



Florida Climate Data¹

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INTRODUCTION

Florida is a hot-humid region (Figure 1). For 6 months of the year temperatures can be above 90°F (32.2°C) and relative humidity can be 50% or higher. (Relative humidity is the ratio of the amount of water vapor actually present in the air to the greatest amount possible at the same temperature.) Abundant sunshine, large bodies of water and 60 inches per year rainfall contribute to Florida's hot-humid climate.

Approximately 36% of the 819 trillion Btu of energy used in Florida homes annually is for air conditioning, considered a necessity in most months, especially in south Florida. (Btu means British thermal unit or the amount of heat required to increase the temperature of a pound of water one degree Fahrenheit.)

SUNLIGHT

From April to November, sunlight intensity in Florida elevates air temperatures above those generally tolerable to people (human comfort level). As a result, Florida's air-conditioning season extends far beyond the summer months. Florida's abundant sunshine, however, continually attracts tourists and new residents, and contributes to the comfortable weather from late fall to early spring.

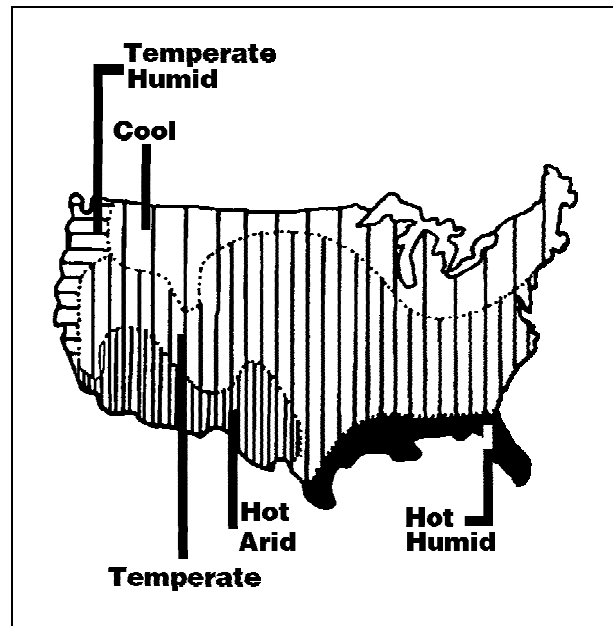


Figure 1. Climatic zones of the United States.

Discomfort exists when there is no relief from the sun. During the day, particularly in Florida's cities, pavement, roofs and walls absorb the sun's rays and later in the day radiate the heat back into the atmosphere. Large cities actually form heat islands and are hotter throughout the year than surrounding rural areas. This

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phenomenon is more true at night than during the day. Properly placed shade trees and ground covers, therefore, can be important in reducing air temperatures surrounding the home, and summer electric bills.

MOISTURE

Minimum humidity usually occurs midday and generally exceeds 50% year round. On a 90°F summer day, relative humidity is between 50-70% but often approaches 90% by dawn. Swimming pools and fountains contribute to increased levels of humidity. Also adding to increased levels is heavy vegetation that blocks air flow around the home.

High humidity inhibits evaporation of sweat from the skin. This lowers the body's ability to cool itself and increases the oppression of the heat.

RAINFALL

Florida is among the wettest states in the U.S. with most areas receiving at least 50 inches of rain annually. The state, however, has great variations in total annual precipitation; floods one year may be followed by drought the next. The panhandle has the most rain; the Keys the least.

The rainy season runs from May 1 or earlier to as late as November. South Florida gets 70% of its annual rainfall during these months; north Florida receives less than 60%. In the latter area during winter, however, continental low-pressure systems usually bring long periods of cloudiness and rain.

Thunderstorms are the main source of rain in Florida, which has more of these storms than any other state. Their frequency and intensity usually peak in July or August. The exception is south Florida where the storms continue into November.

WIND

As a peninsula, Florida receives breezes from both the Gulf of Mexico and Atlantic Ocean. During the winter months in northern Florida these breezes and the prevailing winds from the north force cold air into homes thus carrying away needed warmth. Trees and shrubs used as windbreaks and foundation plantings can

reduce heat-robbing winter winds substantially, reducing the energy required to adequately heat the home.

Winds come from the east, southeast and northeast during the transitional months in fall and early spring. Natural ventilation through open windows and doors is desirable then, even in homes that are air conditioned in the summer months.

In the summer months, winds from the south, southeast and southwest force warm, humid air into homes. Thus, to keep air-conditioned homes cool, energy use increases. To decrease energy use, shrubs and trees should be positioned to divert warm winds away from homes. For naturally ventilated homes, properly-placed vegetation can channel cool breezes toward open windows and doors.

In coastal areas daily breezes of adequate velocity may moderate temperatures. Inland areas, however, must depend on factors that direct or enhance the modest wind flow. Home and vegetation placement may create channels that promote good air flow for unair-conditioned spaces in summer, spring and fall, and air-conditioned areas in spring and fall.

CLIMATIC ZONES

Florida's three climatic zones are classified as hot-humid (Figure 2). Northern Florida, somewhat cooler because of its latitude, can have a significant number of days between November and March when temperatures are below those generally tolerable to human comfort range. At the other extreme, May through September temperatures are above the comfort range.

Central Florida, perhaps less exposed to cooling breezes, has a longer period of high-temperature, high-humidity days. Due to a more southerly latitude, the period of temperatures below human comfort is relatively short. This region may have approximately one month of temperatures and humidities below and 7 months above the comfort range.

South Florida, exposed to daytime onshore breezes, enjoys comfortable temperatures during much of the year. Although the temperature is relatively moderate, the combination of the temperature and high humidity can be uncomfortable from May through September.

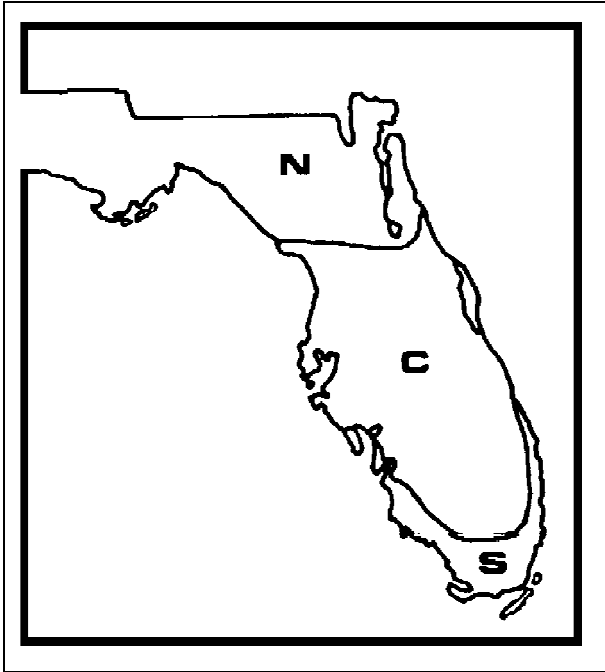


Figure 2. Florida's climatic zones.

During the months when temperatures are below, and particularly above, the comfort range, Floridians are likely to use more energy for heating and cooling, respectively. Understanding the climate in their areas of the state can help residents modify their landscapes (enviroscaping) to increase energy efficiency. For example, strategically placed shade trees and windbreaks can reduce home-cooling costs by 30%. If 1/3 of Florida homes used energy-efficient landscaping to achieve this 30% reduction, approximately 27 trillion Btu of energy, and 5 billion pounds of carbon dioxide and gaseous pollutants would be saved.

CLIMATE DATA

The number of days above 90°F (32.2°C) and below 32°F (0°C), average minimum humidity, and prevailing wind direction are presented monthly for six highly urbanized Florida cities (Figure 3). The temperature and humidity data can be used to predict the months when blocking solar radiation to reduce heat buildup is of most value. Prevailing wind direction data can be helpful in the placement of structures and vegetation to enhance or block air flow.

REFERENCES

- Anonymous. (no date) *Climatological data for Gainesville*. University of Florida Agronomy Department/E.S.S.A. Weather Bureau. Gainesville, FL.
- Anonymous. 1978. *The climate of Alachua County, Florida*. Agr. Exp. Sta. Bul. 796, Sept., Gainesville, FL.
- Anonymous. (no date) *The United States Department of Commerce climatological data, Florida, 1960, 1966, 1970*. Washington, D.C.
- Florida Energy Office. 1992. *Florida energy data report 1970-1990*. Dept. of Community Affairs, Florida Energy Office, Tallahassee, FL.
- Winsberg, Morton D. 1990. *Florida weather*. Univ. Cent. Fla. Press, Orlando, FL.

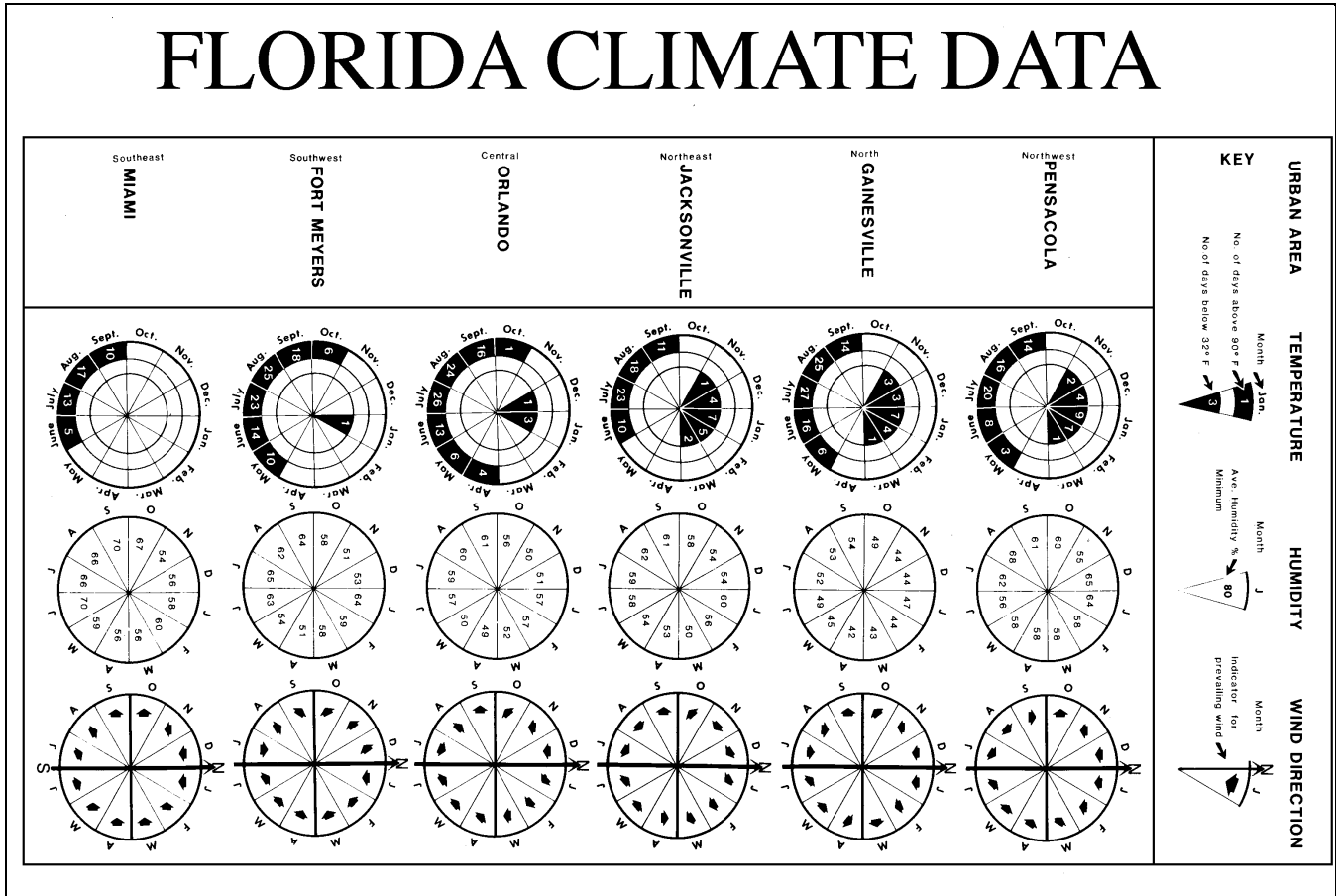


Figure 3.

(1) Climate data for Jacksonville, Miami, Orlando, Fort Meyers and Pensacola were collected from *The United States Department of Commerce Climatological Data, Florida, 1960, 1966, 1970*. Climate data for Gainesville were collected from the Agronomy Department/E.S.S.A. Weather Bureau's "Climatological Data for Gainesville" and from Agricultural Experiment Station Bulletin 796, "The Climate of Alachua County, Florida," September, 1978.

(2) High temperatures and high humidity lead to human discomfort.

(3) Figures of minimum humidity coincide with time of high temperatures (approximately midday).

(4) Prevailing winds may be blocked or enhanced to modify the microclimate. Wind patterns are highly variable for inland Florida during the summer months.