

Climate Prediction Program for the Americas (CPPA)



Jin Huang
NOAA Climate Program Office

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Climate Prediction Program for the Americas (CPPA)

1. Overall RHP situation: Organisation, structure, participants, funding, past and future time line,...
 - CPPA is originated from GCIP and then GAPP
 - In 2004, GEWEX/GAPP and CLIVAR/PACS were merged into CPPA
 - CPPA is sponsored by NOAA
 - CPPA Science Panel provides scientific guidance to the program.



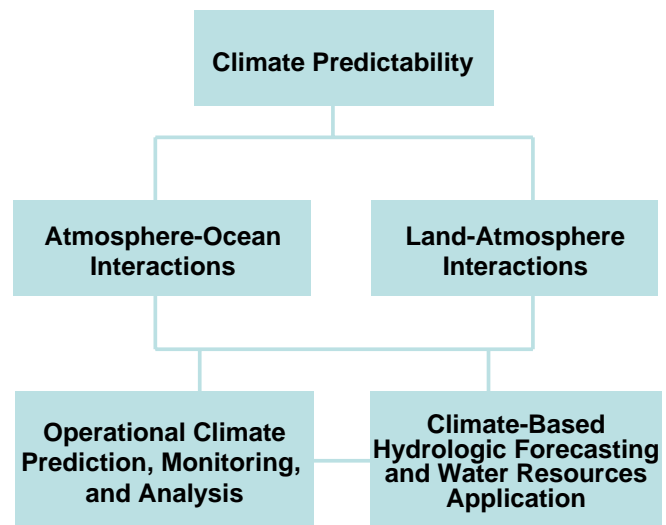
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2. RHP overall objectives and contribution to GEWEX / CEOP objectives

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

Research Components



CPPA Mission: Improve operational intra-seasonal to interannual hydroclimatic predictions for the Americas with quantified uncertainties sufficient for making informed decisions

Current and Near Future Major CPPA Research Areas

- **Climate Predictability on intraseasonal to interannual time scales**
 - Climate phenomena: Monsoon systems, orographic systems (cold and warm season effects), extremes (floods, droughts, hurricanes), teleconnections,
- **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 predictability: soil moisture, snow, vegetation, orography,
- **Operational Climate Prediction, Monitoring, and analysis**
 - transfer research into operations: climate Test Bed, 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,

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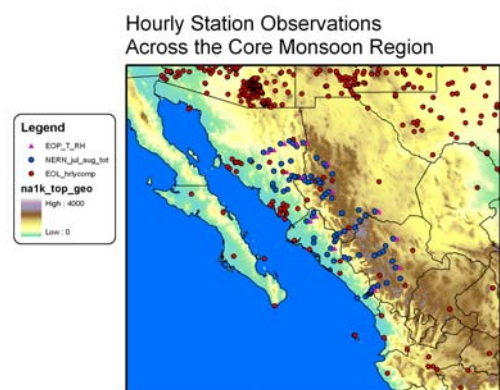
3. Stakeholder or user interactions

- NCEP Operational Seasonal Forecasts
- NWS/River Forecast Centers Operational Hydrologic Forecasts
- Water Resource Managers (thru partnership with other decision support programs)
- Fire Managers

CPPA Contributions to GEWEX-II Objective 1

.... produce consistent research quality data sets.....

- Regional analysis of energy and water cycle over the CPPA region with existing data (2007)
- Support data management for Global CEOP in-situ reference site data (2007-2009)
- Diagnosis of causes of variations of regional and water cycles (2012)
- Provide data in CPPA region (in-situ, remote sensing, and global and regional land and coupled assimilation products) to CEOP (07-09)
- Support research quality climate observing system in North Mexico (2007)
- Promote research observation system to GCOS (2008)



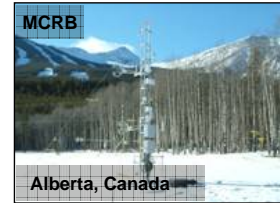
Location of hourly station observations of precipitation. **Blue circles** denote NERN stations, **red circles** represent non-NERN stations and **pink triangle** are NERN temperature/humidity recording stations.

NERN: NAME Event
Raingauge Network

CPPA Contributions to GEWEX-II Objective 2

.... Enhance the understanding....

- Conduct regional field experiment to understand Mountain and Cold Season processes (Mountain 2009-2010)
- Assess role of land surface in drought and extremes (2007-09)
- Improve process understanding of land-atmosphere interaction (ongoing)
- Conduct model transferability studies (ongoing)



CPPA North American Cordilleran Transect

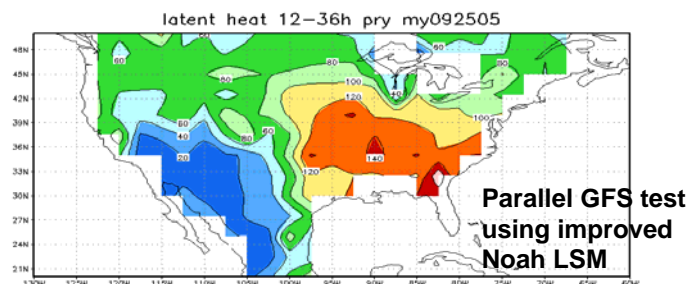
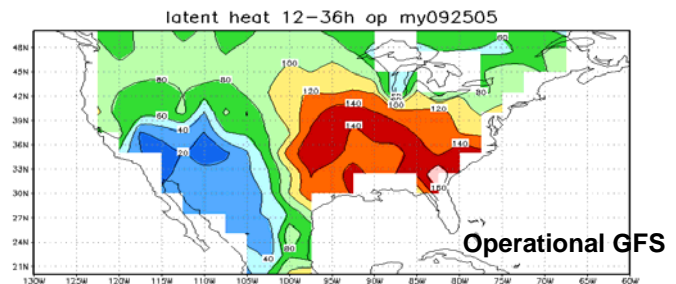
- Measurement of surface fluxes and hydrometeorological conditions during snowmelt;
- Model development:
 - Vegetation-snowcover interactions
 - Scaling in complex terrain

PIs: Marks, Pomeroy, Link, Hardy

CPPA Contributions to GEWEX-II Objective 3

.... Improve the predictive capability

- Assess land -surface process simulations in NCEP Global Model using CEOP reference site observations (2007)
- Support Global Land Data Assimilation System (LDAS)
- Participate GMP initiated modeling activities, such as, GLACE-2, various model inter-comparison projects (2007-2012)
- Process studies in areas of complex terrain (2010-12)
- Observation and model modeling study of diurnal cycles in monsoon region (NAME) (2007-09)



Impact of Noah LSM implementation in GFS: example of warm season forecasts
Noah LSM changes reduce longstanding high bias in GFS surface evaporation over east half of CONUS (K. Mitchell)

CPPA Contributions to GEWEX-II Objective 4

Undertake joint activities with operational hydro-meteorological services...

- **Transfer the Experimental Western and Eastern Seasonal Hydrologic Prediction System to NCEP Operation Platform (2008)**
- **Lunching pilot project to demonstrate multi-model ensemble hydrological prediction (streamflow, snow pack, soil moisture) on medium range (1-2 weeks) and seasonal time scales (2007)**
- **Support HEPEX (Hydrological Ensemble Prediction Experiment) (2007-09)**
- **Quantify uncertainties in hydrologic forecasts (from climate forecasts, initial boundary condition, model, and predictability studies) (HAP)**
- **Downscaling and hydrologic applications of seasonal hindcasts of NCEP CSF model (2008-2010)**

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5. RHP's view on the new CEOP

5.1 Added value of CEOP / GEWEX for RHP

- **CEOP is a platform for coordination of RHP activities with common interests,.....**

- **implication of CEOP as a “project” instead of a “panel” to RHPs?”**

5.2 Expectation of RHP to CEOP / GEWEX

- **Help CPPA to better achieve its science and operational objectives**

5.3 Options for co-operation (i) within CEOP and (ii) beyond (but within GEWEX and WCRP)

(i) Within CEOP: Semi-arid; cold season; Extreme events; Monsoons; HAP; High elevation;

(ii) beyond: GMPP activities; VAMOS (aerosol; cloud)

5.4 Are the revised RHP criteria adequate and ready for approval ?

Yes