Update on NOAA Climate Program

- CPPA Update
- NOAA CPO Program Restructuring
- NOAA Climate Service

Jin Huang

NOAA Climate Program Office
July 29, 2010
Buenos Aires, Argentina
# NOAA’s Climate Mission Goal

**Understand and describe climate variability and change to enhance society’s ability to plan and respond**

<table>
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<tr>
<th>Program</th>
<th>Performance Objective</th>
<th>Outcomes</th>
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<tr>
<td>Climate Observations and Monitoring</td>
<td>Describe and understand the state of the climate system through integrated observations, monitoring, and data management</td>
<td>A predictive understanding of the global climate system on time scales of weeks to decades to a century with quantified uncertainties sufficient for making informed and reasoned decisions.</td>
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<tr>
<td>Climate Research and Modeling</td>
<td>Understand and predict climate variability and change from weeks to decades to a century</td>
<td>Climate-sensitive sectors and the climate-literate public effectively incorporating NOAA’s climate products into their plans and decisions.</td>
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<td>Climate Service Development</td>
<td>Improve the ability of society to plan for and respond to climate variability and change</td>
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Program Lead:
- David Goodrich (NOAA Climate Program Office)
- V. Ramaswamy (NOAA Geophysical Fluid Dynamics Laboratory)
- Margaret Davidson (NOAA Coastal Services Center)
Climate Prediction Program for the Americas (CPPA)

Mission: Improve operational intra-seasonal to interannual hydroclimatic predictions for the Americas

CPPA Objectives:

- Quantify the sources and limits of predictability of climate variations on intra-seasonal to interannual time scale
- Improve predictive understanding and model simulations of ocean, atmosphere and land-surface processes, including the ability to quantify uncertainty
- Advance NOAA’s operational climate forecasts, monitoring, and analysis systems by transferring research to operation
- Develop climate-based hydrologic forecasting capabilities for decision support and water resource applications
CPPA Funded Major Activities
($9.15M/year; ~60 active projects)

- Predictability of Phenomena
  - ENSO, drought/extremes, monsoons, intraseasonal variability

- Process and Modeling Studies
  - air-sea interaction: e.g., EPIC, NAME, VOCALS
  - land-atmosphere interactions: soil moisture, vegetation, snow, topography

- Improving Climate Models and Predictions
  - Development of Land Data Assimilation System (LDAS) and Noah Land model in NCEP CFS
  - Evaluation and model improvement of CFS
  - Multi-regional model downscaling using multi-GCMs seasonal predictions

- Applications of Climate Predictions
  - Drought monitor and prediction products
  - Seasonal hydrological prediction in NWS/OHD and River Forecast Centers (RFCs)
  - Applications of climate information for ecosystem prediction

- Transitioning Research to NWS Operations
  - CPPA Core Project (focus on land & hydrology)
  - joint university-NCEP competitive projects on CFS improvement
1. **Predictability and prediction of ISI climate and impacts over the Americas**
   - **IAS**
     - **Karnauskas**, Seager, Busalacchi: mid-summer drought
     - **Liebmann**, Vera: contributions of organized transient disturbances to ISI rainfall
   - **Evaluate the ability of IPCC-AR5 class models to simulate and predict ISI climate, and to examine ISI climate variability and its impacts over the Americas under a warming climate.**
     - **Ruiz-Barradas**, Nigam: hydroclimate in central US. in warm season
     - **Cavallho**, Jones: an integrated view of the American Monsoon Systems
     - **Fu**, Mo: changes in Pan American ISI climate and their impacts on extremes
     - **Serra**: Evaluation of the Tropical Storm Track in IAS region in IPCC AR5 Models

2. **VOCALS post-campaign data and process modeling**
   - **Shinoda**: atmosphere-ocean coupled processes in the SE Pacific
   - **Mechem**: drizzle and cloudiness transitions in SE pacific marine stratocumulus
   - **Bretherton**, Mechoso, Teixeira, Park, Lord: **Climate Process Team** on stratocumulus to cumulus transition (jointly funded with CTB Program)

3. **One-year fund for M. Douglas to develop int’l collaboration for IASCLIP**
NOAA Climate Program Office

New Program Structure

Director’s Office

- CPO Climate Programs
  - Climate Observations & Monitoring (COM)
  - Modeling, Analysis, Predictions & Projections (MAPP)
  - Earth System Science (ESS)
  - Climate & Societal Interactions (CSI)

- Planning & Programming

- Administrative Services
NOAA Climate Program Office

http://climate.noaa.gov/cpo_pa/

**COM activities:**
- Build and sustain a global climate observing system according to climate monitoring principles
- Develop and maintain long time-series indicators of climate variability and change
- Develop and maintain standard data sets for initialization and evaluation of climate forecast models, assessments of climate change, and informed risk management
- Perform diagnostic studies of observed patterns of climate variability and change on global to regional scales

**ESS activities:**
- Elucidating the physical climate mechanisms involving land-atmosphere-ocean-ice interactions responsible for intraseasonal to multi-centennial climate variability, including abrupt climate change
- Identifying the location, magnitude, dynamics, and variability of global carbon sources and sinks; understanding how ecosystems are impacted by changes in carbon cycling and associated changes in climate
- Improving understanding of the role of aerosols and chemically-active greenhouse gases in the global climate system
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MAPP activities:
• Improving Earth system models
• Supporting an Earth System Integrated Analysis capability
• Improving methodologies for global and regional-scale analysis, predictions, and projections
• Developing integrated assessment and prediction capabilities relevant to decisionmakers based on climate analyses, predictions, and projections

CSI activities:
• Identification and articulation of user-community requirements in multiple sectors, initially with regard to water resources and the coastal zone then branching to related sectors
• Research and development of innovative and broadly applicable approaches to support decision-making, especially for risk characterization, both through a broad network of regionally scoped, long-term efforts and stakeholder-specific efforts
• Promotion of the transfer of knowledge, tools, and products across climate service development efforts (within NOAA, across the federal government, nationally, and internationally).
MAPP FY11 Research Priorities
($3.5M / year)

1. Advances in Regional-Scale Climate Predictions and Projection
   1a) Support the development of next-generation global climate models
   1b) Evaluate uncertainties in regional-scale climate predictions and projections

2. Develop an Integrated Drought Prediction Capability

2. Evaluate Recently Developed Reanalysis Products
ESS FY11 Research Priorities
($4.0M / year)

• Decadal Climate Variability and Predictability
  – AMOC

• Understanding and Improving Prediction of Tropical Convection
  – DYNAMO

• Improving the Understanding and Modeling of Land Surface Processes

• The Global Carbon Cycle

• Aerosols, Atmospheric Chemistry and Climate
  – Analysis of CalNex Study
NOAA Climate Service

- February 8, 2010 - U.S. Commerce Secretary Gary Locke today announced the intent to create a NOAA Climate Service line office dedicated to bringing together the agency’s strong climate science and service delivery capabilities.
- Thomas R. Karl, director of NOAA’s National Climatic Data Center, will serve as transitional director of NOAA Climate Service.
- [http://www.climate.gov](http://www.climate.gov) – that serves as a single point-of-entry for NOAA’s extensive climate information, data, products and services. Known as the NOAA Climate Portal, the site addresses the needs of five broadly-defined user groups: decision makers and policy leaders, scientists and applications-oriented data users, educators, business users and the public.
Building Blocks of Proposed NOAA Climate Service

**NESDIS DATA CENTERS**
- National Climatic Data Center
- National Oceanographic Data Center
- National Geophysical Data Center

**OAR PROGRAM & LABORATORIES**
- Earth System Research Lab
  - Office of the Director
  - Chemical Sciences Division
  - Global Monitoring Division
  - Physical Sciences Division
- Geophysical Fluid Dynamics Laboratory
- Climate Program Office

**NWS FUNDING TO MANAGE NETWORKS (NO STAFF CHANGE)**
- Climate Observing Network
  - Tropical Atmosphere Ocean (TAO)
- Historical Climate Network Modernization (HCN-m)
- Modernization of the Hourly Precipitation Rain Gauges

The physical location of these facilities will not change
NOAA’s Top five long-range (~5-10 years) climate research areas of interest that intersect with VAMOS

- Improving climate models
- Climate extremes (hurricanes, droughts, ...)
- Climate prediction and projection
- Sustaining and enhancing the climate observing system
- Regional-scale climate