

**Project Name:** Assessing multi-trophic impacts of microplastic pollutants across macroinvertebrate food webs in Matagorda Bay, Texas

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**Contract No:** 0046

**Reporting Period:** 3/01/2024-05/31/2024

**Task I: Collect free plastic pollutants found along coastal and wetland environments in Matagorda Bay to develop baseline information on chemical composition and pollution level within microplastic loads.**

Status of the task during this reporting period: not started in progress completed

- Describe the major accomplishments for this reporting period
  - *Hire of graduate student to conduct research (start date June 2024)*
  - *Performed training for Scanning Electron Microscopy (SEM), Energy Dispersive Spectroscopy (EDS) and Sputter Coating equipment for students at University of Houston-Clear Lake*
  - *Identified calibration issue associated with Magnesium Chloride and refined methodology to improve detection of microplastics; analysis ongoing for FTIR spectroscopy and Raman spectroscopy.*
- List the deliverable(s)/milestone(s) completed during this reporting period
  - *Developed manuscript of standard protocol for filtering, sorting, and calibrating sediment and saltwater samples for microplastic and nanoplastic assessment.*
- Were there any problems or obstacles encountered during this reporting period (e.g., delays, remedial action taken, schedule revision).  Yes No If Yes, please explain:
- Briefly describe plans for the next reporting period.
  - *Will continue to collect additional water, sediment, vegetation, and macroinvertebrates from Matagorda Bay and adjacent bays (East/West Matagorda, Tres Palacios, Turtle, Vaes, Keller, Cox, Lavaca, and Chocolate) for continued calibration and assessment of chemical composition and pollution loads.*
  - *Review manuscript of standard protocol for microplastic assessment and submit to professional journal for publication.*
  - *We will develop additional procedures to remove Magnesium Chloride from the samples to proceed.*
  - *The team will compare inventories of baseline samples and historical record to identify taxa for microcosm experiments as part of Task II and Task III.*

**Task II: Determine the presence, identity, and concentration of toxic or unique chemicals/elements found in plant tissues following the introduction of free plastic pollutants and how these pollutants impact plant growth, development, and nutritional content.**

Status of the task during this reporting period: not started in progress completed

- Describe the major accomplishments for this reporting period
  - *Graduate student for Task II thesis proposal approved and will begin sampling in Summer 2024.*
  - *Microphyte taxa selected for study include three algal genera (Rhodomonas, Tetraelmis, and Isochrysis) for inclusion with copepod and jellyfish microcosm as part of Task III.*
- List the deliverable(s)/milestone(s) completed during this reporting period
- Were there any problems or obstacles encountered during this reporting period (e.g., delays, remedial action taken, schedule revision).  Yes No If Yes, please explain:
- Briefly describe plans for the next reporting period.
  - *The team will compare inventories of baseline samples and historical record to identify taxa for microcosm experiments as part of Task II and Task III.*
  - *We will purchase tanks and other materials necessary for microcosm study upon selection of candidate taxa.*
  - *Will continue to collect additional water, sediment, vegetation, and macroinvertebrates from Matagorda Bay and adjacent bays (East/West Matagorda, Tres Palacios, Turtle, Vaes, Keller, Cox, Lavaca, and Chocolate) for continued calibration and assessment of chemical composition and pollution loads.*

**Task III: Determine the presence, identity, and concentration of toxic or unique chemicals/elements of free plastic pollutants found in macroinvertebrates (herbivores, detritivores, and their predators) and how these pollutants impact macroinvertebrate growth, development, and behavior.**

Status of the task during this reporting period: not started in progress completed

- Describe the major accomplishments for this reporting period
  - *Hire of graduate student to conduct research (start date June 2024)*
  - *Graduate student for partial completion of Task III thesis proposal approved and microcosm study to begin Summer 2024*
  - *Candidate taxa for partial completion of Task III identified as Calanoid copepods (Acartia spp.) and cannonball jellyfish (Stomolophus meleagris).*
- List the deliverable(s)/milestone(s) completed during this reporting period
- Were there any problems or obstacles encountered during this reporting period (e.g., delays, remedial action taken, schedule revision).  Yes No If Yes, please explain:
- Briefly describe plans for the next reporting period.
  - *Microcosm ongoing; study to continue into Fall 2024*
  - *We will purchase tanks and other materials necessary for additional microcosm study upon selection of candidate taxa.*