Research towards the next generation of NOAA Climate Reanalyses

A joint effort between…

- Climate Prediction Center
- Earth System Research Laboratory / Cooperative Institute for Research in Environmental Sciences
- National Centers for Environmental Information

Tasks

- Expanding on existing observational datasets
- Using a common data assimilation infrastructure – Ensemble Kalman Filter (EnKF) - develop a hierarchical climate reanalysis approach
  - Stream 0 : Boundary-forced, 1850-present ensemble of “AMIP” simulation
  - Stream 1: Historical, 1850-present using only surface data (20CR)
  - Stream 2: Modern, 1946-present using only surface and conventional upper air data

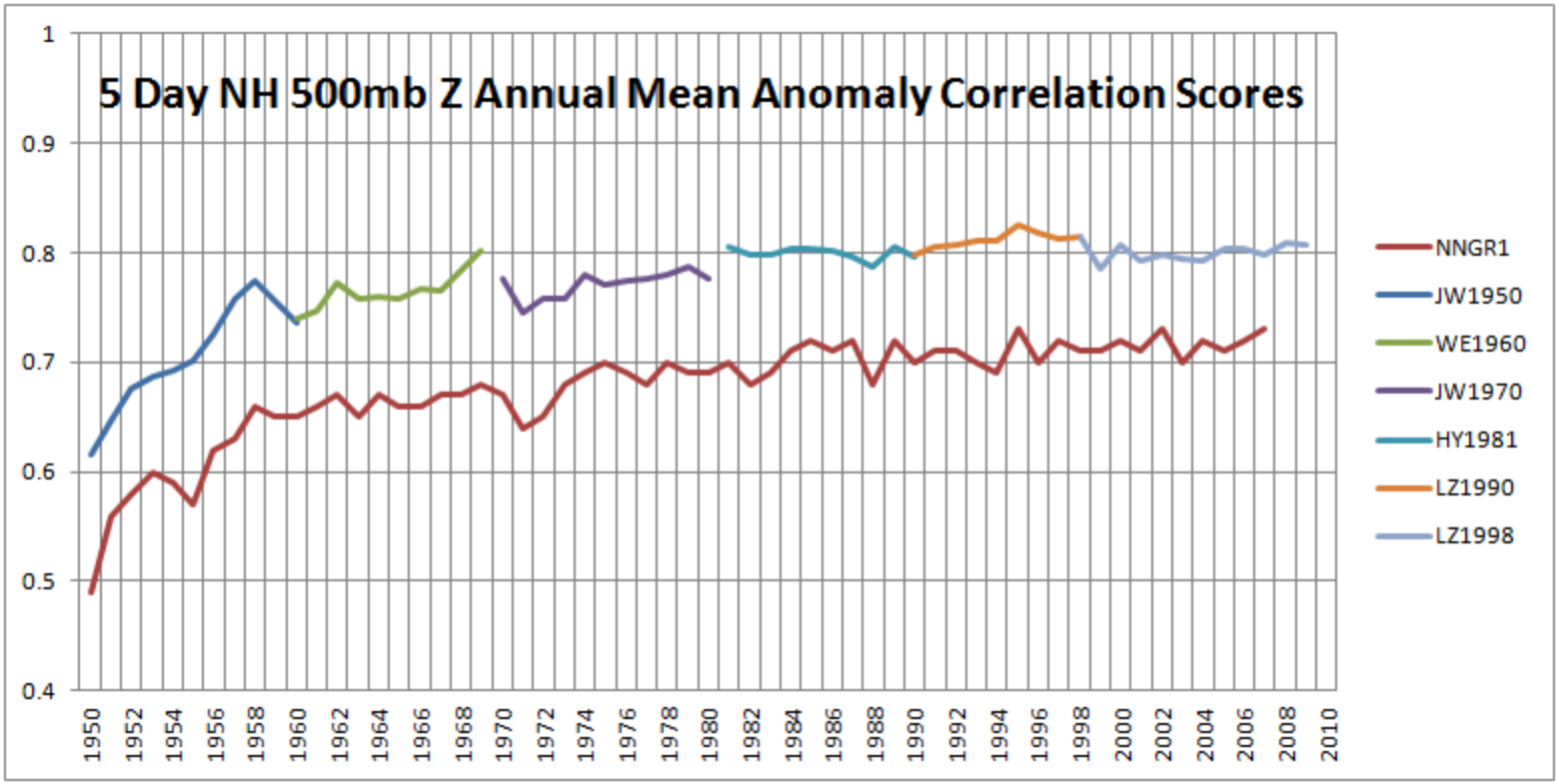
Accomplishments

- Functional (and improved) EnKF prototype data assimilation system on Gaea (NOAA research HPC)
- Compilation of observational datasets on Gaea
- Completed AMIP simulation to document assimilation model biases
- Completing a new surface-input reanalysis as a baseline for comparison
- Completing a conventional observation reanalysis
- Lead and participated in the Climate Reanalysis Task Force

- Current status of Conventional Observation Reanalysis (CORe)
  - Multiple streams (with overlap)
  - Compare performance against R1

Stream	Current Status	Comment
1: 1950-1960	1950 - 196101	Complete
2: 1960-1970	1960 - 197007	Almost done
3: 1970-1980	1970 - 198201	Complete
4. 1980-1990	1980 - 199101	Complete
5. 1990-2000	1990 - 199901	Complete
6. 2000-2010	1998 - 201012	Complete

500-mb Anomaly Correlation
CORe vs. R1



Future Plans

- Continue development of observational datasets including development of homogenization algorithm;
- Continue various assimilation streams of EnKF for 20CRv3 and CORe;
- Initiate a more comprehensive evaluation of CORe performance against R1; assess feasibility of replacing R1 by CORe.