

LONG-TERM STREAMFLOW STATIONS
IN FLORIDA, 1980By
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INTRODUCTION

The flow of streams varies daily, monthly, annually, and over a period of years as a result of variation in rainfall and changes brought about by man. A record of these variations is useful for predicting future streamflow and the longer the streamflow record, the greater its usefulness and reliability in making these predictions. The large map shows the location of the 236 streamflow stations in Florida with 10 or more years of record as of 1980. Figures 1 through 5 show stations (through 1980) with 10 to 20, 20 to 30, 30 to 40, 40 to 50, and more than 50 years of record, respectively.

These 236 long-term streamflow stations meet the criteria for statistical analysis as defined in a study of the national streamflow network (Benson and Carter, 1973). The authors of that report conclude that a reasonable period for determining the flow characteristics of any point on a stream that drains an area of less than 500 square miles is 10 or more years of daily record at that point. For larger drainage areas 25 years of record are needed. The network of streamflow stations is one element of the U.S. Geological Survey program of evaluating the water resources of Florida. The water resources program is conducted in cooperation with the five Water Management Districts, and other Federal, State, and local agencies. The streamflow data gathered by the U.S. Geological Survey serve the public and private sector and are used in making fundamental decisions about water use and management.

Streamflow for purposes of this report is synonymous with discharge and includes the flow of natural and regulated streams and the flow of canals. It is the volume of water and waterborne materials that pass a given point on a stream (or canal) within a given period of time. Streamflow is usually expressed in cubic feet per second as averaged over the period of a day, a month, a year, or a number of years. As the need demands, streamflow also can be expressed in gallons per day, acre feet per year, cubic meters per second, or other units.

To determine streamflow, measurements of the velocity and the depth of the water are made. On natural streams the depth of the water and the streamflow are related. The depth of the water can be determined on a suitable gage, and from a number of measurements at different gage readings a rating curve or table of that relation can be developed. Streamflow can then be determined from the height of the water on the gage in conjunction with the rating curve or table.

Streamflow may be measured at high or low flow (partial record), periodically, or daily. All daily record stations in Florida are equipped with automatic, continuous recording gages.

LONG-TERM STREAMFLOW STATIONS

The Survey operated 394 streamflow stations in Florida during 1980. This number includes 271 daily streamflow stations, 47 periodic streamflow stations, and 76 partial streamflow stations. Of the 271 daily streamflow stations, 202 had 10 or more years of record as of October 1980. In addition 34 discontinued stations had 10 or more years of record. These 236 long-term streamflow stations are listed in downstream order on the table of streamflow stations; their locations are plotted on the large map. Of the 236 stations, 96 have 10 to 20 years of record (fig. 1), 61 have 20 to 30 years of record (fig. 2), 33 have 30 to 40 years of record (fig. 3), 31 have 40 to 50 years of record (fig. 4), and the remaining 15 have more than 50 years of record (fig. 5).

Streamflow stations are operated for specific objectives and when these objectives have been met the stations are discontinued. The objectives are varied and can change with changing conditions. Objectives include determining long-term trends; relation with precipitation; changes wrought by man, suitability for bridges, dams, water transport, public consumption, or sewage disposal; irrigation; and legal considerations. Long-term streamflow stations are usually classified as primary stations and can be used to evaluate records from short-term stations or to estimate runoff conditions at similar ungaged sites.

Many characteristics of streams change with time, and it is necessary to operate a station for a considerable period to determine the rate of change, the cycle of change (if any), the trend of the change, and the relation of these characteristics. Statistical methods may be necessary to extrapolate the data to determine changes and trends for very long periods of time. The flow ungaged streams may be determined with reasonable confidence by transfer of long-term data from records of nearby streams.

Many streamflow stations in Florida with more than 25 years of record continue to be operated because of the continuing urbanization which is accompanied by physical, chemical, and biological changes to the quality and quantity of natural streamflow. Streamflow can be greatly affected by channeling sheet flow to canal flow (as is often the case in south Florida), by redirection of flow across natural divides by canals, by ditching, by pumping of water, and by changes in land use. Low basin divides may allow flow to be exchanged between basins. To not continue long-term records for stations on some streams would deny water managers and others of necessary information needed for current decisions. Some stations are operated indefinitely because they have national or regional significance.

EARLIEST STREAMFLOW RECORDS IN FLORIDA

Two daily streamflow stations in Florida were established in 1906 by M.R. Hall, although miscellaneous measurements were made before that time. Flow records for these stations were published in 1909 (Hall and Bolster, 1909). One station, Suwannee River at White Springs, the earliest valid daily streamflow station in Florida, was operated from May 1906 through December 1908 and from January 1931 through the present (1983). The record for the other station, Silver Springs at Silver Springs, was later discontinued.

Chipola River at Altha was operated from November 1912 through December 1913, and daily gage heights collected. Streamflow was later established on the basis of these records. This station has been reactivated several times.

Periodic measurements were made on many streams from 1913 to 1926 including five canals that drain Lake Okechobee, Perdido River at Muscogee, Blackwater River near Seminole, and North Prong of St. Marys River near Moniac. In June 1926 two stations were established on the Ochlockonee River, one near Havana and the other near Bloxham. These stations have the longest continuous record of any Florida stations. St. Marys River near Macclenny was established in October 1926 and Suwannee River at Ellaville three months later to become the stations with third and fourth longest continuous record in the State. Suwannee River at Luraville, established at the same time as Ellaville, has been discontinued. Santa Fe River near Fort White, established in October 1927, and two stations on the Withlacoochee River, one at Trilby and the other at Holder, were discontinued for various periods although they are now currently (1983) in operation. The Apalachicola River station at Chattahoochee has flow records from October 1928, and the National Weather Service (formerly U.S. Weather Bureau) has stage records from 1919. A station was established on the Kissimmee River near Okechobee in October 1929 and has been in operation continuously since then.

In 1930 the U.S. Geological Survey published daily streamflow data for 17 stations including most of those mentioned above. In 1940 data were published for 69 stations; in 1950 for 110; in 1960 for 160; in 1970 for 227; and in 1980 for 271.

USE OF STREAMFLOW DATA

Excess water was the principal concern of Floridians for many years as canals were dug to drain swamps and to control runoff from the abundant rainfall. Streamflow data were collected by the Survey in cooperation with flood control districts and other political entities at specific locations for the prediction of the duration, frequency, and peak elevations of floods, associated problems of crop management, erosion control, navigation, and evaluation of potential hydropower dams or bridge sites. Recently, the emphasis has shifted from flood control to water management. The need for streamflow data has expanded from requiring data for the control of excess water to requiring data for the allocation of water between users, control of the use of water by industry, agriculture, or municipalities, and the protection and management of the total resource. The Survey routinely collects streamflow data that are necessary for dealing with these problems and for use in low-flow analysis, mapping of flood-prone or environmentally sensitive lands, wastewater treatment and public drinking water supply, industrial process water use, irrigation, protection of fish and wildlife, recreational use of streams, and as a necessary component in the interpretation of water-quality data. Concern with water resources has paralleled the development and population growth of Florida and can be discerned in the pattern of station locations in figures 1-5.

The emphasis of streamflow data analysis has been expanded to include network analysis for areal and regional needs using data from long-term stations to analyze the flow of ungaged streams. The computer models that extend the data use statistical methods that require data that cover the entire range of flow. The extrapolation of this data is used by planners, water managers, and others for both real-time and long-range information to meet legal and operational needs. These statistical methods require long-term records of streamflow associated records of rainfall, and natural and induced characteristics of the drainage basins.

AVAILABILITY OF DATA

Streamflow data are available to the public in various forms: as data that have been verified, but otherwise unvalued; as data reduced to a more manageable form by electronic or manual sorting, tabulating, plotting, or statistical analyses; or as interpretive reports that evaluate the data in terms of surface-water resources. The U.S. Geological Survey's system of data storage and retrieval, WATSTORE, can furnish data or a variety of statistical application programs used to summarize and analyze the data, including data at all of the stations included in the accompanying table. Stream-quality information is also available through STORET, a computerized file of water-quality data maintained by the U.S. Environmental Protection Agency. STORET includes all water-quality data from WATSTORE as well as data from other agencies.

Records of streamflow were published from 1913 to 1961 in U.S. Geological Survey Water-Supply Papers. Beginning with the 1961 water year, this series was replaced by the yearly publication, "U.S. Geological Survey Water-Data Reports." For Florida, the title is "Water Resources Data for Florida—Water Year 19-." U.S. Geological Survey Water-Data Reports. Further information on these publications or data on individual streams or groups of stream are available at U.S. Geological Survey offices in Jacksonville, Miami, Orlando, Tallahassee, and Tampa.

REFERENCES

- Benson, M.A., and Carter, R.W., 1973, A national study of the streamflow data-collection program: U.S. Geological Survey Water-Supply Paper 2028, 44 p.
Hall, M.R., and Bolster, R.H., 1909, Surface water supply of the United States 1907-8, Part II, South Atlantic Coast and Eastern Gulf of Mexico: U.S. Geological Survey Water-Supply Paper 242, 226 p.

Table 1.—Streamflow stations in Florida with more than 10 years of record.

Map color code	Map index No.	Station name	Map color code	Map index No.	Station name	Map color code	Map index No.	Station name
Green	1	North Prong St. Marys River at Moniac.	Blue	82	Diversion to Conservation Area 1 at S-5A.	Yellow	158	Cypress Creek near San Antonio.
Yellow	2	Middle Prong St. Marys River at Taylor.	Blue	83	Levee 8 Canal at West Palm Beach Canal.	Red	159	Cypress Creek near Sulphur Springs.
Blue	3	Turkey Creek at Macclenny.*	Blue	84	West Palm Beach Canal below S-5A-E.	Red	160	Hillsborough River near Tampa.
Red	4	So. Prong St. Marys R. at Glen St. Mary.*	Red	85	West Palm Beach Ca. at West Palm Beach.	Blue	161	Sulphur Springs at Sulphur Springs.
Blue	5	St. Marys River near Macclenny.	Blue	86	Hillsboro Ca. below HGS-4 nr. South Bay.	Yellow	162	Lake Magdalen outlet near Lutz.
Yellow	6	Thomas Creek near Crawford.	Blue	87	Hillsboro Canal at S-6 near Shawano.	Blue	163	Sweetwater Creek near Sulphur Springs.
Blue	7	Jane Green Creek near Deer Park.	Yellow	88	Hillsboro Canal near Deerfield Beach.	Yellow	164	Brook Creek near Sulphur Springs.
Red	8	St. Johns River near Melbourne.	Yellow	89	Pompano Canal at Pompano Beach.*	Green	165	Brook Creek near Lake Fern.
Blue	9	Wolf Creek near Deer Park.	Yellow	90	Cypress Creek at S-37A nr. Pompano Beach.	Blue	166	Brook Creek near Tarpon Springs.
Blue	10	St. Johns River near Cocoa.	Yellow	91	Middle River Canal at S-36.	Blue	167	Alligator Creek at Safety Harbor.*
Blue	11	St. Johns River near Christmas.	Blue	92	North River Canal at S-2 and HGS-4.	Blue	168	Seminole Lake outlet near Largo.*
Blue	12	Little Econlockhatchee R. nr. Union Park.	Yellow	93	Plantation Road Canal at S-33.	Yellow	169	South Branch Anclote River near Odessa.
Red	13	Econlockhatchee R. nr. Chuluota.	Blue	94	New River Canal at S-37A nr. South Bay.	Green	170	Anclote River near Eilers.
Red	14	Wekiva River near Sanford.	Blue	95	New River Canal at Broward-Palm Beach county line.	Yellow	171	Jumping Gully Creek at Loxley.
Red	15	St. Johns River near De Land.	Blue	96	North River Canal near Fort Lauderdale.	Yellow	172	Publiscas Creek R. nr. New Port Richey.
Blue	16	Big Creek near Clermont.	Blue	97	South New River Canal at S-9 near Miami.	Yellow	173	Crystal River near Crystal River.*
Blue	17	Palatka River at Cherry Lake outlet near Groveland.	Blue	98	South New River Canal at S-13 near Davis.	Blue	174	Withlacoochee River near Eva.
Blue	18	Palatka River near Mascotte.*	Red	99	Snake Creek Canal at N.W. 67th Avenue near Hialeah.	Yellow	175	Withlacoochee River near Cumprresco.
Blue	19	Apopka-Bendall Canal near Astatula.	Blue	100	Snake Creek Canal at S-29.	Blue	176	Withlacoochee-Hillsborough Diversion near Richland.
Green	20	Haines Creek near Lisbon.	Yellow	101	Discayne Canal at S-28 near Miami.	Purple	177	Withlacoochee River at Trilby.
Blue	21	Oklawaha River at Moss Bluff.	Yellow	102	Little River Canal at S-27 near Miami.	Yellow	178	Little Withlacoochee River nr. Terrytown.
Blue	22	Oklawaha River near Ocala.*	Blue	103	Miami Ca. at HGS-3 & S-3 at Lake Harbor.	Blue	179	Little Withlacoochee River at Redell.
Red	23	Silver Springs near Ocala.	Yellow	104	Miami Canal at S-8 near Lake Harbor.	Yellow	180	Withlacoochee R. at Wosong Dam at Carlson.
Yellow	24	Oklawaha River near Conner.	Yellow	105	Canal 10 at S-140 near Fort Lauderdale.	Yellow	181	Tampa Outlet Canal at S-13 near Davis.
Green	25	Oklawaha River at Orange Springs.	Yellow	106	Miami Canal east of Levee 30 near Miami.	Yellow	182	Outlet River at Panoschoke Retorts.
Blue	26	Oklawaha River at Rodman Dam near Orange Springs.	Yellow	107	Miami Canal at S-28 near Miami.	Yellow	183	Withlacoochee R. at Wosong Dam at Carlson.
Yellow	27	Oklawaha River at Riverside Landing near Orange Springs.	Yellow	108	Miami Canal at N.W. 86th St. at Miami.	Yellow	184	Tampa Outlet Canal at S-13 near Davis.
Green	28	Cross-Florida Barge Canal at Buckman Lock near Palatka.	Blue	109	Tamiami Canal at N.W. 86th St. at Miami.	Yellow	185	Withlacoochee River near Holder.
Green	29	Little Haw Creek near Seville.	Blue	110	Tamiami Ca. outlets, Monroe to Carnestown.	Yellow	186	Rainbow Springs near Dunnellon.
Red	30	St. Johns River at Palatka.	Blue	111	Tamiami Ca. outlets, 40-mi. bend to Monroe.	Yellow	187	Withlacoochee River at Inglis Dam near Dunnellon.
Red	31	South Fork Black Creek near Penny Farms.	Blue	112	Tamiami Ca. outlets, Miami to Monroe.*	Yellow	188	Barge Canal at Inglis Lock near Inglis.
Red	32	North Fork Black Creek near Middleburg.	Blue	113	Levee 3 Canal near Clewiston.	Yellow	189	Withlacoochee R. Bypass Chan. nr. Inglis.
Red	33	Big Davis Creek at Bayard.	Yellow	114	Tamiami Canal outlets, Levee 67A to 40-mi. bend near Miami.	Yellow	190	Waccasassa River near Gulf Hammock.
Yellow	34	Big Davis Creek at Jacksonville.	Yellow	115	Tamiami Canal outlets, Levee 30 to Levee 67A near Miami.	Yellow	191	Tennille Creek at Lebanon Station.
Yellow	35	Moultrie Cr. at Hwy. 207 nr. St. Augustine.	Blue	116	Tamiami Canal near Coral Gables.	Purple	192	Suwannee River at White Springs.
Blue	36	Moultrie Cr. near St. Augustine.*	Yellow	117	Shapper Cr. at Miller Dr. nr. South Miami.	Red	193	Withlacoochee River near Pinetta.
Yellow	37	Tomoka River near Holly Hill.	Yellow	118	Shapper Canal at S-22 near South Miami.	Purple	194	Suwannee River at Branford.
Green	38	Spruce Creek near Samsul.	Yellow	119	Mowry Canal at S-20A near Homestead.	Blue	195	Santa Fe River near Graham.
Yellow	39	Crane Creek at Melbourne.*	Yellow	120	Canal 111 above S-180 near Florida City.	Blue	196	New River near Lake Butler.*
Yellow	40	Turkey Creek near Palm Bay.*	Blue	121	Taylor Slough near Homestead.	Blue	197	Santa Fe River at Worthington Springs.
Yellow	41	Falmere Canal near Falmere.*	Blue	122	Faka Union River Everglades.	Red	198	Santa Fe River near High Springs.*
Green	42	North Canal at Vero Beach.	Blue	123	Henderson Creek Canal near Naples.	Purple	199	Santa Fe River near Fort White.
Green	43	Main Canal at Vero Beach.	Yellow	124	Golden Gate Canal at Naples.	Blue	200	Suwannee River near Bel.*
Green	44	South Canal near Vero Beach.	Yellow	125	Cochatchee River Canal at Willowby.	Green	201	Suwannee River near Wilcox.
Yellow	45	Fishbeating Creek near Venus.*	Yellow	126	Acre Bridge near Naples.	Green	202	Steinhatchee River near Cross City.
Purple	46	Fishbeating Creek at Palmdale.	Yellow	127	Imperial River near Bonita Springs.	Blue	203	Fenholloway River near Foley.
Yellow	47	Harney Pond Canal at S-71 near Lakeport.	Green	128	Calosahatchee Canal at Moore Haven.	Green	204	Fenholloway River near Perry.
Yellow	48	Indian Prairie Ca. at S-72 nr. Okechobee.	Yellow	129	Calosahatchee Canal at Ortona Lock.	Green	205	Econfina River near Perry.
Yellow	49	Indian Prairie Canal near Okechobee.*	Yellow	130	Peace Creek drainage canal near Alturas.*	Green	206	Aucilla River at Lamont.
Yellow	50	Boggy Creek near Taft.	Blue	131	Lake Lulu outlet at Eloise.*	Green	207	St. Marks River near Newport.
Blue	51	St. Cloud Canal at S-59 near St. Cloud.*	Red	132	Saddle Creek at Struct. P-11 nr. Bartow.	Purple	208	Sophoppy River near Sopchoppy.
Blue	52	Shingle Creek at airport near Kissimmee.	Red	133	Peace River at Bartow.	Purple	209	Ochlockonee River near Havana.
Blue	53	Cypress Creek at Vineland.	Red	134	Peace River at Zolfo Springs.	Green	210	Little River near Quincy.
Yellow	54	Bonnett Creek near Vineland.	Red	135	Little Charley Bowlegs Cr. near Sebring.	Blue	211	Chippola River near Altha.
Yellow	55	Whittenhouse Creek near Vineland.	Red	136	Charlie Creek near Gardner.	Yellow	212	Econfina Creek near Fountain.*
Yellow	56	Reedy Creek near Vineland.	Purple	137	Peace River near Arcadia.	Red	213	Econfina River near Bloxham.
Yellow	57	Davenport Creek near Loughman.	Red	138	Joshua Creek at Nocatoe.	Green	214	Telogia Creek near Bristol.
Green	58	Reedy Creek near Loughman.	Green	139	Horse Creek near Arcadia.	Yellow	215	New River near Wilma.
Green	59	Cattfish Creek near Lake Wales.*	Yellow	140	Shell Creek near Punta Gorda.	Purple	216	Apalachicola River at Chattahoochee.
Blue	60	Kissimmee River near Lake Wales.	Blue	141	Myakka River near Sarasota.	Blue	217	Apalachicola River near Blountstown.
Blue	61	Kissimmee River at S-65 nr. Lake Wales.	Blue	142	Big Slough near Murdock.	Red	218	Chippola River near Altha.
Yellow	62	Kissimmee River at S-68 near Lake Placid.	Blue	143	Manatee River near Bradenton.*	Yellow	219	Econfina Creek near Fountain.*
Yellow	63	Kissimmee River at S-64 near Okechobee.	Yellow	144	Little Manatee River near Wimauma.	Red	220	Econfina River near Bennett.
Yellow	64	Taylor Creek near Sebring.*	Red	145	North Prong Alafia River at Keyville.	Green	221	Choctawhatchee River at Caryville.
Yellow	65	Monroe Ranch drainage ca. nr. Stuart.*	Yellow	146	South Prong Alafia River near Lithia.	Blue	222	Holmes Creek at Vernon.*
Yellow	66	Williamson Ditch at S-7 near Okechobee.	Red	147	Little Alafia River near Hopewell.	Blue	223	Choctawhatchee River near Bruce.
Blue	67	Taylor Creek near Okechobee.	Yellow	148	Alafia River at Lithia.	Blue	224	Alapka Creek near De Funiak Springs.*
Yellow	68	Monroe Ranch drainage ca. nr. Stuart.*	Yellow	149	Sixmile Creek at Tampa.*	Yellow	225	Juniper Cr. at St. Hwy. 85 nr. Niceville.
Yellow	69	Monroe Ranch drainage ca. nr. Stuart.*	Green	150	Fox Branch near Socorro.	Red	226	Yellow River at Milligan.
Yellow	70	Loxahatchee River near Jupiter.	Green	151	Hillsborough River near Zephyrhills.	Green	227	Shoal River near Mossy Head.
Blue	71	West Palm Beach Ca. at HGS-5 at Canal Pt.	Yellow	152	New River near Zephyrhills.	Green	228	Pond Creek near Milton.
Blue	72	West Palm Beach Canal above S-5A.	Yellow	153	Flint Creek near Thomotossa.	Green	229	Shoal River near Crestview.
						Green	230	Blackwater River near Baker.
						Red	231	Pine Barren Creek near Barth.
						Green	232	Brusby Creek near Walnut Hill.
						Red	233	Perdido River near Barriereau Park.

*Station no longer in operation.

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EXPLANATION

- 10 to 20 years of record.
- 20 to 30 years of record.
- 30 to 40 years of record.
- 40 to 50 years of record.
- 50 or more years of record.

Note: Number represents map index to table 1.

Figure 1.—Streamflow stations with 10 to 20 years of record.

Figure 2.—Streamflow stations with 20 to 30 years of record.

Figure 3.—Streamflow stations with 30 to 40 years of record.

Figure 4.—Streamflow stations with 40 to 50 years of record.

Figure 5.—Streamflow stations with more than 50 years of record.

0 10 20 30 40 50 MILES