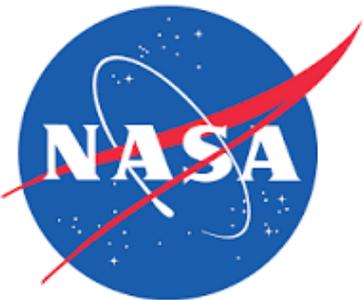


Using Earth Observations to Inform the Valuation of Ecosystem Services that Support Coastal Resilience: Gulf Coast Workshops

Valerie Seidel, Project Director



NASA Biodiversity and Ecological Forecasting Team Meeting, April 24-26, 2018

Objectives

- Identify the ecosystem service valuation methods that work best where stakeholder needs and available Earth Observations overlap
- Contribute to learning among coastal planners and resource managers about how Earth Observations could improve resiliency planning

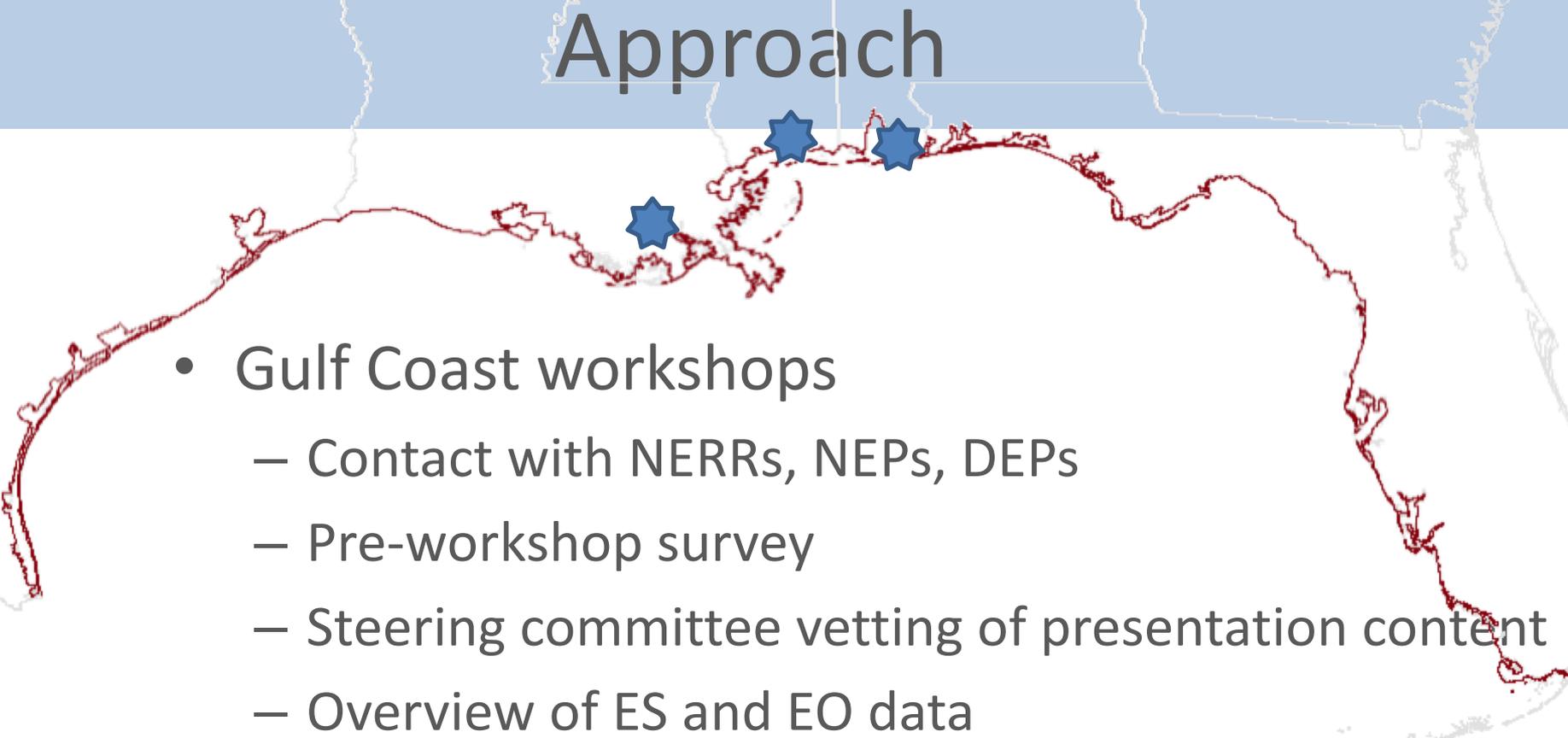
Using Remote Sensing to Quantify Ecosystem Services for Improved Coastal Decision Making

Team

- **Maury Estes** –NASA Earth Science Division project manager
- **Keith Gaddis** –NASA Earth Science Division project manager
- **Valerie Seidel** –Project Director; Principal Economist, The Balmoral Group
- **Dan Dourte** – Co-P.I.; Hydrologist; The Balmoral Group
- **Craig Diamond** – Co-P.I.; Environmental Scientist; The Balmoral Group
- **Christine Shepard** – Director of Science, Gulf of Mexico Program; The Nature Conservancy



Approach

A map of the Gulf Coast of the United States, showing the coastline from Texas to Florida. Three blue stars are placed along the coast, indicating the locations of workshops: one in the Texas region, one in the Louisiana region, and one in the Alabama region.

- Gulf Coast workshops
 - Contact with NERRs, NEPs, DEPs
 - Pre-workshop survey
 - Steering committee vetting of presentation content
 - Overview of ES and EO data
 - Local expert presentation*
 - Discussion of ES and EO challenges
 - Post-workshop surveys

*photos herein from local expert works

Evaluating coastal ecosystem service valuation options

- Generally speaking, coastal ecosystem services have been quantified or valued less frequently than inland or open ocean ecosystems
- Included Co\$ting Nature, InVEST and original models as potential models for workshop content

Graphic: Just Cebrian,
University of South Alabama

Assessing suitability of Earth Observations and derived products to provide the information needed for valuation

- Identified Giovanni, Earthdata as potential tutorial material: importance of understanding/evaluating data before trying to use it for ecosystem service modeling
- Products from MODIS, Landsat, and Sentinel-2 identified for applicability in coastal ecosystem service assessments

Pre-workshop surveys

- Most important ecosystems to participants:

- Salt Marsh
- Barrier Islands
- Oyster Beds
- Freshwater wetlands
- Seagrass

- Most important ecosystem services:

- Flood control
- Erosion Management
- Recreation opportunities
- Food and water supply

Graphic: Grand Bay; Eric Sparks, Mississippi State University

Workshop Prep

- Low levels of EO data literacy
- Only one respondent indicated valuation efforts for Coastal Ecosystem Services
- Most respondents have measured ecosystems
- A few have attempted to measure ecosystem services

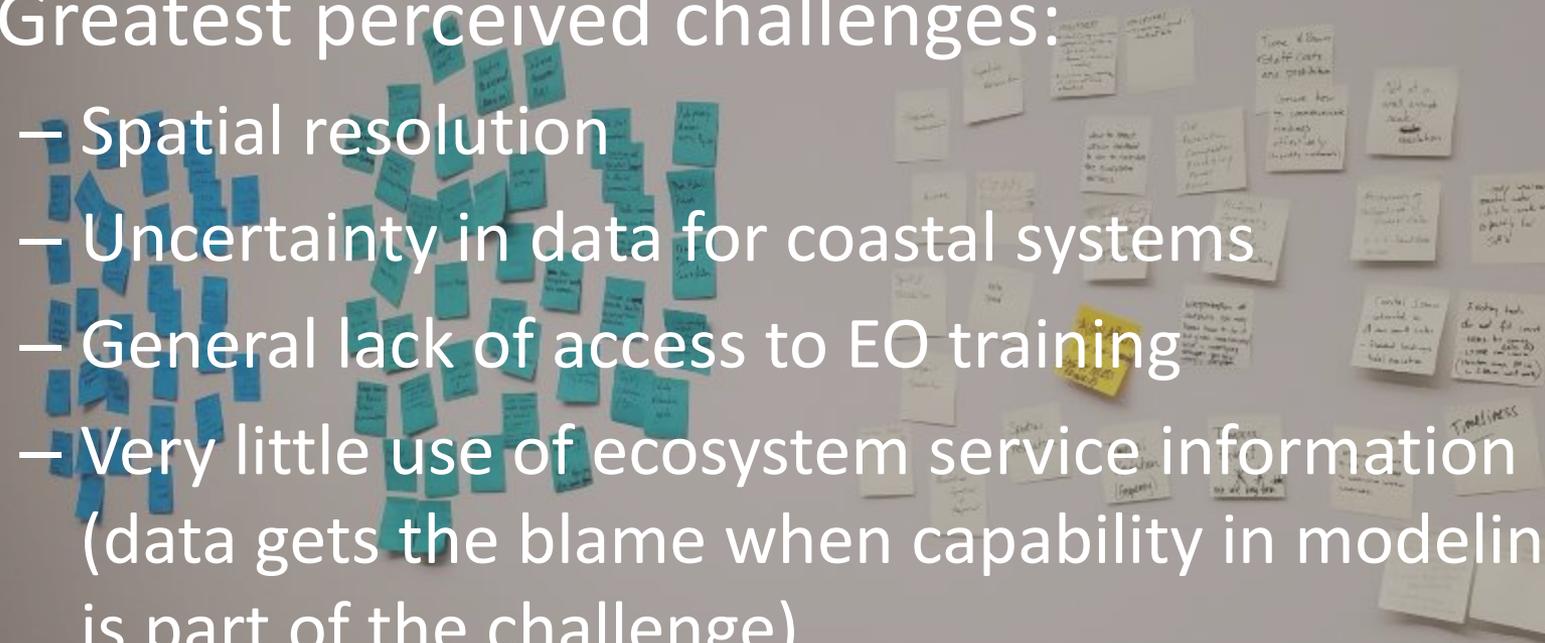
Graphic: Just Cebrian,
University of South Alabama

Workshop Findings

- Workshops completed in MS, AL, LA
- Very different issues in LA than AL, MS
- Local data collection and coastal management efforts include long-term field-collected datasets
- EO data has been used in a few instances for long-term monitoring

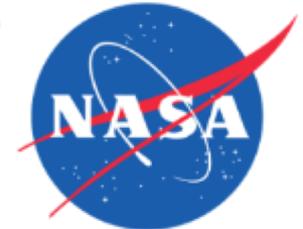


Workshop Findings

- High level of interest in EO
 - Greatest perceived challenges:
 - Spatial resolution
 - Uncertainty in data for coastal systems
 - General lack of access to EO training
 - Very little use of ecosystem service information (data gets the blame when capability in modeling is part of the challenge)
- 

Workshop Findings

Importance of partnerships



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FOR GULF OF MEXICO STUDIES



Workshop Findings

Importance of partnerships

- Learning about the local coastal issues and current state of practice
- Getting the right people in the room



Workshop findings

Gulf Coast workshops

- Many participants are not quantifying ecosystem services, but they are developing capacity to do that: to evaluate project impact, justify funding, prioritize/optimize restoration project locations

Workshop findings: How will you use what you learned?

- Provide insight into what our potential clients may be interested in terms of future services.
 - **Habitat characterization and assessment**
- All of our restoration projects list improved ecosystem services as a desired outcome- this symposium showed where to get the information to back up these goals with real numbers
 - **Introduction of tools unknown to me will help me rapidly produce information for elected officials**
- I will inform planners and natural resource managers about the available data.
 - **See if it's worth my effort & time investment to learn how to use one a tool like InVEST to help the park link resource management actions to ecosystem service consequences in a quantifiable manner**
- Present this information in the project proposals geared towards application of the end products towards planning and decision making
 - **Continue to investigate data available and push for better models/data products related to my work**
- Use to provide info about positive impacts of restoring floodplain forests on the northshore, evaluate which permits to comment on (404, 10, Coastal Use Permits, WQC, ect...)

Next steps

- Workshops upcoming in Texas (Corpus Christi) and Florida (Sarasota)
- Development of follow-up webinar to provide additional training based on recommendations from participants
- Development of white paper to describe how to continue to advance the use of Earth Observations in quantifying coastal ecosystem services (what's needed; how to meet that need)

Graphic: Just Cebrian,
University of South Alabama -
Heron Bay

Questions

- Thank you!



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