



Hydrologic Application Project (HAP)

Reporting Period: February - September 2006

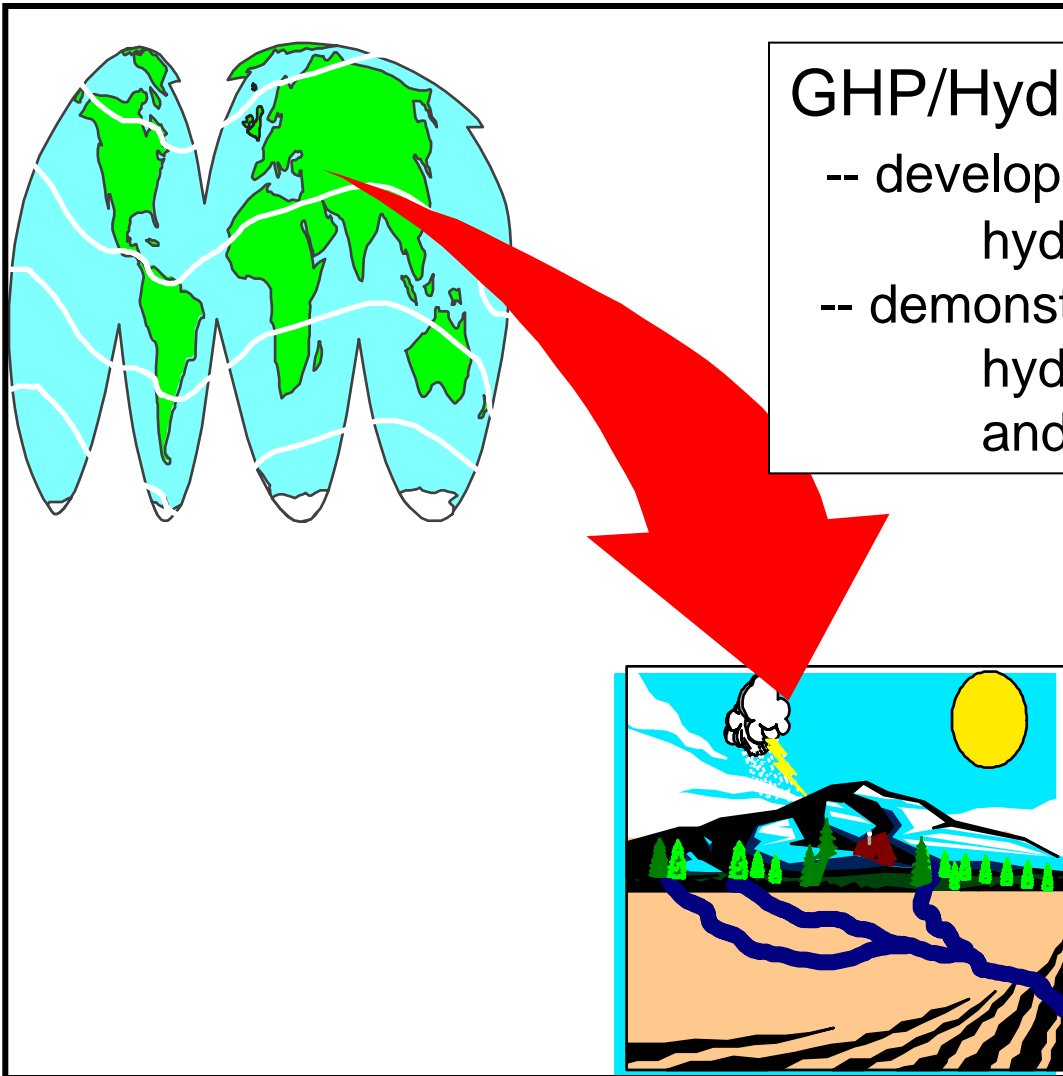
Project Starting Date: Spring 2006

URL: (Under construction)

Eric F Wood, Chair
(Princeton University)

Presented at the pan-GEWEX Workshop

Implementation Strategy



GHP/Hydrologic Application Project

- develop and test probabilistic hydrologic forecasts procedures
- demonstrate how to produce reliable hydrologic ensemble predictions and their use for water resources.

WRAP



HAP

The Water Resource Applications Project (WRAP) goals:

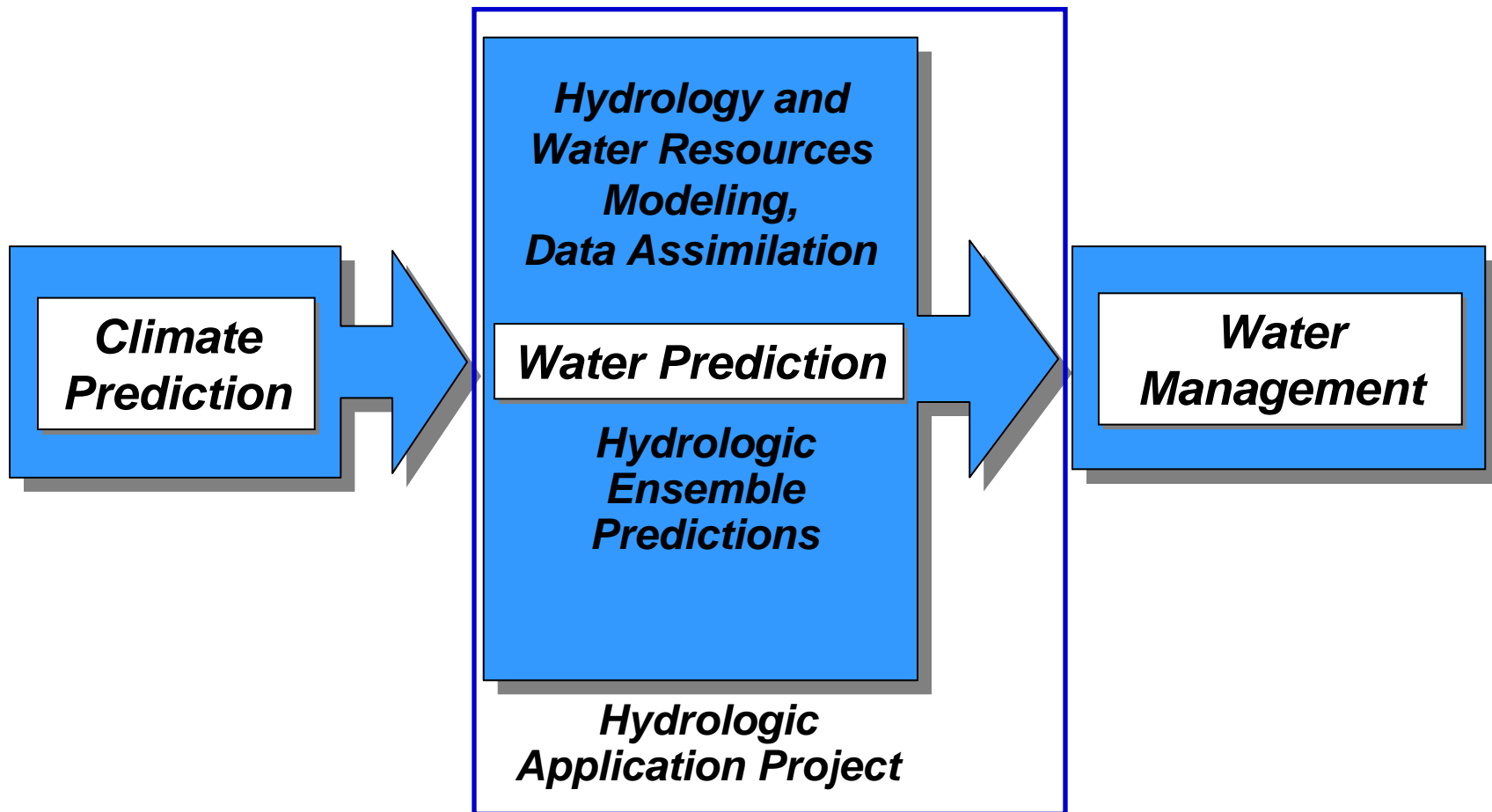
1. Dialogue with hydrological modeling community in operational environment services;
2. Demonstrate skill in predicting changes in water resources and soil moisture on time scales up to seasonal and annual;
3. Collaborate with water resources agencies to develop better hydrometeorological predictions

Developing the science behind skillful ensemble hydrologic seasonal forecasts, and demonstrating their usefulness.

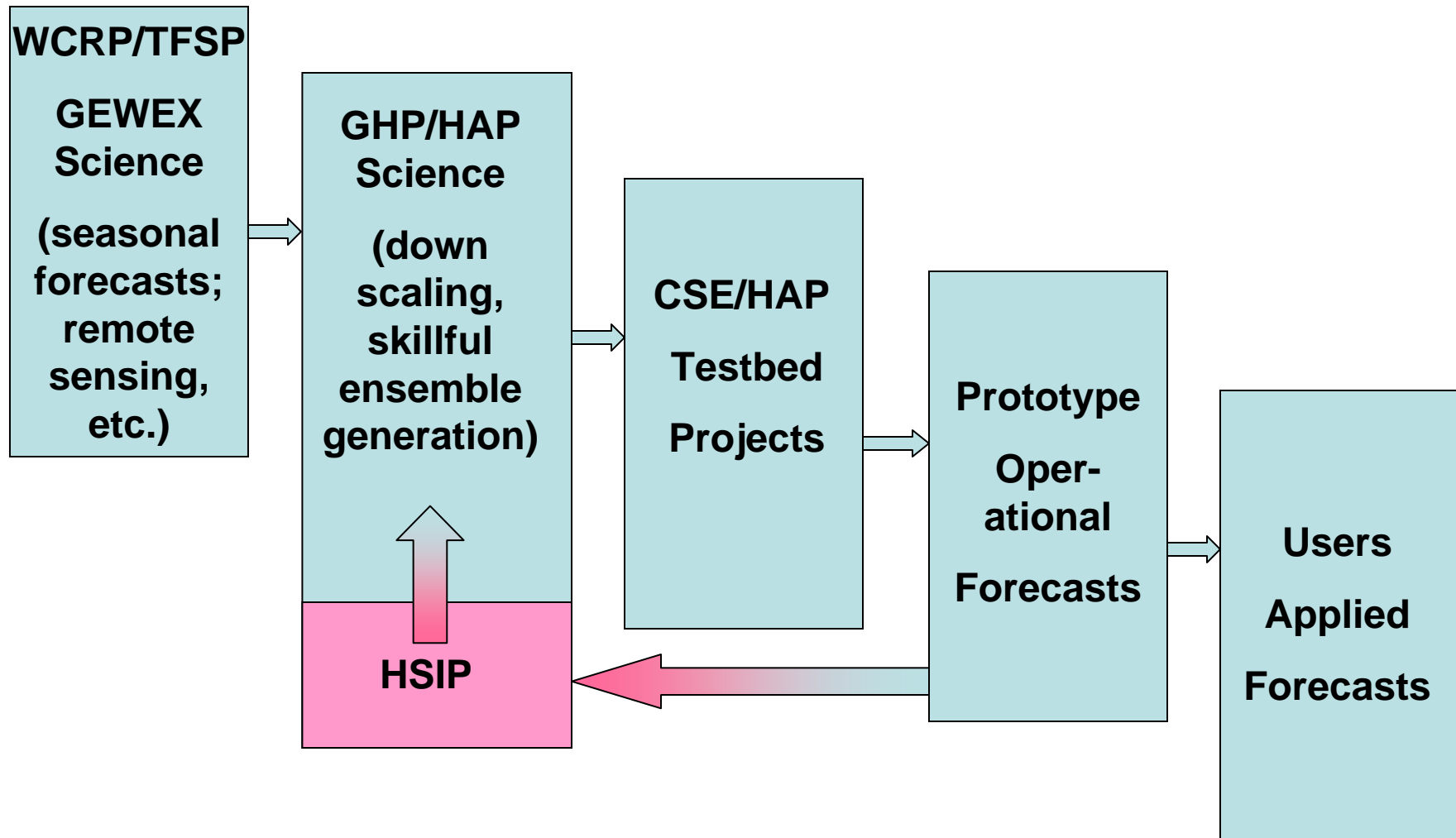
GHP Hydrologic Application Project (HAP) (draft) goals:

1. Developing procedures for assessing current hydrologic conditions through application of GEWEX supported data products, including remotely sensing;
2. Developing and testing of reliable, hydrologic ensemble forecast procedures based on seasonal climate model forecasts;
3. Demonstrating that the procedures can be applied at scales useful for water resources through test-bed sites and demonstration projects;
4. Working with related projects, like GHP/WISE, HEPEX, Project for Ungauged Basins (PUB).

From Climate Prediction to Water Management



HAP Science Infusion Process (HSIP)



Current Status of HAP Activities

Development of a HAP Science Implementation Plan.

Limited progress to date without the establishment of a HAP Working Group and more complete terms of reference.

Seasonal Hydrologic Predictions.

HAP will generate a global (land) hydrologic hindcasts based on NOAA and DEMETER seasonal forecasts and a 50-year surface meteorological data set that will serve as the basis for bias correction and downscaling. There is close collaboration with HEPEX with this activity.

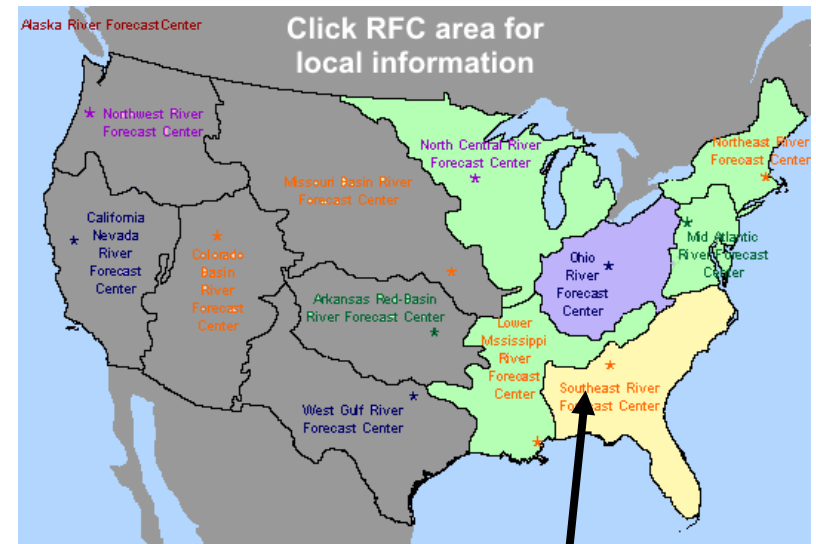
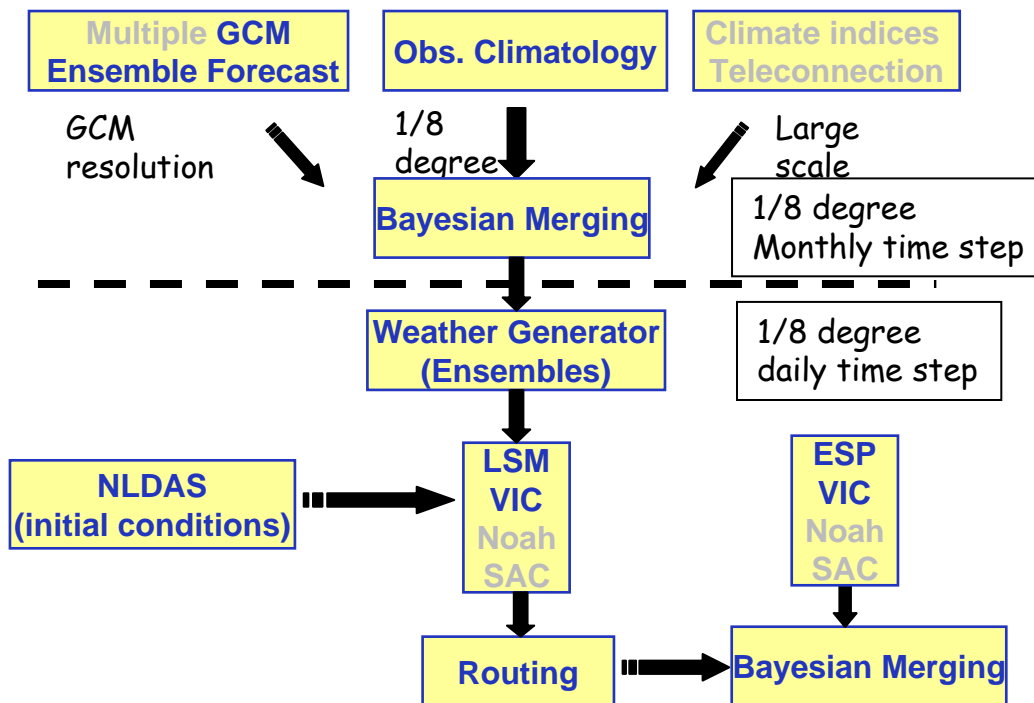
Estimation of current hydrologic conditions (snow, soil wetness)

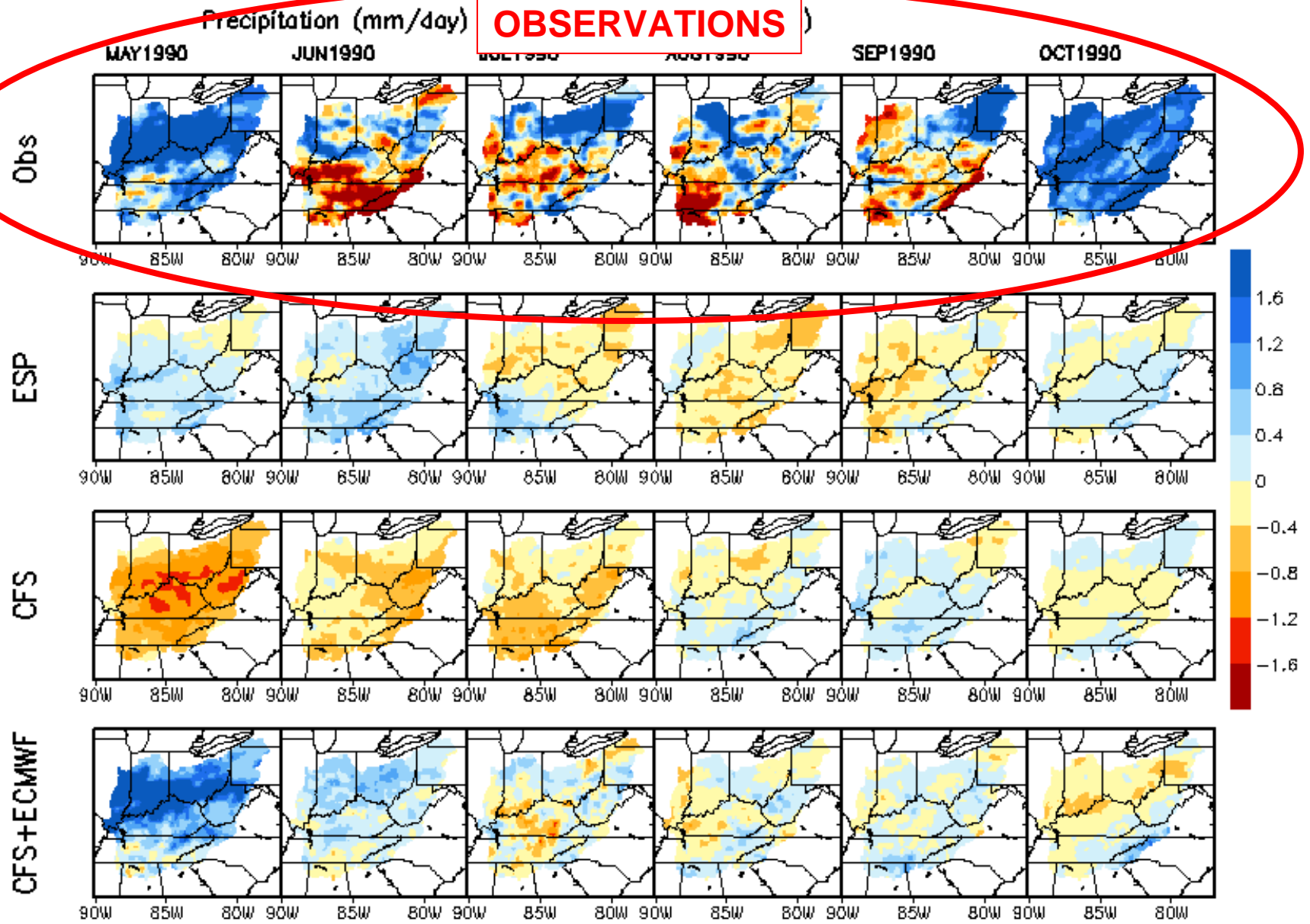
HAP is partnering with groups to estimate such current conditions but needs a strategy to expand this globally. (Requires real-time surface meteorology.)

Experimental Seasonal Hydrologic Forecast System over the Eastern US

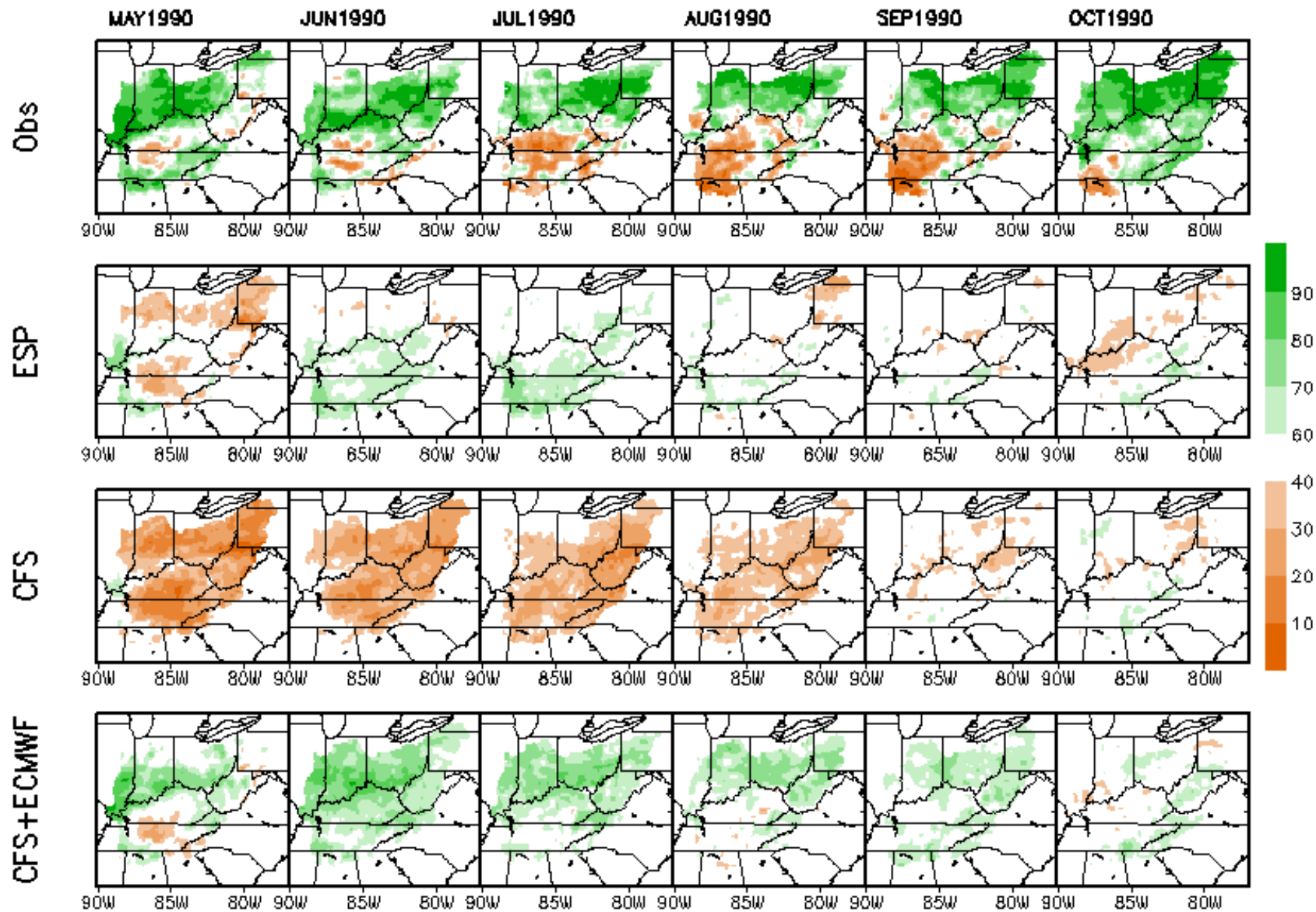
Project objectives:

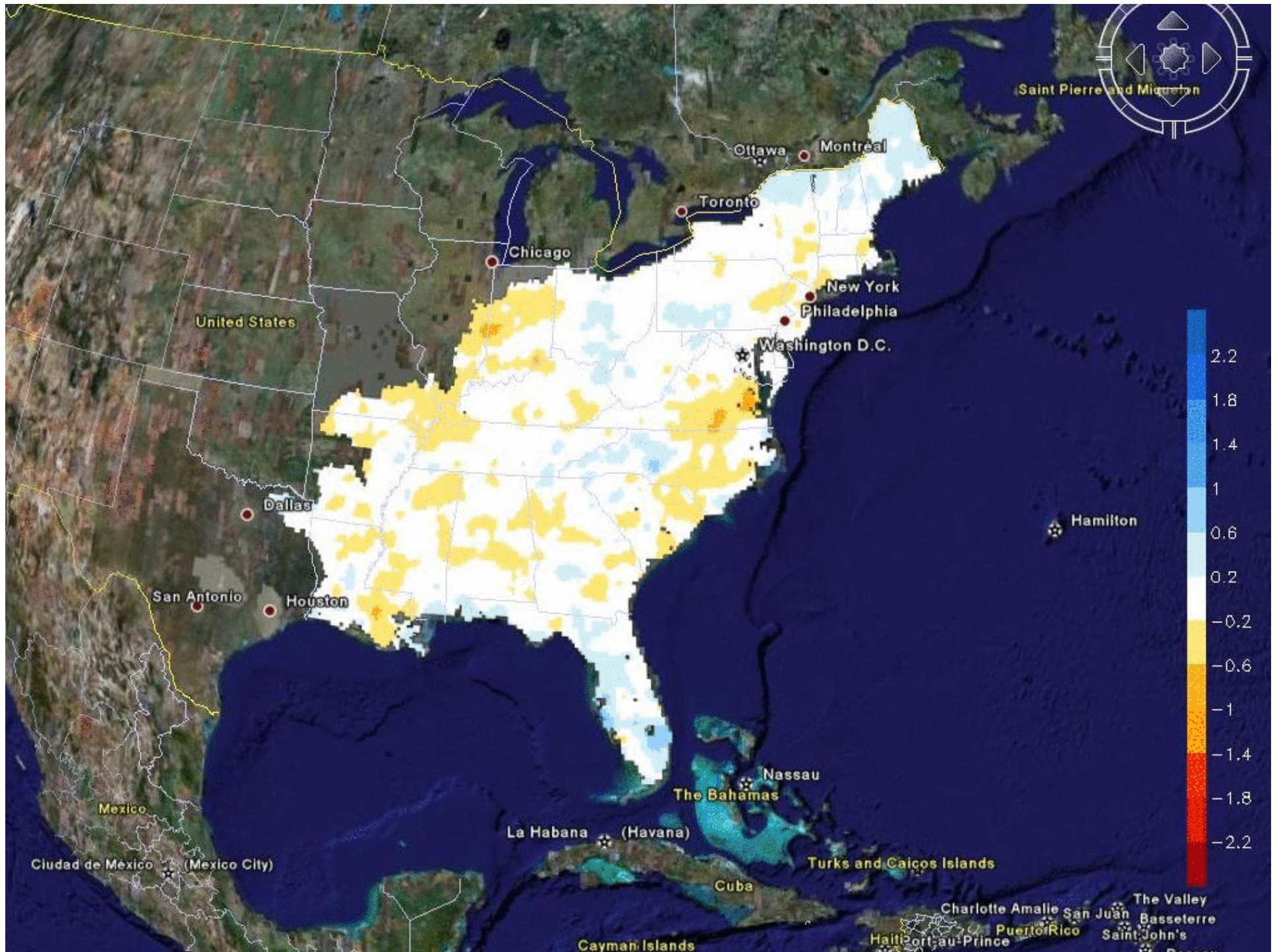
- (i) develop a seasonal hydrologic forecasting system that utilizes NCEP dynamical Climate Forecast System (CFS),
- (ii) evaluate the hydrologic forecast uncertainty and skill over a range of basins and
- (iii) develop verification approaches for the generated hydrologic ensembles.



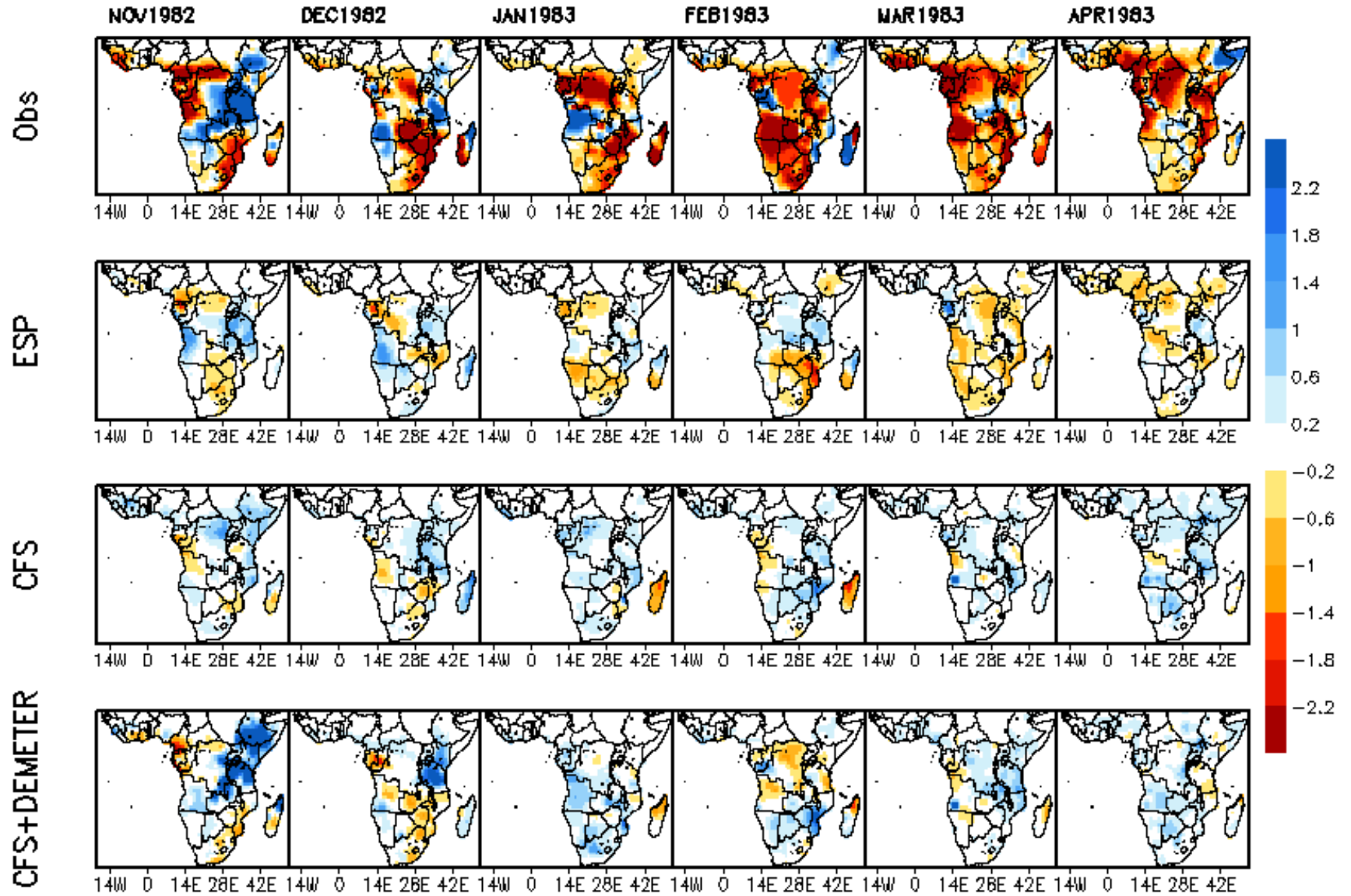


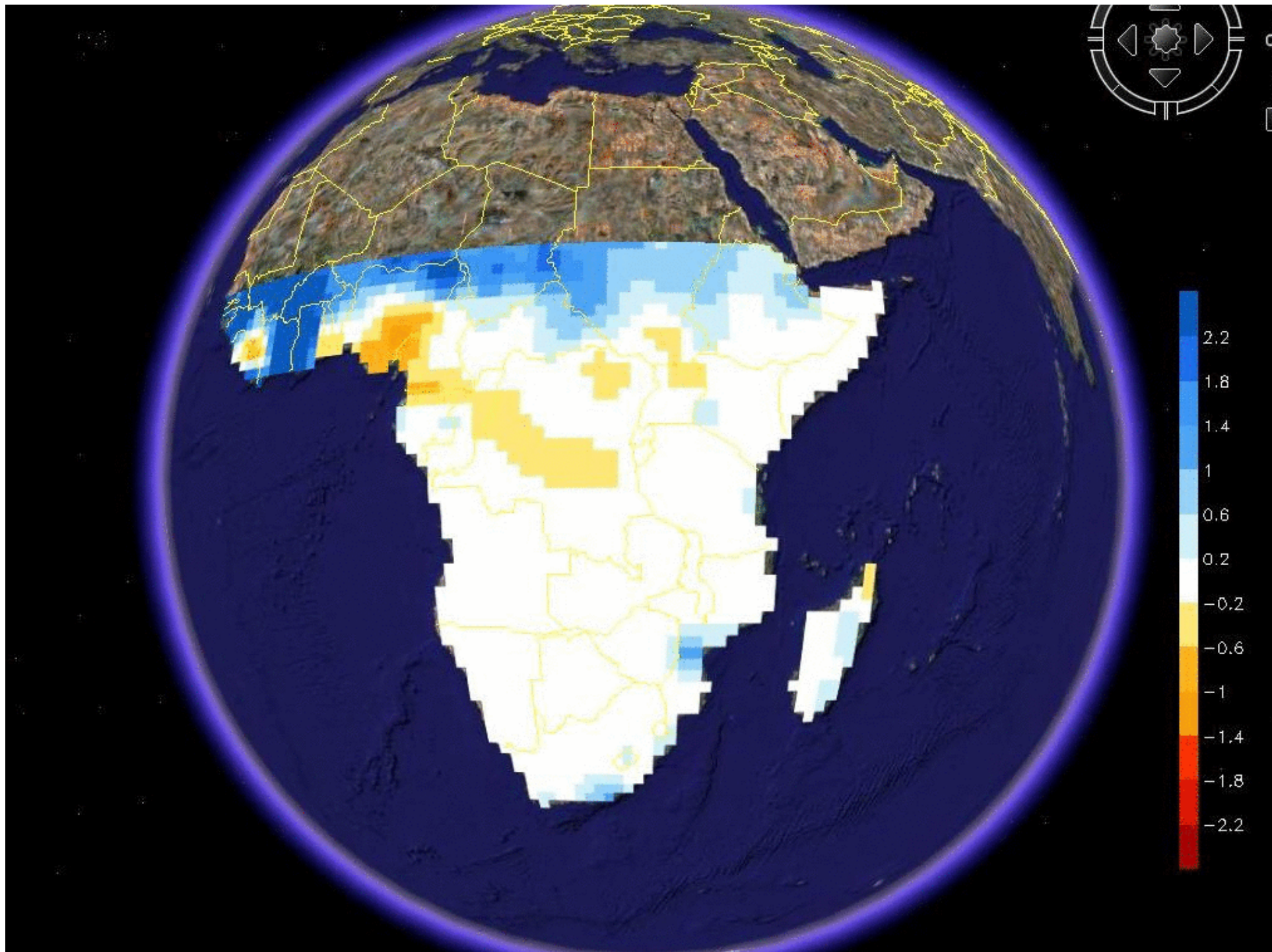
Total Column Soil Moisture (mm) Mean Percentile (Init: 199005)

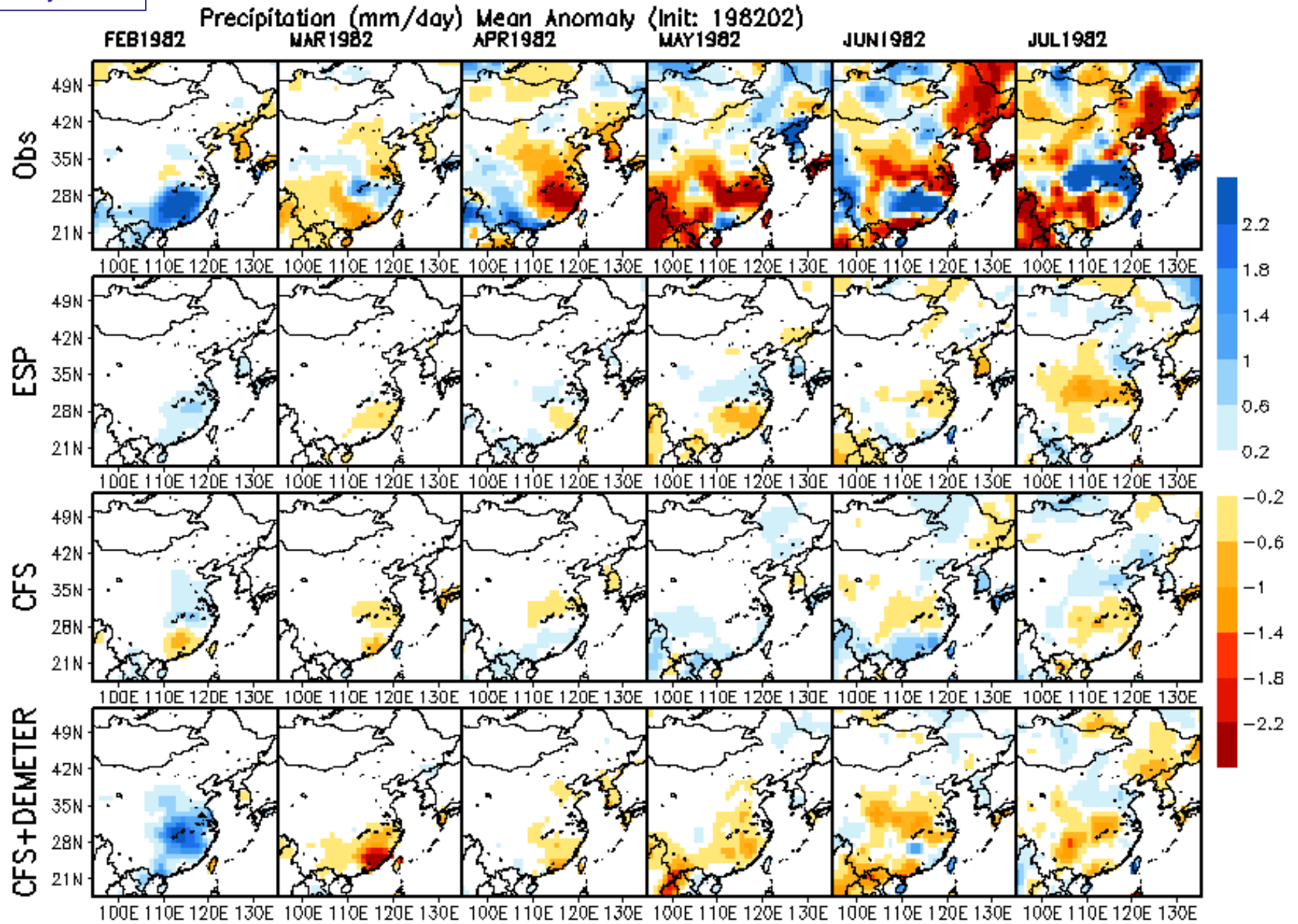


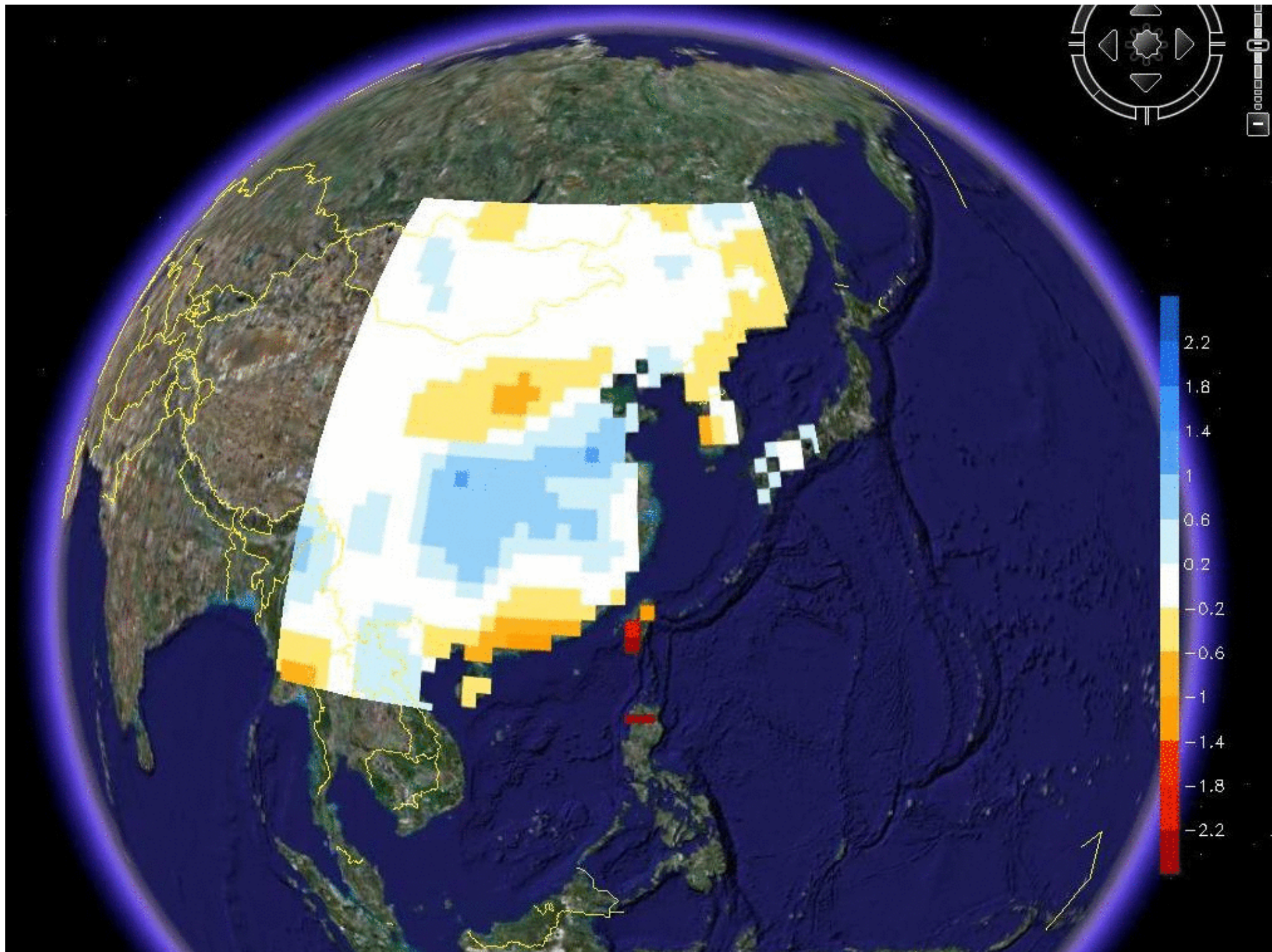


Precipitation (mm/day) Mean Anomaly (Init: 198211)









Realtime Drought Monitoring

Realtime Drought Monitoring (20060928) provided by Land Surface Hydrology Group at Princeton University
More information is available at [here](#)

Real-time assessment of surface hydrologic conditions (soil moisture)



© 2006 Europa Technologies
Image © 2006 NASA
Image © 2006 TerraMetrics

©2006 Google™

45°06'03.81" N 99°38'44.85" W

Streaming ||||| 100%

Eye alt 3625.85 mi

Future HAP Activities

Development of a HAP Science Implementation Plan.

The establishment of a HAP Working Group, finalizing the HAP terms of reference, and writing a science plans needs to be completed over the next 12 months. The science plan should be peer-reviewed.

Seasonal Hydrologic Predictions.

HAP will generate a global (land) hydrologic hindcasts based on NOAA and DEMETER seasonal forecasts. CSEs should identify testbed activities, and groups to evaluate the hydrologic ensemble forecasts. HAP will expand its collaboration with HEPEX.

Estimation of current hydrologic conditions (snow, soil wetness)

HAP will try to work with GLDAS and weather centers to obtain real-time data that will allow for such estimation. GEWEX needs to help to facilitate this.

HAP Linkages

Within GHP

GLDAS can provide input data needed by HAP.

CSEs need to be involved in establishing CSE HAP testbeds, and in testing the HAP forecast products

Within GEWEX

GEWEX Modeling and Prediction Panel (GMPP). Given the modeling focus of HAP, does it fit better in GMPP?

Within WCRP

WCRP Task Force on Seasonal Prediction . Overarching goal of TFSP is “to determine the extent to which seasonal prediction is possible and useful in all regions of the globe with currently available models and data”, which is synergistic with HAP. It is recommended that GEWEX nominate a HAP person to participate on TFSP.

Outside of WCRP

GEOSS HAP would offer products directly relevant to GEOSS.

HEPEX (Hydrologic Ensemble Prediction Experiment. Very synergistic.

UNESCO. HAP needs to get the attention of UNESCO’s IHP.

ESSP. HAP can contribute to Global Water System Project (GWSP)