

# Mega to Micro: Marine Debris Initiatives in Delaware



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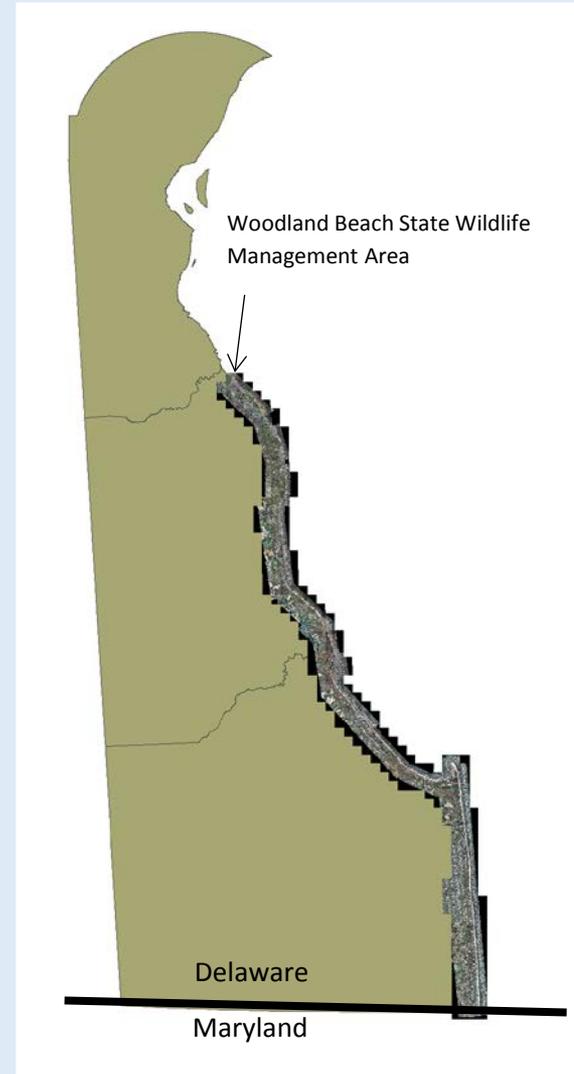
Delaware Coastal  
Programs



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# Mega Debris Identification

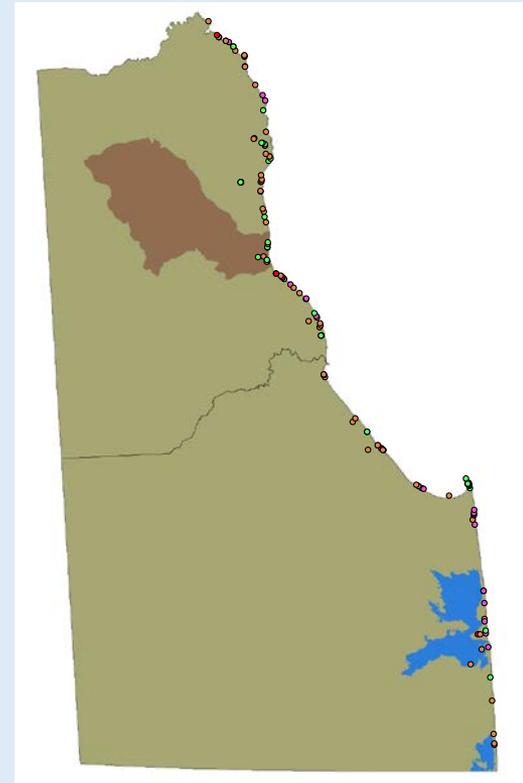
- Identify mega debris using orthoimagery
- Ariel images flown in 2012 following Hurricane Sandy
- Kent and Sussex County
- Understanding emergency response needs after a large storm



# Mega Debris Identification



Debris	
Boats	7
Constructed Wood	32
Miscellaneous	63
Natural Wood	25
Total	127



# Mega Debris Identification

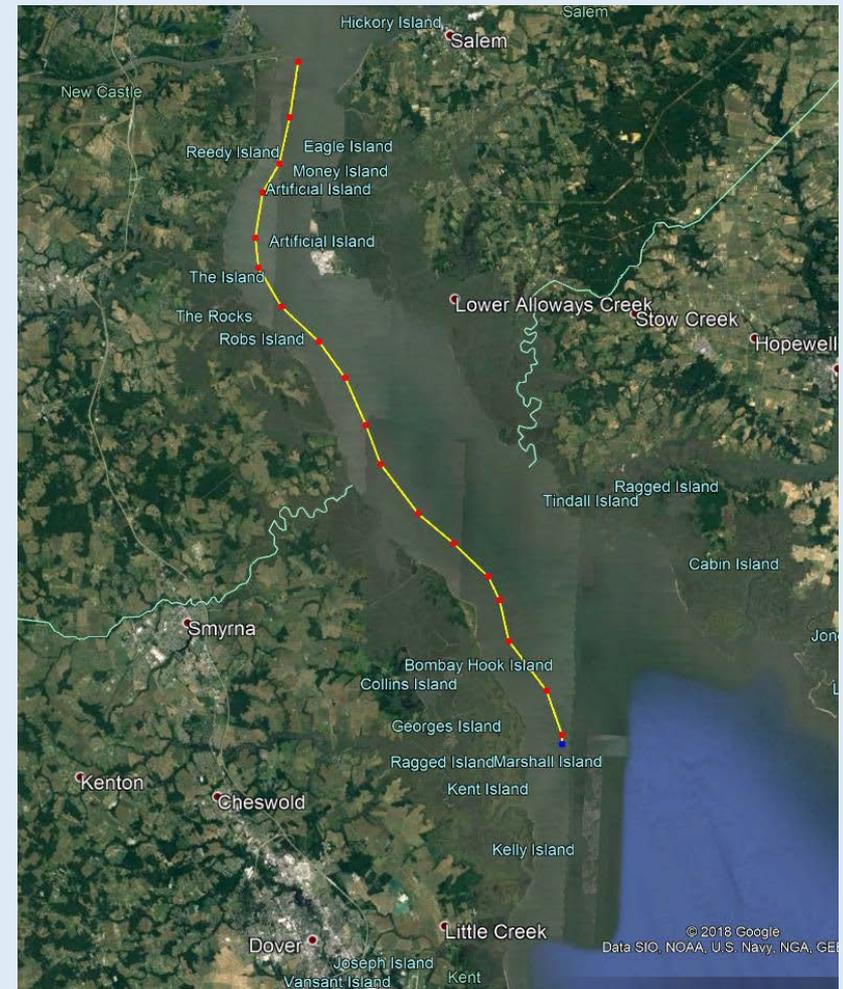


- Data went to the Division of Shoreline and Waterways
- Currently working with Shoreline section to remove derelict debris items

# Macro Debris

## Grappling the Invisible: a Derelict Crab Pot Removal Pilot Study in the Delaware Bay

- Funded by the NOAA Marine Debris Program
- Partnered with Stockton University



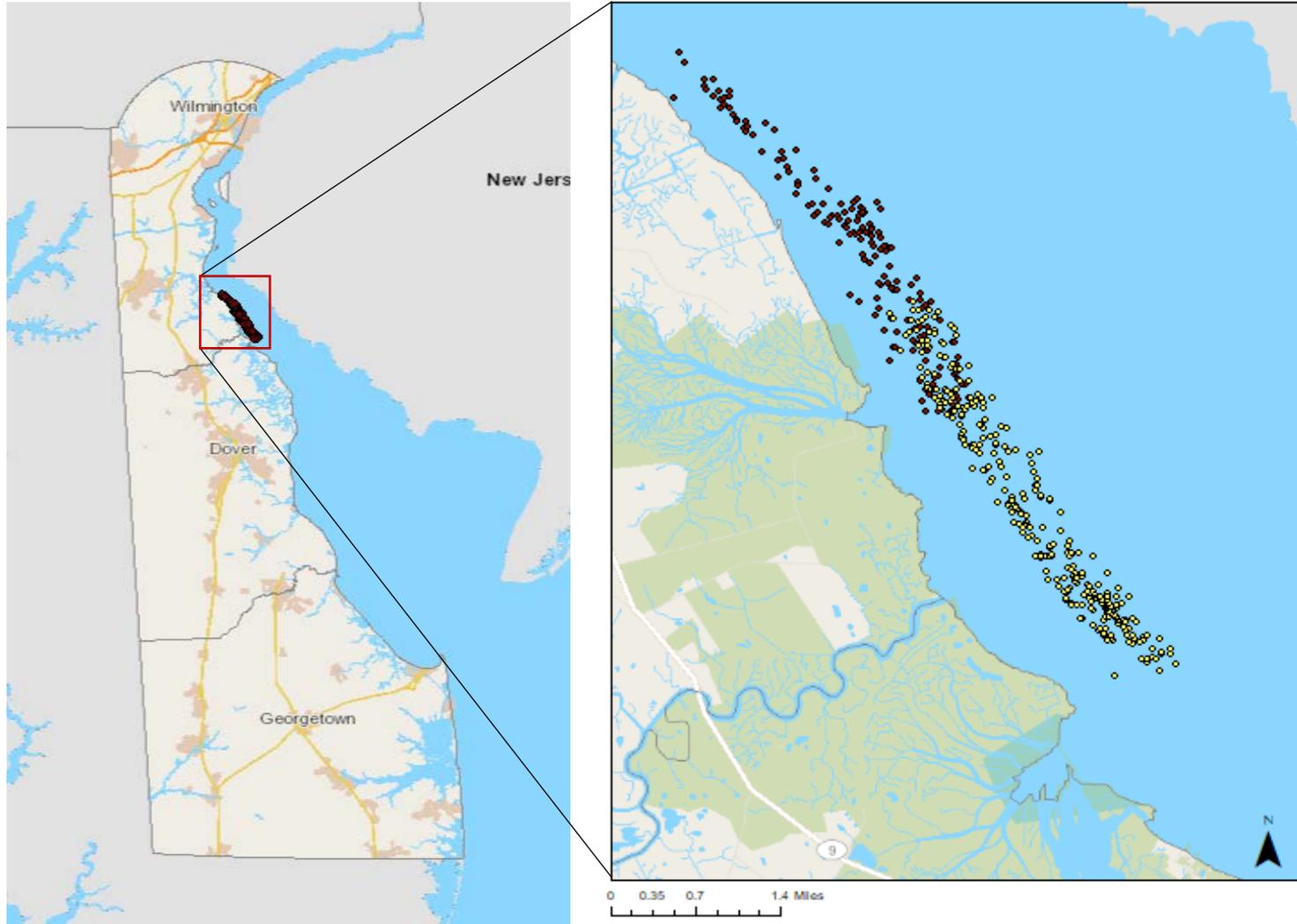
# Grappling the Invisible

## Goals

- Identification of pots in the target area
- Comparing the efficiency and accuracy of the Klein 3900 to the Humminbird Helix 10
- Testing pot removal methods

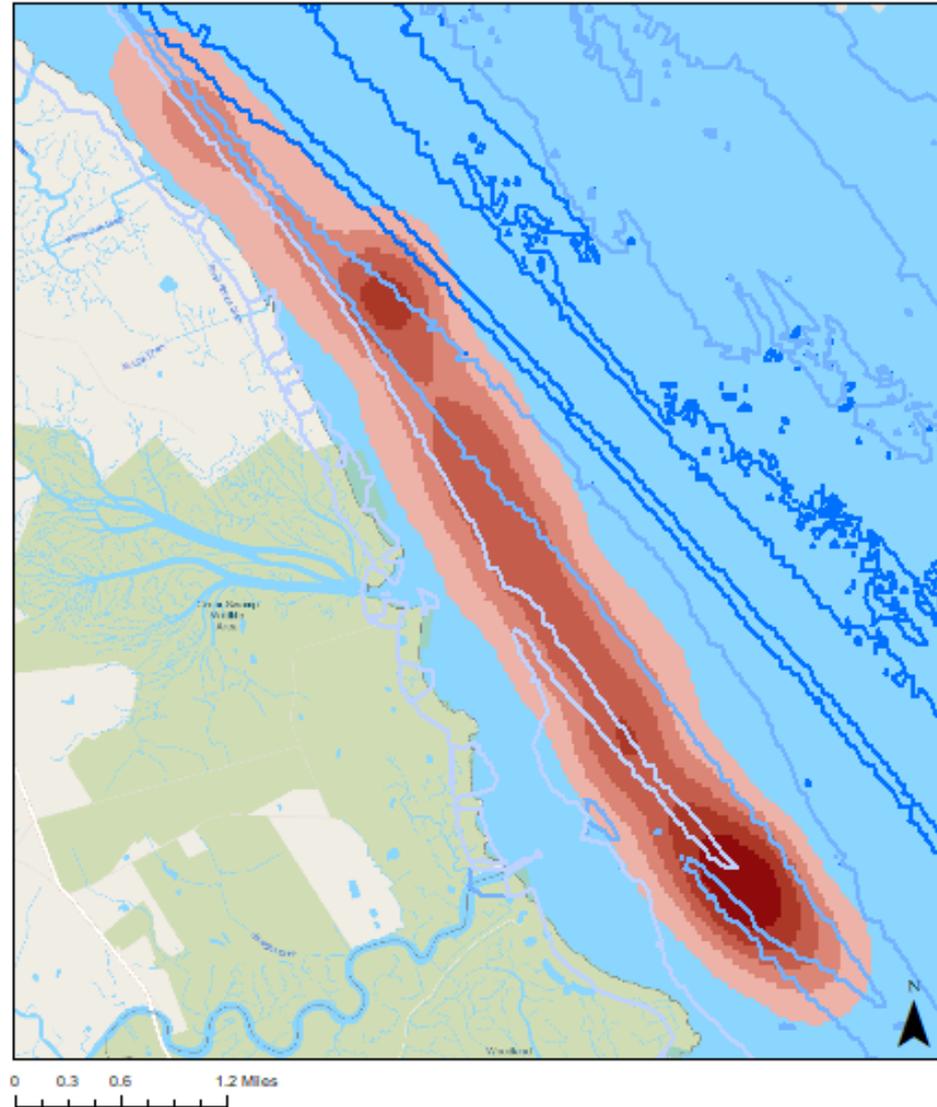


# Grapppling the Invisible



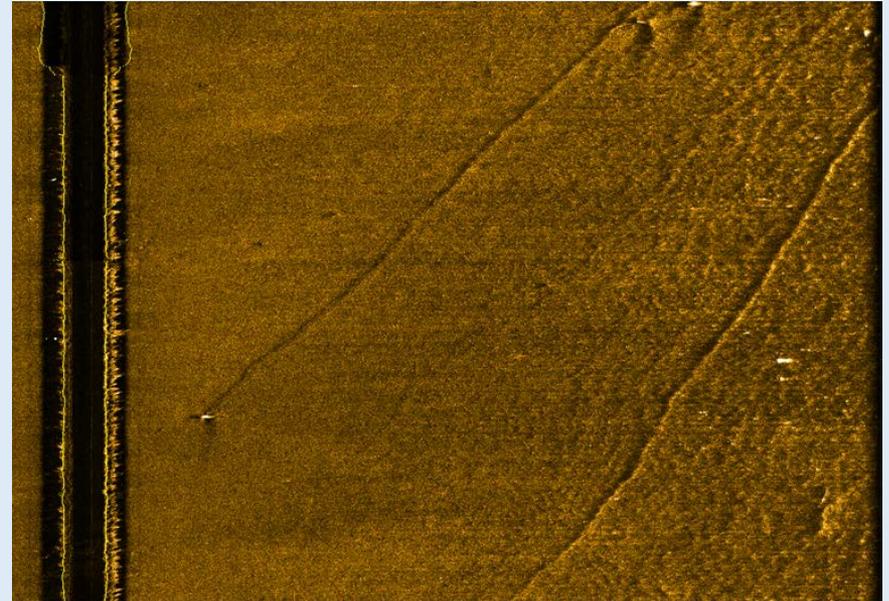
# Grappling the Invisible

- 2017-2019 identified 792 targets with 85% confidence
- 21nm x 0.3 nm (average LFP density = 125 targets/nm<sup>2</sup>)
- Loss was observed in waters ranging from 2-5m depth.



# Grapppling the Invisible

- Challenges
  - Deeper water
  - stronger currents
  - harder bottom types
  - icing events= target movement
  - Working with watermen as the State
- Expanding into the Inland Bays to work with partners at DE Sea Grant and University of Delaware



- Scan 1- Mid-December
- Scan 2- Mid- February
- 175 total pots in the area
- 77% of pots moved 3+ meters away

# Grappling the Invisible

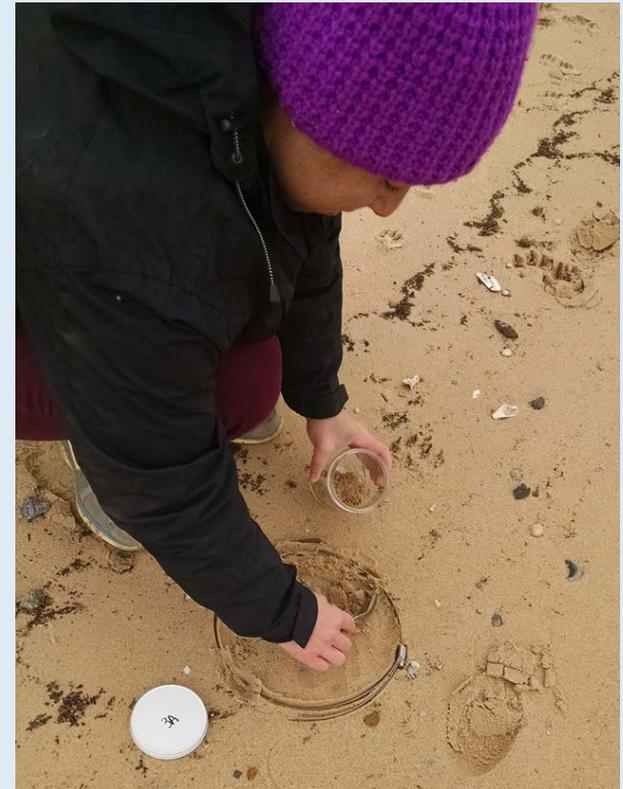


- Education and Outreach in the Inland Bays and lower Delaware Bay about properly rigging crab pots
- Video on DNREC Environmental Perspectives Webpage called *Crab Confidentially*

# Microplastics: Sand and Water

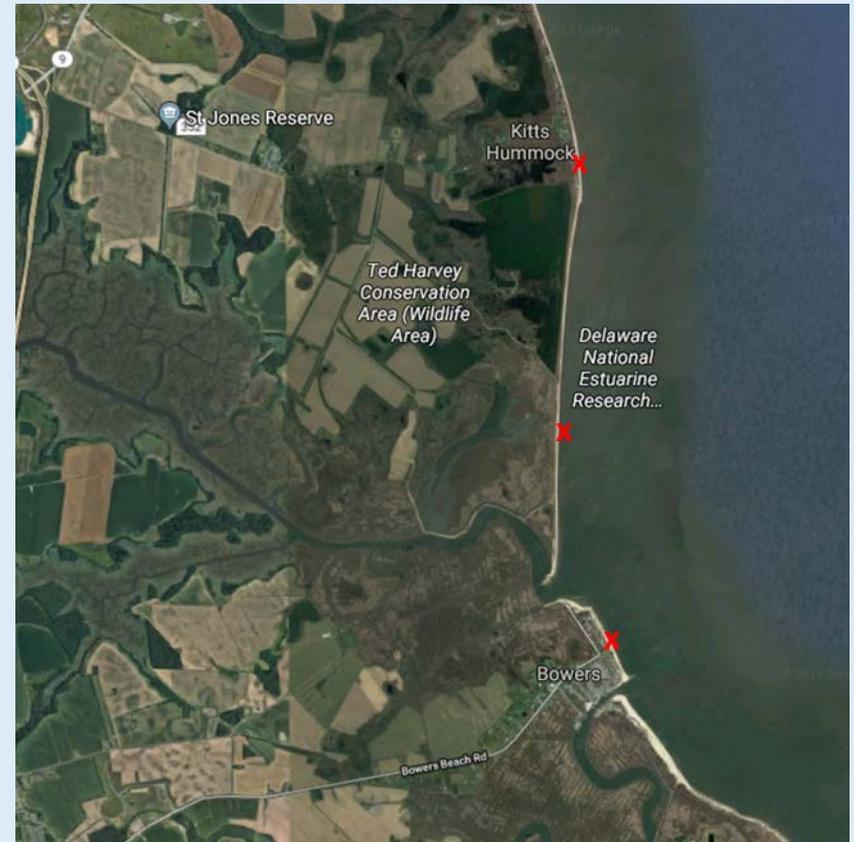
**Optimize and establish a method that can cheaply and efficiently assess sand and water samples for microplastics in DE**

- Presence/absence data
- Establish partnerships and collaborations to increase understanding
- Expand into environmental education/ citizen science

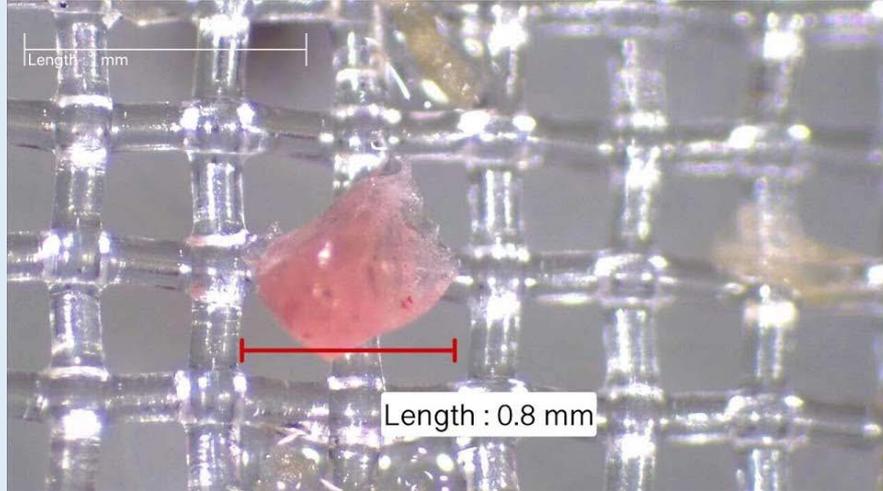


# Microplastics: Sand

- NOAA funded program
- Beaches sampled: Kitts Hummock, Ted Harvey, and Bowers Beach
- Beaches that DNERR samples for HSC spawning
- Microplastics present- predominantly beads and fibers
- 30 samples from each beach collected winter 2019



# Microplastics



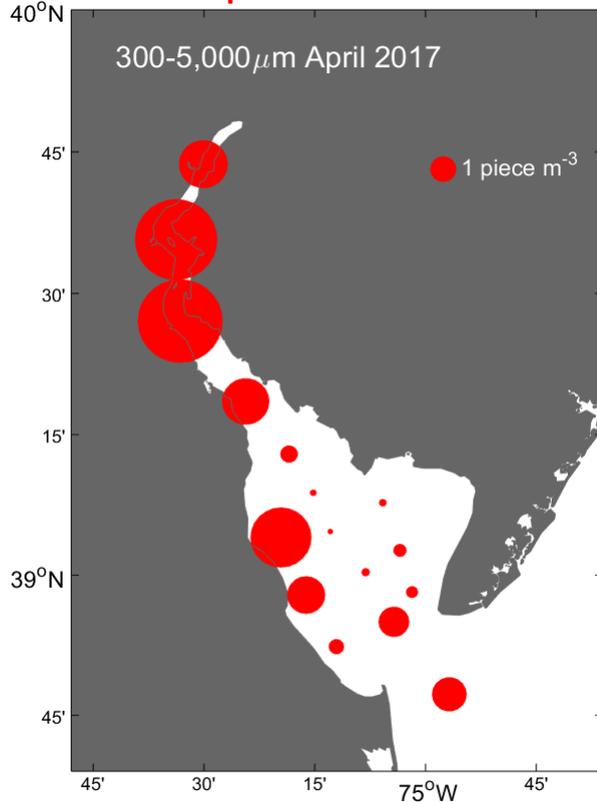
# Microplastics: Water

- Water samples taken during nekton trawls in St. Jones River
- Comparison between the St. Jones and Murderkill River
- Partnering with University of Delaware

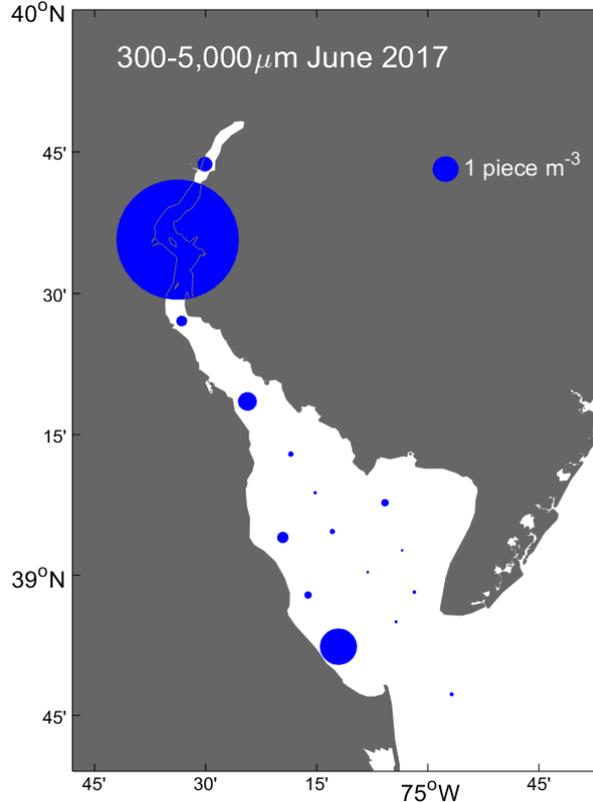


# Microplastics: Delaware Bay

April 2017

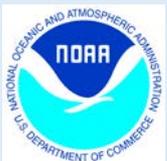


June 2017



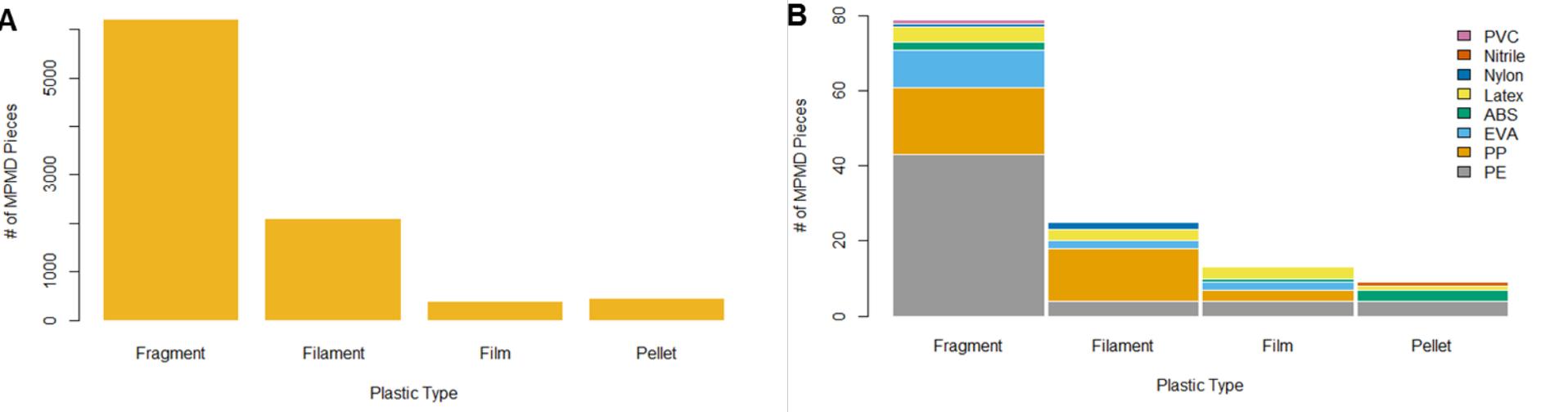
- More plastic baywide in **April** than in **June**
- More plastic upstream
  - Higher population densities
  - Estuarine Turbidity Maximum
- Additional inputs around Dover (Murderkill and St. Jones Rivers)
- Overall: unexpected spatial variability

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Dr. Tobias Kukulka  
Anna Internicola  
Alan Mason



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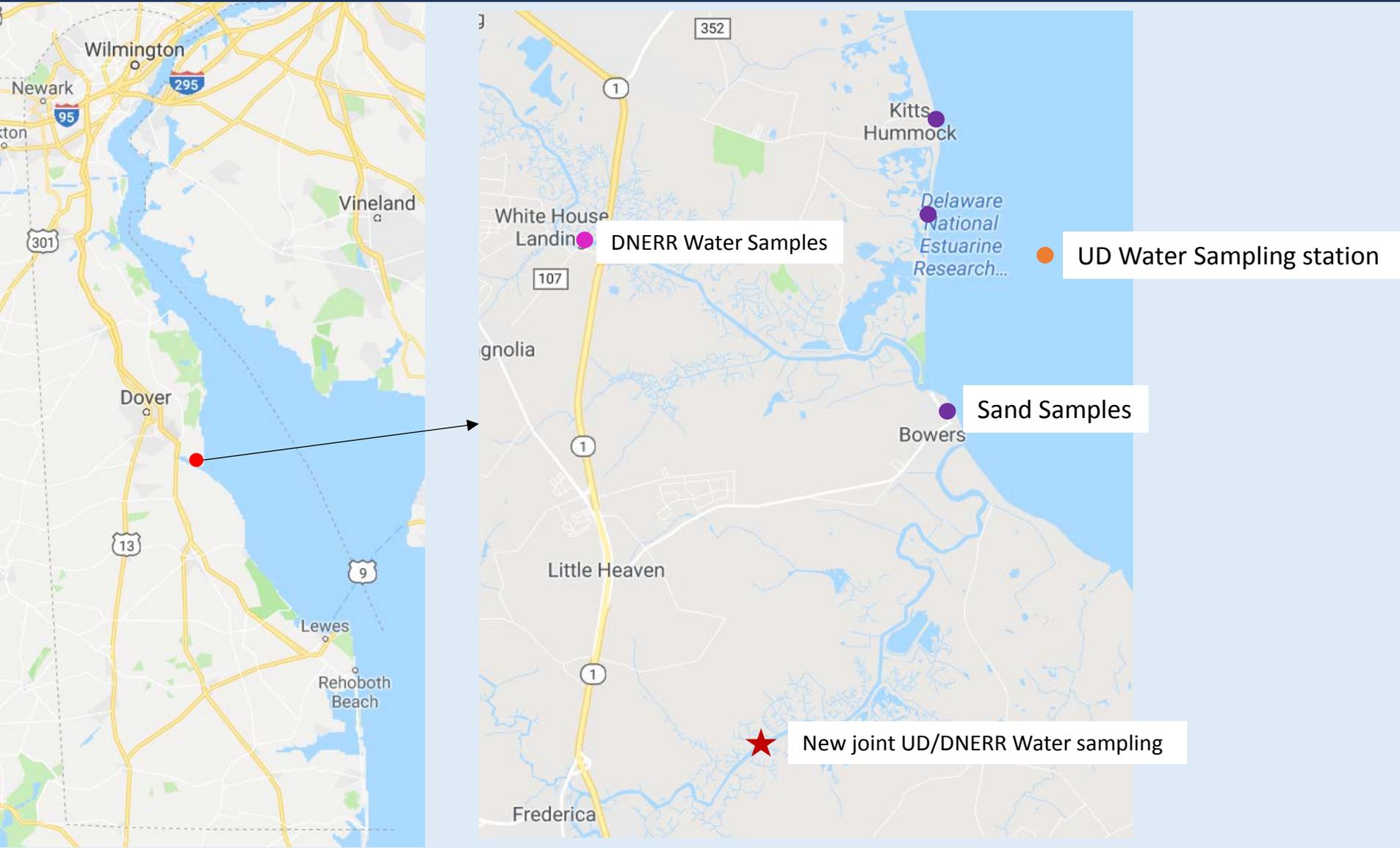
# Microplastics: Delaware Bay



- Baywide, fragments were the dominant microplastic type
- Polyethylene (PE) and Polypropylene (PP) were most common
- Sending DNREC samples for ATR FT-IR testing

Dr. Jonathan H. Cohen, Anna Internicola, Dr.  
Tobias Kukulka, Alan Mason

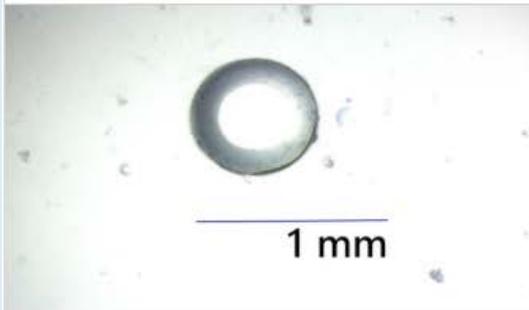
# Microplastics: Water



# Stories from Delaware

## Environmental Perspectives: Marine Debris Adrift at Sea

### Marine Debris Science



Marine debris can be any size from a boat or a dock that washed away in a storm, to a tiny particle that's hard to distinguish from a...

[Read More](#)

### Marine Debris: Make a Choice



Wondering how you can make a difference? There are many ways we can reduce our dependence on plastic and single-use...

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### Keep it Clean: Taking Care of Our Beaches



Delaware is known for having some of the highest-quality beaches in the nation because of our commitment to water...

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