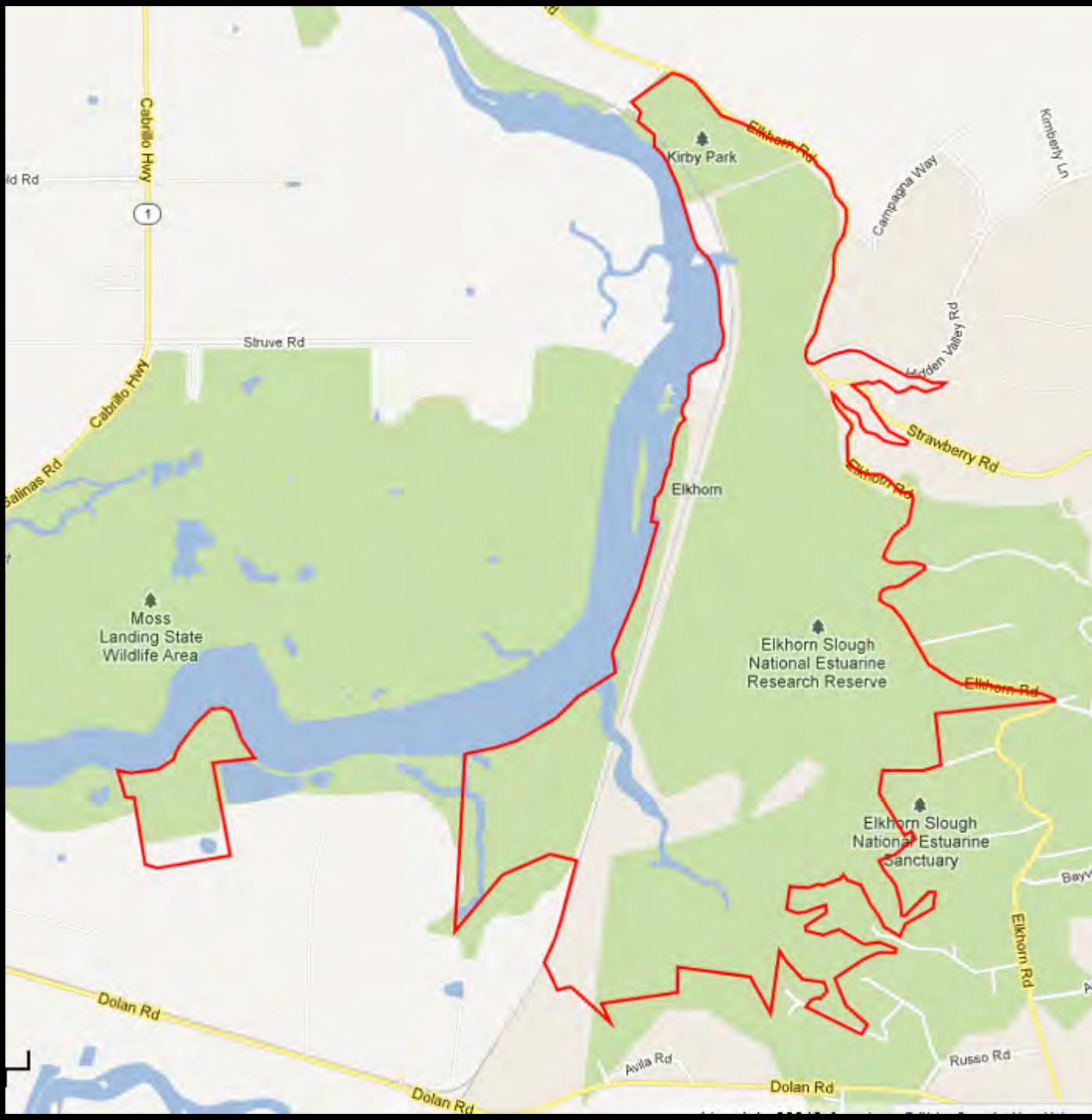
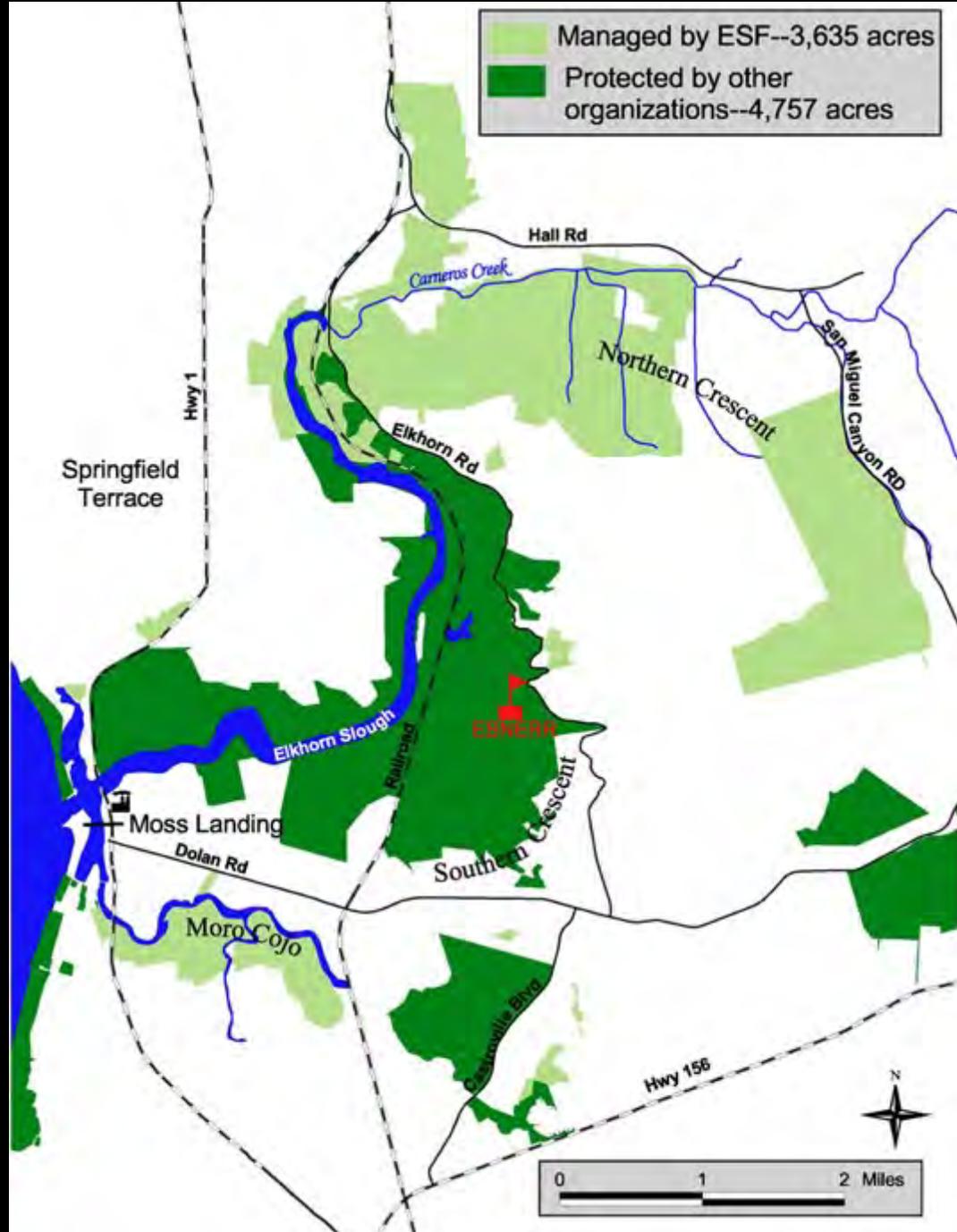




ELKHORN SLOUGH
RESERVE



Elkhorn Slough National Estuarine Research Reserve





[Background](#)

[Research](#)

[Fellowships](#)

[Education](#)

[Training](#)

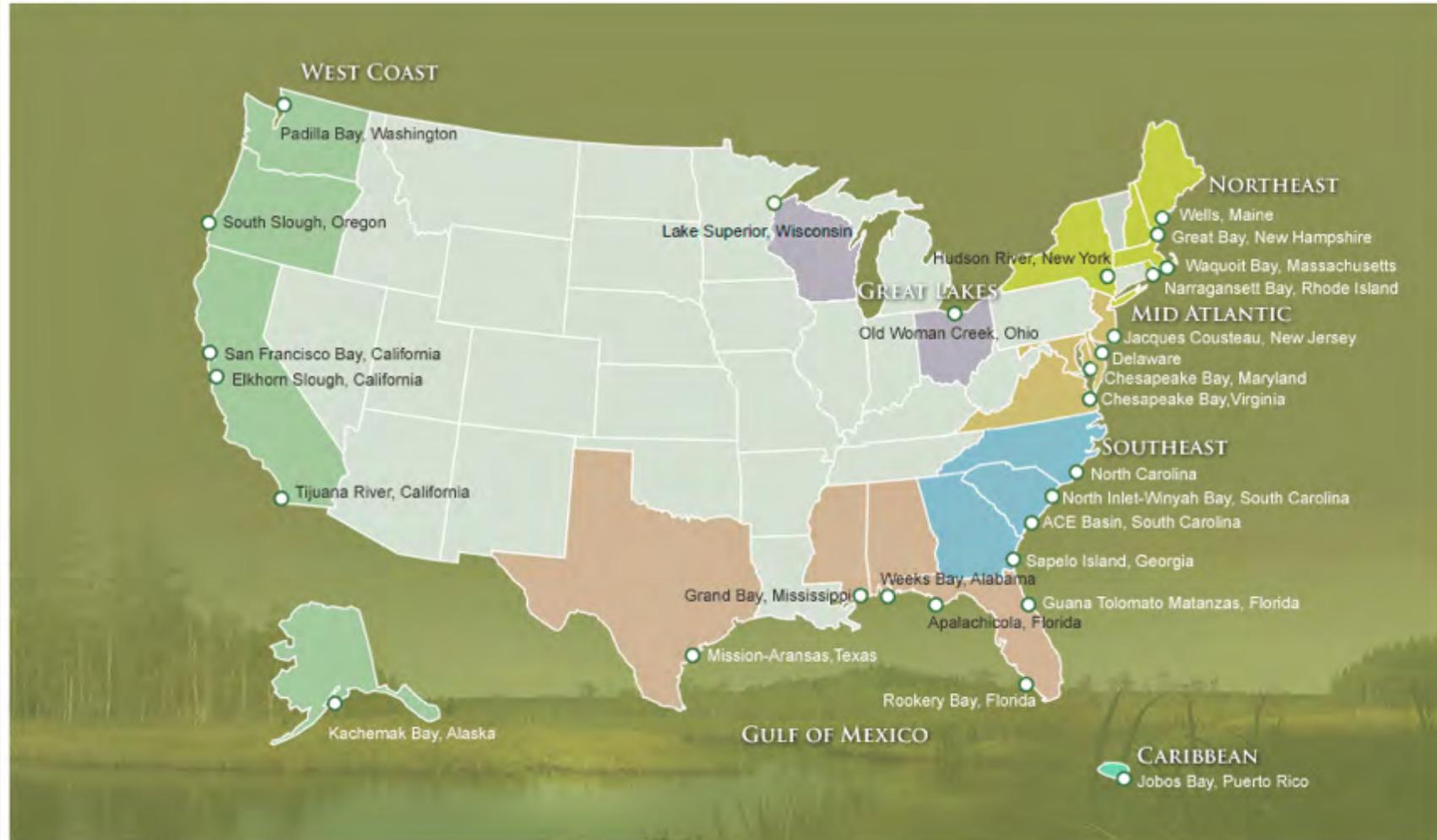
[Stewardship](#)

[News & Calendar](#)

[NERRS Reserves](#)

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NERRS Reserves



National Estuarine Research

VISION:

Resilient estuaries and coastal watersheds where human and natural communities thrive

MISSION:

To practice and promote stewardship of coasts and estuaries through innovative research, education, and training using a place-based system of protected areas.

Research

Research

Kirsten Wasson





Research

- Long term monitoring to detect changes over time

- Short-term projects focused on understanding and diminishing threats to Slough habitats and communities.

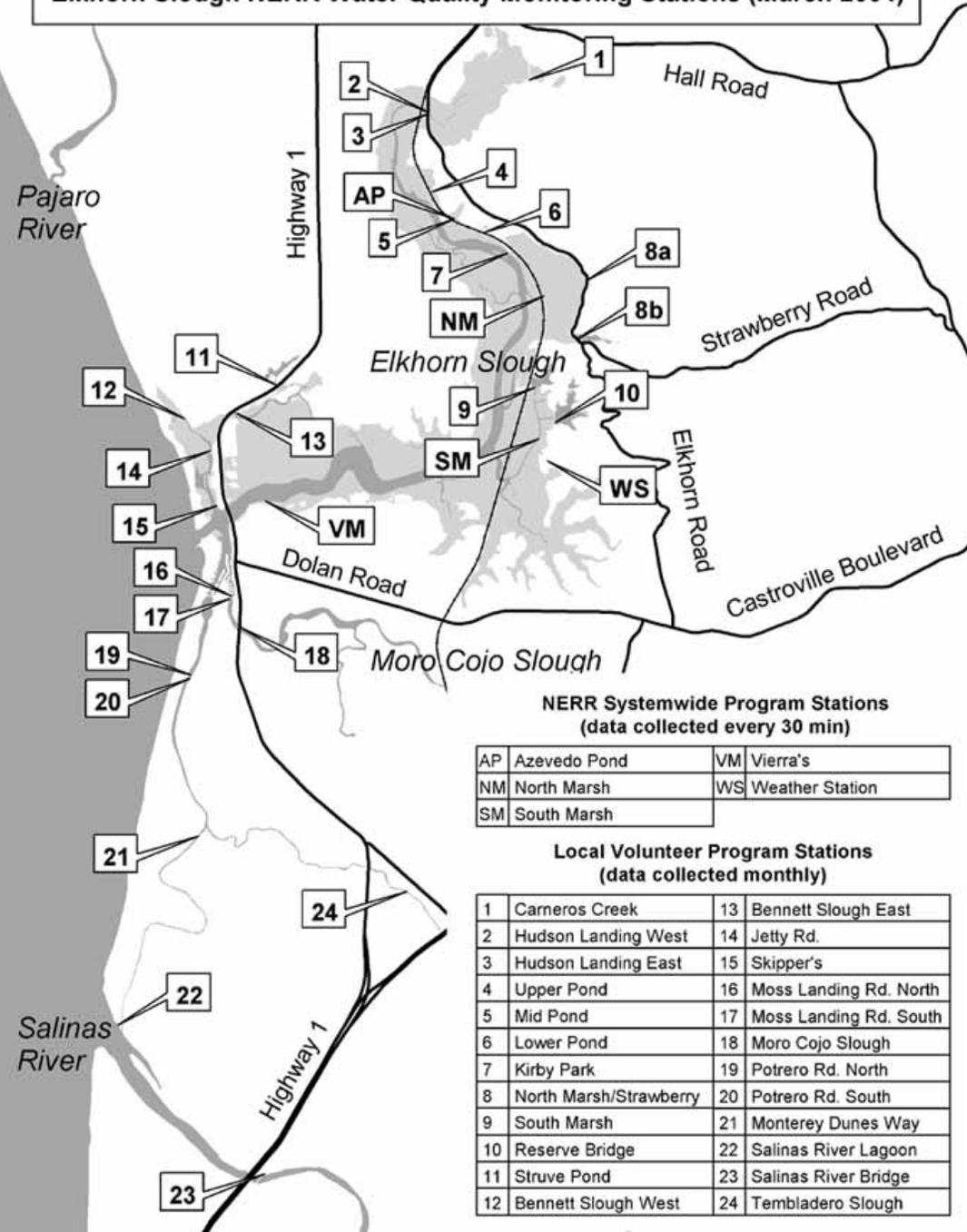
- List of potential projects maintained on line for students.



Water Quality Monitoring

- Volunteer Water Quality Monitoring
 - Sampled monthly since 1988
 - temperature, salinity, dissolved oxygen, pH, turbidity, nitrate, ammonium, and dissolved inorganic phosphate.

Elkhorn Slough NERR Water Quality Monitoring Stations (March 2004)



NERR Systemwide Program Stations
(data collected every 30 min)

AP	Azevedo Pond	VM	Vierra's
NM	North Marsh	WS	Weather Station
SM	South Marsh		

Local Volunteer Program Stations
(data collected monthly)

1	Carneros Creek	13	Bennett Slough East
2	Hudson Landing West	14	Jetty Rd.
3	Hudson Landing East	15	Skipper's
4	Upper Pond	16	Moss Landing Rd. North
5	Mid Pond	17	Moss Landing Rd. South
6	Lower Pond	18	Moro Cojo Slough
7	Kirby Park	19	Potrero Rd. North
8	North Marsh/Strawberry	20	Potrero Rd. South
9	South Marsh	21	Monterey Dunes Way
10	Reserve Bridge	22	Salinas River Lagoon
11	Struve Pond	23	Salinas River Bridge
12	Bennett Slough West	24	Tembladero Slough



HOW SEA OTTERS HELP the Elkhorn Slough Ecosystem

WITHOUT SEA OTTERS

1. Without otters to eat crabs, the crab population rises.

2. Too many crabs burrowing in the mud banks of the slough causes erosion and loss of habitat for other sea creatures.

4. Without oxygen, eelgrass can't grow on the slough floor so fish and other animals that need eelgrass for food and shelter suffer.

3. When crabs eat too many of the sea slugs and isopods that normally feed on algae, the algae grows out of control and sucks up lots of oxygen. This makes it hard for other animals to survive.

WITH SEA OTTERS

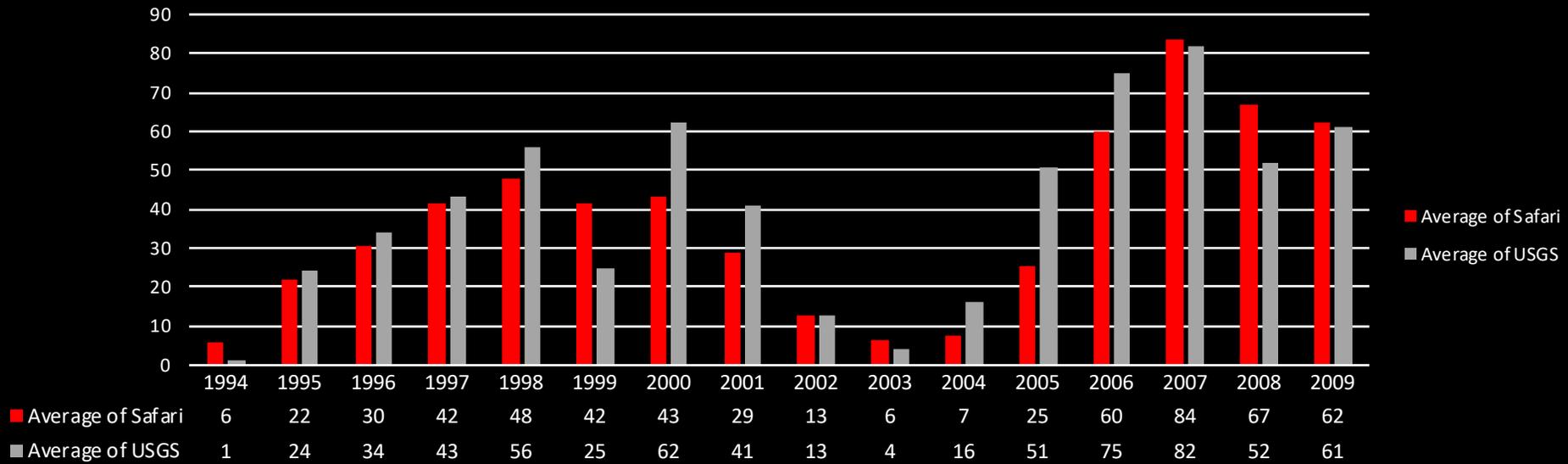
1. Sea otters eat a diet rich in crabs. This helps keep the crab population at a balanced level.

2. Otters eat crabs that burrow in the mud banks of the slough. With fewer crabs, the banks of the slough become stronger, providing structure and habitat for other animals.

4. When algae are in check, sunlight and oxygen enrich the water. Fish and other animals can thrive in the eelgrass.

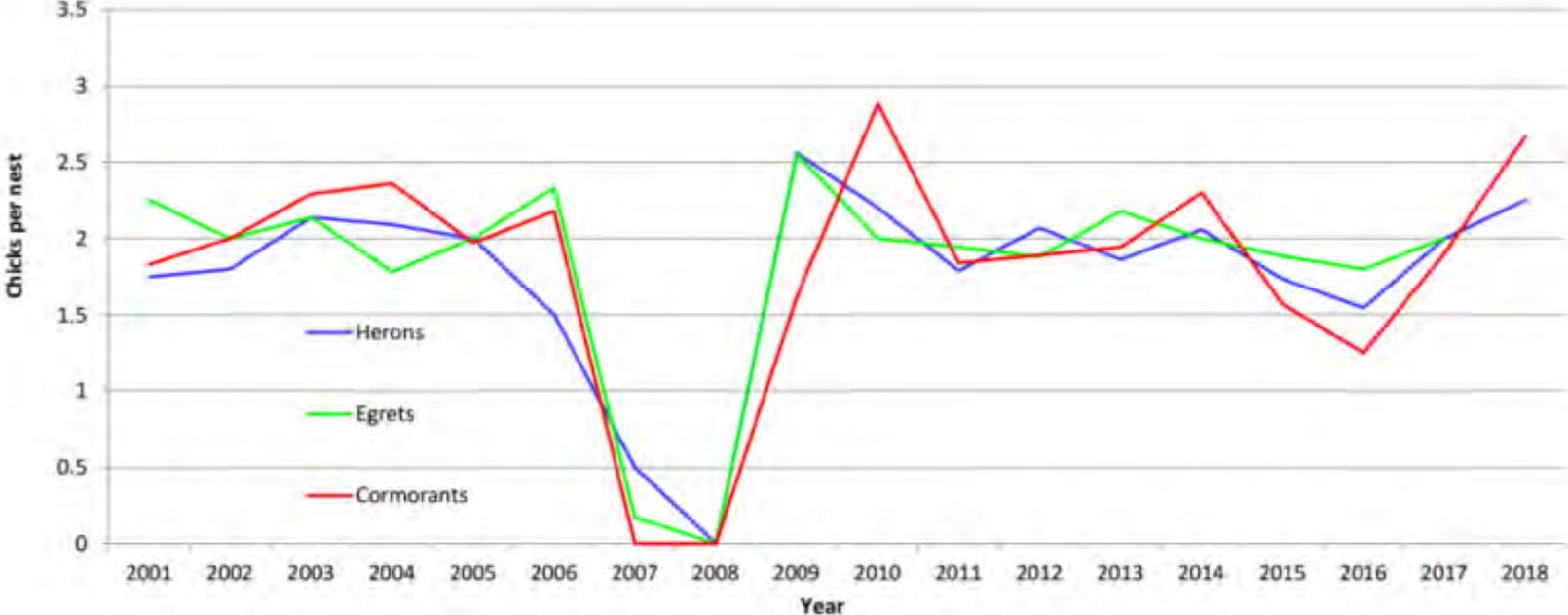
3. When the crab population is under control, slugs and other algae eaters return to the slough and keep algae from overgrowing.

ES Safari Annual Averages and USGS Spring counts



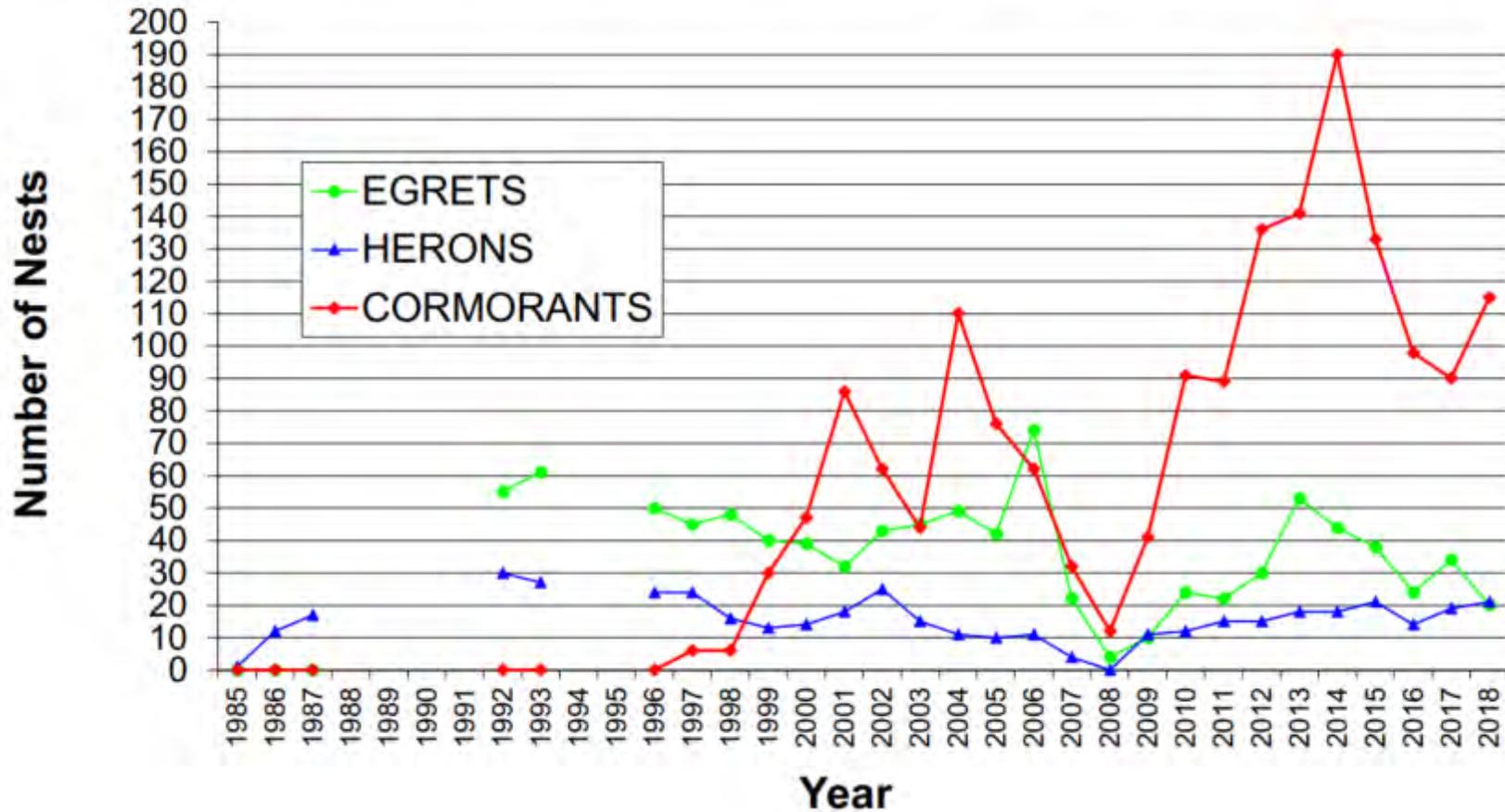
Elkhorn Slough
Safari counts
(averaged by
years)
and
USGS Annual
counts

Reproductive Success



ESNERR Rookery Populations Over Time

Note that nesting occurred in central part of ESNERR, in "Rookery" area, until 2008; nesting then moved to "Seal Bend" part of ESNERR.



A woman wearing a wide-brimmed hat, sunglasses, a dark jacket, and blue jeans stands in a field of tall, dry grass. She is holding a clipboard and looking towards the left. The background shows a line of trees under a clear blue sky.

Stewardship

Andrea Woolfolk



Invasive Plant Control







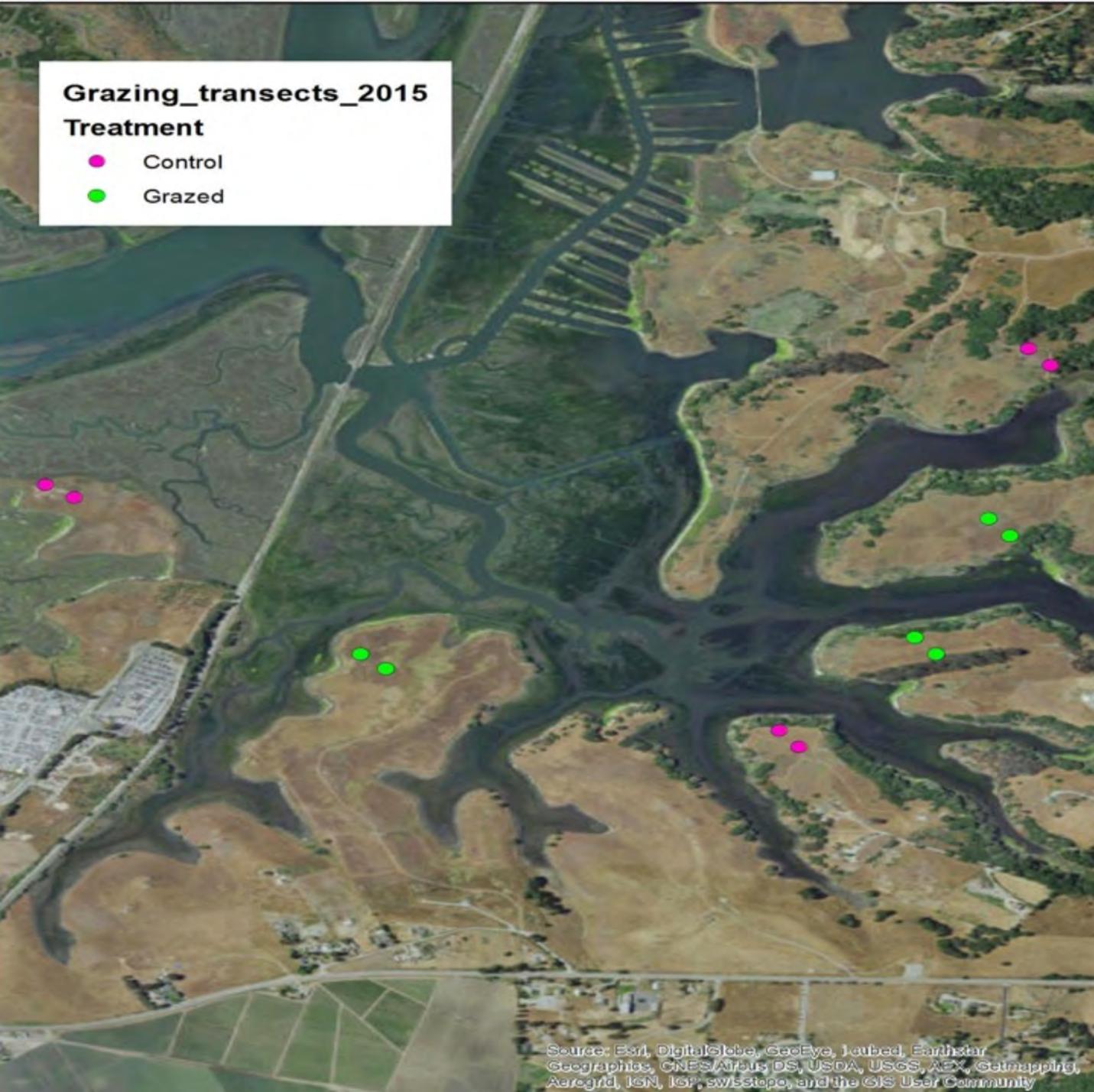
Grazing Program



Grazing_transects_2015

Treatment

- Control
- Grazed



Source: Esri, DigitalGlobe, GeoEye, Iubed, Earthstar, Geographics, CNES/Airbus DS, USDA, USGS, AeroX, Getmapping, Aergrid, IGN, IGP, swisstopo, and the GIS User Community

3 pastures
3 controls





Elkhorn Slough Reserve
Freshwater Ponds



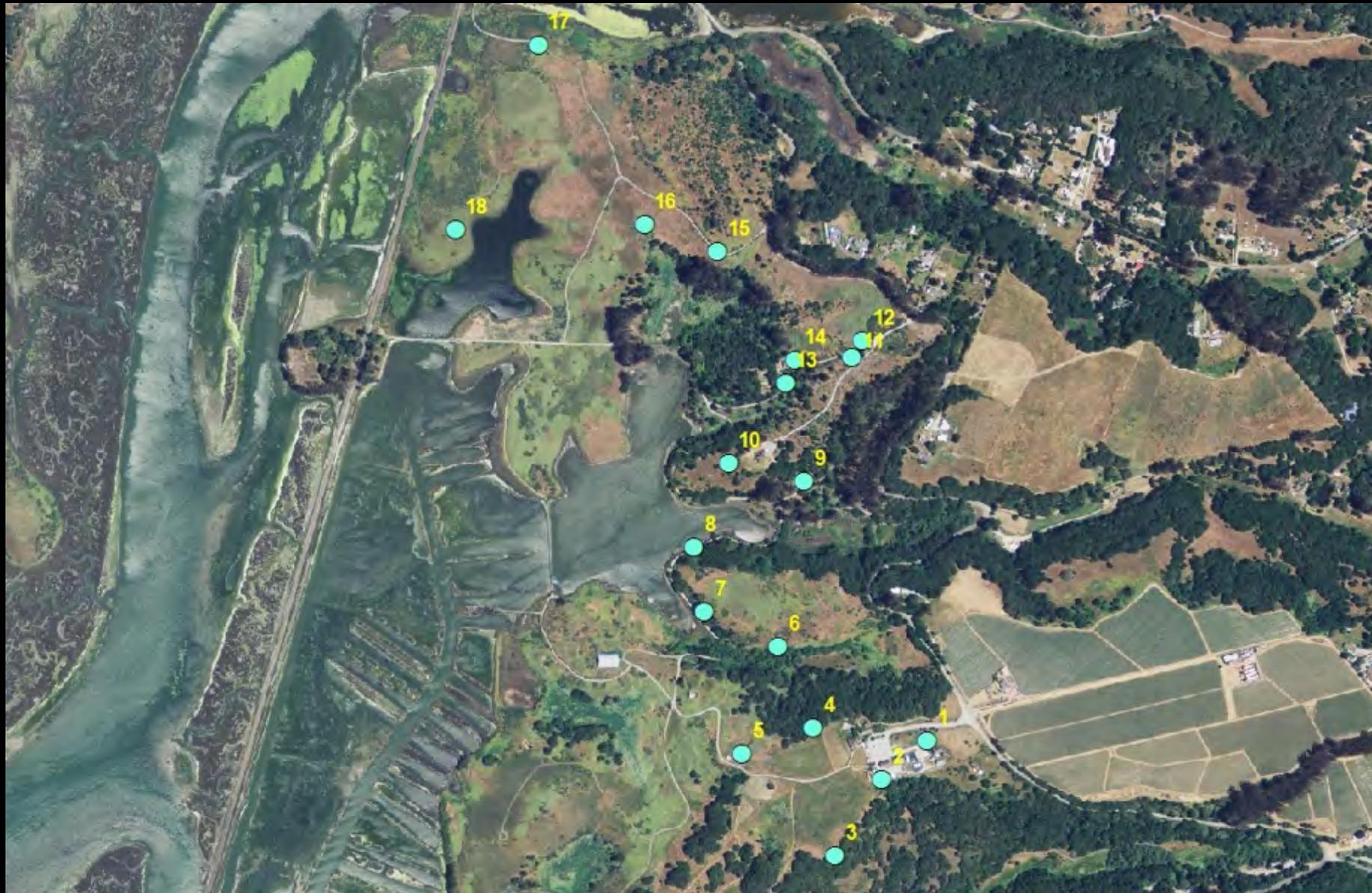














Success



Bushnell

01-12-2011 01:13:53

Lower Cattail: Construction







A Freshwater Landscape









Santa Cruz Long-toed Salamander



California Tiger Salamander





Environmental DNA

Eucalyptus Tree Removal



Eucalyptus Tree Removal







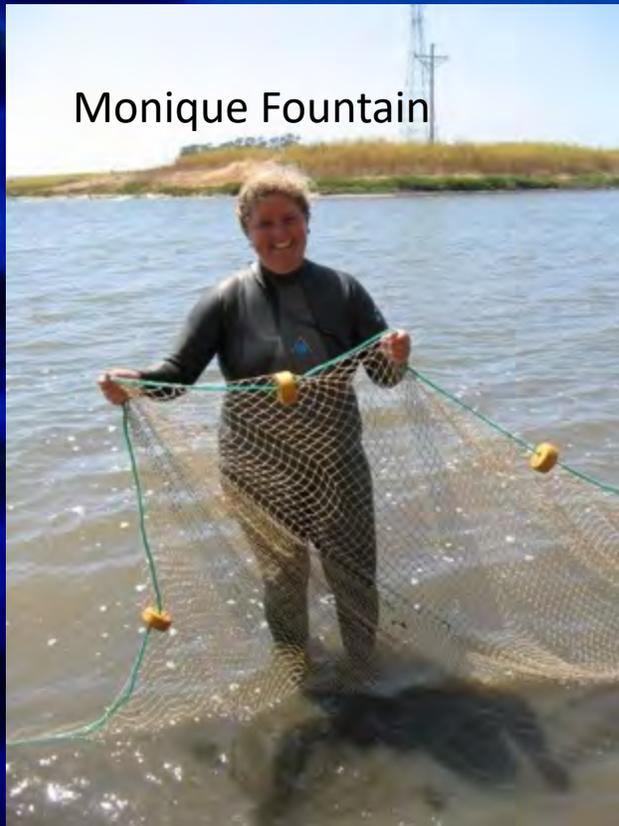
Biochar





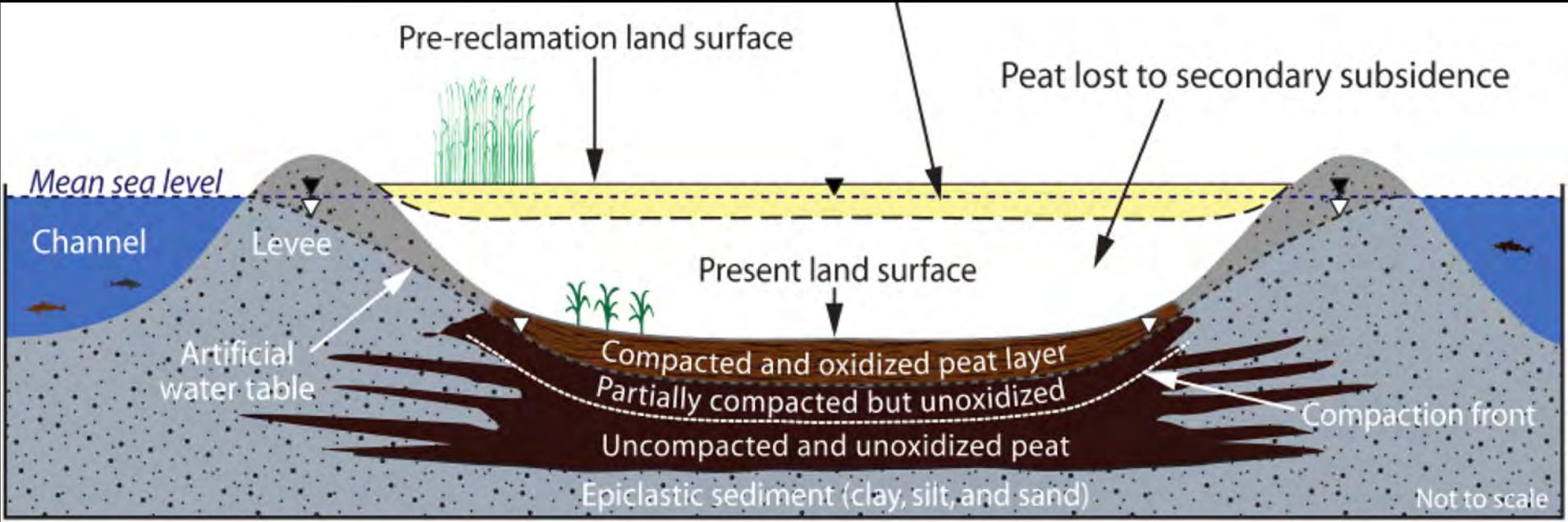


Tidal Wetlands Program



A collaboration to address the significant loss of salt marsh in the Elkhorn Slough. We have lost fifty percent, or 1,000 acres of our salt marshes over the past 150 years.









Google Earth

Imagery Date: 5/9/2018 36°48'45.83" N 121°44'35.36" W elev 0 ft eye alt 18347 ft

1937

5/1931

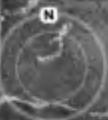


Image NASA
Image Elkhorn Slough Foundation

Google Earth

Imagery Date: 5/26/1931 36°48'55.17" N 121°45'32.93" W elev 0 ft eye alt 18347 ft



Image Elkhorn Slough Foundation

Google Earth

Imagery Date: 5/26/1931 36°48'38.71" N 121°44'45.55" W elev 0 ft eye alt 5041 ft

Hester Phase I

Write a description for your map.

Legend



Google Earth















5/2018



1931

Google Earth

Imagery Date: 5/9/2018 36°48'35.11" N 121°45'16.41" W elev 0 ft eye alt 5041 ft



Feb 28, 2018



April 17, 2018

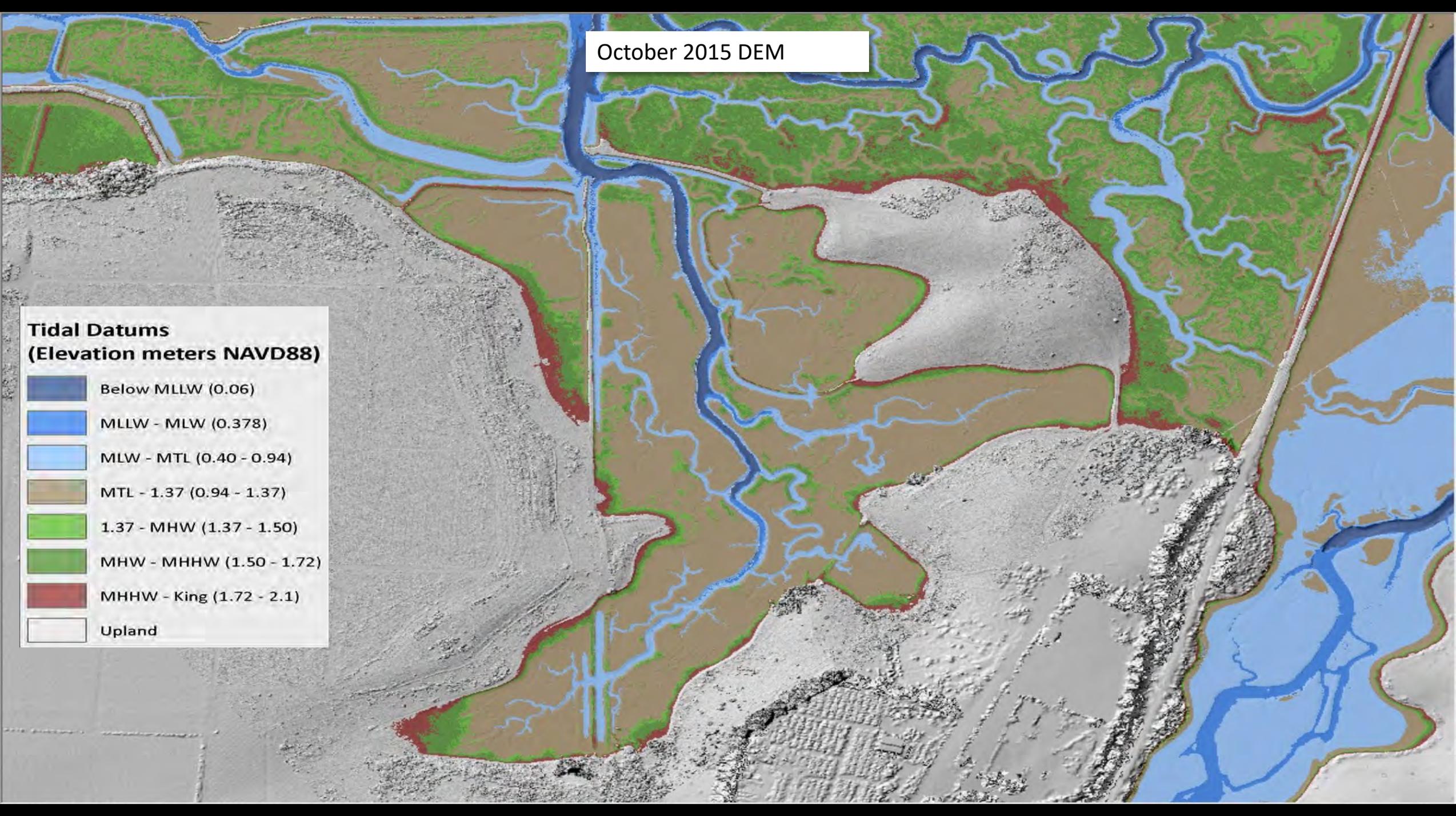
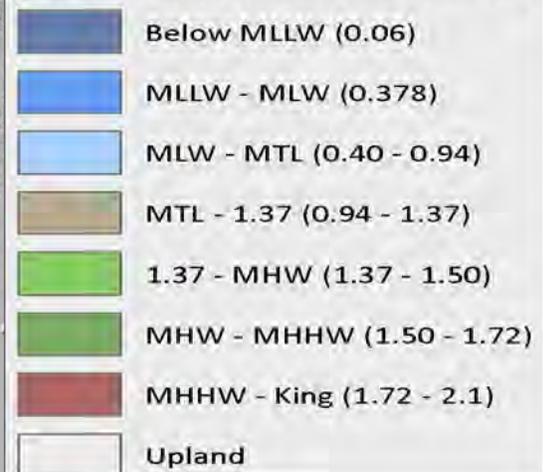


June 6, 2018

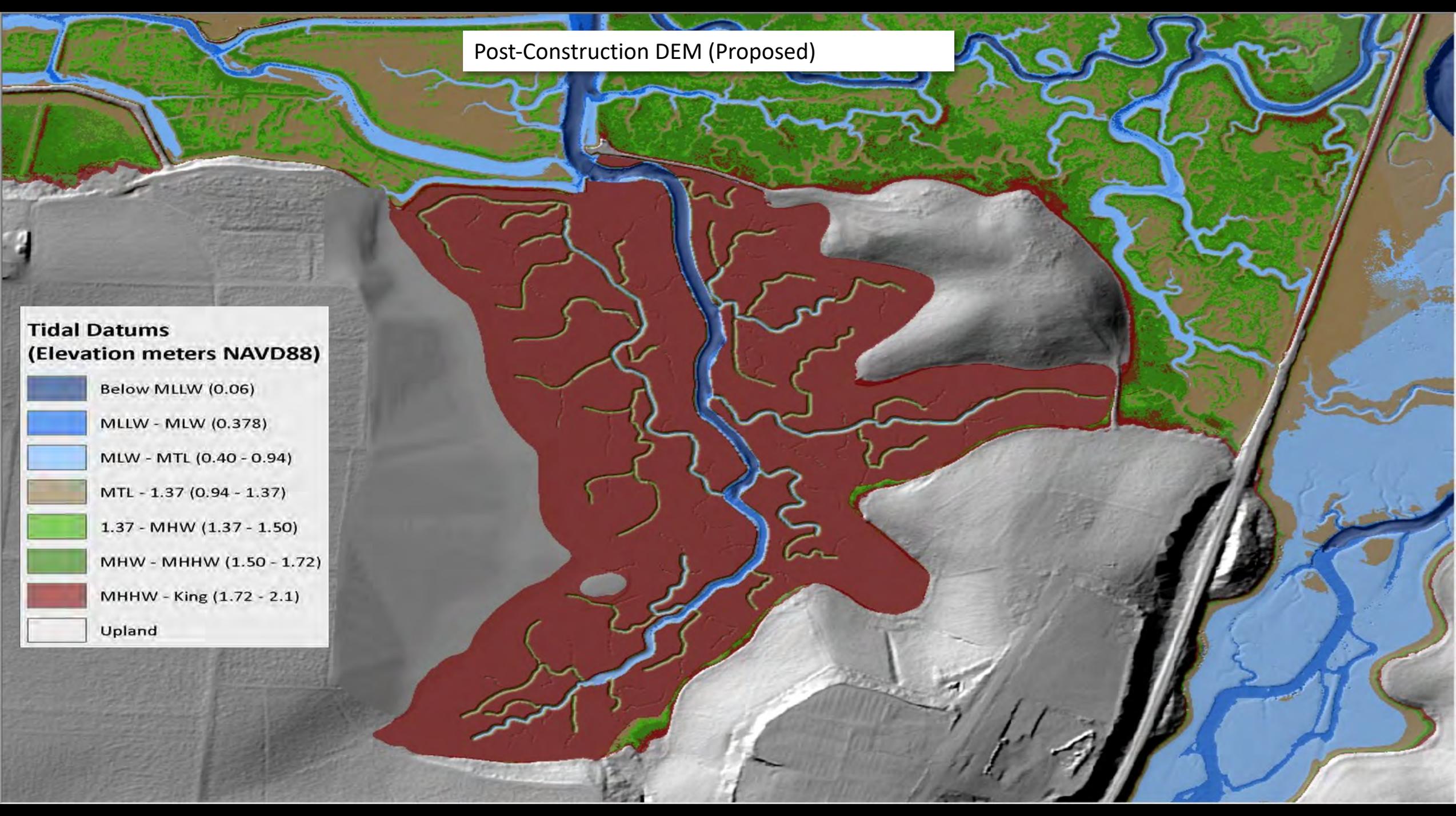


October 2015 DEM

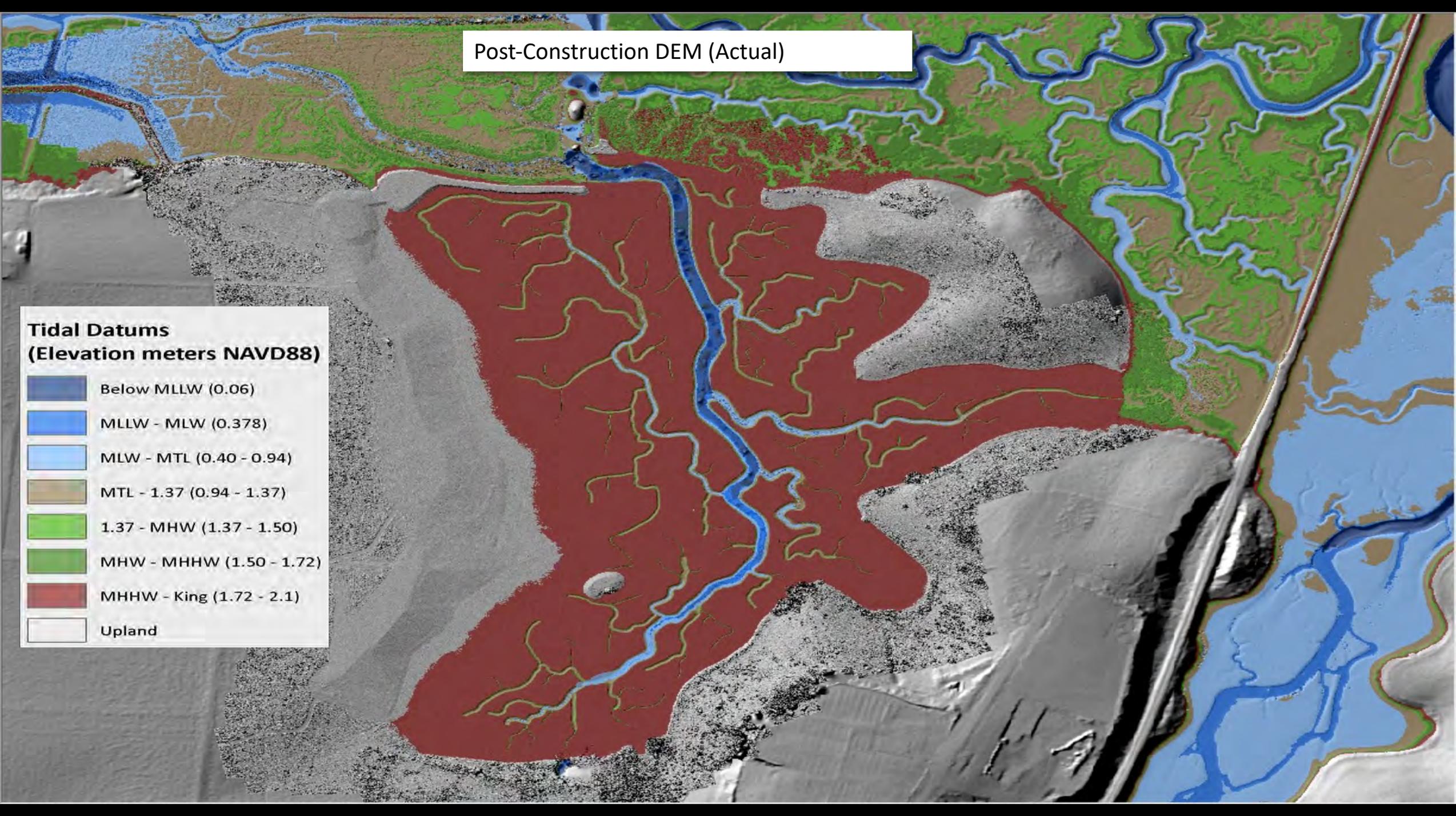
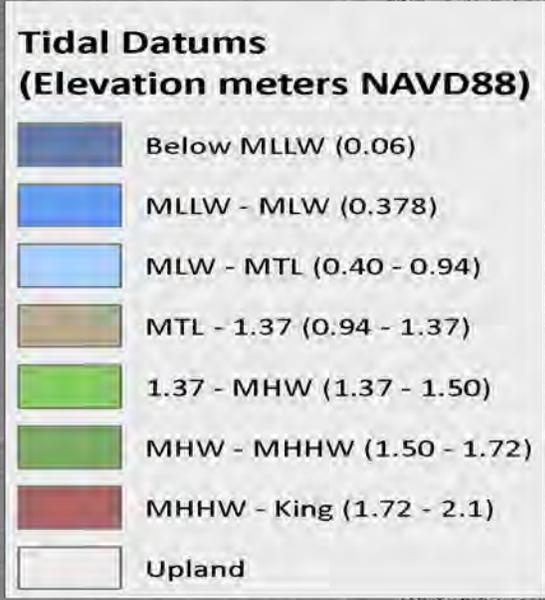
**Tidal Datums
(Elevation meters NAVD88)**



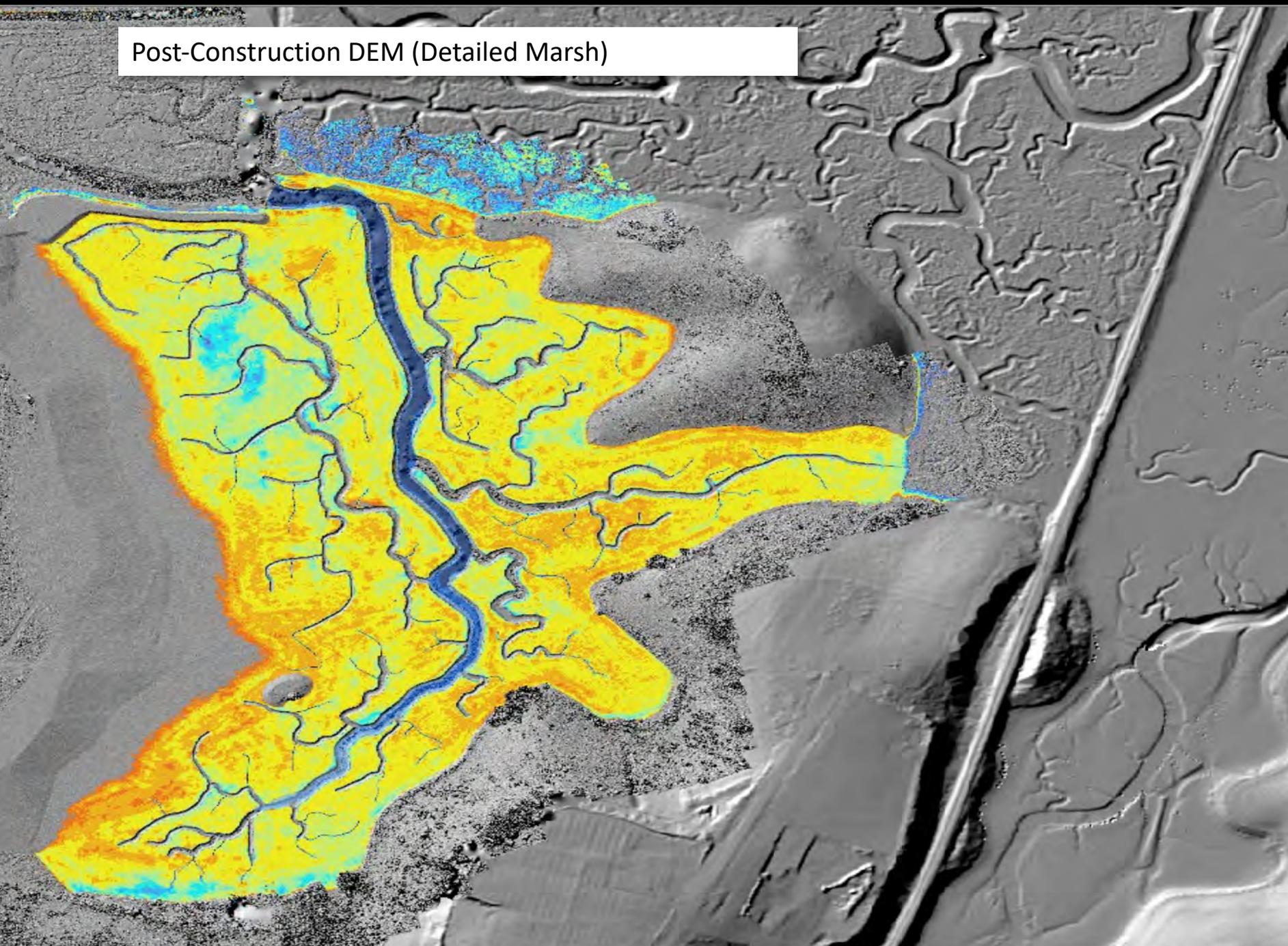
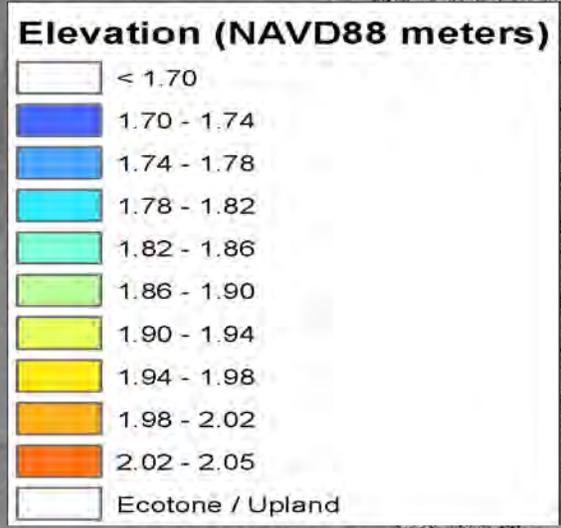
Post-Construction DEM (Proposed)



Post-Construction DEM (Actual)



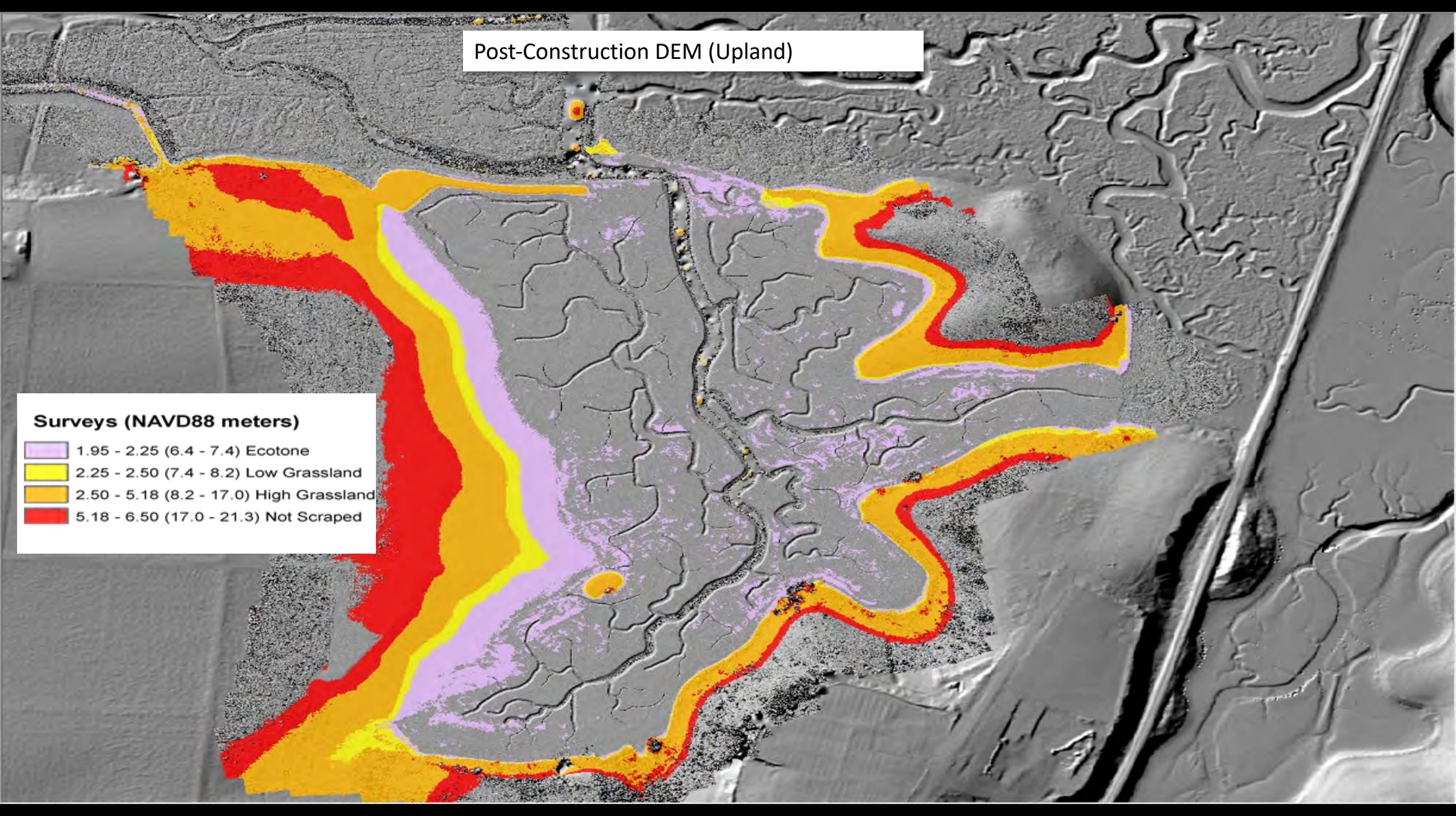
Post-Construction DEM (Detailed Marsh)



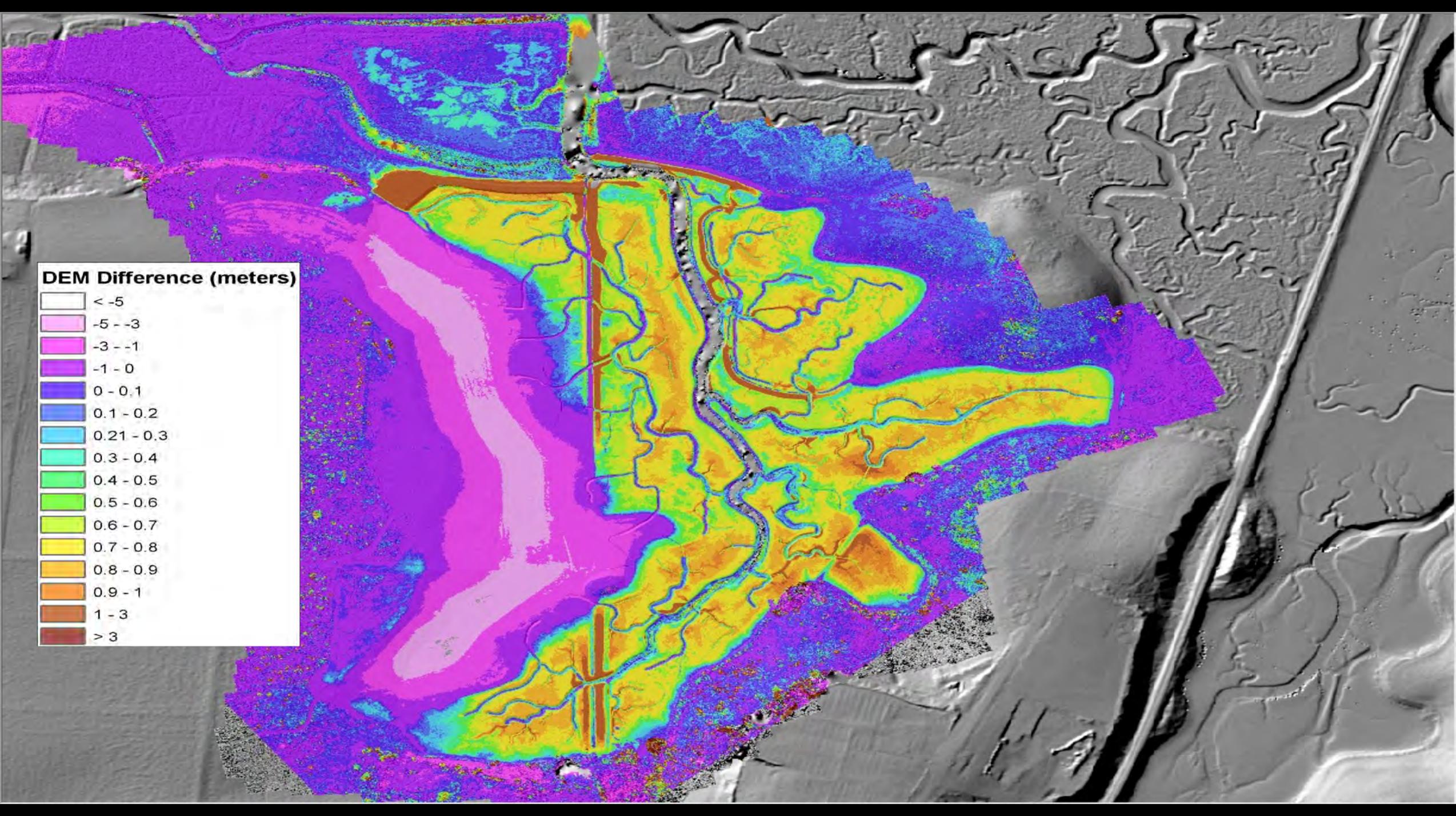
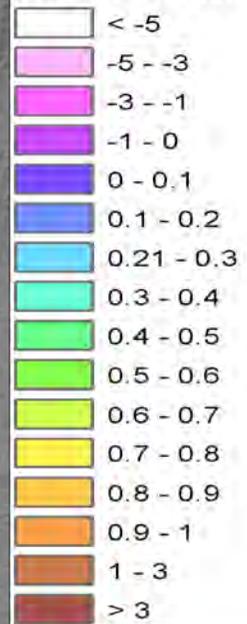
Post-Construction DEM (Upland)

Surveys (NAVD88 meters)

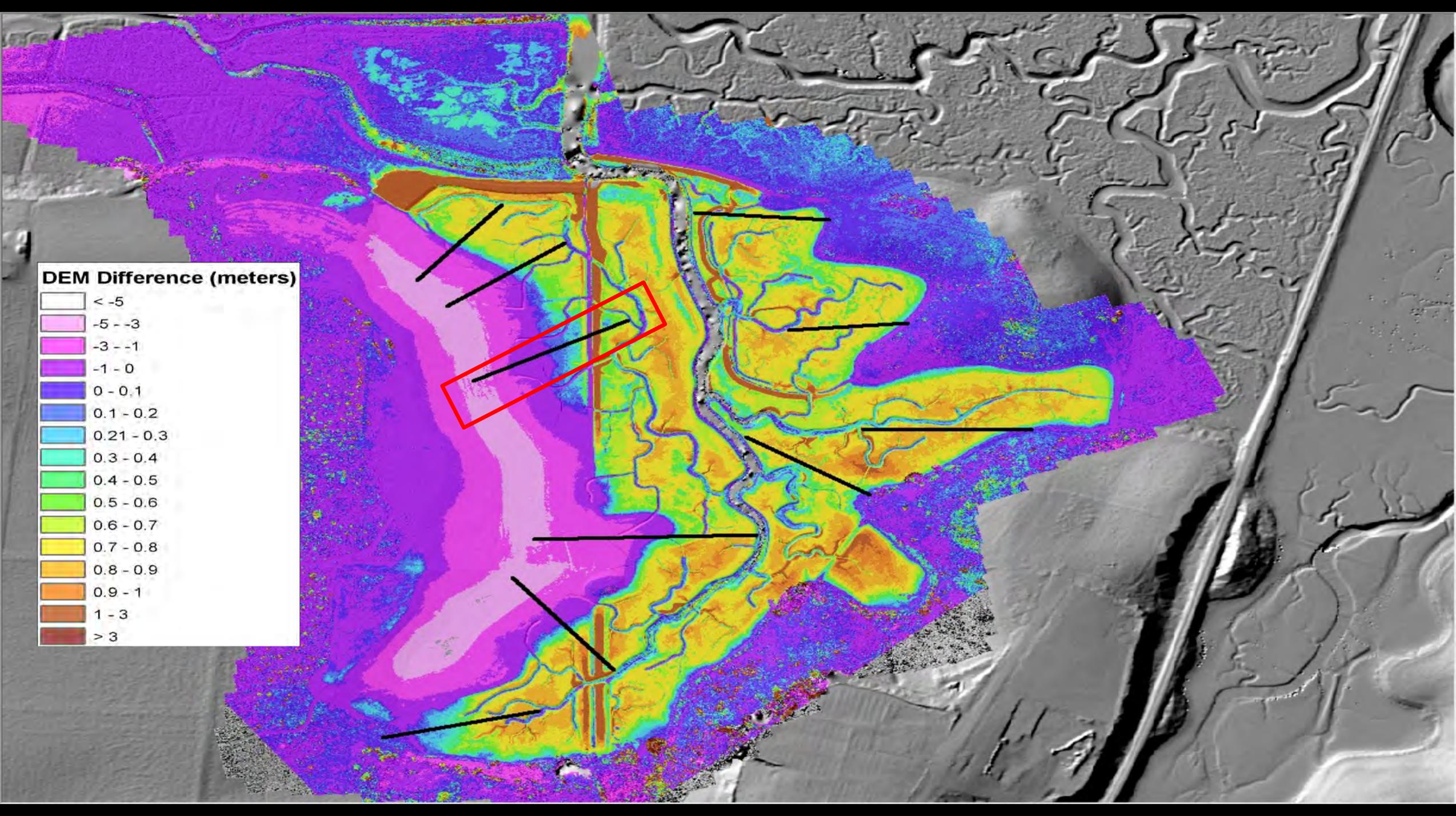
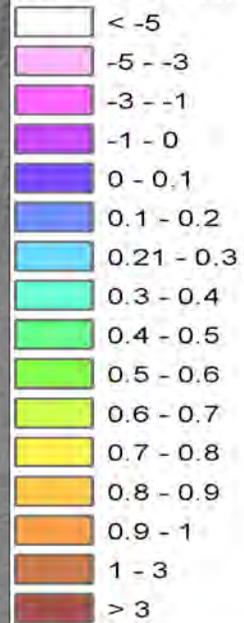
1.95 - 2.25 (6.4 - 7.4)	Ecotone
2.25 - 2.50 (7.4 - 8.2)	Low Grassland
2.50 - 5.18 (8.2 - 17.0)	High Grassland
5.18 - 6.50 (17.0 - 21.3)	Not Scraped



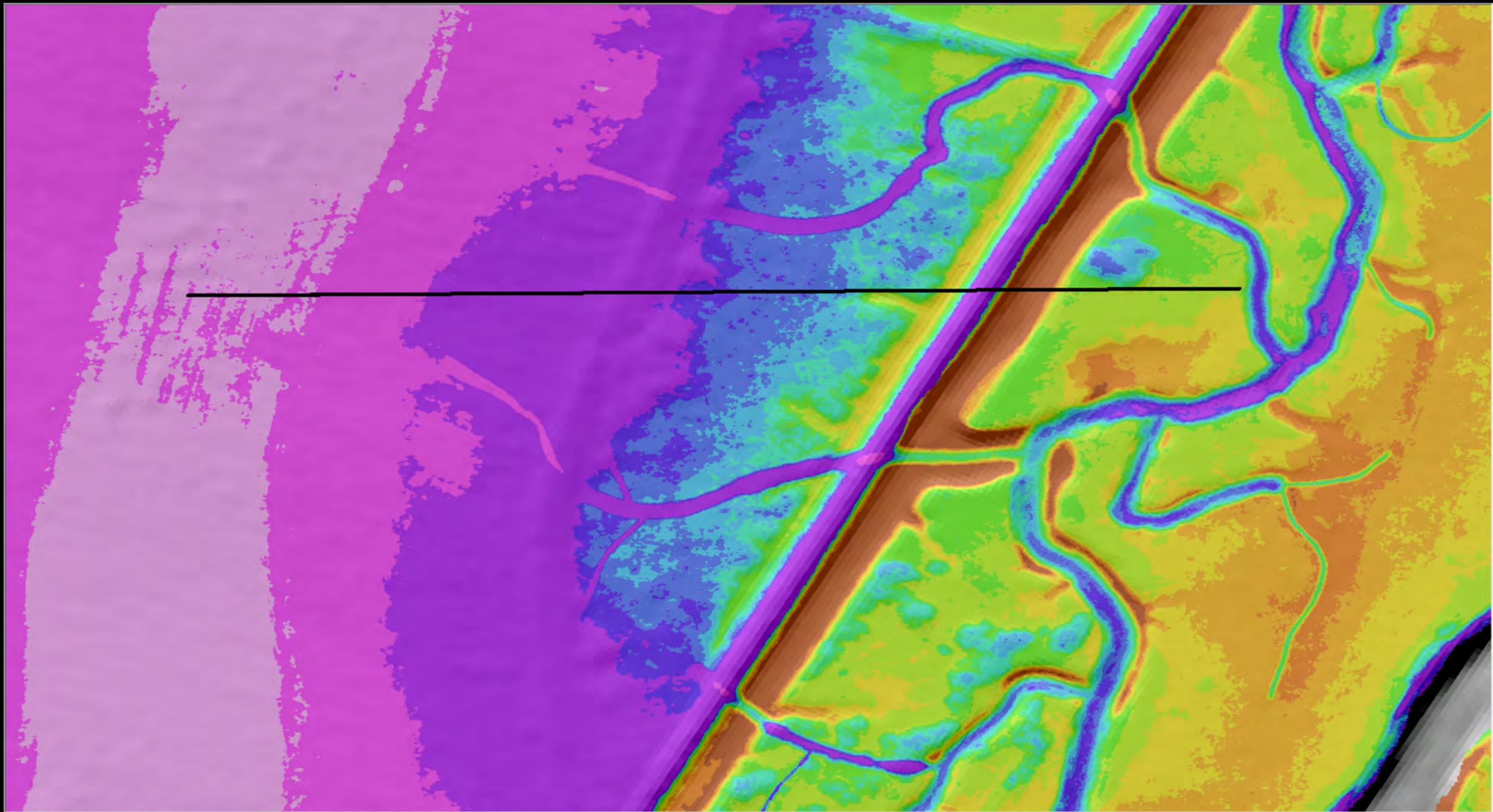
DEM Difference (meters)

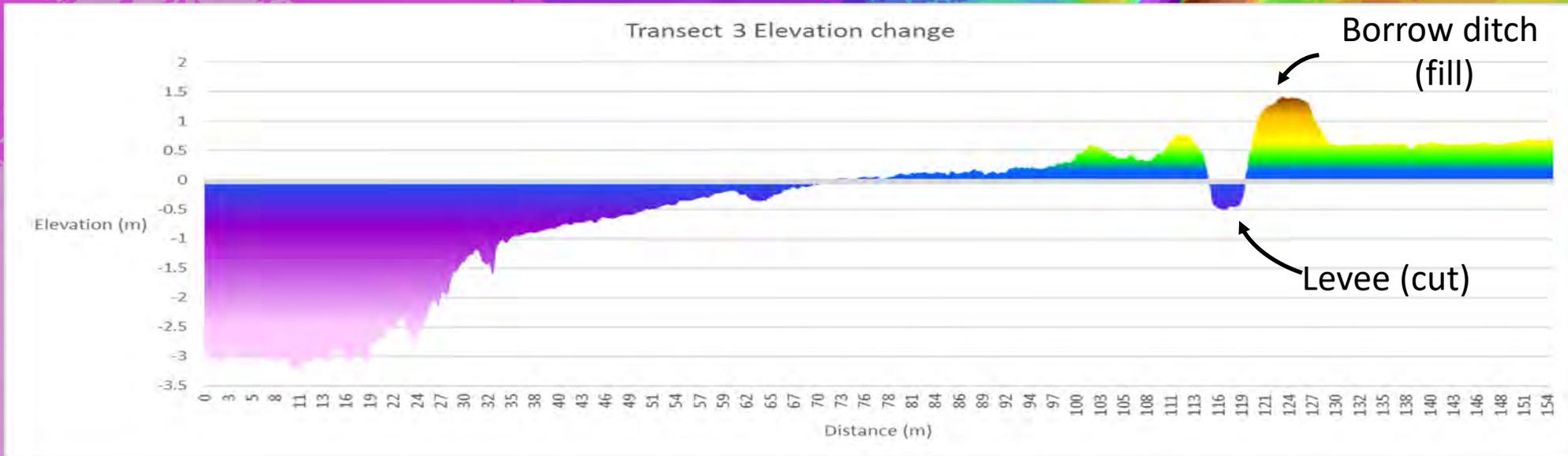


DEM Difference (meters)









Facilities Maintenance



Mike Curthoys





Facility Improvements





Dan Brumbaugh
Coastal Training Program





Coastal Training Program

- Focus on supporting and improving environmental stewardship by *Coastal Decision-Makers (CDMs)* * within the Central Coast region
- Compared to other NERR programs, more outward looking...
- Currently in strategic planning phase, and feedback about CDM needs and opportunities are welcome!

Central Coast Rangeland Coalition





Education



Virginia Guhin

2016 Employee
Excellence
Award Recipient



Ariel Hunter



Estuary Explorers Club
Elkhorn Elementary School



Estuary Explorers Club
Elkhorn Elementary School



Monterey Bay Aquarium WATCH



Agricultural Education



**FARMS
LEADERSHIP
PROGRAM**
**ALUMNI
SCHOLARSHIPS**





Environment For the Americas





Ramsar Designation “Wetland Of International Importance



