

CORRECTED ANNOUNCEMENT - NOTE NEW DATE

The RAP Seminar Series

**NCAR**

Insights into the Predictability of Near-surface Wind Field Forecasts by Mesoscale Meteorological Models

by

Daran L. Rife

National Center for Atmospheric Research
Research Applications Program

Friday, 4 June 2004
Foothills Lab, Building 2, Room 1022
3:30 p.m.

One of the major potential benefits of high-resolution mesoscale models is for capturing the diurnal forcing by the local topography and other surface contrasts. Thus, for those areas and times where diurnal forcing is large, the potential benefit of mesoscale models is great. Yet conventional objective verification metrics seem to poorly reflect the improvement that one might intuitively expect from increased horizontal resolution in areas of complex terrain and coastlines. Is this a paradox? Results from a verification study focusing on model-based, low-level wind forecasts for the area of the Salt Lake Valley, Utah and surrounding mountains during the 2002 Salt Lake City Winter Olympics will be used to address this issue.

Observations from the Salt Lake City region are then used to assess the importance of diurnally forced, land-atmosphere interactions to the local circulation patterns. The time series of observations is spectrally transformed to quantify the spatial variability of the strength of the diurnal forcing during the study period. The amount of spectral power in the band with approximately a diurnal period varies greatly from place to place, as does the amount of power in the bands with periods longer (super-diurnal) and shorter (sub-diurnal) than the diurnal. The results of this analysis are used to illustrate the relationship between the quality of the mesoscale-model forecasts, and the place-to-place variation of energy in the three spectral bands. Some insights into the inherent limits to current mesoscale predictability will be revealed along the way.