

Marine Debris Expedition

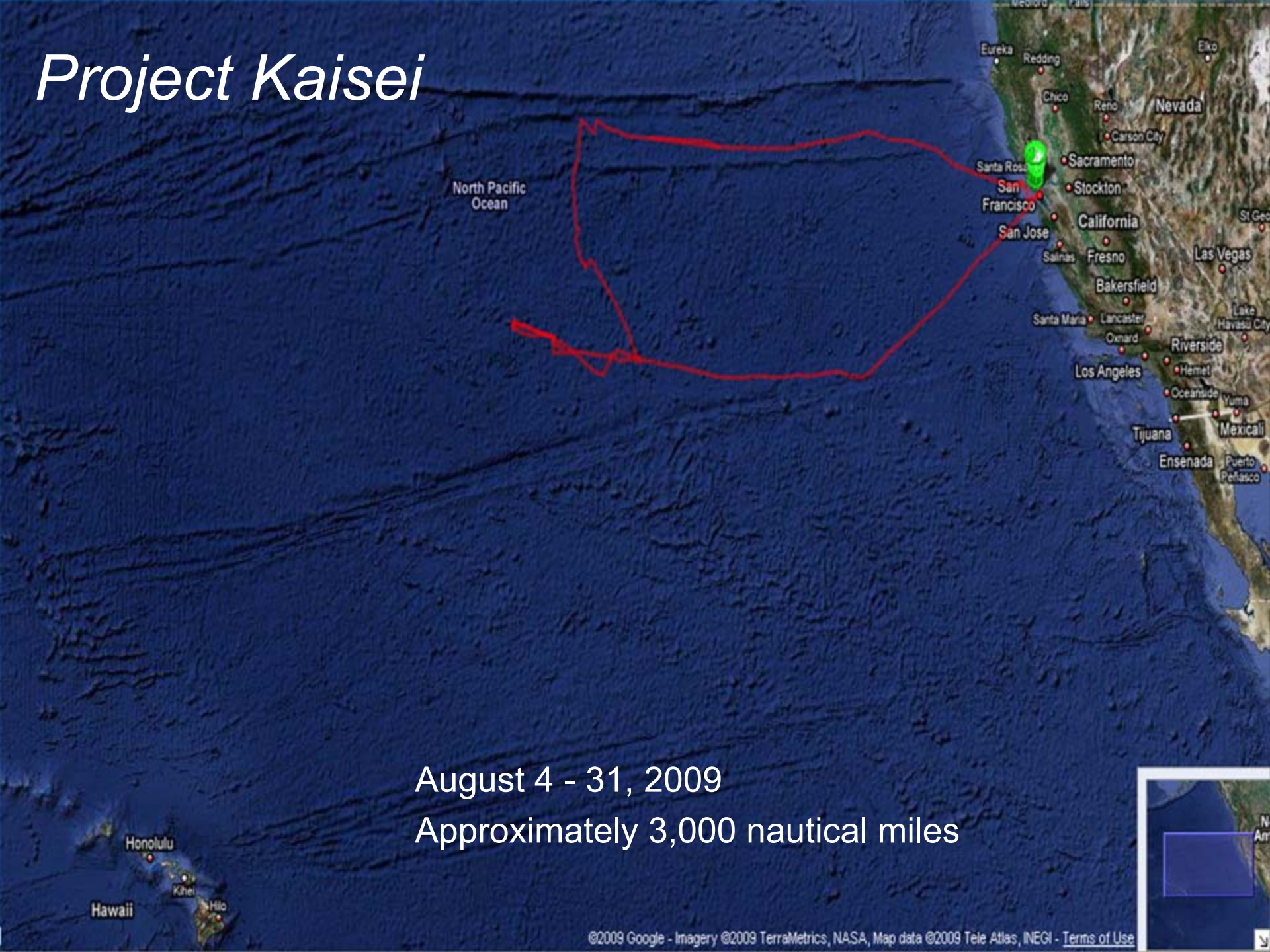
Journey To The Plastic Vortex



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Project Kaisei



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Approximately 3,000 nautical miles



Capturing Large Floating Debris







Common Types of “Larger” Debris

- Buoys
- Plastic detergent and other plastic bottles
- Caps
- Strainers
- Crates
- Laundry baskets
- Pieces of chairs
- Buckets



Fisherman's Catch



Impacts of Marine Debris on the Ocean Environment



Sampling: Water column



Sampled to 180 meters

Dissolved Organic Matter (DOM)



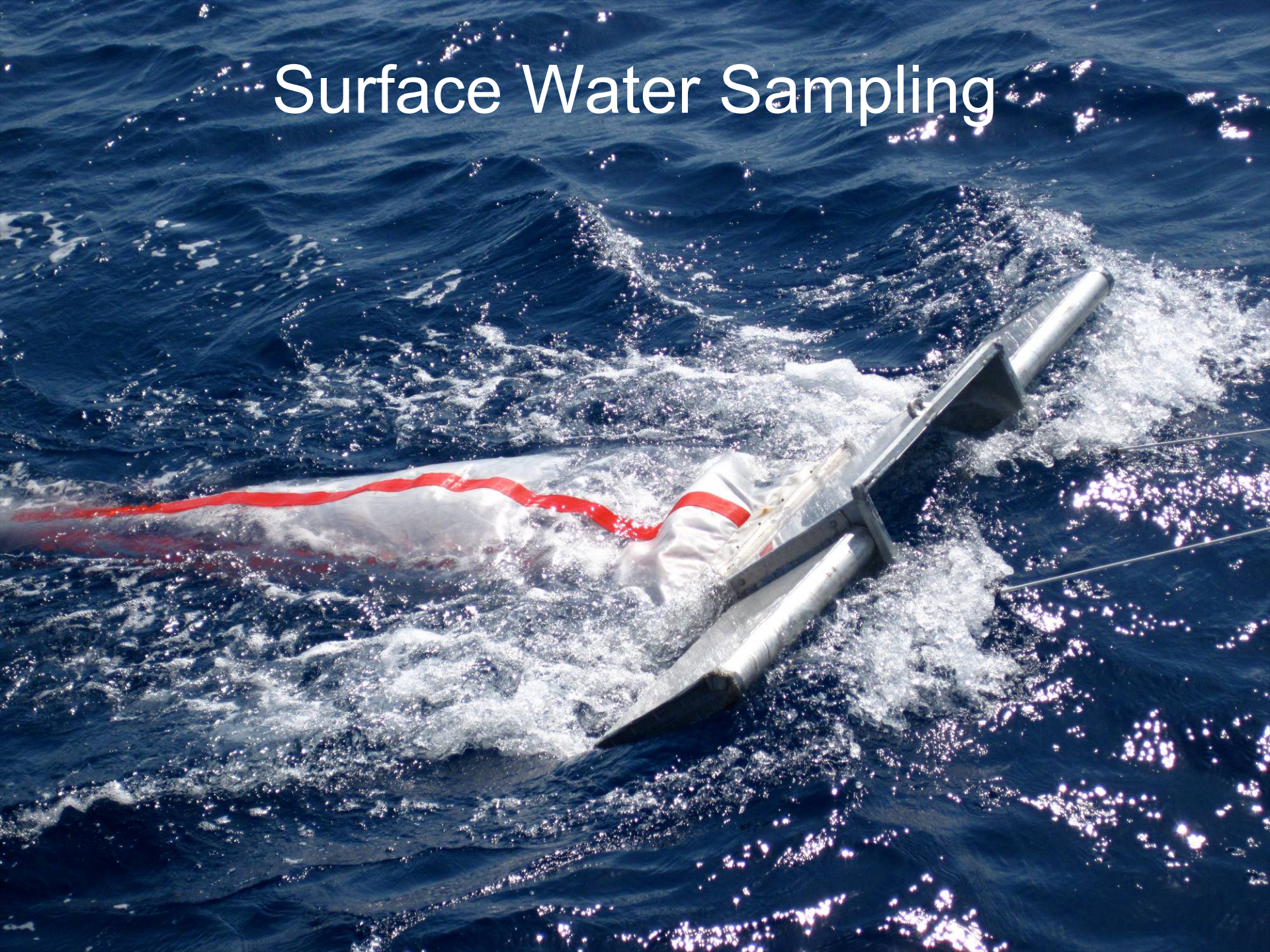
- Extract dissolved carbon molecules
- Evaluate whether marine debris contributes to DOM

Reactive Oxygen Species

- Increased hydrogen peroxide production in presence of plastic
- Increased oxidative stress for organisms



Surface Water Sampling



Cod end



Processing Trawl Samples







Pre-production
plastic pellets –
with biofilm



Impacts of Plastic Debris on Marine Life



Organisms Ingesting Plastic Debris

- More than 180 species reported to ingest plastic debris
- Studies show chemical contaminants adsorb onto plastic surface
- Is marine polymer debris a new transport mechanism for contaminants into the food web?



Mesopelagic Fishes

Lantern fish (Family Myctophidae)



Sample size range: 20-100 mm Total Length

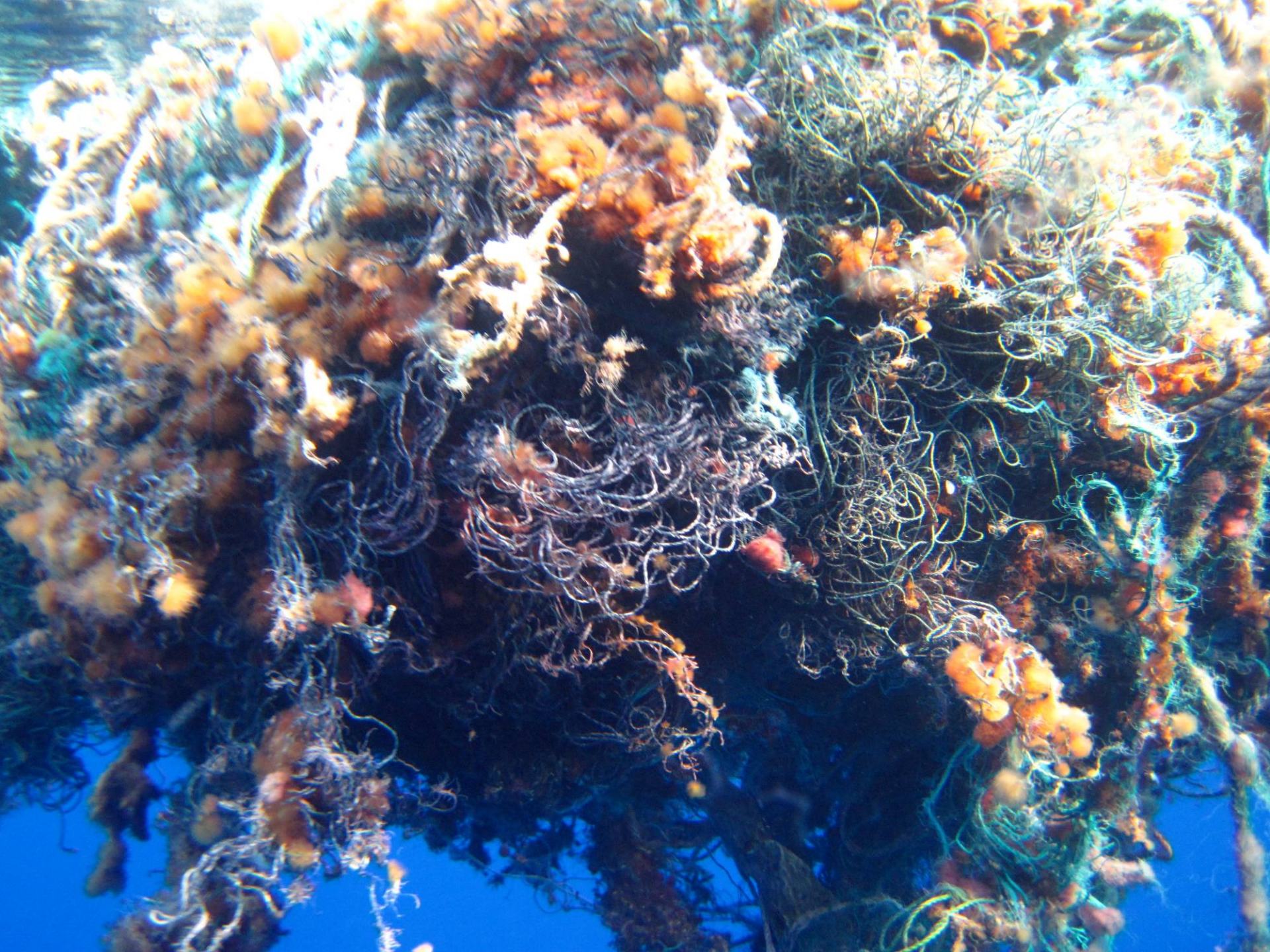


Investigating Food Web Contamination

- Lantern fish feed on zooplankton —→
- Zooplankton is mixed with plastic debris at the ocean surface
- Tuna, mahi-mahi, yellowtail jack, —→ sharks, other fish, squid, and marine mammals feed on lantern fish







A school of yellow-striped snappers swimming in clear blue water. The fish are silvery with a distinct yellow stripe running along the side of their bodies. They are swimming in various directions, creating a sense of movement. The background is a solid, clear blue, suggesting an open ocean environment.

Threats to Marine Life

Photo Credits:

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 - Andrea Neal, principal investigator
 - Michael Gonsior, co-principal investigator
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 - Jo Ruxton, producer
 - Adrian Thibeault-Stone, first mate
 - Aleui Lyman, crew
 - Mike Smith, captain