NOAA-Navy Sanctuary Soundscape Monitoring Project (SanctSound)

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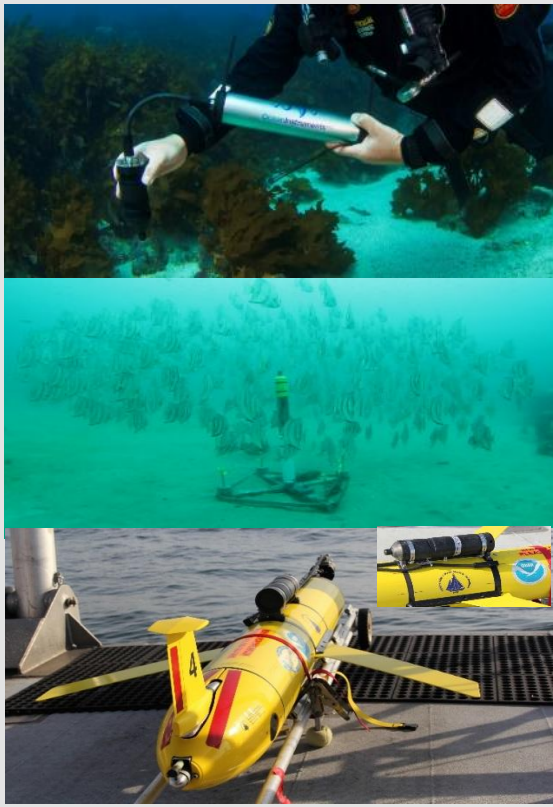
Leila Hatch

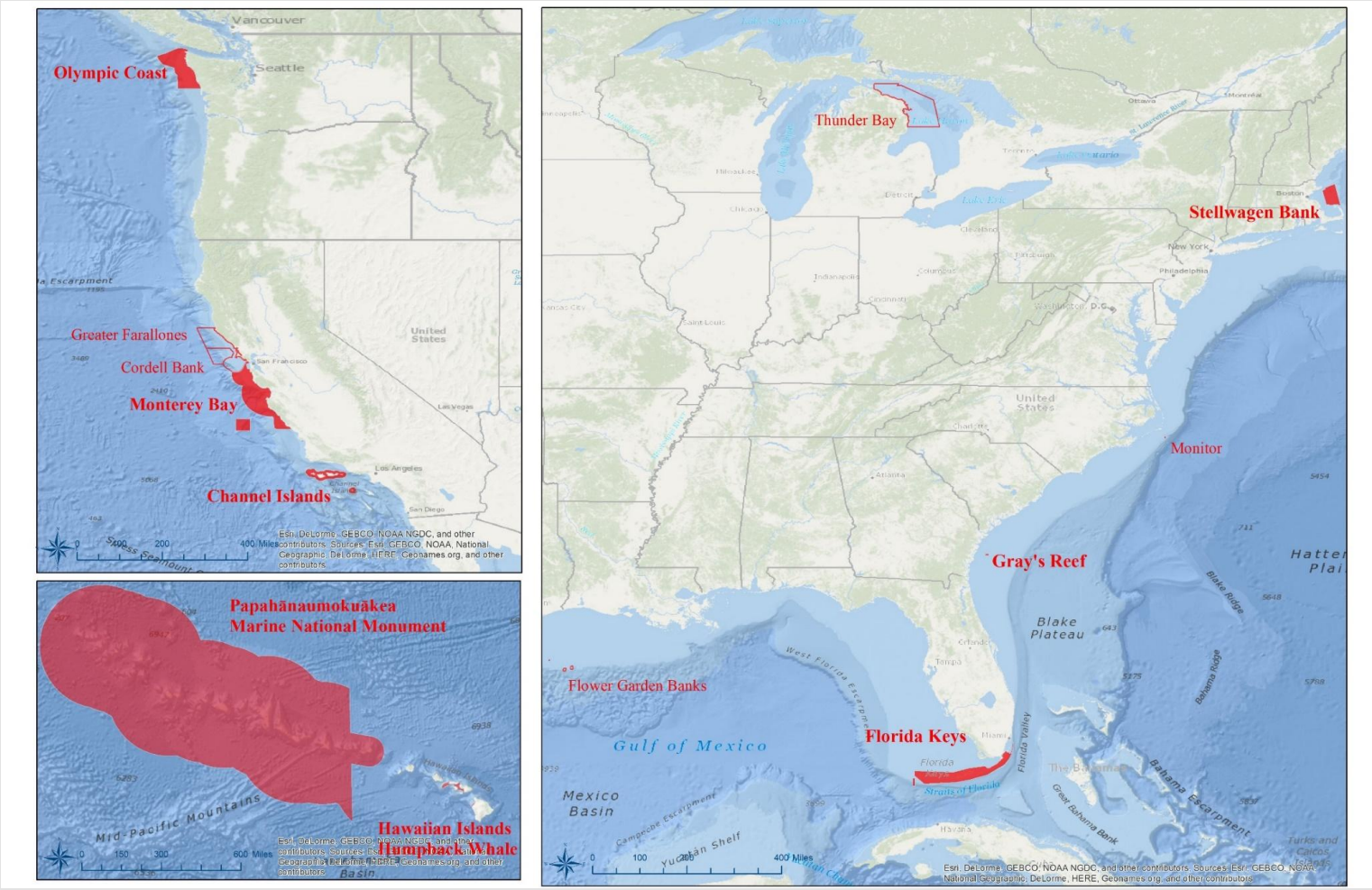
https://sanctuaries.noaa.gov/science/monitoring/sound/

Project Objectives

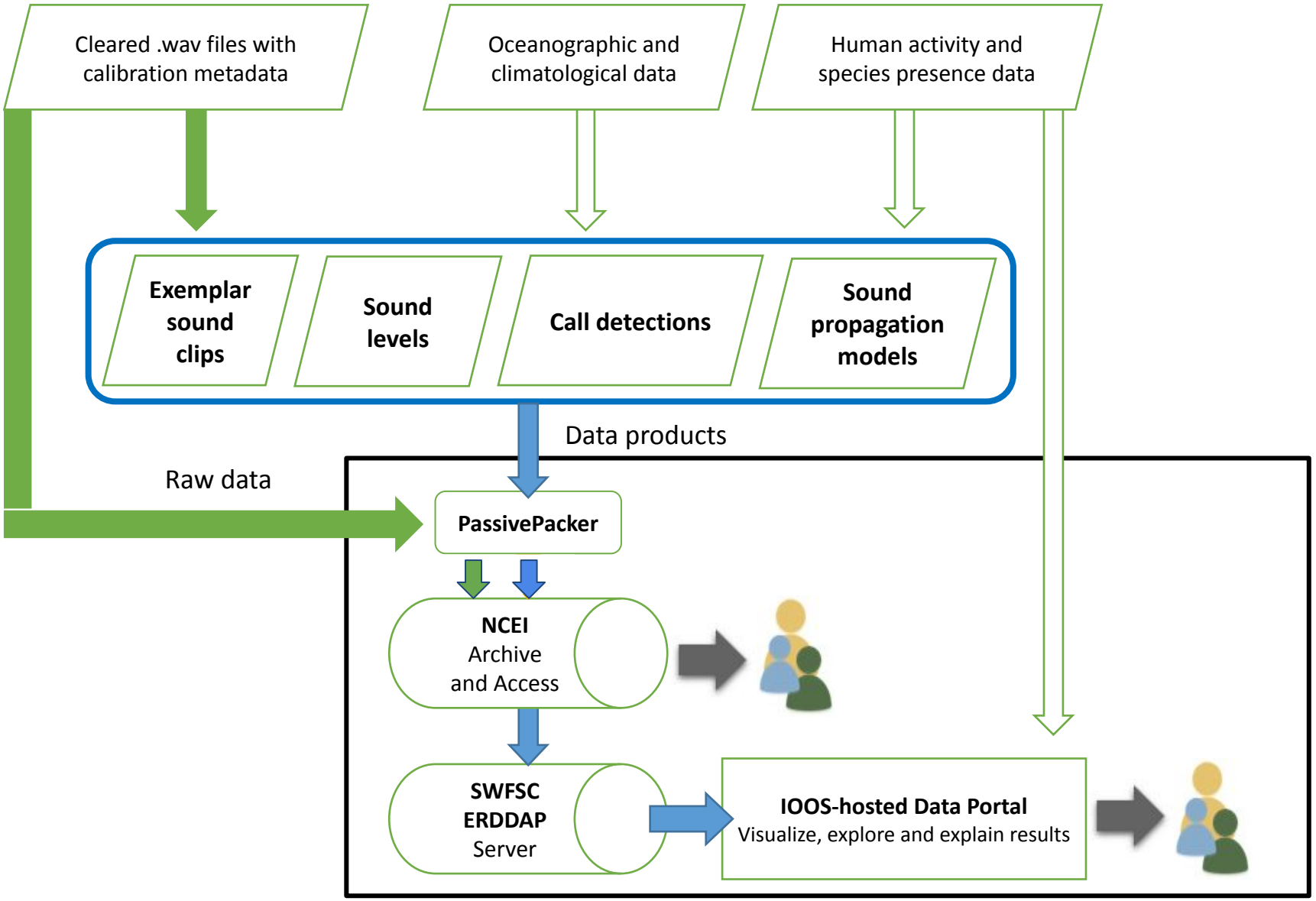
1. Deployment of calibrated passive acoustic recording devices in sanctuaries
2. Holistic sampling of the soundscape
3. Further development of characterization metrics
4. Archiving of data and public access
5. Integration of acoustic metrics with other data



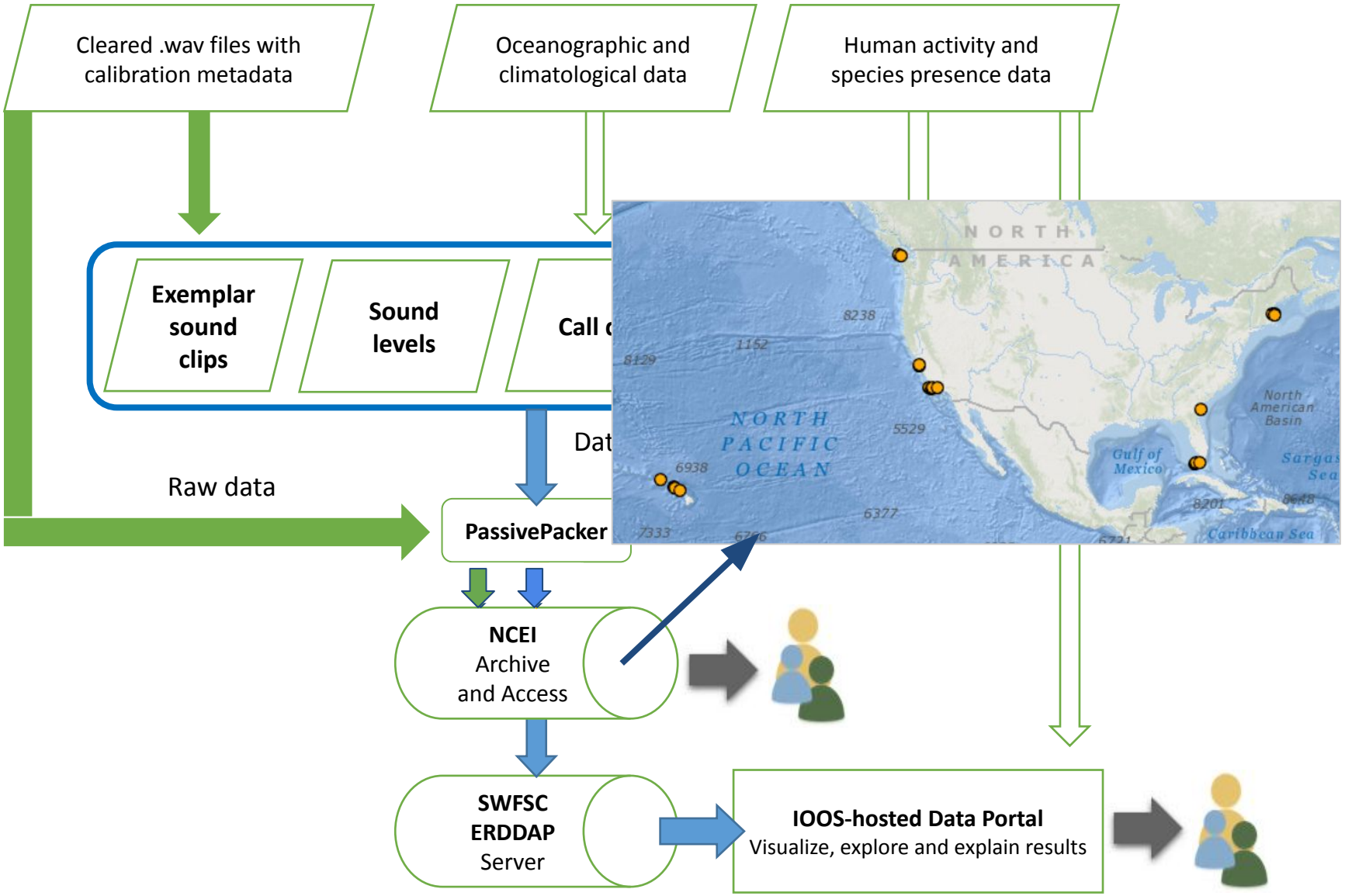
Passive Acoustic Monitoring
National Marine Sanctuaries System



Data Flow


Cleared .wav files with calibration metadata
Oceanographic and climatological data
Human activity and species presence data
Exemplar sound clips
Sound levels
Call detections
Sound propagation models
Data products
Raw data
PassivePacker
NCEI
Archive
and Access
SWFSC
ERDDAP
Server
IOOS-hosted Data Portal
Visualize, explore and explain results

Data Flow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Visualize, explore and explain results
NORTH AMERICA
NORTH PACIFIC OCEAN
Gulf of Mexico
North American Basin
Caribbean Sea
8238
1152
8129
5529
6938
6377
8201
7333

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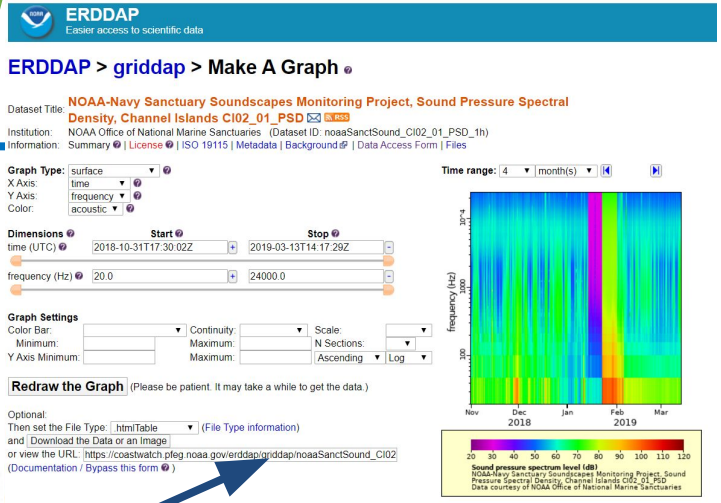

IOOS-hosted Data Portal
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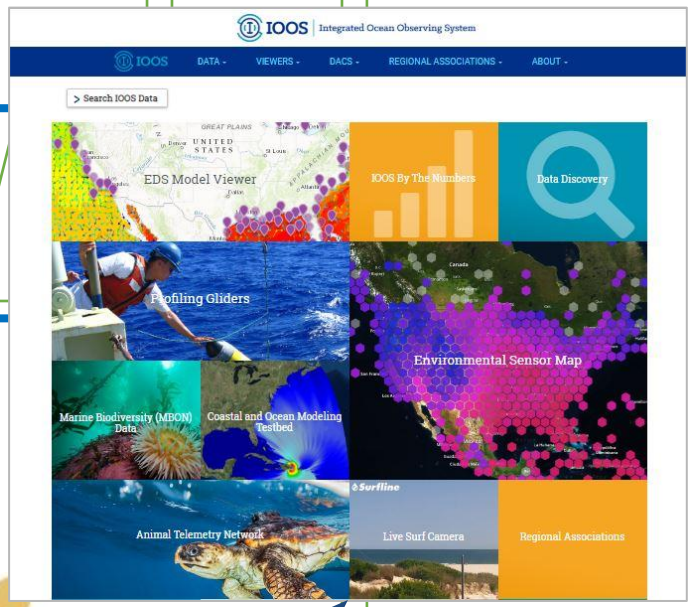


SanctSound.IOOS.US

New SanctSound tile

NOTE: Final IOOS.us SanctSound page is not LIVE.

Currently redirects to the ONMS Sound webpage

Currently DRAFT 2.0 webportal URL is ‘hidden’ from discovery

Portal Overview

Foyer

- General audience focused
- Curated
- Education

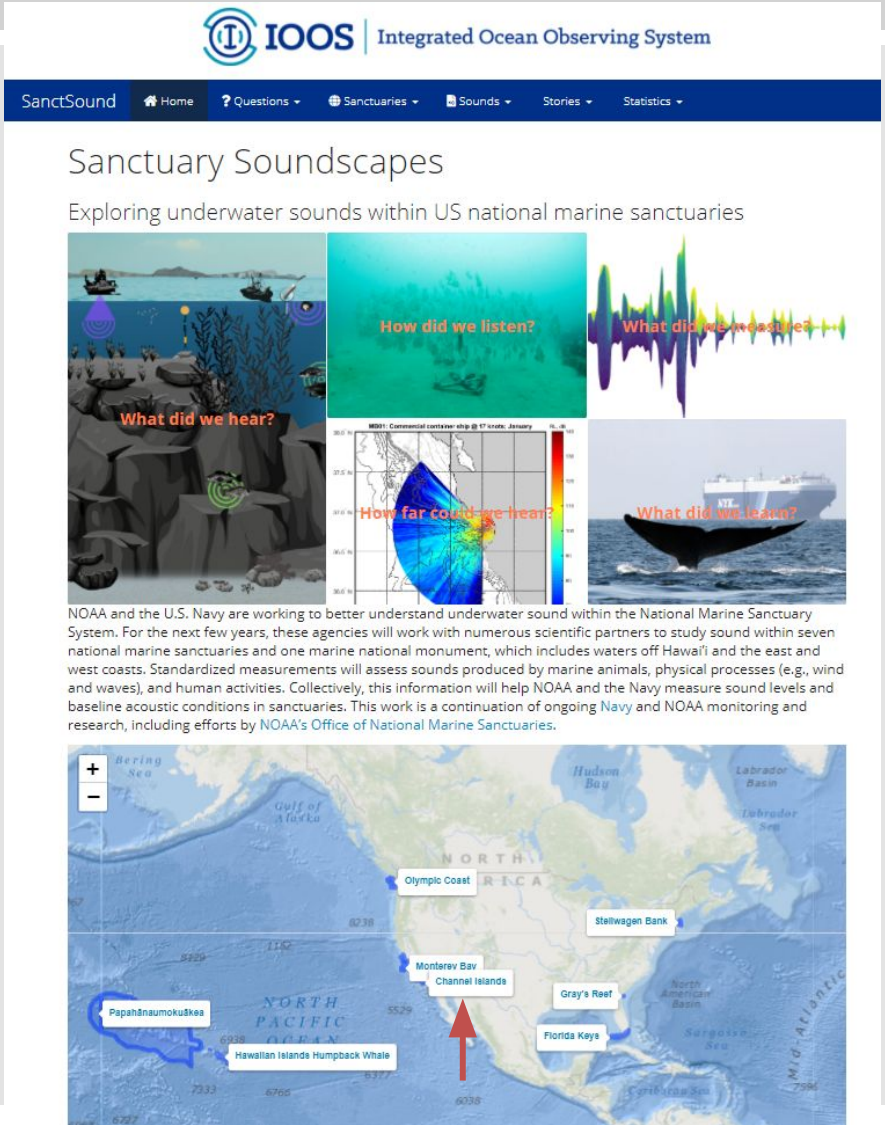
Jennifer Brown, ECOS Consulting, LLC

Ben Best, EcoQuants, LLC

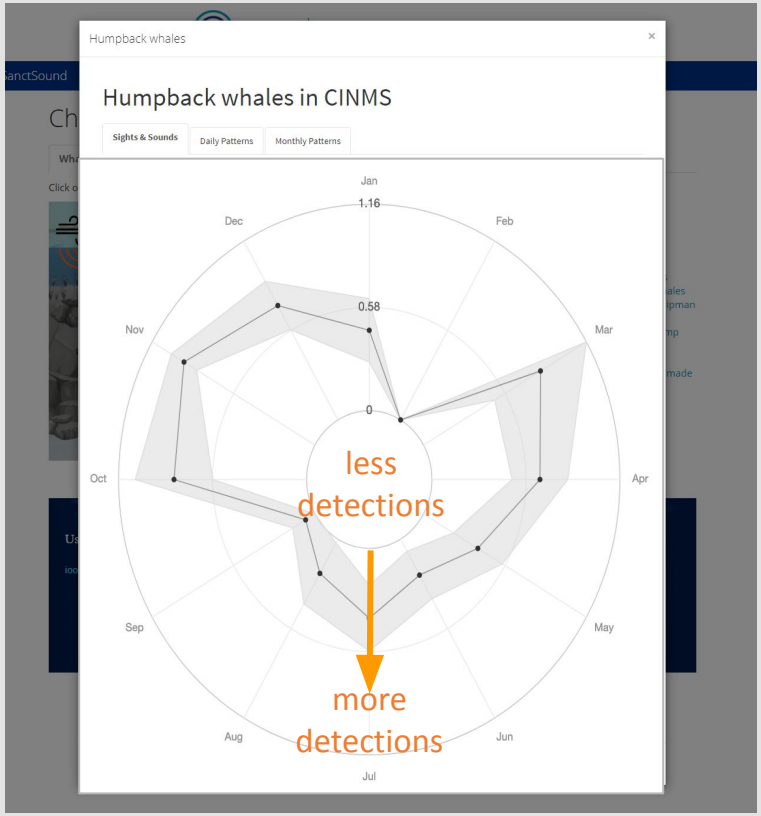
House

- Data focused
- Interactive
- Exploration

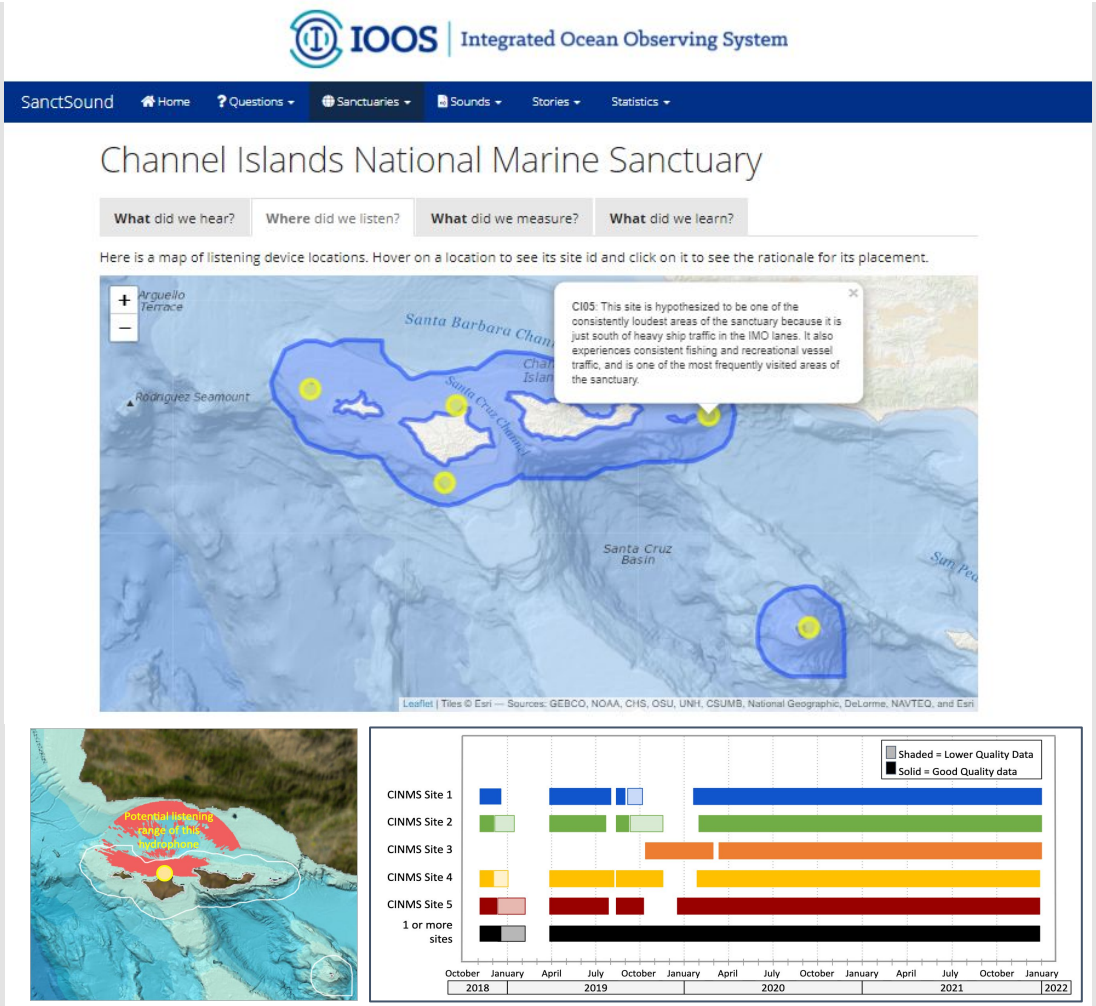
Brian Stone, Axiom Data Science LLC



What did we hear?



Where did we listen?



Peach shading shows the potential listening range of the hydrophone at station

Hydrophone recordings of the CINMS soundscape began in November 2018 at sites CI01 (blue), CI02 (green), CI04 (yellow), and CI05 (red) and in October 2019 at site CI03 (orange). There

What did we measure?

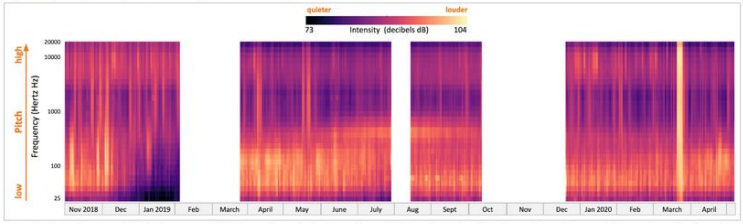
IOOS | Integrated Ocean Observing System

SanctSound | Home | Questions | Sanctuaries | Sounds | Stories | Statistics

Channel Islands National Marine Sanctuary

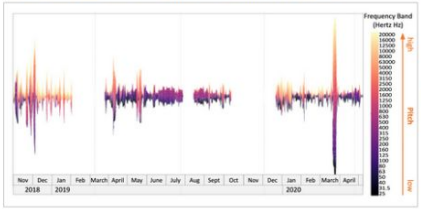
What did we hear? | **Where** did we listen? | **What** did we measure? | **What** did we learn?

Spectrogram: Intensity of different pitches over time



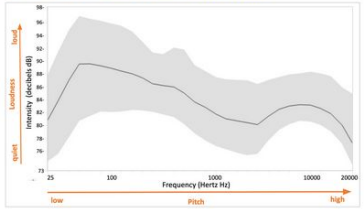
Low pitch sound was much louder (warmer color) in November and early December at CINMS station 5 than in late December and January. The intensity, or loudness, of higher pitch sound remained fairly consistant during this recording period.

Streamplot: Loudness and contribution of different pitches



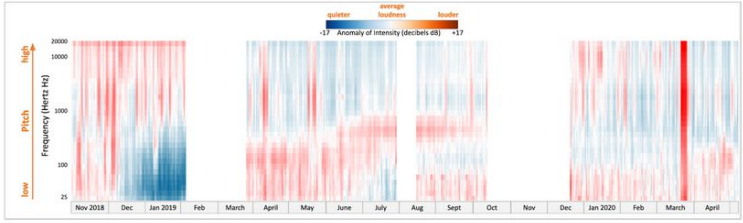
CINMS station 5 was louder (wider bands)in November and early December with lower pitch sounds (cooler colors) contributing the most to the soundscape. In January, the soundscape was quieter (narrower bands) and dominated by higher pitch (warmer color) sound.

Power spec: Variability of loudness across pitch



From November to February at CINMS station 5, the greatest variability in loudness (wider grey shading) occurred around the middle pitches and the least variability in loudness (narrower grey shading) at highest pitches. Average loudness (black line) increased across the lower and middle pitches and peaked around 8000 hertz.

Anomaly plot: Deviation of loudness from average



The anomaly plot helps to highlight that CINMS station 5 was louder than average (shades of red)in November and early December with lower pitch sounds contributing the most to the soundscape. In January and early February, the soundscape was quieter than average (shades of blue) and lower pitch sounds contributed much less to the soundscape at that time.

What did we learn?

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Portal Overview - **House**