**Activity report on the project** "*Microplastic concentration in sediments and waters of Matagorda and San Antonio Bays: Initial assessment and mitigation plans*"

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Period: June 1st 2021 to September 30st 2021 – Field data collection

During June and July, sampling procedure was designed to minimize the potential plastic contamination of the samples (we used metal tubes sleeves for coring). The coring devices of 3-inch diameter and 2 ft and 5 ft long (figure 1) were tested in lakes around Austin before using them in Matagorda Bay. During testing the sample methodology, different grab-sampling devices were used (Ponar, Eckman type grab sampler).

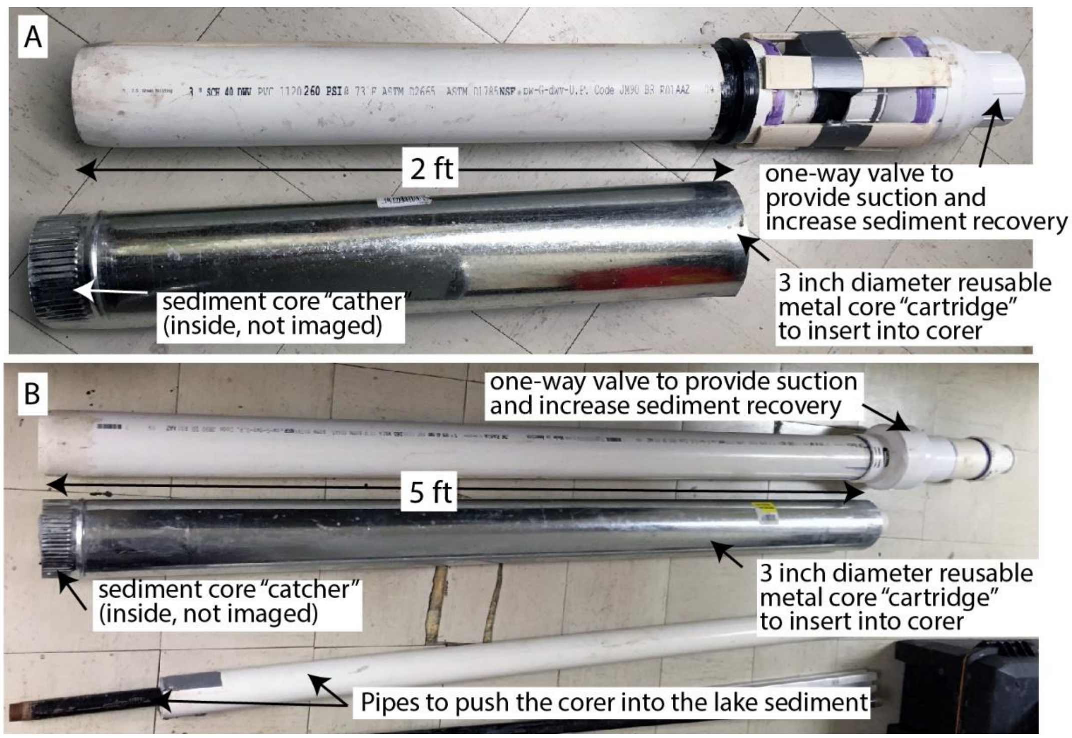


**Figure 1. Push core devices for microplastics. A – Two feet long corer. B – Five feet corer. Note both are designed to utilize reusable metal "cartridges" or "sleeves" to minimize contamination. The metal sleeves can be reused once the collected sediment have been analyzed.**

Two sampling trips were conducted during 11 to 13th of August and 20-21st of September using the *Mowdy* boat from University of Texas, Marine Science Institute in Port Aransas. Sampling for water parameters and superficial sediments from bay bottom and from substrate were also collected (figure 2).

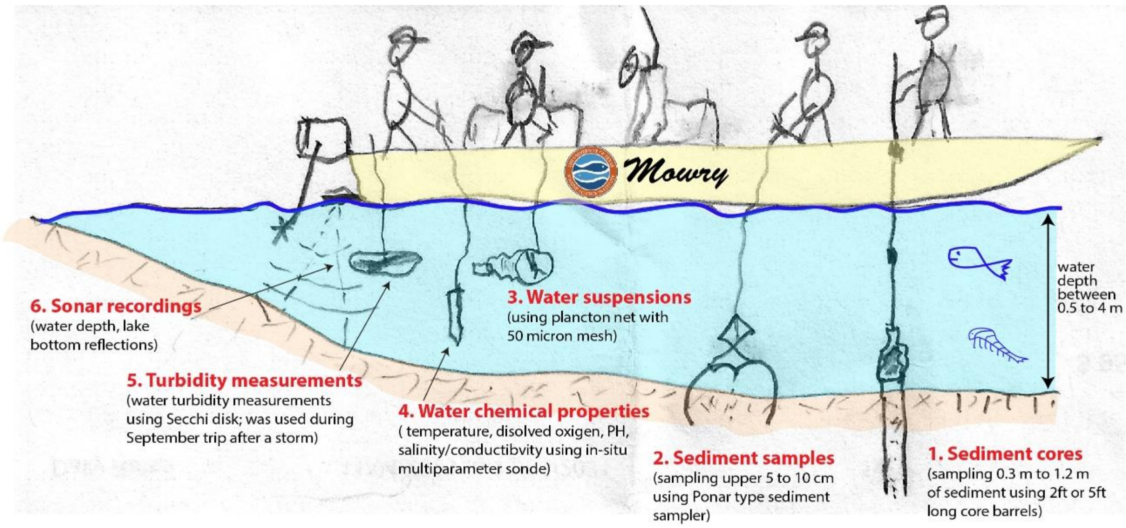


**Figure 2. Sketch depicting the different types of data collected at sampling stations at the San Antonio and Matagorda bays of Texas. At each station, a sediment grab sample or a sediment core was collected.**

Initial fieldwork for sampling of the sediment and water from the San Antonio, Matagorda and East Matagorda bays was carried out in August (11 to 13$^{th}$), where 19 sediment grab samples, 13 shallow sediment cores and 6 water samples were collected (see figure 3 for distribution of samples). Sonar data was recorded along the boat routes between the sampling locations, and exact sampling locations were saved as waypoints. Sonar data will be analyzed in the future using Python to characterize bay bathymetry. Physical-chemical properties of the water (temperature, PH, salinity, dissolved oxygen) were measured at each sample location.

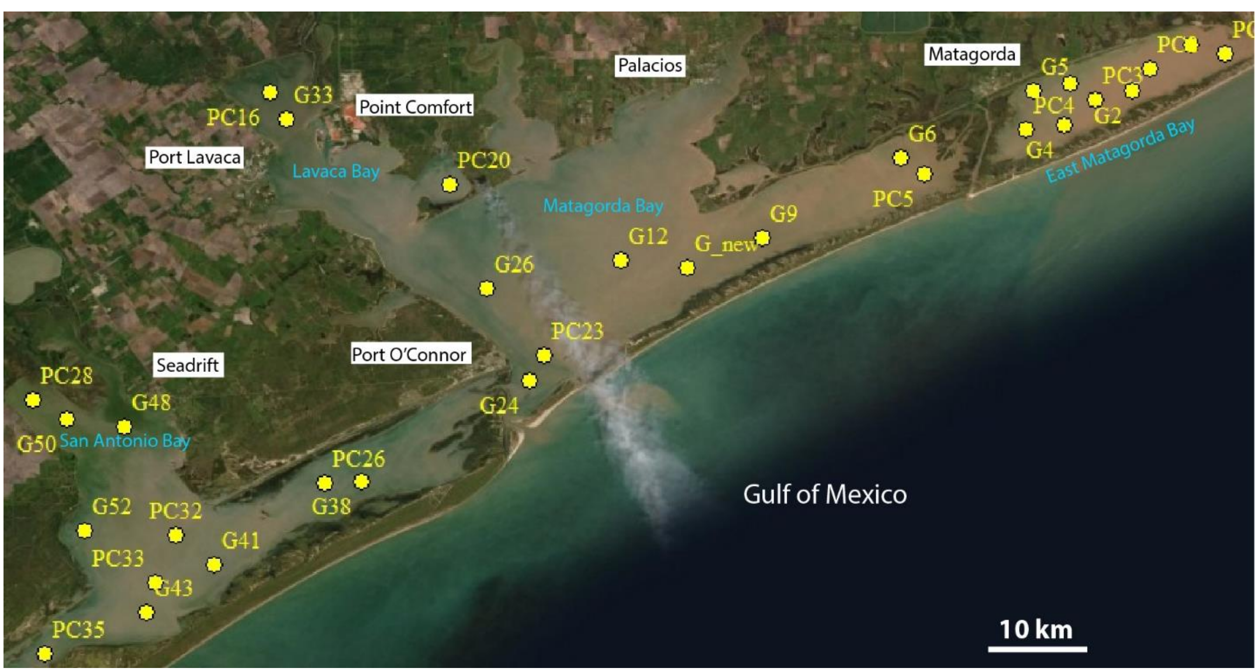


**Figure 3. Sediment sample location during August 2021 field data collection. The symbols meaning: PC (push core), G (grab sample).**

A second trip was undertaken in September (20th and 21st) collecting a number of 29 sediment grab samples, and 14 shallow sediment cores (figure 3). Physical-chemical properties of the water were measured, and 5 water filter samples were collected. The field work was conducted days after a strong storm path intersected the Matagorda Bay. A Secchi disk was used to measure water turbidity to test the possibility of correlating the ancillary turbidity measurements with satellite imagery and calibrate satellite images reflectance.

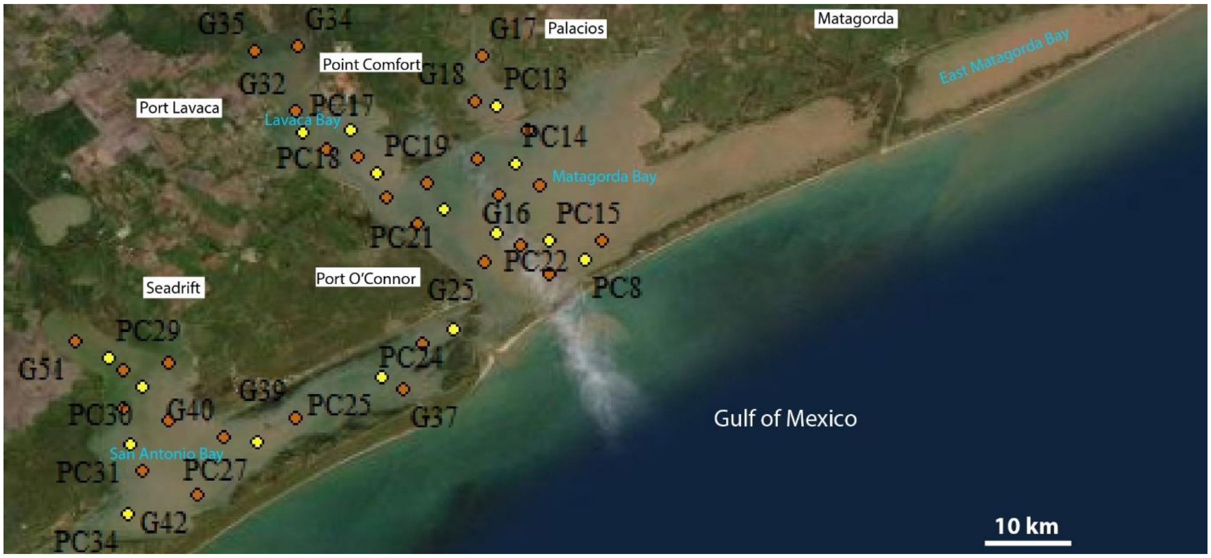


**Figure 4. Sediment sample locations during September field data collection. The symbols meaning: PC (push core), G (grab sample). The two different colors (yellow = cores, orange = sediment grab).**

Sediment samples were stored in plastic bags lined with aluminum foil, and core sleeves were capped with aluminum caps to avoid contamination (figure 5). The samples were indexed and stored in a cold room at Pickle Campus of the University of Texas at Austin.

Laboratory analyses were conducted on selected samples collected in August and September to evaluate different elutriation methods. Initial methods used a range of sediment amounts (i.e., between 100g to 400g), different salts (NaCl, $ZnCl_2$) and separation methods such as normal beaker, funnels or "sliced" glass beaker described by scientists at Japan Agency for Marine-Earth Science and Technology (JAMSTEC). The different method testing helped to identify the best approach to separate microplastics from organic material and clay particles. However, we will try two more methods using lithium metatungstate solution and electrostatic separation before deciding on most time-cost effective method to employ for all samples.


**Figure 5. Sediment samples for microplastic analyses. A- cores on the boat during sampling. B- 2&5 ft cores to be transported to UT lab. C- Indexing of grab samples before storage. D- Samples/ cores stored in cold room.**