

# 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

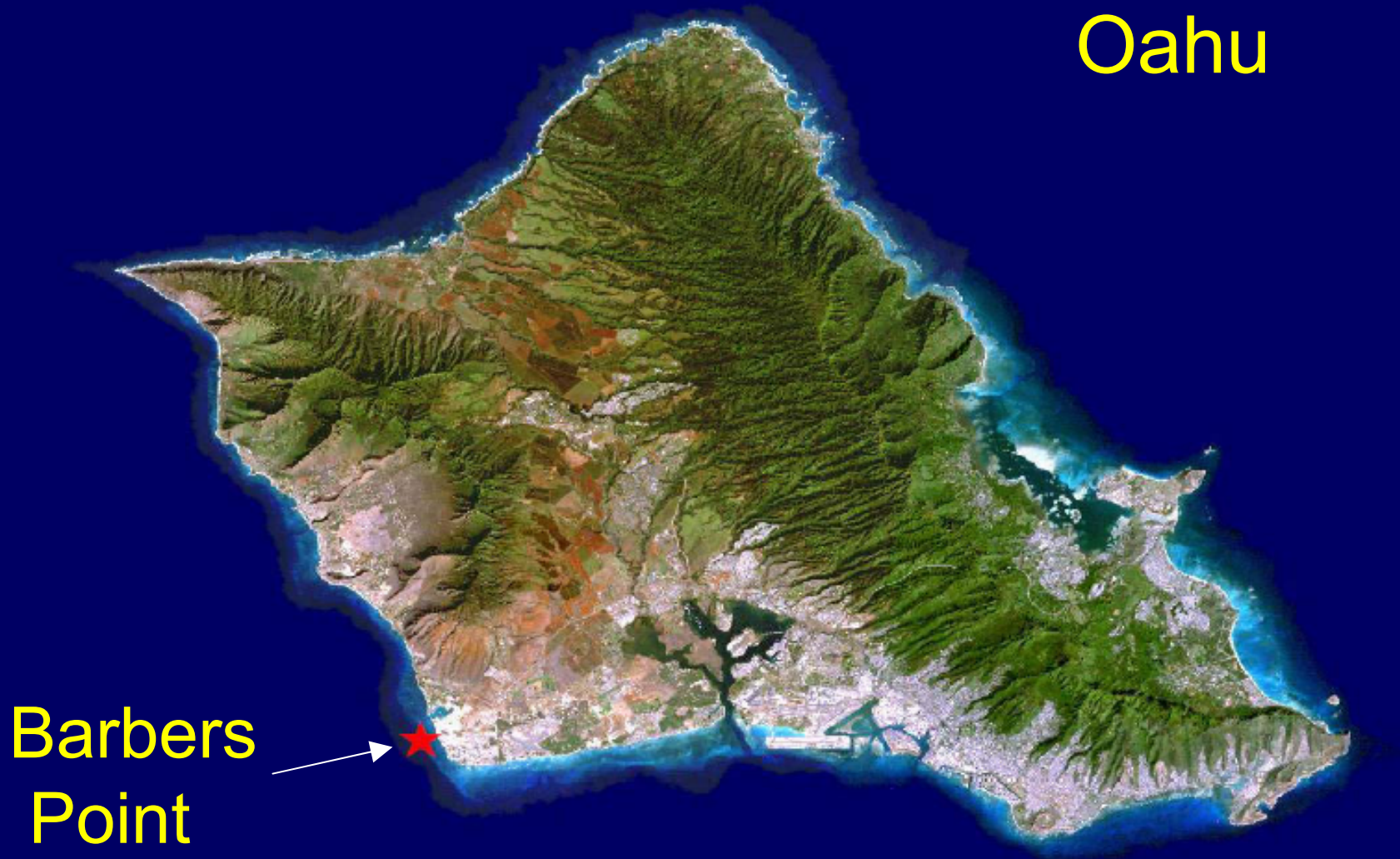
NOAA Fisheries Pacific Islands Regional Office

&

Michael Molina

US Fish and Wildlife Service, Honolulu

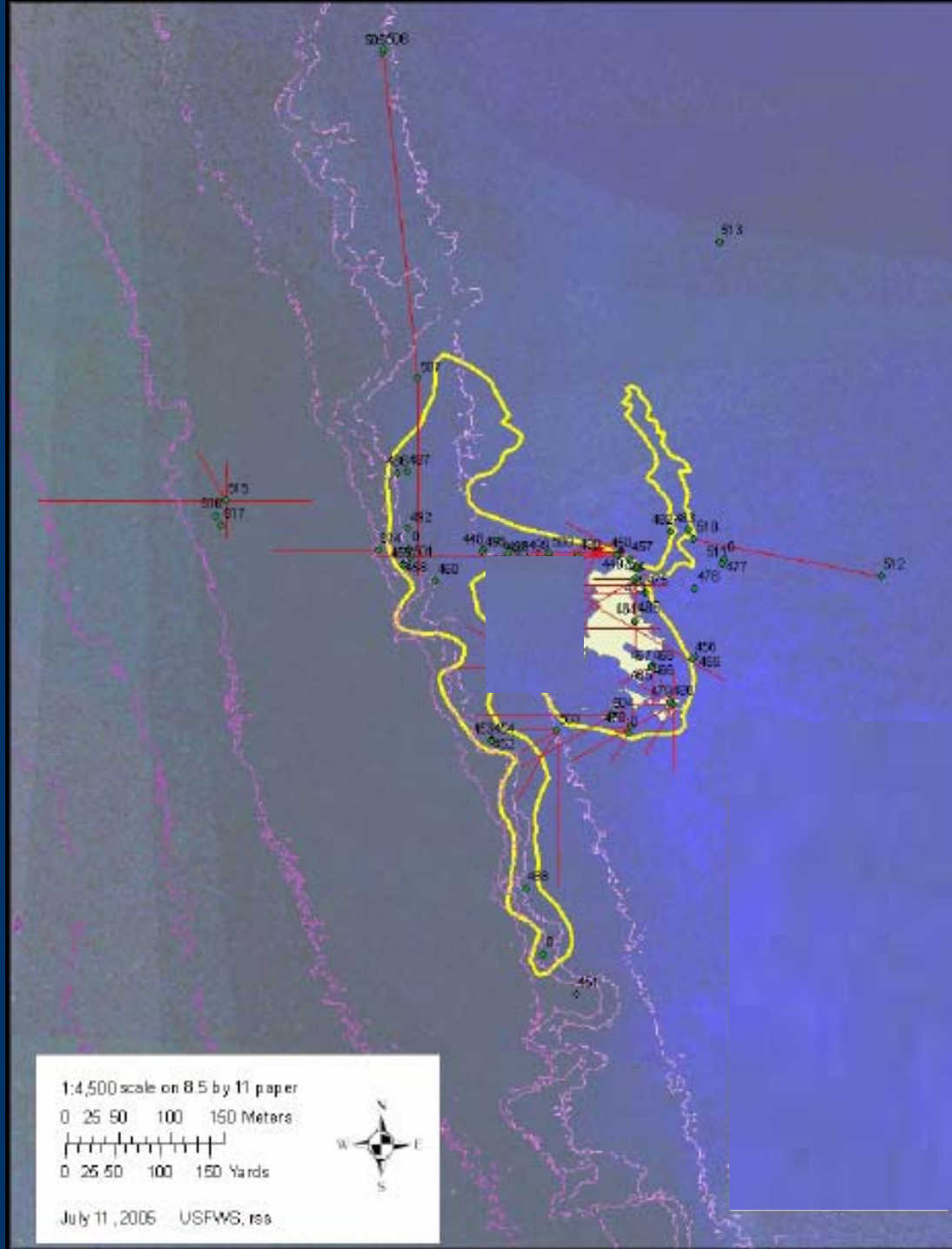
# M/V Cape Flattery Grounding Location



# Background

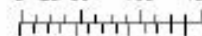
- Vessel Length-555 ft. bulk carrier
- 2 February 2005
- Barbers Point Harbor, Oahu.
- Cause - currently under investigation.
- Total impact  $\approx 15 +$  acres
  - 25 to  $> 100$  ft. depths
    - Ship impact  $\approx 6 +$  acres
    - Response impact  $\approx 9 +$  acres





1:4,500 scale on 8.5 by 11 paper

0 25 50 100 150 Meters



0 25 50 100 150 Yards

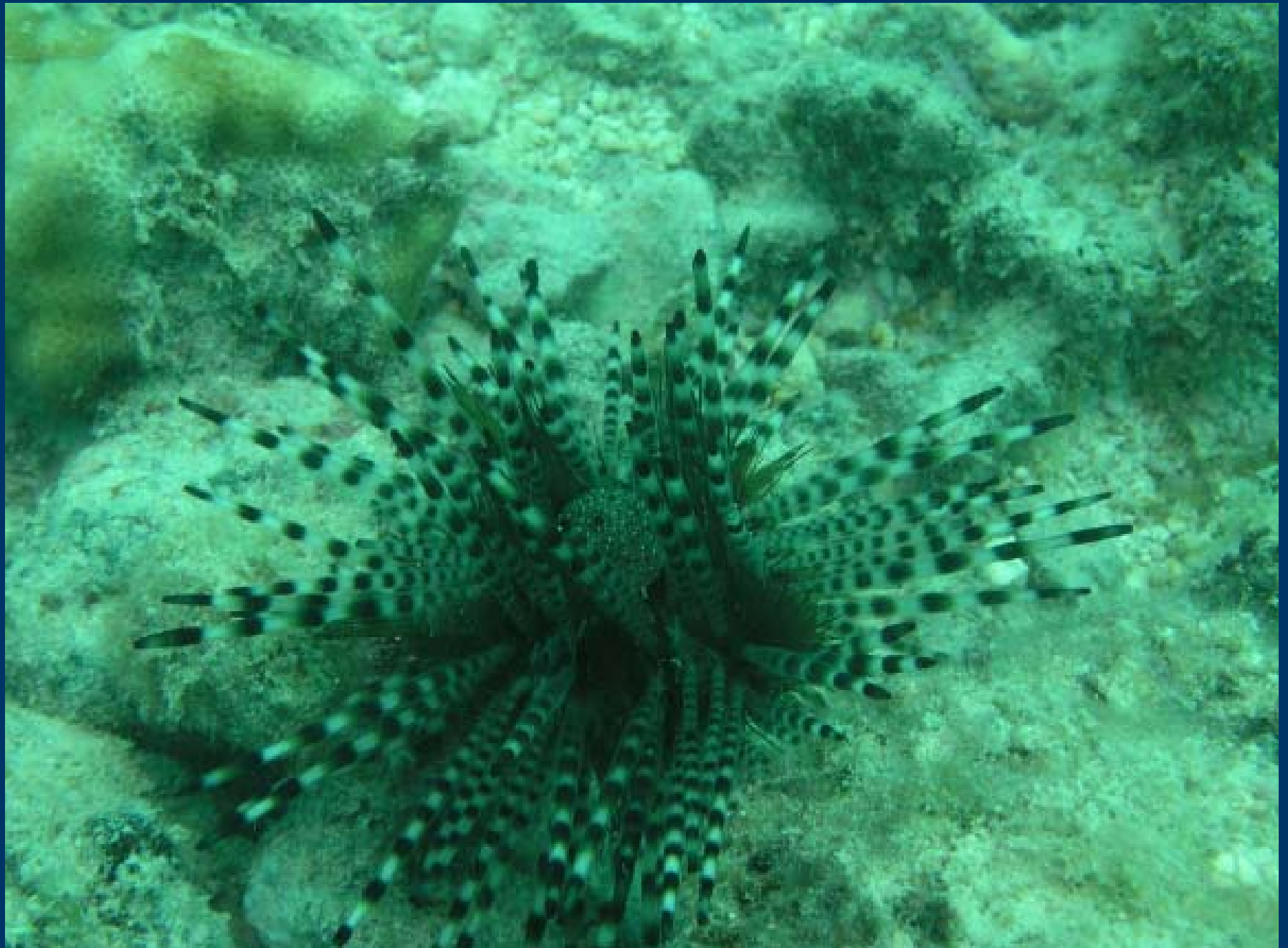


July 11, 2006 USFWS, res

















# 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

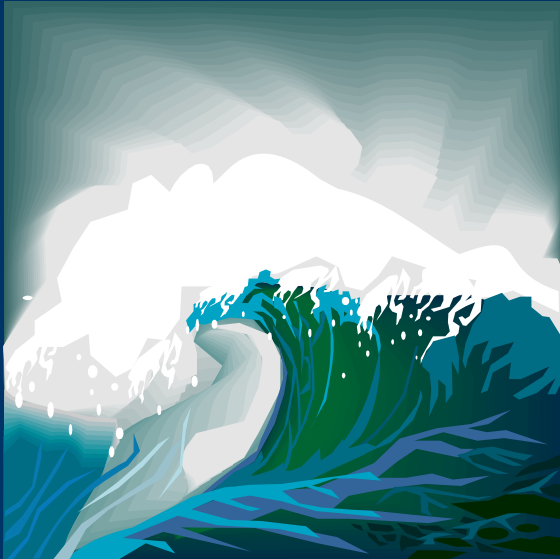
*Pocillopora eydouxi*, *P. meandrina*, *Porites evermannii*, *P. lobata*





# 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.

