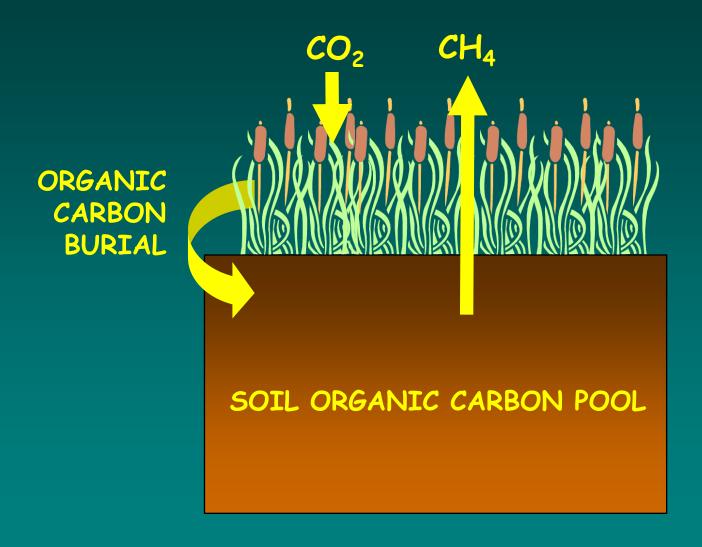


### Global Distribution of Salt Marshes

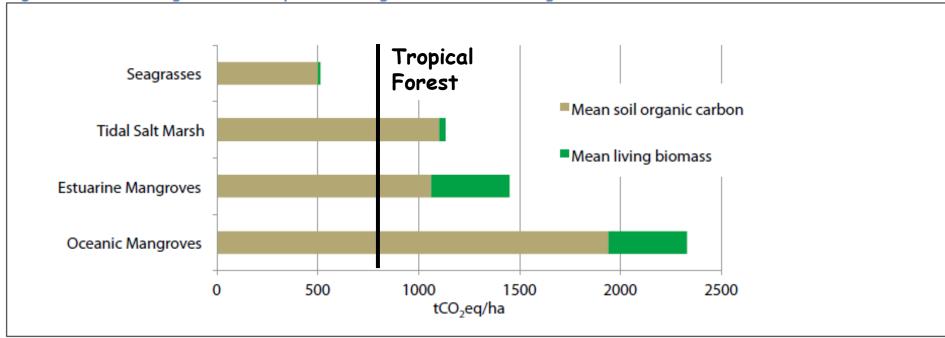


## Parsimonious Salt Marsh Carbon Cycle



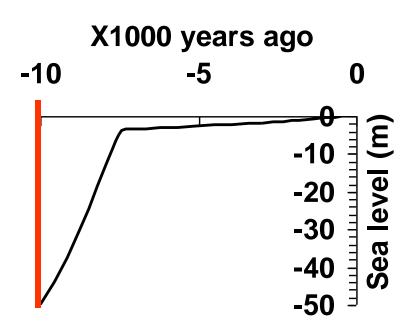
# Carbon Pools (per hectare)

Figure 2. Global averages for carbon pools (soil organic carbon and living biomass) of focal coastal habitats.

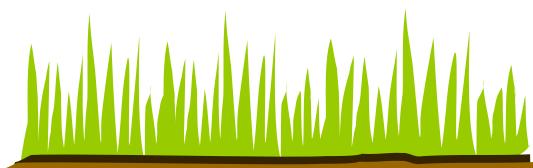




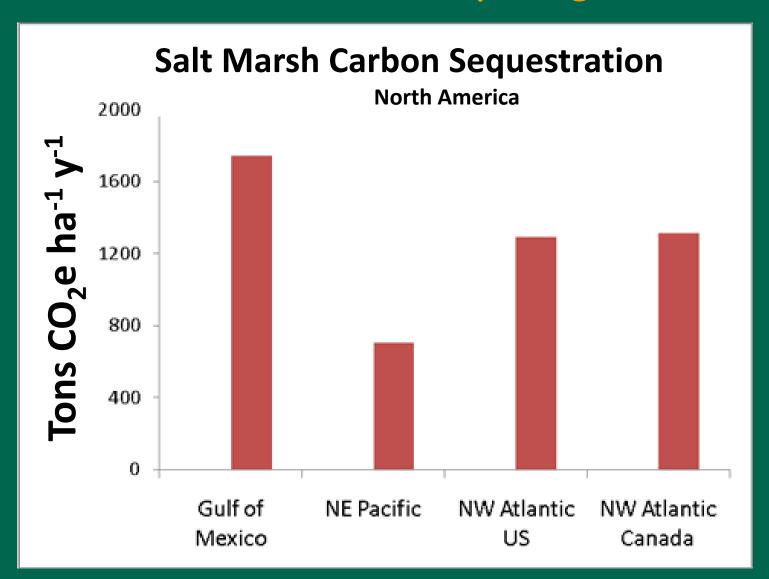
Wetland soils are rich in organic carbon because of slow decay rates due to wet and anoxic soil conditions



Historical Perspective on Sea Level Rise and Wetland Rise



### Sources of Variability: Regional



# Sources of Variability: Landscape

Salinity	Carbon Fraction (%)	Carbon Density (g m <sup>-2</sup> y <sup>-1</sup> )
Tidal Freshwater Marsh	17±2	140±20
Brackish Marsh	20±2	240±30
Salt Marsh	9±1	190±40

# Sources of Variability: Local



Low Sediment Deposition

High Sediment Deposition

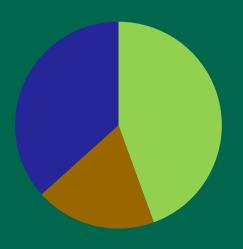


# Sources of Variability: Area



Nelleman et al. 2009 (UNEP)

Total =  $0.66 \times 10^6 \text{ km}^2$ 



Murray et al. (in prep)

Total =  $0.90 \times 10^6 \text{ km}^2$ 

### Sources of Disturbance



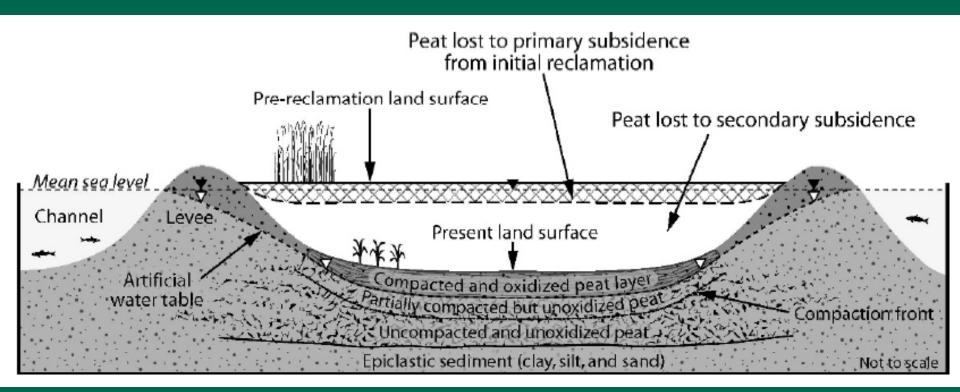
- Drainage for agriculture
- Conversion to salt ponds
- Drainage for mosquito control
- Fill for development

### Sediment Environment is Important

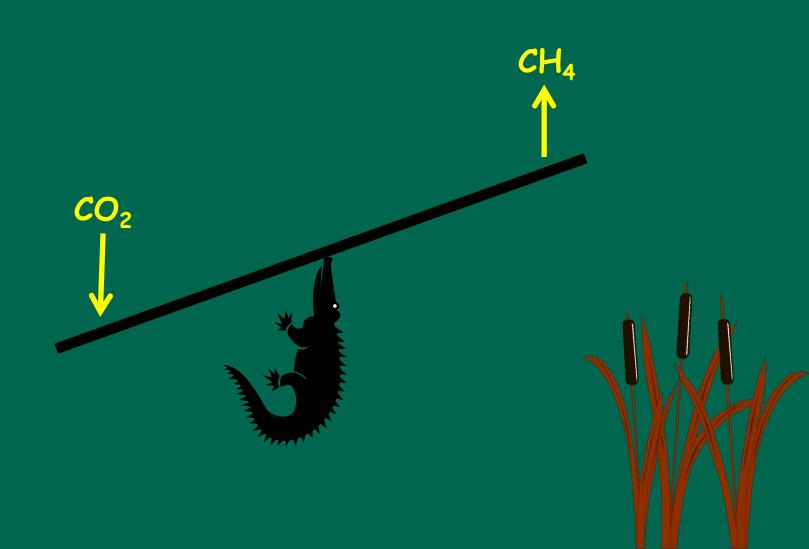


- \* Soil surface accretion and wetland persistence
- \* Risk of carbon loss upon disturbance

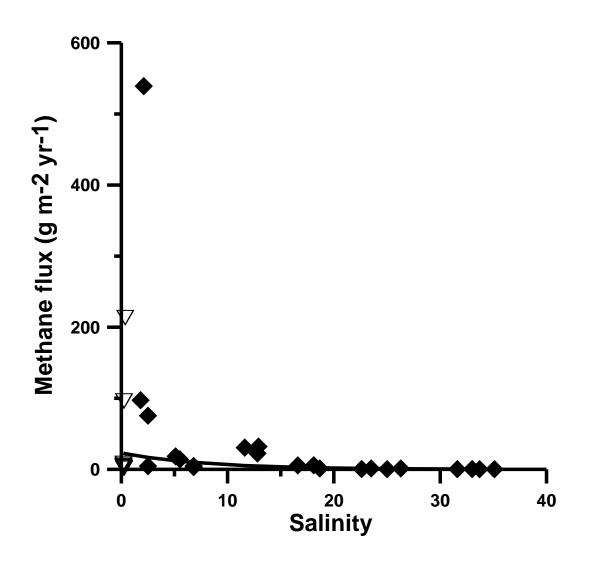
### San Joaquin Subsidence



# The Methane Issue Is it really an issue?

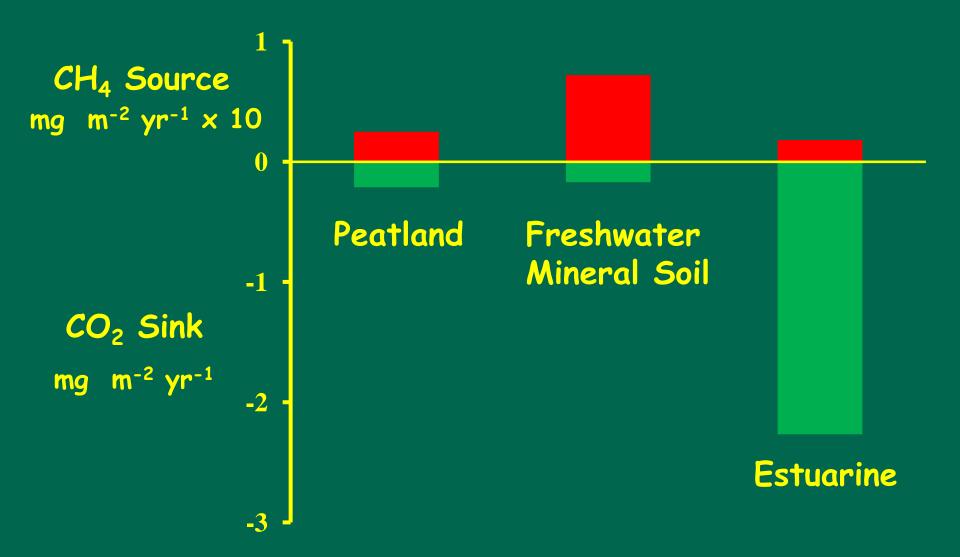


### Methane Emissions Vary with Salinity



Hoffenbarger et al. (in press) Wetlands

### Source-Sink Differences Among Wetland Types



Based on Bridgham et al. (2006) Wetlands

### Wetland Types For Carbon Sequestration

#### Freshwater

### Saltwater

Mineral Soils



freshwater mineral soil wetlands (FWMS)



estuarine

Organic Soils

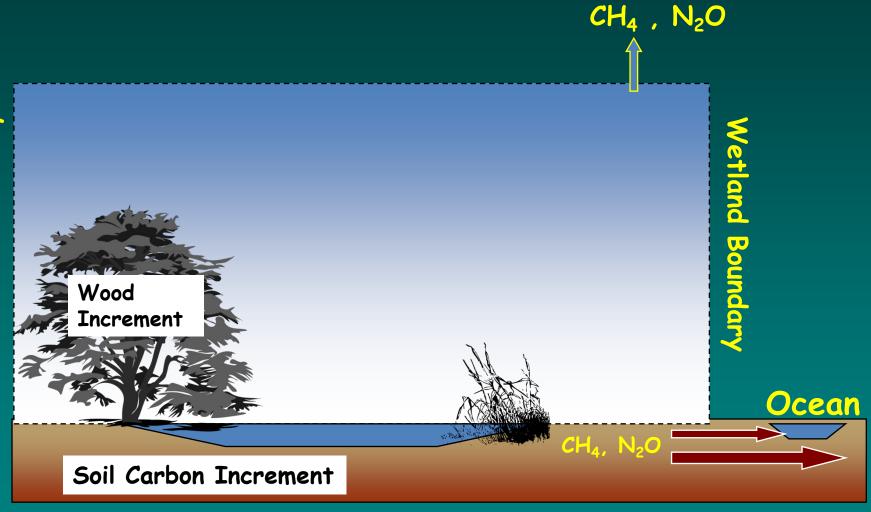


peatland



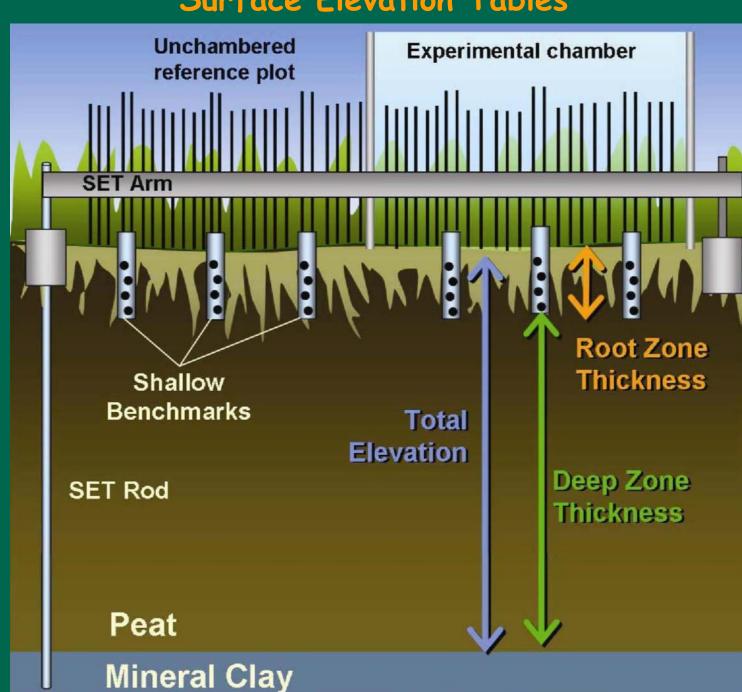
estuarine

## Pool Approach to Carbon Sequestration



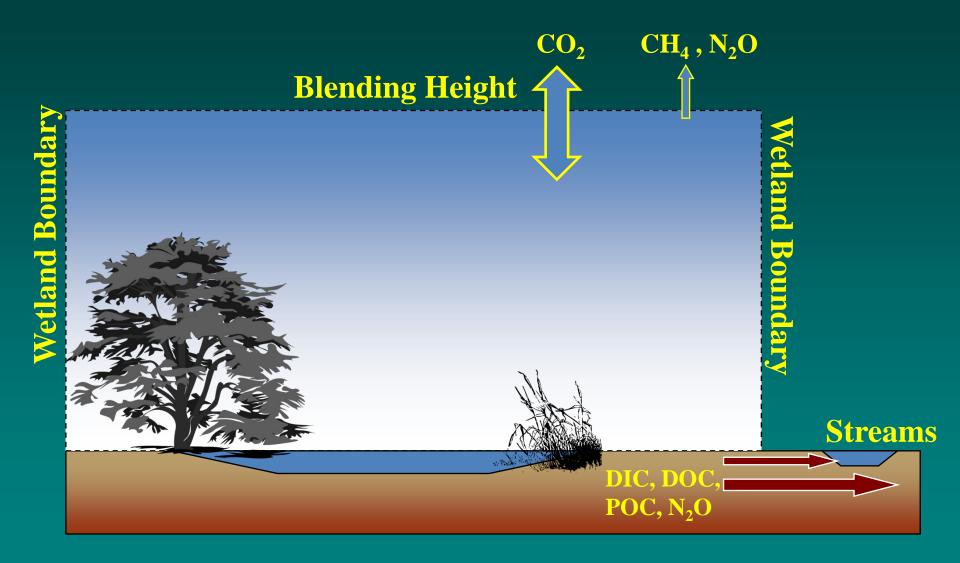


### Surface Elevation Tables



5 m-

### Flux Approach to Carbon Sequestration



Courtesy of Colin Ll



My Time is Up