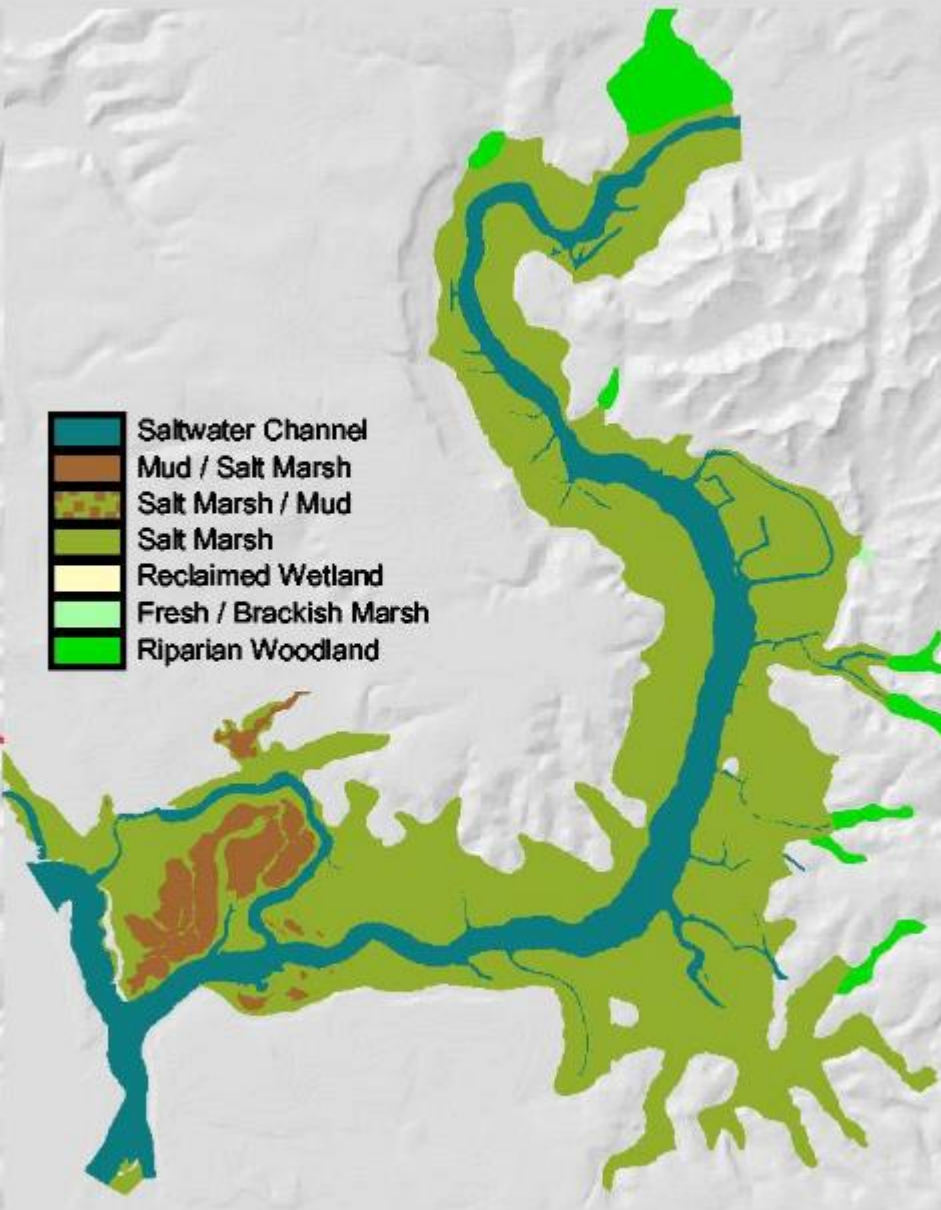


# Tidal Marsh Restoration in Elkhorn Slough

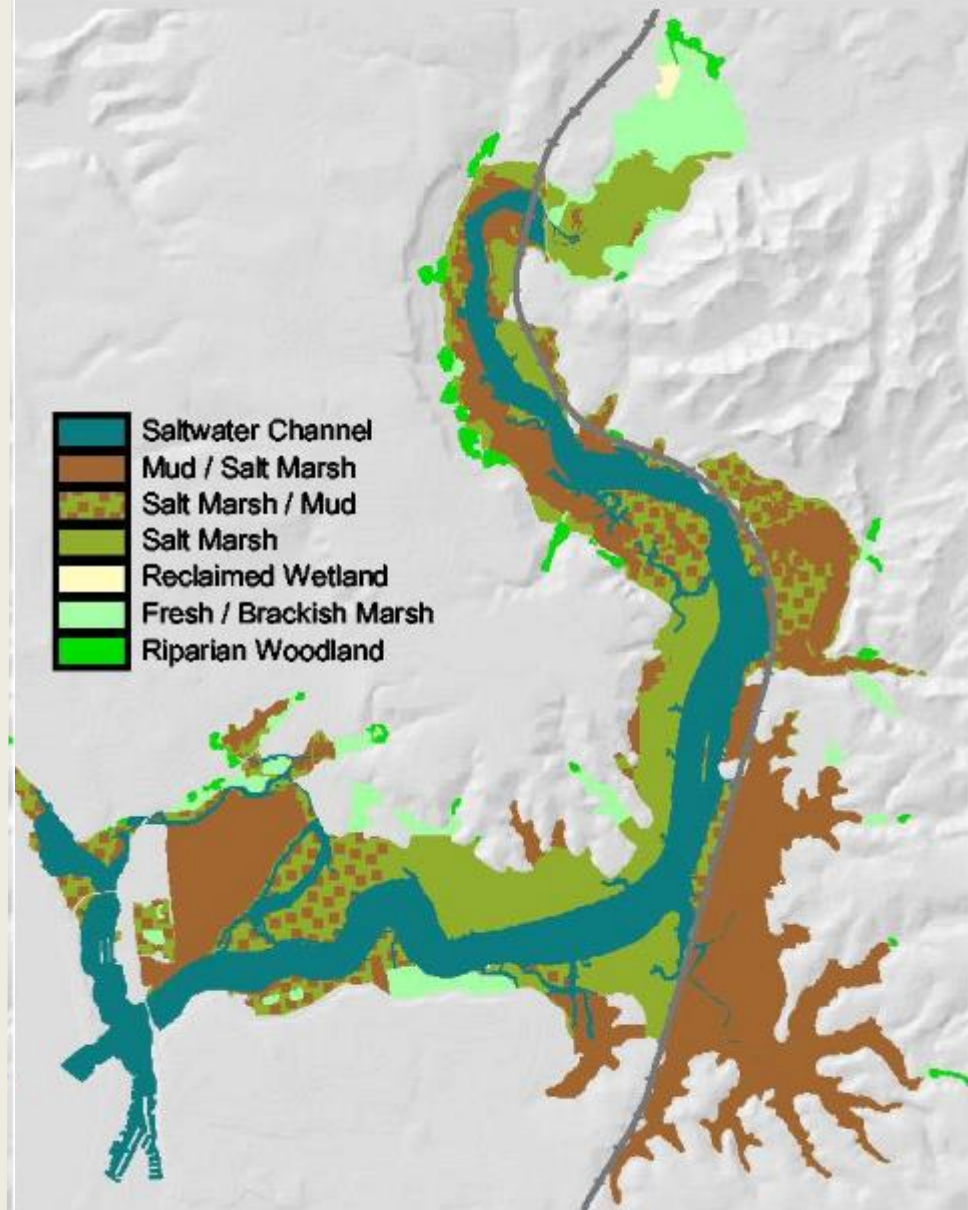
A TWP Project  
(Tidal Wetland Program)  
Elkhorn Slough Reserve



1870



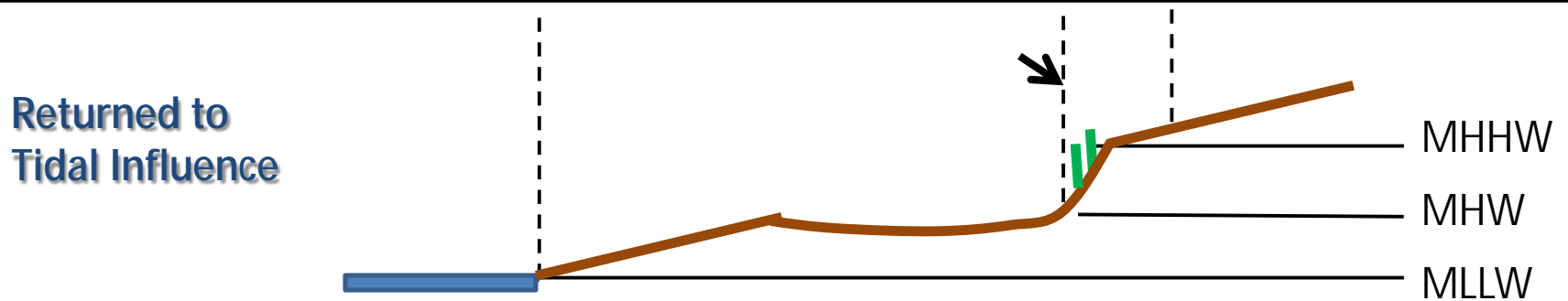
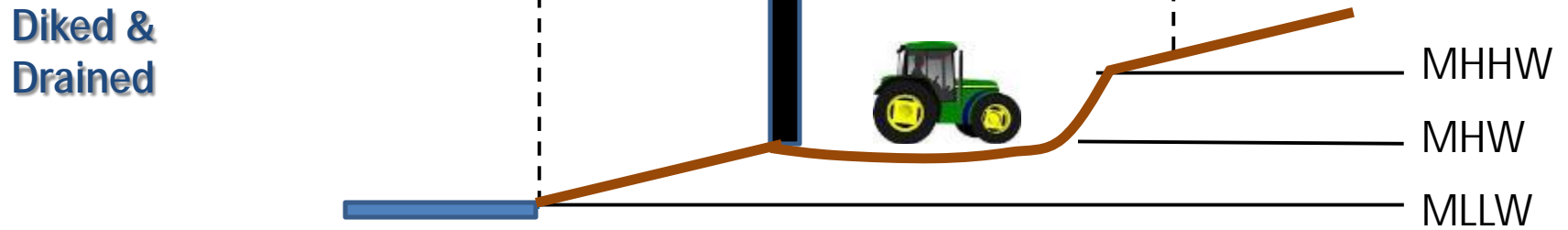
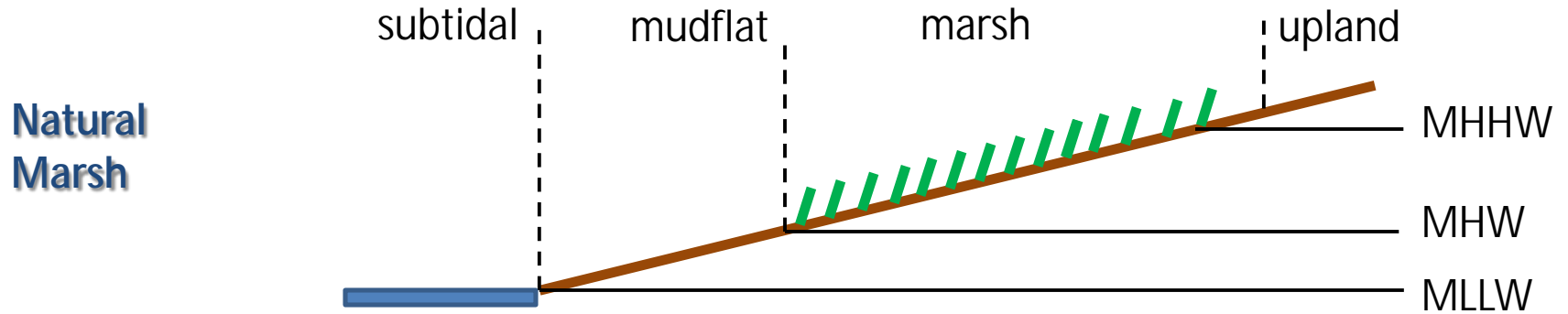
2000



From Van Dyke & Wasson 2005



# Subsidence: shift downward relative to sea-level



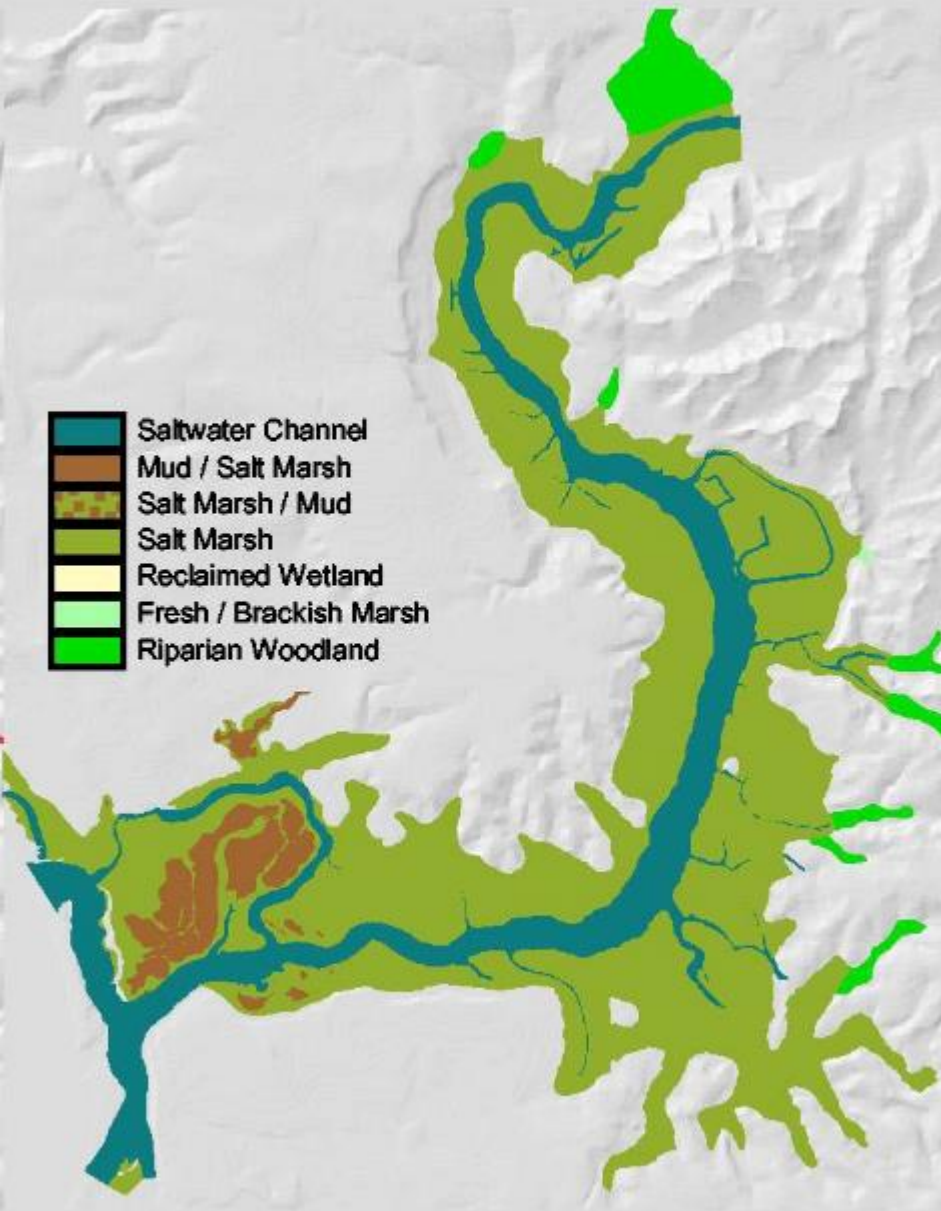
# Subsided marsh



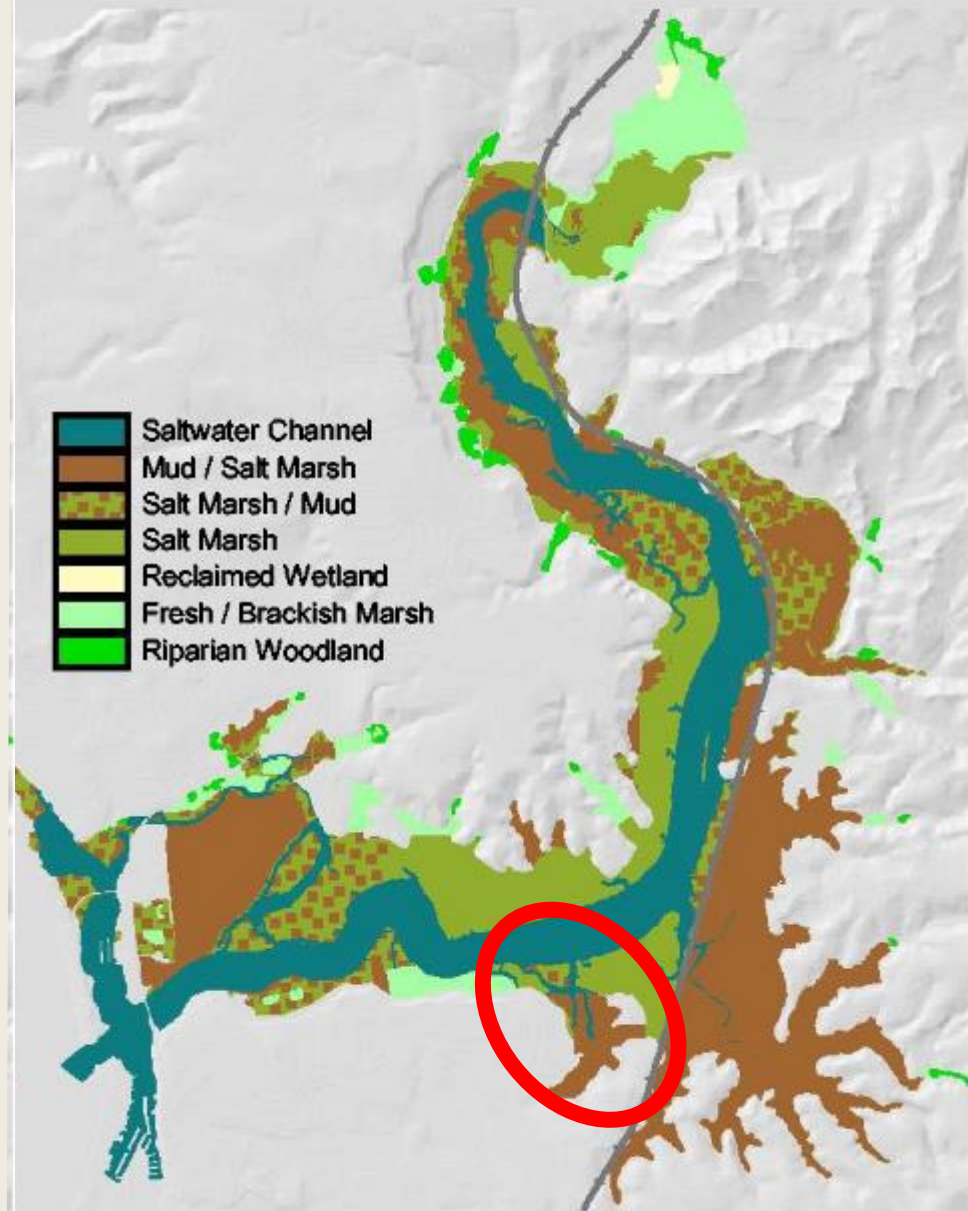
Photo courtesy of Keith Ellenbogen



1870



2000



From Van Dyke & Wasson 2005

# Restoration site - then and now





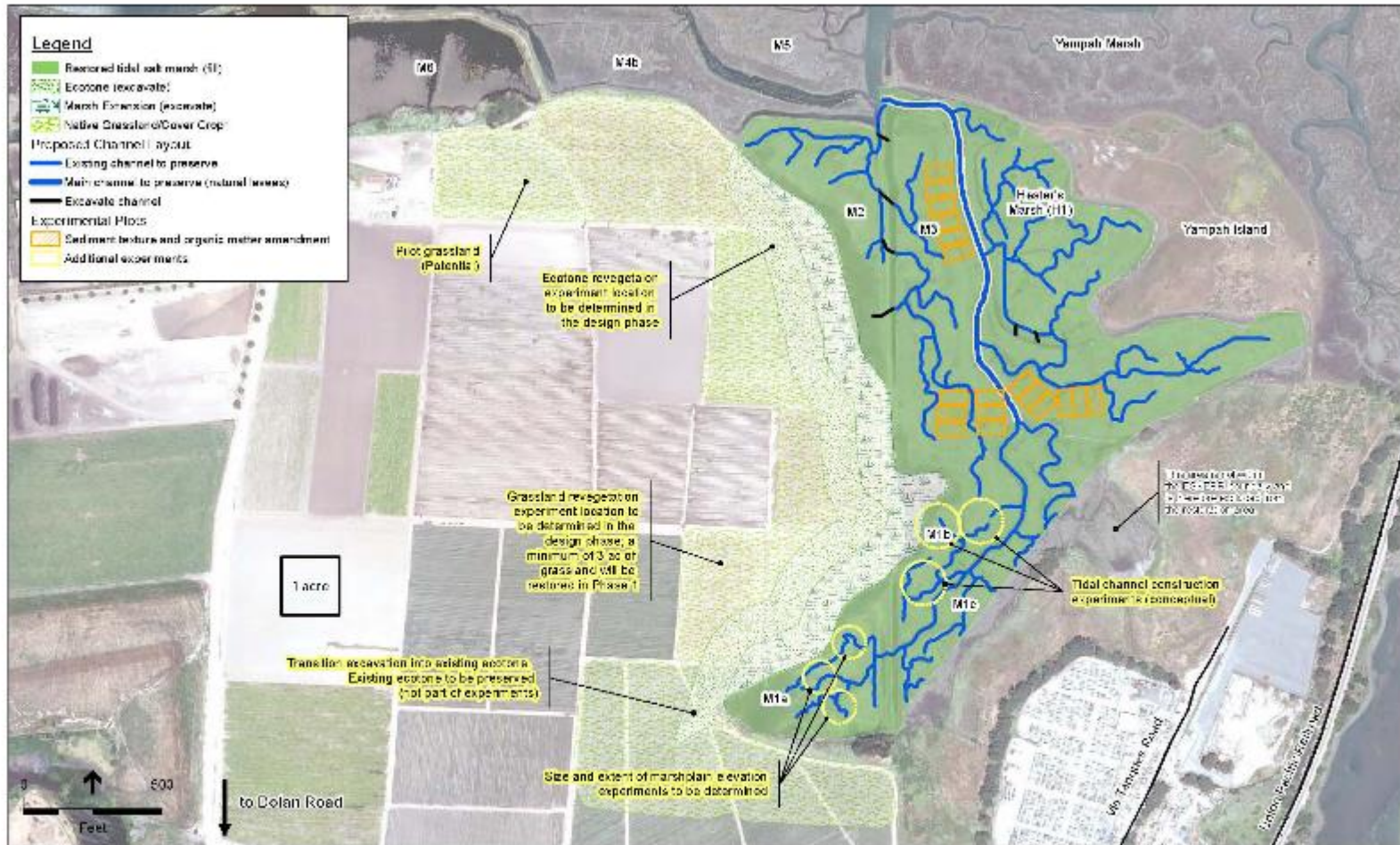


# Restoration Goals

- Restore 66 ac. of functional tidal marsh
- Reduce tidal scour in Elkhorn Slough
- Improve resilience to climate change
- Protect and improve water quality
- Improve sea otter habitat
- Increase understanding of blue carbon



# Restoration Design

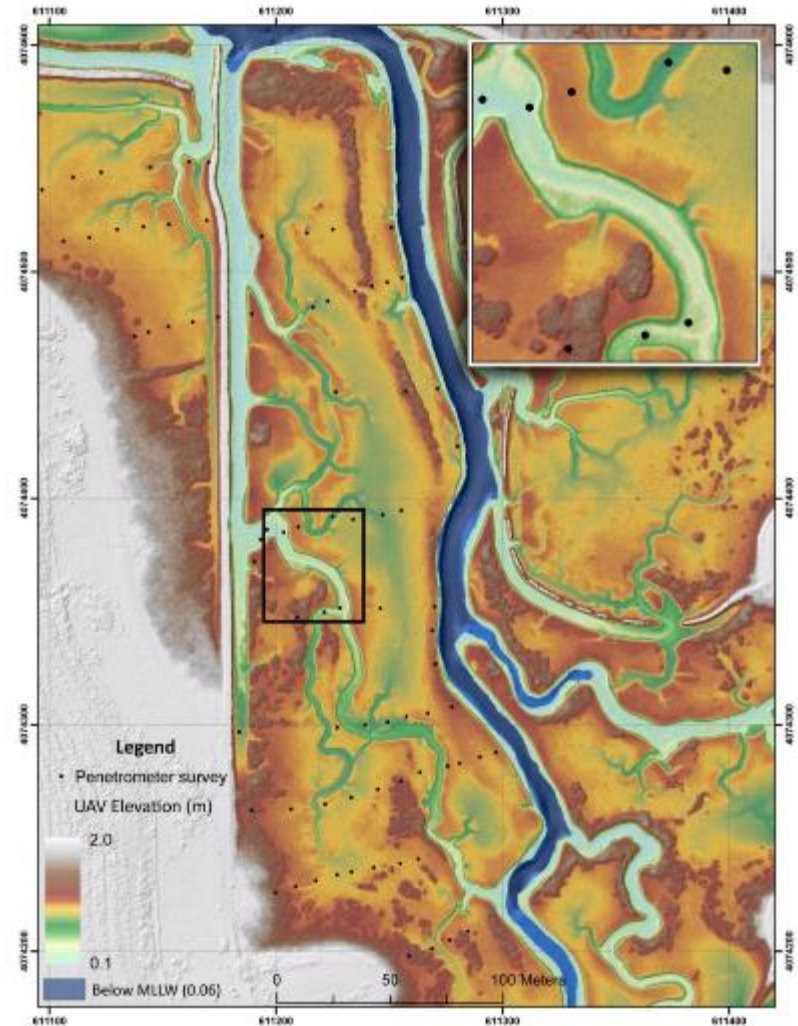
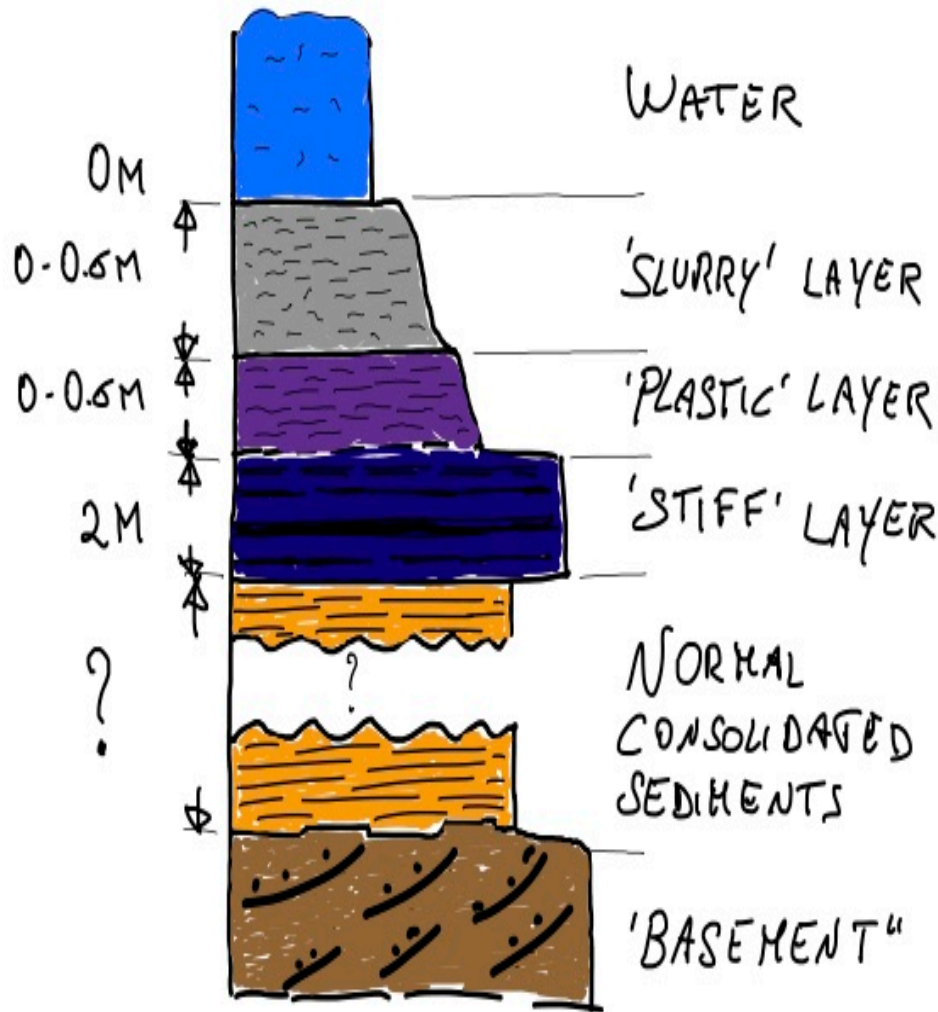


Source: Air photo from NAIP 2010.

\* Extent of native grassland restored in Phase 1 to be determined (3 ac. minimum); Remaining area to be cover cropped.

Elkhorn Slough Tidal Marsh Restoration Project . D120505.00  
 Figure 14  
 Map of Proposed Experiments  
 Conceptual

# A heavy problem





# Grassland Restoration



# MONITORING



Photo courtesy of Keith Ellenbogen



# REMOTE SENSING

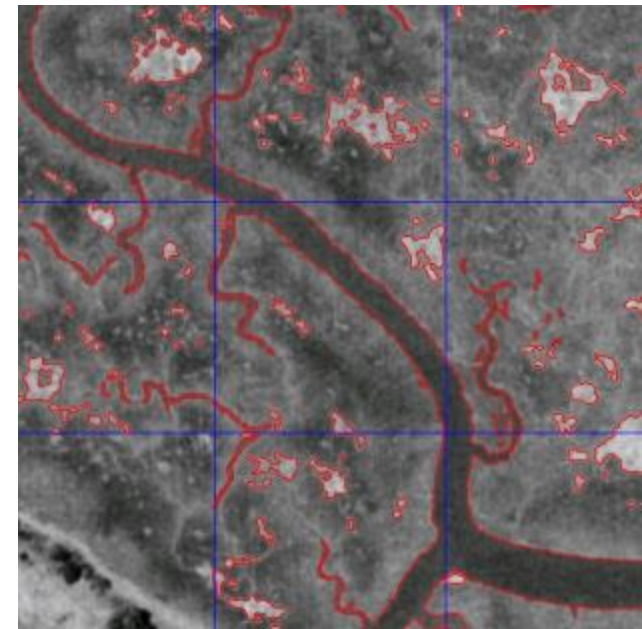
## LiDAR & calculations

- ∅ Elevation
- ∅ Tidal prism displacement
- ∅ Inundation times on marsh



## UAV Aerial imagery analysis

- ∅ Elevation
- ∅ Marsh acreage changes
- ∅ Tidal creek development



# FIELD TRANSECTS

Point - intercept

Ø Plant community

(marsh, ecotone & buffer)

Sediment stakes & feldspar layer

Ø Sediment retention/erosion

Greenhouse gas analysis

Ø Carbon sequestered





# FIELD SAMPLING

Surface elevation tables & feldspar layer

Ø Marsh elevation and sediment deposition

Repeat photography


Ø Landscape changes



Surveys for abundance and behavior

Ø Sea otter and harbor seal habitat use  
Ø Bird and fish surveys



An aerial photograph of a coastal wetland area. A large, winding river flows through the landscape, which is characterized by brown, muddy banks and intricate, meandering channels. In the background, a power plant with several tall smokestacks is visible near the coastline. The sky is clear and blue, and the ocean is visible in the distance.

This project would not be possible without the Tidal Wetland Program participants and funding from the following organizations:

- California State Coastal Conservancy
- California Department of Water Resources
- Wildlife Conservation Board
- USFW National Coastal Wetlands Conservation
- CDFW Greenhouse Gas Program