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Climate of Arizona

Topographic Features

Arizona covers 113,909 square miles, with about 350 square miles of water surface. The state has three main topographical areas: (1) a high plateau averaging between 5,000 and 7,000 feet in elevation in the northeast; (2) a mountainous region oriented southeast to northwest with maximum elevations between 9,000 and 12,000 feet about mean sea level; and (3) low mountain ranges and desert valleys in the southwestern portion of the state. From the White Mountain area across the Mogollon Rim to the San Francisco Peaks lies an unbroken stand of Ponderosa Pine. The Kaibab Plateau north of the Grand Canyon continues this timbered strip into southern Utah. The highest point in the state is Humphreys Peak, located northwest of Flagstaff, with an elevation of 12,611 feet. Baldy Peak, in the White Mountains of eastern Arizona, is the second highest in the state with an elevation of 11,490 feet. The desert valleys of southwestern Arizona are an extension of the Sonora Desert of Mexico, with elevations as low as about 100 feet above sea level in the Lower Colorado River Valley.

The higher elevations of the state, running diagonally from the southeast to the northwest, average between 25 and 30 inches of precipitation (rain plus melted snow) annually, while the desert southwest averages as low as three or four inches per year. The plateau country in the northeastern corner of the state receives approximately 10 inches of precipitation annually. Since vegetation in this area consists of sagebrush and native grasses, it is used primarily for grazing. Higher ridges here are covered with junipers and pinion trees.

Nearly the entire state is in the Colorado River drainage basin which empties into the Gulf of California. The world famous Grand Canyon lies within the state, extending southwestward some 217 miles from the junction of the Little Colorado with the main stream. The Grand Canyon varies in width from 4 to 18 miles, and depths from the rim to the river bed range from 2,700 to as much as 5,700 feet. This is an outstanding example of arid or semiarid land erosion by a major river whose source is in a more rainy area.

Temperature

Cold air masses from Canada sometimes penetrate into the state, bringing temperatures well below zero in the high plateau and mountainous regions of central and northern Arizona. The lowest readings can dip to 35 degrees F below zero. High temperatures are common throughout the summer months at the lower elevations. Temperatures over 125 degrees F have been observed in the desert area. Great extremes occur between day and night temperatures throughout Arizona. The daily range between maximum and minimum temperatures sometimes runs as much as 50 to 60 degrees F during the drier portions of the year. During winter months, daytime temperatures may average 70 degrees F, with night temperatures often falling to freezing of slightly below in the lower desert valleys. In the summer the pine-clad forests in the central part of the state may have afternoon temperatures of 80 degrees F, while night temperatures drop to 35 or 40 degrees F.

The length of the growing season (period between freezes) varies tremendously over Arizona, averaging less than three months in some of the higher areas in the northern and eastern portions of the state. On the other hand, lower desert valleys sometimes have several years in succession without freezes.

Precipitation

Precipitation throughout Arizona is governed to a great extent by elevation and the season of the year. From November through March, storm systems from the Pacific Ocean cross the state. These winter storms occur frequently in the higher mountains of the central and northern parts of the state and sometimes bring heavy snows. Snow accumulation may rach depths of 100 inches or more during the winter. The gradual melting of this snow during the spring serves to maintain a supply of water in the main rivers of the state. Reservoirs on these streams supply water to the desert areas in the lower Salt River Valley and the lower Gila River Valley areas, which are extensively farmed.

Summer rainfall begins early in July and usually lasts until mid-September. Moisture-bearing winds sweep into Arizona from the southeast, with their source region in the Gulf of Mexico. Another important source of moisture for southern Arizona is the Gulf of California. Summer rains occur in the form of thunderstorms which result largely from excessive heating of the ground and the lifting of moisture-laden air along main mountain ranges. Thus, the heaviest thunderstorms are usually found in mountainous regions of the central and southeastern portions of Arizona. These thunderstorms are often accompanied by strong winds and brief periods of blowing dust prior to the onset of rain. Hail occurs rather infrequently.

The average number of days with measurable precipitation per year varies from near 70 in the Flagstaff area to 15 at Yuma. A large portion of Arizona is classed as semiarid and long periods often occur with little or lno precipitation. The air is generally dry and clear, with low relative humidity and a high percentage of sunshine. April, May and June are the months with the greatest number of clear days, while July and August, as well as December, January and February have the cloudiest weather and lowest percent of possible sunshine. Humidities, while low when compared to most other states, are higher throughout much of Arizona during July and August, which is the thunderstorm season. Annual average humidity values based on four readings per day range from 55% at Flagstaff to around 33% at Yuma. Yearly averages of percent of possible sunshine range from 86% to 92%. Due to high temperatures, the dryness of the air, and the high percentage of sunshine, evaporation rates in Arizona are high. Mean annual lake evaporation varies from about 80 inches in the southwestern part of the state to about 50 inches in the northeast. Phoenix averages about 72 inches and Tucson 70 inches per year.

Storms

Flood conditions occur infrequently, although heavy thunderstorms during July and August at times cause floods that do considerable local damage. Floods on the main rivers are mostly limited to the upper basins above storage dams. Flooding in populated areas is rare. Heaviest runoff usually occurs in connection with the arrival of moist tropical air which has its origin in hurricanes that dissipate as they reach land. Heavy rains associated with these systems usually come during August or September, but are likely to occur on the average of once every ten years. High winds accompanying heavy thunderstorms during July and August sometimes reach peak gusts of about 100 miles per hour in local areas, while tornadoes are reported on the average of abut once a year.

Climate and the Economy

There are more than one million acres of land devoted to agriculture in the state. Nearly one-half of this lies in Maricopa County and about one-quarter in Pinal County. Yuma County is the third largest agricultural county, with about 18% of the total acreage in the state. Water for irrigation in the Phoenix area is obtained from storage reservoirs behind Roosevelt Dam on the Salt River, from Horseshoe Dam and Bartlett Dam on the Verde, Carl Pleasant Dam on the Agua Fria, and Coolidge Dam on the Gila River. The Yuma area receives its water from the Colorado River. Pumping of water from wells is common in quite a few of the desert valleys. Extended drought periods sometimes cause curtailment of farming due to lowered water reserves.

Agricultural activities in Arizona include cattle and sheep raising. Some dry-farming is done in Yavapai and Coconino Counties and in the central mountain valleys of the state. This dry-farming is limited primarily to the raising of grains and pinto beans, as well as some fruit. Irrigated crops in the desert valley areas are the most important in the economy of the state. Cotton, alfalfa, grain, citrus fruit, melons, head lettuce, and many truck vegetables are grown throughout the year.

Numerous national monuments furnish recreational facilities throughout Arizona. Winter sports are popular in some of the mountainous regions of the state: the Snow Bowl near Flagstaff is one of the more well known winter sports areas. Forests throughout central Arizona provide hunting of elk, deer, and wild turkey, while desert areas are abundant in smaller game which includes javelina and desert mule deer as well as quail and dove. Fishing is practiced throughout the year in the mountain streams and in numerous reservoirs, as well as in the Colorado River.

The climate has attracted numerous large industrial concerns, particularly in the Salt River Valley. A number of automobile and farm machinery manufacturers have established proving grounds in Arizona, in order to take advantage of the diversity of climate within relatively short distances.

Winter vegetables, particularly head lettuce, find ready markets throughout the country from November through March. Cantaloupe and melon crops find nationwide distribution during the spring months, thus providing fresh vegetables and melons prior to the availability of those products at cities in more northern latitudes.

Mild winter temperatures and the absence of snowfall in the desert areas of southern Arizona attract many winter tourists. The tourist business has proved to be of real economic significance, particularly to the larger metropolitan areas of southern Arizona. The South Rim of the Grand Canyon proves a very popular attraction throughout the entire year. The Grand Canyon is served by rail and air, and roads are kept open to the South Rim throughout the winter months.

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