Hydrometeorological Testbed (HMT)

Applications of HMT Science to "Operational Forecasting"

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HMT Research-to-Operations Challenge

- Find operational venues to vet early HMT research developments in an operational setting
- Collect feedback from operational forecasters to determine the impact of research products and capabilities on operational forecasts
- Re-engineer/refine/retest capabilities based on operational feedback (*iterative approach*)
- Document findings support processes that get promising capabilities into operations

Benefits

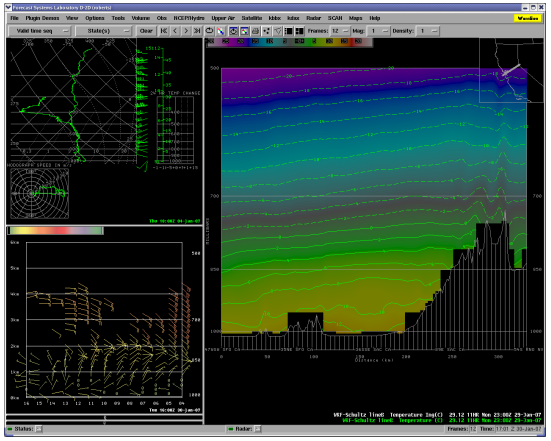
- Improved speed of transitions from research to operations
- Reduced risk of changes/enhancements to operational systems

Year One ('05/'06) Accomplishments

- Advanced (AWIPS-like) LINUX Workstations (ALPS) successfully developed and deployed to four National Weather Service (NWS) offices: Sacramento, Reno, and Monterey Weather Forecast Offices (WFOs) and Sacramento-Nevada River Forecast Center (CNRFC)
- Four-member ensemble forecast model data delivered in real time to forecasters
- Enhanced observational data supplied by MADIS and displayable on ALPS

Year One Operational Feedback

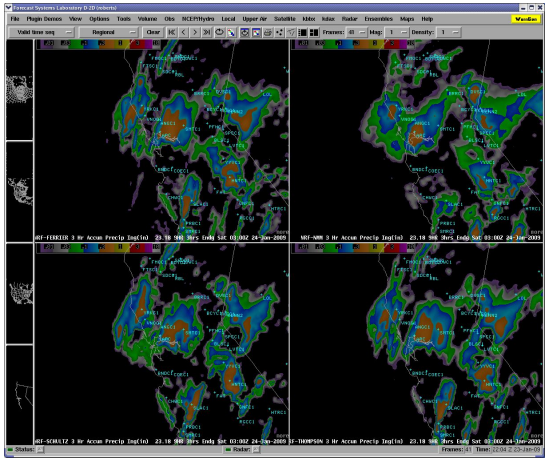
- Ensemble models helpful for melting level, precipitation amount and types, but coverage area (American River Basin) too small for operational use
- ALPS performance for ensemble displays using OpenDAP (fat client/thin server) and distributed database too slow for operations
- MADIS surface and upper-air display enhancements helpful



MADIS-provided rawinsonde sounding, boundary layer profiler, and ensemble model cross section display on ALPS.

Year Two & Three ('06–'08) Accomplishments

- Ensemble model domain expanded spatially and temporally to cover RFC and WFO domains, including Eureka WFO
- ALPS distributed database architecture changed to a "fat server/thin client" approach
- Additional observational data sets added via MADIS



Four-member ensemble precipitation display on ALPS.

Year Two & Three Operational Feedback

- Ensemble information much more useful over entire WFO and CNRFC forecast areas of responsibility but multimodel background would likely yield better results
- ALPS performance using "fat server/thin client" approach nearly an order of magnitude faster, much more acceptable (>1000 ensemble model products displayed per season) – ***The results are formally used for NWS Operations and Services Improvement Process (OCIP)***
- Ensemble information still needs to be made available for gridded forecast preparation via "smart push"
- Additional MADIS surface and upper-air observations routinely used

Year Four ('09/'10) Accomplishments (to date)

- Nine-member, multibackground ensemble model adopted
- Enhanced ALPS ensemble display capabilities added for evaluation
- MADIS observational data sets used at Monterey WFO for operational precipitation analyses

Summary

- ESRL/GSD/ISB has worked effectively with NWS offices and the HMT project to demonstrate new capabilities in an operational setting, collect feedback from operational forecasters, document results, and refine these capabilities for eventual full NWS-operational implementation
- Operational implementation will occur more efficiently since this work in being performed on an AWIPS-like system and within the NWS operational environment