

# Building the NETMAR System Architecture

Anthony Patterson

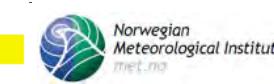
University College Cork

Coastal & Marine Research Centre

*EGU 2012 – Vienna – 26 April 2012*

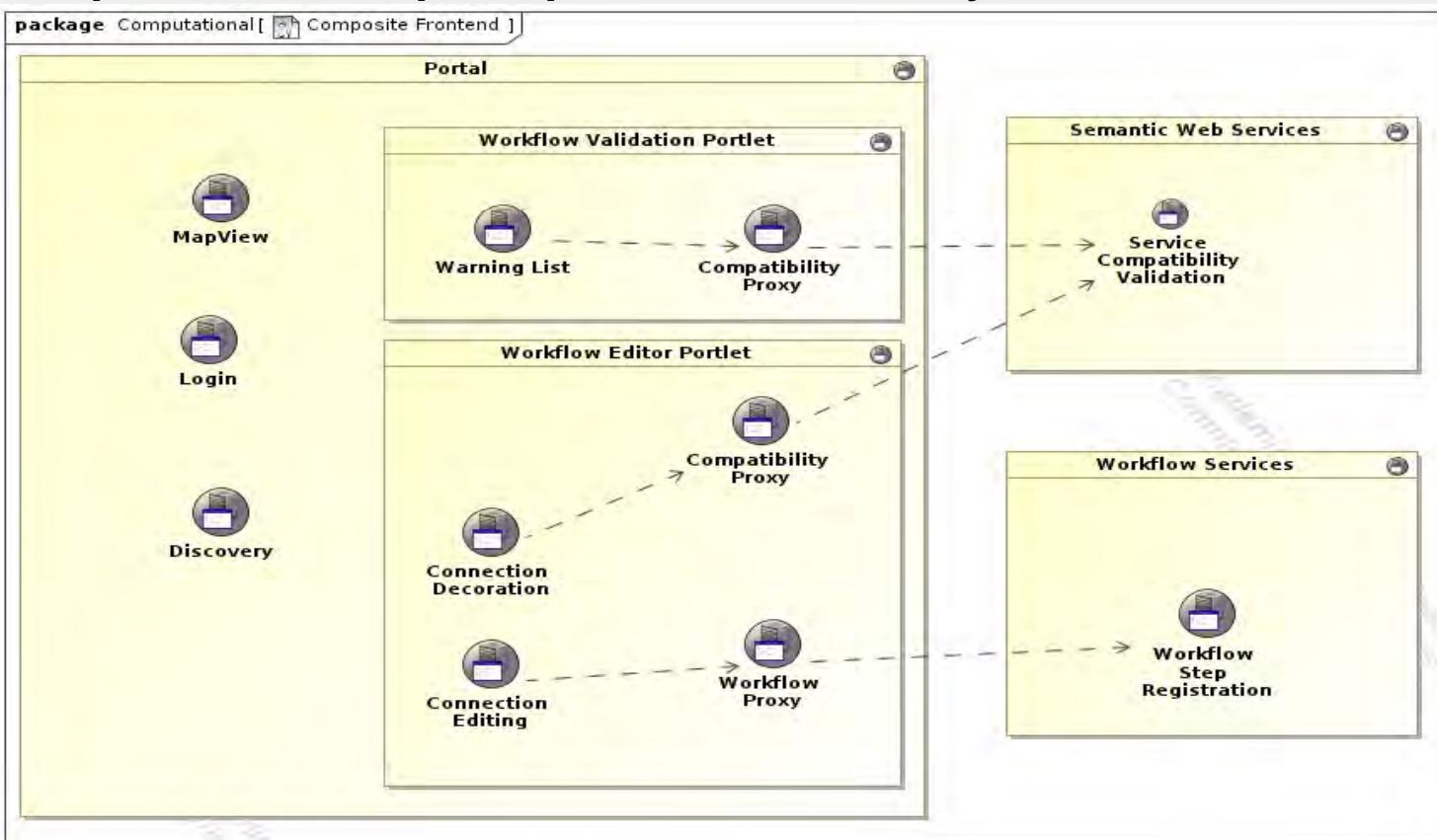


Plymouth Marine  
Laboratory



# Composite Front End (Portal)

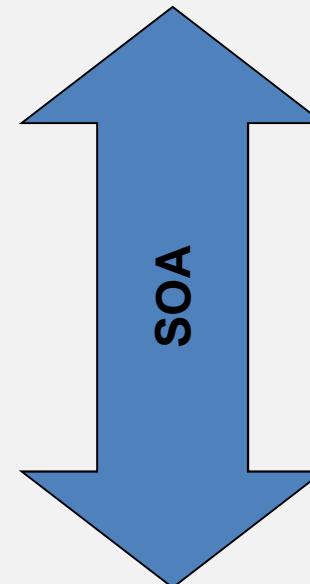
How do you interact with multiple services,  
get an integrated, cohesive user interface and  
still preserve SOA principles and modularity benefits?



# Motivations

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- Operational Autonomy
- Avoid vendor lockin
- Reuse
- Discovery
- Compose new services

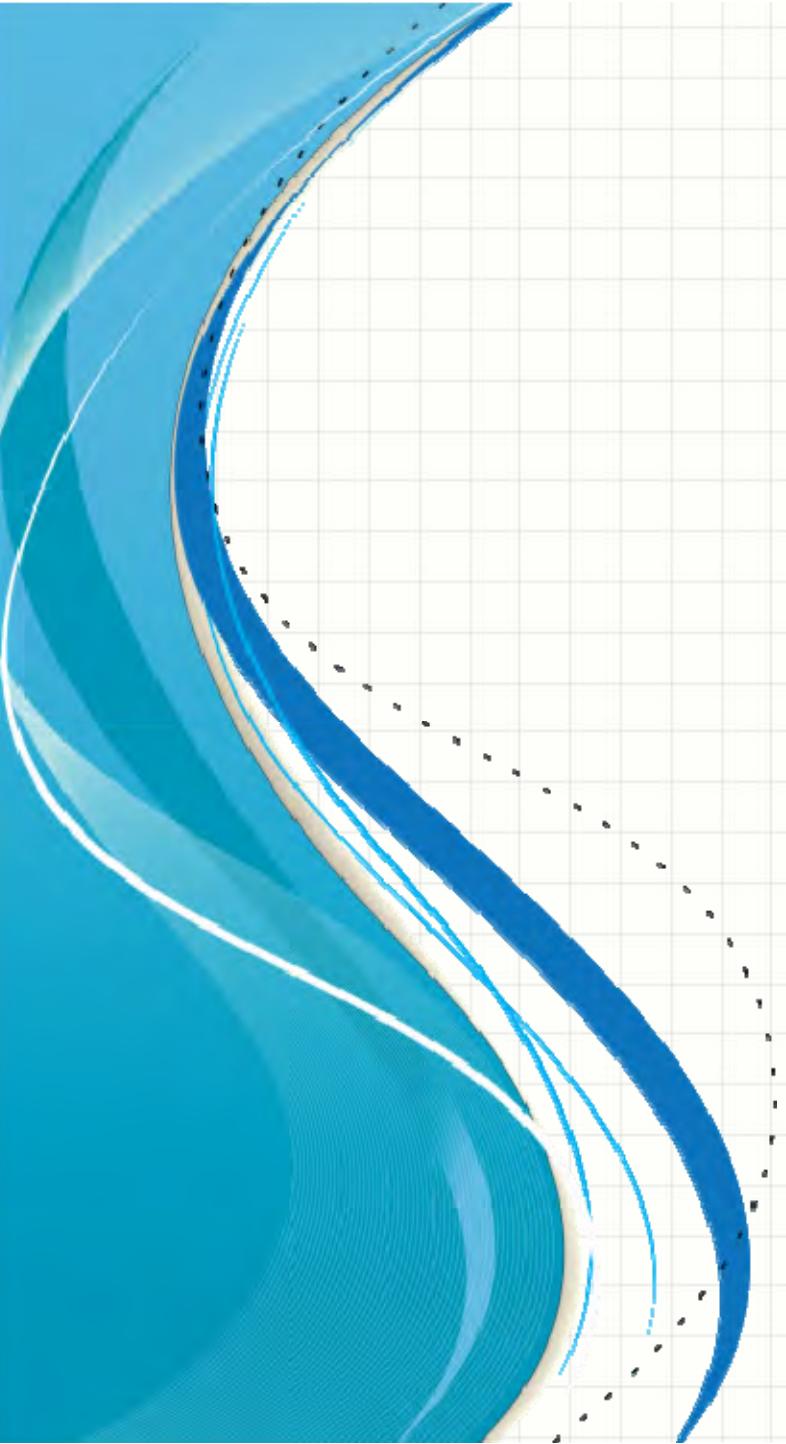


- Easy to learn

# Patterns based reviews

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- Patterns Based Architecture Reviews
- + SOA Patterns
- Teleconferences
- Email discussions
- Identify Tradeoffs, Risks
- Quality Attribute checklist



# **BCO-DMO**

## **DATA DISCOVERY**

Cyndy Chandler  
25 April 2012

NetMAR Focus Group  
EGU, Vienna, Austria

# Shifting expectations

1

- 1980 Experiment data

2

- 1990 Project data

3

- 2000 Program data

4

- 2010 Global data

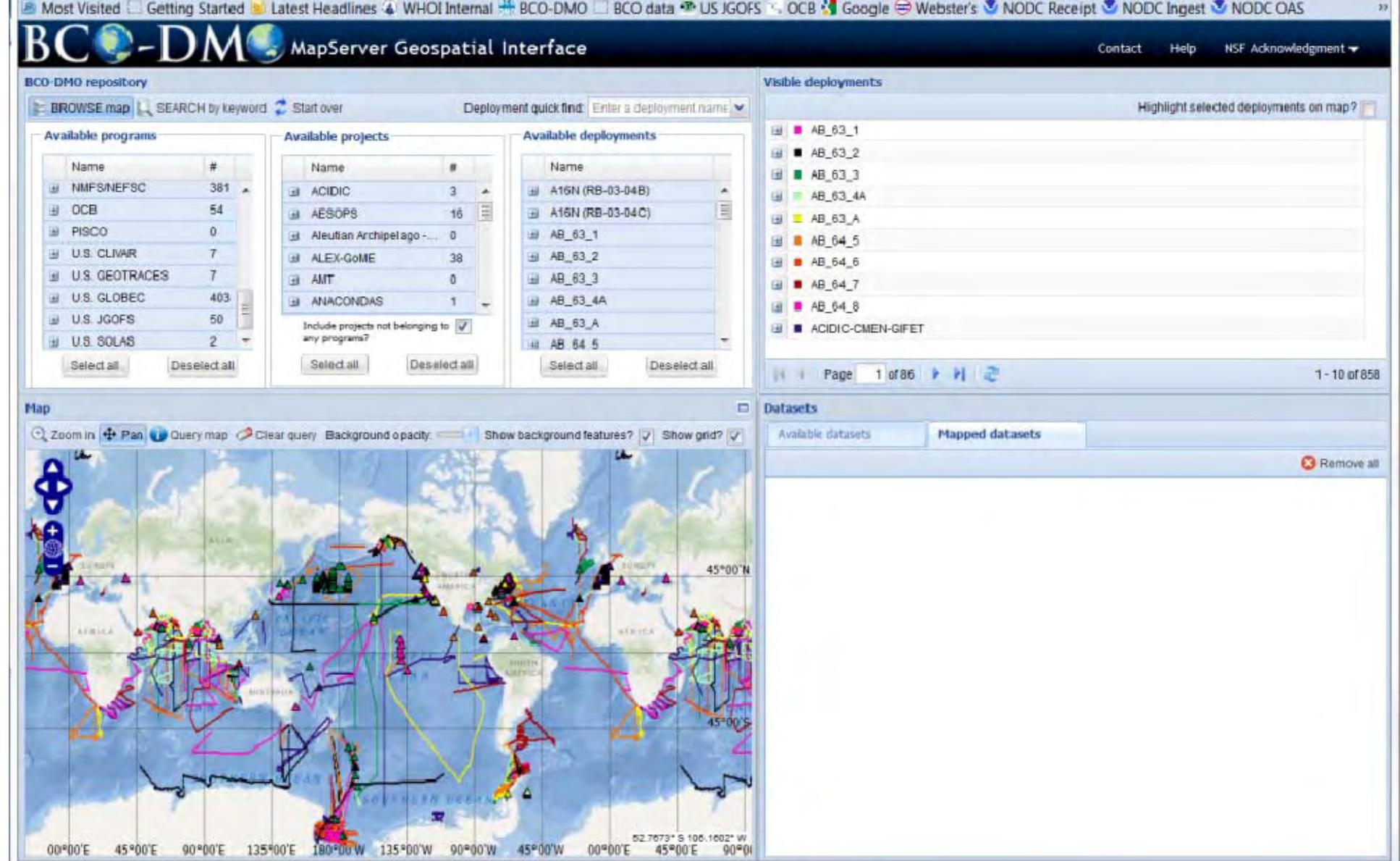
# /jgofs/arabian/INVENTORY --cruise\_id eq TTN043-- Level 1

[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 TT039 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
-----
T_Thompson  TTN043      Process1
=====
PI        co-PI       data_sampled           submitted  on_system  data_entity
-----
Roman     nd          cruise event log        Y          Y          event log
Azam      Smith       Bacteria             Y          Y          bacteria
Azam      Smith       POC PON              Y          Y          poc_pon
Barber     Marra      Primary Prod insitu  Y          Y          primary_prod
Bender     Dickson    O2 Prod insitu       Y          Y          insitu_O2_prod
Bender     Dickson    O2 Prod ondeck       Y          Y          ondeck_O2_prod
Buesseler  nd          Thorium;POC;PON pump  Y          Y          th234_pump
Campbell   Landry     Picoplankton;flow cytometry  Y          Y          picoplankton
Caron      nd          Microzooplankton grazing  Y          Y          grazing
Caron      nd          Microplankton;abundance and biomass  Y          Y          microplankton
Caron      nd          Nanoplankton;abundance and biovolume  Y          Y          nanoplankton
Codispoti  Morrison   Bottle nutrient data      Y          Y          bottle
DMO        nd          Trace Metal bottle cast information  Y          Y          TMbottle
Gardner    Morrison   Mixed layer depths       Y          Y          mixed_layer
Gardner    Richardson Aggregates pmc          Y          Y          pmc
Garside    nd          Nanomolar conc nitrate    Y          Y          low_level_NO3
Goericke   nd          Phytoplankton pigments    Y          Y          HPLC_pigments
Goyet      nd          pCO2 air                 Y          Y          pco2_air
Goyet      nd          pCO2 water               Y          Y          pco2_water
Goyet      nd          TCO2 and total alkalinity  Y          Y          tco2
Hansell    nd          TON                     Y          Y          ton
Marra      nd          PAR                     Y          Y          PAR
McCarthy   nd          Ammonium               Y          Y          ammonium
McCarthy   nd          N15 daily uptake sum    Y          Y          areal_sum
McCarthy   nd          N15 uptake rates       Y          Y          N15_uptake
Measures   nd          Dissolved Fe and Al    Y          Y          TMtrace_Fe_Al
Morrison   Codispoti  CTD measurements       Y          Y          ctd
Peltzer    Hansell    DOC TOC                 Y          Y          toc
Roman     nd          Mesozooplankton Bongo  Y          Y          mesozoo_bongo
Roman     nd          Mesozooplankton MOC    Y          Y          mesozoo_moc
```

US JGOFS Arabian Sea  
Project data



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mapservice.bco-dmo.org/mapserver/maps-ol/index.php

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# BCO-DMO MapServer Geospatial Interface

Contact Help NSF Acknowledgment

BCO-DMO repository

BROWSE map SEARCH by keyword Start over Deployment quick find: Enter a deployment name

Available programs

Name	#
NMFS/NIEFSC	381
OCB	54
PISCO	0
U.S. CLIVAR	7
U.S. GEOTRACES	7
U.S. GLOBEC	403
U.S. JGOFS	50
U.S. SOLAS	2

Select all Deselect all

Available projects

Name	#
AESOPS	16
Arabian Sea	20
EqPac	7
NABE	6
SMP	1

Select all Deselect all

Available deployments

Name
AESOPS_Array
All-119-2
All-119-4
All-119-5
Aircraft_P3_NABE
AVHRR_AESOPS
Darwin_45B
EN198

Select all Deselect all

Visible deployments

Highlight selected deployments on map?

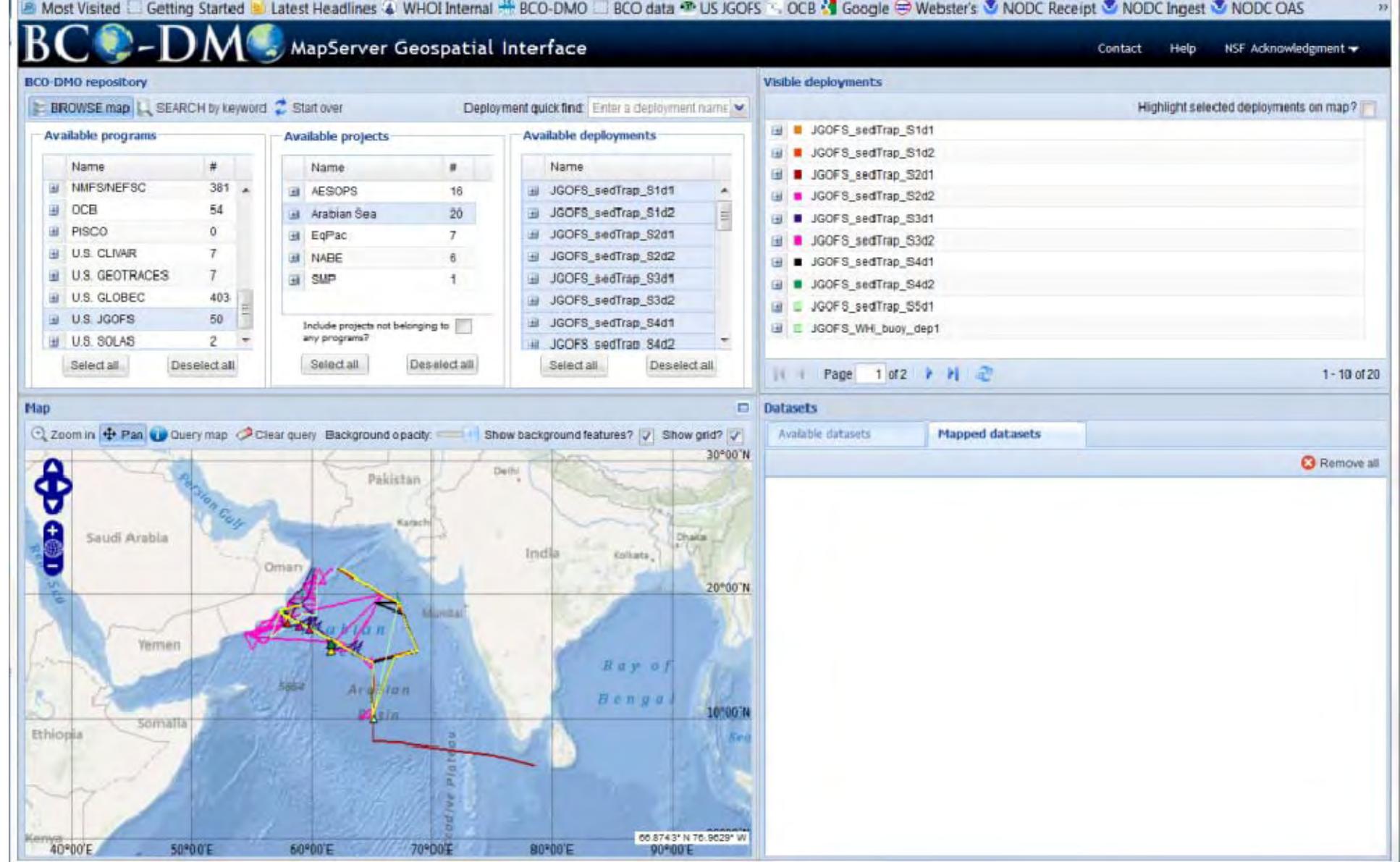
- All-119-4
- All-119-5
- Aircraft\_P3\_NABE
- EN198
- EqPac-Array
- JGOFS\_sedTrap\_S1d1
- JGOFS\_sedTrap\_S1d2
- JGOFS\_sedTrap\_S2d1
- JGOFS\_sedTrap\_S2d2
- JGOFS\_sedTrap\_S3d1

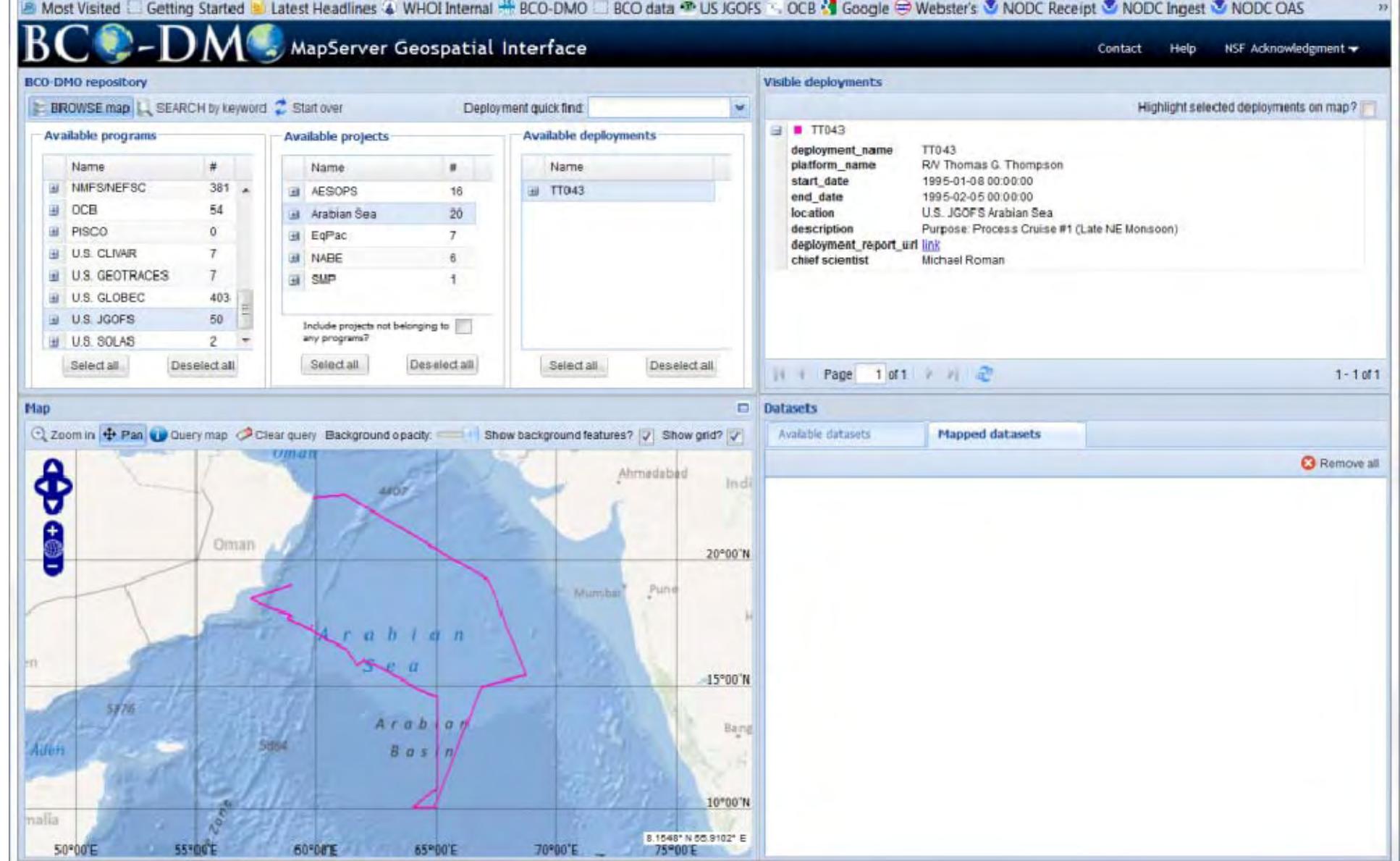
Page 1 of 4 1- 10 of 34

Map

Zoom in Pan Clear query Background opacity Show background features? Show grid?

Available datasets Mapped datasets Remove all





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mapservice.bco-dmo.org/mapserver/maps-cl/index.php Google

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# BCO-DMO MapServer Geospatial Interface

Contact Help NSF Acknowledgment

**BCO-DMO repository**

BROWSE map SEARCH by keyword Start over Deployment quick find: Enter a deployment name

**Available programs**

Name	#
NMFS/NEFSC	381
DCB	54
PISCO	0
U.S. CLIVAR	7
U.S. GEOTRACES	7
U.S. GLOBEC	403
U.S. JGOFS	50
U.S. SOLAS	2

Select all Deselect all

**Available projects**

Name	#
AESOPS	16
Arabian Sea	20
EqPac	7
NABE	6
SMP	1

Select all Deselect all

**Available deployments**

Name
TT043

Select all Deselect all

**Visible deployments**

Highlight selected deployments on map?

- TT043
 

deployment_name	TT043
platform_name	RV Thomas G. Thompson
start_date	1995-01-08 00:00:00
end_date	1995-02-05 00:00:00
location	U.S. JGOFS Arabian Sea
description	Purpose: Process Cruise #1 (Late NE Monsoon)
deployment_report_url	<a href="#">link</a>
chief scientist	Michael Roman

Page 1 of 1 1 - 1 of 1

**Map**

Zoom in Pan Query map Clear query Background opacity: Show background features? Show grid?

**Datasets**

Available datasets Mapped datasets

Group by: deployment  Remove all

Dataset	Deployment
aerosols_long	TT043
aerosols_short	TT043
ammonium	TT043
areal_sum	TT043
bacteria	TT043
bottle	TT043
cruise_reports	TT043
CTD	TT043
euphotic_zone	TT043
event log	TT043
grazing	TT043
HPLC_pigments	TT043

Always keep datasets?

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mapservice.bco-dimo.org/mapserver/maps-cl/index.php Google

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# BCO-DMO MapServer Geospatial Interface

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**BCO-DMO repository**

BROWSE map SEARCH by keyword Start over Deployment quick find: Enter a deployment name

**Available programs**

Name	#
NMFS/NEFSC	381
DCB	54
PISCO	0
U.S. CLIVAR	7
U.S. GEOTRACES	7
U.S. GLOBEC	403
U.S. JGOFS	50
U.S. SOLAS	2

Select all Deselect all

**Available projects**

Name	#
AESOPS	16
Arabian Sea	20
EqPac	7
NABE	6
SMP	1

Select all Deselect all

**Available deployments**

Name
TT043

Select all Deselect all

**Visible deployments**

Highlight selected deployments on map?

**TT043**

deployment_name	TT043
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deployment_report_url	<a href="#">link</a>
chief scientist	Michael Roman

Page 1 of 1 1-1 of 1

**Map**

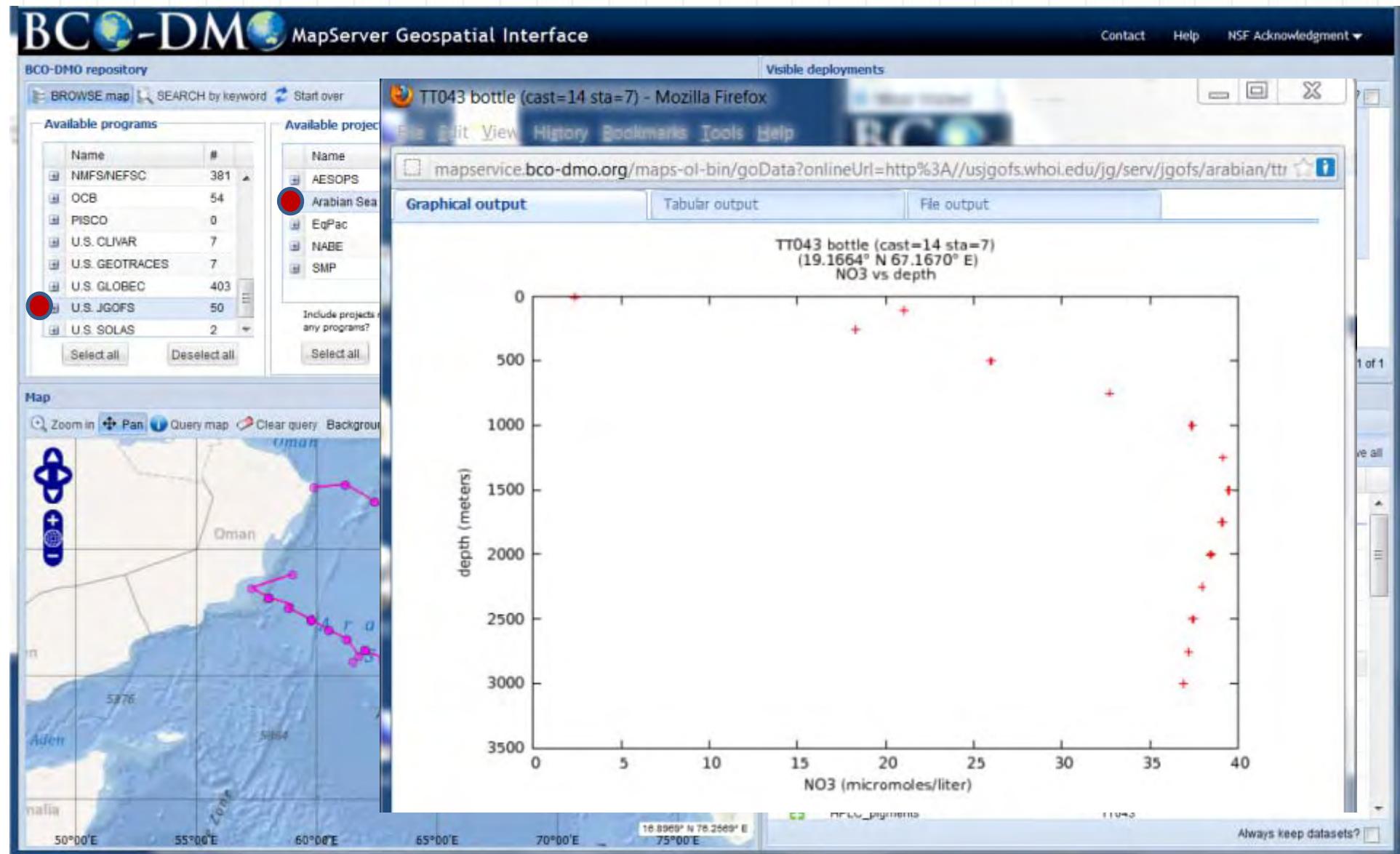
Zoom in Pan Query map Clear query Background opacity: Show background features? Show grid?

**Datasets**

Available datasets Mapped datasets Remove all

bottle (67) @ TT043

# US JGOFS: one of many programs



# Shifting expectations

1

- 1980 Experiment data

2

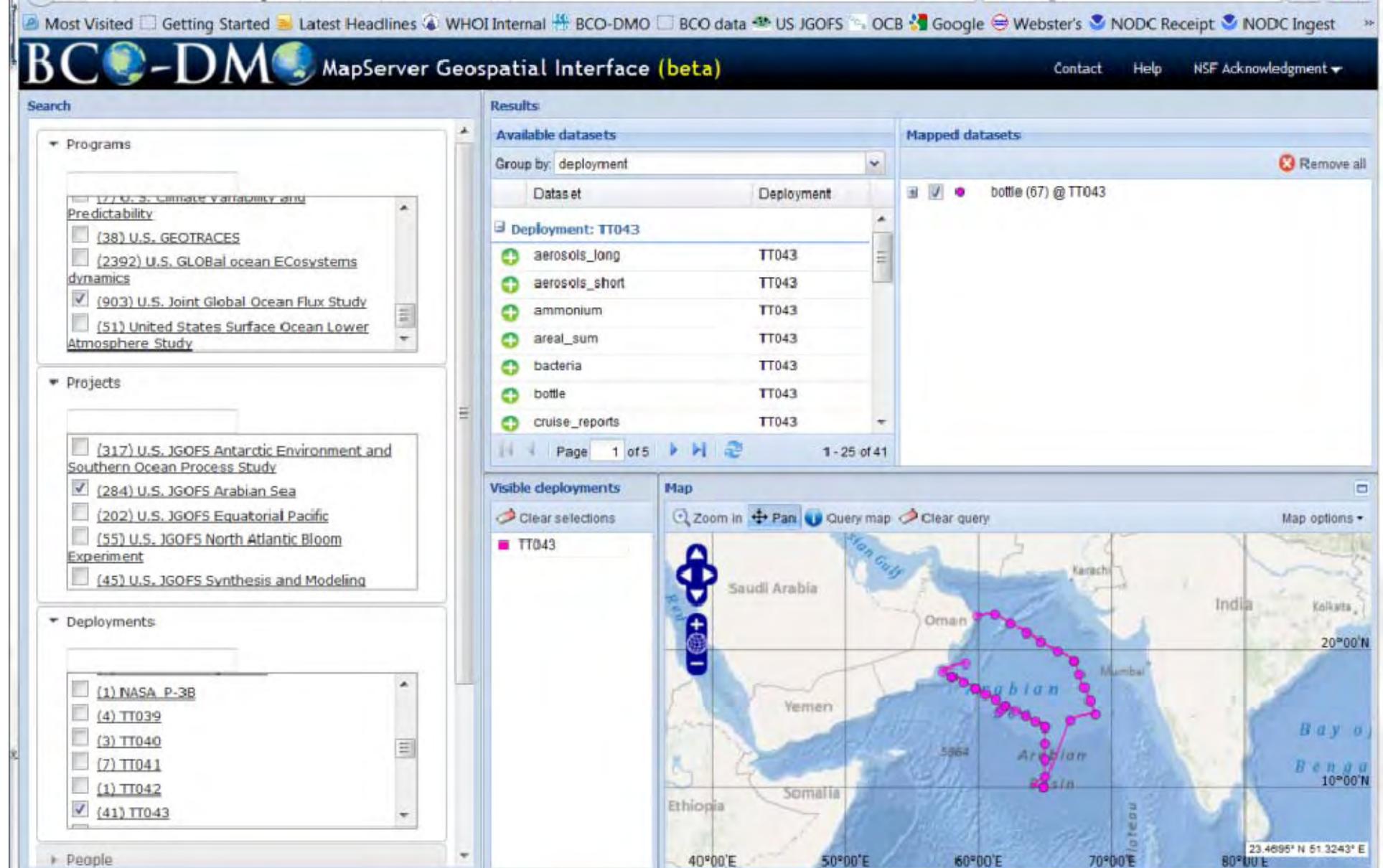
- 1990 Project data

3

- 2000 Program data

4

- 2010 Global data



**BCO-DMO MapServer Geospatial Interface (beta)**

**Results**

Dataset	Deployment
aerosols_long	TT043
aerosols_short	TT043
ammonium	TT043
areal_sum	TT043
bacteria	TT043
bottle	TT043
cruise_reports	TT043

**Mapped datasets:**

- bottle (67) @ TT043

**Map**

The map displays the deployment path of TT043, which starts in Oman and follows a winding route through the Persian Gulf and into the Arabian Sea, ending near the coast of Saudi Arabia and Yemen.

**Visible deployments:**

- TT043

**Map options:**

- Zoom in
- Pan
- Query map
- Clear query



person.mp4

**Biological and Chemical Oceanography Data Collection - Mozilla Firefox**

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# BCO-DMO MapServer Geospatial Interface (beta)

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**Search**

- + Instrument Categories
- + Instruments
- + Parameter Categories
- + Parameters
- + Programs
- + Projects
- + People
- + Deployments
- + Awards
- + Platforms

**Results**

**Available datasets**

Group by: deployment

Dataset	Deployment
EcoMon Plankton 100m <sup>3</sup>	AA8704
EcoMon Plankton 10m <sup>2</sup>	AA8704
Deployment: AA8704	
iioe_chaetognaths	AB_63_1
iioe_copepods	AB_63_1
iioe_decapods	AB_63_1
iioe_nastracoids	AB_63_1
Deployment: AB_63_1	

No datasets have been mapped.  
Click the plus icon next to a dataset to begin.

 inst\_demo.mp4

**Visible deployments**

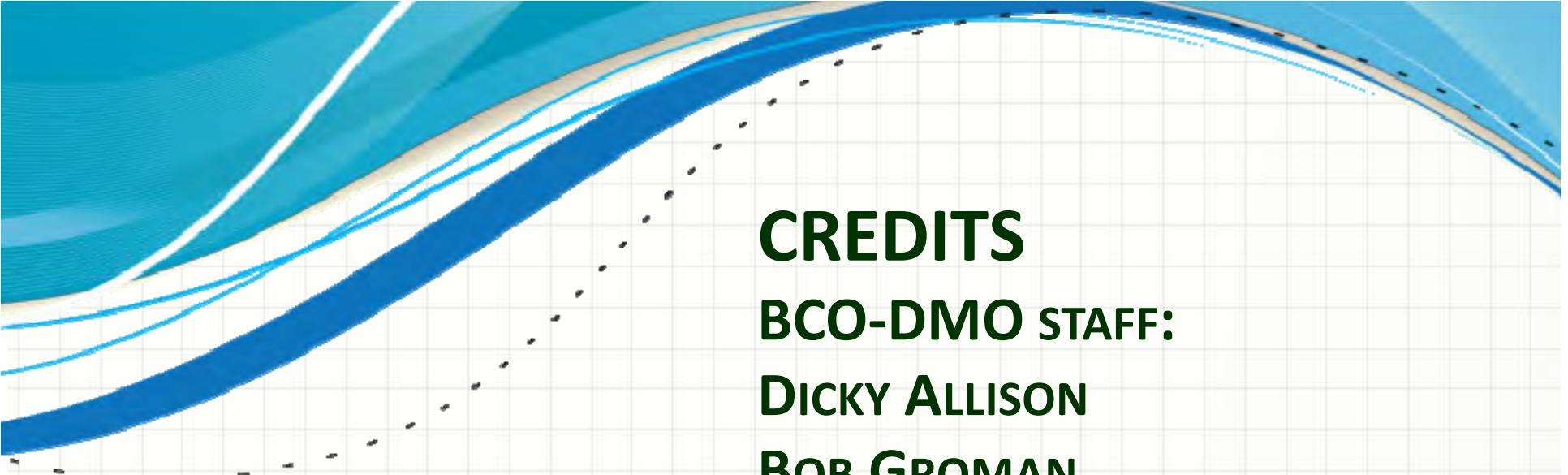
Clear selections

- 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...
- ACIDIC-FCKX...
- ACIDIC-SHLX...
- AE-X0908
- AE-X1103

**Map**

Zoom in Pan Query map Clear query Map options





# CREDITS

## BCO-DMO STAFF:

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### BOB GROMAN



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## PATRICK WEST

## STEFAN ZEDNICK

## PETER FOX

# CHARLTON GALVARINO (MAP)