

26th POGO Annual Meeting Feb 2025

International Quiet Ocean Experiment

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Partnership for
Observation of the Global Ocean

What is IQOE?

- Goal: study effects of sound on marine life by subtracting noise rather than adding it and learn about human and natural sources of soundscapes
- IQOE formally began in 2015 as a Decadal program with [Science Plan](#) under the auspices of SCOR and POGO
- Challenge at outset: experts in marine passive acoustics lacked strong pre-existing networks and did not see themselves as a global interdisciplinary community nor know how to operate as one
- [Evaluation](#) of IQOE conducted in 2023



IQOE ACTIVITIES

1. Synthesize observations of the impacts of the COVID-19 pandemic on ocean sound
2. Task team formed to create specifications for low-cost hydrophones for education and citizen science.
3. Global Library of Underwater Biological Sounds
4. World Ocean Passive Acoustic Monitoring Day
5. Metadatabase of >100,000 sound observations from 1999-2024
6. GOOS Implementation Plan for the Ocean Sound Essential Ocean Variable
7. Support regional networks
8. Analysis of global ocean acoustic data

(www.iqoe.org)

LATEST NEWS

IQOE Releases Inventory of Existing Standards for Observations of Sound in the Ocean

The IQOE Working Group on Standardization has released an inventory of existing standards for observations of sound in the ocean. It can be found on the IQOE Website at <http://www.iqoe.org/sites/default/files/files/IQOE%20Inventory%20of%20Existing%20Standards%20-%20Version%202018-04-08.pdf>.

More news

THE INTERNATIONAL QUIET OCEAN EXPERIMENT (IQOE)

is an international scientific program to promote research, observations, and modelling to improve understanding of ocean soundscapes and effects of sound on marine organisms.

Project Rationale

ACQUISITION OBSERVING SYSTEMS

ACQUISITION DATA PORTAL

LITERATURE LIBRARY

MARINE ANIMAL SOUNDS

IQOE EMAIL LIST SIGN-UP

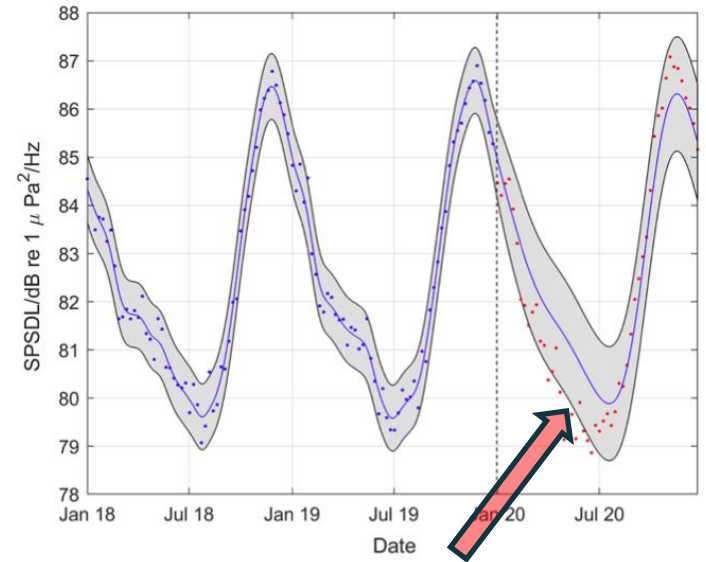
PARTICIPANTS **USEFUL LINKS**

Science Committee History & Projects

Regional Networks Reports & Articles

The IQOE Science Plan proposed an International Year of the Quiet Ocean.... COVID provided the quiet.

1. Synthesize observations of the impacts of the COVID-19 pandemic on ocean sound
IQOE seeks support for a meta-analysis of the 26 Papers on COVID quieting and 154 sites that recorded ocean sound Feb 2019 - Feb 2021



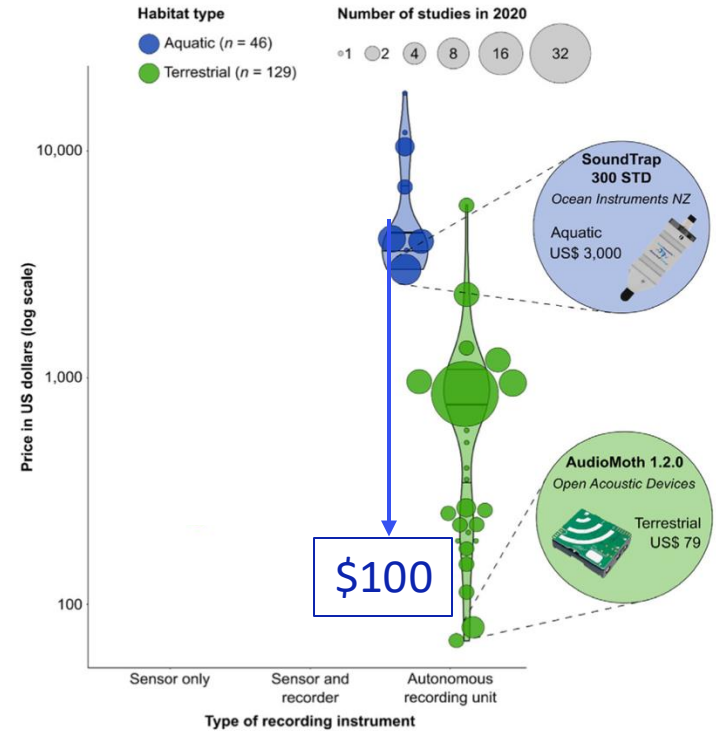
Acoustic Energy 10-40 Hz deep
offshore Wake Island Tropical Pacific

Robinson, Stephen, et al.
(2023) Impact of the
COVID-19 pandemic on
levels of deep-ocean
acoustic noise. *Scientific
Reports* 13:4631.



2. Low-cost ocean acoustic recorders for education & citizen science

POGO and SCOR funded a task team to create specifications and beta test a low-cost ocean sound recording system for education & citizen science



3. Global Library of Underwater Biological Sounds (GLUBS)

- 2023: hired a post-doc with funds from the Lounsbery Foundation and conducted a workshop
- 2024: works through SCOR WG 169 to organize work contributing to GLUBS.
- Three GLUBS working groups have papers completed or in progress, on (1) Infrastructure, (2) AI, and (3) Labelling Acoustic Transients.
- GLUBS is leading a Research Focus in the journal *Frontiers in Remote Sensing* called “Detection and Characterization of Unidentified Underwater Biological Sounds ...”. 7 papers accepted, several others in review.



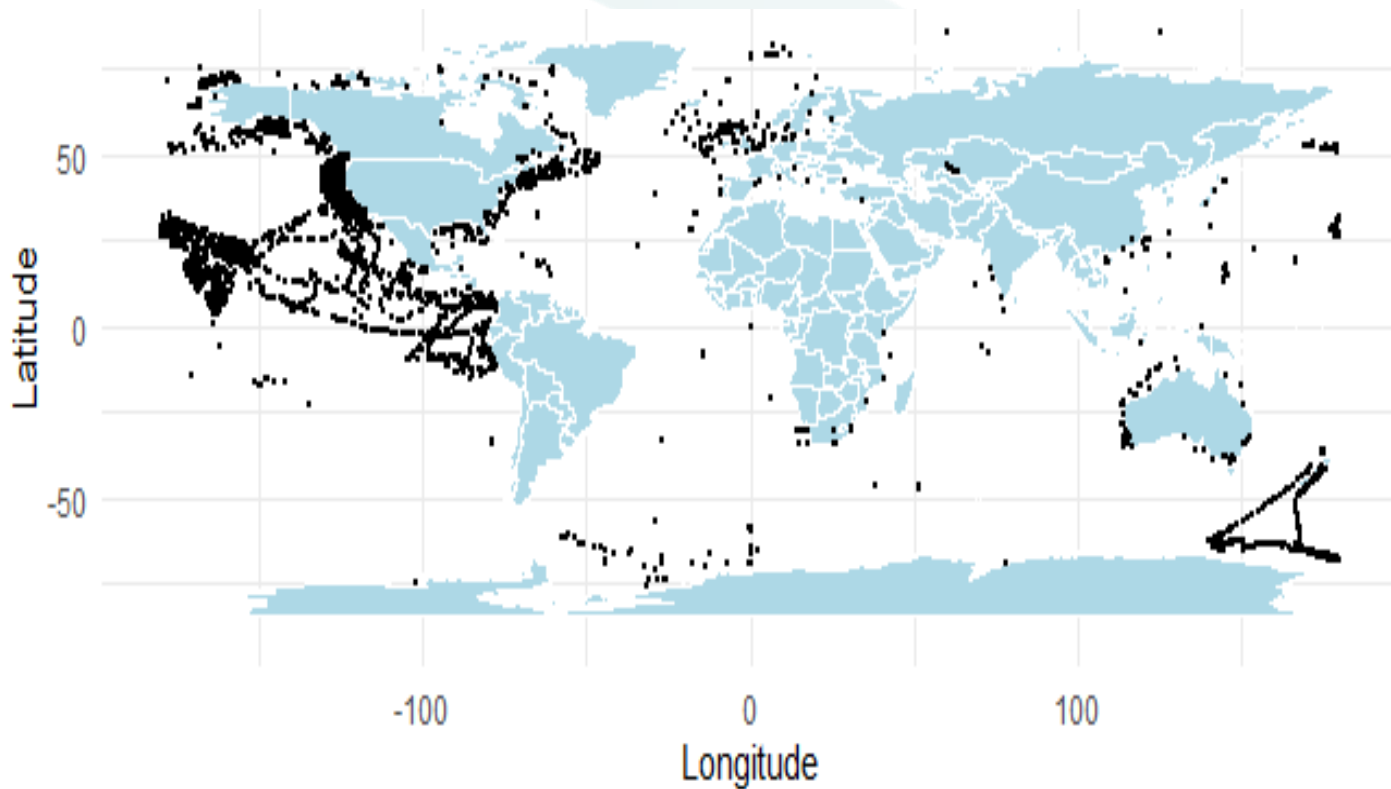
4. World Ocean Passive Acoustic Monitoring (WOPAM) Day: Researchers and Citizen Scientists make ocean acoustic recordings for 1 day each year.



Support received from the Lounsbery Foundation for a post-doc to analyze results of 2023 and 2024 WOPAM Data



5. Metadatabase of sound observation from 1999-2024 exceeds 104,000 records



2016-2018: POGO supported IQOE Working Group that developed an Ocean Sound Essential Ocean Variable accepted by GOOS in 2018

Primary Physical Acoustic Variables

- Sound pressure (p,t)
- Particle motion (x,y,z,t)

?



Ocean Sound EO variable is cross-disciplinary: a physical variable with derived data products relevant to many GOOS goals

Primary GOOS Goals

Climate Change

Wind, Waves, Rain,
Sea Ice

Ocean Health

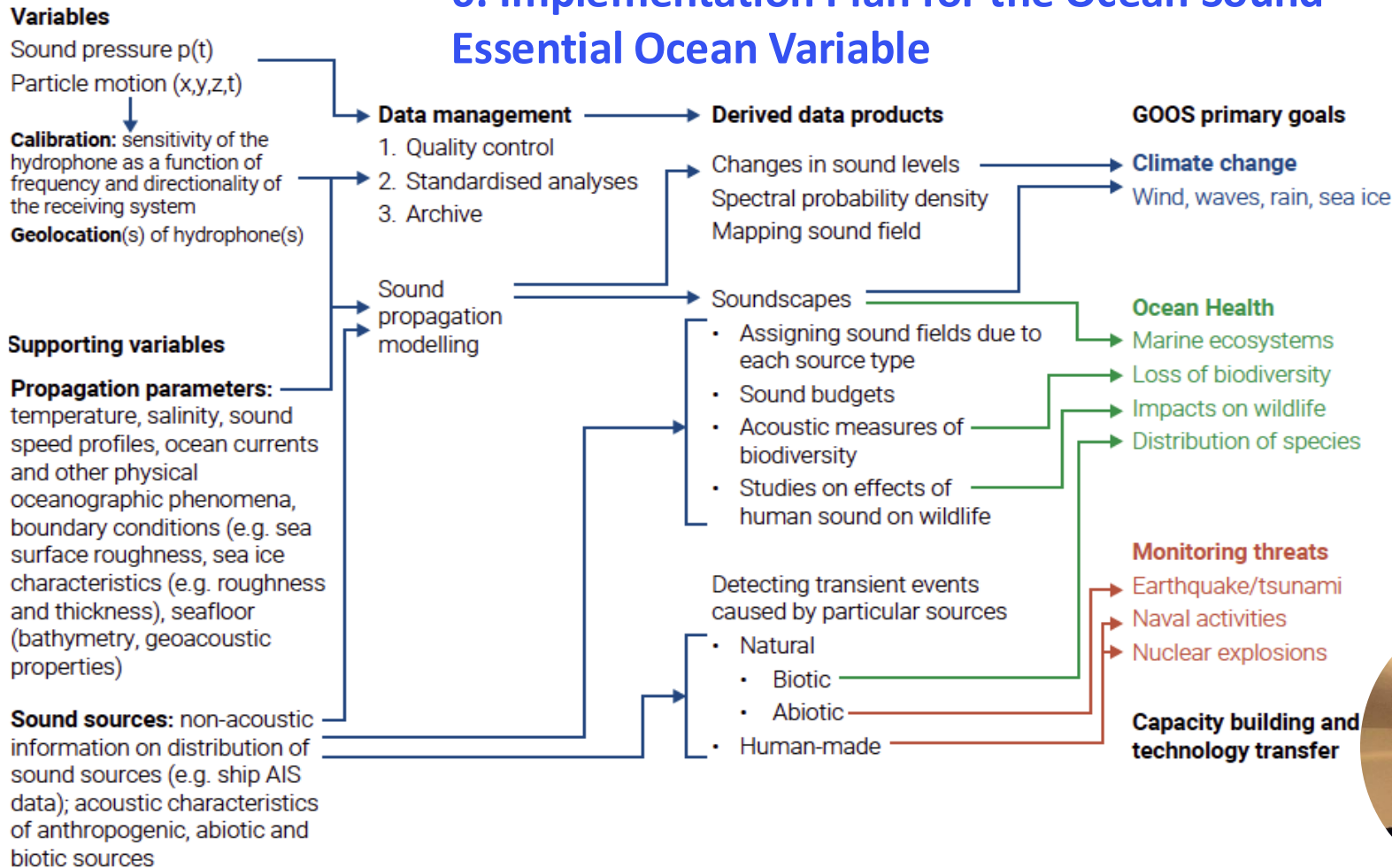
Marine Ecosystems
Loss of Biodiversity
Impacts on Wildlife
Distribution of Species

Monitoring Threats

Earthquake/Tsunami
Vessels
Other
Human
Sound
Sources



6. Implementation Plan for the Ocean Sound Essential Ocean Variable



published 2023

<https://zenodo.org/records/10067187>

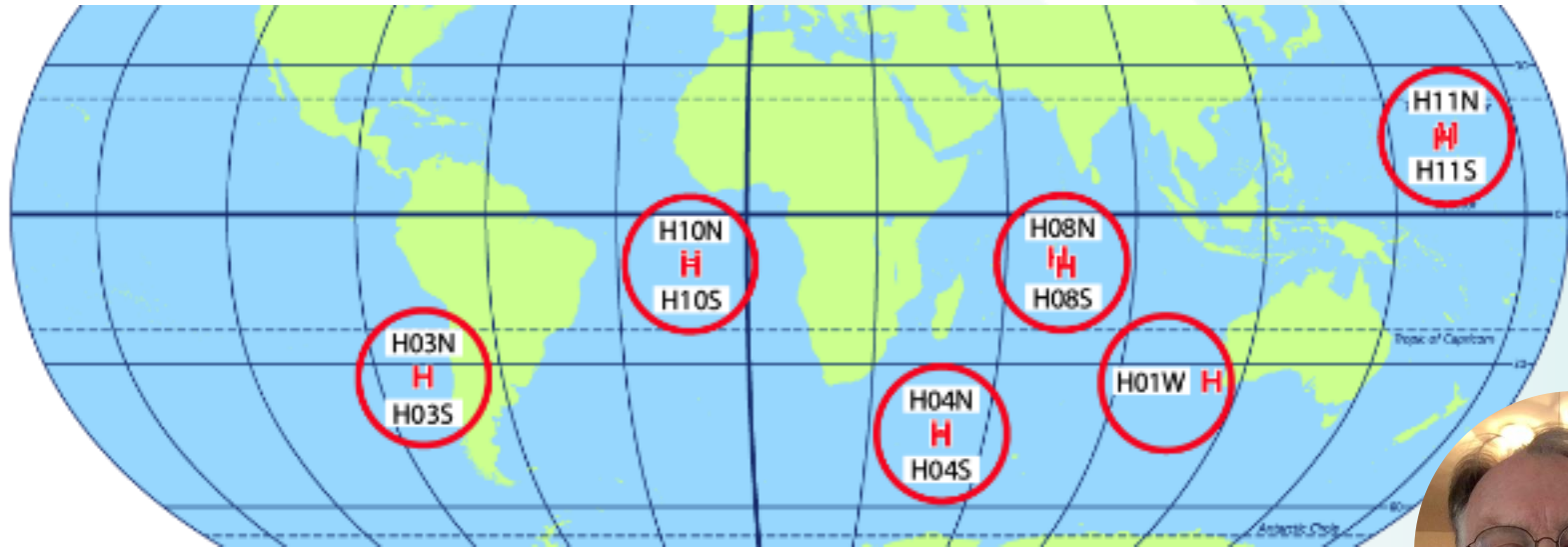


7. Support the African Bioacoustics Community

- >1000 social media followers
- 4th annual conference in Cape Town 2024 had 100 in-person and 61 online participants
- Sound library has 8563 recordings of 326 species
- 2024 sound library workshop in Kruger National Park to train collecting, analyzing and archiving acoustic data



8. Lounsbery Foundation supports acoustician to work with the Comprehensive Test Ban Treaty Organization on data from its global hydrophone network :



Value of IQOE activities to POGO Institutions

- Created a strong interdisciplinary, international network of scientists using ocean sound and encouraged a next generation of leaders
- Developed and won acceptance for Ocean Sound as an Essential Ocean Variable in the Global Ocean Observing System.
 - Developing a network of recorders of ocean sound
 - Developing standards, best practices and software to standardize, archive, and compare/integrate recordings
 - Sponsored global library of underwater sounds
 - Sponsored initiative for low-cost hydrophones

Future for IQOE post sundown circa 2025

Science Committee met in November 2024 and agreed to transition IQOE to implementing GOOS Ocean Sound EOY through several working groups:

- Transition hydrophone operators, standards and best practice, data management into regional and global GOOS networks
- Establish databases of sources of ocean sound (e.g. GLUBS), develop ocean soundscapes
- Organize program to train use of low-cost and calibrated ocean sound recording systems for education and research capacity building
- Monitor success of projects using acoustics to map noise and animals and estimate effects of sound
- Develop ocean sound budgets that can hindcast and forecast sound fields

