

ANNUAL AND SEASONAL RAINFALL IN FLORIDA

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Rainfall on Florida is the source of most water in the State. In central and southern Florida rainfall provides all the water, whereas in north Florida some water enters in streams and through the ground from Georgia and Alabama. Because Florida's water resources are derived chiefly from rainfall in the State, a knowledge of the character of the rainfall is essential to understanding the variations of the State's water resources. This atlas was prepared to summarize and portray the distribution of rainfall in Florida, both areally and from season to season, and is based on rainfall data collected by the U. S. Weather Bureau.

MEAN ANNUAL RAINFALL

The map of mean annual rainfall shows that rainfall varies from about 40 inches in the Florida Keys to more than 64 inches in southeast and northwest Florida, and is greater than 50 inches over most of the State. Both the pattern and amount of mean annual rainfall for the State based on the period 1931-55 are essentially the same as for 1931-60, currently used by the U. S. Weather Bureau as the index of normal rainfall. Mean annual rainfall is important in the evaluation of the State's water resources even though many of its water-supply problems are more closely related to annual and seasonal variations in rainfall than to mean annual rainfall.

SEASONAL DISTRIBUTION

The distribution of mean seasonal rainfall in Florida is shown by maps for different seasons of the year. The spring (March through May) rainfall ranges from about 8 inches in the Florida Keys to more than 16 inches in the northwest and averages about 10 inches in the peninsula. Summer (June through August) is the season of greatest rainfall for most of Florida—ranging from about 16 inches in the Florida Keys to more than 24 inches in southern and west-central Florida and averaging about 20 inches in most other places. The autumn (September through November) rainfall is more than 20 inches in the southeast but decreases northward to less than 10 inches in the northwest and is 2 to 6 inches greater on the east coast of peninsular Florida than on the west coast. Winter (December through February) rainfall increases rather uniformly from less than 5 inches in the south to more than 13 inches in the northwest. Winter is the season of least rainfall for all the State except northwest Florida.

VARIATIONS OF ANNUAL RAINFALL

The variation of annual rainfall is even greater than the areal variations of mean seasonal and mean annual rainfall. The annual, summer, and winter rainfall at Pensacola, Gainesville, and Everglades during 1930-65 are shown by the bar graphs. The rainfall variation range at each of these stations is large. For example, rainfall at Pensacola in 1953 was about 90 inches and in 1954 was less than 29 inches; the range of annual rainfall at Pensacola is 61 inches—about equal to the mean annual rainfall there. The range of variation of annual rainfall at Everglades and at Gainesville is about 40 inches. As shown by the graphs, the annual rainfall usually differs substantially from the mean annual rainfall. The annual and seasonal rainfall variations portrayed by the bar graphs are typical for other seasons of the year and for other stations in Florida.

EFFECTS OF RAINFALL EXTREMES

Large seasonal and annual variations characterize rainfall in Florida; thus both droughts and floods are common.

Droughts result from prolonged periods of deficient rainfall, and may occur even during years with greater than average annual rainfall. Because of such short-term but untimely droughts, many farmers irrigate to insure success of their crops. Sources of supplemental water such as surface reservoirs can be depleted during extended dry periods, and ground-water levels will decline excessively during extremely severe droughts spanning one or more years.

Excessive rainfall can be just as troublesome as drought because of water-disposal problems. In Florida, flooding may result from water accumulation over several relatively wet years but also can result from excessive rainfall in a single season or even a shorter period of a relatively dry year. Tropical storms occasionally yield enough rainfall to cause widespread flooding—over 10 inches of rainfall in 24 hours is not uncommon.

Rainfall variations are part of the climate of Florida. Future variations will be as erratic and unpredictable as those recorded in the past; therefore, floods and droughts will occur as in the past. Flow characteristics of streams, ground-water recharge, and levels of lakes and ground-water reservoirs are all functions of the amount and intensity of rainfall. Therefore, knowledge and understanding of both short- and long-term variations in rainfall are necessary for meaningful evaluation of hydrologic relationships. By recognizing the relations of rainfall and hydrology in planning, man can avoid or minimize many of the water-supply and distribution problems arising from natural variations in rainfall.

SELECTED REFERENCES

- Butson, Keith
1959 *Climates of the States, Florida*: Climatology of the United States, No. 60-8, U. S. Weather Bureau.
1968 (and Prine, G. M.) *Weekly rainfall frequencies in Florida*: Ag. Exper. Station, Institute of Food and Ag. Sci., Univ. of Florida, Gainesville, Florida, Circ. S-187.
Florida State Board of Conservation
1954 *Summary of observed rainfalls on Florida to 31 December 1952*: Florida State Div. Water Survey and Research Paper No. 11.
U. S. Weather Bureau
1954 *Climatological data, Florida Annual Summaries 1953-65*: -66 U. S. Dept. Commerce, National Weather Records Center, Asheville, N. C.

MEAN ANNUAL RAINFALL, 1931 - 1955,
AFTER BUTSON, 1959.

0 10 20 30 40 50 miles

EXPLANATION
(ALL MAPS)

—20—

Lines of equal rainfall, in inches

MEAN SPRING RAINFALL, 1931 - 60.

0 10 20 30 40 50 miles

MEAN SUMMER RAINFALL, 1931 - 60.

0 10 20 30 40 50 miles

MEAN AUTUMN RAINFALL, 1931 - 60.

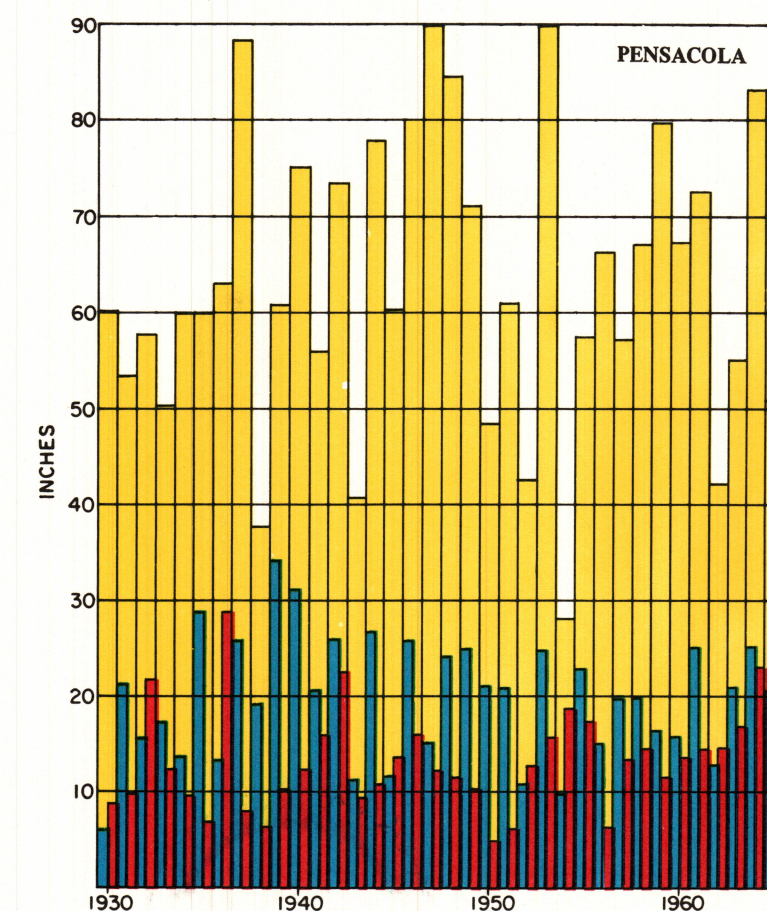
0 10 20 30 40 50 miles

MEAN WINTER RAINFALL, 1931 - 60.

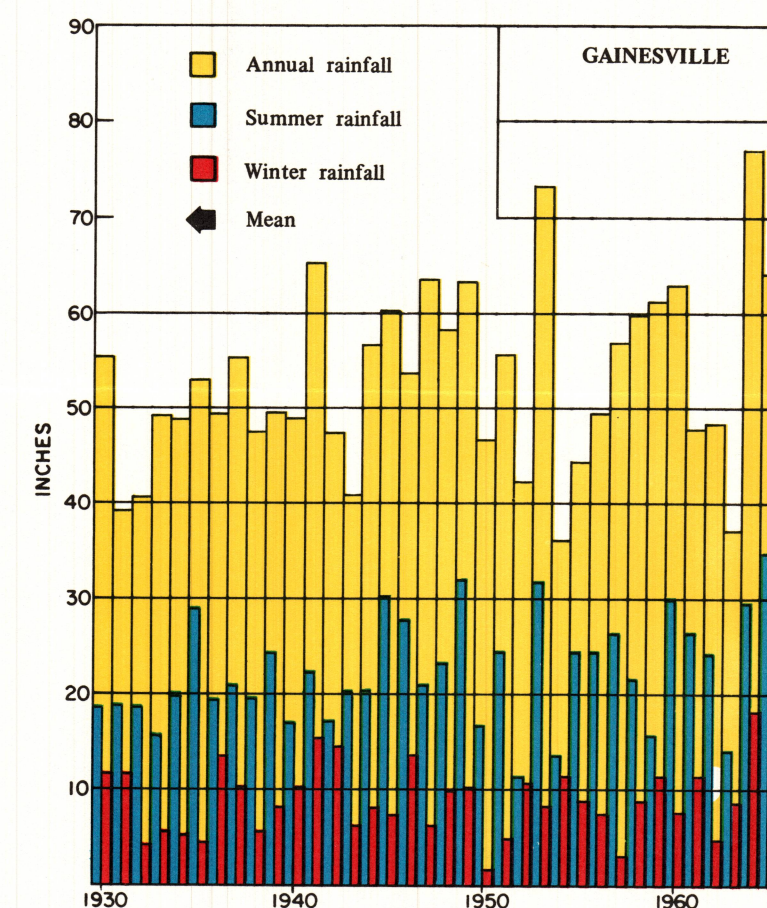
0 10 20 30 40 50 miles

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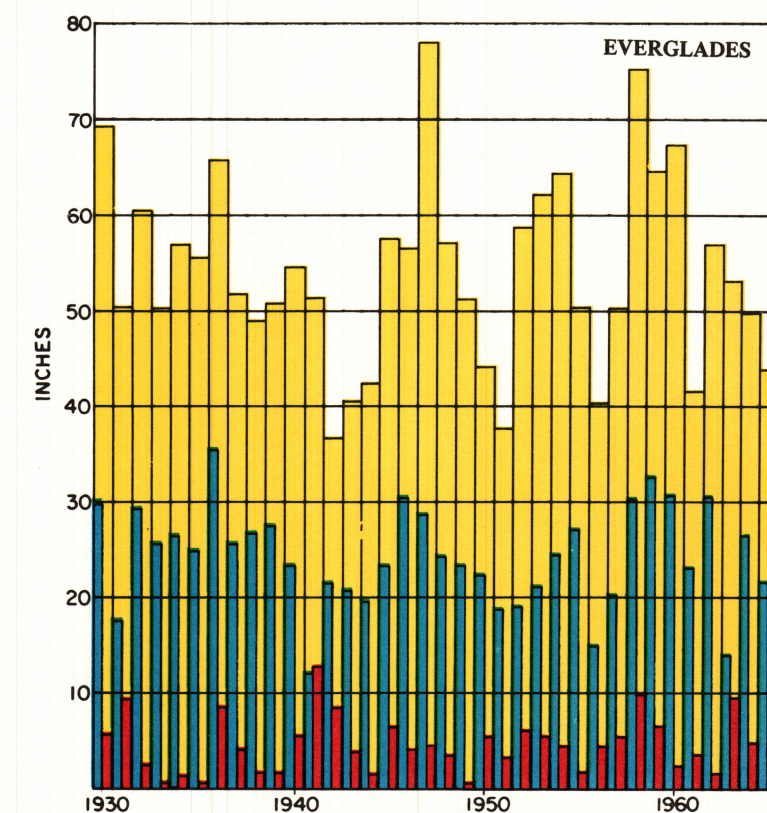
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Annual, summer, and winter rainfall
at Pensacola, Florida, 1930 - 1965.



Annual, summer, and winter rainfall
at Gainesville, Florida, 1930 - 1965.



Annual, summer and winter rainfall
at Everglades, Florida, 1930 - 1965.

Figure 5.— Mean winter (December through February) rainfall, in inches,
1931-1960. Compiled from U.S. Weather Bureau data.