

Climate of Alabama

Introduction

This publication consists of a narrative that describes some of the principal climatic features and a number of climatological summaries for stations in various geographic regions of the State. The detailed information presented should be sufficient for general use; however, some users may require additional information.

The National Climatic Data Center (NCDC) located in Asheville, North Carolina is authorized to perform special services for other government agencies and for private clients at the expense of the requester. The amount charged in all cases is intended to solely defray the expenses incurred by the government in satisfying such specific requests to the best of its ability. It is essential that requesters furnish the NCDC with a precise statement describing the problem so that a mutual understanding of the specifications is reached.

Unpublished climatological summaries have been prepared for a wide variety of users to fit specific applications. These include wind and temperature studies at airports, heating and cooling degree day information for energy studies, and many others. Tabulations produced as by-products of major products often contain information useful for unrelated special problems.

The Means and Extremes of meteorological variables in the Climatography of the U.S. No.20 series are recorded by observers in the cooperative network. The Normals, Means and Extremes in the Local Climatological Data, annuals are computed from observations taken primarily at airports.

The editor of this publication expresses his thanks to those State Climatologists, who, over the years, have made significant and lasting contributions toward the development of this very useful series.

State and Station Normals are available at:

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Topographic Features- The land slopes gradually upward from the low coastal plains around Mobile to the foothills in the central part of the State and then rises more significantly in the northeastern counties. The Appalachians' average elevation in this area is about 800 feet with many of the plateaus averaging over 1,500 feet. Mount Cheaha reaches 2,407 feet for the State's highest elevation while several other peaks top 2,000 feet. Some ridges extend southward through the eastern counties, but they seldom exceed 600 feet.

The Tennessee River flows generally east to west across the extreme northern section of Alabama before turning north to meet the Ohio River. Drainages for the remainder of the state, including important rivers such as the: Mobile, Alabama, Tombigbee, Chattahoochee and Coosa, flow more directly south and southwestward to the Gulf.

Temperature- The climate of Alabama is characterized by moderate seasonality, though becoming somewhat subtropical near the coast. The summers are typically warm and humid, with little day-to-day temperature change. The average high temperatures for the summer range from 80 to 88 degrees Fahrenheit (° F). Slightly cooler temperatures prevail in the higher elevations of the northeastern counties. From late June through mid-August, approximately one-fourth of the evenings are made more comfortable by local afternoon thunderstorms, which bring cool breezes over widely scattered areas. In nearly every year, at least some locations reach highs of 100 or higher. The highest temperature ever recorded in Alabama was 112° F.

In the coldest months, December, January and February, there are frequent shifts between mild air, which has been moistened and warmed by the Gulf of Mexico, and dry, cool continental air. Severely cold weather seldom occurs. Even in the northern third of the State, subzero temperatures are unusual, though the state record was set at -27° F in 1966. In the Tennessee River valley, subzero readings occur on average about once in four years in at least one location. Temperatures of 0 are recorded only rarely and briefly in the south. In the northern sections, temperatures of 10° F or lower occur on an average of about twice each winter, though in one-fourth of winters, no location falls below 10. Across the middle of the State, such temperatures occur about once a year, while they are recorded about once in 10 years in the coastal counties. For most of the state, temperatures in the winter range from 38 to 50° F during the evening. The average low temperatures during the winter can be quite cold ranging from 29 to 35° F.

Since cold air on clear nights collects in low places, there is considerable irregularity in the dates of the last spring or the first fall freezes in all sections. The length of the growing season ranges from 200 days in the northern counties to almost 300 days along the coast.

Precipitation- Precipitation falls almost entirely as rain. Measurable snow occurs in the northern valleys on an average of about twice each winter and a bit more often on the higher ridges. The

average winter snowfall in that area is three to four inches, and since this includes unusually heavy snows in some winters, a few winters have little or none. Snow is rare in south Alabama. From late June through the first half of August, thunderstorms produce most of the precipitation, generally in late afternoon. During late August and in September thunderstorms become less frequent, although high temperatures and high humidity persist, more commonly in the south. Late night and early morning thunderstorms, characteristic of late summer on the coast, continue in these counties until mid-September. Rains during October are nearly always from showers or thunderstorms occurring ahead of cold air masses that move southward from Canada. Such changes become more frequent and more pronounced as winter approaches. Dry, sunny weather prevails most of the time in September and October, but from August through early October, heavy general rain may occur with a tropical system or its remnants moving inland from the Gulf of Mexico. Most types and intensities of rain can occur at any time from December through March or early April. From late April through early June, rain from showers and thunderstorms precedes approaching cool fronts.

Rainfall, when received regularly and in average amounts, is ample for most agricultural, industrial, municipal, transportation and recreational needs. Most rivers in the state are managed, so typical wet and dry spells do not result in high stream flow variations. More rainfall is needed to maintain adequate soil moisture in Alabama than in states further north where temperatures are lower. On an average annual basis, between 55 and 60 inches falls in the north, 50 to 55 inches in central Alabama and 60 to 65 inches in the south. Summer rains are heavier near the coast than inland and winter rains are heavier in the north.

Dry periods of two to three weeks may occur any time during the growing season, which extends from late April through October. Longer periods with little or no rain are more likely to occur in late summer and autumn than at any other time, while a secondary maximum of such periods occurs in May and June. In most sections, periods of three weeks or longer without as much as 0.10 inch of rain occur on an average of once in 12 years in May, once in nine years in June, and once in six years in September. For October, usually the driest month, such dry spells occur about once in three years over most of the State, except about once in two years in the extreme southeast and once in five years in the extreme northeast. The normally low precipitation amount of October is desirable in harvesting cotton, corn and other crops and is important (since it is still warm) to the winter gardens and cover crops that are being started. Pasture grasses also need moisture at this time to maintain growth. Only once in about 20 years, on the average, does a period of three weeks or longer with less than 0.10 inch of rain occur in July. However, the abundant sunshine and the high temperatures of July make it nearly as sensitive as the other summer months from the standpoint of lack of soil moisture. Local droughts occur nearly every year, but severe statewide droughts are practically unknown.

Generally speaking, the long, warm growing season induces deficits of soil moisture relative to the early spring field capacity. To maintain soil moisture within an inch of this capacity for the entire season in Alabama, it has been estimated that about 12 inches of irrigation is needed. Typically 2 to 2.5 inches is needed in May through August with lesser amounts in April, September and October. The effect of an estimated soil moisture deficit varies according to the type of soil since some soils can hold more moisture than others. The effect also varies according to the type of crops, which have different moisture requirements.

The tornado season extends from November through early May with the greatest frequency in March and April. Occasionally, a tropical system moving inland will spawn tornadoes. The state experiences, on average, 20 tornadoes each year. Destructive hurricanes visit the coastal area an average of about once in seven years between July and November. Wind damage, such as uprooted trees and damage to signs and poorly constructed buildings, may occur in local severe thunderstorms any time of the year. The highest wind speeds recorded at inland stations are about 60 to 65 mph; however, the coastal areas can experience winds over 100 mph with hurricanes.

Thunderstorms in the north and central sections occur on an average of two days each month in winter, about 11 days in July, and almost 60 days for the entire year. At Mobile (representative of the coastal area), December, January and February average two days of thunderstorms each; July 18 days, and the year, almost 80 days.

Most hail events occur from February through May, although in the northern counties there are rare occurrences of damaging hail in summer. Because of the immaturity of plants prior to June, hail seldom causes much crop damage. Damage to buildings and automobiles usually occurs in small areas with local thunderstorms. In winter, winds from a northerly direction are most frequent. In summer, the wind is quite variable, but most often from southerly directions. Heavy fog (less than a quarter mile visibility) occurs more frequently in winter. At the four major airport stations: Huntsville, Birmingham, Montgomery and Mobile, annual totals of such days are 20, 8, 23 and 41, respectively.

Climate and the Economy- Cotton, corn, sugar cane, sorghums, peanuts and early season truck crops are particular adaptations to the climate of the region. The large amount of stream flow from winter and early spring rainfall is an important complement of the coal deposits in Alabama, and many industries use hydroelectric power plants in the east-central portion. The full capacity is used in the wettest months, while the year-round capacity averages about one-half that amount. In addition, a large amount of power is produced by hydroelectric plants on the Tennessee River from water coming mostly from North Carolina, Tennessee and Virginia. The Woodruff Dam on the Chattahoochee River is an important hydroelectric project using water from Alabama and Georgia, while Bear Creek Dam in the northwest provides water-control for that entire watershed. Transportation disruptions due to ice and snow are virtually non-existent so that major manufacturing and assembly plants operate effectively 24 hours per day and 7 days per week throughout the year. Abundant fresh water from natural and managed river systems also supports numerous components of the economy from heavy industry to barge-traffic to year-round water sports.