

Sea level rise, coastal marsh, & climate resilience

EESI briefing

May 18, 2022

Lydia Olander, Duke University

*Acknowledgements: Katie Warnell, Duke University
and Carolyn Curran, formerly NOAA*

Coastal marshes create significant value for our communities.



Blue carbon



Coastal protection

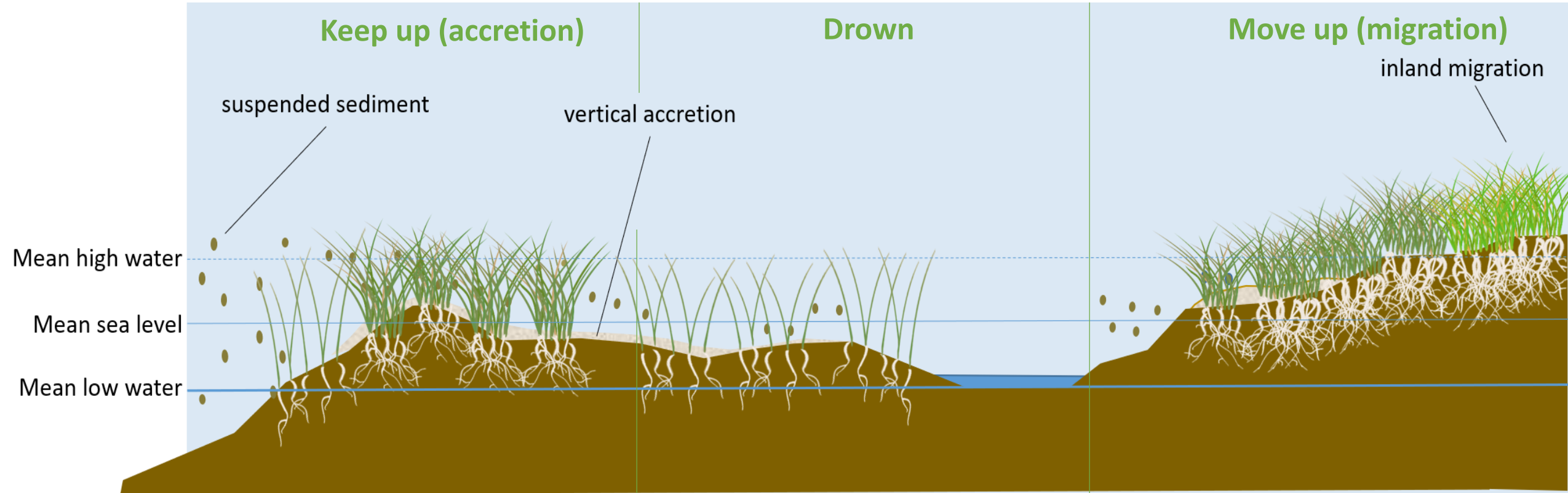
Recreation & tourism



Fisheries

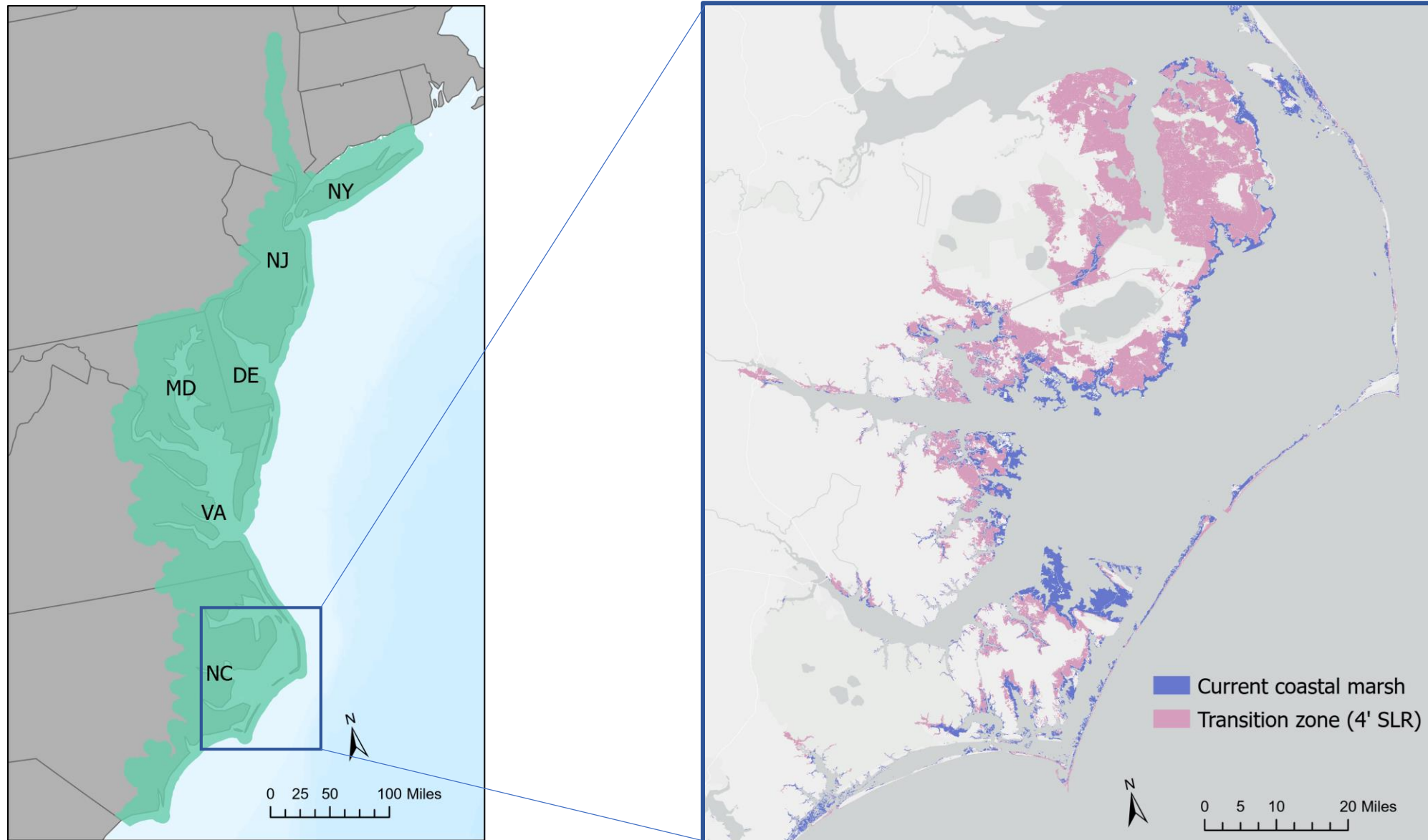


Coastal marsh and sea level rise



...marshes that can't keep up or move up will likely drown as they are inundated by SLR

Our study area: coastal marsh and transition zone



Mid-Atlantic U.S. marshes are vulnerable to SLR, but have significant potential for inland migration.



Warnell, K., L. Olander, and C. Currin. (in review). Sea level rise drive carbon and habitat loss in the U.S. mid-Atlantic coastal zone.

Community impacts



Ecological impacts



Reduced coastal protection

Salt water intrusion and loss of productive lands

Less pleasant views

Loss of stored carbon
Loss of habitats and species

Strategies to enhance resilience under SLR-driven coastal changes

Maintain existing coastal marshes



Prevent or slow inland SWI & marsh migration



Irrigation (to remove excess salt)

Direct inland marsh migration



Removing barriers to migration

Protecting migration corridors

Limit negative impacts of SWI & marsh migration



Invasive species control

Salt-tolerant crop planting

Policies/programs to enable these NB strategies

Simplify permitting
USCAE, NOAA; Funding by
NFWF, REPI, etc...

Rolling easements, USDA/NRCS programs, forest service programs,
profit driven, federal buyouts

Maintain existing coastal
marshes



Prevent or slow inland
SWI & marsh migration



Irrigation (to remove excess salt)

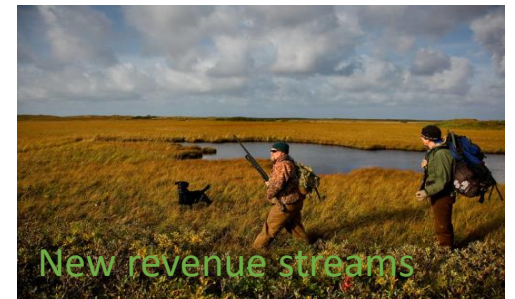
Direct inland marsh migration



Removing barriers
to migration

Protecting
migration corridors

Limit negative impacts of SWI
& marsh migration



Invasive species control
Salt-tolerant crop planting

**Protection/restoration
of habitat**



**FWS
NOAA/NERR
EPA NEP
USACE ER**

**Transition from
agriculture to habitat**



USDA

**Transition from homes
to habitat**

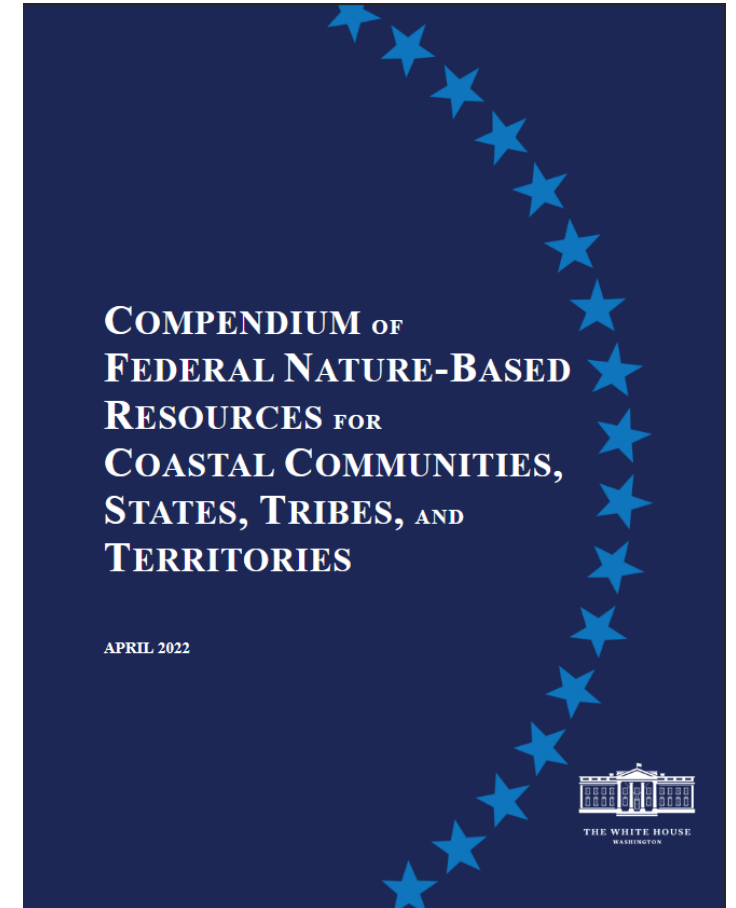


**FEMA
HUD CDBG**

**Constructed protection
w natural features**



**USACE
DOD
DOT**



Executive Order to Strengthen America's Forests, Boost Wildfire Resilience, and Combat Global Deforestation

Section 4. Enlisting Nature in the Fight Against Climate Change

- America the Beautiful initiative
- **Compendium of Federal Nature-Based Solutions for Coastal Communities, States, Tribes, and Territories**
- **Report on Nature-Based Solutions**
- **Guidance on Valuing Nature**
- First U.S. National Nature Assessment





Thank you

Lydia.olander@duke.edu