

# Advancing marine life data management: Passive acoustic archiving and SanctSound Portal

## **Carrie Wall**

NCEI acoustics archive: Chuck Anderson and Veronica Martinez SanctSound portal: Leila Hatch, Brian Stone, Jenn Brown and Ben Best



# Passive Acoustic Data Management

NCEI passive acoustic archive

- Established 2017
- Holds over 100 TB
- Positioned to grow exponentially in the coming year(s)
  - Large holdings at NOAA Fisheries, U.S. Navy- and BOEM-funded projects, National Park Service, and IOOS
  - Ongoing multi-year monitoring efforts
    - NOAA-NPS Ocean Noise Reference Station Network (NRS)
    - NOAA-Navy Sanctuary Soundscape Monitoring Project (SanctSound)
    - NOPP-funded Atlantic Deepwater Ecosystem Observatory Network (ADEON)
    - NOAA Restore Science/DWH NRDA Gulf of Mexico Marine Mammal Monitoring

# **Passive Acoustic Data Management**

## Data submission aided by PassivePacker

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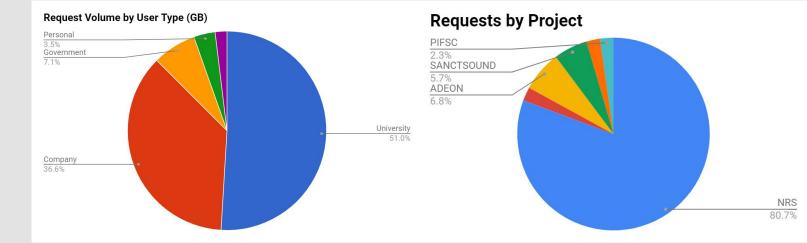
### Data access via mapviewer and Google Cloud

<b>NOAA</b> NATIONAL CENTE	RS FOR INFORMATION	Passive Acoustic Data Viewer	NOAA ENVIRONMENT	ITERN FORMATION	Passive Acoustic Data Viewer
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Passive acoustic data are used by NOAA and other agencies and institutions to monitor living marine	Self 193 St The 13		<ul> <li>Passive acoustic data are used by NOAA and other agencies and institutions to monitor living marine</li> </ul>		Platform Type: Bottom-lander
resources, monitor earthquake and geological activity.	Sea of A	Alecka	resources, monitor earthquake and geological activit	n	
and assess impacts of anthropogenic noise on marine	Okhotsk		and assess impacts of anthropogenic noise on marin		Number of Channels: 1
Information on the archive is available on the NCEI			LA WC		Sampling Details:
Passive Acoustic Data Archive page	M IS MILLING	AMERICA	O.C. Information on the archive is available on the NCEI Passive Acoustic Data Archive page.		Date Range: 2017-11-25T23:34:03 to 2018-06-15T19:37:03 Sample Rate (kHz): 8
Archived Projects	S Part Contraction	8730	Archived Projects		Democrating Unitation: Continuous Data Ouslity:
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Monitoring Project (SanctSound) () Atlantic Decowater Ecosystem Observing	0009	North North	Monitoring Project (SanctSound) (3)		Quality: Good
Network (ADEON) (2)	NORTH	NORTH Basin	<ul> <li>Atlantic Deepwater Ecosystem Observing Network (ADEON) (2)</li> </ul>	Blake	Citation: University of New Hampshire, JASCO Applied Sciences, 2020, ADEON Raw Passive Acoustic Data, NOAA National Centers for
<ul> <li>NOAA National Marine Fisheries Service (NMES) / Ocean Acoustics Program (8)</li> </ul>	PACIFIC OCEAN	PACIFIC OCEAN Onligi Sargaren	<ul> <li>NOAA National Marine Fisheries. Service (NMES) / Ocean Acoustics Program (8)</li> </ul>	Ortando Plateau 643	Environmental Information. https://doi.org/10.25921/0ysj-0c90 [access date]
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pad info@noaa.gov with any questions.		5733	pad.info@noaa.gov with any questions.	p b	Access Data from Google 3293
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# **Public Access**

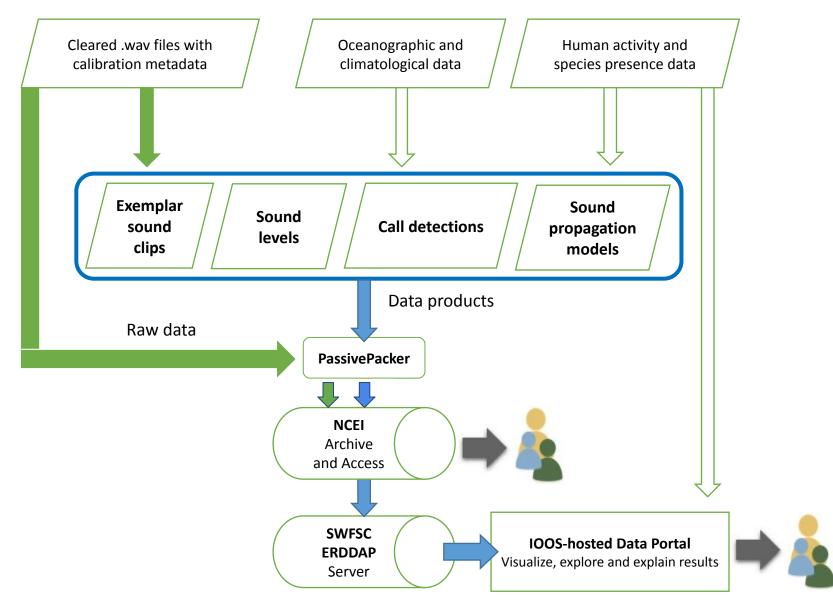
## Volume Delivered 31.4 TB ... plus data accessed directly from GCP

Data Uses	Examples	Project
Whale sounds	Characterize fin whales and blue whales sounds	NRS
Support small business	Small Business Innovation Research, an incubator to develop technology with government and commercial applications	ADEON
Ambient noise	Characterize ambient noise near Channel Islands	NRS
Visualization	Visualize the underwater acoustic environment	NEFSC, NRS





# SanctSound Data Flow



# SanctSound Portal

SanctSound

🚮 Home

## 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

### DOS | Integrated Ocean Observing System

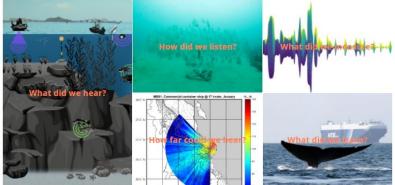
Statistics -

### Sanctuary Soundscapes

? Ouestions -

Exploring underwater sounds within US national marine sanctuaries

🕀 Sanctuaries 👻 📓 Sounds 👻



NOAA and the U.S. Navy are working to better understand underwater sound within the National Marine Sanctuary System. For the next few years, these agencies will work with numerous scientific partners to study sound within seven national marine sanctuaries and one marine national monument, which includes waters off Hawa'i and the east and west coasts. Standardized measurements will assess sounds produced by marine animals, physical processes (e.g., wind and waves), and human activities. Collectively, this information will help NOAA and the Navy measure sound levels and baseline acoustic conditions in sanctuaries. This work is a continuation of ongoing Navy and NOAA monitoring and research, including efforts by NOAA's Office of National Marine Sanctuaries.



## What did we hear?

#### DIOOS | Integrated Ocean Observing System

#### und 🐄 Home ? Questions 🗸 🖷 Sanctuaries 🗸 🗟 Sounds 🖌 Stories 🖌 Statistics 🗸 👘

#### Channel Islands National Marine Sanctuary



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Humpback whales in CINMS

v of sounds including moans, cries, groans



This humpback whale call produced between 100 to recorded in CINMS.

## Where did we listen?

#### IOOS Integrated Ocean Observing System

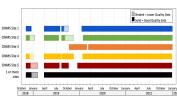
Channel Islands National Marine Sanctuary

SanctSound 🖷 Home ? Questions + 🖶 Sanctuaries + 🖪 Sounds + Stories + Statistics -

Here is a map of listening device locations. Hover on a location to see its site id and click on it to see the rationale for its placement.







## What did we measure?



#### SanctSound 🏕 Home ? Questions + 🖶 Sanctuaries + 🔒 Sounds + Stories + Statistics +

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

#### Channel Islands National Marine Sanctuary

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.

## What did we learn?



SanctSound 🚓 Home ? Questions 👻 🕀 Sanctuaries 👻 🗟 Sounds 👻 Stories 👻 Statistics 🍨

### Channel Islands National Marine Sanctuary



NATIONAL CENTERS FOR ENVIRONMENTAL INFORMATION

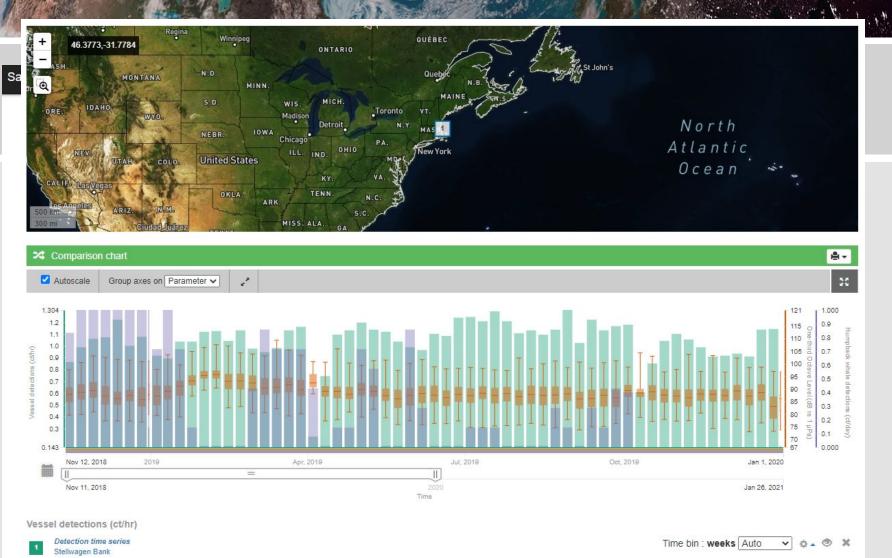


 Image: Detection time series
 Time bin : weeks Auto 
 Image: Auto 

Humpback whale detections (ct/day)

Detection time series Stellwagen Bank SB01 Time bin : weeks Auto 🗸 🗢 🗶