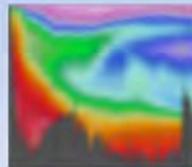


How to use ODV

Ocean Data View



<https://odv.awi.de>

© 2018 Reiner Schlitzer

ODV 5 Version (64 bit) (Mar 19 2018)

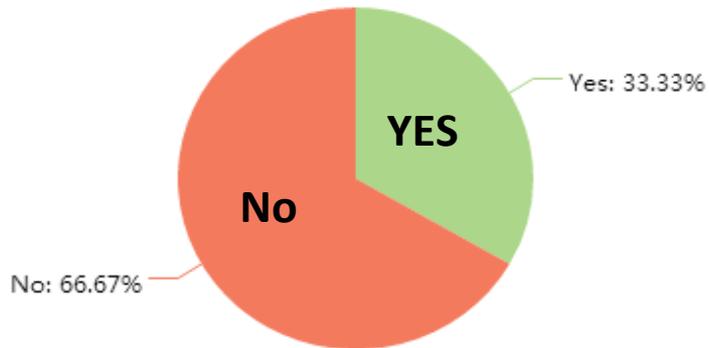
<http://odv.awi.de/>

Currently **>60,000 users**,
10~20 new users every day!!

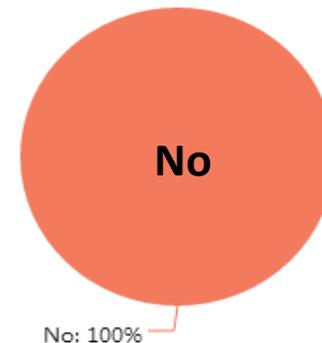
Have you ever used ODV software before?

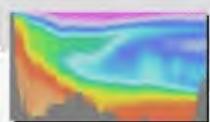


Have you ever created own data spreadsheet for ODV and import into ODV?



Have you ever imported netCDF format data file into ODV?





What is ODV?

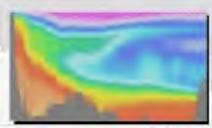
- “Ocean Data View (ODV) is a software package for the interactive exploration, analysis and visualization of oceanographic and other geo-referenced profile, time-series, trajectory or sequence data. ODV runs on Windows, Mac OS X, Linux, and UNIX (Solaris, Irix, AIX) systems. ODV data and configuration files are platform-independent and can be exchanged between different systems.”
- Data from **Argo**, **GTSP**, **CCHDO**, **World Ocean Database**, **World Ocean Atlas**, **World Ocean Circulation Experiment (WOCE)**, **SeaDataNet**, and **Medar/Medatlas** can be directly imported into ODV.
- ODV also supports the **netCDF format** and lets you explore and visualize CF, COARDS, GDT and CDC compliant netCDF datasets.



Prof. Reiner Schlitzer
Alfred Wegener Institute

*His Research Interests:
Modeling; Nutrient and Carbon
Cycles; Information Systems;
Productivity and Particle Fluxes;
Radionuclides*

Free, Easy-to-use, visual, practical...etc..



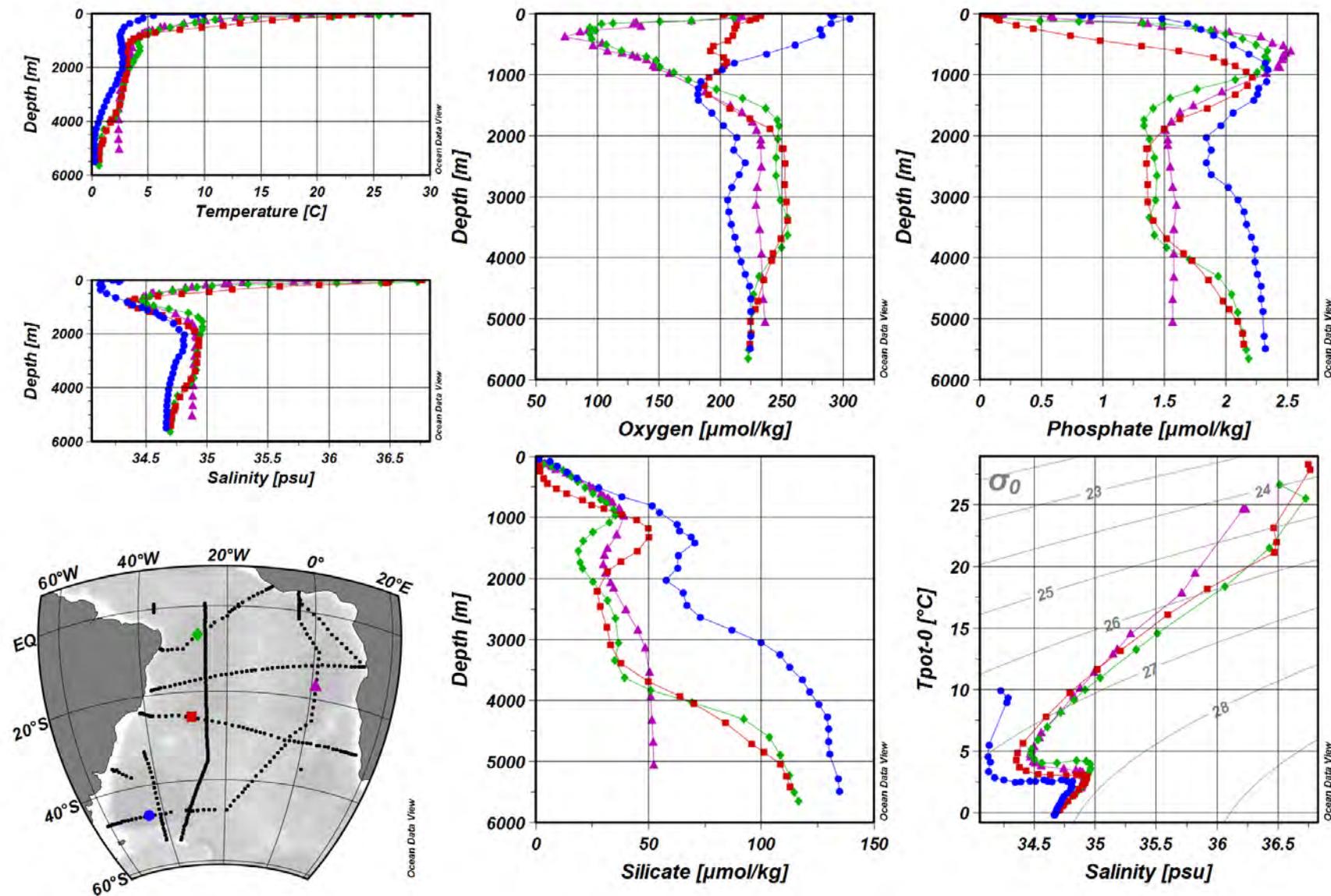
What can you do with ODV?

- [property/property plots of selected stations](#)
- [scatter plots for sets of stations](#)

- [color sections along arbitrary cruise tracks](#)
- [color distributions on general isosurfaces](#)

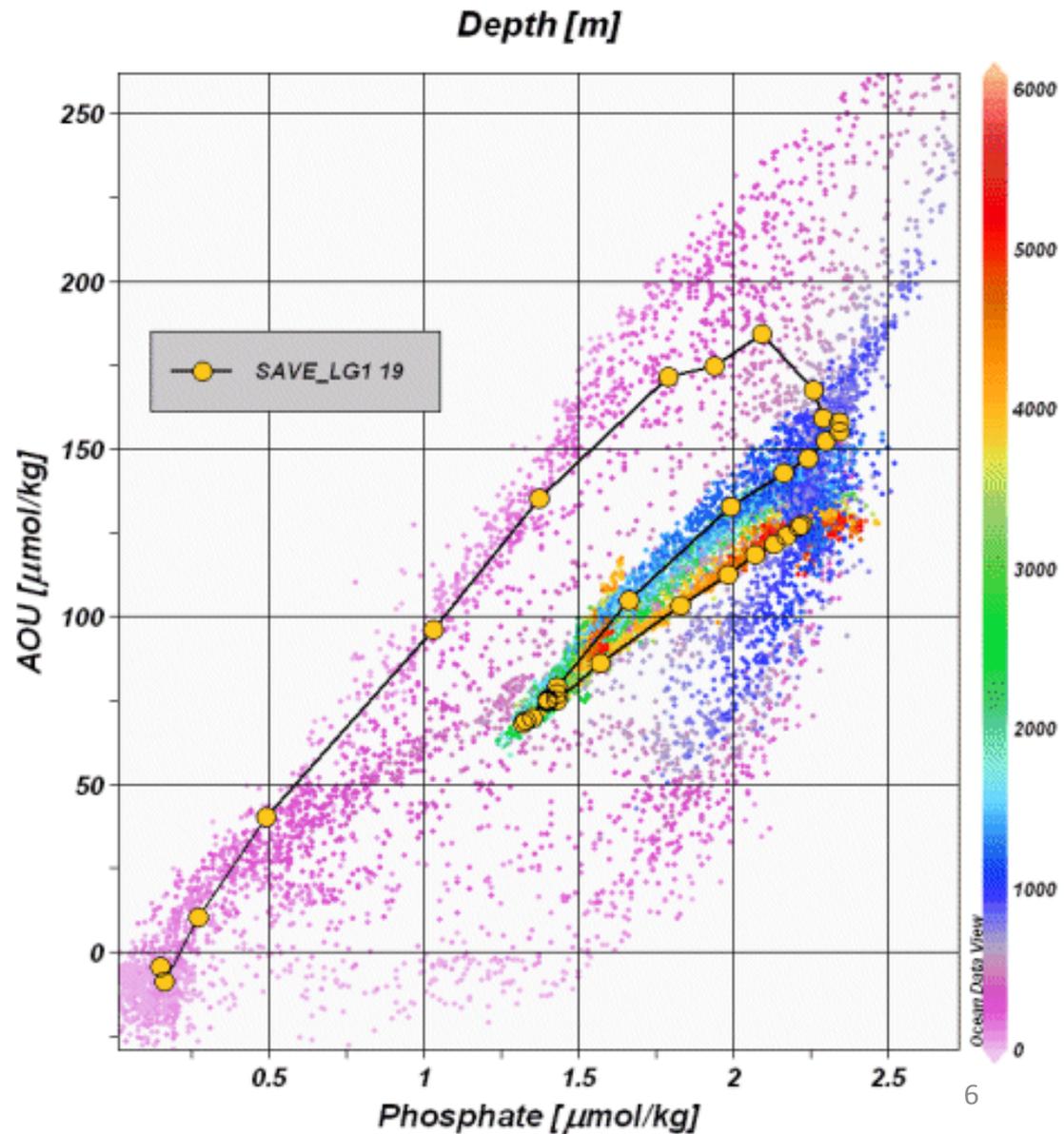
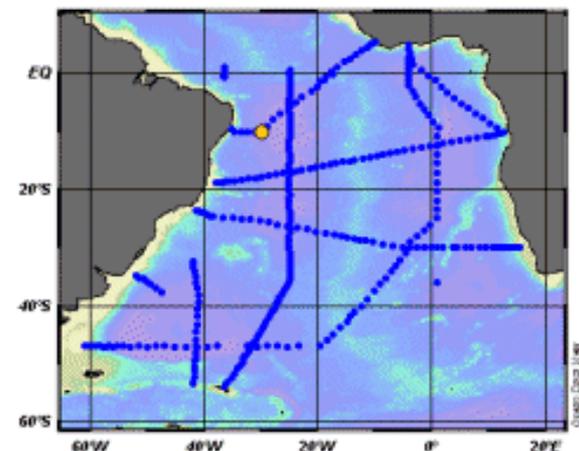
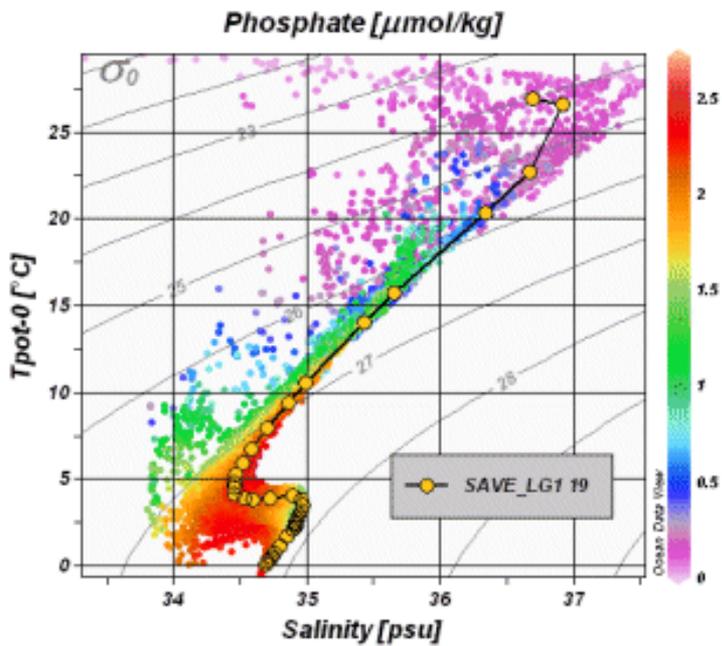
- [geostrophic velocity sections](#)
- [temporal evolution plots of tracer fields](#)
- [differences of tracer fields between repeats](#)
- [Animations](#)
- [interrupted maps.](#)

Example. property/property plots of selected stations



Example.

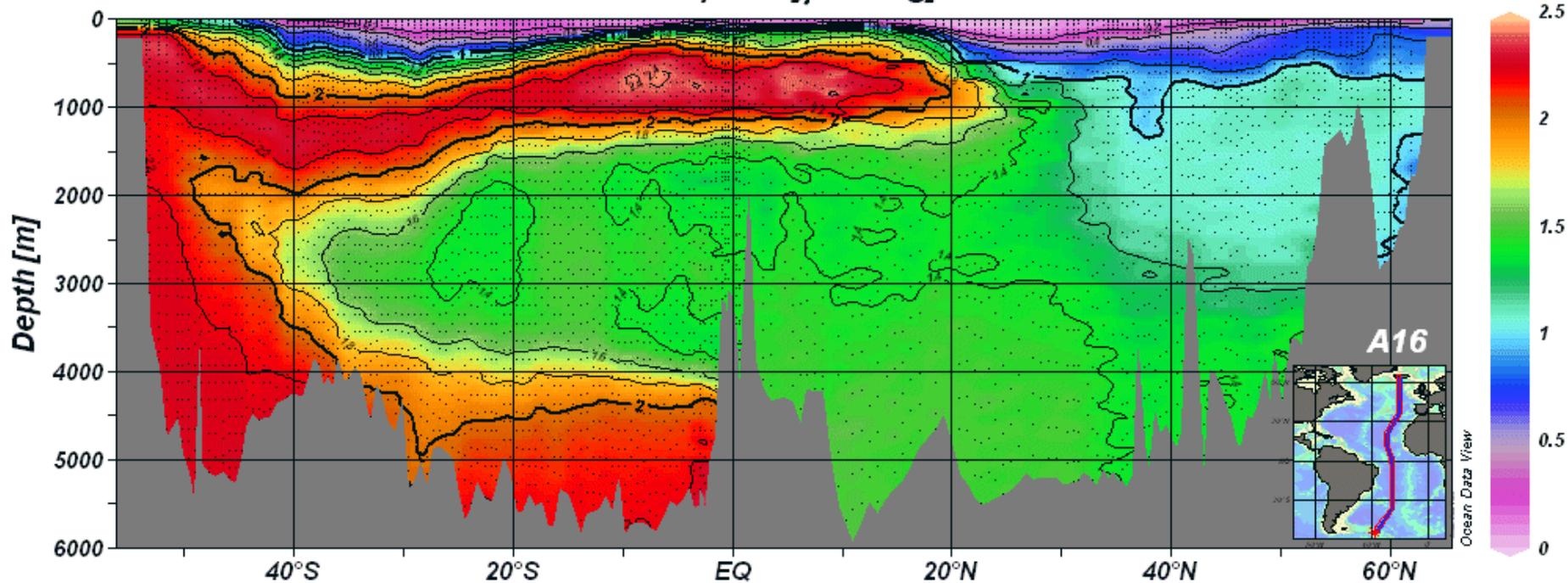
scatter plots for sets of stations



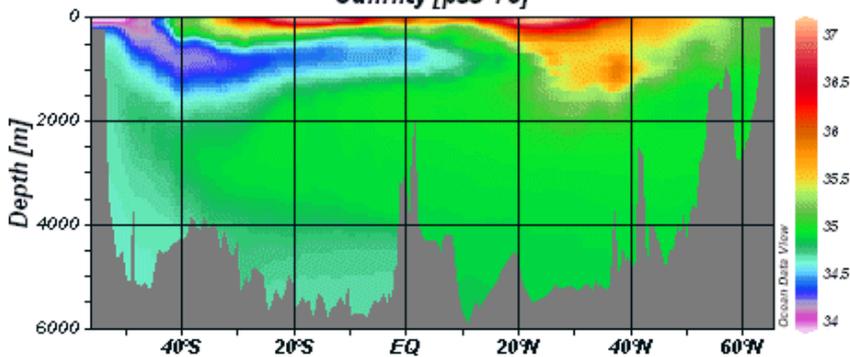
Example. color sections along arbitrary cruise tracks

eWOCE

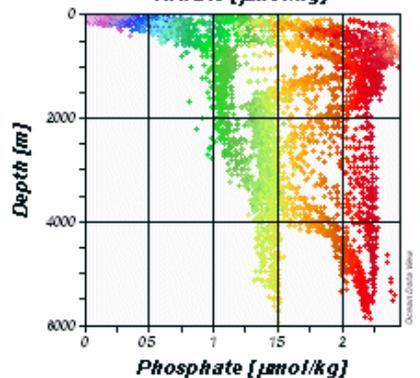
Phosphate [$\mu\text{mol/kg}$]



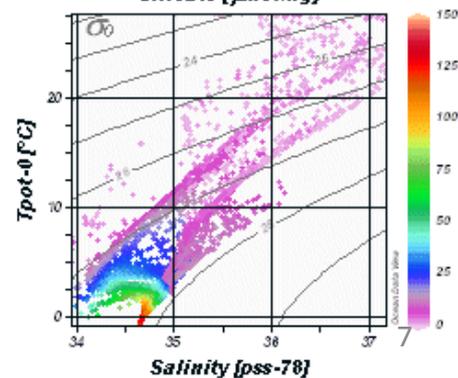
Salinity [pss-78]



Nitrate [$\mu\text{mol/kg}$]



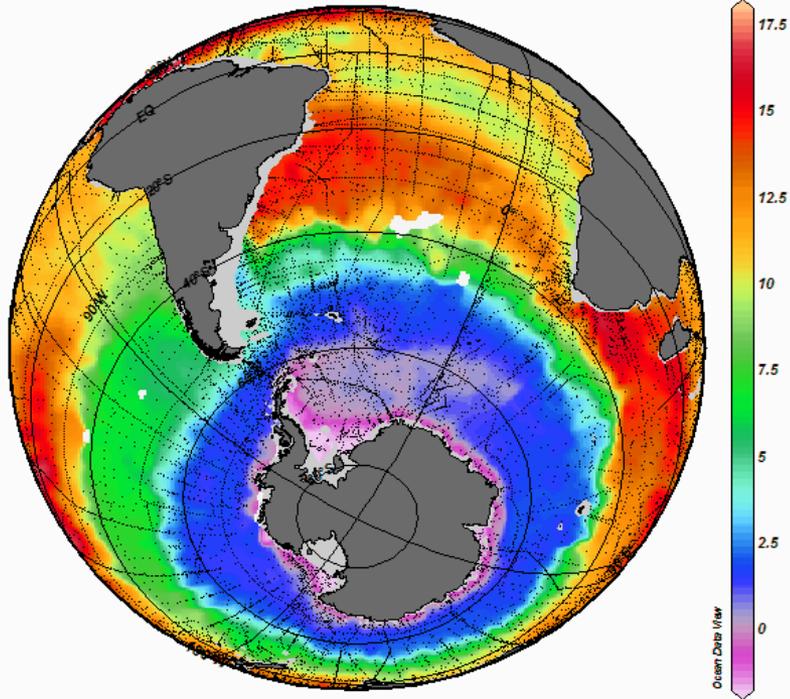
Silicate [$\mu\text{mol/kg}$]



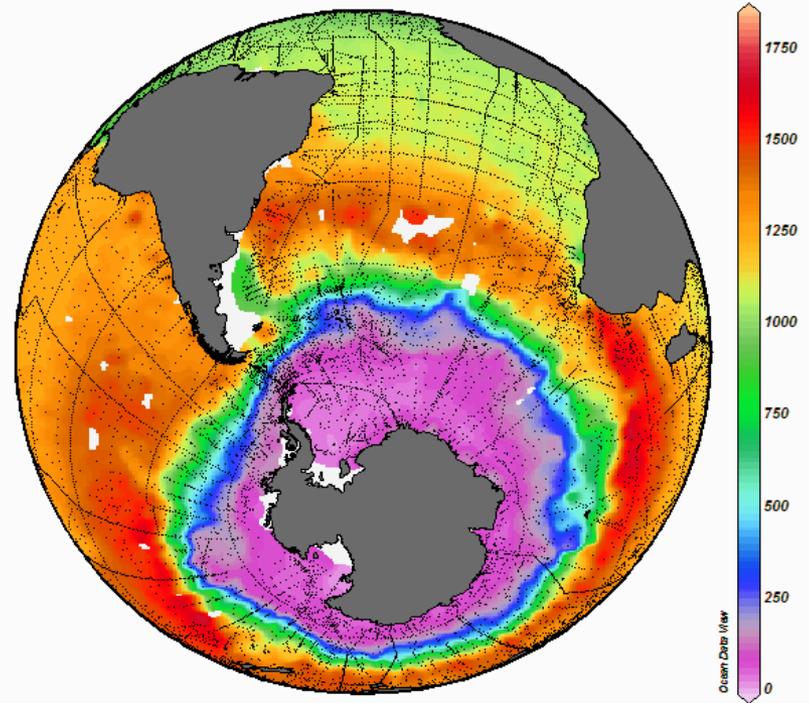
Example.

color distributions on general isosurfaces

Temperature [C] @ Depth [m]=300

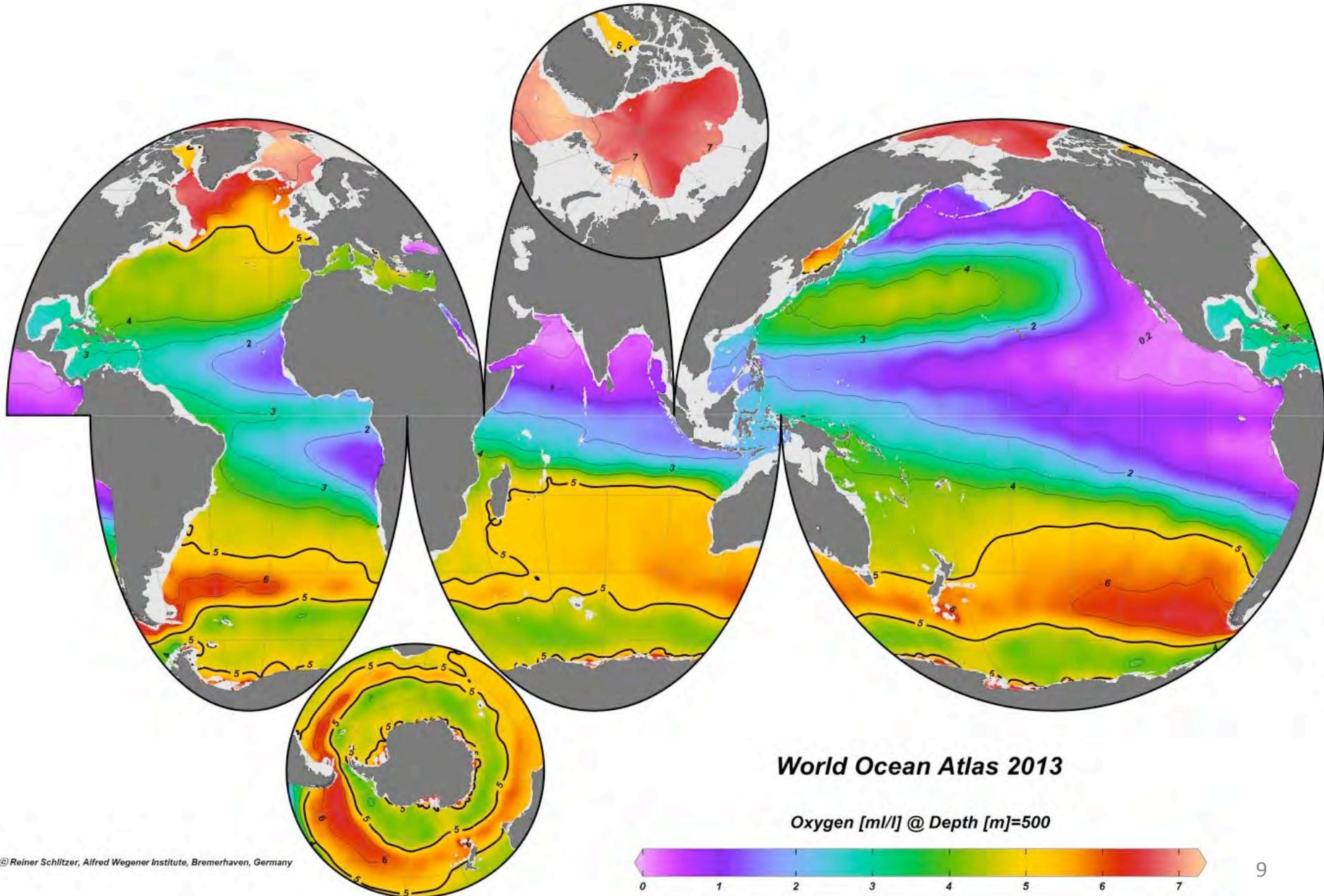


Depth [m] @ Sigma-0 [kg/m³]=27.5



Example.

interrupted maps



World Ocean Atlas 2013

Oxygen [ml/l] @ Depth [m]=500

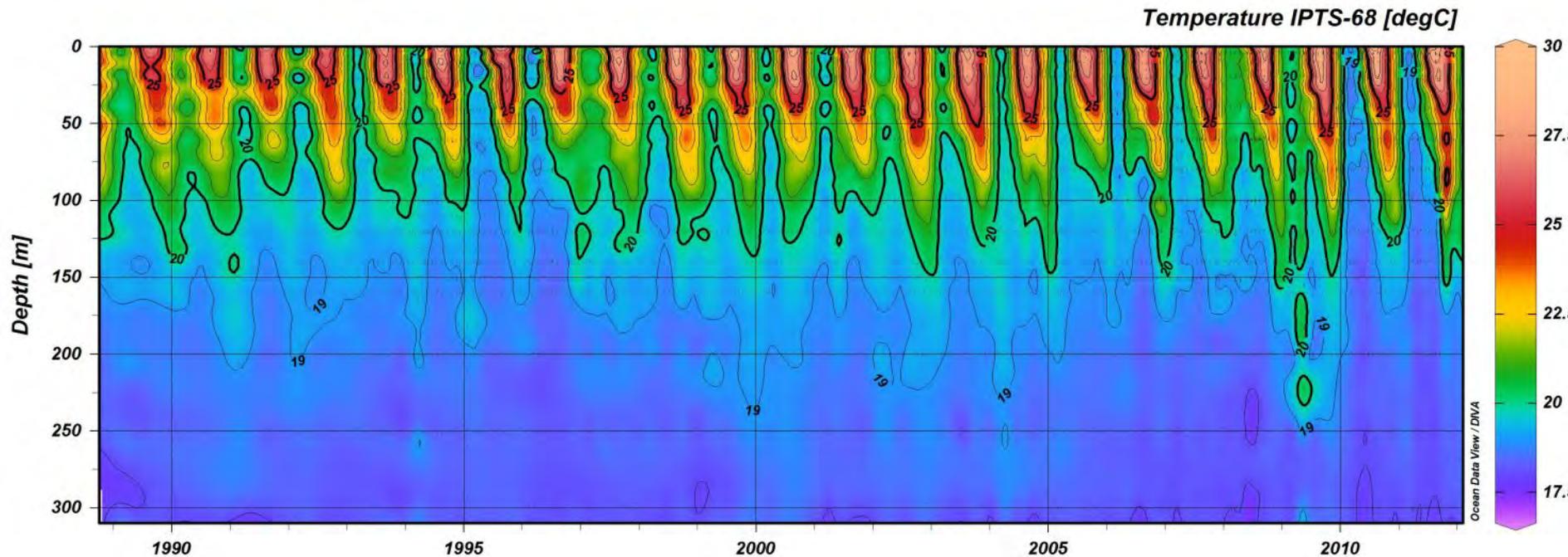


Ocean Data View / DINA

Example.

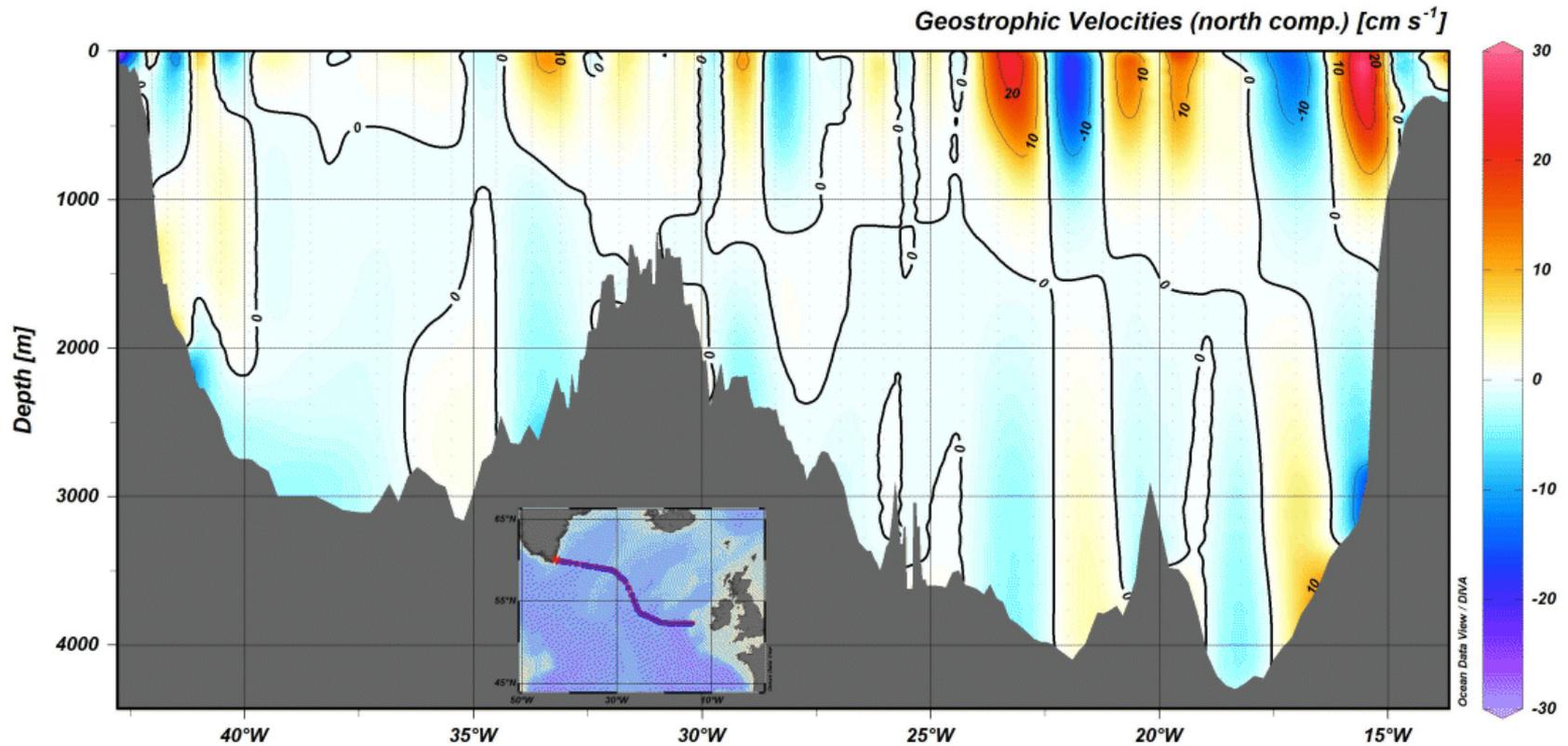
temporal evolution plots of tracer fields

- Time-series data at BATS station



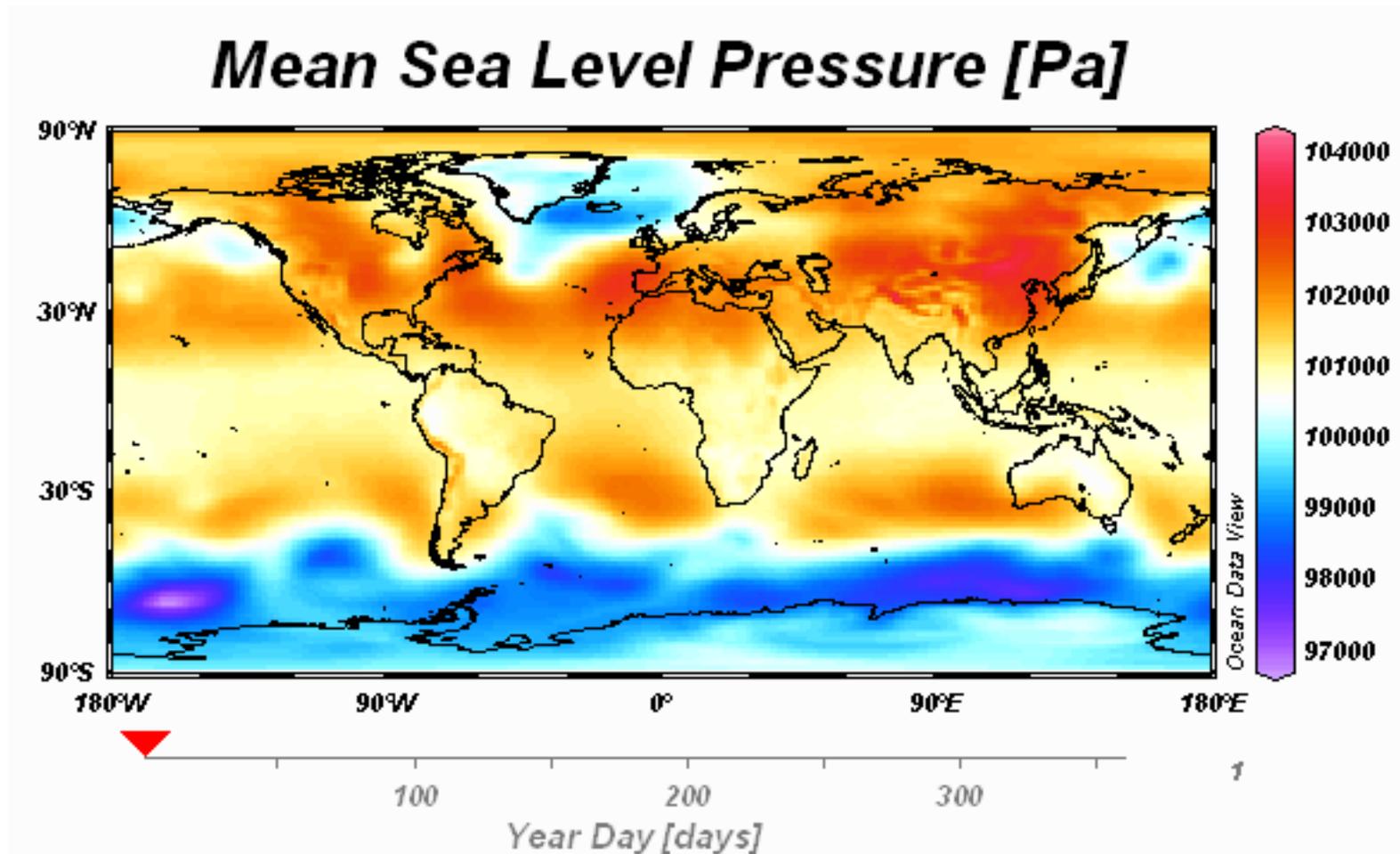
Example.

Geostrophic velocity sections



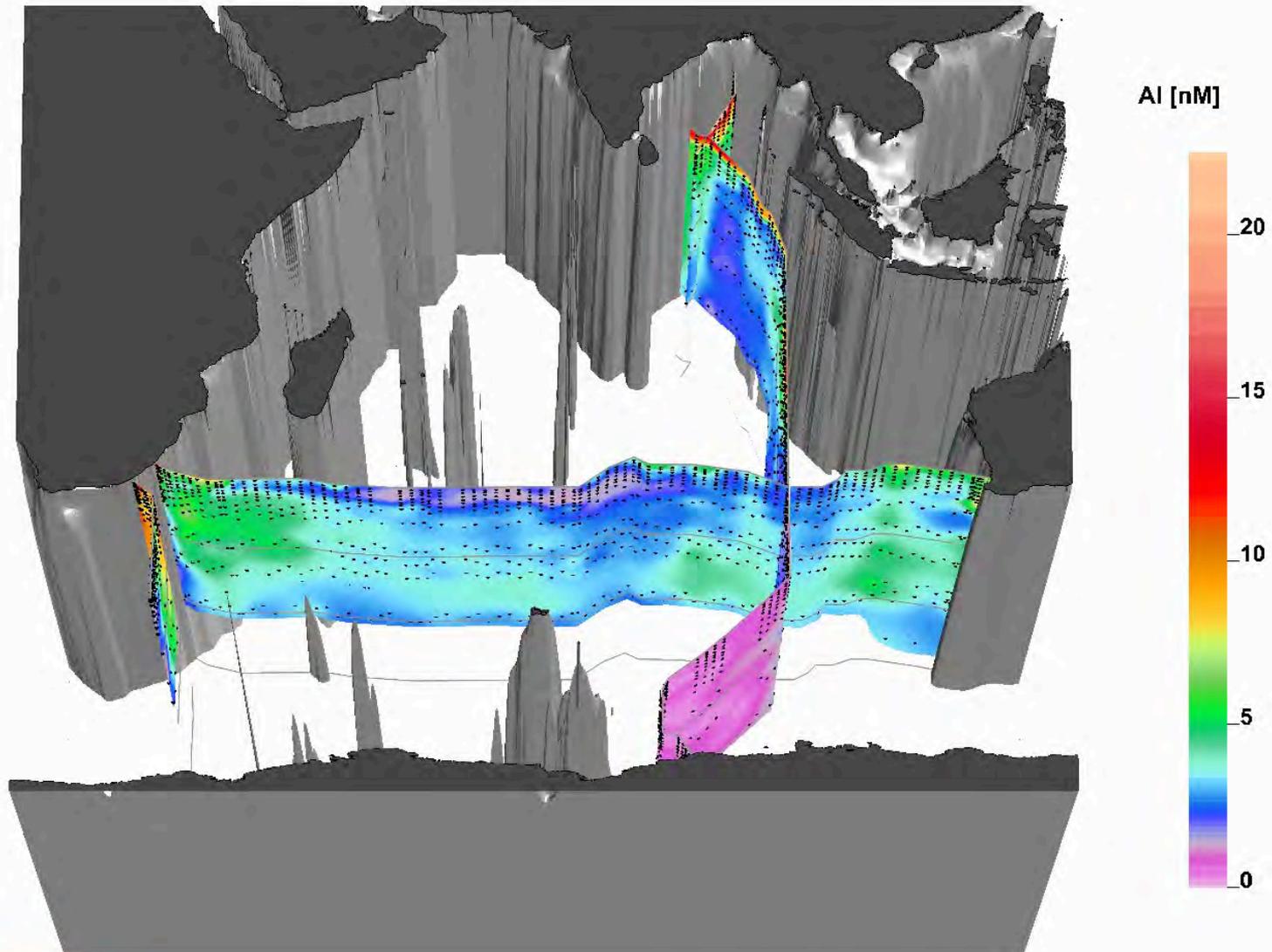
Example.

animations



Example.

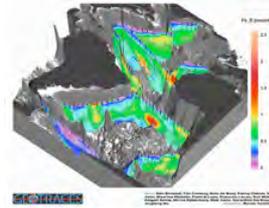
animation 2



Data: Maxime Grand, Christopher Measures, Mariko Hatta,
William Landing, Peter Morton, Clifton Buck, William
Hiscock, Joseph Resing Graphics: Reiner Schlitzer

Example.

animation 2



- <http://www.geotraces.org/dp/idp2014>



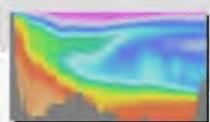
Data sets are able to be downloaded in ODV format
- CCHDO website (<http://cchdo.ucsd.edu/>)

Various programs:

- GO-SHIP
- SOCCOM
- USHYDRO
- WOCE
- DIMES
- ELLETT
- Project Carina
- Hawaii Ocean Time Series (HOTS)
- Bermuda Atlantic Time Series (BATS) ...etc



<http://cchdo.ucsd.edu/search?dtstart=1800>

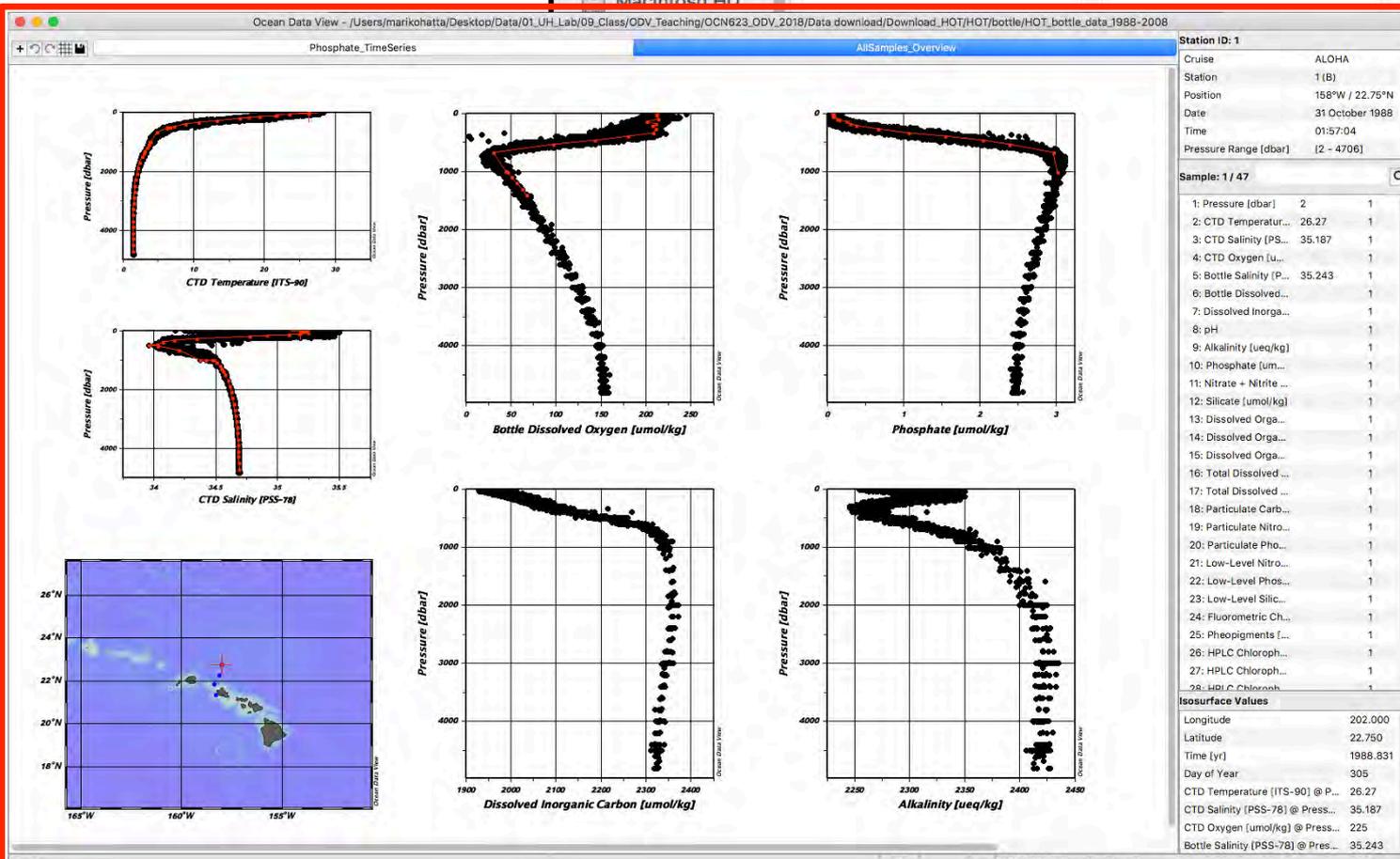
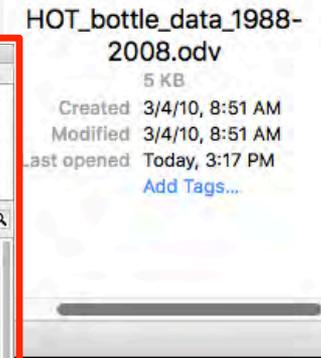


Let's get started

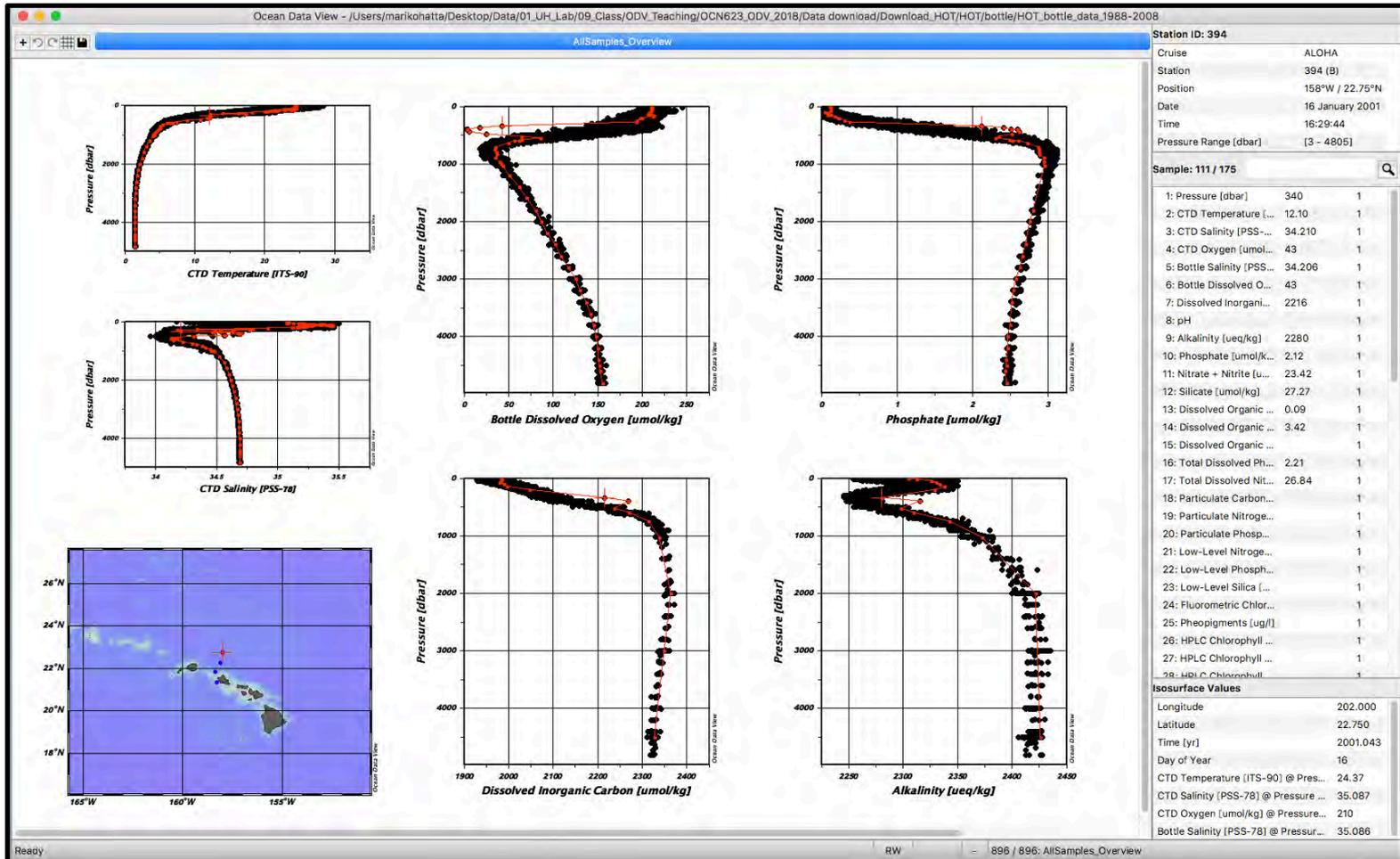
Installation <http://odv.awi.de/en/software/download/>

1. Download data and open it
2. Modify views
3. Create your own data file
4. Open new ODV & import your data file
5. Make T-S diagram and derived variable
6. How to save figures and views

Find where you have put ODV data files on your computer.

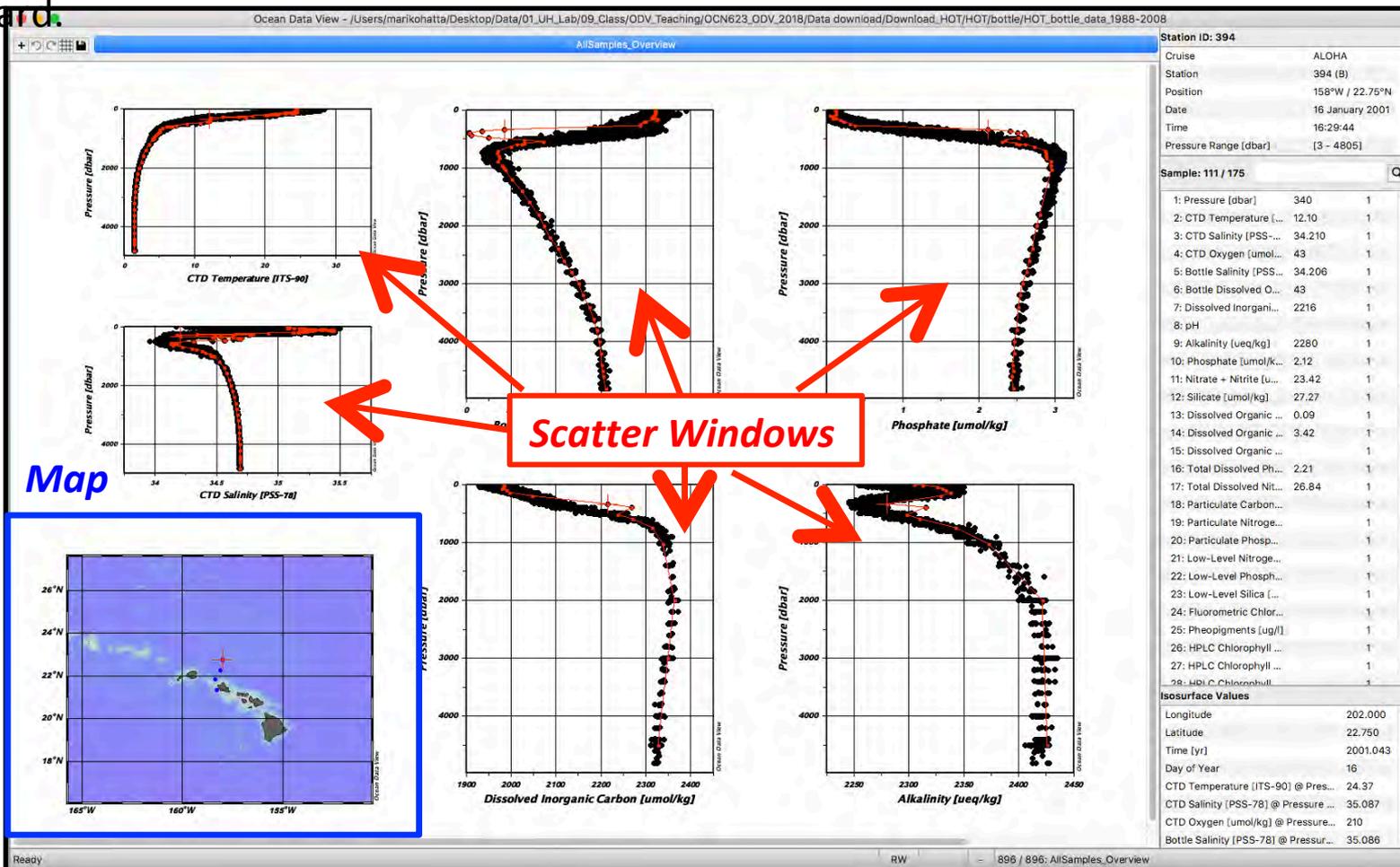


“6 Scatter Windows” mode



“6 Scatter Windows” mode

In scatter mode, all data within the map are shown. Clicking on a particular station, will highlight that station's data in red. If the station has multiple occupations, like HOT, then you can scroll between different occupations with the left and right arrows on your keyboard.



“6 Scatter Windows” mode

You can move up and down the red highlighted profile with up and down keys. And the data corresponding to the point will be shown in the variables window.

The screenshot displays the Ocean Data View interface. On the left, a map shows the sampling location in the Pacific Ocean near Hawaii. The main area contains six scatter plots showing data profiles against pressure (0 to 4000 dbar):

- CTD Temperature [ITS-90]
- Bottle Dissolved Oxygen [umol/kg]
- Phosphate [umol/kg]
- CTD Salinity [PSS-78]
- Dissolved Inorganic Carbon [umol/kg]
- Alkalinity [ueq/kg]

On the right, the 'Station ID: 394' information is shown, including Cruise (ALOHA), Station (394 (B)), Position (158°W / 22.75°N), Date (16 January 2001), Time (16:29:44), and Pressure Range (34.405). Below this is the 'Sample: 111 / 175' table:

Parameter name	Value	Quality flag
1: Pressure [dbar]	340	1
2: CTD Temperature [...]	12.10	1
3: CTD Salinity [PSS-...]	34.210	1
4: CTD Oxygen [umol...]	43	1
5: Bottle Salinity [PSS...]	34.206	1
6: Bottle Dissolved O...	43	1
7: Dissolved inorgani...	2216	1
8: pH		1
9: Alkalinity [ueq/kg]	2280	1
10: Phosphate [umol/K...	2.12	1
11: Nitrate + Nitrite [u...	23.42	1
12: Silicate [umol/kg]	27.27	1
13: Dissolved Organic ...	0.09	1
14: Dissolved Organic ...	3.42	1
15: Dissolved Organic ...		1
16: Total Dissolved Ph...	2.21	1
17: Total Dissolved Nit...	26.84	1
18: Particulate Carbon...		1
19: Particulate Nitroge...		1
20: Particulate Phosp...		1
21: Low-Level Nitroge...		1
22: Low-Level Phosph...		1
23: Low-Level Silica [...]		1
24: Fluorometric Chlo...		1
25: Fluorometric Chlo...		1
26: HPLC Chlorophylli ...		1
27: HPLC Chlorophylli ...		1
28: HPLC Chlorophylli ...		1
29: HPLC Chlorophylli ...		1
Isosurface Values		
Longitude	202.000	
Latitude	50	
Time [yr]	.043	
Day of Year		
CTD Temp	7	
CTD Salinity [PSS-78] @ Pressure ...	35.087	
CTD Oxygen [umol/kg] @ ...		
Bottle Salinity [PSS-78] @ ...		

Green arrows point from the 'Value' and 'Quality flag' columns of the table to the corresponding data points in the plots. A blue box highlights the map. The word 'Variables' is written in green at the top right of the interface.

Quality Flag (QF)

Quality flag document: <http://odv.awi.de/en/documentation/>

ODV flag:
QF

Flag Description	ODV
good quality	0
unknown quality	1
questionable quality	4
bad quality	8

-Every parameter and each sample can have its own quality flag, good, unknown, questionable, or bad.

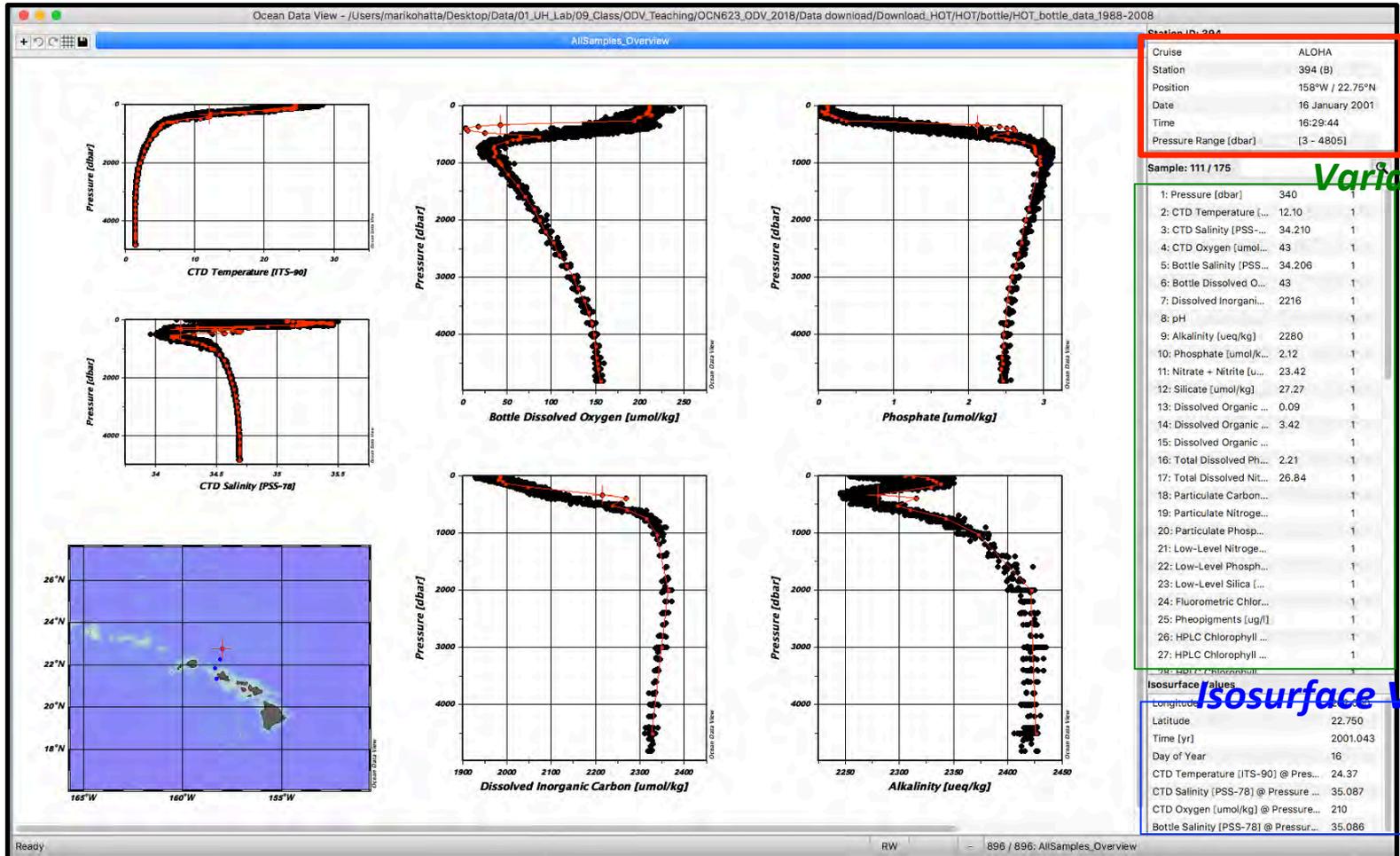
-You use the flag to identify data quality, you can then isolate bad data from your figure!

- ODV always assign quality flag = 1 i.e. unknown if you do not.

“6 Scatter Windows” mode

“Metadata” show the information of the selected station on the map (e.g. Cruise name, Station #, Position (Long/Lat), sampling date etc.)

Metadata

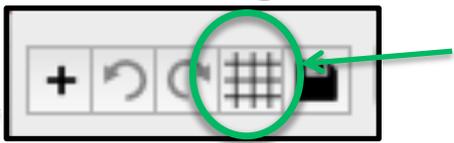


Variables

Isosurface Values

“Isosurface values” show the calculated/selected values at the selected station. (see detail in the ODV manual)

Let's change the layout of the canvas



Click the icon.

Metadata

Metadata

Station ID	394
Cruise	ALOHA
Station	394 (B)
Position	158°W / 22.75°N
Date	16 January 2001
Time	16:29:44
Pressure Range [dbar]	[3 - 4805]

Variables

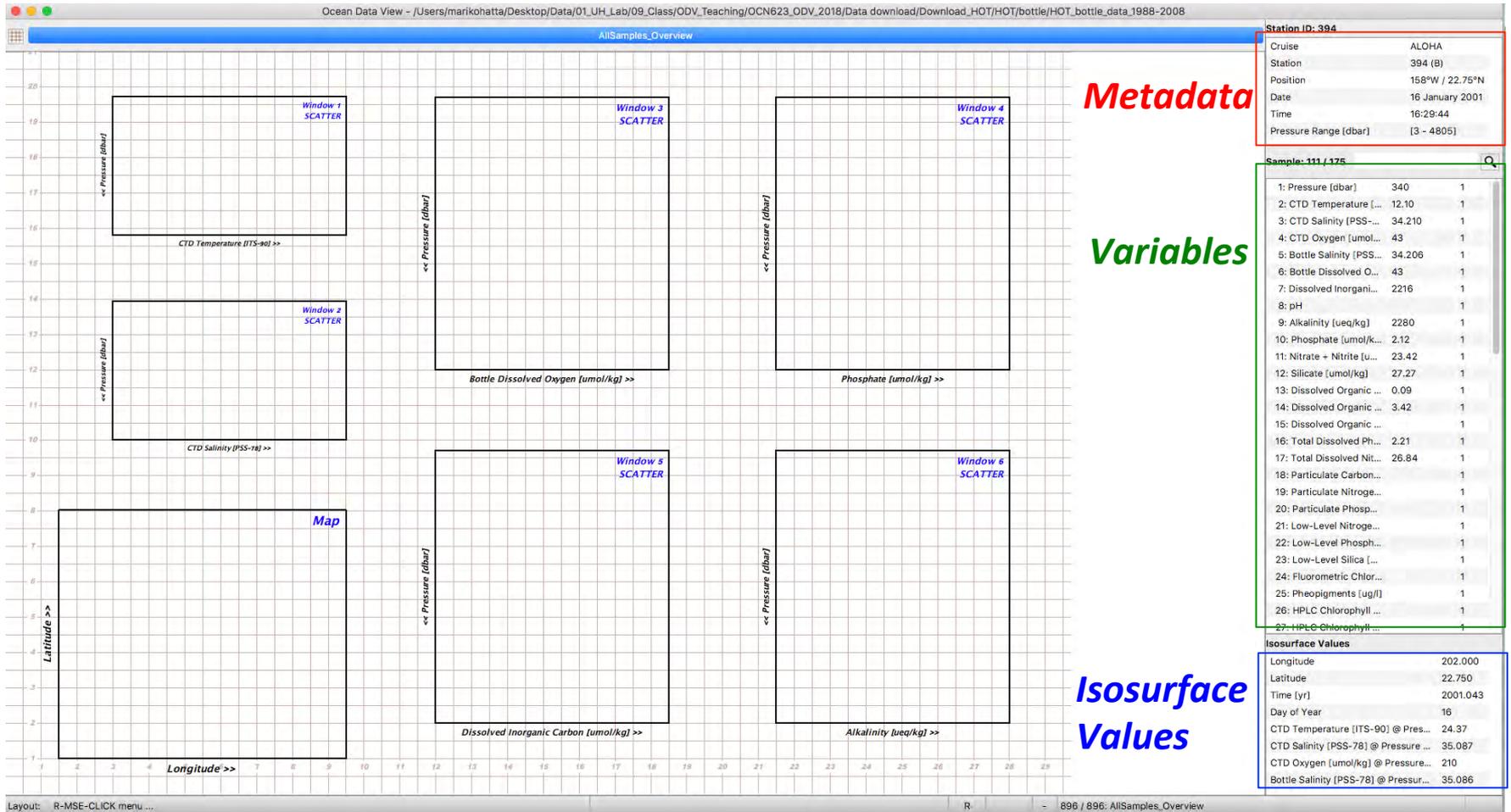
1: Pressure [dbar]	340	1
2: CTD Temperature [...	12.10	1
3: CTD Salinity [PSS-...	34.210	1
4: CTD Oxygen [umol/...	43	1
5: Bottle Salinity [PSS...	34.206	1
6: Bottle Dissolved O...	43	1
7: Dissolved Inorgan...	2216	1
8: pH		1
9: Alkalinity [ueq/kg]	2280	1
10: Phosphate [umol/k...	2.12	1
11: Nitrate + Nitrite [...	23.42	1
12: Silicate [umol/kg]	27.27	1
13: Dissolved Organic ...	0.09	1
14: Dissolved Organic ...	3.42	1
15: Dissolved Organic ...		1
16: Total Dissolved Ph...	2.21	1
17: Total Dissolved Nit...	26.84	1
18: Particulate Carbon...		1
19: Particulate Nitroge...		1
20: Particulate Phosph...		1
21: Low-Level Nitroge...		1
22: Low-Level Phosph...		1
23: Low-Level Silica [...]		1
24: Fluorometric Chlor...		1
25: Pheopigments [ug/l]		1
26: HPLC Chlorophyll ...		1
27: HPLC Chlorophyll ...		1

Isosurface Values

Longitude	
Latitude	22.750
Time [yr]	2001.043
Day of Year	16
CTD Temperature [ITS-90] @ Pres...	24.37
CTD Salinity [PSS-78] @ Pressure ...	35.087
CTD Oxygen [umol/kg] @ Pressure...	210
Bottle Salinity [PSS-78] @ Pressur...	35.086

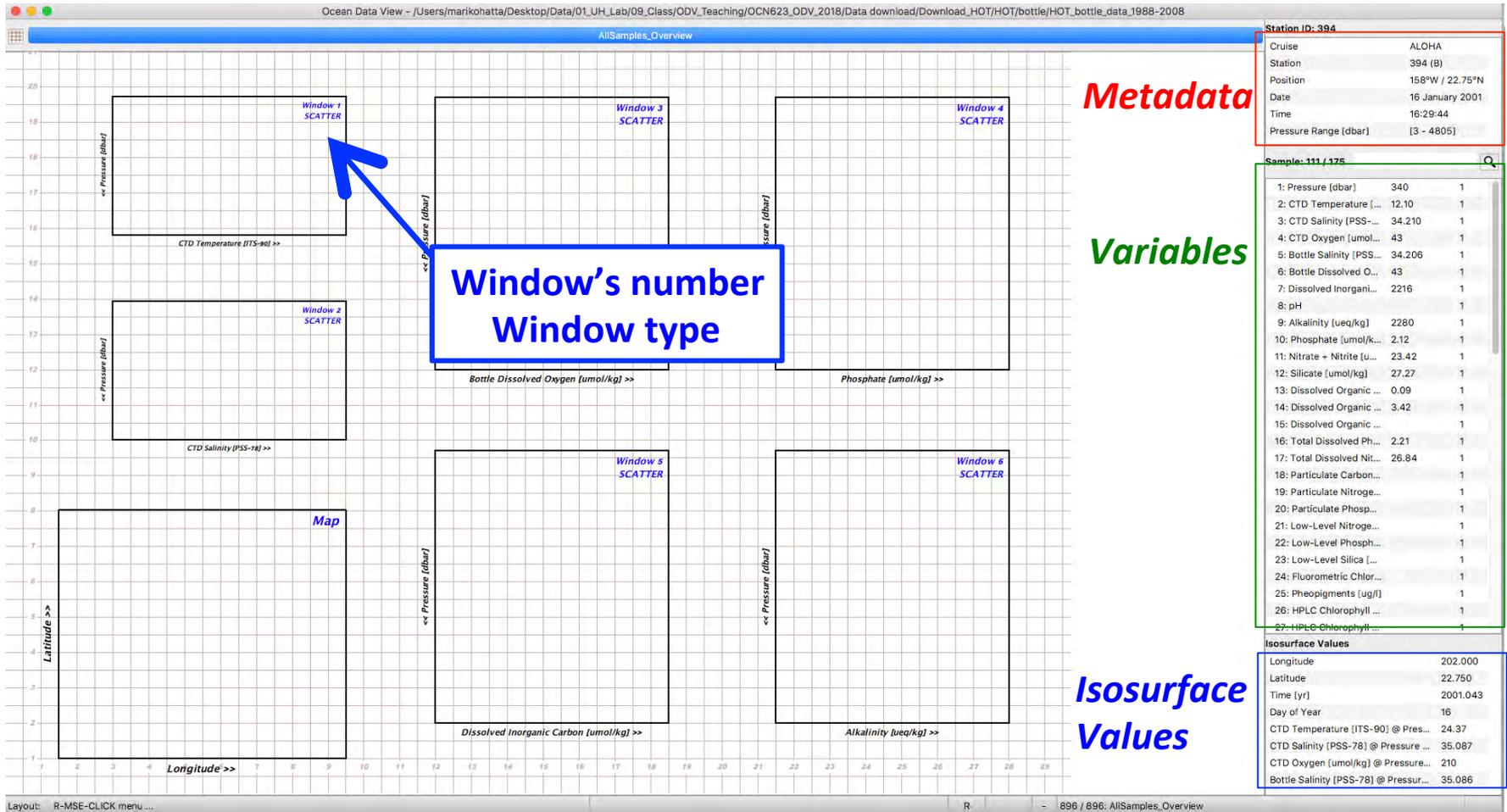
Or Move your cursor in the white part (it should not be on the map or on any scatter window)
 Right click ("control" + click if you are Mac user), and select "Window Layout".

“6 Scatter Windows” layout mode



“6 Scatter Windows” layout mode

This is “layout mode” of 6 scatter windows, and you can modify the layout of your windows (e.g. add new window, change the size, select different parameter etc.)



“6 Scatter Windows” layout mode

Move your cursor on the scatter window that you want to modify, and then **Right click** (“control” + click if you are Mac user).

Change the size of windows

Add the new windows

Variables

Isosurface Values

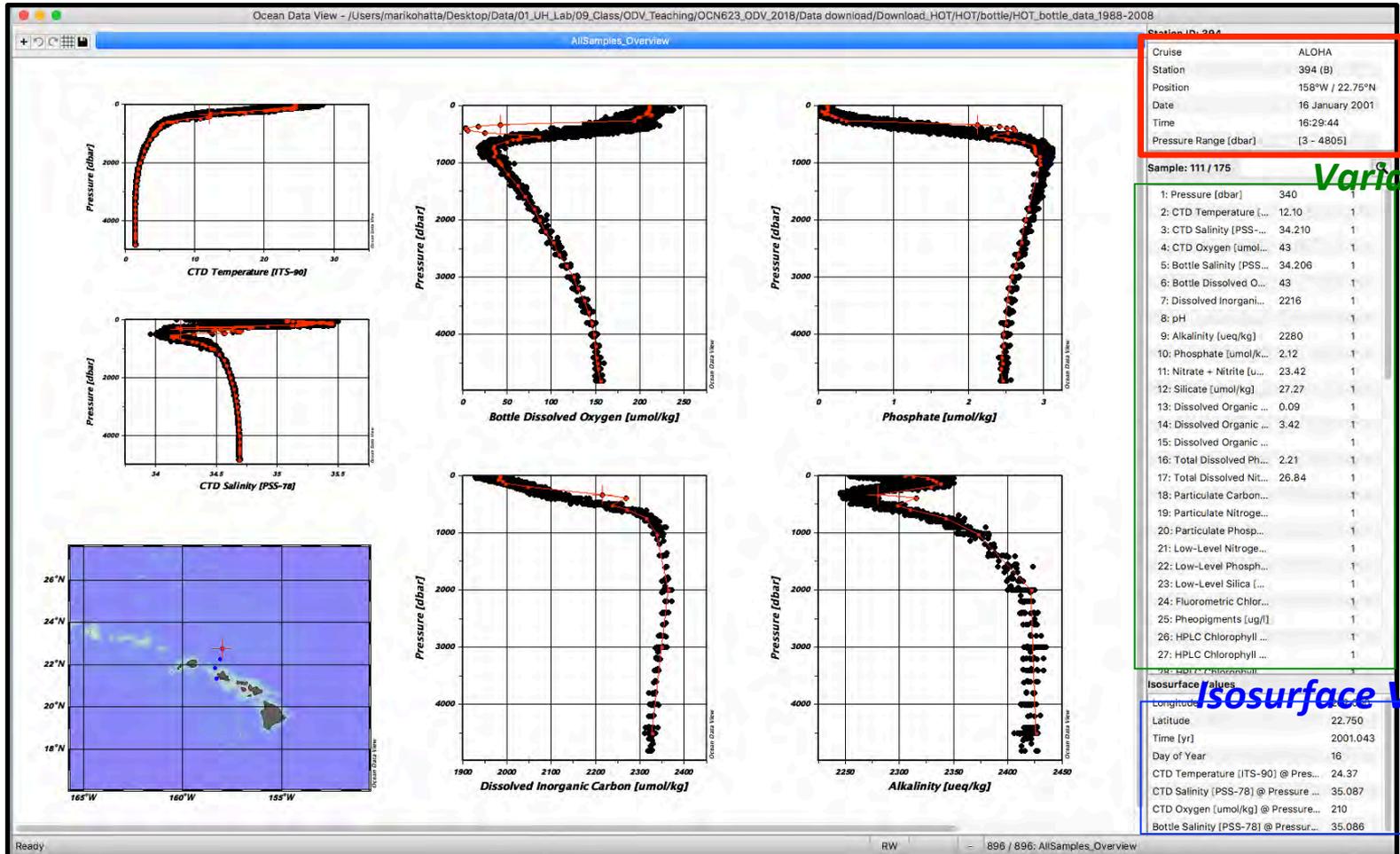
Variables	
2: CTD Temperature [ITS-90]	12.10
3: CTD Salinity [PSS-78]	34.210
4: CTD Oxygen [umol/kg]	43
5: Bottle Salinity [PSS-78]	34.206
6: Bottle Dissolved O ₂ [umol/kg]	43
7: Dissolved Inorganic Carbon [umol/kg]	2216
8: pH	1
9: Alkalinity [ueq/kg]	2280
10: Phosphate [umol/kg]	2.12
11: Nitrate + Nitrite [umol/kg]	23.42
12: Silicate [umol/kg]	27.27
13: Dissolved Organic Carbon [umol/kg]	0.09
14: Dissolved Organic Nitrogen [umol/kg]	3.42
15: Dissolved Organic Phosphorus [umol/kg]	1
16: Total Dissolved Phosphorus [umol/kg]	2.21
17: Total Dissolved Nitrogen [umol/kg]	26.84
18: Particulate Carbon [umol/kg]	1
19: Particulate Nitrogen [umol/kg]	1
20: Particulate Phosphorus [umol/kg]	1
21: Low-Level Nitrogen [umol/kg]	1
22: Low-Level Phosphorus [umol/kg]	1
23: Low-Level Silica [umol/kg]	1
24: Fluorometric Chlorophyll [ug/l]	1
25: Pheopigments [ug/l]	1
26: HPLC Chlorophyll [ug/l]	1
27: HPLC Chlorophyll [ug/l]	1

Isosurface Values	
Longitude	202.000
Latitude	22.750
Time [Yr]	2001.043
Day of Year	16
CTD Temperature [ITS-90] @ Pressure [dbar]	24.37
CTD Salinity [PSS-78] @ Pressure [dbar]	35.087
CTD Oxygen [umol/kg] @ Pressure [dbar]	210
Bottle Salinity [PSS-78] @ Pressure [dbar]	35.086

After you change the layout, select “Accept”.

“6 Scatter Windows” mode

Metadata



Variables

Isosurface Values

Let's change the temperature plot to pH.

To make changes in any window, put your cursor and right click ("control" + click if you are Mac user) click in the window, then select "Properties".

Metadata

The screenshot shows the Ocean Data View interface. A context menu is open over a plot, listing options such as Redraw, Save Plot As..., Zoom, Auto-Zoom In, Move to Foreground, Full Range, X-Variable, Y-Variable, Z-Variable, Extras, and Properties... (highlighted in red). The background shows three plots: CTD Temperature [ITS-90], CTD Salinity [PSS-78], and Phosphate [umol/kg]. A metadata table is visible on the right, and a list of variables is shown below it. A blue box highlights the 'Isosurface Values' section of the metadata table.

Station ID: 394	
Cruise	ALOHA
Station	394 (8)
Position	158°W / 22.75°N
Date	16 January 2001
Time	16:29:44
Pressure Range [dbar]	[3 - 4805]

Sample: 111 / 175	
1: Pressure [dbar]	340
2: CTD Temperature [ITS-90]	12.10
3: CTD Salinity [PSS-78]	34.210
4: CTD Oxygen [umol/L]	43
5: Bottle Salinity [PSS-78]	34.206
6: Bottle Dissolved O ₂ [umol/L]	43
7: Dissolved Inorganic Nitrogen [umol/L]	2216
8: pH	1
9: Alkalinity [ueq/kg]	2280
10: Phosphate [umol/kg]	2.12
11: Nitrate + Nitrite [umol/L]	23.42
12: Silicate [umol/kg]	27.27
13: Dissolved Organic Carbon [umol/L]	0.09
14: Dissolved Organic Nitrogen [umol/L]	3.42
15: Dissolved Organic Phosphorus [umol/L]	1
16: Total Dissolved Phosphorus [umol/L]	2.21
17: Total Dissolved Nitrogen [umol/L]	26.84
18: Particulate Carbon [umol/L]	1
19: Particulate Nitrogen [umol/L]	1
20: Particulate Phosphorus [umol/L]	1
21: Low-Level Nitrogen [umol/L]	1
22: Low-Level Phosphorus [umol/L]	1
23: Low-Level Silica [umol/L]	1
24: Fluorometric Chlorophyll [ug/L]	1
25: Pheopigments [ug/L]	1
26: HPLC Chlorophyll [ug/L]	1
27: HPLC Chlorophyll [ug/L]	1

Isosurface Values	
Longitude	
Latitude	22.750
Time [yr]	2001.043
Day of Year	16
CTD Temperature [ITS-90] @ Pressure [dbar]	24.37
CTD Salinity [PSS-78] @ Pressure [dbar]	35.087
CTD Oxygen [umol/L] @ Pressure [dbar]	210
Bottle Salinity [PSS-78] @ Pressure [dbar]	35.086

Let's change the temperature plot to pH.

Select "Data" tab, then select "X-axis" (now selected "2:CTD Temperature [ITS-90] ").

Metadata

The screenshot shows a software interface with three main panels. On the left, there are two plots of Pressure [dbar] vs. CTD Temperature [ITS-90] and CTD Salinity [PSS-78]. The top plot shows a typical CTD profile. The middle plot shows a similar profile but with salinity on the x-axis. At the bottom left is a map showing the location of the data collection site in the Pacific Ocean near Hawaii. The central panel is the 'Properties Window 1' with the 'Data' tab selected. The 'X-Axis' dropdown menu is set to '2: CTD Temperature [ITS-90]'. The 'Y-Axis' dropdown menu is set to '1: Pressure [dbar]'. The 'Z-Axis' dropdown menu is set to '(none)'. The 'Reverse range' checkbox is checked for the Y-Axis. The 'Apply to all windows' checkbox is unchecked. The 'Help', 'OK', and 'Cancel' buttons are visible at the bottom of the window. On the right, there is a 'Metadata' section with a table of station information and a 'Variables' section with a list of variables and their values. The 'Isosurface Values' section is also visible at the bottom right.

Station ID: 394	
Cruise	ALOHA
Station	394 (B)
Position	158°W / 22.75°N
Date	16 January 2001
Time	16:29:44
Pressure Range [dbar]	[3 - 4805]

Sample: 111 / 175	
1: Pressure [dbar]	340
2: CTD Temperature [ITS-90]	12.10
3: CTD Salinity [PSS-78]	34.210
4: CTD Oxygen [umol/kg]	43
5: Bottle Salinity [PSS-78]	34.206
6: Bottle Dissolved O ₂ [umol/kg]	43
7: Dissolved Inorganic Nitrogen [umol/kg]	2216
8: pH	1
9: Alkalinity [ueq/kg]	2280
10: Phosphate [umol/kg]	2.12
11: Nitrate + Nitrite [umol/kg]	23.42
12: Silicate [umol/kg]	27.27
13: Dissolved Organic Carbon [umol/kg]	0.09
14: Dissolved Organic Nitrogen [umol/kg]	3.42
15: Dissolved Organic Phosphorus [umol/kg]	1
16: Total Dissolved Phosphorus [umol/kg]	2.21
17: Total Dissolved Nitrogen [umol/kg]	26.84
18: Particulate Carbon [umol/kg]	1
19: Particulate Nitrogen [umol/kg]	1
20: Particulate Phosphorus [umol/kg]	1
21: Low-Level Nitrogen [umol/kg]	1
22: Low-Level Phosphorus [umol/kg]	1
23: Low-Level Silica [umol/kg]	1
24: Fluorometric Chlorophyll [ug/l]	1
25: Pheopigments [ug/l]	1
26: HPLC Chlorophyll [ug/l]	1
27: HPLC Chlorophyll [ug/l]	1

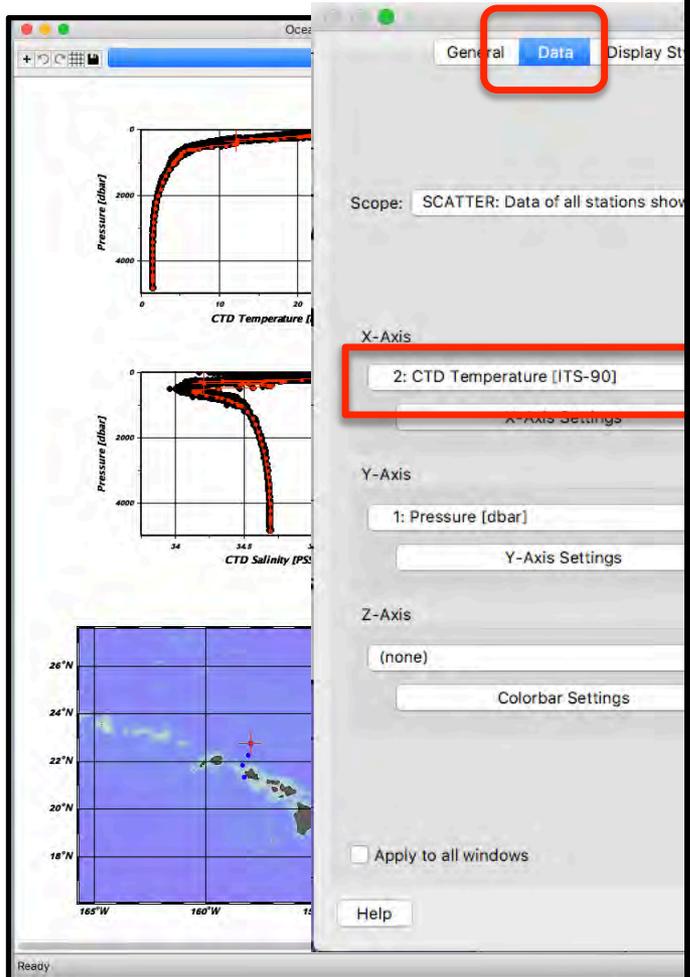
Isosurface Values	
Longitude	158.0
Latitude	22.750
Time [yr]	2001.043
Day of Year	16
CTD Temperature [ITS-90] @ Pressure [dbar]	24.37
CTD Salinity [PSS-78] @ Pressure [dbar]	35.087
CTD Oxygen [umol/kg] @ Pressure [dbar]	210
Bottle Salinity [PSS-78] @ Pressure [dbar]	35.086

Variables

Isosurface Values

Let's change the temperature

Select "8:pH", then select "OK".



- 1: Pressure [dbar]
- 2: CTD Temperature [ITS-90]
- 3: CTD Salinity [PSS-78]
- 4: CTD Oxygen [umol/kg]
- 5: Bottle Salinity [PSS-78]
- 6: Bottle Dissolved Oxygen [umol/kg]
- 7: Dissolved Inorganic Carbon [umol/kg]
- 8: pH
- 9: Alkalinity [ueq/kg]
- 10: Phosphate [umol/kg]
- 11: Nitrate + Nitrite [umol/kg]
- 12: Silicate [umol/kg]
- 13: Dissolved Organic Phosphorus [umol/kg]
- 14: Dissolved Organic Nitrogen [umol/kg]
- 15: Dissolved Organic Carbon [umol/kg]
- 16: Total Dissolved Phosphorus [umol/kg]
- 17: Total Dissolved Nitrogen [umol/kg]
- 18: Particulate Carbon [umol/kg]
- 19: Particulate Nitrogen [umol/kg]
- 20: Particulate Phosphorus [nmol/kg]
- 21: Low-Level Nitrogen [nmol/kg]
- 22: Low-Level Phosphorus [nmol/kg]
- 23: Low-Level Silica [umol/kg]
- 24: Fluorometric Chlorophyll a [ug/l]
- 25: Pheopigments [ug/l]
- 26: HPLC Chlorophyll c3 [ng/l]
- 27: HPLC Chlorophyll c1+c2 [ng/l]
- 28: HPLC Chlorophyll c1+c2+c3 [ng/l]
- 29: HPLC Peridinin [ng/l]
- 30: HPLC 19' Butanoyloxyfucoxanthin [ng/l]
- 31: HPLC Fucoxanthin [ng/l]
- 32: HPLC 19' Hexanoyloxyfucoxanthin [ng/l]
- 33: HPLC Prasinoxanthin [ng/l]
- 34: HPLC Diadinoxanthin [ng/l]
- 35: HPLC Zeaxanthin [ng/l]
- 36: HPLC Chlorophyll a (chl a) [ng/l]
- 37: HPLC Chlorophyll b (hplc) [ng/l]
- 38: HPLC Chlorophyll c4 [ng/l]
- 39: HPLC α -Carotene [ng/l]
- 40: HPLC β -Carotene [ng/l]
- 41: HPLC Carotenes [ng/l]
- 42: HPLC Chlorophyllide a [ng/l]
- 43: HPLC Violaxanthin [ng/l]
- 44: HPLC Lutein [ng/l]
- 45: HPLC Monovinyl Chlorophyll a [ng/l]
- 46: HPLC Divinyl Chlorophyll a [ng/l]
- 47: Heterotrophic Bacteria [#*1e5/ml]
- 48: Prochlorococcus [#*1e5/ml]
- 49: Synechococcus [#*1e5/ml]
- 50: Eukaryotes [#*1e5/ml]
- 51: Adenosine 5' Triphosphate [ng/kg]
- 52: Guanosine 5' Triphosphate [ng/kg]
- 53: Hydrogen Peroxide [umol/kg]
- 54: Nitrous Oxide [nmol/kg]
- 55: Particulate Silica [nmol/kg]
- 56: Phycoerythrin 0.4 fraction [ng/l]
- 57: Phycoerythrin 5 fraction [ng/l]
- 58: Phycoerythrin 10 fraction [ng/l]
- 59: $\delta^{15}N$ of PN [permil]
- 60: TD-700 Chlorophyll a [ug/l]
- 61: TD-700 Chlorophyll b [ug/l]

pH.

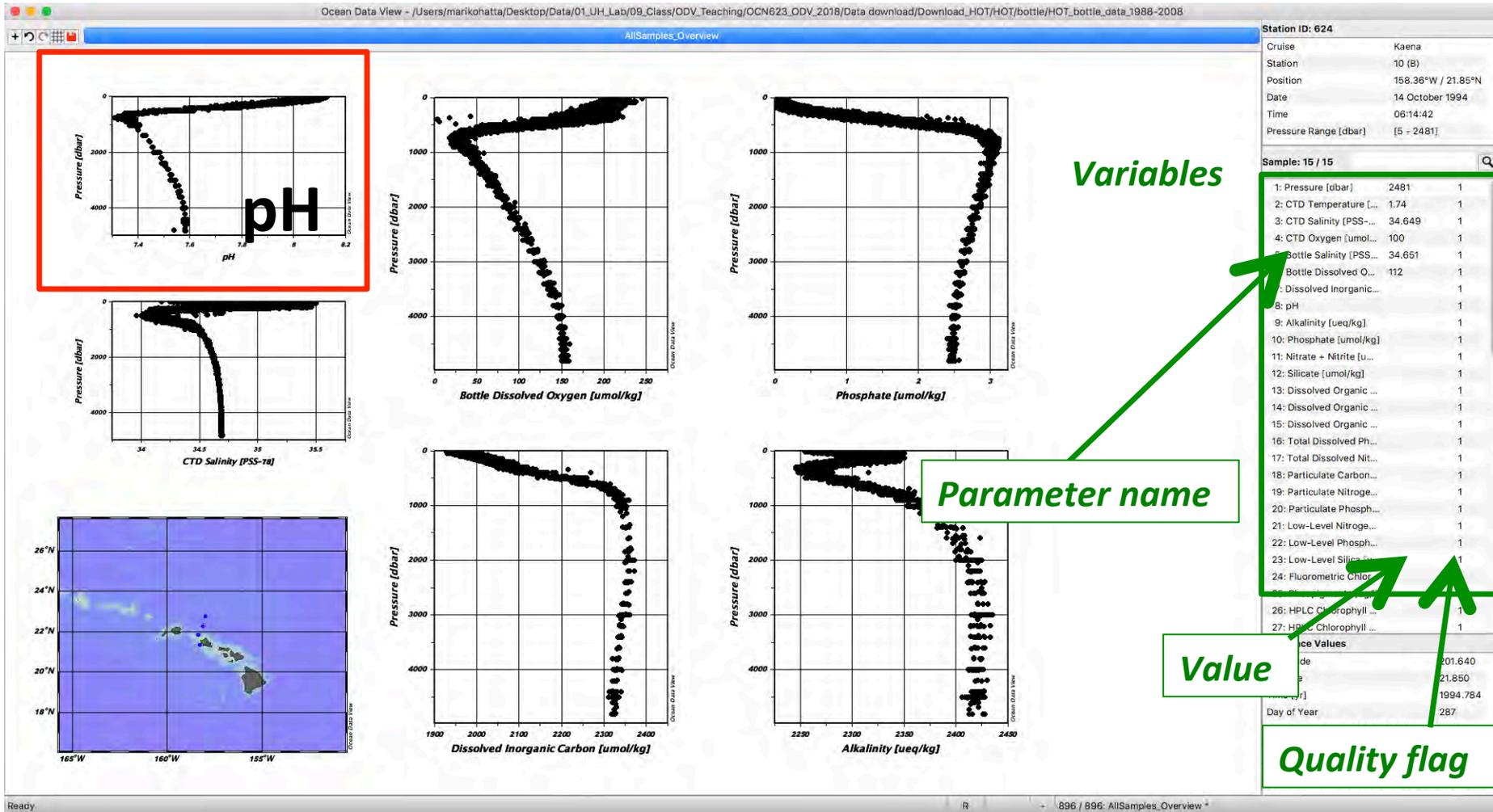
Metadata

Variables

Trace Values

“6 Scatter Windows” mode

Now you will see the modified scatter window showing pH as a vertical profile.



Now, we are going to modify the sample selection criteria used for the plot.

Let's modify the sample selection criteria!

Move your cursor in the scatter window that you want to change the selection criteria, right click ("control" + click if you are Mac user), then select "**Sample Selection Criteria**".

The screenshot displays the Ocean Data View interface. On the left, there are three scatter plots: pH vs Pressure [dbar], CTD Salinity [PSS-78] vs Pressure [dbar], and a map view. A context menu is open over the pH plot, listing various actions. On the right, a panel shows station information and a list of variables for sample 15/15. Green annotations highlight specific parts of the interface.

Context Menu:

- Redraw
- Save Plot As...
- Save As Interrupted Map...
- Zoom
- Z-Zoom
- Auto-Zoom In
- Auto-Zoom Out
- Move to Foreground
- Move to Background
- Full Range
- Set Ranges
- X-Variable
- Y-Variable
- Z-Variable
- Extras
- Sample Selection Criteria...
- Properties...

Station ID: 624

Cruise: Kaena
Station: 10 (B)
Position: 158.36°W / 21.85°N
Date: 14 October 1994
Time: 06:14:42
Pressure Range [dbar]: [5 - 2481]

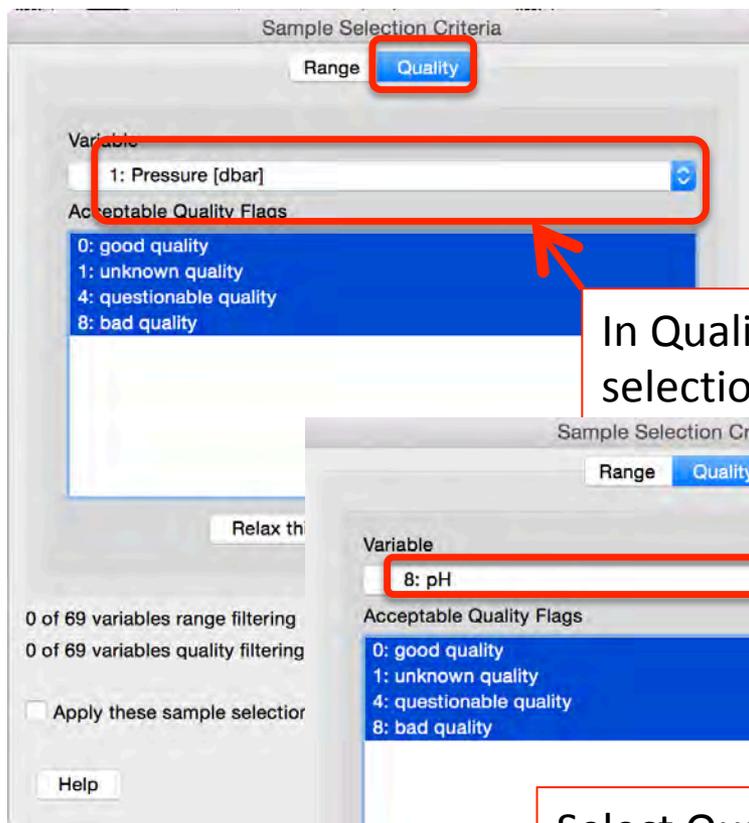
Sample: 15 / 15

1: Pressure [dbar]	2481	1
2: CTD Temperature [...]	1.74	1
3: CTD Salinity [PSS-...	34.649	1
4: CTD Oxygen [umol...	100	1
5: Bottle Salinity [PSS...	34.651	1
6: Bottle Dissolved O...	112	1
7: Dissolved Inorganic...		1
8: pH		1
9: Alkalinity [ueq/kg]		1
10: Phosphate [umol/kg]		1
11: Nitrate + Nitrite [u...		1
12: Silicate [umol/kg]		1
13: Dissolved Organic ...		1
14: Dissolved Organic ...		1
15: Dissolved Organic ...		1
16: Total Dissolved Ph...		1
17: Total Dissolved Nit...		1
18: Particulate Carbon...		1
19: Particulate Nitroge...		1
20: Particulate Phosph...		1
21: Low-Level Nitroge...		1
22: Low-Level Phosph...		1
23: Low-Level Silica...		1
24: Fluorometric Chlor...		1
26: HPLC Chlorophyll ...		1
27: HPLC Chlorophyll ...		1

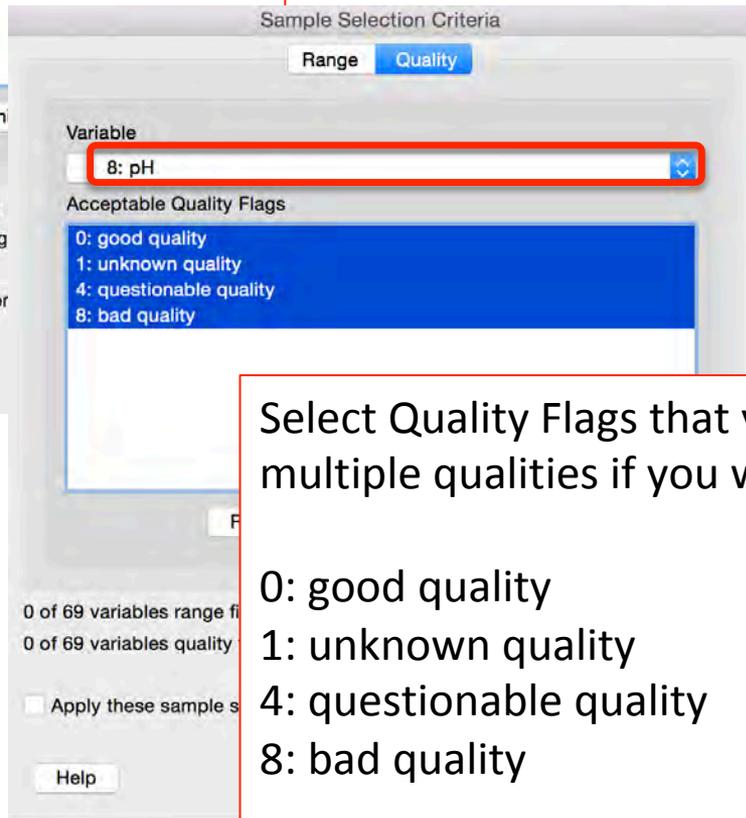
Annotations:

- Variables:** Points to the list of variables.
- Parameter name:** Points to the variable name in the list.
- Value:** Points to the numerical value in the list.
- Quality flag:** Points to the quality flag in the list.

How to modify the sample selection criteria (Quality Flag)!



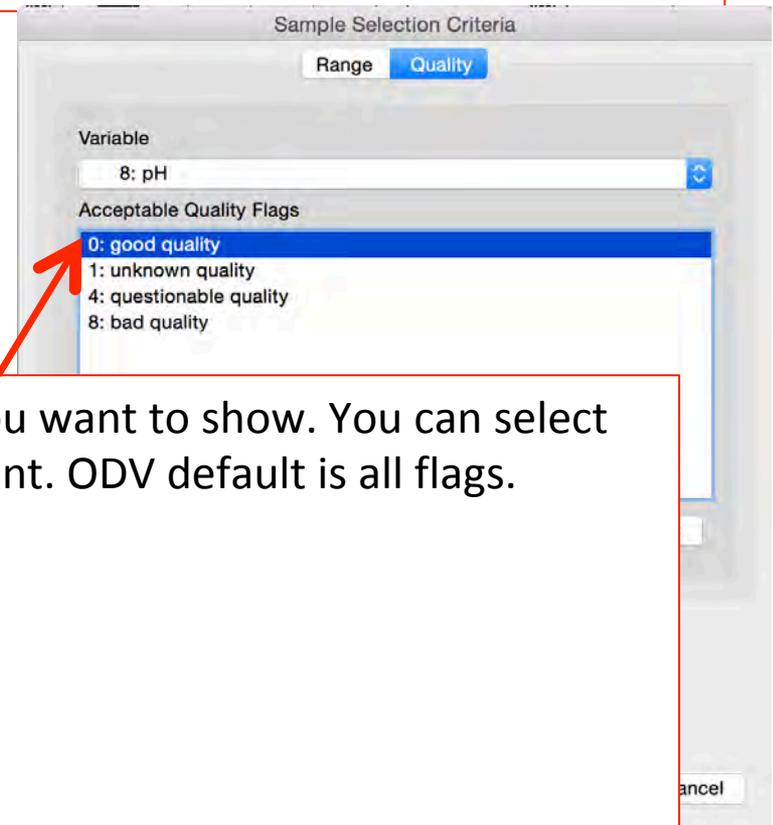
In Quality tab, select "Variable" that you want to modify the selection criteria.



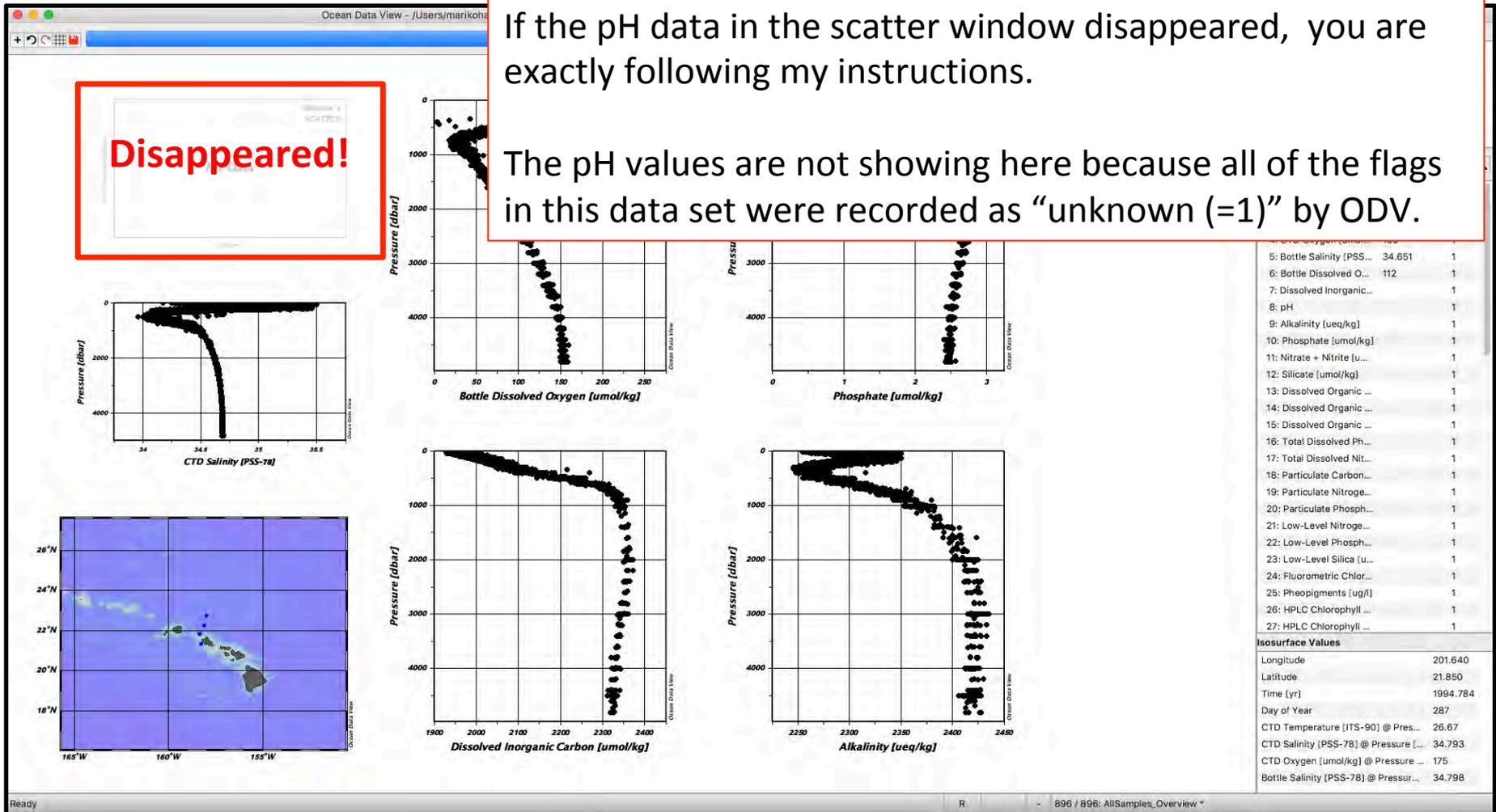
Select Quality Flags that you want to show. You can select multiple qualities if you want. ODV default is all flags.

- 0: good quality
- 1: unknown quality
- 4: questionable quality
- 8: bad quality

Select only "0:good quality" here.

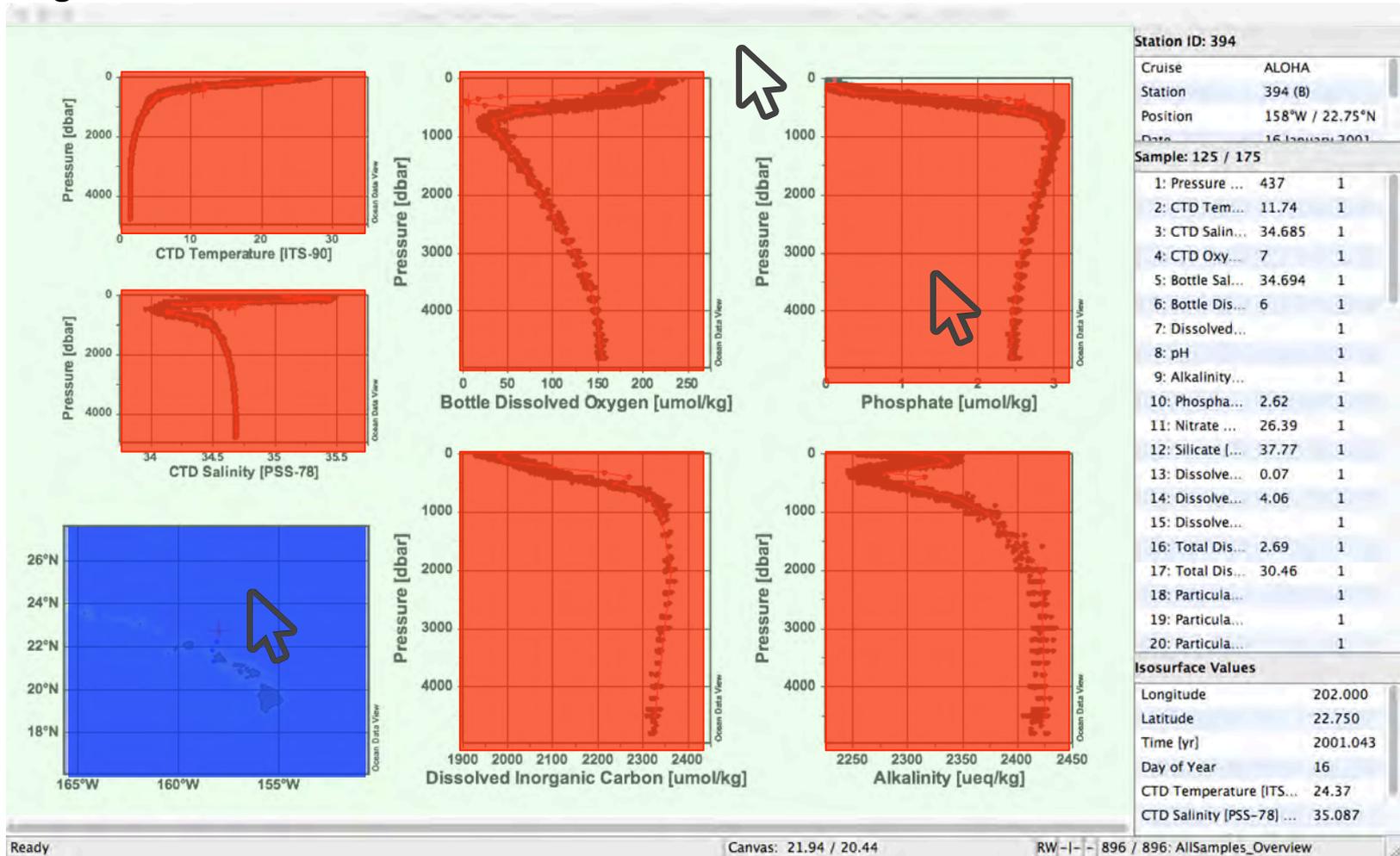


“6 Scatter Windows” mode



Different window types (shown in color) have different pop-up menus!

Depending on what you want to modify, you have to select “Map” or “Scatter Window” or “background”.



Map

Scatter Windows

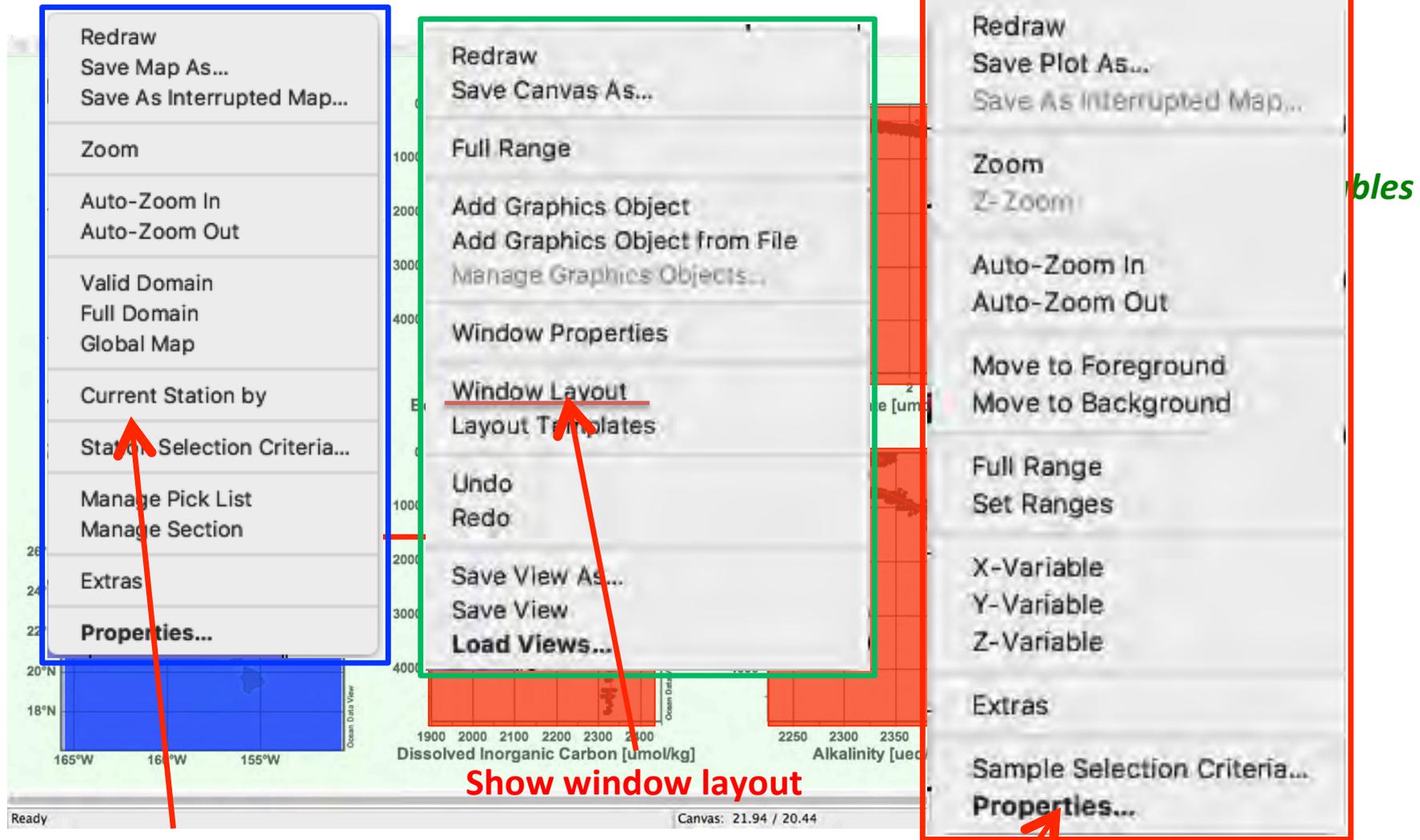
Background

Different window types (shown in color) have different pop-up menus!

Map

Background

Scatter Windows

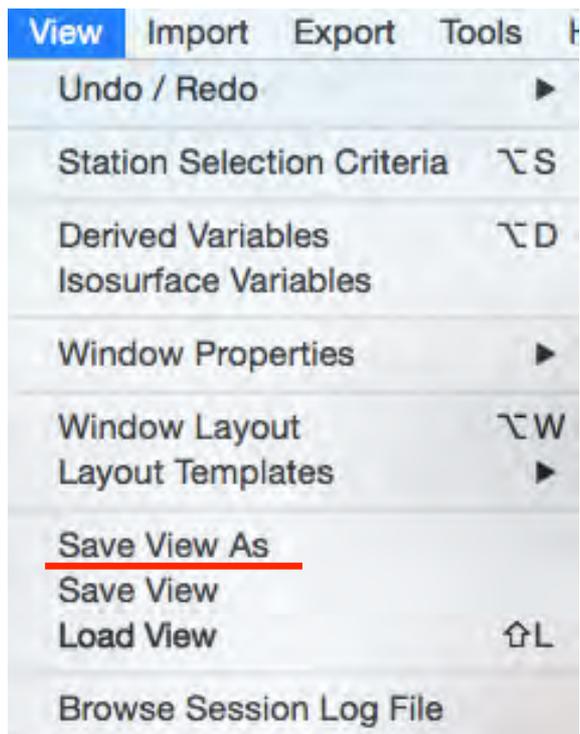


Change the scale of Map

Change the properties of the window

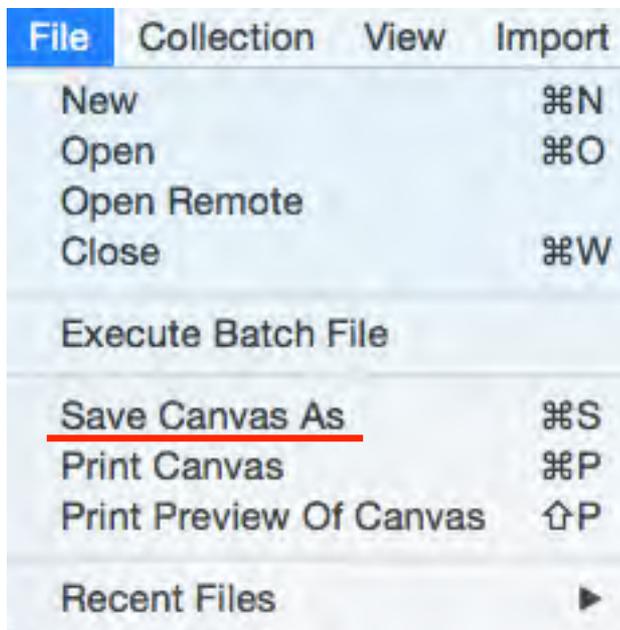
How to save figures and views

All of the parameters in a canvas, window types, parameters shown, scaling, etc. are known as a view which can be saved. Click “View” in the Menu Bar to select “Save View as” or “Save View”.



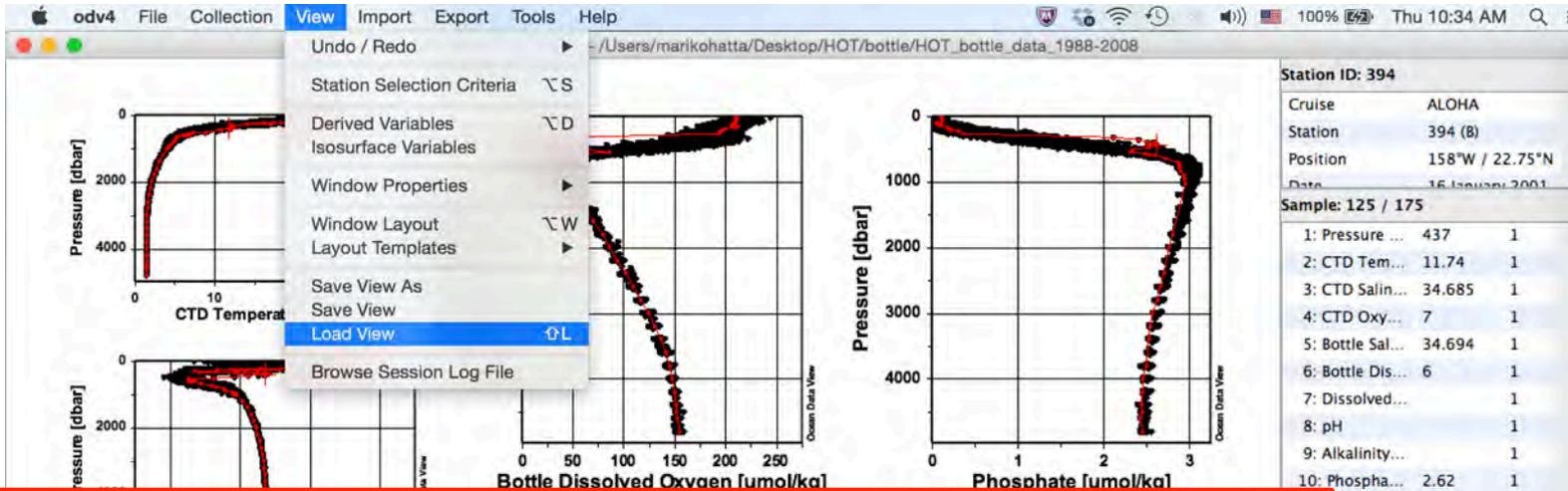
How to save figures:

Click “File” in the Menu Bar to select “Save Canvas as”.



Tip: The highest resolution of the canvas you can save is 499, which would be important for a publication. Also when you print the Canvas, it would take a long time to print. Save as the canvas, and then print it (faster!).

Let's change the view from the vertical profiles to "Phosphate Time Series" mode!



Station ID: 394

Cruise	ALOHA
Station	394 (8)
Position	158°W / 22.75°N
Date	16 January 2001

Sample: 125 / 175

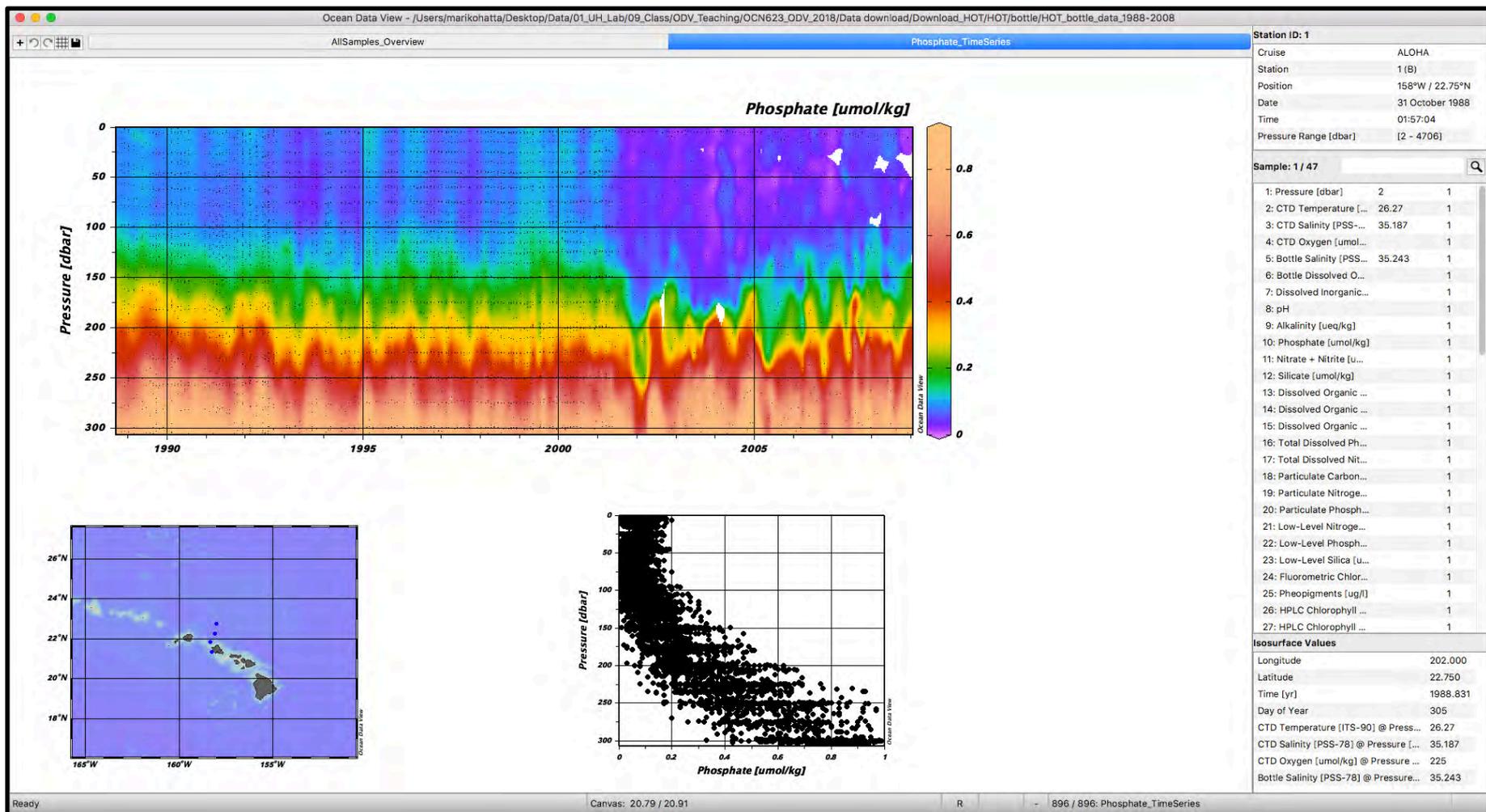
1: Pressure ...	437	1
2: CTD Tem...	11.74	1
3: CTD Salin...	34.685	1
4: CTD Oxy...	7	1
5: Bottle Sal...	34.694	1
6: Bottle Dis...	6	1
7: Dissolved...		1
8: pH		1
9: Alkalinity...		1
10: Phospha...	2.62	1
nitrate ...	26.39	1
silicate [...]	37.77	1
dissolve...	0.07	1
dissolve...	4.06	1
dissolve...		1
total Dis...	2.69	1
total Dis...	30.46	1
articula...		1
articula...		1
articula...		1
face Values		
ude	202.000	
	33.756	

The screenshot shows a file browser window with the following directory structure:

- bottle
 - HOT_bottle_...8-2008.Data
 - HOT_bottle_...88-2008.odv
 - data
 - gobjects
 - info
 - inventory
 - logfile
 - metadata
 - misc
 - patches
 - settings
 - views
 - AllSamples_Overview.xview
 - AllStationsMap.xview
 - DIC_TimeSeries.xview
 - Oxygen_TimeSeries.xview
 - OxygenSatu...Series.xview
 - pH_TimeSeries.xview
 - Phosphate_TimeSeries.xview
 - Silicate_TimeSeries.xview
 - Temperature...Series.xview

- Map
- DIC Time Series
- Oxygen Time Series
- pH
- Phosphate Time Series**
- Silicate
- Temperature

Phosphate Time Series



Tip: ODV 5.0.0 for the first time allows working with multiple open views at the same time. The new Views Bar located just below the main menu bar lets you easily open and save views, undo or redo recent view changes, switch to or from layout mode, or select one of the open views by clicking on its tab.

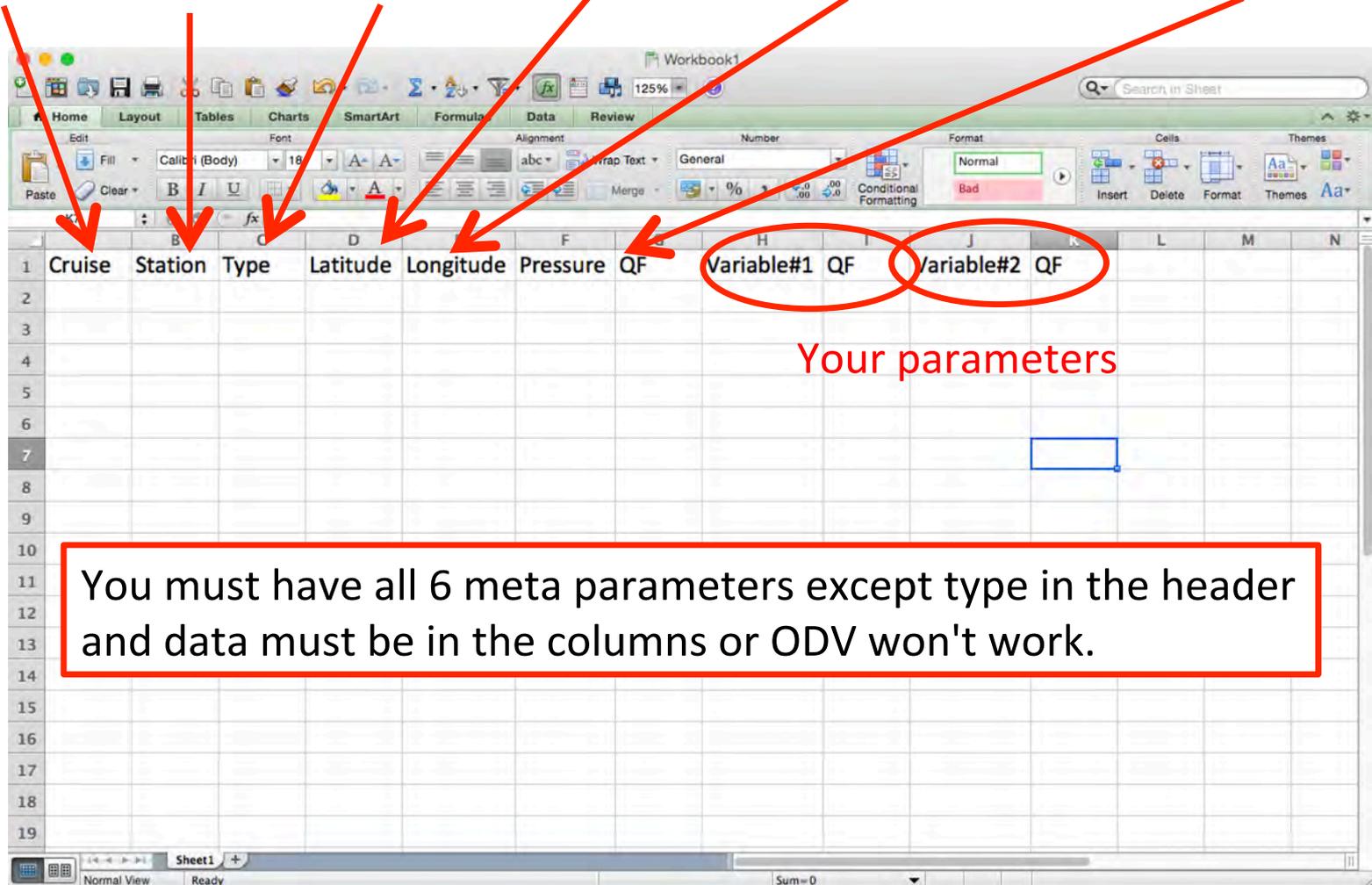
(https://odv.awi.de/fileadmin/user_upload/odv/misc/What_is_new_in_ODV_5.0.0.pdf)

Exercise 1.

Now to create your own ODV readable text file

1. Open the “header.xlsx” file, and look at the first row. The essential parameters are:

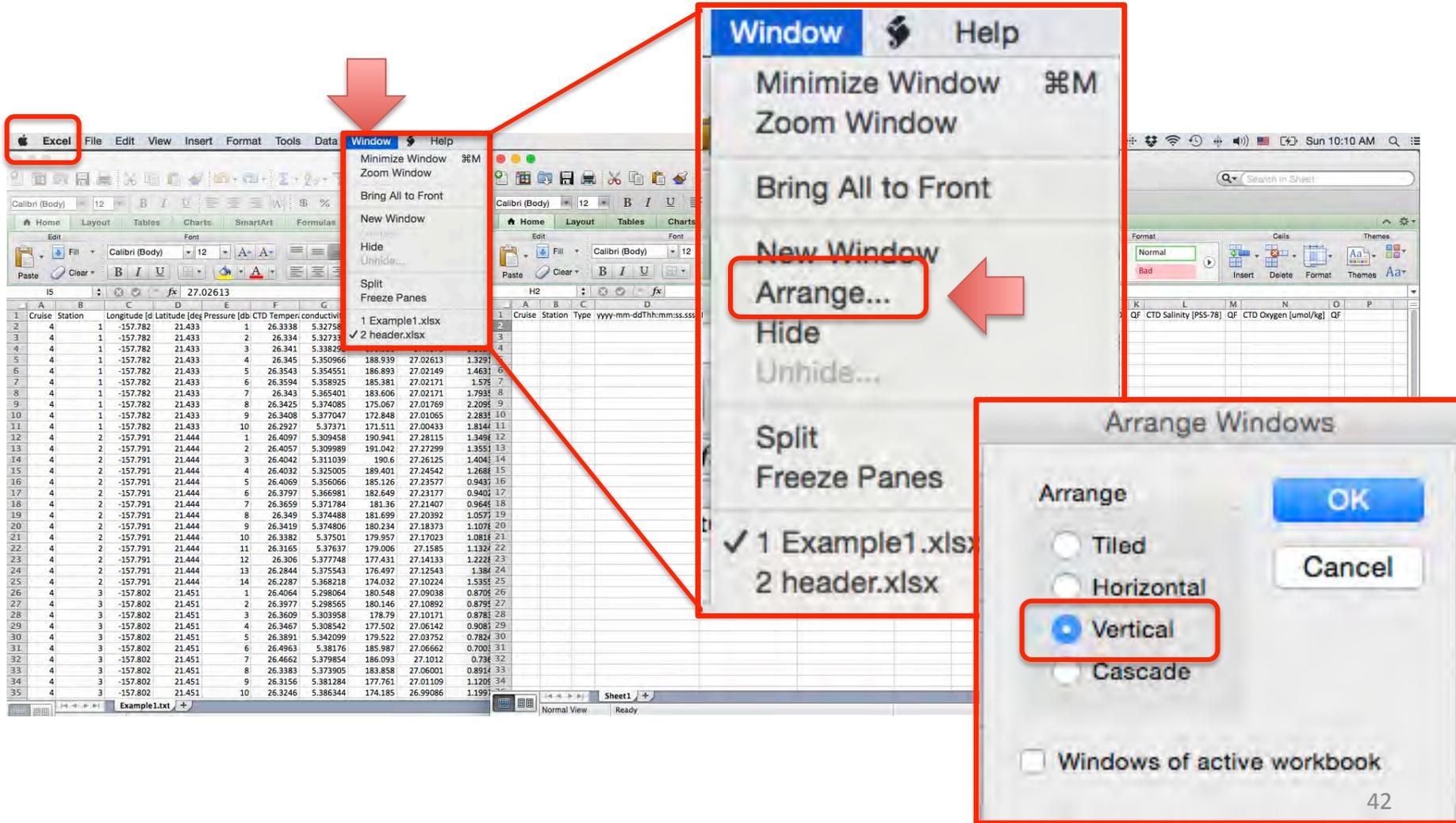
Cruise (name) Station (numbers) Type (B or C) Latitude (North +, South -) Longitude (East +, West -) Pressure QF (or depth)



You must have all 6 meta parameters except type in the header and data must be in the columns or ODV won't work.

2. Open “example1.xlsx” and then let’s arrange the windows to look at both Excel files together.

Select “Window”- then select “Arrange”, then click “vertical”.



3. Copy the parameter values from “example1.xlsx” to the correct parameter name in the “header.xlsx” Excel spreadsheet.

header.xlsx

Example1.xlsx

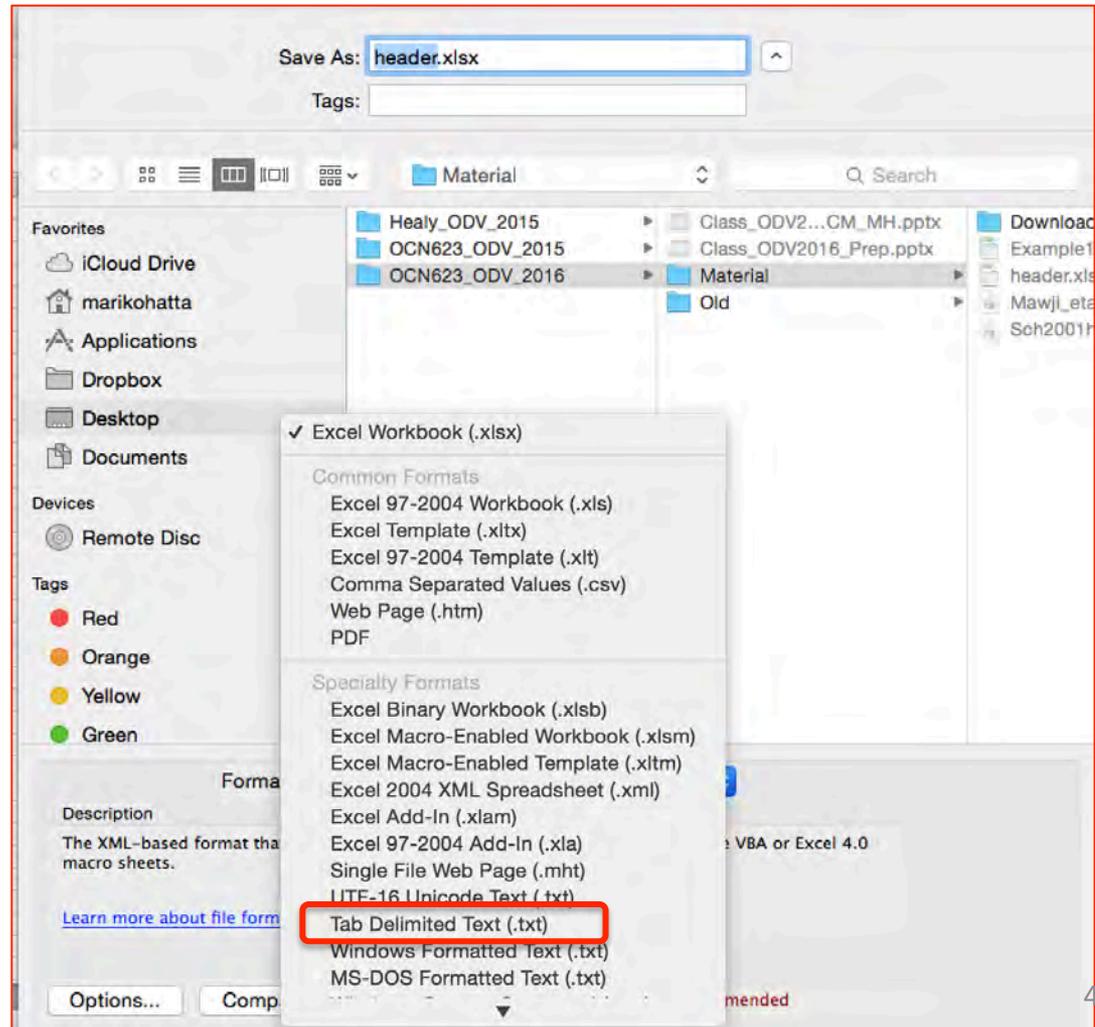
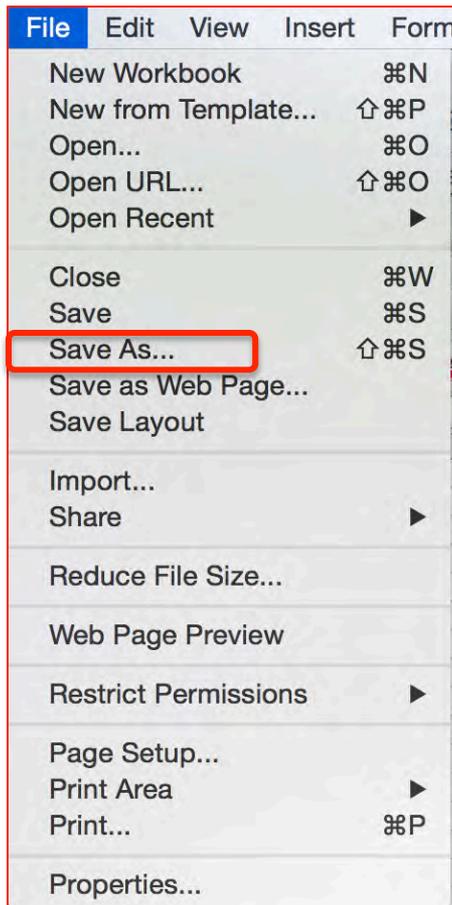
The image shows two Excel spreadsheets side-by-side. The left spreadsheet, titled 'header.xlsx', has columns A through G with headers: Cruise, Station, Type, yyyy-mm-ddThh:mm:ss.sss, Longitude [degrees_east], Latitude [degrees_north], and Bot.depth [m]. The right spreadsheet, titled 'Example1.xlsx', has columns A through J with headers: Cruise, Station, Longitude [d], Latitude [deg], Pressure [db], CTD Temper, conductivity, oxygen, CTD Oxygen, and Fluoror. A red arrow points from the data in the right spreadsheet to the corresponding header cells in the left spreadsheet. Both spreadsheets have a red box around their respective data columns.

Cruise	Station	Type	yyyy-mm-ddThh:mm:ss.sss	Longitude [degrees_east]	Latitude [degrees_north]	Bot.depth [m]
2	4	1	-157.782	21.433		
3	4	1	-157.782	21.433		
4	4	1	-157.782	21.433		
5	4	1	-157.782	21.433		
6	4	1	-157.782	21.433		
7	4	1	-157.782	21.433		
8	4	1	-157.782	21.433		
9	4	1	-157.782	21.433		
10	4	1	-157.782	21.433		
11	4	1	-157.782	21.433		
12	4	2	-157.791	21.444		
13	4	2	-157.791	21.444		
14	4	2	-157.791	21.444		
15	4	2	-157.791	21.444		
16	4	2	-157.791	21.444		
17	4	2	-157.791	21.444		
18	4	2	-157.791	21.444		
19	4	2	-157.791	21.444		
20	4	2	-157.791	21.444		
21	4	2	-157.791	21.444		
22	4	2	-157.791	21.444		
23	4	2	-157.791	21.444		
24	4	2	-157.791	21.444		
25	4	2	-157.791	21.444		
26	4	3	-157.802	21.451		
27	4	3	-157.802	21.451		
28	4	3	-157.802	21.451		
29	4	3	-157.802	21.451		
30	4	3	-157.802	21.451		
31	4	3	-157.802	21.451		
32	4	3	-157.802	21.451		
33	4	3	-157.802	21.451		
34	4	3	-157.802	21.451		

Cruise	Station	Longitude [d]	Latitude [deg]	Pressure [db]	CTD Temper	conductivity	oxygen	CTD Oxygen	Fluoror	
2	4	1	-157.782	21.433	1	26.3338	5.327588	191.079	27.04528	1.
3	4	1	-157.782	21.433	2	26.334	5.327333	191.199	27.02925	1.
4	4	1	-157.782	21.433	3	26.341	5.338292	191.321	27.0275	1.
5	4	1	-157.782	21.433	4	26.345	5.350966	188.939	27.02613	1.
6	4	1	-157.782	21.433	5	26.3453	5.354551	186.893	27.02149	1.
7	4	1	-157.782	21.433	6	26.3594	5.358925	185.381	27.02171	1.
8	4	1	-157.782	21.433	7	26.343	5.365401	183.606	27.02171	1.
9	4	1	-157.782	21.433	8	26.3425	5.374085	175.067	27.01769	2.
10	4	1	-157.782	21.433	9	26.3408	5.377047	172.848	27.01065	2.
11	4	1	-157.782	21.433	10	26.2927	5.37371	171.511	27.00433	1.
12	4	2	-157.791	21.444	1	26.4097	5.309458	190.941	27.28115	1.
13	4	2	-157.791	21.444	2	26.4057	5.309989	191.042	27.27299	1.
14	4	2	-157.791	21.444	3	26.4042	5.311039	190.6	27.26125	1.
15	4	2	-157.791	21.444	4	26.4032	5.325005	189.401	27.24542	1.
16	4	2	-157.791	21.444	5	26.4069	5.356066	185.126	27.23577	0.
17	4	2	-157.791	21.444	6	26.3797	5.366981	182.649	27.23177	0.
18	4	2	-157.791	21.444	7	26.3659	5.371784	181.36	27.21407	0.
19	4	2	-157.791	21.444	8	26.349	5.374488	181.699	27.20392	1.
20	4	2	-157.791	21.444	9	26.3419	5.374806	180.234	27.18373	1.
21	4	2	-157.791	21.444	10	26.3382	5.37501	179.957	27.17023	1.
22	4	2	-157.791	21.444	11	26.3165	5.37637	179.006	27.1585	1.
23	4	2	-157.791	21.444	12	26.306	5.377748	177.431	27.14133	1.
24	4	2	-157.791	21.444	13	26.2844	5.375543	176.497	27.12543	1.
25	4	2	-157.791	21.444	14	26.2287	5.368218	174.032	27.10224	1.
26	4	3	-157.802	21.451	1	26.4064	5.298064	180.548	27.09038	0.
27	4	3	-157.802	21.451	2	26.3977	5.298565	180.146	27.10892	0.
28	4	3	-157.802	21.451	3	26.3609	5.303958	178.79	27.10171	0.
29	4	3	-157.802	21.451	4	26.3467	5.308542	177.502	27.06142	0.
30	4	3	-157.802	21.451	5	26.3891	5.342099	179.522	27.03752	0.
31	4	3	-157.802	21.451	6	26.4963	5.38176	185.987	27.06662	0.
32	4	3	-157.802	21.451	7	26.4662	5.379854	186.093	27.1012	0.
33	4	3	-157.802	21.451	8	26.3383	5.373905	183.858	27.06001	0.
34	4	3	-157.802	21.451	9	26.3156	5.381284	177.761	27.01109	0.

4. Save “header.xlsx” in Tab delimited format (.txt) is now “header.txt”.

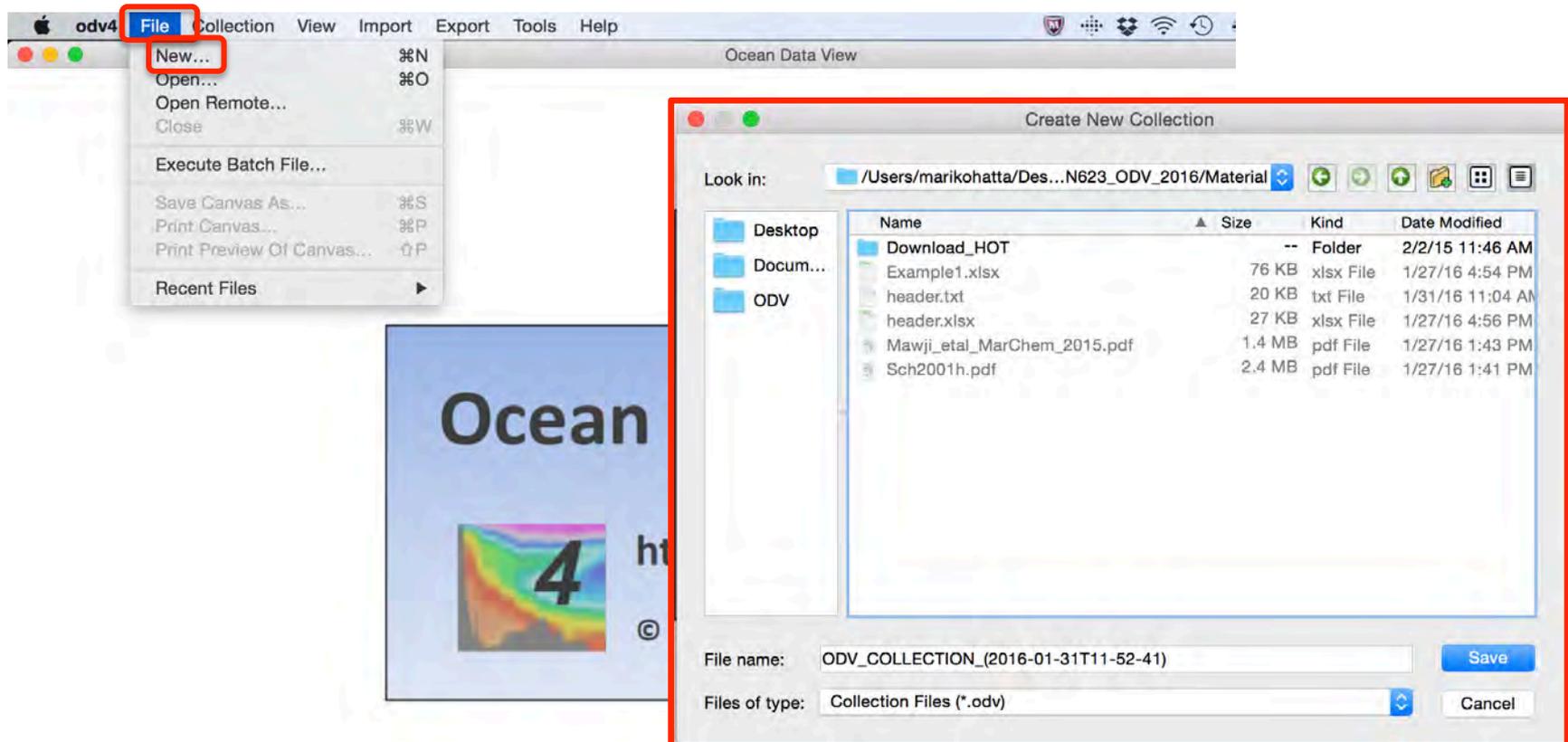
ODV will only recognize files in the tab delimited format (.txt).



Exercise 2.

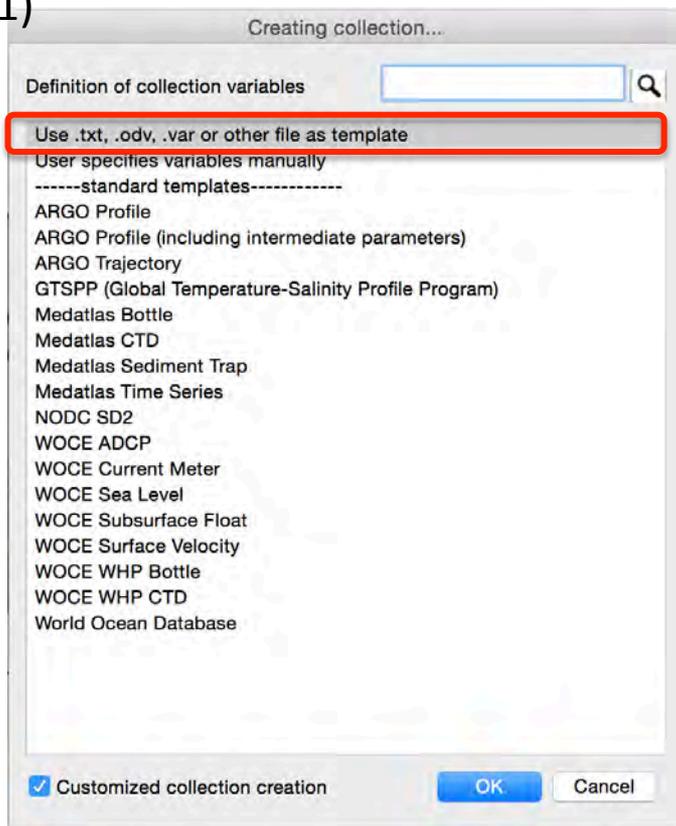
Let's create your own ODV file & figures

1. Close the HOT ODV data file. Open up the ODV program you downloaded. Then, let's create new collection. Select "File" tab, and select "New". Then, find the place you want to save the new ODV collection.

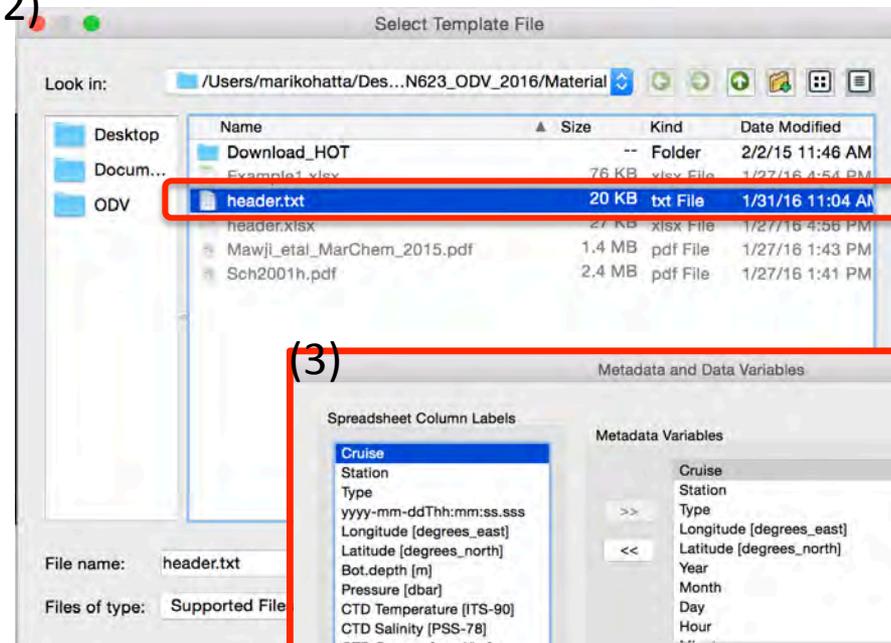


2. Choose “Definition of collection variables”. Select “Use .txt,.odv,.var or other file as template” and select your file that you made (“header.txt”).

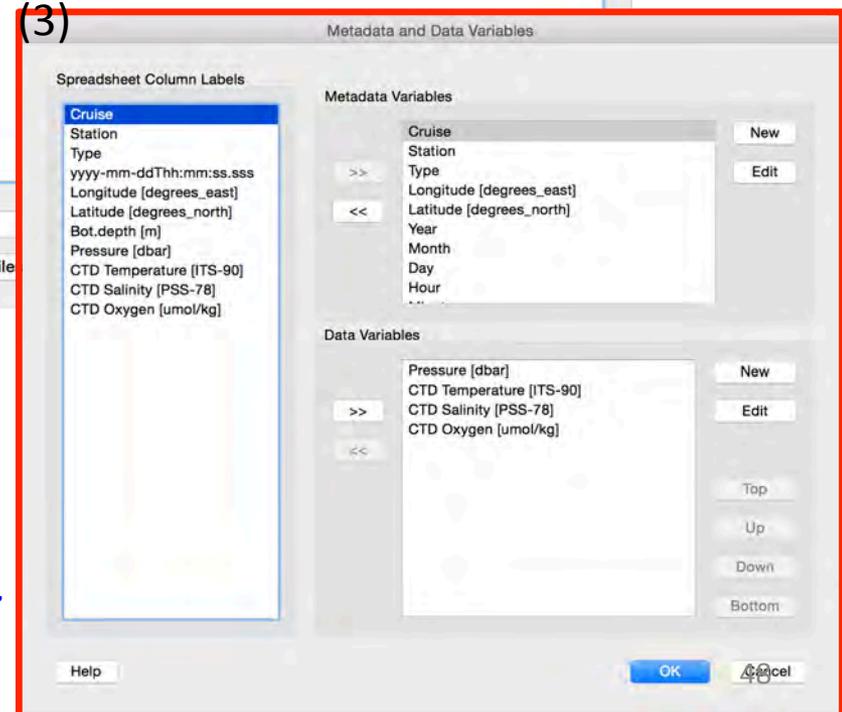
(1)



(2)



(3)



This step defines how ODV will read your data (i.e. metadata, variable name, QF etc.)

Collection Properties

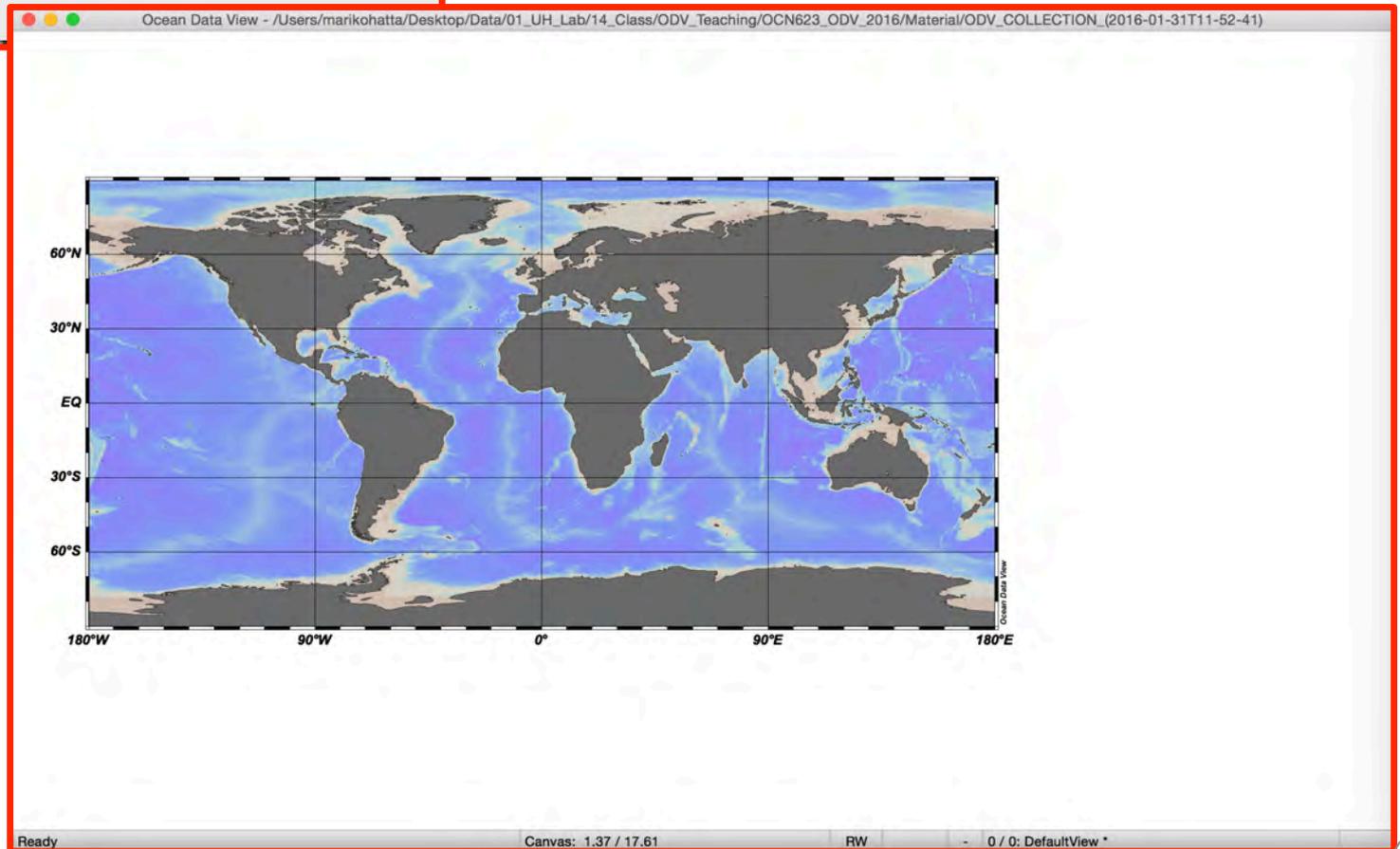
Data Field: GeneralField

Data Type: GeneralType

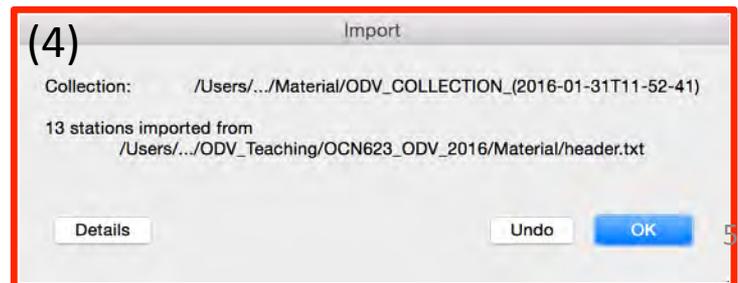
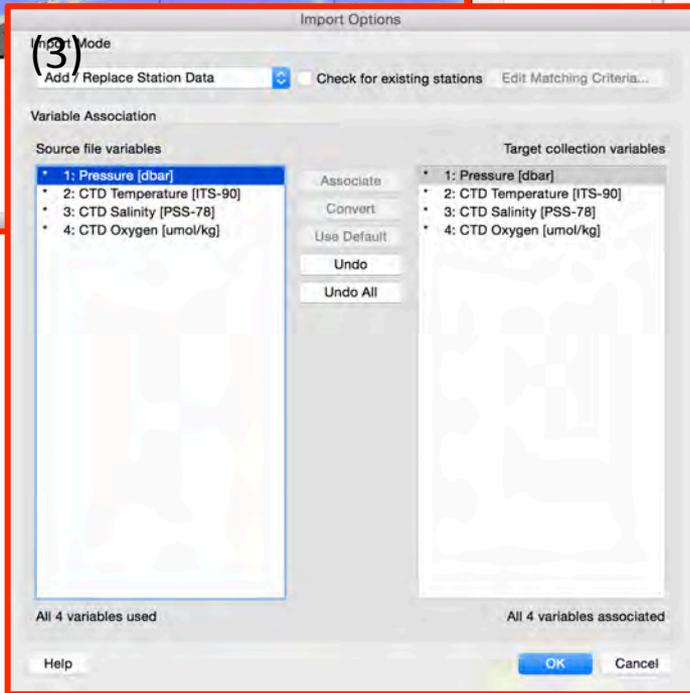
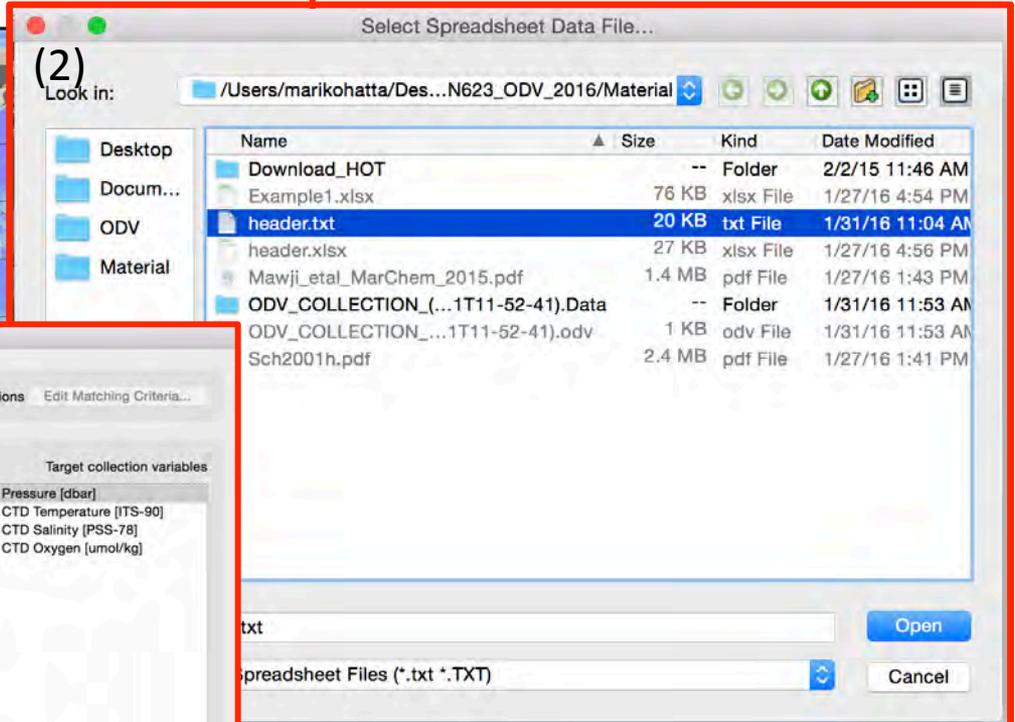
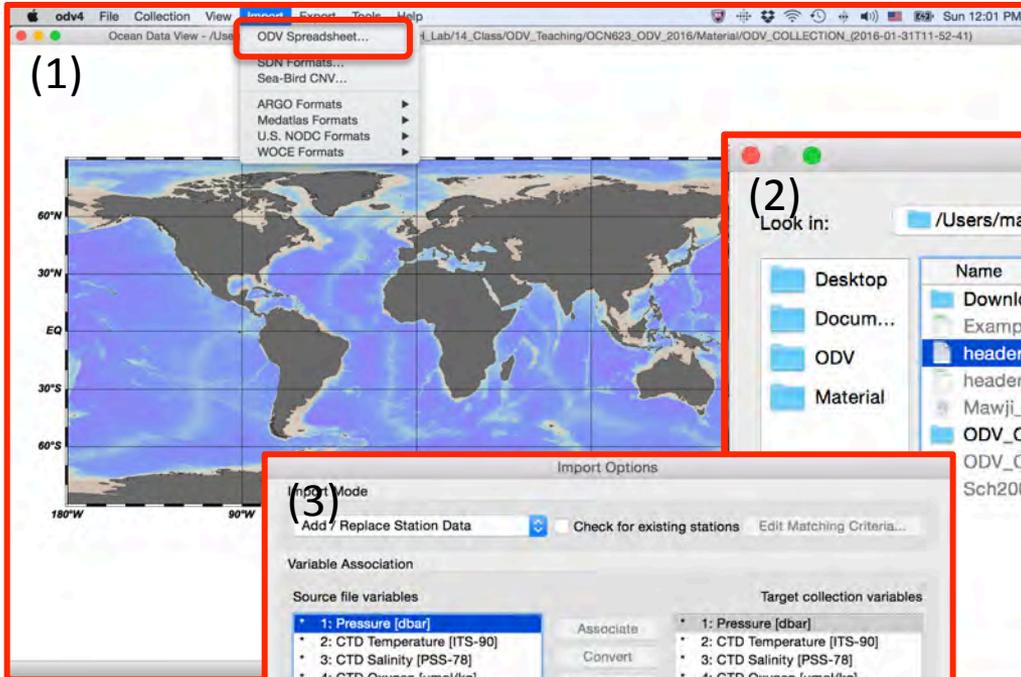
Primary Variable: Pressure [dbar]

Help OK Cancel

Now you made a new ODV file with your parameters in the header. Next, you have to import your data!

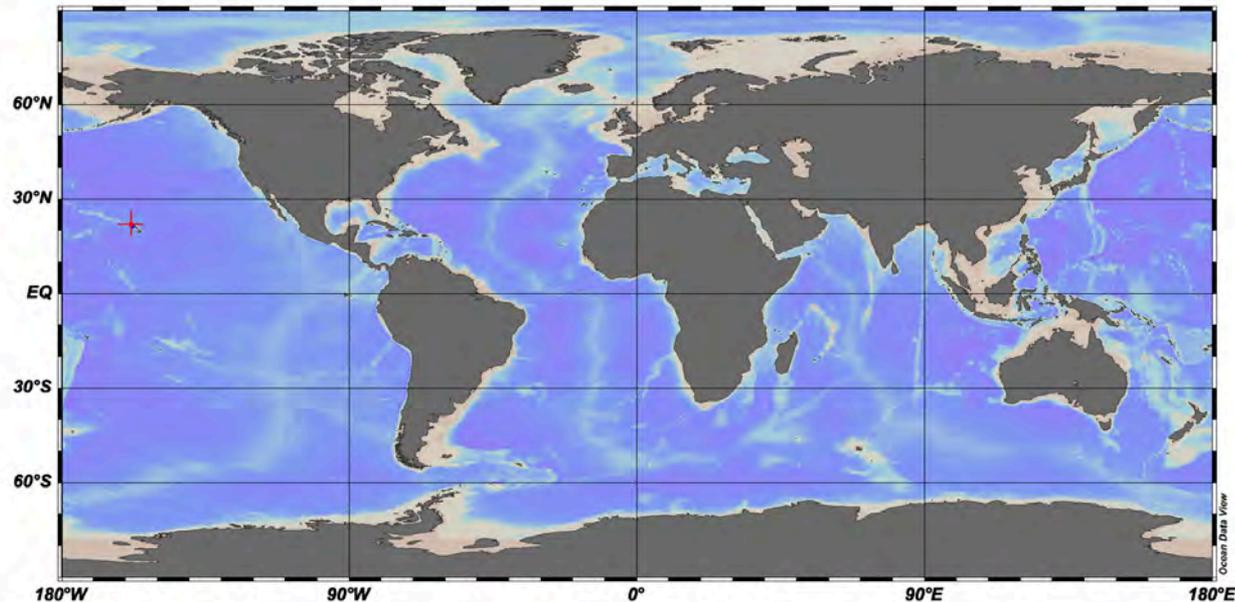


3. Click “Import”, and select “ODV spreadsheet” and select the txt file that you made. *This step actually imports your data into ODV.*



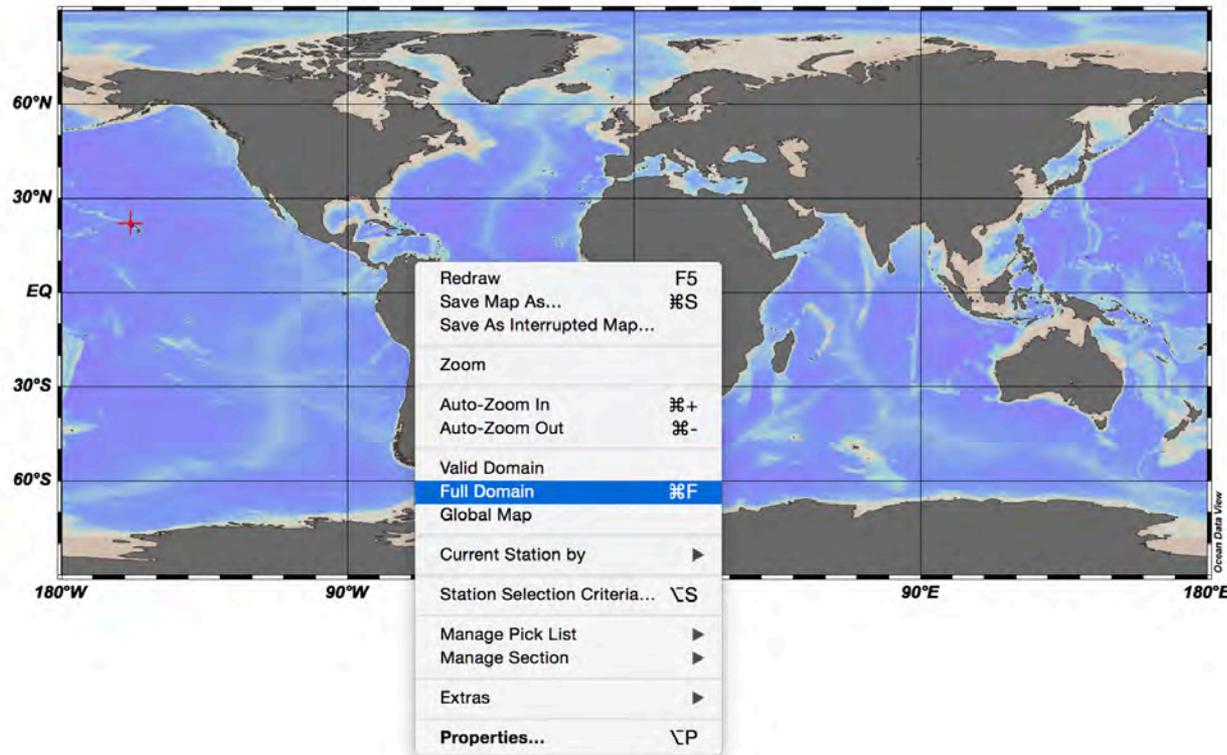
Now you can see your data on the screen!

Use a magnifying glass!



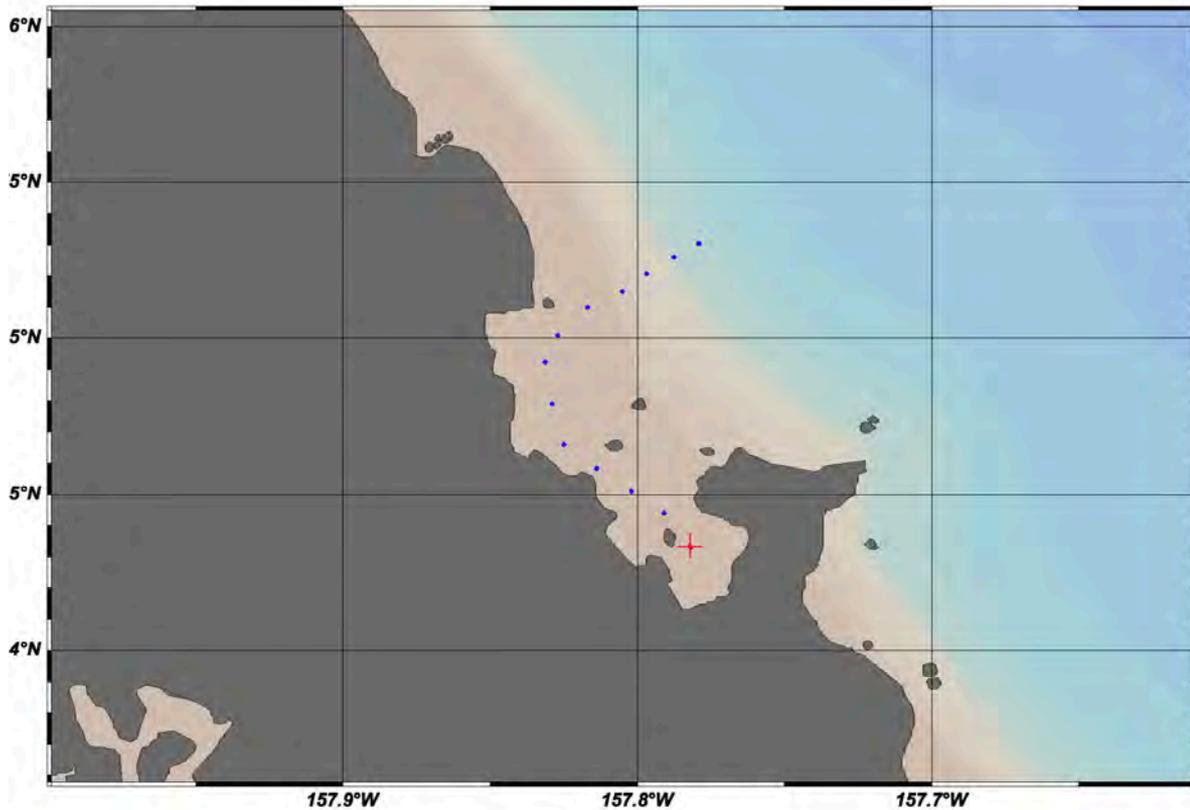
Station ID: 1		
Accession N...	1	
Cruise	4	
Station	1 (B)	
Position	157.782°W / 21.433°N	
Date		
Time		
Pressure Ra...	[1.00 - 10.00]	
Bot.depth [m]		
Sample: 1 / 10		
1: Pressure [d...	1.00	1
2: CTD Tempe...	26.33	1
3: CTD Salinit...	34.14	1
4: CTD Oxyge...	27.05	1
Isosurface Values		
Longitude		-157.782
Latitude		21.433
Time [yr]		
Day of Year		
Pressure [dbar] @ Pressur...	1.00	
CTD Temperature [ITS-90]...	26.33	
CTD Salinity [PSS-78] @ P...	34.14	
CTD Oxygen [umol/kg] @ ...	27.05	

Zoom the map: Right click on “Map” window, and select “Full Domain”.



Accession N...	1
Cruise	4
Station	1 (B)
Position	157.782°W / 21.433°N
Date	
Time	
Pressure Ra...	[1.00 - 10.00]
Bot.depth [m]	
Sample: 1 / 10	
1: Pressure [d...	1.00 1
2: CTD Tempe...	26.33 1
3: CTD Salinit...	34.14 1
4: CTD Oxyge...	27.05 1
Isosurface Values	
Longitude	-157.782
Latitude	21.433
Time [yr]	
Day of Year	
Pressure [dbar] @ Pressur...	1.00
CTD Temperature [ITS-90]...	26.33
CTD Salinity [PSS-78] @ P...	34.14
CTD Oxygen [umol/kg] @ ...	27.05

Kaneohe Bay data!



Accession N...	1
Cruise	4
Station	1 (B)
Position	157.782°W / 21.433°N
Date	
Time	
Pressure Ra...	[1.00 - 10.00]
Bot.depth [m]	
Sample: 1 / 10	
1: Pressure [d...	1.00 1
2: CTD Tempe...	26.33 1
3: CTD Salinit...	34.14 1
4: CTD Oxyge...	27.05 1
Isosurface Values	
Longitude	202.218
Latitude	21.433
Time [yr]	
Day of Year	
Pressure [dbar] @ Pressure...	1.00
CTD Temperature [ITS-90] ...	26.33
CTD Salinity [PSS-78] @ Pr...	34.14
CTD Oxygen [umol/kg] @ P...	27.05

Let's make "2 scatter windows" using Layout Templates

The screenshot shows the 'odv4' software interface. The 'View' menu is open, and 'Layout Templates' is selected. The '2 SCATTER Windows' option is highlighted with a red box. The background shows a map of the ocean with station locations and a data table on the right.

Station ID: 1

Accession N...	1
Cruise	4
Station	1 (B)
Position	157.782°W / 21.433°N
Date	
Time	
Pressure Ra...	[1.00 - 10.00]
Bot.depth [m]	

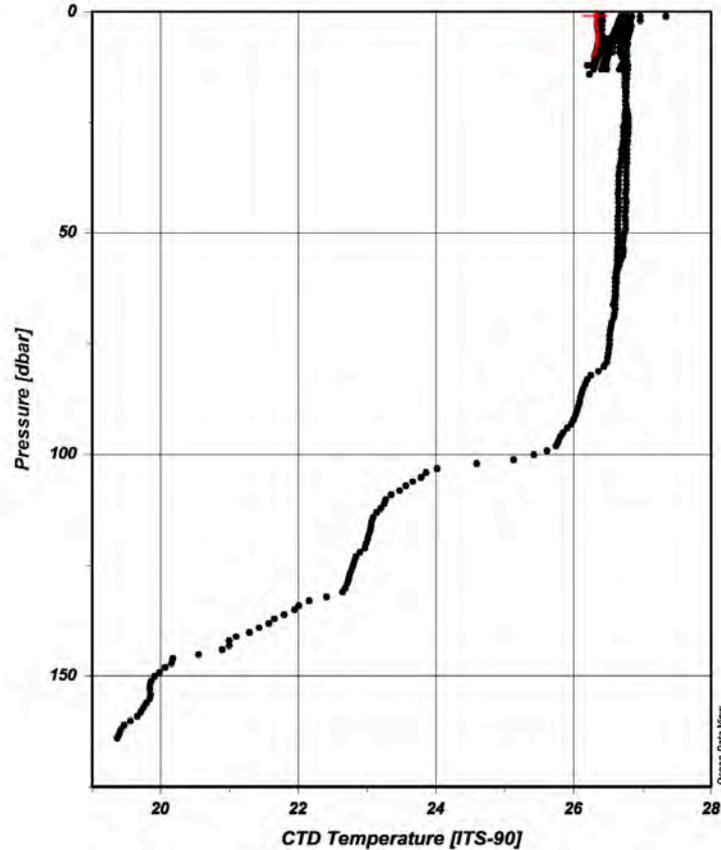
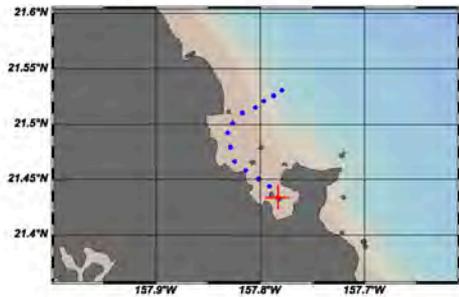
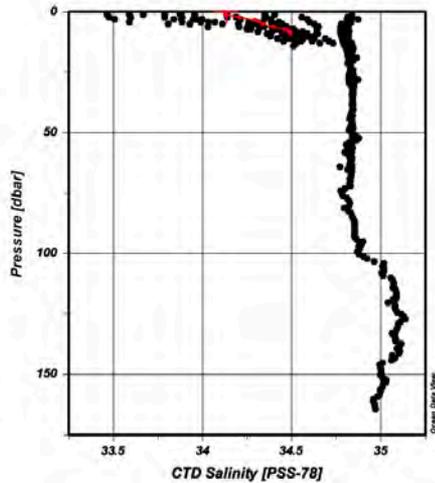
Sample: 1 / 10

1: Pressure [d...	1.00	1
2: CTD Tempe...	26.33	1
3: CTD Salinit...	34.14	1
4: CTD Oxyge...	27.05	1

Isosurface Values

Longitude	202.218
Latitude	21.433
Time [yr]	
Day of Year	
Pressure [dbar] @ Pressure...	1.00
CTD Temperature [ITS-90] ...	26.33
CTD Salinity [PSS-78] @ Pr...	34.14
CTD Oxygen [umol/kg] @ P...	27.05

“2 scatter windows” mode



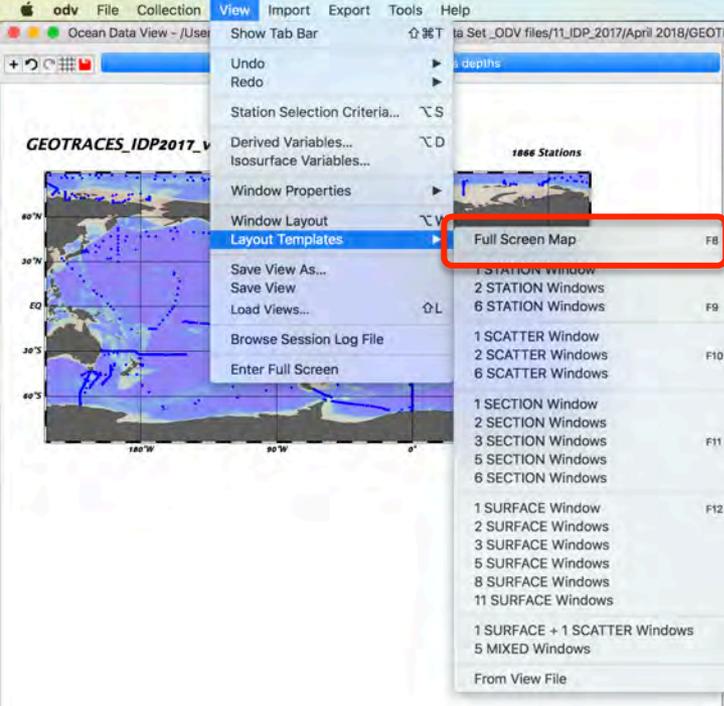
Accession N...	1
Cruise	4
Station	1 (B)
Position	157.782°W / 21.433°N
Date	
Time	
Pressure Ra...	[1.00 - 10.00]
Bot.depth [m]	

Sample: 1 / 10

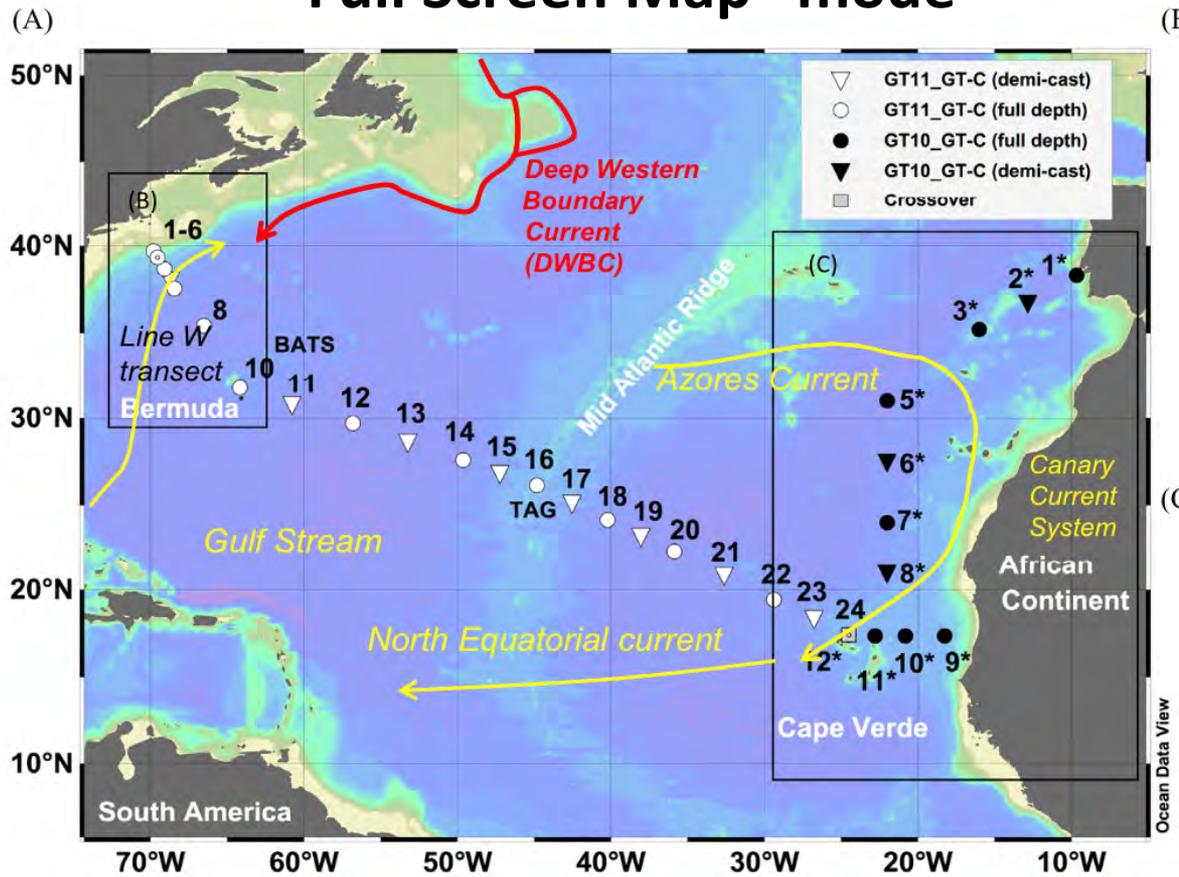
1: Pressure [d...	1.00	1
2: CTD Tempe...	26.33	1
3: CTD Salinit...	34.14	1
4: CTD Oxyge...	27.05	1

Isosurface Values

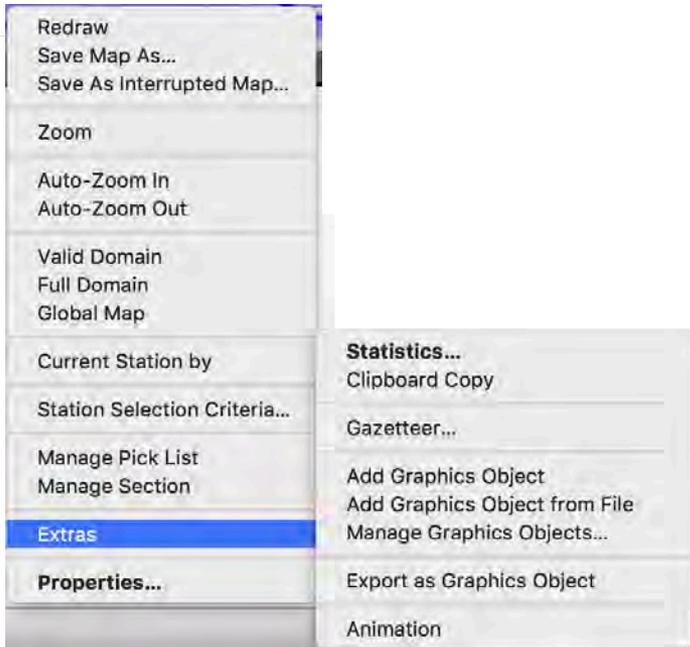
Longitude	202.218
Latitude	21.433
Time [yr]	
Day of Year	
Pressure [dbar] @ Pressure...	1.00
CTD Temperature [ITS-90] ...	26.33
CTD Salinity [PSS-78] @ Pr...	34.14
CTD Oxygen [umol/kg] @ P...	27.05



Draw Map & stations “Full Screen Map” mode



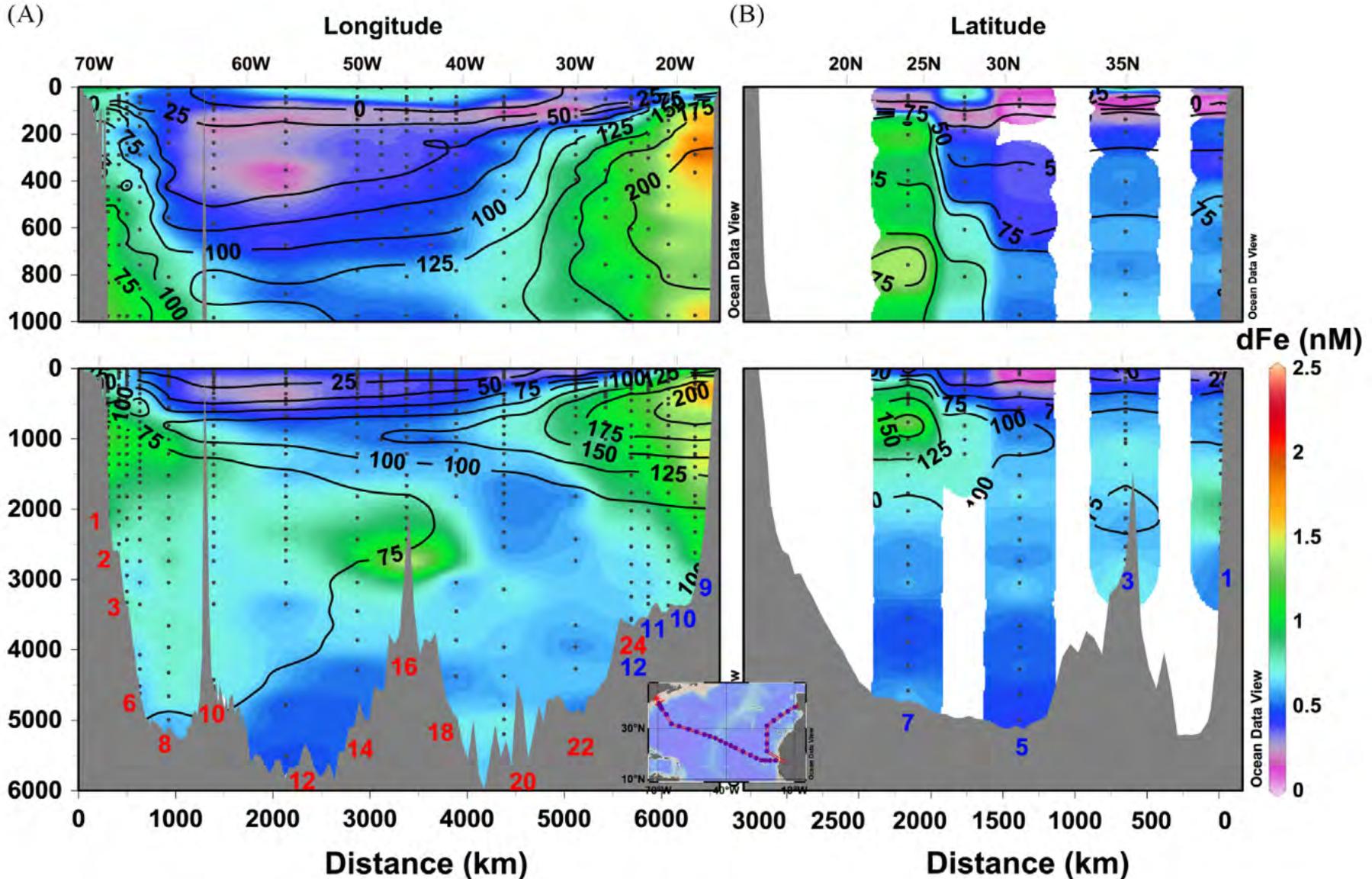
Hatta et al., 2014 & Measures et al., 2014



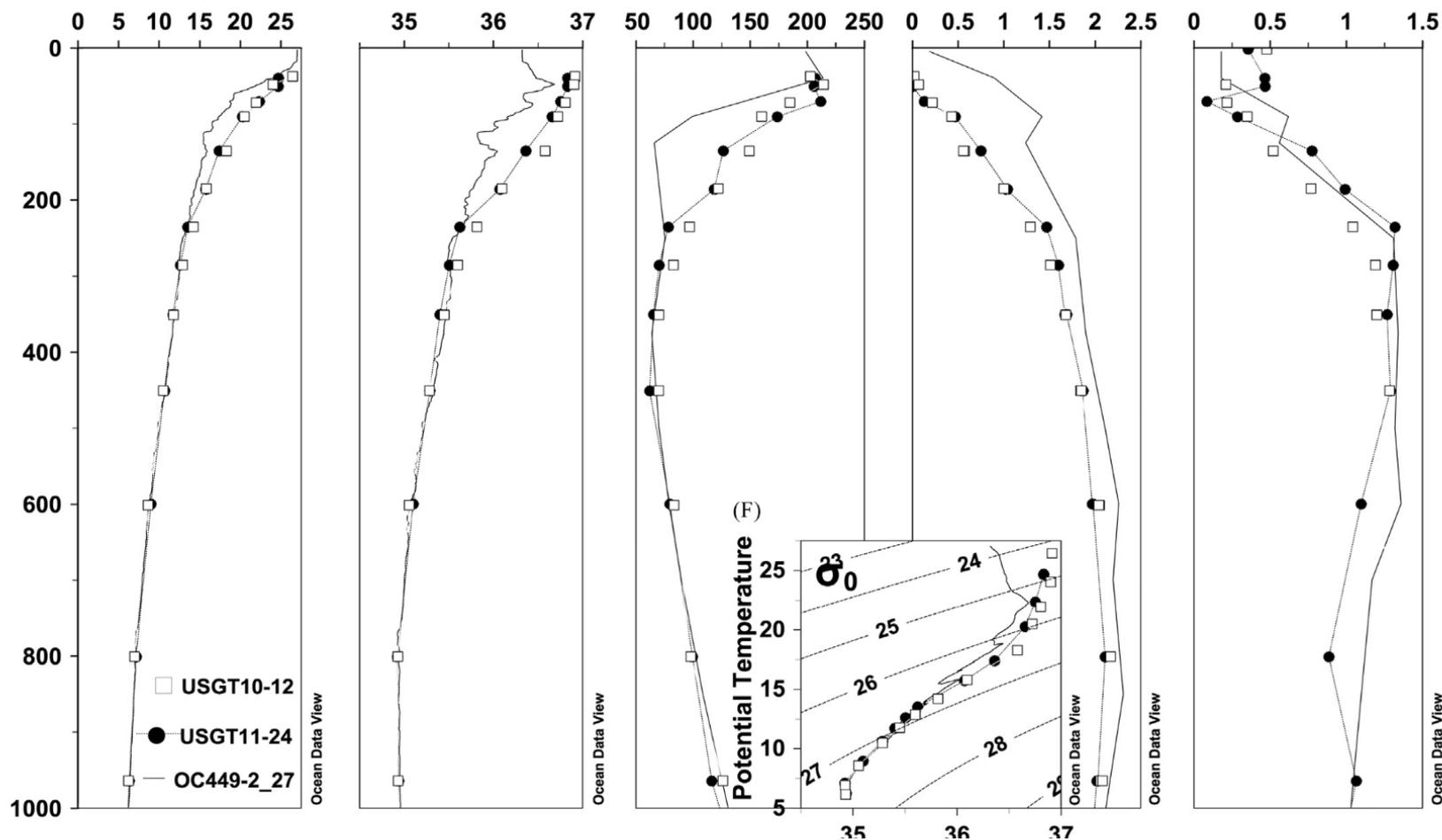
Move your cursor on the Map window, and then **Right click** (“control” + click if you are Mac user). Select “Extras”, and “Add Graphics Object.”

Fe distributions along the track overlaid with the AOU value as contour

“Section Windows” mode

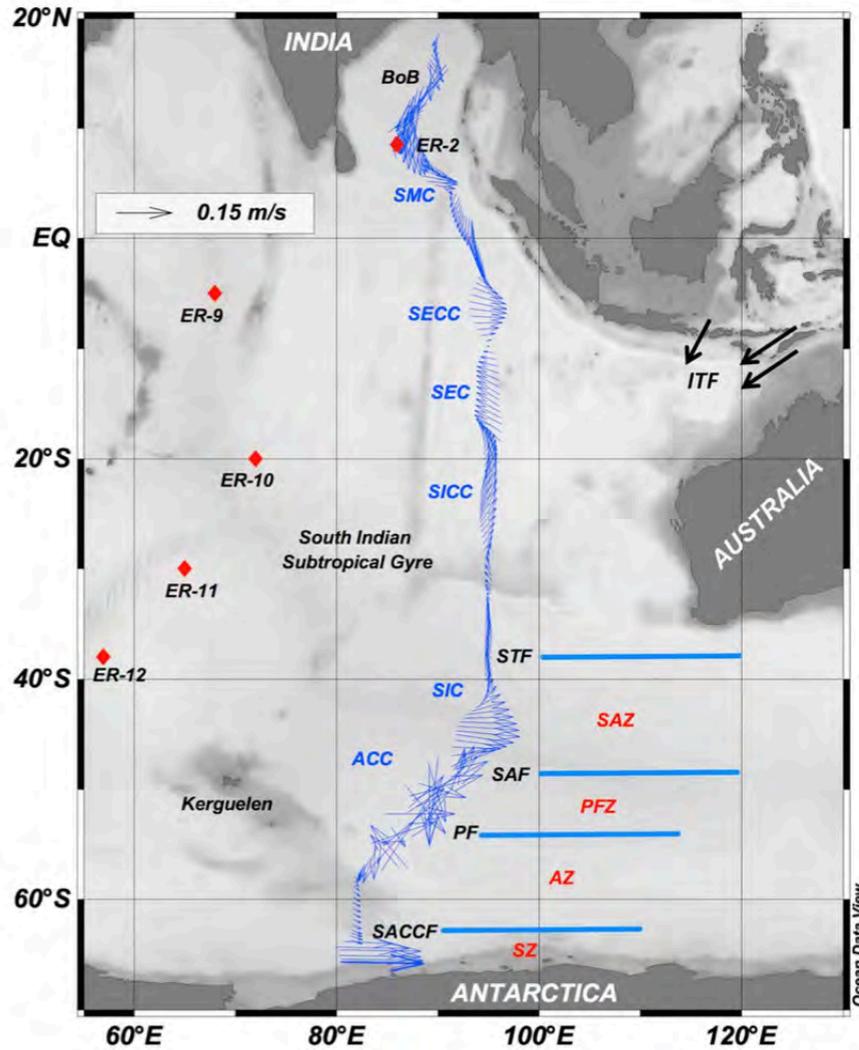


Vertical Profiles + T-S diagram "Station Windows" mode



“SURFACE Windows” mode

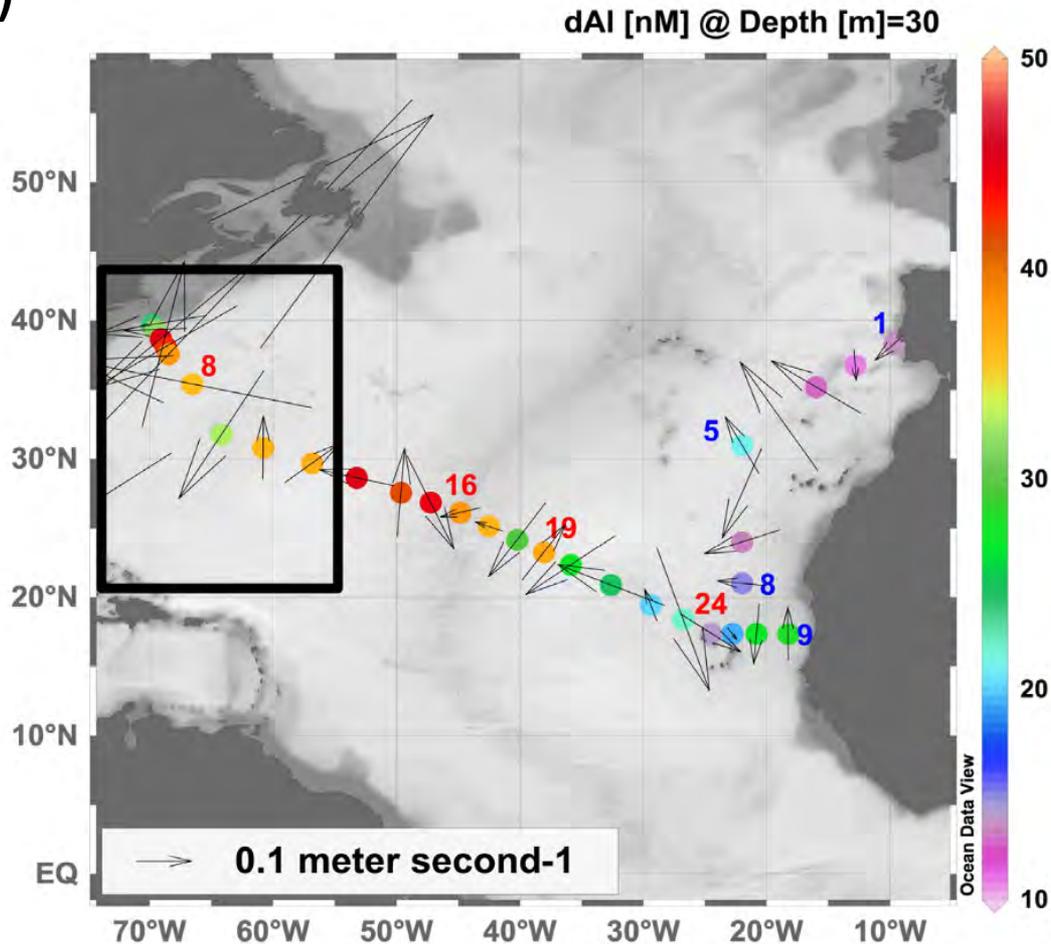
ADCP data during the cruise



Grand et al., 2015

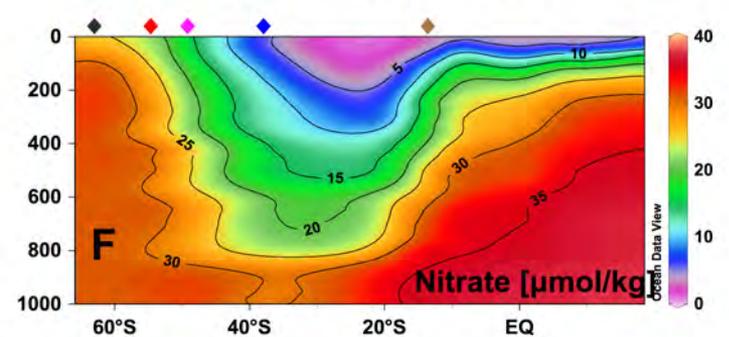
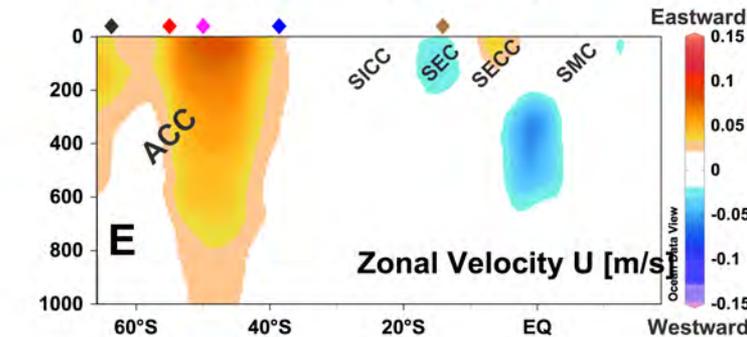
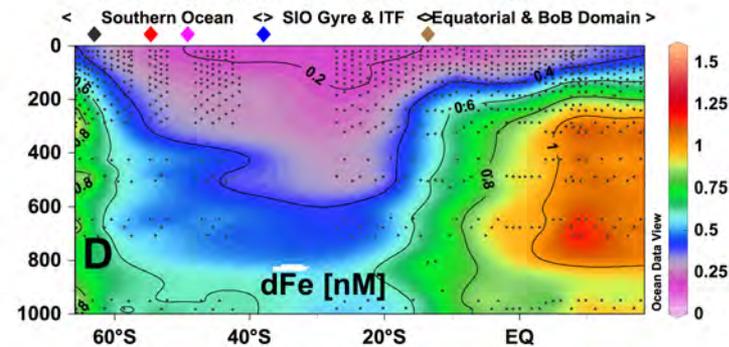
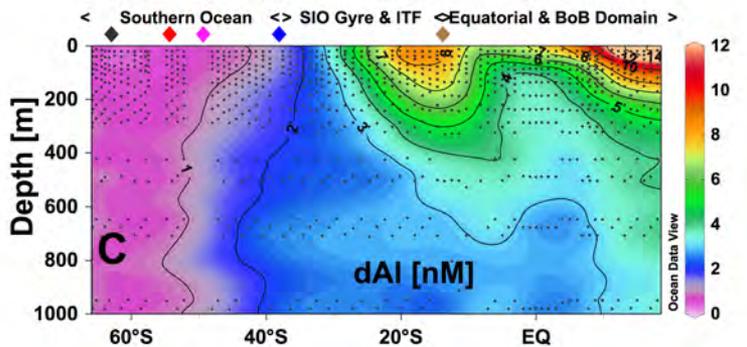
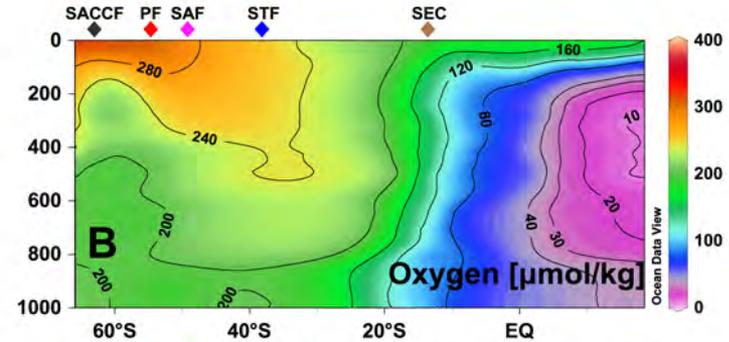
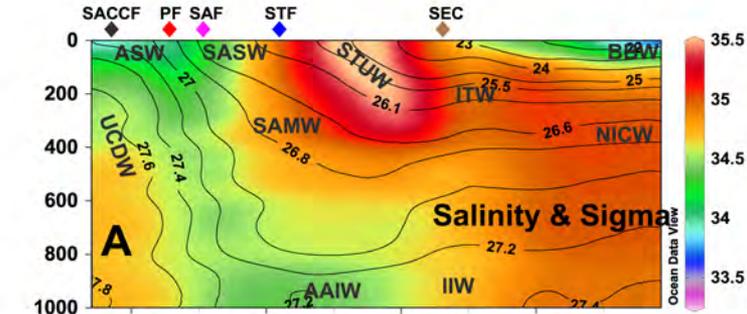
“SURFACE Windows” mode

Concentrations with color as well as flow direction
(ADCP data)



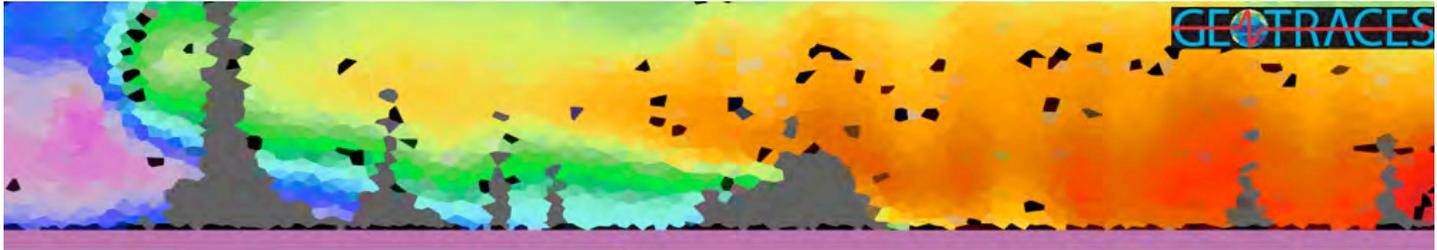
“Section Windows” mode

Temperature overlaid with Salinity



ADCP

Goldschmidt meeting 2016



Exploring *GEOTRACES* Data with *Ocean Data View*

Sunday, 26 June 2016 (9-16h) - Yokohama, Japan

- <http://www.geotraces.org/meetings/meetings-by-year/eventdetail/263/-/exploring-geotraces-data-with-ocean-data-view>

Reference

ODV User's Guide:

<http://odv.awi.de/en/documentation/>

HOT ADCP data:

<http://currents.soest.hawaii.edu/hot/>

Kaneohe data:

<http://data.nodc.noaa.gov/cgi-bin/iso?id=gov.noaa.nodc:0099831>

Questions?

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