58.01	58.20	58.33	58.36	58.37
1981	56.38	56.42	56.48	56.56	56.61	56.65	56.91	57.20	57.40
1982	55.79	55.84	55.86	55.88	55.92	55.95	56.00	56.64	57.15
1983	58.03	58.03	58.05	58.07	58.10	58.20	58.42	58.75	58.73
1984	57.99	58.03	58.08	58.21	58.40	58.50	58.52	58.70	58.66
1985	55.69	55.71	55.75	55.77	55.82	56.03	56.33	56.69	57.00
1986	57.41	57.44	57.49	57.53	57.56	57.62	57.82	58.07	58.11
1987	57.13	57.14	57.16	57.20	57.28	57.51	57.99	58.38	58.24
1988	56.23	56.24	56.27	56.31	56.40	56.68	56.96	56.92	57.04
1989	56.17	56.20	56.24	56.31	56.43	56.57	56.82	57.17	57.51
1990	54.21	54.24	54.29	54.40	54.52	54.61	54.73	54.99	55.22
1991	54.14	54.15	54.15	54.16	54.16	54.17	54.24	54.68	55.01
1992	54.36	54.38	54.41	54.48	54.58	54.62	54.72	54.85	55.00

Table D12. Low stage data (feet, National Geodetic Vertical Datum) for Orange Lake, 1943–92. *Lowest mean values for the following number of consecutive days in reference year ending September 30.*

Year	1	7	14	30	60	120	183	274	365
1943	55.32	55.35	55.37	55.38	55.45	55.61	55.84	56.24	56.57
1944	55.61	55.63	55.66	55.69	55.73	55.74	55.84	56.31	56.60
1945	56.14	56.21	56.26	56.35	56.51	56.82	57.14	57.47	57.67
1946	58.02	58.05	58.08	58.17	58.30	58.58	58.72	58.74	59.09
1947	58.10	58.16	58.19	58.22	58.24	58.36	58.58	58.60	58.93
1948	58.67	58.70	58.71	58.74	58.84	59.10	59.41	59.68	59.75
1949	58.01	58.03	58.06	58.09	58.16	58.26	58.39	58.46	58.65
1950	56.60	56.65	56.67	56.71	56.82	57.01	57.15	57.46	57.83
1951	56.28	56.31	56.32	56.34	56.37	56.42	56.61	56.98	57.44
1952	56.96	56.98	56.99	57.06	57.11	57.41	57.75	57.96	57.97
1953	56.42	56.47	56.48	56.52	56.59	56.62	56.68	56.97	57.21
1954	56.32	56.34	56.34	56.37	56.53	56.88	57.25	57.79	58.12
1955	54.11	54.17	54.24	54.28	54.31	54.42	54.66	55.04	55.30
1956	50.38	50.42	50.45	50.48	50.51	50.67	50.86	51.29	51.83
1957	50.67	50.69	50.73	50.83	50.90	51.03	51.16	51.42	51.74
1958	54.89	55.11	55.27	55.49	55.66	55.83	56.14	56.65	56.81
1959	56.92	56.97	57.00	57.03	57.09	57.23	57.62	58.22	58.36
1960	57.26	57.28	57.31	57.36	57.44	57.58	57.86	58.10	58.44
1961	57.10	57.18	57.20	57.26	57.28	57.49	57.71	57.99	58.37
1962	55.70	55.73	55.75	55.76	55.77	55.82	56.03	56.43	56.84
1963	54.99	55.04	55.04	55.12	55.29	55.44	55.64	55.59	55.65
1964	54.96	55.09	55.16	55.25	55.35	55.62	56.59	57.19	57.63
1965	58.02	58.05	58.09	58.20	58.39	58.67	58.85	58.92	59.14
1966	58.40	58.43	58.45	58.48	58.55	58.59	58.75	58.74	58.82

Table D12—*Continued*

Year	1	7	14	30	60	120	183	274	365
1967	57.52	57.58	57.64	57.70	57.76	57.91	58.18	58.28	58.45
1968	56.64	56.67	56.71	56.75	56.85	56.95	57.10	57.33	57.54
1969	57.70	57.72	57.74	57.77	57.82	58.01	58.19	58.24	58.33
1970	58.25	58.29	58.33	58.35	58.41	58.61	58.92	59.22	59.16
1971	57.22	57.24	57.26	57.27	57.31	57.42	57.65	57.81	57.89
1972	57.37	57.40	57.43	57.51	57.57	57.77	58.08	58.31	58.56
1973	58.14	58.16	58.18	58.23	58.31	58.48	58.84	58.97	58.90
1974	56.93	56.98	57.03	57.09	57.16	57.37	57.54	57.70	57.98
1975	56.91	56.93	56.94	56.98	57.05	57.10	57.33	57.56	57.70
1976	56.32	56.36	56.40	56.49	56.55	56.75	56.83	57.03	57.10
1977	54.80	54.81	54.84	54.91	54.93	55.12	55.52	55.94	55.96
1978	54.17	54.18	54.21	54.24	54.33	54.58	55.50	56.37	57.00
1979	57.60	57.64	57.67	57.71	57.78	57.95	58.09	58.12	58.14
1980	57.90	57.94	58.01	58.09	58.18	58.30	58.43	58.41	58.44
1981	56.36	56.41	56.46	56.50	56.58	56.66	56.94	57.25	57.46
1982	55.68	55.71	55.74	55.76	55.80	55.82	55.91	56.59	57.12
1983	57.89	57.92	57.92	57.93	57.96	58.03	58.22	58.53	58.53
1984	58.20	58.21	58.24	58.35	58.51	58.58	58.70	58.82	58.77
1985	55.78	55.80	55.83	55.85	55.87	56.05	56.38	56.75	57.07
1986	57.32	57.37	57.37	57.42	57.45	57.50	57.73	57.97	58.08
1987	57.04	57.06	57.09	57.14	57.25	57.45	57.91	58.32	58.22
1988	55.99	56.02	56.04	56.08	56.14	56.49	56.86	56.82	56.97
1989	55.96	56.02	56.05	56.11	56.24	56.35	56.57	56.97	57.34
1990	53.59	53.60	53.61	53.64	53.69	53.77	54.03	54.42	54.73
1991	51.86	51.89	51.92	52.01	52.03	52.24	52.60	53.03	53.69
1992	53.65	53.67	53.71	53.78	53.92	54.01	54.19	54.40	54.63