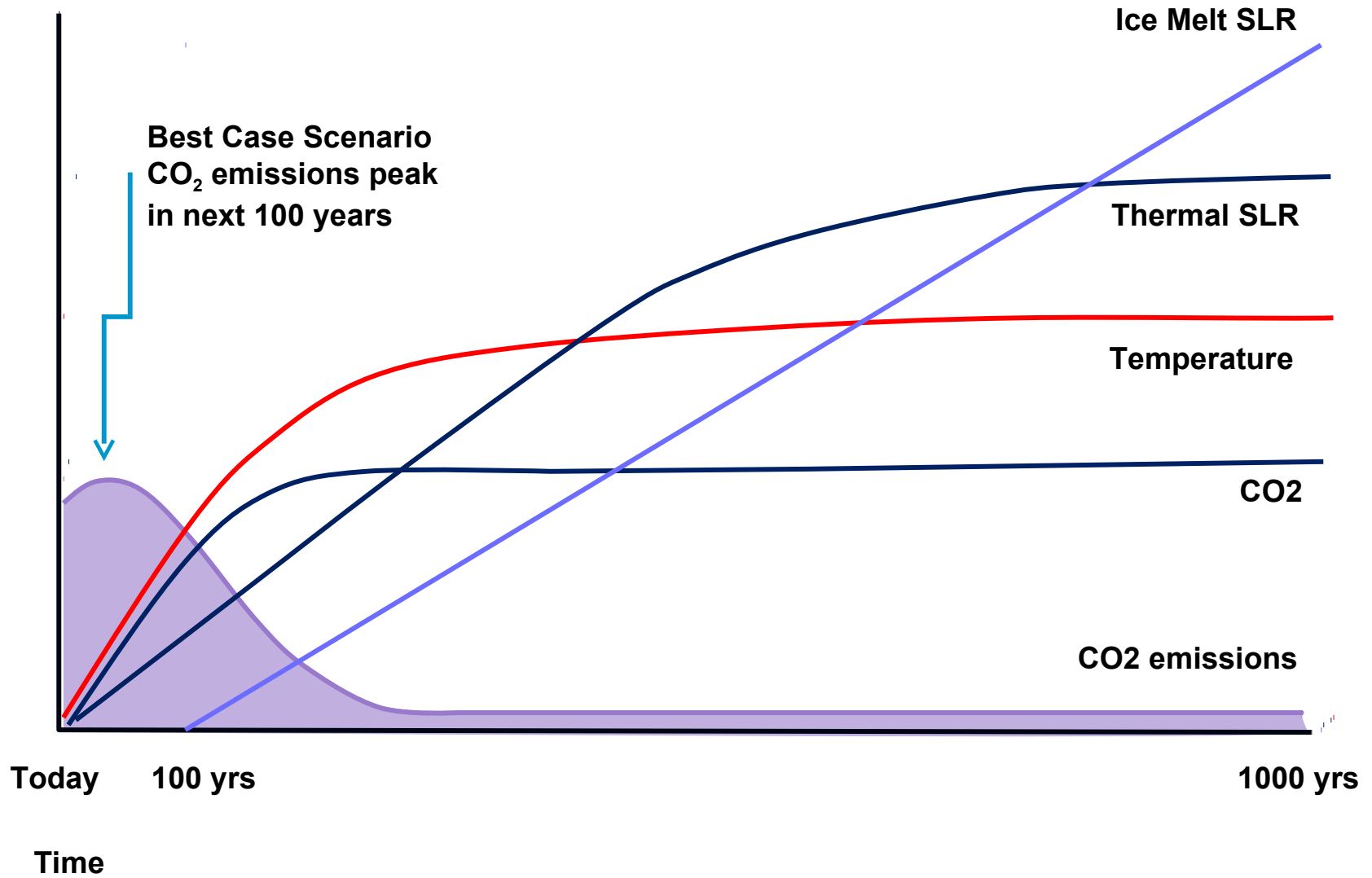


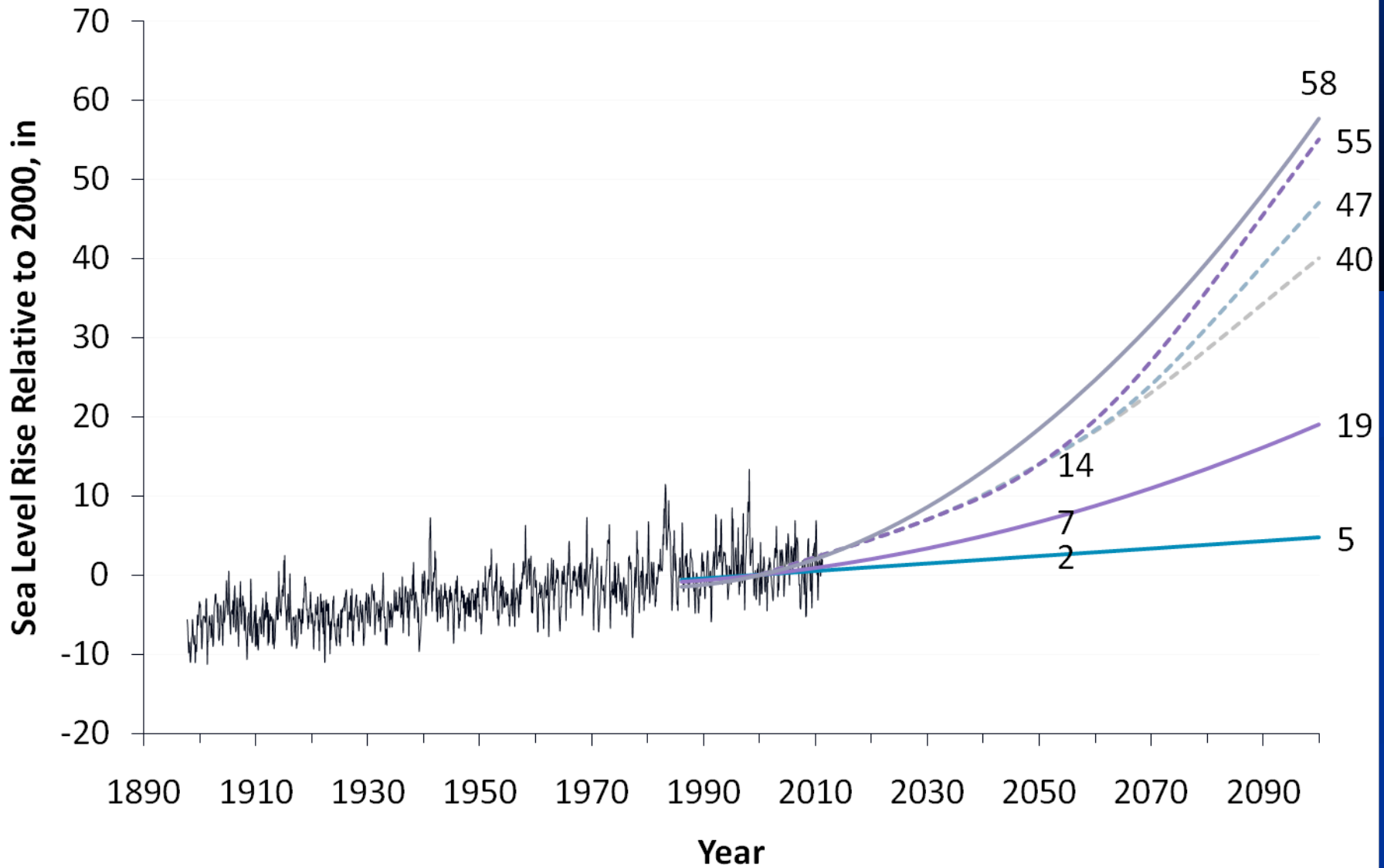
PREPARING FOR SEA LEVEL RISE ALONG NORTH SAN PABLO BAY

**Highway 37 Stewardship Study Meeting
July 19, 2011
Jeremy Lowe, ESA PWA**

Magnitude



Sea Level Rise - USACE (2009) Circular 1155-2-211
OPC Resolution March 11, 2011





**2000 -
0 in**



2050 14 in



**2100 55
in**



2100+ ??
in

Uncertainty

- Confidence in long-term projections
- Not seen as a big problem yet
- Will uncertainty reduce in the future?
- Lack of useful precedents
- Lack of acceptance/understanding of risk

What if the projection is wrong?

What if the projection is right?



6.5ft NAVD - King Tide, January 2011

5.9ft NAVD – MHHW

0.6ft increase ~ 2010 - 2030



Photo: Mark Songey, 02/17/11



Photo: Heidi Nutters, 11:30am, 02/17/11

Overtopping



Frank's Dump West - New Year's Eve 2005
8.9 ft tides; 40mph westerly winds

Photo: Mark



Flooding



Crossing of Sonoma Creek & Hwy 121
New Year's Eve Storm 2005

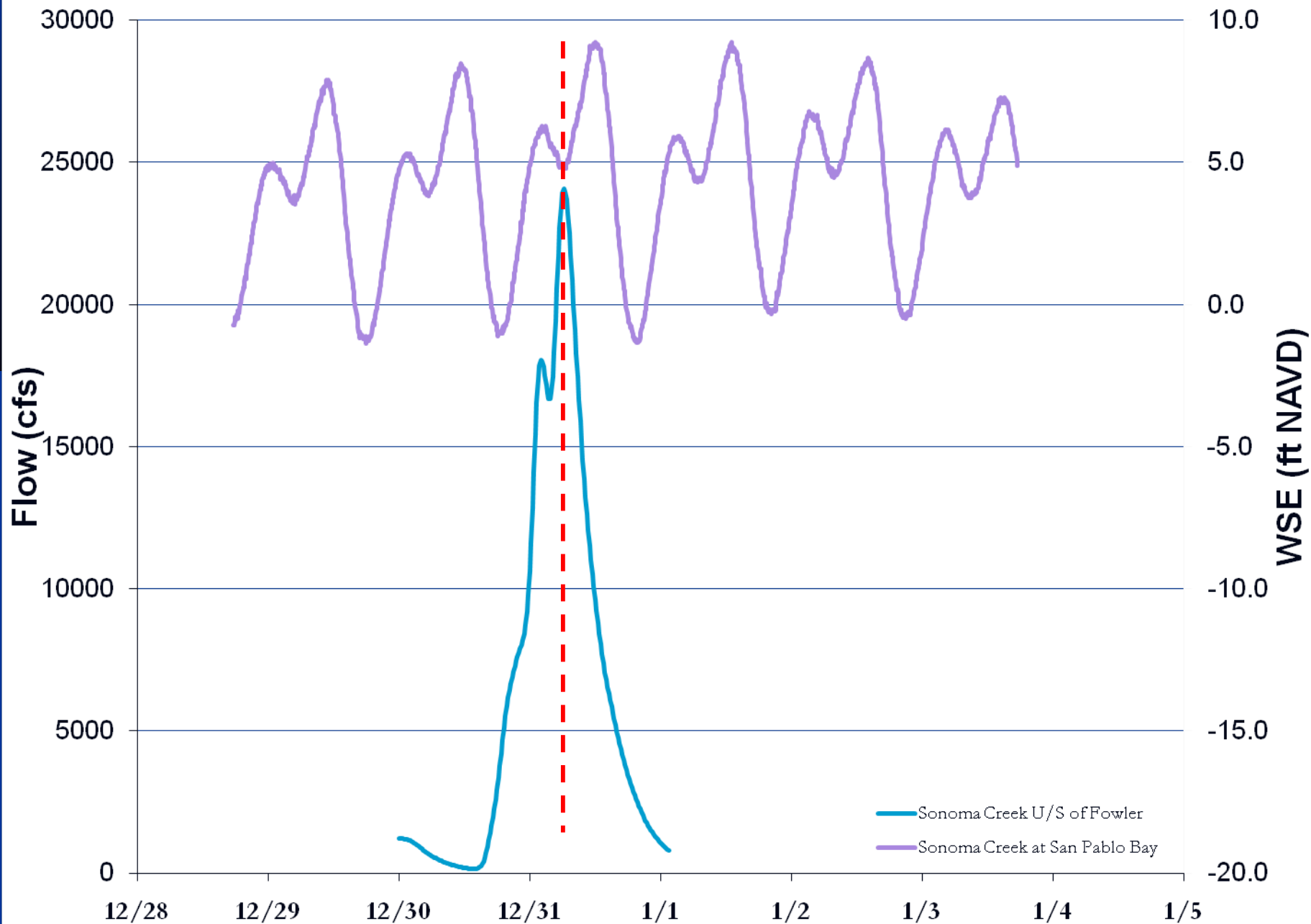
Photo: Betty

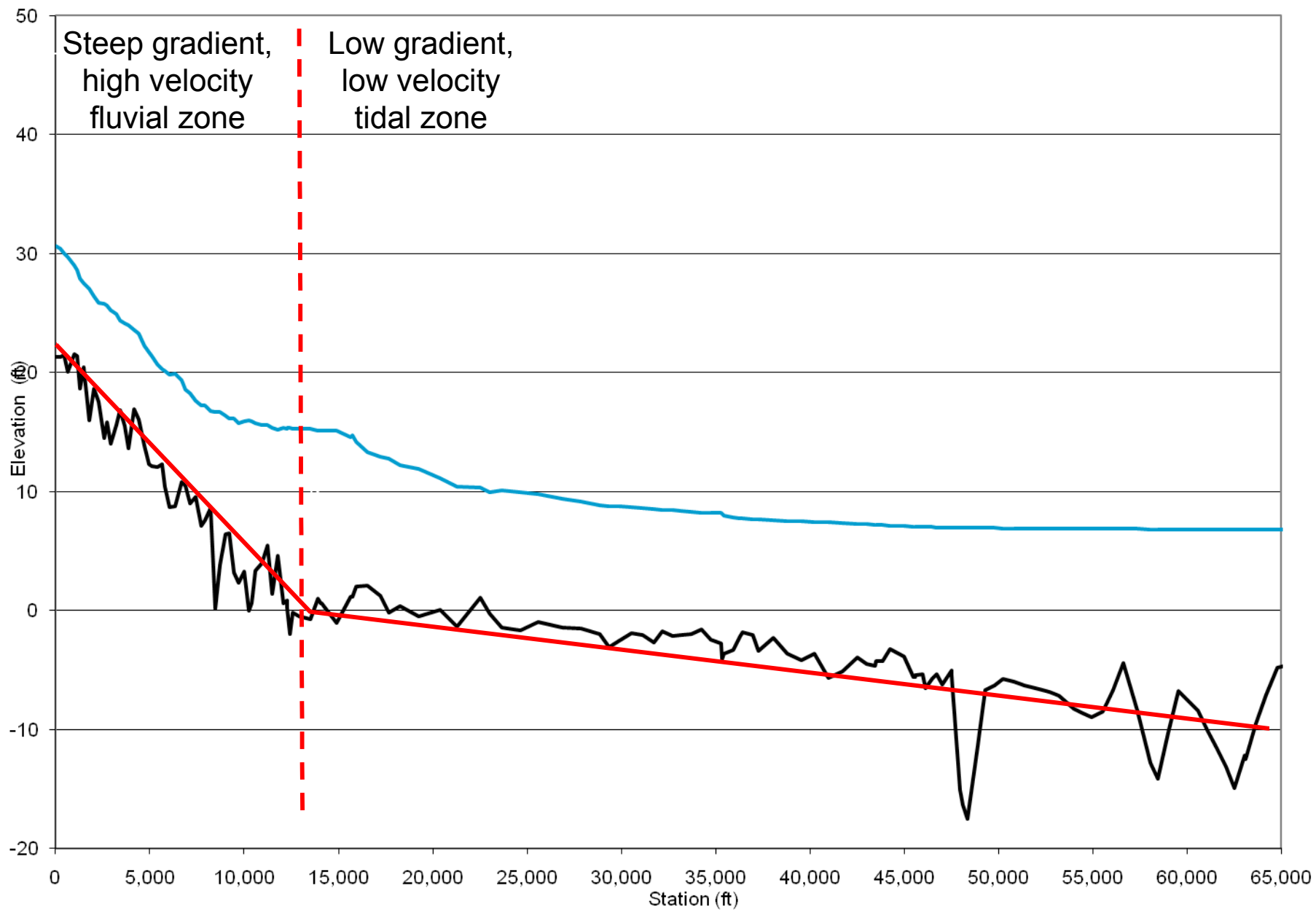
Erosion

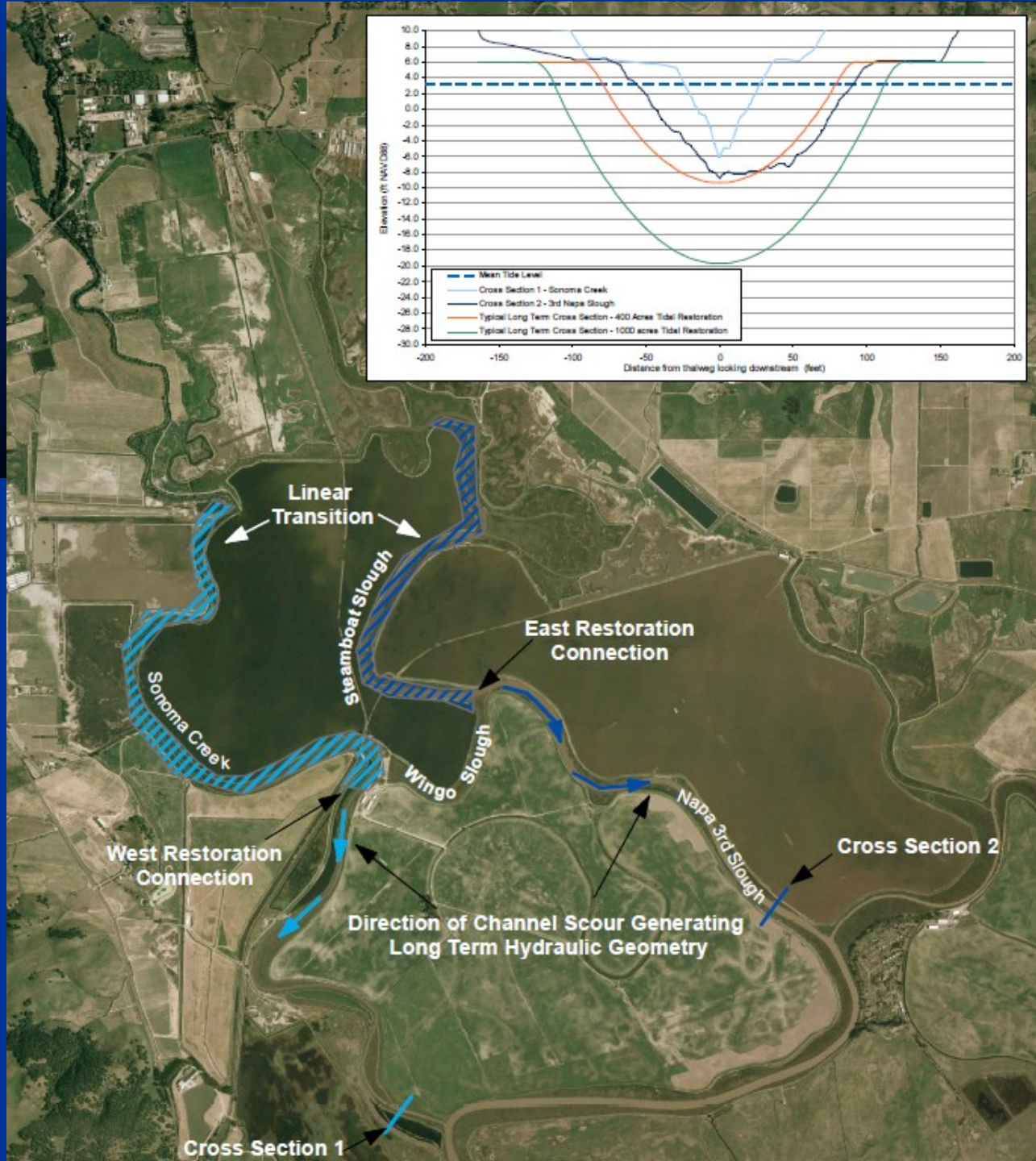
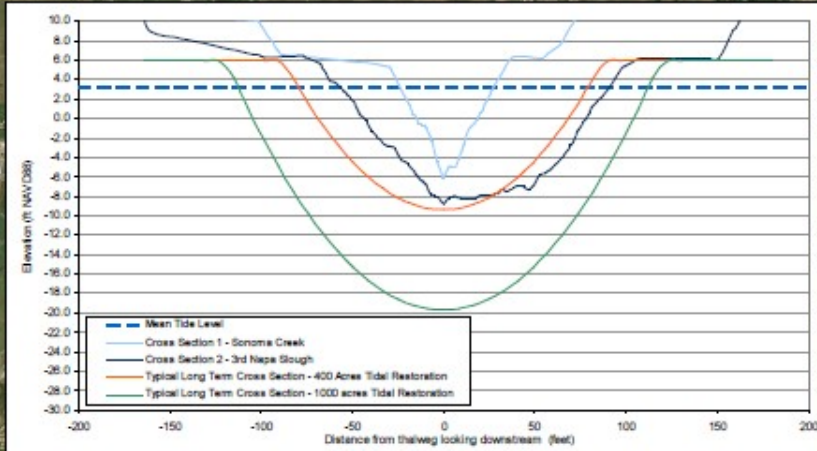


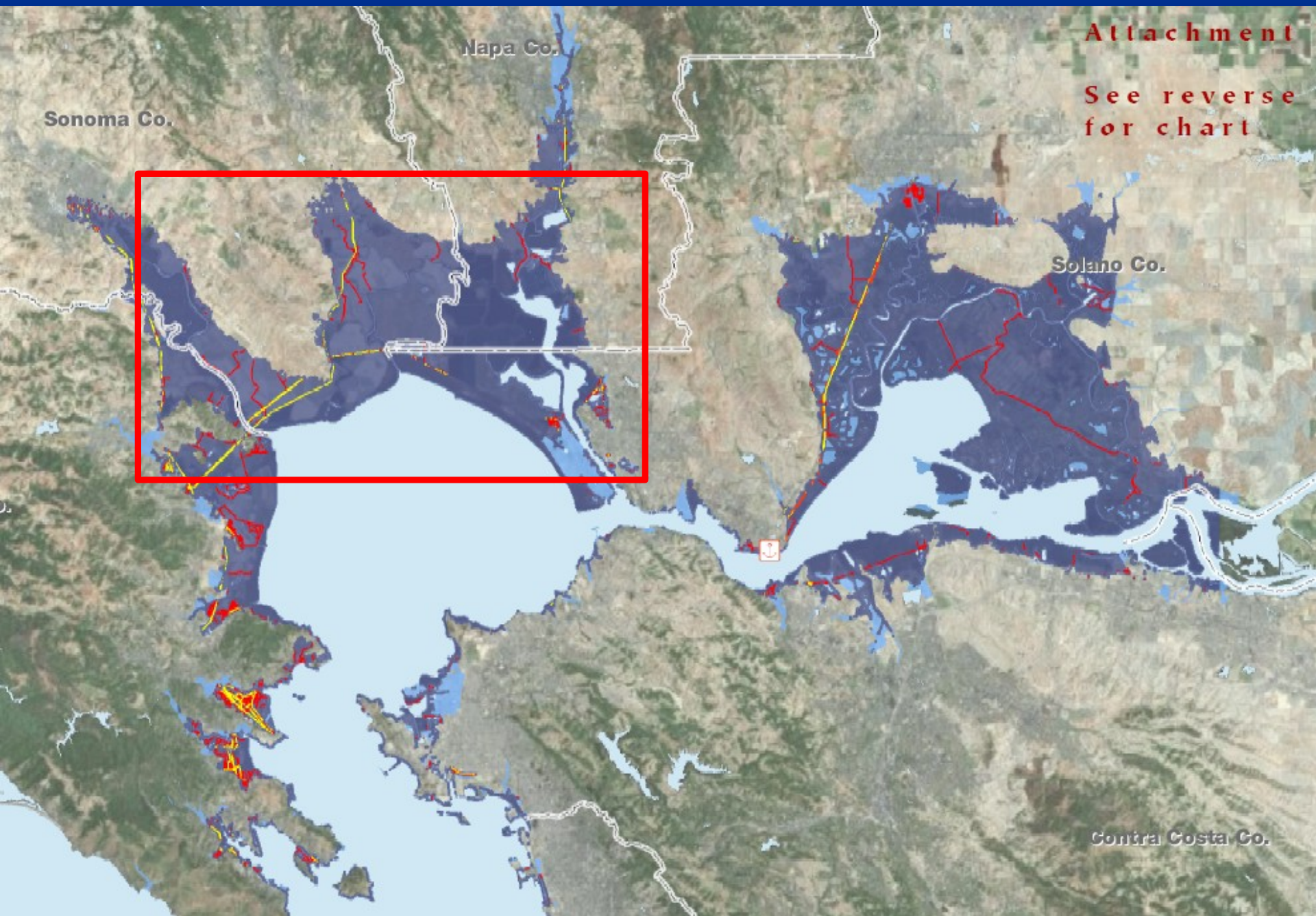
Crossing of Sonoma Creek & Hwy 121
New Year's Eve Storm 2005

Photo: Sonoma









Attachment

See reverse
for chart

Year 0 (Current Conditions)

— Levees and Roads

Elevation (m) relative to MHHW

< 2 m (subtidal)

-2 - -0.6 m (intertidal mudflat)

-0.6 - -0.2 m (low marsh)

-0.2 - 0.2 m (mid-high marsh)

> 0.2 m (upland)

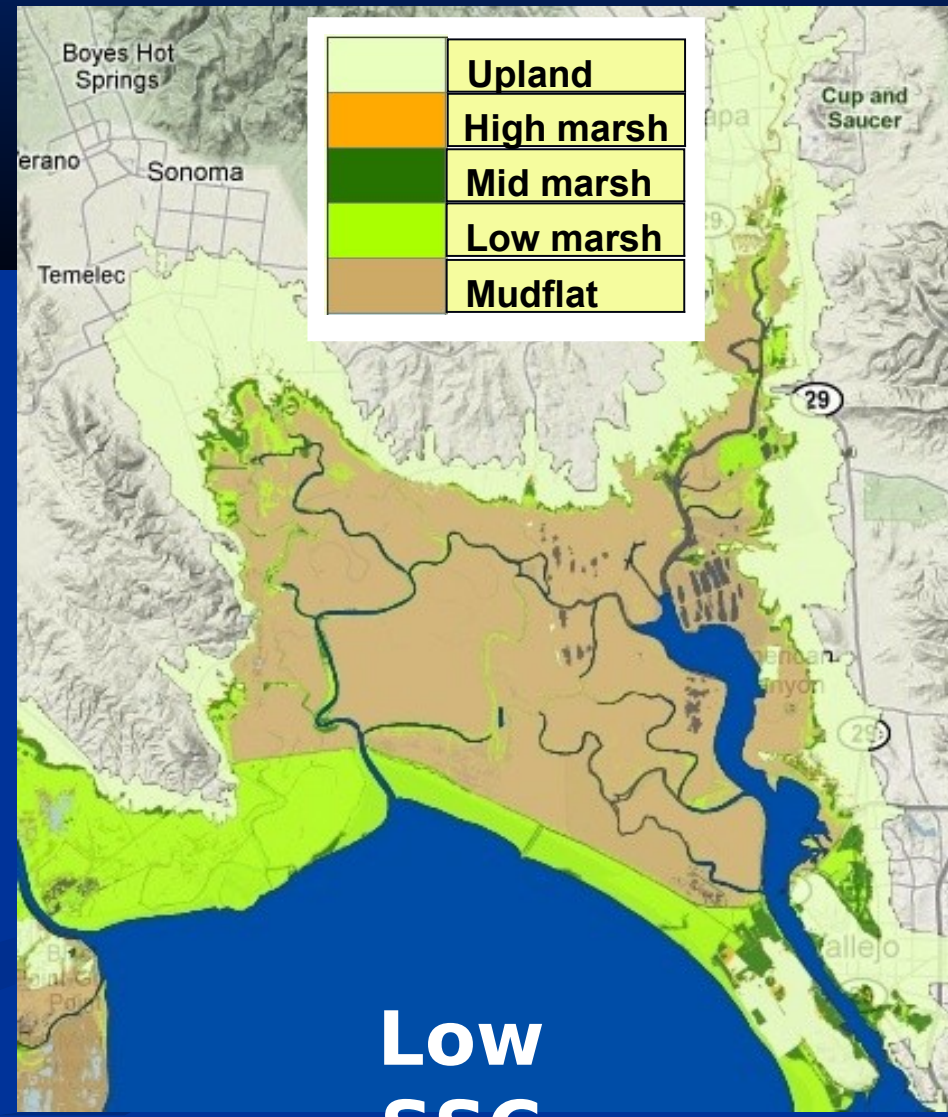
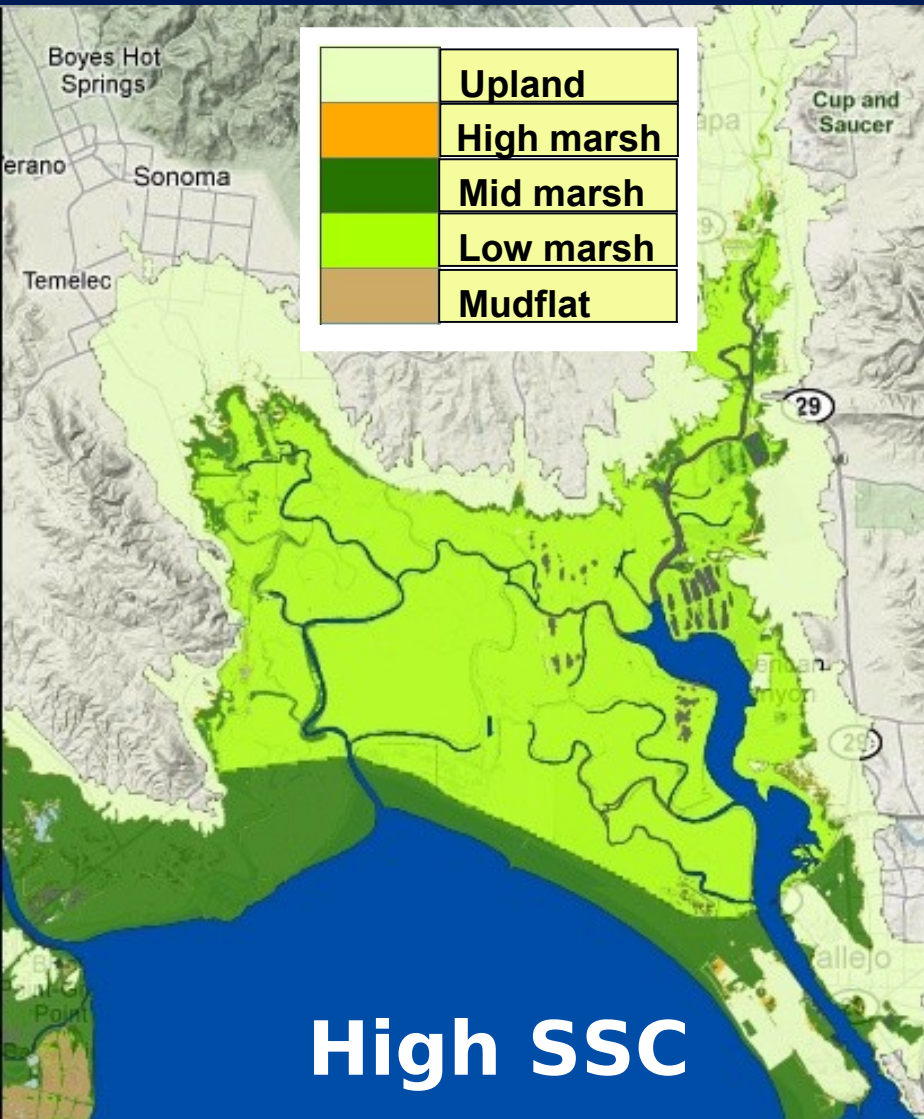
No Data

Diked Areas

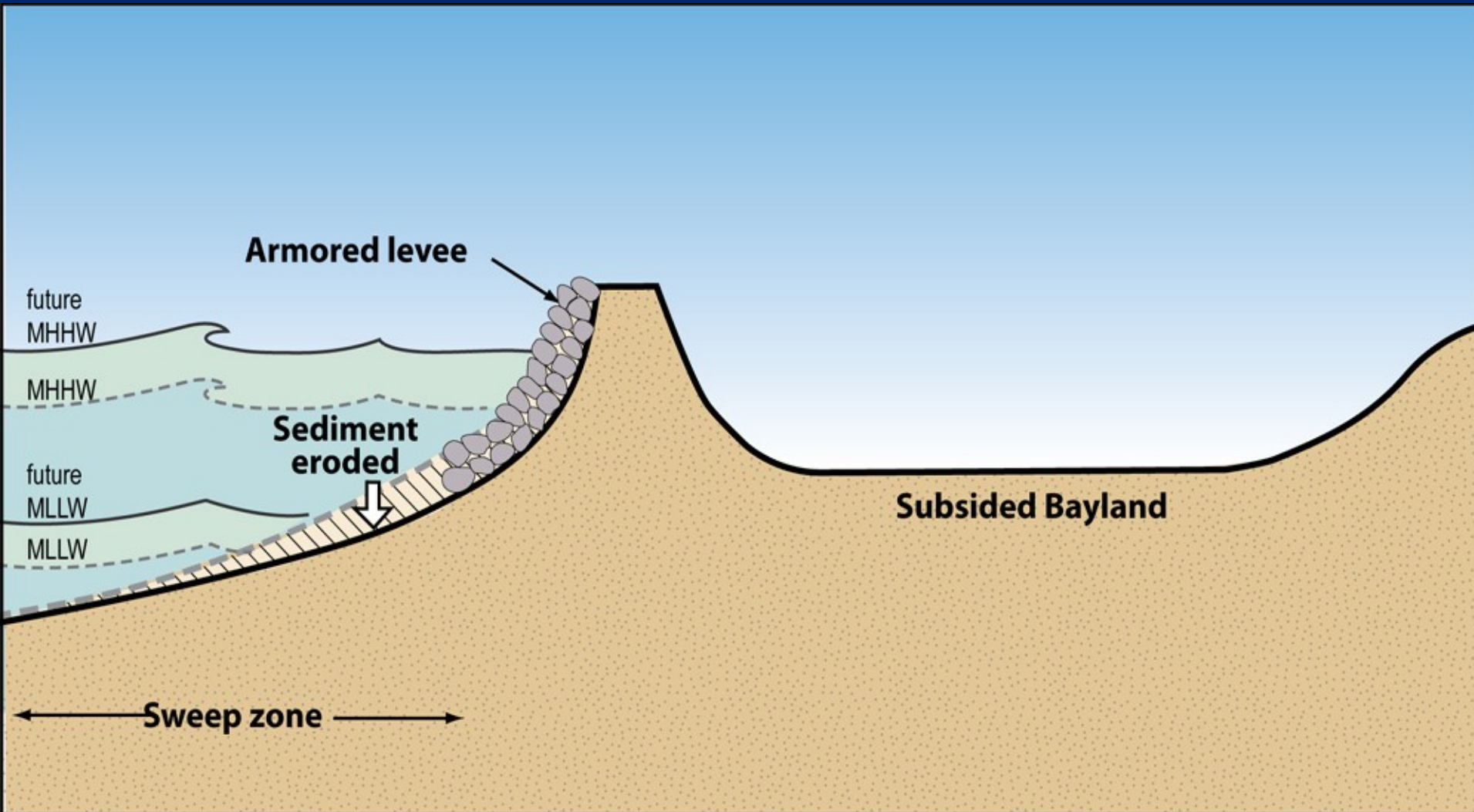
Developed Areas



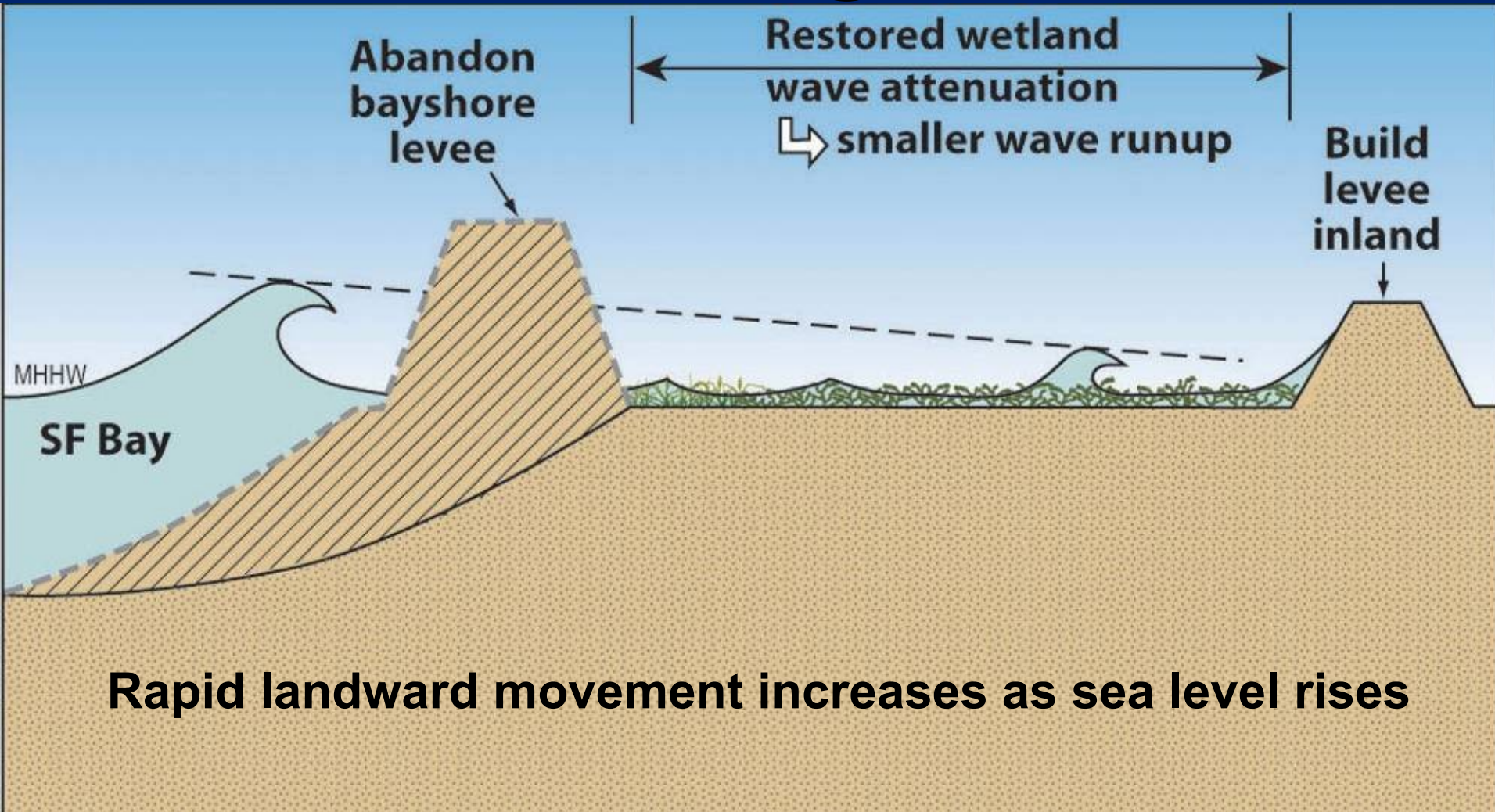
High SLR Scenario (NRC-III) 2110



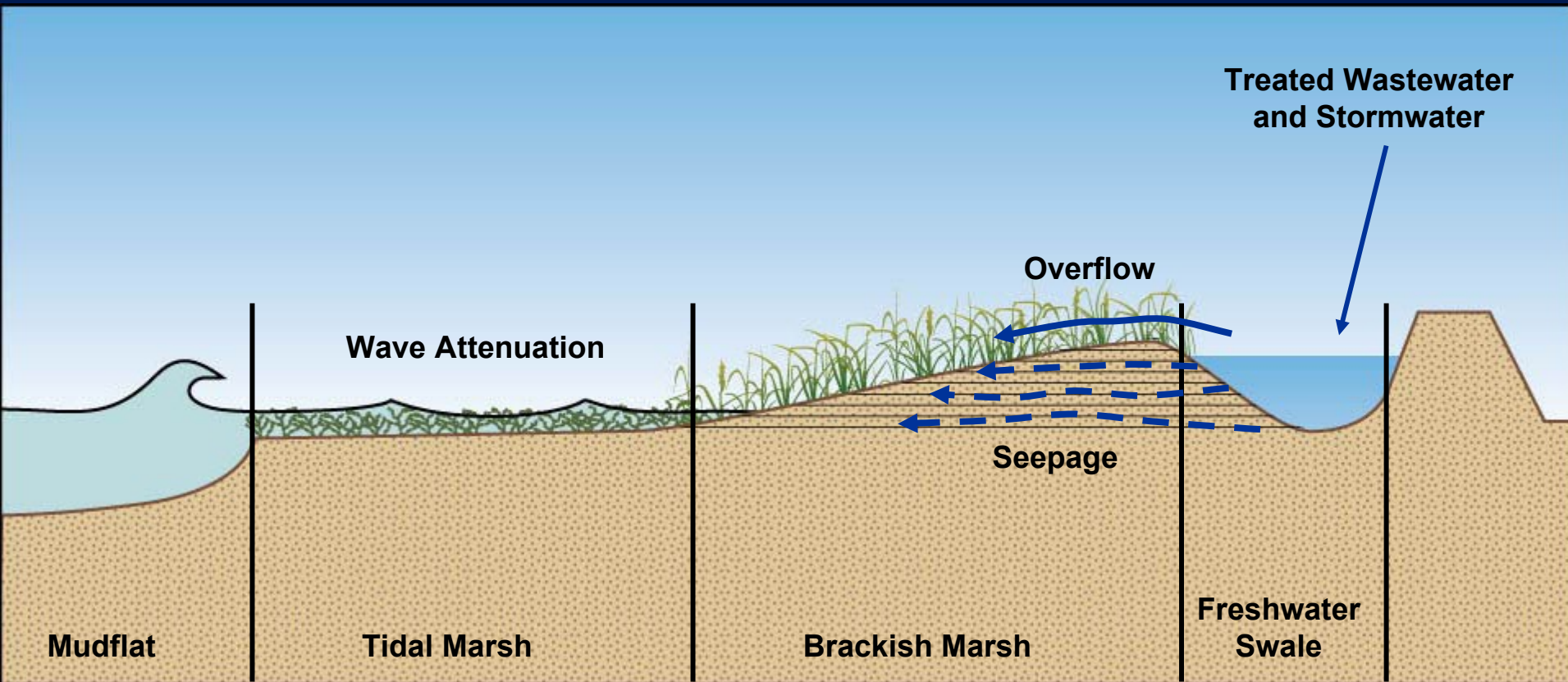
Hold the Line



Realign



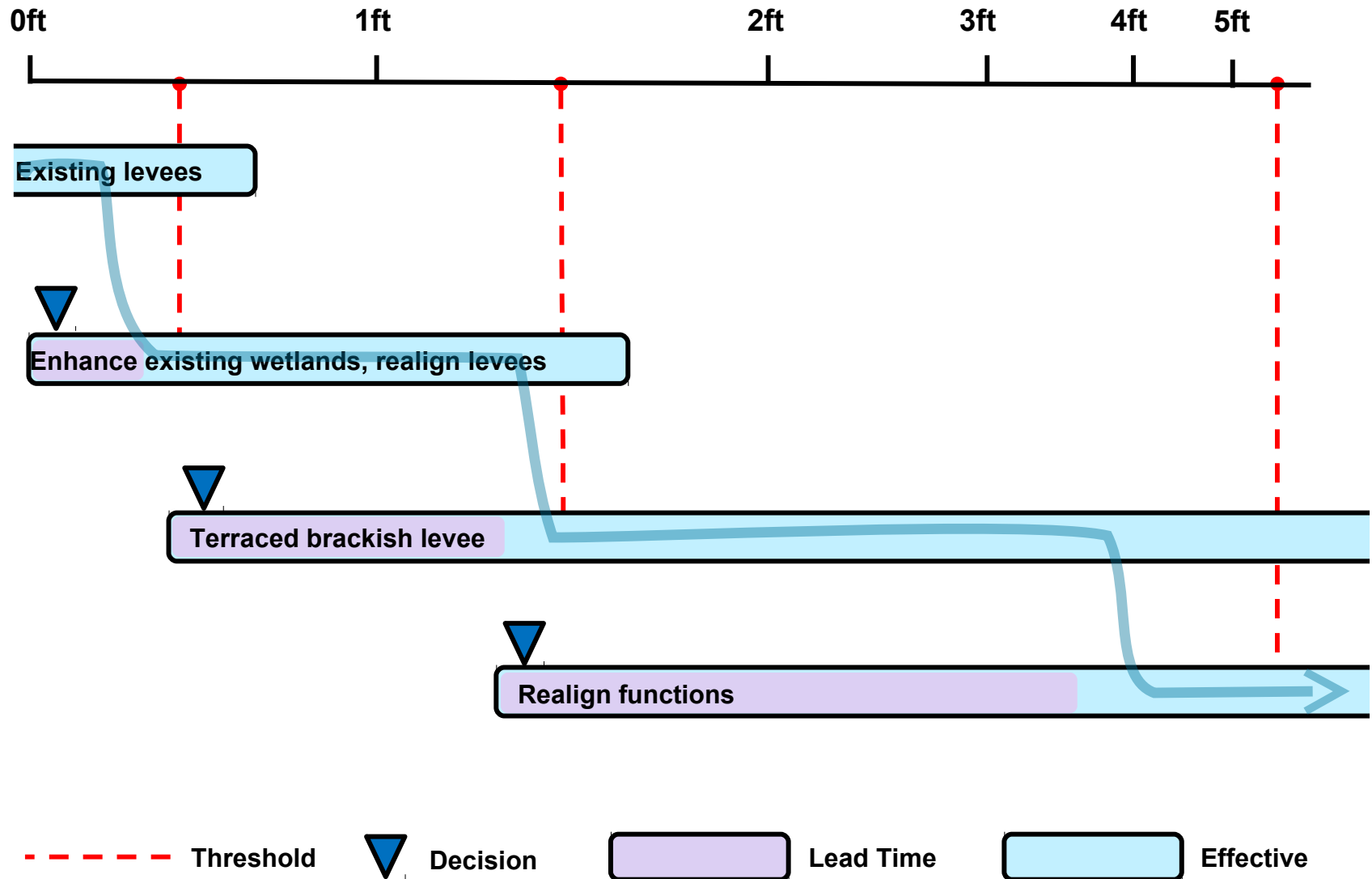
Terraced Brackish Levee



Constraints

- Limited understanding of climate change
- Lack of supportive policies
- Lack of appropriate measures
- Existing regulations
- Cost
- Social/financial rigidity and conflicts
- Short-term planning horizons

An Adaptation Strategy?



Next Steps

- Understand vulnerabilities and thresholds
- Focus on priority climate risks
- Balance both climate and non-climate risks
- Look for low regrets and win-win options
- Avoid actions that limit future options
- Use adaptive management to cope with uncertainty
- Monitor the effectiveness of decisions
- Work together

Not an Adaptation Strategy



San Pedro Road, China Camp - January 2010 spring tide
Photo: Peter