Subject: Ocean Biogeographic Information System (OBIS)

In 2008, the IOC Executive Council and the OBIS Governing Board discussed the possible adoption of OBIS into the IOC. The Executive Council considered OBIS a highly attractive future component of IOC Programmes, a natural partner of IODE and, in particular, the value of OBIS as a global repository for marine biological data. The Executive Council accepted the wish of the OBIS Governing Board to investigate different scenarios for a closer affiliation between IOC and OBIS, including the adoption of OBIS by the Commission. The Executive Council requested the Executive Secretary and the IOC Data and Information Management Advisory Group (IODE) to work together with the OBIS Secretariat to develop a document for submission to the 25th Session of the IOC Assembly in 2009. The urgency for a decision is due to the reduction in 2010, and termination in 2011, of the funding for OBIS from the Census of Marine Life Programme.

That the IOC has expressed interest in acquiring OBIS, once the private source of funds ceases, is not surprising. The IOC has been trying to establish an increased presence in biological marine data for many years with limited success. These data are needed by governments to satisfy their obligations to international conventions and programmes such as the Convention on Biodiversity, the Global Programme of Action and the proposed series of Integrated Ocean Assessments under the Regular Process of the UN. In addition, national programmes dealing with climate change, climate impacts and mitigation policies will be impossible to complete without the availability of the biological component from the ocean environment. Member States need to know what will happen to habitats and migration routes of marine life when faced with temperature changes and acidification due to greenhouse gases. The distribution of exotic species, loss of habitat and biodiversity due to development and environmental changes again are areas of intense concern in national and international ocean issues that cannot be addressed without the OBIS data. 

IOC Circular Letter No. 2304
(Available in English and French)

28 May 2009

To: Official National Coordinating Body for Liaison with the IOC in States Members of the IOC

Cc: The Chairperson and Vice-Chairpersons of the Commission
Permanent Delegates/Observer Missions to UNESCO of IOC Member States
National Commissions for UNESCO of IOC Member States
Officers of Major IOC Subsidiary Bodies (Scientific, Technical and Regional)
The Census of Marine Life and its OBIS Programme has energised a community of biological scientists including biogeographers, evolutionists and taxonomists that has coalesced into a global programme with real potential for growth and achievement of a suite of new information services and uses for the OBIS data. This community needs to be fostered and the interest and momentum achieved sustained by governmental action.

Preliminary discussions have found no legal or administrative obstacles to prevent the Commission adopting OBIS as an IOC project or programme. The transfer of the responsibilities from the regional network of OBIS nodes to governmental jurisdiction or oversight also appears to be reasonably achievable. The present host institution of Rutgers University in the USA has indicated that the present arrangements for space and support could continue to be provided, but a major requirement remains in terms of staffing.

There is no doubt that the transfer of OBIS to governmental responsibility will require the commitment of extra-budgetary resources from Member States, especially in the near term. The regular UNESCO budget to the Commission for the present biennium is already established and future recommendations for additional monies or staff resources from UNESCO will need careful examination and preparation.

The purpose of this circular letter is to request Member States of the IOC to consider the importance of ocean biodiversity science and the valuable knowledge and information it can generate for policy and management and how to raise the resources to support its operation within the IOC. A business plan (IOC/INF-1258) is being prepared and will be presented to the Assembly at its 25th Session (http://www.ioc-unesco.org/ioc-25); however your consideration of this matter prior our meeting would be greatly appreciated and would facilitate the decision-making process.

Yours sincerely,

[signed]

Javier Valladares
IOC Chairman
OBIS is a global network of marine biodiversity scientists collaborating to mobilise, integrate and publish primary biogeographic data, to promote and develop tools for data exchange and quality control, and to introduce biodiversity in the context of oceanography. OBIS works with the marine scientific community to enhance open availability of data, and to translate marine biodiversity data into information relevant to both basic science and sustainable management of the environment. If you have data you want to publish, contact us through info@iobis.org

The Ocean Biogeographic Information System (OBIS) has developed as a facility for finding, absorbing, integrating, assessing and analysing data about life in the oceans. OBIS aims to stimulate research and generate new hypotheses on evolutionary processes and species distributions. It serves as a basis for informed management of marine biodiversity by making data freely accessible over the internet and interoperable with other data systems. OBIS was created as the data integration component of the Census of Marine Life (CoML), but has grown beyond its original scope: any organization, consortium, project or individual is encouraged to contribute. It now integrates data from many sources, over a wide range of marine themes, from poles to the equator, from microbes to whales.

Maps illustrating the global nature of OBIS. Left: locations of the offices of Regional OBIS Nodes. Right: coverage by the different Census of Marine Life projects

The international secretariat is hosted by Rutgers University in New Jersey, USA. A global network of Regional and Thematic OBIS Nodes assures the world-wide scientific support needed to fulfil the global mandate. Strong ties exist with many of the important international environmental organisations, such as the Intergovernmental Oceanographic Commission of UNESCO and its International Data and Information Exchange programme, the Global Biodiversity Information Facility, the Encyclopedia of Life, the Convention for Biological Diversity, the Food and Agricultural Organisation and many others. OBIS and its network of Regional Nodes provide global information on marine biodiversity in this network of organisations.
Within the OBIS community, software tools are developed for data exploration and analysis. Development has been driven by a series of international conferences: first the ‘Colour of Ocean’ conference in Brussels, 2002, then two ‘Ocean Biodiversity Informatics’ conferences, in Hamburg 2004 and Halifax 2007, respectively. Smaller technology workshops have brought the OBIS community together with Google, and with the open source geospatial community.

Standards development and implementation are an integral part of the activities. Data integration on a massive scale, as practiced by OBIS, is critically dependent on appropriate standards for data exchange and documentation. When possible, existing standards are used in building the OBIS infrastructure. Where needed, OBIS plays an active role in furthering standard development. The World Register of Marine Species was developed by the OBIS community, led by its European node, as a continuously updated expert-controlled vocabulary for species names. Other quality control tools, e.g. for detecting outliers in environmental space, are being developed.

The international OBIS portal is developed and maintained by the secretariat at Rutgers, with assistance from many in the community. It provides an on-line, user-friendly search interface to all OBIS data. It offers facilities to download data, and access to external tools for data visualisation and analysis. The web site is highly used, with over a million hits per month, and more than 100,000 records viewed per day. In April 2009, it contained 18.5 million records, from 633 distinct datasets, and 105,000 species. With this, OBIS is by far the largest provider of primary data on marine species and their distributions. OBIS is recognised by all as GBIF’s marine thematic component. If you are a custodian of data not yet available through OBIS, please do get in touch to discuss collaboration.

Many more datasets exist than the ones that are available through OBIS. We want to expand the holdings, and work with data custodians to make their data available for re-use. Data are extremely valuable, and in view of the historic nature of environmental observations, unique. OBIS works with scientists worldwide to mobilise data, including targeted campaigns of data archaeology and rescue.

Below are two maps illustrating possible applications of the OBIS data. The left-hand map is a global analysis of marine biodiversity patterns. Such a global map is only made possible by the massive data integration of OBIS. The right-hand map illustrates the potential spread of an invasive species, and can be used by environmental managers to plan for action.

Sample output from OBIS. Left: Hurlbert’s index, $ES(50)$, calculated on a grid of 5x5 degrees. $ES(50)$ is the expected number of distinct species in a random sample of 50 observations; it is an estimator of species richness that is independent of sampling bias. Right: observations and potential spread of an invasive species, the lionfish. Yellow dots are actual observations; red area indicates where oceanographic conditions are similar to its native Red Sea, and how far the species could spread.