
Gustavo Adolfo Gómez-Pimpollo Crespo

Spain

Q1

Hydrography, being a science, has evolved hand in hand with technological developments mainly occurring in the last few decades. On this regard, the following milestones should be highlighted:

- GPS positioning. It meant an improvement in logistical and operational planning of hydrographic cruises, resulting in greater efficiency in survey performance as well as greater accuracy in data captured.
- Introduction of the multi-beam echo sounder. It meant a notable leap forward in quality compared to the single-beam echo sounder, by attaining total coverage of the seafloor, which made it possible to identify potential dangers to navigation not detected with the previous technology, and to improve data used to produce nautical charts, increasing the safety of navigation.
- The use of unmanned vehicles, not as a part in the history of hydrography, but due to their current and future relevance, they will have a great impact in the development of hydrographic surveys.

Q2

The main technological development in the hydrography field will be using Artificial Intelligence (AI) in the cartographic production line (such as using AI to edit bathymetric data) regularly.

Indeed, there are already companies that have developed AI algorithms to edit acquired bathymetric data, but these algorithms are the first steps of research, considering that much more advanced algorithms will be achieved for use in the field of hydrography, oceanography and geodesy, both in machine learning and especially in deep learning.

The employment of AI will allow the collection of a large amount of bathymetric data obtained by a large number of vessels sailing with multi-beam echo sounders around the world. All this information will be stored in clouds for processing and integration into their companies or hydrographic services.

This is another great challenge for humankind, to have better knowledge of the seafloor because we have already mapped about a quarter of our seas and oceans, especially in deep waters. That is to say, we are still far from knowing what we have underwater, and the resolution of our global map is lower than that of the Mars surface.

Q3

It is complicated to choose only one because there are many interesting articles. However, there is one that I want to highlight, the article "Review of active and passive optical methods in Hydrography" written by Dr. Gottfried Mandlbürger. I liked this article quite a lot because it is very complete. It is very complicated to explain clearly in one article the different employed optical methods (active and passive), their use on board platforms (satellites, crewed or unmanned aerial vehicles and remotely operated vehicles), the available different acquired data processing techniques, as well as indicating the great variety of applications these methods have.
