

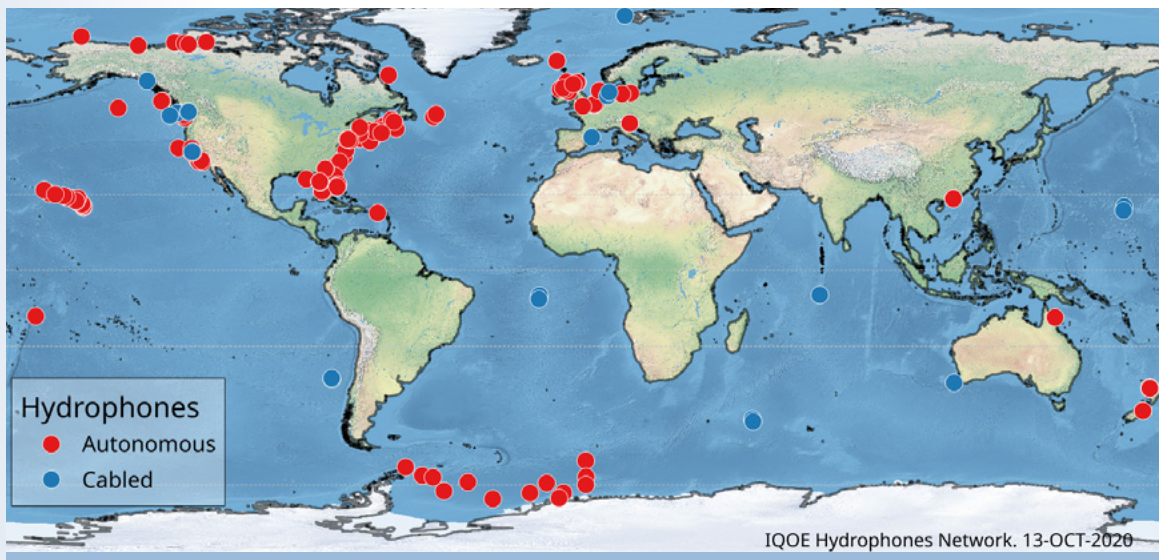
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As with all other areas of ocean science, the COVID-19 pandemic has slowed field activities related to IQOE, but scientists in the community have held some meetings virtually. And, as some countries have opened up, some field activities have resumed.

TAKING ADVANTAGE OF THE DECREASE IN COMMERCIAL ACTIVITY FROM COVID-19

IQOE is working to coordinate hydrophone operators to compile data during the COVID-19 period to examine what might be learned from these observations. To date, the network includes 216 hydrophones represented by 38 different individuals (see figure below). One of the efforts to study the effects of the pandemic on ocean noise, on the west coast of Canada, was reported in an [article by the Canadian Broadcasting Company](#). The Lounsbery Foundation is funding an effort led by Jennifer Miksis-Olds to produce the *Ocean Sound Software for Making Ambient Noise Trends Accessible (MANTA)*, expected to be available in early 2021. This software will provide hydrophone operators means to analyze their data according to [IQOE Guidelines](#) and to contribute to a global database related to ocean sound led by the Open Portal to Underwater Sound (OPUS) data group at the Alfred Wegener Institute in Bremerhaven, Germany. Data from the hydrophone network will be important to look for any changes in ocean sound during the pandemic, and will also continue to provide a valuable global resource to study trends and variations in ocean sound more broadly in the future. More details about MANTA and OPUS will be provided in the near future.

IQOE efforts to create a global dataset of hydrophone observations will be highlighted in a forthcoming issue of *Eos: Transactions of the American Geophysical Union*, and were mentioned in an article in [Science magazine](#) in August 2020 and an article on the [Reuters news service](#) in June 2020.



IQOE Hydrophone Network as of 13 Oct. 2020 (n = 216; some sites overlap and show as a single dot at this scale).

Please contact Ed Urban (ed.urban@scor-int.org) if you would like to be involved in this activity.

Several articles have been published related to a global analysis of the effects on the pandemic on the environment ([Bates et al., 2020](#) and [Rutz et al., 2020](#))

OCEAN SOUND ESSENTIAL OCEAN VARIABLE (EOV)

IQOE was given responsibility for the Ocean Sound Essential Ocean Variable (EOV) by the Global Ocean Observing System (GOOS), after proposing this EOV. Each GOOS EOV works through a process that starts with approval of specifications for the EOV, followed by creation of an implementation plan. IQOE has formed a committee to create the implementation plan (see <https://www.iqoe.org/groups/ocean-sound-eov-implementation-committee>). The committee will work remotely, potentially holding a virtual workshop.

IQOE DATA PORTAL

The MareHUB project at the Alfred Wegener Institute has hired a data portal programmer and a data manager, who are working with Olaf Boebel to develop a prototype portal (OPUS, Open Portal to Underwater Sound) based on data from the PALAOA, HAFOS, and FRAM projects. The data office will help collate outputs from the MANTA software to create a data product that should be useful to the global community. It is envisioned that this product will be updated on a regular schedule.

ONE NEW IQOE ENDORSEMENT

IQOE agreed to endorse one proposed project since the *IQOE Newsletter #5*, the “Australasian fish call catalogue (AFCC): A machine learning database”. This proposal was led by Miles Parsons of the Australian Institute of Marine Science and would contribute to the IQOE WG on Acoustic Measurement of Ocean Biodiversity Hotspots.

SPECIAL JOURNAL ISSUES

Several special issues of journals of potential interest to the IQOE community are now open:

- Research Focus in *Frontiers in Marine Science* on [Before-After Control-Impact \(BACI\) Studies in the Ocean](#). Submission deadline is 9 February 2021.
- Research Focus in *Frontiers in Marine Science* on [Innovation and Discoveries in Marine Soundscape Research](#). Submission deadline is 24 February 2021.

- Special issue of the *Journal of the Acoustical Society of America* on [Ocean Acoustics in a Changing Arctic](#). Submission deadline is 31 March 2021.
- Special issue of the *Journal of the Acoustical Society of America* on [COVID-19 Pandemic Acoustic Effects](#). The submission deadline is currently open-ended.

NEWS FROM ENDORSED PROJECTS

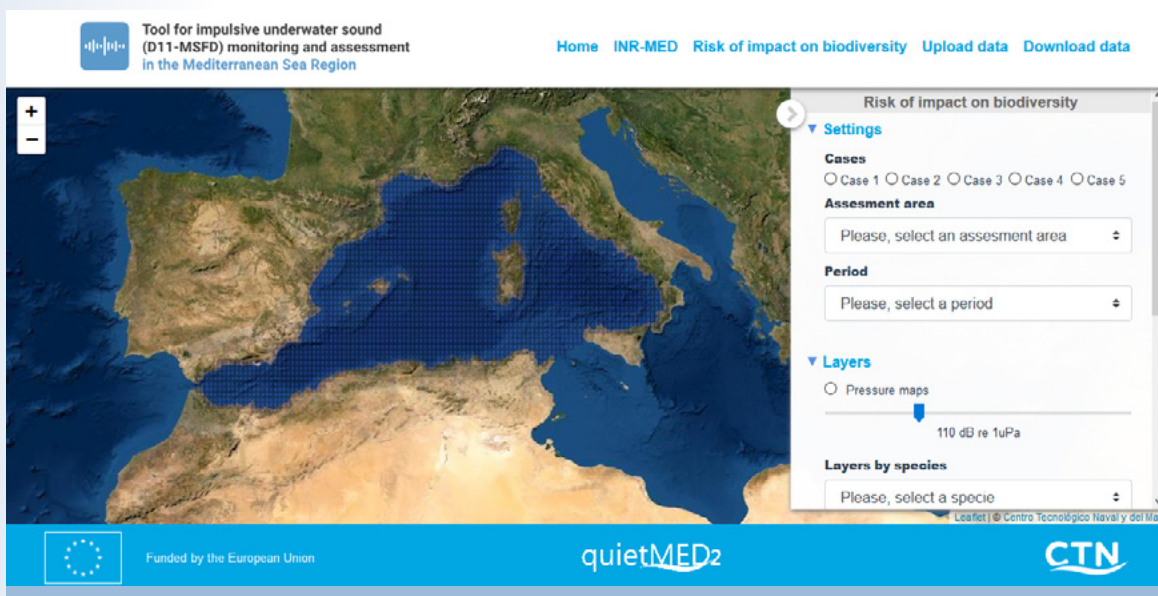
- **JOMOPANS** (<https://northsearegion.eu/jomopans/about/>)—JOMOPANS released its 2020 newsletter in April 2020 (see https://northsearegion.eu/media/12836/newsletter_jomopans_2020_200406.pdf). JOMOPANS has now completed two years of work. The final year of the project will focus on harmonizing models and observations, with the goal of validating the models and the soundscape maps with the data from the measurement campaign. In summer 2020, all soundscape maps were produced, which gives a picture on the levels of continuous noise in the North Sea for 2019. The maps are used to assess the environmental status of the North Sea with respect to noise and to help marine managers to handle continuous noise in the busiest sea of the world. JOMOPANS lost two hydrophones in the past year that were later recovered. A SoundTrap device moored in Dutch waters in August 2019 washed up on a beach in Denmark in summer 2020. A German hydrophone moored in the central North Sea washed up on a Swedish beach, in April 2020. Both devices were returned to their owners and some data salvaged.
- **Joint Framework for Ocean Noise in the Atlantic Seas (JONAS)** (<https://www.jonasproject.eu/>)—JONAS had planned a stakeholder workshop on user requirements for the JONAS Underwater Noise Visualisation for March 2020, to be held in Lisbon. Because of COVID-19, the event was postponed until June 2020, with a switch from in-person to virtual mode. The successful workshop made it possible to gather input from both researchers and policymakers. JONAS scientists were interviewed by both the [BBC](#) and the [Guardian](#) newspaper regarding the effects of the pandemic on ocean noise. JONAS is in the final three entries in a competition for EU Web Awards; the winner will be announced at a ceremony in November.

- **Ports, Humpbacks, Y Soundscapes In Colombia (PHySIC)**—Work continues in Colombia for this project, including a great deal of activity by local faculty and their students. Dr. Natalia Botero Acosta is about to replace an Ecological Acoustic Recorder (EAR) at Morro Mico for its third season and will work through October to gather biopsies for stress hormone analysis concurrent with measurements of sound levels in the same area. She will start processing the biopsy

samples in Dr. Ari Friedlaender's lab in January for her Fulbright Scholar project. In his undergraduate thesis at Los Andes University in Bogotá, Colombia, Daniel Noreña documented the whistle repertoires of five species of dolphins for the first time in the Gulf of Tribugá. The acoustic features of four of the five species' whistles were significantly different from the acoustic features of whistles from the same species near the port of Honolulu, in the English Channel, and in the Panama Canal. Three of those four species had whistle bandwidths lower in frequency in the quieter Gulf of Tribugá than in the more disturbed environments. The fourth species had a higher average bandwidth than conspecifics in more disturbed areas. Daniel will be presenting a poster at the Acoustical Society of America (ASA) Virtual Conference in December. Mar Palanca is preparing two papers on the humpback whale social call repertoires in the Gulf of Tribugá and will be presenting at the ASA conference and ABC (African Bioacoustics Conference) in December and November, respectively. She will finish her master's degree in April 2021 from the University of Bonn. Maria Paula Rey-Baquero and Laura Valentina Huertas-Amaya are both progressing on their undergrad theses at Pontificia Universidad Javeriana in Bogotá, Colombia. Maria Paula will be presenting on the soundscape diel cycles from both Nuqui and Morro Mico sites in 2018 and 2019 at the ASA conference. Valentina will be presenting her noise maps of simulated shipping lanes from a potential port at Tribugá at the ABC. Both students are co-authors on a recently submitted paper for a special issue of *Frontiers of Marine Science* on the [effects of whale watching on cetaceans](#) from regions where ecotourism is in its infancy. The PHYsIC project was started to document

acoustic and bioacoustics observation before the beginning of a port construction project, which has now been delayed.

- **QUIETMED2** (<http://quietmed2.eu>)—On 10–11 September, the QUIETMED2 project organized an on-line Training session for Competent Authorities from Member States to support the implementation of the Marine Strategy Framework Directive (MSFD), to establish new regionally coordinated measures. The aim of this workshop was to provide specific guidance for EU Member States to establish new measures oriented to the risk of impact caused by underwater noise on marine mammals and collect feedback from Competent Authorities. One of the main topics discussed was the joint proposal of a methodology to establish thresholds in the Mediterranean Sea Region developed within the QUIETMED2 project. The proposed methodology is aligned with the work done by the MSFD Task Group on Noise. In addition to providing feedback, the participants had the opportunity to test the applicability of this methodology by using the management tool being developed by the project, designed to address the risk of impact on biodiversity in the Mediterranean Sea: <http://quietmed2.ctninnova.com/>. Furthermore, this workshop aimed to boost cooperation in the Barcelona Convention context. This event included 40 participants, including Competent Authorities from nine different countries and representatives from six non-EU countries from the Mediterranean Sea Basin.
- **SanctSound** (<https://sanctuaries.noaa.gov/science/monitoring/sound/>)—SanctSound is conducting ongoing maintenance of a stationary recording array



Screenshot of QUIETMED2 management tool (<http://quietmed2.ctninnova.com/>).

and six mobile listening surveys using autonomous vehicles in Gray's Reef and Stellwagen Bank National Marine Sanctuaries and Papahānaumokuākea Marine National Monument. Sound data files are available from 2019–2020 for download from [NOAA's National Centers for Environmental Information passive acoustic data archive](#).

Get your project endorsed

IQOE would like to endorse any research project or observation activities that are relevant to IQOE. Information about the endorsement process and endorsed projects can be found at <http://www.iqoe.org/projects>. The benefits of endorsement include increased international visibility of endorsed projects, which are usually national or regional, and the potential for joint activities with other endorsed projects and with other IQOE-involved scientists.

WG PROGRESS

Acoustic Measurement of Ocean Biodiversity Hotspots—

The WG has published the following review article:

Mooney, T.A., L. Di Iorio, M. Lammers, T-H. Lin, S. Nedelec, M. Parsons, C. Radford, E. Urban, and J. Stanley. 2020. Listening forward: approaching marine biodiversity assessments using acoustic methods. *Royal Society Open Science* 7:201287. <http://dx.doi.org/10.1098/rsos.201287>

The WG is discussing the possibility of making standardized observations of bioacoustic diversity in several different locations about the world, and following up on other ideas presented in their paper, such as a library of marine sounds, including those of unknown origin. This database would be an open-access resource and useful as a machine learning database.

Arctic Acoustic Environment—The WG will convene a virtual conference on Sound in the Arctic Ocean on 11–12 November (see [description](#), [program](#), and [registration](#)), Twenty papers will be presented over two half-days and 86 individuals have registered for the conference so far.

Marine Bioacoustical Standardization and Standardization—The WG is in the process of developing an inventory of bioacoustical standards, analogous to [the document produced by the Standardization WG](#).

NATIONAL/REGIONAL ACTIVITIES

Several national efforts beyond endorsed activities are directly relevant to IQOE. If you have news of national scientific projects or meetings related to IQOE, please email them to [Ed Urban](#).

Canada

MERIDIAN issued its latest [eNewsletter](#) in September 2020. MERIDIAN has been busy during the pandemic, holding a series of workshops on ocean data management and releasing new software products:

- [Kadlu](#) is a software package for modeling underwater noise
- [Ketos](#) is an interface for working with acoustic data and deep neural networks
- [Kedgi](#) is a graphical interface to run MERIDIAN acoustic detection and classification software
- [MERIDIAN Discovery Portal](#) makes it possible to discover ocean acoustic data, vessel tracking data, and available software products

The University of Quebec team associated with MERIDIAN made the first official release of its [Ocean Soundscape Atlas](#).

Russia

On 19–23 October 2020, Russian scientists convened the biennial school-seminar named after Acad. L.M. Brekhovskikh on “Ocean Acoustics”, combined with the XXXIII session of the Russian Acoustic Society. This was the first of the conference series convened in virtual format, taking place on the Internet platform “meet.ocean.ru” of the Institute of Oceanology Russian Academy of Sciences, Moscow. Six lectures and 59 reports were presented (46 oral reports and 13 in poster form, mainly in Russian).

IQOE EMAIL LIST

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Endorsed projects (8): ADEON, JOMOPANS, JONAS, NRS, PHYsIC, QUIETMED2, SanctSound, TANGO

Publications in Aquatic Acoustic Archive: 6,831

IQOE Email List: 342