

DATA ACCESS TUTORIAL 2012 OCB PI SUMMER WORKSHOP

DATA ACCESS: CATALOG BROWSE

SCENARIO 1: you are a former US JGOFS or US GLOBEC researcher, and you know what data you are looking for

Go to: <http://usjgofs.whoi.edu/jg/dir/jgofs/>

select/click on Process Studies

http://usjgofs.whoi.edu/jg/serv/jgofs/Process_Studies.html?Bdir=usjgofs.whoi.edu/jg/dir/jgofs/,info=usjgofs.whoi.edu/jg/info/jgofs/Process_Studies%7D

select Arabian Sea INVENTORY

URL: <http://usjgofs.whoi.edu/jg/serv/jgofs/arabian/INVENTORY.html>

select cruise ID TTN043 (Thomas Thompson cruise 43)



/jgofs/arabian/INVENTORY ---- Level 0

[Directory](#) [Documentation](#) [Download & Other Operations](#)

[Level 0](#) [Next Level](#) [Flat Listing](#)

```
# Arabian Sea Inventory
# version December 16, 2002
#
# DMO note: March 2007: added links to data entities
#           October 2009: added TTN039 cruise data links
#
# Notes regarding data not yet submitted to U.S. JGOFS Data Management Office
#   n = no data available; y = data available from relational database
#   n1 = data not submitted; PI retired prior to submitting data
#
```

ship	cruise_id	cruise_name
nd	Arabian Sea	nd
T Thompson	TTN039	InterCal
T Thompson	TTN043	Process1
T Thompson	TTN045	Process2
T Thompson	TTN049	Process4
T Thompson	TTN050	Process5
T Thompson	TTN053	Process6
T Thompson	TTN054	Process7

About 12 rows down in the data inventory list, select “bottle” for the Niskin bottle nutrient data

<http://usjgofs.whoi.edu/jg/serv/jgofs/arabian/ttn-043/bottle.html>

/jgofs/arabian/ttn-043/bottle ---- Level 0

Directory
Documentation
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Flat Listing

```
# version May 8, 2000
# Lou Codispoti
# Hydrographic data (temp, salinity and nutrients)
# Thomas Thompson cruise TTN-043, Process Cruise 1
#
```

event	sta	sta_std	cast	date	time_begin	time_end	lat_begin	lon_begin	lat_end	lon_end
01081534	1	N1	1	19950108	15.5911	16.0578	22.37988	59.87935	22.38396	59.87429
01090209	2	N2	1	19950109	2.1589	2.9286	22.48278	61.18499	22.48239	61.18636
01090629	2	N2	4	19950109	6.4614	7.9606	22.48339	61.18338	22.48280	61.18327
01091815	3	N3	1	19950109	18.2825	18.7475	21.83320	62.39985	21.83267	62.39997
01092007	3	N3	3	19950109	20.1614	21.7183	21.83295	62.40008	21.83251	62.39592
01100410	4	N4	1	19950110	4.1644	4.8219	21.18314	63.54985	21.18348	63.55026
01100745	4	N4	4	19950110	7.9464	9.4206	21.18284	63.55040	21.17936	63.54994
01101926	5	N5	1	19950110	19.5142	19.9544	20.56668	64.66689	20.56659	64.66723
01102107	5	N5	3	19950110	21.6886	23.1967	20.56756	64.66634	20.56996	64.66378

Explanation of buttons in the data system:

Next Level	expands the data to the next level of detail
Documentation	displays the supporting documentation for this dataset
Data Display	returns to data display from documentation display
Directory	displays (returns to) the Data Directory listing for this cruise
Download & Other Operations	options for download, subsetting and reformatting of data

You would follow a similar process for US GLOBEC data, but you would start with the data server for that program:

<http://globec.whoi.edu/jg/dir/globec/>

and selecting the relevant project of interest from the US GLOBEC data categories:

Georges Bank: <http://globec.whoi.edu/jg/dir/globec/gb/>

Northeast Pacific: <http://globec.whoi.edu/jg/dir/globec/nep/>

Southern Ocean: <http://globec.whoi.edu/jg/dir/globec/soglobec/>



DATA ACCESS: TEXT-BASED SEARCH

SCENARIO 2: you are familiar with the way BCO-DMO organizes data, and you have some idea of what data you are looking for

Go to: <http://bco-dmo.org>

Select DATA from the top navigation area



The DATABASE links in the left navigation area provide an idea of how the data are organized. Data sets are grouped by Program (largest collection), Project (smaller in scope than a Program), Deployment (cruise, mooring, and many other examples), Dataset (a logical collection of data).

To locate the same US JGOFS data set that we found in the first scenario, one could start with any of the depending on what you know about the data of interest. For example, if you know you are interested in US JGOFS data, start at the top level "Programs".

Select Programs from the left navigation area.

Enter JGOFS in the search box. Click the button.

Select "U.S. Joint Global Ocean Flux Study" from the Program list.

URL: <http://osprey.bco-dmo.org/program.cfm?flag=view&id=2&sortby=program>

Your browser display should look like this, showing a brief description of US JGOFS.

The screenshot shows the BCO-DMO website interface. At the top is the BCO-DMO logo and navigation buttons: HOME, DATA, RESOURCES, and ABOUT. Below the logo is a "DATABASE" section with a list of categories and counts: Welcome, Programs (23), Projects (190), Deployments (1487), Datasets (5860), Instruments (260), Parameters (1232), People (1301), Affiliations (297), Funding (43), and Awards (402). To the right of this list is the "Program: U.S. Joint Global Ocean Flux Study" page. This page includes a globe icon, a list of affiliated programs, acronym (U.S. JGOFS), URL (Program Web Site), start date (1984), end date (2005), and geolocation (Global). Below this is a "Description" section with text about the study's goals and history. At the bottom left is a "GEOSPATIAL ACCESS" section with a map.

Category	Count
Welcome	
Programs	23
Projects	190
Deployments	1487
Datasets	5860
Instruments	260
Parameters	1232
People	1301
Affiliations	297
Funding	43
Awards	402

Program: U.S. Joint Global Ocean Flux Study

Affiliated programs:
 Acronym: U.S. JGOFS
 URL: [Program Web Site](#)
 Start date: 1984
 End date: 2005
 Geolocation: Global

Description:

The United States Joint Global Ocean Flux Study was a national component of international JGOFS and an integral part of global climate change research.

The U.S. launched the Joint Global Ocean Flux Study (JGOFS) in the late 1980s to study the ocean carbon cycle. An ambitious goal was set to understand the controls on the concentrations and fluxes of carbon and associated nutrients in the ocean. A new field of ocean biogeochemistry emerged with an emphasis on quality measurements of carbon system parameters and interdisciplinary field studies of the biological, chemical and physical process which control the ocean carbon cycle. As we studied ocean biogeochemistry, we learned that our simple views of carbon uptake and transport were severely limited, and a new "wave" of ocean science was born. U.S. JGOFS has been supported primarily by the U.S. National Science Foundation in collaboration with the National Oceanic and Atmospheric Administration, the National Aeronautics and Space Administration, the Department of Energy and the Office of Naval Research. U.S. JGOFS, ended in 2005 with the conclusion of the Synthesis and Modeling Project (SMP).

GEOSPATIAL ACCESS

Scroll down and expand the Projects section from “Additional program information”.

URL: <http://osprey.bco-dmo.org/program.cfm?flag=viewp&id=2&sortby=program>

Select US JGOFS Arabian Sea from the list of project names.

Additional program information

► Funding

► People

▼ Projects

U.S. JGOFS Antarctic Environment and Southern Ocean Process Study	(AESOPS)
U.S. JGOFS Arabian Sea	(Arabian Sea)
U.S. JGOFS Equatorial Pacific	(EqPac)
U.S. JGOFS North Atlantic Bloom Experiment	(NABE)
U.S. JGOFS Synthesis and Modeling	(SMP)

Browser displays the project description page.

URL: <http://osprey.bco-dmo.org/project.cfm?id=7&flag=view>

DATABASE

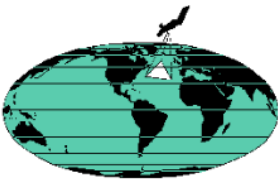
- Welcome
- Programs 23
- Projects 190**
- Deployments 1487
- Datasets 5860
- Instruments 260
- Parameters 1232
- People 1301
- Affiliations 297
- Funding 43
- Awards 402

Project: U.S. JGOFS Arabian Sea

Acronym: Arabian Sea
Program: [U.S. Joint Global Ocean Flux Study \[U.S. JGOFS\]](#)
URL: [Project Web Site](#)
URL: [Project Data Site](#)
Start date: 1994-09
End date: 1996-01
Geolocation: Arabian Sea

▼ **Description:**

The U.S. Arabian Sea Expedition which began in September 1994 and ended in January 1996, had three major components: a U.S. JGOFS Process Study, supported by the National Science Foundation (NSF); Forced Upper Ocean Dynamics, an Office of Naval Research (ONR) initiative; and shipboard and aircraft measurements supported by the National Aeronautics and Space Administration (NASA). The Expedition consisted of 17 cruises aboard the R/V Thomas Thompson, year-long moored deployments of five instrumented surface buoys and five sediment-trap arrays, aircraft overflights and satellite observations. Of the seventeen ship cruises, six were allocated to repeat process survey cruises, four to SeaSoar mapping cruises, six to mooring and benthic work, and a single calibration cruise which was essentially conducted in transit to the Arabian Sea.



Scroll down that page and expand the Datasets section.

Additional Project Information

► **Datasets**

► Deployments

► Project coordinators

URL: <http://osprey.bco-dmo.org/project.cfm?flag=viewd&id=7&sortby=project>

Select the data set of interest from the list, in this case “bottle”.

URL: <http://osprey.bco-dmo.org/dataset.cfm?id=10257&flag=view>

The screenshot shows the BCO-DMO dataset page for 'bottle'. On the left, under 'Additional Project Information', there is a 'Datasets' section with a list of datasets. The 'bottle' dataset is highlighted with a red circle, and a red arrow points to it. On the right, the 'Dataset: bottle' section is displayed. It includes a table with project details, a description, and links to expand sections like 'Deployments' and 'Funding'.

Additional Project Information

▼ **Datasets**

Dataset
aerosols_long
aerosols_short
aggregates
ammonium
areal_sum
bacteria
bio_optics
bottle
calcite_prod
chl_fluor
cruise_reports

Dataset: bottle

View data: to access data, check the deployments below.

Project:	U.S. JGOFS Arabian Sea
Validated:	yes
Data version:	October 28, 1996
Version date:	Oct 28, 1996

Dataset handle ID (e.g. DOI or other persistent identifier): not yet assigned

► **Current state:** Final no updates expected

▼ **Description:** Hydrographic Data: temp, salinity, nutrients from Niskin bottles
Hydrographic Data: temp, salinity, nutrients from Niskin bottles

► **Acquisition description:**

► **Processing description:**

More information about this dataset:

► **Funding**

► **Deployments**

► **Instruments associated with this dataset**

► **Parameters associated with this dataset**

From the bottle dataset display page, expand the [Deployments](#) section below to access data from all of the Arabian Sea cruises during which Niskin bottle data were collected.

URL: <http://osprey.bco-dmo.org/dataset.cfm?id=10257&flag=viewp>

Locate the cruise of interest from the Deployment list, in this case TT043.

DO NOT CLICK ON ANYTHING YET. Did you click? If so, use the Browser BACK arrow to return to URL: <http://osprey.bco-dmo.org/dataset.cfm?id=10257&flag=viewp>

IMPORTANT: to access the data, select the [data info](#) link on the right in the TT043 row.

See the screen shot on the next page ...

Explanation: From the expanded list of Deployments from which Arabian Sea bottle data were contributed, one can follow several links.

Deployment [TT043](#) is a link to information about that cruise.

Platform [R/V Thomas G. Thompson](#) is a link to information about that vessel.

The Investigator names, [Codispoti](#) and [Morrison](#) are links to information about those people.

Also note that some table columns ([blue text](#)) are sortable, e.g. [Start date](#)

More information about this dataset:► **Funding**▼ **Deployments**

Deployment	Synonyms	Start date	Platform	Investigator	
TT039	TTN039 TN39 TTN-039	Sep 18, 1994	R/V Thomas G. Thompson	Louis Codispoti (Principal Investigator)	data info
TT043	TTN043 TN043 TTN-043	Jan 8, 1995	R/V Thomas G. Thompson	Louis Codispoti (Principal Investigator) John Morrison (Co-Principal Investigator)	data info
TT045	TTN045 TN045 TTN-045	Mar 14, 1995	R/V Thomas G. Thompson	Louis Codispoti (Principal Investigator)	data info

OK – now! Select the [data info](#) link on the right in the TT043 row.

URL: <http://osprey.bco-dmo.org/datasetDeployment.cfm?ddid=1447&did=353&flag=view>

Your browser display of the [bottle](#) data from cruise [TT043](#) should look like this ...

Dataset: [bottle](#) **Deployment:** [TT043](#)

[Get Data](#)
[Map It](#)

Principal Investigator:	Louis Codispoti (Old Dominion University)
Co-Principal Investigator:	John Morrison (North Carolina State University)
Data version:	December 16, 2002
Version date:	16 December 2002
Data validated:	yes
Dataset handle ID:	
Project:	U.S. JGOFS Arabian Sea (Arabian Sea)
Deployment:	TT043
Deployment synonyms:	TTN043,TN043,TTN-043
Coordinated deployments:	
Current state:	

▼ **Description:** Hydrographic Data: temp, salinity, nutrients from Niskin bottles

Hydrographic Data: temp, salinity, nutrients from Niskin bottles

► **Acquisition description**

► **Processing description**

► **People associated with this dataset deployment**

From this deployment-specific dataset display page, there are many options to display additional information about this dataset. Additional documentation can be accessed by selecting the clickable blue links or expanding the blue section headers.

However, we want the data ...

For this dataset there are two choices: [Get Data](#) and [Map It](#). At this point, please click the [Get Data](#) button to access these data online.

Browser displays URL: <http://usjgofs.whoi.edu/jg/serv/jgofs/arabian/ttn-043/bottle.html> in another window or browser tab depending on the browser configuration. This display should look familiar as it is the same dataset shown in Scenario #1.

/jgofs/arabian/ttn-043/bottle ---- Level 0

[Directory](#)
[Documentation](#)
[Download & Other Operations](#)

[Level 0](#)
[Next Level](#)
[Flat Listing](#)

```

# version May 8, 2000
# Lou Codispoti
# Hydrographic data (temp, salinity and nutrients)
# Thomas Thompson cruise TTN-043, Process Cruise 1
#
=====
event      sta  sta_std  cast  date      time_begin  time_end  lat_begin  lon_begin  lat_end  lon_end
-----
01081534   1    N1       1    19950108  15.5911    16.0578   22.37988  59.87935  22.38396  59.87429
01090209   2    N2       1    19950109  2.1589     2.9286    22.48278  61.18499  22.48239  61.18636
01090629   2    N2       4    19950109  6.4614     7.9606    22.48339  61.18338  22.48280  61.18327
01091815   3    N3       1    19950109  18.2825    18.7475   21.83320  62.39985  21.83267  62.39997
01092007   3    N3       3    19950109  20.1614    21.7183   21.83295  62.40008  21.83251  62.39592
01100410   4    N4       1    19950110  4.1644     4.8219    21.18314  63.54985  21.18348  63.55026
01100745   4    N4       4    19950110  7.9464     9.4206    21.18284  63.55040  21.17936  63.54994
01101926   5    N5       1    19950110  19.5142    19.9544   20.56668  64.66689  20.56659  64.66723
01102107   5    N5       3    19950110  21.6886    23.1967   20.56756  64.66634  20.56996  64.66378

```

If one returns to the previous browser window with the display of Dataset: TT043 bottle URL: <http://osprey.bco-dmo.org/datasetDeployment.cfm?ddid=1447&did=353&flag=view> clicking the [Map It](#) button would open this dataset in the MapServer data access system.

Click the Map It button, to launch the MapServer GIS for this dataset.

Click OK in the dialog box to confirm that you wish to launch the MapServer GIS with a specific dataset selected.

The browser opens a new window or tab, and the display should look similar to this for URL: <http://mapservice.bco-dmo.org/mapserver/maps-ol/index.php?datasetId=10257&deployment=TT043>

Some things to notice on the map shown above:

- * The TT043 cruise track in light green, with the map zoomed in to see the Arabian Sea region.
- * Up top, the MapServer is in “BROWSE map” mode.
- * Because we launched the MapServer from the text-based data discovery system, the only “Available deployment” (panel in the middle of the top half of the panel displays) is TT043, the one we had selected.

Once again, there are many ways to access additional information from this display:

- * Clicking the + box to the left of the TT043 cruise ID in the “Available deployments” panel, displays metadata about that cruise.

To the right, still in the top half of the display, in the “Visible deployments” panel:

- * Right click on the TT043 cruise ID to display available options for that cruise
- * Clicking the + box to the left of the TT043 cruise ID displays cruise metadata including a link to the cruise report if one is available

Down below (right) in the “Datasets” panel:

- * Clicking on the + symbol in the green circle, or anywhere on the row with the dataset name (Bottle) or cruise ID (TT043), requests that this dataset be ‘mapped’

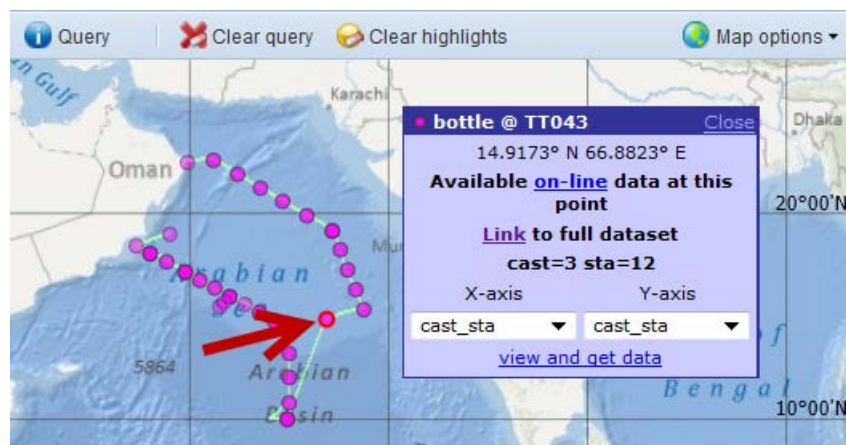
Try it ... small colored dots should appear in the map panel to the left, and the Datasets panel on the right has shifted to a display of “Mapped datasets”, of which there is only one at the moment.

The single mapped dataset is listed, with a color coded dot, the dataset name (Bottle), a number (67) that indicates the number of sampling locations included in this dataset, from the selected cruise (TT043). Once again, we have several options:

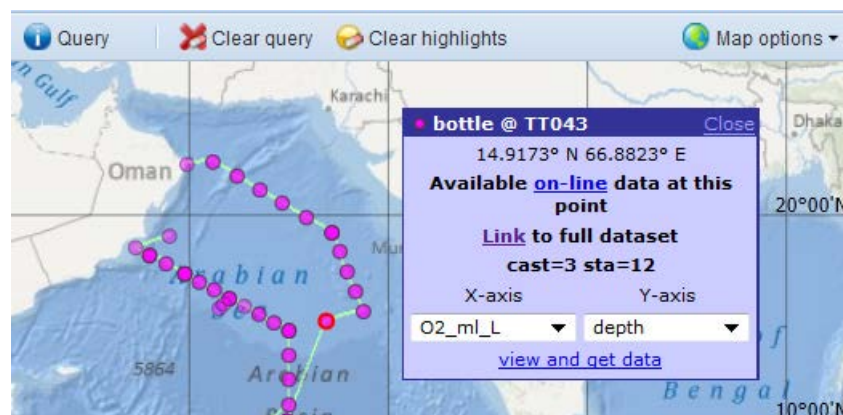
- * expanding the + symbol, shows the status of this dataset (it has been mapped)
- * right-clicking anywhere on the text in the row with the dataset name pops up a menu with several options
 - * view a tabular listing of the sampling locations, with options for data export
 - * a link to view the full dataset online
 - * the ability to change the color of the dots on the map
 - * the ability to save/bookmark the MapServer link to this dataset (for later access)
 - * and the ability to remove this dataset from the map (remove the dots)

Note that unchecking the box in this row also 'removes this dataset from the map'.

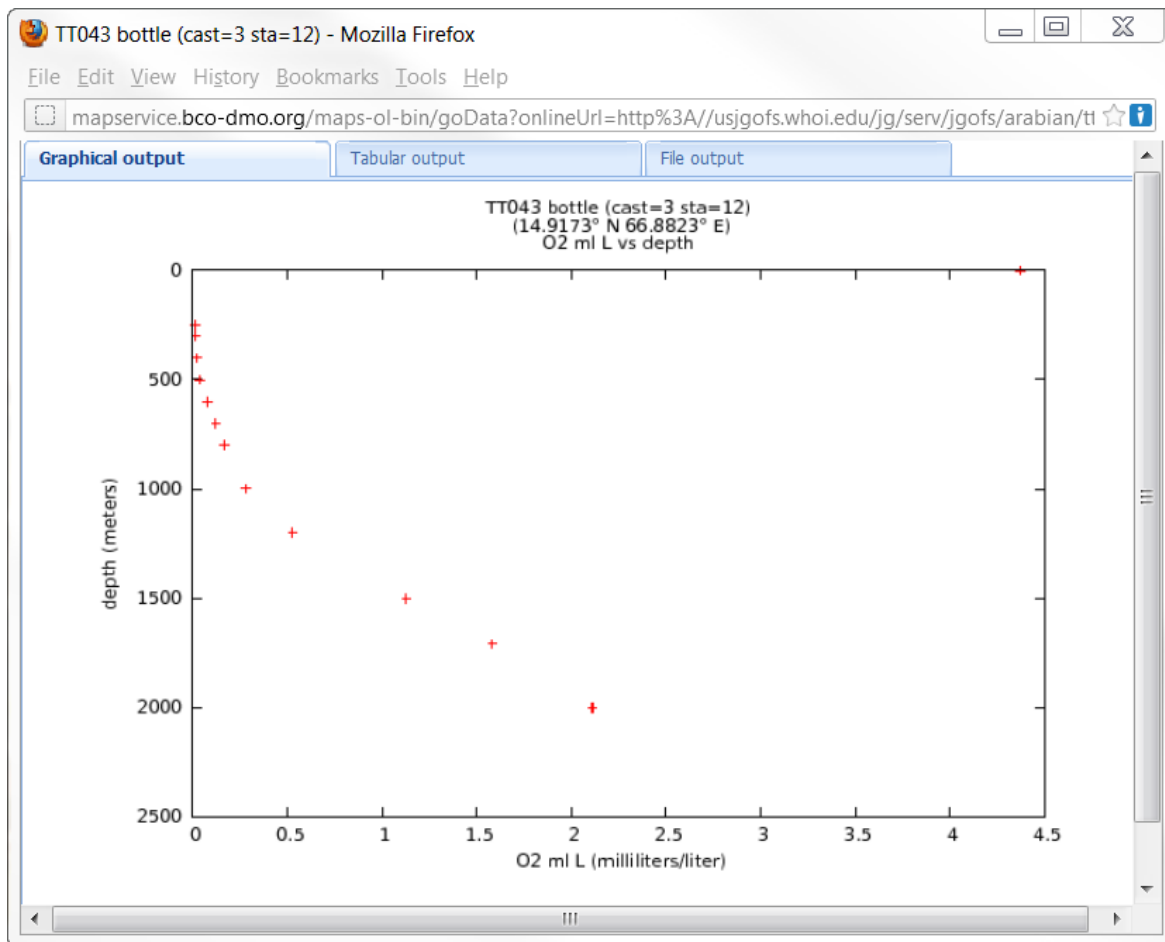
The MapServer also provides the ability to generate 'quick view' plots of the data at a sampling location. On the map, select the dot for station 12, cast 3 (red arrow) to bring up a dialog box that offers: links to the data from the database and a way to select variables from the dataset to generate a 'quick view' X-Y plot.



Select: X-axis 'O2_ml_L' and Y-axis 'depth'



Click "view and get data" to generate the plot on the next page of dissolved oxygen vs. depth.



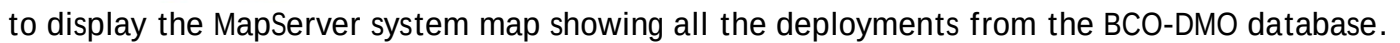
Notice once again, several tabs at the top make it easy to view a tabular list of the data in the graph or download the data from the “File output tab”.

Acknowledgments

The MapServer interface is a custom implementation of the Open Source MapServer software developed at the University of Minnesota. The BCO-DMO MapServer system is the result of collaboration between programmer Charlton Galvarino (Second Creek Consulting, Columbia, SC) and BCO-DMO staff members. In particular, BCO-DMO marine biology data specialist, Dicky Allison has led this development effort. Funding for this work is provided by the National Science Foundation Division of Ocean Sciences and Office of Polar Programs.

SCENARIO 3: you are interested in data from a particular geographic region

At the bottom of the DATABASE column on the left, click on the GEOSPATIAL ACCESS map



BCO-DMO MapServer Geospatial Interface

BCO-DMO repository

BROWSE map KEYWORD search ADVANCED search Start over Quick find: enter a deployment name

Available programs

Name	#
ASCOS	1
CAMEO	1
CoML	100
Dimensions of Biodiv...	0
ETBC	2
FeSynth	15
GoMX - DHOS	12
Historical	11

Select all Deselect all

Available projects

Name	#
ACIDIC	3
AESOPS	16
Aleutian Archipelago -...	0
ALEX-GoME	38
AMT	0
ANACONDAS	1

Include projects not belonging to any programs? ☒

Select all Deselect all

Available deployments

Name
A16N (RB-03-04B)
A16N (RB-03-04C)
AB_63_1
AB_63_2
AB_63_3
AB_63_4A
AB_63_A
AB_64_5

Select all Deselect all

Visible deployments

Highlight selected deployments on map? ☐

☒	AB_63_1
☒	AB_63_2
☒	AB_63_3
☒	AB_63_4A
☒	AB_63_A
☒	AB_64_5
☒	AB_64_6
☒	AB_64_7
☒	AB_64_8
☒	ACIDIC-CMEN-GIFET

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Map

Zoom in Pan Query Clear query Clear highlights Map options

Datasets

Available dataset Mapped datasets

Group by: deployment

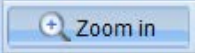
Dataset	Deployment

Always keep datasets? ☐

The most common way to use the MapServer GIS is to define a region of interest on the map.

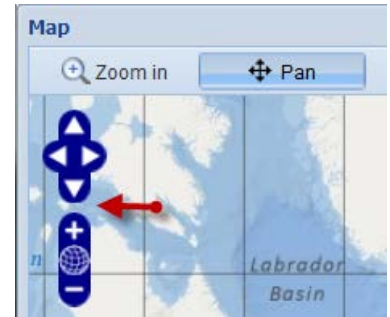
For example: you are interested in phytoplankton blooms in the North Atlantic.

Remember that the colored lines represent cruise tracks; symbols represent fixed sampling sites (e.g. mooring locations or time-series sites). Notice the orange cruise track just West of Europe (between the Labrador and North Sea in the vicinity of Ireland at 50° N 20° W).

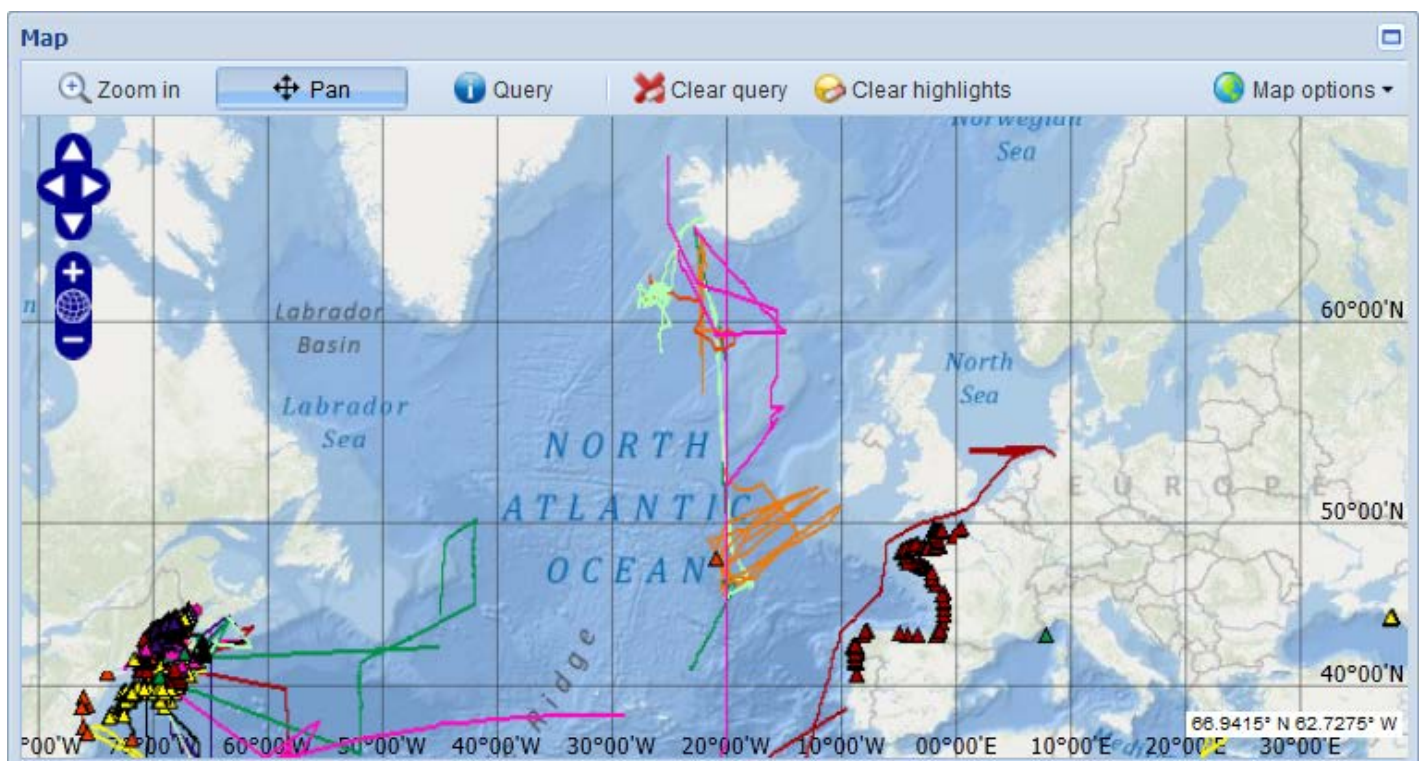
Click the “Zoom in” button  and then click and drag to define an area on the map.

Notice the available map positioning tools shown at right.

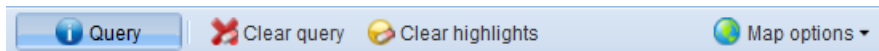
The default mode is Pan, and if using the “Zoom in” button you will need to put the “mapper” in Zoom mode each time if doing multiple zoom actions. Suggestion: once the area of interest has been selected using “Zoom in”, use the zoom tools (indicated by the red arrow).



Use the various map positioning tools (shown above right) until your map looks something like the screen shot below.



There is a lot of information displayed on this map and in the associated panels. We notice an assortment of cruise tracks (colored lines) and fixed sampling locations (colored triangle symbols). The map system offers several tools for figuring out what is being shown on the map. The map controls appear in a tool bar above the map.



To find out what cruises these are, use the Query tool (click on the Query button now). Then click on a colored item on the map. For example, click on that orange cruise track southwest of Ireland.

Look in the “Visible deployments” panel in the upper right of the browser window.

The screenshot shows the BCO-DMO MapServer Geospatial Interface. The top navigation bar includes buttons for Query, Clear query, Clear highlights, and Map options. The main interface is divided into several panels:

- Available programs:** A table listing programs and their counts.

Name	#
ASCOS	1
CAMEO	1
CoML	100
Dimensions of Biodiv...	0
ETBC	2
FeSynth	15
GoMX - DHOS	12
Historical	11
- Available projects:** A table listing projects and their counts.

Name	#
ACIDIC	3
AESOPS	16
Aleutian Archipelago -...	0
ALEX-GoME	38
AMT	0
ANACONDAS	1
- Available deployments:** A table listing deployments and their counts.

Name	#
A16N (RB-03-04B)	
A16N (RB-03-04C)	
AB_63_1	
AB_63_2	
AB_63_3	
AB_63_4A	
AB_63_A	
AB_64_5	
- Visible deployments:** A list of visible deployments with checkboxes.

Deployment Name
All-119-4
All-119-5
Aircraft_P3_NABE
AL9205
AL9306
AL9403I
AL9403II
AL9404
AL9410
AL9505
- Map:** A map of the North Atlantic Ocean showing various cruise tracks and sampling sites. The map includes a zoom in button, a pan button, and a query button. The map shows the Labrador Sea, North Sea, and the Atlantic Ocean. A series of dark red triangles represents sampling sites, and a series of orange lines represents cruise tracks.
- Datasets:** A panel showing available datasets and mapped datasets. The "Available dataset" tab is selected, showing a list of datasets grouped by deployment.

Dataset	Deployment
P3_SST_chl	Aircraft_P3_N...
P3axbt	Aircraft_P3_N...

The list of visible deployments indicates that the selected navigation track is from a P3 aircraft flight done as part of the US JGOFS NABE basin study. The coastal sampling sites (series of dark red triangles) were established by the EuroWinter-2010 project. Want to know more about that project? Click on the boxed + symbol to the left of the dark red square on the “EuroWinter-2010” line. This opens a box that displays information about this deployment activity. Many more options are available by right-clicking on the “EuroWinter-2010” line.

But let's find some data ...

Still in Query mode, click on the light green cruise track in the upper middle of the map. In the Visible deployments panel, this deployment is identified as KN193-03. Right click on the highlighted KN193-03 line in the Visible deployments panel, and select “View deployment metadata”.

The screenshot shows the BCO-DMO MapServer Geospatial Interface in a Firefox browser window. The interface is divided into several panels:

- Available programs:** A table listing programs and their counts.
- Available projects:** A table listing projects and their counts.
- Available deployments:** A table listing deployments and their counts.
- Visible deployments:** A list of visible deployments with a context menu open, showing options like "Single-out deployment", "Zoom to deployment", "View deployment metadata", "Export deployment as KML", and "MapServer link to deployment".
- Map:** A map of the North Atlantic region showing various features like the Denmark Strait, Reykjanes Ridge, and Rockall Rise. A light green cruise track is visible.
- Datasets:** A panel showing available datasets and mapped datasets. The "Deployment: KN193-03" section lists several datasets associated with this deployment.

Name	#
ASCOS	1
CAMEO	1
CoML	100
Dimensions of Biodiv...	0
ETBC	2
FeSynth	15
GoMX - DHOS	12
Historical	11

Name	#
ACIDIC	3
AESOPS	16
Aleutian Archipelago -...	0
ALEX-GoME	38
AMT	0
ANACONDAS	1

Name	#
A16N (RB-03-04B)	
A16N (RB-03-04C)	
AB_63_1	
AB_63_2	
AB_63_3	
AB_63_4A	
AB_63_A	
AB_64_5	

Deployment
All-119-4
All-119-5
Aircraft_P3_NABE
Biofloat_48
EN198
KN193-03

Dataset	Deployment
Calibration Re...	KN193-03
Cruise Track	KN193-03
CTD 1m avera...	KN193-03
CTD full resolu...	KN193-03
Niskin Bottle H...	KN193-03

This opens up a new browser window or tab with a view of the deployment metadata/documentation (shown on the next page).

View of KN193-03 deployment (cruise) metadata (documentation) retrieved by the MapServer from the BCO-DMO database.

The screenshot shows a web browser window with two tabs. The active tab is titled "osprey.bcodmo.org/deployment.cfm?flag=view&id=833". The browser's address bar also shows "metadata: our best hope". The website header features the BCO-DMO logo and navigation buttons for HOME, DATA, RESOURCES, and ABOUT. The main content area is divided into two columns. The left column, titled "DATABASE", contains a list of categories with their respective counts: Welcome, Programs (23), Projects (191), Deployments (1487), Datasets (5860), Instruments (260), Parameters (1232), People (1301), Affiliations (297), Funding (43), and Awards (402). The right column, titled "Deployment: KN193-03", includes a "Map It" button and detailed information about the deployment: Deployment: KN193-03, Deployment synonyms: NAB08 Process Cruise, Coordinated deployments: B10-2008, B4-2008, B9-2008, Biofloat_48, SG140, SG141, SG142, SG143, Platform: R/V Knorr, Platform type: vessel, Start date: 5/1/2008, End date: 5/22/2008, Location: subpolar North Atlantic, Iceland Basin, 60.7° to 61.7° N, 25° to 27.7° W, and Deployment report: none. Below this is a "Description" section with a detailed account of the cruise, including the use of autonomous platforms, CTD calibration, and various measurements. A "GEOSPATIAL ACCESS" section at the bottom left shows a map of the North Atlantic with deployment tracks.

Return to the map view, the browser window with this URL address:

<http://mapservice.bco-dmo.org/mapserver/maps-ol/index.php>

Most likely this is in the browser tab that precedes the one you have been looking at with the deployment metadata (that looks like the screen shot above).

Now take the map out of Query mode by clicking on the "Pan" map tool button and click the "Clear query" map tool button to remove the red "X" from the map.

Let's see what data the 2008 North Atlantic Bloom Experiment (NAB 2008) investigators have shared from their KN193-03 cruise.

In the “Datasets” panel (in the lower right of the browser window), select the Niskin Bottle dataset. Notice the pink dots that appear on the map.

Use the Zoom + tool to zoom in the map until the spatial extent looks similar to this screen shot (some additional dialog windows from the next step have already been opened and are visible in the image below).

The screenshot shows the BCO-DMO MapServer Geospatial Interface. The main map displays a geographic area with various sampling locations marked by pink dots. A red arrow points to a specific location. A dialog box is open for the 'Niskin Bottle Hydrography' dataset, showing a list of variables and a 'view and get data' link.

Available programs

Name	#
ASCOS	1
CAMEO	1
CoML	100
Dimensions of Biodiv...	0
ETBC	2
FeSynth	15
GoMX - DHOS	12
Historical	11

Available projects

Name	#
ACIDIC	3
AESOPS	16
Aleutian Archipelago -...	0
ALEX-GoME	38
AMT	0
ANACONDAS	1

Available deployments

Name
A16N (RB-03-04B)
A16N (RB-03-04C)
AB_63_1
AB_63_2
AB_63_3
AB_63_4A
AB_63_A
AB_64_5

Visible deployments

Highlight selected deployments on map?
Aircraft_P3_NABE
Biofloat_48
EN198
KN193-03
SJ0516

Map

Zoom in, Pan, Query, Clear query, Clear highlights, Map options

Datasets

Available datasets, Mapped datasets

Remove all

Niskin Bottle Hydrography ...

Available on-line depth

Link to full cast

X-axis: allox

Y-axis: depth

view and get data

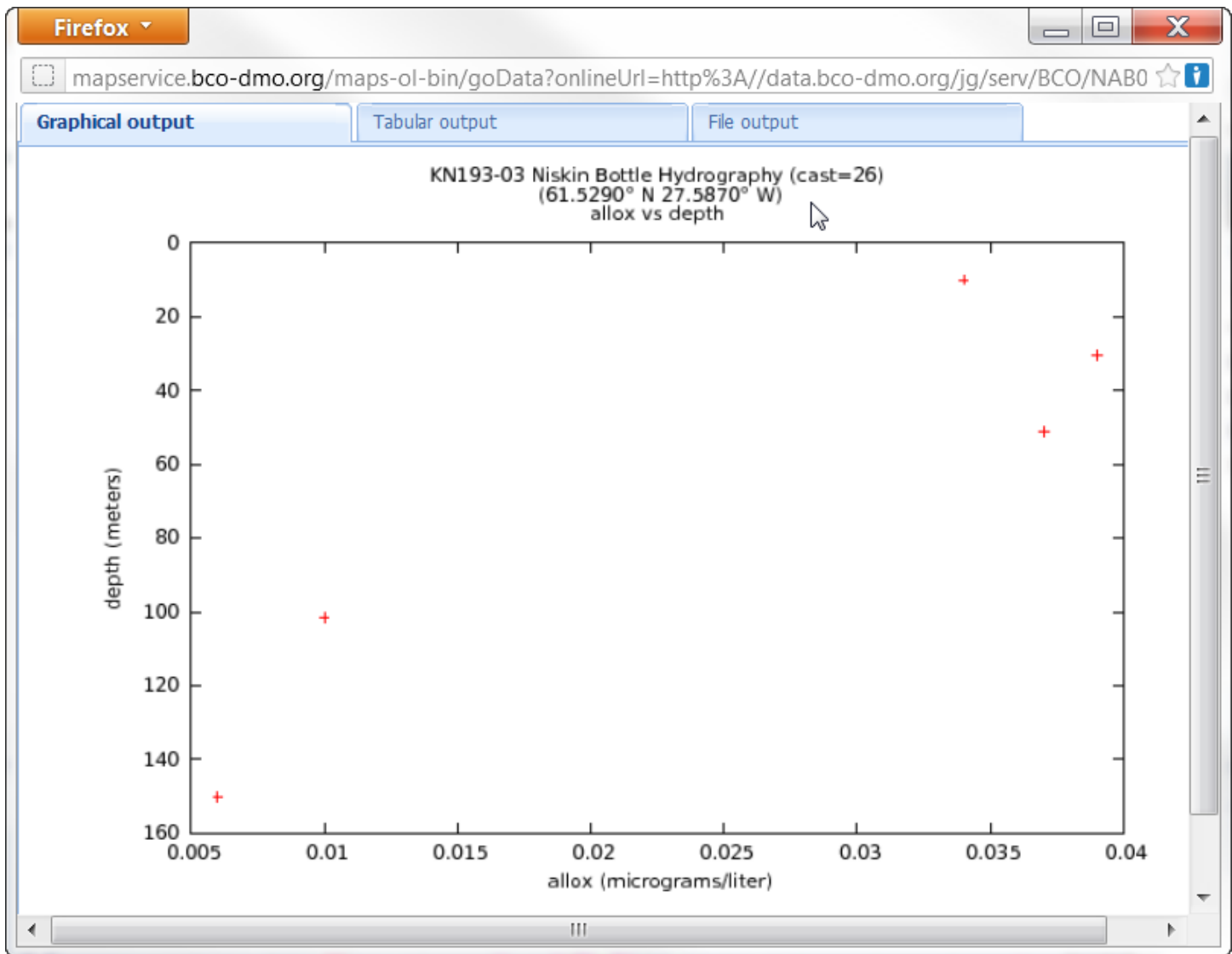
Select the upper leftmost sampling location dot (indicated by the red arrow) to open up a KN193-03 Niskin Bottle Hydrography dialog window. From that dialog window, one can access the data in tabular form or as a ‘quick view’ plot.

First a quick plot to see what the data look like:

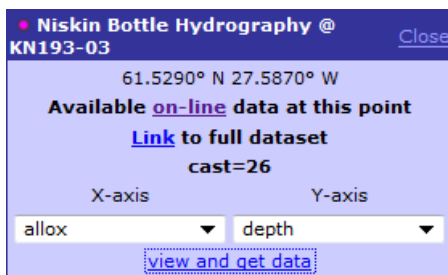
Keep “allox” on the X-axis, but select “depth” as the Y-axis.

Click the “view and get the data” link at the bottom of the dialog box.

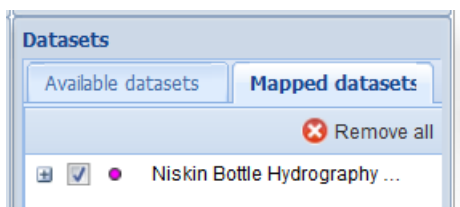
A plot window opens showing the requested allox vs. depth plot clearly labeled to confirm that the plot is of KN193-03 Niskin Bottle Hydrography from cast 26.



The data can be downloaded using several different methods:

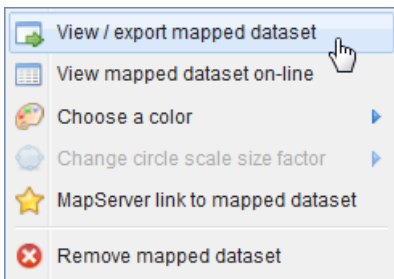


from the map dialog box, one can view the data from the selected point, or use “Link to full dataset” to view a listing of the all the records in the full data.



Another option is to right click on the dataset line in the Datasets panel (to the right of the map display).

Right clicking the dataset name brings up the dataset options menu, from which one can export the data. Choose “View/export mapped data”.



In addition to the data table display, one has the option to download the data as CSV (comma-separated values) or KML (Google Earth) formatted files.



KN193-03 : Niskin Bottle Hydrography

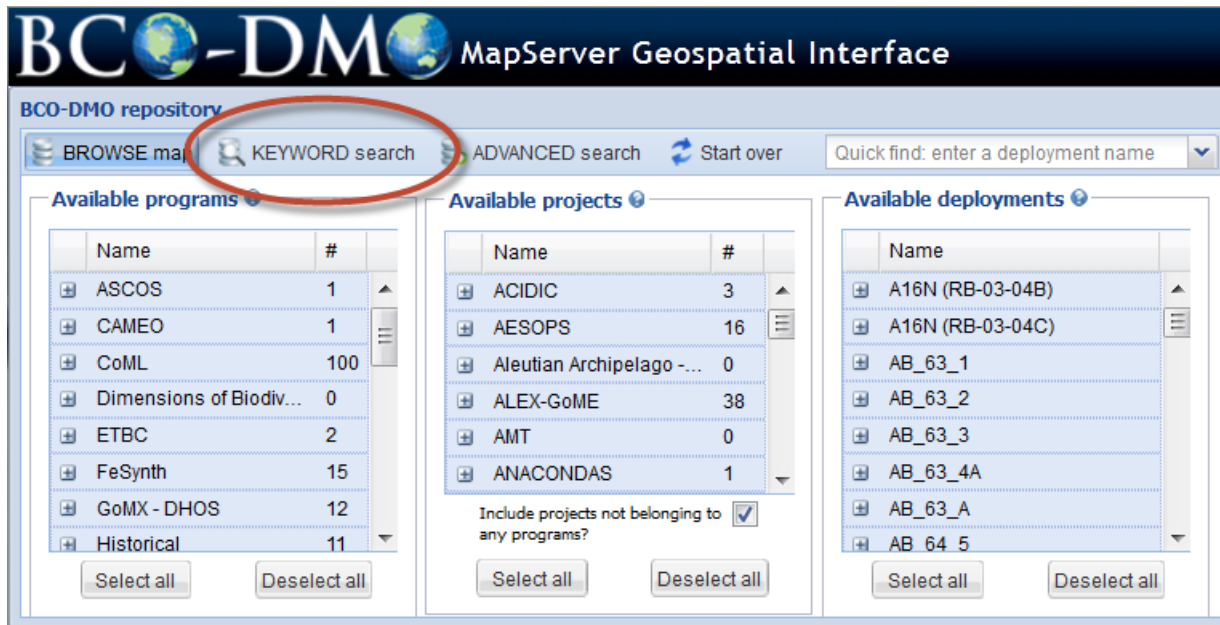
Locate on map		Latitude (dd N)	Longitude (dd E)	ID	On-line link
center-map	highlight	61.163	-25.352	cast=1	link
center-map	highlight	60.853	-26.637	cast=2	link
center-map	highlight	60.983	-26.882	cast=3	link
center-map	highlight	60.733	-26.892	cast=4	link
center-map	highlight	60.978	-26.379	cast=5	link
center-map	highlight	60.731	-26.386	cast=6	link
center-map	highlight	60.682	-27.188	cast=7	link
center-map	highlight	60.787	-27.116	cast=8	link
center-map	highlight	60.923	-26.996	cast=9	link
center-map	highlight	60.906	-27.421	cast=10	link
center-map	highlight	60.906	-27.420	cast=11	link
center-map	highlight	60.910	-27.412	cast=12	link
center-map	highlight	61.167	-26.523	cast=13	link
center-map	highlight	61.087	-26.749	cast=14	link
center-map	highlight	61.070	-26.663	cast=15	link
center-map	highlight	61.083	-26.631	cast=16	link
center-map	highlight	61.296	-26.188	cast=17	link
center-map	highlight	61.521	-25.721	cast=18	link
center-map	highlight	61.223	-25.717	cast=19	link

Buttons: Cancel, Save as CSV, Save as KML

DATA ACCESS: MAP KEYWORD SEARCH

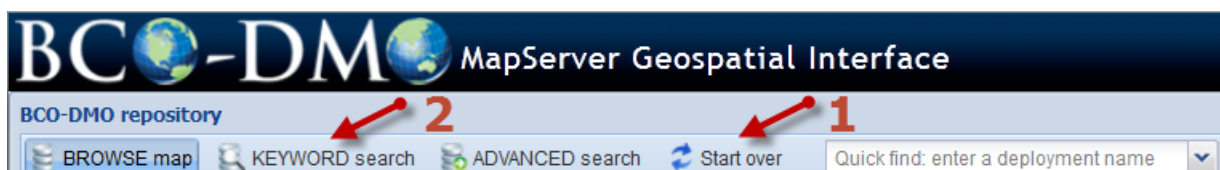
SCENARIO 4: you are interested in data of a particular type

The MapServer has a KEYWORD search that is useful for finding certain types of data.



To test out the KEYWORD search function,

- (1) click "Start over" in the top tool bar above the search panels and
- (2) click the KEYWORD search menu item.



Enter something of interest in the "Dataset search string" text entry box.

For example, type in "pigments".

Notice the result set of datasets that match this query appear in the window. Select the third one, “chlorophyll phaeophytin”.

The screenshot shows the BCO-DMO search interface. The 'Search criteria and results' section has a 'Dataset search string' of 'pigments'. The 'Run search' button is highlighted. The 'Available deployments' section lists several deployments, including AESOPS_Array, AII-119-4, AII-119-5, COOK19MV, DRFT08RR, EN198, EqPac-Array, and HG93 CARIACO. The 'Select all' button is highlighted.

Dataset	Description
bottle_summ	Niskin bottle summary product; basic hydrographi
chlorophyll and phaeophytin	pigments; chlorophyll and phaeophytin
chlorophyll_phaeophytin	pigments chlorophyll-a and phaeophytin sampled
chl_fluor	Chlorophyll-a and phaeopigments, fluorometric m
dist-pp	Productivity, PIC, Chl-a and Phaeo Pigments along
HPLC pigments OC	pigments from HPLC analysis of bottle samples

The screenshot shows the BCO-DMO MapServer Geospatial Interface. The 'Search criteria and results' section has a 'Dataset search string' of 'pigments'. The 'Run search' button is highlighted. The 'Available deployments' section lists OC404-01 and OC404-04. The 'Visible deployments' section shows OC404-01 (EDDIES 2004 Surve...) and OC404-04 (EDDIES 2004 Surve...). The 'Map' section shows a map of the North Atlantic Ocean with a pink line indicating a cruise track. The 'Datasets' section shows a list of datasets, including HPLC pigments OC and chlorophyll_phaeophytin, grouped by dataset and deployment.

Dataset	Description
bottle_summ	Niskin bottle summary product; basic hydrographi
chlorophyll and phaeophytin	pigments; chlorophyll and phaeophytin
chlorophyll_phaeophytin	pigments chlorophyll-a and phaeophytin sampled
chl_fluor	Chlorophyll-a and phaeopigments, fluorometric m
dist-pp	Productivity, PIC, Chl-a and Phaeo Pigments along
HPLC pigments OC	pigments from HPLC analysis of bottle samples

The MapServer updates to show that these data have been reported from two deployments: OC404-01 and OC404-04. The cruise tracks are displayed on the map, and the datasets which could be grouped by “dataset” or “deployment” are listed in the bottom right “Datasets” panel.

The datasets have been discovered and at this point one can proceed to map the datasets and view them either online or in graph form.

Glossary of Terms

BCO-DMO	Biological and Chemical Oceanography Data Management Office http://bcodmo.org/
GIS	Geospatial Information System; a map system to display spatial data
MapServer	Open Source software for publishing spatial data and providing interactive mapping applications via the Web http://mapserver.org/
US GLOBEC	GLOBAL Ocean ECosystems Dynamics research program http://www.usglobec.org/
US JGOFS	United States Joint Global Ocean Flux Study http://usjgofs.whoi.edu/