

A technique for forecasting turbulent mountain waves was investigated using MODIS and GOES-12 water vapor (6.7 $\mu$ m) imagery combined with hourly analyses from the RUC model. The limited domain of the Colorado and New Mexico mountains was chosen. Upon examining MODIS water vapor imagery daily from January 1, 2004 through May 31, 2004 within this domain it was found that wave signatures related to orography were present approximately 15% of the time.

To determine the probability of turbulence occurring in the waves seen in the imagery, pilot reports were examined for correlation. Approximately 90% of the severely turbulent days had wave signatures in the water vapor imagery during the time period of the reports. The wave signatures on these turbulent days appear different in the imagery from the signatures on the days that were less turbulent. The turbulent days had complex wave patterns with apparent interference and crossing wave fronts that extended downwind for a significant distance. The days that were less turbulent had wave signatures that were much simpler with wave patterns that could be characterized as linear.

The hourly RUC analyses showed that the atmosphere during the turbulent wave events had wind and temperature profiles appropriate for mountain waves.

The hourly RUC data combined with the MODIS water vapor imagery shows that, with high-resolution satellite imagery, it may be possible for turbulent situations due to mountain induced wave activity to be nowcasted and forecasted. Ultimately, an algorithm could be developed incorporating model data and satellite imagery to automate the mountain wave induced turbulence forecasting.

