



## **Climate Utah -- Cathedral Peaks, Monument Valleys, Ancient Lakes and the Greatest Snow on Earth**

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### **A Geographical Wonderland**

Erupting from a collision of competing influences, Utah's climate matches its diverse geography. Expansive mountain ranges — including the world's steepest (the Wellsville Range in northern Utah) combine with vast deserts and the Great Salt Lake to create large variations in both temperature and precipitation across the state. Where cathedral peaks climb to 13,000 feet from desert floors 9,000 feet below, temperatures vary from summertime highs of 117 in the southwest, to 69 below zero in the northeast (Peter Sinks in northern Utah's Bear River Range lays claim to the second-lowest temperature recorded in the lower-48). In the west, Pacific air is wrung dry as it washes over the neighboring Sierra-Nevada mountains, creating Utah's great western desert, with average annual rainfall of less than five inches. In the east, desert air combines with the Great Salt Lake and passing storm systems to dramatically enhance precipitation across the Wasatch Range, to more than 50 inches annually.

### **A Global Crossroads**

Utah's geography is not the only source of its great diversity of climate. Nestled in the intermountain west, Utah occupies a crossroads of larger-scale, nonlocal climatic influences. The southern precipitation regime is strongly influenced by El Nino — sea surface temperature fluctuations of the eastern and central tropical Pacific — while the northern regime correlates with a different Pacific influence, the so-called quasi-decadal oscillation of the central and western Pacific. So too, the state straddles the line of mid-latitude subsidence, the so-called Hadley Cell of hot, moist air bubbling up over the tropics, moving poleward, and sinking again in the mid-latitudes. The result is a considerable disparity in precipitation between the desert of southern Utah and a wetter northern Utah. Adding more to the story studies conducted by the Utah Climate Center, based principally on tree-ring analysis, suggest enormous, mega-drought periods through much of the past 1,000 years.

### **An Ancient Lake and The Greatest Snow on Earth**

Utah's Great Salt Lake is the remnant puddle of a vast inland sea, Lake Bonneville. At 1,000 feet deep and more than 19,000 square miles, Lake Bonneville rivaled the Great Lakes in size. It's sudden retreat 14,000 years ago left behind Utah's west desert, the famous salt flats, and a pathetic, 30-foot deep puddle: the Great Salt Lake. Nevertheless, the Great Salt Lake is one of the world's largest salt lakes. Further, its proximity to the Wasatch Mountains produces some of the most coveted skiing on Earth. A mere 30 miles from the lake's eastern shore, Alta ski resort tops out more than 6500 feet above the lake. The result of altitude and lake-effect enhanced precipitation results in an average annual snowfall of more than 500 inches! Dry and fluffy, with just enough density to float the skier, it's a powder skier's dream.

What all this means is that the traditional notion of climate as the 30-year average falls well short of describing the Utah experience. For it's not the averages that tell the story, but the vast variability that keeps Utahans closets equipped for all extremes.

For more information on Utah's Climate please visit the Utah State Climate Office at: <http://climate.usurf.usu.edu/>