



# OBIS-SEAMAP: an Online Biogeography Database for Marine Mammals

<http://seamap.env.duke.edu/>

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## Abstract

Since its launch in 2002, the OBIS-SEAMAP project has successfully collected and disseminated marine mammal survey data from/to around the globe. As a thematic node of Ocean Biogeographic Information System (OBIS), OBIS-SEAMAP, hosted at Duke University, USA, has been one of the largest data providers to OBIS. In addition, we have developed advanced mapping and visualization technologies that were applied to the renovation of the OBIS Portal web site in October 2010; these methods provide researchers with a valuable and consistent way to explore marine mammal observation data. Recently the project has incorporated non-traditional data types such as satellite-linked telemetry, passive acoustic monitoring and photo-identification. We work directly with researchers in these fields to feature non-traditional data and provide custom-tailored tools. The OBIS-SEAMAP web site offers advanced tools including representation of oceanographic variables, spatially and temporarily scalable animation of tagged animal movements, expanded metadata search for acoustic datasets and online workflow for viewing and matching photo-identification images. In response to growing data needs for effective marine mammal conservation, more national and international agencies are using the OBIS-SEAMAP data archive and advanced technologies the project offers. Examples include: noise impacts on cetaceans, off-shore wind energy site selection, marine spatial planning and identification of ecologically and biologically significant areas in open waters. We present how the OBIS-SEAMAP data are used in such emerging conservation issues as well as our future plans to facilitate collaboration with other data holders and expand the capability of data exchange among them.

### Data holdings

2.8 million records  
from 411 datasets  
for 311 species

### Why Contribute?

- Help understand species global distribution
- Gain access to integrated visualization tools and value-added outputs
- Archive your valuable data off-site and make it available through major data centers
- All data remain your intellectual property as a data provider



OBIS-SEAMAP, Ocean Biogeographic Information System Spatial Ecological Analysis of Megavertebrate Populations, is a spatially referenced online database, aggregating marine mammal, seabird and sea turtle observation data from across the globe.

Current holdings  
#records: 2,291,295  
#datasets: 332 #species: 295  
Records by 1° cells

0-10
10-100
100-1,000
1,000-10,000
>10,000

Quick Link | Species/DataSet/provider name or ITIS TSN/DataSet ID

Browse Species | Browse Datasets | Advanced Search

Scientific name begins with Cetacea

Scientific name	Common name	Rank	#records	#datasets
Aves	Birds	Class	2,162,181	78
Mammalia	mammals	Class	289,748	238
Theria		Subclass	289,713	238
Eutheria		Infraclass	289,713	238
Carnivora	carnivores	Order	59,018	80
Cetacea	cetaceans	Order	210,454	226
Sirenia	dugongs	Order	20,241	8
Reptilia	Reptiles	Class	170,003	158

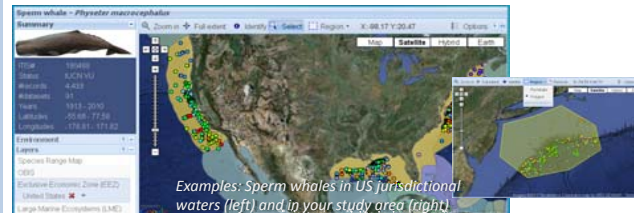
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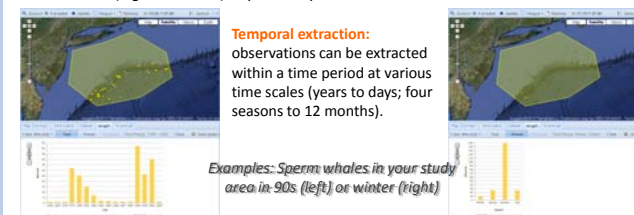
Award Number: OCE-1138046

## What Makes OBIS-SEAMAP Unique?

### Exploring data in space & time

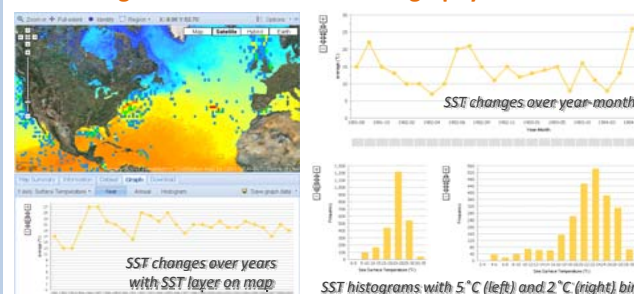


**Spatial extraction:** observations can be extracted within commonly referred zones (e.g. EEZ or LME) or your study area.



**Temporal extraction:** observations can be extracted within a time period at various time scales (years to days; four seasons to 12 months).

### Associating Observations with Oceanography



**Summarize:** Environmental variables sampled on sightings are summarized on time-series graphs at various time scales as well as histograms with adjustable bin sizes.

**Download:** Sampled environmental variables are included in downloads (CSV or ESRI shapefile).

We house 2 terabytes of oceanographic data

- Pathfinder SST
- Aviso MADT SSH
- SeaWiFS / MODIS / CZCS / OCTS Chlorophyll a

## Contribution to International OBIS Network

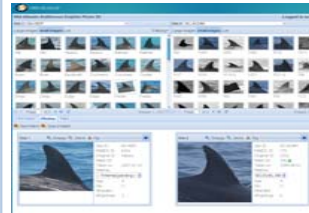


OBIS has become an official activity of UNESCO IOC & IODE\*. The OBIS-SEAMAP team made significant contribution to the renovation of the IOBIS Portal.

\*IOC: Intergovernmental Oceanographic Commission; IODE: International Oceanographic Data and Information Exchange

## Specialized Applications & Emerging Demands

### Photo ID



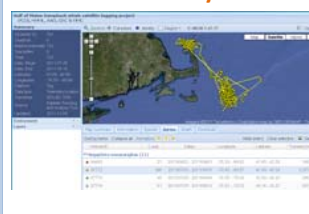
An online workflow and set of tools to compare fin images help researchers identify movement patterns of animals. The system has been implemented for the Mid-Atlantic Bottlenose Dolphin Catalog (MABDC) and Pacific Islands Photo-Identification Network (PIPIN; spinner dolphin). We look for other species and catalogs to apply to our framework.

### Passive Acoustic Monitoring



To deal with diverse methods for the detection, classification and localization of passive acoustic monitoring data, OBIS-SEAMAP continues improving data management, metadata standards, and mapping and visualization tools for PAM data in close collaboration with the Navy, BOEM and other acoustic monitoring researchers.

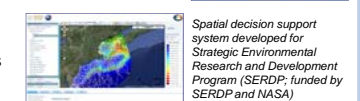
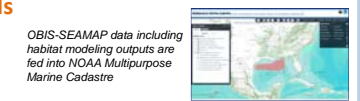
### Satellite Telemetry



Interested in mapping animal movements, tracing them in animation or associating their locations with oceanographic variables? These are some of the features for telemetry data available on the OBIS-SEAMAP web site. Telemetry data can be directly submitted to OBIS-SEAMAP or via Satellite Tracking and Analysis Tool (STAT) by [seaturtle.org](http://seaturtle.org).

## Meeting Emerging Demands

Emerging demands in marine conservation such as marine spatial planning, statistical habitat modeling, renewable energy site selection and data sharing with government agencies drive OBIS-SEAMAP to collaborative projects to develop novel analytical tools feeding in the OBIS-SEAMAP data. The OBIS-SEAMAP team have been and will be establishing stronger partnerships with NOAA-NMFS Fisheries Science Centers, the Navy, BOEMRE, NASA etc. to cope with these demands.



OBIS-SEAMAP data are used to develop density models and a data gap analysis for a NOAA Cetacean Mapping working group, which will support Marine Spatial Planning in the US

## Conclusion

OBIS-SEAMAP has evolved into an analytical & collaborative framework while remaining fundamentally a data archive & sharing platform. We strive to extend and improve services and tools that OBIS-SEAMAP has to offer to help marine mammal researchers confront emerging issues. We also seek for more data submissions and joint projects.