

The operational utility of weather forecasts

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This paper investigates a winter season's worth of daily "front page" weather forecasts and compares these to the observed weather. The forecasts for any given day—issued five, four, three, two, one, and zero days prior to the day of observation—were analyzed for accuracy with respect to precipitation occurrence, precipitation type, hazardous winds, snowfall amount, and daily maximum and minimum air temperature. The forecasts, issued by the National Weather Service, Sacramento, California, were centered on the University of California Berkeley's Central Sierra Snow Laboratory (CSSL), 3.5 km west of the Sierra Nevada crest at Donner Pass, California. CSSL is equipped with both recording and telemetered instrumentation, and has full-time staff whom conduct a wide variety of hydrometeorologic measurements and observations.

The accuracy of weather forecasts for 154 days during Winter 2010 were found to increase as forecast issue day decreased, but the most accurate forecasts were not always those issued on day zero (day of). Accuracy of the occurrence of precipitation was best one day out at 81 percent; precipitation type was forecasted most accurately 85 percent of the time three days out; and hazardous winds most accurate one day out at 94 percent. The average ratio of observed snowfall to forecasted snowfall was 1.37 for the day of, 1.47 one day out, and 1.48 two days out. Forecasts were slightly better at predicting maximum daily air temperature than minimum, with the best accuracy two days out for air temperature maximum, and one day out for minimum