

# NETWORKING AND EXPANDING ACOUSTIC OBSERVATIONS IN THE GLOBAL OCEAN

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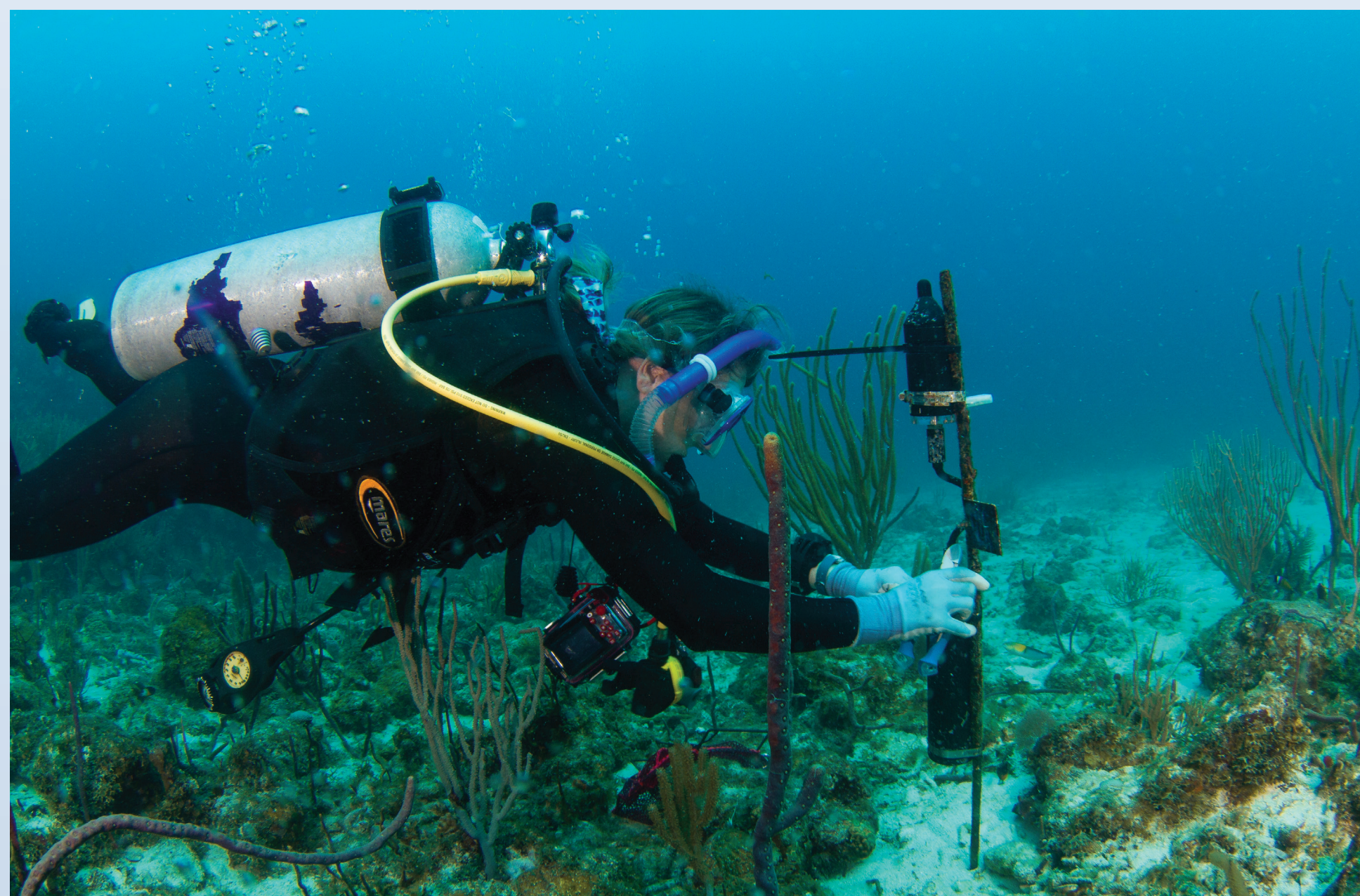
**The International Quiet Ocean Experiment (IQOE)** is the first international project designed to help coordinate and gain synergy from isolated passive acoustic observations and experiments taking place worldwide. IQOE implementation has so far consisted mainly of four components: (1) creation of focused working groups, (2) endorsement of national and regional projects that will help IQOE fulfill its goals, (3) proposal of an Ocean Sound Essential Ocean Variable (EOV), and (4) establishment of an international IQOE data office to compile and make available acoustic and bioacoustic data. IQOE is stimulating new observations of ocean sounds and helping to coordinate existing observations and to make ocean acoustic and bioacoustic data more accessible.

## IQOE WORKING GROUPS

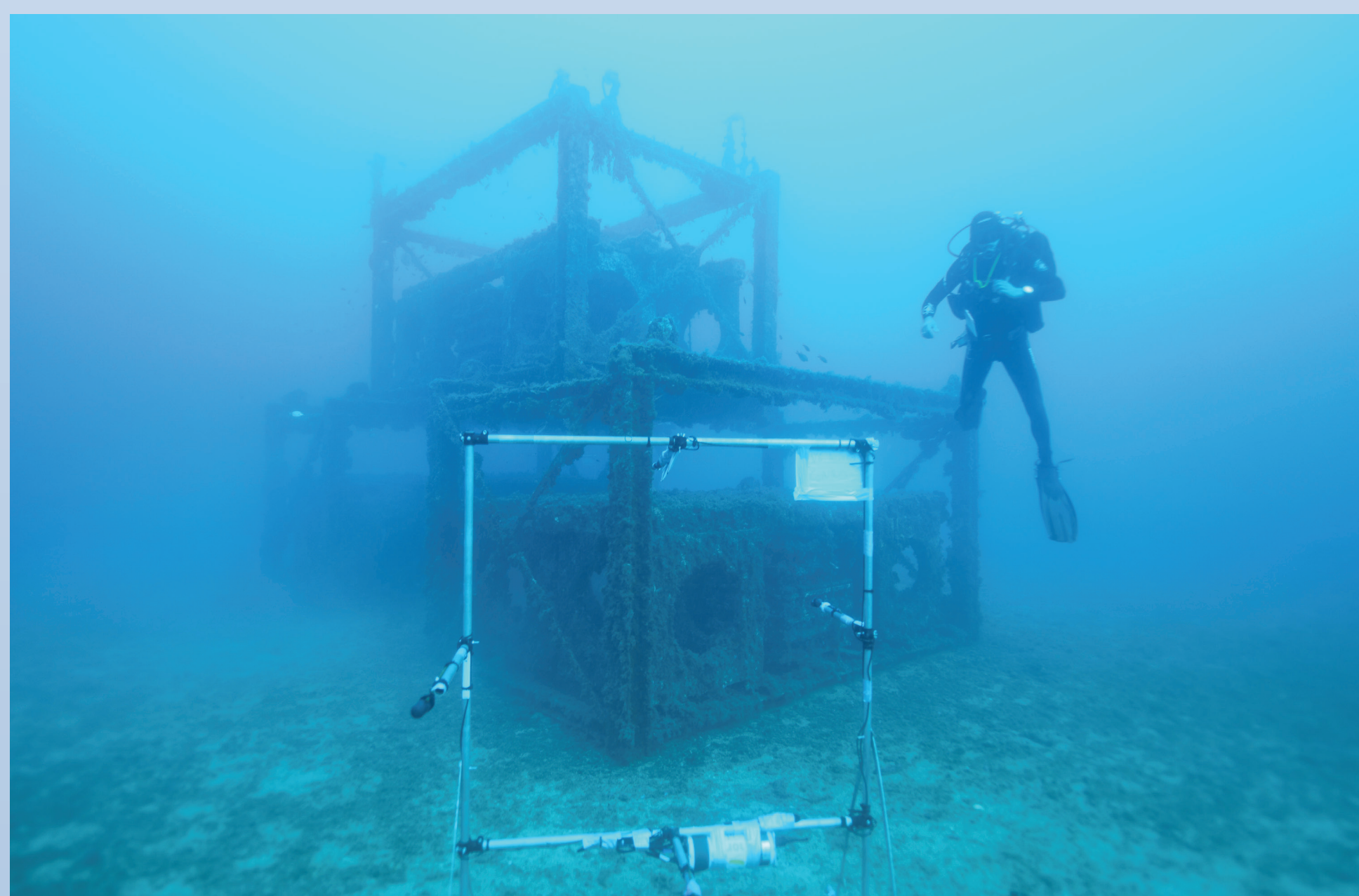
IQOE has formed 5 working groups so far to focus on specific issues:

1. Acoustic Measurement of Ocean Biodiversity Hotspots
2. Arctic Acoustic Environment
3. Data Management and Access
4. Marine Bioacoustical Standardization
5. Standardization

The IQOE WG on Acoustic Measurement of Ocean Biodiversity Hotspots brings together scientists from different parts of the world who are monitoring the sounds of marine organisms as a measure of marine biodiversity (see two examples of observation approaches in photos below).



Dr. Amy Aprill deploying an acoustic recorder on a coral reef off the island of St. John, U.S. Virgin Islands. Scientists from the Sensory Ecology and Bioacoustics Lab at the Woods Hole Oceanographic Institution have been listening to these reefs since 2013. They are evaluating how larvae use sound to find and settle on reefs and how marine soundscapes may be used to estimate reef health and biodiversity. Photo credit: Paul Caiger, WHOI.



Acoustic mapping of an artificial reef for ecological restoration programs in the French Mediterranean. Aluminum structure with an acoustic recorder and 4 hydrophones allowing the 2D and 3D localization and monitoring of broadband sounds emitted by the invertebrates inhabiting the reef. Photo credit: CHORUS Institute.

## OCEAN SOUND ESSENTIAL OCEAN VARIABLE (EOV)

The Partnership for Observation of the Global Ocean (POGO) formed an IQOE Working Group to work on observation related issues: (1) making information about passive acoustic observing systems available on the IQOE Website and (2) proposing an Ocean Sound EOV.

The Biological and Ecology Panel of the Global Ocean Observing System approved the Ocean Sound EOV. The next step will be an implementation meeting focused on this EOV.

## IQOE-ENDORSED PROJECTS

IQOE has endorsed 7 national and regional projects so far. These projects help achieve IQOE goals and IQOE assists these projects by providing mechanisms for agreements on standardized methods of data collection and archiving.

1. ADEON: Atlantic Deepwater Ecosystem Observatory Network
2. JOMOPANS: Joint Monitoring Programme for Ambient Noise North Sea
3. JONAS: A Joint program for Ocean Noise in the Atlantic Seas
4. PHYSIC: Ports, Humpbacks, Y Soundscapes In Colombia
5. QUIETMED2: Joint programme for GES assessment on D11-noise in the Mediterranean Marine Region
6. SanctSound: NOAA Navy Sanctuary Soundscape Monitoring Project
7. TANGO: Rerouting shipping lanes in the Kattegat – effects on soundscape and ecosystem

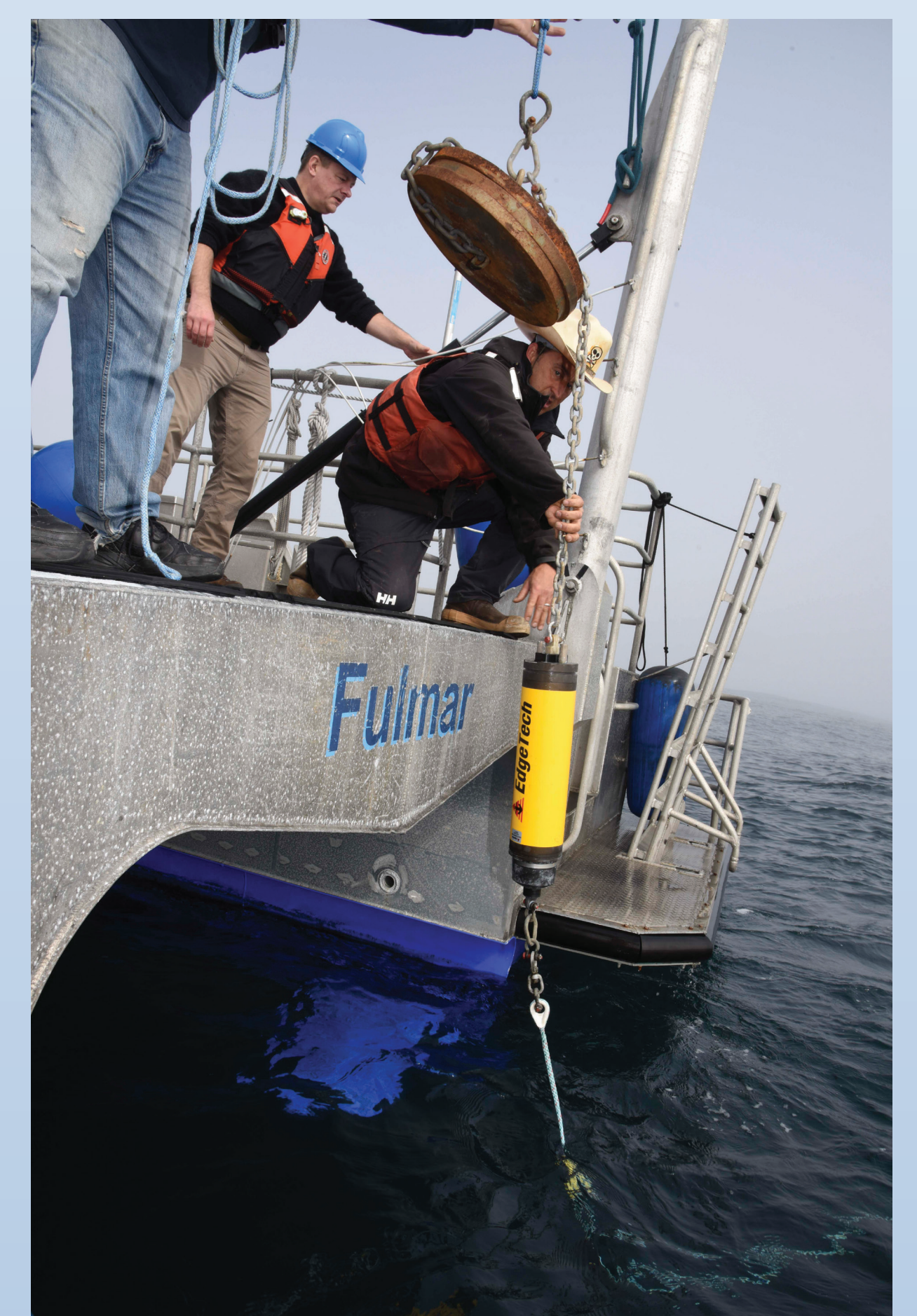
By three photos below show examples of deployments of hydrophones the three different IQOE-endorsed projects.



SCUBA deployment of an Ecological Acoustical Recorder (Oceanwide Science Institute) on July 28, 2019, by Dr. Kerri Seger of Applied Ocean Sciences, LLC, and Liliana Arango, owner of Kákiri Estación de Buceo in Guachalito, Colombia. A 33% duty cycle at 15.625 kHz will sample for 1.5 months at Morro Mico: a small island along the Pacific Coast of Colombia marking the southern border of Utria National Park protected waters.



Launch of the Swedish Vinga station for Jomopans (Jomopans/FOI)



SanctSound is monitoring underwater sound in seven U.S. National Marine Sanctuaries and one U.S. Marine National Monument. Temporary moorings such as this one in the Monterey Bay National Marine Sanctuary are being retrieved and redeployed to achieve continuous and coordinated recording effort at over thirty locations over three plus years. Credit: U.S. Navy Photo by Javier Chagoya

## IQOE INTERNATIONAL DATA CENTER

The Alfred Wegener Institute (AWI) in Germany advertised to fill two positions to conceive, implement and operate a data portal that will allow easy access to acoustic data and basic data products related to ocean acoustics. These positions are for a data scientist and a data engineer, who will work closely with the IQOE WG on Data Management and Access and the WG on Standardization.