The Biological and Chemical Oceanography Data Management Office
Who We Are and What We Do

The Biological and Chemical Oceanography Data Management Office (BCO-DMO) was created to serve principal investigators funded by the National Science Foundation (NSF) Biological and Chemical Oceanography Sections and the Office of Polar Programs Antarctic Organisms & Ecosystems Program as a facility where marine biogeochemical and ecological data and information developed in the course of scientific research can easily be disseminated, protected, and stored on short and intermediate time-frames. The Data Management Office also provides research scientists and others with the tools and systems necessary to work with marine biogeochemical and ecological data from heterogeneous sources with increased efficacy. To accomplish this, two data management offices (former- U.S. JGOFS and U.S. GLOBEC) were united in 2006 and enhanced to provide a venue for submission of electronic data and metadata and other information for open distribution via the World Wide Web.

The BCO-DMO data management system is composed of a metadata database, the distributed client-server JGOFS/GLOBEC data system, and a Web browser interface with simple text-based and map-based user interfaces that provide access to the information and data available from the BCO-DMO repository. A distinguishing characteristic of the BCO-DMO approach is the provision of direct access to data, not just the metadata. To accomplish this, the underlying object oriented JGOFS/GLOBEC data management system (Flierl, et al. 1992), used by both US JGOFS and US GLOBEC, was retained as a very flexible, Web-based system that easily serves both data and images. It is compatible with all standard browsers. The JGOFS/GLOBEC data management system supports both distributed data servers and distributed clients through the use of standard Web protocols. It provides a simple and relatively straightforward way to make ASCII data and images available on

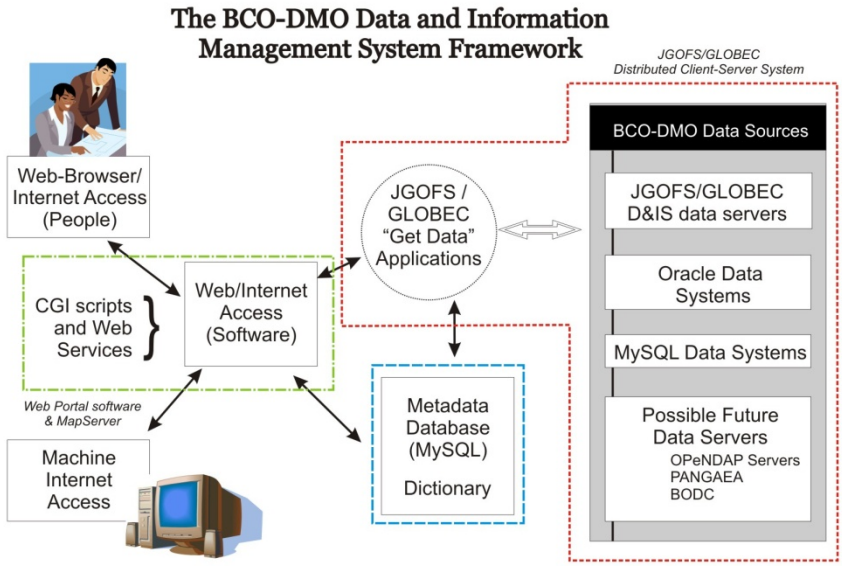

Figure 1. A drawing of the BCO-DMO data management system framework.

the Web. Consequently, the BCO-DMO data management system is composed of three major components (Figure 1): the metadata database[1], the JGOFS/GLOBEC data management system, and the Web interface supporting simple text-based and geospatial user interfaces that provide access to the information and data available from the BCO-DMO repository.

The office manages existing and new data sets from individual scientific investigators and collaborative groups of investigators, and continues to make these available online. The office works with principal investigators and other data contributors on data quality control; maintains an inventory and program thesaurus of strictly defined field names; generates metadata Directory Interchange Format records required by Federal agencies; ensures submission of data to national data centers; supports and encourages data synthesis by providing new, online, web-based display tools; and facilitates regional, national, and international data and information exchange. The data being served provide the scientific investigators with an opportunity to explore the complex and multifaceted datasets wherever they reside world-wide and to collaborate with colleagues in addressing pressing environmental questions, problems, and challenges that are exacerbated with the increasing pace of climate change.

The BCO-DMO collection of datasets are a publicly available resource accessible via the BCO-DMO website (http://www.bco-dmo.org). It supports synthesis and modeling activities, reuse of oceanographic data for new research endeavors, availability of "real data" for teachers/students at K-12 and college level to use in their classes, and provides decision-support field data for policy-relevant issues. BCO-DMO outreach activities help to foster long-term collaborative partnerships between data management professionals and research investigators through participation in community training courses and workshops both National and International. Our participation in these activities also helps to reduce community barriers by fostering the sharing of ideas between synergistic but independent research. A key component in the development of interoperable data repository systems is adoption of cyber-infrastructure standards to enable exchange of data and information between distributed data systems. Exchange of knowledge at oceanographic and informatics meetings is an important mechanism by which standards development and adoption occurs.

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[1] The existence of sufficient metadata enables the discovery and accurate reuse of data by more than just the initial investigators who collect and process the data.