

GLOBE, ACOPS, PSC workshop on  
Space and the Marine Environment  
Portcullis House  
Jan22 2009

Concluding remarks of Lord Julian Hunt  
(Vice President GLOBE, President ACOPS, Vice President PSC)

The workshop broadly agreed that there is an urgent need to deal with the deteriorating state of the marine environment and that monitoring from space provides an essential contribution, both scientifically and in policy terms. There was a constructive dialogue between representatives from government departments and agencies, universities, research laboratories, space industry, and non-governmental organizations. The conclusions of the meeting should be useful for the National and devolved Governments of the UK and the responsible agencies, such as the Marine Management Organisation, Natural England, Environment Agency, and new local bodies for fisheries, tourism etc. as they establish the regulatory and operational methods for implementing the new Marine and Coastal Access Bill. The conclusions are also relevant for assisting the UK to meet its EU responsibilities for the marine environment. How bodies such as, GLOBE and ACOPS on the UK space industry and other organizations at the meeting all have world-wide interests in reviewing the changing state of the biosphere, and working with organizations internationally. The conclusions should also contribute to studying and dealing with problems of marine environment in many other regions of the world.

The introductory overview by Dr R Watson, Chief Scientist of Defra, underlined how the marine environment around the UK as well as globally is changing physically, as temperatures and acidity rise and the ocean depth varies, and also ecologically as these factors and water pollution combine to destroy plant and animal species and allow alien species to become established. The ocean depth is also varying more rapidly to further complicate these ecological processes especially along the shore line. The operational requirements for improved monitoring, including satellite derived information were also highlighted. Speakers urged a greater awareness of the situation by politicians and decision makers, though there was due recognition of the steps being taken in the UK to expand marine protected areas when the current Marine Bill is passed. The Bill is also intended to improve the planning and resolution of conflicting interests of conservation and economic exploitation of marine resources.

It is important to understand that unlike legislation for protected areas on land, such as national parks, these areas will have to be mapped and regulated through scientific study as the marine environment changes (or uses change such growth of wind or tidal power) other countries, such as New Zealand, have already shown the success of this approach which has led to acceptance of protected areas by all relevant parties.

Continuing observation and measurement will be essential. Space based remote sensing will play an increasing role, since it enables changing environment to be mapped more rapidly. The UK will be in a strong position to use this data effectively now that the new

European Space Agency's INTEGRAL Science Data Centre (ISDC) has been set up at the Rutherford Appleton Laboratory. This development complements the ESA GMES programme which incorporates satellite data into environmental monitoring and forecasting services, so onto improve their coverage and their accuracy. Enhanced monitoring of marine environmental conditions (temperature, chlorophyll concentration, sea level rise) will be possible through the ESA GMES Sentinel Satellites building on the heritage of the current missions. At the same time, this data is increasingly incorporated into computational modeling to provide operational predictions for agencies and governments in Europe initially for the atmospheric environment (e.g. London air pollution [www.airtext.info](http://www.airtext.info)) and soon for the marine environment ([www.gmes.info](http://www.gmes.info)).

Examples were given where regional marine monitoring is practically important for the UK for predicting and dealing with firstly environmental hazards such as coastal flooding and water pollution from on-shore sources and from shipping (e.g. Marine Coast Guard Agency use of radar satellites in recent years), and secondly marine resources from fishing to mineral extraction and underground oil extraction or carbon sequestration. UK government agencies are increasingly their use of satellite derived information in many of these maritime policy areas. UK scientists also contribute to understanding the global marine environment using satellite and surface sensing of temperature, waves, ice cover, biological activity etc. The whole world is affected by the variations in the Pacific Ocean surface temperature – which is monitored from space and buoys above and below the surface; the UK will be more immediately affected by melting of the Arctic ice which will soon be monitored in detail by the Cryosat satellites ([www.Esa.int](http://www.Esa.int)) due for launching in October 2009. An exciting new aspect of remote sensing is the monitoring of animal movements from space and aircraft. In some programmes (which have been approved and published by the Zoological Society of London) very small instruments on live seals when tracked from space are showing in more detail than ever before the physical properties of the surface layers of the ocean, which need to be better understood for predicting climate change and the effects of pollution.

These examples show how important it is to have excellent collaboration between agencies, nationally and internationally and open exchange of data. Such exchange tends to be more restrictive when the data is used more for practical applications than for research. It varies greatly between agencies. Much space data of value for environmental monitoring is freely available. However with tight budgets in agencies and research groups valid data cannot always be purchased so to draw up the most accurate maps for decisions making. Since the economic consequences of these decisions are considerable, either the costs of data need to be met for operational or planning purposes or there needs to be a change in the data charging arrangements. The charges for European environmental and survey data is reducing, but is still not as low as in the USA.

GLOBE, ACOPS and PSC are very grateful to all the speakers and the contributors to the discussion. Comments are welcome to the GLOBE office [www.globeinternational.org](http://www.globeinternational.org)