EESLR-NGOM PROJECT: GETTING ACCESS

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MBNEP PIC Meeting – 5 Rivers Delta Resource Center

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Overview

- Background: What is EESLR -NGOM?
- Potential outputs: What will be available
- Feedback: Getting access faster and better

Ecological Effects of Sea Level Rise in the NGOM

Lead PI: Scott Hagen, LSU

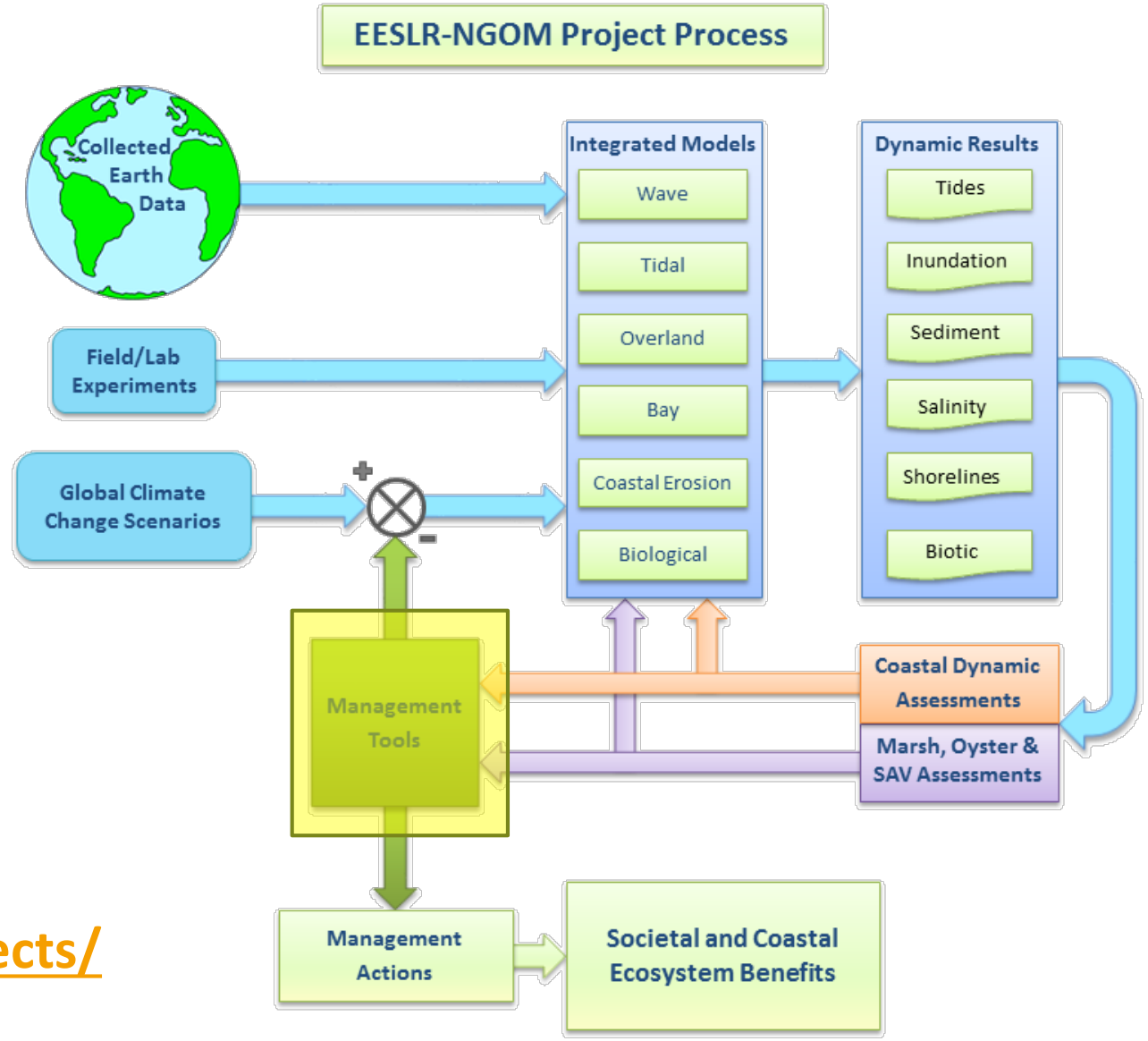
Ecological Effects of Sea Level Rise in the NGOM

- NOAA funded 5 year project
- Application focused
- Intertidal marshes, oyster, & SAV habitats
- Field & laboratory experiments
- Circulation modeling
  - Tidal hydrodynamics
  - Waves
  - Hurricane storm surge
- Flow & transport modeling from watershed to sea
  - Salinity
  - Sediment

A system of systems approach to changing climate & sea level rise

Scott Hagen & Team: Five relevant publications

1. Dynamics of sea level rise and coastal flooding on a changing landscape, http://dx.doi.org/10.1002/2013GL058759
2. The dynamic effects of sea level rise on low-gradient coastal landscapes: a review, http://dx.doi.org/10.1002/2015EF000298
3. A coupled, two-dimensional hydrodynamic-marsh model with biological feedback, http://dx.doi.org/10.1016/j.ecolmodel.2016.01.013
4. Synthetic storms contributing to coastal flooding in Florida's Big Bend region with application to sea level rise impact, http://dx.doi.org/10.3319/TAO.2012.04.17.01(WMH)
5. Dynamic simulation and numerical analysis of hurricane storm surge under SLR with geomorphologic changes along the northern Gulf, http://dx.doi.org/10.1002/2015EF000347



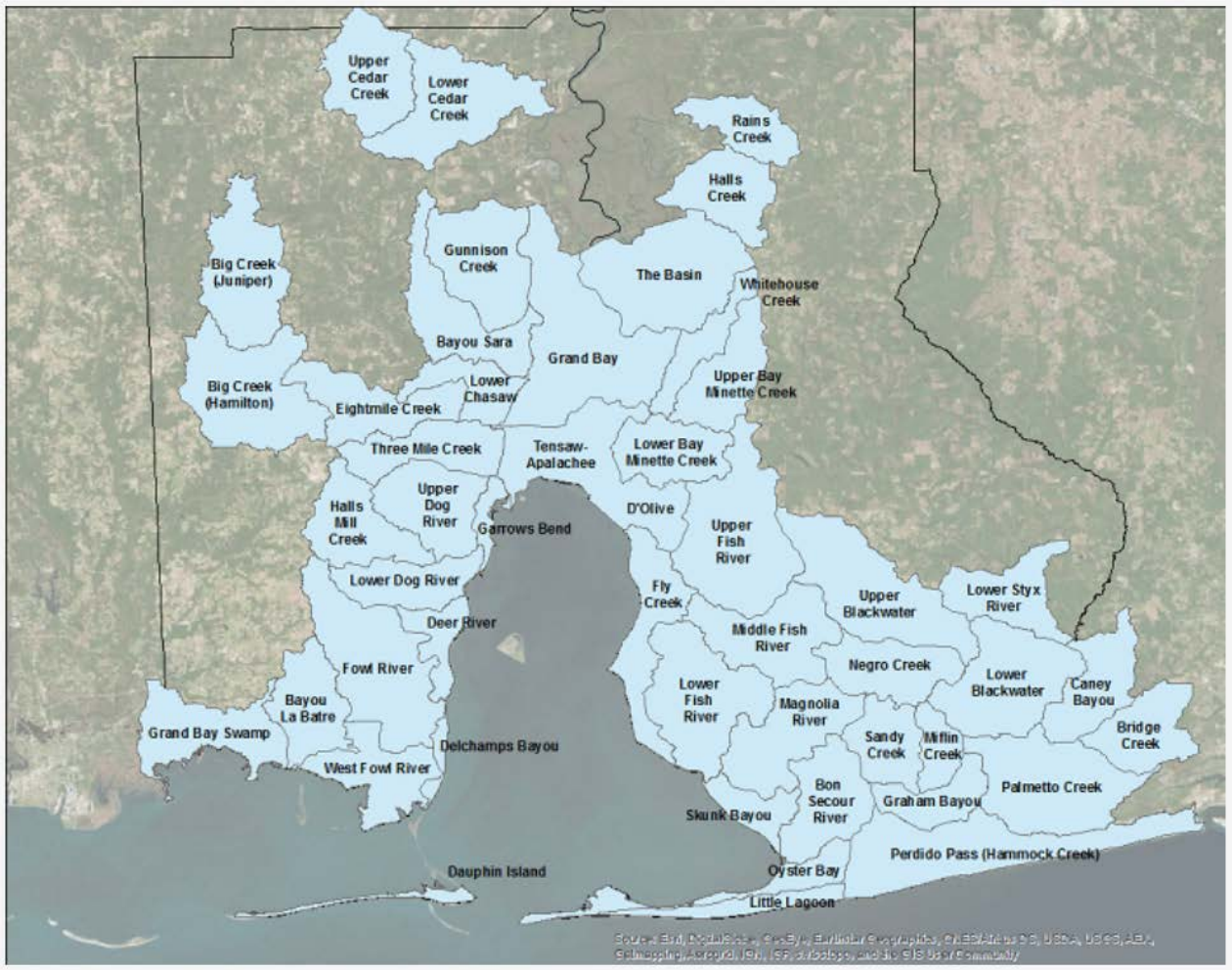
https://coastalscience.noaa.gov/projects/detail?key=162

Questions

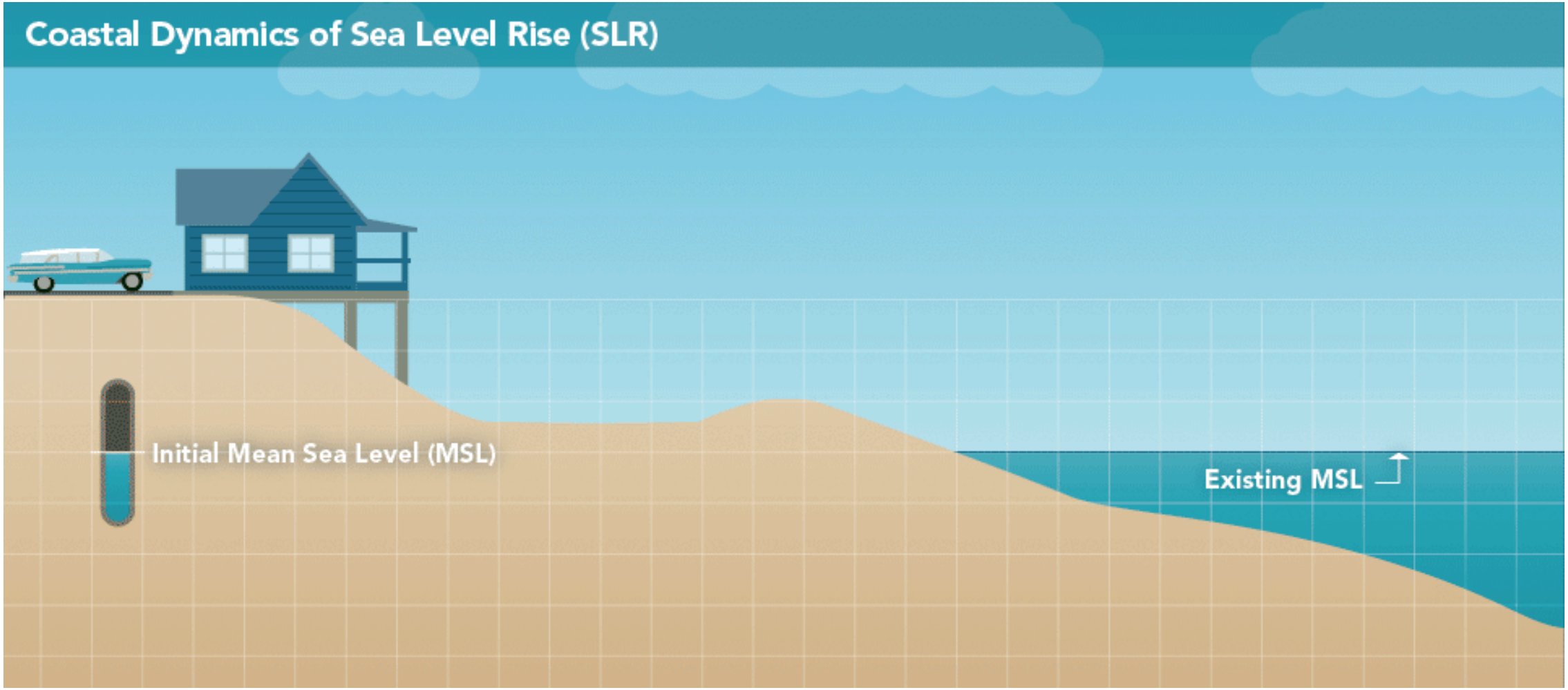
- What management/restoration applications could you use these data for?
- Which of these applications/need are the most immediate?
- How would you like to access these data?

EESLR Focus Areas/Outputs for Management

- Improved sea-level rise model
- Tidal dynamics and shoreline morphology
- Remote sensing & elevation
- Habitat vulnerability/suitability models
  - Marsh
  - Oyster
  - SAV
- Dynamic storm surge model



SLR -Beyond bathtub assessments



Passeri, D.L. & S.C. Hagen, et al. "The dynamic effects of sea level rise on low-gradient coastal landscapes: a review." Earth's Future, Online, April, 2015. http://dx.doi.org/10.1002/2015EF000298.

Hydro-MEM

- Marsh response to SLR
- MEM
  - Sediment inputs
  - Biomass density
  - Biological response
- Hydrodynamic
  - Spatially-explicit
  - Marsh topography
  - Tides
- Improved spatial predictions

Ecological Modelling 327 (2016) 29–43

Contents lists available at ScienceDirect

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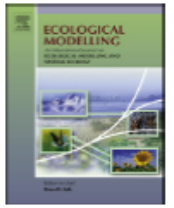

A coupled, two-dimensional hydrodynamic-marsh model with biological feedback

Karim Alizad[a,*], Scott C. Hagen[b], James T. Morris[c], Peter Bacopoulos[d], Matthew V. Bilskie[b], John F. Weishampel[e], Stephen C. Medeiros[a]

Oyster Habitat Suitability Model

- Hydrodynamic model: Oysters & Salinity
  - SLR
  - Winds
  - Tides
  - River flow
  - Sediments

Estuarine, Coastal and Shelf Science 156 (2015) 7–18

Contents lists available at ScienceDirect

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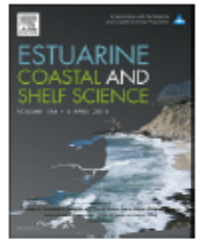
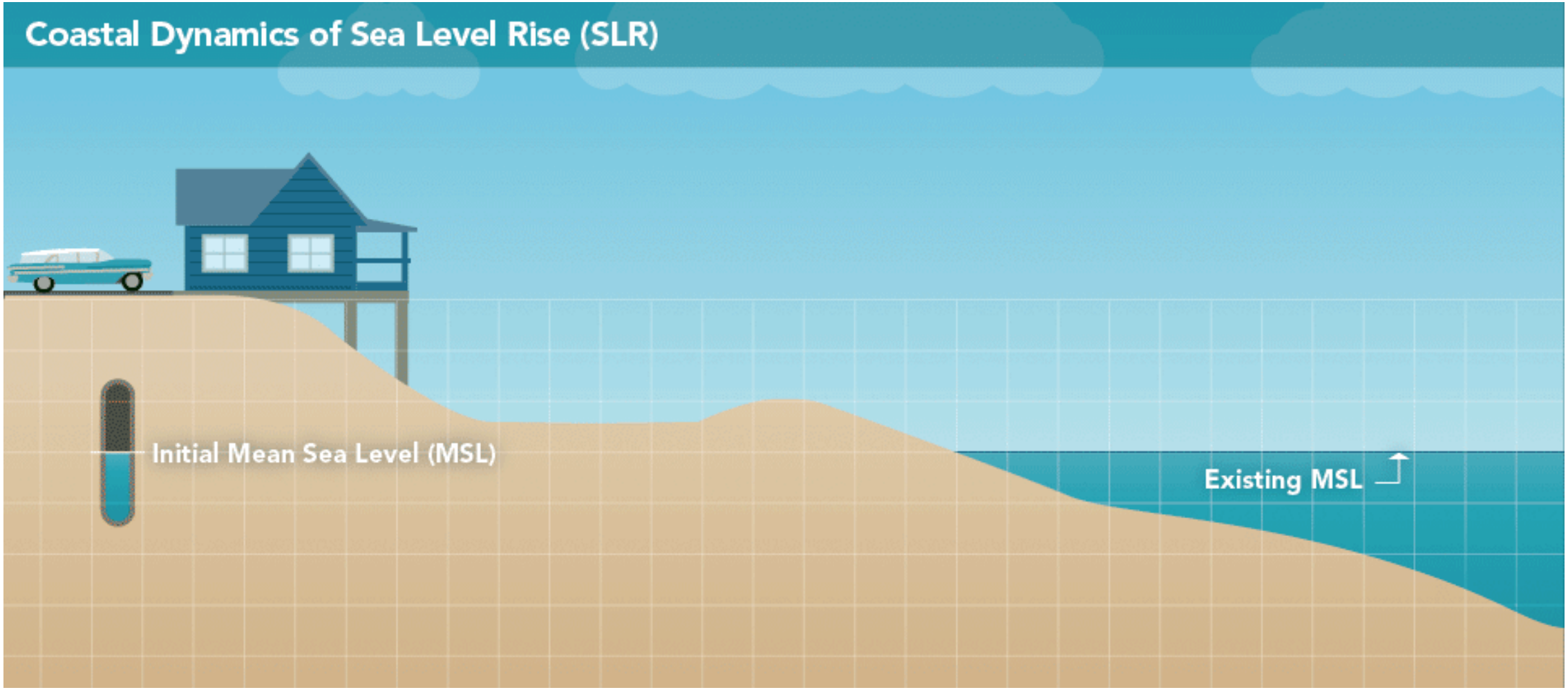


Hydrodynamic modeling and analysis of sea-level rise impacts on salinity for oyster growth in Apalachicola Bay, Florida

Wenrui Huang [a, d, *], Scott Hagen [b], Peter Bacopoulos [c], Dingbao Wang [b]

Storm surge & SLR



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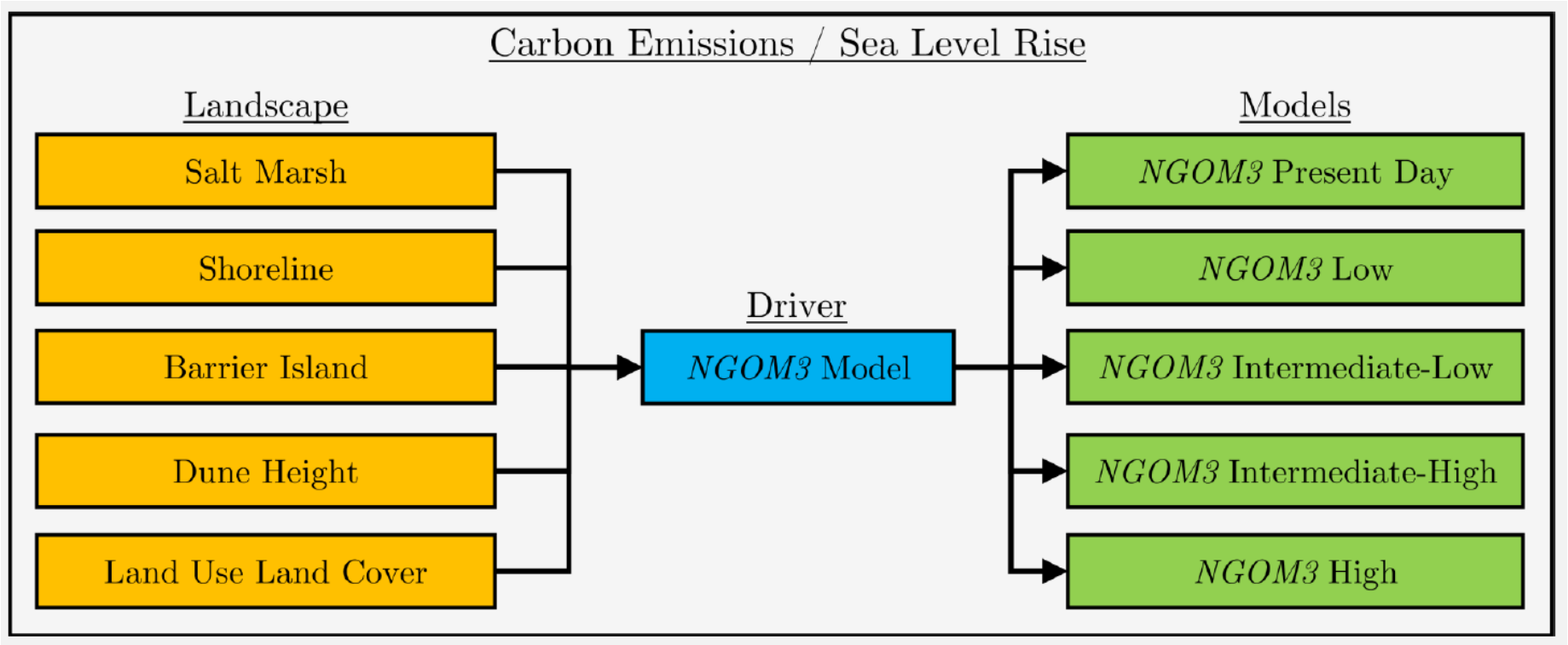
EESLR-NGOM, NOAA Award NA10NOS4780146 | S.C. Hagen et al.

NGOM3 – Dynamic storm surge modeling



K Alizad, SC Hagen, JT Morris, P. Bacopoulos, MV Bilskie, JF Weishampel (2015). "A coupled, two-dimensional hydrodynamic-marsh model with biological feedback." Ecological Modeling, Under Review.

K Alizad, SC Hagen, JT Morris, SC Medeiros, MV Bilskie, JF Weishampel (2015). "Coastal wetland response to sea level rise in a fluvial estuary system." Earth's Future. Submitted

DL Passeri, SC Hagen, NG Plant, MV Bilskie, SC Medeiros, KA Alizad (2015). "Tidal hydrodynamics under future sea level rise and coastal morphology in the northern Gulf of Mexico." Earth's Future, Under Review.

MV Bilskie, SC Hagen, KA Alizad, SC Medeiros, DL Passeri, H Needham, A Cox (2015). "Dynamic simulation and numerical analysis of hurricane storm surge under sea level rise along the northern Gulf of Mexico." Earth's Future. Submitted.

STORY MAP

http://noaa.maps.arcgis.com/apps/MapJournal/index.html?appid=964181e11b4d4736ac85d7ecd33104ab

Summary Points

- Dynamic modeling
  - No “bath-tub”
- Regionally developed, tested, and applied
- High resolution outputs – 10 m
- Years of interdisciplinary-research
- Opportunity to develop

WHAT MANAGEMENT OR RESTORATION APPLICATIONS COULD YOU USE THESE DATA FOR?

WHICH OF THESE APPLICATIONS/NEEDS ARE THE MOST IMMEDIATE?

HOW WOULD YOU LIKE TO ACCESS THESE DATA?