

THE CALIFORNIA FLOODING RAINS DURING FEBRUARY, 1986
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ABSTRACT

After an unusually strong and persistent pattern of atmospheric circulation over the United State in Fall 1985, it became quite changeable (although high amplitude anomalies still prevailed). Following a fall that was cold in the West and warm in the East with heavy precipitation, a high pressure ridge set in over the West during December, with generally light precipitation over most of the country. Throughout the winter, the central North Pacific was very active, with large negative atmospheric pressure anomalies centered at about 45°N, 160°W. This activity may have been encouraged by an enhanced meridional eastern North Pacific sea surface temperature (SST) gradient, with positive SST anomalies in the subtropics and negative anomalies in midlatitudes. However, in January, the western high pressure ridge remained strong and temperatures were remarkably warm, increasing the threat of drought in California after the two previous dry winters. However, in February, storms from a greatly expanded and southerly displaced Aleutian Low broke into the West Coast. An unusual siege from February 11 to February 20 flooded central and northern California, with very heavy precipitation and record to near-record runoff. Upwards of 50 percent of annual average precipitation fell on locations from the upper San Joaquin to the Feather River drainage basins, and the largest flow since observations began in the early 1900's was recorded on the Sacramento River at Sacramento. The atmospheric pattern that was responsible for this remarkable stormy spell developed when the western high pressure retrograded to the northwest into the Aleutians, accompanied by the strengthened and southerly extended storm tract that moved into California. Although exact details vary from case to case, this episode displayed meteorological conditions similar to those in several other historical California winter flood events. These included a long duration of very strong westerly to southwesterly winds over a long subtropical fetch into California. Much of the precipitation during this series of storms was orographically induced by the moisture laden flow rising over the Sierra ranges. Due to the warm air mass, snow levels were relatively high (about 7500 feet) during the heaviest precipitation, resulting in copious runoff.