NOAA’s Climate Program Office

Modeling, Analysis, Predictions, and Projections Program

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MAPP Program

A mission-oriented competitive research program at the interface between basic Earth system science and operational/service needs.

Program Managers:
- Don Anderson (Lead)
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NOAA/OAR/CPO/MAPP
Current MAPP Research Thrusts

**Drought**
Understanding, monitoring and prediction of drought over North America in support of NIDIS

**climate & extremes prediction**
ISI climate prediction based on multi-model (NMME), multi-methodology approaches and best practices.

**long-term climate outlooks**
Long-term regional climate outlooks for North America based on CMIP5

**re-analysis**
Advancing atmospheric re-analysis and exploring the potential for IESA

**model development**
Improving global climate and Earth system models via CPTs and high-resolution/regional experimentation

**partnerships with NCEP’s Climate Test Bed and NIDIS**
The MAPP Task Forces

A new approach..
- A Drought Task Force
- A CMIP5 Task Force
- A Prediction Task Force

- Connecting the dots.
- Combining forces to attain greater advances

Very different from drizzling $ over research areas..

New or advanced knowledge/capability
MAPP and NCEP Climate Activities

**MAPP Program**
- Other MAPP Research
- Competitively selected projects involving NCEP and the external community/NOAA labs

**NCEP Climate Activities**
- In-House Climate R&D
- Climate data management and dissemination
- Operational Climate products and services
- Etc..
1. Climate model development (CPT)
2. ISI climate prediction (including a regional scales focus)
3. Drought monitoring and prediction in connection with NIDIS
4. Re-analysis research and development

Of the above, model development, climate prediction and drought currently involve NCEP-CTB
GOAL: Test and evaluate climate modeling and prediction research advances for improved NOAA operations.

A goal shared by MAPP and NCEP-CTB

Not any MAPP research project... need the “right” research questions, interest/support to work with NCEP and vice-versa, a clear outcome that can inform operational implementation
A Partnership for MAPP-CTB Research

• A partnership established by the 2012 MAPP-CTB Execution Agreement

External research collaborations of excellence and funding..

A test-bed including models, data, internal expertise, computers..

MAPP

NCEP-CTB

• A new process ($ does not suffice..):
  • Competitively select MAPP-CTB projects of clear interest to NCEP, including metrics to test research advances
  • A systematic assessment of the outcomes for operational use and implementation potential by NCEP.
Examples of MAPP research activities involving CTB
Drought Task Force Advancing U.S. drought monitoring and prediction

Who/What
-A multi-agency/multi-institution group of 30-plus MAPP Investigators research involving CTB
-Research projects exploring improved methodologies for drought monitoring (e.g. remote sensing) and prediction (e.g. NMME)

Roles
-Providing focus, coordination and leadership to MAPP funded drought research in support of NIDIS
-Extending NOAA's research capability via external collaborations
-Improving NOAA operations via CTB
-Contributing/leveraging International efforts (GDIS)

Broad Priorities
-To understand and explain drought
-To test current capabilities and research advances
-To incorporate research advances experimentally to improvement current drought information systems

A spectrum of drought research activities, with MAPP-CTB research at the RtO end but connected to the rest
MAPP Drought Task Force

- Research to improve the basic capability to monitor and predict drought, at national and regional scale.
- Involves Climate Test Bed research to improve NOAA’s operational climate models and prediction methodologies
A broad multi-institutional interagency-funded MAPP-CTB research project:
• 2 year project involving U Miami, GFDL, NCEP, ESRL, NCAR, NASA, IRI, U of Princeton, COLA
• With NOAA/NSF/DOE/NASA support.
• Address prediction research questions and test specific metrics to help the design of an optimal system.

Potential Outcomes/Payoffs:
• An optimal design of a multi-model system for probabilistic drought prediction

This project is part of the MAPP Climate Prediction Task Force, a broader effort to advance ISI climate prediction.

NMME Forecast Verification analyses

Precipitation forecasts anomaly correlation
June-August; June start

Temperature forecasts anomaly correlation
June-August; June start

Courtesy of IRI
Closing Considerations
MAPP-CTB Research Opportunities

- FY12: Develop an experimental National Multi-Model Ensemble climate prediction system
- FY13: Research to Advance Climate and Earth System Models - Climate Modeling and Process Teams including a CTB opportunity
  - Cryospheric processes
  - Cloud and cloud-radiative processes

- These are significant given current MAPP budget situation
- Both FY12 and FY13 projects follow the new process, including a final review
Challenges

• Budget for MAPP-CTB activities is insufficient and uncertain (MAPP was reduced by over 30% in FY12)
• NCEP-CTB internal dedicated resources (ref. NCEP AOP) to support research projects unclear...
• Once a MAPP-CTB project delivers a capability advancement as an outcome of research how will NCEP introduce it into operations? E.g. NMME or new drought monitoring tools, how will they be utilized once the MAPP-CTB research project is over?
• Failure in the above will discourage future RtO research investments.
Opportunities

- A MAPP and NCEP CTB RtO shared goal and an unprecedented partnership
- A new process in place to select the “right” projects, follow-them through, and define outcomes for operations
- MAPP Task Forces provide the opportunity to connect NCEP-CTB with other research efforts
- New opportunities with NCEP’s new facility and current momentum to reorganize/optimize NCEP’s climate activities
- NCEP-CTB has the opportunity to work with other programs/agencies, depending on its interest, not just MAPP.