Climate Prediction Program for the Americas (CPPA)
and
NOAA Climate Program

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VAMOS Panel Meeting (VPM9)

Outline

- NOAA Climate Program

- CPPA Overview
  - background
  - science objectives
  - Science Panel
  - research areas
  - program budget
  - contribution to VAMOS

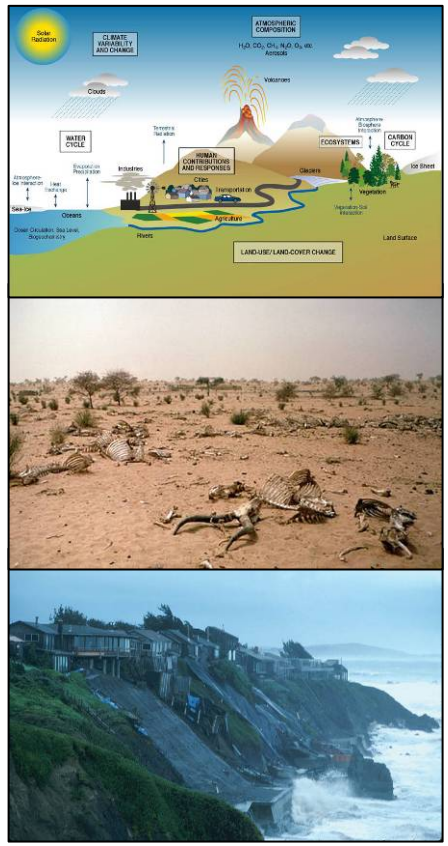
- Summary

NOAA Climate Goal

Understand Climate Variability and Change to Enhance Society's Ability to Plan and Respond

OUTCOMES

- A predictive understanding of the global climate system on time scales of weeks to decades with quantified uncertainties sufficient for making informed and reasoned decisions
- Climate-sensitive sectors and the climate-literate public effectively incorporating NOAA's climate products into their plans and decisions

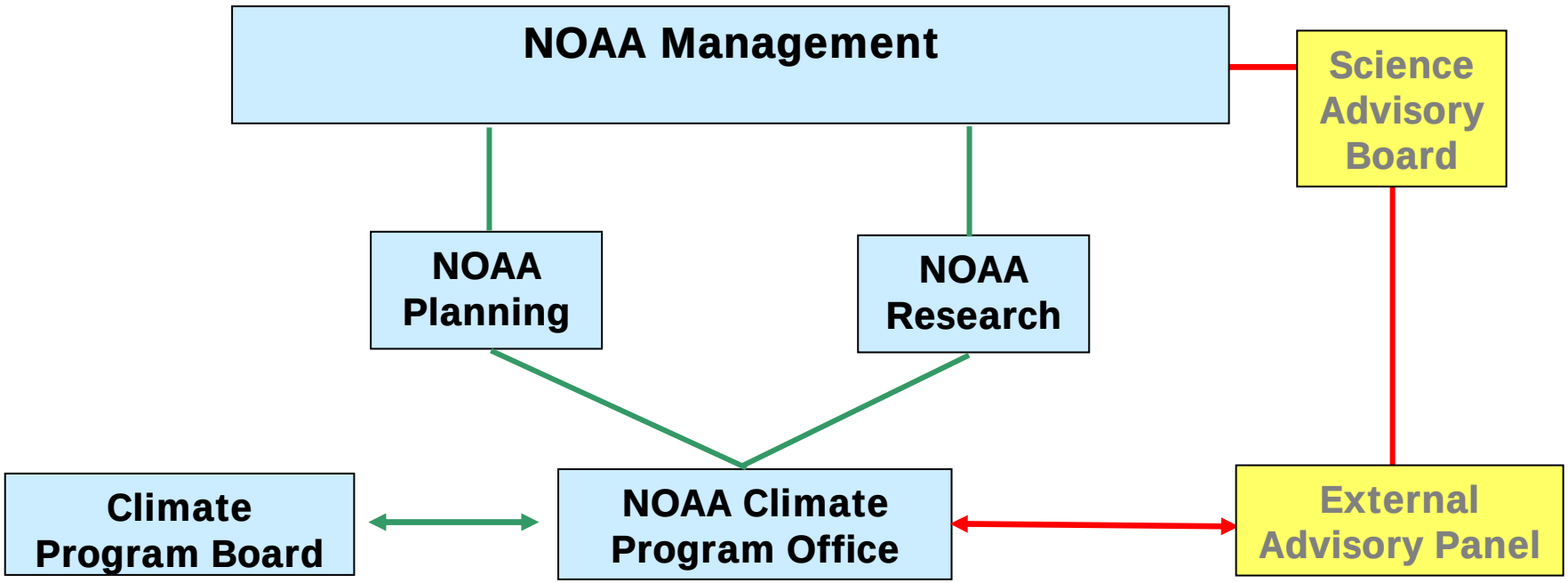


PROGRAMS				
Observations & Analysis	Climate Forcing	Predictions & Projections	Climate & Ecosystems	Regional Decision Support

NOAA Climate Program

Overarching Organization

new web site: www.climate.noaa.gov



Develops program

All NOAA represented

NEW
Administers goal and programs

Includes
Climate Office
Office of Global Programs (OGP)
Climate Observations and Services Program
Office of Climate Observations and ARGO
Arctic Research Office

Provides scientific and programmatic advice

Climate Prediction & Projection Program

Participating NOAA Line Offices:

- **NOAA Research (OAR)**
  - GFDL
  - NOAA Climate Program Office
    - Climate Dynamics and Experimental Prediction (CDEP)
    - **Climate Prediction Program for Americas (CPPA)**
    - Climate Variability and Predictability (CVP)

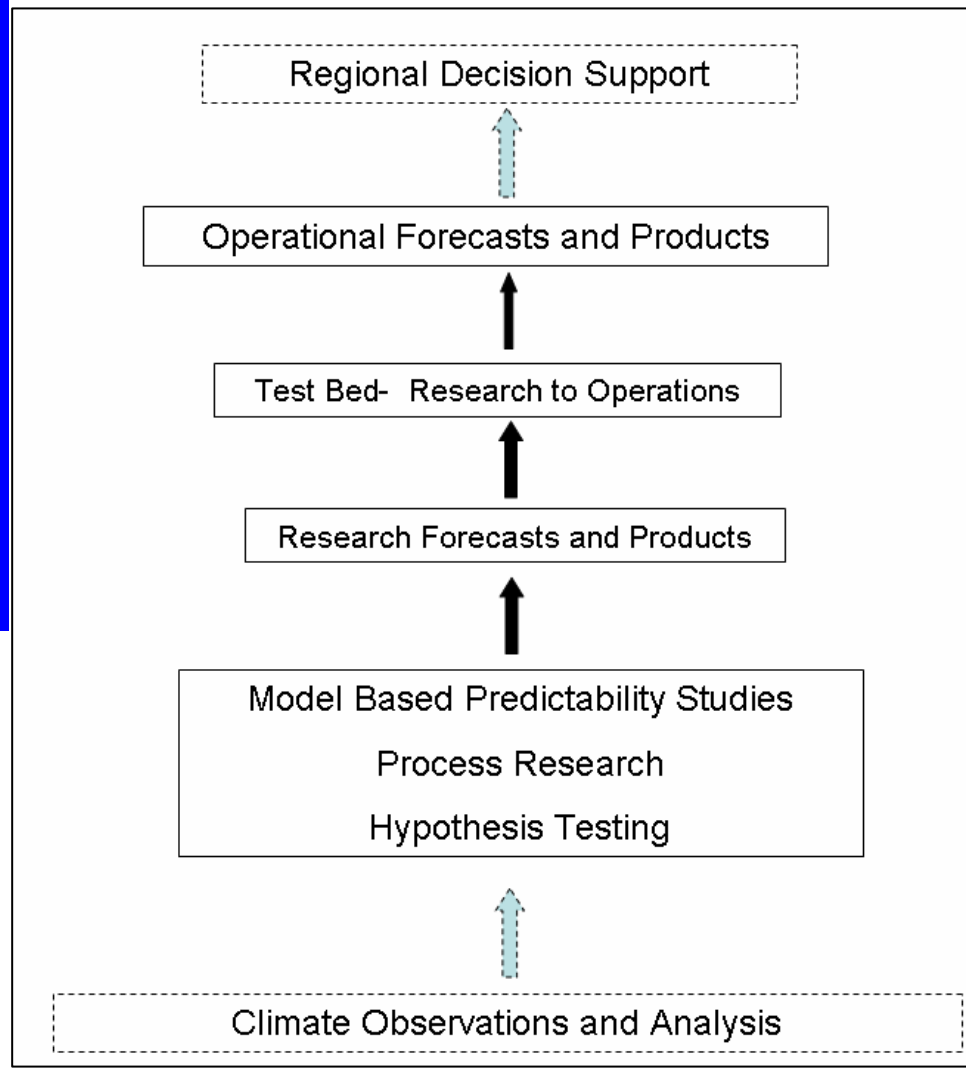
- **National Weather Service**
  - National Centers for Environmental Predictions
    - CPC
    - EMC
  - Office of Hydrology Development

Climate Prediction & Projection Program

Objectives:

• to provide climate forecasts for multiple time-scales to enable regional and national managers to better plan for the impacts of climate variability

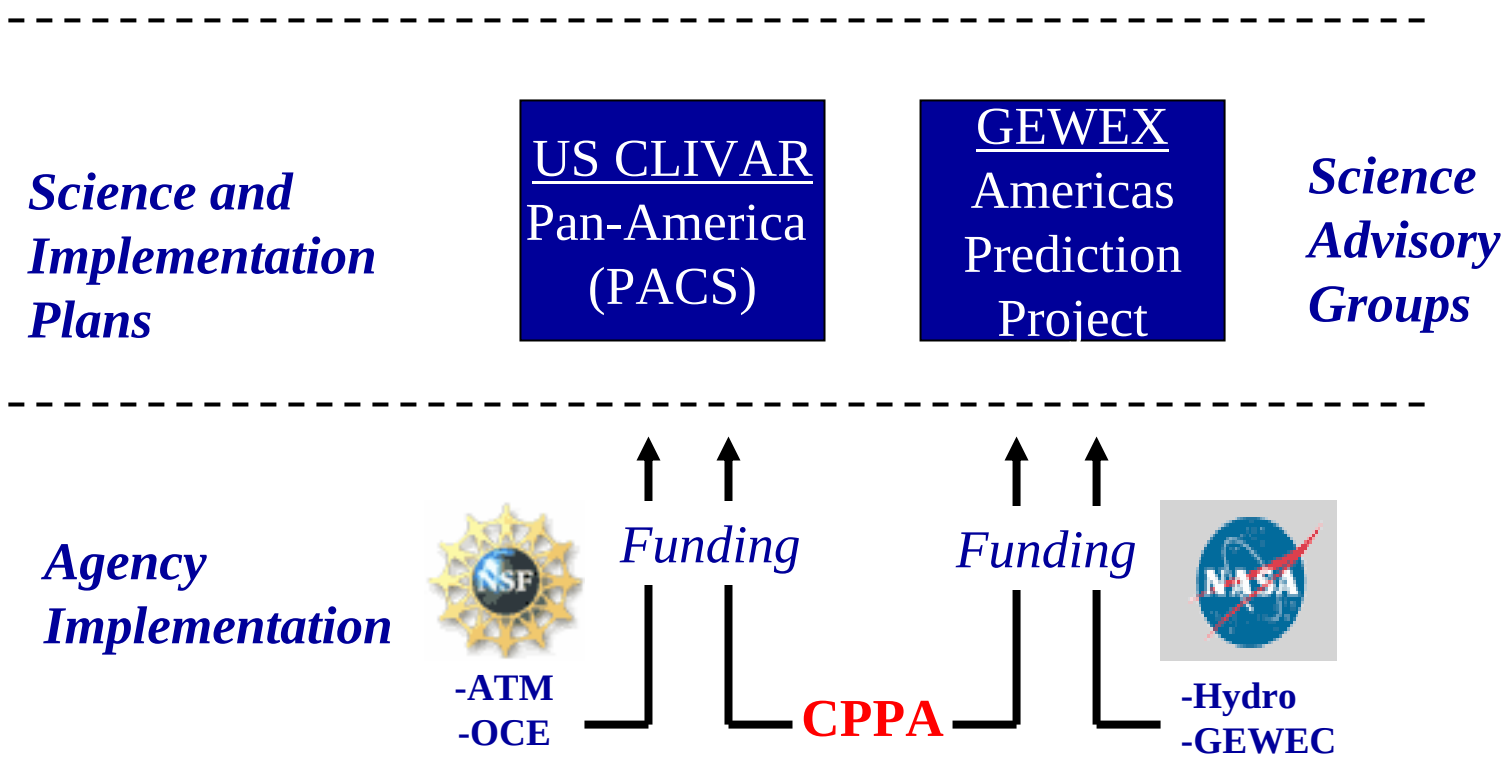
• to provide climate assessments and projections to support policy decisions with objective and accurate climate change information



Program Components:

- **Operational Climate Outlooks and Assessments**
- **High-end Climate/Earth System Model Development**
- **Applied Research and Product Development**
- **Test models against observations and define requirements for observing systems to support forecasts and improve models**
- **Analysis of the Climate System**

CPPA Previous Programmatic Structure



Pan America Climate Studies (PACS)

Science Objective: **to extend the scope and improve the skill of climate prediction over the Americas on subseasonal to interdecadal time scales by**

- **Promoting a better understanding of and more realistic simulation of coupled ocean-atmosphere-land processes;**
- **Determining the predictability of warm-season precipitation anomalies over the Americas on subseasonal and longer time scales; and**
- **Advancing the development of the climate observing and prediction systems.**

PACS focuses on the phenomena that are crucial for organizing seasonal rainfall patterns:

- the oceanic ITCZs

- the continental scale monsoon systems

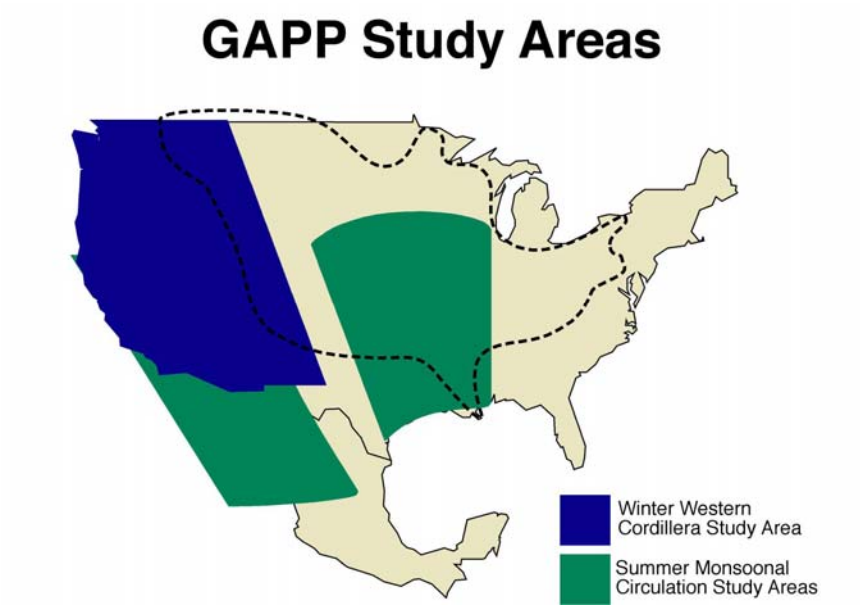
- the tropical and extratropical storm tracks

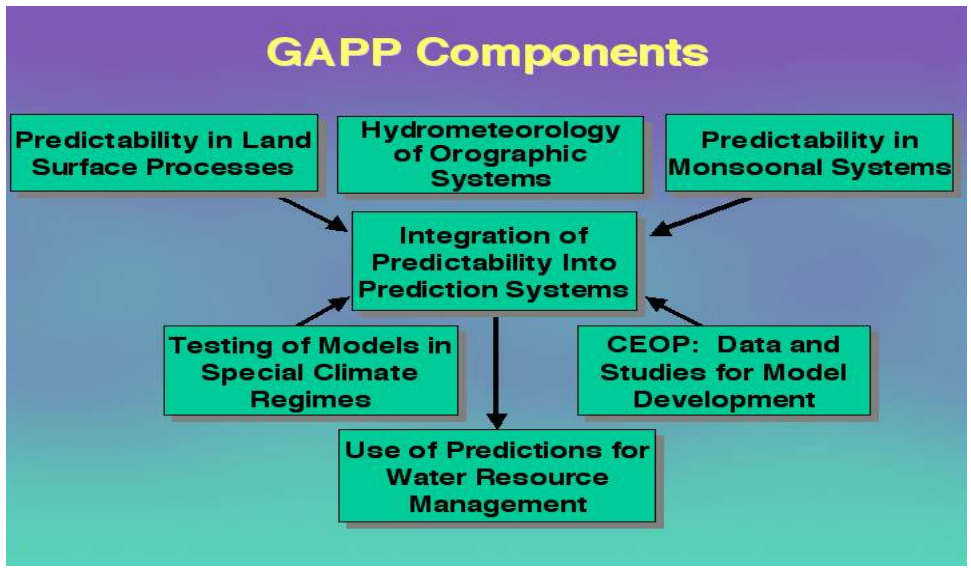
- Eastern Pacific Investigations of Climate (EPIC)
- North American Monsoon Experiment (NAME)
- Monsoon Experiment over South America (MESA)

GEWEX Americas Prediction Project (GAPP)

Science Objectives:

- **Prediction:** To improve monthly/seasonal climate prediction focused on improved understanding and modeling of land-atmosphere interactions.
- **Applications:** To interpret and transfer climate forecast information for optimal water resource management.





Current and Near Future Major CPPA Research Areas

- Ocean-Atmosphere Interactions

- role of air-sea interaction in climate predictability: ENSO, ITCZ/Cold tongue, air-sea fluxes, equatorial upwelling, …

- Land-Atmosphere Interactions

- role of land-atmosphere interaction in climate predictabilit:soil moisture, snow, vegetation, orography, …..

- Climate Predictability on intraseasonal to interannual time scales

- role of atmosphere-land-ocean interaction in climate predictability: Monsoon systems, orographic systems (cold and warm season effects), extremes (floods, droughts, hurricanes), teleconnctions, ….

- Operational Climate Predictaion, Monitoring, and analysis

- transfer research into operations: climate testbed, land data assimilation, operational model improvement (global, regional, and land surface); drought monitoring and prediction, model intercomparison studies)

- Climate -Based Hydrologic Forecasting and Water Resource Applications

- Improve hydrologic forecasting capability based on climate forecasts: hydrology test bed, ensemble hydrology forecasts, ….

CPPA Past Accomplishments

- NAME (North American Monsoon Experiment)

- LDAS (Land Data Assimilation System)

- Land model in NCEP Climate Forecast System

- Drought monitoring and prediction (NIDIS)

- EPIC (East Pacific Investigation of Climate)

- Transition of research to NCEP and NWS operations

- North America Regional Reanalysis

- Climate-based hydrologic forecasts

CPPA FY07 Priorities

- **Predictability and Prediction Studies:**
  - Impact of ocean and land on extreme events, such as, drought
  - Research forecasts utilizing high resolution downscaling; dynamic vegetation
  - Model evaluation and improvement for Western mountain and cold season processes

- **Understanding and Predicting of Monsoon Systems in Americas:**
  - Utilize NAME 2004 field observations
  - Variability and predictability of the South American monsoon system

- **Understanding and Simulating Ocean-Atmosphere Processes in the Eastern Pacific**
  - ocean-atmosphere processes in eastern tropical and south Pacific regions
  - climate variability in those regions and the remote regions influenced by the variability.

- **Improving Ensemble Hydrologic Prediction**
  - Multi-model hydrology forecast framework;
  - Data assimilation; uncertainty representation;forecast evaluation;

- **CPPA Synthesis Projects**
  - In areas of 1) air-sea interaction; 2) land-atmosphere interaction;
    3) hydrologic forecasting and water resource application

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P&P Desired End State (based on FY08-12 Planning)

- Initial State in FY08:
  - Improved operational seasonal forecasts
  - Experimental seasonal forecasts based on multi-model ensembles
  - Develop an understanding of decadal trends
  - Experimental decadal prediction
  - Application models for drought, fire, water resources
  - Earth system models for next sets of national and international assessment
  - Better knowledge of uncertainties in climate projections
  - Development of a vigorous research-to-operations program with implementation of Climate Test-bed

P&P Desired End-State (based on FY08-12 Planning)

- End State in FY12
  - Improved operational seasonal forecasts based primarily on dynamical techniques
  - A broader suite of climate forecast products and services (extending to health, energy, ecosystems, disaster mitigation etc.)
  - IPCC AR5 in 2012 and reduced uncertainty in the projection of future climate
  - Transition decadal forecasts into operations
  - Estimate of likelihood of abrupt climate change
  - A robust research-to-operations program implemented

Summary

- **CPPA is an integrated program supporting both CLIVAR (&VAMOS) and GEWEX science goals.**

  ✓ **CPPA will continue to achieve PACS and GAPP objectives, but need to coordinate/adapt latest development in science communities (CLIVAR, GEWEX, and others).**

- **CPPA is part of NOAA Climate Prediction and Projection Program**

  ✓ **Process studies & field observations need to be linked to and contribute to model improvement and NOAA climate goals.**

The first CPPA PIs meeting will be held in Tucson, AZ during Aug.14-16 followed by NAME SWG meeting