

Visualizing Fitness for Purpose

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Biological and Chemical Oceanography Data Management Office
Woods Hole Oceanographic Institution

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Ecosystem Based Management
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BCO-DMO is funded by NSF

- In 2006, two data management offices (US JGOFS and US GLOBEC) were united and enhanced, and supported by an NSF grant → Biological and Chemical Oceanography Data Management Office (BCO-DMO).
- BCO-DMO is recognized in the 2011 Division of Ocean Sciences Sample and Data Policy (NSF, 2011) as one of several program-specific data offices to support projects funded by Ocean Sciences Biological or Chemical Oceanography Sections or NSF OPP ANT Organisms & Ecosystems Program



BCO-DMO staff provide data management support for investigators

We:

- Partner with individual investigators and those associated with collaborative research projects
- Support data management throughout the project
- Capture and record documentation (metadata) sufficient to support data reuse and re-purposing
- Manage data and metadata and ensure their availability online
- Archive in appropriate data center (e.g. NODC); and cooperate and contribute to special repositories (e.g. CDIAC, OBIS, GenBank)

'proposal to preservation'

We do not:

- Create “products”
- Make contour plots
- Attempt data analysis (except sometimes for quality control)
- Scrape web sites for data
- Want to duplicate the efforts of other data repositories or data collection centers

About the data and the contributors:

- We accommodate a wide variety of biological, chemical, and physical oceanography measurements, laboratory experiments, and modeling results. Metadata and data are added or updated daily.
- In addition to providing access to the **metadata**, we also provide online access to the **data** in a consistent manner, with sufficient metadata so others can make full use of these data.

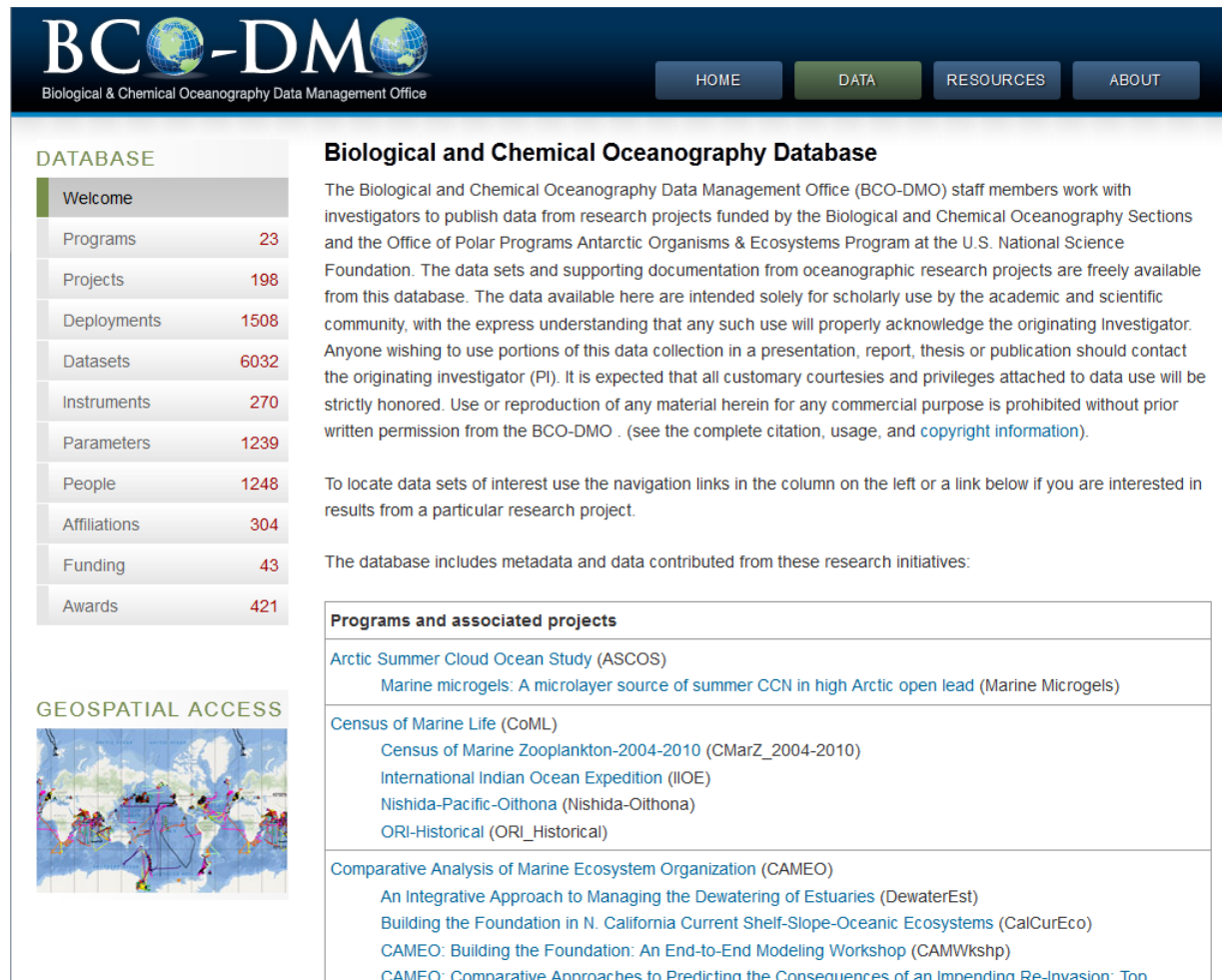
Our system components:

- Metadata are stored in a MySQL relational database
- Backend data access is via the JGOFS/GLOBEC data management system supporting tabular data, images, movies, links, etc.
- Text based access via ColdFusion (with conversion to Drupal eventually)
- Geospatial access via (OGC compliant) MapServer
- Converts our metadata to FGDC standard *PRN*
- Download/extract data in many formats including CSV, TSV, Matlab, ODV, netCDF, KML, WMS, and WFS

How the system is used:

- Text-based/category access (by people, project, dataset, award, deployment, instrument, parameter, ...)
- **Geospatial access via MapServer**
- Keyword search option within MapServer
- Faceted search in (beta) advanced search
- **Viewing the data**

Text-based access – www.bco-dmo.org



BCO-DMO
Biological & Chemical Oceanography Data Management Office

HOME DATA RESOURCES ABOUT

DATABASE

Welcome	
Programs	23
Projects	198
Deployments	1508
Datasets	6032
Instruments	270
Parameters	1239
People	1248
Affiliations	304
Funding	43
Awards	421

Biological and Chemical Oceanography Database

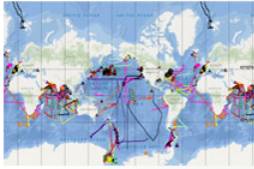
The Biological and Chemical Oceanography Data Management Office (BCO-DMO) staff members work with investigators to publish data from research projects funded by the Biological and Chemical Oceanography Sections and the Office of Polar Programs Antarctic Organisms & Ecosystems Program at the U.S. National Science Foundation. The data sets and supporting documentation from oceanographic research projects are freely available from this database. The data available here are intended solely for scholarly use by the academic and scientific community, with the express understanding that any such use will properly acknowledge the originating Investigator. Anyone wishing to use portions of this data collection in a presentation, report, thesis or publication should contact the originating investigator (PI). It is expected that all customary courtesies and privileges attached to data use will be strictly honored. Use or reproduction of any material herein for any commercial purpose is prohibited without prior written permission from the BCO-DMO. (see the complete citation, usage, and [copyright information](#)).

To locate data sets of interest use the navigation links in the column on the left or a link below if you are interested in results from a particular research project.

The database includes metadata and data contributed from these research initiatives:

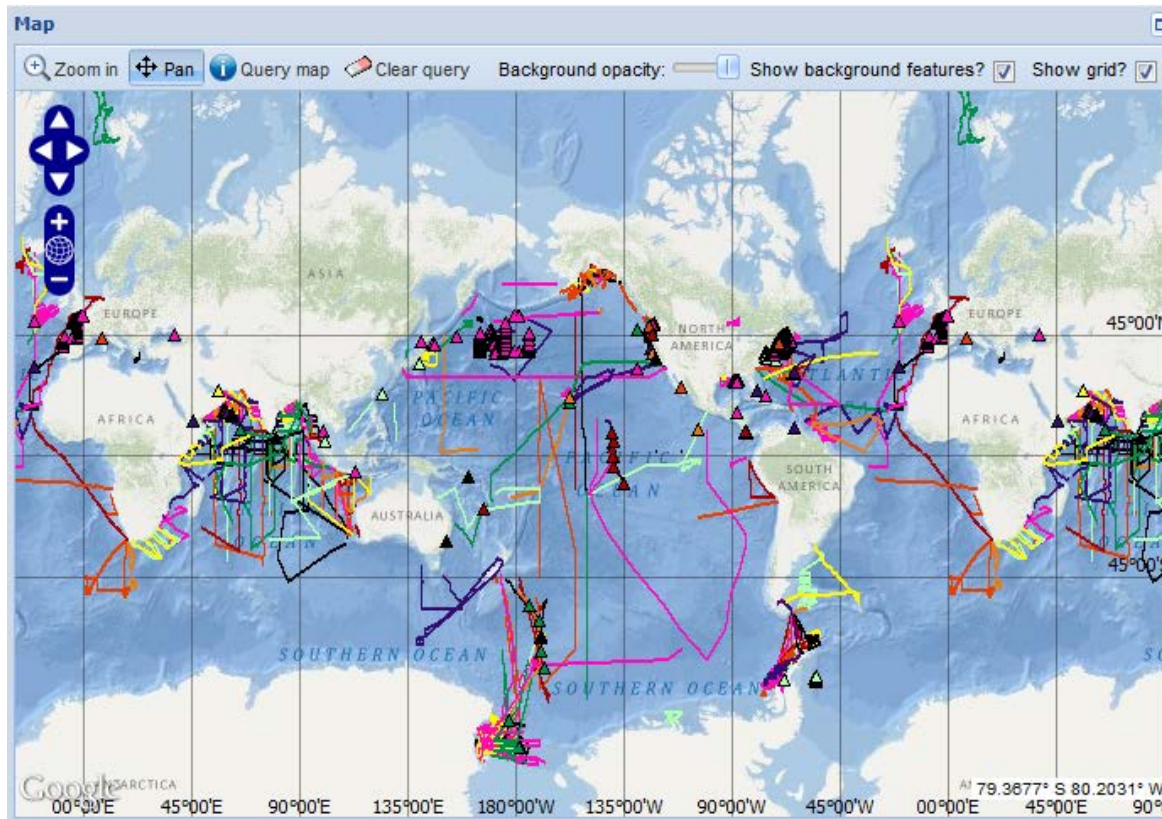
Programs and associated projects
Arctic Summer Cloud Ocean Study (ASCOS) Marine microgels: A microlayer source of summer CCN in high Arctic open lead (Marine Microgels)
Census of Marine Life (CoML) Census of Marine Zooplankton-2004-2010 (CMarZ_2004-2010) International Indian Ocean Expedition (IIOE) Nishida-Pacific-Oithona (Nishida-Oithona) ORI-Historical (ORI_Historical)
Comparative Analysis of Marine Ecosystem Organization (CAMEO) An Integrative Approach to Managing the Dewatering of Estuaries (DewaterEst) Building the Foundation in N. California Current Shelf-Slope-Oceanic Ecosystems (CalCurEco) CAMEO: Building the Foundation: An End-to-End Modeling Workshop (CAMWkshp) CAMEO: Comparative Approaches to Predicting the Consequences of an Impending Re-Invasion: Top

GEOSPATIAL ACCESS



MapServer - www.bco-dmo.org

Geospatial access is provided by the MapServer interface:

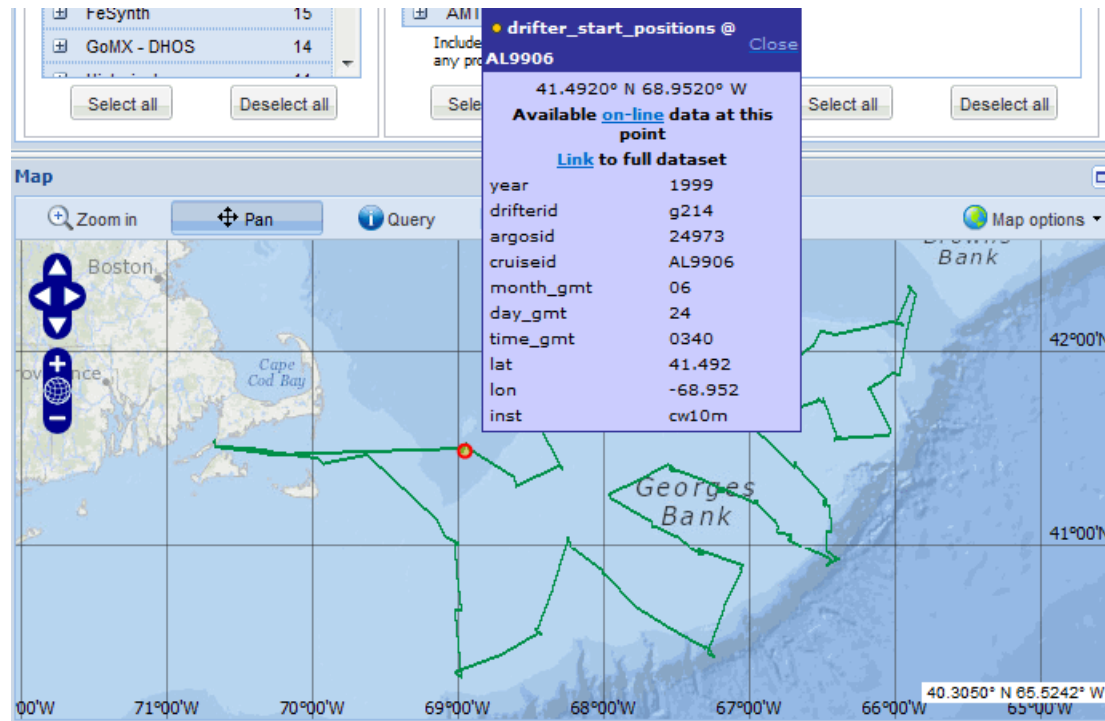


Geospatial context:

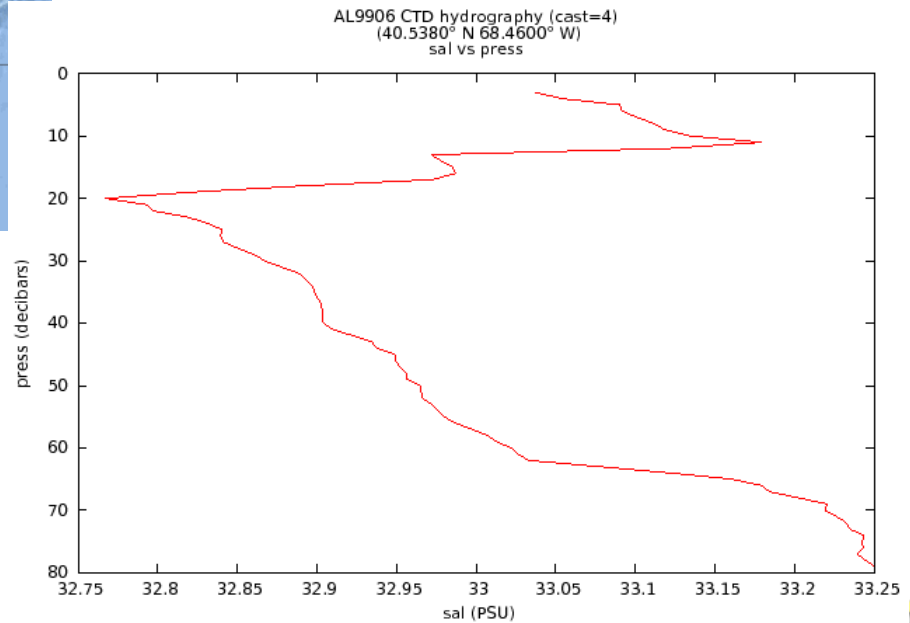
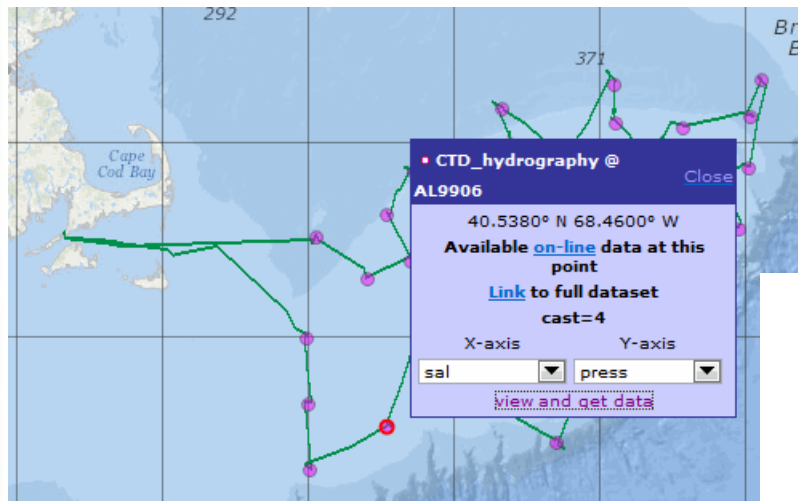
- MapServer itself provides “fitness for purpose” information
- Displays deployments, mooring locations, experiment locations
- Zoom in option
- Rubber banding (rectangular only)
- Immediate feedback on deployments in the area selected/viewed
- Selecting dataset(s) of interest
- Not discussing textual/search options in this talk

Visualization options depends on type of data

- List of parameters collected and values shown at that location



Basic X-Y plot



Biological and other types of abundance plots

Mapping options for zoo_sq_meter_moc

Narrow by taxon

- Bivalve larvae
- Bryozoans
- Calanus_finmarchicus
- Calanus_spp.
- Calocalanus_spp.
- Candacia_spp.

Scale it?

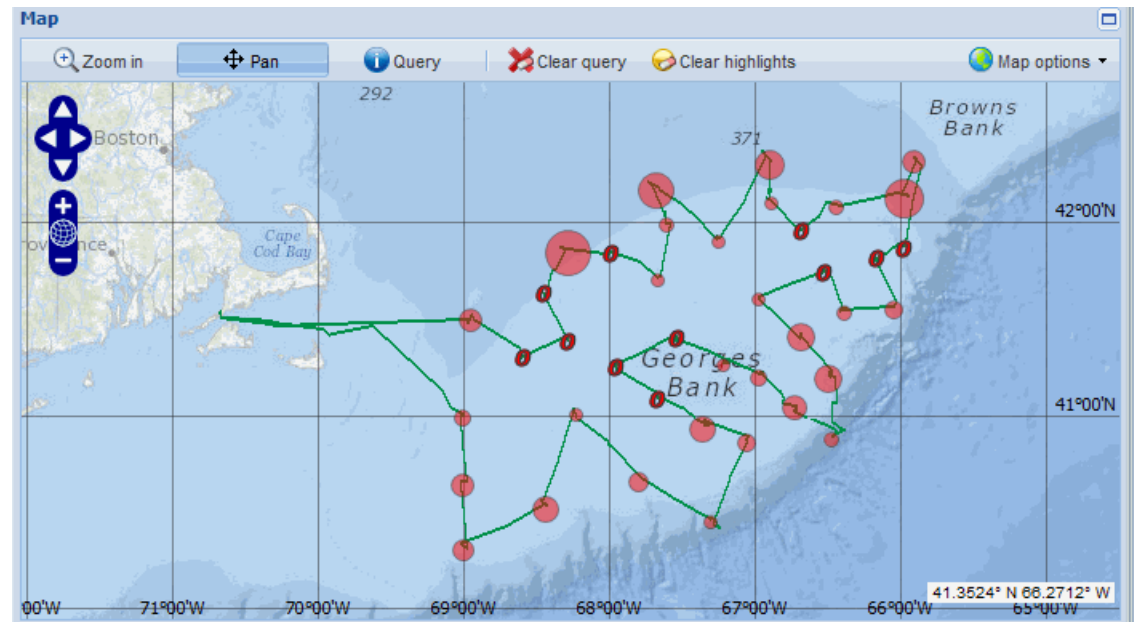
Group by

count

Narrow by stage

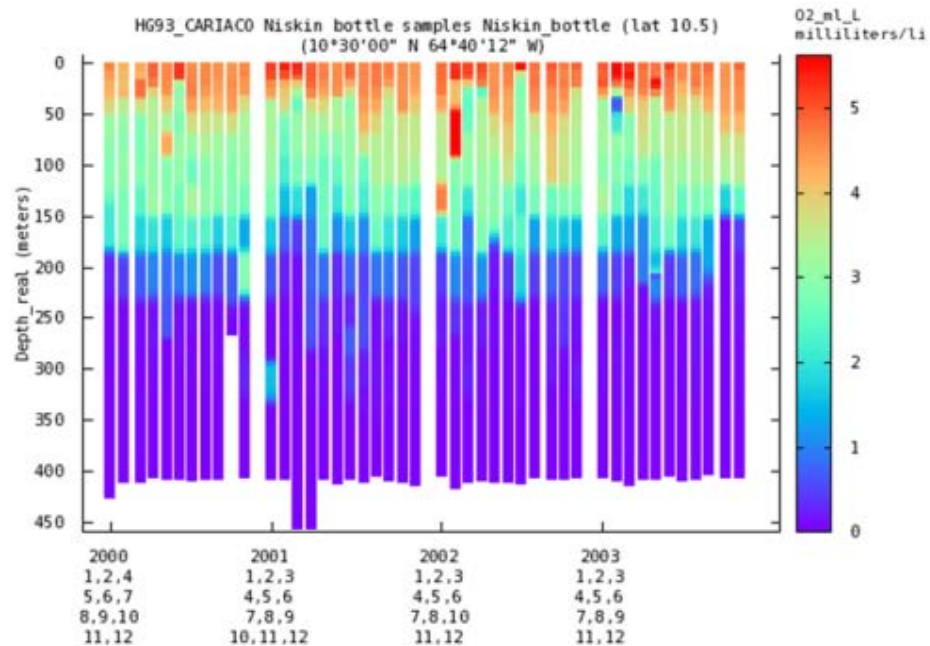
m2_fem

Map it Cancel



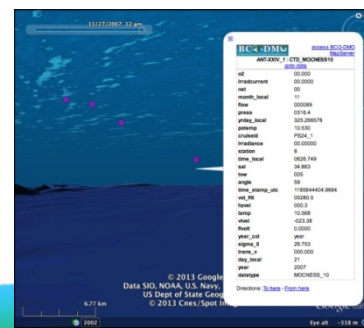
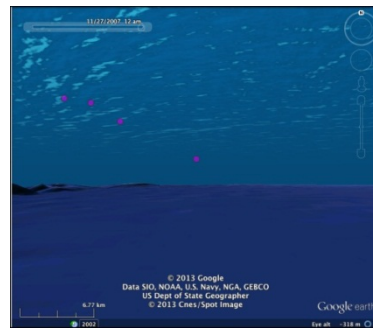
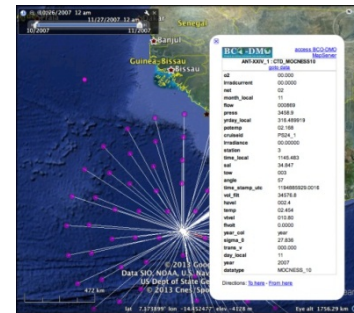
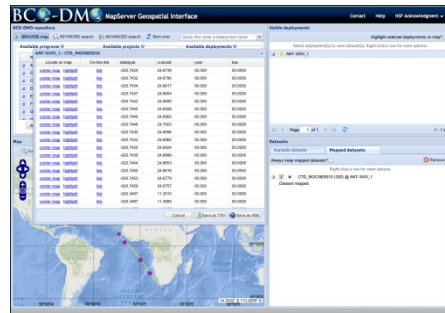
Time series data

HG93_CARIACO Niskin bottle samples



Using Google Map with KML file download

- For the ANT-XXIV_1 deployment, select the CTD_MOCNESS10 dataset. Right click on the dataset name, and select the “View/export mapped dataset” option. Then choose the Save As KML file for displaying by GoogleMap.



Fitness for Purpose

- The goal for the user interface is to have an effective visualization to aid the investigator in determining whether data will be useful to them
- Can we be “All things to all people”? We can try, and one of the important requirements is information about the data. Tools must be “data driven”, and metadata enables this.
- Recognize that different audiences require different interfaces (but adds to development time and cost, and reduces one’s focus)
- Attributes of fitness include data location, data type, acquisition time, data & metadata quality, and the methodology used to collect and process data.
- The richer the options, the more complex the system is to use. Help text, video help files, careful programming, ... can mediate this.

THE
END

<http://www.bco-dmo.org>

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