Modeling, Analysis, Predictions and Projections (MAPP) Program

Annarita Mariotti, Dan Barrie, Heather Archambault
OAR/Climate Program Office
How NOAA uses models

Integrate Earth system observations

Understand environmental processes and predictability

Predict conditions on timescales of hours, days, weeks, and seasons

Project conditions on timescales from decades to a century

These needs cut across Line Office interests
MAPP’s program role

Strategically expand NOAA’s internal capabilities for modeling and prediction in support of Mission needs

Expand NOAA’s R&D

Tap into research expertise of external community

Transition Research into Applications

Improve NOAA services to enhance societal resilience

Coordinate and Engage

Connect NOAA with the external community to advance science and services
Predictions from weeks to seasons, reanalysis for long-term monitoring, model and prediction system development, and outlooks from decades to centuries.

**Applications**
Operational use via the CTB, drought applications via NIDIS, projections applications via National Climate Assessment, etc.

**Years of experience and community engagement in these areas.**
Annual Competitions
Select the highest quality research projects through a rigorous peer-review process

Task Forces
Coordinate projects; foster engagement between OAR labs, NCEP, and external community

Coordination
E.g., with NGGPS, NCEP centers, NOAA line offices, other USGCRP agencies and programs; topical reports

Webinars, Workshops, and Newsletter
Communicate achievements and get input; foster collaboration
The MAPP program has regular solicitations for CTB projects
  o Coordinated with CTB Management Team and NCEP centers
  o MAPP-CTB projects constitute majority of CTB transition work
  o Coordinated with NGGPS program

MAPP managers are part of the CTB Management Team
  o Meet quarterly with CTB Director and NCEP managers to discuss progress and issues with ongoing projects and future plans
  o Co-developed the current CTB process over past few years
  o Contributing to CTB Science and Implementation plan
  o Co-organize CTB workshops

MAPP fosters coordination with CTB activities
  o Co-organizing PI groups (Climate Model Development Task Force), webinars and topical workshops

A prime example of OAR-NWS coordination
All projects are at “Readiness Level” 5-8 on the R&D Funnel

- **Highlight:** The NMME seasonal prediction system, a platform for operational prediction and R2O

- Nine ongoing projects, with potential transition into NWS operations over next 2 years

- Several new projects to be selected in FY16 in areas of modeling, data assimilation, and subseasonal prediction
Highlights of MAPP activities

- California drought report and ENSO assessment
- CMIP5 report
- North American Multi-Model Ensemble
- MAPP webinar series – 5th year, 2500+ participants
- Climate and Earth System modeling report
- 8 MAPP-organized workshops since 2012
MAPP outlook

NCEP unified modeling
Coordination with NGGPS (e.g. physics, infrastructure, focusing on CFS aspects)

Seamless weeks-to-seasonal prediction
Predictability and prediction systems for weeks 3-4, leveraging external community’s seasonal prediction experience

Global high-resolution modeling
Interagency coordination, intra-NOAA coordination

Next-generation reanalyses
Climate-quality monitoring and predictions
CMIP modeling
diagnostics and science

Drought and potential new applications
NIDIS, heat health, ecosystem and water-level modeling and prediction
Closing thoughts

• MAPP strategically supports NOAA’s modeling and prediction needs, extending NOAA’s capabilities – and can expand to address cross-LO interests conditional on new resources

• MAPP has and can continue to contribute to CTB activities in support of NWS by connecting the external community to NOAA’s R2O.

• MAPP–CTB activities are a primary example of NWS–OAR collaboration

Questions for this workshop:

• Which CTB relevant areas/methodologies will be scientifically mature for transition into operations or service applications over the next 3–5 and 5–10 years?

• Which operational improvements can we foresee on these timescales?