

Summary of 7th NCEP Ensemble User Workshop

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and organizing committee

June 13-15 2016
Auditorium, NCWCP
College Park, MD

Logistics and Agenda

- **Logistics**

- Workshop organized by EMC/NCEP and DTC/NCAR (co-organizer)
- June 13-15 2016, College Park, MD, **150+** participants
 - NWS Headquarters/NWC/MDL (18), NCEP (45), NWS regions (4)
 - OAR (18), DoD (5), academic (14), private (12)
 - International (33) and others (2)
- For further info, see: <http://www.dtcenter.org/events/workshops16/ensembles/>

- **59 presentations (51 last workshop) and 6 posters**

- Five invited talks from WPC (Dave Novak), CPC (Dave DeWitt), ECMWF (Roberto Buizza), UKMet (Nigel Roberts) and Glenn Romine (NCAR)
- Nine main sessions and three jointly sessions to cover all interesting topics for all time scales
- Present/review all ensemble forecast systems
- Reports from NCEP Service Centres, Regions (WFOs) and private users
- Studies from research communities
- Experiences exchanges around national and international centres

- **Session discussion**

- Open discussion of users requirements and NCEP's plan
- Open discussion on international collaboration
- Open discussion on research-to-operation-to-research loop

Main Theme and Purpose

- Main Theme
 - Continue to support NWS in its transition from single value to probabilistic forecasting
- The purpose
 - Bring together experts and users involved in the generation and use of NCEP ensembles,
 - Review progress on the generation and use of operational products since our last meeting in March 2014,
 - Discuss plans for future efforts and collaborations. The ultimate goal is to convey forecast uncertainty in a user-relevant form. Collaborative efforts on the national (NUOPC, DTC) and international (NAEFS, NMME) scale have been also discussed.

Themes in Details

- Current state and plan of operational ensembles and products
 - What is the current state of operational ensembles? The reviews include all scales and downstream applications, such as regional, global, climate, wave/surge, hydrological, hurricane and etc ...
 - What products and guidance are available to users? The reviews include the products from NCEP UPP, NAEFS SPP, SREF post products (and others) for public, NBP for NWS and etc...
- User requirements and future plans
 - How are ensembles currently used by broader users? The reviews include NCEP centers, NWC, fields (regions and WFO/RFC), private sectors and etc...
 - What are the evidence-based requirements for future ensemble generations? Those include future storm scale ensemble, week 3&4 global ensemble and others.
 - How can we work together to fulfill those requirements within operational limitations? This includes the reviews of UMAC's recommendations, plan of NGGPS, ensemble post-processing, plan for reanalysis/reforecast and others.
 - How can we improve our services for broader users? Those will cover data distribution, product generation, product visualization, forecast verification and others.
- Encourage national/international community participation and cooperation
 - How do we engage the community to encourage external model development and facilitate research-to-operations (and operations-to-research)? This includes the discussions from NCAR/DTC, NGGPS project, MMAP project, NMME, NOAA testbeds and others.
 - How can external developers make the R2O process easier, making it more likely their work will be incorporated operationally?
 - How can we enhance national cooperation through various projects? This includes ESPC/NUOPC, NMME and others.
 - How can different nations increase cooperation to improve (combined) ensemble products and future development? This includes experiences sharing from NAEFS, NMME, many foreign national centers (and institutions).

Outcomes and Recommendations

- Outcomes
 - Have final report for NWS roadmap reference
 - Prepare science report to submit BAMS (?)
 - Work on unification of NCEP production suite
 - Improve coordination/collaboration of research-development-operation
 - Enhance international coordination/collaboration
- Recommendations
 - Data sharing
 - Post processing and reforecast
 - Unify verification metric
 - Need evidenced based decision making for model upgrades based on UMAC recommendations
 - WMO may be a best venue to lead international collaboration through RDP/FDP project

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- Session chairs
- Session discussion leads
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