

Group 3: Data Assimilation

Christa Peters-Lidard, Per Kallberg, Andy Wood, Eric Wood,
Pedro Viterbo, Steven Mullen, Matthias Drusch, Gilbert Brunet,
Hoshin Gupta, Robert Hartman

- Goal:
 - Clarify and possibly edit words “reliable” and “engineering quality”
- Objectives:
 - It is important that HEPEX component design be generic enough for international application

Data Assimilation Activities

- Activities should attempt to address commonalities/differences and build on experience in
 - Atmospheric data assimilation
 - Land data assimilation
 - Hydrologic model assimilation (manual adjustment)
- Data assimilation should focus on improving quantities that are hydrologically relevant at the land surface (e.g., PQPE).

Data Assimilation Activities

- Land surface/hydrological models could be continuously improved (like atmospheric models) by confronting models with observations.
- What observations do we have that we are not currently using/producing in data assimilation systems?
 - State variables with memory, e.g., soil moisture, snow.
 - Consider proxies for soil moisture, e.g., 2-m air temperature and humidity.
 - Timely precipitation information (e.g., radar-gauge-satellite) is critical.
- How can hydrologic constraints (streamflow) be applied to constrain the land surface states? Spatial/temporal scale separation could be used.

Ensembles

- Need a long-term reanalysis to sample the pdf. How would one construct such an analysis?
- Are there any meaningful “perfect” model scenarios that could be designed to help constrain data assimilation activities?
- We need a framework to evaluate the impact of the observing systems on the land hydrology pdfs
- Need to address the issue that ensembles are multivariate quantities based on
 - IC, Forcing, Parameters, Models, Outputs
- Characterize the sources of error and covariance between them.
- Use the framework of Ensemble data assimilation approaches to evaluate the required ensembles