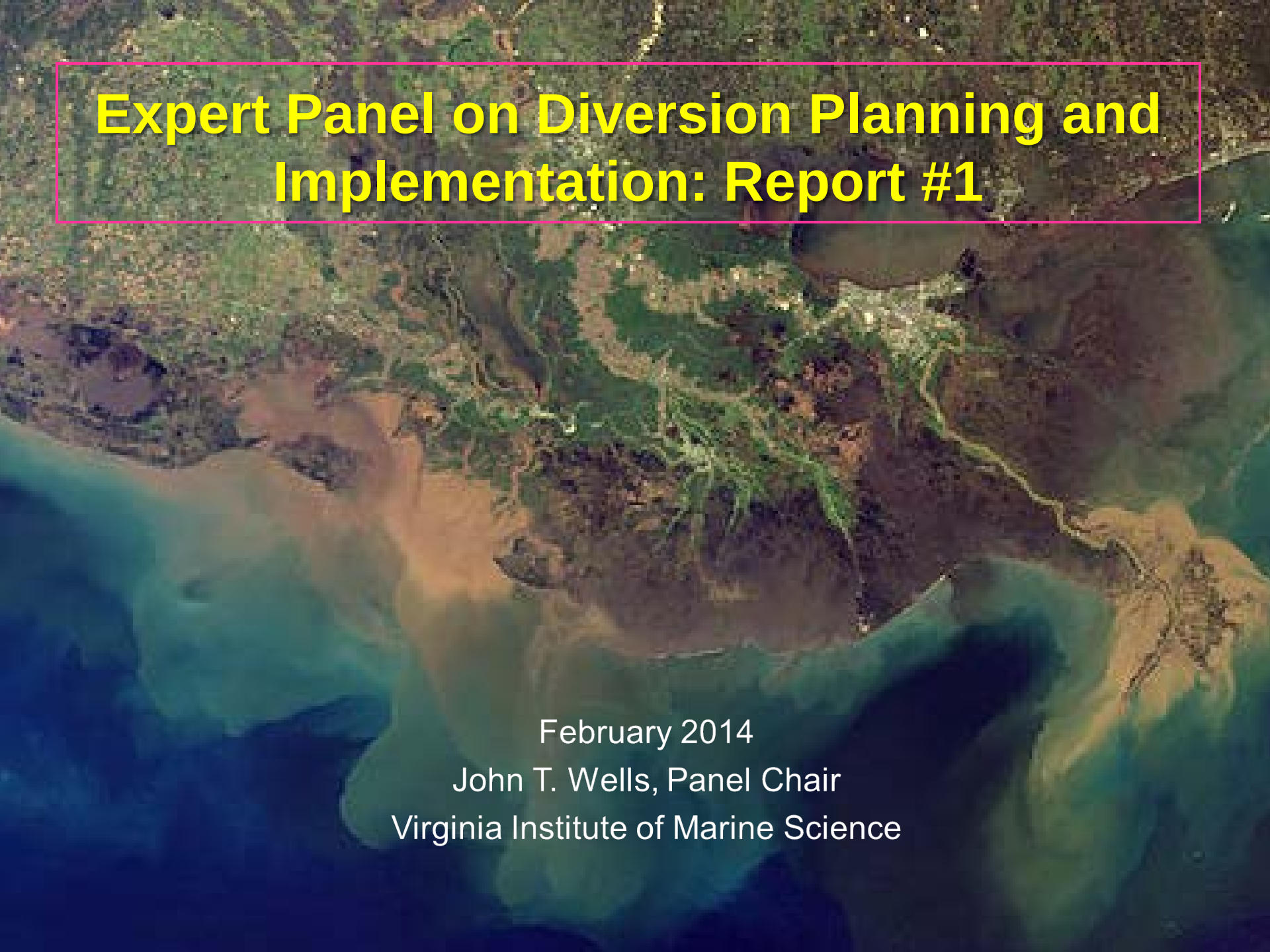
Expert Panel on Diversion Planning and Implementation: Report #1



February 2014

John T. Wells, Panel Chair
Virginia Institute of Marine Science

Expert Panel on Diversion Planning and Implementation: Background

- Formed to provide technical advice on planning and implementation of freshwater and sediment diversion projects
- Nominations solicited in August 2013; more than 60 experts nominated
- Selections made by The Water Institute
- Expertise encompasses the natural and social sciences as well as engineering
- Experience with Mississippi River and Louisiana restoration (or other large restoration projects)
- Expected to meet up to three times per year over next three years

Expert Panel Members

- Loretta Battaglia, - Southern Illinois University Carbondale
- Phil Berke - Texas A&M University
- Jim Boyd - Resources for the Future
- Linda Deegan - Marine Biological Laboratory
- Bill Espey - RPS Espey Inc.
- Liviu Giosan - Woods Hole Oceanographic Institution
- Will Graf - University of South Carolina (emeritus)
- Matt Kirwan - Virginia Institute of Marine Science
- Tom Minello - NOAA Southeast Fisheries Science Center
- Martha Sutula - S. California Coastal Water Research Project
- John Teal - Woods Hole Oceanographic Institution (emeritus)
- John Wells - Virginia Institute of Marine Science (CHAIR)

Frequently Asked Questions

- **Why are there no Panel members from Louisiana?**
  - Experts from Louisiana are in fact currently engaged and leading much of the work
  - The Panel was established to review and advise the CPRA and the teams that are engaged in these efforts
- **What authority does the Panel have?**
  - We are not a decision-making panel
  - We will provide expert advice and recommendations for consideration
- **Is the Panel reviewing the decisions made in the Master Plan?**
  - No, the Panel is advising on science and research needs related to advancing and further developing/designing sediment diversion projects that were in the 2012 Comprehensive Master Plan

Summary of Meeting #1

- Panel meeting was held January 8th-9th, 2014 at State Capitol Welcome Center (Baton Rouge)
- Context presentations from CPRA, USACE and key stakeholders
- Focus on **uncertainty** and the ways in which scientific and engineering uncertainty could be understood and reduced to the maximum extent possible
- Agency panel discussion
- Public comment period

Meeting #1 Report

Six main themes regarding uncertainty

#1: The Importance of Data

#2: The Absence of Analogs

#3: Uncertainty in Ecological Outcomes

#4: Uncertainty in Social and Economic Outcomes

#5: Design and Operational Uncertainties

#6: Framing Expectations in Light of Uncertainties

Structure of recommendations

- Near-term needs to support planning
- On-going needs to support effective communication
- Project-specific needs tied to pre- or post-construction of individual projects

Broad Takeaway Messages

Uncertainty results from natural environmental variability and imperfect representation in models

There are six specific areas in which diversion uncertainty must be framed and understood (data; analogs; ecological outcomes; economic and social outcomes; design and operations; expectations)

Uncertainty must be explicitly addressed at the planning and design stages of diversions

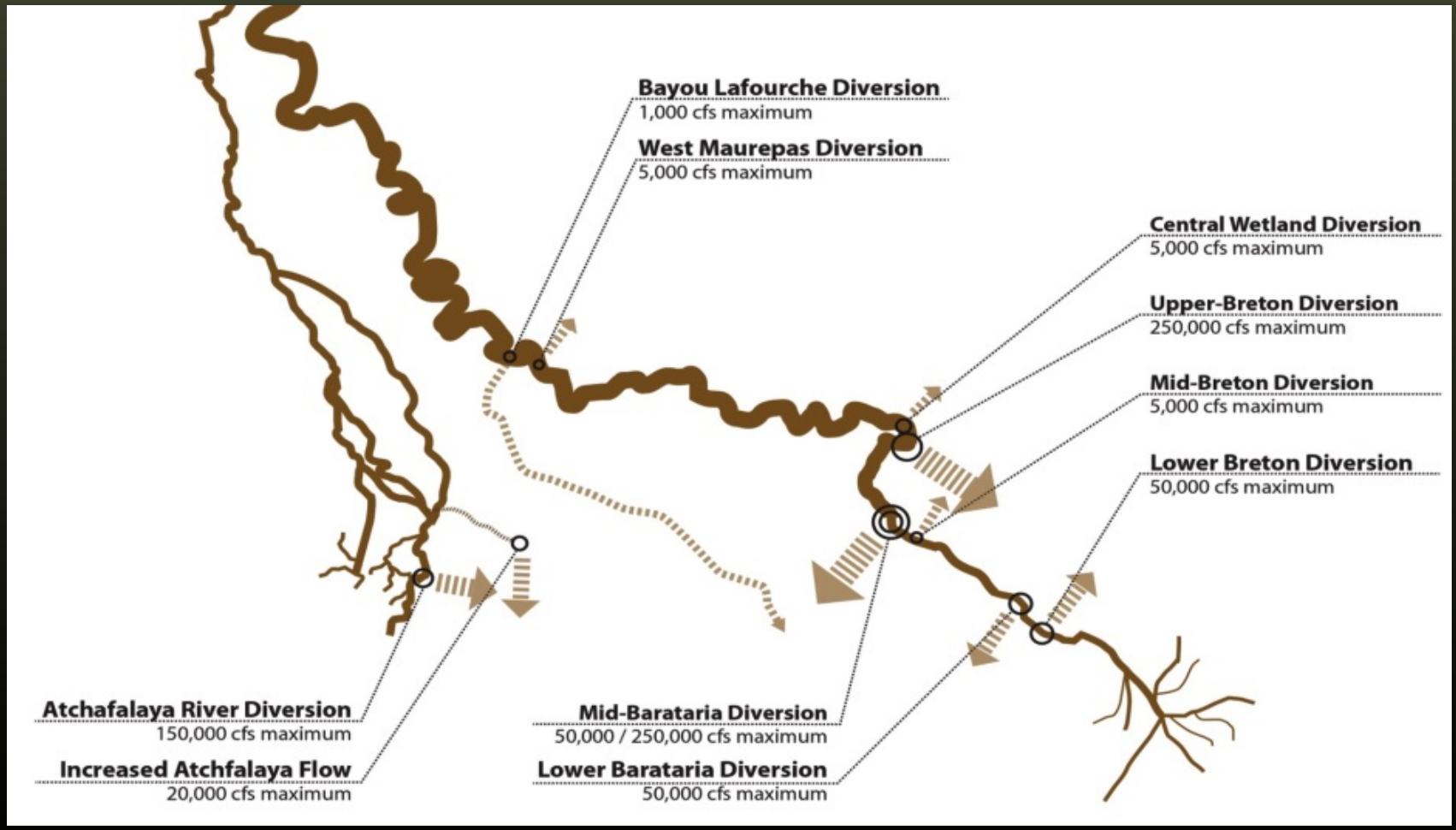
Modeling plant and animal communities presents a considerably greater challenge than modeling the physics, and nonlinear ecological effects should be expected

Biophysical and social outcomes must be linked, and social outcomes cannot be addressed as an afterthought

The Panel recommends that highest priority be given mainly to near-term needs in the areas of understanding and forecasting ecological outcomes, incorporating economic and social assessments, and in effective communications

Recommendations

Report available at www.thewaterinstitute.org



Reducing Uncertainty in Project Outcome: The Importance of Data

- **Project-specific.** Review data requirements for determining project success, assessing environmental impacts, and developing models. Start project data collection at least two years before project construction, and develop recommendations for data collection after construction is complete.

- **On-going.** Establish a centralized internet location for baseline and monitoring data that is accessible to all. The maintenance of such a data warehouse should be considered to be an integral part of the restoration and be fully supported by restoration funds.

Uncertainty due to the Absence of Land-Building Analogs

- **Project-specific.** Choose a diversion site, collect baseline data, develop comprehensive monitoring and research protocols to evaluate project success, inform adaptive management of the diversion, and reduce uncertainty in future diversions.

- **Near-term.** Start broad-based monitoring now to collect physical data for areas that are anticipated diversion sites as well as natural analog (reference) sites. Convene workshops to identify the categories of data needed and how they would be used.

- **Near-term.** Measure past rates of land building and other indicators of landscape and habitat change using sediment core-based proxies and subsurface imaging techniques to reconstruct timescales of natural crevasse delta construction. Model past crevasse delta development to hindcast style and rates of land building. Where data from analog sites cannot be measured or is otherwise insufficient, use expert judgment to define plausible ranges of outcomes.

Uncertainties in Ecological Outcomes

- **Near-term (high priority).** Convene a session at a future Panel meeting to identify specific biophysical variables that should be targeted for monitoring and address questions about the spatial and temporal resolution required in a sampling program, expected power of statistical analyses, and gear efficiency.
- **Near-term (high priority).** Propose the biophysical modeling framework that will be used to analyze scenarios and forecast ecological outcomes. Summarize all ecological models available to examine impacts of diversions and begin development of a variety of new models. Ecosystem models are needed that are spatially articulate and include trophic interactions. A model ensemble approach is recommended and complementarity in model results can provide confidence in conclusions.
- **On-going.** Develop a decision-making framework to complement monitoring efforts specifying how monitoring data will be analyzed and how the results will be used to guide adaptive management decisions.

Uncertainties in Ecological Outcomes (continued)

- **Near-term.** Investigate water driven erosion through numerical modeling of receiving basins with different configurations of intertidal land. Manipulate flooding frequencies and nutrient loads in flooding water in an intermediate scale experiment (~10,000–100,000 m^2) to assess biological and geomorphological impacts.

- **Near-term.** Add simulations of sediment deposition across vegetated marshes to numerical modeling currently being conducted on sediment transport to receiving basins.

- **Near-term (high priority).** Convene a Panel session devoted to water quality including speakers to present what is known and expected. This effort should include contrasting views on nutrient impacts, but be wider in scope than simply the nutrient-marsh stability issue.

Uncertainty in Social and Economic Outcomes: Complex System Interactions

- **Near-term (high priority).** Ensure that diversion assessments (models, data, outcomes, and monitoring) include both biophysical and socioeconomic elements. Incorporate the role of upstream social and economic factors, including other diversions and restoration projects, into diversion project performance assessment.

- **On-going (high priority).** Communicate regularly with affected communities to exchange and incorporate social data into planning and implementation.

- **Near-term (high priority).** Acknowledge the difficulties and uncertainties associated with non-linear biophysical and social outcome relationships. Ideally, diversion modeling—particularly of biotic phenomena—would explicitly incorporate conservation science designed to capture these non-linear effects.

Design and Operational Uncertainties

- **Near-term (high priority).** Account for a range of scenarios that convey uncertainty and realistic expectations of performance. Experts should involve stakeholders and the public in the development of scenarios and decisions regarding the design of diversions.

- **Project-specific.** Report trends in performance of the diversion structures on a regular basis (e.g., annual report card), and communicate these to the public.

- **Project-specific**. Develop real-time coordination and communication systems among organizations with responsibilities to manage and make adjustments in response to varying impacts of diversions.

Framing Expectations in Light of Uncertainties

- **On-going.** Develop a communications plan that links decision framework outcomes to key elements of communication to stakeholders, policymakers, and politicians.

Plans for next meeting

- Meeting #2 will be held April 30th in New Orleans at UNO Lindy Boggs Conference Center
- Field trip planned for Panel prior to meeting
- Agenda topics currently under development
- Materials and comments for consideration by the Panel between or in advance of meetings can be sent to: appliedresearch@thewaterinstitute.org

Questions?

Report of Meeting #1 available at:
www.thewaterinstitute.org

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