Matagorda Bay Mitigation Trust 2023-2024 Funding Cycle
Title: Evaluating Ecological and Human Health Risk of PFAS in Matagorda Bay
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Q1 July 2024 Progress Report

Q1 Update:

We have started sample collection to assess the PFAS body burdens of Eastern oysters from Matagorda Bay. We are currently processing these samples to quantify PFAS in the UT MSI Core Lab Facilities.

Phase 1:

During Q1, we collected market size Eastern oysters from four locations across Matagorda Bay to assess PFAS body burdens. All Eastern oysters were collected under co-PI Nielsen's active Scientific Permit through Texas Parks and Wildlife (TPWD) collection permit (SPR-0822-116). Oysters have been collected from Half Moon Reef (Site 1, Figure 1), Oliver Point Reef (Site 2, Figure 1), Schicke Point Living Shoreline (Site 3, Figure 1), and a small reef off of Point Comfort (Site 6, Figure 1). At each location, water quality parameters (temperature, salinity, pH, and dissolved oxygen) were measured and three water samples were also collected to measure PFAS. Five market size (3 in. / 7.62 cm) Eastern oysters were subsequently collected along the reef from each site (Sites 1-3, 6, Figure 1) and immediately placed on ice. Oysters were then transported to UT MSI where they were measured, weighed, and shucked. The oyster tissue (i.e., meat) was immediately weighed (i.e., wet weight) and placed in a PFAS free container at -80°C following US EPA method EPA 712-C-16-004 "*Ecological Effects Test Guidelines OCSPP 850.170 Oyster Bioaccumulation Factor (BCF)*". Both these tissue samples and their paired water samples are being prepared for analysis at the UT MSI Core Lab Facilities for the PFAS listed in Table 1. Abiotic samples will be analyzed using modified EPA methods 533 and 537.1 and biotic samples (e.g., oyster tissue) will be determined according to EPA draft method 1633, with one instrument modification that is permitted under section 1.6 of EPA Method 537.1. This includes the use of IM Q-TOF LC-MS rather than LC-MS/MS, which allow for more cost-effective analyses with higher-mass accuracy and mass-defect filtering.

We are currently planning sampling trips in East Matagorda Bay to collect Eastern oysters from the Oyster Farm Reef and Sargent Oyster Reef (Sites 4-5, Figure 1) during Q2.

Figure:

Figure 1. Oyster sampling locations for assessments of PFAS bioaccumulation.

Table:

Analyte	Internal Standard Reference
PFBS	2
PFHxA	1
HFPO-DA	1
PFHpA	1
PFHxS	2
ADONA	1
PFOA	1
PFOS	2
PFNA	1
9Cl-PF3ONS	2
PFDA	1
NMeFOSAA	3
PFUnA	1
NEtFOSAA	3
11CL-PF3OUdS	2
PFDoA	1
PFTrDA	1
PFTA	1
^{13}C2-PFHxA	1
^{13}C3-HFPO-DA	1
^{13}C2-PFDA	1
d5-NEtFOSAA	3
^{13}C2-PFOA– IS#1	-
^{13}C4-PFOS– IS#2	-
d3-NMeFOSAA–IS#3	-

Table 1. PFAS to be analyzed using EPA Method 537.1 for water samples collected from each sampling site in Matagorda Bay (Figure 1, Sampling Sites 1-3, 6).