

TOO MUCH  
TOO LITTLE  
TOO LITTLE  
POOR QUALITY



# The Integrated Water Resources Science and Services Framework: A New Interagency Program

Collaborative Science, Services And Tools To Support Integrated And Adaptive Water Resources Management

**Rob Hartman**

California-Nevada River Forecast Center  
NOAA National Weather Service

**Adaptation Strategies and Information Needs in Response to Extreme Events Workshop**

**13–14 March 2012**

# GROWING WATER CHALLENGES

A Triple Threat



# GROWING WATER CHALLENGES

## *Stationarity is dead*

The Past is No Longer A Prologue

Uncertainty due to climate change impacts:

- ✓ Water Supplies
- ✓ Water Management Systems
- ✓ Water Rights and Agreements
- ✓ Water Forecast Models
- ✓ Decision Support Systems
- ✓ Adaptation Decisions



# IWRSS: A NEW BUSINESS MODEL

- Consortium of Federal agencies with roles in water resources
- Initially NOAA, USGS, and USACE; will expand in future
- MOU signed by Dr. J. Lubchenco, Dr. M. McNutt, T. (Rock) Salt, May 2011
- Multi-agency framework to:
  1. Integrate services and service delivery, including river and flood forecasts, by:
    - Improving system interoperability and data synchronization
    - Standardizing data
    - Developing collaborative tools
  2. Provide new geospatial water resources information products and services to improve Common Operating Picture among partners and stakeholders



# Integrated Water Resources Science and Services

## Five-Point Strategy

### Innovative Federal Consortium

- New business model for interagency collaboration
- Leverage investments
- Common Operating Picture

### In-Region Stakeholder Participation

- Deployment of regional service agents
- Strengthen participatory processes
- Develop social capital
- Regional Pilot Studies

### New Digital Information Products

- Summit to Sea
- Floods to Droughts
- Past, Present and Future

### Single Portal for Water Information

- One-stop shopping
- Federal Toolbox for forecasts, data, maps, policies, programs

### National Water Center

- New bricks and mortar facility
- Synthesis and Integration
- Multi-agency staffing



# IWRSS ROADMAP

*A new business model for interagency collaboration in the information age*



Partner and co-invest to solve large problems

Leverage multi-disciplinary skills to formulate effective solutions

Enable cross-agency teams to be able to solve problems holistically

Develop Common Operating Picture through system interoperability, standardized data, and collaborative tools

Engage in regional pilot studies to engage key stakeholders; test and refine IWRSS systems, products and services

## Integrated Water Resources Science and Services (IWRSS)

*An Integrated and Adaptive Roadmap for Operational Implementation*

Don Cline, NOAA (Compilation)  
IWRSS Workshop Participants (NOAA, USACE, USGS)  
Cross-cutting Theme Teams for Human Dimensions and Technical Information Services  
Regional Case Study Contributors

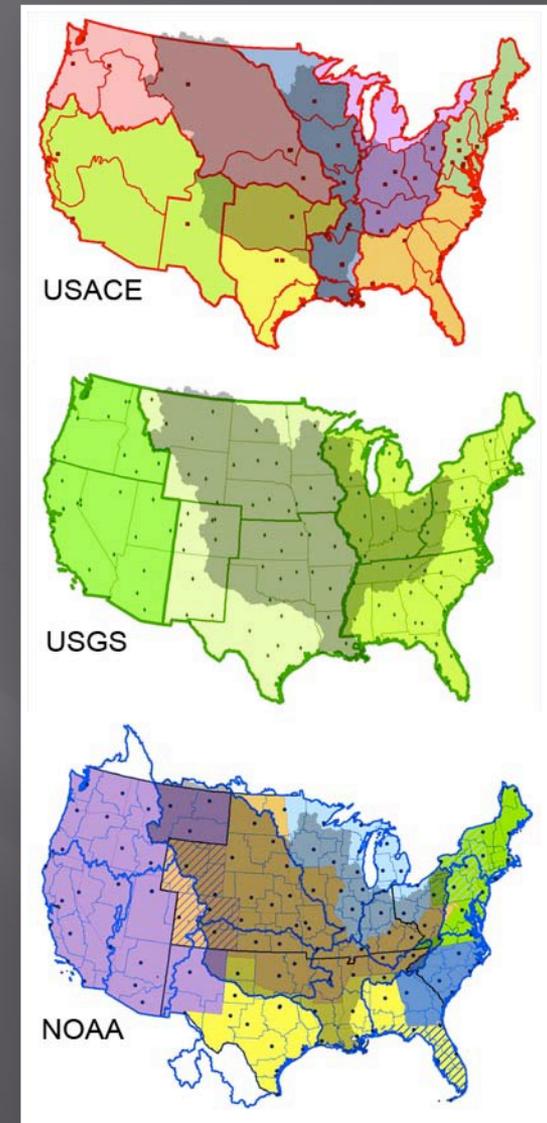


DRAFT v1.1  
February, 2009

# Additional Material

# GROWING WATER CHALLENGES

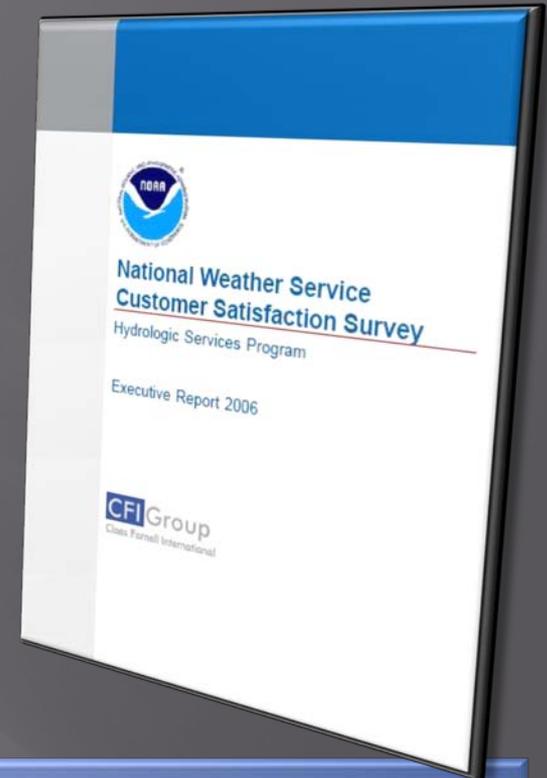
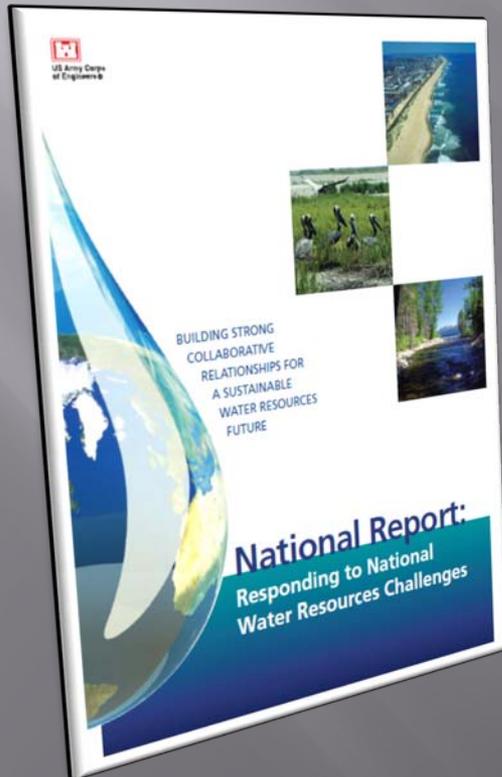
- ✓ 24 Federal Agencies have a role in fresh water
- ✓ Water resources activities are primarily independent
- ✓ Flood operations coordinated through USACE District Offices, USGS Science Centers, and NOAA/NWS River Forecast Centers
- ✓ Unique, non-standard exchange mechanisms for critical data (email, phone and web are common)
- ✓ Limited leveraging of R&D investments or sharing of technology, modeling capabilities, and expertise
- ✓ Research to operations activities are often time and labor intensive
- ✓ Unlike the **Weather Enterprise**, there is no national support center for water data and information synthesis, integration, collaboration and coordination across organizational and geographic boundaries



# STAKEHOLDER NEEDS

## Decision-makers in water management sectors say they need:

- ✓ Expanded/new high resolution water information in space and time to inform decisions
- ✓ Simplified access to better integrated information
- ✓ Quantification of uncertainty to manage risk
- ✓ Enhanced communication of flood risk using flood forecast maps



## NWS completed extensive outreach to objectively define, validate and prioritize stakeholder needs

### Partnered with Claes Fornell International (CFI) Group and David Ford Consulting Engineers

*surveyed users of NOAA's hydrologic information via the American Customer Satisfaction Index (2002, 2004, 2006, 2008, 2011)*

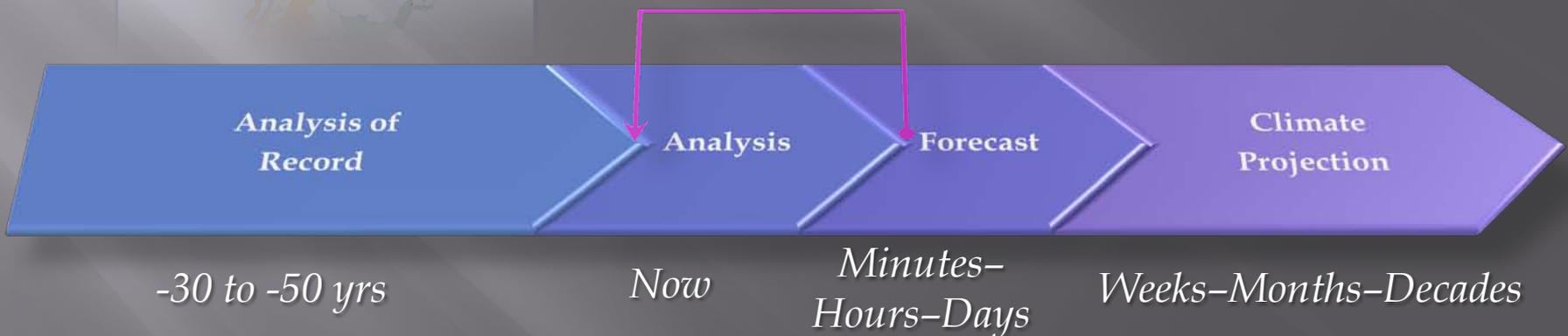
*carried out national surveys and targeted user forums with emergency managers, private sector, media, and water resources managers*

## USACE conducted National Needs Assessment for all 50 States

# IWRSS SCOPE



Provide summit to sea, high-resolution (initial goal: half hour; half km) gridded water resource information for the **United States & North America** and globally (at lower resolution); derived from observations and model output



# NATIONAL WATER CENTER



- NOAA is constructing the IWRSS National Water Center (NWC) at the University of Alabama, Tuscaloosa.
  - 60,000 SF facility (full occupancy = 200)
  - groundbreaking was February 21, 2012
  - completion in Summer 2013
- Key Components & Capabilities
  - operations center for water analysis, forecasting and decision support
  - applied water resources research and development center
  - geo-intelligence laboratory
  - distance-learning center
  - Joint agency coordination and collaboration; common operating picture
  - multi-agency interoperability



National Water Center  
Grand Opening  
~16 Months



Initial Operating  
Capability (IOC)  
2.5 years



Baseline Operating  
Capability  
5 Years



Full Operating  
Capability  
10 Years

# IWRSS CROSS-CUTTING THEMES

## Human Dimensions



- Stakeholder Interactions and Communications

Establishing and maintaining a strong participatory process for IWRSS, and building the social capital necessary for success.

## Technical



- Information Services

Implementing sound IT engineering practices to promote the coordination, integration and facilitation of interagency activities to pursue common goals.

## Operational Science



- Summit-to-Sea Modeling and Prediction Framework

Developing physical and social science aspects of a well-integrated national water resources information system that is responsive to the needs of stakeholders.