

**Laurent Kerléguer**

France

**Q1**

Of course, considering technology, one would immediately think of acoustic sounding and multibeam echosounders as key milestones and indeed they are! But sticking to the 100<sup>th</sup> anniversary, acoustic sounding is anterior. For me the game changer is the satellite positioning which has really and universally revolutionized the way we conduct surveys and their accuracy. It has been for the better, although there is still a taste of nostalgia when you think of field work that was required in the age of optical positioning with signals on shore.

The accuracy we have reached on moving vessels is just amazing. Autonomous navigation that develops would not be possible without Global Navigation Satellite System that seems so easy and natural to anyone nowadays.

More generally, hydrographers are metrologists, accuracy is a second nature for them. One has to admit that from ping to chart we have made significant progress on so many parameters that can spoil the result if you do not master them: speed of sound in the water, attitude of the platform, tide, data processing...

**Q2**

Massive data, how we get it and what we do with it.

The next biggest challenge for our community will be to bring quicker and more accurate answers to users.

We are still a long way from knowing our ocean from a holistic perspective, encompassing physical, chemical and biological parameters from shore to abyss. The high resolution in the deep that we need to survey ecosystems, will require a disruptive approach.

The technology is there, already dramatically accelerating our capacity to collect data at sea thanks to unmanned vehicles. Still we have to be able to deploy these systems in number, and the economic model to do this cannot be based on profit because there is not "deep sea B" and if we spoil it for exploitation it will probably be forever.

Another issue is our capacity to process massive data to deliver smart products. The ultimate smart product might be the digital twin of the ocean that will model the ocean in all its complexity and interfaces so that we can anticipate, at the laboratory, the consequences of our actions. That is ambitious and exciting challenge where Hydrographers have a major role to play.

**Q3**

Actually, all the articles are interesting for hydrographers. The editorial line is a good balance between articles on the evolution of methods, articles on future challenges and articles on experiences. It is also a good balance between writers from institutional organizations and industry.

I was particularly interested in the article Portugal's cartographic responsibility in Africa as it is a good example of a positive approach to capacity building. Capacity building is essential for the IHO to progress as a collective organization as our standards and techniques are constantly evolving. The Portuguese experience described in this article has strong resonance for the Shom, which is engaged in similar processes. In particular, long-term support is an essential key to success. Congratulations to Portugal for what they are doing and for letting us know about it in this very nice article.