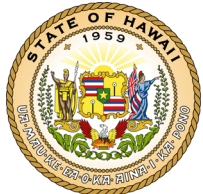


# Juvenile fish use estuaries

## DLNR-DAR Estuary Project

Kim Peyton, Troy Shimoda, Troy Sakihara, Tim Shindo,  
Skippy Hau, Jody Kimmel



Speak for the fish

Sustainable fisheries rely on  
healthy estuaries.





A photograph of a steep, verdant mountain slope. Several thin, white waterfalls are visible, cascading down the green foliage. The scene is misty and atmospheric.

mauka

An aerial photograph of a coastal town. The town is built on a flat area between brown, hilly mountains and a deep blue ocean. The water is clear, showing some rocky patches near the shore.

muliwai

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An underwater photograph showing a sea turtle swimming over a vibrant coral reef. The turtle's head and front flippers are visible as it moves through the clear blue water. The reef below is covered in various types of colorful coral.

makai











[illegible]



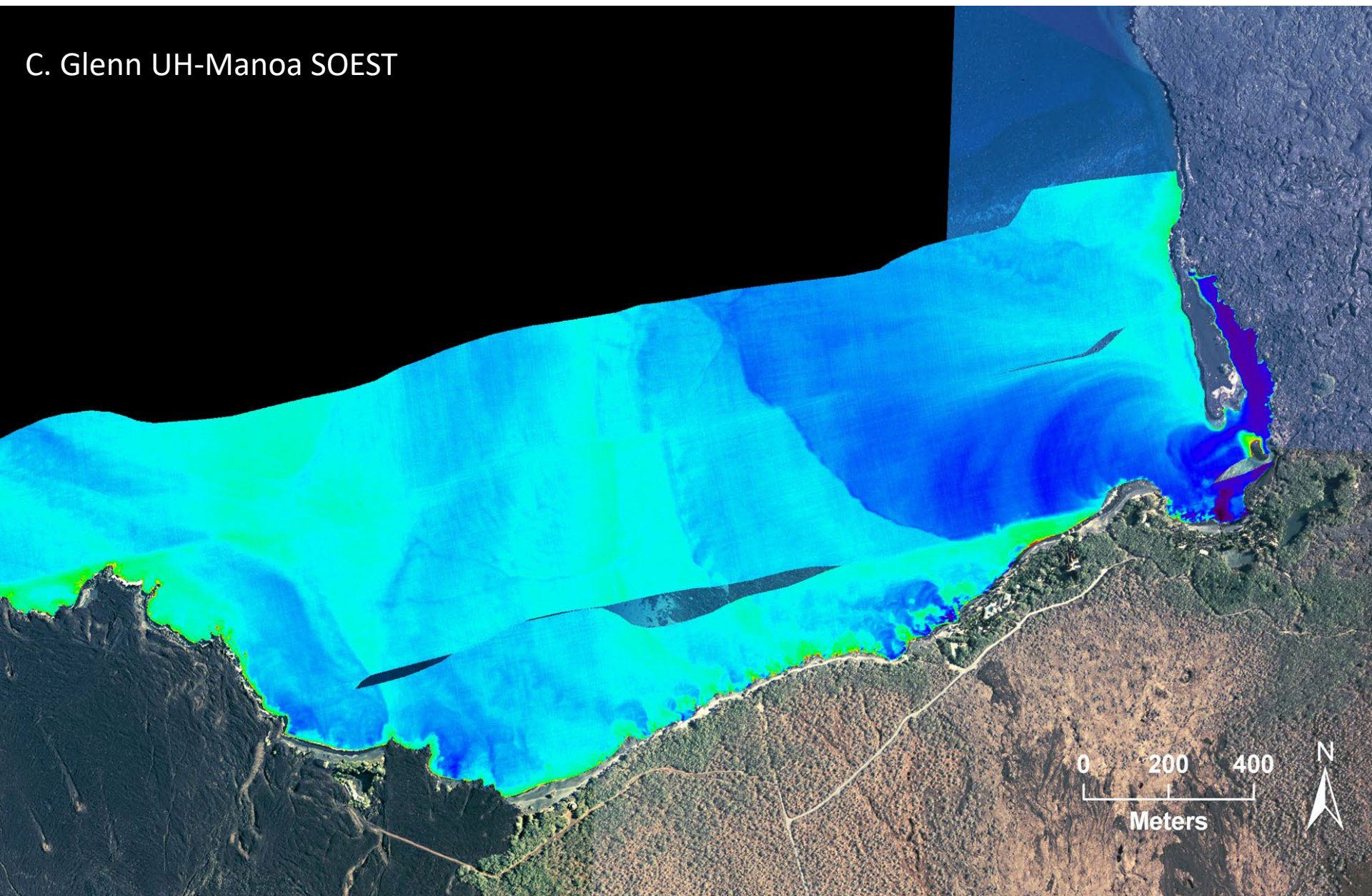








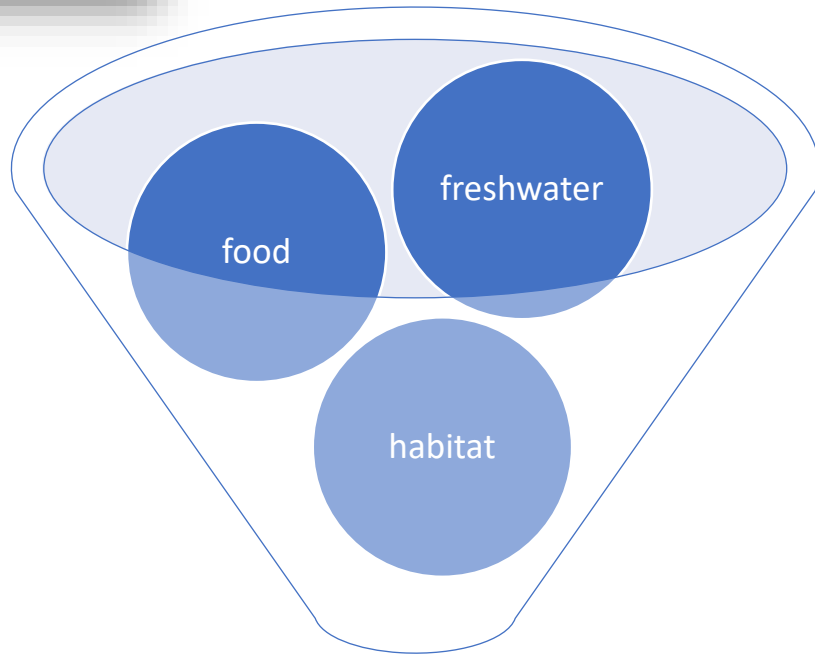
C. Glenn UH-Manoa SOEST



Sustainable fisheries relies on healthy estuaries.



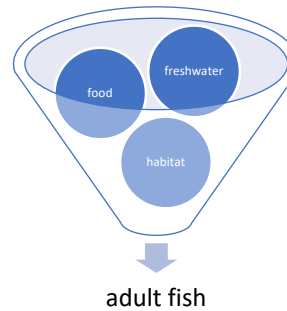
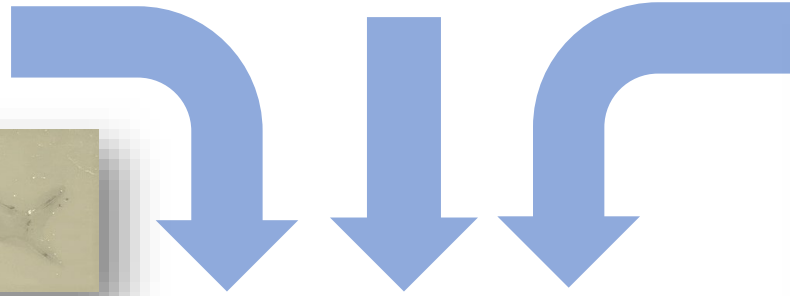
as plankton in ocean currents



estuaries

adult fish

# plankton in ocean currents



estuaries

If fish cannot survive their juvenile phase in estuaries, why would we expect them to reach sexual maturity for reproduction or legal size for sport fishing?



Data directs actions





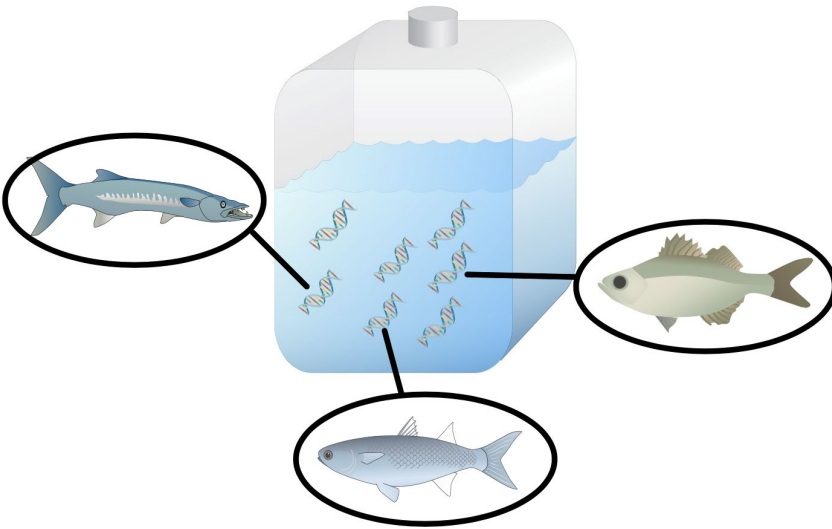
# Statewide monitoring in estuaries for fish conservation.



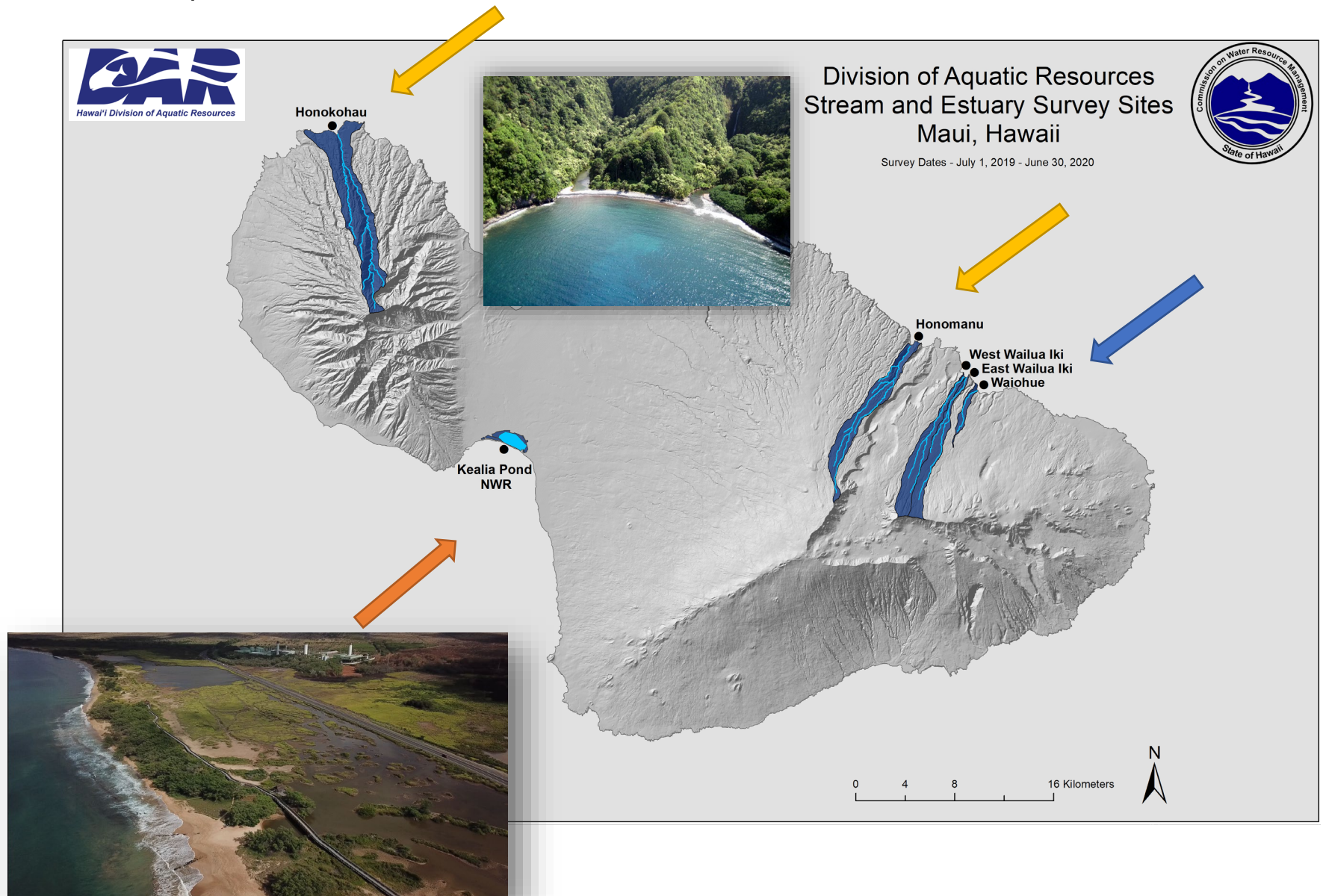


# Environmental DNA (eDNA)

eDNA



# How did fish in East Maui streams and estuaries respond to a return to 100% baseflow conditions?

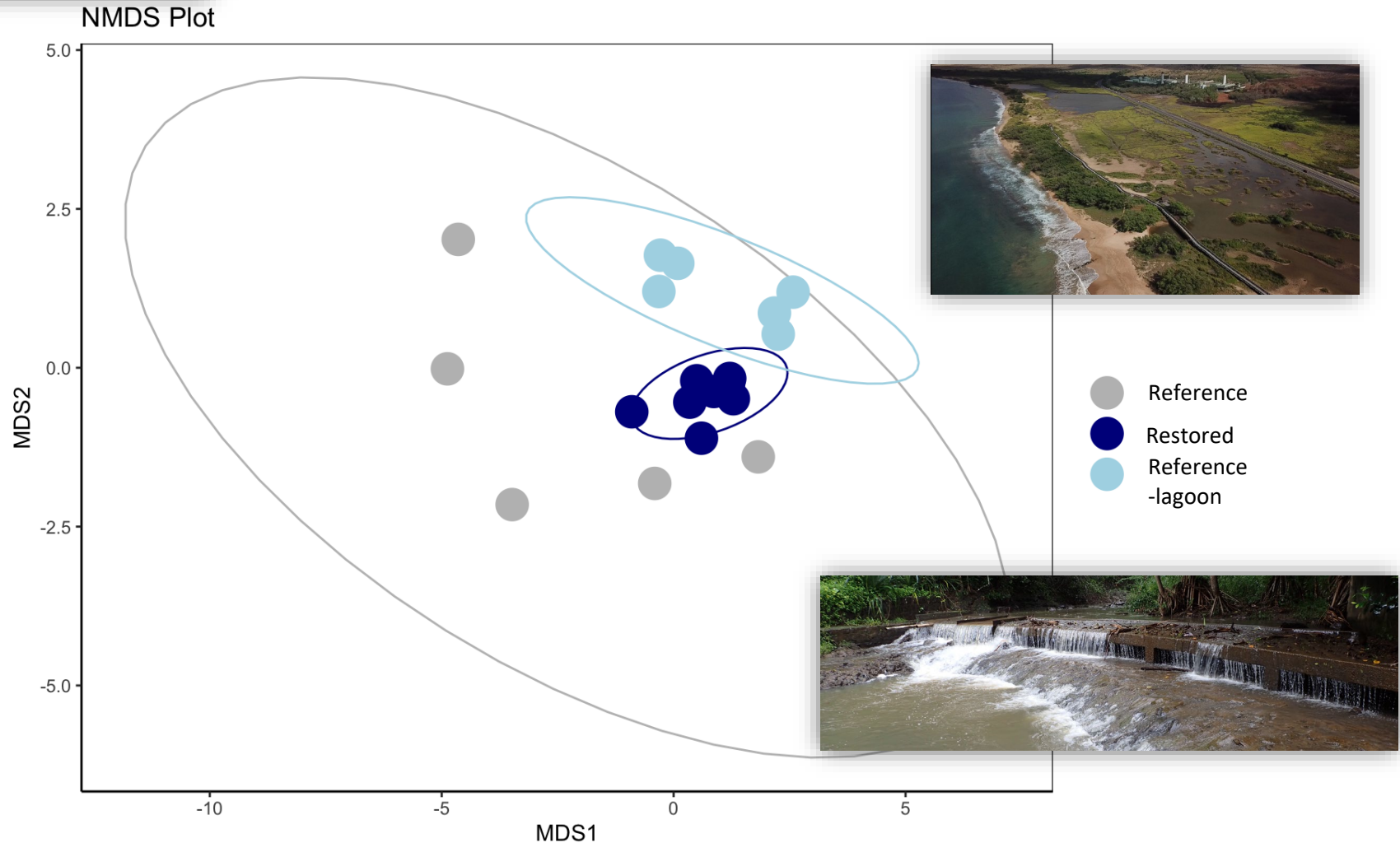






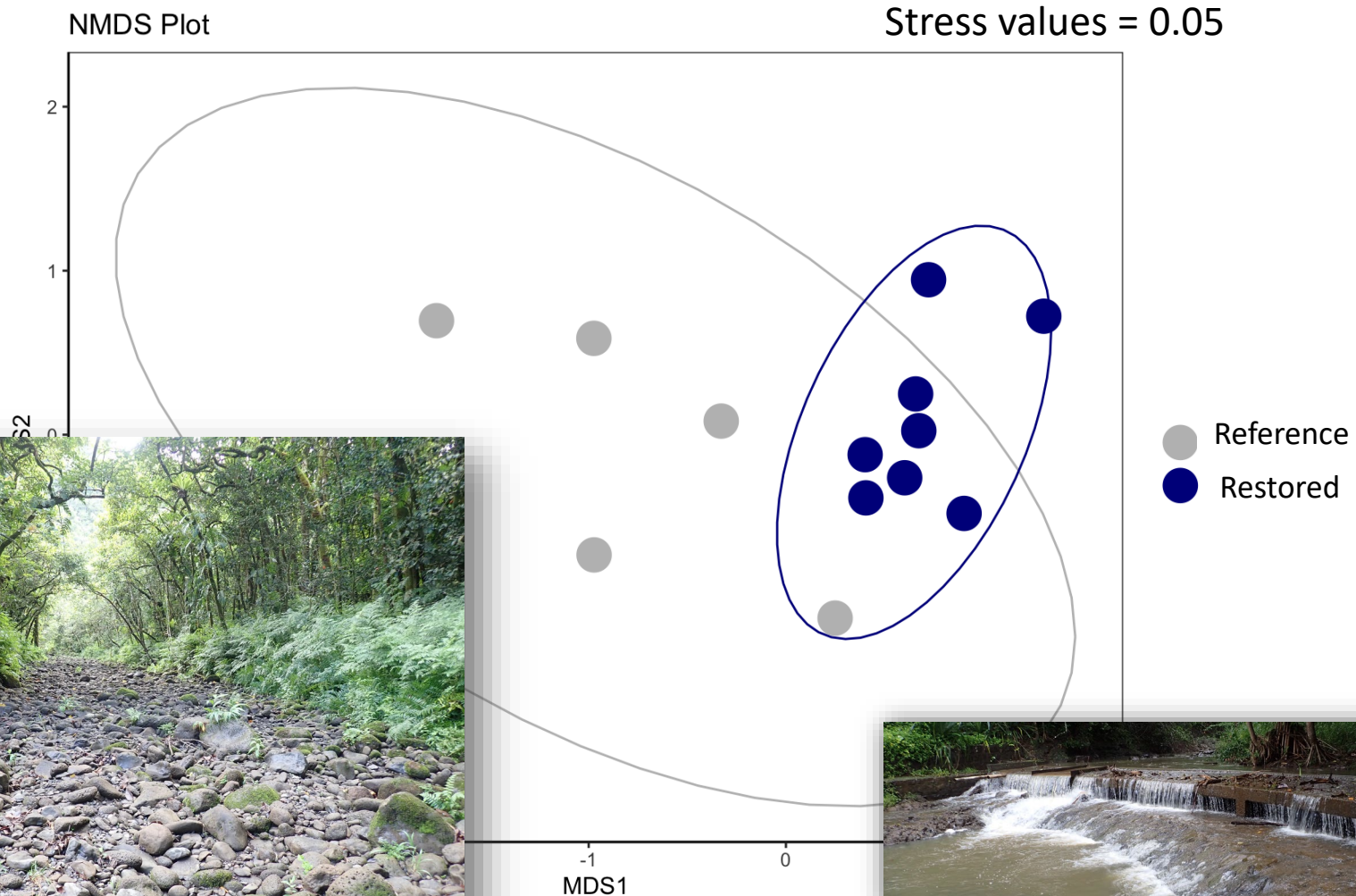
Fish communities in restored estuaries were distinct from reference sites.

Stress values = 0.09





Fish communities in restored streams were distinct from those in reference sites.





Estuaries in poor condition are bottlenecks for coastal fisheries productivity.



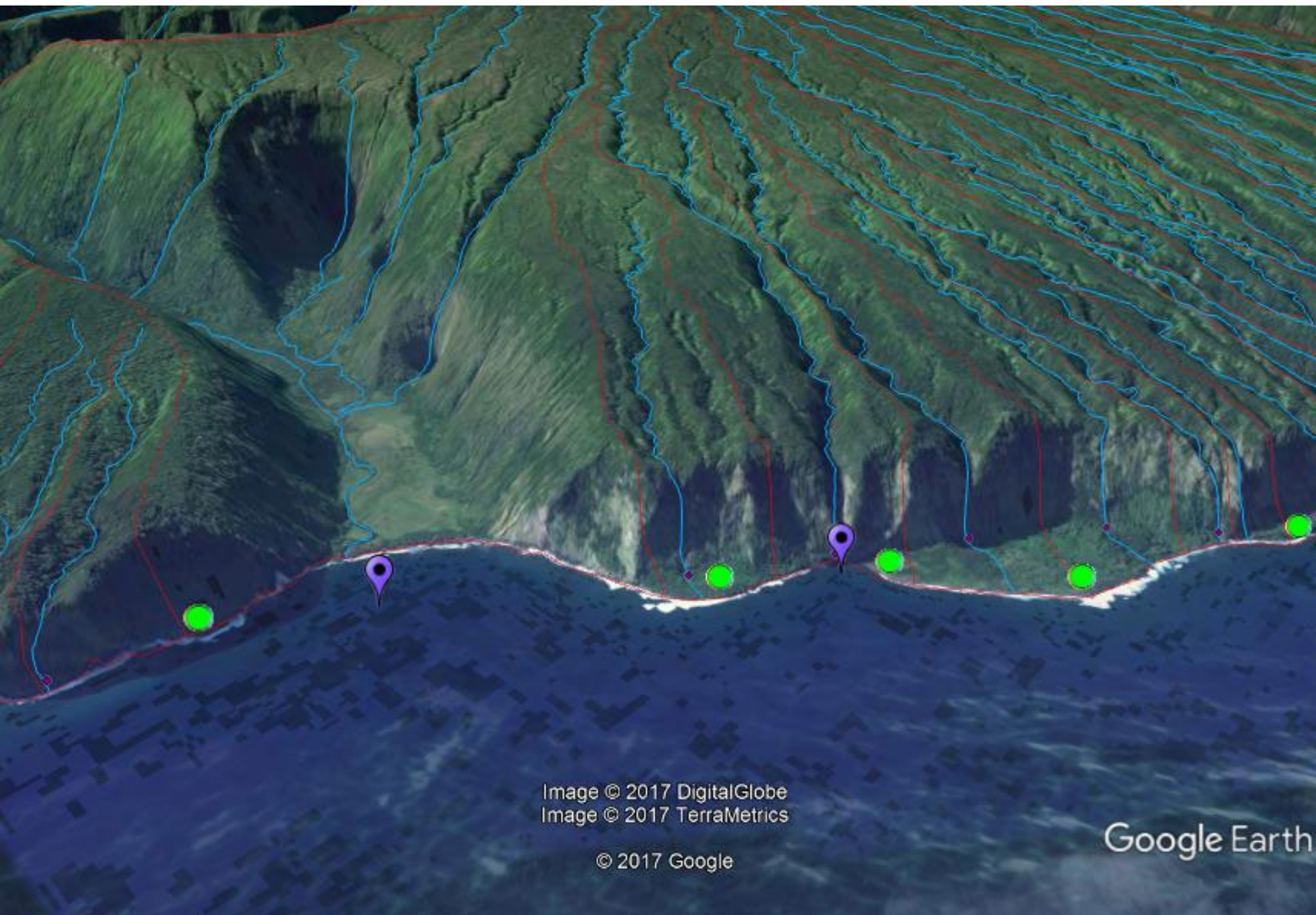


Image © 2017 DigitalGlobe  
Image © 2017 TerraMetrics

© 2017 Google

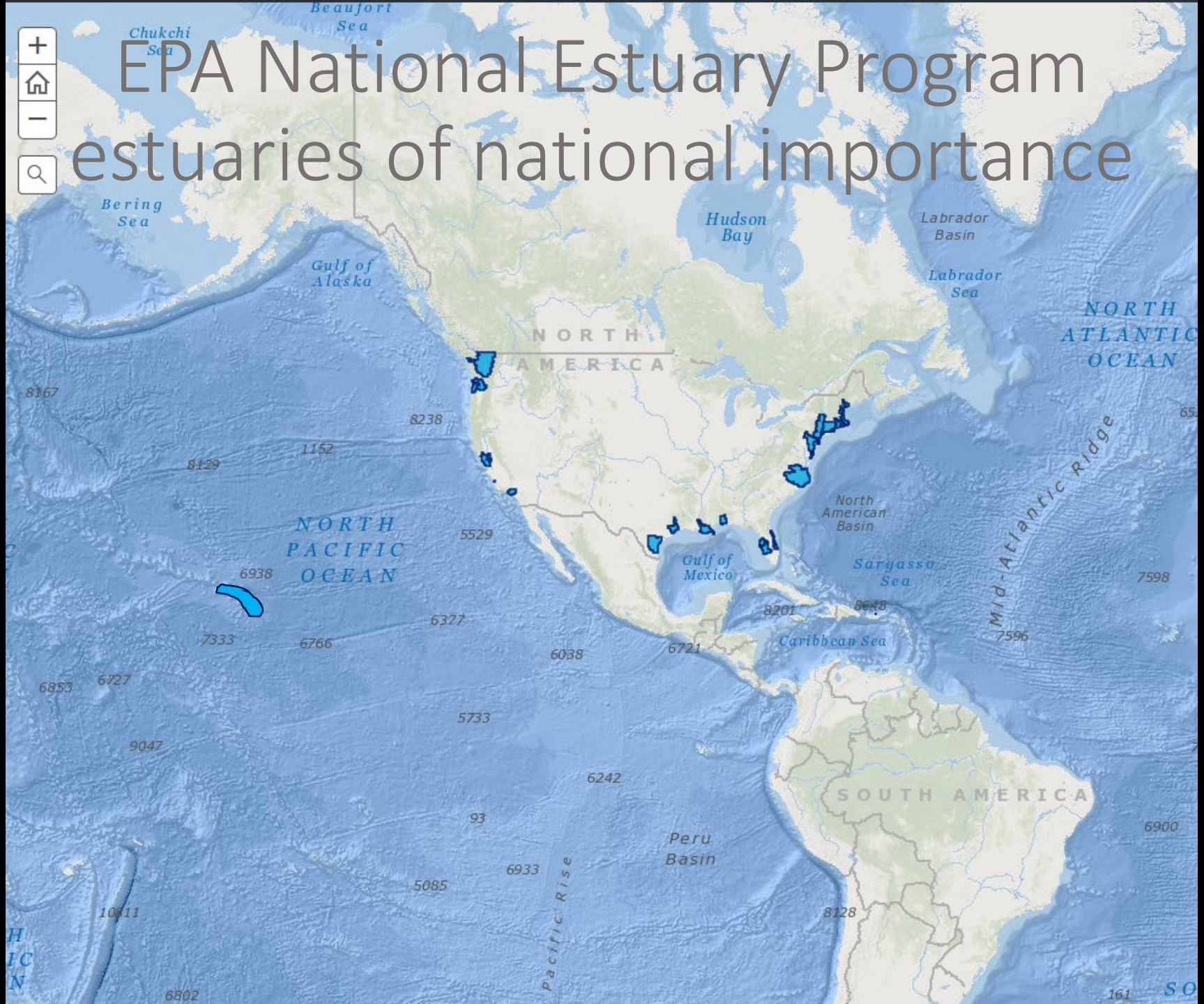
Google Earth





# EPA National Estuary Program

## estuaries of national importance





A photograph of a steep, verdant mountain slope. Several thin waterfalls are visible, cascading down the rocky terrain. The vegetation is dense and green.

mauka

An aerial photograph of a coastal town. The town is built on a flat area between the ocean and a range of brown, rocky mountains. The water is a deep blue, and the sky is clear.

muliwai

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An underwater photograph showing a sea turtle swimming over a vibrant coral reef. The water is clear blue, and the coral is in various shades of green and yellow.

makai