In terms of collaboration with other global programmes and international agencies, what is JCOMM doing in order to enhance liaison, both within and outside the UN system?

JCOMM emerged primarily from the Commission for Marine Meteorology and, prior to this, was involved in working with the maritime community on marine observations and maritime safety services; our interest in this area has not decreased. Today, our primary partners in the delivery of safety services under SOLAS are the International Maritime Organization (IMO), the International Hydrographic Organization (IHO) and the International Chamber of Shipping (ICS). Most recently, JCOMM worked closely with IMO and IHO in the implementation of five new Metareas for maritime safety services in the Arctic Ocean, the requirement for which is a direct result of increased melting of Arctic sea ice and the opening up of new sea routes in that region. JCOMM also works closely with IMO in marine environmental protection, particularly in the provision of metocean services to support marine accident emergency response. It seems likely that this work will be extended in the near future to include the modelling of the transport of radioactive material in the ocean, in conjunction with the International Atomic Energy Agency (IAEA), among others. Much work has also been undertaken in the past few years with IHO and IMO in utilising new eNavigation technologies to deliver information on sea ice – and eventually meteorological conditions – to ships at sea through their onboard computers.

Recently, JCOMM has had increasing interactions with sections of the private sector such as the offshore oil and gas industry, ship builders and ship classification societies on issues related to service delivery and the implications of climate change for key ocean variables such as average and extreme waves; this has had subsequent impacts on platform and ship design. There are many other interactions, of varying importance and durability depending on the issues involved, such as with the Programme for Observation of the Global Ocean (a consortium of major ocean research institutions), and the components of the International Council for Science, the Scientific Committee on Oceanic Research, and the Scientific Committee on Antarctic Research. Whenever necessary, JCOMM also interacts with other UN agencies such as FAO and UNEP on fisheries support and coastal area management issues. Finally, we maintain close relations with the operators of satellite data collection systems such as Inmarsat, Argos and Iridium, since the utility of the operational ocean observing system depends to a large extent on such systems for data delivery.

Can you highlight some of the limitations currently facing integrated marine observing systems?

There are at least two aspects to integration here: you can integrate at the platform/deployment end; and you can integrate at the data delivery end. Both are valid and are being addressed through JCOMM.

Regarding the former, since the hardware and deployment costs involved with autonomous ocean platforms are substantial, one looks to maximise the return on investment by including multiple sensors on the platform. There are complications here from a number of perspectives, including sensor maintenance and calibration over time, and more complex communications/data retrieval issues. Nevertheless, JCOMM works closely with the ocean research community to ensure that multi-sensor platforms are deployed in relevant ocean areas, to deliver data to benefit the whole user community.

In addition to using multi-sensor platforms, you can also integrate platform deployments to quite a large degree. Deployment of ocean data platforms is often an expensive and logistically complex business, so it is important to try to maximise the value of every deployment opportunity by dispensing as many platforms as possible, of multiple types, with every voyage. This approach is increasingly becoming part of the operational service of JCOMMOPS, where deployment opportunities are advertised through the web site, and/or actively sought.
The second component of observing system integration brings us into the realm of the WMO Integrated Global Observing System, WIGOS. The implementation of WIGOS was formally approved by the recent 16th WMO Congress and the system seeks to deliver fully interoperable data streams from a large range of environmental observing systems into the WMO Information System, and thus to users. JCOMM participated actively in the pilot phase of WIGOS, and one outcome of this was the ocean data portal mentioned earlier. This portal, which will eventually be linked to similar ocean portals at national level – as well as to other components of WIGOS – will facilitate discovery of and access to a wide range of ocean data by all users.

How do you ensure that the marine observing system is responsive to the evolving needs of all users of marine data and products?

I would classify users here under two main categories: primary users, essentially major data processing centres, which require the data to generate products for different downstream user types and applications; and secondary users, who generally require processed data and products for specific applications. The first category includes, for example, numerical weather prediction (NWP), climate modelling, analysis and prediction and ocean forecasting, etc. For these types of applications, WMO maintains a major requirements database, to which JCOMM contributes and which informs the development and implementation of our ocean observing system. To date, JCOMM has concentrated on addressing the requirements for climate, specified through the implementation plans for the Global Climate Observing System (GCOS) on the understanding that, if we can fully satisfy such requirements, we will also cover indirectly some of the needs of other application areas. Nevertheless, we realise that ocean forecasting, for example, requires ocean data on quite different spatial and temporal scales to those for climate, and these additional requirements are now also being actively addressed.

The second category of users involves direct applications of processed data and products at global, regional and national levels. At the global level, we have users such as international shipping, where requirements for services are regulated to a certain extent through the provisions of SOLAS, to which JCOMM conforms very closely. Secondary users at regional and national levels include, for example, fisheries cooperatives, coastal communities subject to storm surges, extreme waves, sea level rise and tsunami, and of course national agencies which provide the services. Here we regularly seek feedback through the national agencies, but often also directly from the user communities through workshops and similar outreach activities. This feedback is used to revise or develop new technical guidance on metocean service provision, as well as to inform our capacity development work in maritime countries.

What plans for the future of JCOMM do you have? What direction do you anticipate moving in?

Prospects for future developments under JCOMM are, if anything, even more exciting than we have seen in the decade since its establishment. There is no doubt in my mind that the coming decade will see the widespread implementation of operational ocean analyses and forecasts, in the same way we now have numerical weather prediction models delivering accurate meteorological forecasts out to seven days and more. The development work will build around enhanced understanding of ocean processes and how to model them, together with increased real time ocean data availability, and ever improving techniques for assimilating such data into the models. Future forecast systems will involve full dynamic coupling among atmosphere, ocean, cryosphere, waves, tides and land processes such as river runoff. In fact the same dynamic coupling will also apply to the NWP models, to further improve weather and climate forecasting. The new generation of ocean forecast models will serve applications as diverse as shipping, navies, marine accident emergency response, coastal protection and coastal disaster risk reduction, marine environmental protection and management and fisheries.

The other likely area of future development will involve JCOMM expanding its remit and expertise, and embracing fields other than the traditional marine meteorology and physical oceanography. OceanObs09, the major ocean conference held in Venice in 2009, demonstrated that scientists involved in ocean biogeochemistry are closing in on the capability to systematically monitor their part of the marine environment, as well as to model some of the processes involved. There is likely to be increasing pressure on JCOMM to assist in this new development. We will clearly require additional expertise and resources to do so, but should maintain a close watch on developments, and not shy away from becoming involved when the time is right.