PRESS BRIEFING: Listening to a quieter ocean in the pandemic to track impacts on marine life

Wednesday, 9 December
1:00 pm US Eastern Time

AGU FALL MEETING

SHAPING THE FUTURE OF SCIENCE

AGU FALL MEETING

INFORMATION FOR REPORTERS

- Slides from this presentation are available in the Fall Meeting Media Center: https://www.agu.org/Fall-Meeting/Pages/Attend/Media-Center

- A recording of this event will be posted to AGU's YouTube channel: https://www.youtube.com/c/AGUvideos

- An informal, 30-minute discussion room via Zoom will follow this event:
  - Link will be posted in this event's chat box
  - Meeting ID: 962 1469 2326
  - Passcode: agupress

- Questions: Email news@agu.org

SHAPING THE FUTURE OF SCIENCE

Panelists

Jason Gedamke
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Christine Gabriele
Wildlife Biologist /National Park Service
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Bob Dziak
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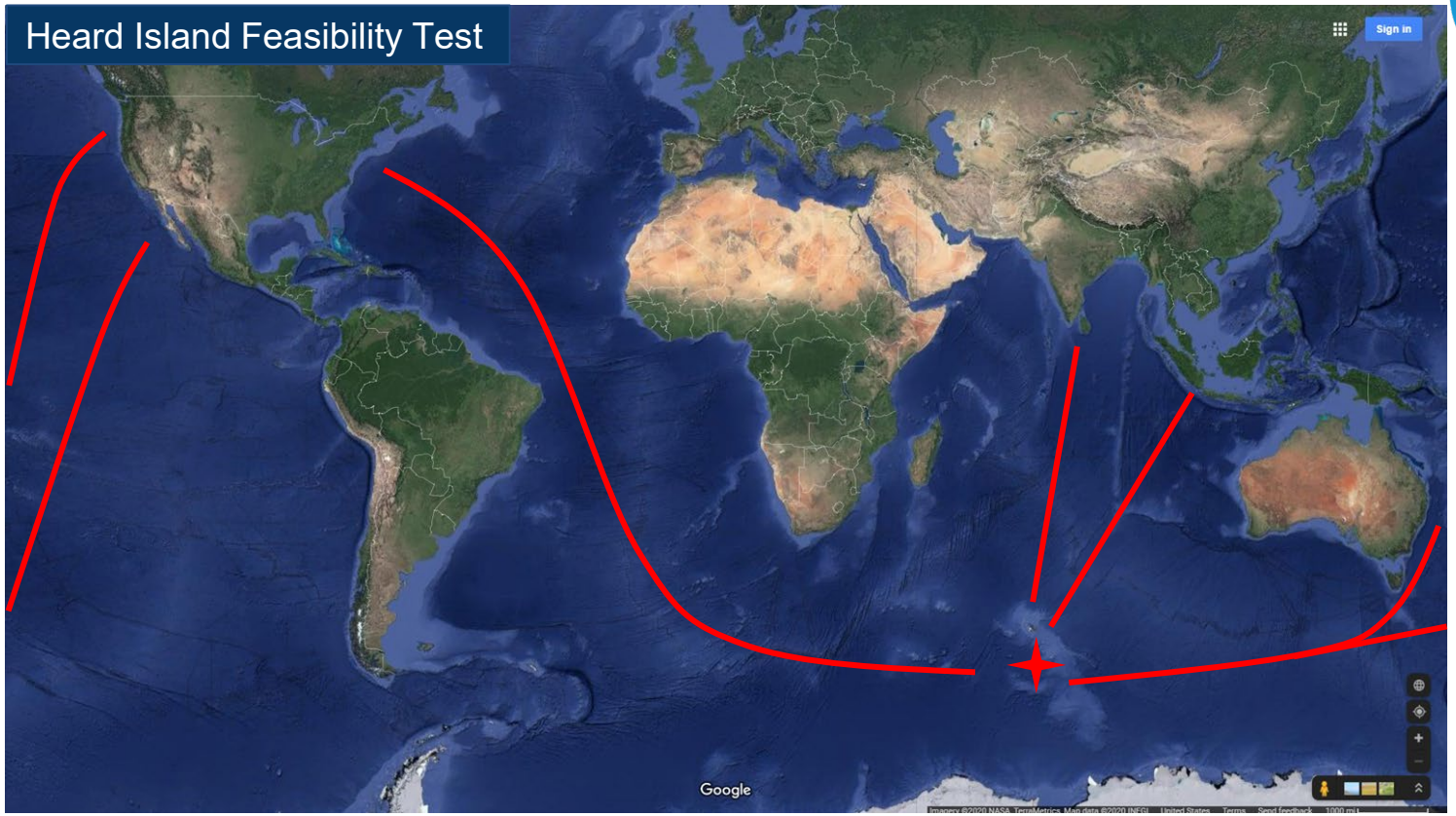
Ocean Sound During the Pandemic

Jason Gedamke
Fisheries Biologist/NOAA
jason.gedamke@noaa.gov

Introduction to Ocean Sound & Listening to Changing Soundscapes

Ocean sounds can travel great distances



Ocean Soundscapes

Natural Physical




Natural Biological





Ocean Soundscapes

Natural Phy

Human Produced Sounds

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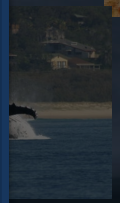
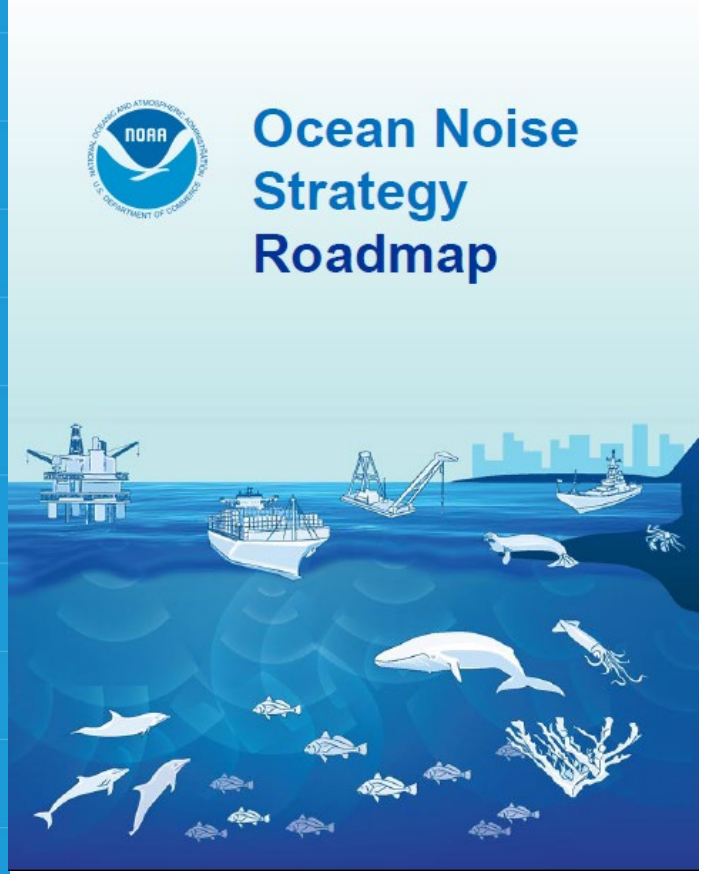
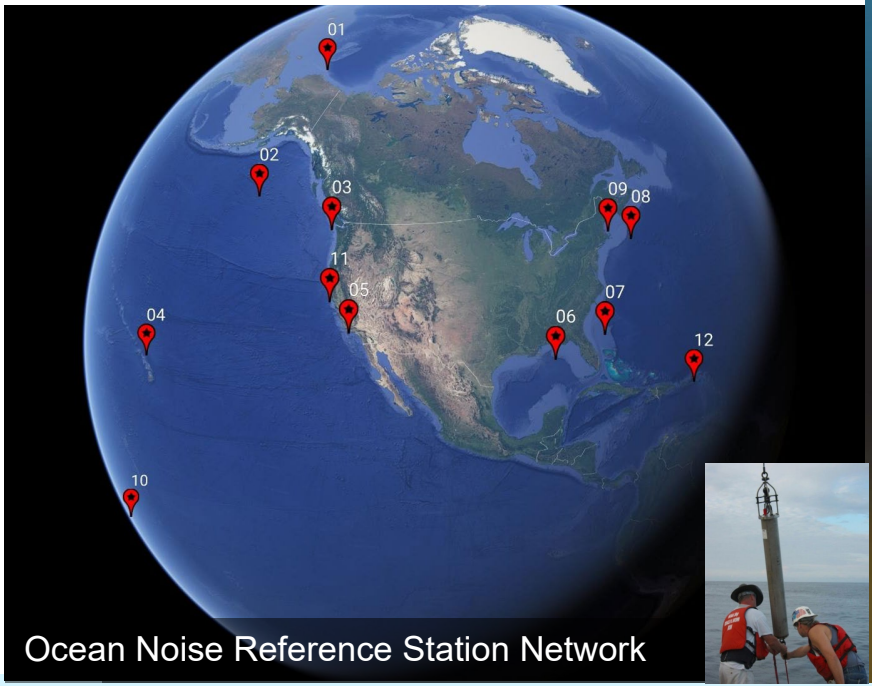
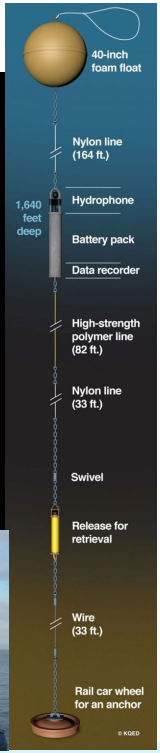


NOAA's Ocean Noise Strategy

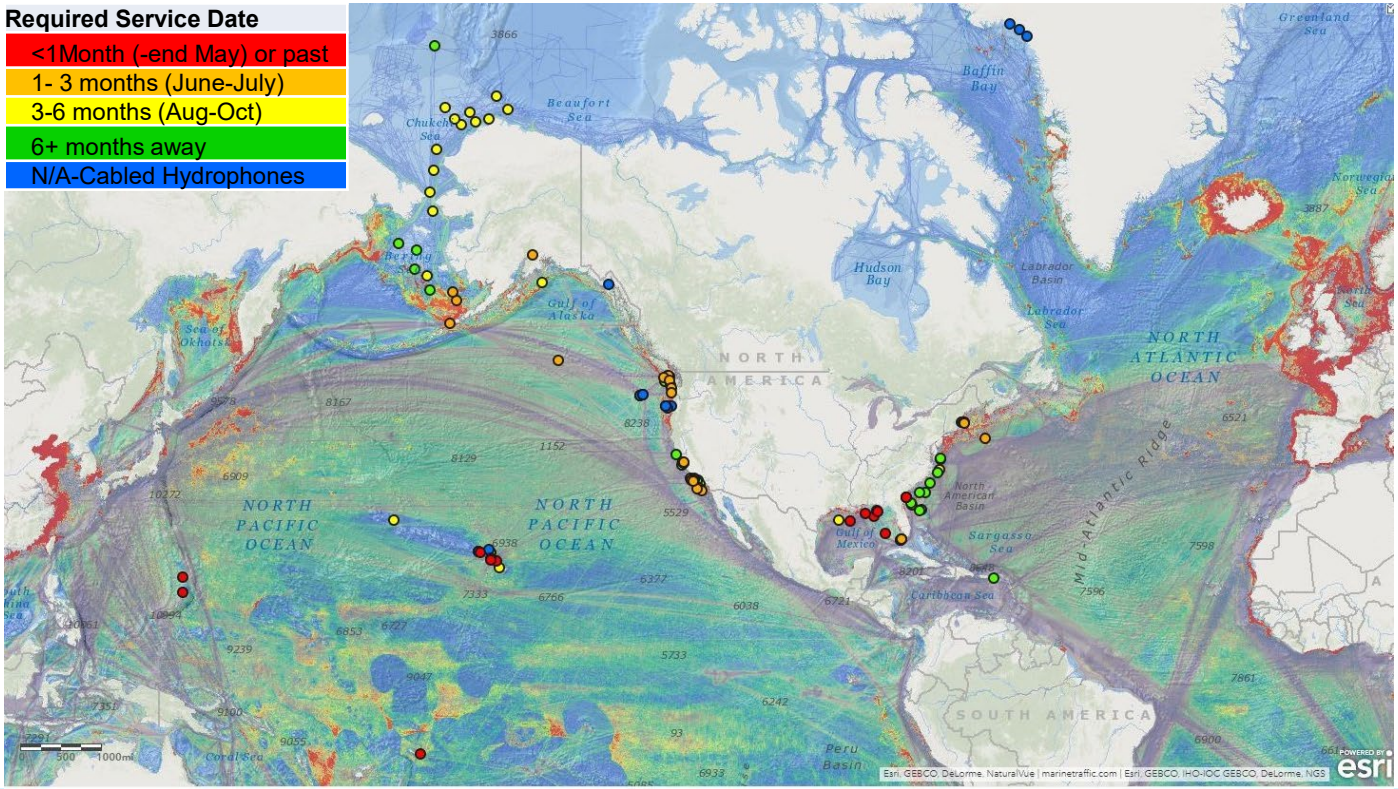


https://cetsound.noaa.gov/road -map





COVID19: Interagency and International Effort

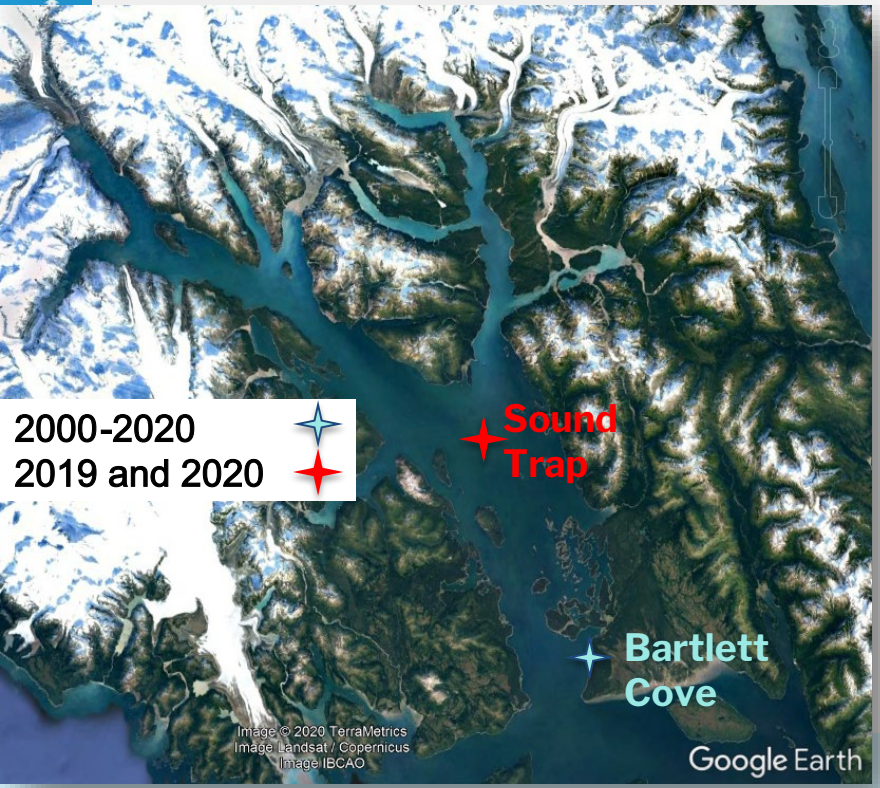


Ocean Sound During the Pandemic

Christine Gabriele
Wildlife Biologist
National Park Service
chris_gabriele@nps.gov

Underwater Listening in Glacier Bay National Park, Alaska

Where and How We Listened

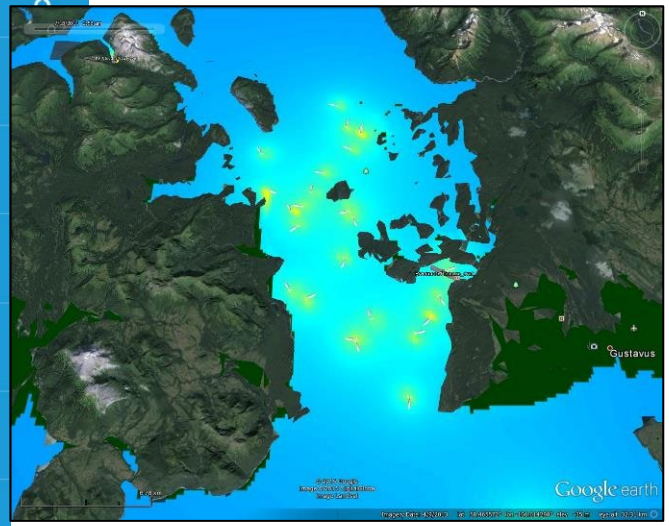


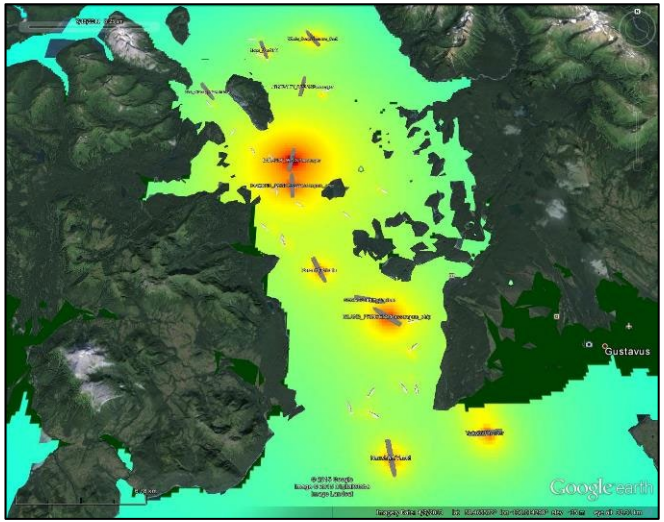
Sound Trap 2019 and 2020

Wind, Rain, Seals, Vessels, and Whales

Cabled Hydrophone 2000-2020

From the Whale's Perspective





Model simulations estimate that in typical summer traffic, vessel noise decreases the distance over which whales can communicate from ~1.5 miles to ~75 yards on average.

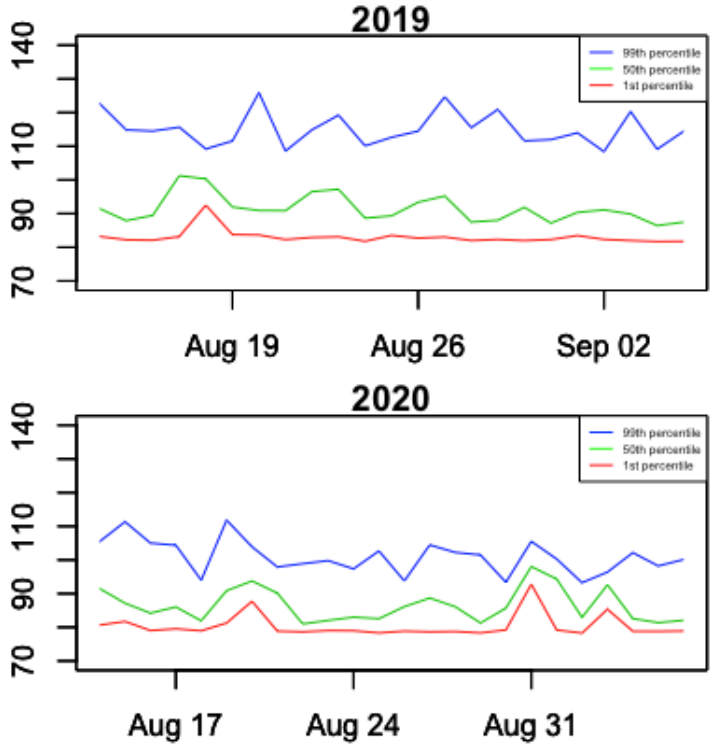
Foraging whales make short, quiet calls that can be masked by vessels

Whales call louder in noise, or even stop calling

Sources: Fournet et al. (2018)JASA Express Letters143: EL105., Fournet et al. (2018).Mar. Ecol. Prog. Ser.607: 251-268.,
Gabriele et al.(2018)Frontiers Mar. Sci.5: article 270.

How was 2020 Different?

PRELIMINARY RESULTS FROM SOUND TRAP



Loudest sounds were 14 dB (RMS re 1 uPa) quieter in 2020

Median daily sound levels were 4.8dB quieter in 2020

OUTSTANDING QUESTIONS

Did whales communicate differently in the quiet?

How did sound levels differ for the full season in Bartlett Cove?

Whales rested more, were spread out and occupied the shipping lanes. There were lots of calves!

Why Does Listening Matter?

- It lets us acknowledge the human noise footprint and learn how to reduce it
- Helps managers make better decisions and protect vulnerable populations.
- Raises public awareness which is a key to protecting our oceans and wild places

NOAA

NATIONAL PARK SERVICE

NAVSEA WARFARE CENTERS Carderock Division

TheCornellLab Center for Conservation Bioacoustics

Oregon State University

Syracuse University

National Park Foundation

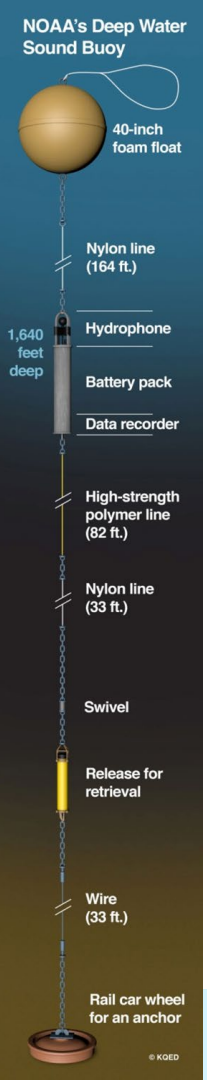
Ocean Sound During the Pandemic

Bob Dziak

Research Oceanographer

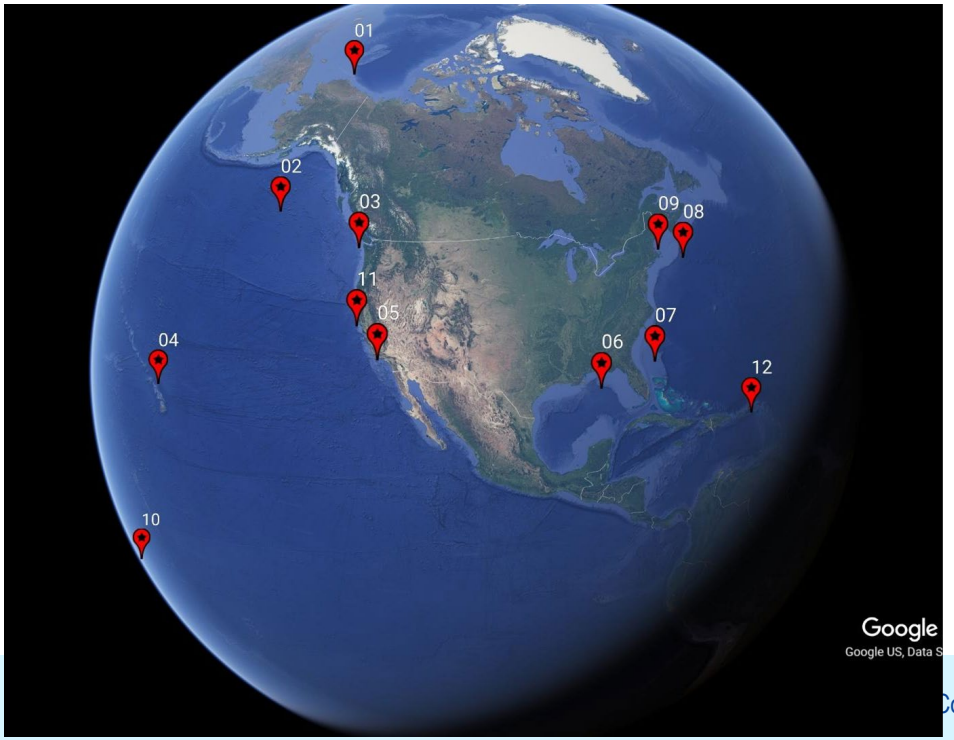
NOAA/Pacific Marine Environmental Laboratory

Examples from the U.S. Pacific Northwest Coast



NOAA/NPS Noise Reference Station (NRS) Network

Low frequency, long-term passive acoustic monitoring

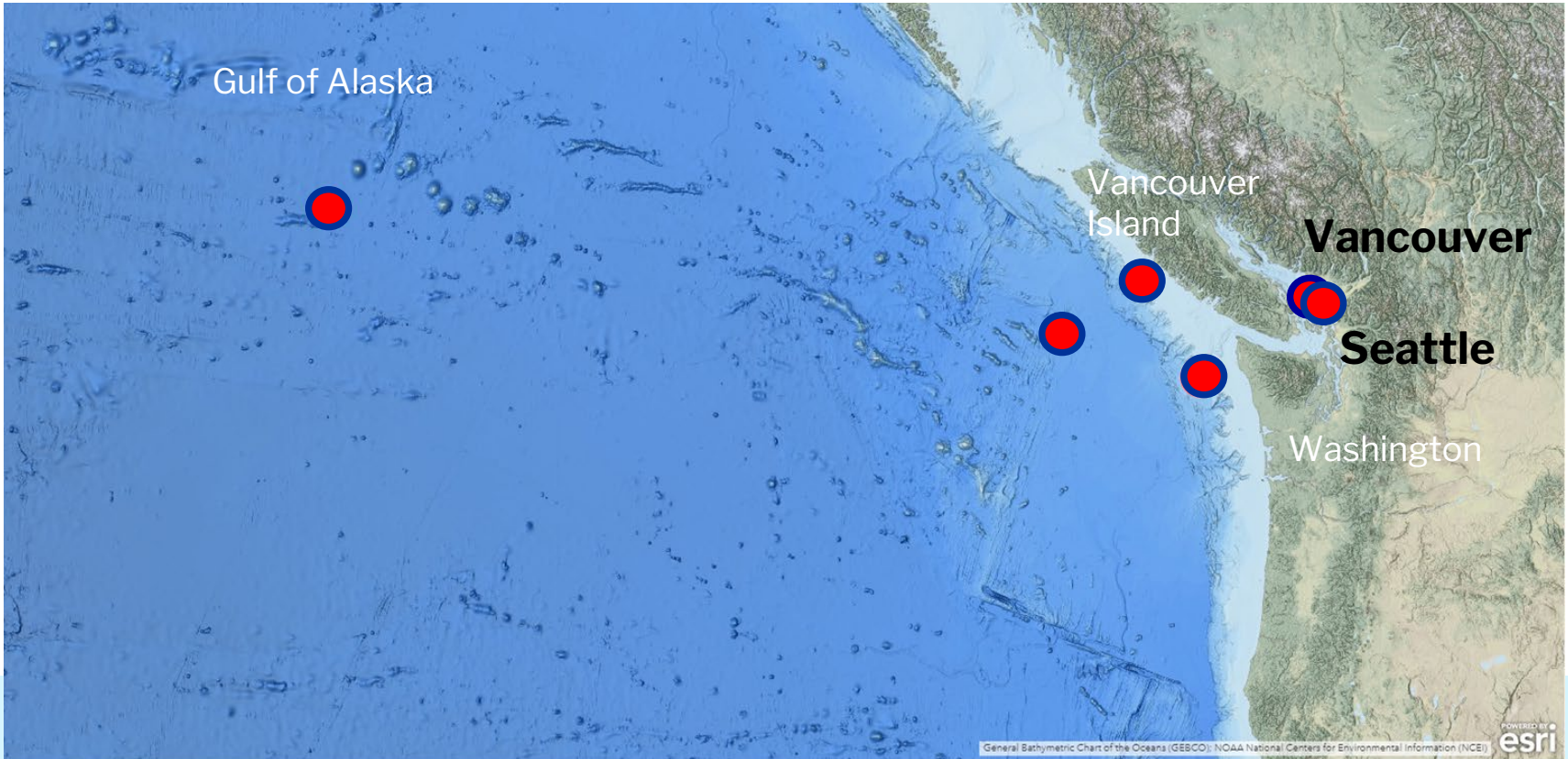


Long-term recordings allow comparison between and within sites over time.

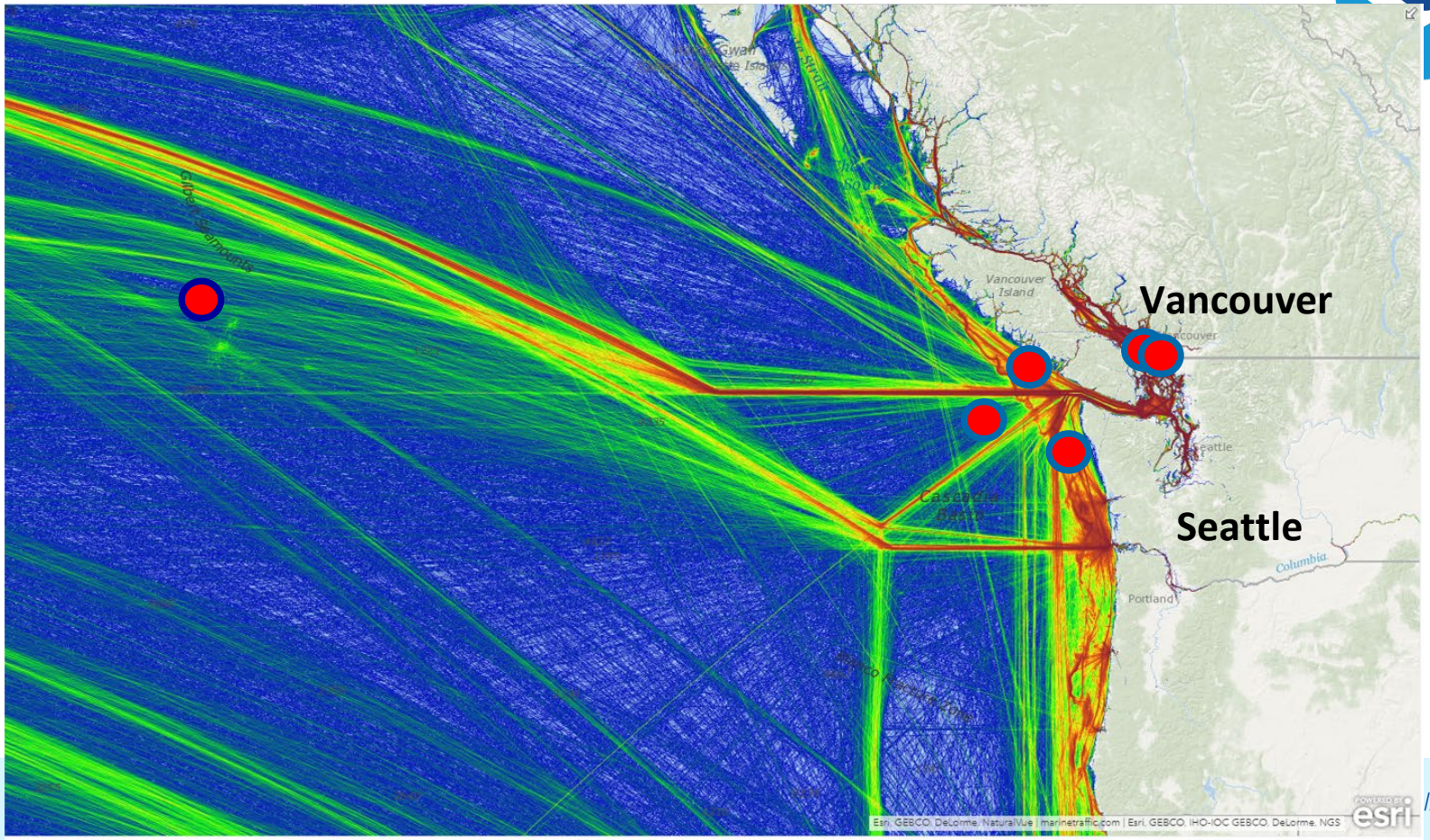
Addressing needs:

- Characterization and comparison of soundscapes broadly across US waters
- Empirical validation of predictive soundscapes
- Assessment of long-term trends and changes in soundscapes

Hydrophone “ocean listening sites” in the Pacific Northwest



Major Shipping Lanes in Pacific Northwest



Summary of Main Points

- Economic impacts of pandemic resulted in decrease in ship noise in deep ocean off the Pacific Northwest, inland waters of Puget Sound
- Ocean sound researchers will pool global ocean sound data to examine patterns worldwide
- New research, and the year -to-year baseline data, will be used to assess potential impacts of human generated sound on marine animals, ecosystems.

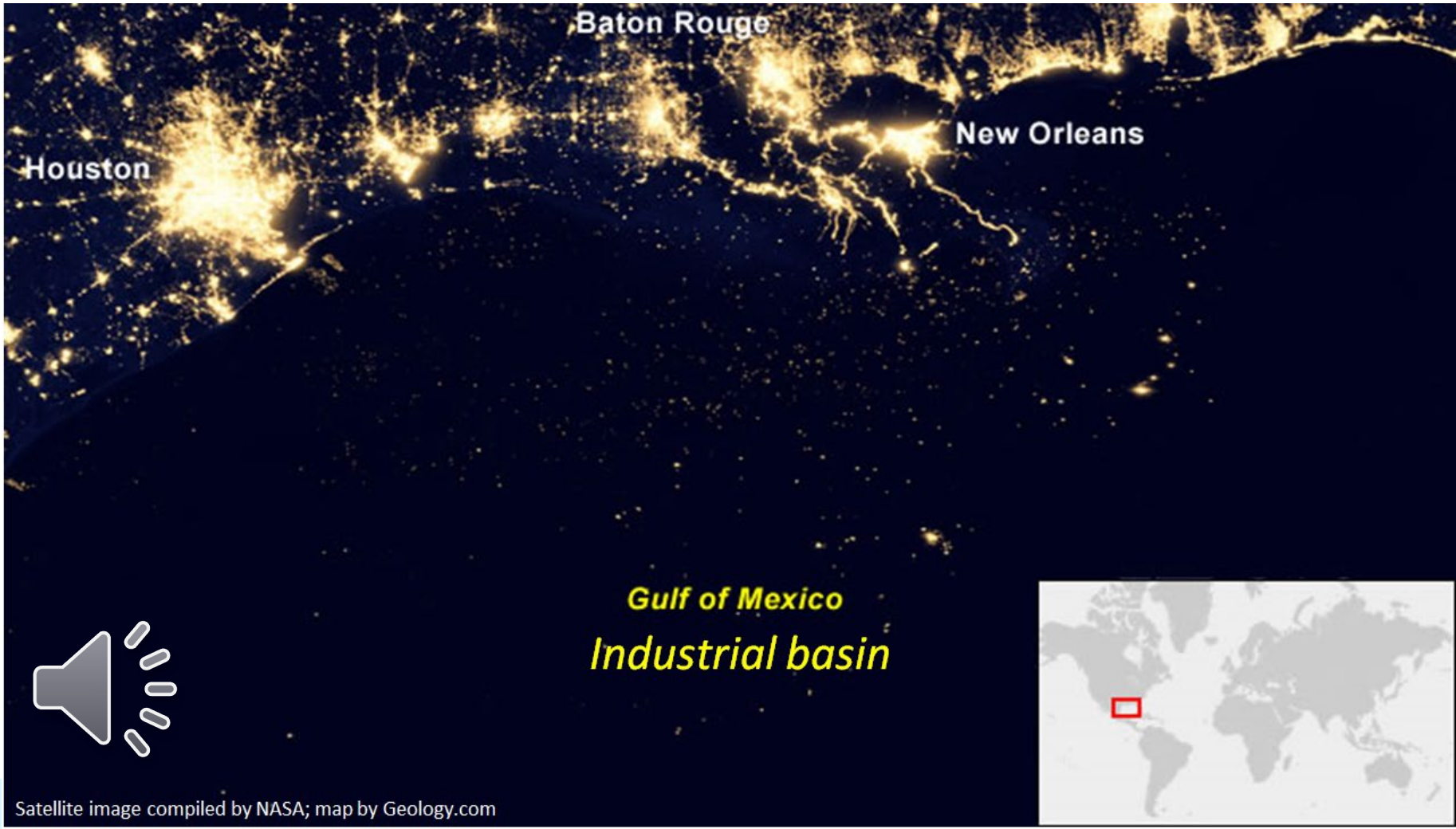
TEXAS A&M UNIVERSITY
GALVESTON CAMPUS.

Marine Bioacoustics Laboratory

Ocean Sound During the Pandemic

Ana Širović
Associate Professor
Texas A&M University at Galveston

Noisy global oceans: listening beyond ships and borders


Baton Rouge
New Orleans
Houston
Gulf of Mexico
Industrial basin
Satellite image compiled by NASA; map by Geology.com

Flower Garden Banks National Marine Sanctuary

Seismic exploration is ubiquitous

Seismic exploration impacts marine life worldwide

Ocean Sound During the Pandemic

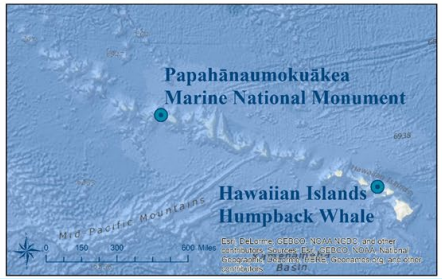
Leila Hatch

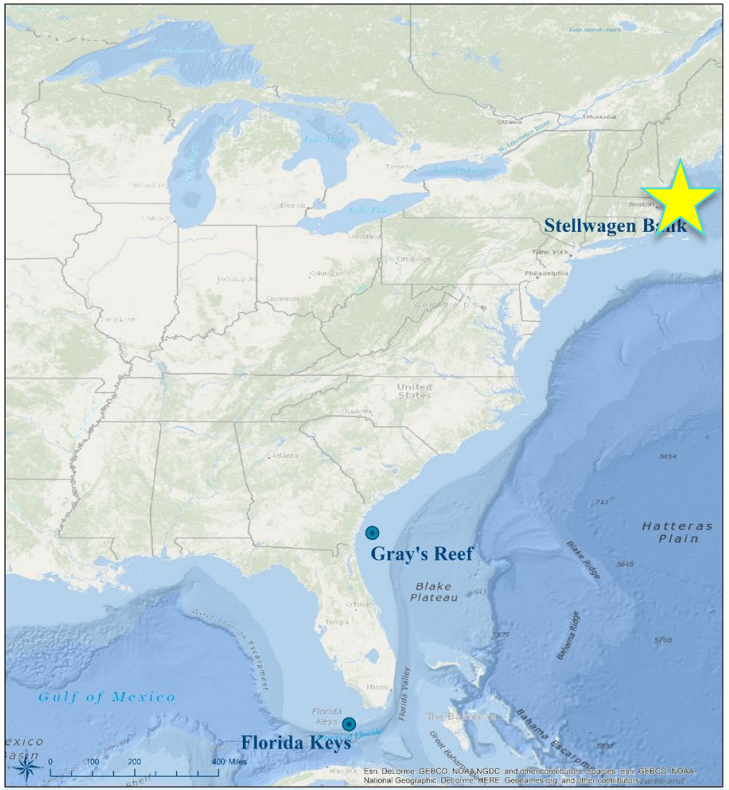
NOAA Marine Ecologist

Stellwagen Bank National Marine Sanctuary

Listening in U.S. National Marine Sanctuaries

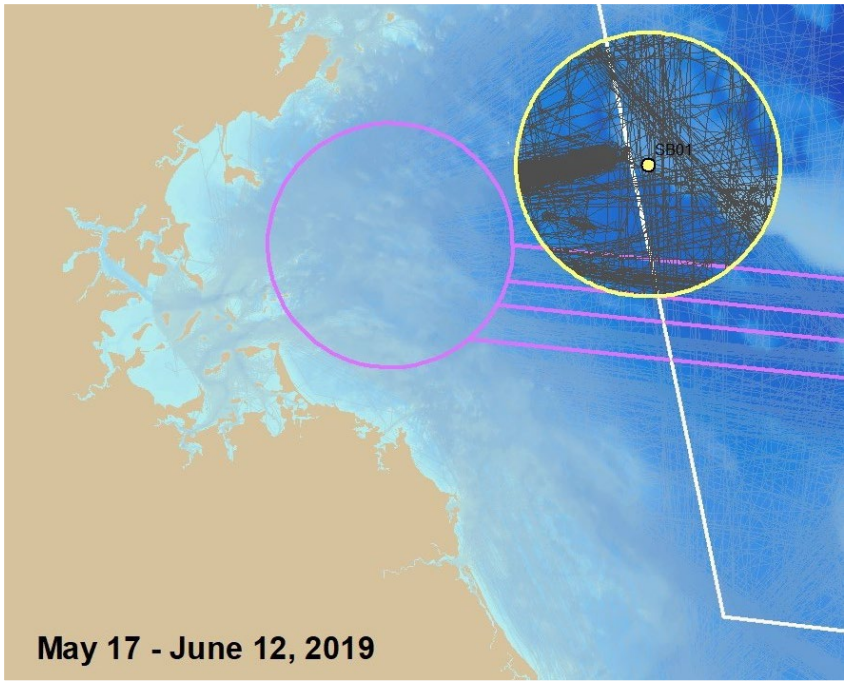
Listening in U.S. National Marine Sanctuaries

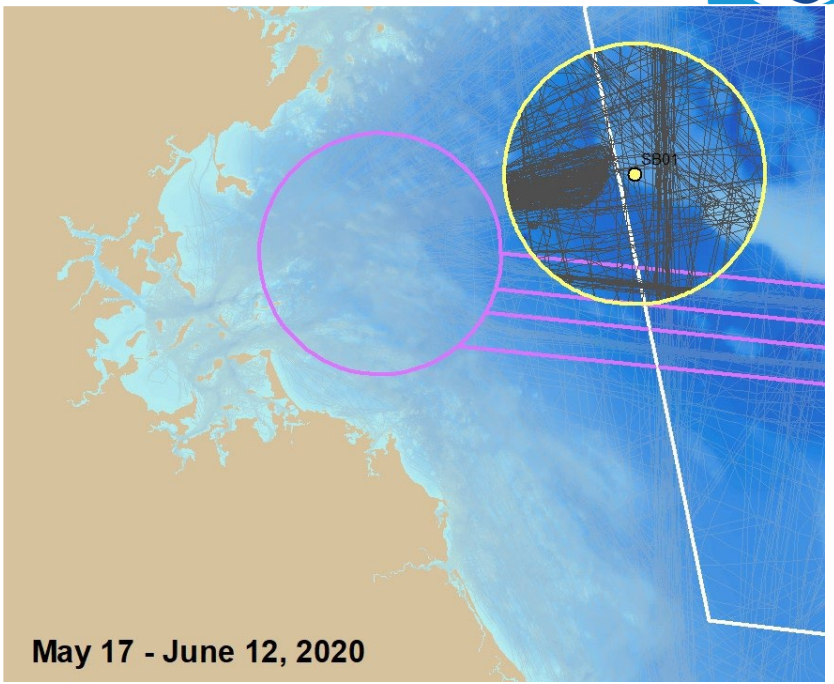




- 30 recording stations in 7 Sanctuaries and 1 Marine National Monument
- Multi -year standardized measurements (before, during and “after” COVID)

COVID 19: Fewer Vessels? Quieter Waters?





MBARI Monterey Bay Aquarium Research Institute

National Marine Sanctuary Foundation

sea

Moss Landing Marine Laboratories

NPS Praestantia per Scientiam

Hopkins Marine Station of Stanford University

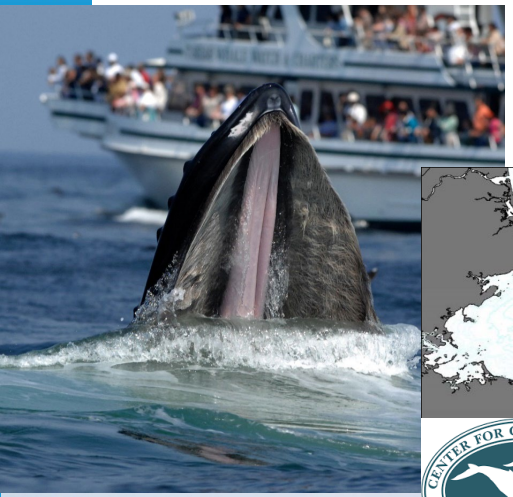
Scripps Institution of Oceanography UC San Diego

NOAA 50 Years

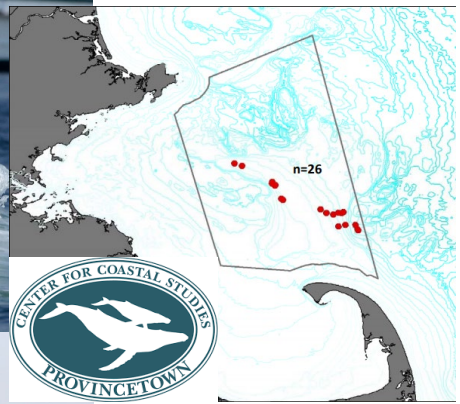
NOAA Fisheries

National Marine Sanctuaries

Quieter Waters = Easier to Communicate? Less Stress?



- Humpback whales in highly trafficked National Marine Sanctuaries
  - Studying their use of sound to communicate before, during and after COVID
  - Comparing stress hormones from whales sampled during and after COVID



NATIONAL MARINE SANCTUARIES

HOPKINS MARINE STATION OF STANFORD UNIVERSITY

CALIFORNIA OCEAN ALLIANCE

Better Understanding = Better Decisions

- International and national regulatory efforts
- Industries designing and operating “greener” vessels
- Consumers reducing their environmental footprint

INTERNATIONAL MARITIME ORGANIZATION

Transport Canada

Additional Resources

- National Park Service: Sounds recorded in Glacier Bay
- National Park Service sound clips, videos and publications
- NOAA PMEL underwater video, sound and imagery
- Underwater Sound and Marine Life - *includes ocean sound clips*
- John Ryan (MBARI) Acoustical Society Talk
- NOAA Pacific Marine Environmental Lab Acoustics Program
- NOAA-Navy Sanctuary Sound Monitoring Project
- NOAA's Ocean Noise Strategy Roadmap
- NOAA/National Park Service Ocean Noise Reference Station Network

Monica Allen, NOAA Communications
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QUESTIONS

Please write your questions in the Q&A box and AGU will ask it on your behalf.

Reminder: A 30-minute, informal discussion will commence in Zoom after this event ends.

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