

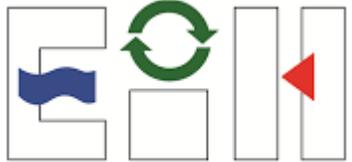
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Estimating abundance of microplastics in surface waters and sediments of the Galveston Bay watershed

Presented by Emily Cox

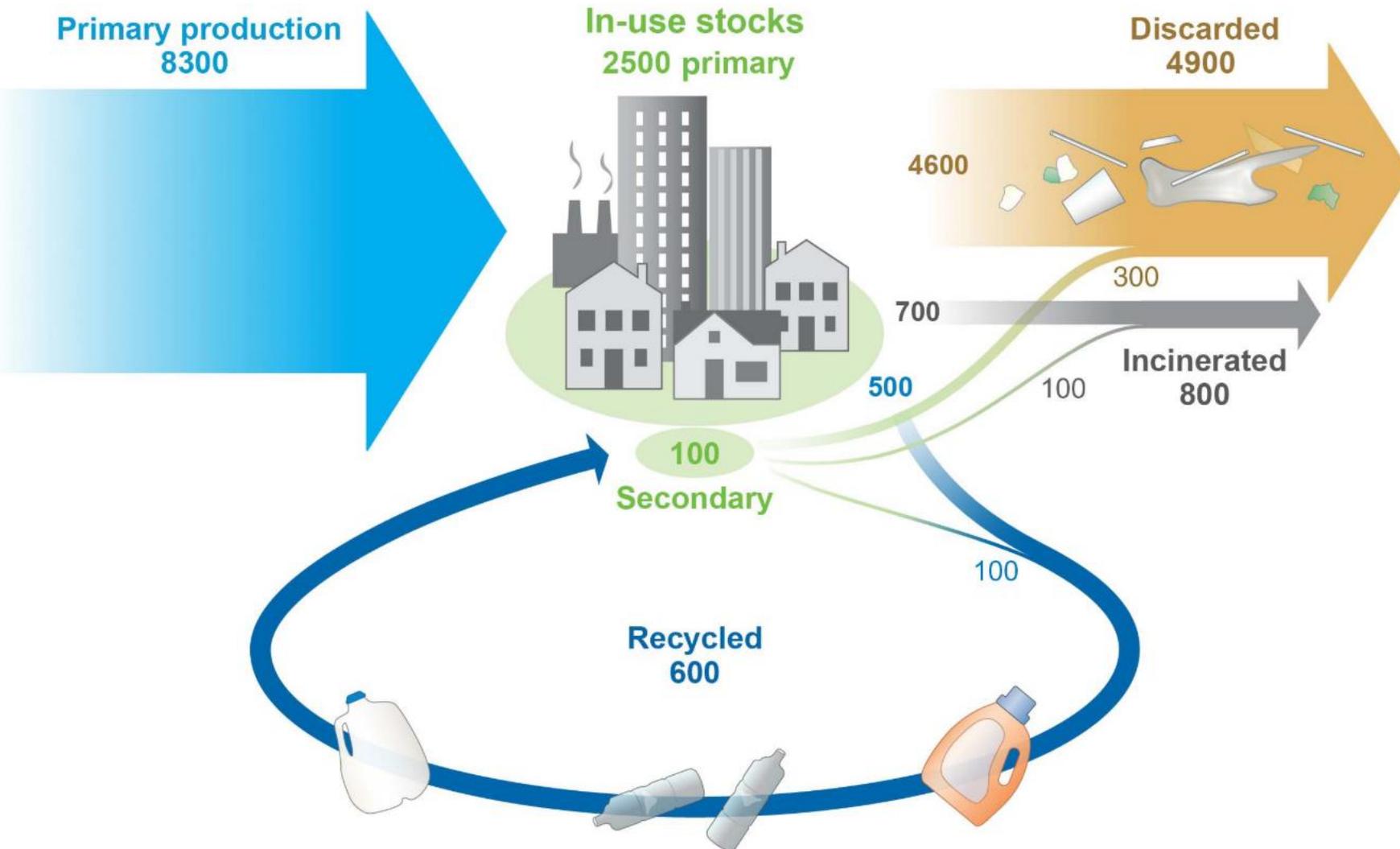
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Production, use, and fate of all plastics made from 1950 – 2015, in million metric tons (Mt; Geyer et al., 2017)

- **Microplastics (MPs)** – small plastic pieces <5 mm in length
- >5.25 trillion microplastics particles are floating in the world's oceans (Eriksen et al., 2014)

Microplastics = Hazardous waste

(Eriksen et al., 2014)

**MP absorb
toxins**

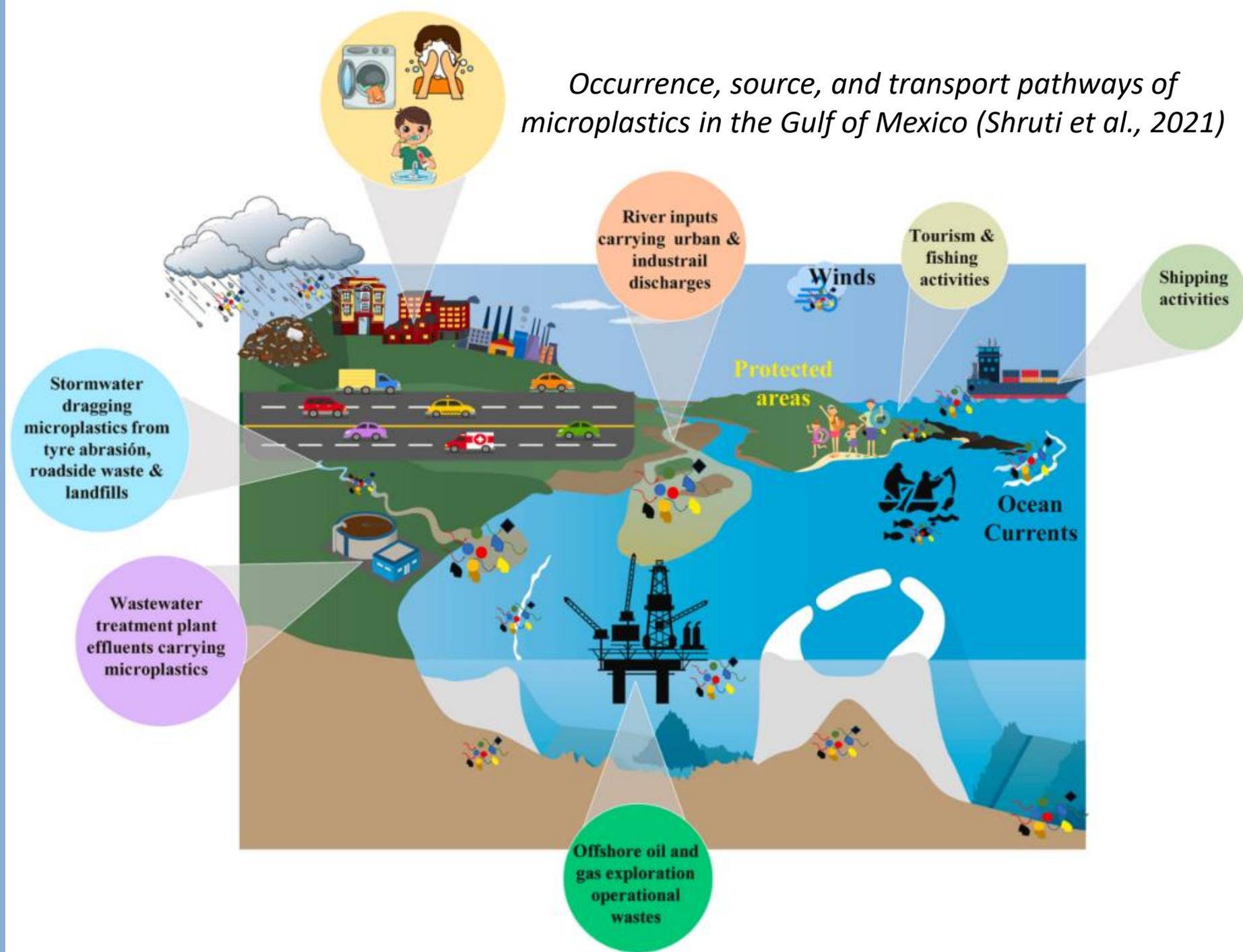
**Ingestion
Bioaccumulation
Biomagnification**

**Human
toxicity**



- Heavily urbanized estuaries are especially vulnerable to microplastic pollution
- Nurdle Patrol collected 181,216 plastic pellets in Texas (Tunnell et al., 2020)

Occurrence, source, and transport pathways of microplastics in the Gulf of Mexico (Shruti et al., 2021)



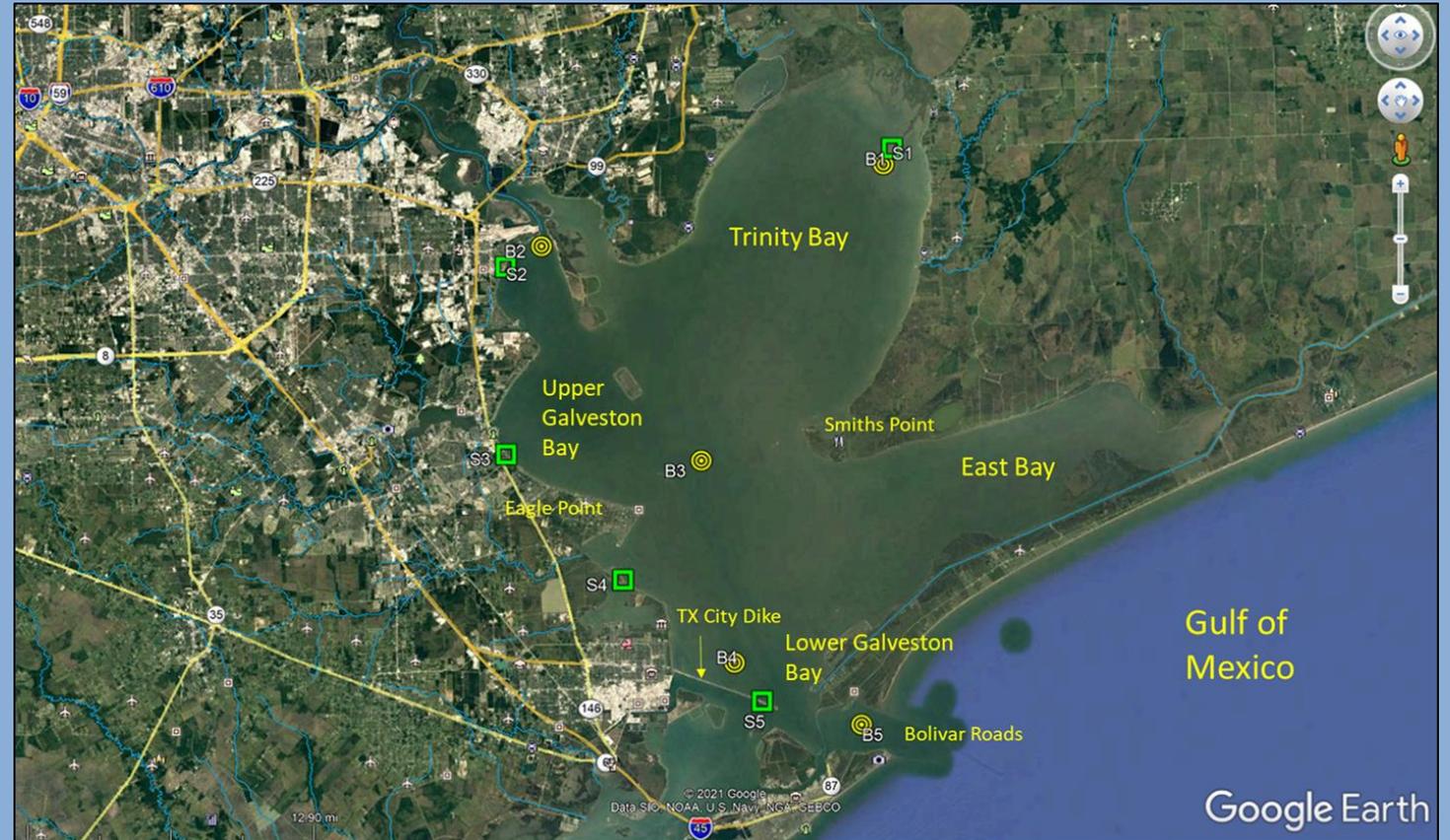
Study Objectives

Objective 1: To collect & analyze surface water and sediment samples at shoreline sites and open bay sites to estimate microplastic concentrations within surface waters and sediments of the Galveston Bay watershed.

Objective 2: To describe the microplastics found and examine the data to describe what factors may contribute to the distribution of microplastics in Galveston Bay surface waters and sediments.

Materials & Methods

- **Field data collection**
 - 5 open bay sites
 - 5 shoreline sites
- **Laboratory analysis**
 - Vacuum filtration
 - Density separation
 - Microscopic identification
- **Citizen science**
 - Mississippi State University Extension (Sartain et al., 2018)
 - Florida MP Awareness Project (FMAP)



Map from EIH's microplastic quality assurance project plan (QAPP; Guillen, 2021)

Surface water sample collection

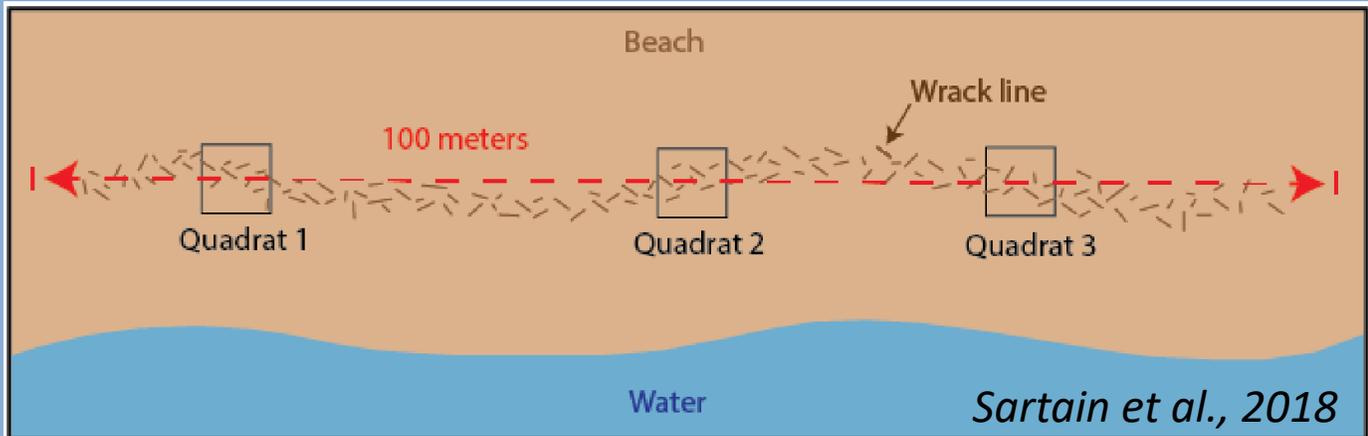


3 replicate 1L surface
water grabs →

← 3 replicate neuston net
tows (335 μm mesh) with
attached flowmeter



Sediment sample collection



- Benthic sediments – 3 replicate Ekman/Petit Ponar grabs
- Shoreline sediments – 3 replicate 0.25m² quadrat along wrack line

Laboratory sample analysis

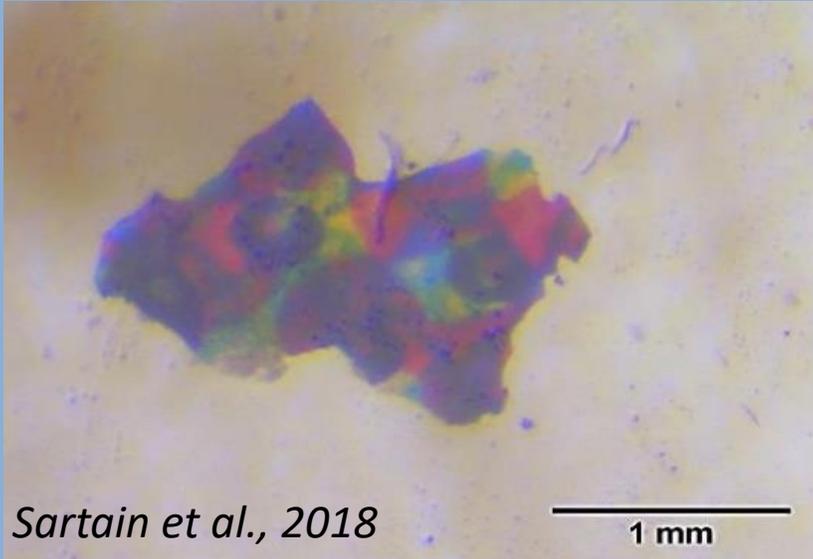


← Density separator

Vacuum filter →



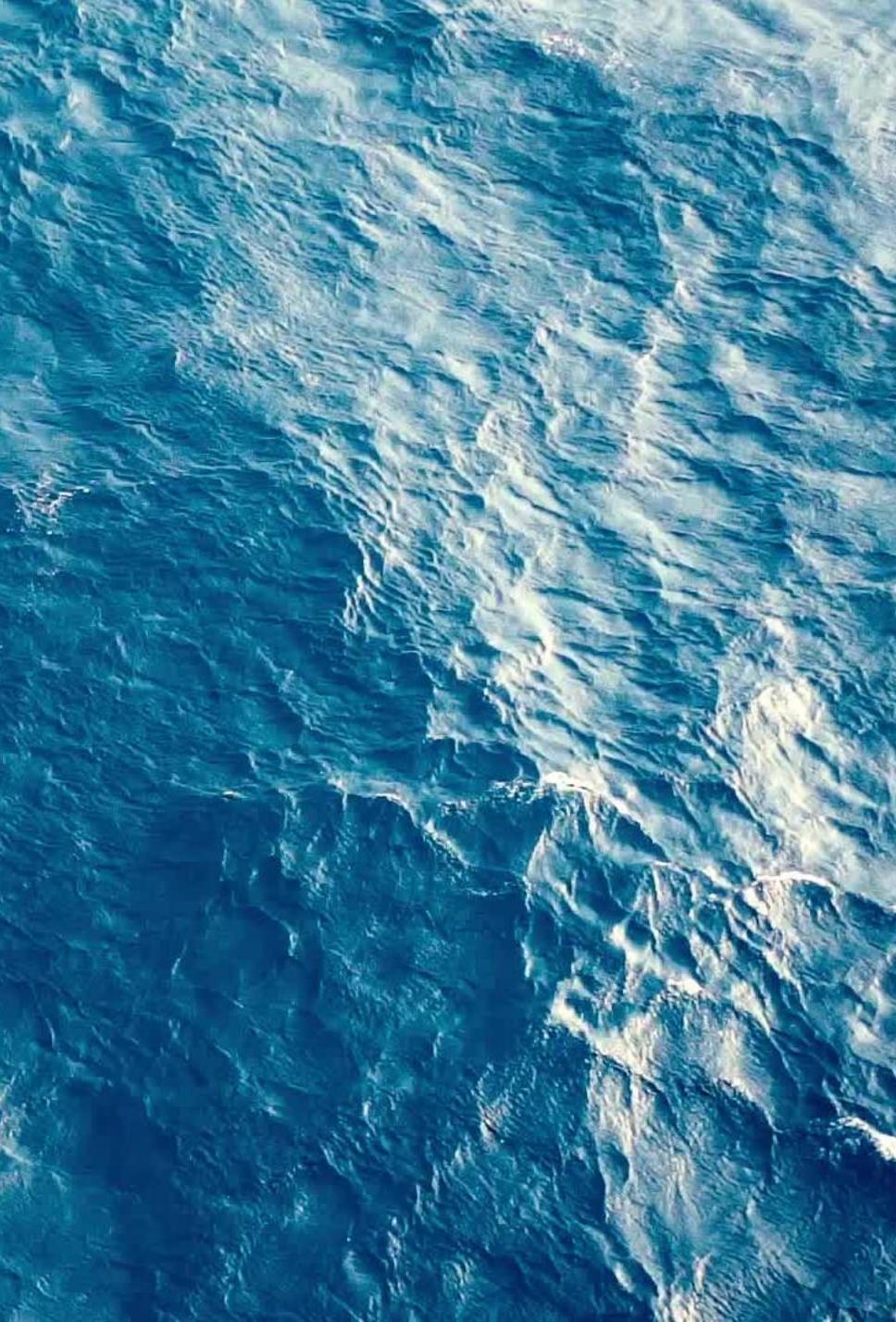
Sartain et al., 2018



Microscopic identification

Following methods found in:

- Marine & Environmental Research Institute (MERI)
- NOAA microplastics analysis manual
- Sartain et al., 2018
- FMAP



Expected Results

- Higher concentrations of MPs in sediment samples than water samples
- Higher concentrations of MPs from estuary-fed sites than marine sites
- Higher concentrations of MPs in Galveston Bay surface waters & sediments than other estuaries

Questions?



	<p>Texas Commission on Environmental Quality</p>			
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