

# Top 10 Most Read Articles in Hydro International 2016



We are revealing Hydro International's ten most read articles in 2016! We did not tweak anything: this is what it is! So this list gives you an indication on what is hot in the hydrographics industry. Underwater communications, positioning and technical backgrounds of sensor technology appear to be the key topics in our field as of 2016. Let's see what next year will bring! For now: enjoy looking back at the trends and developments of the past year, and get a good insight into the state of today's surveying profession.

## [Technology in Focus: Underwater Electromagnetic Propagation](#)

Underwater wireless communications links have almost exclusively been implemented using acoustic systems. Optical links have proved impractical for many applications. Although underwater radio links were experimentally evaluated in the pioneering days of radio, they did not meet the requirements of the time. Given modern operational requirements and digital communications technology, the time is now ripe for re-evaluating the role of electromagnetic signals in the underwater environment.

## [OpenSeaMap - the Free Nautical Chart](#)

Nautical charts are expensive, and in many countries data are not always up to date. OpenSeaMap is an alternative solution which is free for anybody to use worldwide. Following the example of Wikipedia, the data are collected by volunteers and are visible on the chart within just a few minutes. OpenSeaMap involves experienced mariners, programmers and thousands of data collectors, all of whom are working to produce a nautical chart with comprehensive, relevant and up-to-date data for water sports which is open to everyone and free of charge.

## [Deep-water Black Box Retrieval](#)

Restricted operating life, limited range and bearing ambiguity in deep water are the known limitations of current locator beacons mounted on aircraft. These problems raise important questions: what is the best method of locating existing pingers and what can replace them? In deep water, pinger detection equipment could be installed on a submarine. Alternatively, a transponder beacon can provide both range and bearing information, as well as demonstrate a significantly longer listening life. Although heavier and therefore not suitable for light aircraft, commercial aircraft could easily accommodate such beacons allowing easier retrieval of the aircraft black boxes.

## [Safe Navigation with Uncertain Hydrographic Data](#)

Despite the best efforts of Hydrographic Offices (HOs) around the world, the ENC's that are on the market today do not always depict the real world as accurately as would be desired. This situation arises because gathering detailed hydrographic data is slow and consequently, ENC's (and paper charts) are compiled from multiple data sources, some modern and comprehensive, some old (even ancient) and others from all stages in between. When the IHO developed the S-57 standard this situation was recognised and the quality of survey data used to compile ENC's had to be encoded within a composite data quality indicator 'Category of Zone of Confidence' (CATZOC).

## [Thirty Years of Discovering the Mariana Trench](#)

Thirty Years of Discovering the Mariana Trench On 23 March 1875, HMS *Challenger* sounded in 4475 fathoms at latitude 11°24N, longitude 143°16E to the southwest of the Mariana Islands and north of the Caroline Islands. Because this great depth was unexpected, the *Challenger* scientists sounded twice to ensure the accuracy of the sounding. Occasionally this depth has been reported as the greatest valid depth known up to that time, but in fact that honour fell to the USS *Tuscarora* which had sounded in 4655 fathoms in what is now known as the Kuril Trench in 1874.

## [Technology in Focus: How Does Inertial Navigation Work?](#)

In hydrography, we are used to working underwater where no positions are available from satellite navigation systems. In other professional fields, experience has shown that position updates from satellites may not always be available, or are potentially incorrect: examples are unintentional jamming of the extremely weak GNSS signals and signal reflections leading to erroneous positions. With a few exceptions, the future of back-up terrestrial positioning systems is uncertain. And there are also applications for which position updates are necessary at higher frequencies than satellite systems can provide for.

## **Technology in Focus: Multi-beam Echosounders**

The evolution of multi-beam echo sounders (MBES) is leading to systems with enhanced capabilities in their traditional markets, but also provides features to allow the expansion of their use into new areas and applications. This short review highlights some of the features of the latest generation of systems. The attributes of an MBES system are traditionally described by technical specifications, such as operating frequency, pulse length, beamwidth, number of beams and coverage. These technical parameters define the nature of the system, but the fundamental characteristics of greatest interest.

## **Introducing GIS to Support Maritime Accessibility**

With over 500 line connections to and from more than 1,000 ports around the globe, the Port of Rotterdam in The Netherlands is the cornerstone of international freight transport. It is the perfect base for import and export and a gateway to the European market and its more than 500 million consumers. However, this favourable location has one downside, namely siltation. Therefore, hydrographic surveys are conducted on a daily basis in the Port of Rotterdam using a survey programme based on siltation rates, dredging operations, port operations and client requests.

## **SMD Deliver Seep-sea Mining Vehicles**

Subsea engineering company SMD has passed a significant milestone as the MV *Happy Delta*, loaded with the world's first deep sea mining vehicles, has left the Port of Tyne in the UK. As well as the three mining machines or seafloor production tools (SPTs), SMD designed and manufactured the full spread equipment required to remotely operate, launch and recover the SPTs from the deck of the ship onto which they will be installed in 2017. The SPTs and associated equipment, totalling over 1,000 tonnes, have been loaded onto the vessel which has set sail for Duqm Port in Oman where they will undergo further testing.

## **Technology in Focus: Insides of Side-scan Sonar**

Although today's multibeam echo sounders come with a backscatter option the more traditional Side-scan Sonar (SSS) still has many advantages when it comes to bottom imaging. Over the past years, SSS technology has gone through an evolution rather than a revolution. In this article we will zoom in on the current state of the art of this useful acoustic imaging device.

**...and one runner-up as bonus:**

## **Creature From the Deep: 'Monster' Discovery of Nessie**

Mid-April 2016, Kongsberg Maritime Ltd, UK, has uncovered the elusive Nessie. That is, the long lost model of Nessie which was used during filming of 1970's 'The Private Life of Sherlock Holmes'. The discovery was made during a survey of Loch Ness, led by Kongsberg Maritime Ltd and supported by The Loch Ness Project and VisitScotland. Operation Groundtruth is the first survey of its kind in Scotland, making use of Kongsberg Maritime Ltd's MUNIN AUV (Autonomous Underwater Vehicle). The underwater vehicle is able to map vast areas up to a depth of 1,500m at high resolution.