

The RAP Seminar Series



NCAR

A stochastic ensemble prediction system

by

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Quantitative nowcasts of rainfall are based on the advection of the observed rain field forwards in time. The accuracy of the nowcasts depends on the rate at which the field is developing in Lagrangian coordinates, the accuracy and resolution of the advection estimates, and the accuracy of the radar reflectivity to rainfall conversion. In any event, the accuracy of the nowcasts rapidly becomes pedestrian indeed and the maximum lead-time is generally less than one hour for quantitative rainfall forecasts. An alternative strategy is to admit that it is not possible to forecast rainfall quantitatively at high space and time resolutions and to attempt to provide probabilistic nowcasts either in the form of a probability distribution that is conditioned on the current rain field, or as an ensemble of nowcasts, each equally likely. Similar concerns regarding the accuracy of NWP rainfall forecasts exist and it is reasonable to assume that the skill of the NWP rainfall forecast is a function of scale and that the deterministic forecast should be perturbed through stochastic downscaling so as to generate an ensemble of forecasts. This seminar reports on progress in the development of STEPS, a joint Met Office (U.K.) and Bureau of Meteorology (Australia) model to generate an ensemble of stochastic forecasts that are conditioned on a scale-dependent merging of the advection nowcast with the NWP forecast.