

# Blue Data: Unlocking the potential

At this critical time for our global seas and oceans, experts from across the marine industry joined forces to address the big marine questions

“Almost everything, from the clothes we wear to the food we eat has crossed the ocean one way or another. The Blue Economy is an enormous market, comprising as much as 90% of world trade and is expected to be worth some £3.2 trillion by 2030.” These opening remarks from James Bidwell, co-founder of Re\_Set and chair of the Springwise innovation intelligence network, set the scene for this year’s Blue Data Conference hosted by the UK Hydrographic Office (UKHO) in late January.

The series of virtual talks and panel discussions explored how digital and data transformation is redefining the future of marine navigation, driving safety standards, unlocking new efficiencies, and supporting the advent of autonomous shipping. And particularly appropriate as we enter the UN Decade of Ocean Science for Sustainable Development, the Conference tackled broader issues such as environmental protection, offshore renewable energy, and how a sustainable marine economy has the potential to change millions of lives.

“Across the entirety of the Blue Economy, data is a key enabler in unlocking vast economic and social opportunities. Our future is Blue”, affirmed Bidwell, who added, “The stakes are high but the opportunities are boundless.”

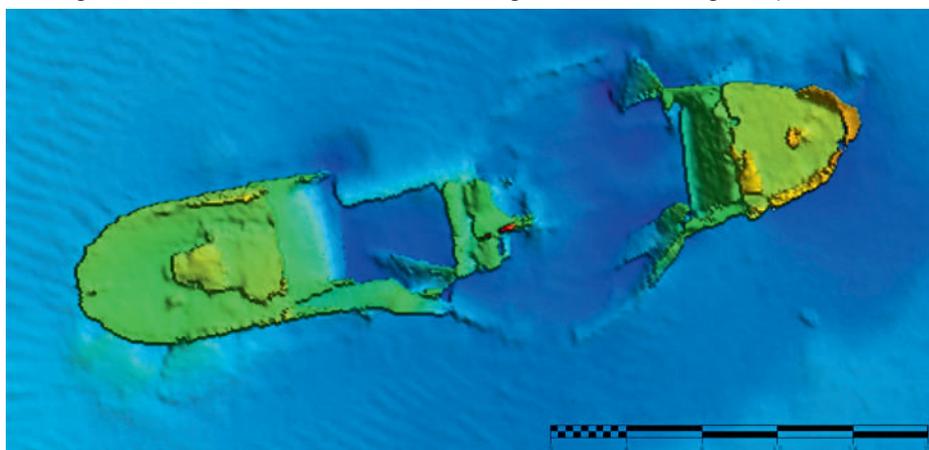
## Stable foundation

A scalable, open framework on which to realise those opportunities was the theme of a presentation by George Huish, Product Manager at the UKHO. Having outlined the numerous definitions and variations of a Marine Spatial Data Infrastructure (MSDI), he focussed on the UKHO’s adoption of the UN-GCIM Integrated Geospatial Information Framework as a stable foundation on which to build and evolve.<sup>1</sup>

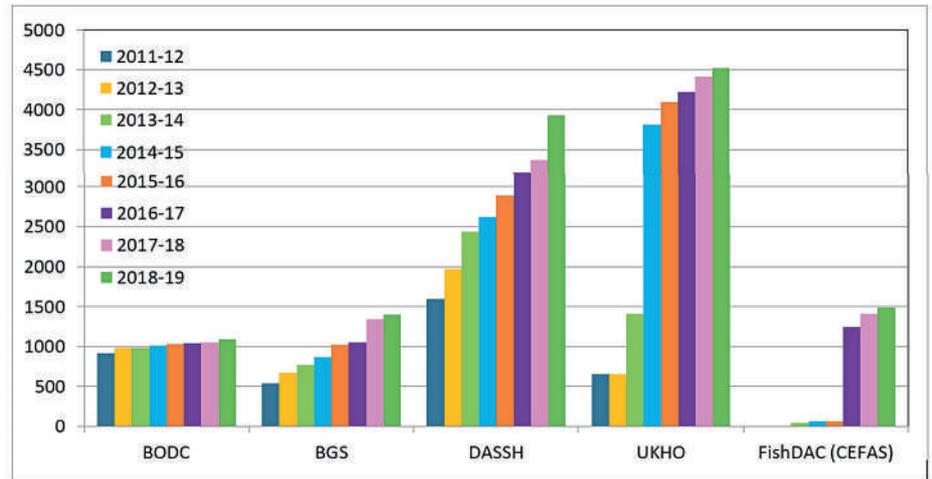
It is on this basis that the UKHO is building an MSDI that will make data

findable, accessible, interoperable and reusable. Huish noted how the organisation is exploiting its wealth of oceanographic data to support sustainable economic growth, not least in coastal states affected by climate change. That data also held out new opportunities in activities ranging from offshore renewable energy to marine conservation, and from coastal tourism to disaster resilience.

In expanding the frontiers of marine geospatial data, he described how the organisation is working with partners on



Improving navigational safety. This previously uncharted wreck was found in waters off Anguilla as part of the UKHO’s Overseas Territories Seabed Mapping Programme. Image: UKHO



Growth in the number of marine datasets held by a subset of UK bodies and collated by MEDIN's Data Archive Centre. In total, some 12,800 datasets have been archived and 2.8 million requests for data were received during 2018-2019. Source: MEDIN

a seabed mapping programme to improve shipping safety and environmental protection for 14 British Overseas Territories.<sup>2</sup> Implemented as a series of marine data portals, he said the results have been encouraging but accepted that there is long way to go, with many island states facing massive challenges. "But with access to high quality and trusted marine geospatial data, they will be equipped to make better collective decisions about how to protect their oceans and ensure a sustainable and prosperous future in the Blue Economy," he concluded.

**Crucial role**

The role for geospatial data, products and services in the marine economies was elaborated by Claire Jolly from the Organisation for Economic Co-operation and Development (OECD). As Head of its Ocean Economy Group<sup>3</sup>, her remit is to improve the measurement of ocean economic activities and explore how science and innovation can boost sustainability. Geospatial data contributes to both activities, said Jolly, who went on to examine how such data is crucial to our understanding of ocean dynamics and, thereby, able to deliver economic and societal benefits.

As well as working with NOAA to study

the commercial take-up of marine data products, the OECD has launched a number of initiatives to map the data flows of selected public sector repositories. The first to bear fruit is one conducted in collaboration with the Global Ocean Observing System (GOOS)<sup>4</sup> and Britain's Marine Environmental Data and Information Network (MEDIN).<sup>5</sup> This looked in detail at the flow of data across selected marine activities in the UK and found that the siting of offshore wind farms and other commercial activity, including coastal tourism and port development, are absolutely reliant on geospatial marine data. "This is not only because it makes sense for operational and environmental protection reasons, but also because of regulations that require new actors to make use of the data and demonstrate the sustainability of their proposals," explained Jolly.

In turning to the growing importance of marine geospatial data for developing countries, Jolly cited a recently-published OECD report on Official Development Assistance.<sup>6</sup> This, she said, established the value of marine geospatial data in justifying both shore-based and offshore investment.

Improving the long-term sustainability of our oceans, gaining a greater understanding of the marine environment, and assessing

the impact of economic activity would, concluded Jolly, remain key goals for the OECD.

**Meeting goals**

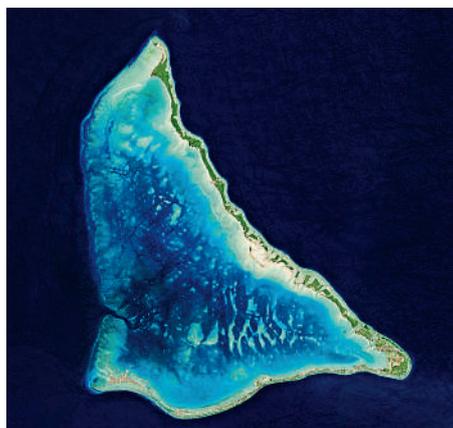
The theme of sustainability was taken up by Sam Harper, UKHO's Head of Hydrographic Programmes, who reviewed how seabed mapping and Blue Data contributes to that goal. Yet there remains a global deficit of seabed data, with the IHO estimating that 80% of the Caribbean seabed is yet to be mapped. This figure increases to 95% in the Pacific, and even in UK territorial waters, upwards of 60% of the seabed remains to be surveyed.

Nautical charts for safe navigation at sea are, of course, a principal driver in gathering hydrographic, bathymetric and seabed mapping data, but its wider uses are many and varied said Harper. These include helping to deliver on multiple development goals such as SDG and where a clear and holistic picture created by marine geospatial data can help balance competing priorities.

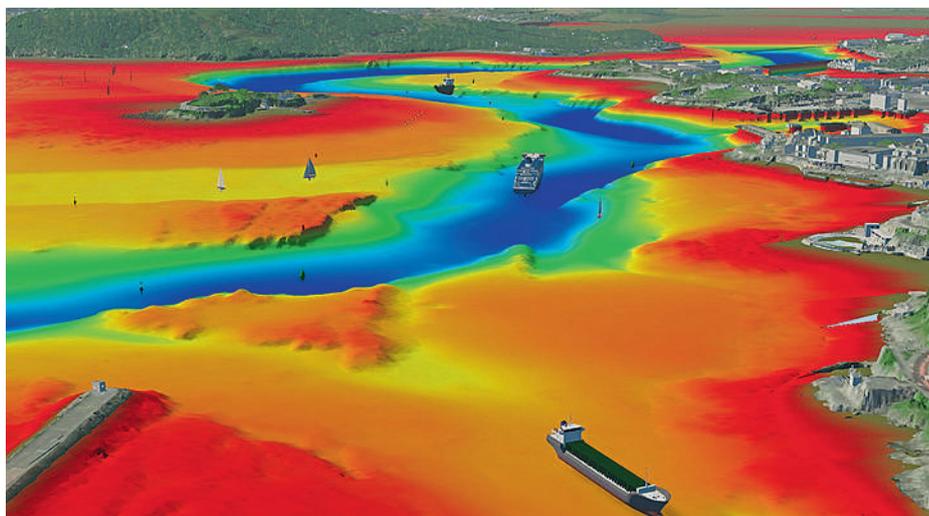
Harper went on to outline some of the pressing challenges facing the Blue Data community. The funding of seabed mapping is a particular issue, given its expense and complexity, and the case for greater



Blue Data is the keystone to many and varied activities. Source: UKHO



Holding back the tide in Kiribati. Consisting of some 33 atolls with a land mass of just 800 km<sup>2</sup>, the island nation is surrounded by 3.5 million km<sup>2</sup> of ocean. This image, acquired by the Copernicus Sentinel-2 mission, shows the string of islets within Kiribati's Tarawa Atoll. Image: ESA



Simulation of an autonomous vessel navigating Plymouth Sound, using GMT's award-winning navigation system. Image: BMT

investment is irrefutable. Ocean literacy, capability and capacity is another challenge, particularly for developing nations that lack the people and tools with which to conduct seabed mapping for themselves. The lack of a shared lexicon for how we talk about and describe the ocean environment poses another challenge, as does the difficulty of identifying the various value chains into which Blue Data feeds.

Following a review of UKHO's charting portfolio, Harper presented a case study on the compilation of seabed mapping for Belize as part of the Commonwealth Marine Economies Programme.<sup>7</sup> Here, data was gathered in a way that not only delivered up-to-date nautical charts, but also lent itself to a host of further uses by project partners within UK government, by key stakeholders in Belize, and by overseas agencies such as the Miami-based National Hurricane Center.

Harper also described how the UKHO will conduct a scoping study for the independent island nation of Kiribati in the Central Pacific ... one that could be completely submerged by the ocean due to rising sea levels. Using satellite-derived bathymetry (SDB) for over 2,500 km<sup>2</sup> of ocean, the study will help identify areas most at risk to flooding and plan vital sea defences. Here, the UKHO is working for the first time with members of the international finance community that are underwriting the project. "This is the sort of partnership we need to do more of as a community, especially if we are serious about meeting some of the higher Sustainable Development Goals," suggested Harper.

### Navigating the way ahead

With estimates suggesting that autonomous shipping could be worth a staggering £111 billion and employ well over half a million people by 2030, there was much to discuss in a panel session hosted by Alisdair Pettigrew, MD of BLUE Communications.

Dan Hook, MD of Ocean Infinity opened the discussion by looking at the pros and cons of uncrewed operations but saw a steady gain in net benefits. A lowering of CO<sub>2</sub> emissions, a significant reduction in offshore power consumption, and the opportunity to lower offshore HSE exposure were all being reported. "In terms of overall operational efficiency, we also seeing unmanned vessels gathering more data and doing tasks more quickly and efficiently," said Hook. In looking to the future, he saw the optimisation of communications, better operational planning, training and simulation, and the development of ever-richer navigational models as fundamental to growth in a sector that is quickly coming of age.

Mark Casey, Head of Research, Design & Innovation at the UKHO, agreed with the need for more comprehensive navigational data, for the current generation of Electronic Navigation Charts were never designed for uncrewed vessels. "Such charts are only a representation of ground truth, can suffer data inconsistencies, and have been compiled purely to help experienced mariners make informed decisions," he said. However, by encoding and adding new datasets such as high-resolution gridded bathymetry in a machine-readable format, autonomous navigation would be made safer, less polluting and more efficient. Although some way off, he saw solutions based on the IHO's new S-100 Universal Hydrographic Data Model as paving the way.<sup>8</sup>

Needless to say, the UKHO is heavily involved in pushing the boundaries, not least with its 'Unlocking Autonomous Navigation Challenge' for innovators and start-ups. At the end of last year, Taunton-based design, engineering, and risk management consultancy BMT was the first to be awarded funding under the scheme for its new, enhanced navigation system.<sup>9</sup>

Katrina Kemp, Smart Ships & Automation Policy Officer at the Maritime and

Coastguard Agency, rounded-off the session by outlining how the agency is putting measures in place to fill the void of a virtually non-existent regulatory framework for autonomous operations. Easier said than done, but progress was being made to update the Workboat Code for autonomous vessels of under 24m. The MC&A is also working with the IMO to ensure that any domestic regulation is compatible with international standards. "It's not an easy task, but everyone I speak to agrees that this is what needs to happen," she concluded.

**Further information on these and other presentations delivered during the course of this year's conference can be found at [https://discover.admiralty.co.uk/blue-data-conference?utm\\_medium=email&utm\\_source=campaign&utm\\_campaign=Blue-Data-Conference-2021&utm\\_term=viewagenda&utm\\_content=registrationconf](https://discover.admiralty.co.uk/blue-data-conference?utm_medium=email&utm_source=campaign&utm_campaign=Blue-Data-Conference-2021&utm_term=viewagenda&utm_content=registrationconf)**

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