Ocean Sound & Ocean Noise:

Increasing knowledge through research partnerships

NOAA FISHERIES
Office of Science & Technology

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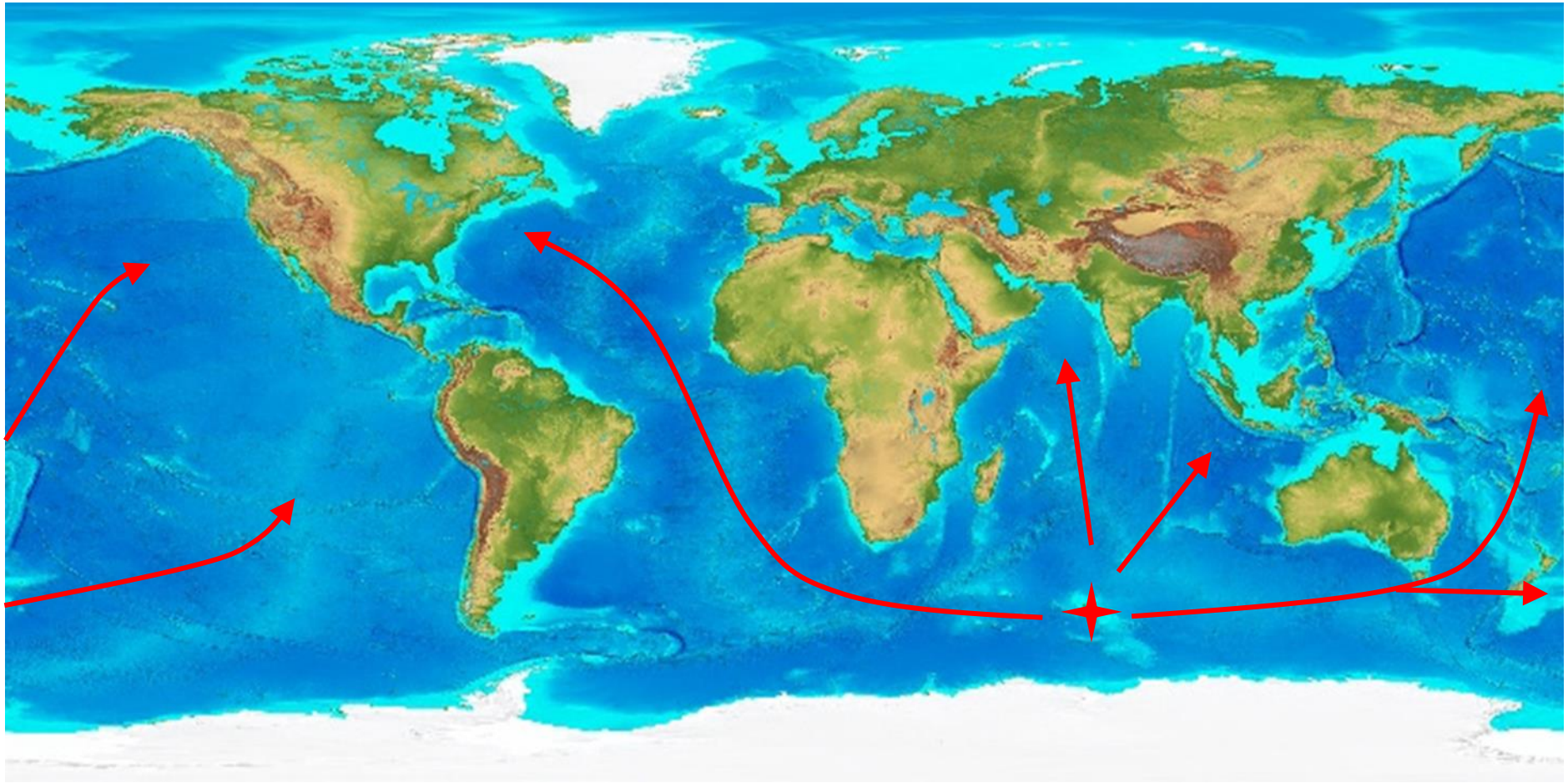
To survive and reproduce, animals need to:

- Attract mates
- Defend territories or resources
- Establish social relationships
- Coordinate feeding
- Interact with parents or offspring
- Avoid predators or threats

Communication is often essential.

Communication exists in many forms.

Over large distances in water, most forms of communication are not practical.

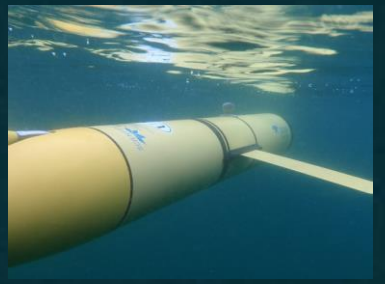


Sound, however, travels exceptionally well underwater.

Understanding How Man-made Noise May Impact Marine Life

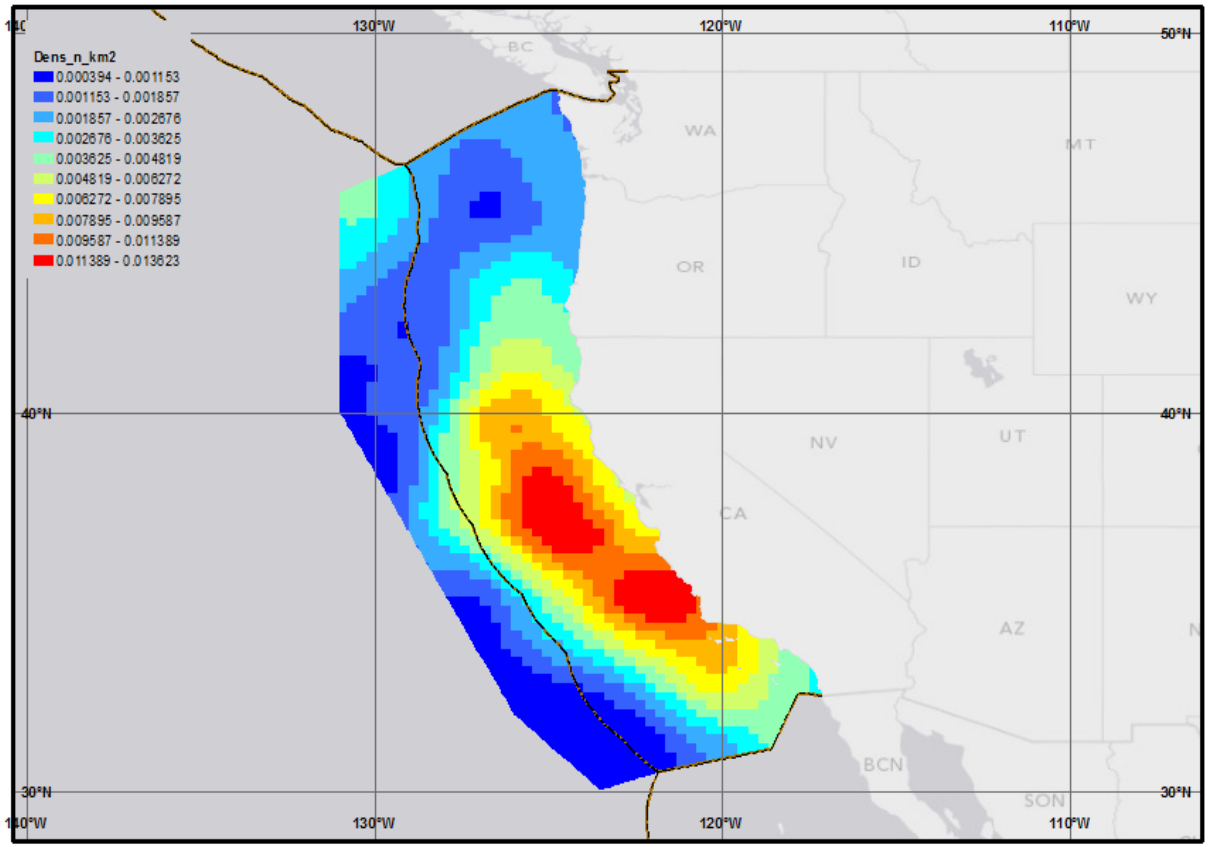
- Where acoustically sensitive species occur and how they use sound
- Where and how man is altering the underwater acoustic habitat

Frontiers in Research



Cetaceans & Sound (CetSound)

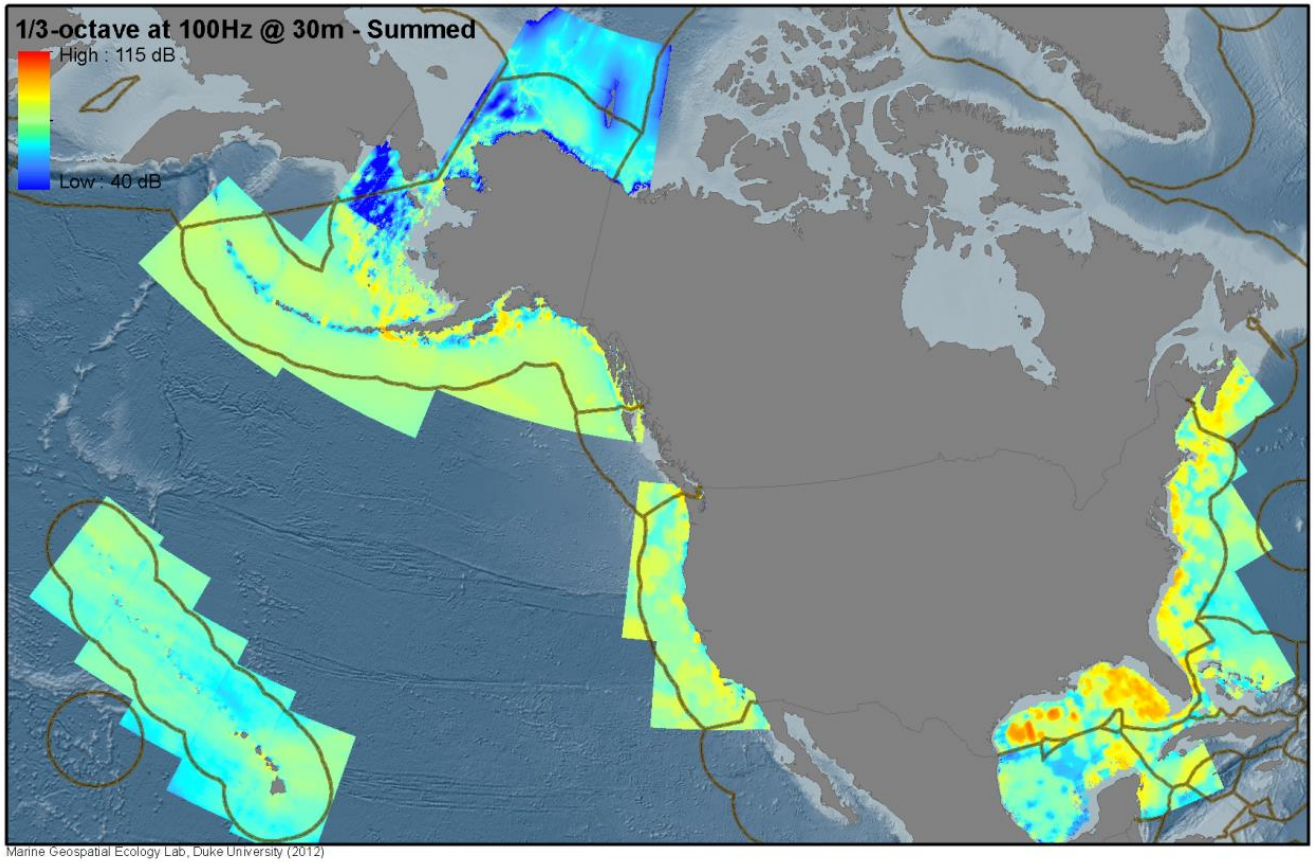
CetMap: Mapping Cetaceans in U.S. waters



http://cetsound.noaa.gov

Cetaceans & Sound (CetSound)

SoundMap: Mapping man-made sound in U.S. waters

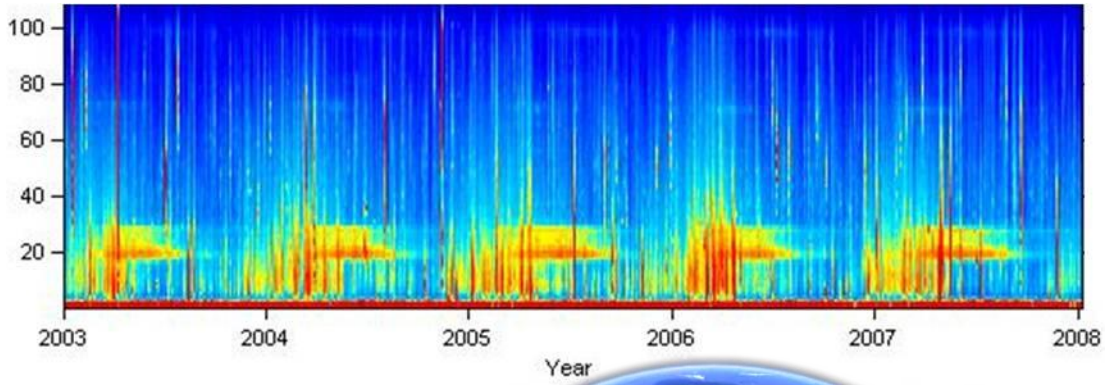


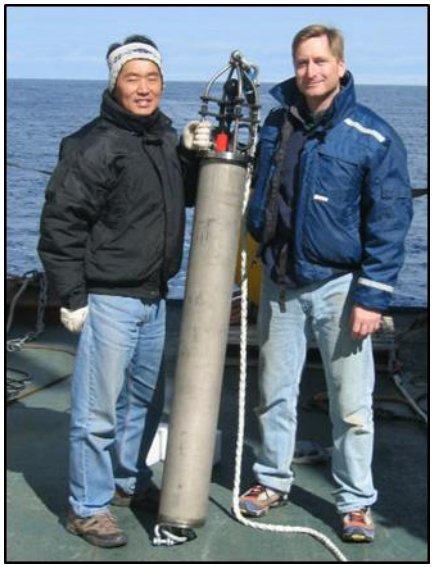
Marine Geospatial Ecology Lab, Duke University (2012)

http://cetsound.noaa.gov

Ocean Noise Reference Station Network

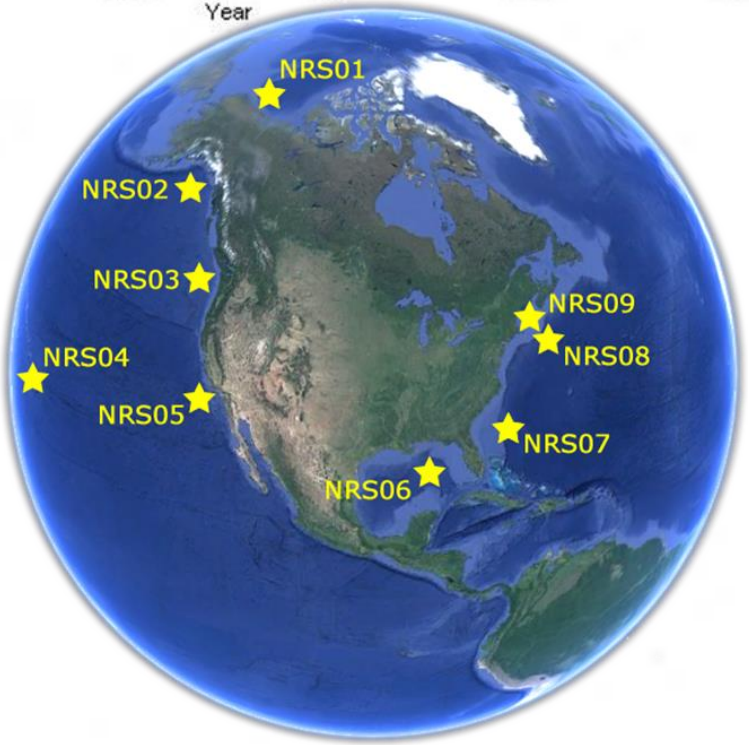
NOAA's first across agency acoustic monitoring system





Partners:

- **OAR-PMEL-lead**
- NOAA Fisheries Science Centers
- NOAA Fisheries OST
- National Marine Sanctuaries



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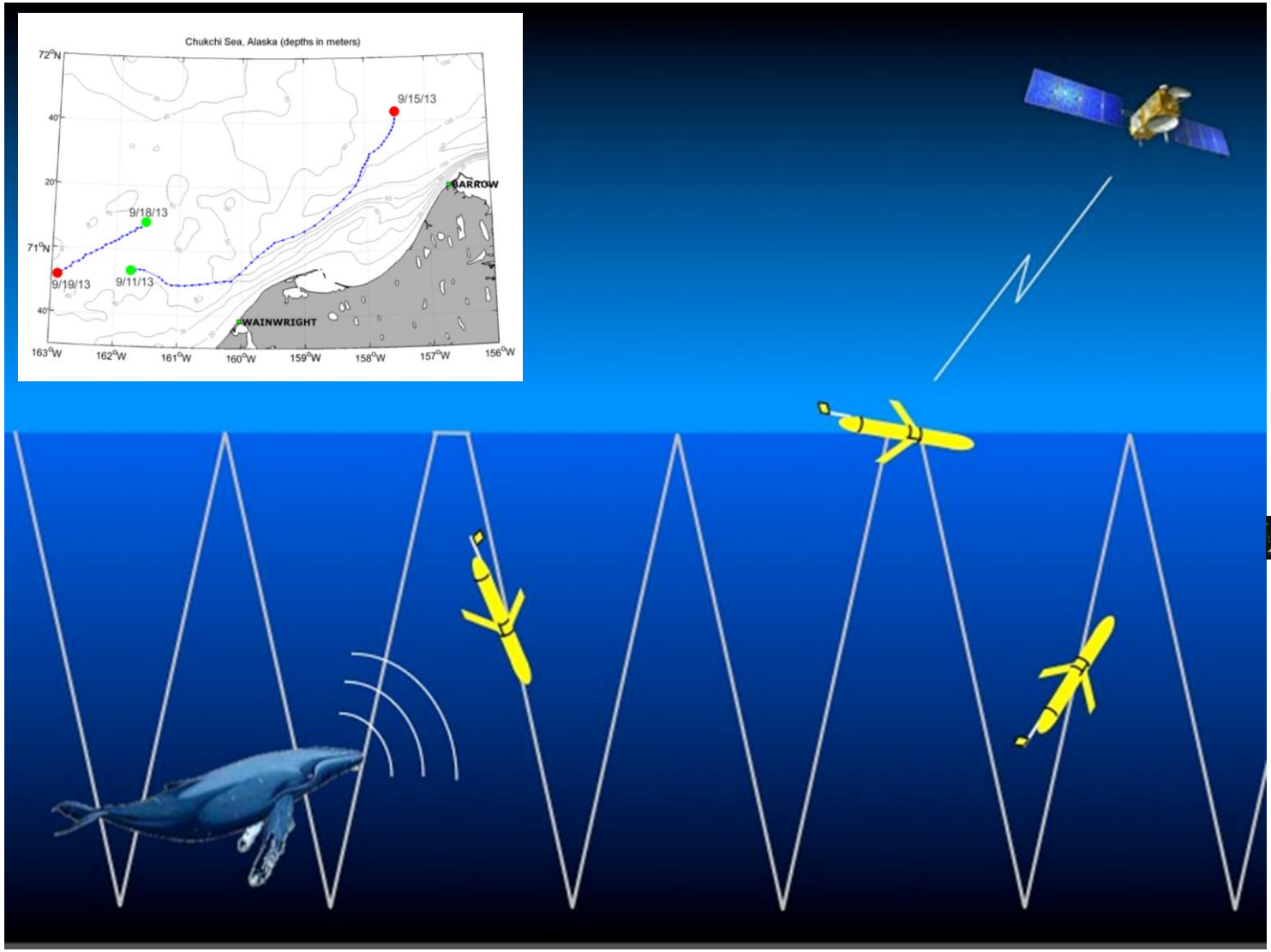
Autonomous Vehicles

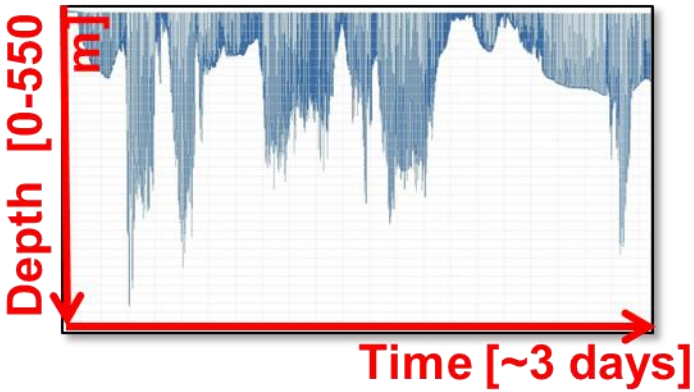


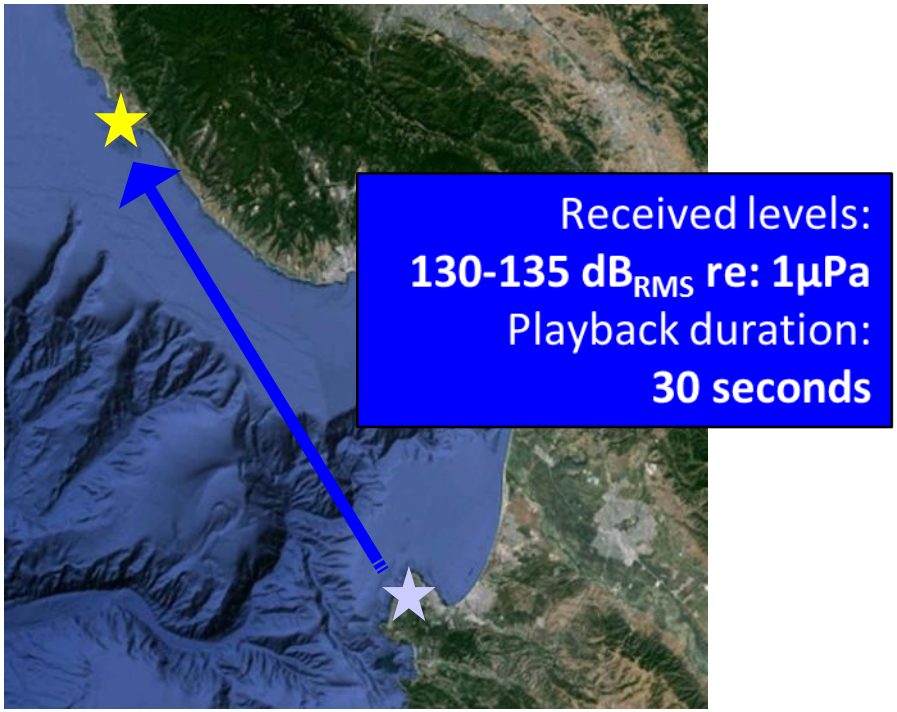
AOOS Alaska Ocean Observing System

APL

WOODS HOLE OCEANOGRAPHIC INSTITUTION 1930

Acoustic Playback Tags





PMEL

Work conducted under NOAA/NMFS permit #14636 (Costa, UCSC)

Fregosi, S. *et al*: Animal-borne active acoustic tag

Future Directions

Underwater acoustic propagation is efficient. Hence, marine mammals have evolved to heavily rely on sound (and we can eavesdrop on their sounds to learn more about them).

Anthropogenic sound also travels far—man has fundamentally altered the ocean soundscape in the last ~200 years.

We need a better understanding of:

- When and where marine mammals and other acoustically sensitive marine species occur
- How man has changed & continues changing the underwater soundscape
- How these changes may impact marine life


Questions?