

World Hydrography Day 2024

7 questions to Stewart Dunne, Former Hydrographer of Australia

Interviewer: Knut Hartmann of EOMAP



Stewart Dunne joined the Royal Australian Navy in 1990 and has a wide operational and capability acquisition background. He specialized as a Hydrographic Surveyor in 2000 and was selected as Hydrographer of Australia in 2020, leading the Australian Hydrographic Office and representing the Government's hydrographic interests domestically and abroad. He transitioned from the Navy in 2024 and is currently a Director of his own consultancy business, AusPac Hydrosatial, and a Non-Executive Director on the Board of the Geospatial Council of Australia.

Knut Hartmann:

Stewart, you're a highly experienced hydrographer. It is a great honour to hear your thoughts on occasion of this World Hydrography Day. - Personal pathways to hydrography often are the most interesting ones. So, let's dive into this interview: How did your career begin and what made you engage in hydrography?

Stewart Dunne:

A hydrographic career was not on my radar when I left school nor when I joined the Royal Australian Navy. Ten years into my career, I was told to specialise, and I wanted a vocation that was interesting, allowed to work outdoors and was scientific as a discipline. Luckily, hydrography was a Navy specialisation and as a career path offered everything that I was after and allowed me to contribute to both the national and military survey tasks. I undertook my early training in Sydney and then my advanced training through the Royal Navy and Plymouth University. It's been a wonderful career, taking me to very remote places throughout the region, conducting surveys that have contributed in very meaningful ways. In my later careers years, the role of Hydrographer of Australia was the pinnacle of my time in Navy and allowed me to lead and manage the Australian Hydrographic Office, deliver the HydroScheme Industry Partnership Program and represent Australia both as a Navy Officer and a hydrographic surveyor in many domestic and international fora.

Knut:

Today is 21st June, World Hydrography Day. This year's theme is "Hydrographic Information – Enhancing Safety, Efficiency and Sustainability in Marine Activities". What does this mean to you?

Stewart:

This is a great theme. It really points to the value of hydrosatial information as underpinning all that is important in the maritime domain. It supports and delivers safety of life at sea through the provision of nautical charts, it protects our environment and the marine flora and fauna within, it allows us to legally claim our maritime boundaries, it facilitates most of Australia's trade and allows us to exploit the marine environment in a safe and sustainable way. It is fundamental to almost every marine activity.

Knut:

The first World Hydrography Day was held in 2006. Can you describe the journey of hydrography in these 18 years?

Stewart:

The hydrospatial industry has undergone considerable transformation, driven by technological advancements that include the ongoing progress in digitisation, computer and data processing capabilities and other technologies and tools such as earth observation and autonomy. Sensors and equipment have become smaller, and in many ways more complex and the way we process, quality control and manage data is becoming more automated and increasingly is being done remotely. The internet has become widely available at sea, and has allowed a move to autonomy and remote survey operations and data transfer that will continue to develop exponentially. This will not negate the need for qualified and experienced surveyors in the future, I argue the other way, there will never be a greater need, but our roles, where we do our jobs and the tools we use have and will change significantly. I can still remember conducting a part of a survey in 2006 using a leadline!

Knut:

Thanks for this review! - As you can imagine, I'm specifically interested in your experience with the use of satellite technology for shallow water mapping. From a technological perspective, the ability to advance shallow water mapping and to monitor coastal changes – without being physically on site – keeps fascinating me. What do you see in SDB, and could you share an example of your experience?

Stewart:

I'm a firm believer that for the users of hydrospatial data, products and services there is no one tool that will meet your needs. Satellite Derived Bathymetry (SDB) is a key tool in your toolbox. SDB has wide utility. I'll give you two examples of how we used this in my previous workplace: The Australian Hydrographic Office collects hydrospatial data for both national charting and military purposes. On the national side, SDB is used as a planning tool to better understand where data collection surveys should take place and then once decided, the data is used as a safety tool to understand where the dangers to navigation lie. The ability to 'see' and then correctly position navigation safety hazards, such as reefs etc, allows every Hydrographic Office to update charts in a way where it most matters. I would say that every country has charts that are outdated, SDB is a great tool to help remedy aspects of this. In Australia, we also observe the progress other nations make. The UKHO was the first Hydrographic Office worldwide to integrate SDB and use it for official British Admiralty charts. We saw that they had contracted EOMAP, the technology leader with almost 20 years of experience in this field, and decided to work with them, too.

On the military side, the software tools by EOMAP, such as WATCOR-X, and the discrete way the data is collected, provides advantage and I believe offers an essential tool for military planners and operators in the field. These tools open up more of the operating environment than just the traditional way militaries collect environmental data in times of competition and conflict.

Knut:

I'm representing EOMAP, a service provider for satellite-derived bathymetry and hydrographic remote sensing. From my experience, your innovative approach and uptake of new technology in Australia is amazing. On the other hand, I've noticed that some other Hydrographic Offices or Navies are more reluctant to embrace innovations, especially if these come from abroad. What would you say to them from your experience?

Stewart:

From my experience, the long involvement with EOMAP has helped us better understand the wide utility of earth observation data, products and services. SDB and hydrographic remote sensing give the end user far greater reach, a hands-on approach in the office, quicker results for a fraction of the cost of traditional data collection means. SDB does have limitations though, but like every new technology you adopt, it's about understanding what you are using and implementing it in a fit for purpose way. Hydrographic Offices and militaries around the world should be early adopters of innovation and technology because our clients and end users of our products are!

Knut:

Now, we've already looked 18 years back, but how about the coming 18 years? What do you consider the upcoming technologies and drivers of highest relevance for the hydrographic domain?

Stewart:

I'll go back to a previous comment I made: Transforming work practices from an essentially manual system into a digital cloud-based data system and moving from a crewed to an uncrewed system will likely drive cost savings in the long term and will be key drivers in how the industry operates. Data collection will increasingly prioritise quality control and feature remote work. I think holders of data need to understand that in the modern era, data collection, management and storage are, generally speaking, very expensive and a sunk cost.

How we unlock the true value of the data is by building contemporary and exploitable foundation datasets and making this available to multiple users. From a government perspective, this is about making data available across agencies. The maxime, that you should collect once and use multiple times, is absolutely true. To fully exploit the innovations that are available – digital twins, virtual and augmented reality – you need good – quality and quantity – data. SDB has a great role to play here.

Knut:

I understand that hydrography has been – and still is - a very male-dominated field. Future developments will probably encourage more gender equality and diversity, as the field tends to become more interdisciplinary and involve more career paths. Just to state, we've an almost equal gender balance in our company, so that gives me a basis. Would you say that hydrography is on the right track?

Stewart:

The hydrographic industry is getting better. The fact of the matter is that there is a growing need for suitably qualified and experienced people across all elements of our discipline. Tapping a wider, diverse workforce is the only solution and using technical innovation will underpin this. Broadening and growing our workforce will also see greater training and qualification opportunities open up as well. I recently visited Australian Spatial Analytics, a social enterprise with a high level of expertise in data services that offers a wonderful opportunity: ASA is enabling geospatial and digital engineering careers for neurodiverse adults. For me, this visit was both an education and an inspiration, as this group of people is often overlooked for work opportunities.

Innovation isn't always about getting the next best piece of equipment, it's also about changing the way we think!

Knut:

That's a great final point. Stewart, we thank you for these insights and wish you a great World Hydrography Day!