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Ocean Week
Sea: The Future
2022

A Scientific Synthesis of Marine Protected Areas in the US: Status and Recommendations

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on behalf of 30 co-authors

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A new tool for assessing MPAs: *The MPA Guide*

A way to describe MPA **quality** as well as **quantity**.

1. Identifies the Stage of Establishment of an MPA – Proposed/Committed, Designated, Implemented, Actively Manged
2. Groups MPAs according to their Level of Protection – Fully, Highly, Lightly, Minimally Protected
3. Specifies Enabling Conditions for effective and equitable MPAs
4. Links the likely Outcomes that can be expected for an MPA based on its level of protection

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Grorud-Colvert et al., *Science*, 2021

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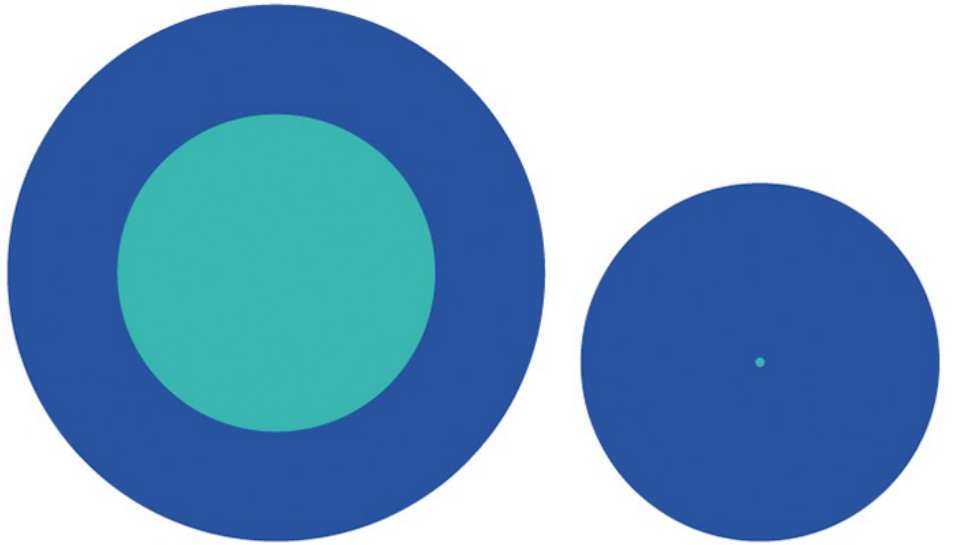
What do we have?

- 26% of US waters are in an MPA.
  - The vast majority of area is highly or fully protected, and most MPAs are actively managed
- 1.9% of the waters around the continental US are protected in any kind of MPA
  - The vast majority is lightly or minimally protected
- Almost all MPA area, including highly or fully protected area, is in the central Pacific
- Level of Protection varies significantly by region.

Total Area of MPAs in each U.S. Region



Total Marine Area
Total MPA Area
Percent of Total Marine Area in MPAs

Pacific	Alaska	Southeast	Southwest	Northeast	Northwest
5,802,156km²	3,710,339km²	1,421,348km²	573,975km²	514,011km²	247,799km²
3,065,885km²	24,190km²	29,549km²	32,607km²	24,324km²	10,305km²
52.8%	0.7%	2.1%	5.7%	4.7%	4.2%

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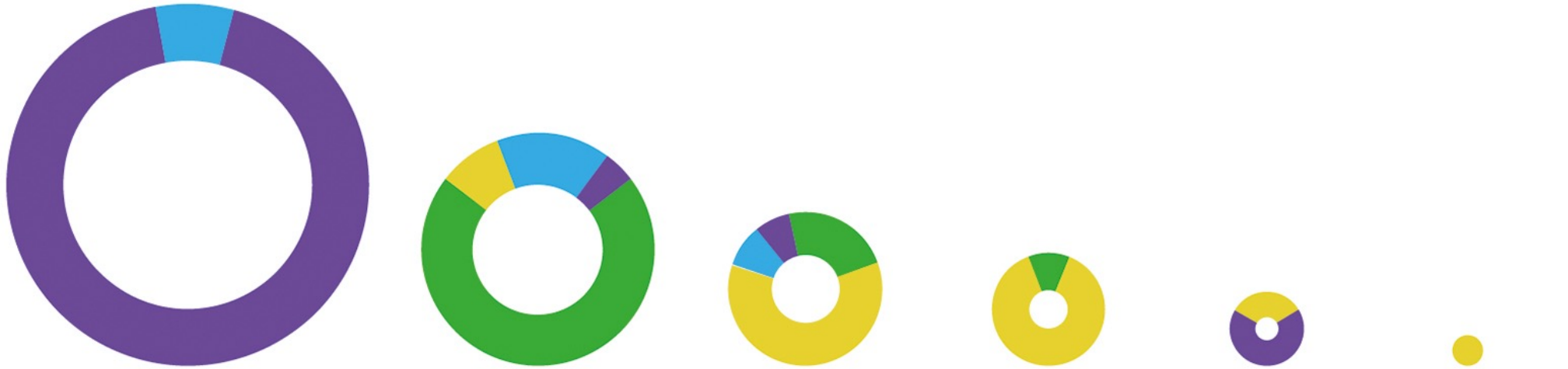
Percent MPA Coverage in this Analysis by Level of Protection



Pacific		Alaska		Southeast		Southwest		Northeast		Northwest	
7.0%	92.9%	15.4%	4.3%	8.9%	7.2%	0.0%	0.0%	0.0%	66.9%	0.0%	0.0%
0.0%	0.1%	68.2%	8.4%	22.3%	59.2%	12.1%	87.9%	0.0%	33.2%	0.0%	100%
		3.7% Unknown		2.4% Unknown							

MPA Levels of Protection

Fully

Highly

Lightly

Minimally

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National Marine Sanctuaries

- American Samoa
- Monterey Bay
- Florida Keys
- Greater Farallones
- Olympic Coast
- Channel Islands
- Hawaiian Islands Humpback Whale
- Cordell Bank
- Stellwagen Bank

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Thank you.

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http://mpa-guide.protectedplanet.net

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Strengthening Our National Marine Sanctuaries – Opportunities at Stellwagen Bank

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Stellwagen Bank National Marine Sanctuary

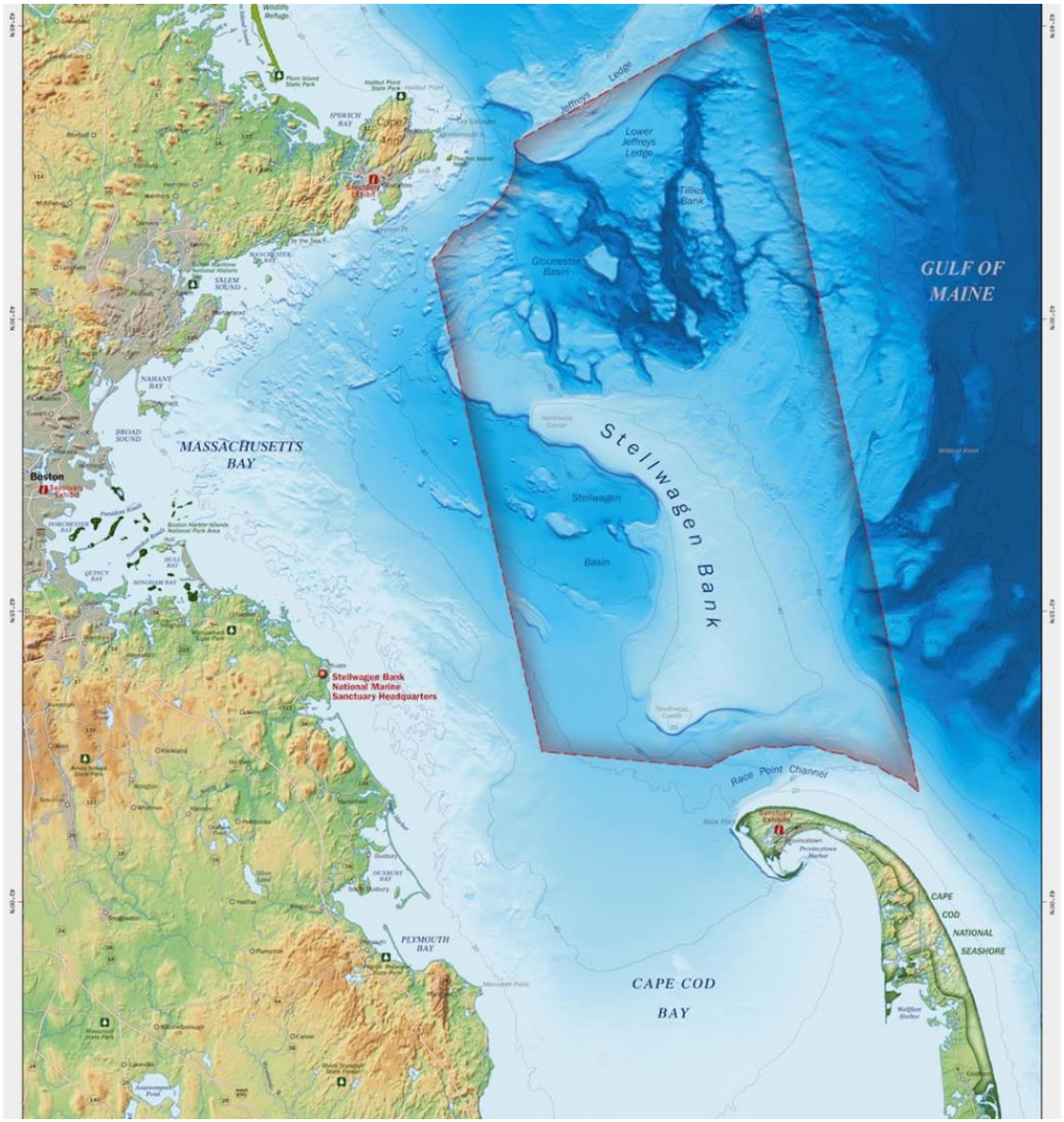

Image: NOAA

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Stellwagen's Extraordinary Resources

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Sounds from natural and human sources fill the sanctuary, like the noises of ships and the vocalizations of whales. Photo: WCNE/NOAA (NOAA Fisheries Permit #981-1707)

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Stellwagen 2020 Condition Report: Resource Depletion and Habitat Degradation

- Iconic species like the North Atlantic right whale, humpback whale and Atlantic cod are in poor or fair/poor condition, and in some cases their condition is worsening.
- “Measurable degradation of habitat quality” primarily due to the impacts of commercial fishing gear.
- Increasing levels of noise that “interrupt behavior and communication for many species”
- Maritime heritage resources subject to “severe, persistent, and widespread impacts.” Contact with fishing gear “has affected nearly every maritime heritage resource in the Sanctuary.”

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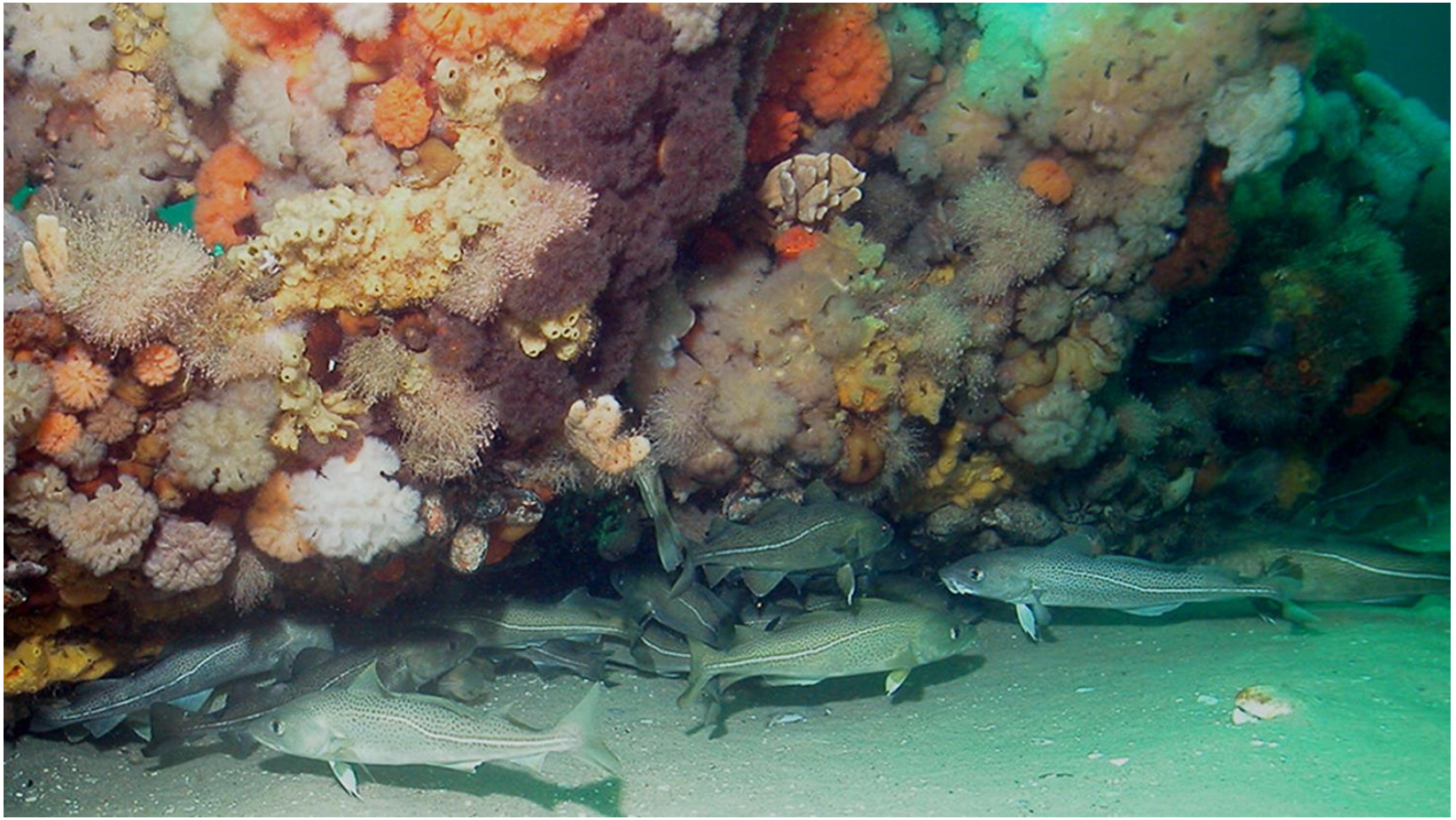
Dr. Les Kaufman -- Boston University



Atlantic cod shelter under part of the Paul Palmer wreck. Photo: NOAA

7 Actions to Strengthen the Management of Stellwagen Bank National Marine Sanctuary

1. Institute a 10-nm speed limit to reduce ship strikes.
2. Monitor and manage anthropogenic noise to prevent harm to wildlife
3. Prohibit fishing for Atlantic cod within the Sanctuary- one of the last places where they feed, grow, and reproduce in some abundance, thereby ensuring a future for this all-important fish throughout the region.
4. Manage fish as wildlife and not just commodities.
5. Insist that fishing gear that harms wildlife has no place in a National Marine Sanctuary.
6. Designate wildlife replenishment zones within the Sanctuary that are permanently off limits to fishing and also serve as scientific reference areas
7. Protect foundational species, like sand lance and herrings, to the benefit of all other Sanctuary wildlife as well as people.

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Quieting our Sanctuaries

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Our marine sanctuaries are an acoustic world…

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Andrew Gery/NOAA Fisheries

James Watt/NOAA

Our marine sanctuaries are an acoustic world…

Andrew Gery/NOAA Fisheries

OSU/GEMM Lab

James Watt/NOAA

Our marine sanctuaries are an acoustic world…

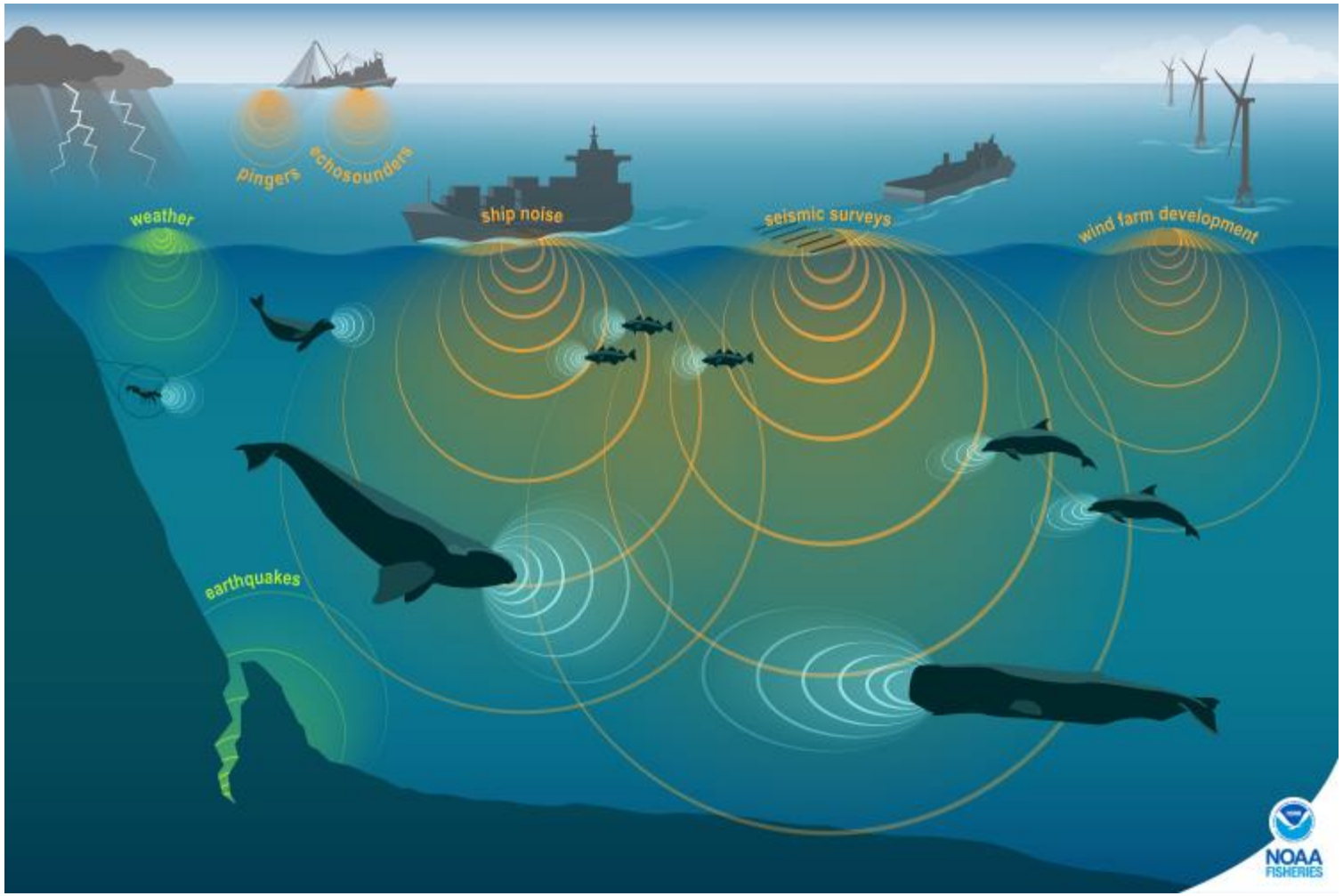
J. Moore/NOAA under permit #15420

Andrew Gerry/NOAA Fisheries

OSU/GEMM Lab

James Watt/NOAA

Noise generated by human activities can injure marine life, drown out sounds necessary for survival, and degrade the marine ecosystem



Noise adversely affects almost all marine species:

- Habitat avoidance
- Altered vocalizations
- Changes in swim speed and direction
- Alarm responses
- Adverse stress response
- Hearing and sensory impairment
- Injury
- Death

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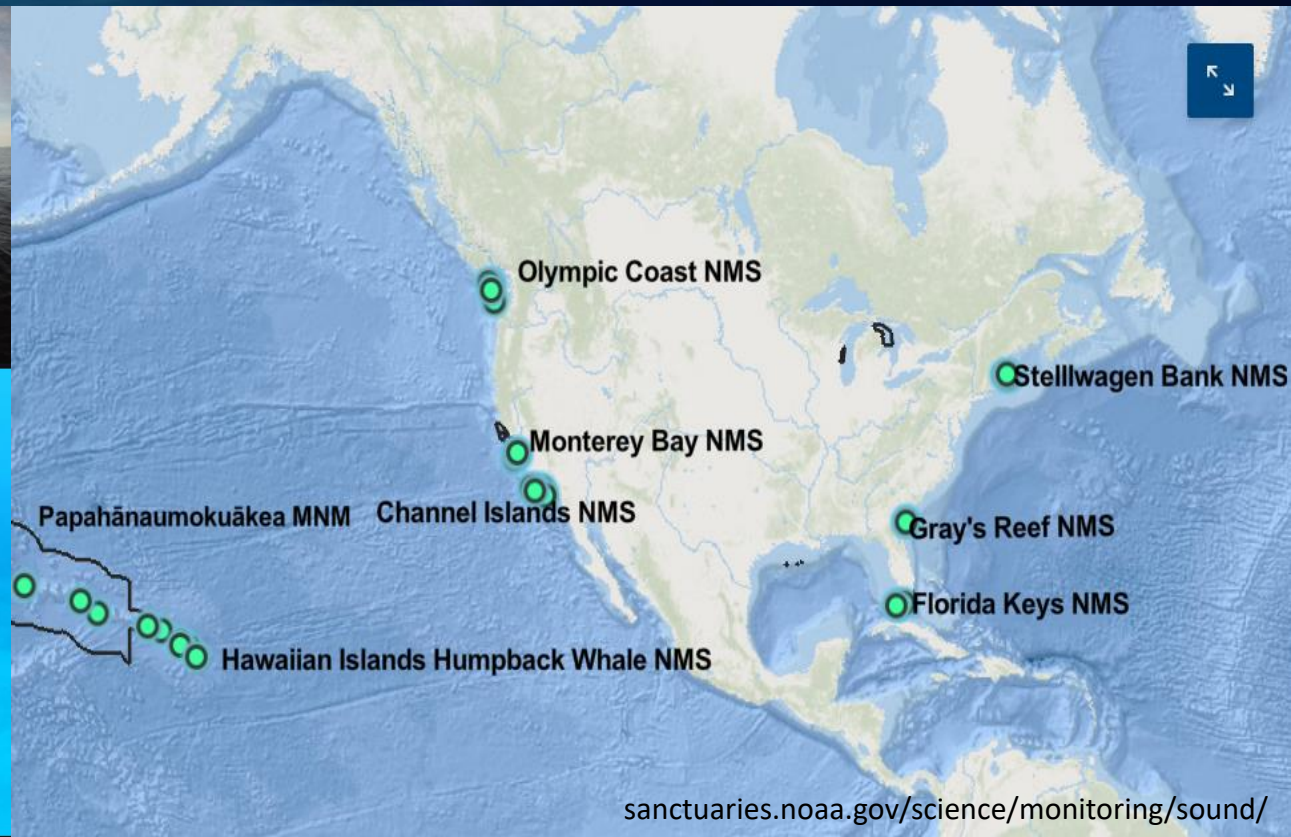
Sanctuary Soundscape Monitoring Project (SanctSound)

Exploring underwater sounds within the U.S. National Marine Sanctuary System



sanctuaries.noaa.gov/science/monitoring/sound/

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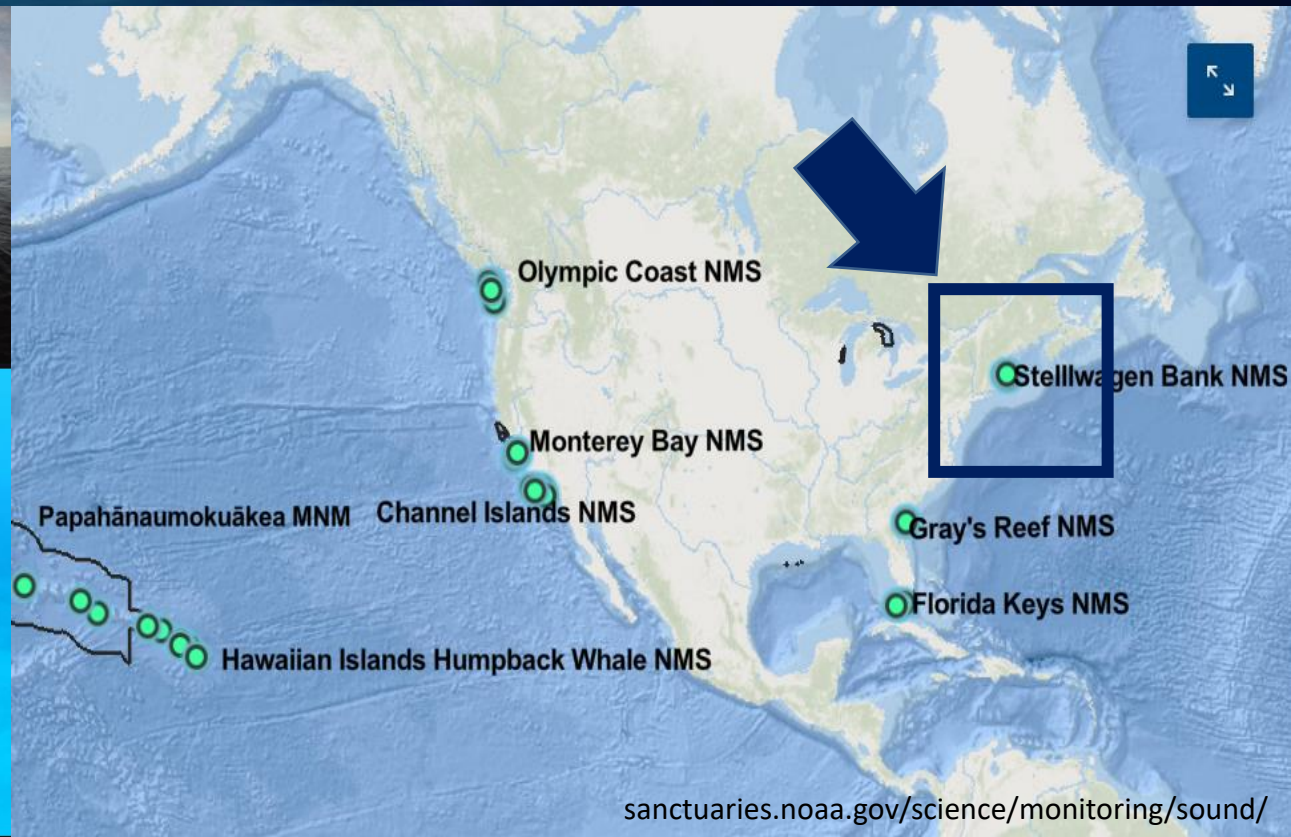
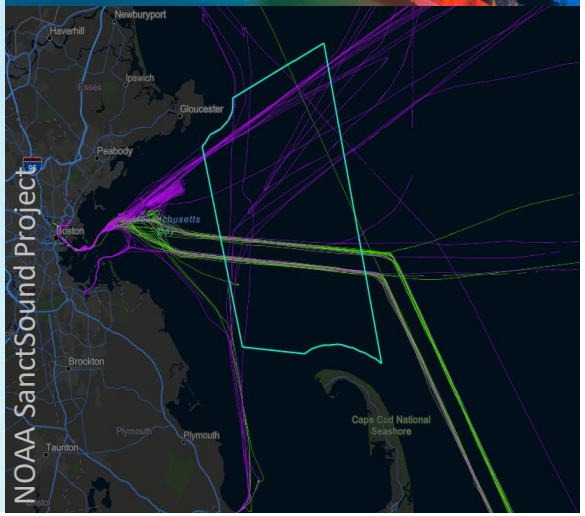


sanctuaries.noaa.gov/science/monitoring/sound/

Stellwagen Bank NMS experiences the most continuous loud noise of any sanctuary or monument included in SanctSound



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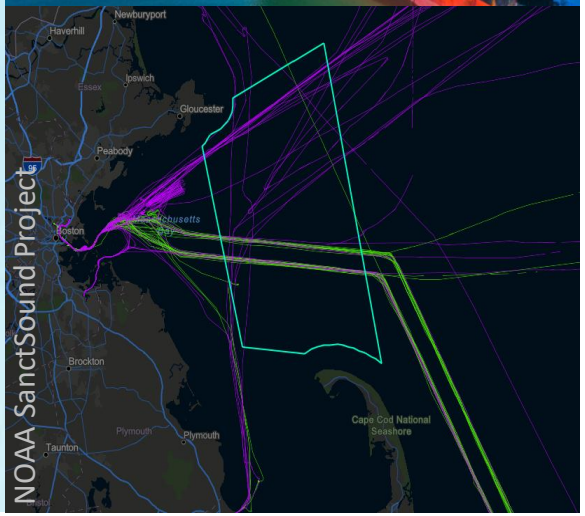

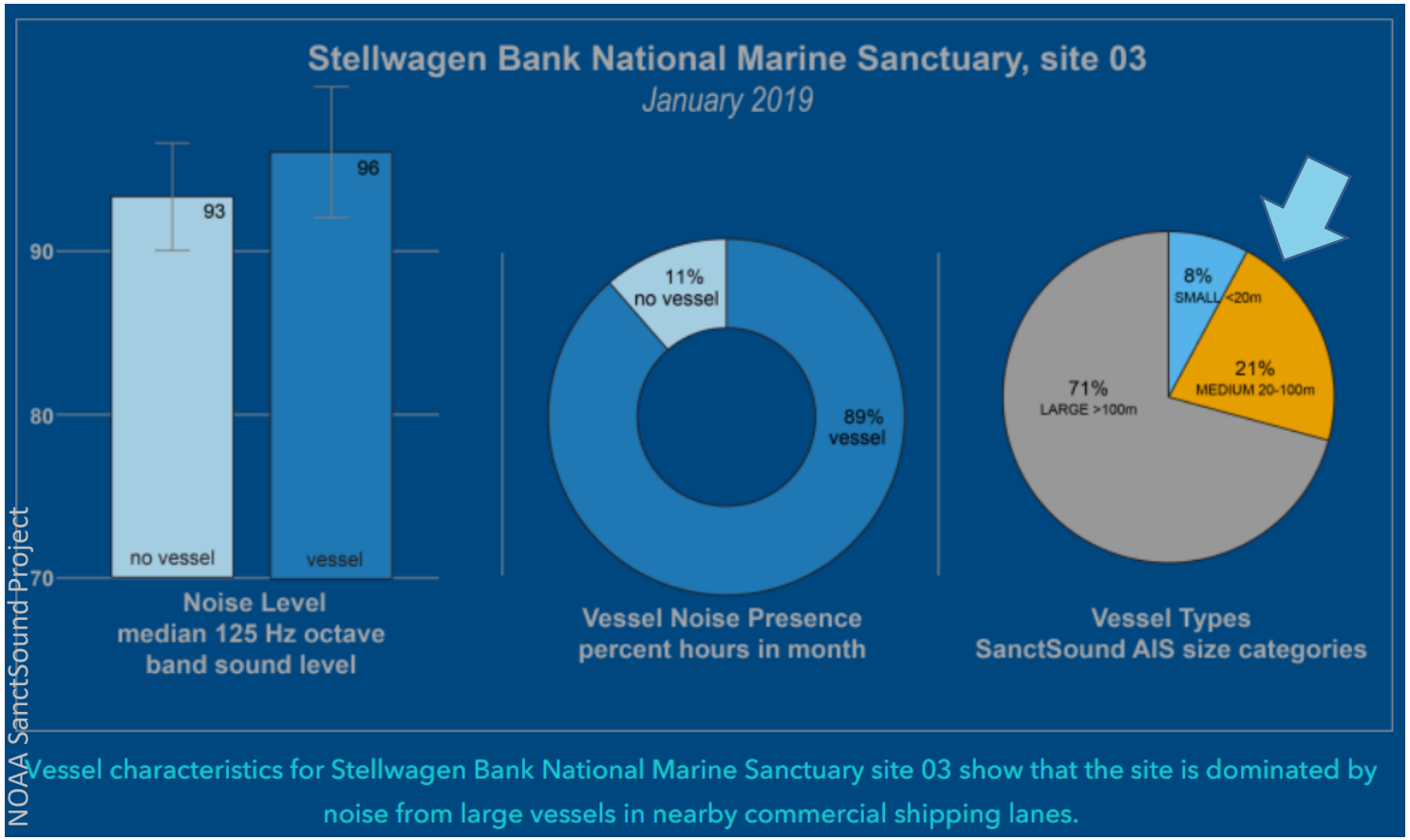

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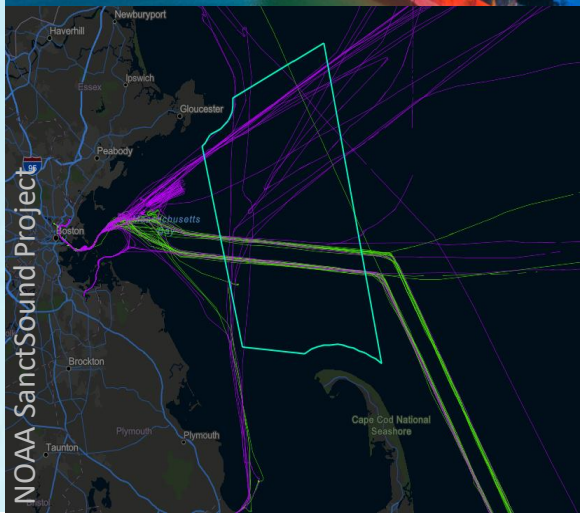

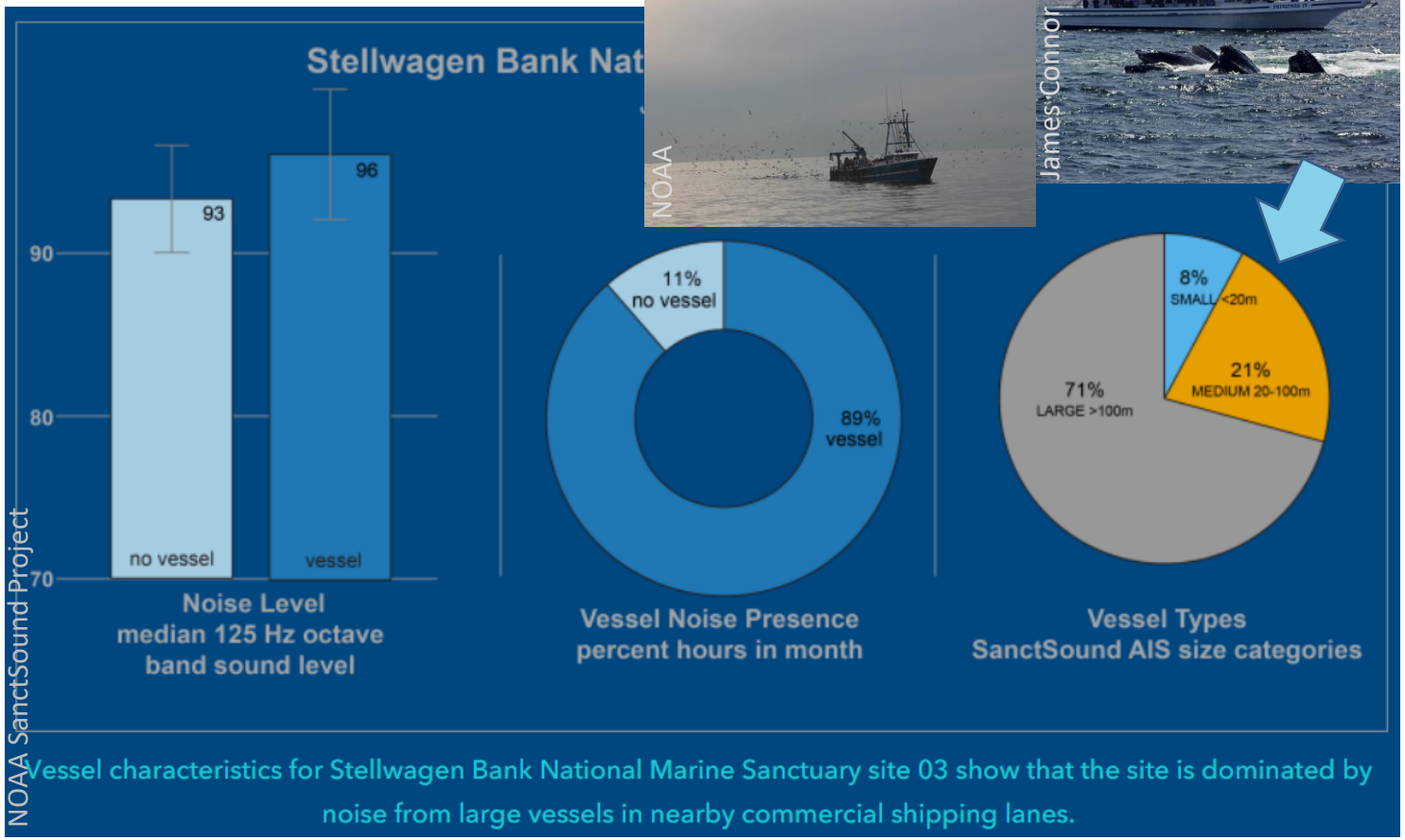

Vessel characteristics for Stellwagen Bank National Marine Sanctuary site 03 show that the site is dominated by noise from large vessels in nearby commercial shipping lanes.

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Noise within Stellwagen Bank NMS has measurable effects on the Sanctuary's iconic and endangered species

- Atlantic cod vocalizations ("grunts") are critical for successful spawning
- Effective calling radius was reduced to only 1.3m when noise levels were highest

- Fin whale, humpback whale, and minke whale signals experience masking level of 80% of more
- Communication area is reduced from 16 km^2 for right whales to over 2100 km^2 for fin whales

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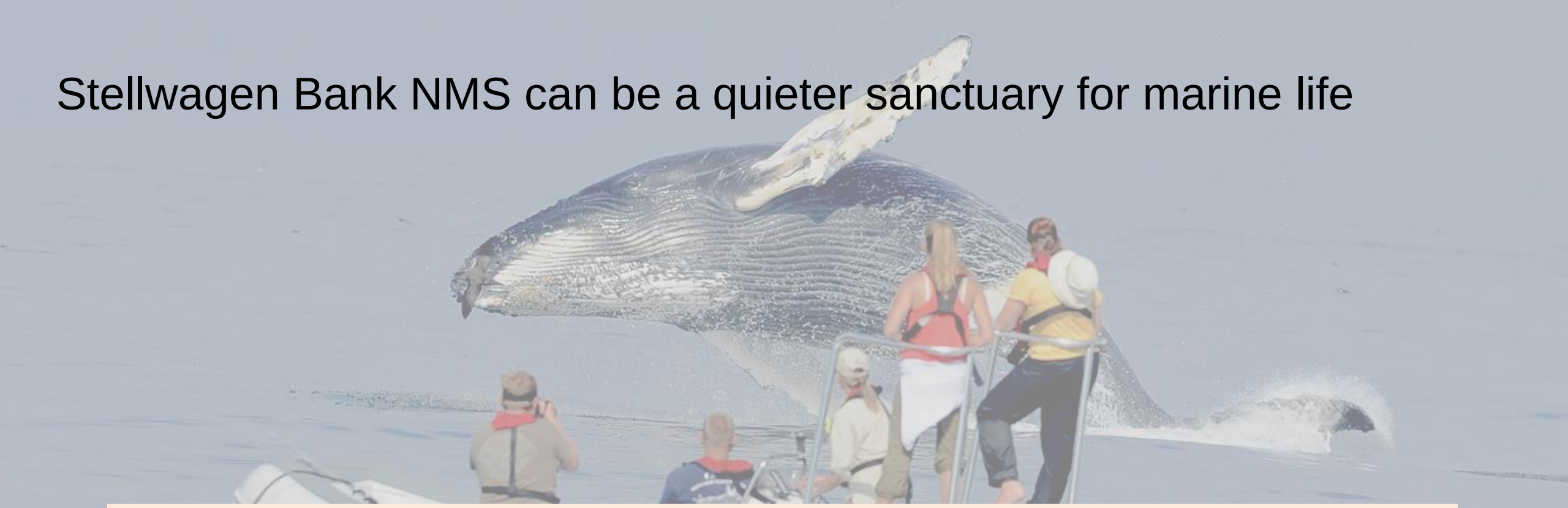
Stanley, JA., et al. *Scientific reports* 7.1 (2017): 1-12; Cholewiak, D., et al. *Endangered Species Research* 36 (2018): 59-75

Slowing vessels down reduces noise…

Slowing vessels down reduces noise…
…resulting in the co-benefit of reduced vessel strike risk

Stellwagen Bank NMS can be a quieter sanctuary for marine life



- Stellwagen Bank NMS should be proactive in managing noise within the Sanctuary
- The Soundscape Action Plan could be amended to commit the Sanctuary to:
    i. Conduct sector-specific noise management planning, in partnership with private sector stakeholders
    ii. Implement noise mitigation measures within 12 months
- Sanctuary staff and NOAA could advance noise reduction strategies at the International Maritime Organization (IMO)
- Vessels should travel at speeds of 10 knots or less to reduce vessel strike risk for humpback whales and other species
    - Slowing vessels down will also help reduce vessel noise.

Image taken under NOAA Fisheries permit #14245

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Thank you

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Saving a National Treasure: Florida Keys National Marine Sanctuary

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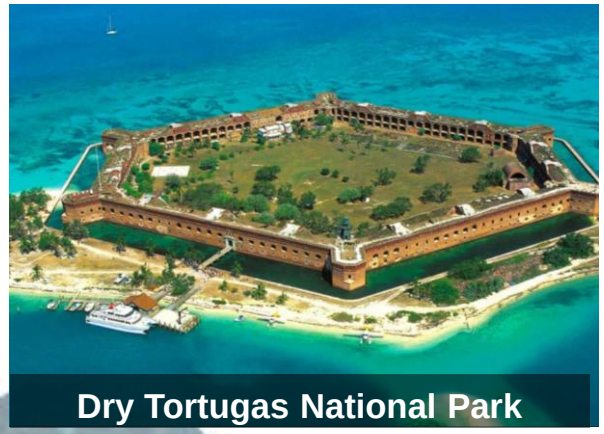
Pathway to 30x30: Conserving America's most valuable underwater treasures

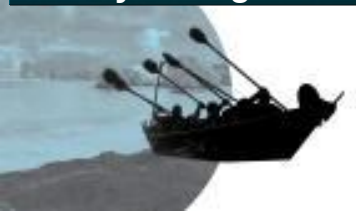
Florida Keys National Marine Sanctuary


Florida Keys NMS


Everglades National Park


Dry Tortugas National Park


Biscayne National Park



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Florida Keys Fisheries Decline – **1950s**

Source: McClenachan (2009)

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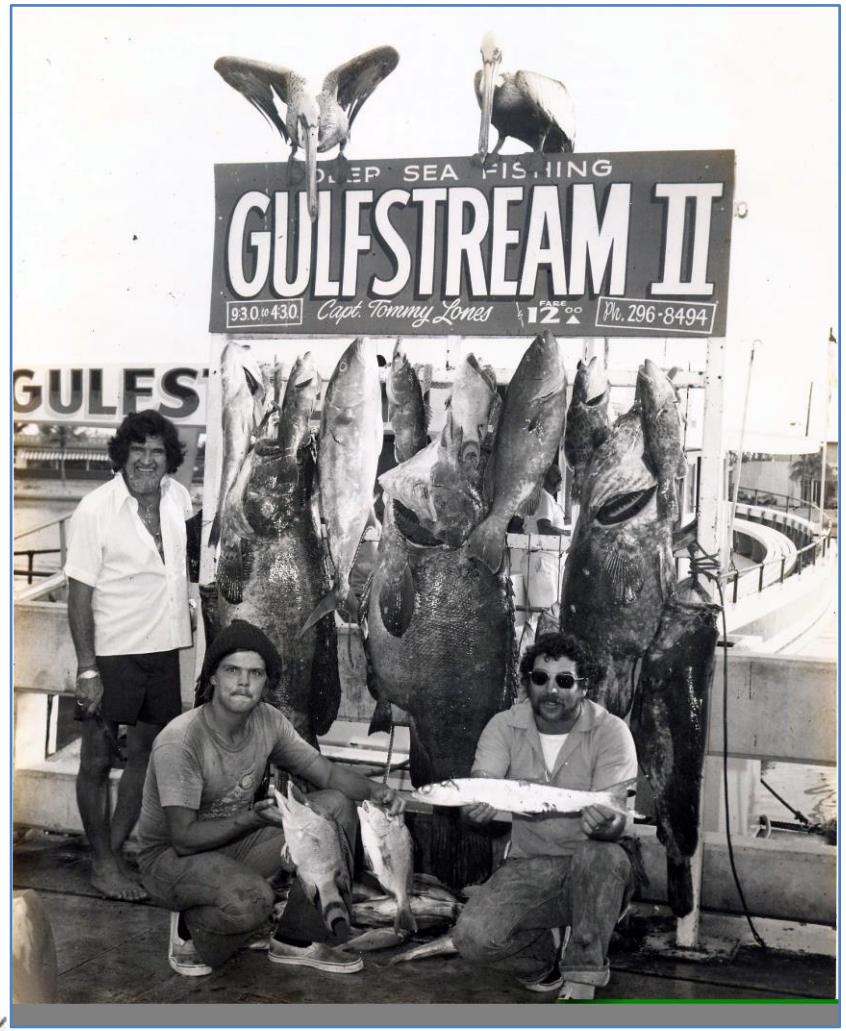
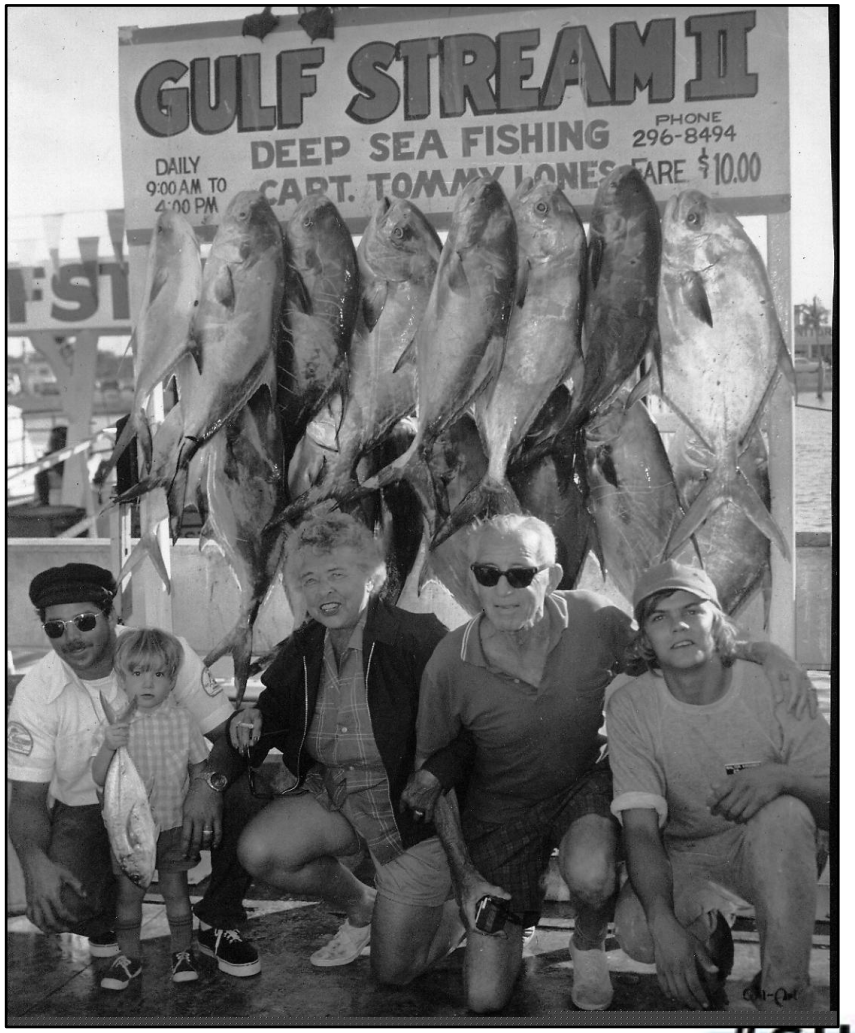
Florida Keys Fisheries Decline – **1960s**





Source: McClenachan (2009)

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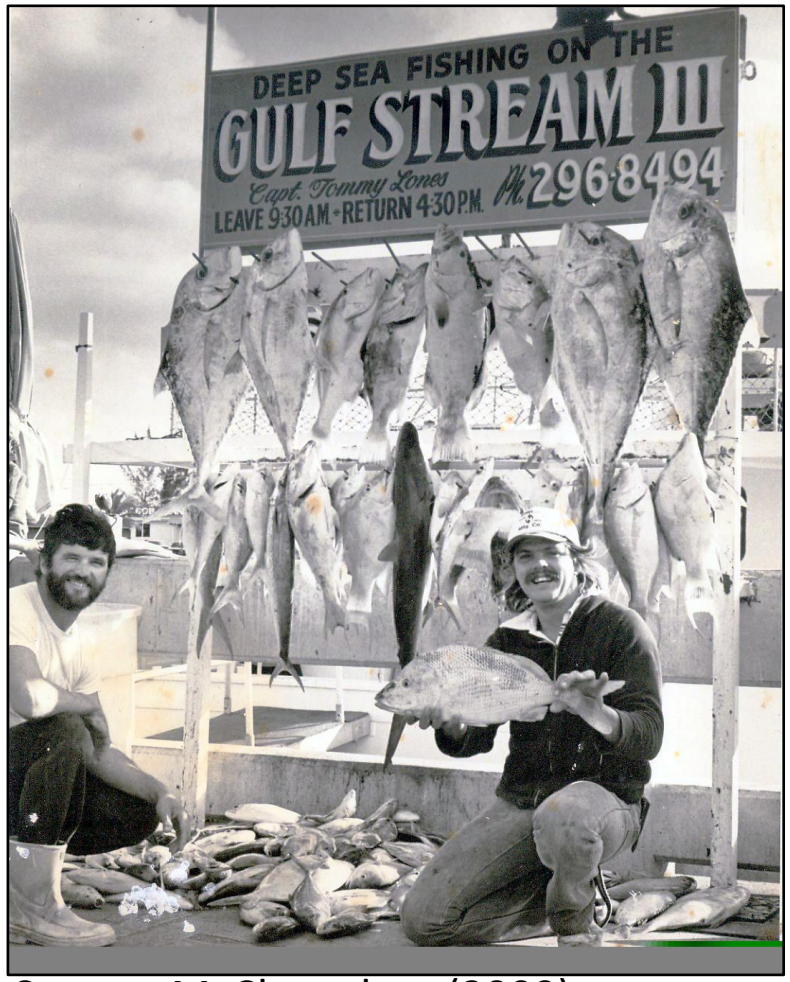
Florida Keys Fisheries Decline – **1980s**



Source: McClenachan (2009)

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Florida Keys Fisheries Decline – **2000s**

Source: McClenachan (2009)

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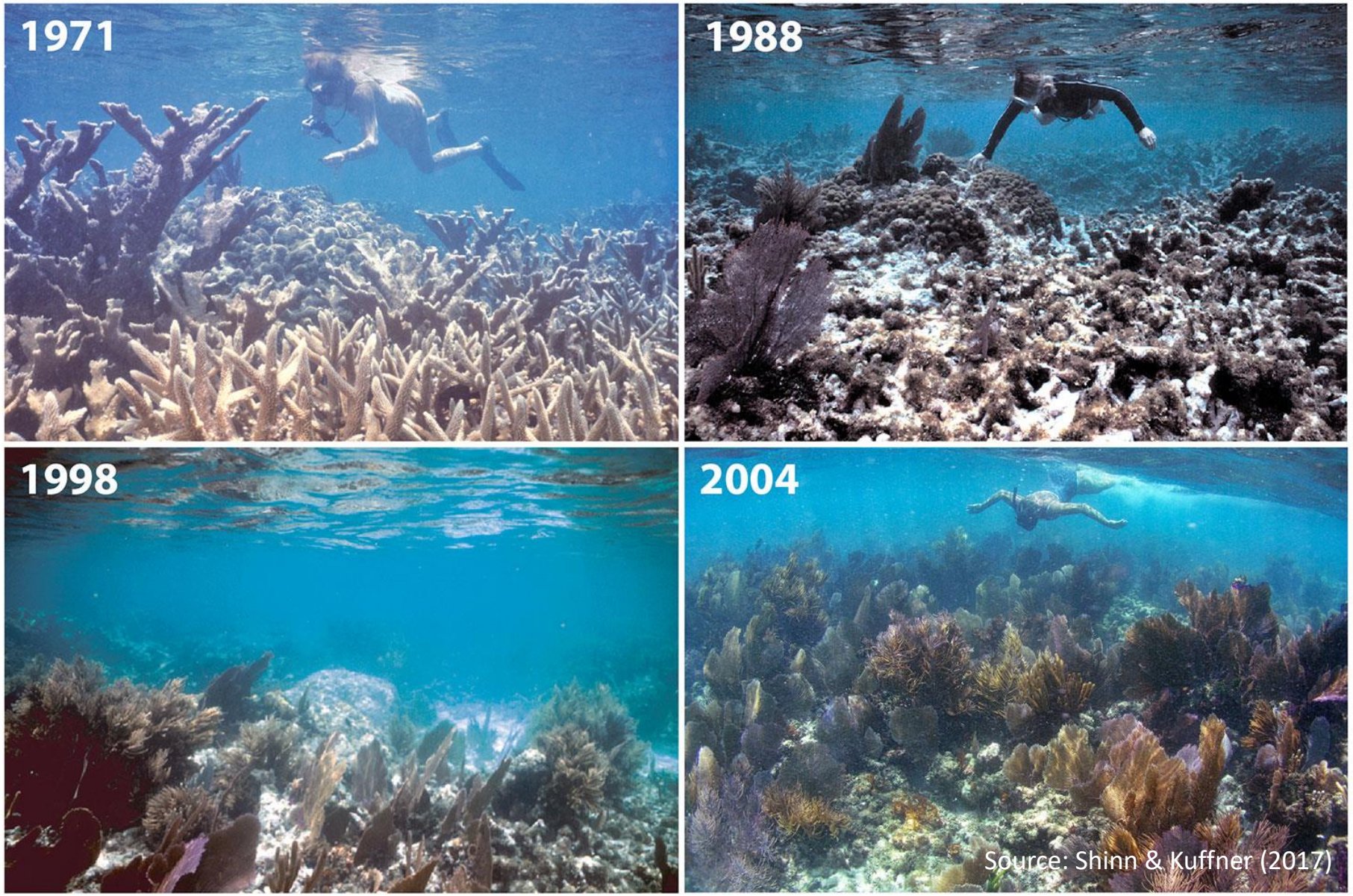
Coral Reef Decline – Grecian Rocks



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FLORIDA KEYS NATIONAL MARINE SANCTUARY

SAVING A NATIONAL TREASURE IN THE

Restoration Blueprint

Action Opportunities

1. Expand Sanctuary boundaries to include Pulley Ridge, west of Dry Tortugas
2. Fully protect and expand shoreline-to-reef zones at Boca Chica and Carysfort Reef and marine protected areas in the Tortugas Corridor
3. Prevent increasing damage to seagrass meadows and protect wildlife by slowing boats in appropriate shallow waters

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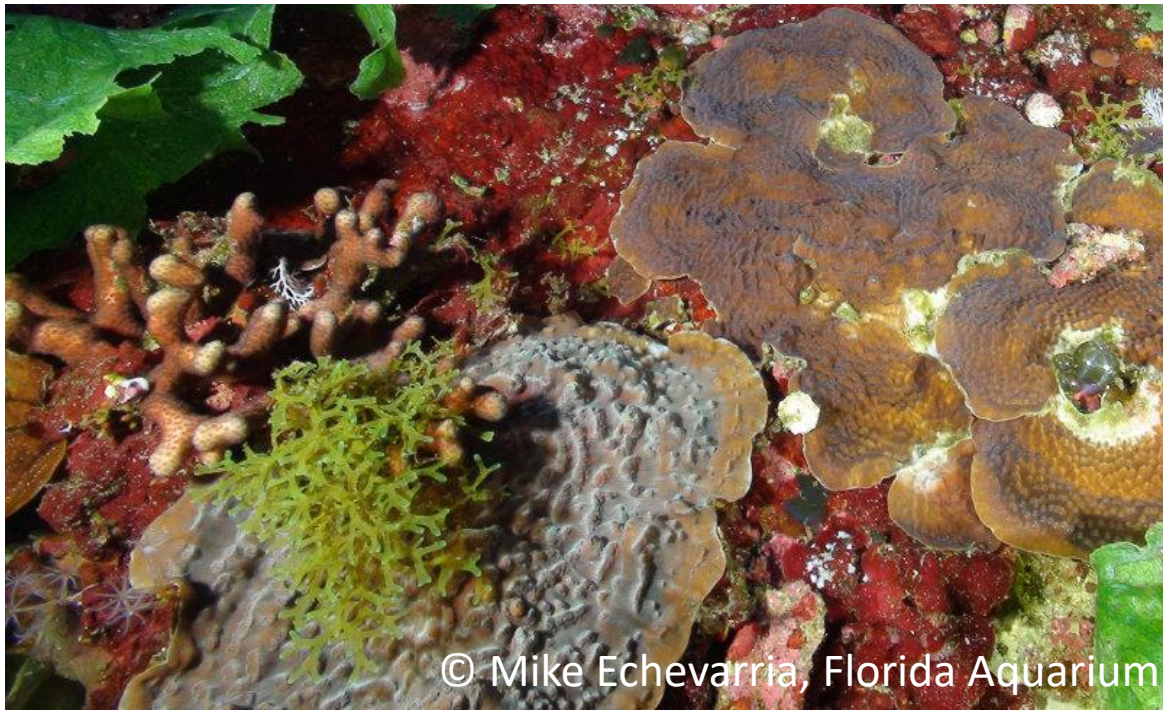
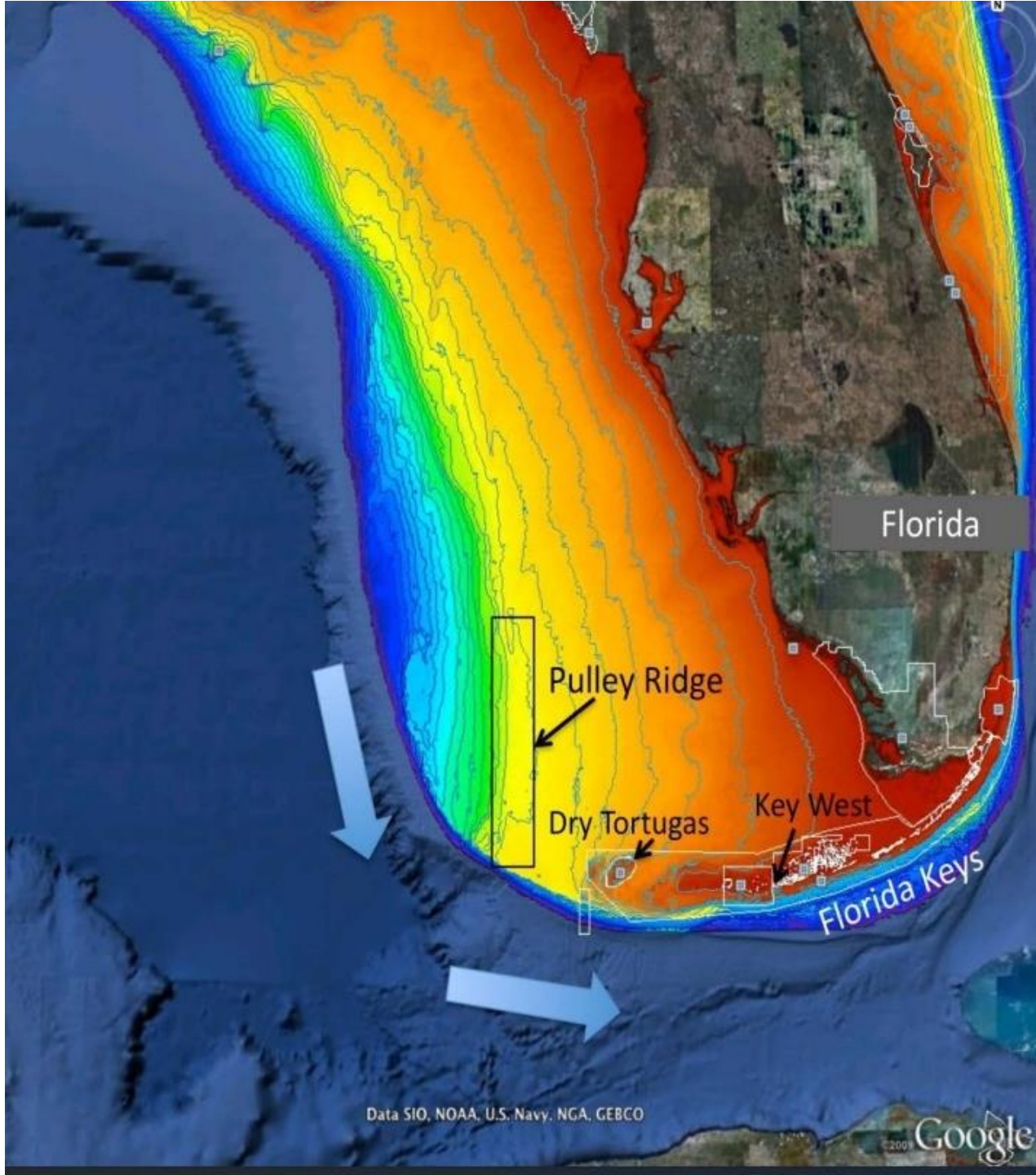
Pulley Ridge Expansion & Tortugas Corridor Protections





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Thank you.

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Recommendations for strengthening marine sanctuaries

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A North Atlantic right whale skim feeds on zooplankton. Photo: NOAA (NOAA Fisheries Permit #633-1763-01)

Sanctuary management plans and regulations must effectively protect sanctuary resources and respond to threats identified in condition reports

Sanctuary designation documents should authorize regulation of a broad range of uses that may adversely affect sanctuary resources

Shorthorn sculpin, northern red anemone, spiny sunstar and blood star sit on the sandy seafloor. Photo: Ben Haskell/NOAA

NOAA must fully utilize its authority over regulated uses in order to better protect sanctuary resources

Herring gull hitches a ride on a humpback whale's head. Photo: WCNE/NOAA (NOAA Fisheries Permit #981-1707)

Ocean sunfish swims near sanctuary divers. Photo: NOAA

Sanctuary management plans and regulations must be reviewed and updated to address changing conditions and current challenges on a more regular basis

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2. Sanctuary designation documents should authorize regulation of a broad range of uses that may adversely affect sanctuary resources

3. NOAA must fully utilize its authority over regulated uses in order to better protect sanctuary resources

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