Forum for Operational Oceanography

Australian Forum for Operational Oceanography
FOO 2015 Conference
21-23 July 2015
Esplanade Hotel, Fremantle

Meeting Report

The inaugural meeting of an Australian Forum for Operational Oceanography (FOO) was held in Fremantle, Western Australia on 21-23 July 2015. With an eye to recent developments around the world, the purpose was to bring together marine industries, service providers, government agencies, and research providers to consider how we can better utilise marine observations, modelling, and computational and information systems to enhance the social, economic and environmental benefits of Australia's vast and valuable marine estate.

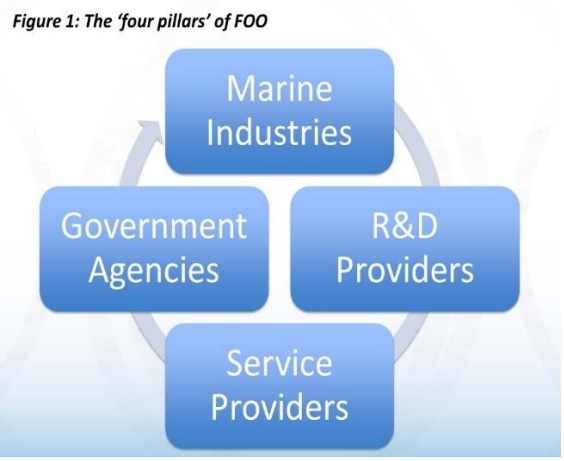


Figure 1: The 'four pillars' of FOO

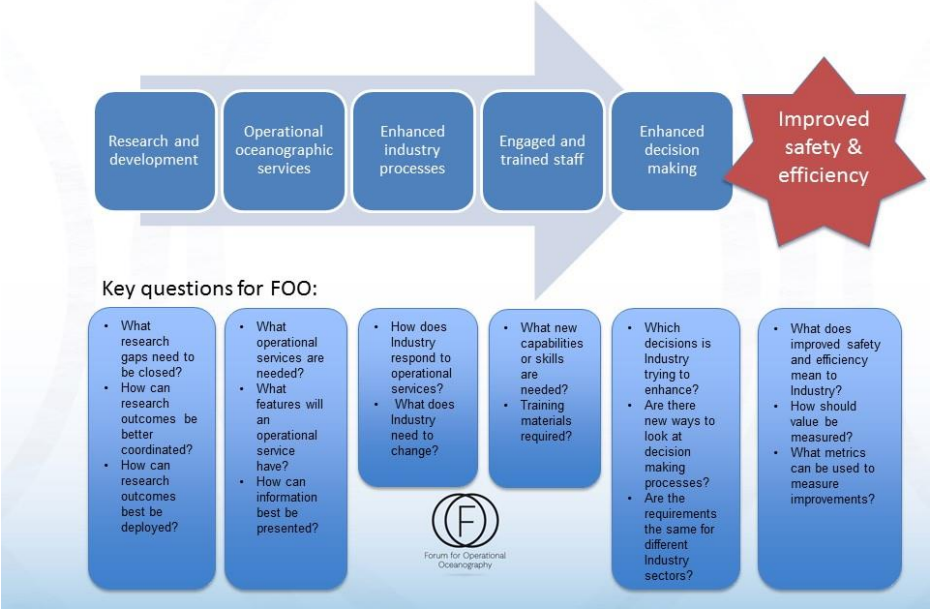
The meeting was attended by 123 invited participants from 50 organisations, with good representation from all 'four pillars' of the Forum's stakeholder base (see *Figure 1*). Full details can be found on the conference website.

Operational oceanography was discussed as having a broad definition. It is very young relative to weather forecasting, but is already providing many products and applications. It was emphasised that Operational Oceanography is both a national and international endeavour that is only possible through partnerships and collaboration. It provides an array of societal and economic benefits and there is significant potential to grow these benefits for Australia.

An overview of operational oceanography around the world was provided, covering North America, Europe, Asia and Australia. This included an international keynote from Dr Colin Grant on "Operational oceanography and the oil and gas industry – the UK experience". In summary it was noted that operational oceanography is growing rapidly in other parts of the world, with significant investments being made e.g. in new satellite missions and new centres focused on ocean services. This growth is being driven by the needs of end users including operation of critical infrastructure, management of valuable environments, impacts of climate change, saving lives and sustaining livelihoods. Integration and collaboration are consistent features of international developments i.e. across academia and industry, private and public sectors, and defence and civilian domains.

In setting the context for the meeting, it was proposed that the Forum focus on a 'value chain' for operational oceanography in Australia (see *Figure 2*). With a goal of improved safety and efficiency of marine industries in mind, this value chain would include enhanced decision making, by engaged and trained staff, using enhanced industry processes, that rely on operational oceanographic services, developed and improved through research and development.

Figure 2: The operational oceanography 'value chain'



In summing up the opening session, it was proposed that if our goal is to improve the safety and efficiency of marine industries, our reality is that Australia currently lags behind Asia, Europe and North America in operational oceanography. There is opportunity to achieve much more through better collaboration and integration. The Forum gives us a way forward, providing a mechanism to develop a Road Map for future development of operational oceanography in Australia (see *Figure 3*).

Figure 3: Goal, Reality, Opportunity, Way Forward

The meeting then proceeded into a session on assessing present capabilities, designed to bring all Forum participants up to speed on what can we do now. The scope of capabilities under consideration covered the issues of ocean circulation, sea state and weather, climate, atmosphere and ecosystems. Talks were given on observing systems, modelling systems and computational and information systems. This included a keynote by Dr Ray Canterford from the Bureau of Meteorology on "Operational marine and ocean services at the Bureau". The first day was rounded out by a high-level panel discussion on the business drivers for operational oceanography in Australia.

Australian Government
Department of Industry and Science

The meeting was sponsored by the Australian Government Department of Industry and Science, and The Honourable Ian Macfarlane MP, Minister for Industry and Science addressed the Forum on the morning of the second day. The Minister stressed the importance of the ocean to Australia, and commended the participants for coming together with a focus on bringing science, government services and industry application together with the aim of increasing ocean benefits to our island nation.

The uses of operational oceanography were then discussed through a series of invited talks and Q&As. An international keynote on "The U.S. Coast Guard's Search and Rescue mission and operational oceanography" was delivered by Art Allen (USCG). Three sessions followed on the themes of Emergency Response, Coastal and Marine Management, and Oil Spills. Local, regional and national perspectives were provided by speakers from Australia, complemented with talks from New Zealand, the United Kingdom and the United States. The second day was rounded out by a talk on operational oceanography in the Australian Defence Force.

Discussing operational oceanography from the perspective of end users proved to be very informative. It highlighted the need to understand challenges and constraints faced by operational decision makers, which condition their ability to actually use available products and services. It emphasised the importance of taking a value chain approach as outlined on the first day.

Having set the context, assessed current capabilities and considered uses of operational oceanography, the final session of the meeting focused on identifying and addressing future challenges and opportunities.

Talks selected from a high-quality field of submitted abstracts were presented on:

- Improved tropical cyclone wind and wave forecasts for offshore industries
- Assessment of metocean forecast data and consensus forecasting
- Advances in swell prediction for Australia's North West Shelf
- Wave forecast and wave climate, advances and challenges
- Enhanced storm surge forecasting services
- Operational oceanography in the nearshore.

Aided by the session chairs and international keynote speakers, all participants then worked together in plenary to discuss what next.

Most importantly, a show of hands indicated overwhelming support for the Australian Forum for Operational Oceanography to endure. Feedback about the first meeting was very positive, and participants did not want it to be a one-off event.

There was a strong desire to build on the dialogue commenced at the meeting to establish effective, ongoing communication between Forum participants. A number of suggestions were made regarding additional stakeholders the Forum could engage who were not represented at the first meeting. It was noted that such a meeting is already too big to be a working group. It will be necessary to form smaller expert teams focused on a short list of Forum-agreed priorities in order to make progress.

Candidate priority areas that emerged from discussions during the meeting include the following:

Candidate priority areas	**Aspects discussed**
1. Surface currents	Optimising Bluelink for surface currents, standardising thickness (one metre as in the US?), SLDMB data, use of high frequency radar
2. Surface waves	Source of error in swell set up, combining spectral and phase resolving models, ocean (vs lake) observations to inform source term development, shallow water bathymetry for nearshore waves

3. Thermal structure	Getting the physics right remains a key gap in economically important areas (e.g. North West Shelf), prediction of internal wave extremes, significance for engineering design
4. Consensus forecasting	Keeping pace with model development, verification, metrics, international collaboration
5. Data products	Industry using global analyses and products rather than raw data, opportunity to produce shelf reanalysis products for Australia using additional data now available
6. Data stewardship	Data quality, calibration details, data access, research/government/ industry cooperation driven by value

In terms of practical next steps, it was agreed that the participant list and all of the presentations will be made available. The Steering Committee responsible for organising the meeting will conclude its work by the end of August 2015. A new leadership team for the enduring Australian Forum for Operational Oceanography will need to evolve, taking the interests and capacities of all participants and other potential stakeholders into account.

Sincere thanks go to the Department of Industry and Science for their sponsorship and attendance, the keynote speakers, other international speakers, and all of the participants.

Prepared by the Co-Chairs
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on behalf of the FOO 2015 Steering Committee