Model Inputs
Tidal extremes and tidal prism changes

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Main program themes:

- Inventory and model baseline data that can be used to interoperate and monitor future changes.

- We believe that mean sea-level rise scenarios do not always evaluate the risk to species completely, that tidal cycles and storm events should be incorporated.

Climate change projections for sea level extremes for CA coast

- Low pressure winter storms can cause ocean surfaces to rise, (one millibar (mb) decrease in pressure = one cm rise in sea level).

- Higher sea levels can also occur due to: precipitation, runoff, seasonal wind patterns, upwelling along the coast, which can enhance storm surge heights if they occur at that time.

- The additive effects of: storms, tides, waves, and El Niño/Southern Oscillation (ENSO) events on sea level can be very large.

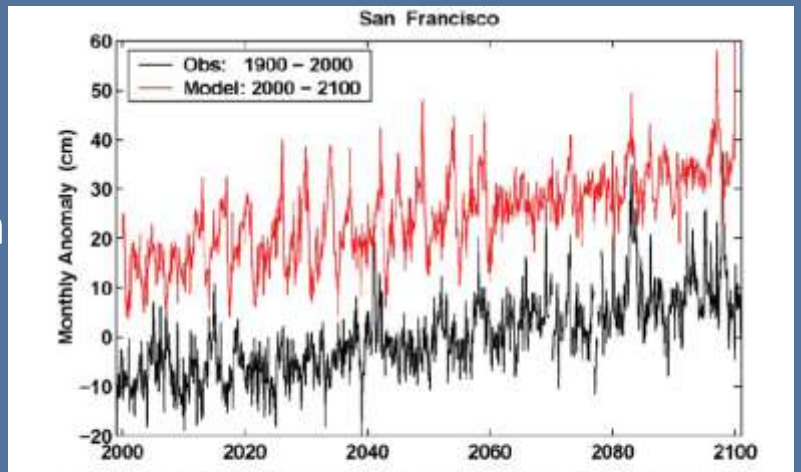


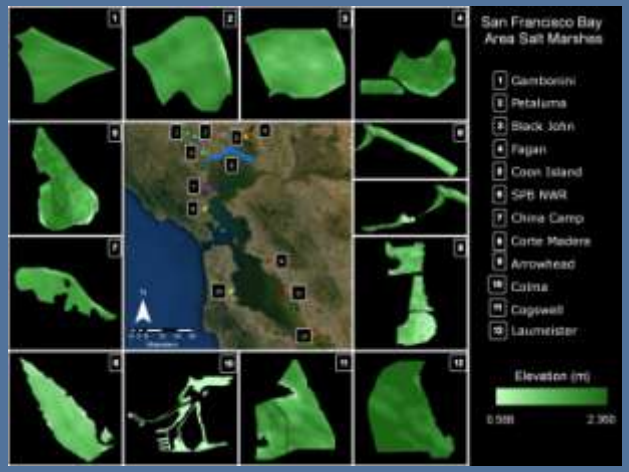
Fig. 5 Model projected (*red*) monthly San Francisco sea level anomalies from mean sea level, for 2000–2100 from GFDL A2 model input with linear trend amounting to 20 cm increase, 2000–2100. Observed (*black*) monthly sea level from San Francisco tide gage (1900–2100) is shown for comparison

(Cayan *et al. Climate Change* 2008)

Model Input

Data: Elevation Survey

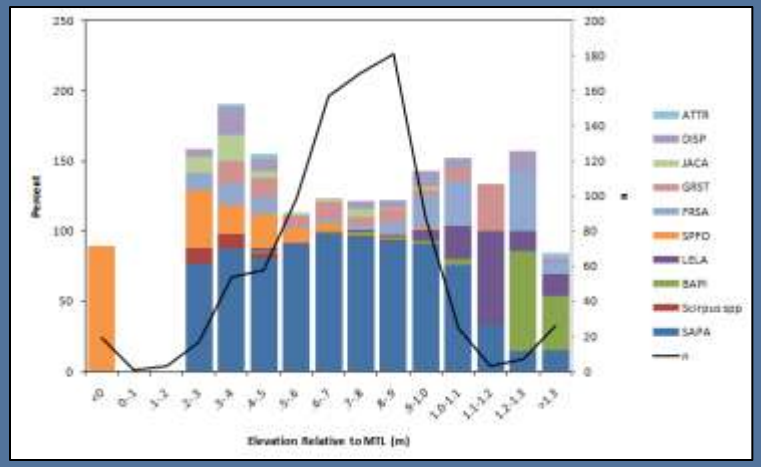
- **Real Time Kinematics GPS Network (RTK GPS) determines x,y,z position (Measured +/- 2.5 cm accuracy). Synthesized to develop elevation models.**



Model Input

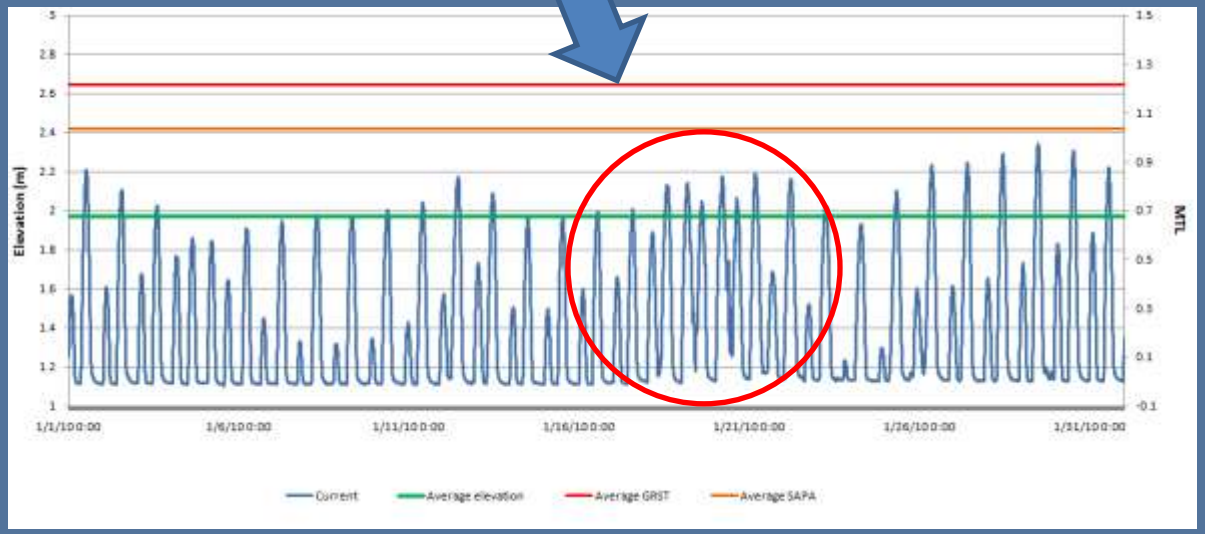
Data: Vegetation Survey

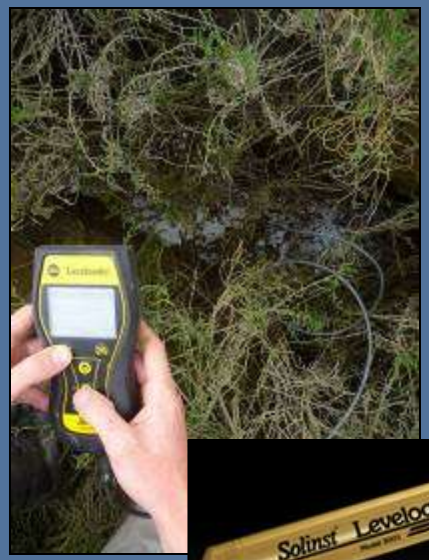
- **Vegetation data collected at 50% of elevation points.**
- **Data collected include: species, percent cover, max and average heights.**



Model Input

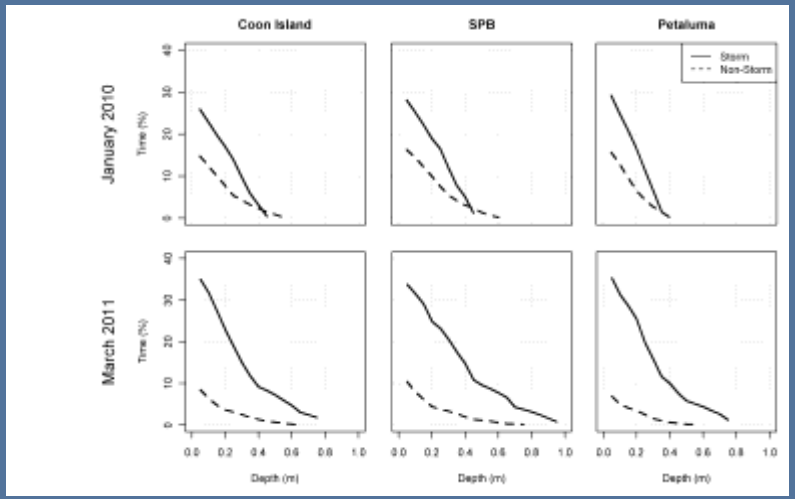
Data: Water level logging





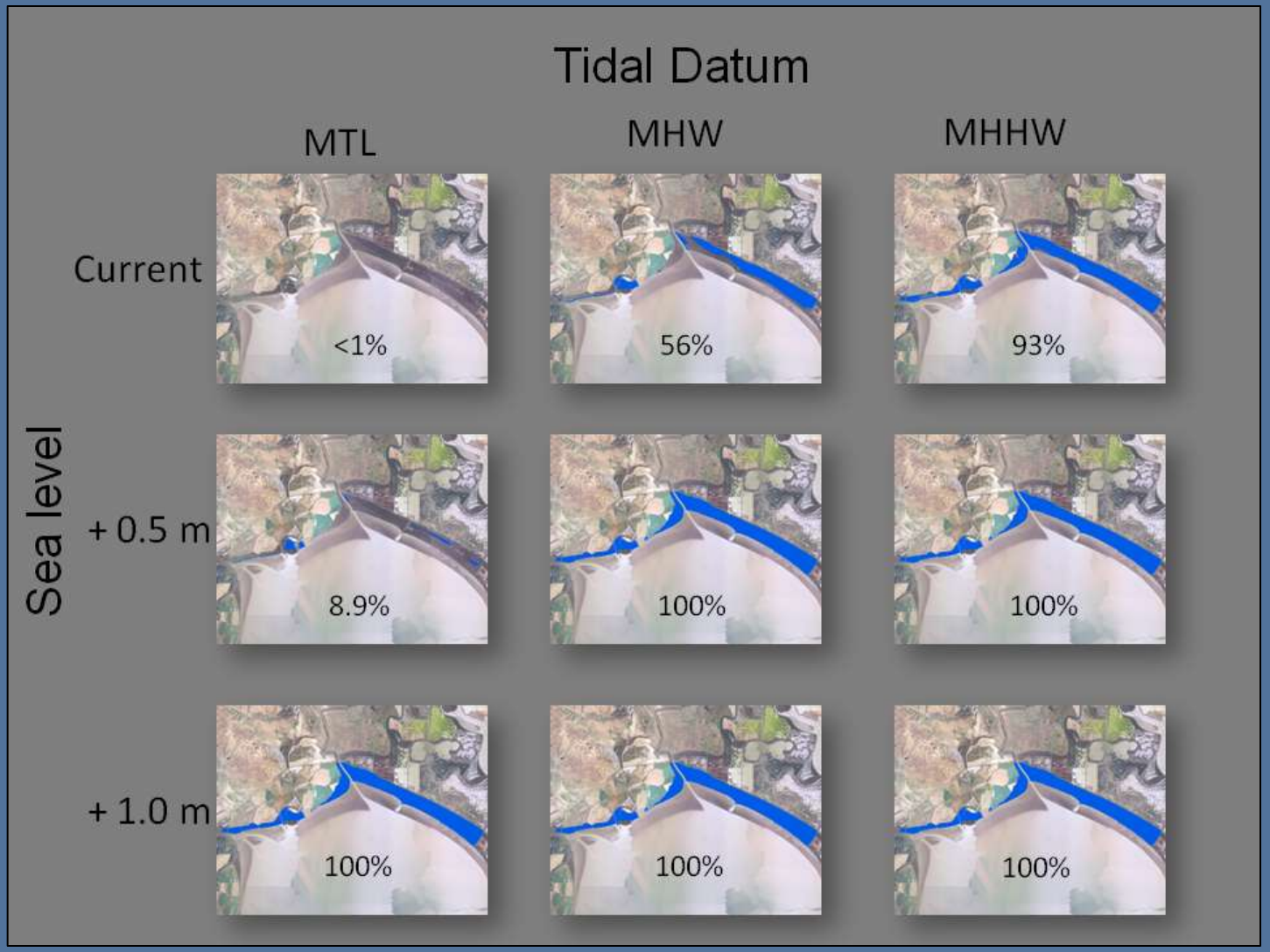
January 2010 and March 2011 Storms

- **March 2011 storm had over 90% of the vegetative habitat under water during the Max SLH at all sites.**
- **Mean higher high water (MHHW) and maximum sea level height (SLH) were determined from water level loggers deployed in 2nd order channels.**



Site	January 2010			March 2011		
	MHHW Non-Storm	MHHW Storm	Max SLH Storm	MHHW Non-Storm	MHHW Storm	Max SLH Storm
Coon Island	40.88	55.95	65.41	7.46	80.94	93.59
Petaluma Marsh	46.58	73.90	78.52	15.55	92.85	97.78
SPB	54.27	65.46	72.23	23.45	90.00	95.85

Example: Using tidal datum in sea-level rise modeling



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