

Group 4: Hydrological Modeling

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HEPEX GOALS

- What is the operational focus of HEPEX ? Is it just extreme events or does it also include "regular" events (e.g., relevant to ecosystem needs)
- Would be good to identify the "users" of HEPEX tools/products. Different users may have different needs - however is there a possible convergence in terms of models / products?
- Will HEPEX help the user with implementation issues? Incorporate knowledge of the economics of the situation?
- Users perceived "needs" may be the result of having adapted to currently available information. HEPEX interaction with users should be two-way - products/activities should not be limited to what users "think" they require. Users can be trained about what science has to offer.
- Should consider time scales required for forecasts of precipitation and streamflow -- flash flood, daily, seasonal

Issues / Observations:

- 1) We find that model "structures" vary with place and lead-time - a consequence of using simple model structures?
- 2) Need data for extreme events
- 3) Clarify the confusion of terminology between (and within) fields - the words uncertainty, parameter etc., are used with different meanings
- 4) Need to model to predict variables that can be "observed"
- 5) Is there a need for a "common" model framework for hydrology? (object oriented strategy). May be more useful for science discussions than for operations / applications.
- 6) Each modeling group should be encouraged to reflect on how to represent the inherent model uncertainty (structures, parameters) in the predictions.
- 7) Should be using data on internal variables for calibration
- 8) Consider Unified framework -- Environmental systems are forced by precipitation during storms and ET during inter-storm periods
- 9) Define typical time scales for different phenomena of interest

ACTIVITIES

- 1) **Intercomparison of Distributed vs. lumped models.**
 - a) What level of discretization is required? Spatial scale?
 - b) How can we propagate uncertainty through highly nonlinear hydrologic models?
 - c) How can we explain and correct for lack-of-fit of models (both lumped and distributed)?
 - d) Develop Diagnostic tools
- 2) **Creation of a common/benchmark data set** (high res rainfall, spatial data, nested runoff, etc.)
 - a) Synthetic experiment?
- 3) **Adapt modeling strategy to take advantage of relative strengths of hydrologic and meteorologic models** (spatial representation, stochastic approaches, dynamical representation)
 - a) Define hydrologic/meteorologic interface/information exchange
- 4) **Integrate with/take advantage of MOPEX, PUB, DMIP, etc.**
- 5) **Promote common level of modeling expectation within the HEPEx community ?**