

Goat Rock Beach Jetty Feasibility Study

Matt Brennan, PhD, PE

Dane Behrens, PhD, PE

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Monte Rio Community Center

National Marine Fisheries Service (NMFS) 2008 Biological Opinion (BO) Estuary Management Objectives

During the dry season (May 15 – October 15)

Less of this...



More of this...



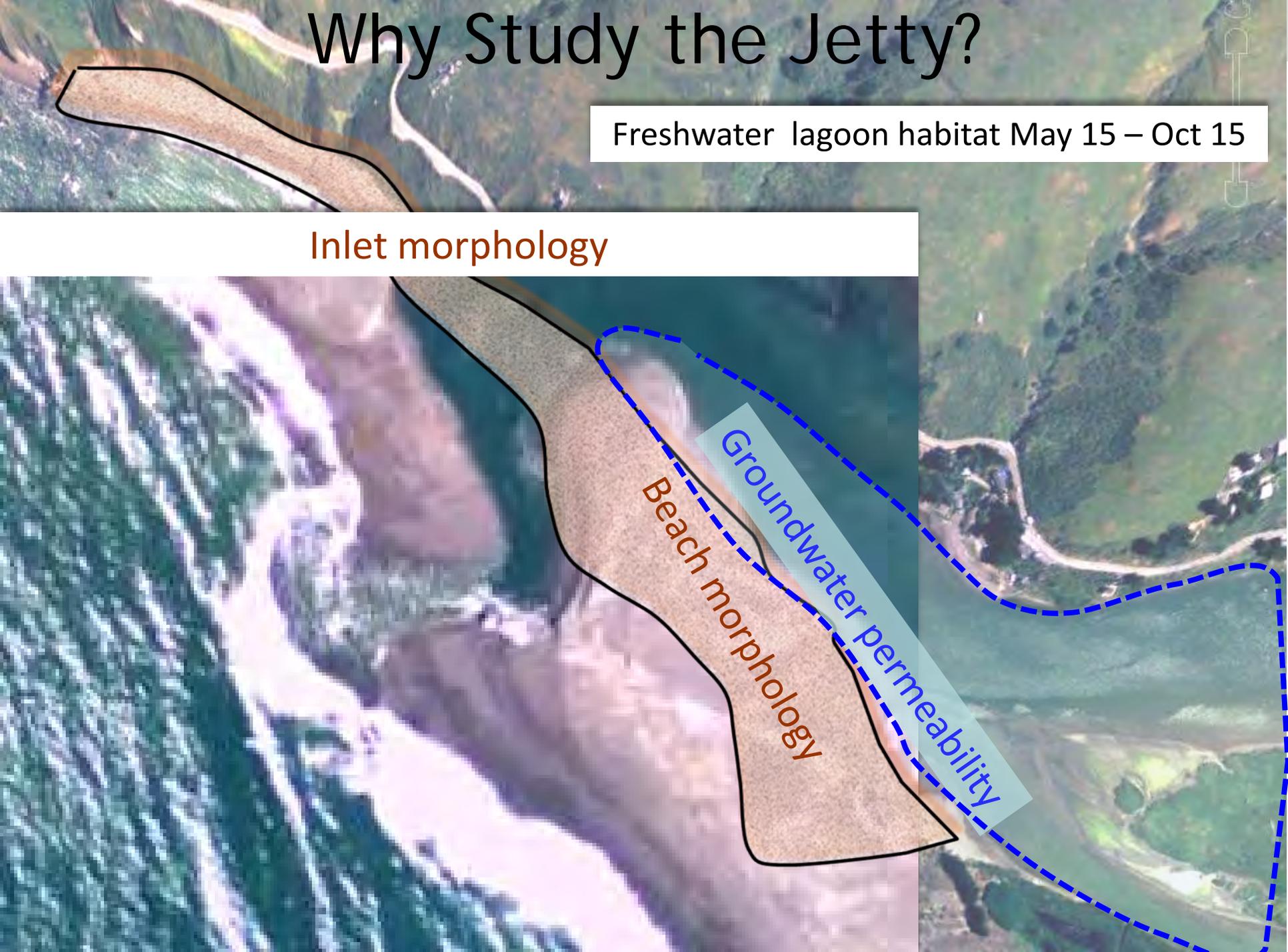
Why Study the Jetty?

Freshwater lagoon habitat May 15 – Oct 15

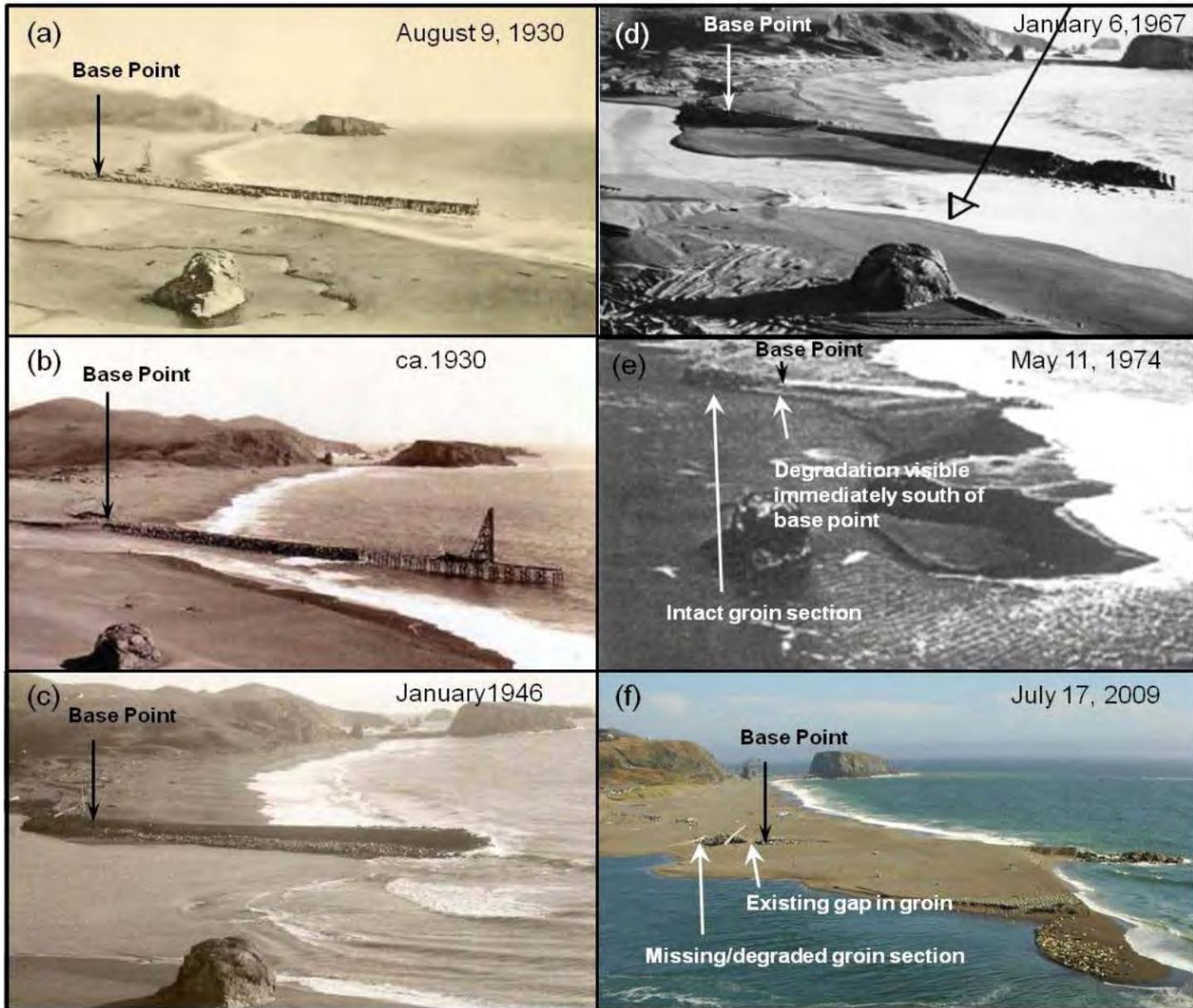
Inlet morphology

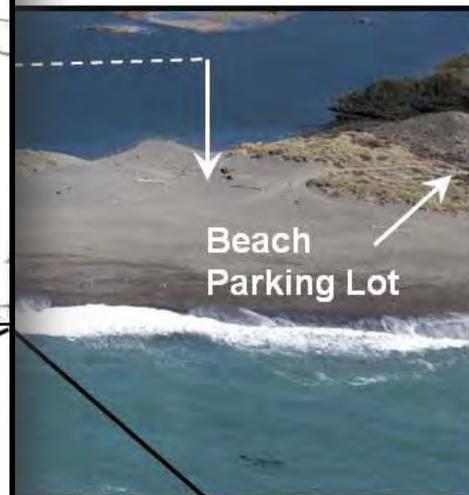
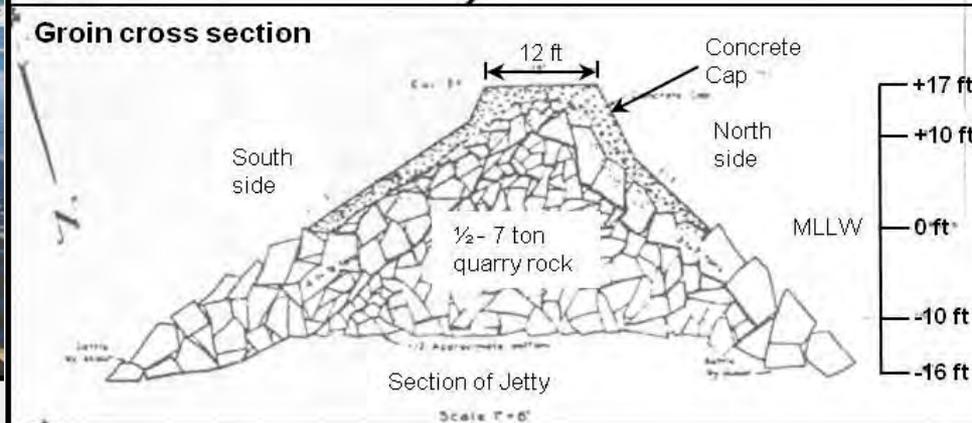
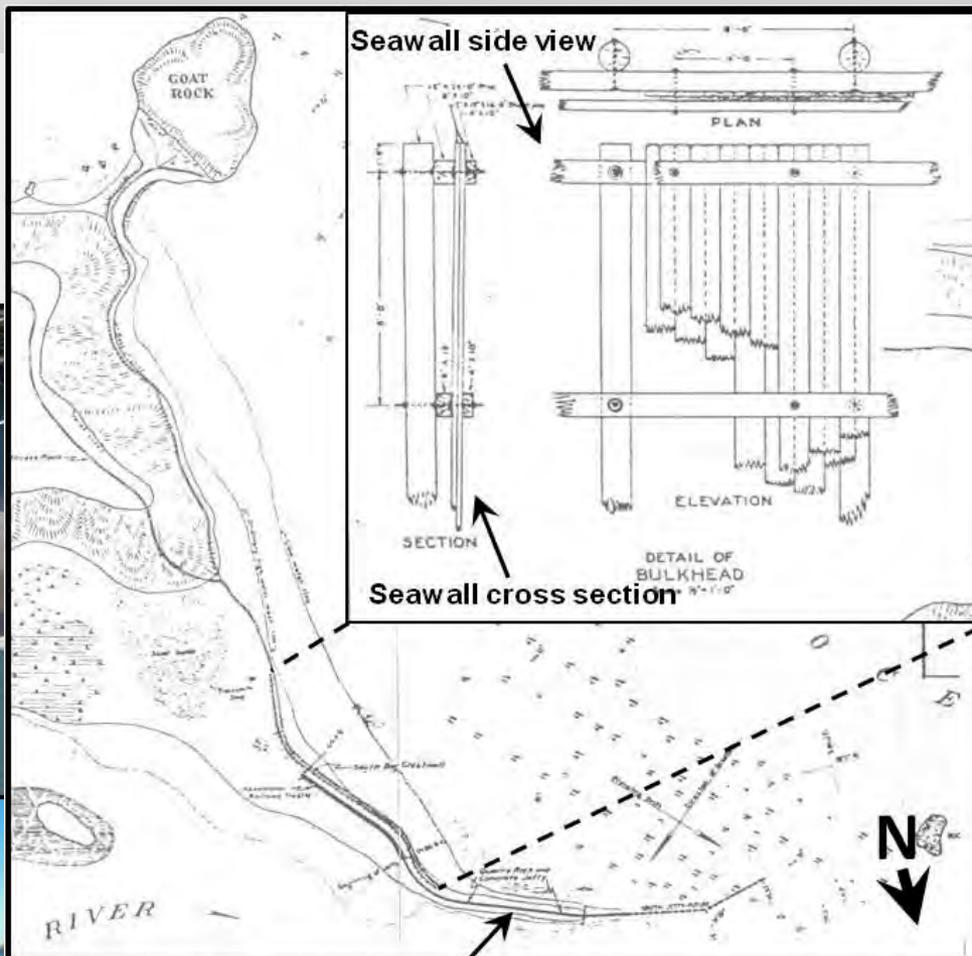
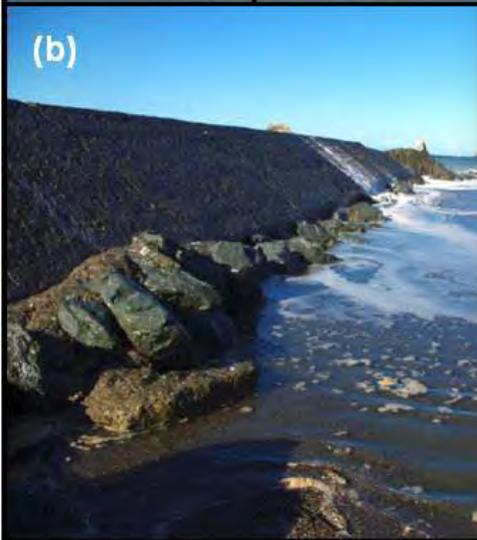
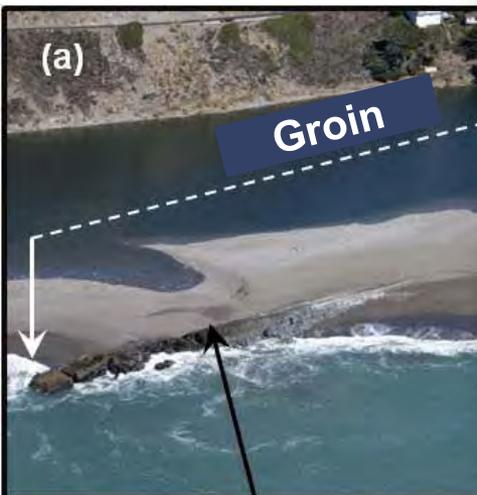
Groundwater permeability

Beach morphology

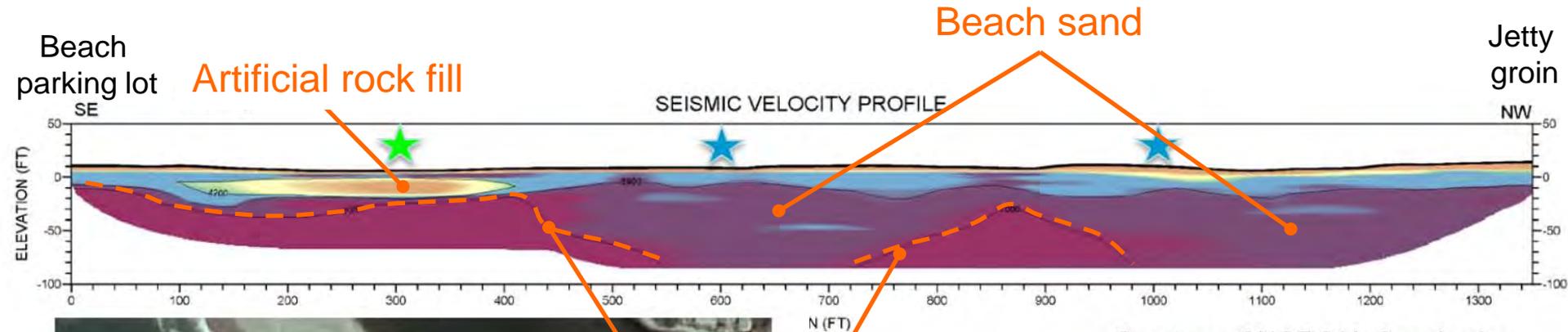
An aerial photograph of a coastal inlet. A brown shaded area at the top left is outlined in black and labeled 'Inlet morphology'. A larger brown shaded area at the bottom is outlined in black and labeled 'Beach morphology'. A blue dashed line outlines a large area on the right side of the inlet, labeled 'Groundwater permeability'. The water is dark blue, and the surrounding land is green and brown.

Evolution of the Jetty

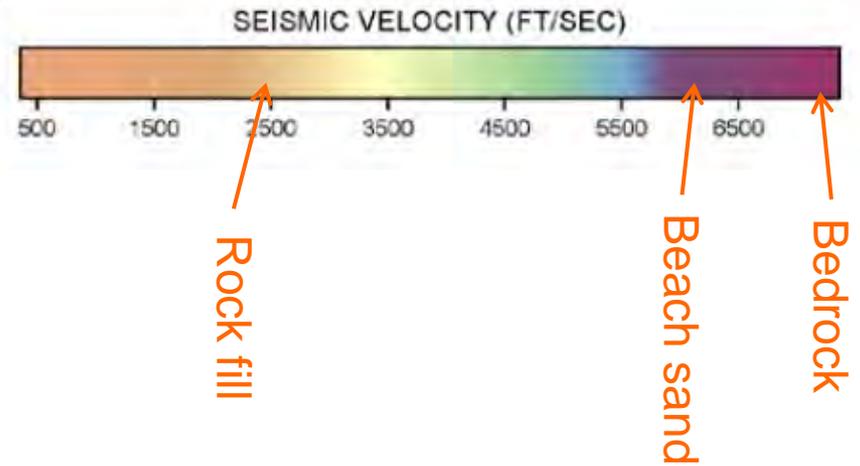




Seismic Beach Berm Profile

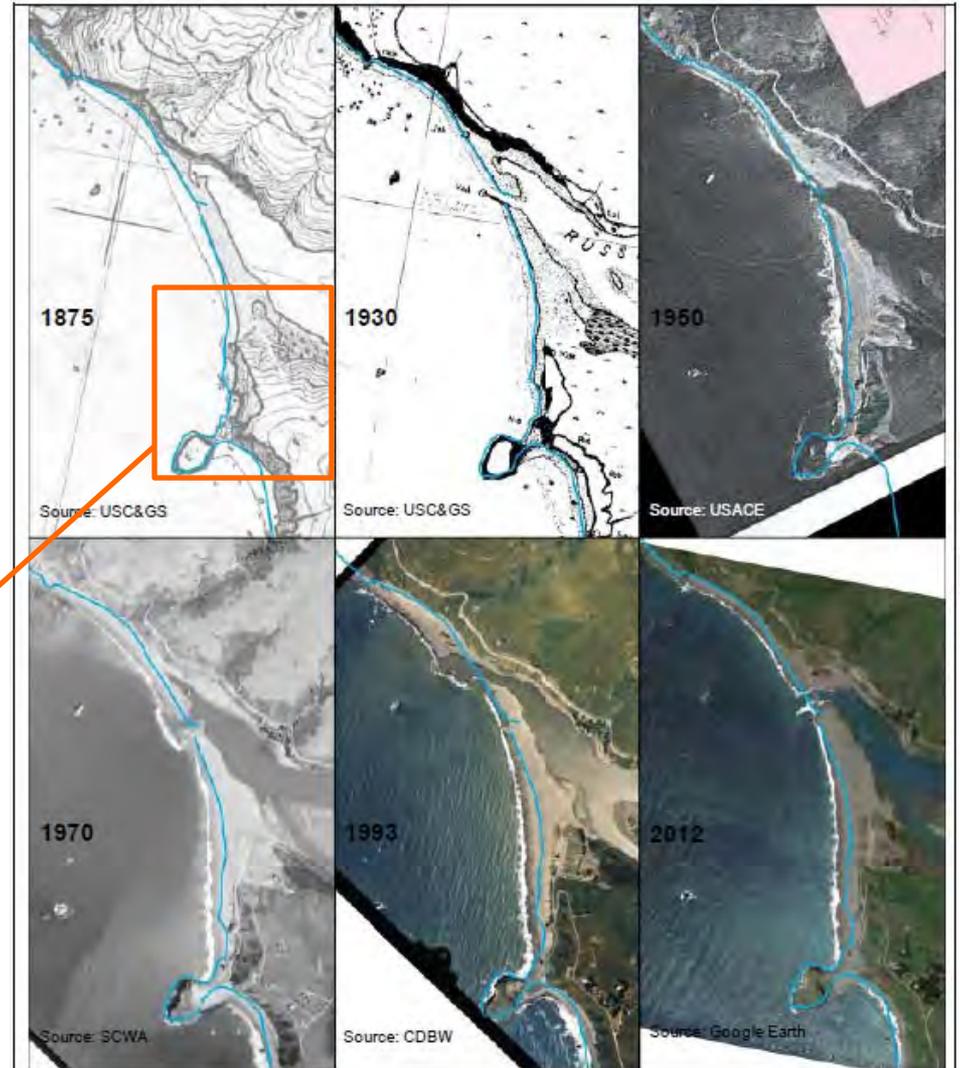


Courtesy of NORCAL Geophysics



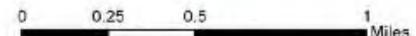
Beach Morphology: Influence of Construction Adjacent to Goat Rock

Prior to jetty construction, Goat Rock was only connected to the shore by a tombolo (low-lying sand spit).



Legend

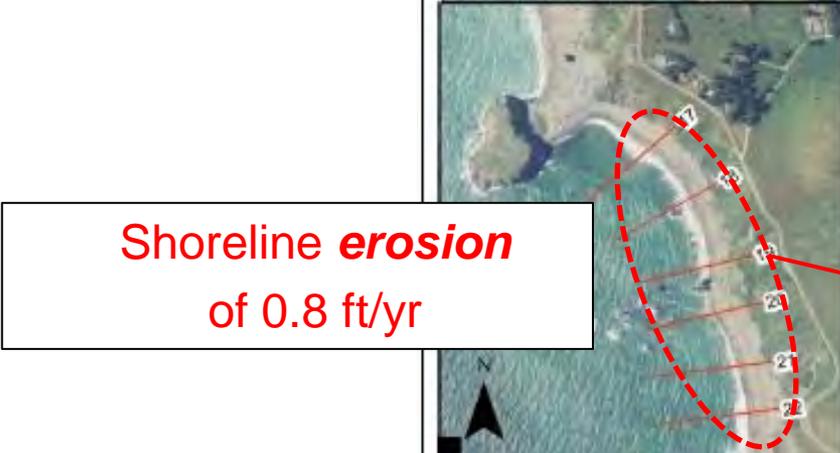
— 1930 shoreline



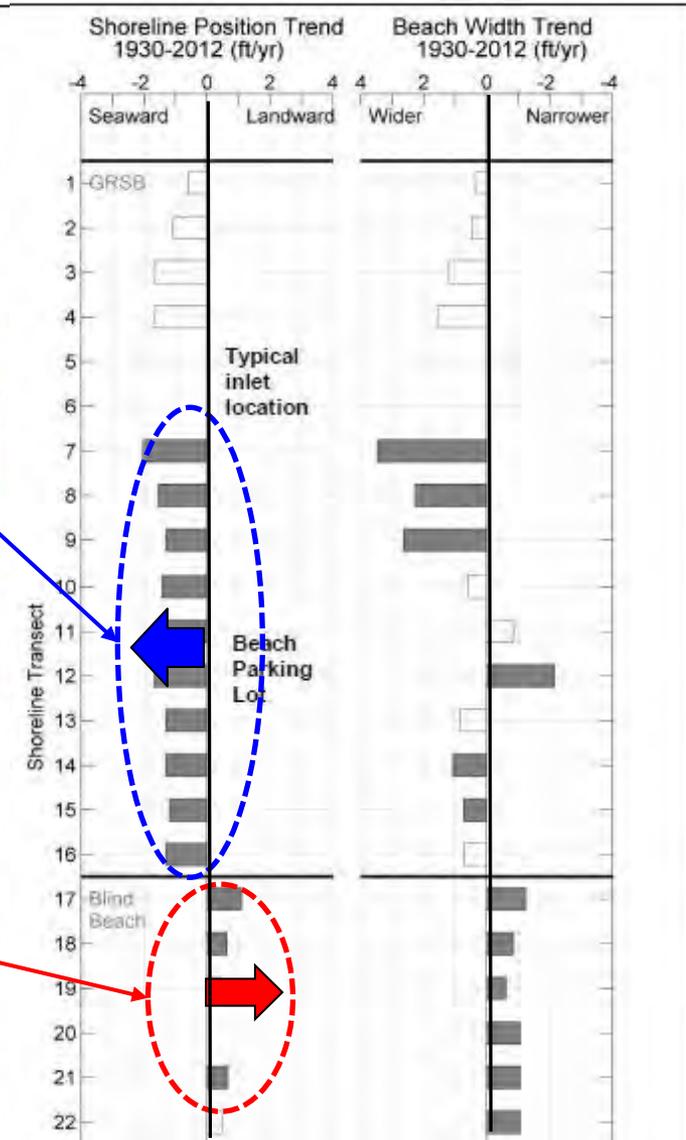
Beach Morphology:

Influence of Construction Adjacent to Goat Rock

Shoreline *accretion*
of 1.5 ft/yr

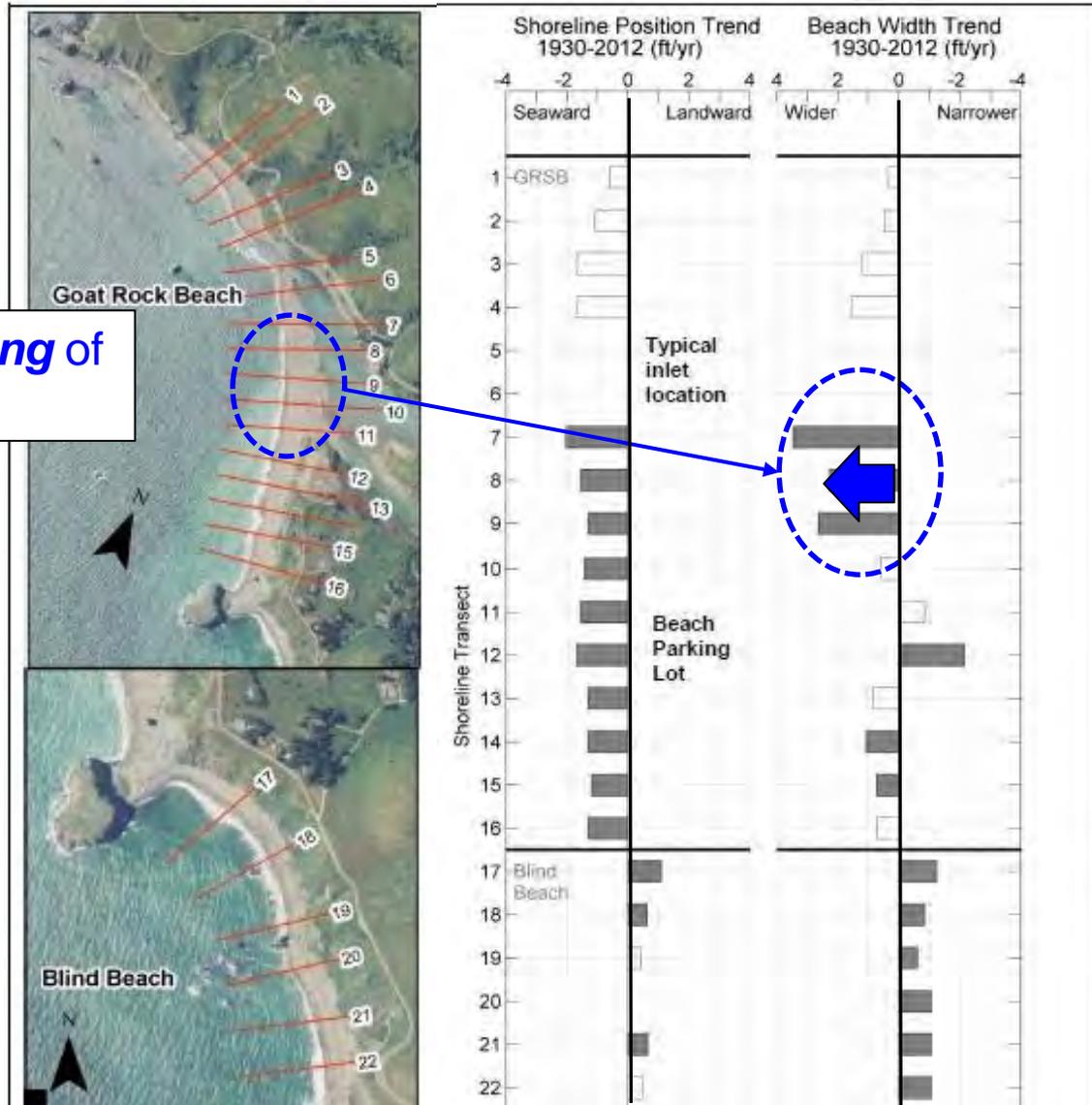


Shoreline *erosion*
of 0.8 ft/yr

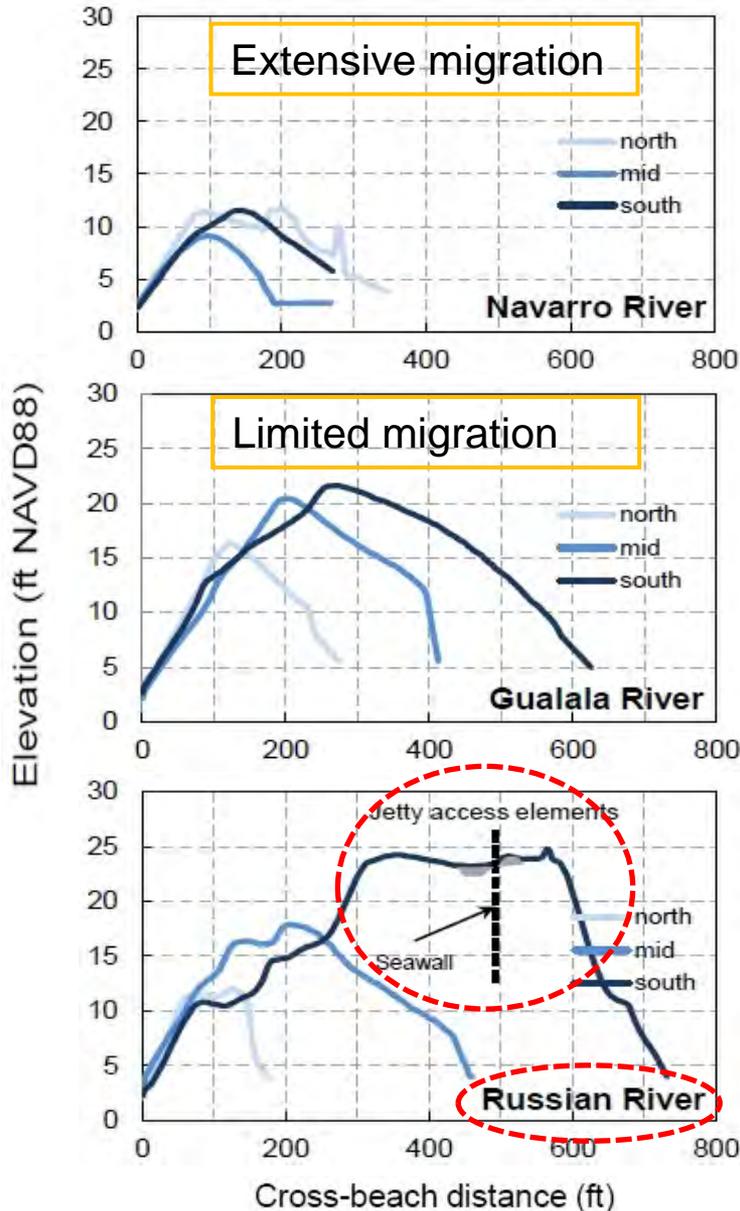


Beach Morphology: Influence of Jetty Access Elements

*Beach widening of
2 ft/yr*



Beach Morphology: Influence of Jetty Access Elements



- Sites with extensive inlet migration have lower, nearly uniform beach spits
- Sites with less frequent inlet migration or movement have higher, less uniform beach crests
- Jetty access elements likely widened and maintained high beach south of the groin

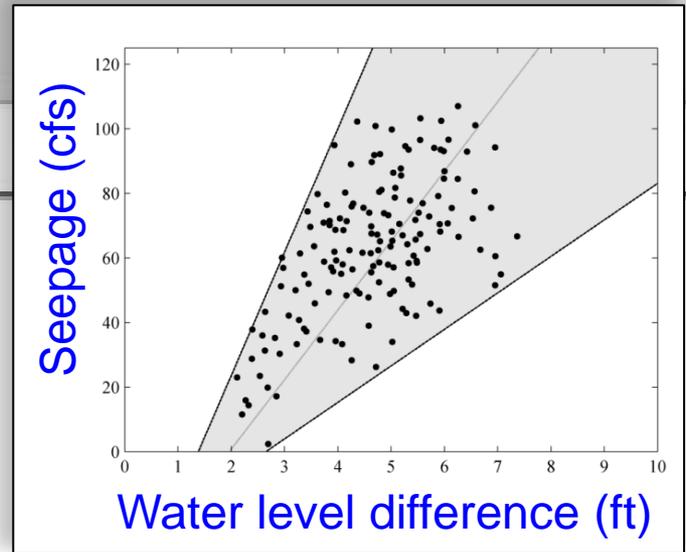
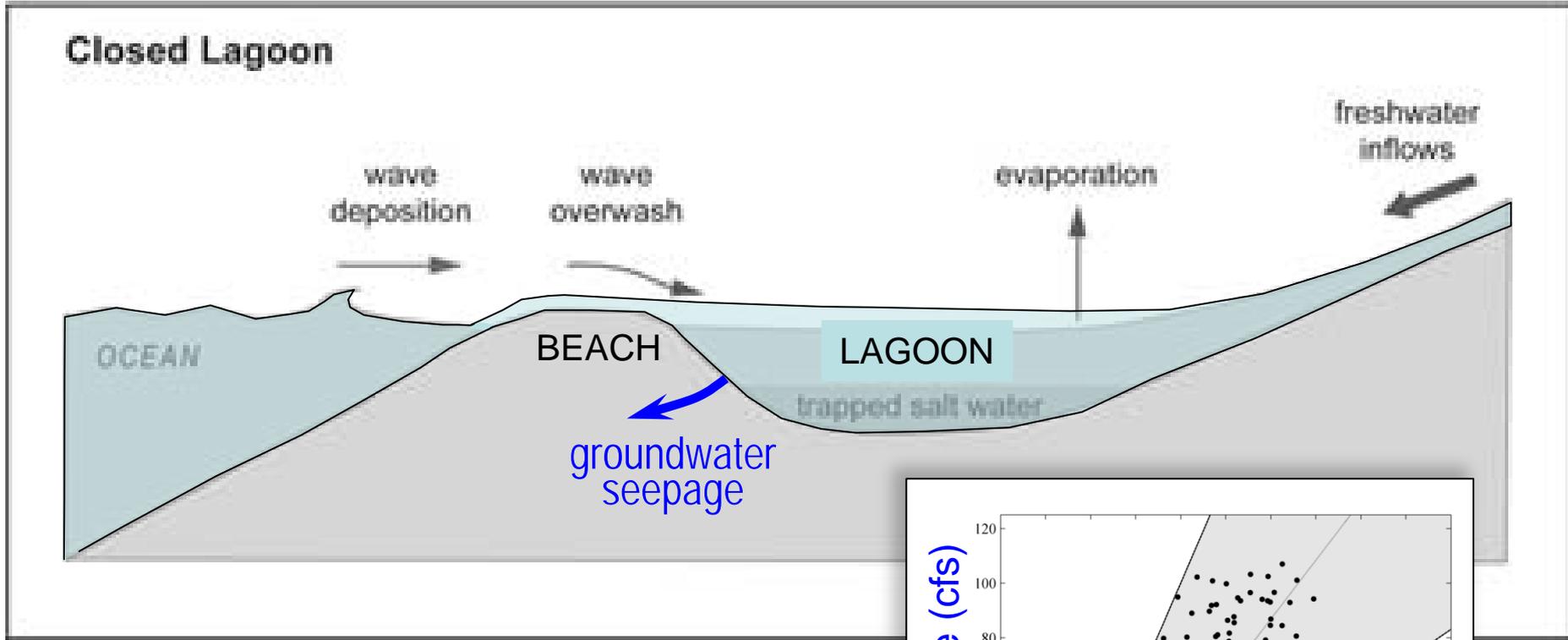
Inlet Morphology



Jetty's influence on self-breaching



Groundwater Seepage

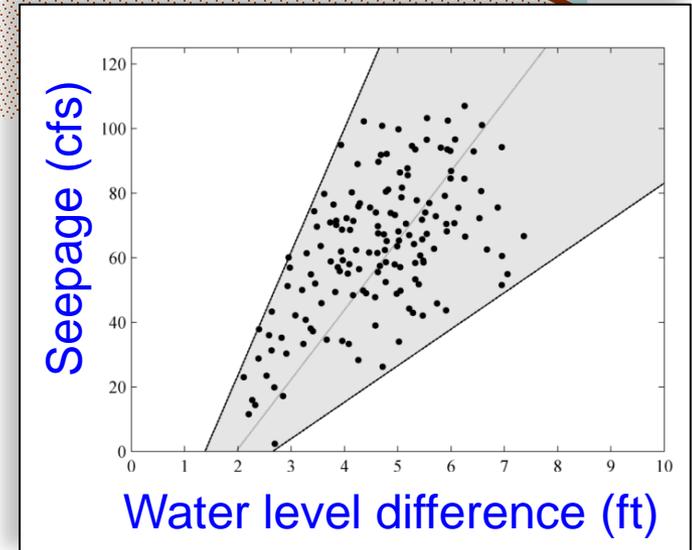
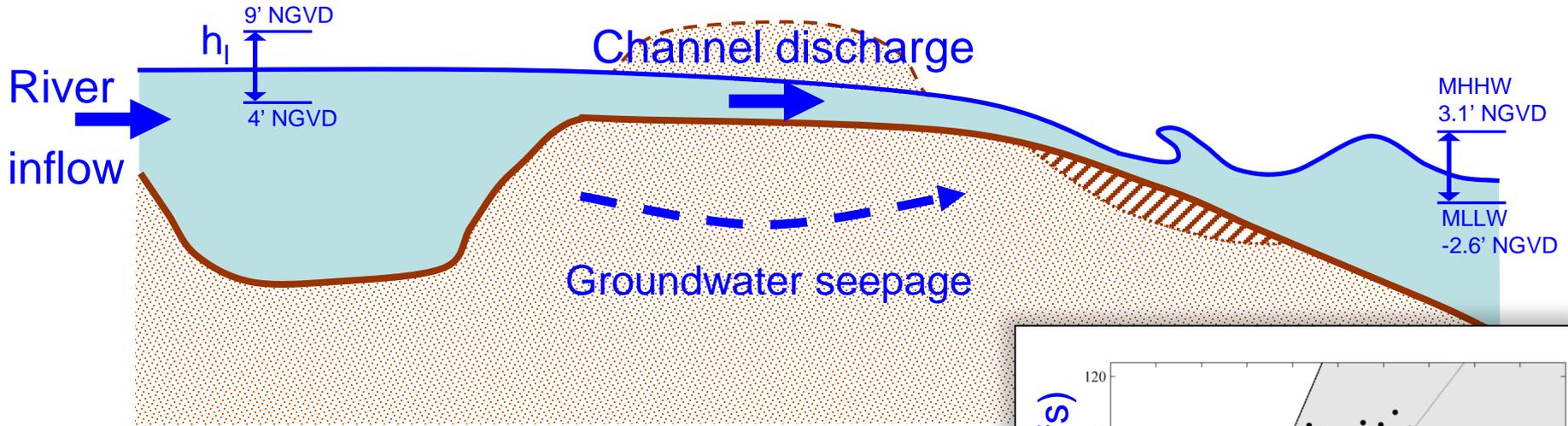


Groundwater Seepage

Estuary

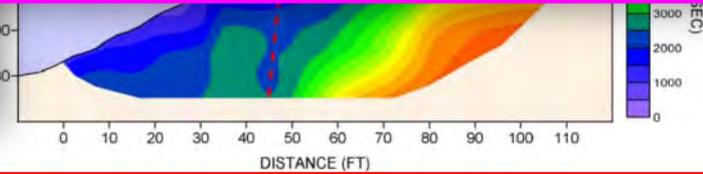
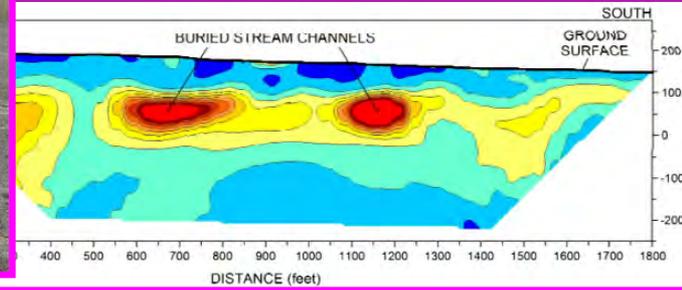
Outlet channel

Ocean

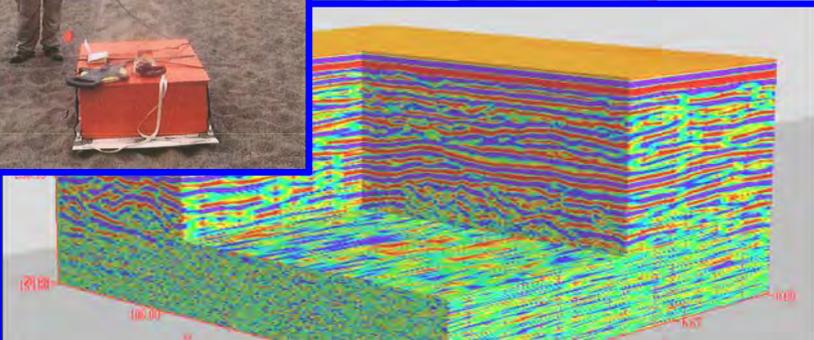
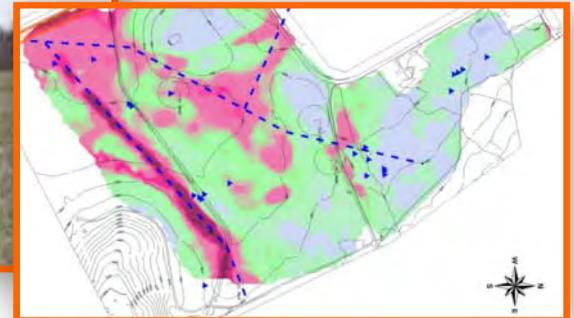


Subsurface Beach & Jetty Monitoring

Electrical Resistance Tomography



Electromagnetic Monitoring

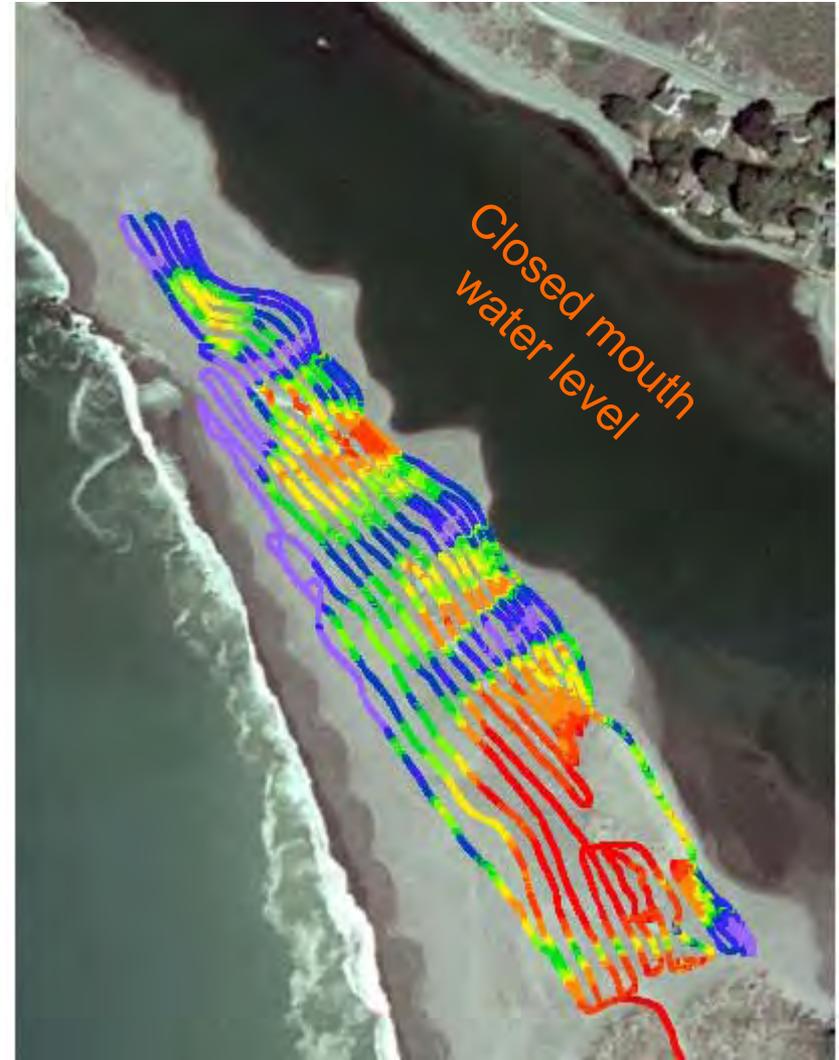
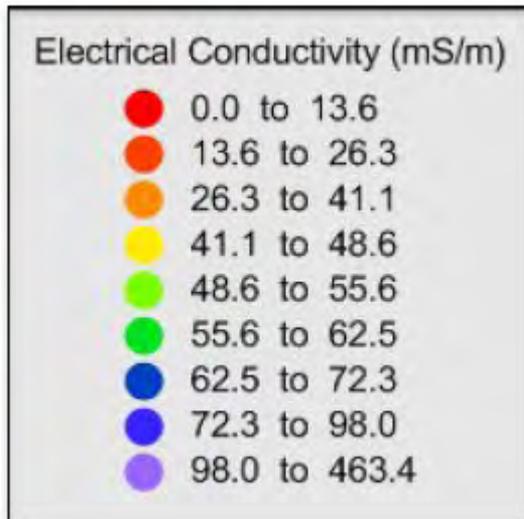


Ground Penetrating Radar

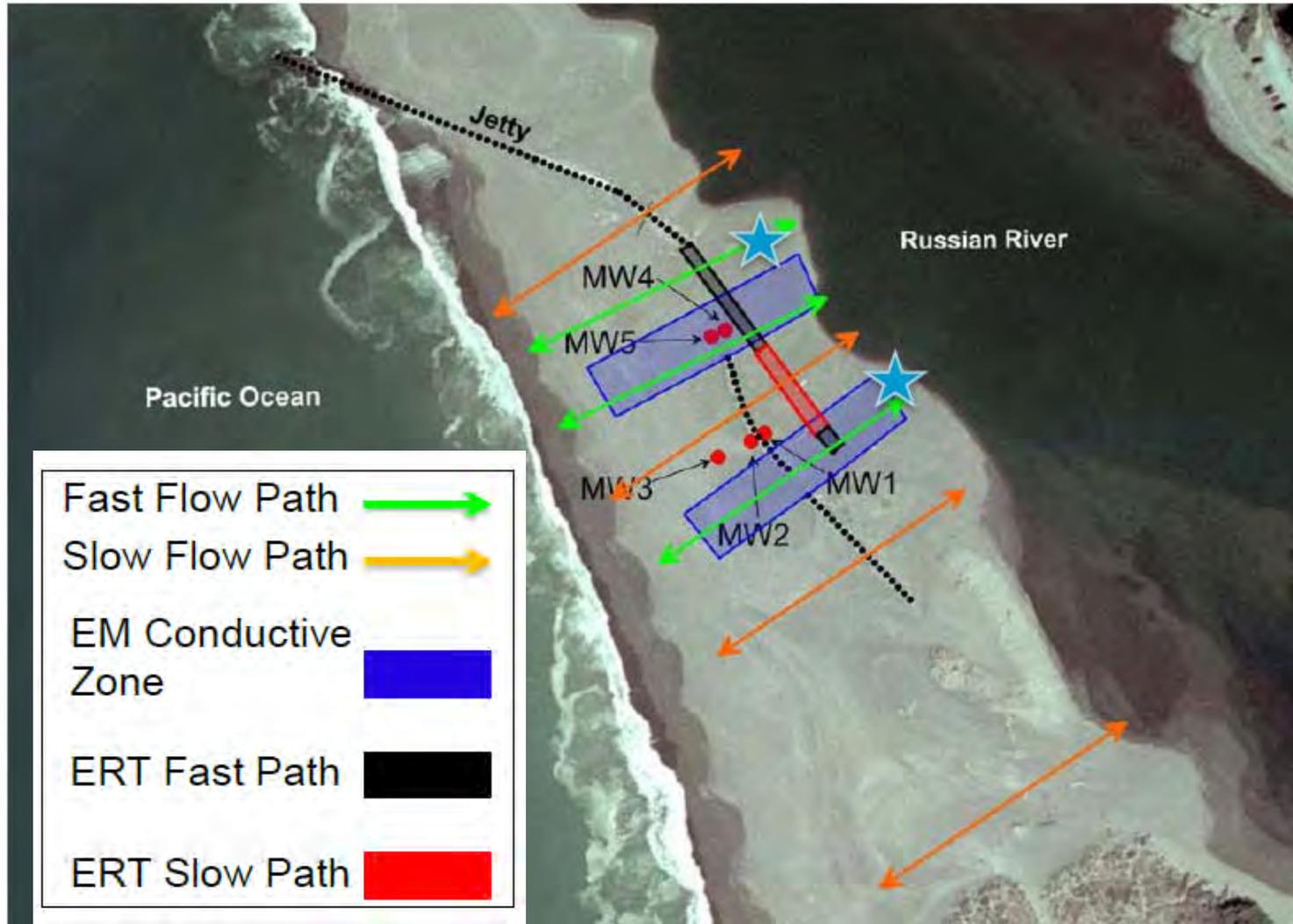
Subsurface electrical conductivity

Fresher / drier

Wetter / saltier



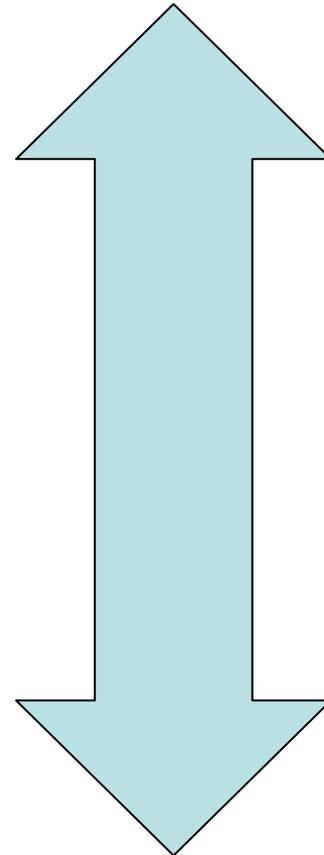
LBNL Seepage Summary



Jetty Study Conceptual Alternatives (For *feasibility*, not implementation)

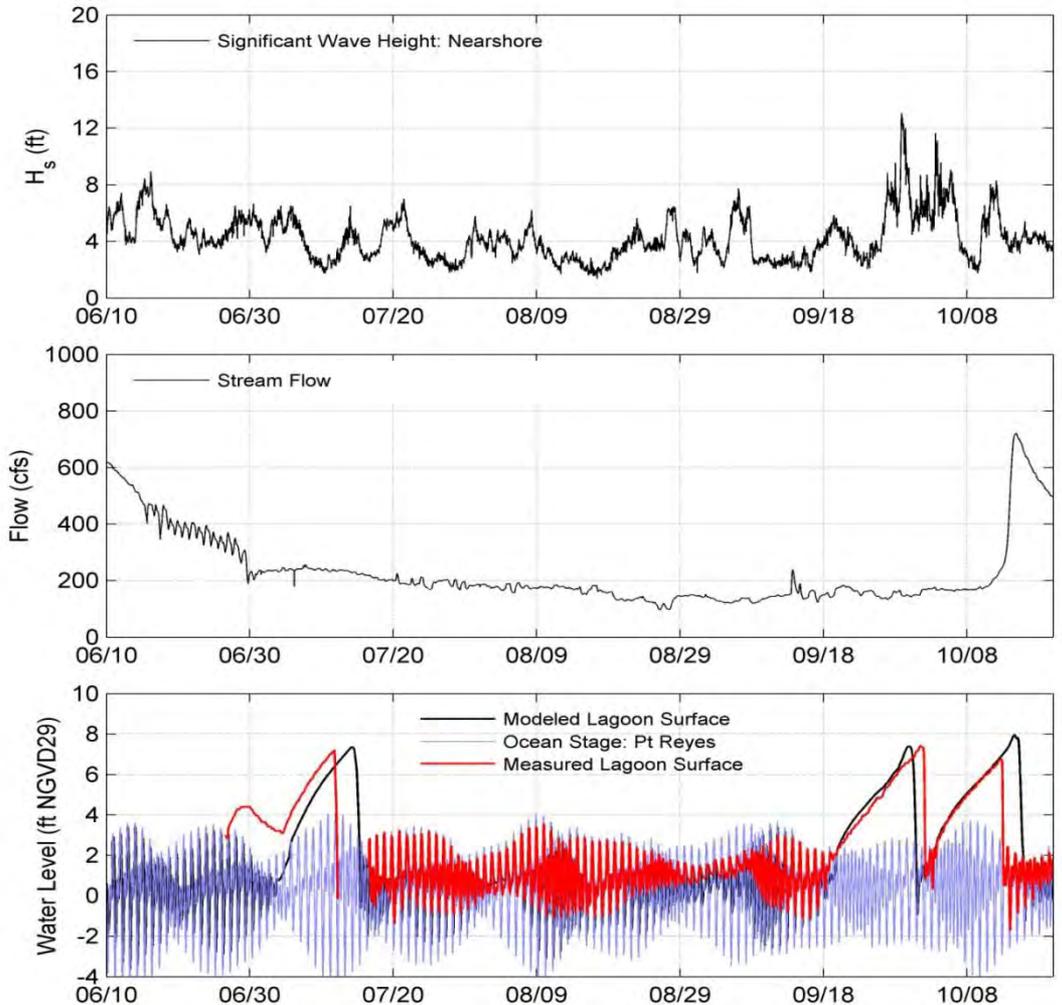
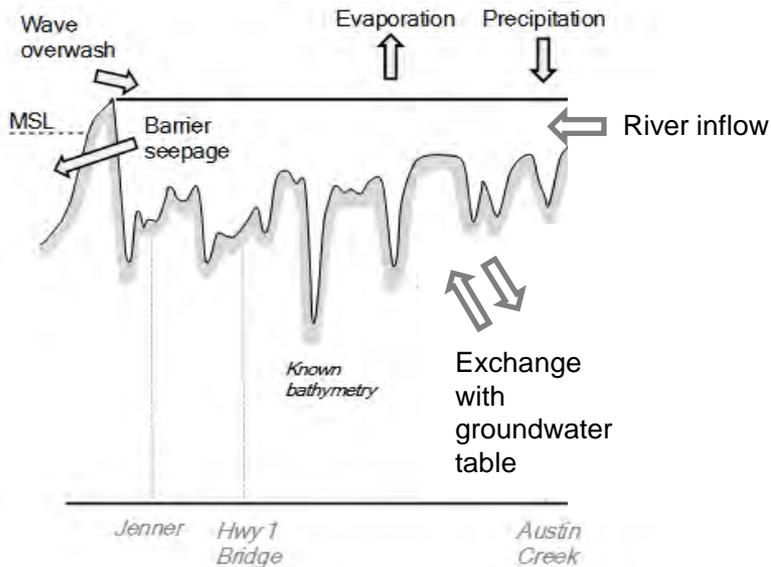
- No Action
- Notch Jetty
- Demolish Groin In-Place
- Remove Access Elements
- Remove Groin
- Remove Full Jetty

Less change

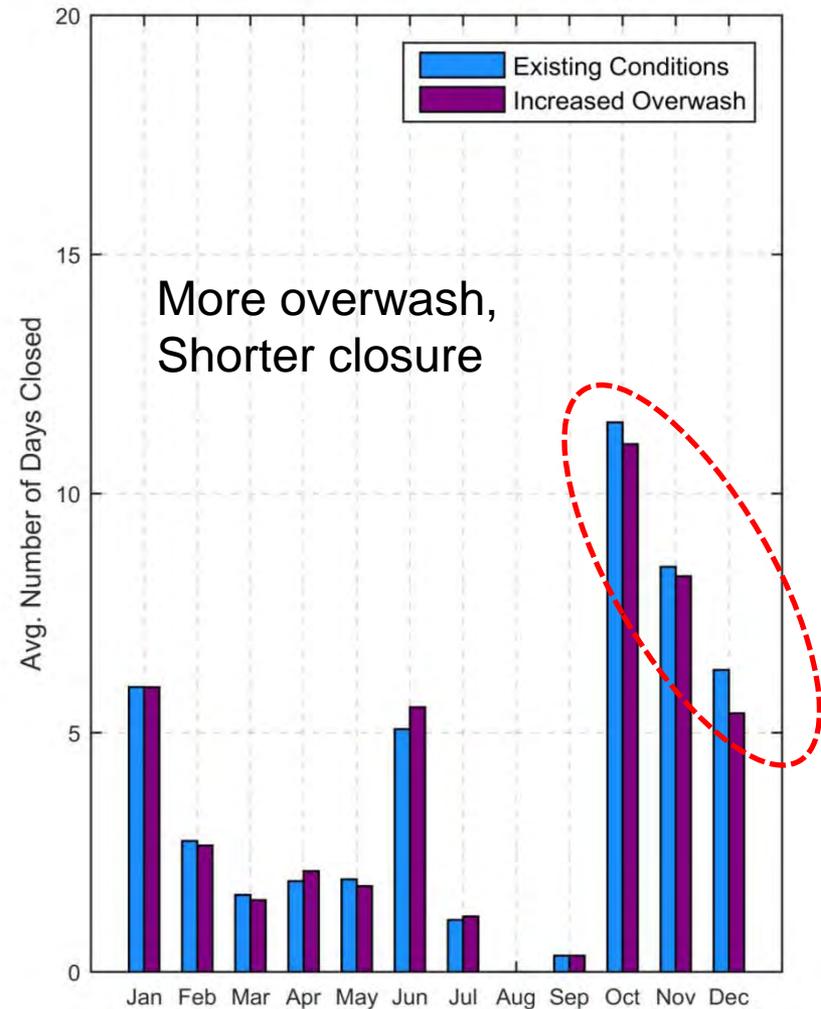
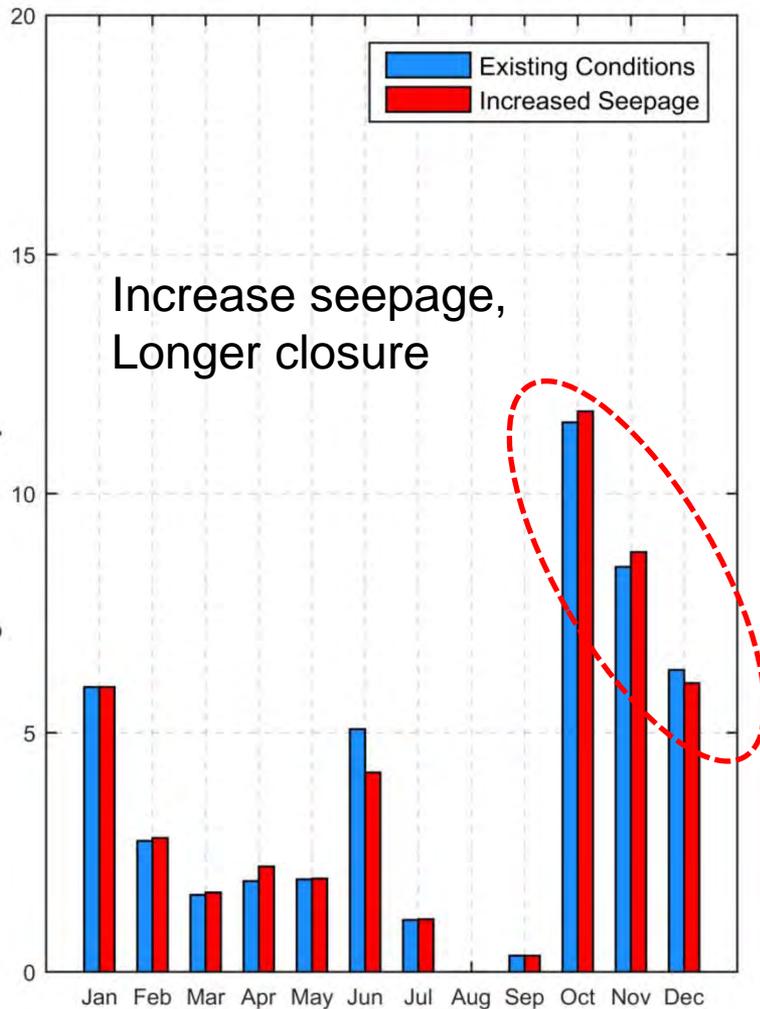


More change

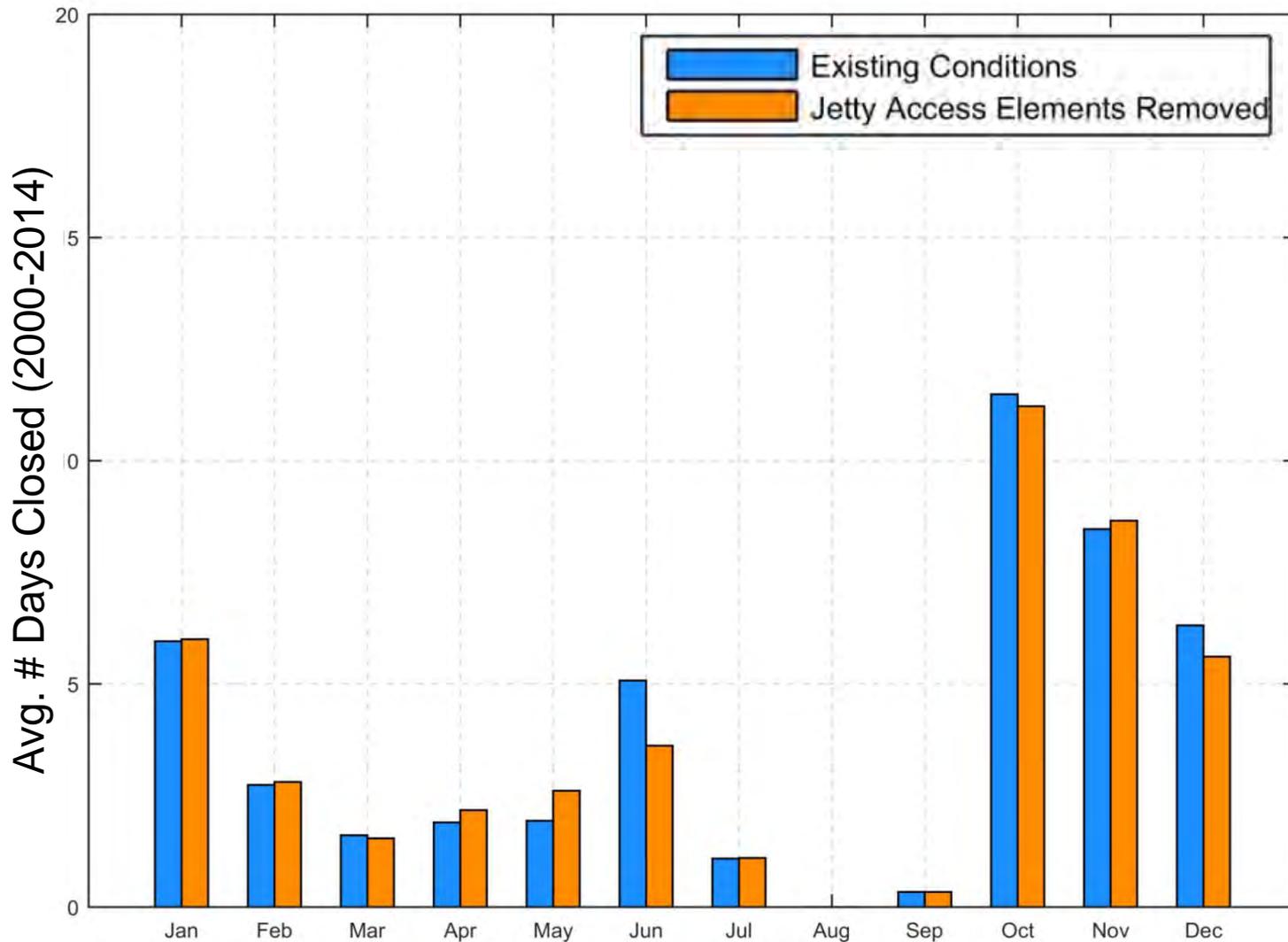
Estuary Water Balance Model



Predicted effect of removing jetty access elements on closure



Predicted effect of removing jetty access elements on closure



Jetty Feasibility Study – Next steps

- Characterize inlet morphology in model
- Complete alternatives evaluation
- Draft feasibility study report
- Final feasibility study report (est. August 2015)