

1086-37-2982 **Eugenia Kalnay*** (ekalnay@atmos.umd.edu). *New Ensemble Kalman Filter Applications.*

The Ensemble Kalman Filter (EnKF) has become increasingly the method of choice for data assimilation (DA). In particular the Local Ensemble Transform Kalman Filter (LETKF) is easily implemented and offers powerful uses of DA: 1) Improving models: EnKF allows estimation of optimal evolving model parameters without observations. It is possible to estimate and correct model biases and state dependent model errors during model integration. 2) Extracting more information from observations: Conventional EnKF can be suboptimal. More information from observations is possible by repeated use through Running in Place (RIP), with major forecast improvements. 3) Forecast sensitivity to observations: Kalnay et al. (2012) updated the formulation of "forecast sensitivity to observations without adjoint" of Liu & Kalnay (2008). Ota et al. (2012) applied it to real observations assimilation at NCEP, finding regional cases of forecast skill breakdown in the 24hr forecast, and identifying problematic observations. 4) Effective DA of rain: Current methods successfully assimilate observed precipitation. Without DA however, the free forecasts worsen in a few hours. Lien et al (2012) found that assimilating a Gaussian transformed variable instead of rain within LETKF resulted in improved forecasts. (Received September 26, 2012)