

A Quantitative Precipitation Forecasting Method for Mountain Snowfall

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In the winter months, December through March, 1995-96 a methodllogy was adapted and used for forecasting snowfall amounts at the 9000 to 9500 foot elevation at the Jackson Hole Ski Area, located in the Teton Range in the north- . western corner of the State of Wyoming. This method utilized easily obtainable atmospheric variables from synoptic scale weather maps and prognostic charts to formulate a Quantitative Precipitation Forecast, (QPF), for the following 24 hour period. Atmospheric variables used in this study were: precipitable water, temperature, upward vertical velocity and vorticity. Each of these factors were considered and weighted in the formulation of the QPF, according to their relative size and/or strength, as well as their expected duration Each of these variables could be taken from available daily meteorological information and existing computer models of the atmosphere, to calculate a daily QPF. The end goal is to develop a simple formula in a computer program that, after eiitering attained values and answering a few questions, will estimate the amount of snowfall at a mountain elevation. This method is not a complex computer model based on a specific topographic or geographic area, nor is it based on any statistical or historical storm analysis. This is a best "guesstimate", if you will, of forecasted snowfall based on current and forecasted meteorological variables that can be assigned a weight or value and plugged into the formula. Calculation's of QPF's were verified each day for accuracy, on days when snowfall was forecast and received, with an average percentage of accuracy using this method of 80% for the entire winter. This only includes days which had snowfall in the forecast. Zero category days were not included in the accuracy analysis. That is, days when no snowfall was forecast and no snowfall was received, were not counted as correct. If zero category days are included the accuracy of this method increased to 87% for the Winter of 1995/96.