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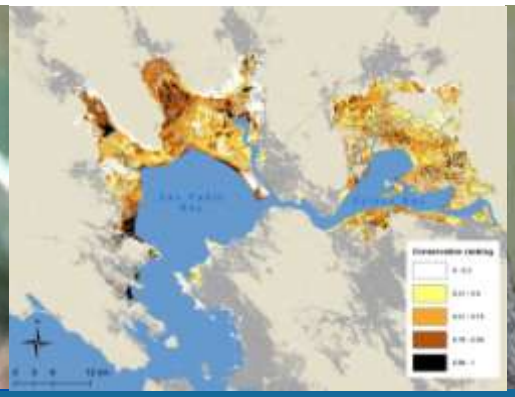
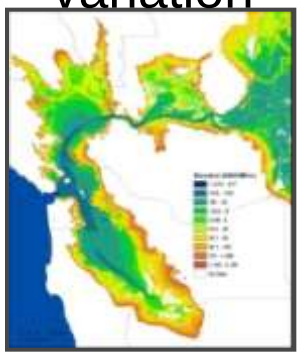



MARSH98:
A hybrid modeling approach applied to San Francisco Bay

Sam Veloz, Diana Stralberg, Julian Wood ,Dennis Jongsomjit, Grant Ballard PRBO Conservation Science;
Lisa Schile UCB; John Callaway USF; Tom Parker SFSU, Steve Crooks , Matt Brennan ESA PWA

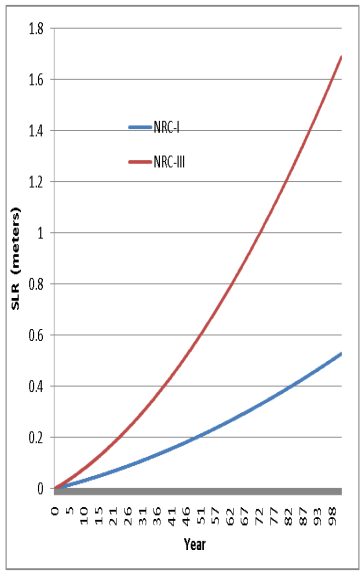
Hybrid Model Development

Spatial variation



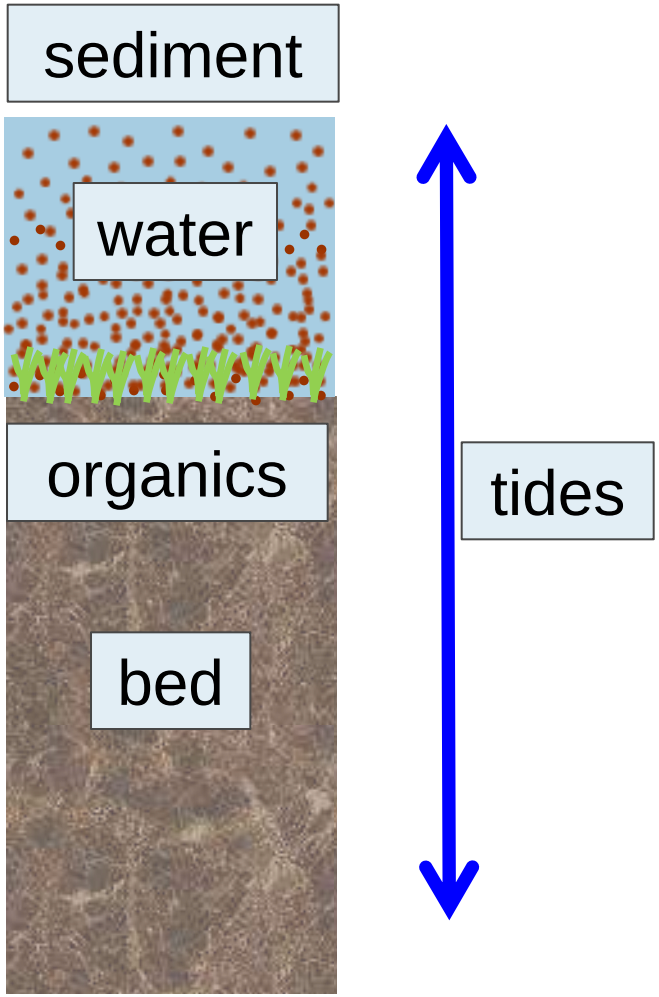
Bed model (Marsh98)

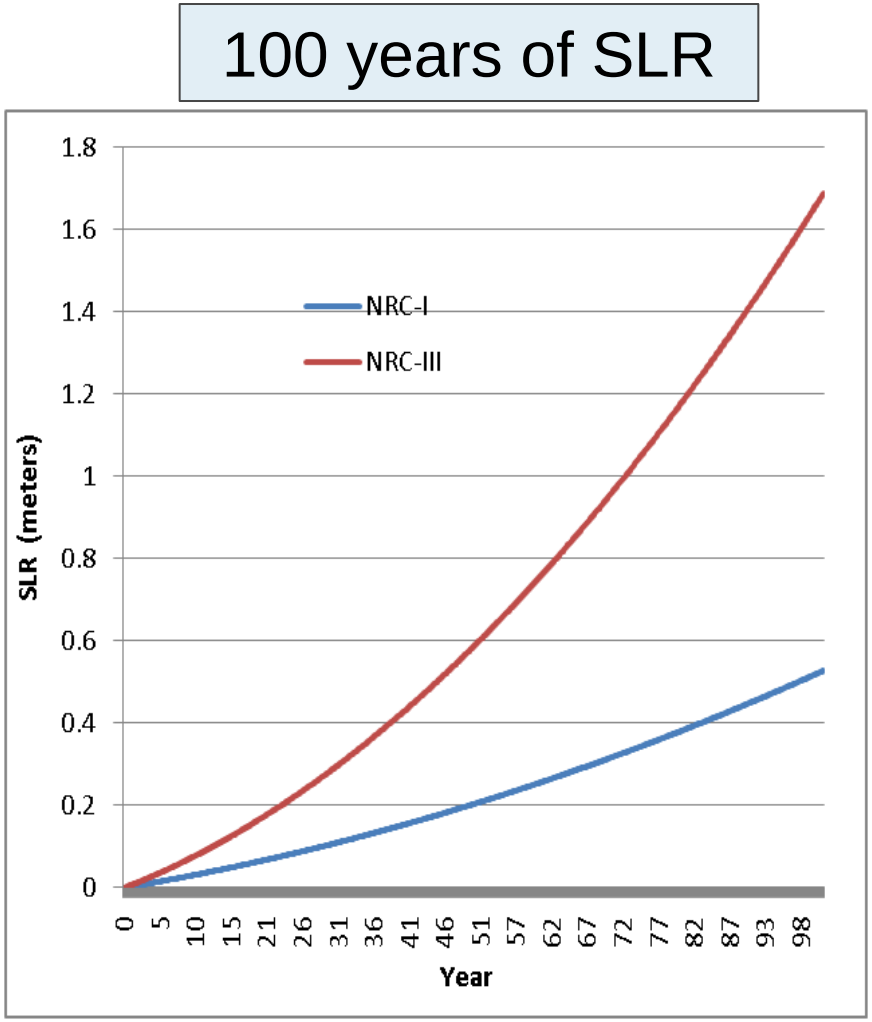
Non-linear sea level rise



Habitat prediction maps

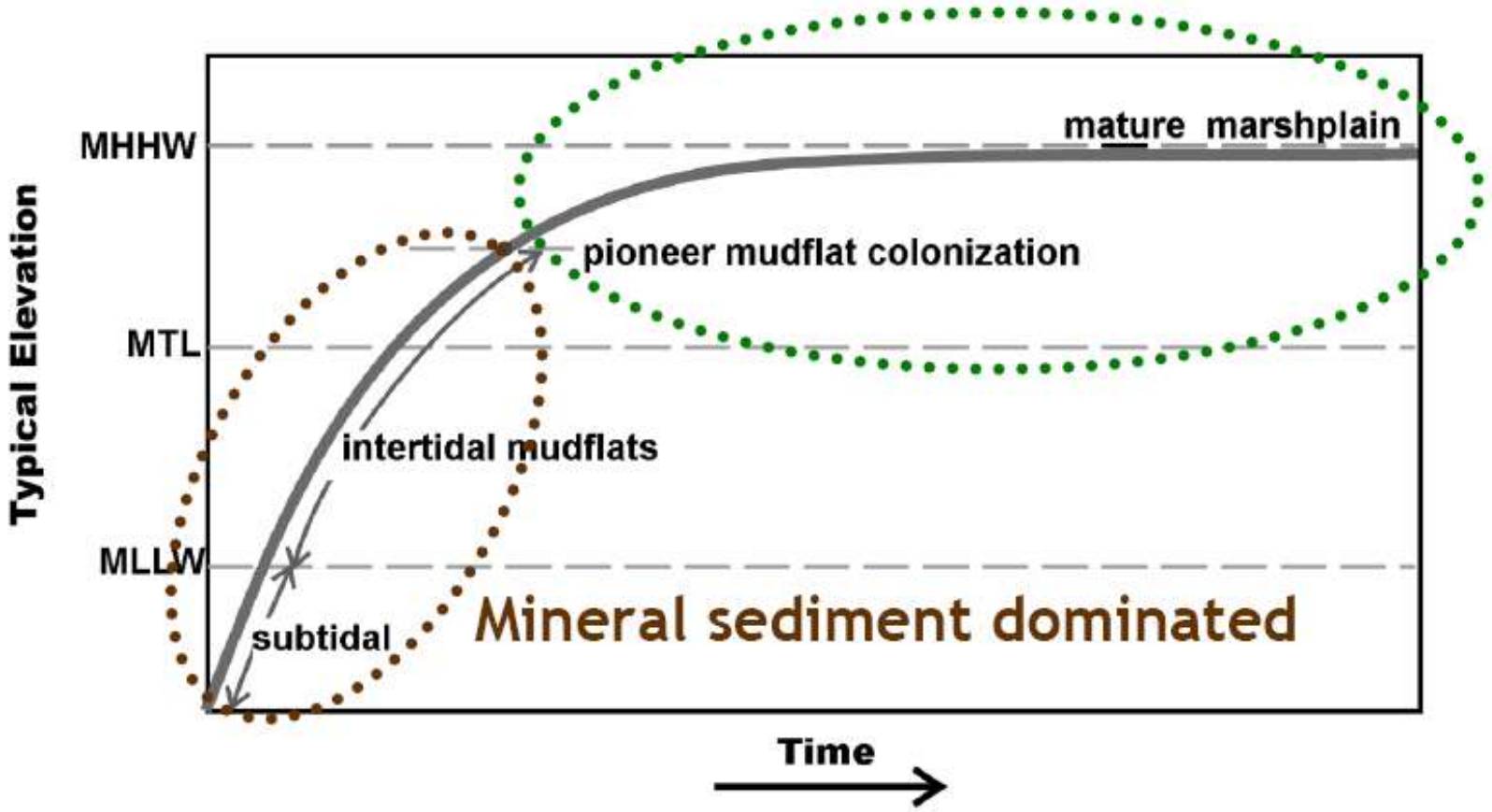
Marsh98 – Bed Accretion Model



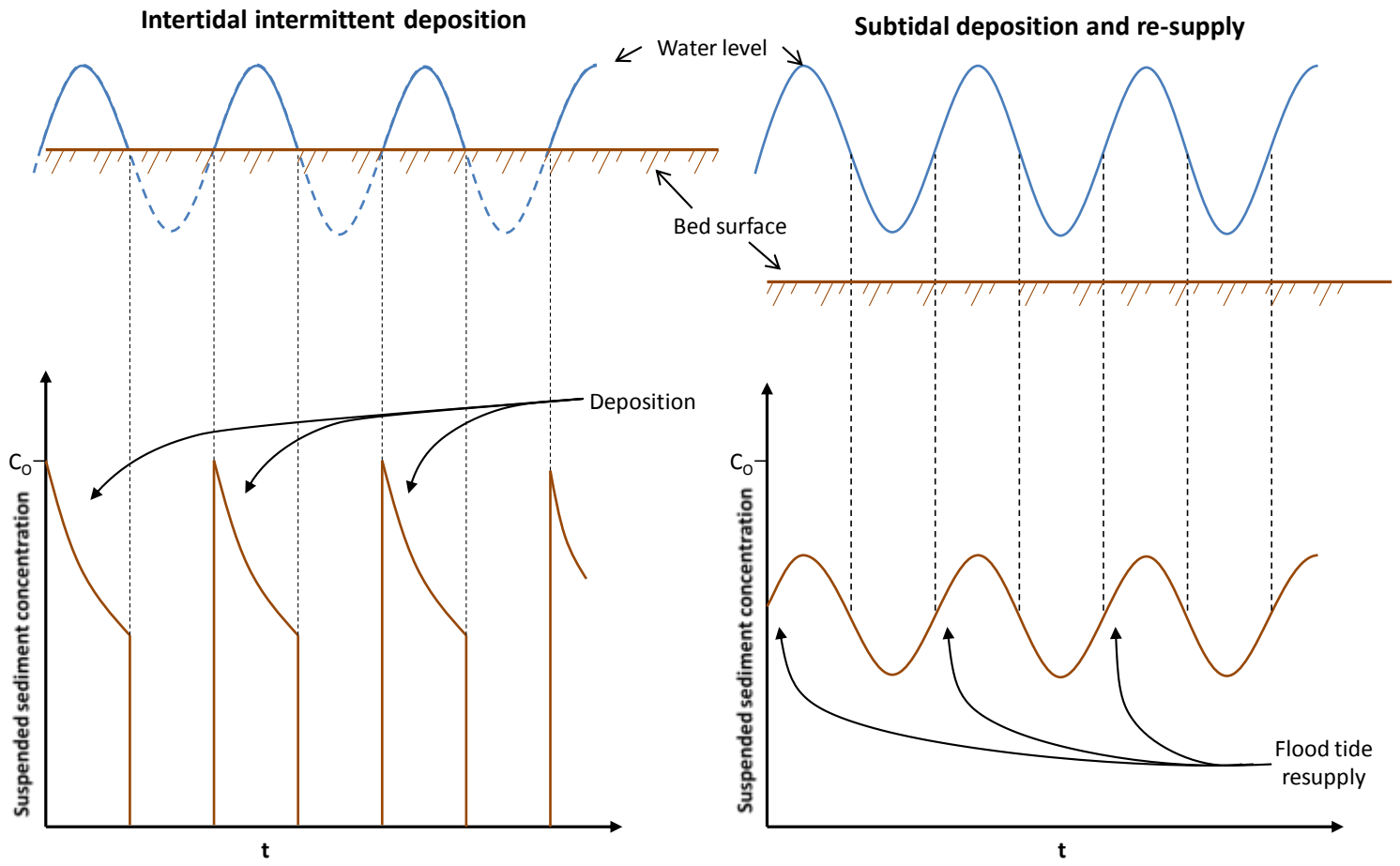


Modeled Bed Evolution

Vegetation & inundation duration dominated

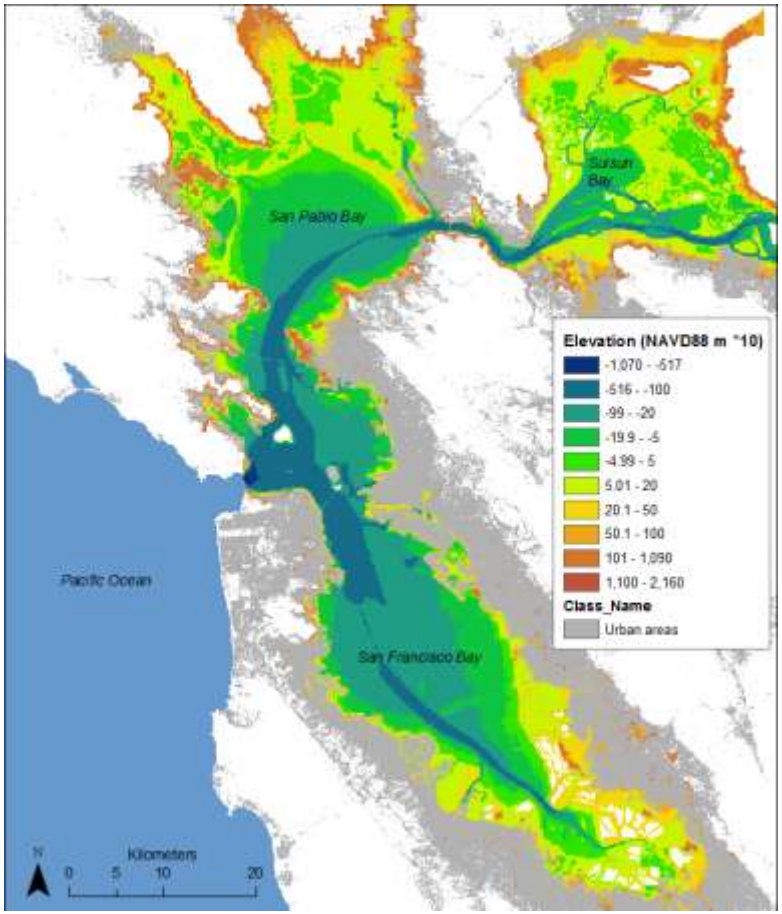


Marsh98 deposition algorithm for intertidal and subtidal bed elevations

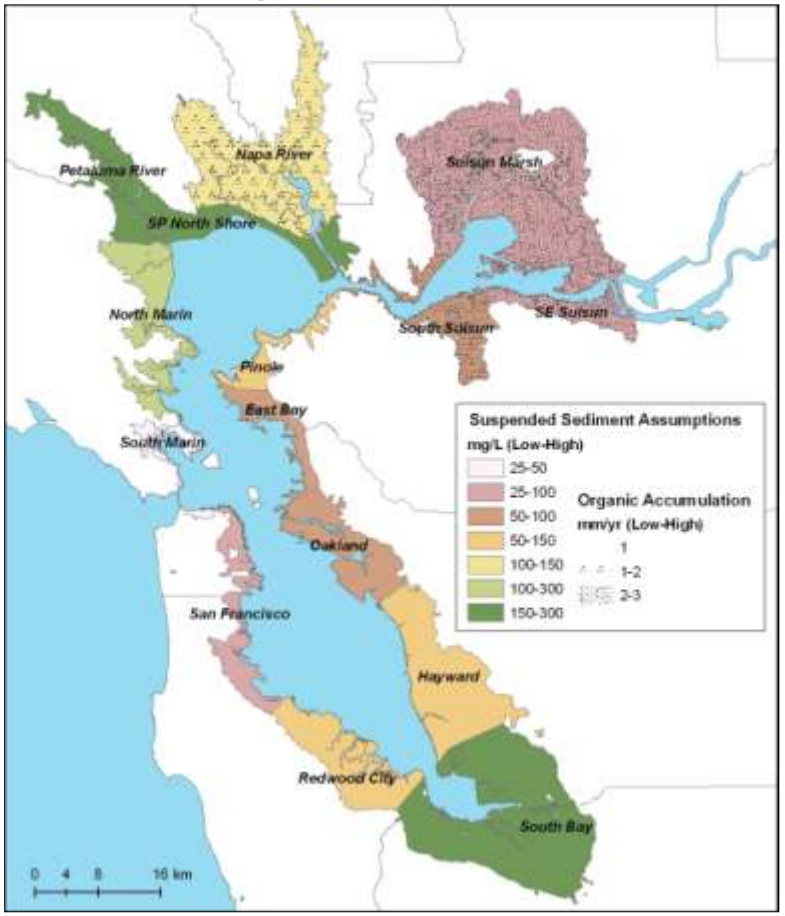


Our Hybrid Approach: Inputs

Base elevation



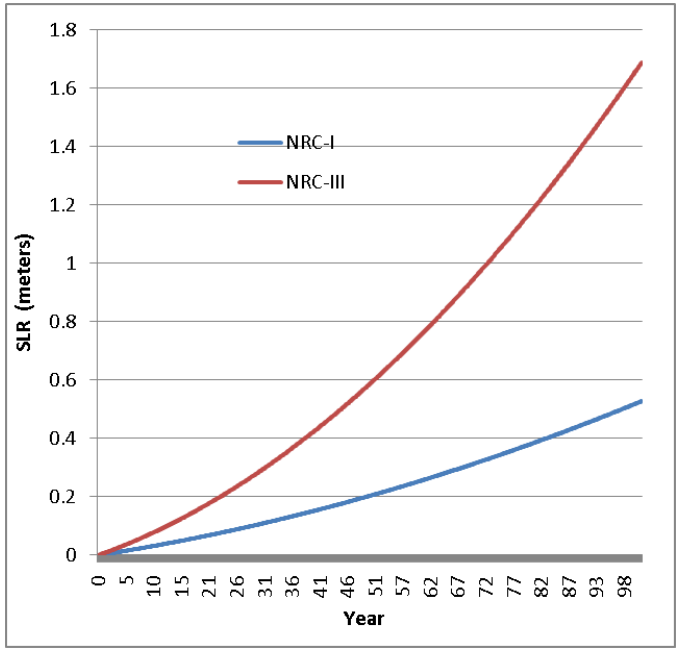
Sub-regional scenarios



Our Hybrid Approach: Inputs

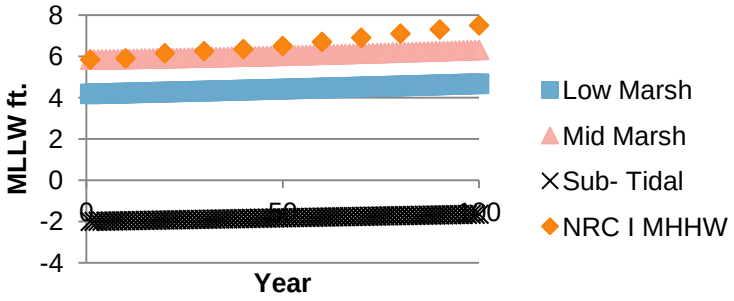
- **Initial bed elevations**
  - Sub-tidal -2.4m MHHW
  - Low marsh -0.5m MHHW
  - Mid marsh 0 m MHHW
- **Two non-linear SLR scenarios**
  - Low = 0.52m/100 yrs
  - High= 1.65m/100yrs

Results were interpolated to other initial elevations in 10 cm increments:

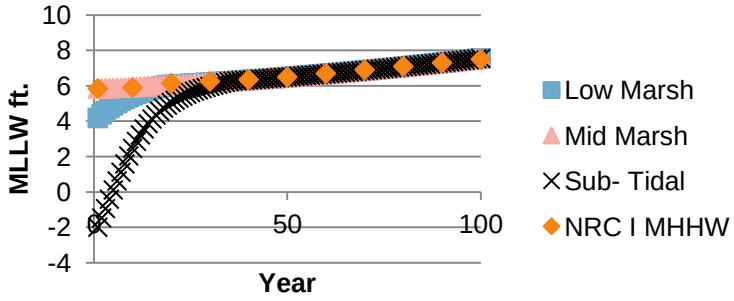


The model is very sensitive to suspended sediment concentrations

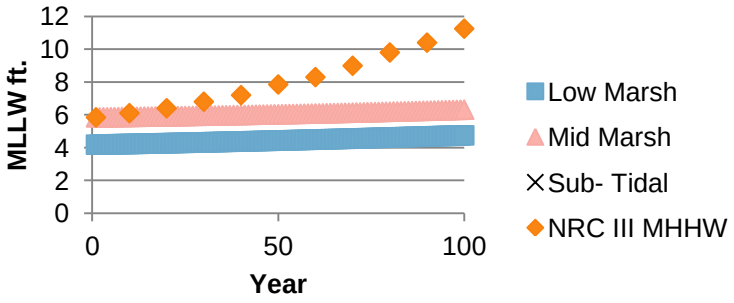
Sediment = 25 mg/L Low SLR



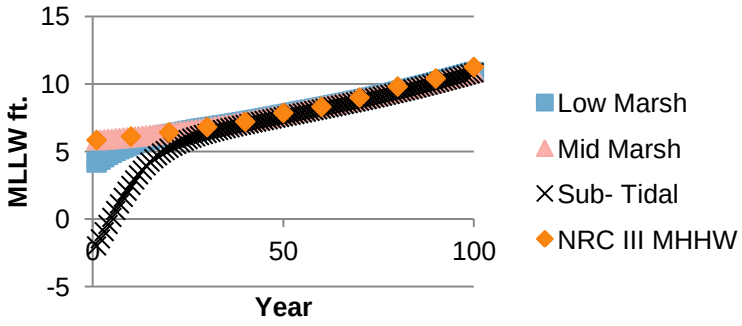
Sediment = 300 mg/L Low SLR



Sediment = 25 mg/L High SLR

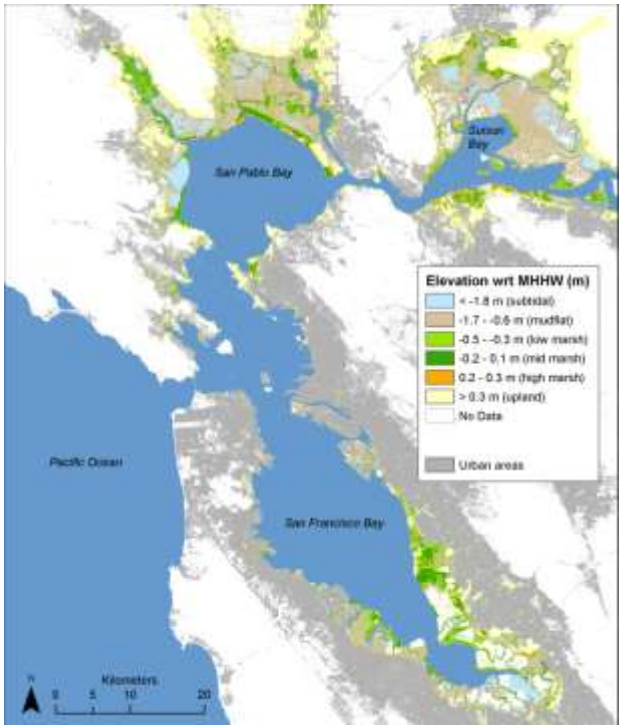


Sediment = 300 mg/L High SLR

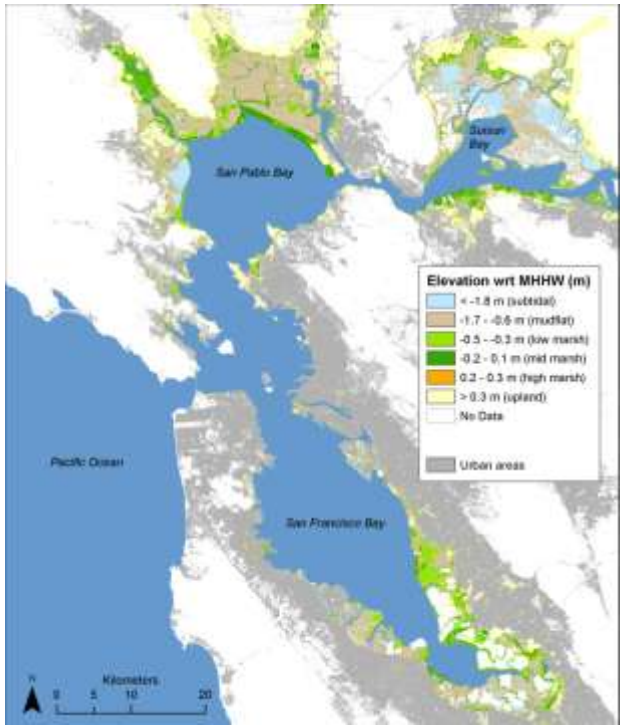


Hybrid results Low sediment/ Low Organic accumulation High SLR

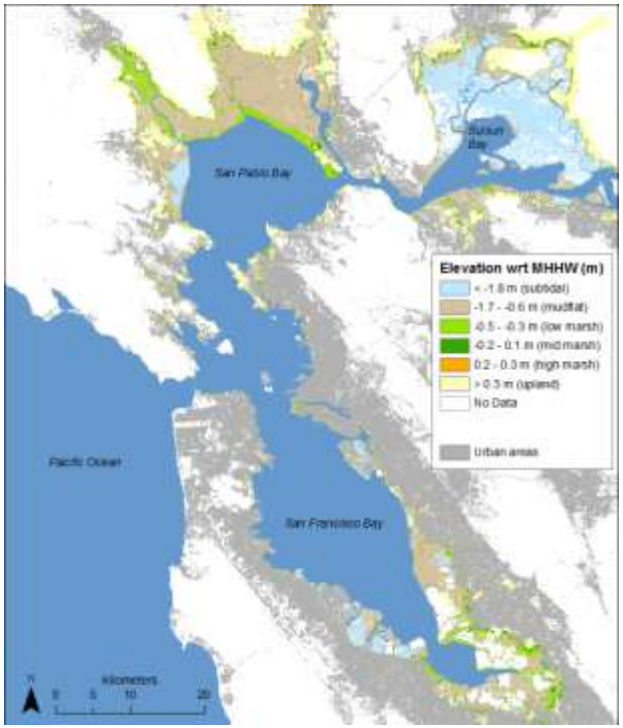
2010



2060

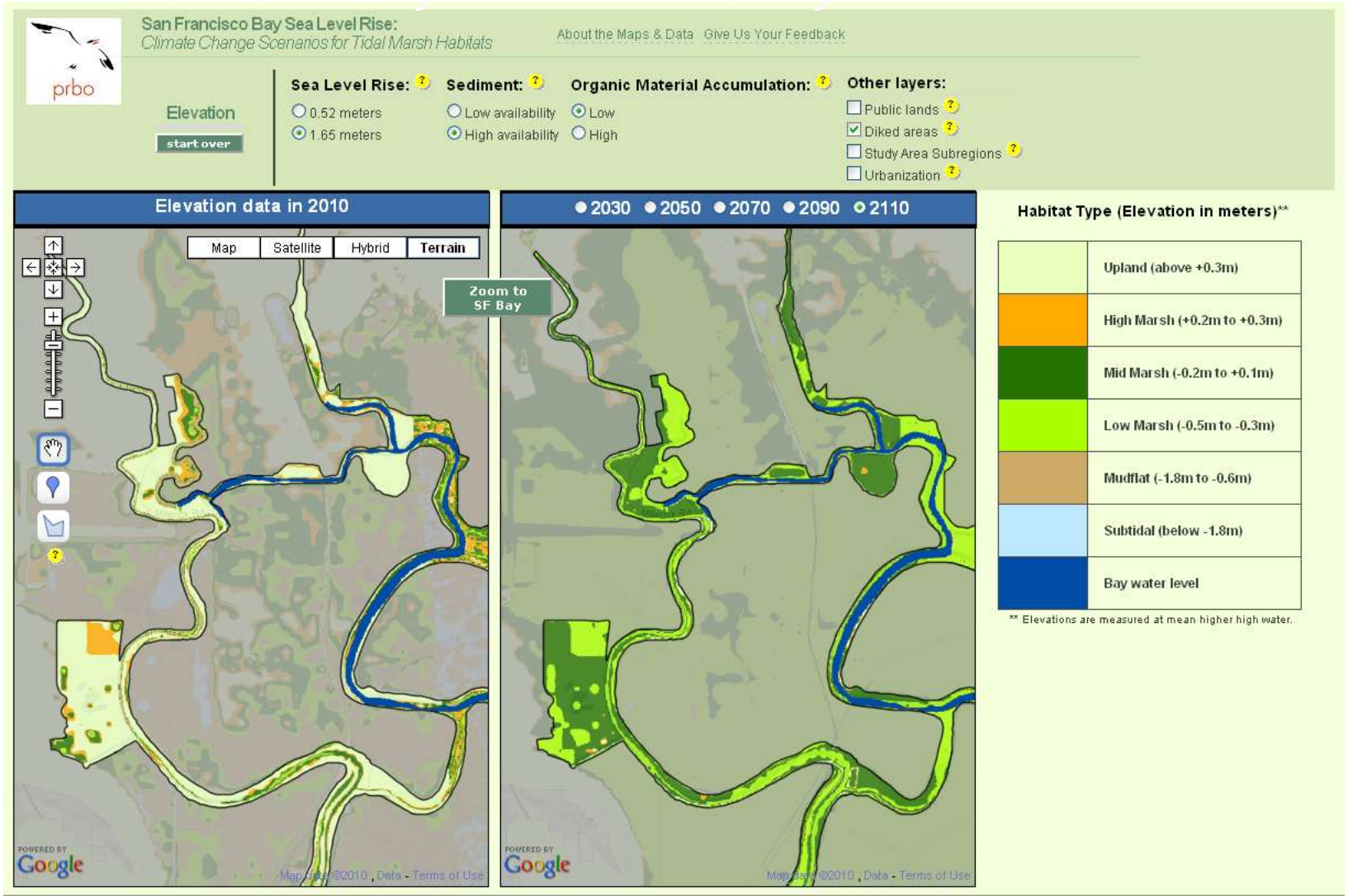


2110



PRBO Conservation Science

PRBO's Sea-level Rise Decision Support Tool
www.prbo.org/sfbayslr



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Rate of marsh accretion: Key assumptions

- Accretion rates are dependent on:
  - Availability of suspended sediment
  - Depth and periods of inundation by high tides