

# Emergency Response to Major Damage Events

## *M/V Cape Flattery, Barbers Point, Oahu, 2005*

NOAA Fisheries Pacific Islands Regional Office

US Fish and Wildlife Service, Honolulu

State of Hawaii Division of Aquatic Resources



Gerry Davis

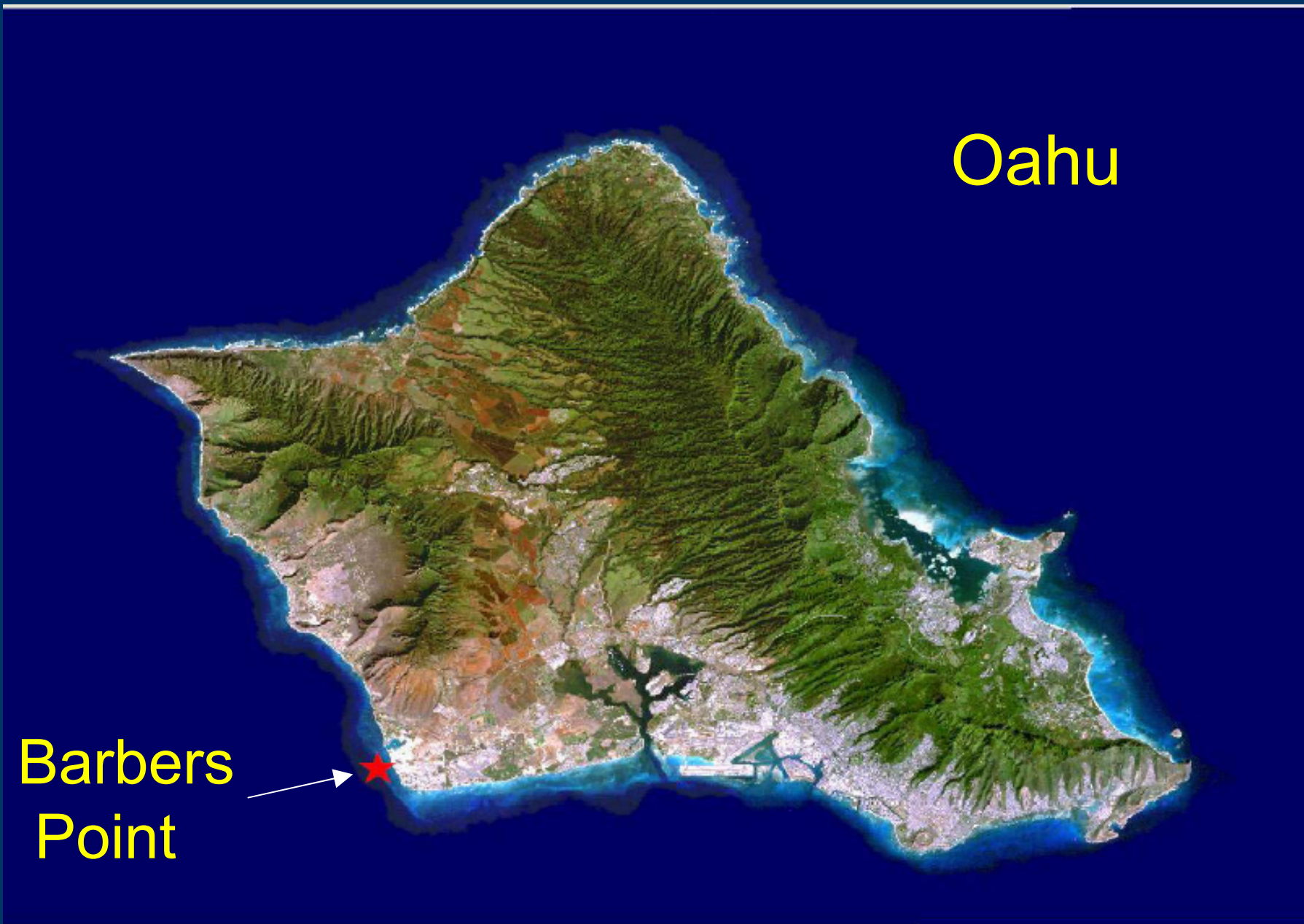
NOAA Fisheries Pacific Islands Regional Office

&

Michael Molina

US Fish and Wildlife Service, Honolulu

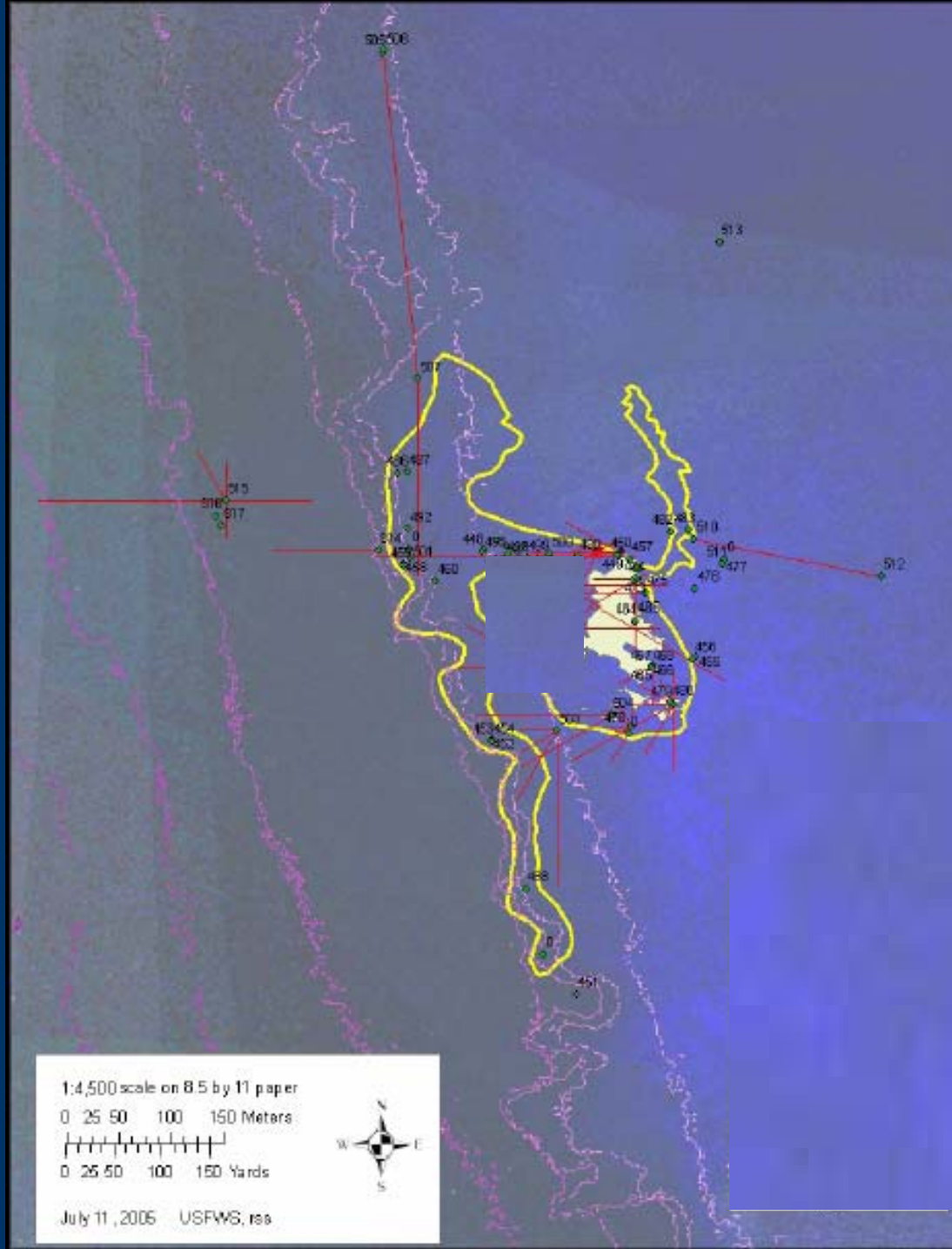
# M/V Cape Flattery Grounding Location



# Background

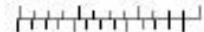
- Vessel Length-555 ft. bulk carrier
- 2 February 2005
- Barbers Point Harbor, Oahu.
- Cause - currently under investigation.
- Total impact  $\approx 15 +$  acres
  - 25 to  $> 100$  ft. depths
  - Ship impact  $\approx 6 +$  acres
  - Response impact  $\approx 9 +$  acres





1:4,500 scale on 8.5 by 11 paper

0 25 50 100 150 Meters



0 25 50 100 150 Yards



July 11, 2006 USFWS, res













# Reef Pulverized by the Ship's Hull



# Uncontrolled Release of Cement



## Towlines, Cables and Chains Trailing Far Below the Waters Surface



# Towline Damage

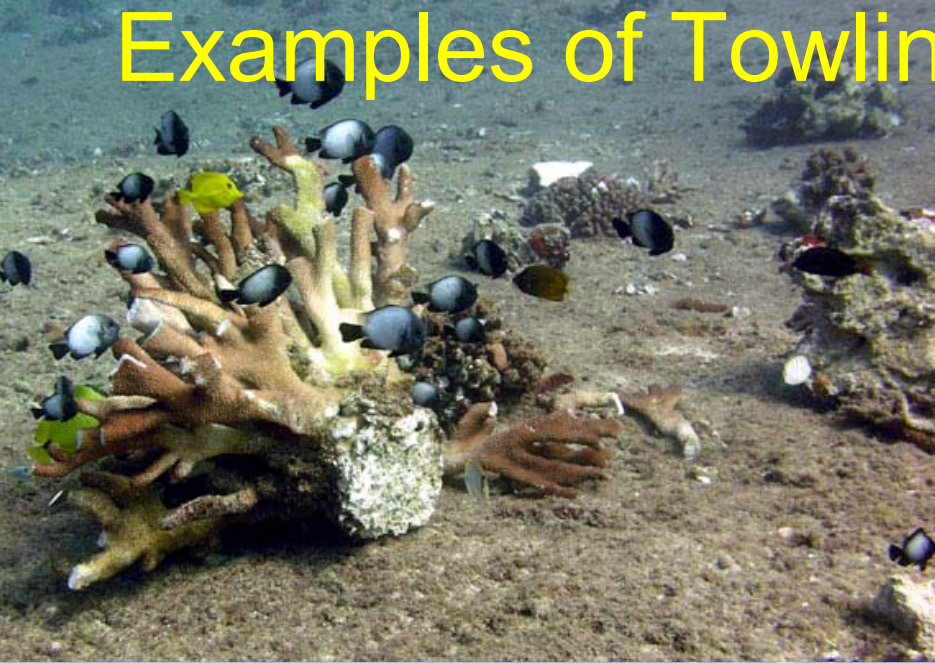




# Anchor Damage



# Examples of Towline Damage to Corals



# PRE-ASSESSMENT





# FRAGMENTED CORAL



# Preparing Substrate and Corals for Cement



# Delivering Cement (30 – 55 ft. depths)





# Placing Cement



# Creating Aggregation



# Completed Aggregation



# Example Aggregates



# Preliminary Data

## Cape Flattery Emergency Coral Restoration Summary Data, Barbers Point, Oahu.

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<b>No. Cement Stations</b>	<b>18</b>
<b>No. Cement Aggregates</b>	<b>105</b>
<b>No. Colonies</b>	<b>825</b>
<b>Total Aggregate Area (m<sup>2</sup>)</b>	<b>34</b>

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**Plus over 400 individual colonies righted;  
metal debris removed**



# Projected Reef Area Stabilized

- Approximately 660 m<sup>2</sup> of cumulative reef area enclosed.
- Represents, at best, 1 % of damaged area.
- Stabilized all large coral colonies located.

# Short-term Findings:

Tissue regeneration

Habitat utilization

Limited mortality



# Long-term Monitoring

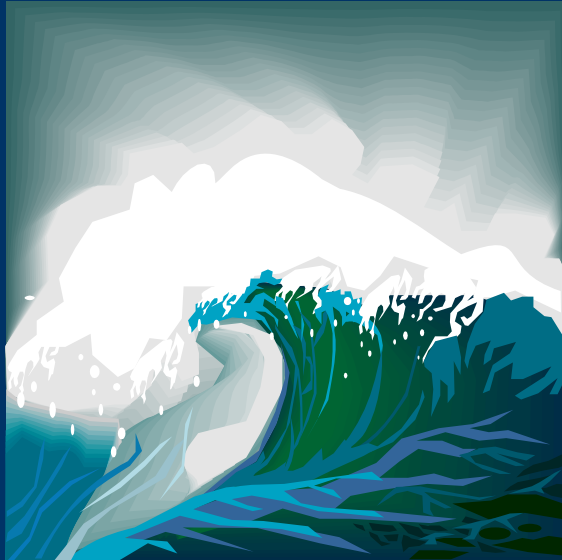
- Annual monitoring for 5 years (proposed)
- 189 reference corals mapped & measured

*Pocillopora eydouxi*, *P. meandrina*, *Porites evermannii*, *P. lobata*



# Potential Threats to Cement Aggregates

- Burial & breakage
- Direct wave impacts
- Coral predation
- Breakage by turtles
- Human use impacts
- Invasive species



# Response Restoration Effort

Multi-agency cross state/federal partner approach.

Over 50 individuals required to complete effort.

Over 200 logged dives.

New assessment and restoration techniques applied.

