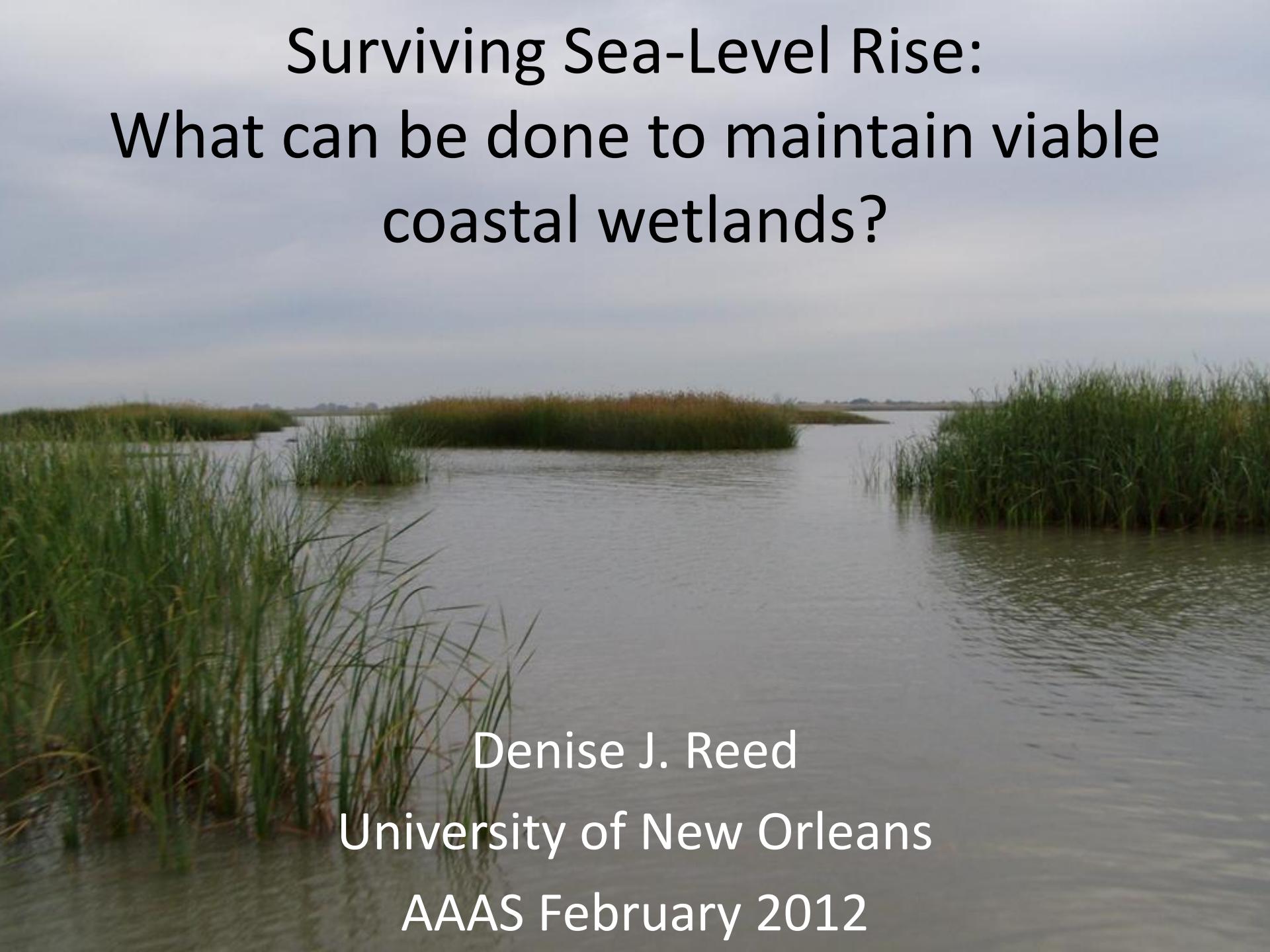


# Surviving Sea-Level Rise: What can be done to maintain viable coastal wetlands?



Denise J. Reed

University of New Orleans

AAAS February 2012

# Bottom Line

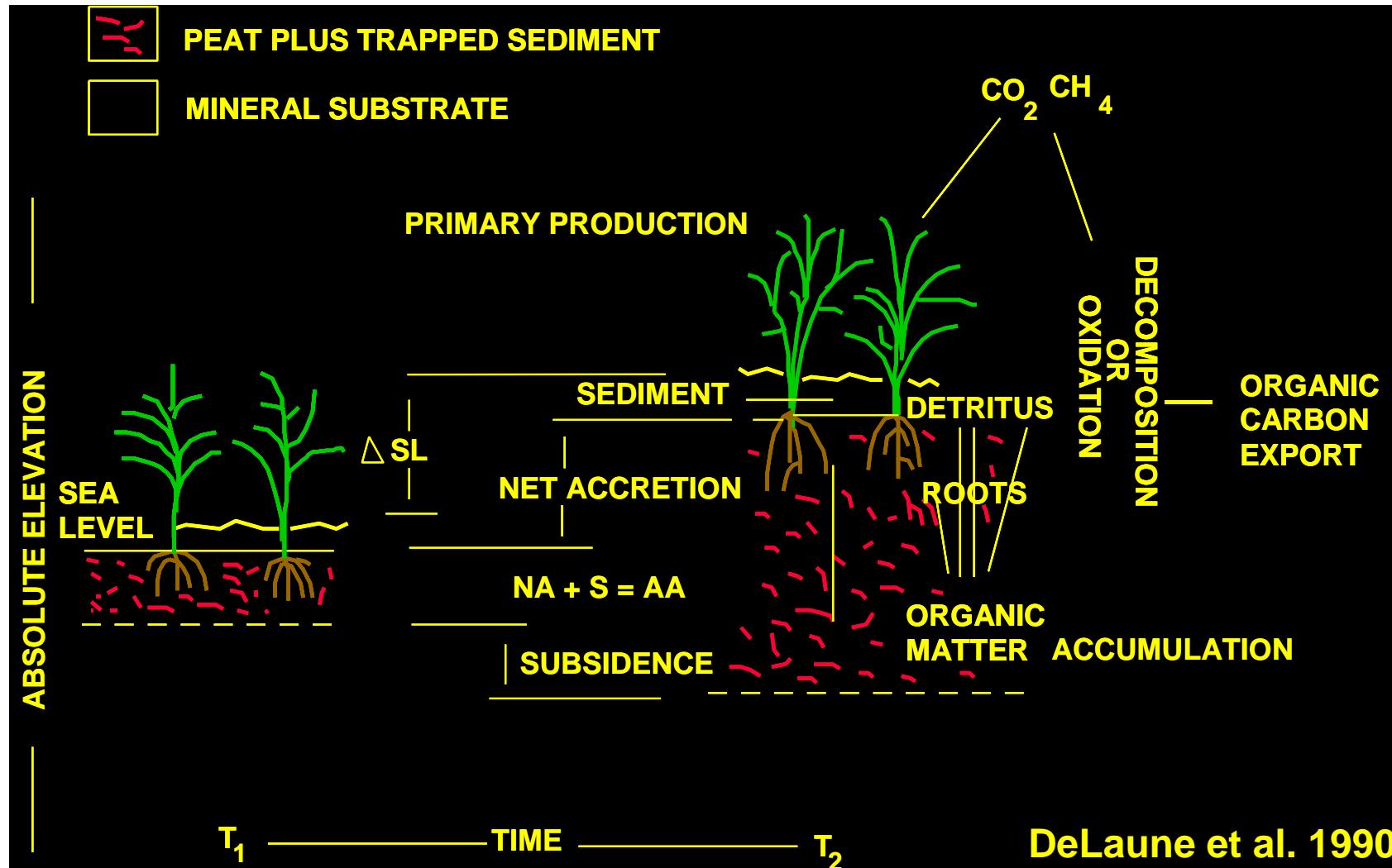
- ***Is sea-level rise a threat to coastal marshes?***  
Yes – but.... here may be other more important threats
- ***What will happen on the west coast?***  
The news is better than in many other areas
- ***What can be done?***  
The best intervention may be no intervention.

# NE Pacific Coastal Wetlands



# Sea Level Rise

- Rates are more important than amounts

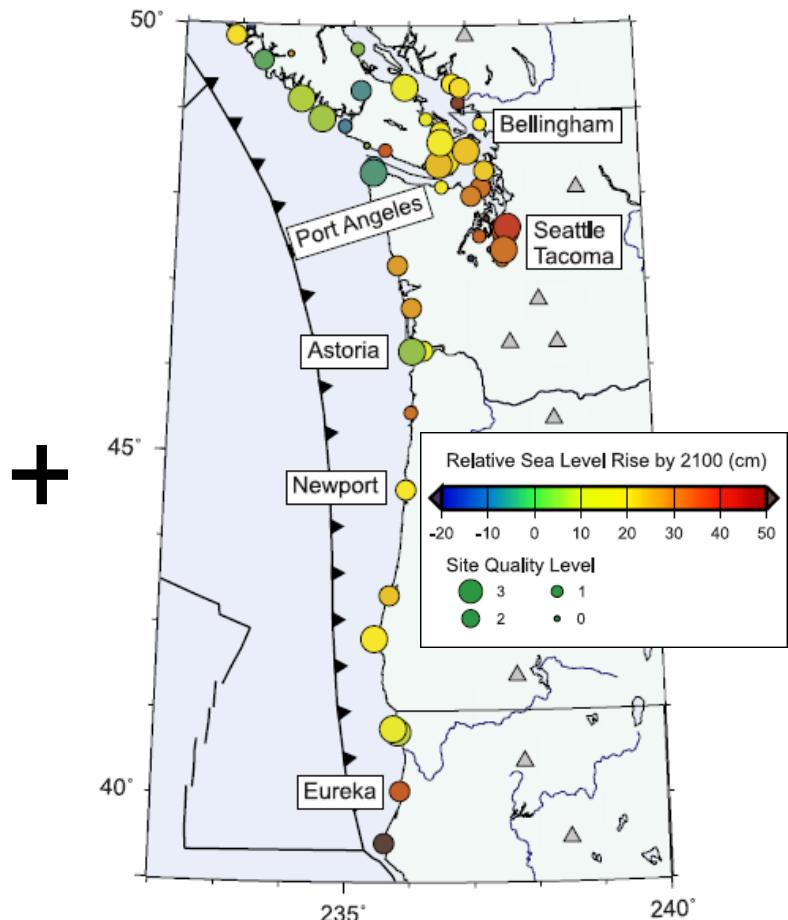
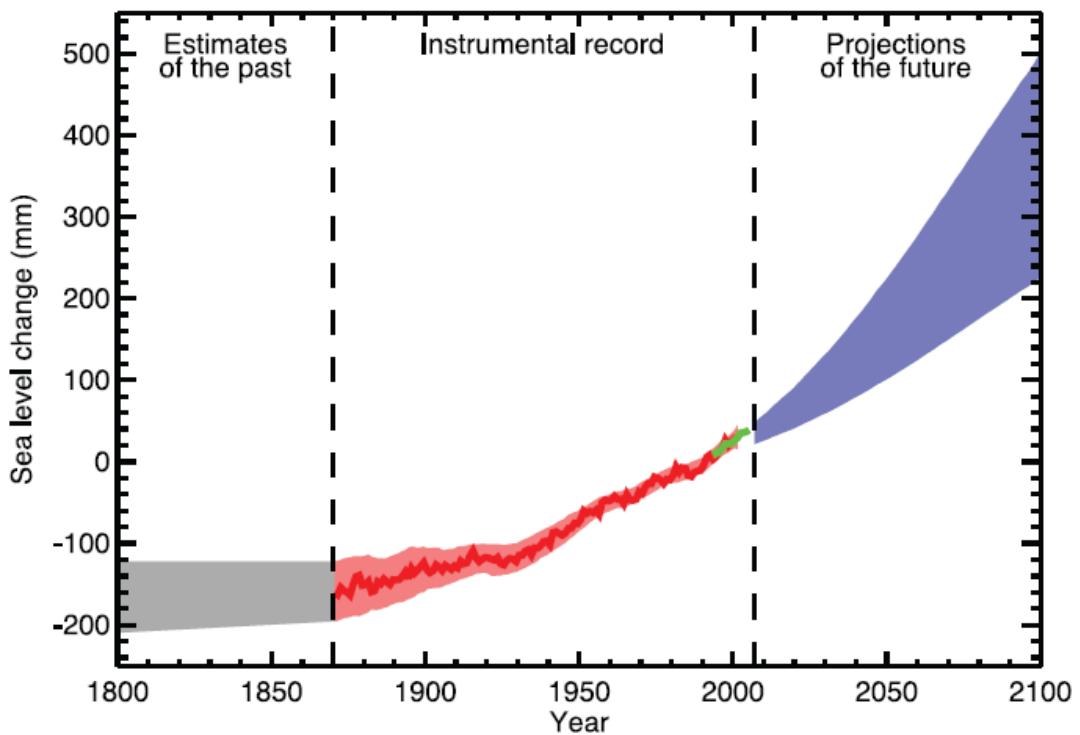


# One of the number of threats



# SLR and NE Pacific Marshes

- Not just the ocean....



NATIONAL WILDLIFE FEDERATION

## Sea-level Rise and Coastal Habitats in the Pacific Northwest

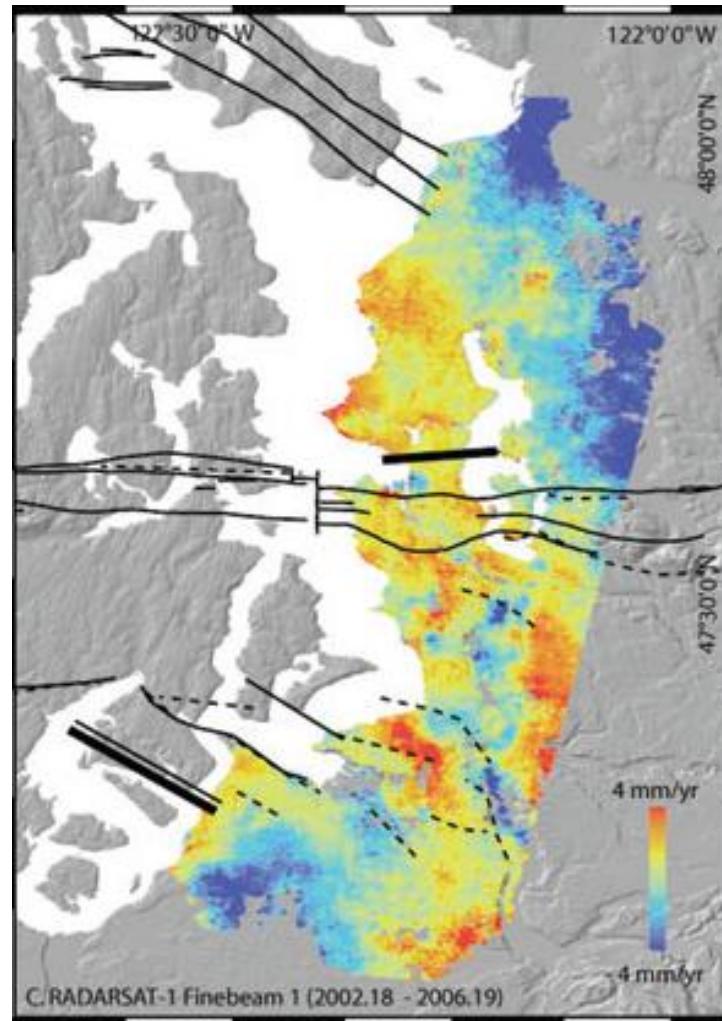
An Analysis for Puget Sound, Southwestern  
Washington, and Northwestern Oregon



- Assumed marsh accretion rates of  $3.6\text{-}3.75 \text{ mm yr}^{-1}$
- Predicted that salt marsh would expand, partly at the expense of more inland fresh marsh areas

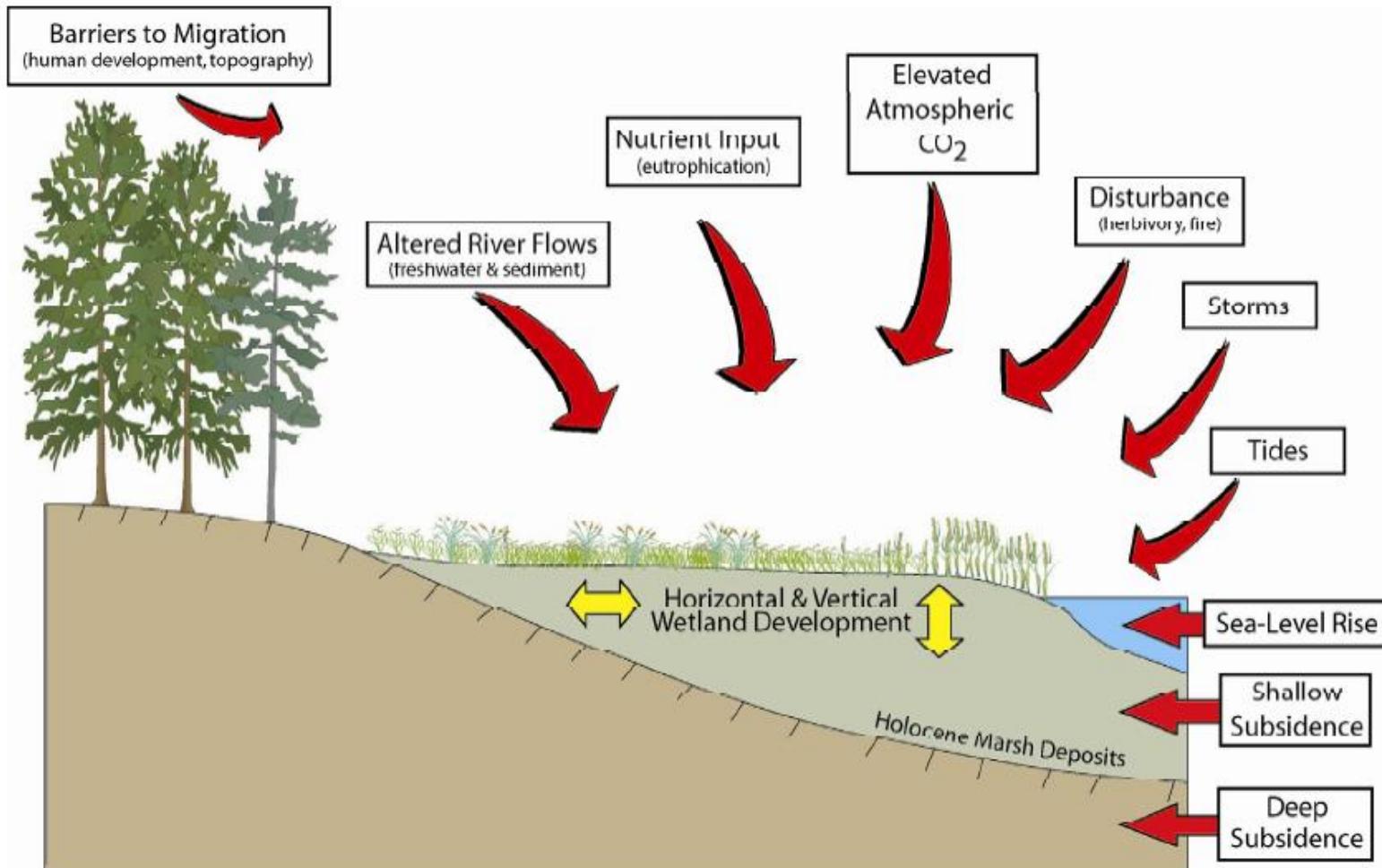
# ‘Net Rates’

- IPCC SLR 4-7mm
- Vertical land motion?
- Finnegan InSAR study
- 2002-2006 rates→
- Current accretion rates maybe adequate?
- ***Where*** the marsh is makes a difference



Finnegan et al. 2008

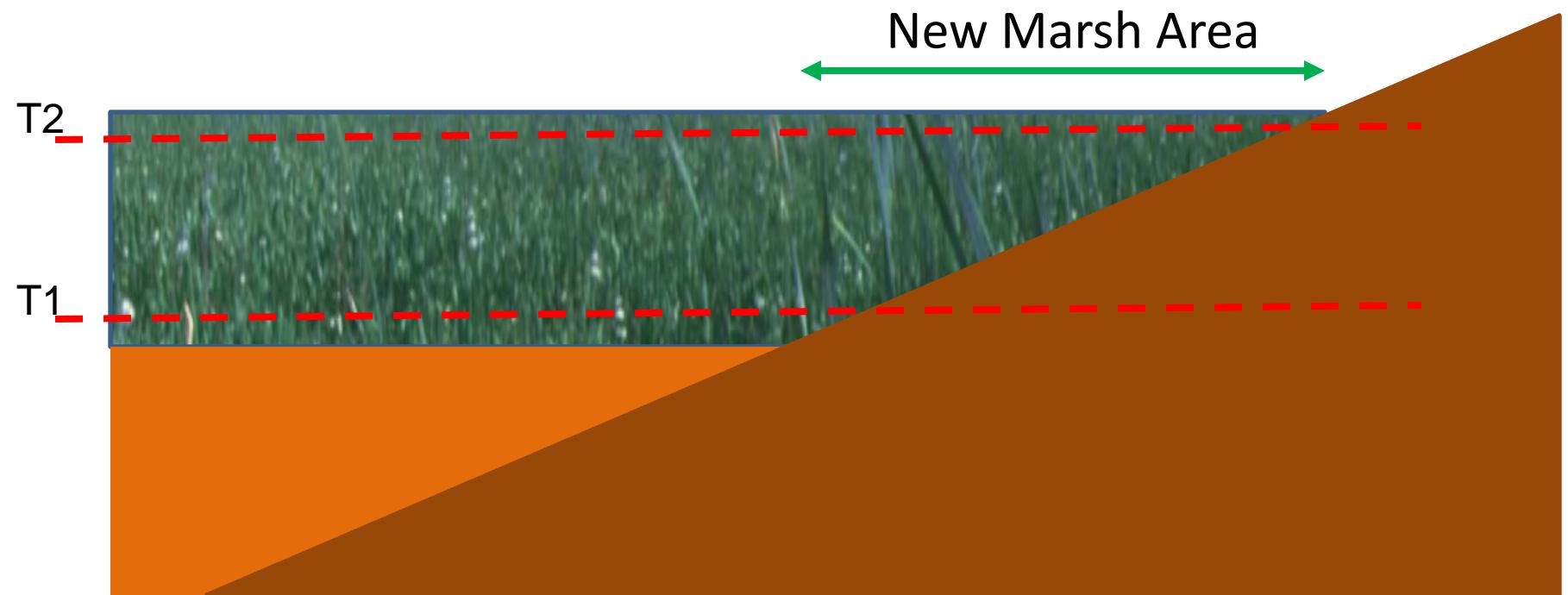
# What can be done?



# Vertical vs Horizontal

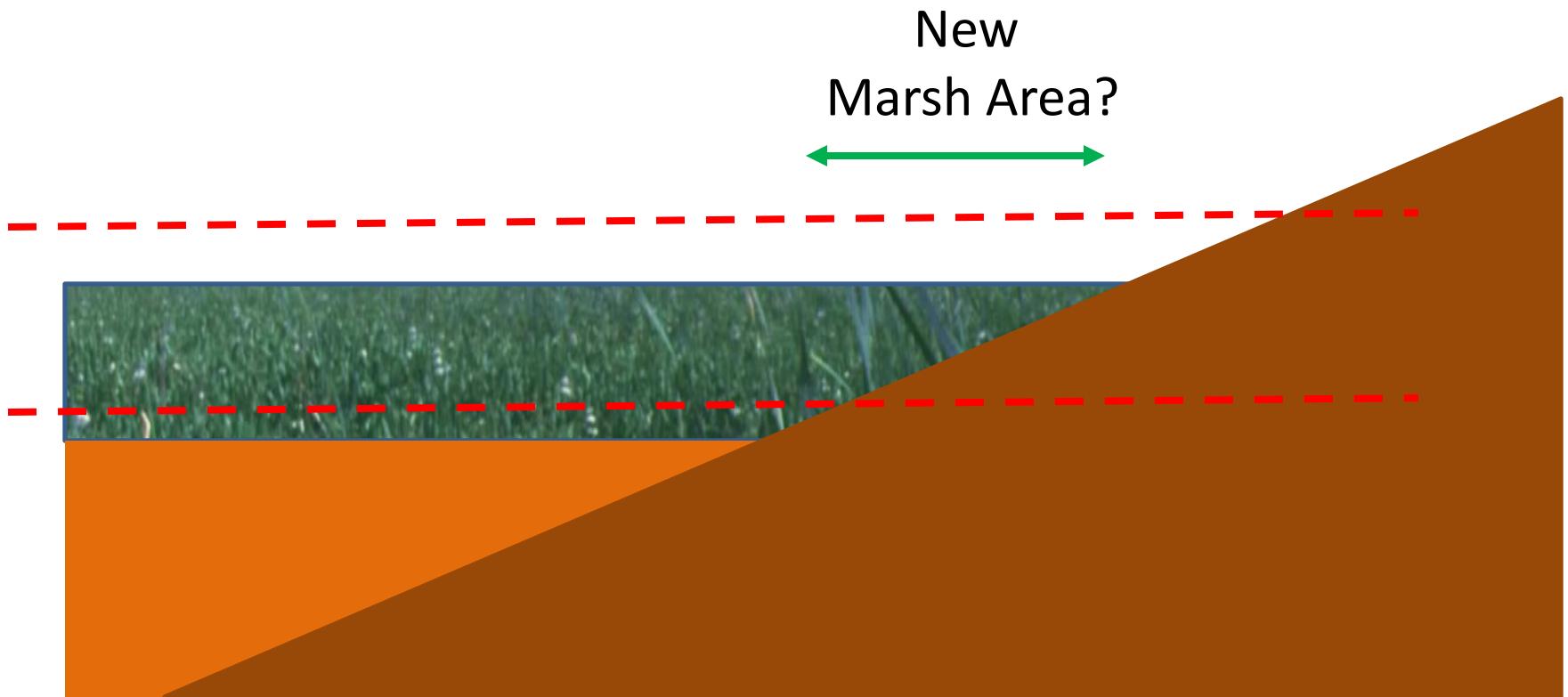
- Marshes must accrete vertically to keep pace with the local ‘net’ rate of sea-level rise
- Higher sea-level means more land is flooded and migration onshore

Rate of.....  
SLR≈ Surface Elevation Change

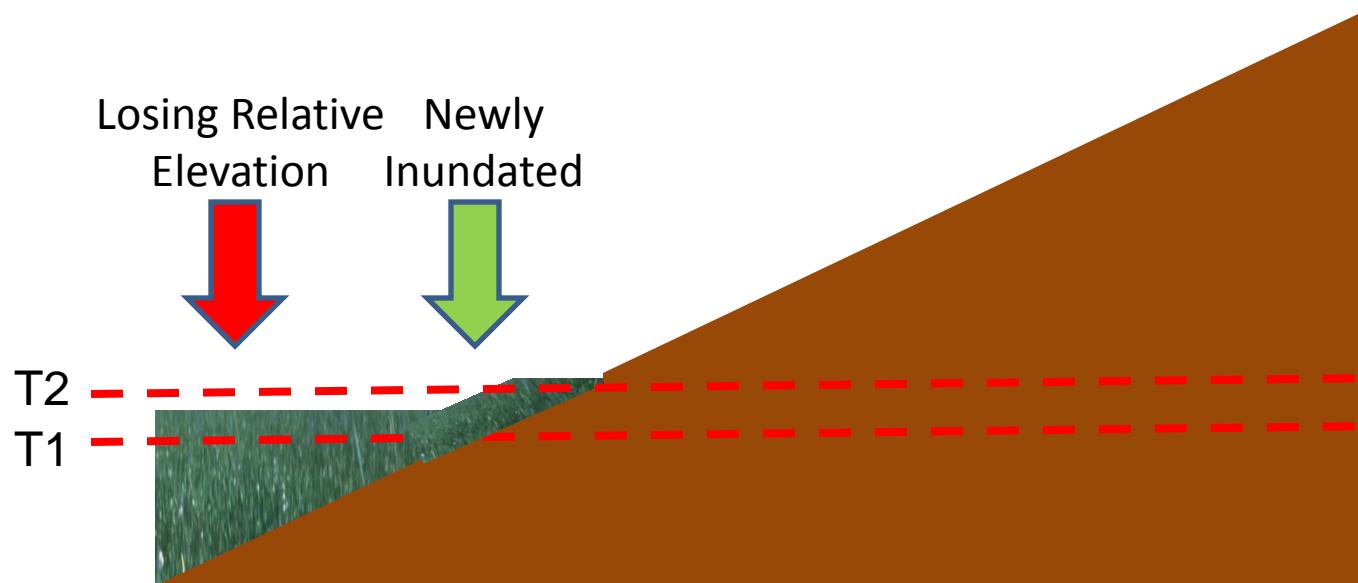


# Rate of.....

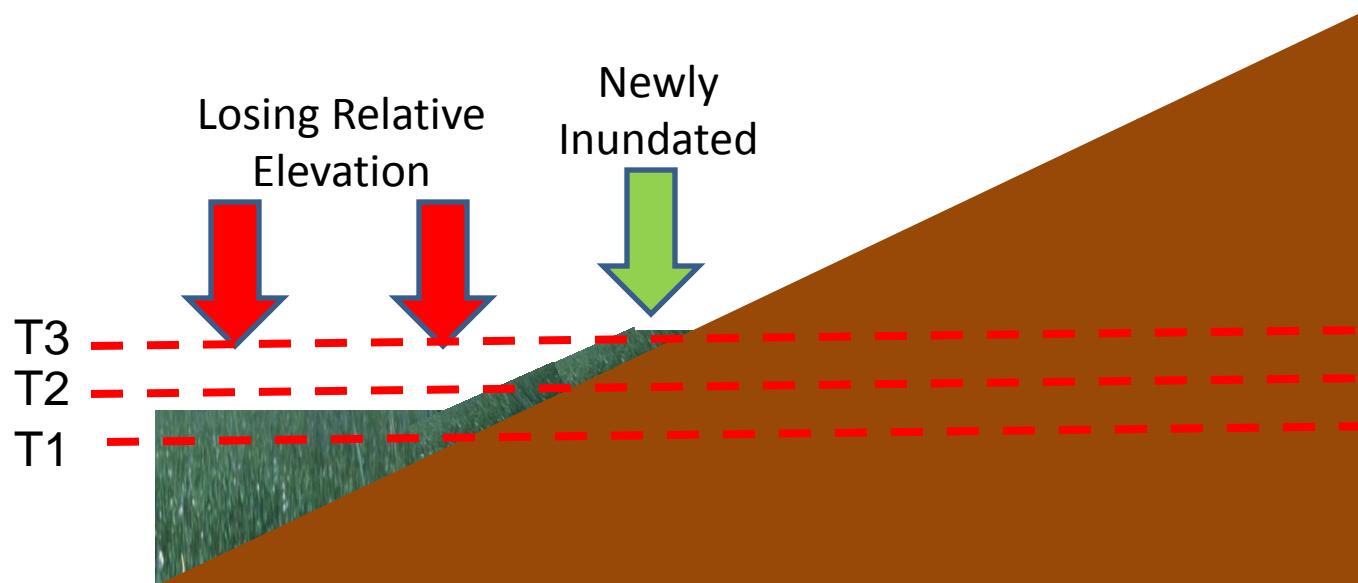
# SLR> Surface Elevation Change



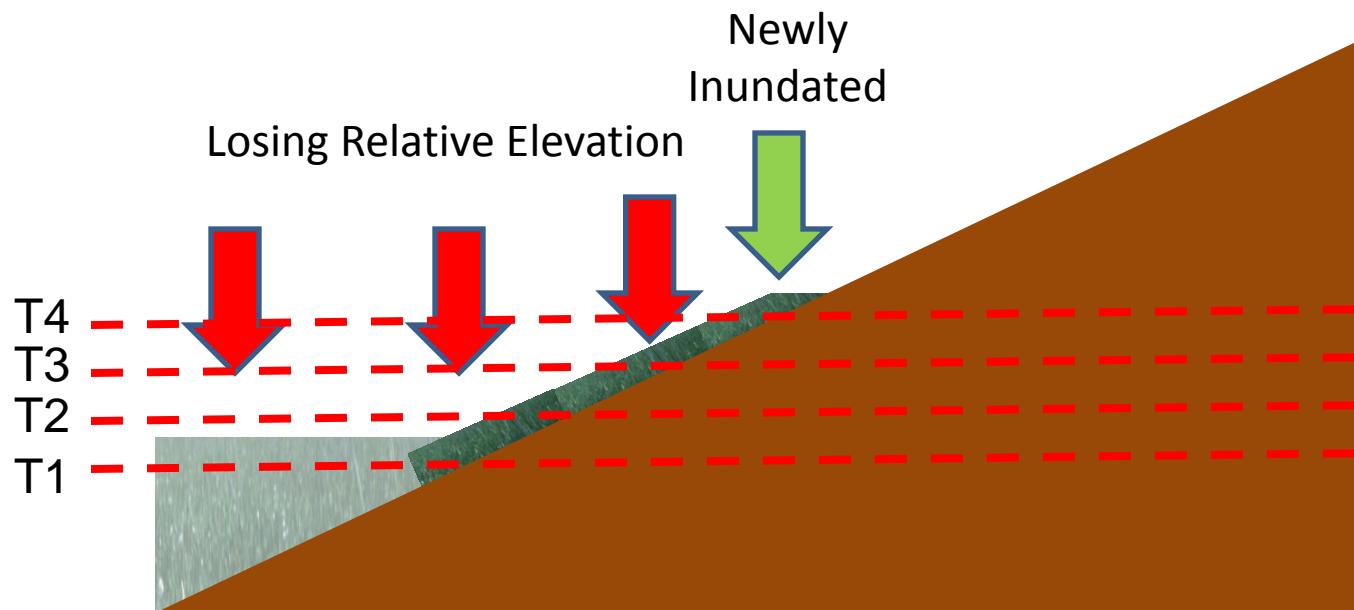
# Rate of..... SLR> Surface Elevation Change



# Rate of..... SLR> Surface Elevation Change

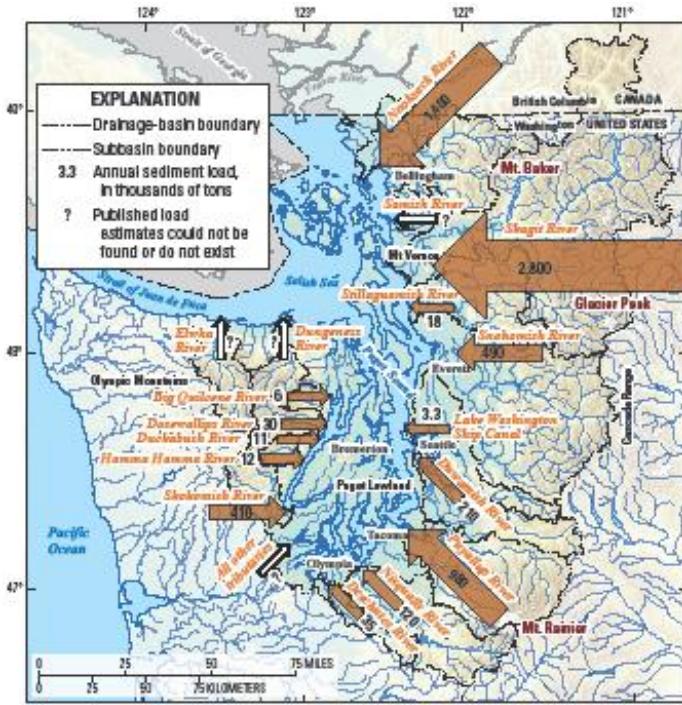


# Rate of..... SLR> Surface Elevation Change



# What Can Be Done?

- Promote vertical accretion!
  - Allow for sediment delivery
  - Allow for sediment distribution
  - **Where** makes a difference



# Bottom Line

- ***Is sea-level rise a threat to coastal marshes?***  
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