Introduction to Ocean Data View

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Discovery and Use of Operational Ocean Data Products and Services

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ITCOOcean, INCOIS, Hyderabad

Ocean Data View Course

Objective

- Import, Visualise, quality control oceanic datasets

What you will learn

- A large publicly available dataset exists
- Basic ODV operations, data analysis and visualization
- Importing data of various formats
- Basic quality control using ODV
- Gridding techniques for data interpolation
- Using own and sample datasets

Overall course content – ODV Basics

Day 1	• Overview, capabilities and demonstration • Introduction to ODV
Day 2	• Basic plotting using ODV • Gridding techniques for data interpolation • Derived variables
Day 3	• Importing different types of data into ODV –NETCDF, ASCII, CTD
Day 4	• Basic quality control • Data calculator, Basic Statistics • Additional visualization techniques
Day 5	• Tasks using own datasets • Web-based ODV

Ocean Data View

Software for easy access, interactive analysis and visualization of profile, time-series, trajectory or general sequence data.

- Versatile, GUI, easy to use and platform independent
- Available for windows, Mac OS X, Linux and Unix
- Supports native ODV collection format and netCDF.
- Reads and imports many oceanographic data formats (e.g., WOD, ARGO, GTSPP, WOCE, SeaDataNet, MedAtlas, Sea-Bird...)

Ocean Data View

Pros:

- Easy to use – no commands – GUI
- Multiple OS platform – windows/Linux
- Different data formats – netcdf, ascii
- Interactive data interpolation/gridding
- Derived variables, and data calculator
- Best for cruise, in-situ - csv, txt data and WOD data

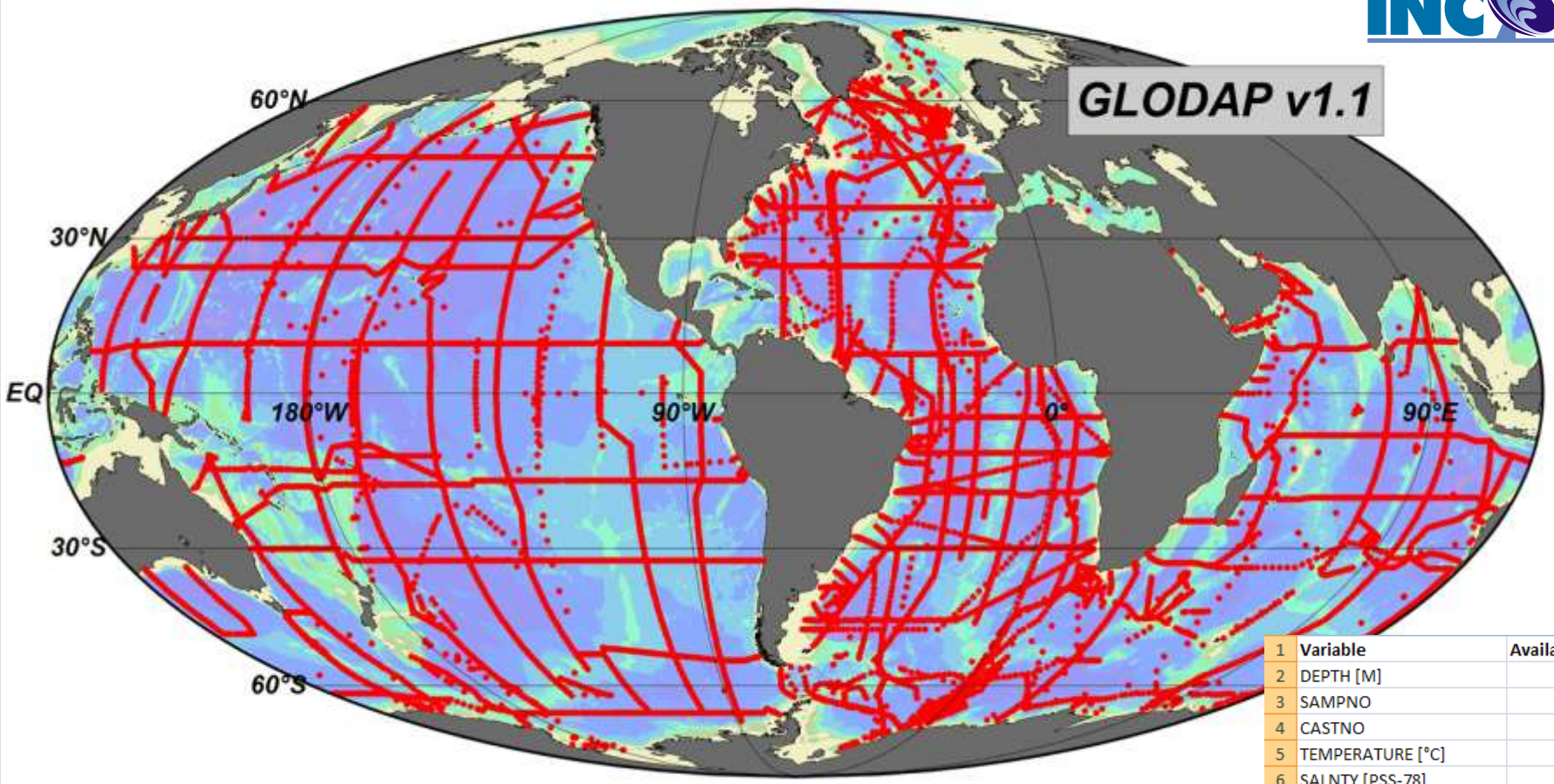
Cons:

- Data import requires manual interventions
- Variable association is required
- Specified format for text importing
- Data exported into netcdf format may require processing of data dimensions before plotting in other software
- Undo options are limited

ODV Collection

- Optimized for variable length profile/sequences
- Binary format for dense storage and fast data access
- Can be used to handle many types of data formats

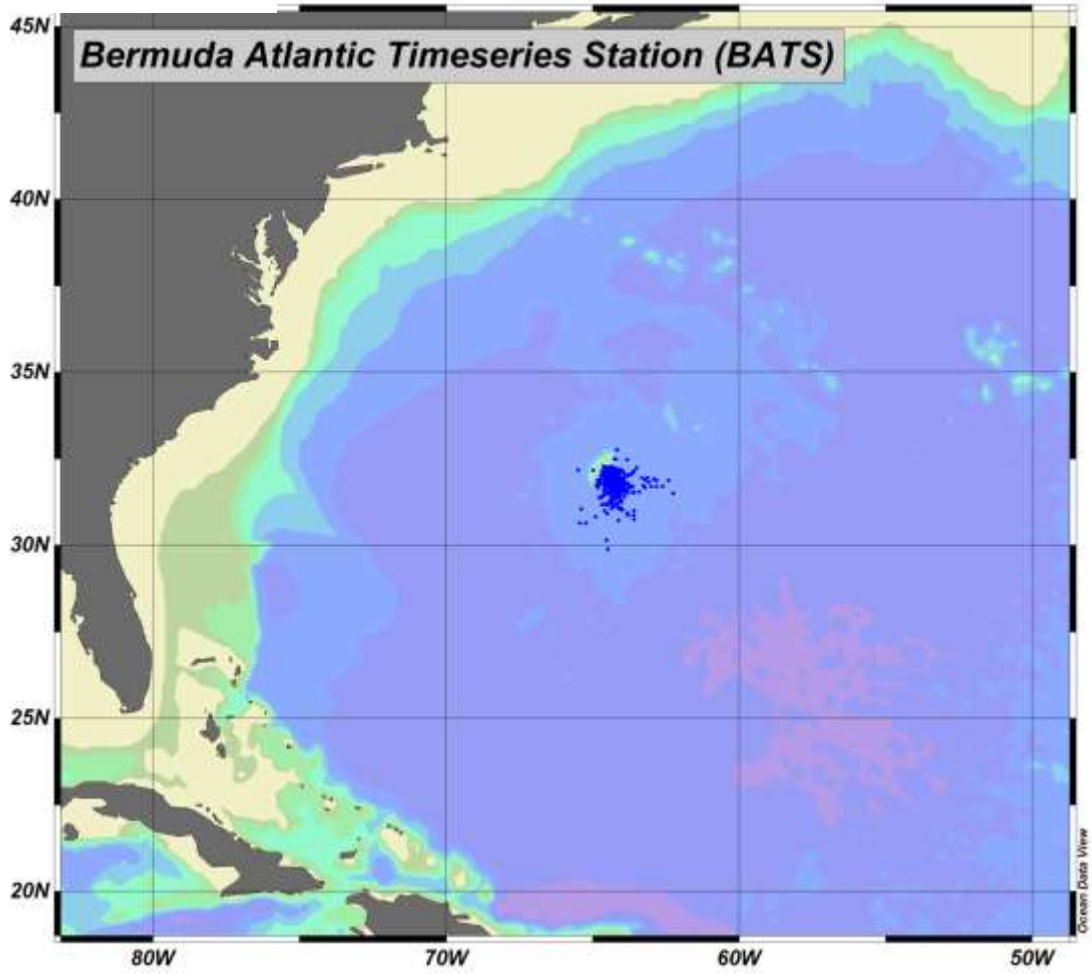
Example Data Collections



	Variable	Availability
2	DEPTH [M]	100
3	SAMPNO	99
4	CASTNO	99
5	TEMPERATURE [°C]	98
6	SALNTY [PSS-78]	94
7	OXYGEN [UMOL/KG]	95
8	PHSPHT [UMOL/KG]	90
9	SILCAT [UMOL/KG]	94
10	NITRAT [UMOL/KG]	93
11	NITRIT [UMOL/KG]	66
12	CFC-11 [PMOL/KG]	37
13	CFC-12 [PMOL/KG]	35
14	ALKALI [UMOL/KG]	28
15	TCARBN [UMOL/KG]	34
16	DELC14 [/MILLE]	5
17	DELC13 [/MILLE]	4
18	ANTHRCO2 [UMOL/KG]	16
19	C14E	5

12,470 stations

367,023 samples



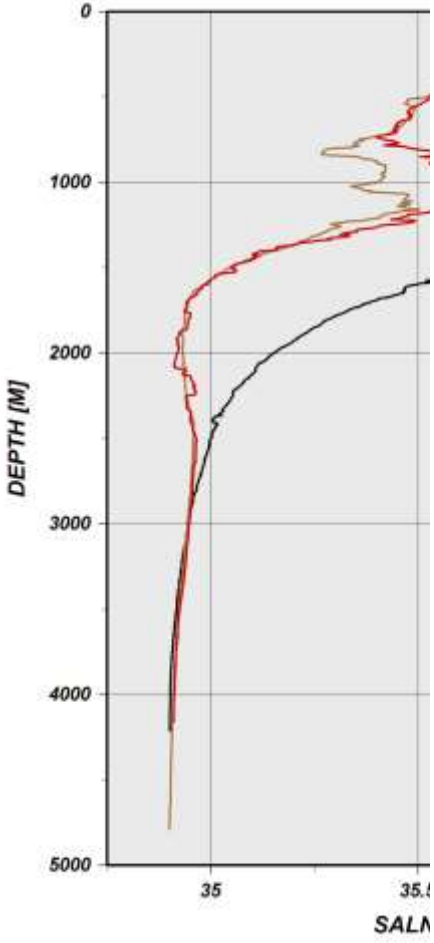
	Variable	Availability
2	Depth [m]	100
3	Pressure [db]	69
4	Temperature ITS-90 [° C]	98
5	CTD Salinity [PSS-78]	61
6	Salinity [PSS-78]	67
7	Oxygen [umol/kg]	65
8	Oxygen Fix Temp [° C]	63
9	Oxygen Anomaly [umol/kg]	67
10	Carbon Dioxide [umol/kg] [DIC]	5
11	Alkalinity [uequiv]	3
12	Nitrate+Nitrite [umol/kg]	17
13	Nitrite [umol/kg]	15
14	Phosphate [umol/kg]	17
15	Silicate [umol/kg]	18
16	Particulate Organic Carbon [ug/kg]	9
17	Particulate Organic Nitrogen [ug/kg]	9
18	Dissolved Organic Carbon [ug/kg]	6
19	Dissolved Organic Nitrogen [ug/kg]	6
20	Bacteria [cells*10^8/kg]	7
21	Chlorophyll c3 [ng/kg]	4
22	Chlorophyllide a [ng/kg]	4
23	Chlorophyll c1 + c2 & Chlorophyll Mg 3,8	4
24	Peridinin [ng/kg]	4
25	19'- Butanoyloxyfucoxanthin [ng/kg]	4
26	Fucoxanthin [ng/kg]	4
27	19'- Hexanoyloxyfucoxanthin [ng/kg]	4
28	Prasinoxanthin [ng/kg]	4
29	Diadinoxanthin [ng/kg]	4
30	Alloxanthin [ng/kg]	4
31	Diatoxanthin [ng/kg]	4
32	Zeaxanthin + Lutein [ng/kg]	4
33	Chlorophyll b [ng/kg]	4
34	Chlorophyll a [ng/kg]	4
35	a+ß Carotene [ng/kg]	4
36	Turner Chlorophyll a [ug/kg]	4
37	Turner Phaeopigments [ug/kg]	4
38	Lutein [ng/kg]	1
39	Zeaxanthin [ng/kg]	1
40	a Carotene [ng/kg]	1
41	Carotene [ng/kg]	1
42	Sample Id	100

2383 stations

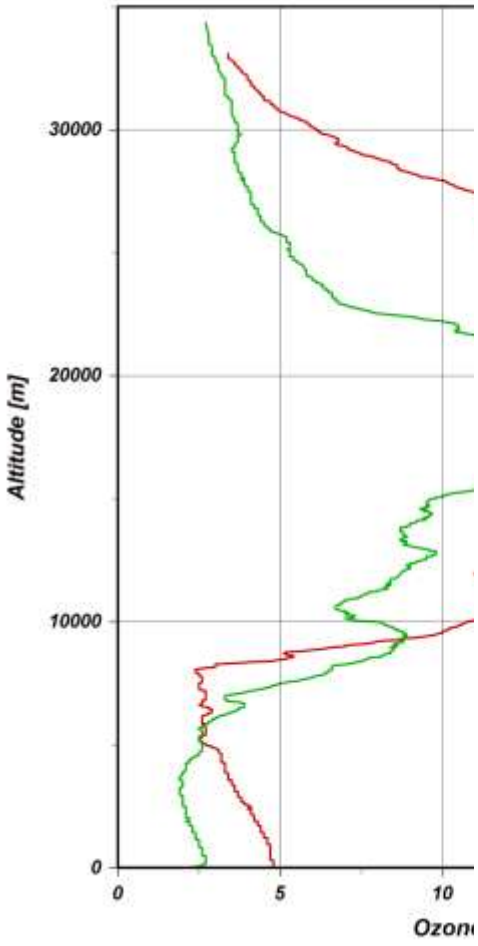
46,124 samples

Profiles

Ocean

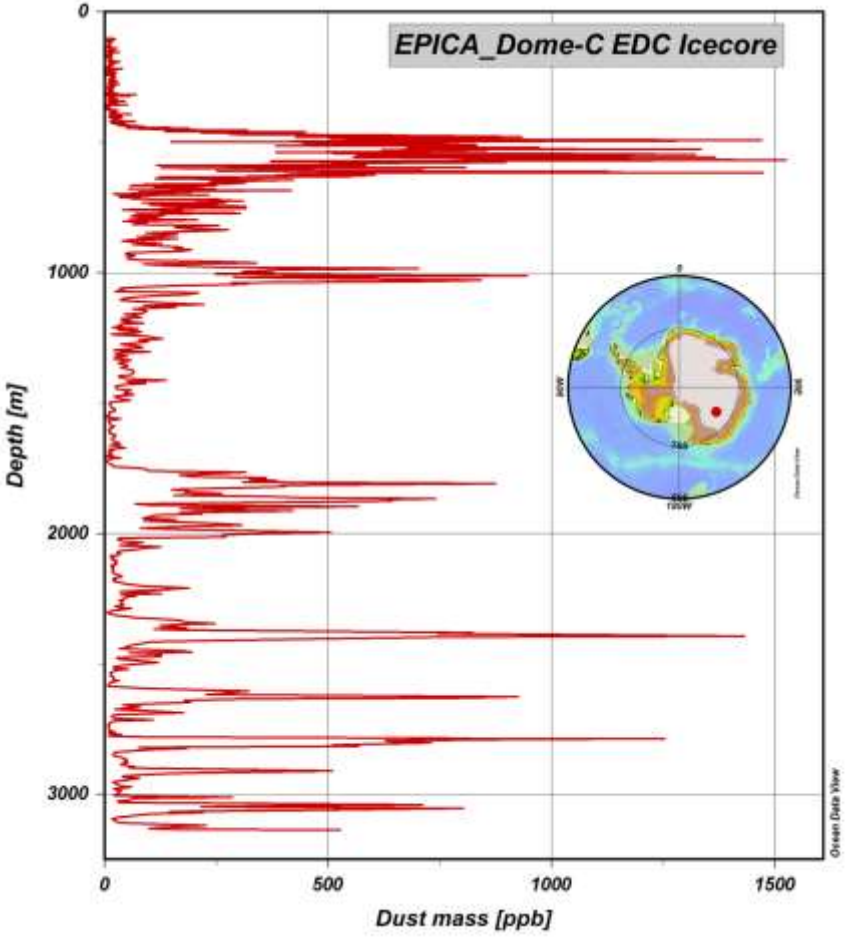


Atmosphere



Ice

Sediments, Soil, ...



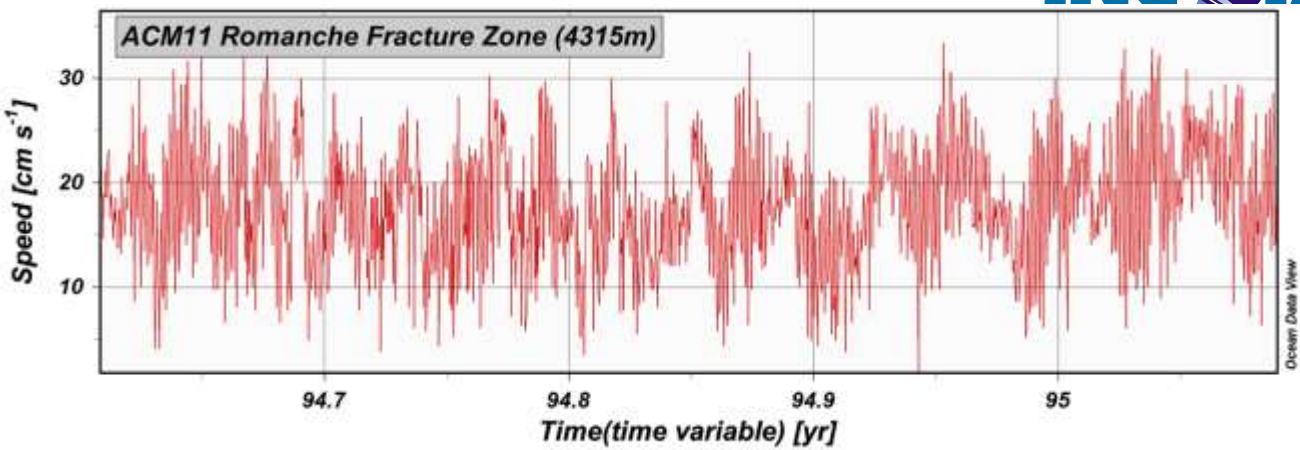
Timeseries

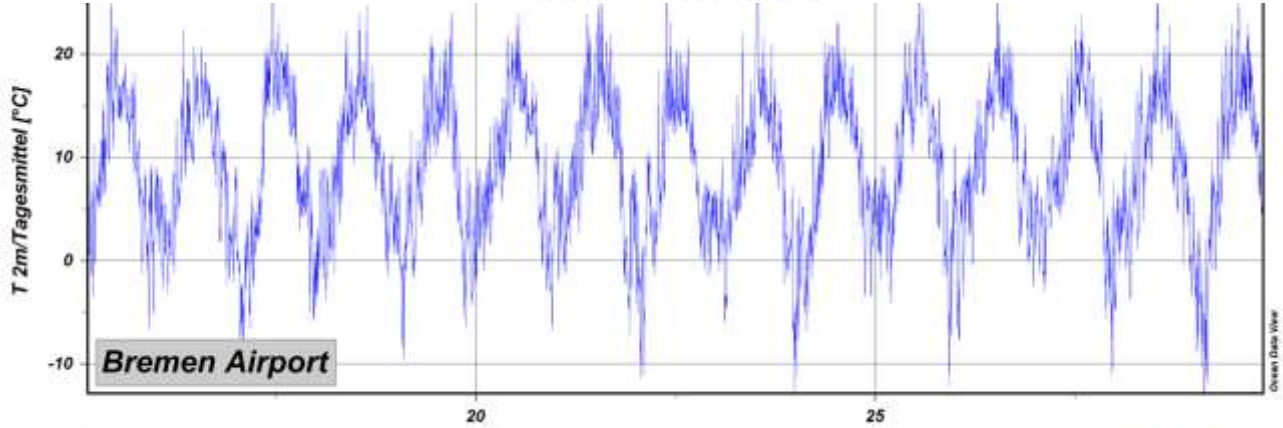
Ocean

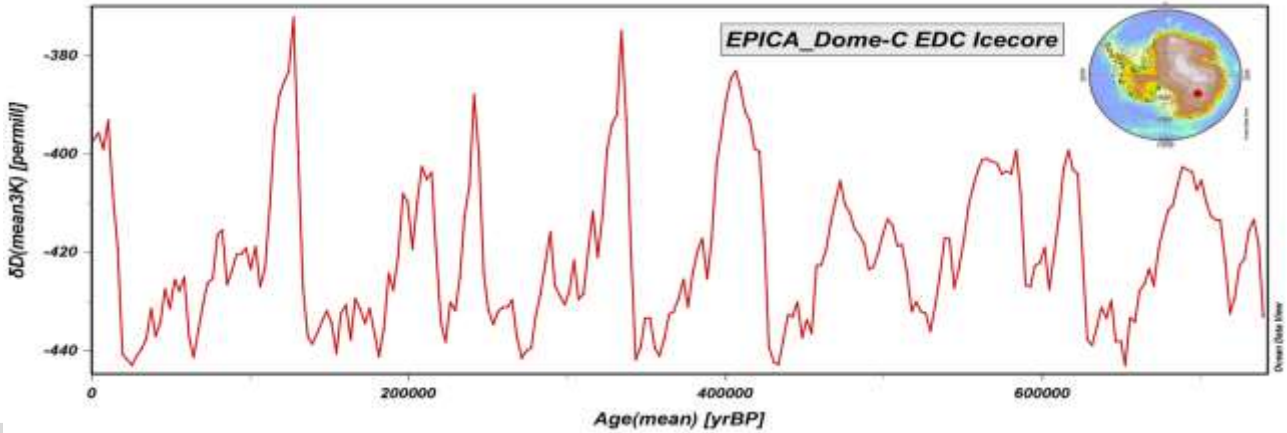
Atmosphere

Ice

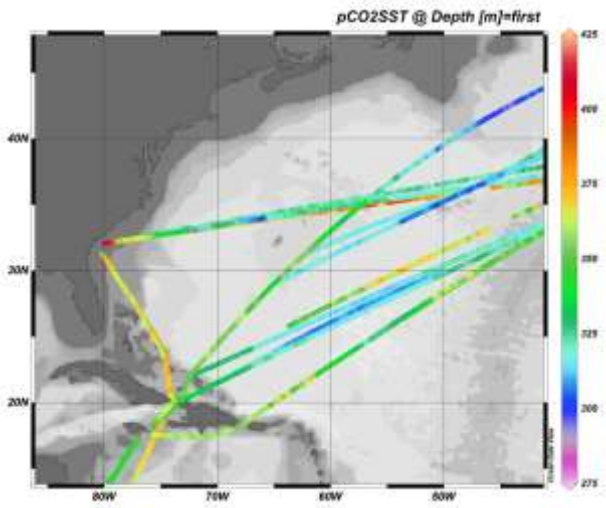
etc. …



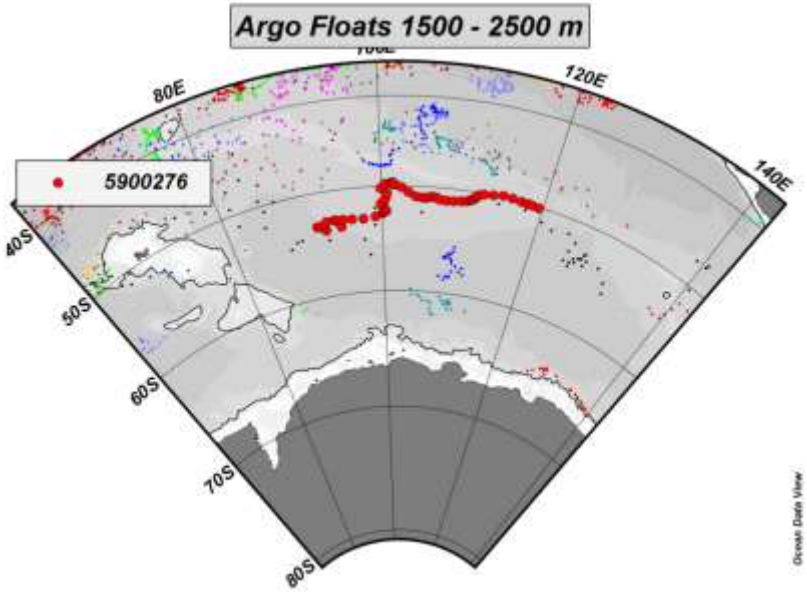




Trajectories

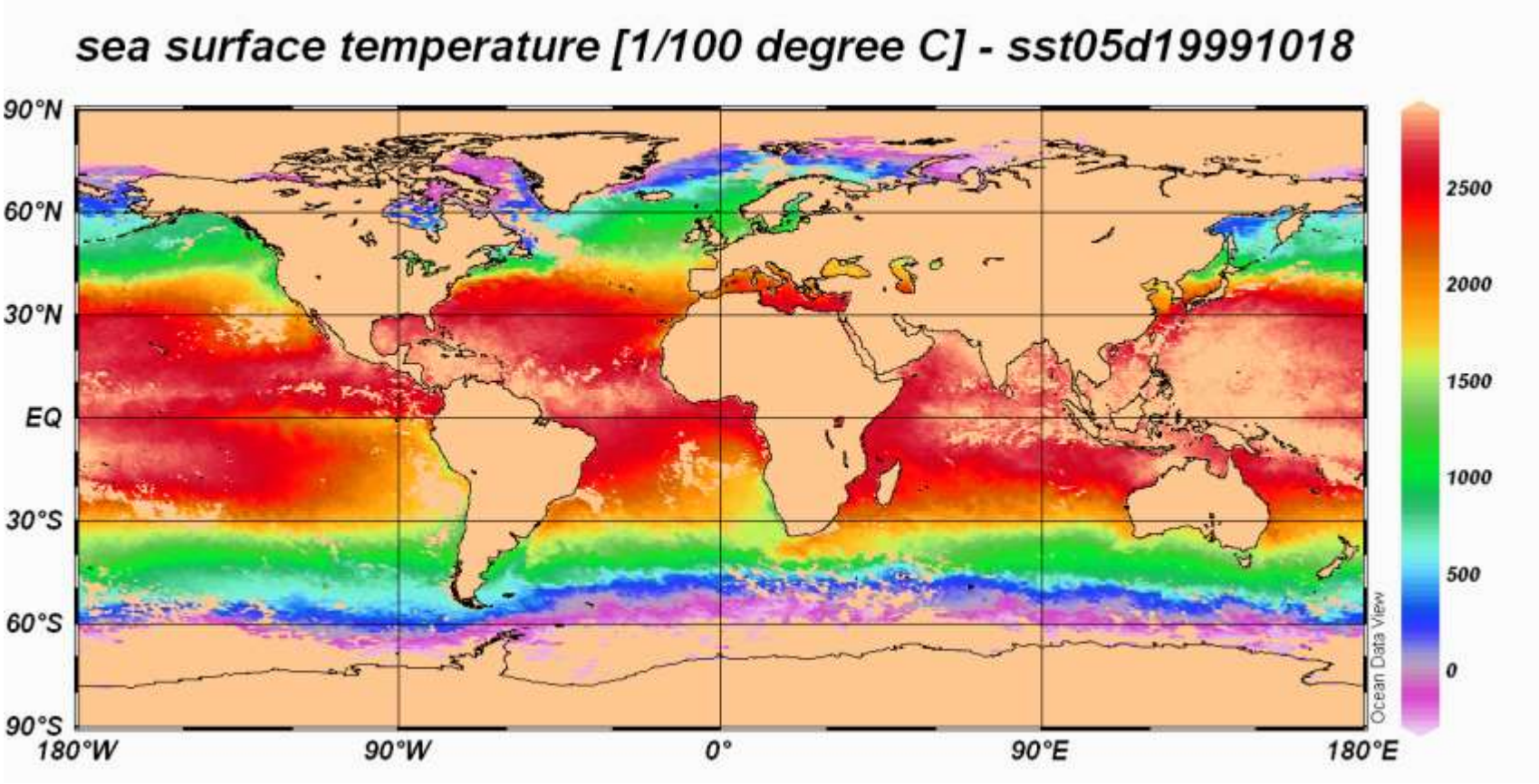


Underway
Ship Data

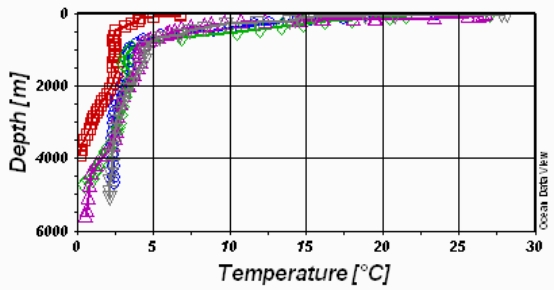


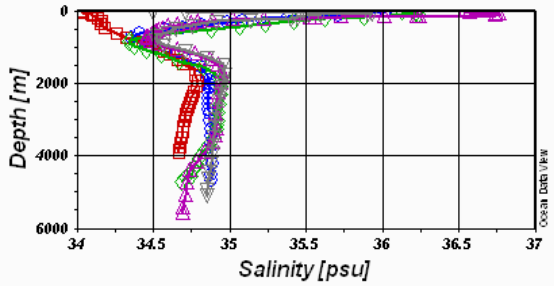
Float Trajectories

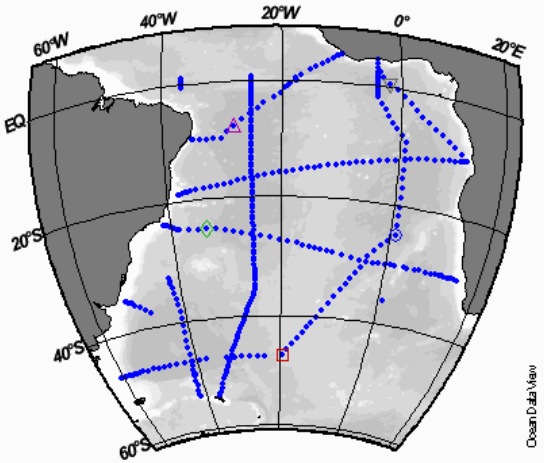
Other – Satellite Data (netCDF)

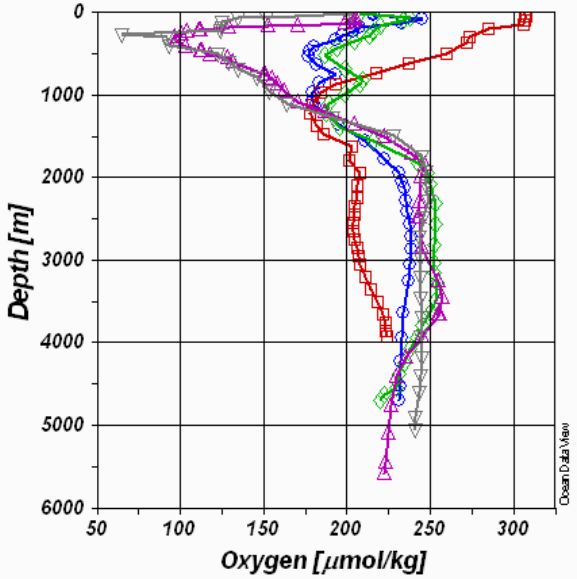


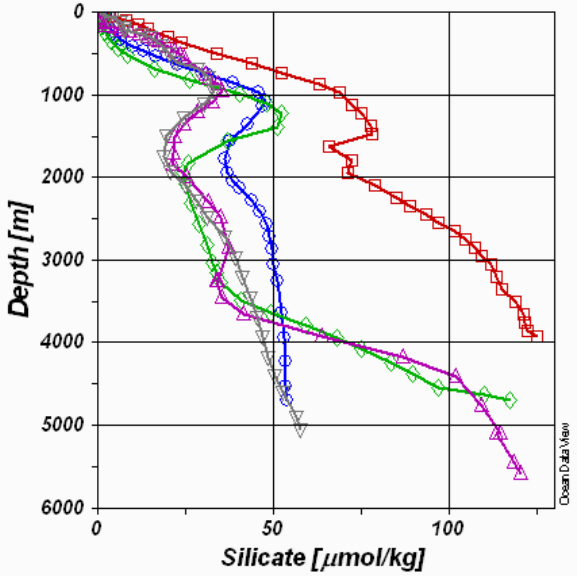
STATION Mode

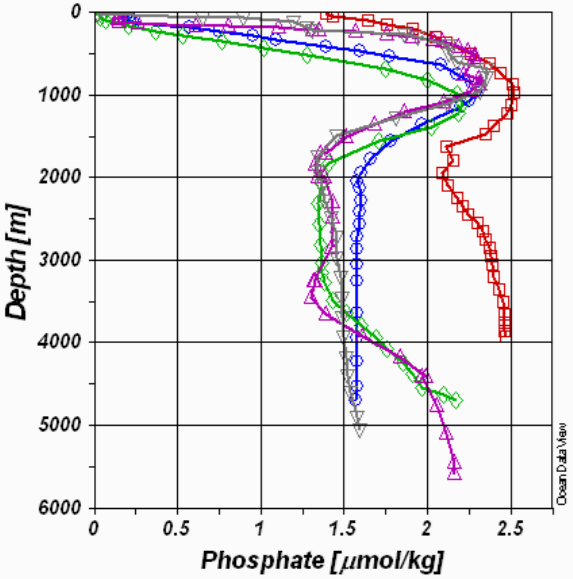


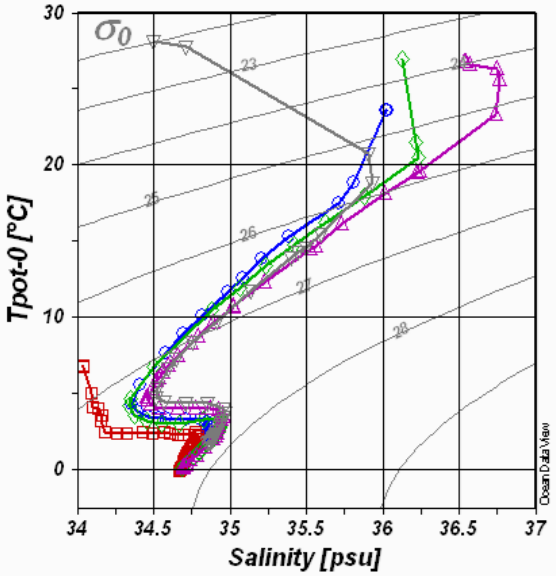




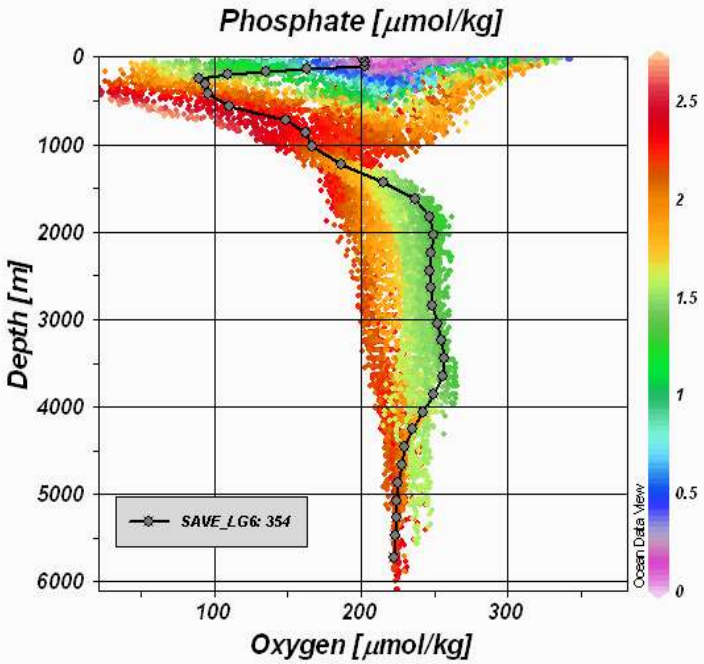


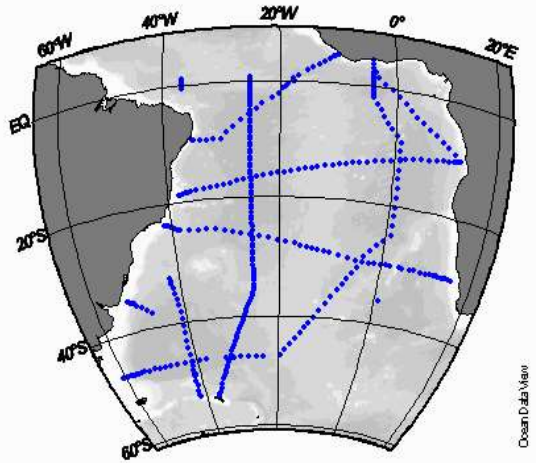


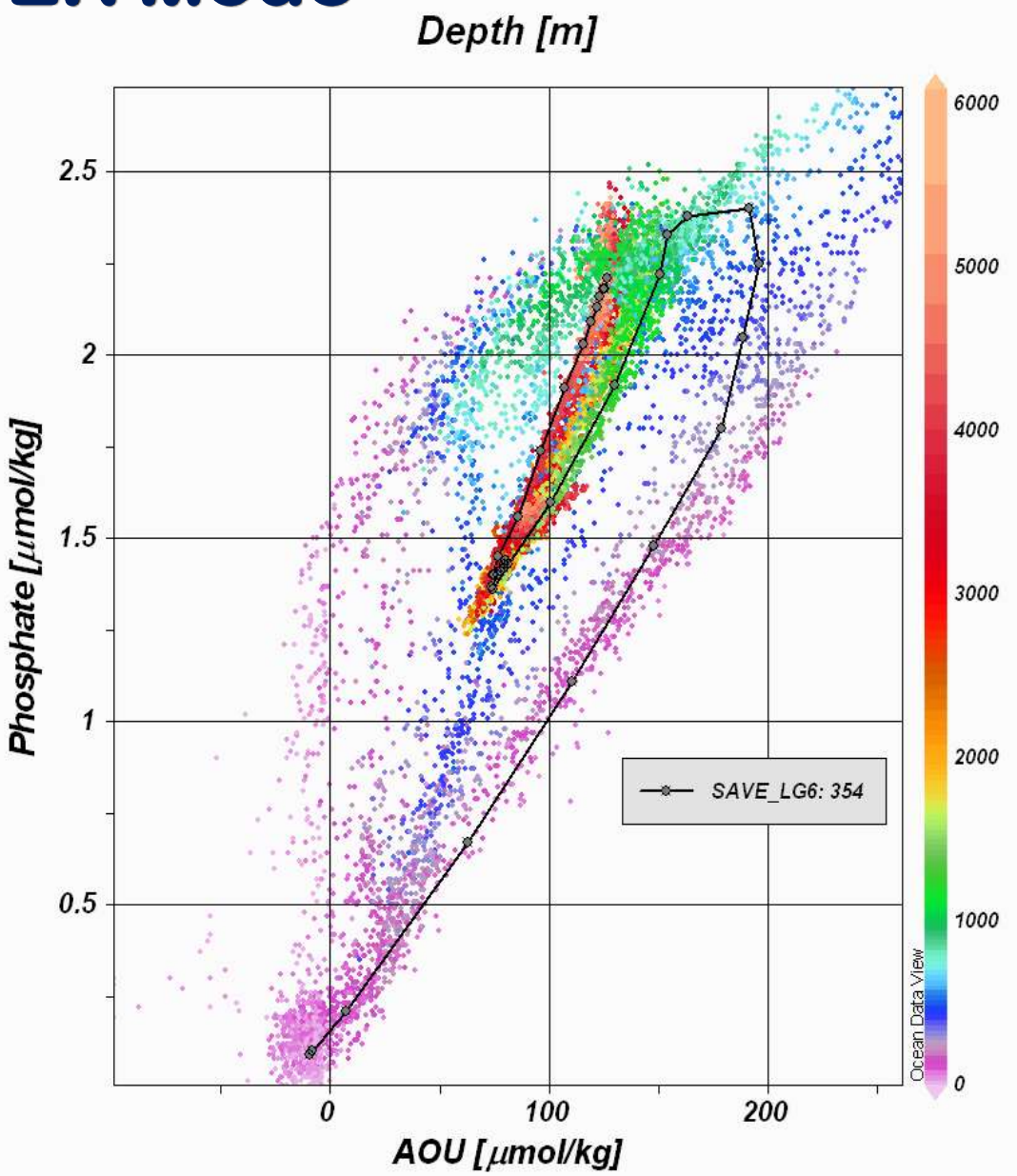




SCATTER Mode

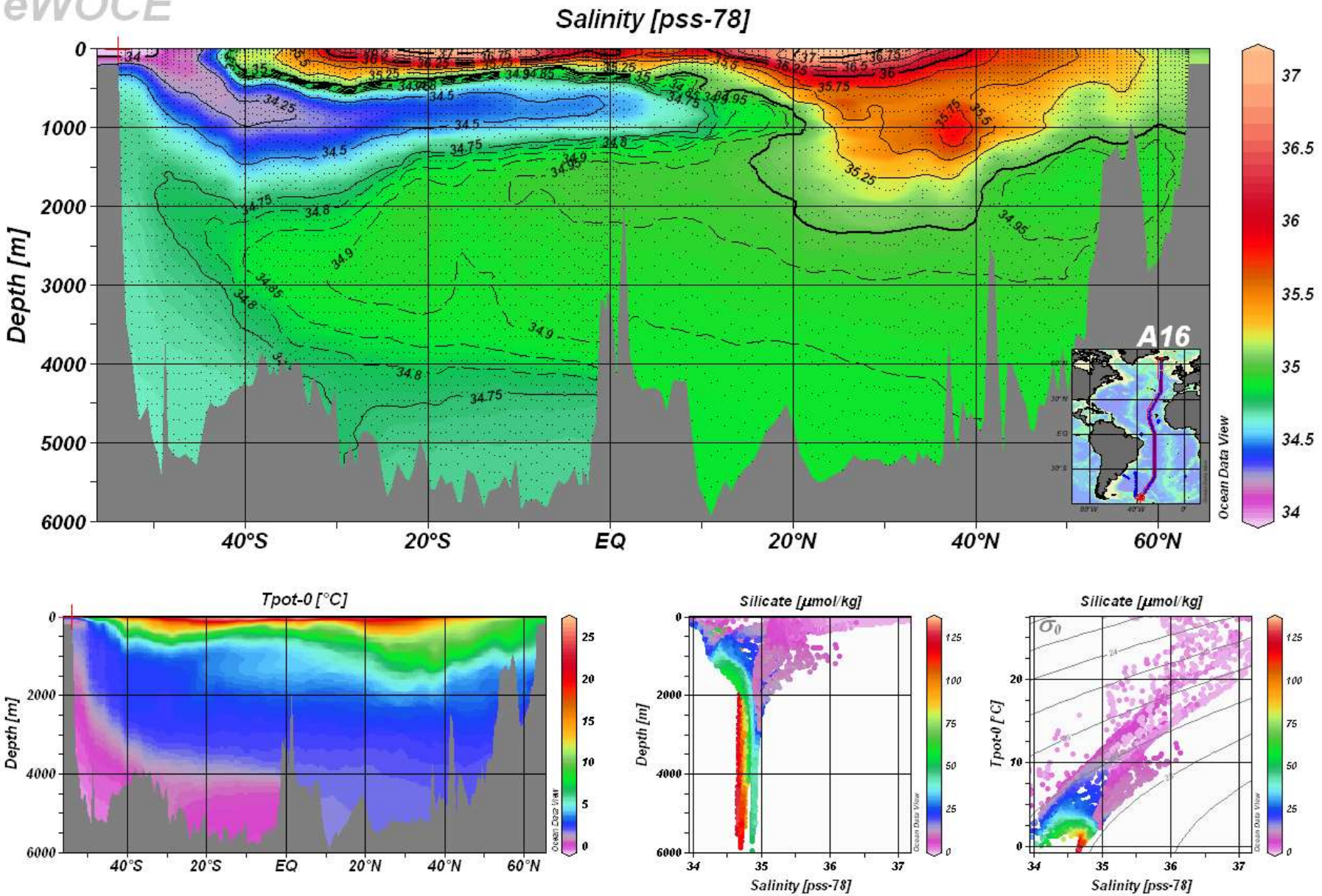






SECTION Mode

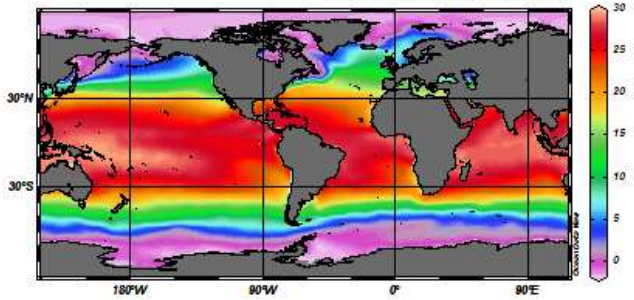
eWOCE



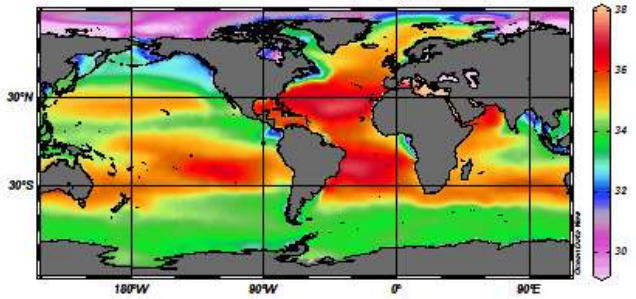
SURFACE Mode

WOA09_Jan-Mar

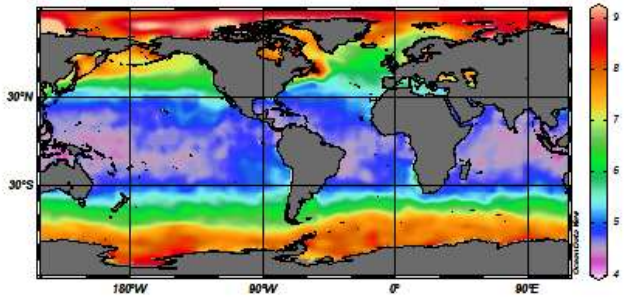
Temperature [°C] @ Depth [m]=0



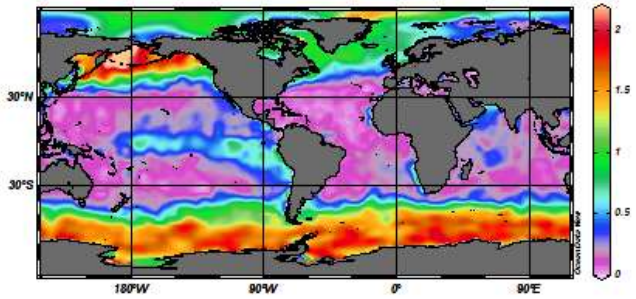
Salinity [psu] @ Depth [m]=0

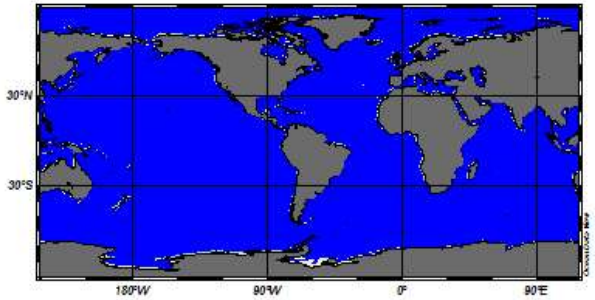


Oxygen [ml/l] @ Depth [m]=0

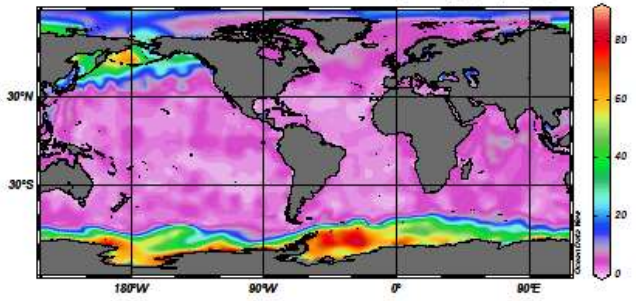


Phosphate [µmol/l] @ Depth [m]=0

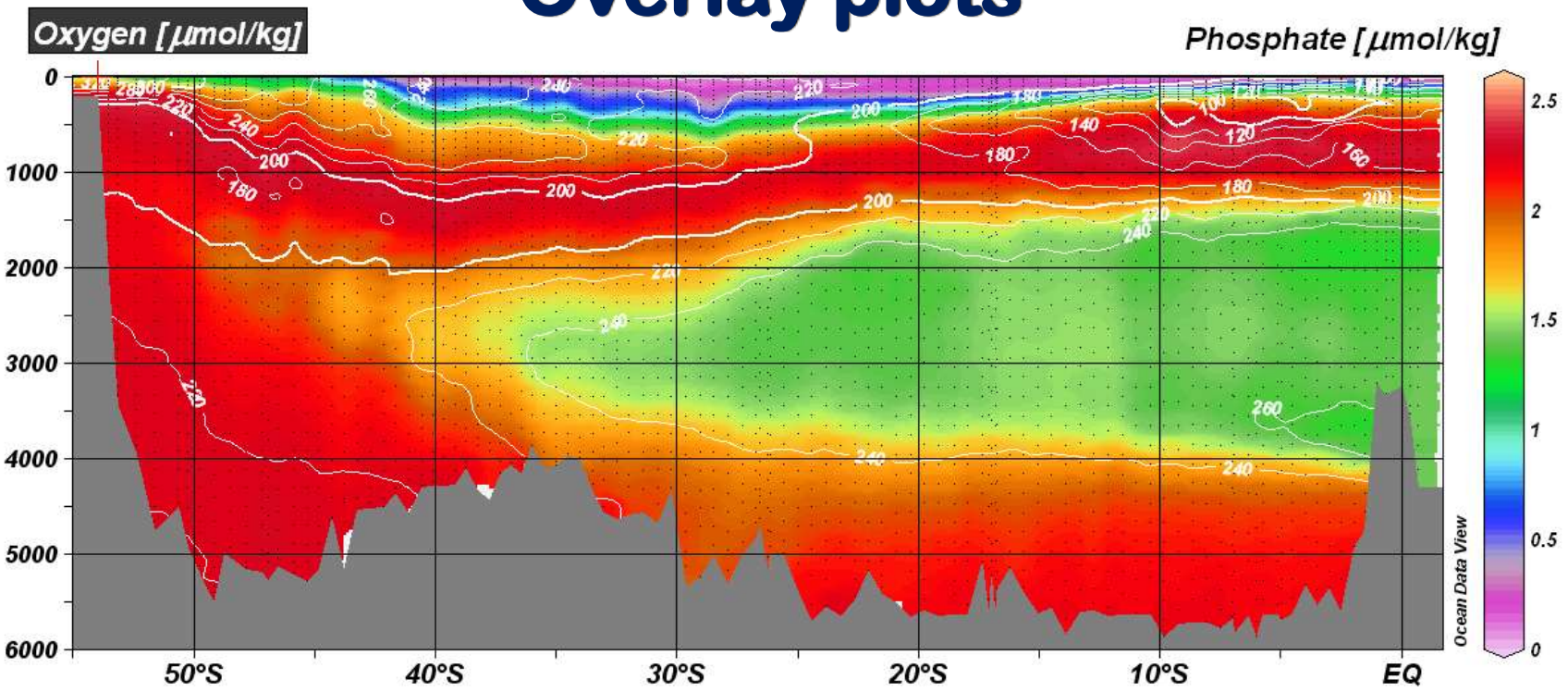


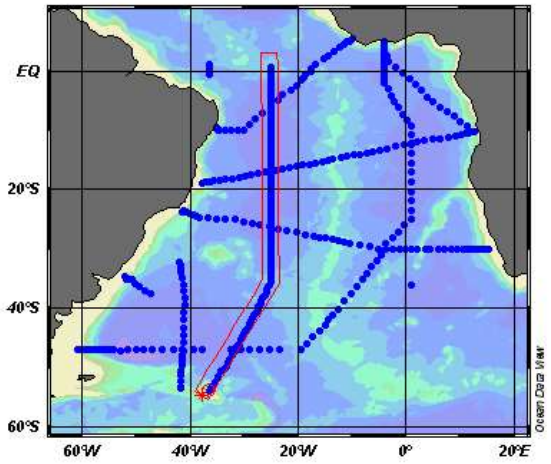


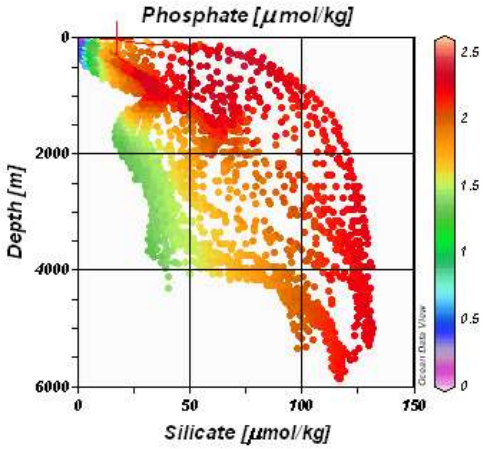
Silicate [µmol/l] @ Depth [m]=0

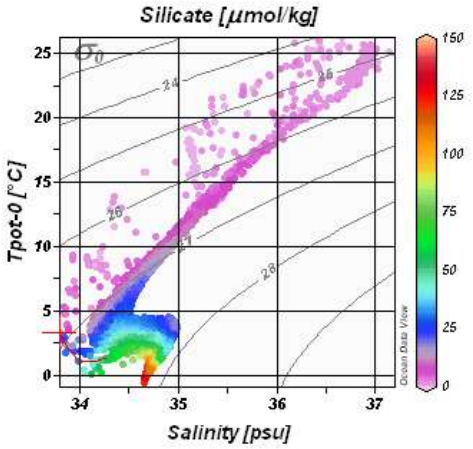


Overlay plots

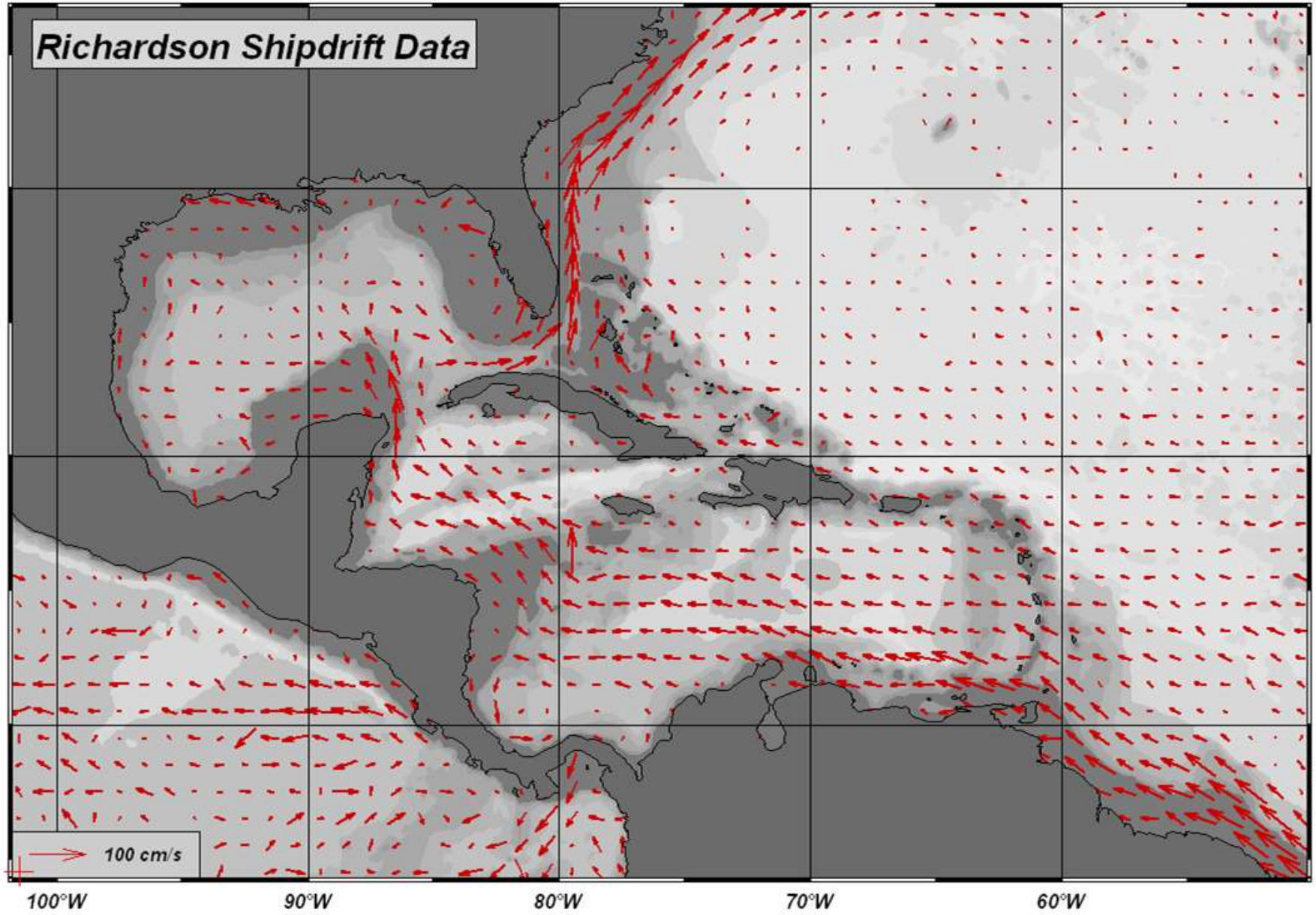








Vector Plots

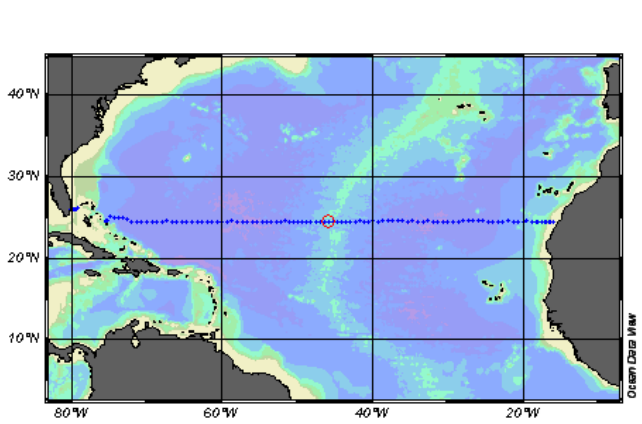


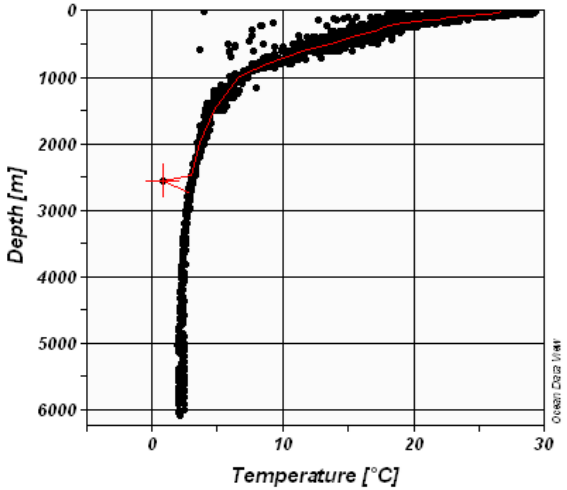
Derived Variables

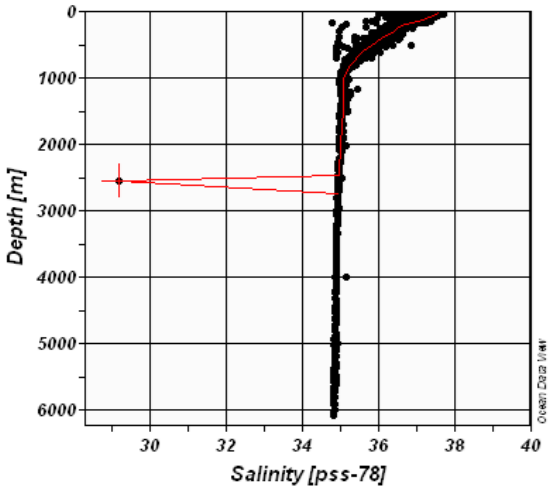
List of built-in derived variables

Variable	Comment
AOU [umol/kg]	Apparent oxygen utilization
Brunt-Väisälä Freq. [cycl/h]	EOS80
CFC-11 Saturation [%]	Warner & Weiss, Deep Sea Res., 32,1485-1497,1985
CFC-12 Saturation [%]	Warner & Weiss, Deep Sea Res., 32,1485-1497,1985
CFC-10 Saturation [%]	Bullister & Wisegarver, Deep Sea Res., 45,1285-1302,1998
CFC-113 Saturation [%]	Bu & Warner, Deep Sea Res., 42,1151-1161,1995
CH4 Saturation [%]	Wiesenburg & Guinasso, J. Chem. Eng. Data,24,356-,1979
CO_2(TCO_2,TALK) [umol/kg]	Dickson and Goyet, DOE Handbook, 1991
CO_3^{--}(TCO_2,TALK) [umol/kg]	Dickson and Goyet, DOE Handbook, 1991
Day of Year(header mon/day/year) [days]	Day of the Year [days] derived from header mon/day/year
Day of Year(time variable) [days]	Day of the Year [days] derived from a time variable
Difference from Reference Data	(details)
Dynamic Height [dyn m]	EOS80 (any reference pressure)
Freezing Temperature [°C]	F. Millero, UNESCO Tech. Papers in the Marine Science, No. 28., 29-35, 1978
HCO_3^-(TCO_2,TALK) [umol/kg]	Dickson and Goyet, DOE Handbook, 1991
Neutral Density [kg/m^3]	Jackett & McDougall, J. Phys. Ocean., 237-263, 1997 (more info)
Oxygen Saturation [%]	Weiss, Deep Sea Res., 17, 721-735, 1970
pCFC-11 [pptv]	Warner & Weiss, Deep Sea Res., 32,1485-1497,1985
pCFC-12 [pptv]	Warner & Weiss, Deep Sea Res., 32,1485-1497,1985
pCFC-10 [pptv]	Bullister & Wisegarver, Deep Sea Res., 45,1285-1302,1998
pCFC-113 [pptv]	Bu & Warner, Deep Sea Res., 42,1151-1161,1995
pCH4 [ppbv]	Wiesenburg & Guinasso, J. Chem. Eng. Data,24,356-,1979
pCO_2(TCO_2,TALK) [uAtm]	Dickson and Goyet, DOE Handbook, 1991; Weiss 74
pH(TCO_2,TALK)	Dickson and Goyet, DOE Handbook, 1991
Potential Density [kg/m^3]	EOS80 (any reference pressure)
Potential Temperature [°C]	Bryden, Deep Sea Res.,20,401-408, 1973 (any reference pressure)
Potential Vorticity [10^{-12} m^{-1} s^{-1}]	Planetary potential vorticity (derived from Brunt Vaissala Frequency Q=f/g*N^2)
Pressure [db]	Saunders, J. Phys. Ocean., 1981
Ratio	Any two variables
Sound Speed [m/s]	Chen & Millero 1977, jasa, 62, 1129-1135
Specific Heat C_p [J/(kg °C)]	F. Millero et al, J. Geoph. Res., 78, 4499-4507, 1973
Time(header mon/day/year) [yr]	Decimal time [yr] derived from header mon/day/year
Time(time variable) [yr]	Decimal time [yr] derived from a time variable
Vertical Derivative	Any variable
Second Vertical Derivative	Any variable
Vertical Integral	Any variable

Data Quality Control

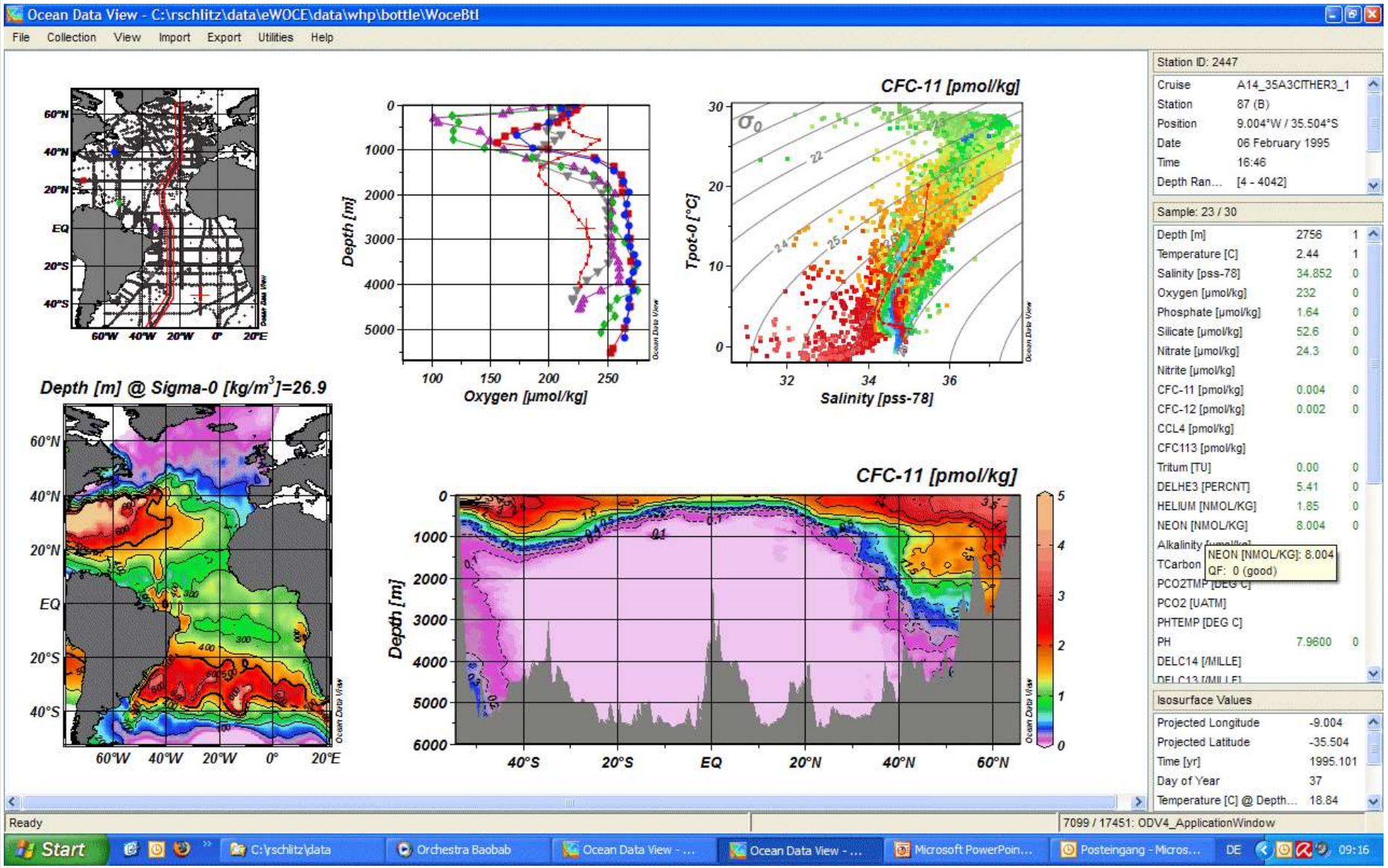






- Easy spotting and identification of outliers or offsets
- Painless editing of data value and quality flag
- Logging of all values or flag modifications
- Automatic range checks and manual or automatic editing

ODV – Application Window



Built-in Importers:

- U.S. NODC World Ocean Database
- GTSPP netCDF 4 files
- ARGO profile and trajectory data
- MEDAR/MEDATLAS data
- WOCE CTD and bottle data
- Sea-Bird .cnv format
- Various spreadsheet file formats

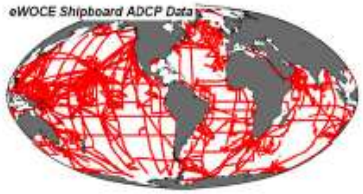
Oceanography - WOCE

eWOCE Data

eWOCE provides global or basin-wide data collections for most WOCE data streams, including ADCP, CTD, XBT, current meters, profiling floats, sea-level, sea surface T/S, subsurface floats, surface drifters, hydrography, nutrients and tracers.

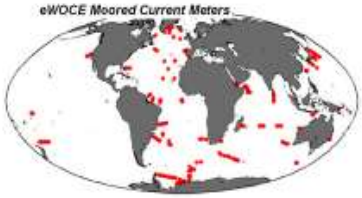
ADCP Data

Shipboard ADCP velocity profiles for more than 240,000 stations and 540 cruises from the ADCP Program.



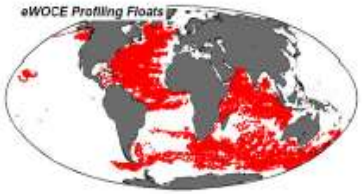
Current Meter Data

Velocity and hydrographic data for more than 1300 moored current meters from the Current Meter Program.



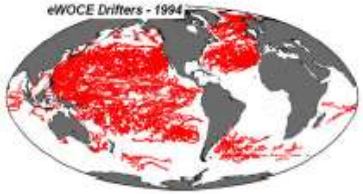
Profiling Float Data

More than 31,000 temperature and salinity profiles from more than 1600 profiling floats.



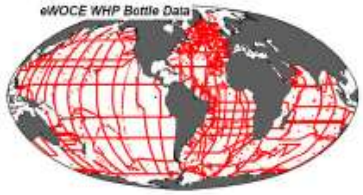
Surface Drifter Data

Trajectories and velocity data for more than 12,000 drifters from the Surface Velocity Program (daily data organized by years, 1979-2000).



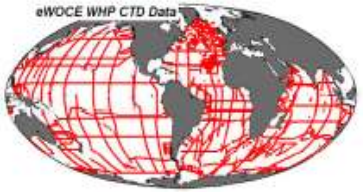
WHP Bottle Data

Hydrographic, nutrient and tracer data from the WOCE Hydrographic Program (>17,400 stations).



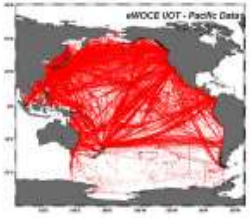
WHP CTD Data

High resolution CTD data from the WOCE Hydrographic Program (>18,500 stations).



Upper Ocean Thermal Data

More than 1 million temperature and salinity profiles from the Upper Ocean Thermal Program (organized by ocean basins; separate data collection for high density lines).



Data Sources

Name of Dataset	Source	Type of Data	Web Address
ARGO		Temperature, Salinty, Oxygen etc (Profile, Trajectory)	http://www.argo.ucsd.edu/
The Global Temperature and Salinity Profile Programme (GTSPP)	NOAA	Temperature, salinity (surface, sub-surface)	https://www.nodc.noaa.gov/GTSPP/
World Ocean Database (WOD)	NOAA	MBT, XBT, CTD, MRB, PFD, Glider etc	https://www.nodc.noaa.gov/OC5/WOD/pr_wod.html
World Ocean Atlas (WOA)	NOAA	Temperature, Salinty, Oxygen, phosphate etc	https://www.nodc.noaa.gov/OC5/WOA09/pr_woa09.html
World Ocean Circulation Experiment (WOCE)	NOAA	Hydrography, Sea-level, XBT, Float, Drifter, Current Meter, ADCP etc	https://www.nodc.noaa.gov/woce
SeaDataNet	Pan-European Infrastructure For Ocean & Marine Data Management	CTD – Bio-chemical-physical oceanography variables	https://www.seadatanet.org
MEDAR/MEDATLAS II	Mediterranean Data Archaeology and Rescue	CTD, Bottle, MBT, XBT etc	http://www.ifremer.fr/medar

Sample Spreadsheet Data

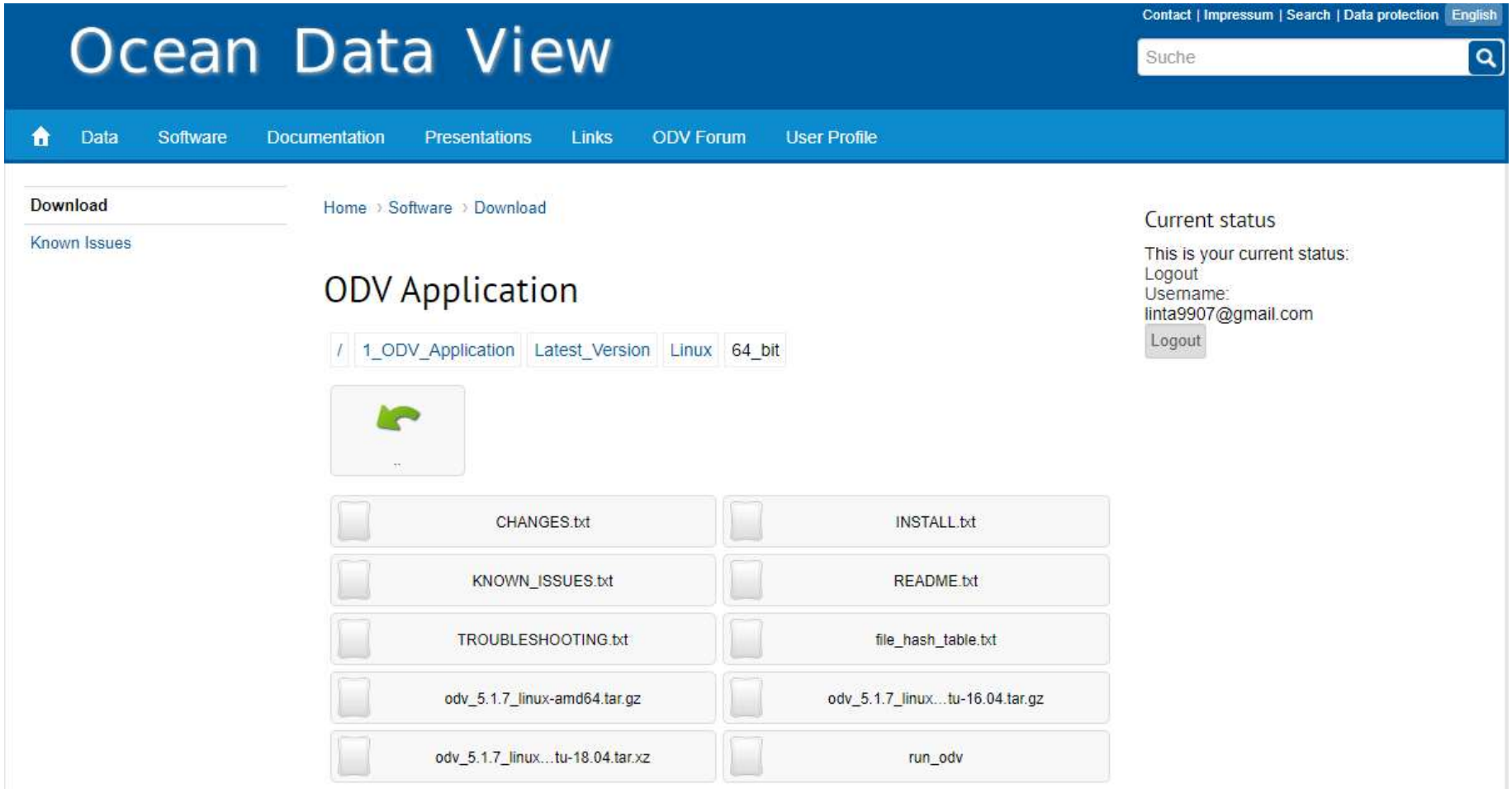
Cruise	Station	Type	yyyy-mm-ddThh:mm:ss.sss	Longitude [degr	Latitude [degre	Bot. Depth [m]:M	DEPTH [M]	QF	TEMPERATU	QF	SALNTY [PSS	QF
17	16618	B	1992-07-10T00:00:00.000	335.000	-69.22	4658	4.0	1	-1.773	1		1
							5.0	1	-1.793	1	34.4414	1
							28.0	1	-1.772	1	34.4436	1
							49.0	1	-1.704	1	34.4953	1
							98.0	1	0.232	1	34.6280	1
							148.0	1	0.528	1	34.6515	1
							198.0	1	0.764	1	34.6760	1
							247.0	1	0.860	1	34.6906	1
							297.0	1	0.831	1	34.6953	1
							346.0	1	0.780	1	34.6950	1
							392.0	1	0.740	1	34.6895	1
							445.0	1	0.688	1	34.6835	1
							491.0	1	0.653	1	34.6894	1
17	16619	B	1992-07-11T00:00:00.000	333.733	-68.72	4698	6.0	1	-1.810	1	34.4568	1
							40.0	1	-1.808	1	34.4558	1
							78.0	1	-1.807	1	34.4561	1
							119.0	1	0.345	1	34.6381	1

Date format in csv spredsheet data

1. Assign header to the date column of the data as yyyy-mm-dd
2. Open the csv data in excel, select all the date values, use ‘format cells’ to set as the specified custom format
3. Make sure the date is written in the specified format as yyyy-mm-dd

ODV Website:
http://odv.awi.de

1. **Register**
2. **Download for Ubuntu/Mac/Windows**



ODV Installation Steps - Linux

1
- **Download** the run_odv file and the odv_...linux-amd64_ubuntu....gz file (corresponding your ubuntu version)
- Copy the file run_odv to your desktop

2
- **Extract** the .gz file into a new folder named ODVhome in home, where you would like to install ODV. It will build directories automatically

3
- **Go the extracted folder** ..ODVhome from terminal where the installation files are located.
- Type 'pwd'. Copy this path of the ODVhome folder.

4
- **Go to desktop** through terminal and type 'gedit run_odv'.
- After the line ODV HOME= paste the copied path of the ODVhome folder.
- So the **path is set.** Now close gedit

5
- Type 'chmod u+x run_odv' to **give permission** to the file run_odv
- Type './run_odv' to **run odv**

Basic Data analysis with ODV

Creating a collection

- First basic step
- WOD - powerful tool for studying climate and the ocean environment - world's largest collection of ocean profile-plankton data available internationally without restriction
- Combination of various projects – WOCE, CLIVAR, Argo, GTSPP etc, (part of NODC, IOC/IODE)

Create Collection using World Ocean Database

Part 1:

Download data from World Ocean Database

WODselect - World Ocean Database retrieval system

Step 1:

- Go to https://www.nodc.noaa.gov/ >WOD > WODSelect
- Tick the box for GEOGRAPHIC COORDINATES and DATASETS
- Select the Build a query button

WORLD OCEAN DATABASE SELECT AND SEARCH

Note: At this time, World Ocean Database 2018 (WOD18) contains prereleased data and flags for the WOA18.

The WOD is an NCEI product and an IODE (International Oceanographic Data and Information Exchange) project.
This work is funded in partnership with the NOAA OAR Ocean Observing and Monitoring Division.

The WOD*select* retrieval system allows a user to search *World Ocean Database* and new (quartely updated/added) data using a user-specified search criteria. A distribution map and cast count of these search criteria will give the user the option to have the data extracted and placed on the NODC FTP site in the *WOD* native, 'csv', and netCDF data formats.

To build a user defined search query:

1. Place check mark in front of any number of criteria.
2. Press the "Build a query" button.

(If any criteria below are not checked, the default will apply).

SEARCH CRITERIA: (definitions)	**DEFAULT:**
☑ **Geographic Coordinates**	- whole world
☐ **Observation Dates** - *e.g., Year(s), Month(s), Day(s)*	- all years/months/days
☑ **Dataset** - *e.g., OSD, CTD, XBT*	- all datasets
☐ **Measured Variables** - *e.g., Temperature, Salinity, Nutrients*	- all available variables
☐ **Biology** - *e.g., Phytoplankton, Zooplankton*	- all available plankton
☐ **Deepest Measurement**	- all depths
☐ **Country**	- all countries
☐ **Ship/Platform**	- all ships/platforms
☐ **Cruise**	- all cruises
☐ **Accession #**	- all accessions
☐ **Project**	- all projects
☐ **Institute**	- all institutes
☐ **Data Exclusion Using WOD Quality Control Flags**	- no exclusion
☐ **Data Additions**	- WOD18 released data

Build a query Reset

Step 2:

- Enter the coordinates for the Area of Interest bounding box.

  Top (latitude): **10** degrees

  Bottom (latitude): **5** degrees

  Left (longitude): **65** degrees

  Right (longitude): **75** degrees

- Tick the first 7 DATASET options.
- Select the Get an Inventory button

BACK TO BUILD a new query

GEOGRAPHIC COORDINATES:
(Use A or B below, then continue) HELP

A. Manually input coordinates

Northern edge 20

Western edge 65 **Eastern edge** 75

Southern edge 10

B. Rubberband selection coordinates Draw Map

DATASET:
Plankton data are only present in the OSD dataset.
Nutrient and chlorophyll data are only present in the OSD and SUR datasets.
*Important note about BT bias corrections in WOD13

- [x] Ocean Station Data (OSD) [Bottle, low resolution CTD/XCTD, plankton data]
- [x] High Resolution CTD/XCTD (CTD)
- [x] Expendable Bathythermograph (XBT)
- [x] Mechanical Bathythermographs (MBT) [includes Digital Bathythermograph, µBT]
- [x] Profiling Floats (PFL)
- [x] Drifting Buoys (DRB)
- [x] Moored Buoys (MRB) [TAO, PIRATA, others]
- [ ] Autonomous Pinniped Bathythermographs (APB)
- [ ] Undulating Oceanographic Recorder (UOR) [Towed CTD]
- [ ] Surface-Only (SUR) [Bucket, Thermosalinograph]
- [ ] Glider data (GLD)

Get an Inventory Please, CLICK ONLY ONCE, it may take a while before results are shown.

Step 3:

- Select the *CRUISE LIST* button.

- Select the link from any one of the Cruise Reference. This will display the Cruise Information Record showing a map of the cruise.

BACK TO BUILD a new query

Thu Jun 27 11:28:46 2019

COPY OF YOUR DATABASE SEARCH CRITERIA:

GEOGRAPHIC COORDINATES: **Longitude** from 65.0000 to 180.0000; **Latitude** from 20.0000 to 10.0000

DATASET: OSD,CTD,XBT,MBT,PFL,DRB,MRB

MEASURED VARIABLES (extract): all variables

QUERY RESULTS:

VIEW DATA DISTRIBUTION PLOT | CRUISE LIST

Please, CLICK ONLY ONCE, it may take a while before results are shown.

The cast count for your request is:

34626	OSD casts
7539	CTD casts
92632	XBT casts
87428	MBT casts
93582	PFL casts
307	DRB casts
9018	MRB casts
325132	TOTAL casts

Full (expanded) file size estimate (531.4 MB)

Gzipped file size estimate (129.8 MB)

NOTE: *the file size estimates are for the WOD native format*

Data extractions will take approximately 59 min.

DOWNLOAD DATA

If you encounter any problems, please contact: OCL.help@noaa.gov

BACK TO BUILD a new query

COPY OF YOUR SEARCH CRITERIA

To return to the EXTRACT DATA option, use browser "Back" button

GEOGRAPHIC COORDINATES:	**Longitude** from 65.0000 to 75.0000; **Latitude** from 20.0000 to 10.0000
DATASET:	OSD,CTD,XBT,MBT,PFL,DRB,MRB
MEASURED VARIABLES (extract):	

CRUISE LIST

The individual cruise/accession links provide cruise or accession information record and a data distribution plot, except for cruise number "0". For more information, please see the "COLUMN DEFINITIONS" below. Platform and Institute codes are defined below the cruise list.

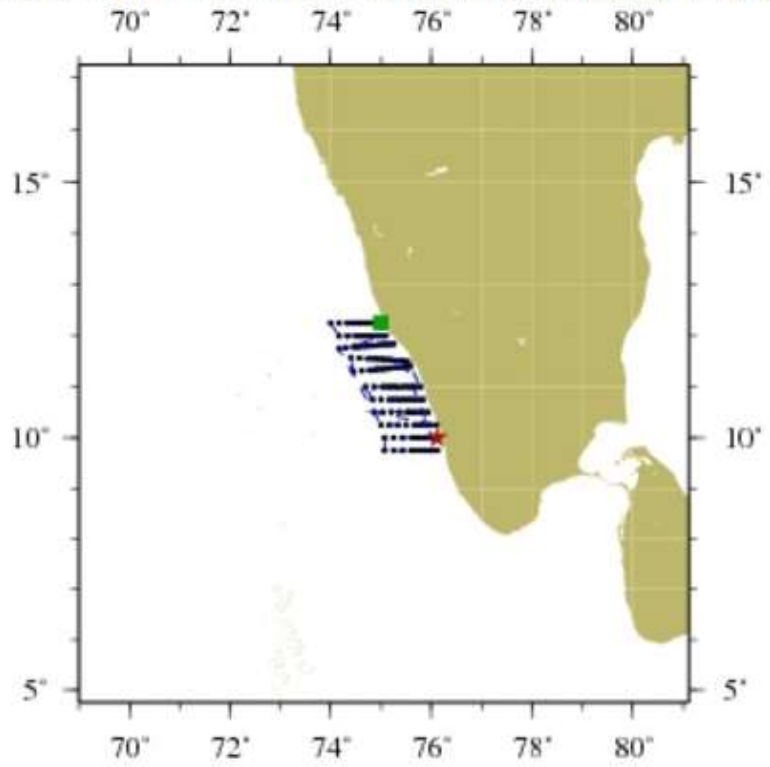
To get data for specific cruise(s) or accession(s):

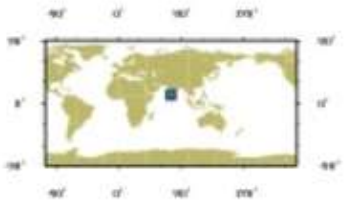
1. Place check mark in front of any number of cruises and/or accessions,
2. Press SUBMIT CRUISE/ACCESSION button and return to the main database search page.

COLUMN DEFINITIONS

#	Cruise Reference	Institute	Platform	#Casts	Accession#	Start Date	End Date	Orig. Cruise ID
1	GB012994		10441	84	0095925	2/28/1800	6/ 3/1800	
2	99000000	783		200961	0000505	7/ 7/1874	12/19/2018	NODC-0000-0
3	US032939	89	2105	3	0071062	2/ 3/1878	2/11/1878	
4	US032940	89	2105	9	0071062	2/10/1879	4/ 6/1879	
5	JP000000	89		166653	0071062	9/13/1884	12/31/2000	
6	GB012740	89	5832	21	0071062	3/13/1890	5/ 5/1890	
7	GB012742	89	5832	42	0071062	10/20/1890	12/24/1890	
8	GB012743	89	5832	8	0071062	4/23/1891	5/ 2/1891	
9	GB012744	89	5832	35	0071062	10/22/1891	12/ 5/1891	
10	GB012745	89	5832	38	0071062	2/22/1892	5/ 4/1892	
11	GB012746	89	5832	28	0071062	10/21/1892	11/ 8/1892	
12	GB012749	89	5832	9	0071062	3/13/1893	4/25/1893	
13	GB000000	89		94568	0071062	6/ 9/1893	3/25/2015	
14	GB012751	89	5832	36	0071062	10/16/1893	11/26/1893	
15	GB012754	89	5832	3	0071062	5/ 4/1894	5/ 5/1894	
16	SU000000	89		89542	0071062	10/ 1/1894	7/28/1990	

CRUISE INFORMATION RECORD (Also available in csv format)





WOD Cruise Reference: IN000012

Number of Casts: 122

★ = Start of cruise track

■ = End of cruise track

NOAA/NESDIS/NODC Ocean Climate Laboratory

http://www.nodc.noaa.gov

WOD CRUISE REFERENCE	IN000012
COUNTRY	INDIA (IN)
NODC ACCESSION NUMBER (OSD)	7000616
NODC ACCESSION NUMBER (OSD)	9700310
SHIP NAME (7000616)	KALAVA
INSTITUTE (7000616)	CENTRAL MARINE FISHERIES RESEARCH STATION (MANADAPAM CAMP)
INSTITUTE (9700310)	CENTRAL MARINE FISHERIES RESEARCH STATION (MANADAPAM CAMP)
SUBMITTING INFORMATION (7000616)	
SUBMITTING INSTITUTE	CENTRAL MARINE FISHERIES RESEARCH STATION (MANADAPAM CAMP)
SUBMISSION DATE	6/1/1970
SUBMITTING INFORMATION (9700310)	
SUBMITTING INSTITUTE	YugNIRO
SUBMITTING INVESTIGATOR	TROTSENKO; DR. BORIS G.
SUBMISSION DATE	9/15/1998
DATE OF FIRST CAST	11/12/1957
DATE OF LAST CAST	12/18/1957
TOTAL NUMBER OF CASTS	122
Temperature [t] PROFILES	122
Salinity [s] PROFILES	118

CAST	LATITUDE	LONGITUDE	DATE	TIME	VARIABLES MEASURED
290114	10.000	76.117	11/12/1957	11.000	ts
290119	10.000	76.033	11/12/1957	12.000	ts
290122	10.000	75.950	11/12/1957	13.200	ts
290124	10.000	75.867	11/12/1957	14.200	ts
290126	10.000	75.783	11/12/1957	15.200	ts
290128	10.000	75.700	11/12/1957	16.200	ts
290130	10.000	75.617	11/12/1957	17.500	ts
290132	10.000	75.433	11/12/1957	19.000	ts
290136	10.000	75.250	11/12/1957	22.200	ts
290146	10.000	75.067	11/13/1957	1.200	ts
290153	9.750	75.067	11/13/1957	5.000	ts
290161	9.750	75.250	11/13/1957	7.400	ts
290171	9.750	75.433	11/13/1957	9.700	ts
290183	9.750	75.600	11/13/1957	12.200	ts
290189	9.750	75.683	11/13/1957	15.100	ts
290193	9.750	75.783	11/13/1957	16.000	ts

Step 4:

- Return to the QUERY RESULTS screen (go back two times – click browser back button twice).
- Select VIEW DATA DISTRIBUTION PLOT. This is the distribution map showing all data in the current selection.
- Select DOWNLOAD DATA button.

BACK TO BUILD a new query

Thu Jun 27 10:49:35 2019

COPY OF YOUR DATABASE SEARCH CRITERIA:

GEOGRAPHIC COORDINATES:	**Longitude** from 65.0000 to 75.0000; **Latitude** from 20.0000 to 10.0000
DATASET:	OSD,CTD,XBT,MBT,PFL,DRB,MRB
MEASURED VARIABLES (extract):	all variables

QUERY RESULTS:

VIEW DATA DISTRIBUTION PLOT | CRUISE LIST

Please, CLICK ONLY ONCE, it may take a while before results are shown.

The cast count for your request is:

3690	OSD casts
570	CTD casts
5244	XBT casts
1974	MBT casts
13657	PFL casts
0	DRB casts
141	MRB casts
25276	TOTAL casts

Full (expanded) file size estimate (43.4 MB)

Gzipped file size estimate (10.9 MB)

NOTE: *the file size estimates are for the WOD native format*

Data extractions will take approximately 4 min.

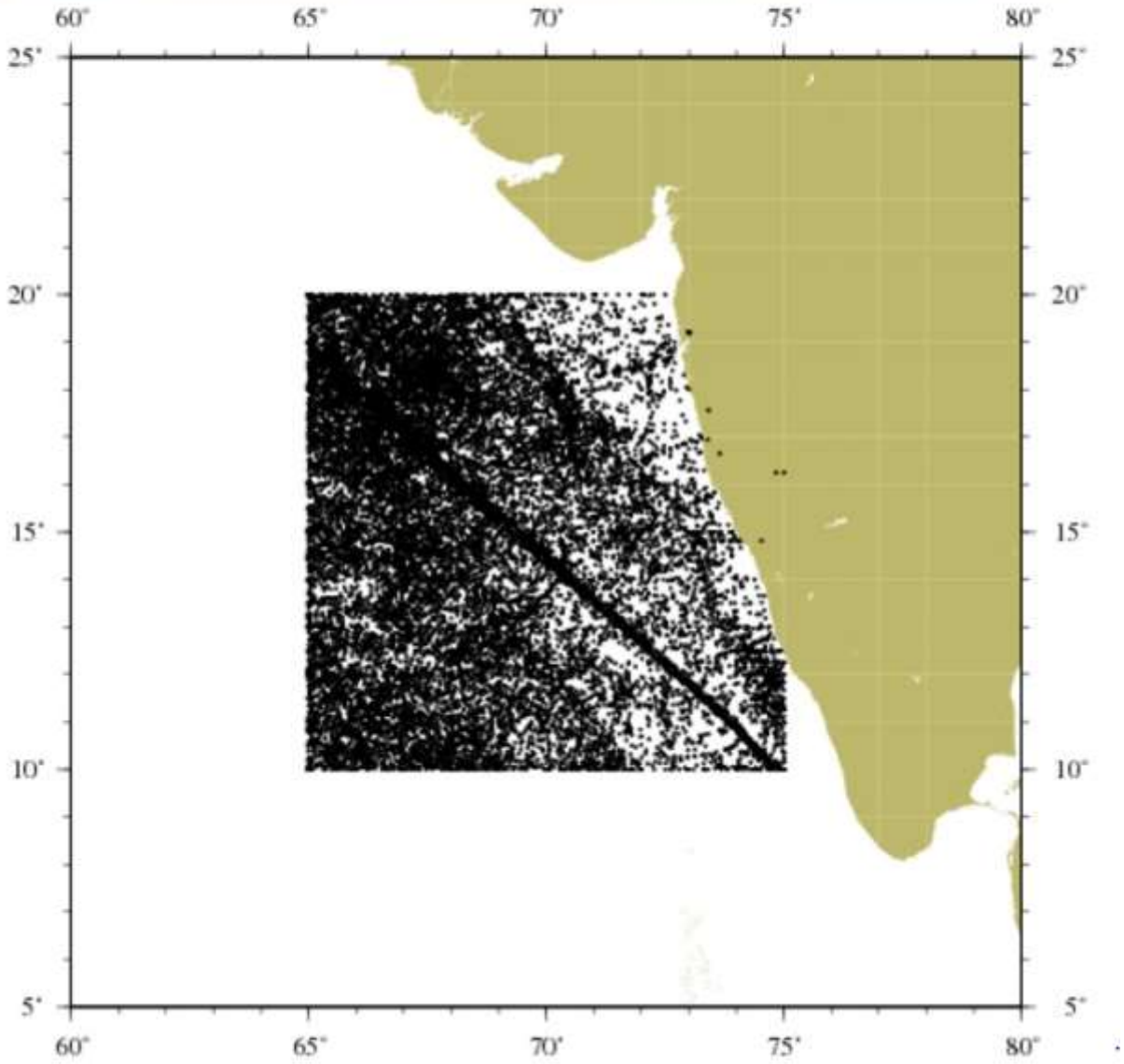
DOWNLOAD DATA

If you encounter any problems, please contact: OCL.help@noaa.gov

BACK TO BUILD a new query

DOWNLOAD DATA

DATA DISTRIBUTION PLOT:



Step 5:

- To download the data select:

  WOD native ASCII format.

  Data from each selected instrument in a separate file

  Observed level data

- Enter your email address then select EXTRACT DATA button.

DOWNLOAD DATA:

1. CHOOSE FORMAT

- (•) **WOD native ASCII format**
  Ocean Data View supports WOD native format
  - output example
  - downloading and reading instructions
- (•) Data from each selected instrument in separate file
- ( ) Data from all selected instruments together

- ( ) **Comma Delimited Value (CSV) format**
  Ocean Data View does not support csv format
  - output example
  - downloading and reading instructions
- (•) Standard output *CSV output definitions
- ( ) 2007 Excel rows limit
- ( ) Older Excel rows limit

netCDF format

- ( ) single cast *more info
  (available on observed levels only)
- ( ) ragged array *more info

2. CHOOSE DEPTH LEVEL

- (•) **Observed level data**
  - definition
- ( ) **Standard level data**
  - definition

3. CHOOSE FLAG TYPES

- ( ) **IQuOD** (flags, uncertainties, additional metadata)
  - definition
- (•) **WOD flags**
  - definition

4. CHOOSE XBT/MBT corrections (not applicable for single cast netCDF format)

Info on XBT bias corrections

No corrections ▼

5. EXTRACT DATA

Enter your **E-mail** address [ ] to EXTRACT DATA

[This email address will only be used to notify you when the extraction is completed.
This email will provide information on the file name(s) and instructions (and/or a link) for downloading the data from the NODC FTP site.]

If you encounter any problems, please contact: OCL.help@noaa.gov

BACK TO BUILD a new query

You have successfully submitted request to the WOD database.

When ready data will be located at
https://data.nodc.noaa.gov/woa/WOD/SELECT/
The files will be of the form:

ocldb1561635331.5272.OSD.gz
ocldb1561635331.5272.CTD.gz
ocldb1561635331.5272.XBT.gz
ocldb1561635331.5272.MBT.gz
ocldb1561635331.5272.PFL.gz
ocldb1561635331.5272.DRB.gz
ocldb1561635331.5272.MRB.gz

There may be multiple files.

An email will be sent to you when data are ready with a full list of files.

Click here for information about WOD database, downloading data, format description, and data reading programs.

For any questions or comments, please contact: OCL.help@noaa.gov

Step 6:

- After a short period you will receive an email notification that the files are ready to download. Click on each link to save the file.
- Do not uncompress these files. ODV can use the files in compressed form.

Your WODselect data are ready!

Inbox ×

WODselect@noaa.gov

to me

The WODselect data you requested are now ready.

To download your file(s), click on the link(s) below:
Press shift key while clicking to avoid automatic file expansion

File names are:

https://data.nodc.noaa.gov/woa/WOD/SELECT/ocldb1561635331.5272.OSD.gz
https://data.nodc.noaa.gov/woa/WOD/SELECT/ocldb1561635331.5272.CTD.gz
https://data.nodc.noaa.gov/woa/WOD/SELECT/ocldb1561635331.5272.XBT.gz
https://data.nodc.noaa.gov/woa/WOD/SELECT/ocldb1561635331.5272.MBT.gz
https://data.nodc.noaa.gov/woa/WOD/SELECT/ocldb1561635331.5272.PFL.gz
https://data.nodc.noaa.gov/woa/WOD/SELECT/ocldb1561635331.5272.MRB.gz

****

FOR MORE INFORMATION ABOUT DOWNLOADING, READING
AND VIEWING WOD DATA:

http://www.nodc.noaa.gov/OC5/SELECT/dbsearch/sysinfo.html

Step 7:

- Save the OSD file in Documents\ODV\DATA with the filename osd_all_india_wod.gz.
- Similarly save the CTD and PFL files this folder.

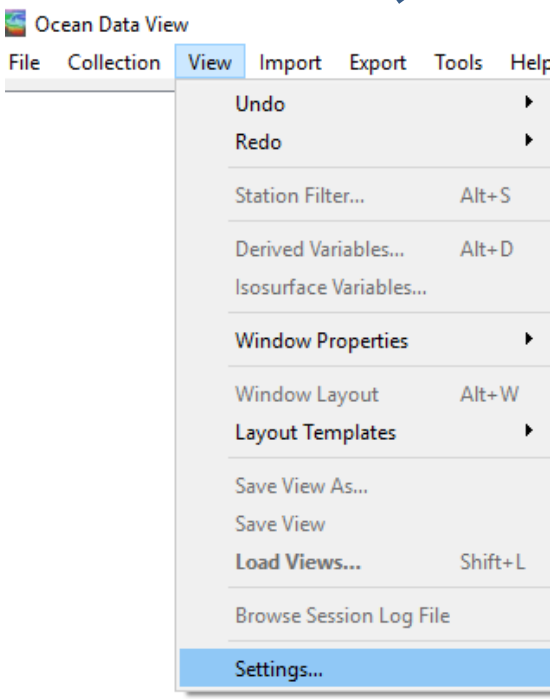
- Please copy all the data provided, to the folder **User\Documents\ODV\Data** for ease of handling/importing during this training session

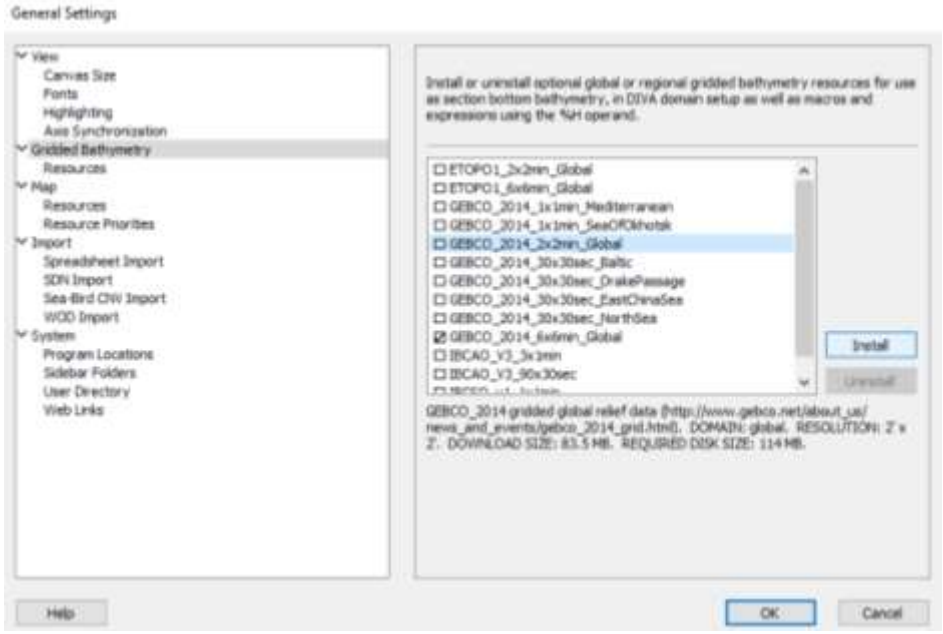
Part 2:

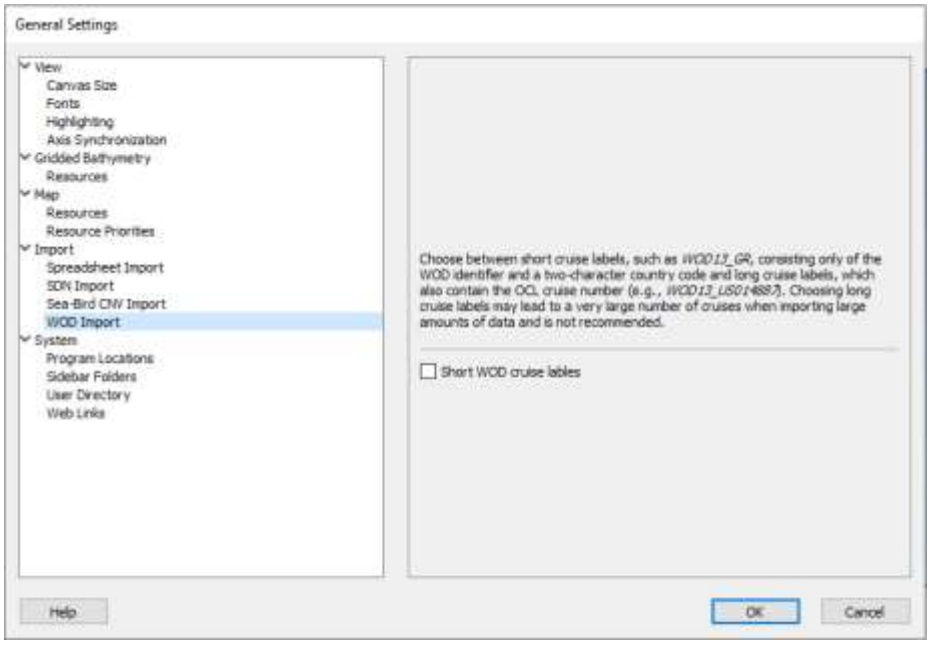
Create ODV Collection from WOD

1. Setup:

- To begin, you will need to customize ODV general settings such as the graphics and text fonts, the size of the canvas, etc.
- Select View > Settings display the General Settings window
- Gridded Bathymetry > GEBCO_2014_2x2min_Global > Install (requires Internet)
- Import. For WOD Import unselect the box to choose short cruise labels as we want long cruise labels.

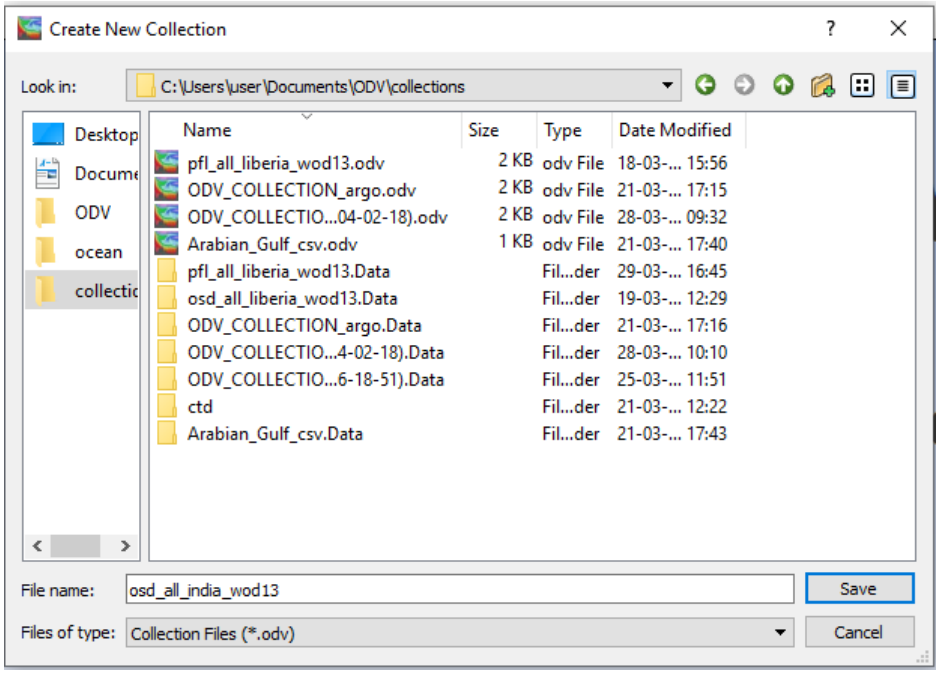

Ocean Data View
File
Collection
View
Import
Export
Tools
Help
Undo
Redo
Station Filter... Alt+S
Derived Variables... Alt+D
Isosurface Variables...
Window Properties
Window Layout Alt+W
Layout Templates
Save View As...
Save View
Load Views... Shift+L
Browse Session Log File
Settings...


General Settings
View
Canvas Size
Fonts
Highlighting
Axis Synchronization
Gridded Bathymetry
Resources
Map
Resources
Resource Priorities
Import
Spreadsheet Import
SDN Import
Sea-Bird CNV Import
WOD Import
System
Program Locations
Sidebar Folders
User Directory
Web Links
Install or uninstall optional global or regional gridded bathymetry resources for use as section bottom bathymetry, in DIVA domain setup as well as macros and expressions using the %H operand.
ETOPO1_2x2min_Global
ETOPO1_6x6min_Global
GEBCO_2014_1x1min_Mediterranean
GEBCO_2014_1x1min_SeaOfOkhotsk
GEBCO_2014_2x2min_Global
GEBCO_2014_30x30sec_Baltic
GEBCO_2014_30x30sec_DrakePassage
GEBCO_2014_30x30sec_EastChinaSea
GEBCO_2014_30x30sec_NorthSea
GEBCO_2014_6x6min_Global
IBCAO_V3_3x3min
IBCAO_V3_90x30sec
Install
GEBCO_2014 gridded global relief data (http://www.gebco.net/about_us/news_and_events/gebco_2014_grid.html). DOMAIN: global. RESOLUTION: 2' x 2'. DOWNLOAD SIZE: 83.5 MB. REQUIRED DISK SIZE: 114 MB.
Help
OK
Cancel

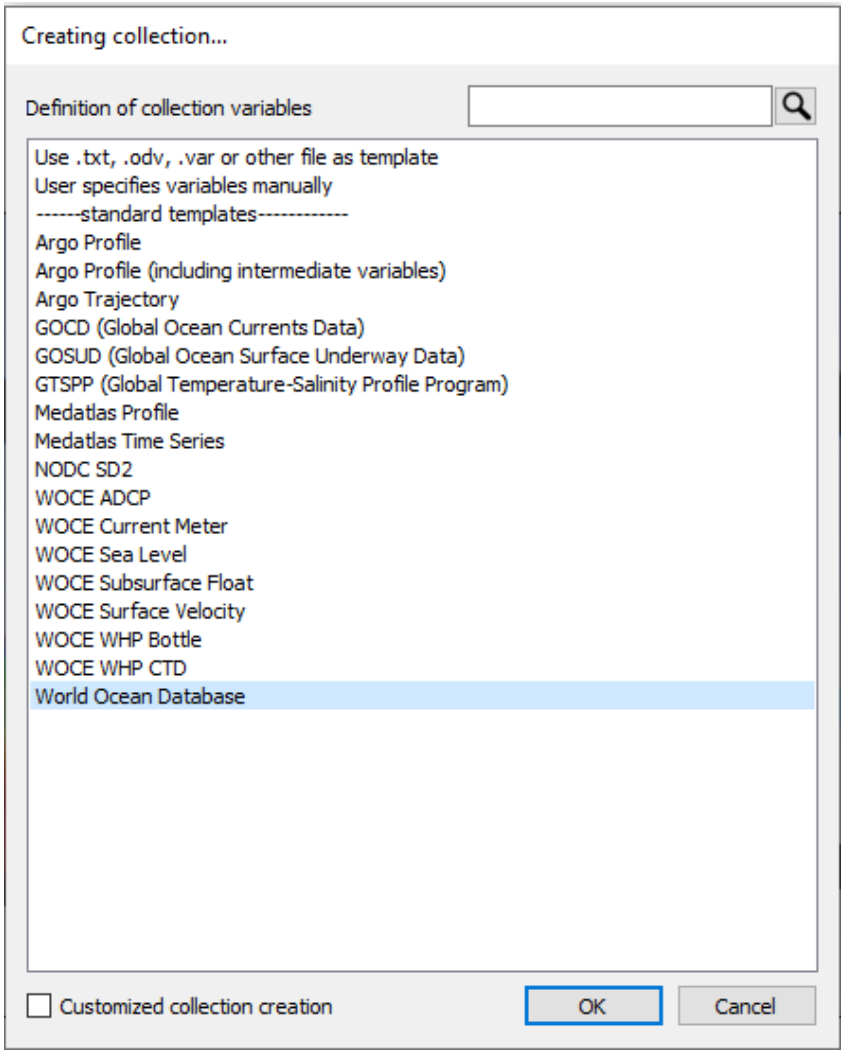

General Settings
View
Canvas Size
Fonts
Highlighting
Axis Synchronization
Gridded Bathymetry
Resources
Map
Resources
Resource Priorities
Import
Spreadsheet Import
SDN Import
Sea-Bird CNV Import
WOD Import
System
Program Locations
Sidebar Folders
User Directory
Web Links
Choose between short cruise labels, such as WOD13_GR, consisting only of the WOD identifier and a two-character country code and long cruise labels, which also contain the OCL cruise number (e.g., WOD13_US014887). Choosing long cruise labels may lead to a very large number of cruises when importing large amounts of data and is not recommended.
Short WOD cruise labels
Help
OK
Cancel

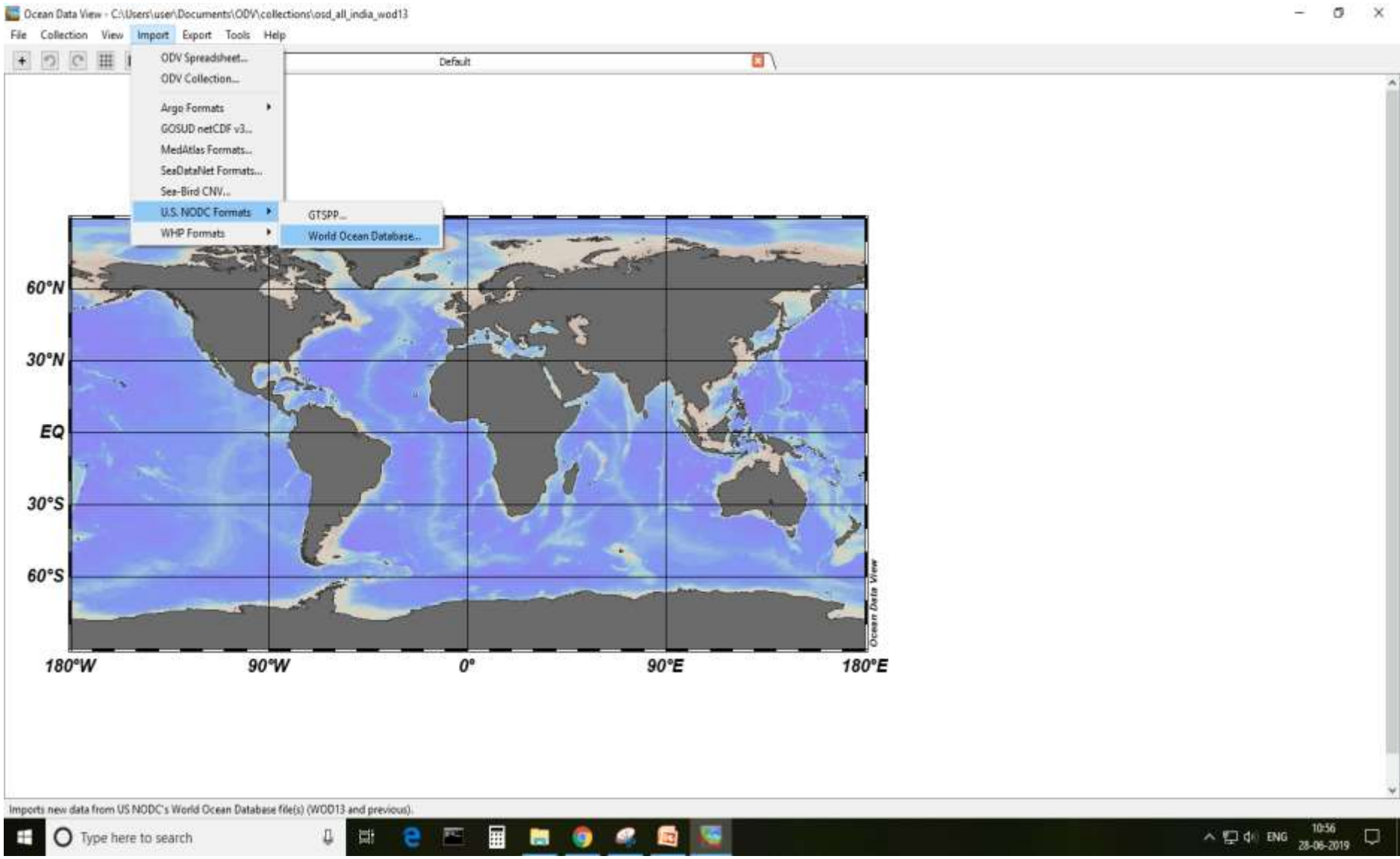
2. Create new collection

- To start a new collection for the ocean station data, select File > New.
- Navigate to the folder ODV > Collections and enter the collection name osd_all_india_wod13



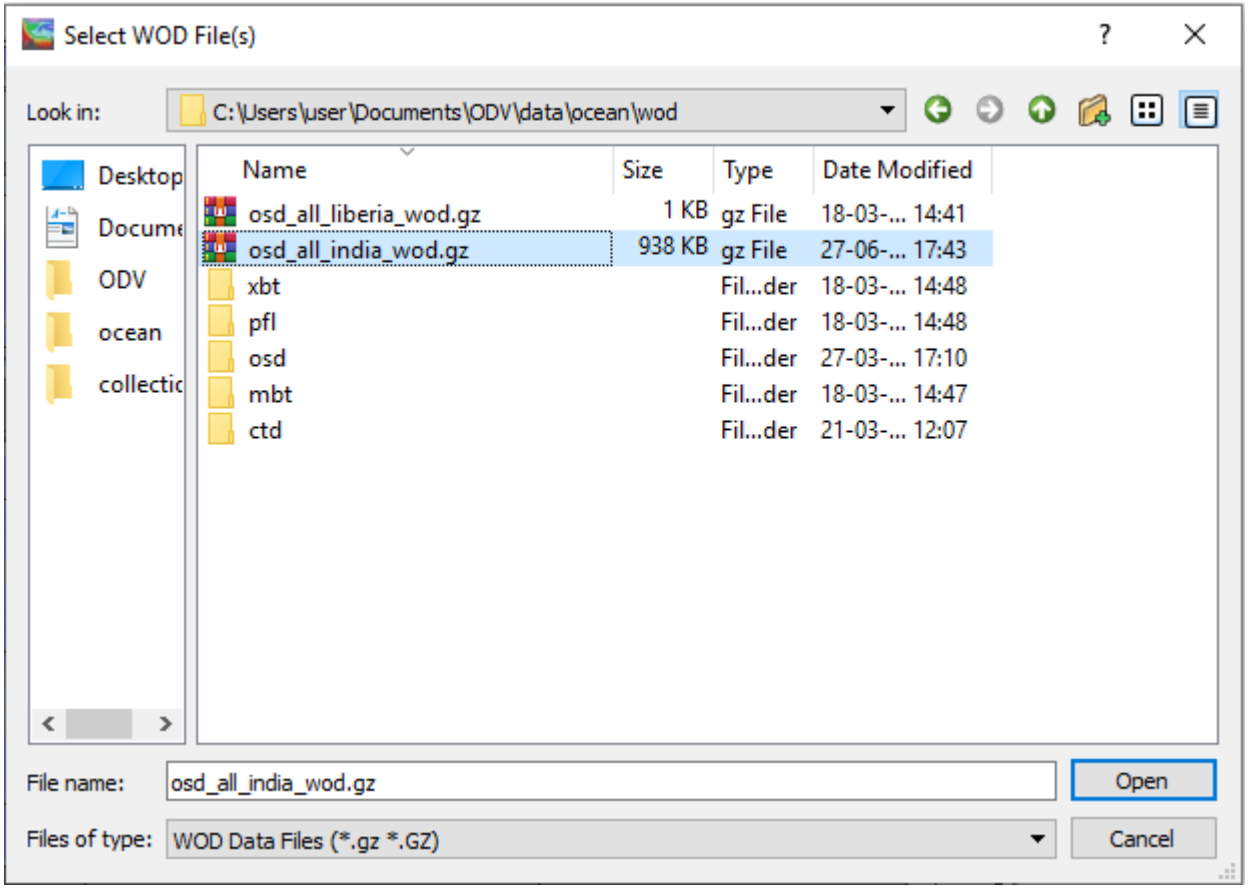
- Select the option World Ocean Database from the Creating collection window. A global map opens indicating the new collection has been created



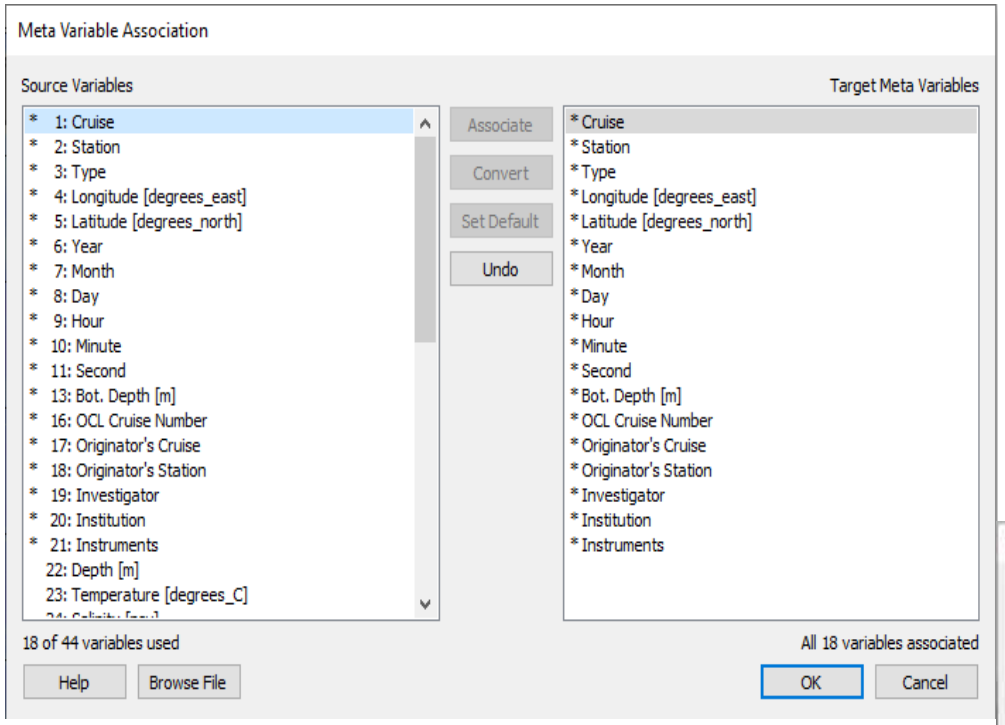

Ocean Data View - C:\Users\user\Documents\ODV\collections\osd_all_india_wod13
File Collection View Import Export Tools Help
ODV Spreadsheet...
ODV Collection...
Argo Formats
GOSUD netCDF v3...
MedAtlas Formats...
SeaDataNet Formats...
Sea-Bird CNV...
U.S. NODC Formats
WHP Formats
GTSPP...
World Ocean Database...
Default
60°N
30°N
EQ
30°S
60°S
180°W
90°W
0°
90°E
180°E
Ocean Data View
Imports new data from US NODC's World Ocean Database file(s) (WOD13 and previous).
Type here to search
ENG
10:56
28-06-2019

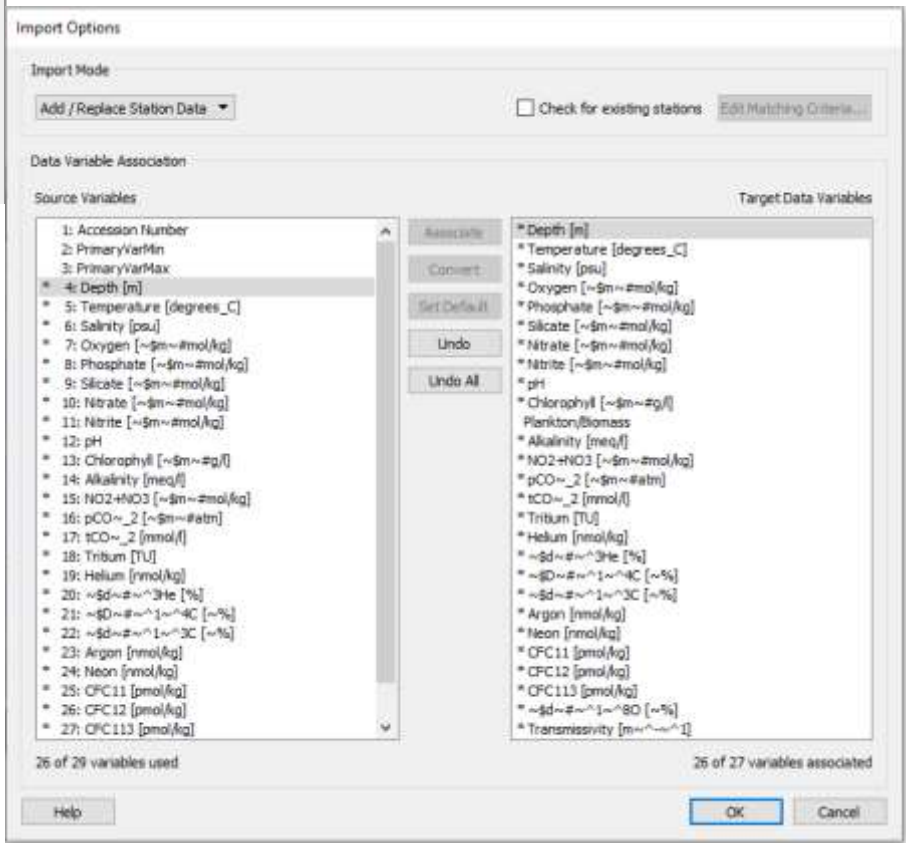
3. Import data

- To add data to the collection select Import > US NODC Formats > World Ocean Database

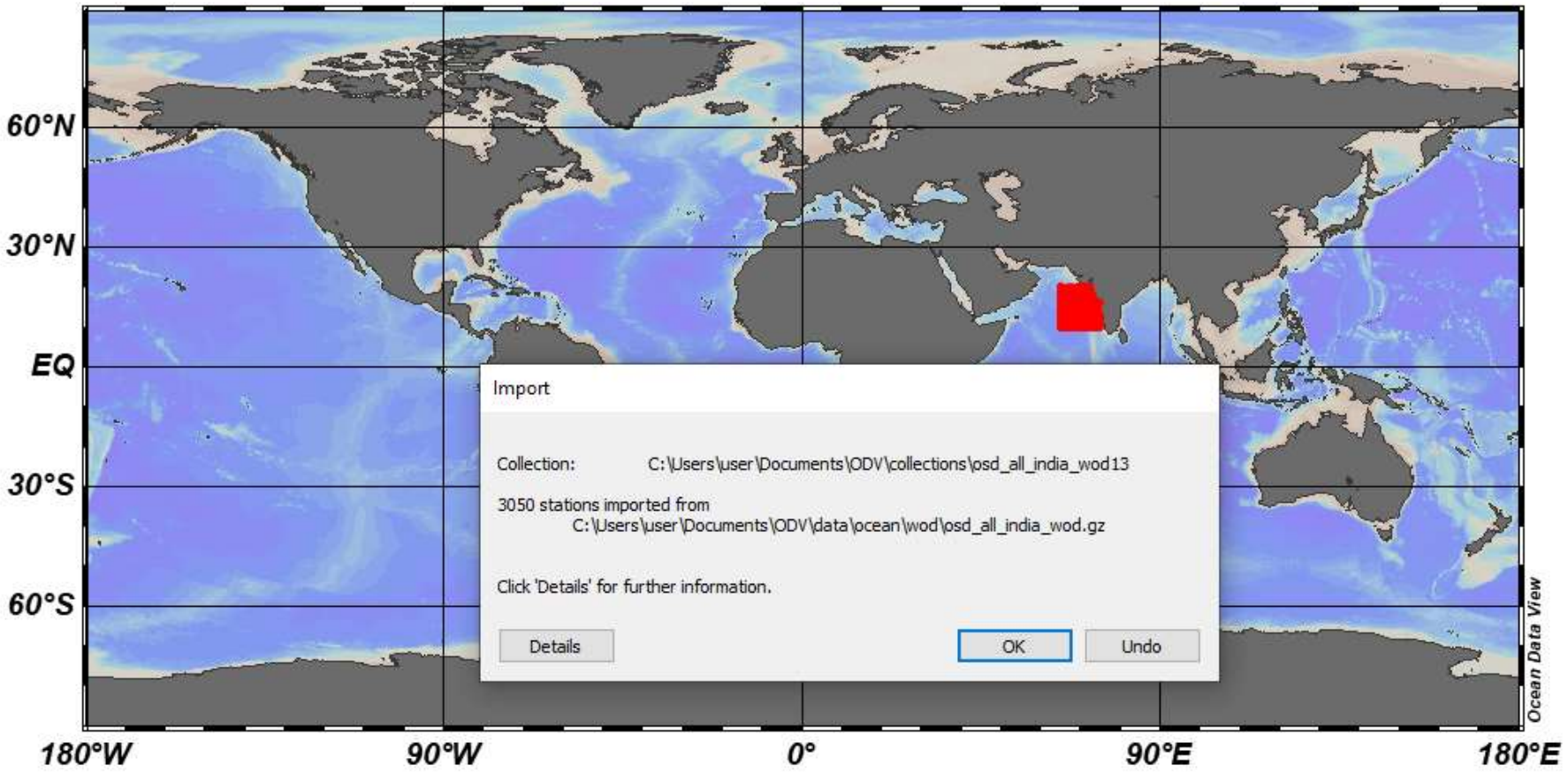


- Then navigate to the Documents > Data folder and select the OSD data osd_all_india_wod.gz





- Using the Import Options dialog box you can associate the variables of the imported data with the variables already defined in the collection.


60°N
30°N
EQ
30°S
60°S
180°W
90°W
0°
90°E
180°E
Import
Collection: C:\Users\user\Documents\ODV\collections\osd_all_india_wod13
3050 stations imported from
C:\Users\user\Documents\ODV\data\ocean\wod\osd_all_india_wod.gz
Click 'Details' for further information.
Details
OK
Undo
Ocean Data View

Options:

- To view the full screen map, select View > Layout Templates > Full Screen Map.
- To save the current view, select View > Save View As and name the view station_map_all.
- To save the distribution map as an image, right-click on the map and select Save Map As then specify the file name and select the file type.

Other Options:

- Change Projection
- Zoom to desired
- Add graphic objects
- Explore menu options

Keep in mind:

- Save views and plots frequently, whenever needed
- Undo options are limited

Task:

- Repeat these steps to create collections for the other WOD datasets (CTD, PFL).