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Q1

The invention of the sonar represented a revolution in the determination of the ocean depths. Using acoustic waves, even the measurement of the deepest parts of the ocean takes only a few seconds. Sonar-based bathymetry has hugely improved our knowledge of the seafloor.
Since the first launch in the 70s, Global Navigation Satellite Systems (GNSS) have been continuously improved to the point that it is now difficult to imagine surveying without satellite positioning. The Danish Navy has been among the first performers of ellipsoidally referenced surveys.
The development of ECDIS has played a central role in the digital transition of the hydrographic community. The advent of digital nautical cartography has triggered huge innovations in how Denmark was managing and publishing geospatial data.
Finally, the S-100 family of standards is setting the path for a new generation of navigation services, which will ultimately replace the current traditional products. S-100 represents a great opportunity for a paradigm shift on how we support safety of navigation. S-100 will also support optimized ship-routing and, thus, the reduction of the environmental footprint of global shipping.

Q2

Although shipborne acoustic sensors will maintain a fundamental role for the coming years, a variety of other measurement technologies and platforms will be increasingly used.
Remote sensing will play an important role in this context. Specifically, spectrally derived bathymetry (SDB) has evolved considerably, and machine learning will likely play an important role in developing effective depth predictors.
Trusted Crowd-Sourced Bathymetry (TCSB) is ready for becoming operational, benefiting from the implementation of the VDES (AIS 2.0) technology for data transfer prioritization and scalability. The installation of a network of smart devices aboard designated partners' vessels has potential for becoming one of the primary sources of hydrospatial information.
The use of autonomous surface vehicles (ASVs) will also gain momentum in the next few years. However, to fully embrace autonomous surveying smarter sensors, system interfaces and algorithms still need to be developed. Nevertheless, we foresee ASVs becoming the primary platform to conduct systematic hydrographic surveys in the long term.

Q3

This is a very difficult question. There are so many great technical articles that have been published in the 100 years of IHR activity. Naming one about a specific technology or innovation would be somehow unfair for the many great ones not mentioned. As such, I prefer to mention a recently published article that is a bit different from the ones usually published on the IHR: "The Empowering Women in Hydrography Project" (https://doi.org/10.58440/ihr-28-n09). I feel the relevance of this project to finally overcome any unconscious bias and discrimination. If we do not support and cultivate the talents, skills, and creativity of women in Hydrography and hydrospatial disciplines, we will not succeed in our own mission to provide data and services for the benefit of society.