



## **IHO Input to Part I of the Report of the UN Secretary General on Oceans and Law of the Sea**

This contribution is provided in response to letter *LOS/SGR/2018/I/IGO* dated 9 October 2017 as the input from the International Hydrographic Organization to Part I of the report of the UN Secretary General on Oceans and Law of the Sea. It addresses the topic of the nineteenth meeting of the Informal Consultative Process: “*Anthropogenic underwater noise*”.

1. The International Hydrographic Organization (IHO) is the inter-governmental consultative organization whose principal aim is to ensure that all the world’s seas, oceans and navigable waters are properly surveyed and charted, through the coordinated endeavours of national Hydrographic Offices. The IHO has been hosted by the Government of Monaco since its creation in 1921 and its current membership stands at 87 Member States.

2. Hydrography in general comprises the measurements of all the physics of the seas but has a focus on measuring the depth of the water (bathymetry) and fixing the position of all the hazards and obstructions to navigation that lie on the seafloor, such as wrecks and rocks. Although tides and currents, as well as the characteristics of the water column such as temperature and salinity, are measured using passive methods, the depth measurements are performed mainly with specialized ships and boats operating echo sounders and sonars emitting pulsed hydro acoustic noise of different frequencies vertically and horizontally into the water column down to the seabed.

3. Hydro acoustic survey methods work in frequency bands from approximately 10 kHz up to 400 kHz with some specialised systems working up 700 kHz; depending on the water depth the pulse lengths can be of several seconds. Hydro acoustic measurement methods are highly sensitive to interference from other noise sources generated by or in the platform. Hydrographic vessels are therefore constructed to emit as little noise as possible by their propulsion unit and other auxiliary systems. These specific arrangements to a greater extent avoid the emission of considerable underwater noise into the water column by the platform.

4. To date hydro acoustic survey methods remain the most efficient and most appropriate technology to undertake depth surveys in shallow, mid and deep waters. The impact of their noise emissions to the marine ecosystem is the subject of diverse ongoing scientific investigations. Although the initial research has drawn some interesting conclusions, the results of these investigations are not fully coherent nor definitive, however the reduction of hydro acoustic noise emissions should be a future goal.

5. There are alternative technologies for measuring depths and the detection of wrecks and obstructions by remote sensing using survey aircraft and drones fitted with lasers. Useful information can also be derived from satellite observations. These technologies are constantly improving and indicate promising prospects for a further reduction of emissions of hydro acoustic noise into the water column by hydrographic activities - in particular for shallow waters within a depth range down to 30 m.

6. The IHO proactively addresses the wider use of these alternative methods as part of its technical work programme as well as by means of its capacity building activities, i.e. sharing of best practice in workshops and education courses.

7. Although significant progress has been made already in the extended use of remote sensing more can be expected in the years to come, it is acknowledged that echo sounding and sonar equipment will remain an essential technology for the safe, efficient and sustainable conduct of many human activities that take place in, on or under the sea.