Emergent Needs from Water Operators

"What will NOAA's Future Hydrologic Models Consist of ?"

"How will They be Developed under IWRSS ?"

USACE has productive relationships with several RFCs

-- We want to continue these

-- ***Good for NOAA / Good for USACE / Good for stakeholders***

USACE also does its own H&H modeling and forecasting to account correctly for water control features on managed waterways : important for getting to discharge from forecast precipitation and stage

-- These will continue, too

And the ***NOAA + USGS + USACE MOU (May 2011)*** that governs development of IWRSS also specifies development of the larger ***Federal Support ToolBox for Integrated Water Resource Management*** initiative

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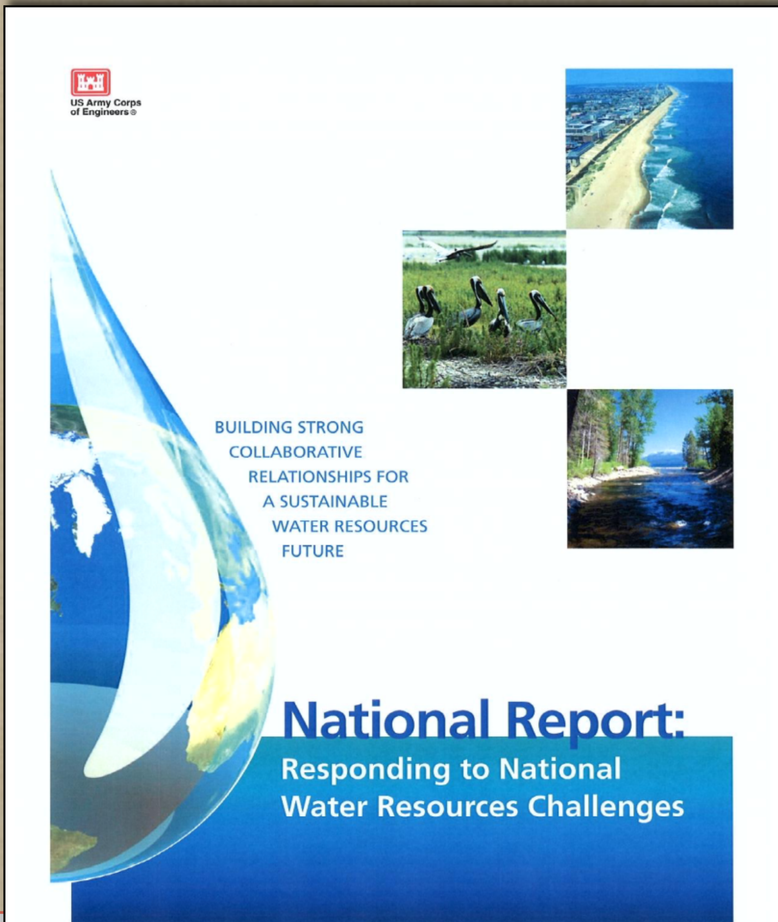
Emergent Needs from Water Operators *(cont'd)*

"What will NOAA's Future Hydrologic Models Consist of ?"

"How will They be Developed under IWRSS ?"



meeting 2008; report 2010; MOU 2011

MOU signed in 2011 for "Collaborative Science, Services, & Tools for Integrated & Adaptive Water Resources Management" -- NOAA + USGS + USACE signatories now; more to join

-- Develop the Federal Support ToolBox for IWRM & IWRSS to help prototype new developments

-- Charters & communication strategy are under development (some completed)

-- First focus is on data interop & common structures for data warehousing & transfer

-- *Neither the ToolBox nor IWRSS creates a national water agency*

Emergent Needs from Water Operators *(cont'd)*

"What will NOAA's Future Hydrologic Models Consist of ?"

"How will They be Developed under IWRSS ?"

"This Memorandum of Understanding is a commitment by our agencies to work together and closely coordinate our efforts in water management to provide the nation with critically needed water resources information and support for better and smarter water planning and management." Rock Salt (for Joellen Darcy), US Army Civil Works

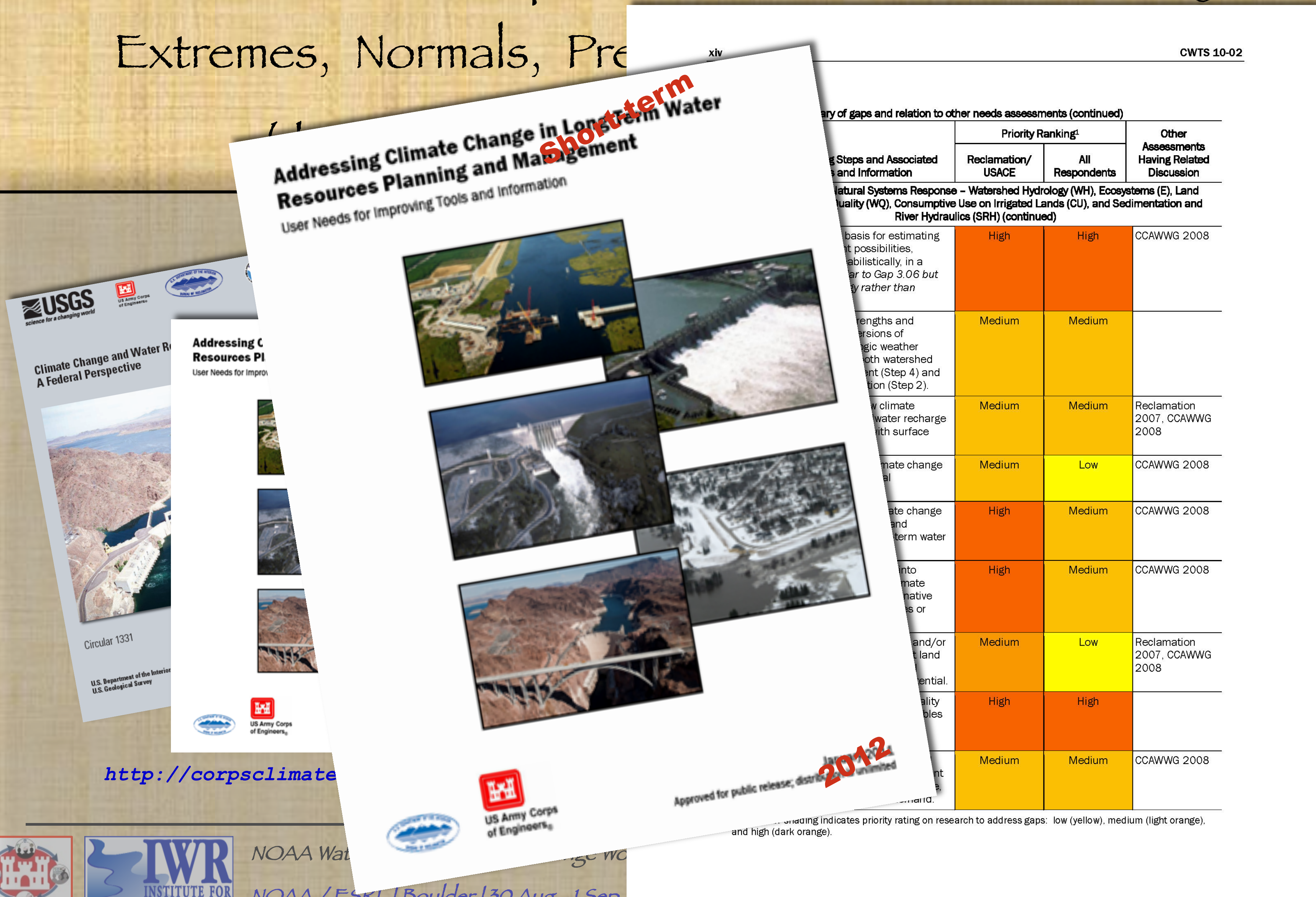
"This initiative will leverage each agency's expertise to improve water resource forecasts and facilitate informed decisions, all utilizing the best available science. This marks a step forward in providing tailored, easily accessible and usable water information services to the people who need it." Jane Lubchenco, NOAA

"This partnership is a great example of how forward-thinking government agencies can enhance their complementary resources while providing great service to the nation on issues of critical importance. We built upon a successful collaboration developed during times of extreme events, and we are extending it to a stronger, enduring relationship through the MOU." Marcia McNutt, USGS

Emergent Needs from Water Operators *(cont'd)*

"What Scientific Inputs are Needed on Water Cycle

Extremes, Normals, Pre



http://corpsclimate

Emergent Needs from Water Operators *(cont'd)*

Science to Engineering Decision Tier *(sea-level example :Heidi Moritz, USACE-NWD)*

Strategic and Tiered Decision-Making Based on Potential Risk of Sea Level Change

Establish strategic decision context

Is this a small or large project? Existing or new project?
What are the business line and mission areas impacted? How might these change under the high SLC curve?
Are there system or cumulative effects possible?
Is there potential for negative or maladaption impacts?
What is the potential for significant or catastrophic consequences? (life safety, property, critical infrastructure, ecosystems)
Does the project encourage public and private investment that will influence future risk?
Who should be involved in the evaluation of input and potential impacts?

Small project, no significant or system consequences.

Large project, significant or system consequences.

Strategic development investments, (e.g. major port expansion or flood risk reduction system upgrades), shapes future long term community development.

First Decision and Review Point
- Who should be involved?
- How much analysis time is required?
- What is the expected level of effort?

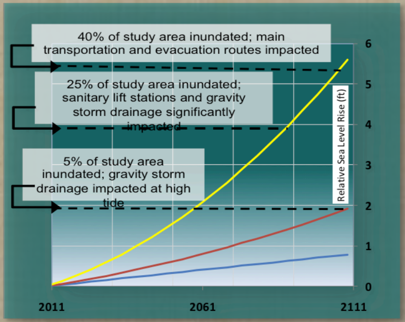
Final Decision and Review Point

Tier 1: Project Area Vulnerability to SLC

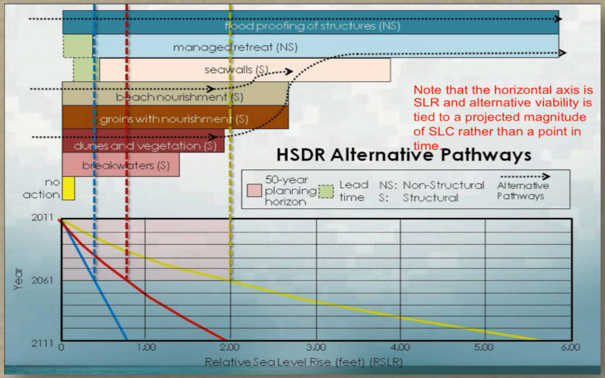
Planning Steps 1 and 2

Identify problems and opportunities
Inventory and forecast conditions

Using high SLC curve, define future affected area and conditions which impact project.
Establish impacted area for 3 epochs (20, 50, 100 years).
When in the planning horizon are impacts expected to be realized?
Bracket SLC within overall loading parameters.
Assess coastal vulnerability index (CVI).
Identify to what extent decisions made now preclude or define future actions.
Using inventory and forecast methods to summarize critical infrastructure, weak links, thresholds.



Coastal Vulnerability Index (CVI) is a function of 6 input parameters: geomorphology, coastal slope, relative SLC, shoreline erosion/accretion, mean tide range, and mean wave height. (USGS, 2000)



Intermediate Decision and Review Point Using Results from Project Area Vulnerability Assessment

Small project area, SLC provides relatively small contribution within overall loading, CVI is low, robust thresholds, minimal critical infrastructure

Qualitative SLC analysis; limited quantitative analysis

Large project area, SLC provides significant contribution to overall loading, CVI is high, weak thresholds, significant critical infrastructure

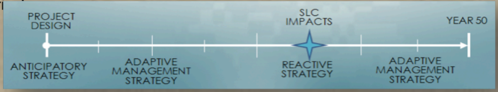
Significant quantitative SLC analysis required
Given the potential SLC, is protection or retreat likely to be a more viable and sustainable option?

Tier 2: Alternative Development Considering SLC

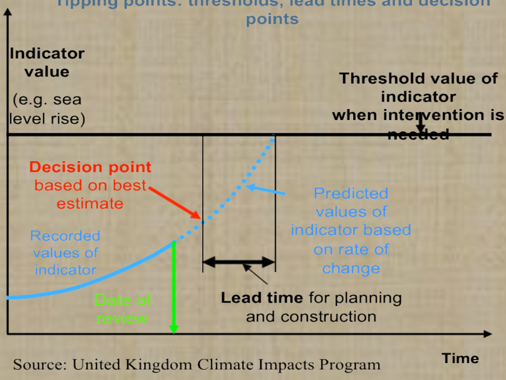
Planning Steps 3 and 4 — Formulate and Evaluate Alternatives

Develop measures to address Problems & Opportunities with consideration of project area vulnerability to SLC.
Evaluate measure adaptability to SLC.
- Develop qualitative and quantitative performance metrics.
- Evaluate frequency impacts from SLC. Are impacts extreme event driven or overall process driven?
- Define measure stability and performance mode sensitivity to SLC.
- Assess how inundation, erosion, wave attack may change with SLC.

Combine measures into alternatives that are resilient to SLC over the planning horizon.
Implementation strategies range between anticipatory, reactive, adaptive, and combinations of the three.
Establish start and finish points at which alternatives remain viable and determine if alternatives are adaptable at the end of the planning period.



Tipping points: thresholds, lead times and decision points



Source: United Kingdom Climate Impacts Program

Tier 3: Alternative Selection Considering SLC

Planning Steps 5 and 6 — Compare Alternatives and Make a Recommendation

Reassess adequacy of measures to address problems and opportunities and planning objectives.
Are residual risks manageable and does a plan exist to manage them?
Is the strategy sustainable? Are resources available for the system to remain viable?
How do the alternatives compare given the defined performance metrics?
What can go wrong, how can it happen, what are the consequences, how likely is it?
Does implementation of this strategy preclude future decisions or opportunities?

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photo courtesy: Keith Dixon, NOAA GFDL

Thanks for your invitation & interest

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