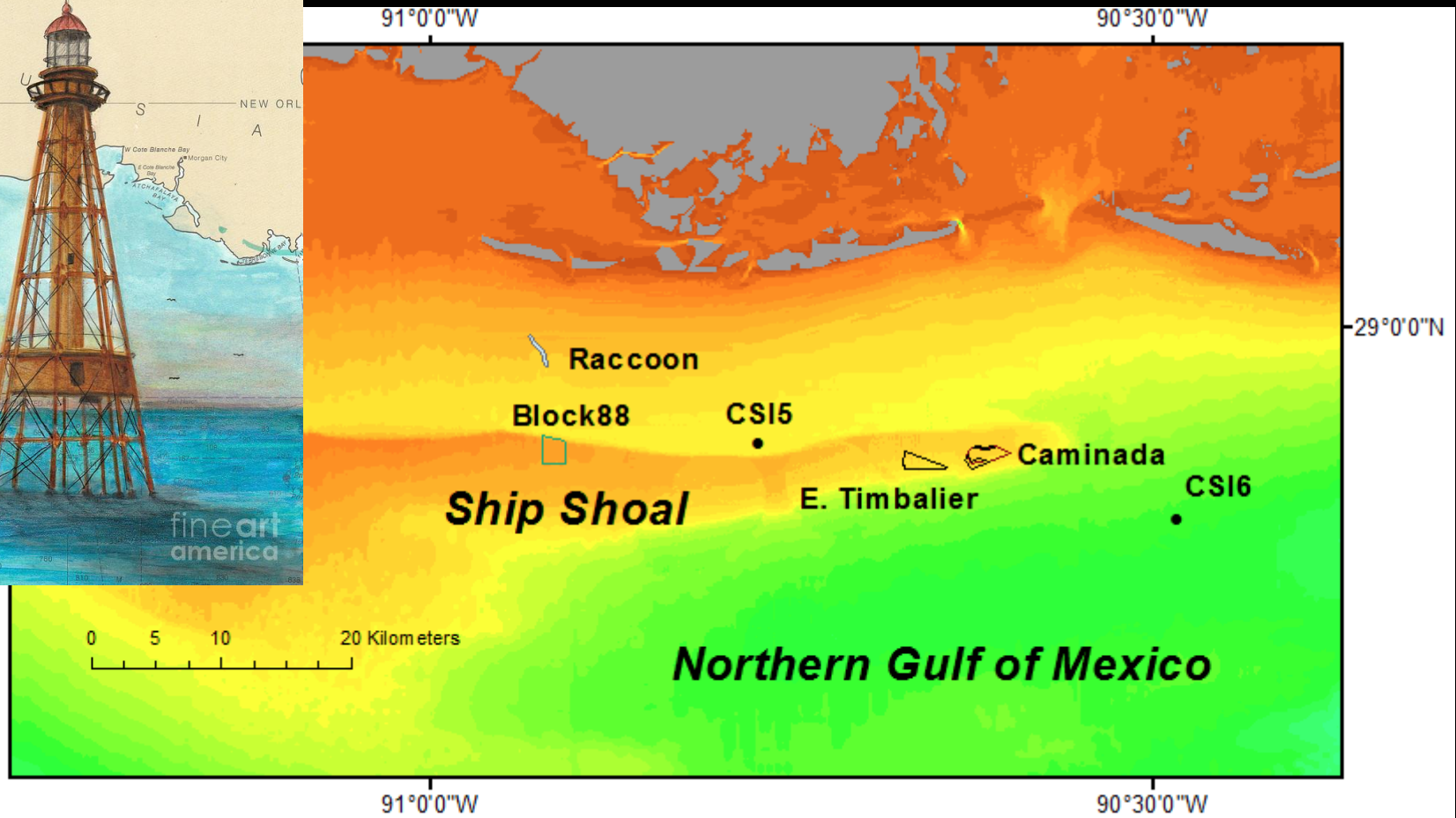
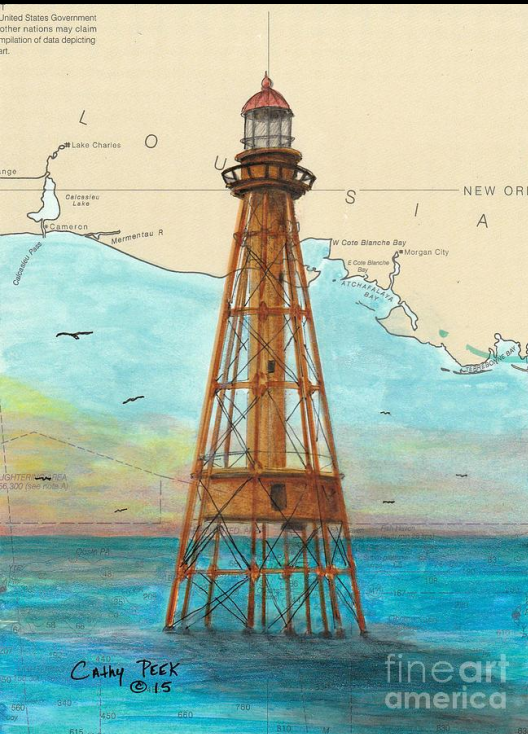


Responses of Ecological Function of the Ship Shoal Biological Communities Subjected to Dredging

United States Government
Other nations may claim
sovereignty over certain
territories. The depiction of
territories is not intended to
imply any claim of
sovereignty by the United States
Government.



Overarching Project Goals

- BOEM is charged with managing OCS sediment resources.
- This work was commissioned to determine the ecosystem effects of dredging.
- Determine if there are functional differences in control site and borrow sites (pre- and post-dredging).
- If so, investigate if these differences correlate with biophysical differences (grain size, flow characteristics).
- Finally, determine if there are regional differences in recovery (Gulf of Mexico vs. Atlantic).

Ship Shoal Physical Characteristics

- Ship Shoal is a reworked deltaic headland located 10 miles off of the central coast of Louisiana
- The shoal is ~30 miles long and 2-6 miles wide with an average depth of 20ft.
- Ship shoal contains 14.3 billion cubic yards of fine sand.
- Previously the shoal has been dredged for the Caminada Headland Beach Restoration Increments I & II.
- These projects extracted 11 million cubic yards of sand.

Ship Shoal Biological Characteristics

- The relatively shallow depth of the shoal support significant benthic productivity that support high secondary productivity relative to surrounding waters.
- Shrimp, Blue Crabs, Red Drum, Black Drum, Cobia, Gray Snapper, YOY Red and Lane Snapper use the shoal as forage habitat.
- During spring and early summer the shoal is a refuge for low oxygen conditions typical in the northern gulf during these months.

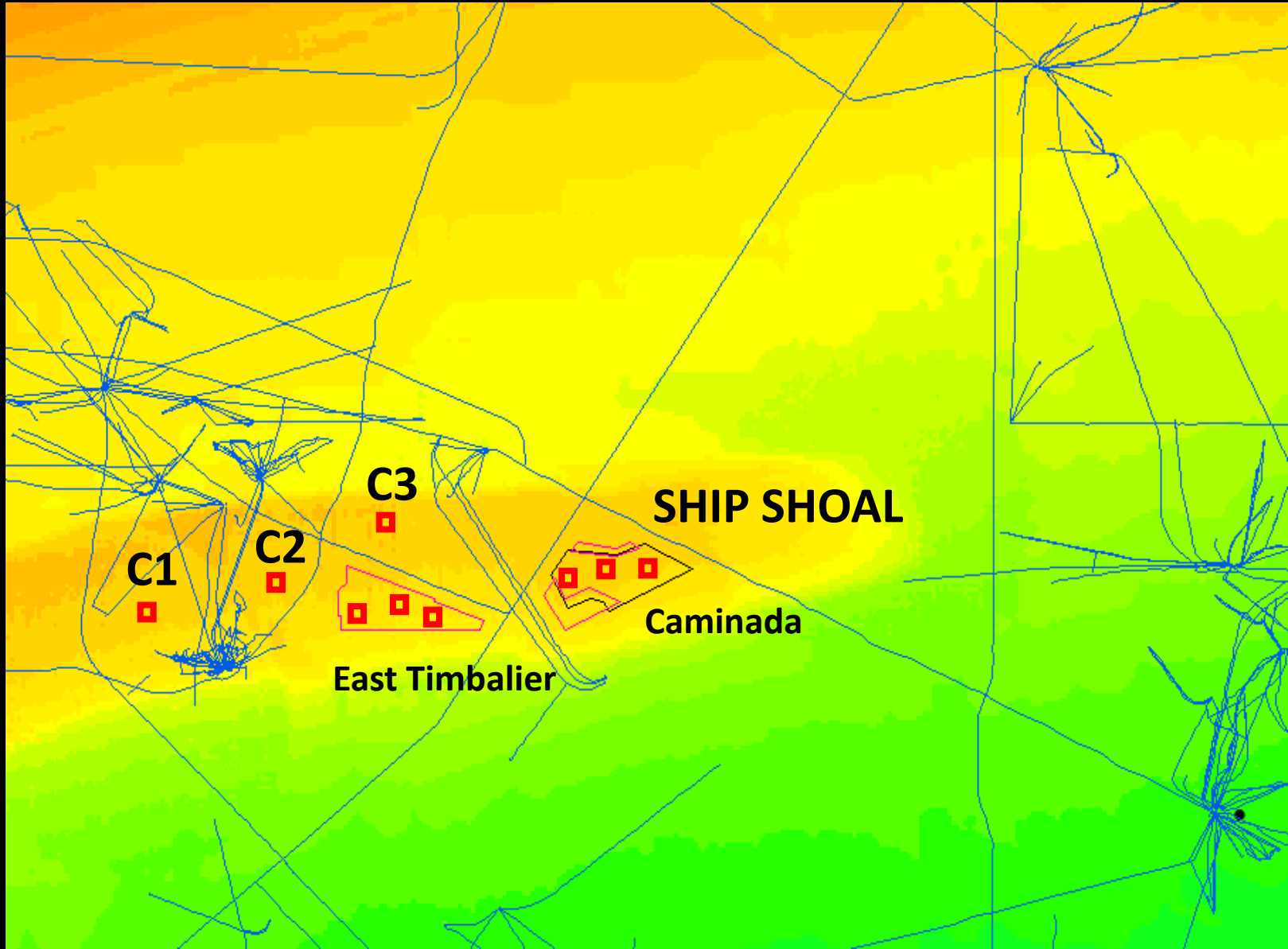
General Approach

- We will use a modified Before-After Control Impact (BACI) design.
- Sampling will focus on two treatment areas: the Caminada borrow pit (Caminada), the proposed Terrebonne borrow pit (Timbalier), and three reference areas.
- Sampling will occur in all six sites during the spring (March–April), summer (June–July), and fall (October–November) of 2020 and 2021.

Hypothesis

- Previous work done on the physical recovery of mud-capped dredge pits in the norther Gulf of Mexico suggests that the physical recovery could be quite rapid.
- Obelz et al. (2018) observed that infilling of barrow areas that was an order of magnitude greater than natural areas on a decal time frame.
- If the SS dredge areas respond in a similar fashion then we hypothesize **that the ecological effects may be relatively short lived (~10 years).**

Reference and Sample Locations

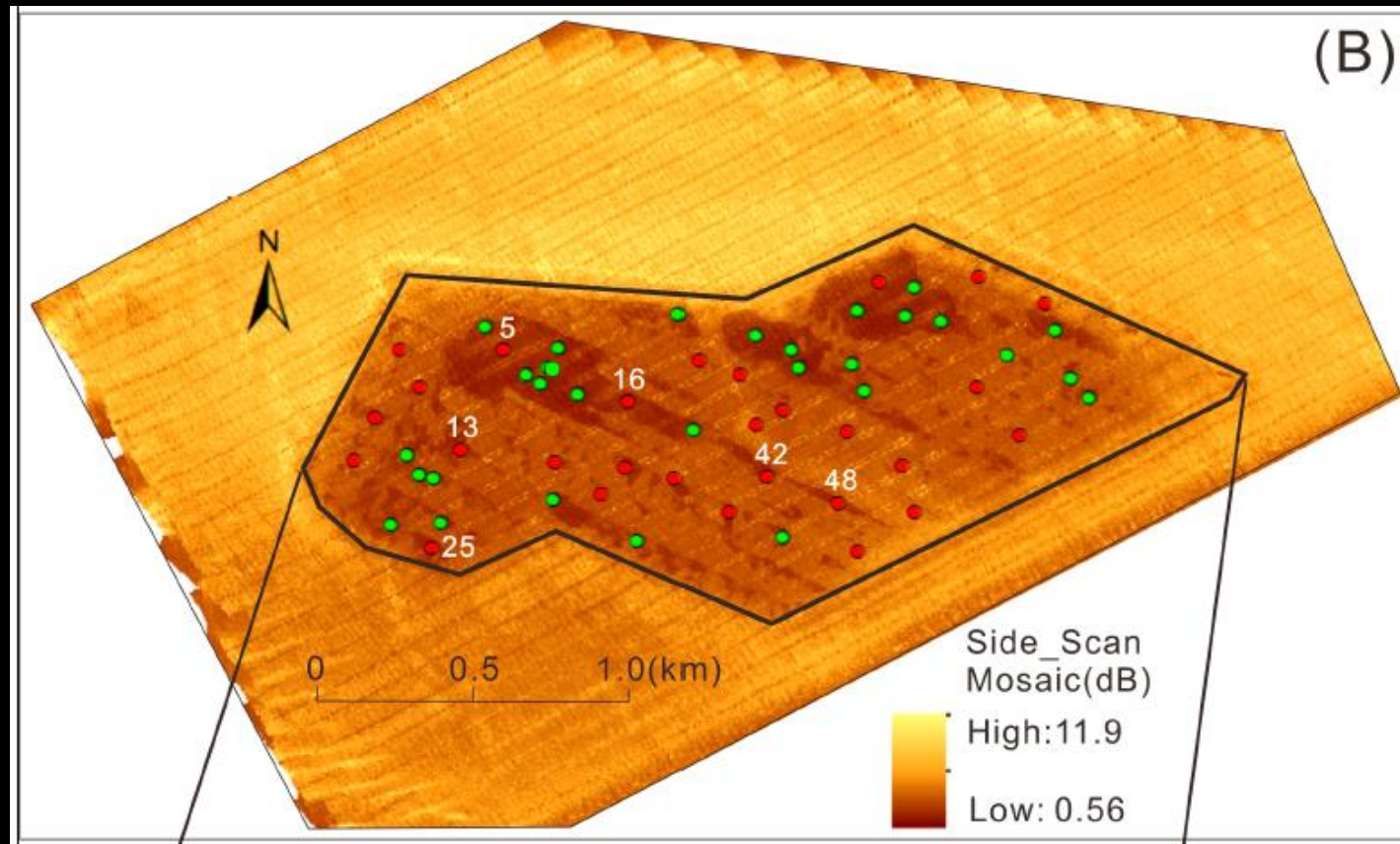


Project Component	Year 1			Year 2			Year 3		
Season	1	2	3	1	2	3	1	2	3
Graduate Student Recruitment	X	X							
Postdoc Recruitment	X	X							
Review of existing research	X	X							
Geophysical observation			X			X			
Water quality and plankton		X	X	X	X	X	X		
Benthic microalgae and primary production		X	X	X	X	X	X		
Macrobenthic communities		X	X	X	X	X	X		
Nekton work		X	X	X	X	X	X		
Isotope work					X	X	X	X	X

Methods

Geo-Physical Sampling-

High Resolution side-scan sonar for bathymetry and sub-seafloor profiling.



Methods

Water Quality and Plankton Sampling

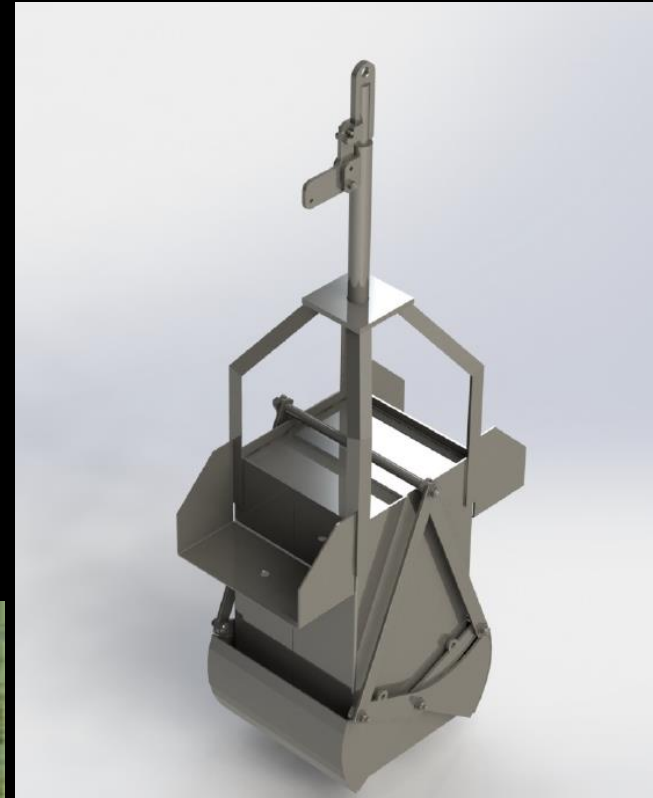
CTD casts for all water quality parameters
LICOR, PAR, and Plankton tows at three
depths to assess plankton assemblage.



Methods

Benthic Primary Production

Four replicate 30cm x 30cm GOMEX box cores will be used to collect sediment for benthic primary production analysis and nutrient analysis.



Methods

Benthic Infauna

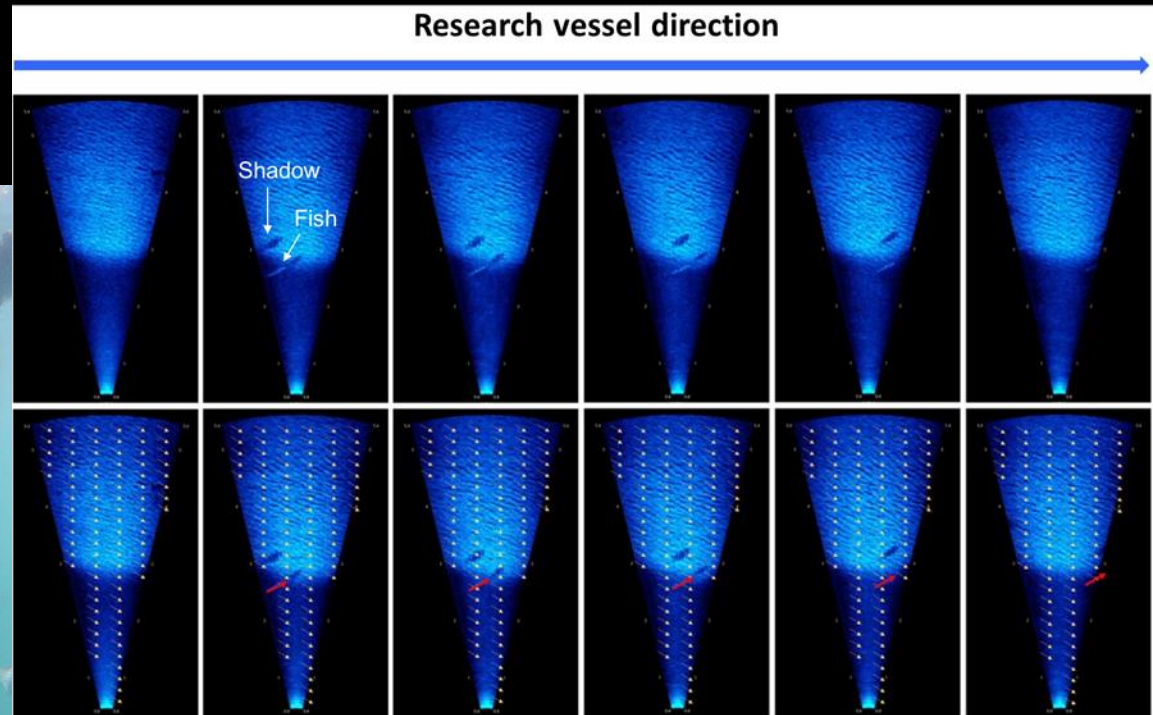
The same benthic cores will be subsampled for benthic faunal density estimates.



Methods

Nekton Community sampling

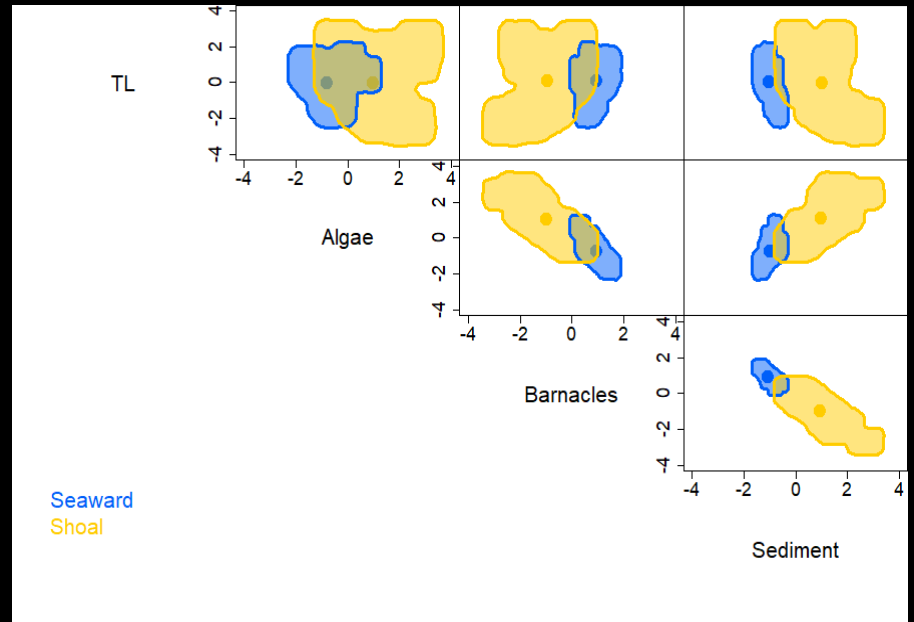
Day and night traditional nekton sampling (trawls, longlines, hook-and-line) will be coupled with new acoustic abundance and biomass sampling.



Methods

Food Web Analysis

We will use new stable isotope metrics to determine the effects of dredging on the food web and determine how quickly they recover.



THANK YOU

