



# Integrating Water Science and Services



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July 15, 2008

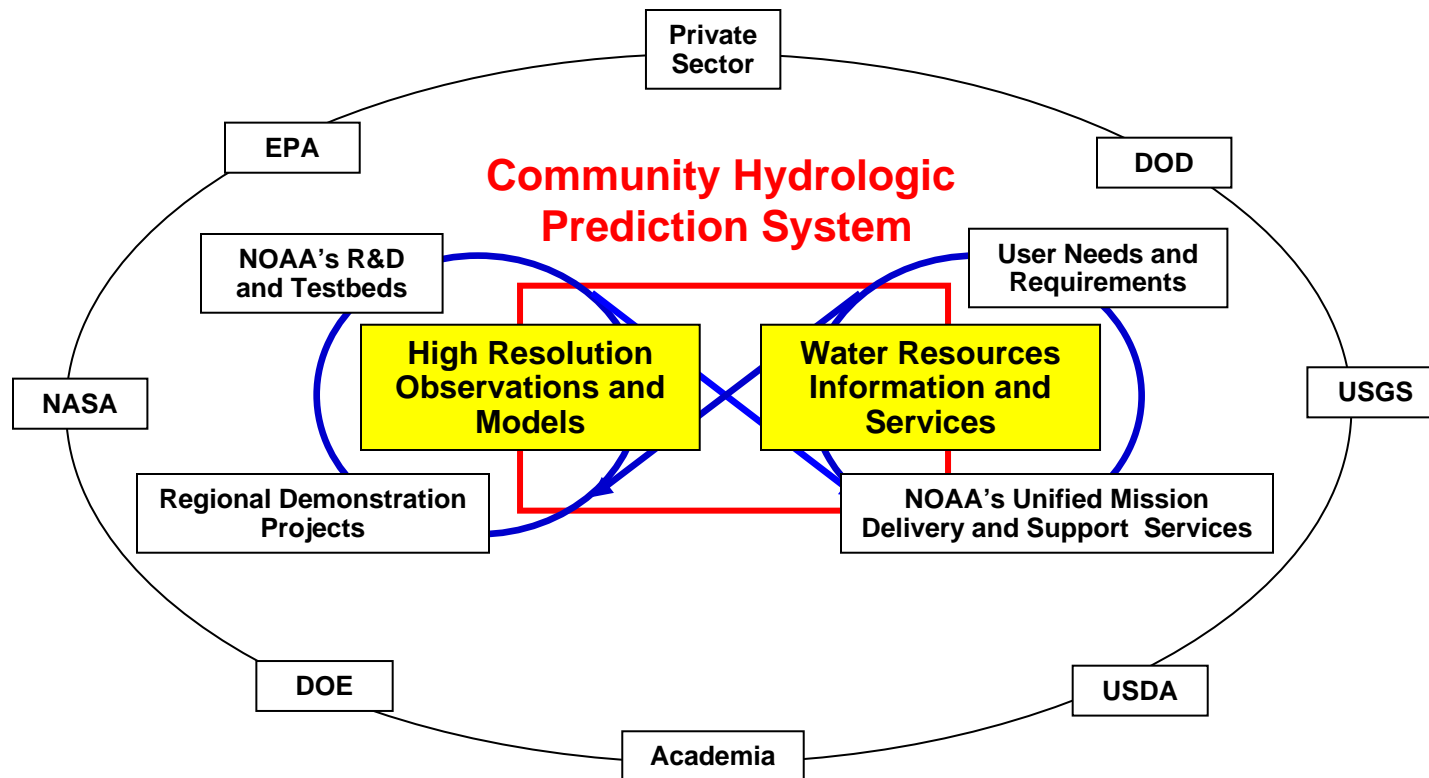




# Advance NOAA Water Forecasting



- **Enable Full Use of Existing and New Observing Systems**
  - Infrastructure and tools to enhance data infusion and assimilation capabilities
- **Accelerate Research-to-Operations**
  - Incorporate models and science developed by partners
  - Deploy integrated (water, climate, ecosystem information) services for time scales of hours to months





# Public Demands



- **Integrated and Expanded Services**
  - “There is a lot of water information on NOAA’s website for those who are willing to dig long enough. That is sometimes frustrating especially when unsure of a technical or industry name for the information being searched.” \*\*
  - “We use the various drought products: drought monitor, soil and Palmer indices, etc., frequently for general information and for reservoir decisions. But it seems that there are different products on different NOAA sites.” \*\*
  - “NOAA should strengthen its performance in coastal management and support an integrated approach to oceans management and reduction of land based pollution.” (2004, U.S. Commission on Ocean Policy)
  - “I wish that the National Weather Service would forecast more rivers and streams across the nation to better suit the needs of individual cities and towns nationwide.” \*\*
  - “Please include additional flood information for Waverly, Iowa.” (NWS web feedback, June 14, 2008)

\*\* (2006, Customer Satisfaction Survey, Hydrologic Services Program)



# Water Resources Challenges



## Issues:

- Precipitation and snowfall patterns are changing
- More wet and dry extremes are expected
- Impacts are exacerbated by population shifts to coasts, highlands, and drylands
- Communities, ecosystems and economies are at risk
- America needs better information to manage risks for the potential water "crises"

## Response:

NOAA is well positioned to play a major role in providing water resource forecasting services to the nation

## Emerging Water Forecasting Concerns:

"The dozens of recent levee collapses along the Mississippi river have prompted calls for stronger protection, but if those levees had held, the water would have risen even higher downstream.

And now there's more of it. Global warming seems to be creating a modest increase in violent downpours, but the real problem is the transformation of Midwestern wetlands into farmland and asphalt. Farmers have sucked their fields dry with millions of miles of tile drains, which helps explain why the Iowa and Cedar rivers rose so quickly last week." (Time Magazine, June 23, 2008)

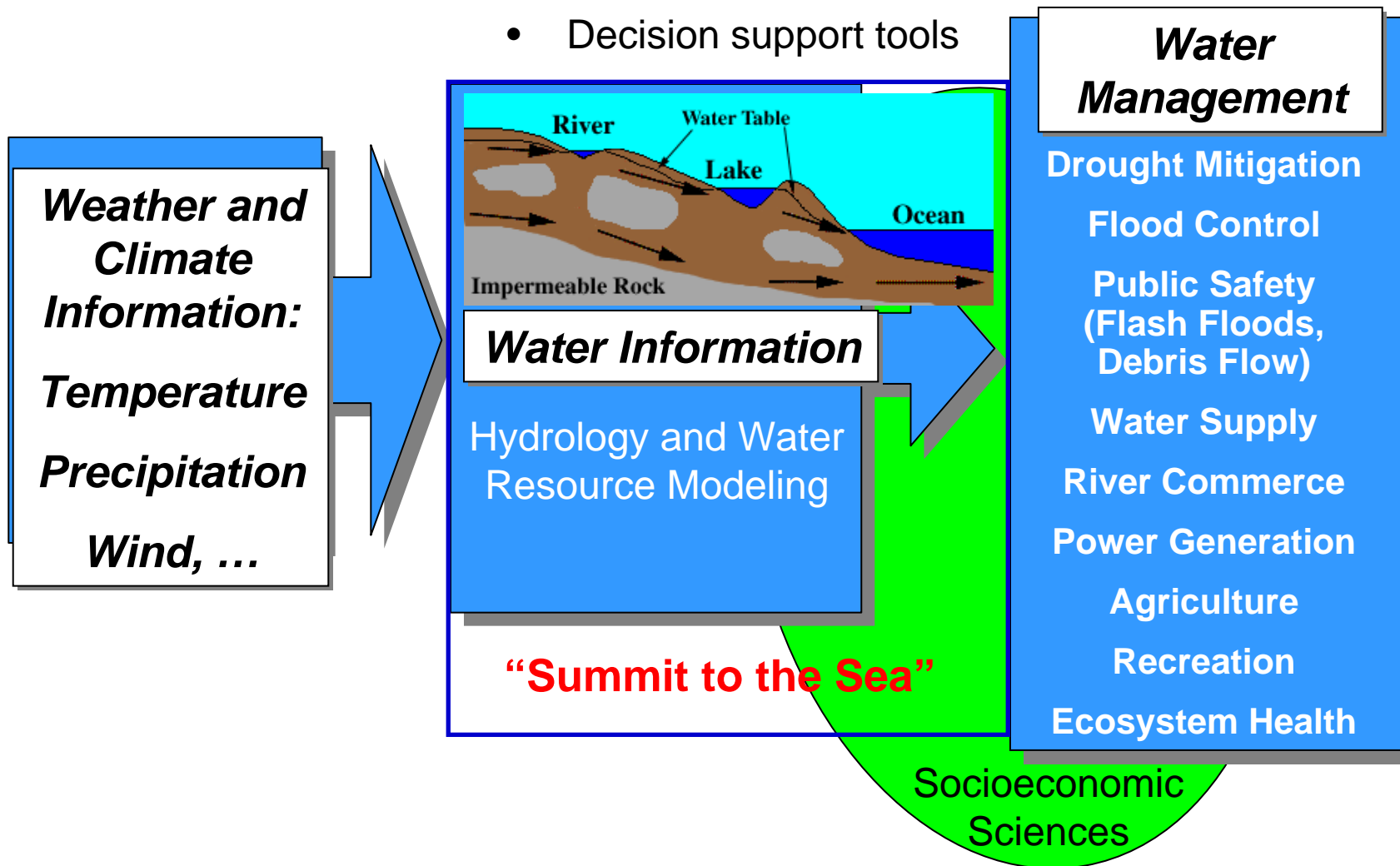




# Objective: More Useful Water Information and Services for Decision Makers



- Higher spatial and temporal resolution
- Comprehensive forecasts for the entire watershed
- Decision support tools





# NOAA Integrated Water Resource Services: FY08/09 Priorities



- Demonstrate Integrated Water Resource Services
  - Deliver and evaluate soil moisture forecasts for Arizona (CBRFC)
  - Facilitate National Integrated Drought Information System Pilots for Upper Colorado (CBRFC, MBRFC) and Southeast (SERFC, LMRFC) River Basins
- Complete Planning for Critical Projects
  - Coastal/Estuary/River Informational System for the Southeast (FY10/11 implementation) - (SERFC)
  - HydroMet Testbed East (FY10/11 implementation) - (SERFC)
- Advance Water Quality Projects
  - Support Great Lakes Beach and Water Quality forecasting prototype (NCRFC, OHRFC)
  - Support Delaware River Basin and Estuary water quality monitoring activities (MARFC)



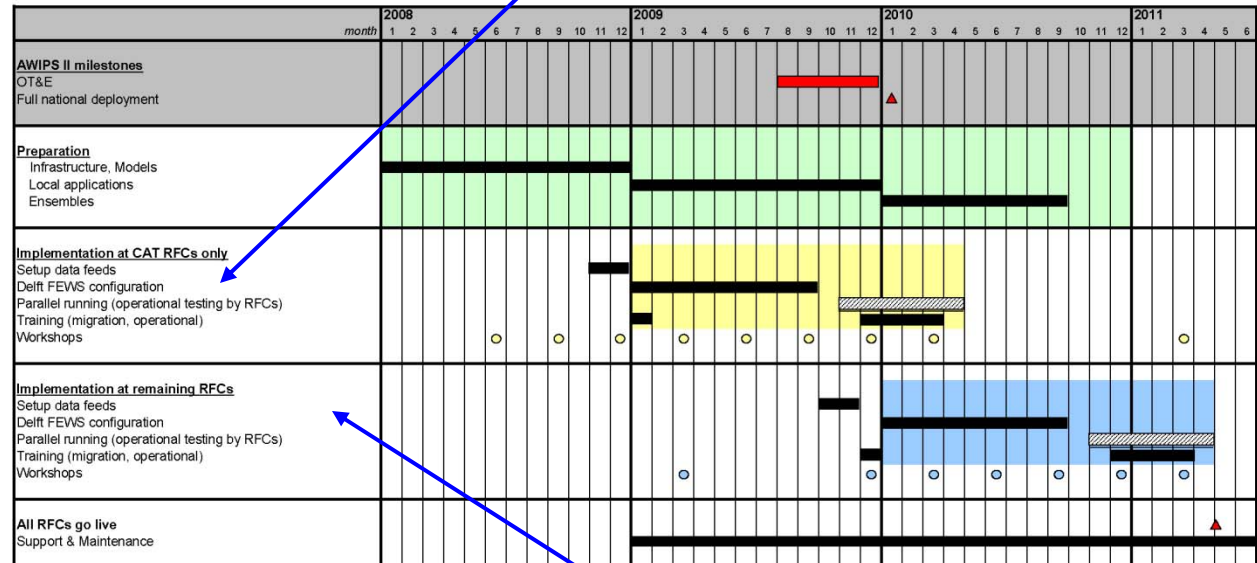
# CHPS Evolution Strategy

**CHPS Acceleration Team (CAT):  
leading the charge!**

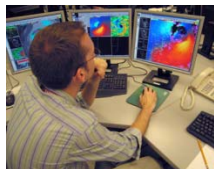
- **ABRFC**
- **CNRFC**
- **NERFC**
- **NWRFC**

**Deployment Phase 1:**

CAT RFCs only  
Reduce the risk for all RFCs



**Multiple levels of training:**



- Configuration
- System administration/ troubleshooting
- Operational forecasting

**Deployment Phase 2:**

Remaining RFCs  
CATs mentor other RFCs

- NWS access to *USACE* hydrology models
  - **Reservoir Simulation** model in use at Sacramento RFC as of November 2007
  - **River Analysis System** hydraulic model into CHPS now underway
- CHPS integration into AWIPS II
  - Integration points defined by *Raytheon*



# Filling in the Pieces of the Hydrologic Puzzle



## Observations

- Observed, Forecast Precipitation
- Temperature
- Evapotranspiration

## Verification

- Point Info
- Watershed Info
- Uncertainty

## Infrastructure

- Research to Operations
- Data Exchange
- Community Modeling

## Hydro Data Assimilation

## Ensembles

## Flash Floods

- Flash Flood Guidance
- Threshold Frequency

## Hydrologic Models

- Soil Moisture Accounting
- Tidal and other Hydraulic Impacts
- Snowpack
- Land-Surface Interaction

