How to use ODV

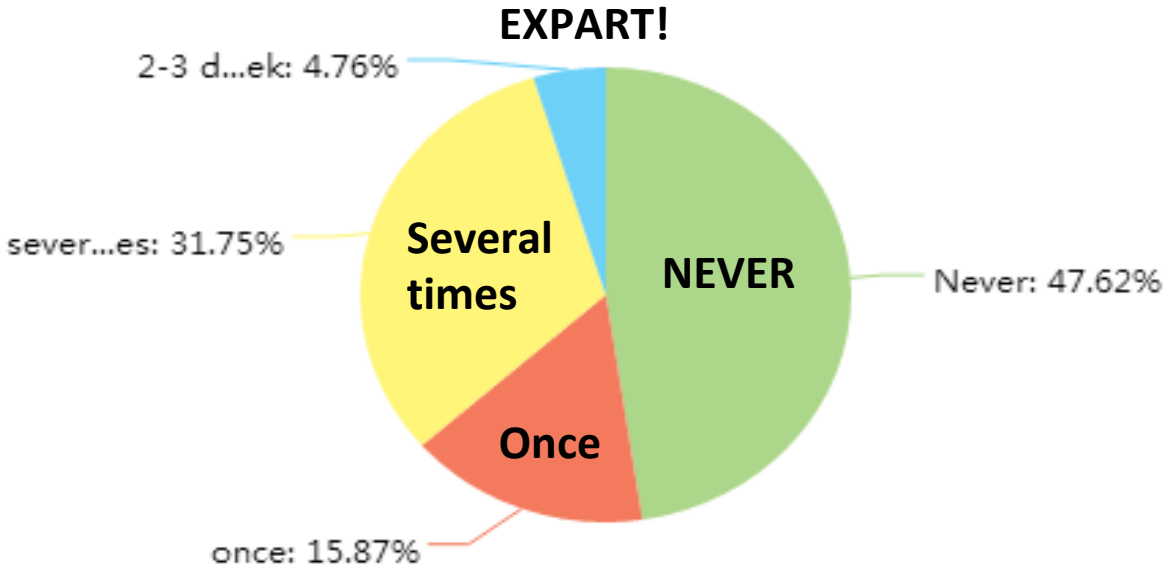
ODV 5 Version (64 bit) (Mar 19 2018)

http://odv.awi.de/

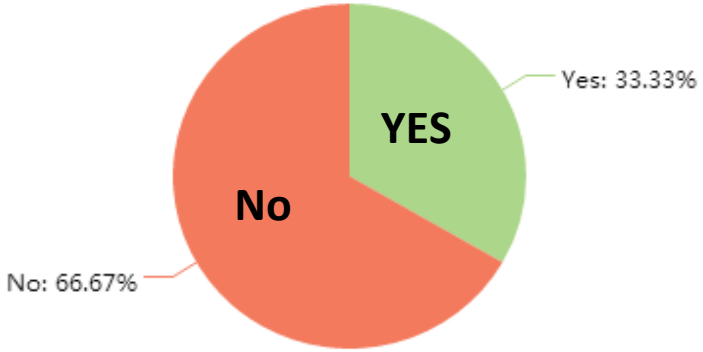
Currently **>60,000** users,
10~20 new users every day!!

May 2, 2018

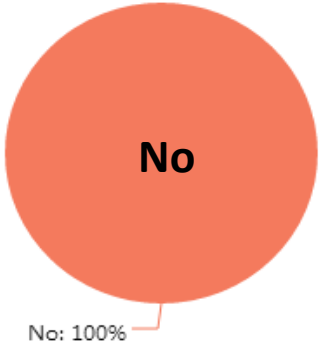
Have you ever used ODV software before?



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, GTSPP, 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.

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

Prof. Reiner Schlitzer
Alfred Wegener Institute

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

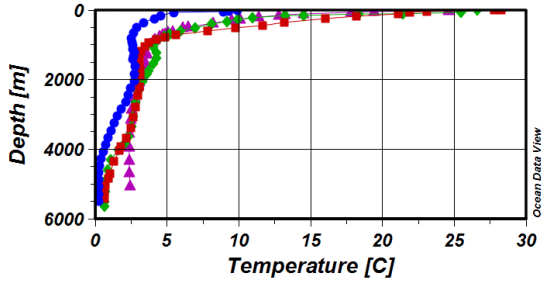
What can you do with ODV?

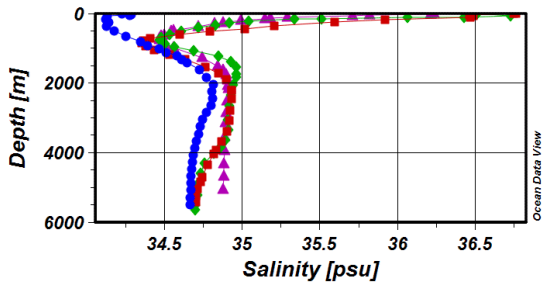
- property/property plots of selected stations
- scatter plots for sets of stations

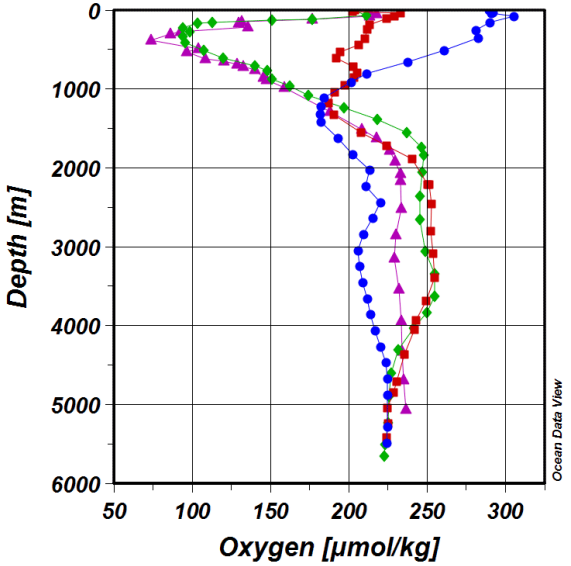
- color sections along arbitrary cruise tracks
- color distributions on general isosurfaces

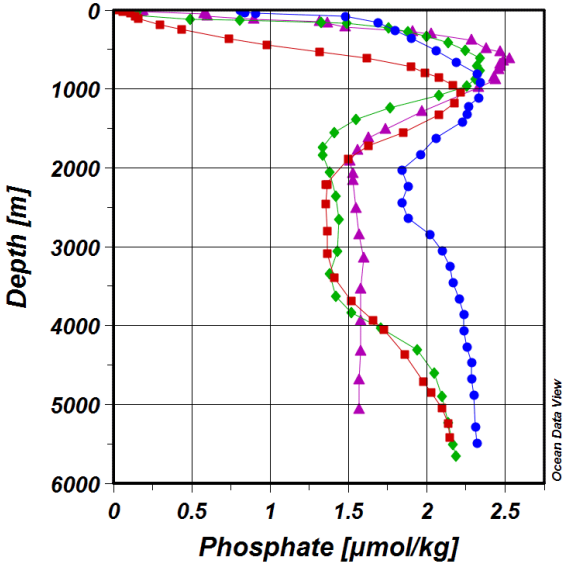
- geostrophic velocity sections
- temporal evolution plots of tracer fields
- differences of tracer fields between repeats
- Animations
- interrupted maps.

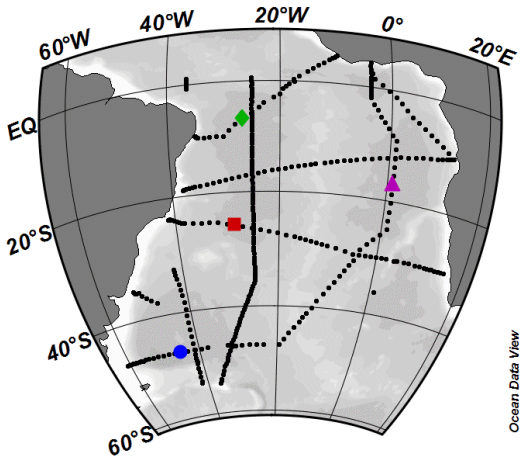
Example. property/property plots of selected stations

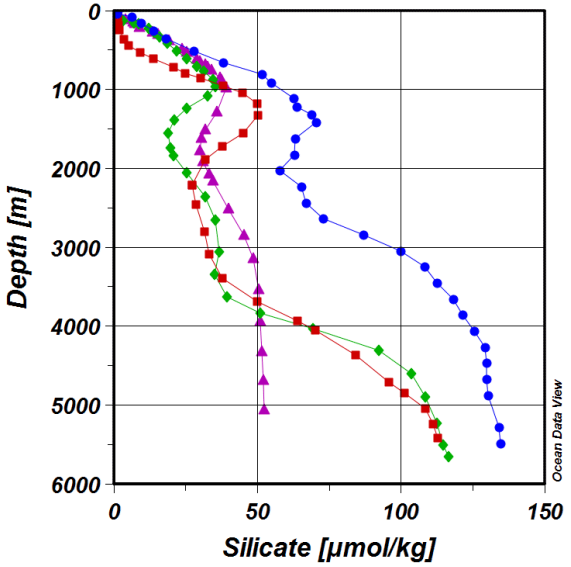


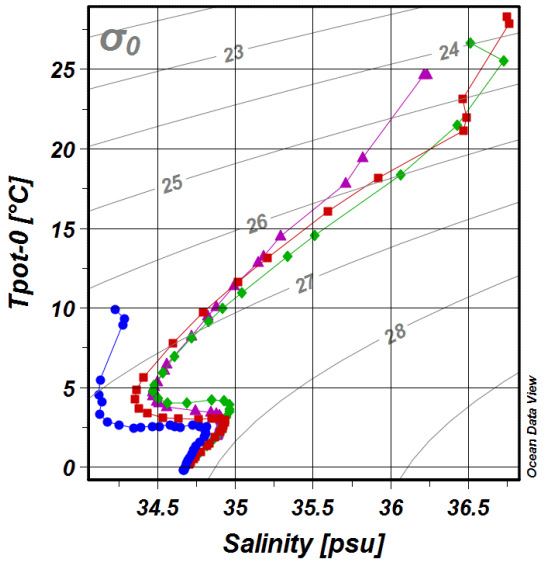




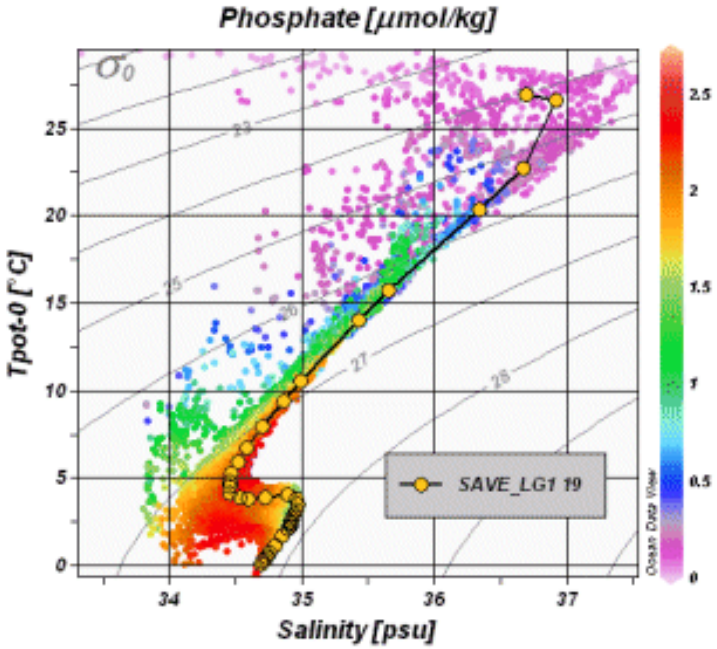


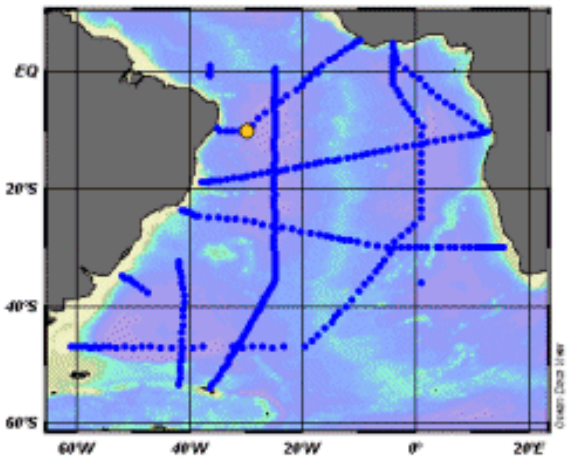


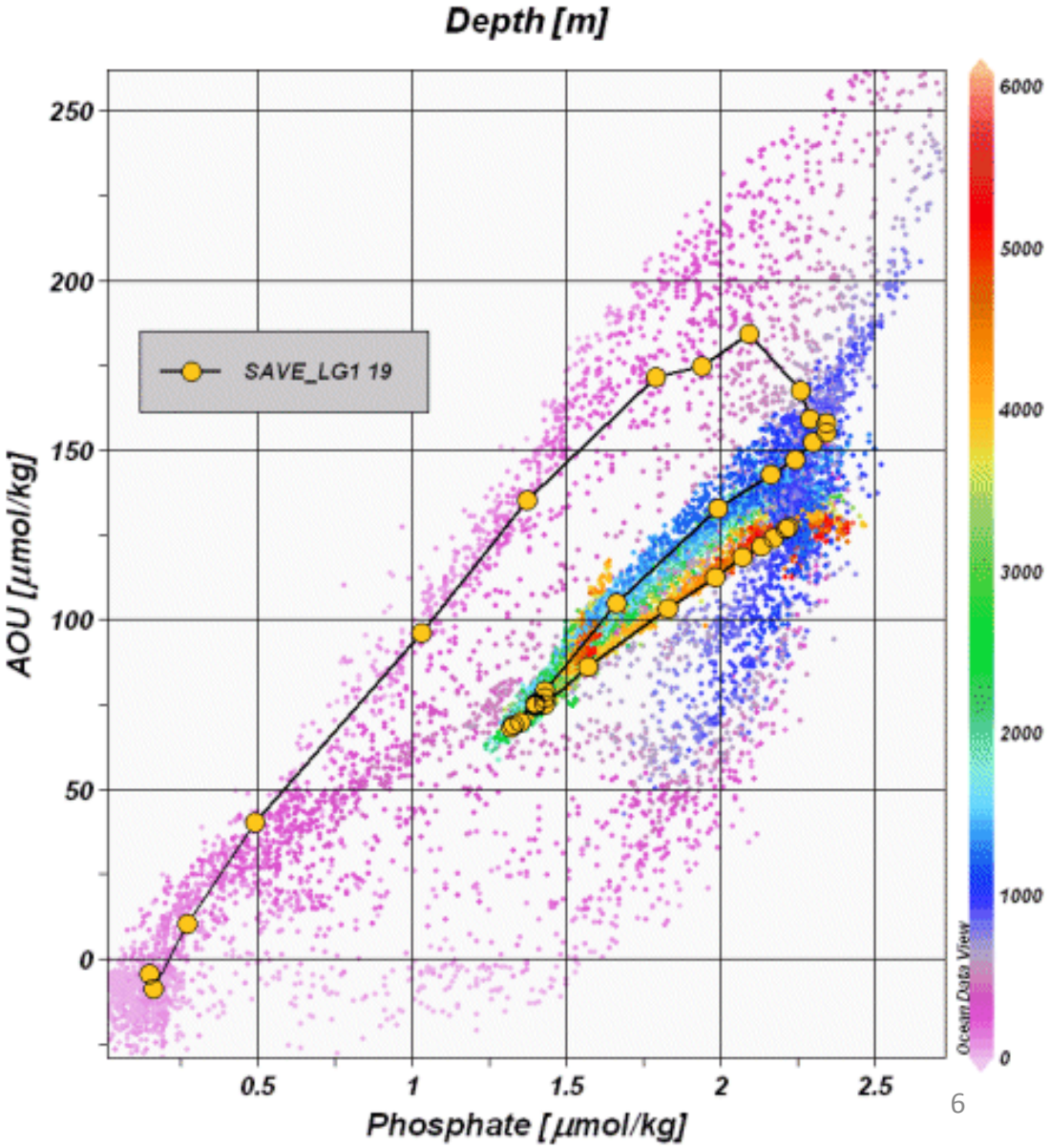




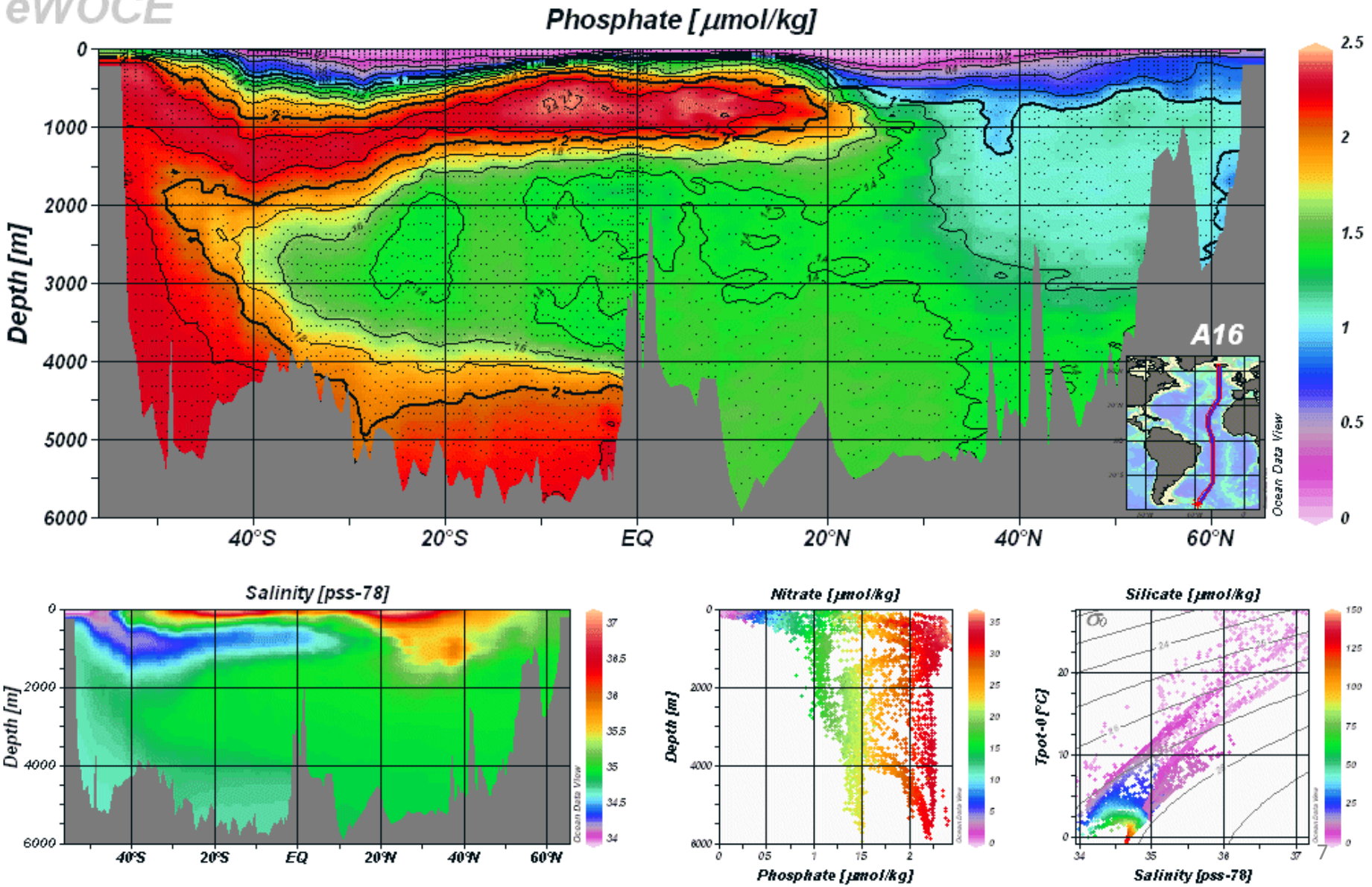
Example. scatter plots for sets of stations



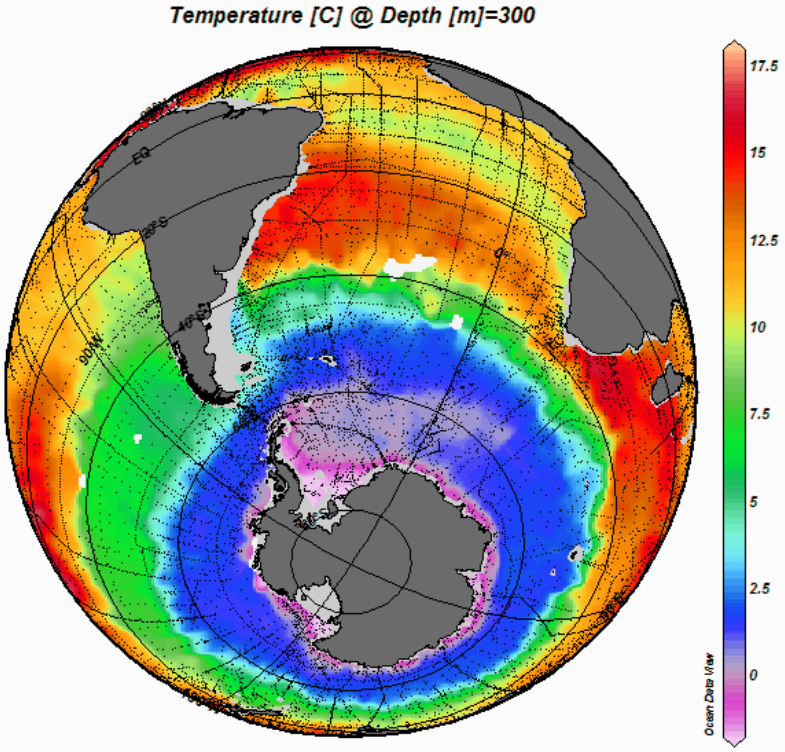


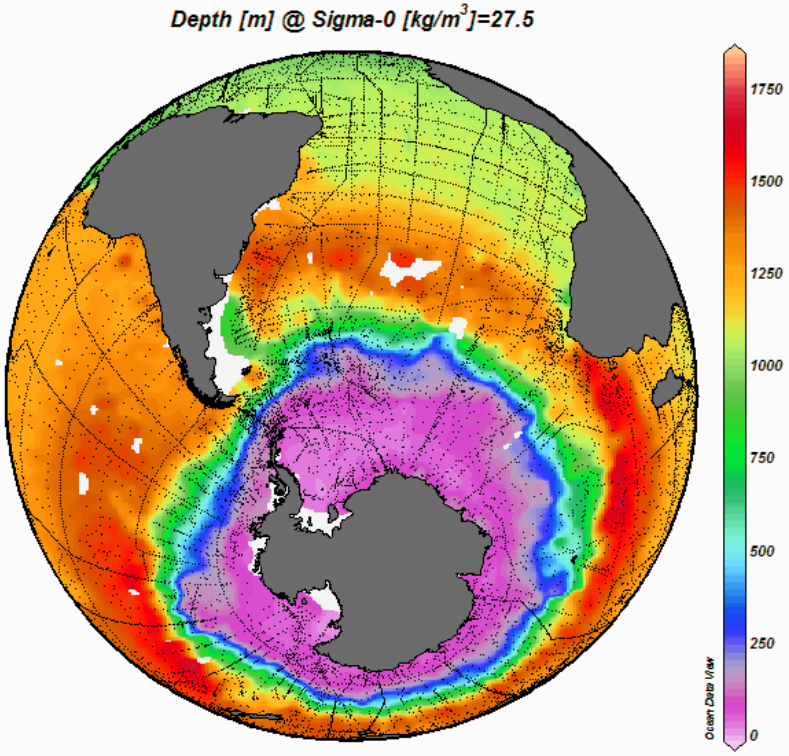


Example. color sections along arbitrary cruise tracks

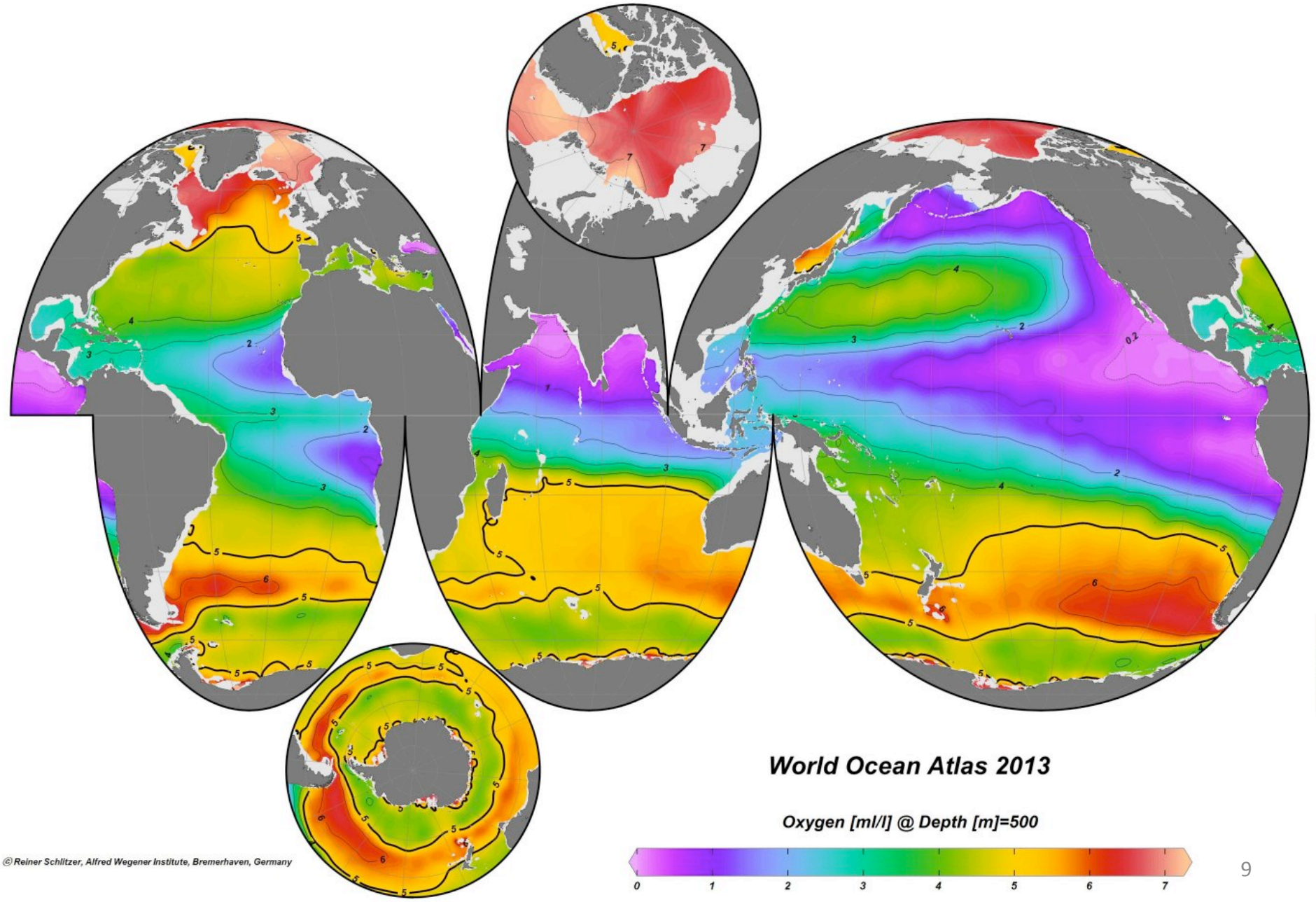


Example. color distributions on general isosurfaces



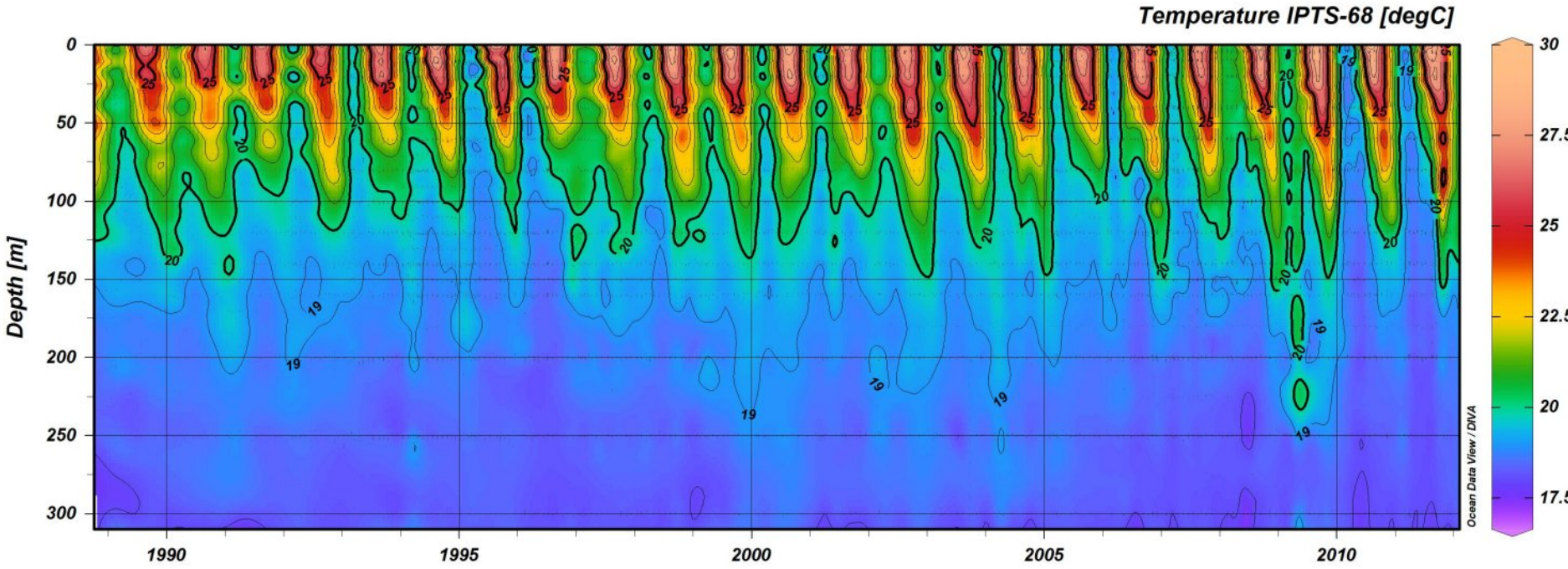


Example. interrupted maps



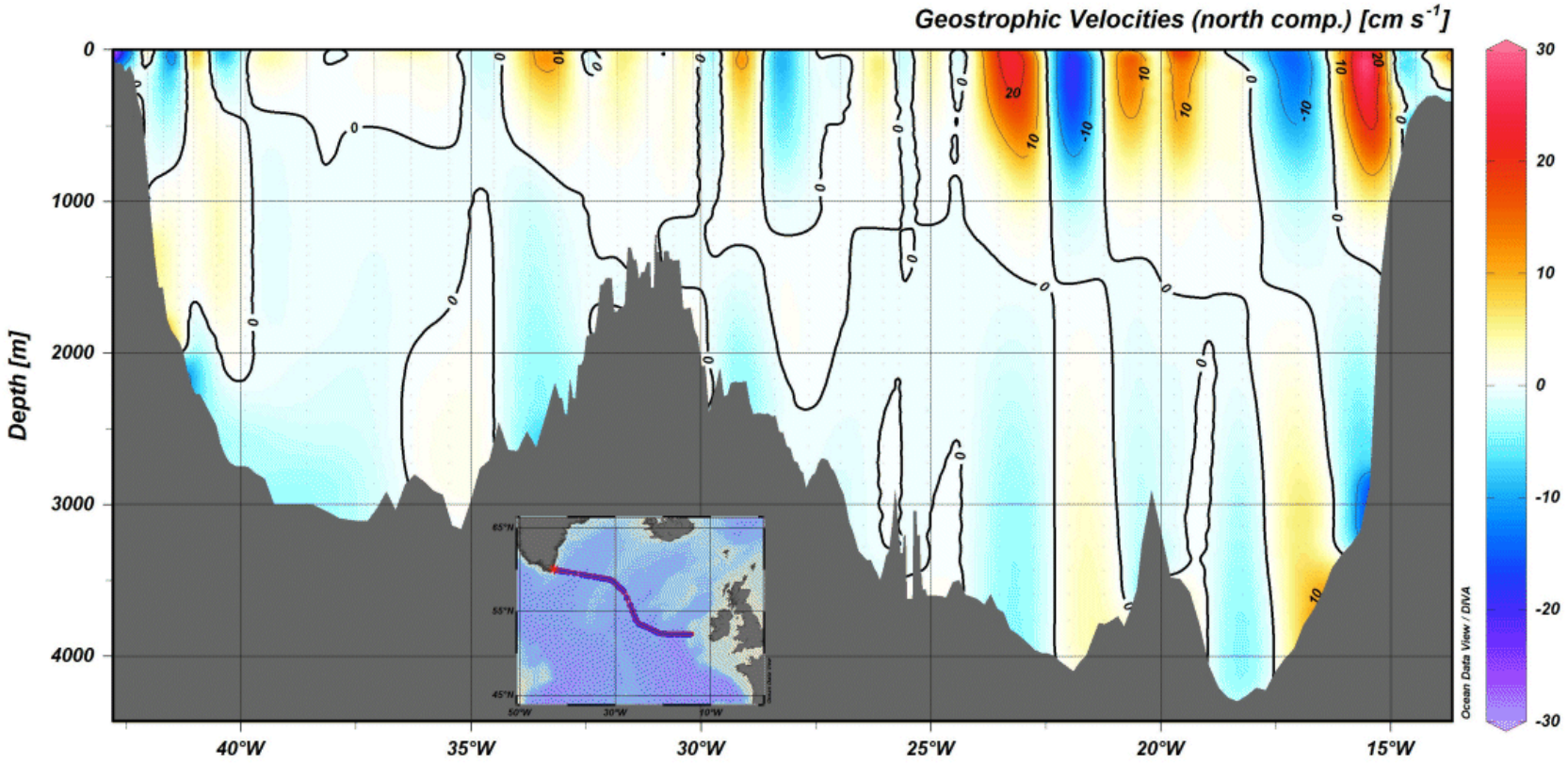
Example.

temporal evolution plots of tracer fields - Time-series data at BATS station



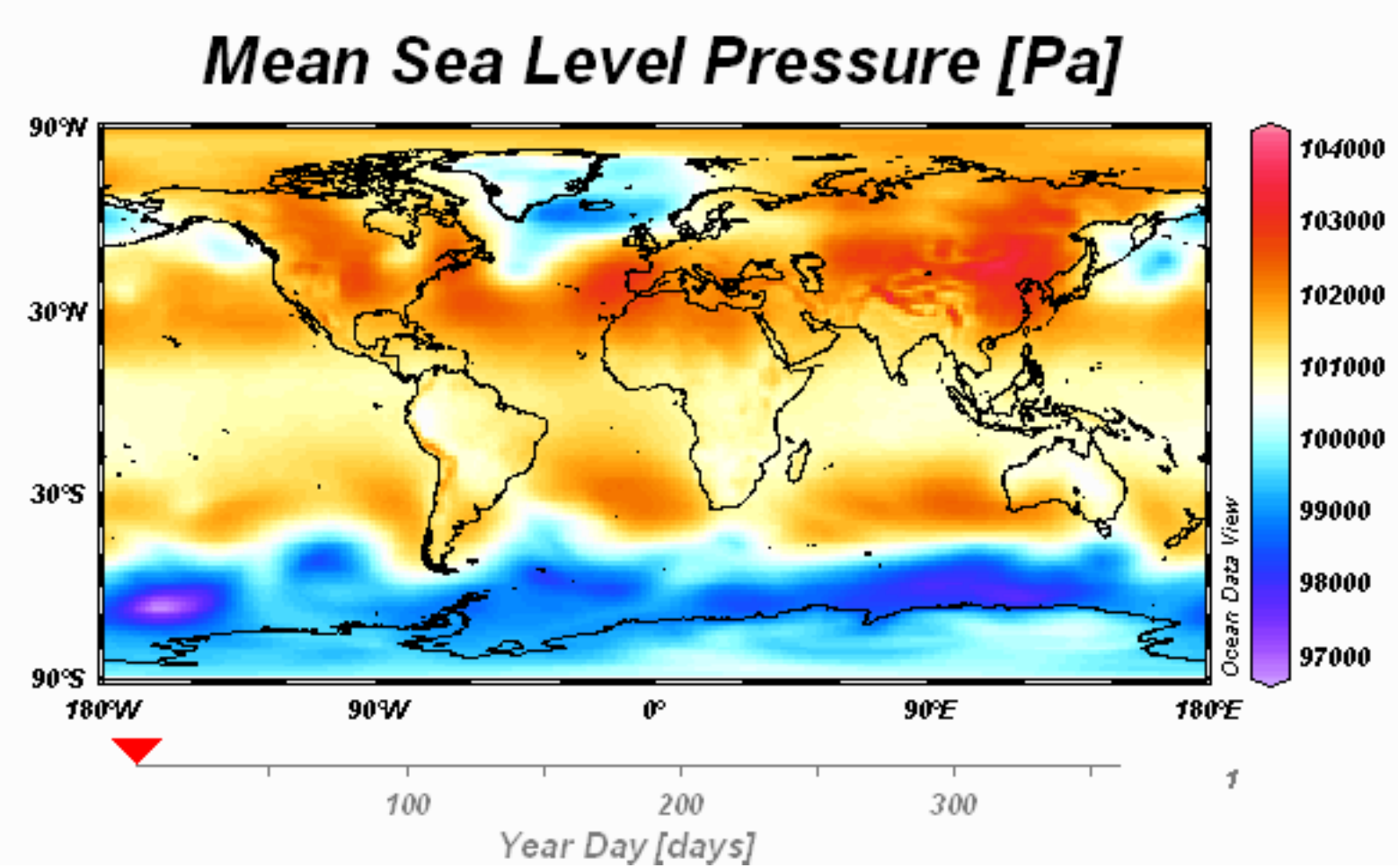
Example.

Geostrophic velocity sections



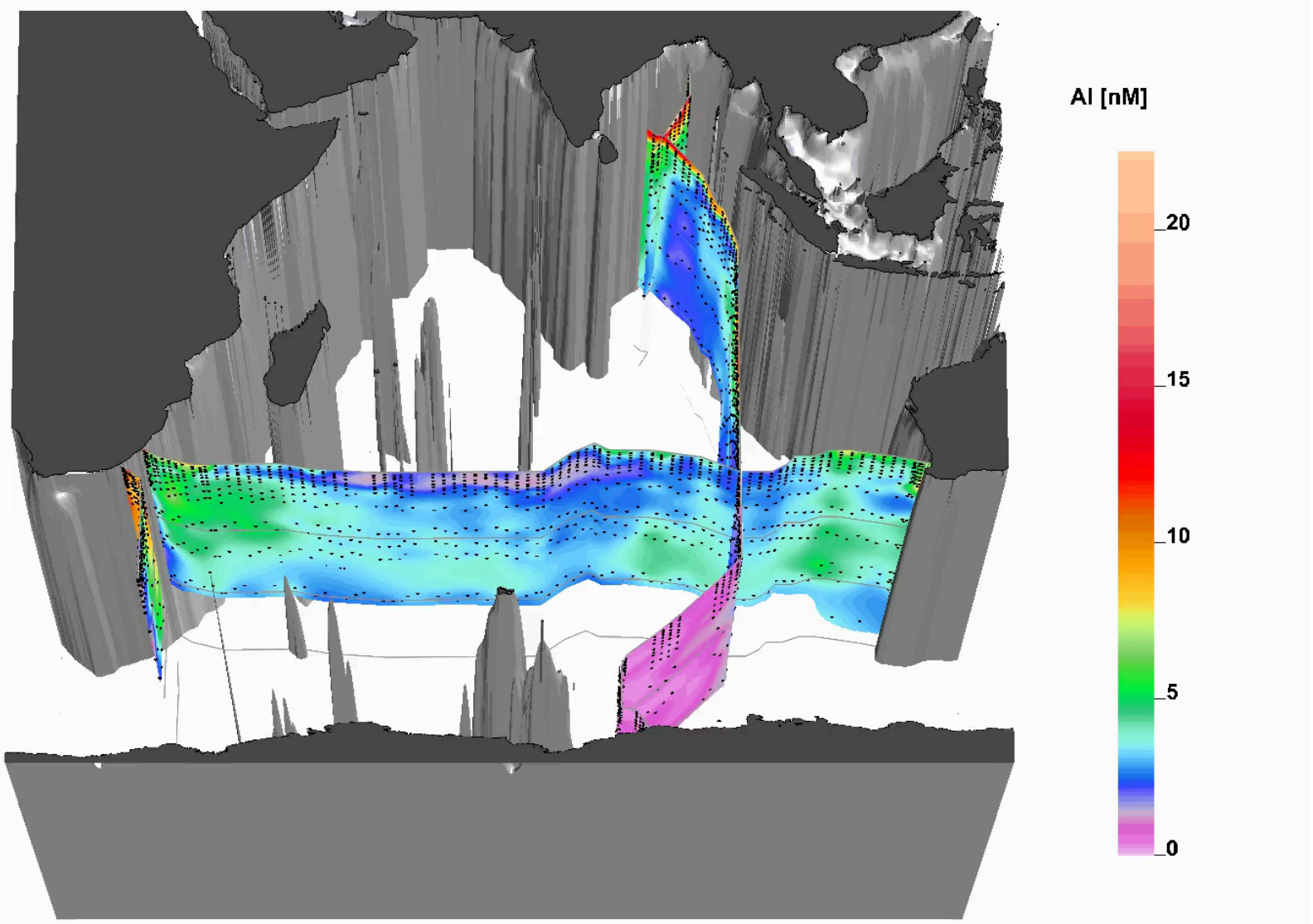
Example.

animations



Example.

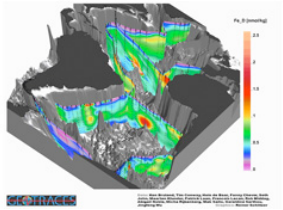
animation 2



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

Example.

animation 2



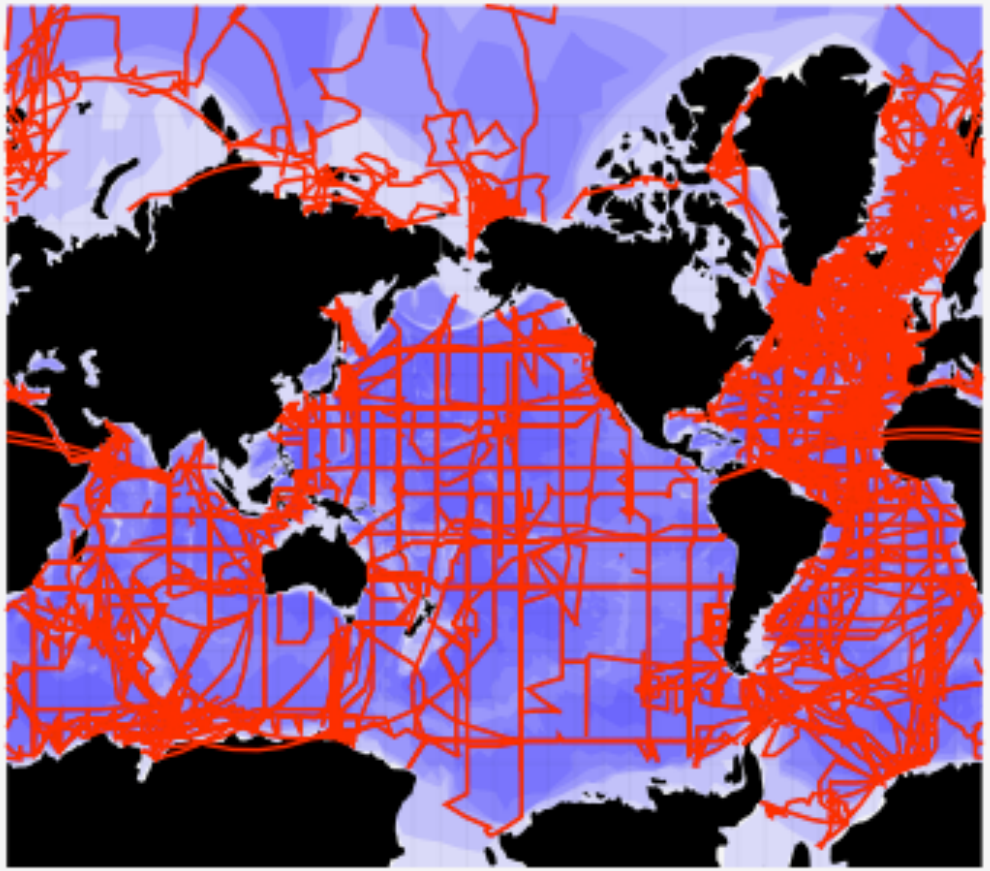
GEOTRACES INTERMEDIATE DATA PRODUCT 2014

- 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



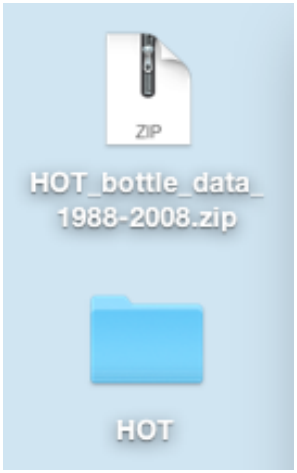
http://cchdo.ucsd.edu/search?dtstart=1800

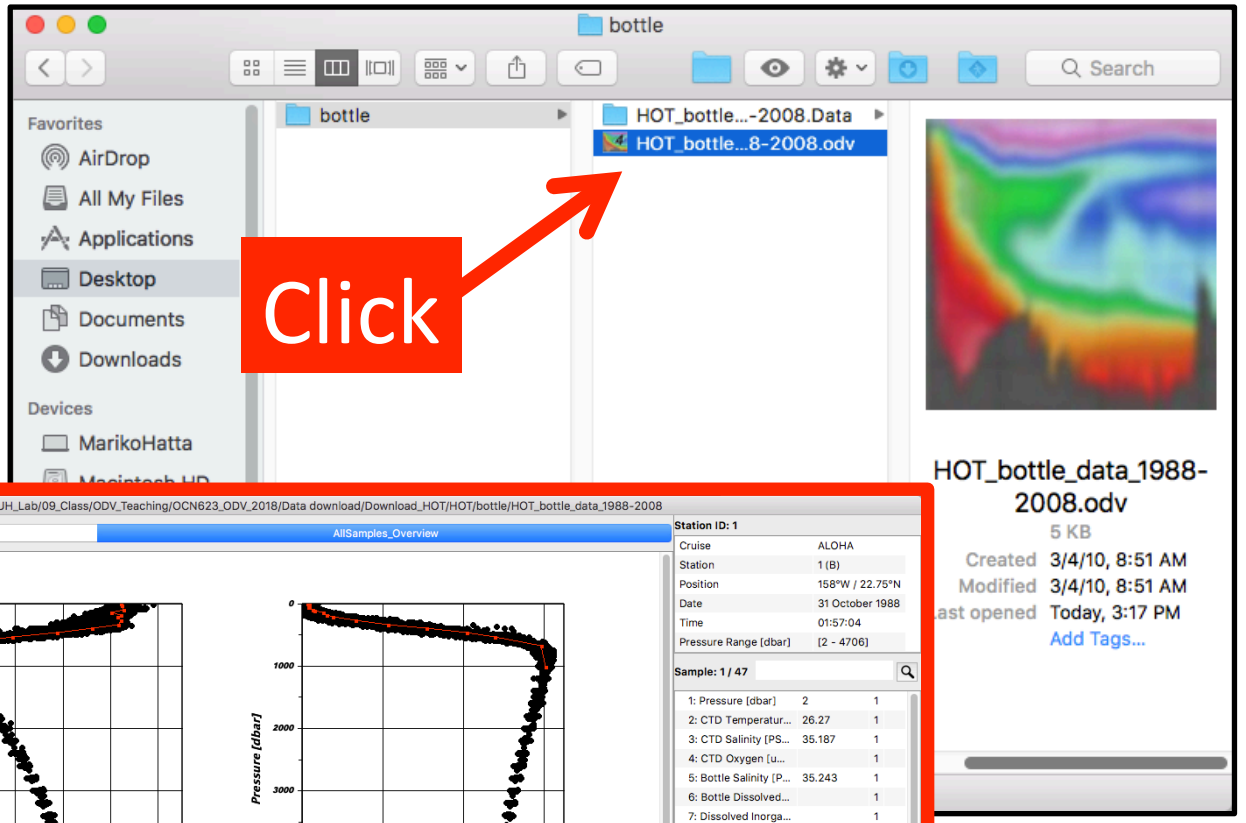
Let's get started

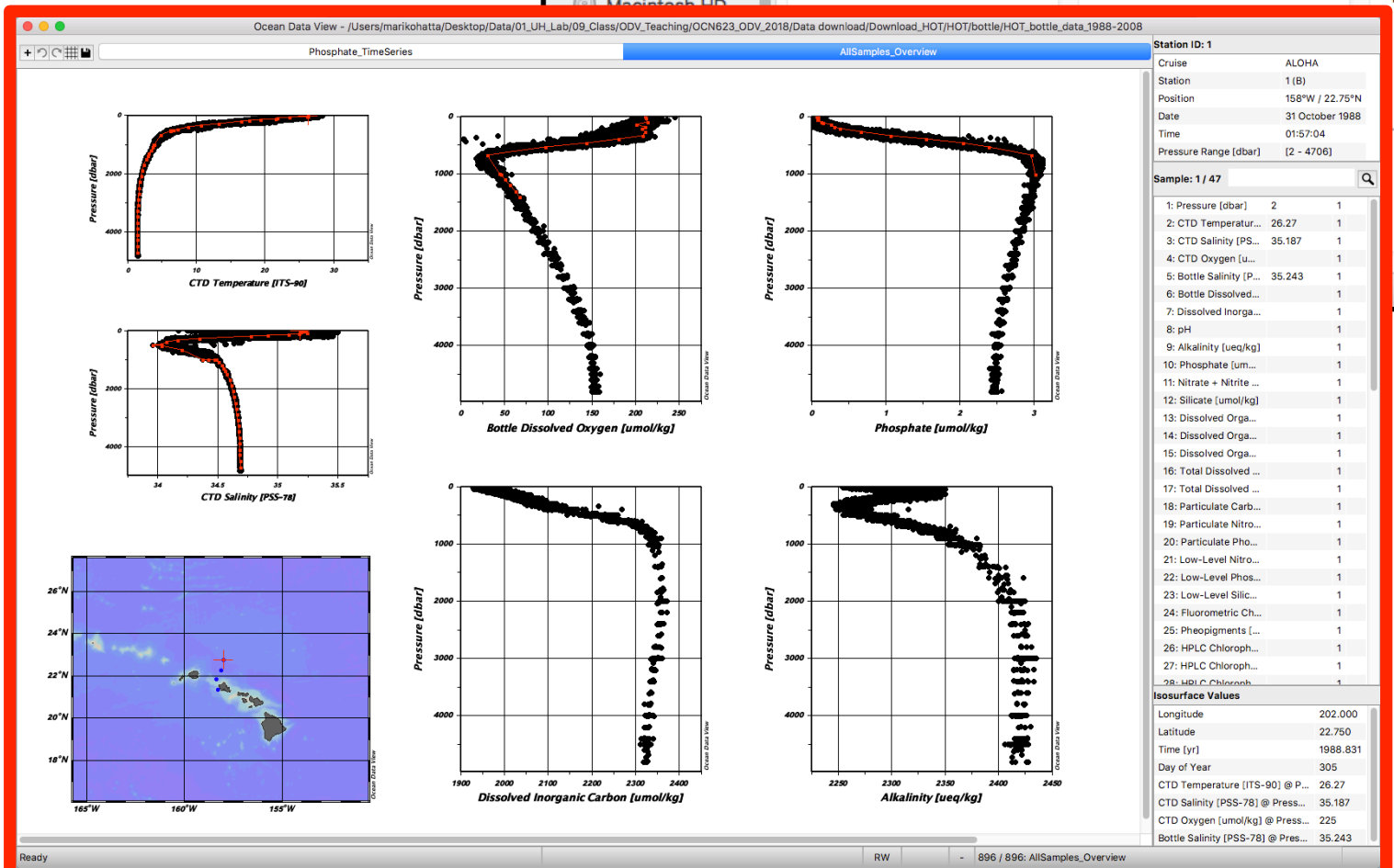
Installation http://odv.awi.de/en/software/download/

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

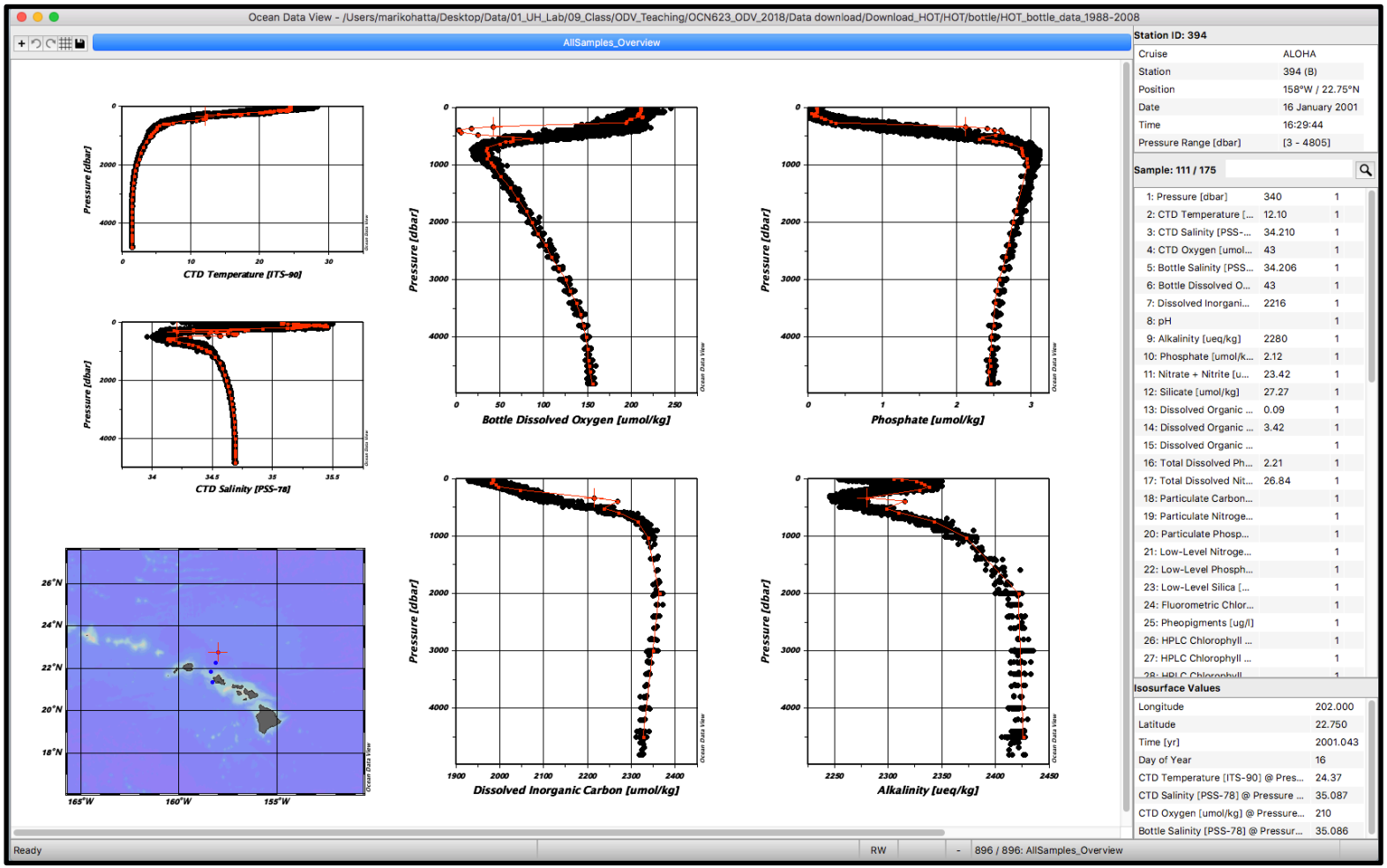
Find where you have put ODV data files on your computer.


ZIP
HOT_bottle_data_1988-2008.zip
HOT


bottle
Search
Favorites
AirDrop
All My Files
Applications
Desktop
Documents
Downloads
Devices
MarikoHatta
bottle
HOT_bottle...-2008.Data
HOT_bottle...8-2008.odv
Click
HOT_bottle_data_1988-2008.odv
5 KB
Created 3/4/10, 8:51 AM
Modified 3/4/10, 8:51 AM
Last opened Today, 3:17 PM
Add Tags...

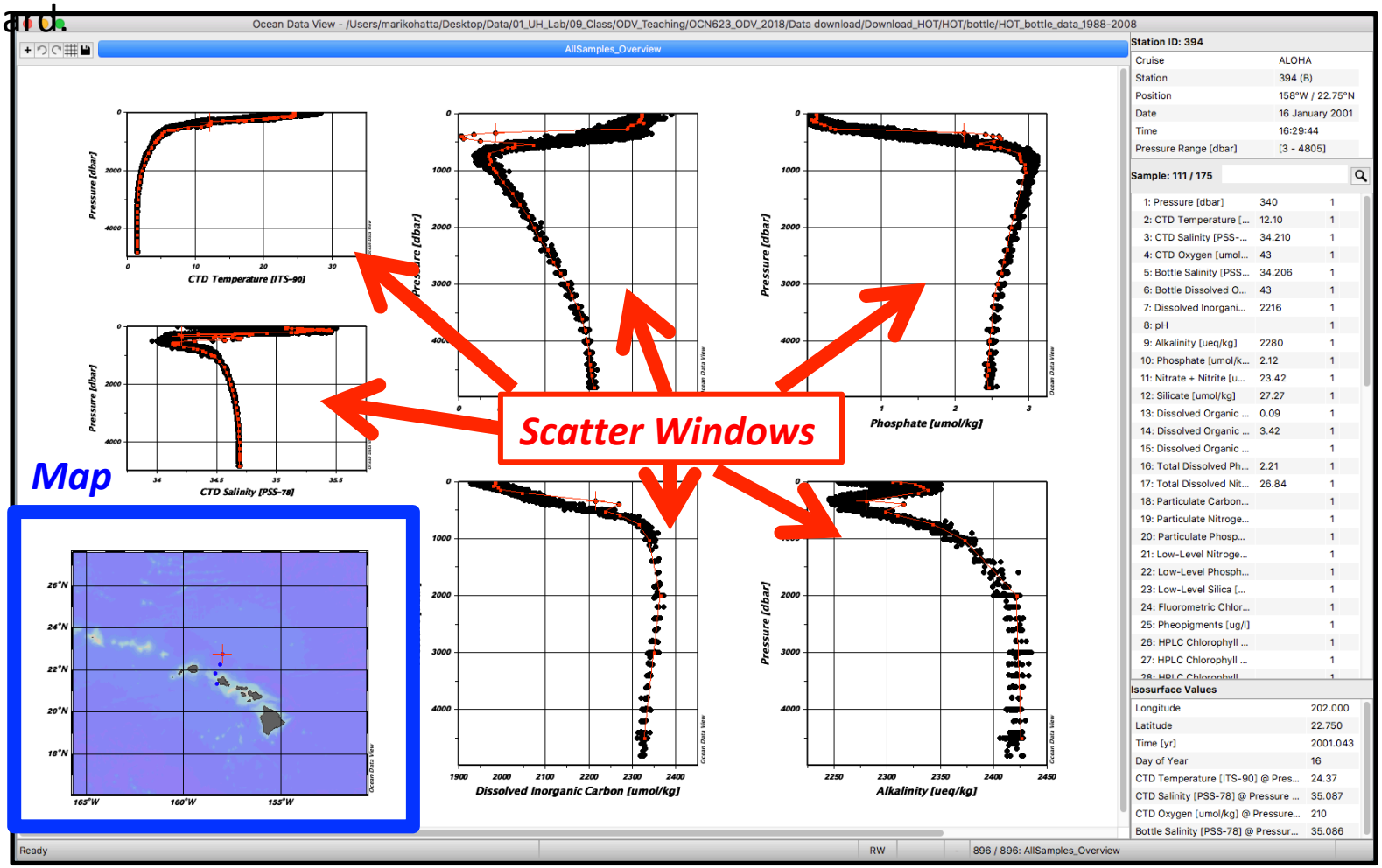

Ocean Data View - /Users/marikohatta/Desktop/Data/01_UH_Lab/09_Class/ODV_Teaching/OCN623_ODV_2018/Data download/Download_HOT/HOT/bottle/HOT_bottle_data_1988-2008
Phosphate_TimeSeries
AllSamples_Overview
CTD Temperature [ITS-90]
Bottle Dissolved Oxygen [umol/kg]
Phosphate [umol/kg]
CTD Salinity [PSS-78]
Dissolved Inorganic Carbon [umol/kg]
Alkalinity [ueq/kg]
Pressure [dbar]
Station ID: 1
Cruise ALOHA
Station 1 (B)
Position 158°W / 22.75°N
Date 31 October 1988
Time 01:57:04
Pressure Range [dbar] [2 - 4706]
Sample: 1 / 47
Isosurface Values
Longitude 202.000
Latitude 22.750
Time [yr] 1988.831
Day of Year 305
Ready
896 / 896: AllSamples_Overview

“6 Scatter Windows” mode



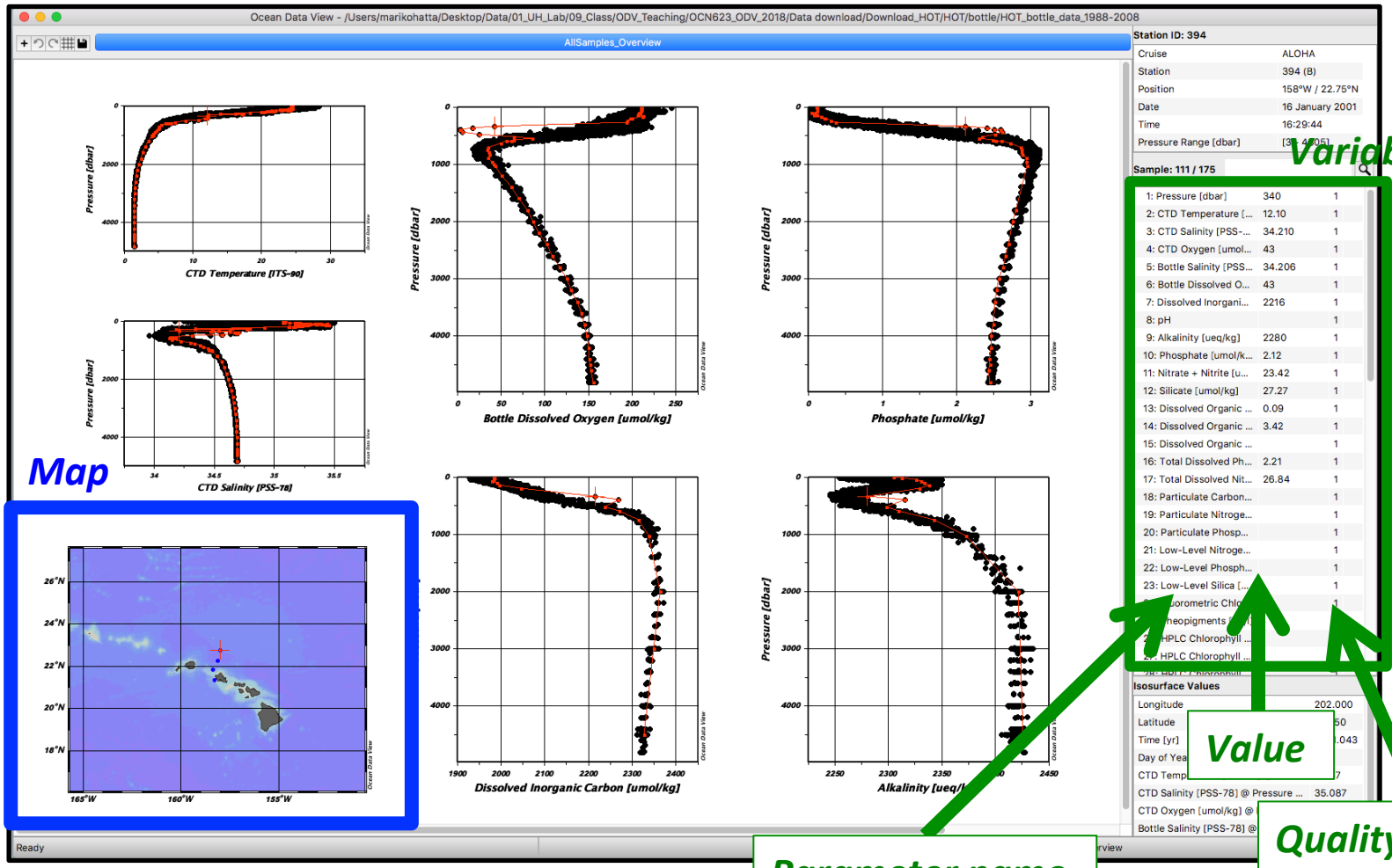
“6 Scatter Windows” mode

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.



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.

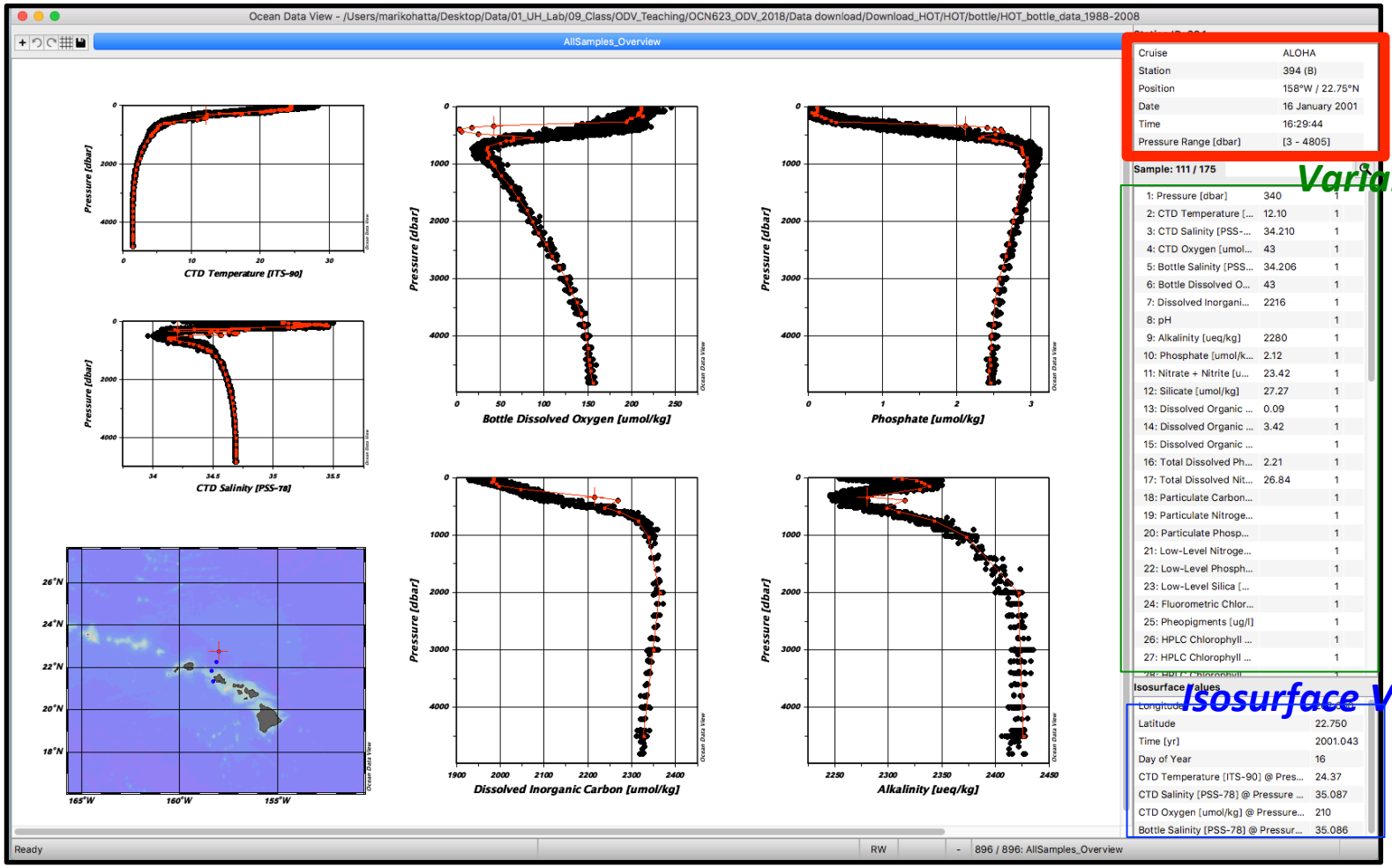
-You use the flag to identify data quality, you can then isolate bad data from your figure!

- 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

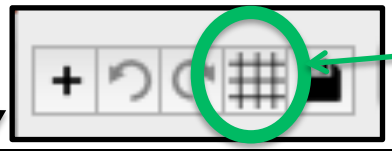


Variables

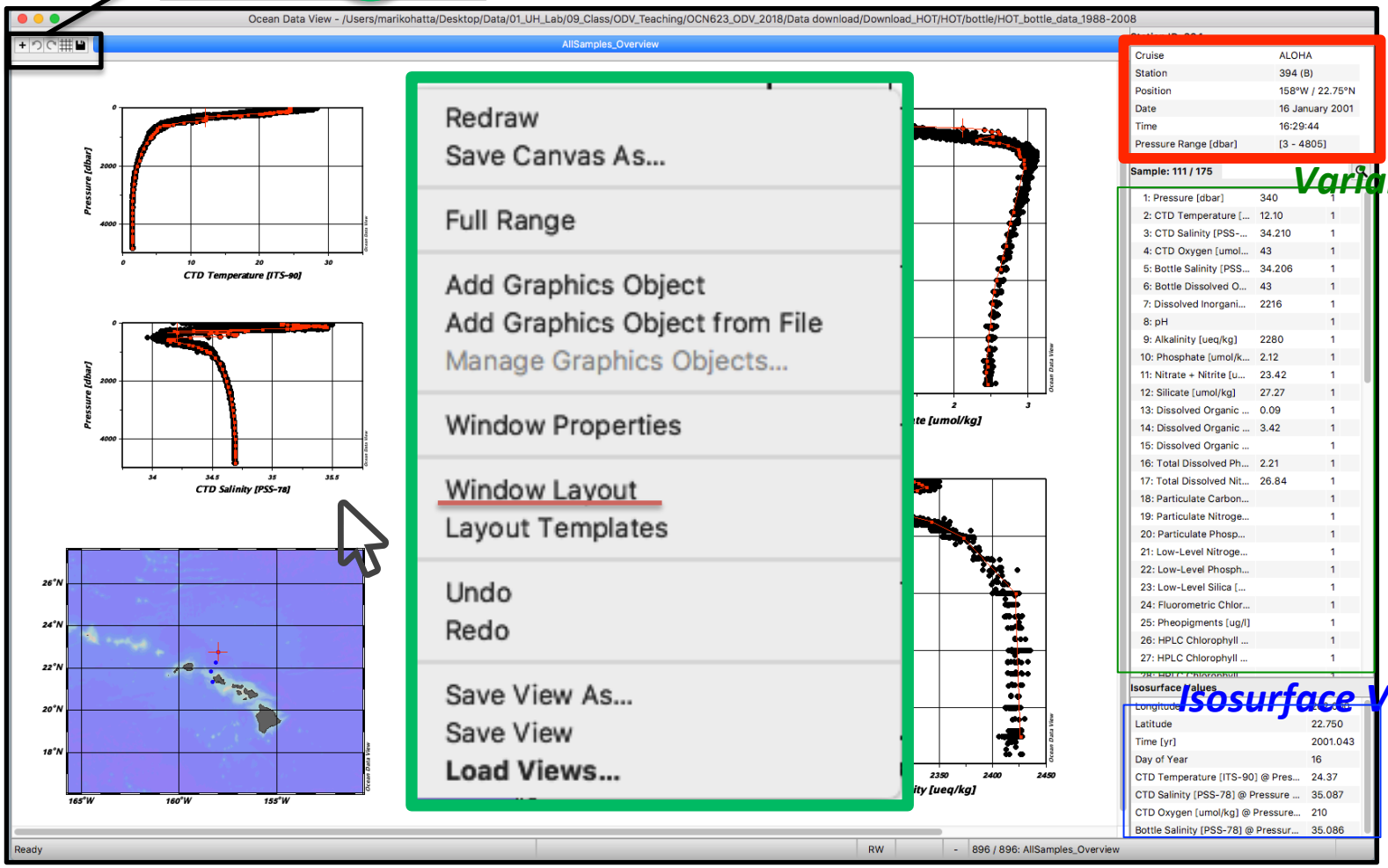
Isosurface Values

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

Let’s change the layout of the canvas

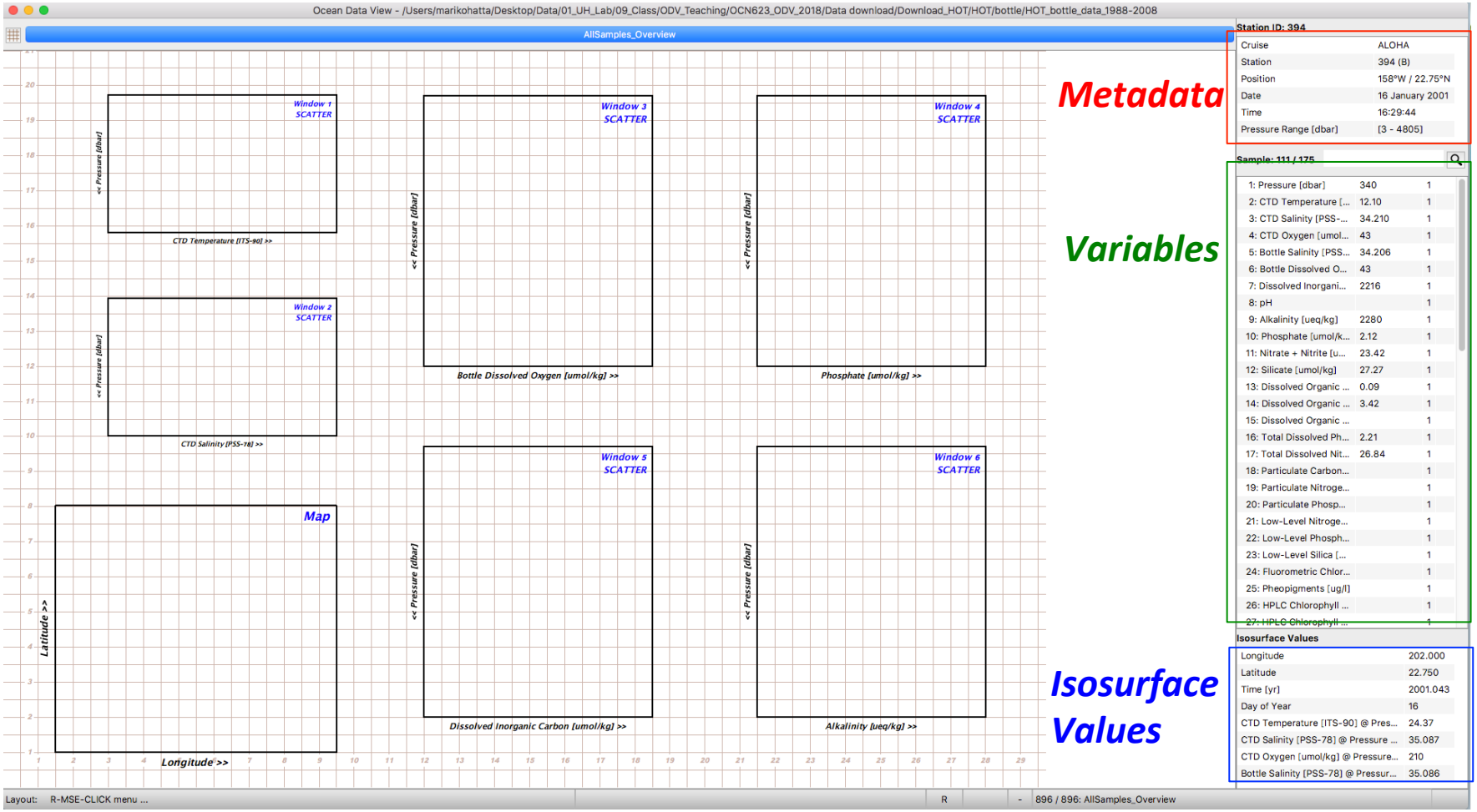


Click the icon.



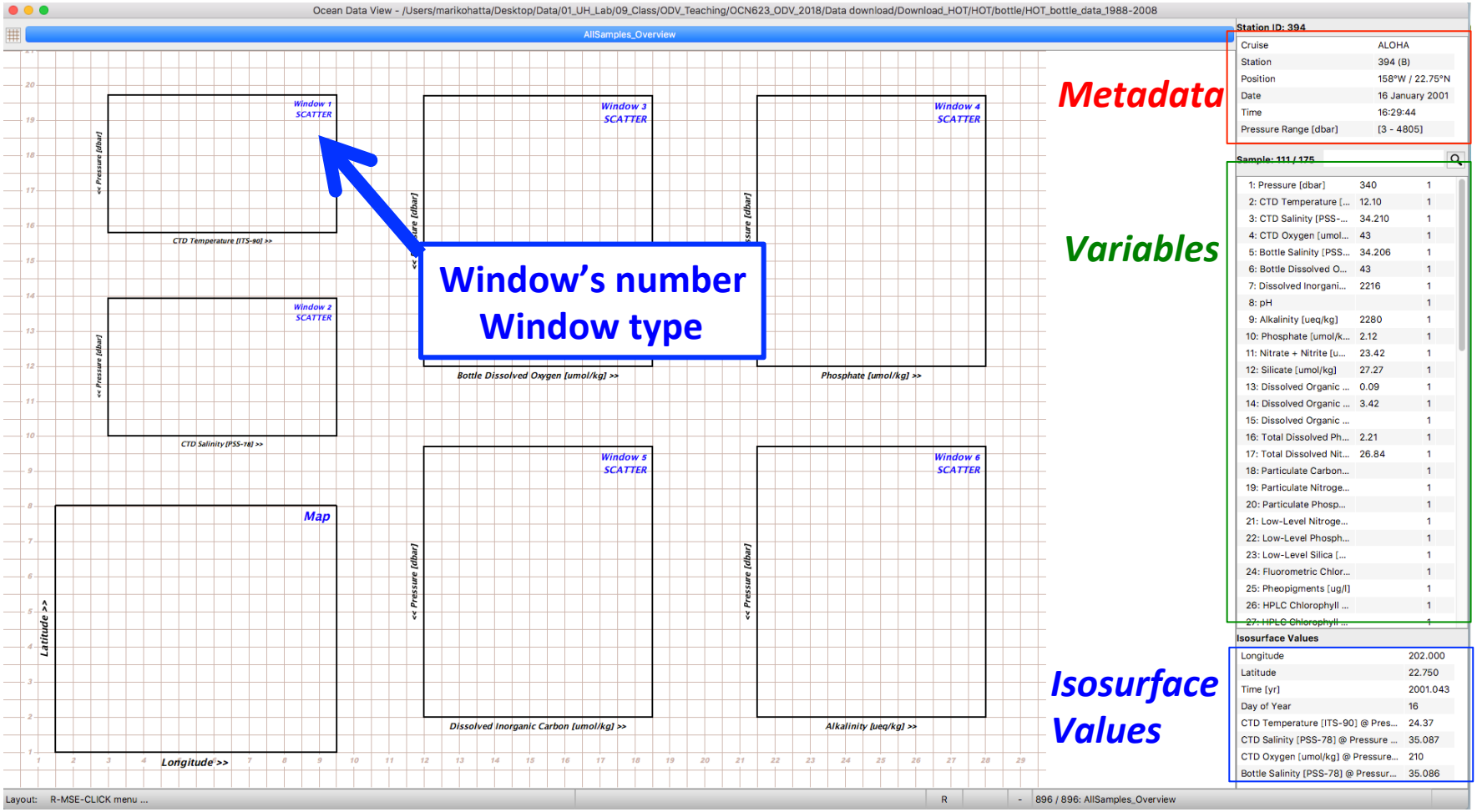
Or Move your cursor in the white part (it **should not** be on the map or on any scatter window) **Right click (“control” + click if you are Mac user)**, and select “Window Layout”.

“6 Scatter Windows” layout mode



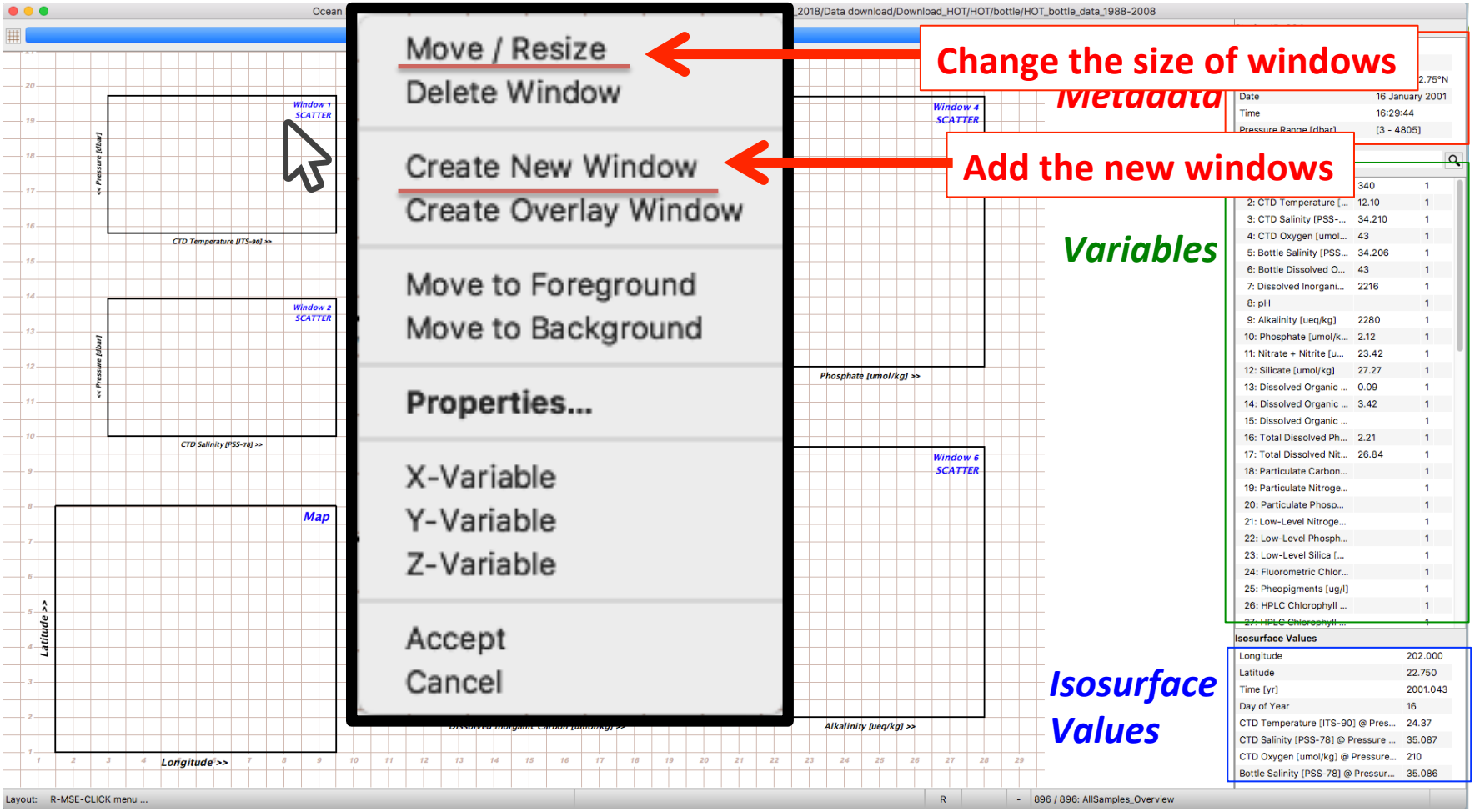
“6 Scatter Windows” layout mode

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.)



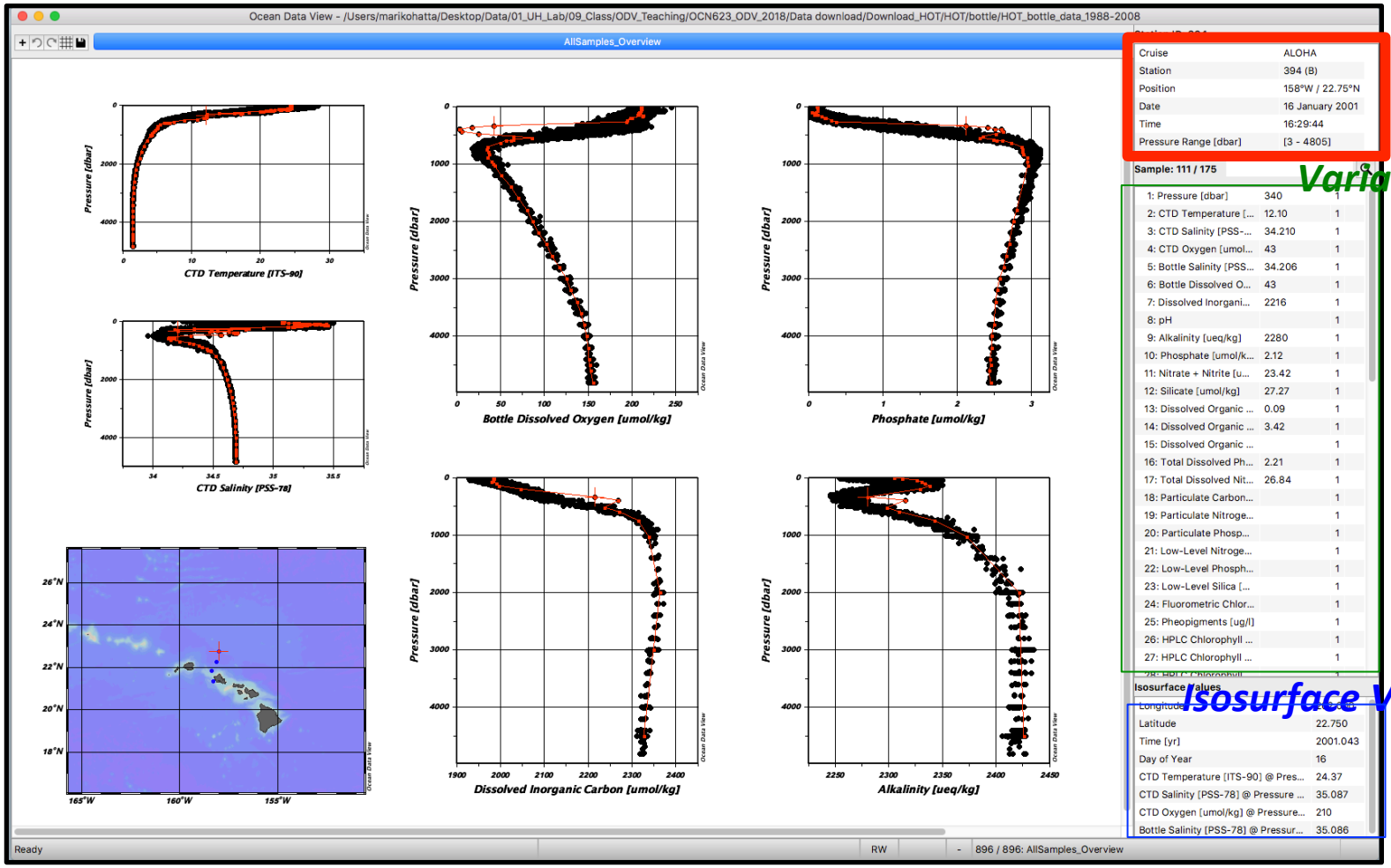
“6 Scatter Windows” layout mode

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



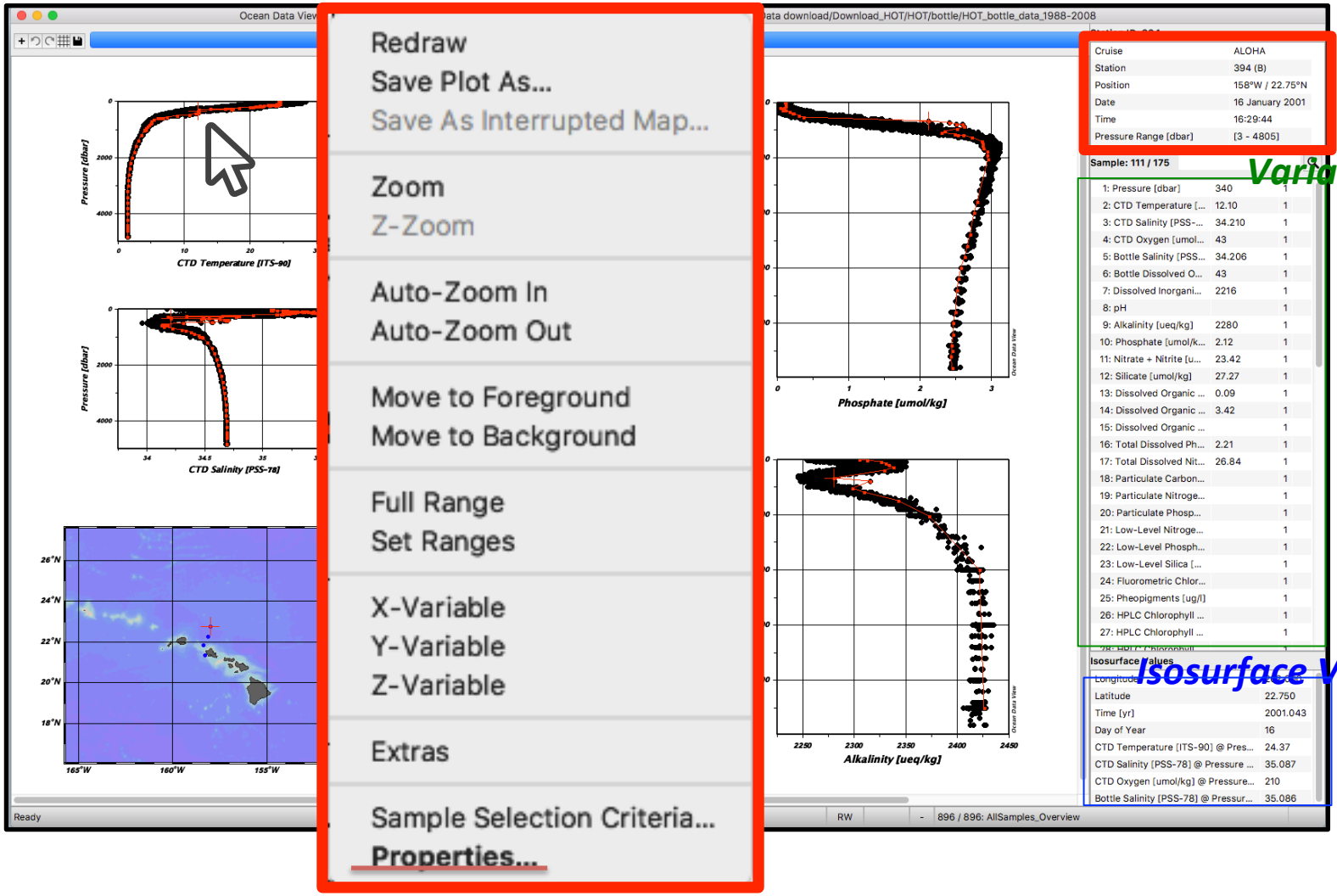
After you change the layout, select “Accept”.

“6 Scatter Windows” mode



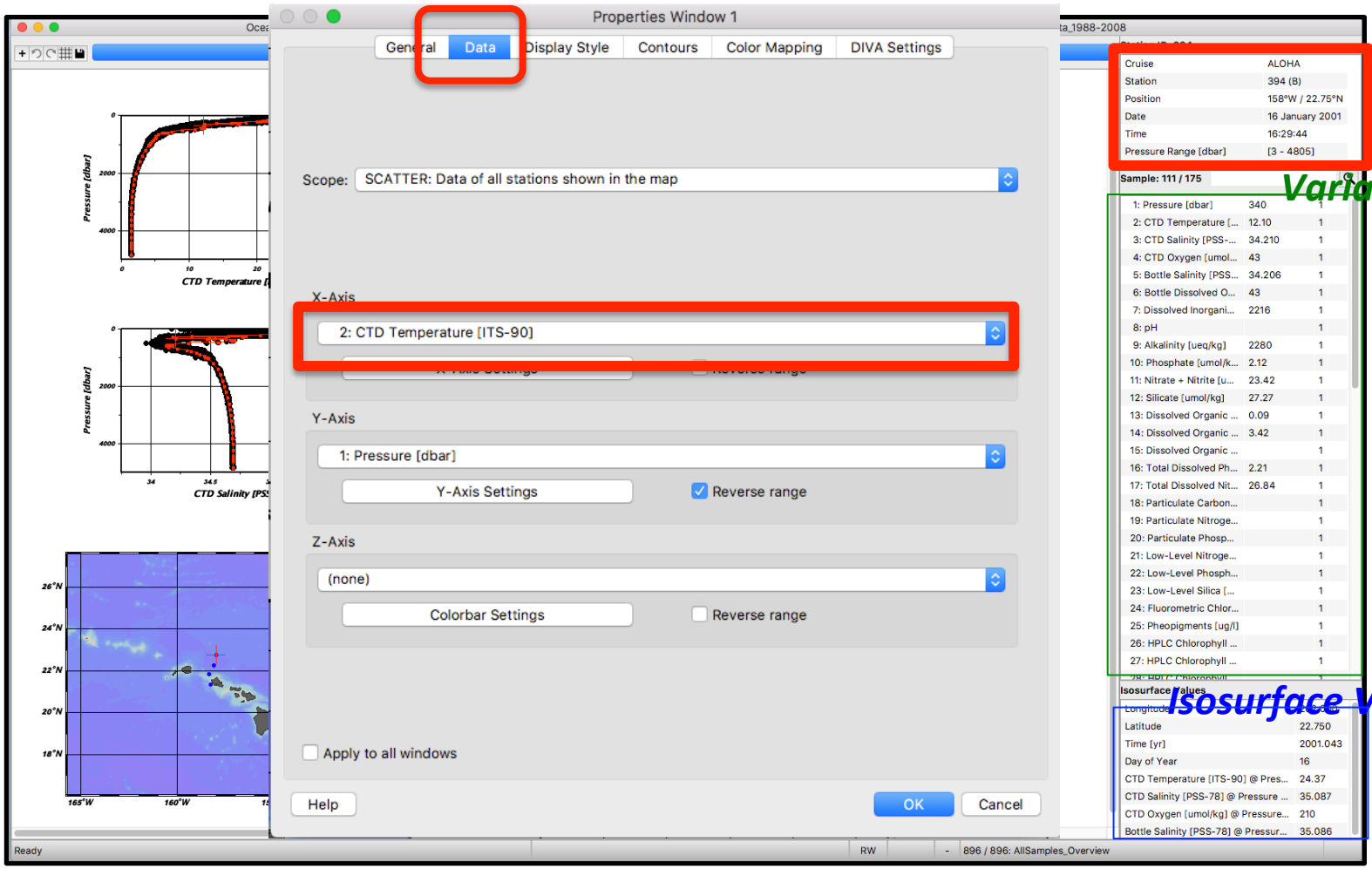
Let’s change the temperature plot to pH.

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”.



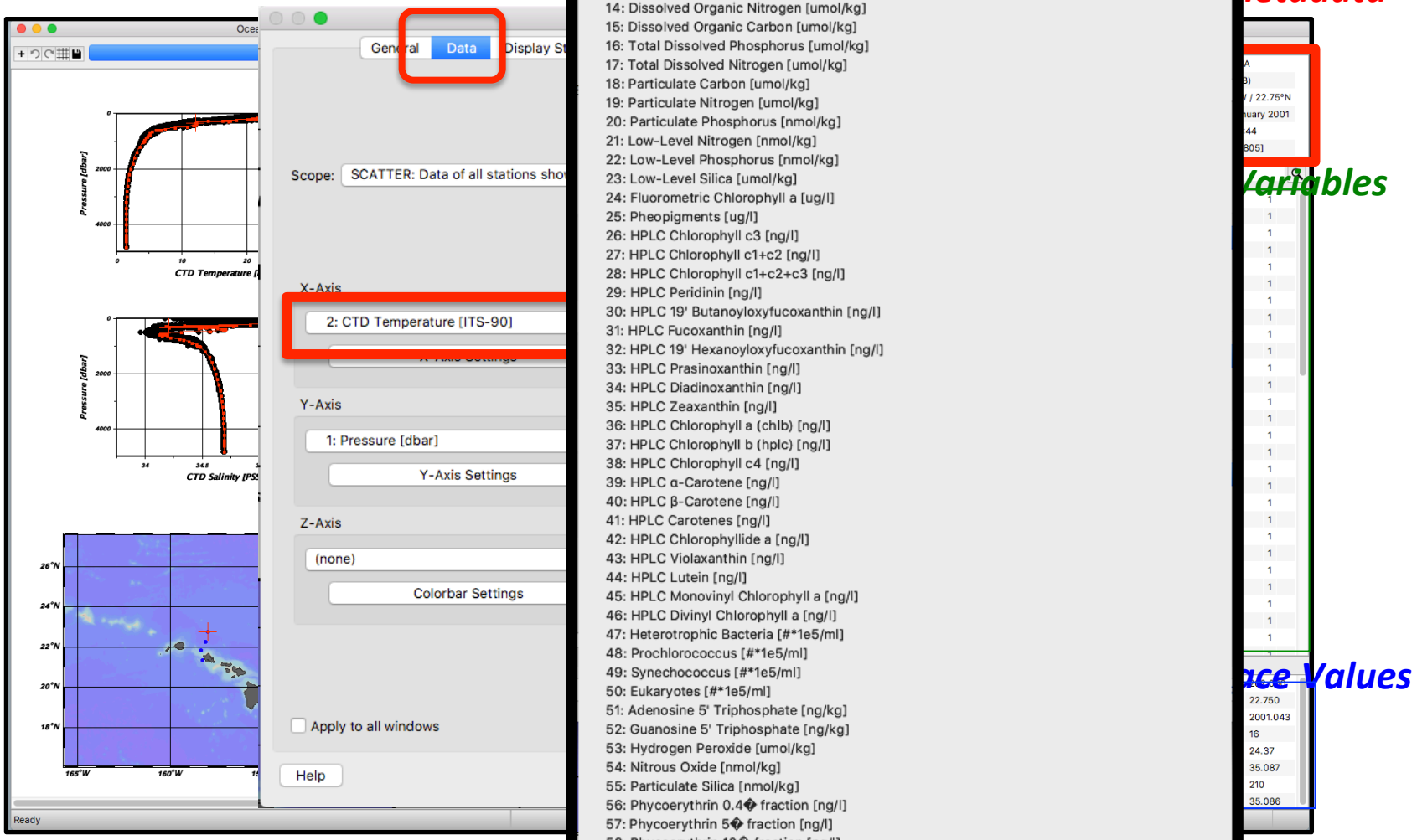
Let’s change the temperature plot to pH.

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



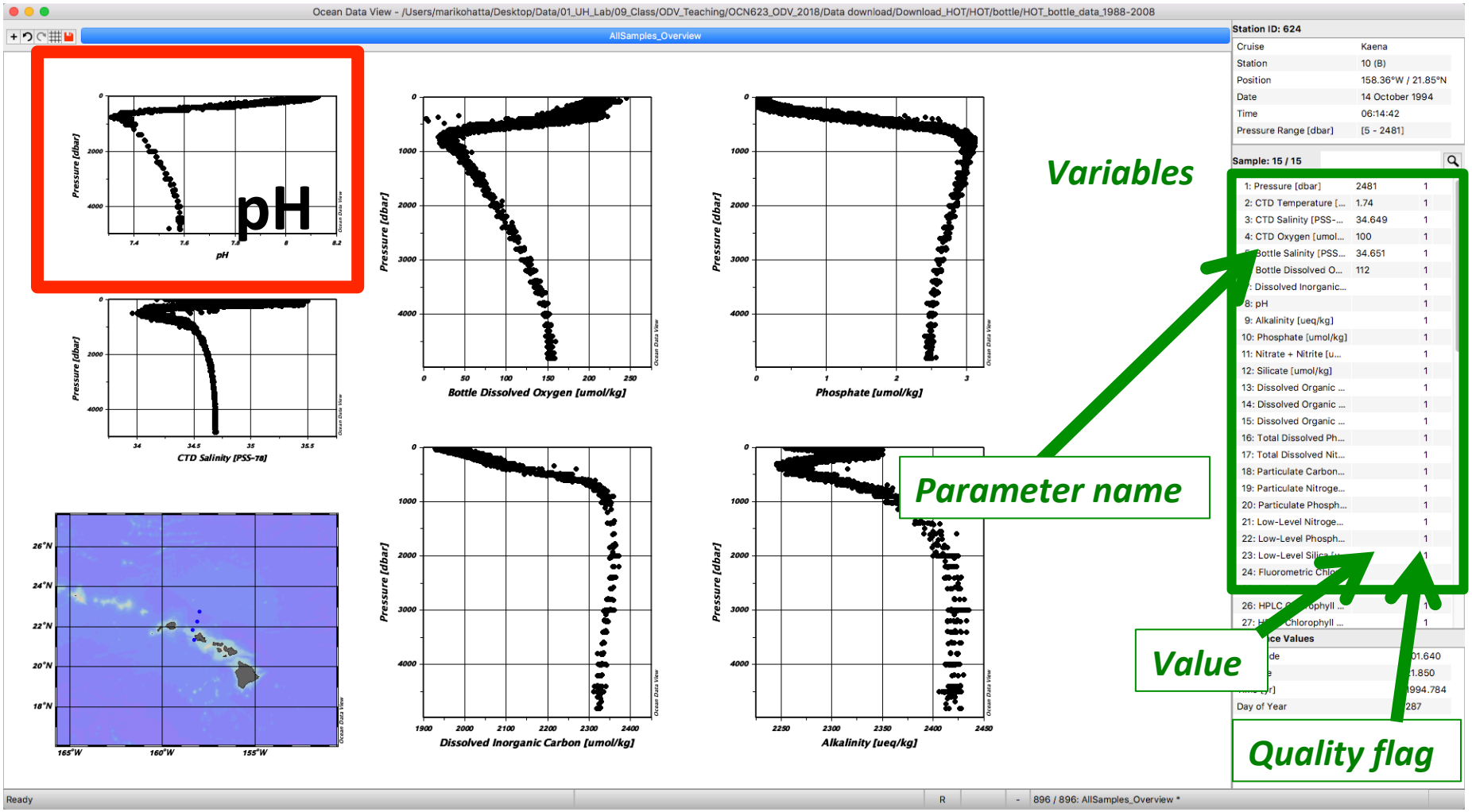
Let's change the te pH.

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



“6 Scatter Windows” mode

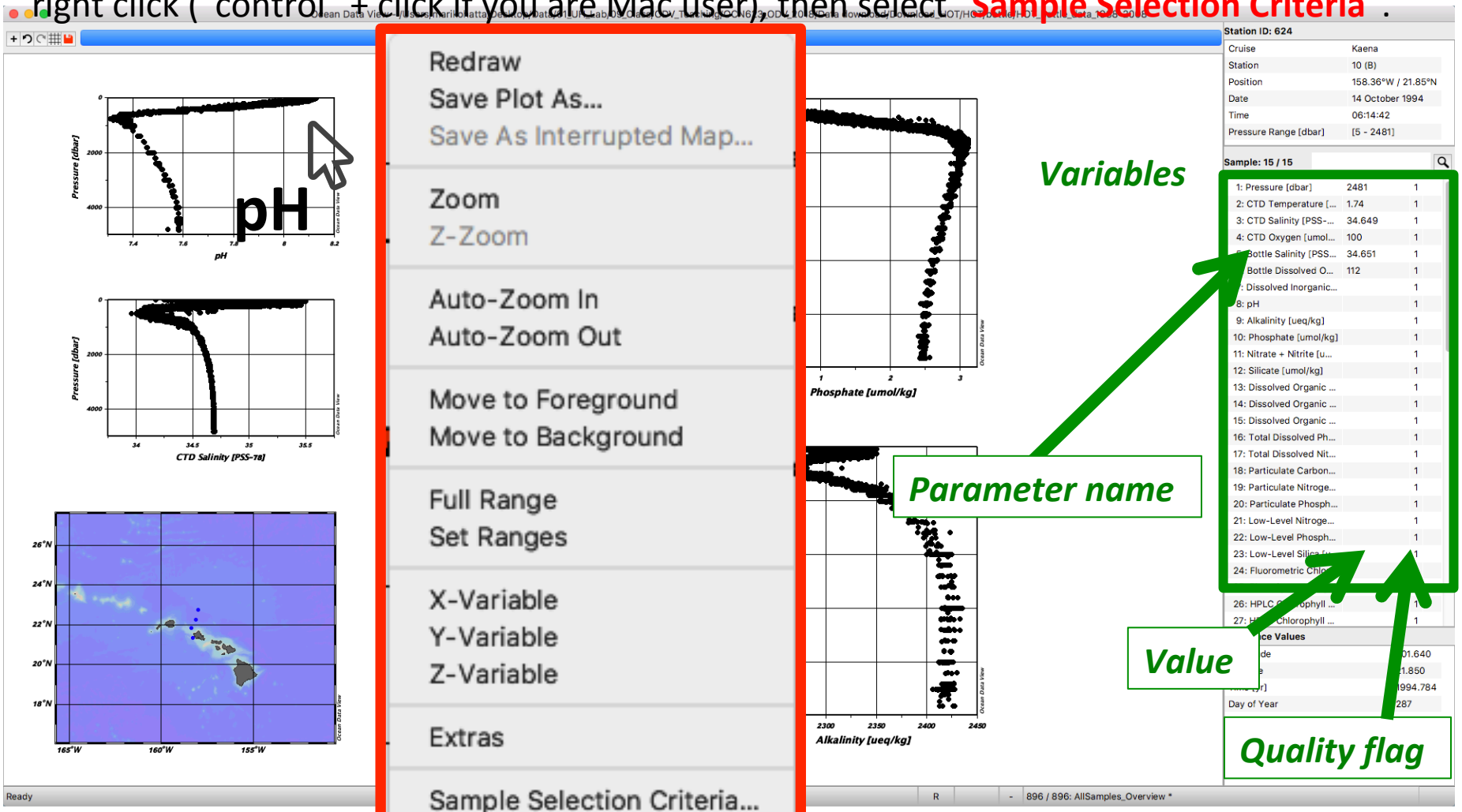
Now you will see the modified scatter window showing pH as a vertical profile.



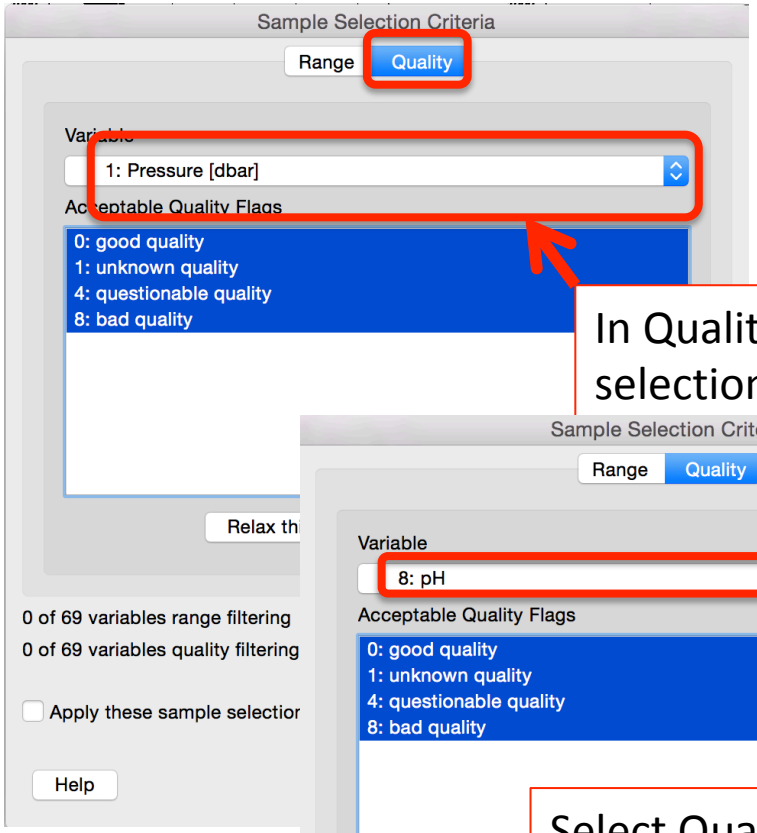
Now, we are going to modify the sample selection criteria used for the plot.

Let's modify the sample selection criteria!

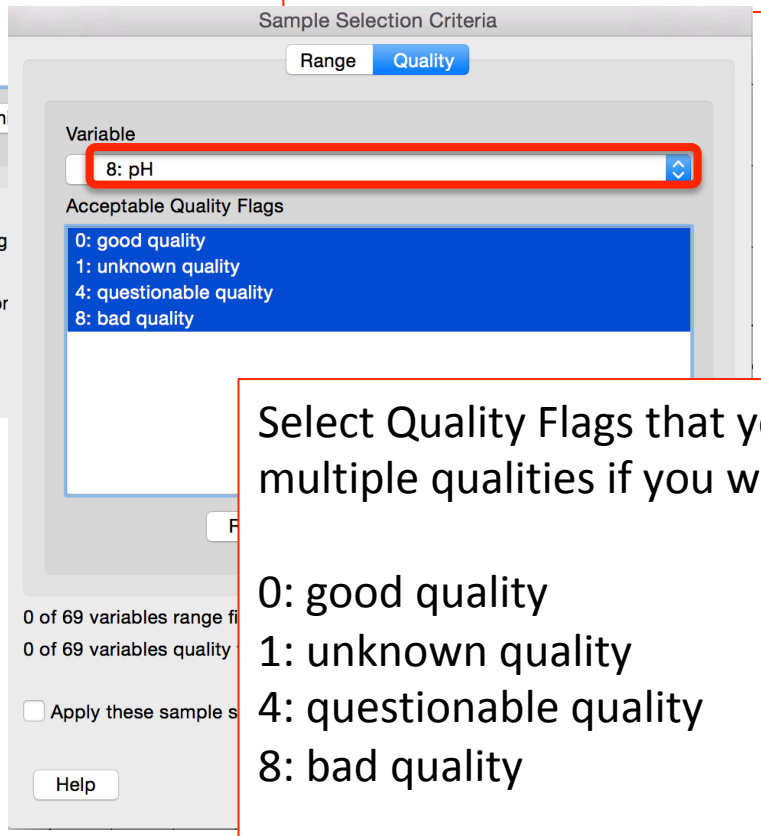
Move your cursor in the scatter window that you want to change the selection criteria, right click ("control" + click if you are Mac user), then select "**Sample Selection Criteria**".

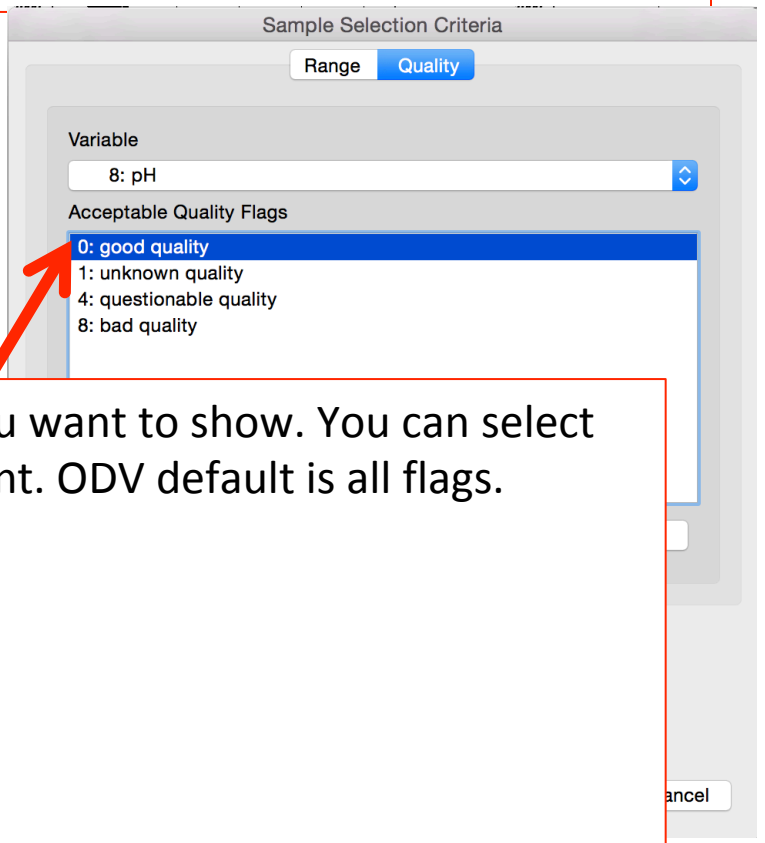


How to modify the sample selection criteria (Quality Flag)!



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



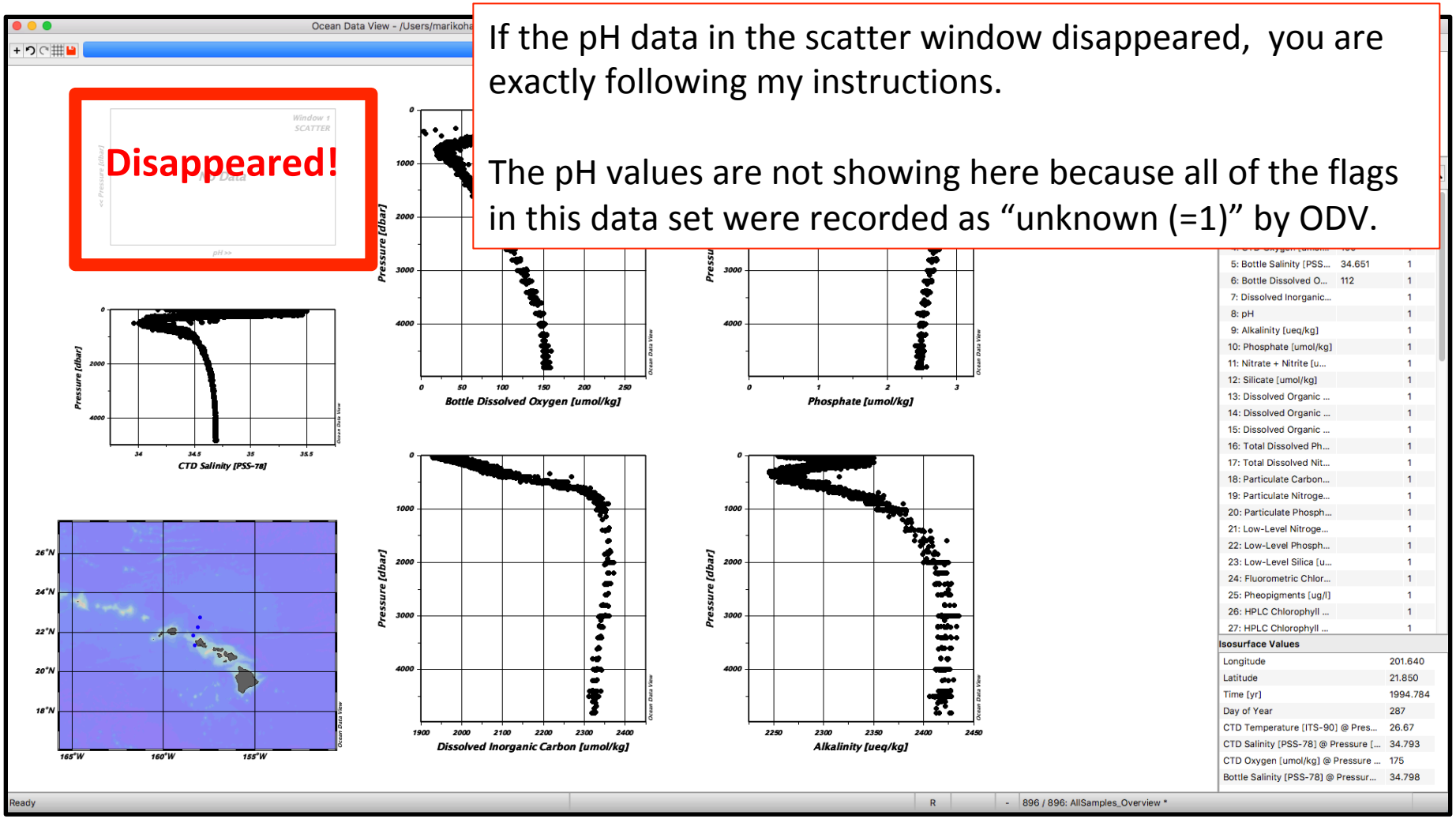


Select Quality Flags that you want to show. You can select multiple qualities if you want. ODV default is all flags.

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

Select only “0:good quality” here.

“6 Scatter Windows” mode

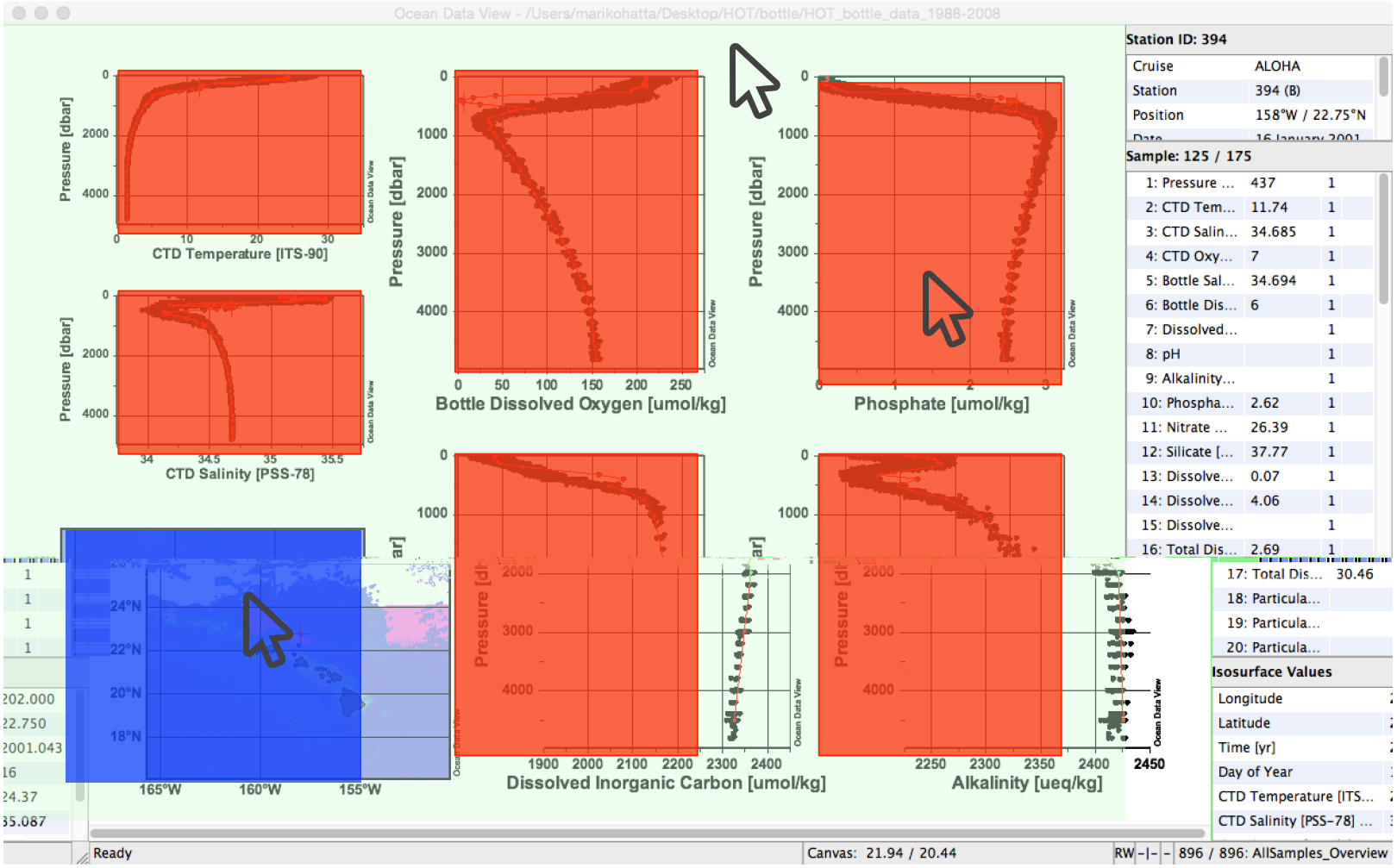


If the pH data in the scatter window disappeared, you are exactly following my instructions.

The pH values are not showing here because all of the flags in this data set were recorded as “unknown (=1)” by ODV.

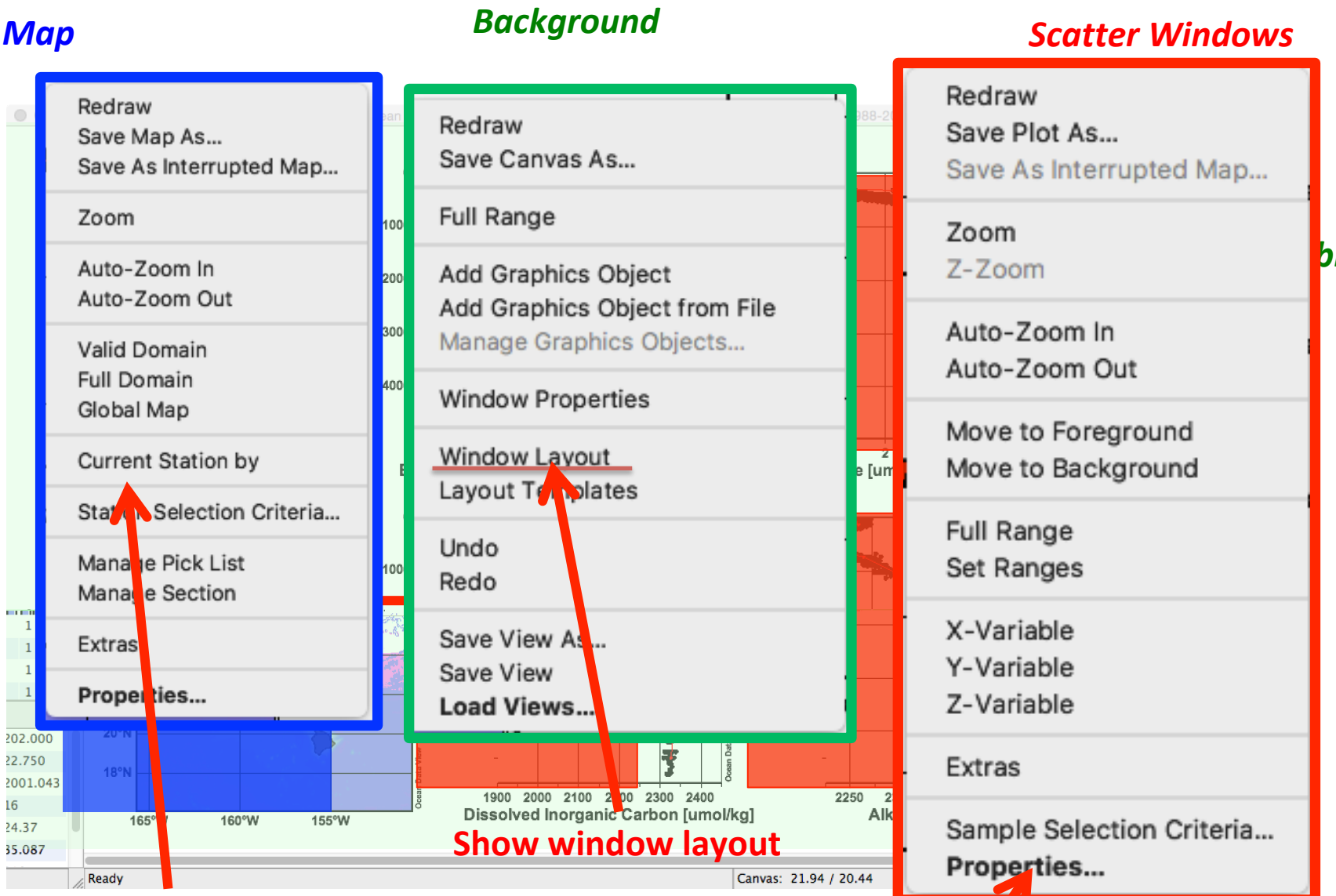
Different window types (shown in color) have different pop-up menus!

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!



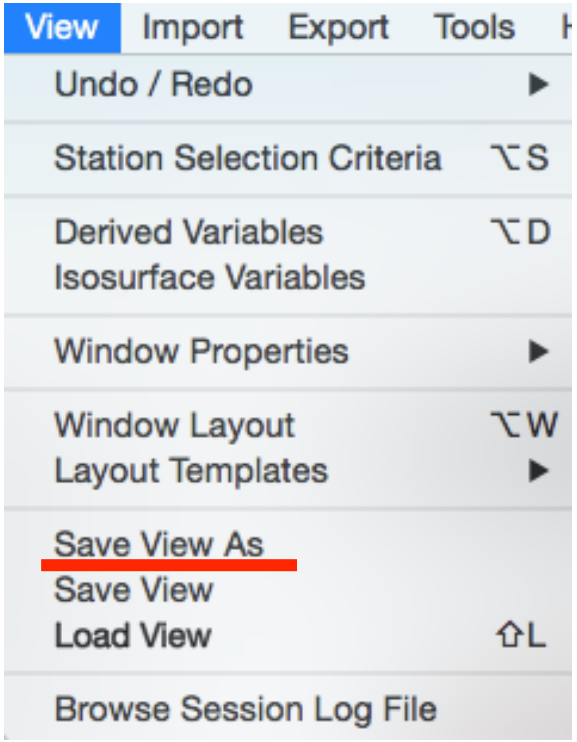
Show window layout

Change the scale of Map

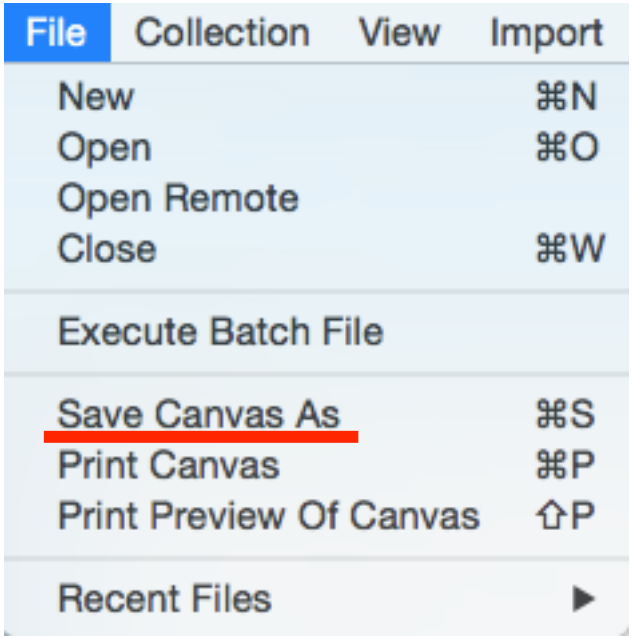
Change the properties of the window

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”.

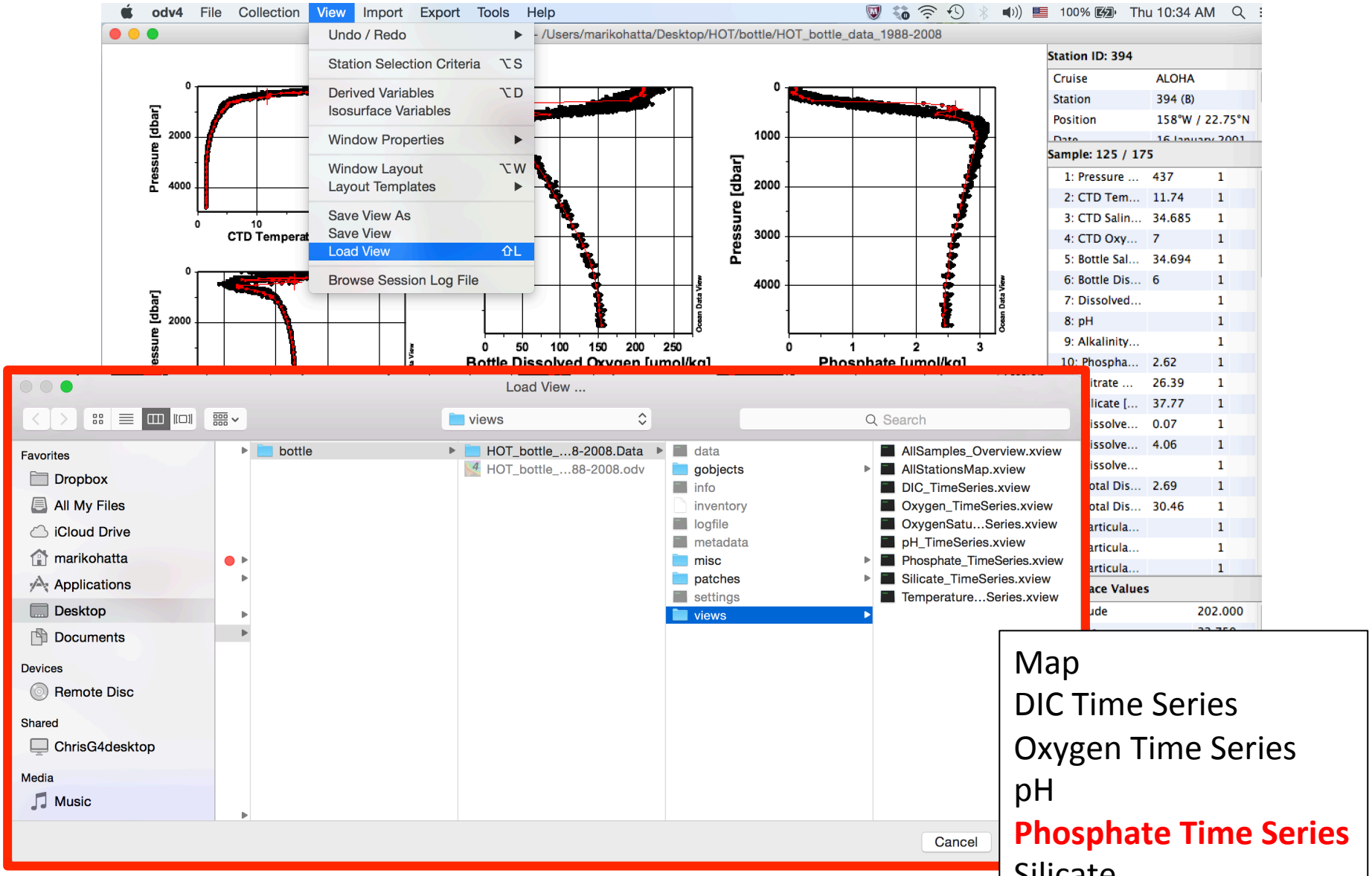


How to save figures:
Click “File” in the Menu Bar to select “Save Canvas as”.



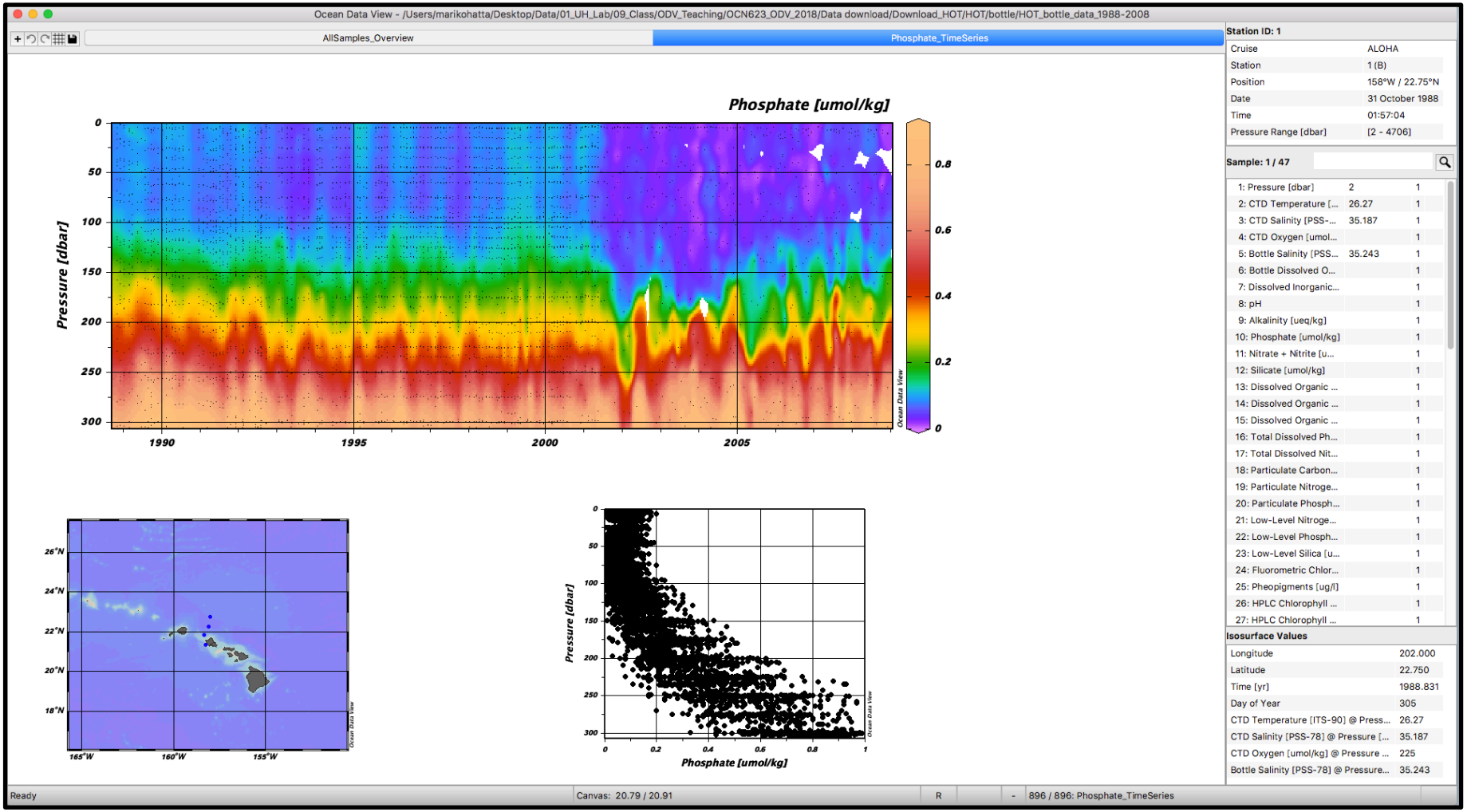
Tip: The highest resolution of the canvas you can save is 499, which would be important for a publication. Also when you print the Canvas, it would take a long time to print. Save as the canvas, and then print it (faster!).

Let’s change the view from the vertical profiles to “Phosphate Time Series” mode!



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

Phosphate Time Series



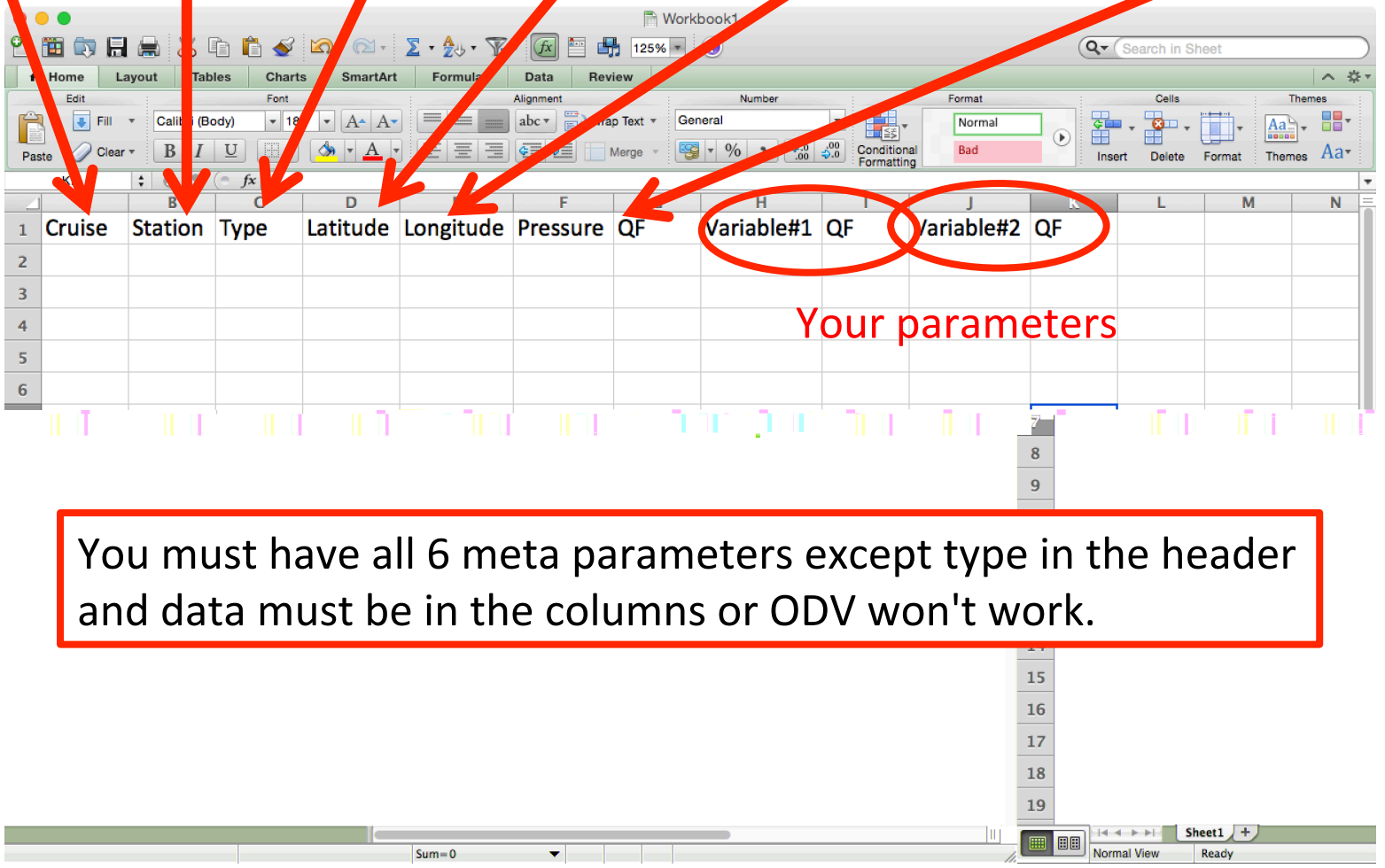
Tip: ODV 5.0.0 for the first time allows working with multiple open views at the same time. The new Views Bar located just below the main menu bar lets you easily open and save views, undo or redo recent view changes, switch to or from layout mode, or select one of the open views by clicking on its tab.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

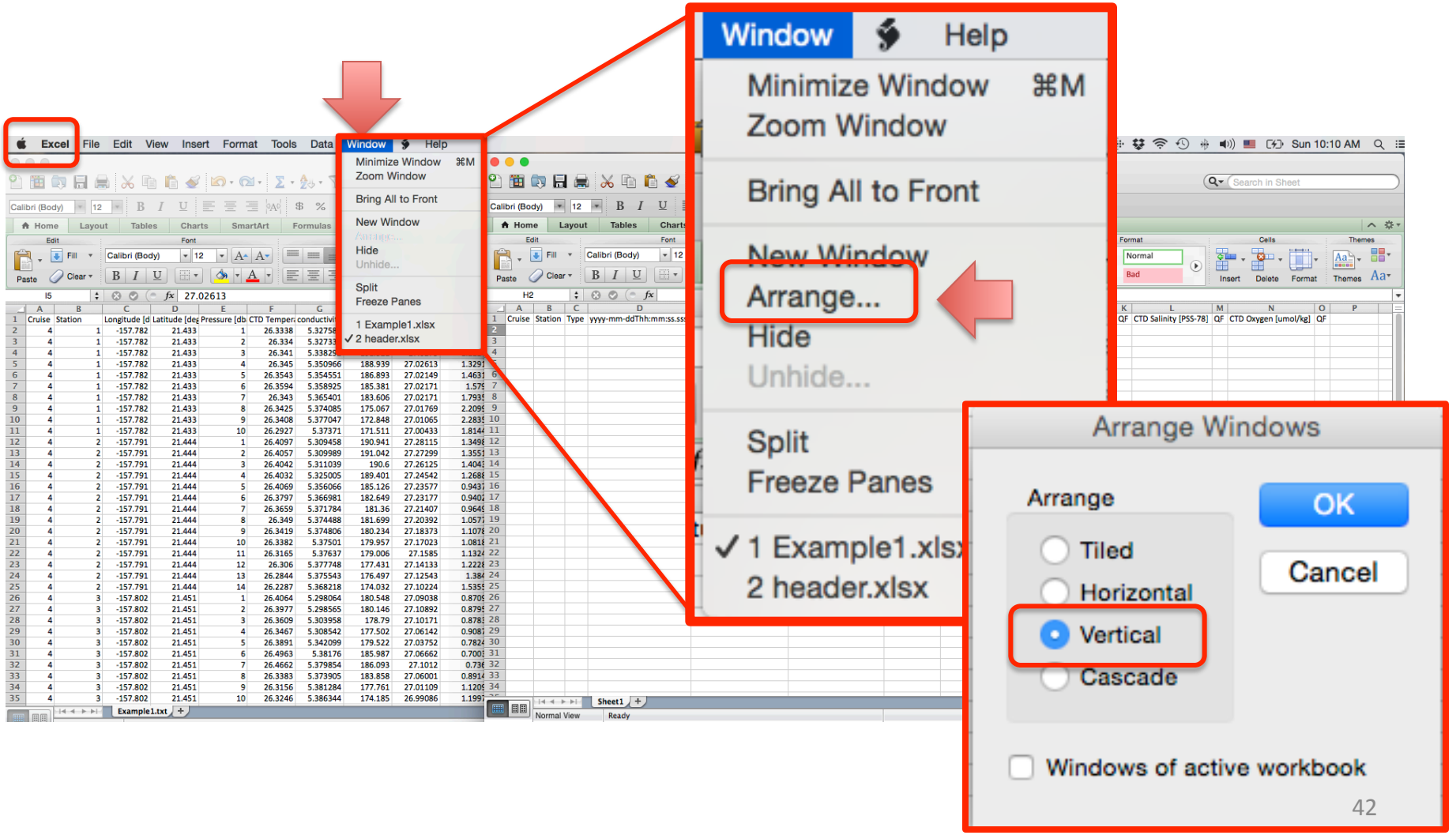
Cruise *(name)* Station *(numbers)* Type *(B or C)* Latitude *(North +, South -)* Longitude *(East +, West -)* Pressure *(or depth)* QF



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.

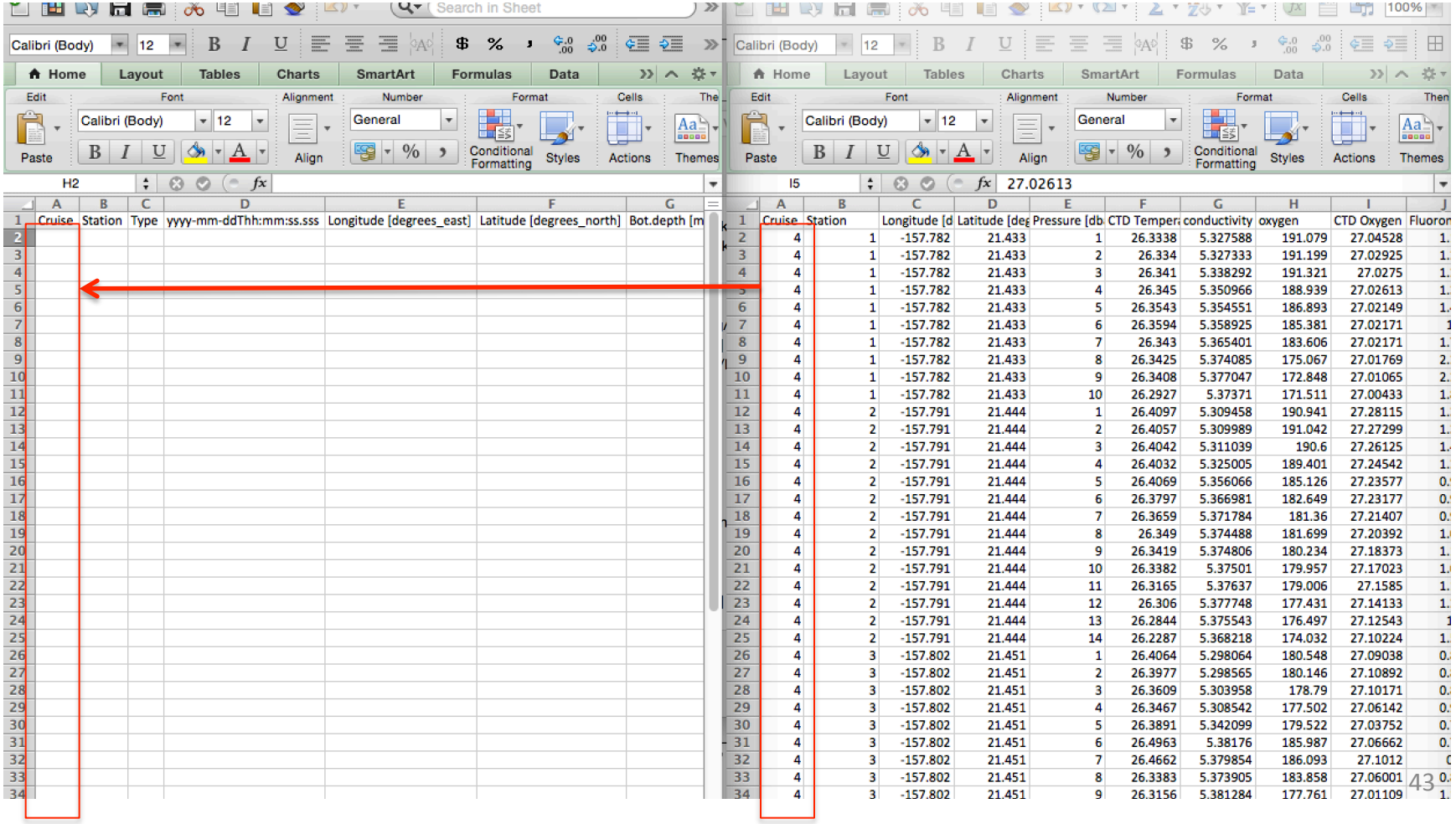
Select “Window”- then select “Arrange”, then click “vertical”.



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

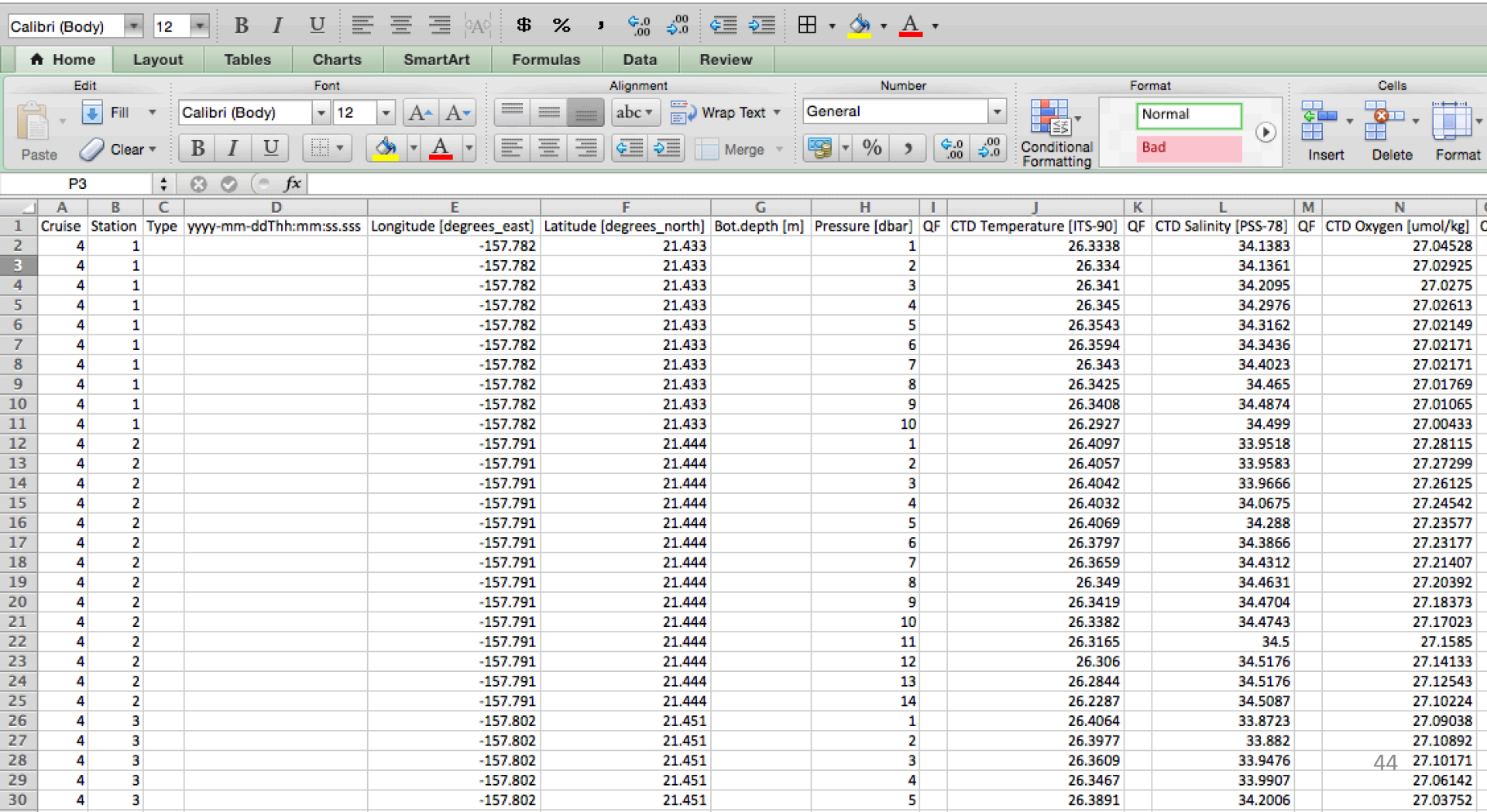
header.xlsx

Example1.xlsx



When you have finished, it should look like this.

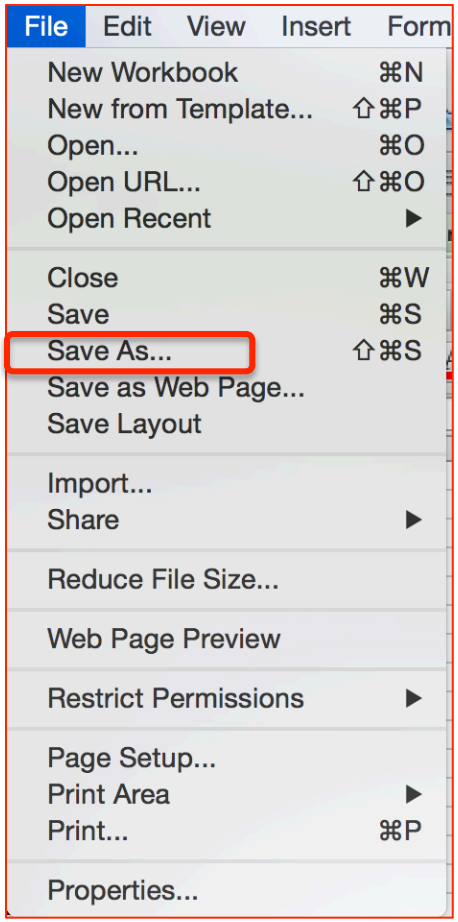
header.xlsx

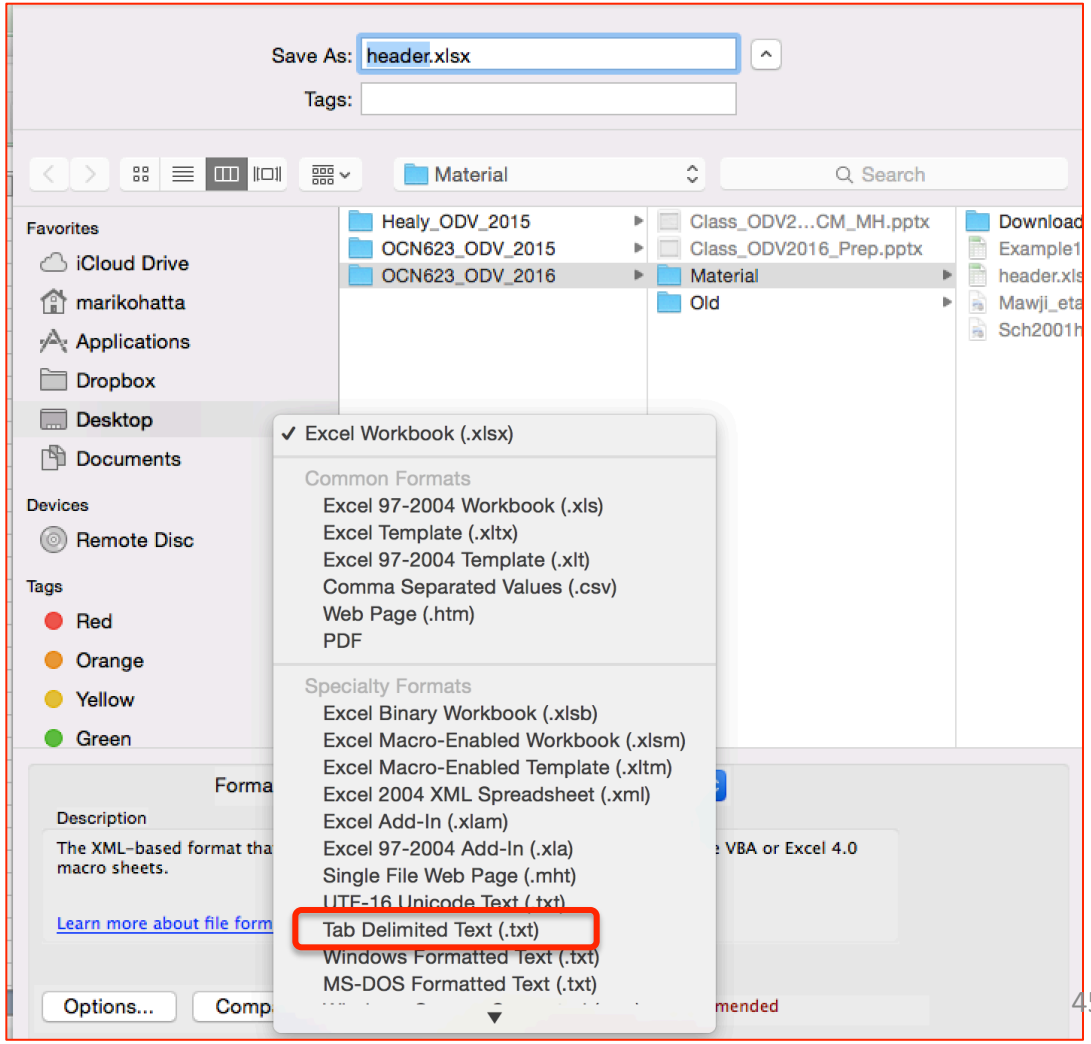


	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Cruise	Station	Type	yyyy-mm-ddThh:mm:ss.sss	Longitude [degrees_east]	Latitude [degrees_north]	Bot.depth [m]	Pressure [dbar]	QF	CTD Temperature [ITS-90]	QF	CTD Salinity [PSS-78]	QF	CTD Oxygen [umol/kg]
2	4	1			-157.782	21.433		1		26.3338		34.1383		27.04528
3	4	1			-157.782	21.433		2		26.334		34.1361		27.02925
4	4	1			-157.782	21.433		3		26.341		34.2095		27.0275
5	4	1			-157.782	21.433		4		26.345		34.2976		27.02613
6	4	1			-157.782	21.433		5		26.3543		34.3162		27.02149
7	4	1			-157.782	21.433		6		26.3594		34.3436		27.02171
8	4	1			-157.782	21.433		7		26.343		34.4023		27.02171
9	4	1			-157.782	21.433		8		26.3425		34.465		27.01769
10	4	1			-157.782	21.433		9		26.3408		34.4874		27.01065
11	4	1			-157.782	21.433		10		26.2927		34.499		27.00433
12	4	2			-157.791	21.444		1		26.4097		33.9518		27.28115
13	4	2			-157.791	21.444		2		26.4057		33.9583		27.27299
14	4	2			-157.791	21.444		3		26.4042		33.9666		27.26125
15	4	2			-157.791	21.444		4		26.4032		34.0675		27.24542
16	4	2			-157.791	21.444		5		26.4069		34.288		27.23577
17	4	2			-157.791	21.444		6		26.3797		34.3866		27.23177
18	4	2			-157.791	21.444		7		26.3659		34.4312		27.21407
19	4	2			-157.791	21.444		8		26.349		34.4631		27.20392
20	4	2			-157.791	21.444		9		26.3419		34.4704		27.18373
21	4	2			-157.791	21.444		10		26.3382		34.4743		27.17023
22	4	2			-157.791	21.444		11		26.3165		34.5		27.1585
23	4	2			-157.791	21.444		12		26.306		34.5176		27.14133
24	4	2			-157.791	21.444		13		26.2844		34.5176		27.12543
25	4	2			-157.791	21.444		14		26.2287		34.5087		27.10224
26	4	3			-157.802	21.451		1		26.4064		33.8723		27.09038
27	4	3			-157.802	21.451		2		26.3977		33.882		27.10892
28	4	3			-157.802	21.451		3		26.3609		33.9476		27.10171
29	4	3			-157.802	21.451		4		26.3467		33.9907		27.06142
30	4	3			-157.802	21.451		5		26.3891		34.2006		27.03752

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

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

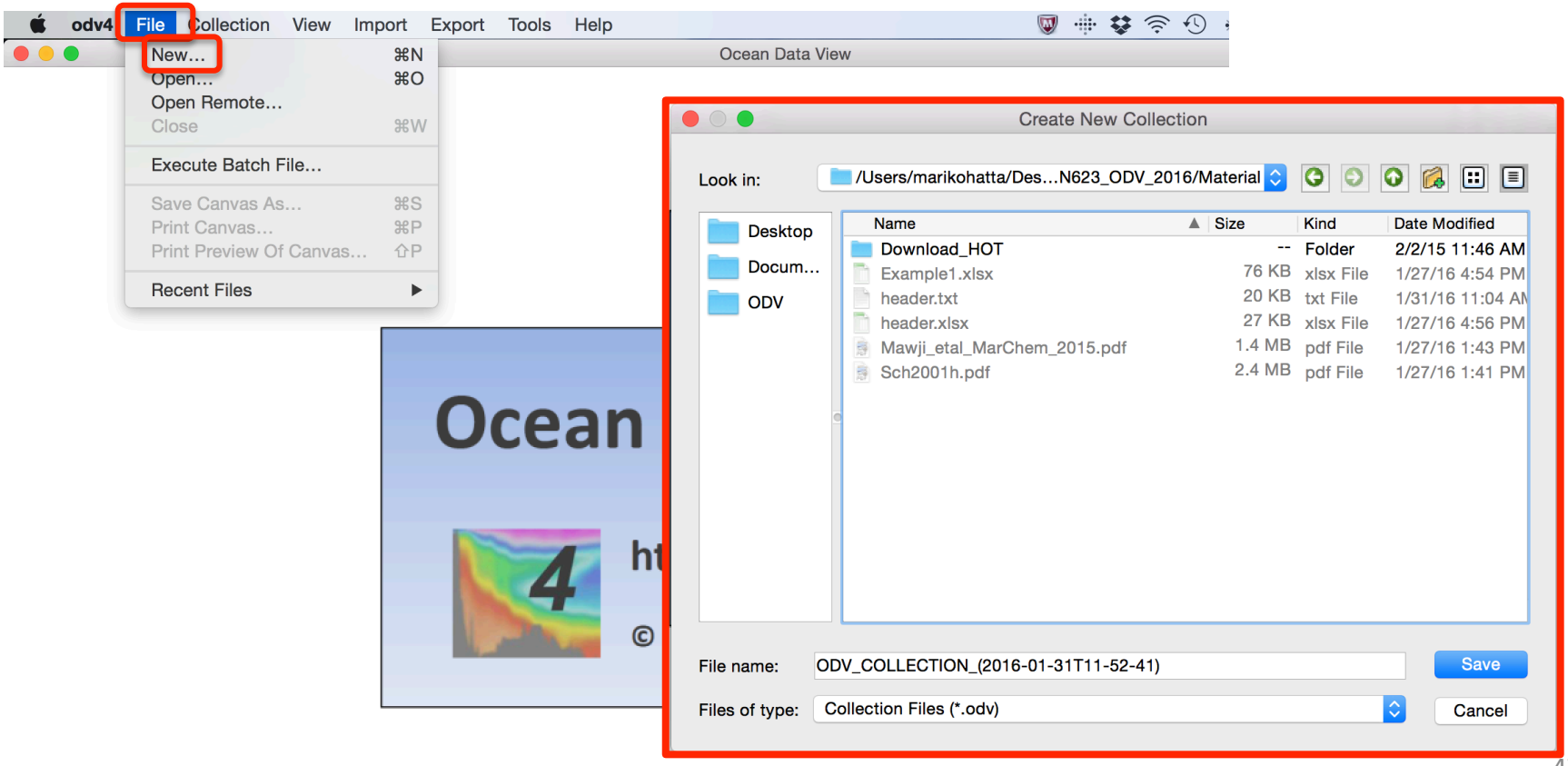




Exercise 2.

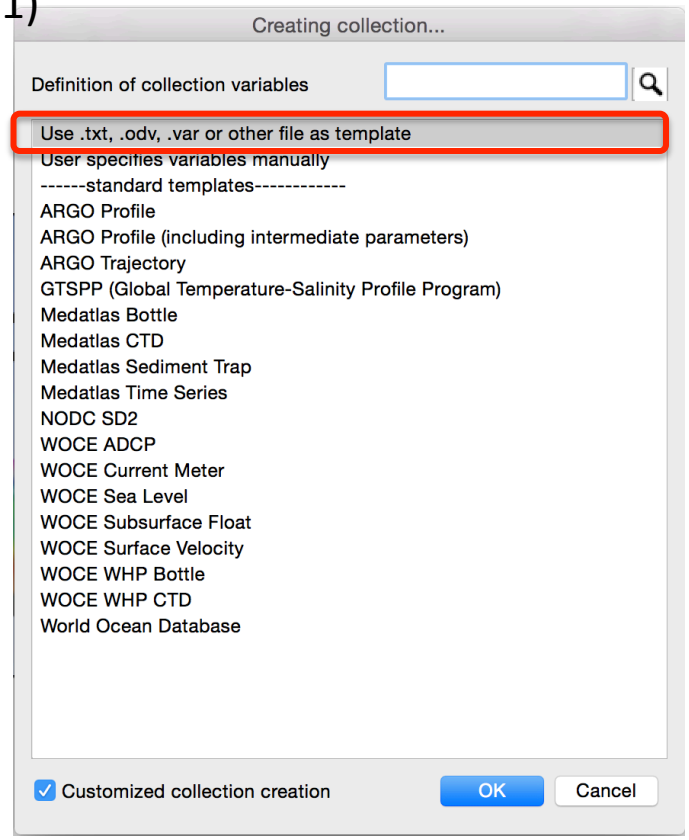
Let’s create your own ODV file & figures

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.

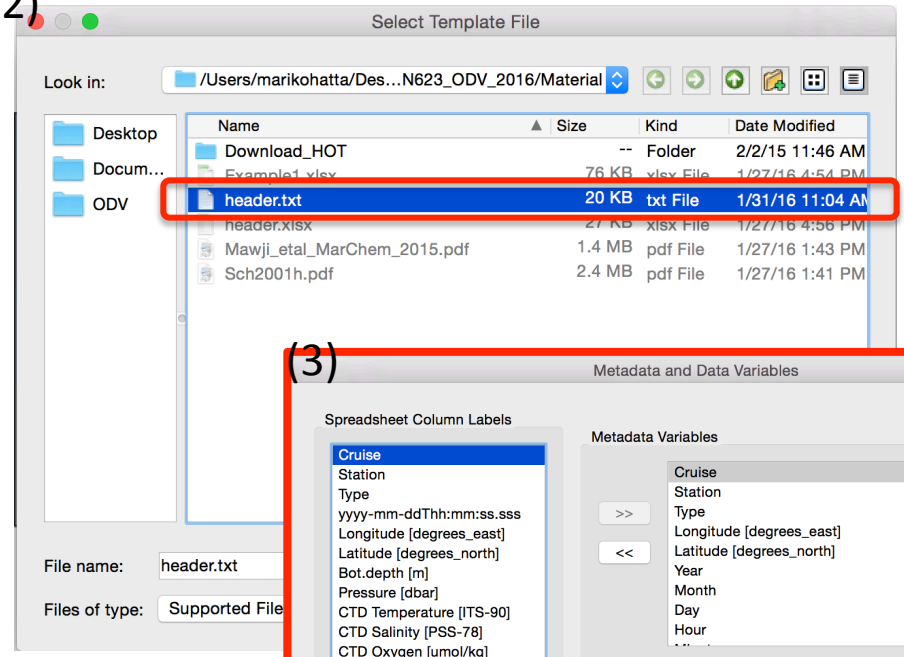


2. Choose “Definition of collection variables”. Select “Use .txt,.odv,.var or other file as template” and select your file that you made (“header.txt”).

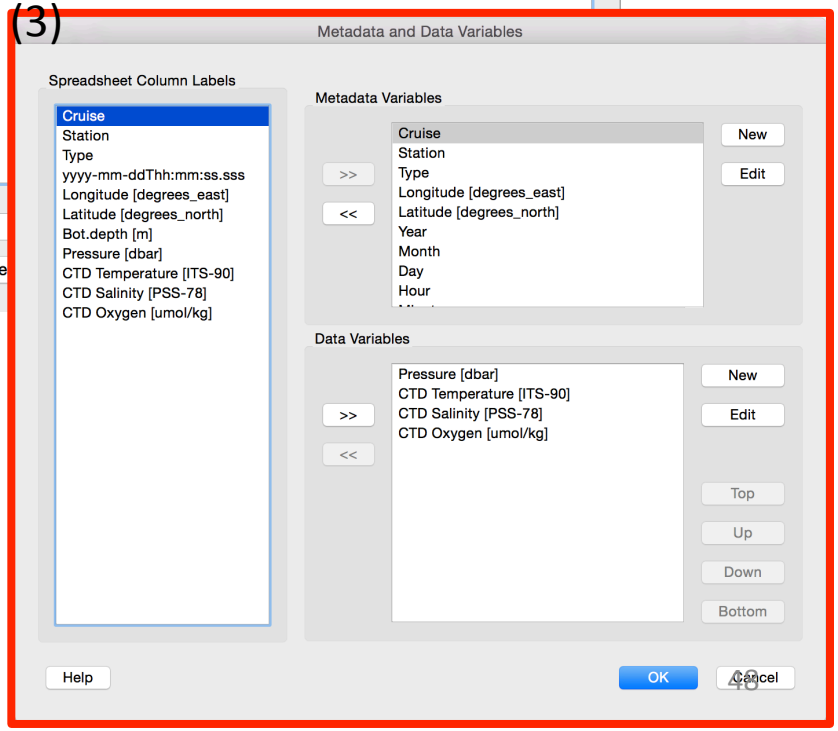
(1)



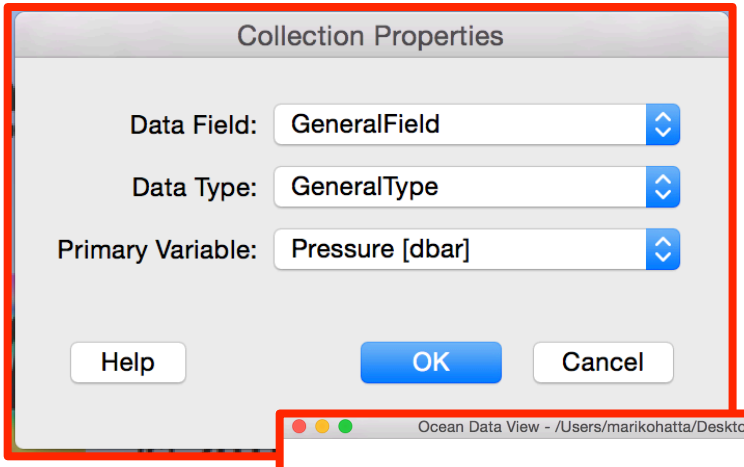
(2)



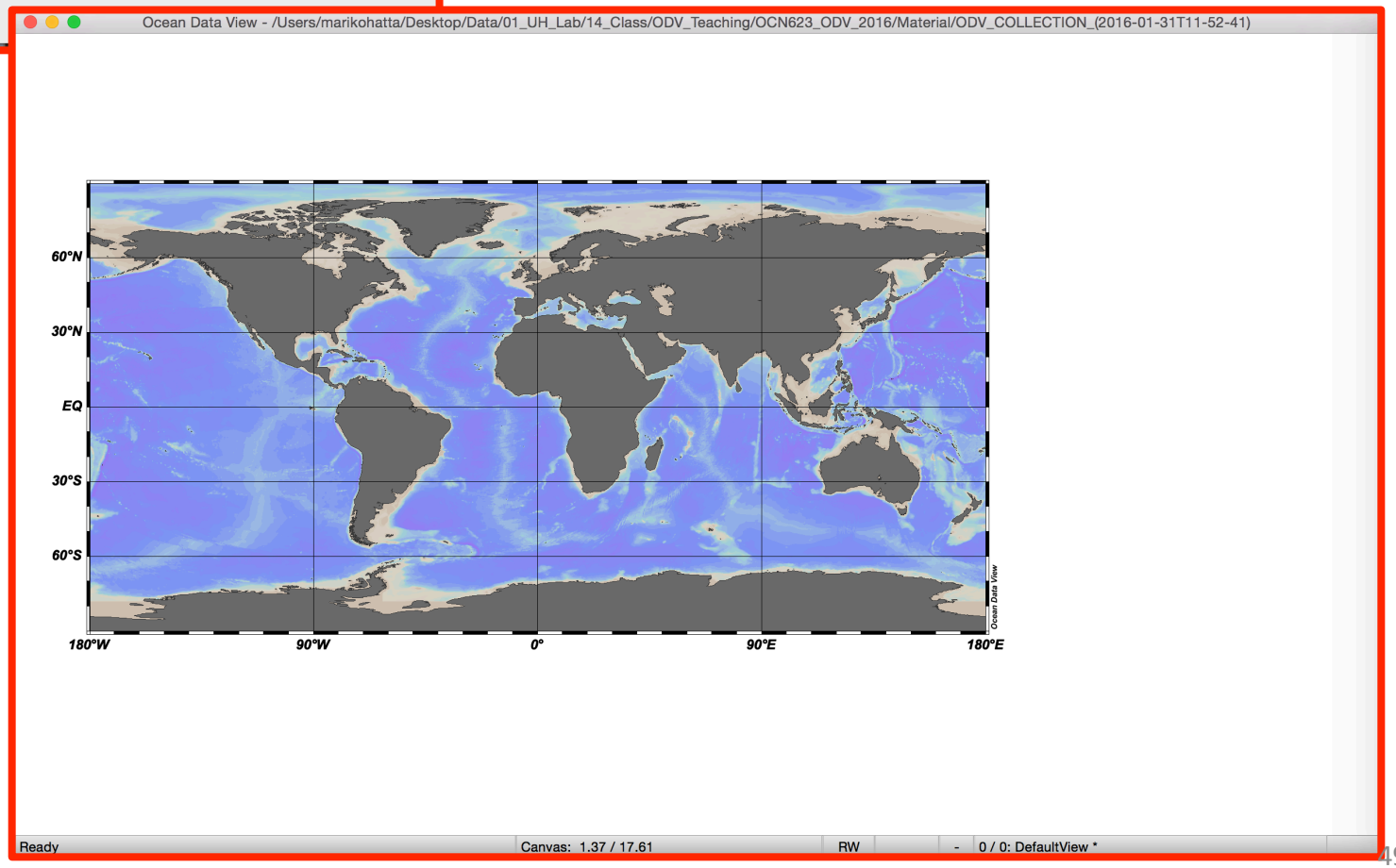
(3)



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

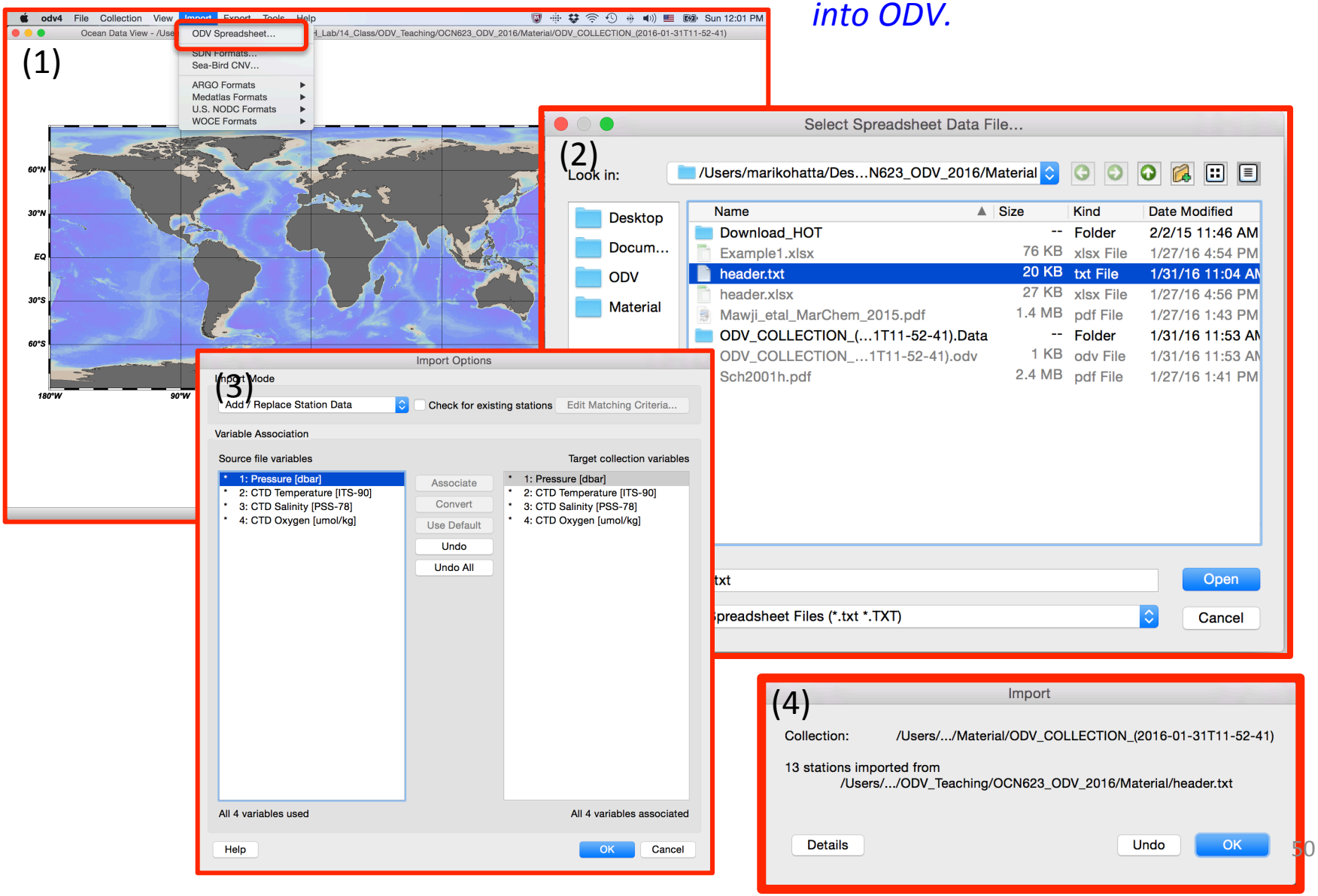


Now you made a new ODV file with your parameters in the header. Next, you have to import your data!



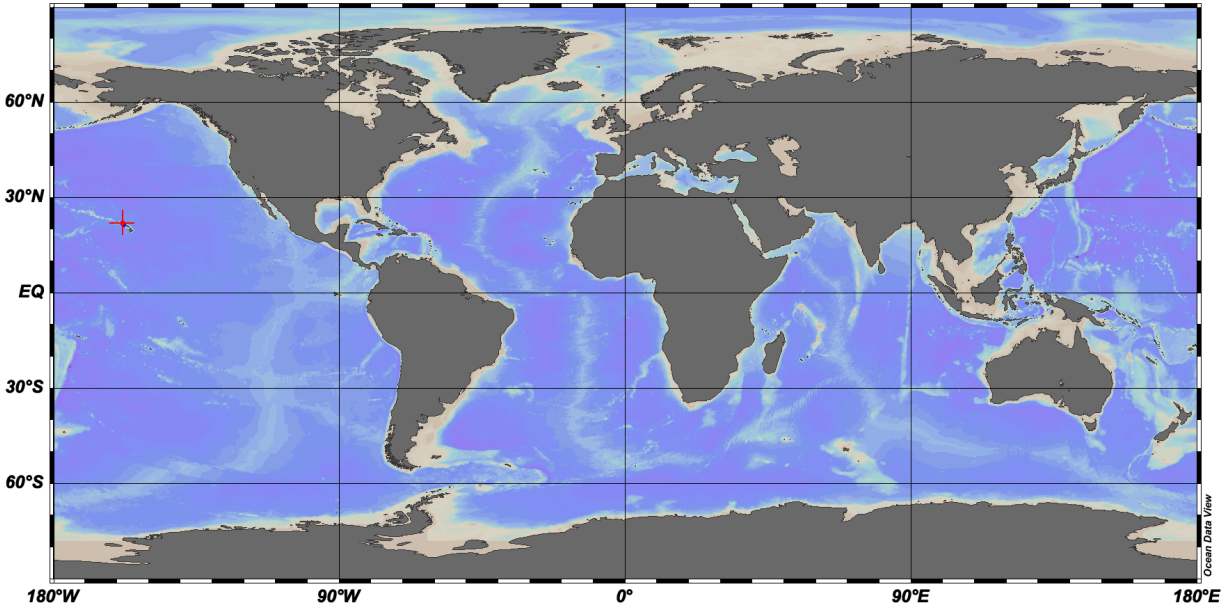
3. Click “Import”, and select “ODV spreadsheet” and select the txt file that you made.

This step actually imports your data into ODV.



Now you can see your data on the screen!

Use a magnifying glass!



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]	

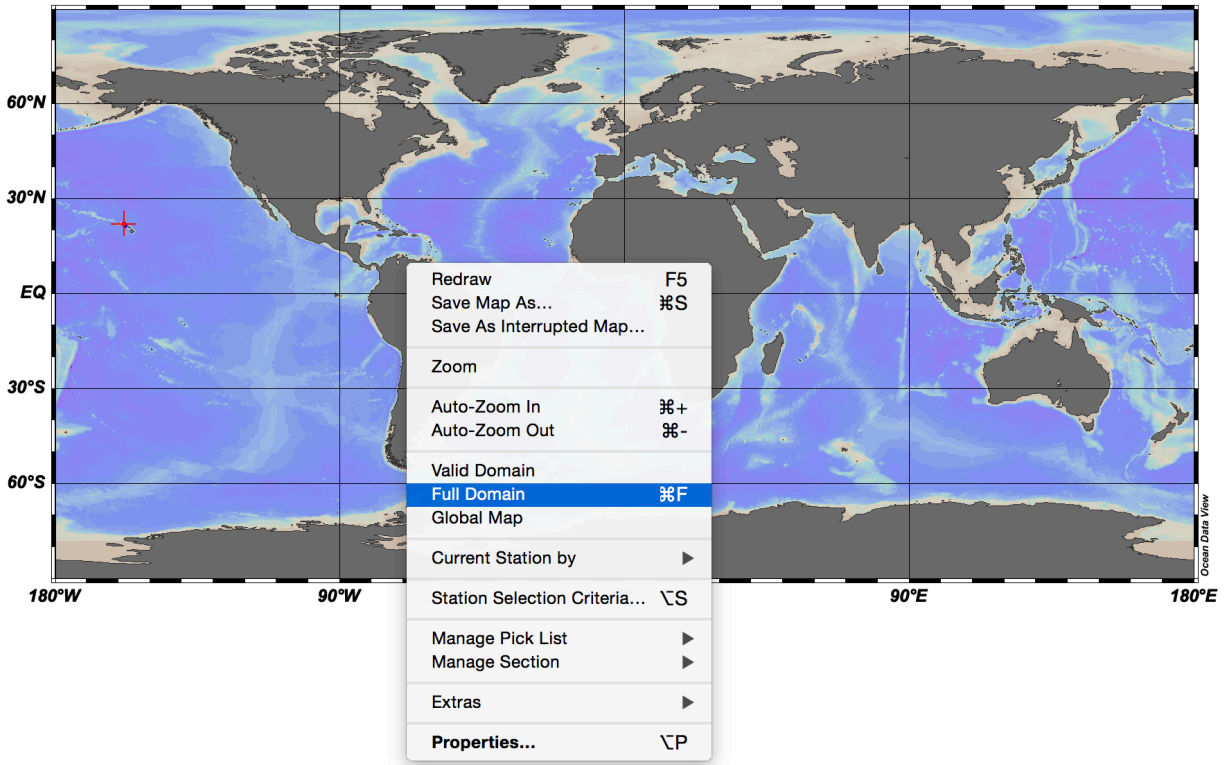
Sample: 1 / 10

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]	

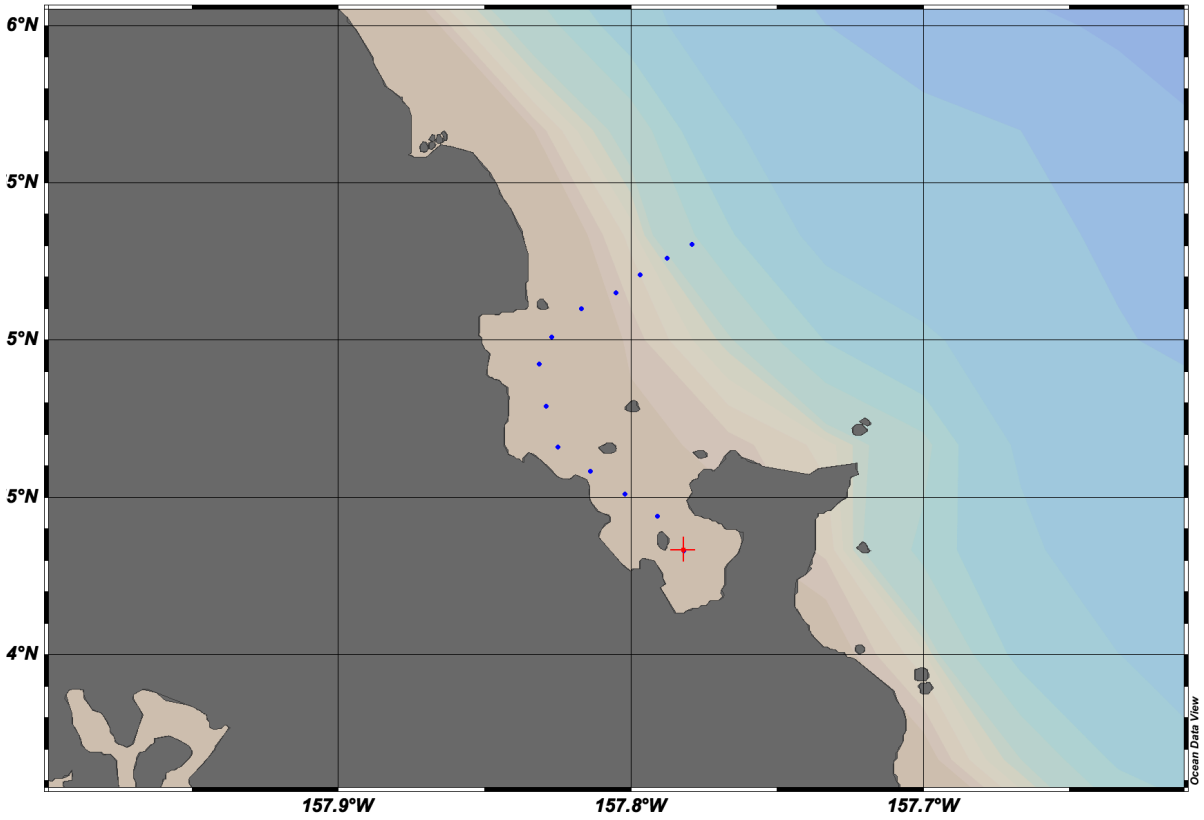
Sample: 1 / 10

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]	

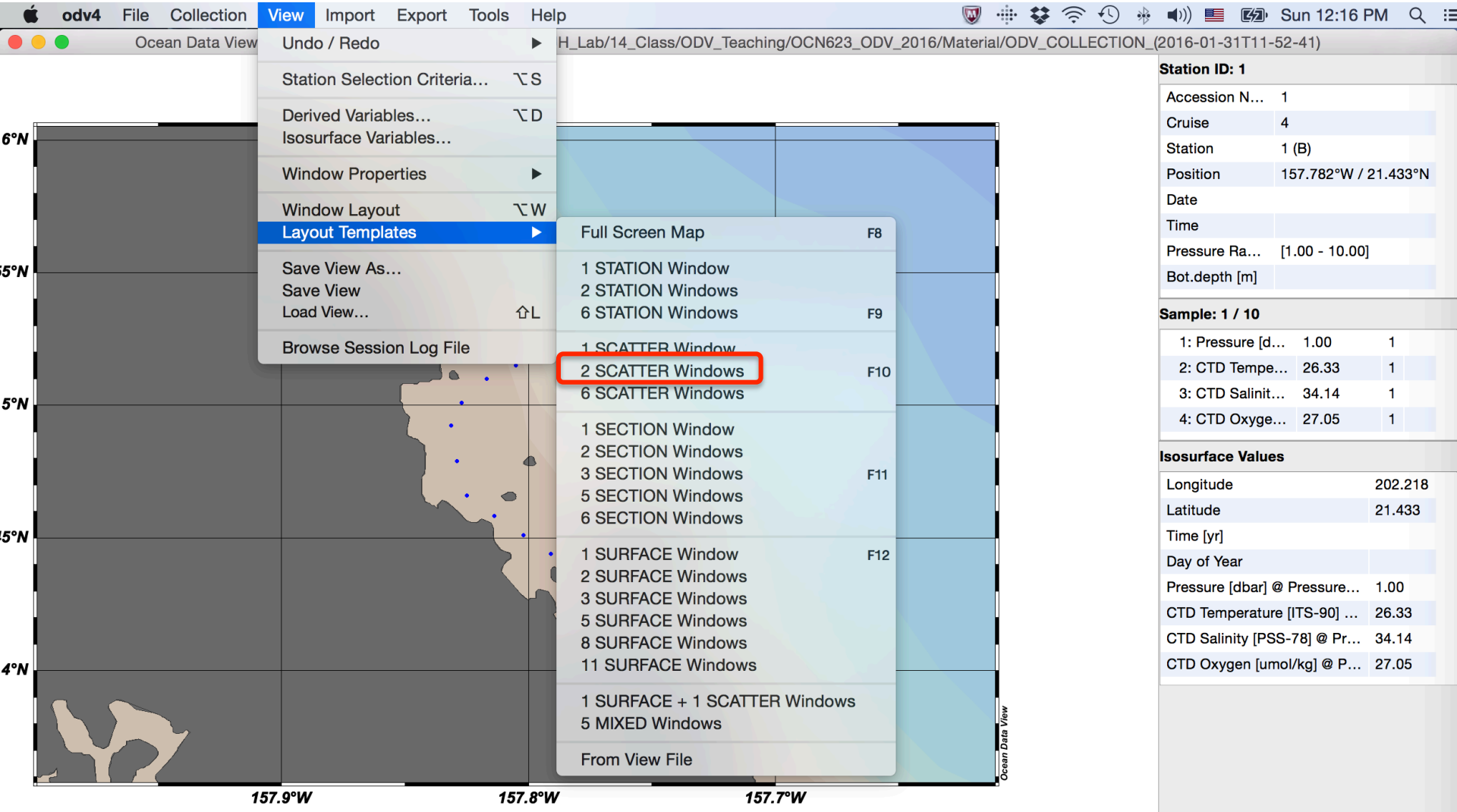
Sample: 1 / 10

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

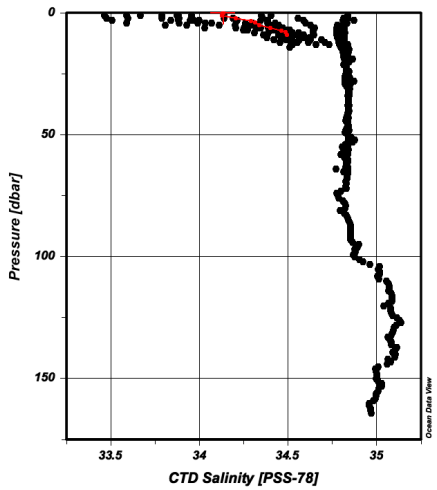
Isosurface Values

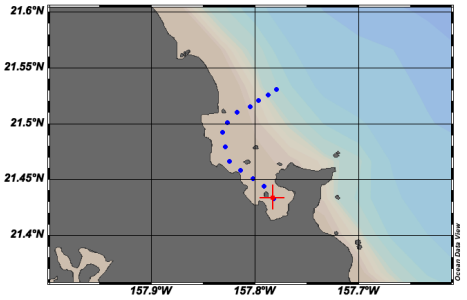
Longitude	202.218
Latitude	21.433
Time [yr]	
Day of Year	
Pressure [dbar] @ Pressure…	1.00
CTD Temperature [ITS-90] …	26.33
CTD Salinity [PSS-78] @ Pr…	34.14
CTD Oxygen [umol/kg] @ P…	27.05

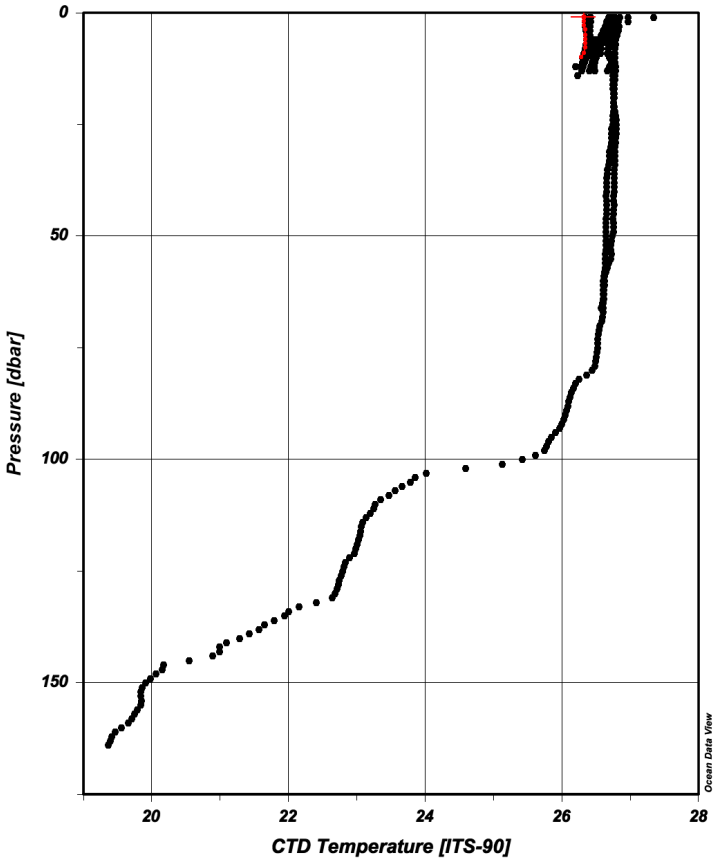
Let’s make “2 scatter windows” using Layout Templates



“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]	

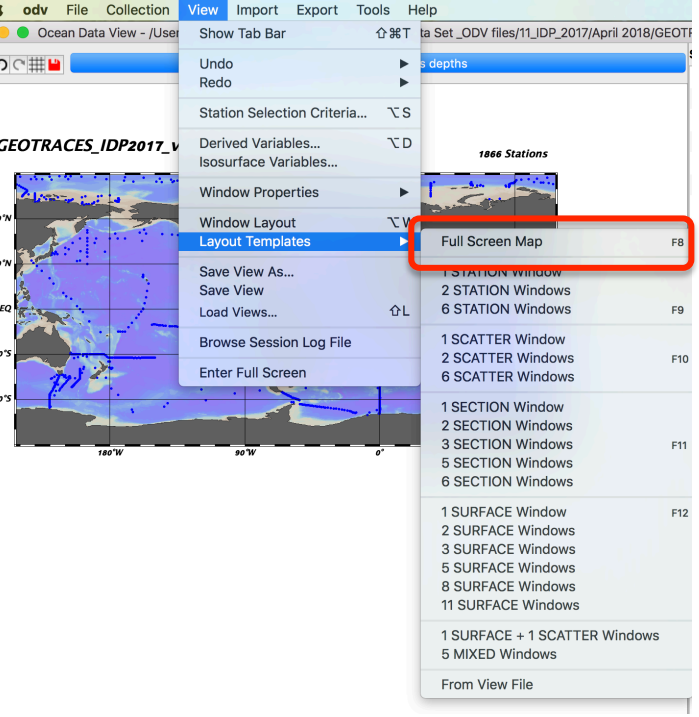
Sample: 1 / 10

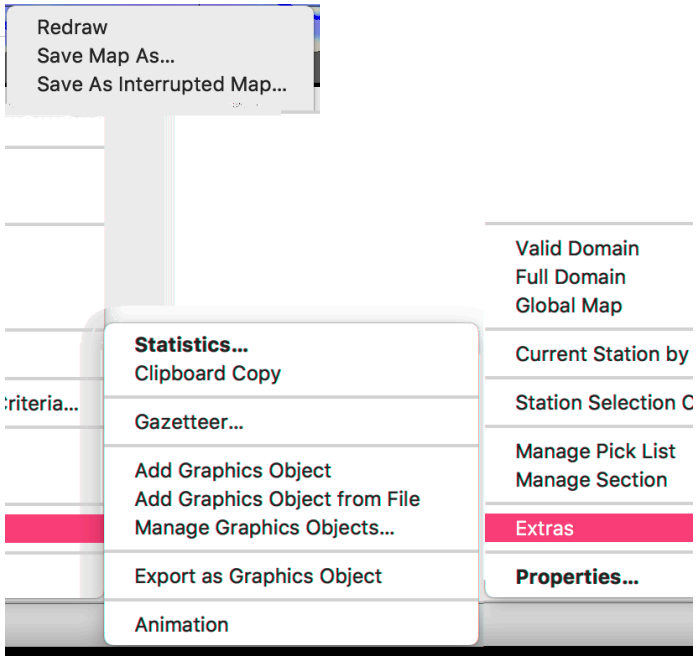
1: Pressure [d…	1.00	1
2: CTD Tempe…	26.33	1
3: CTD Salinit…	34.14	1
4: CTD Oxyge…	27.05	1

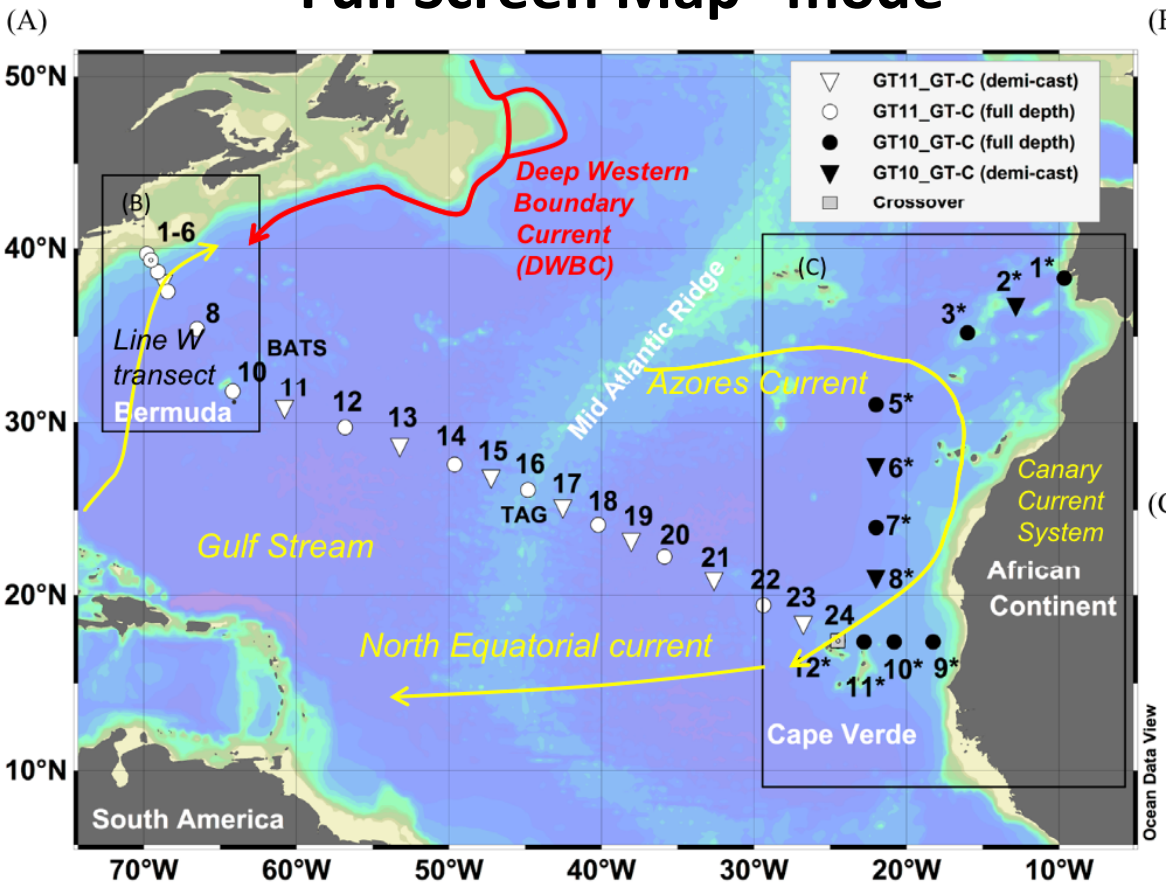
Isosurface Values

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





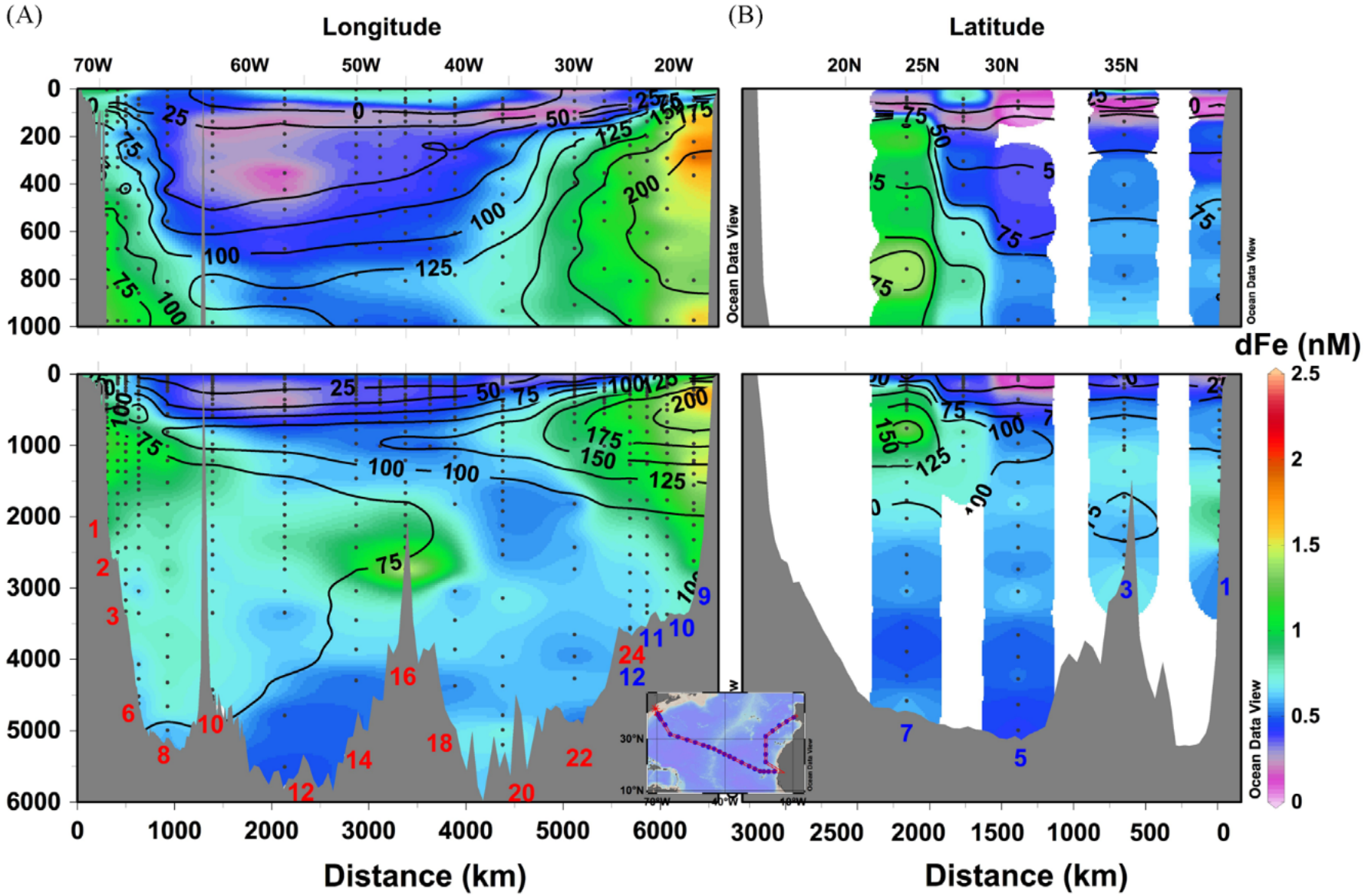


Hatta et al., 2014 & Measures et al., 2014

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

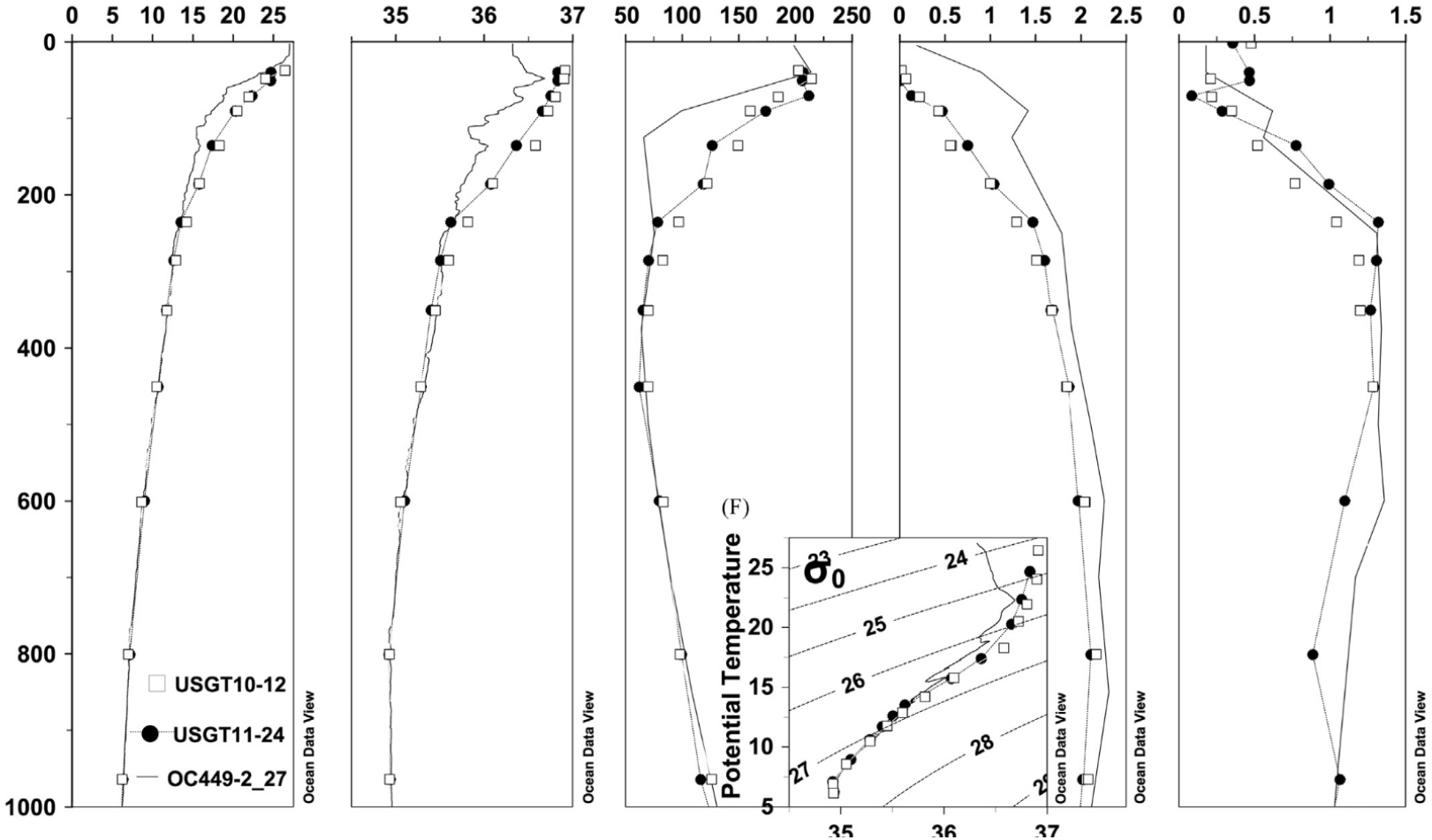
Fe distributions along the track overlaid with the AOU value as contour

“Section Windows” mode



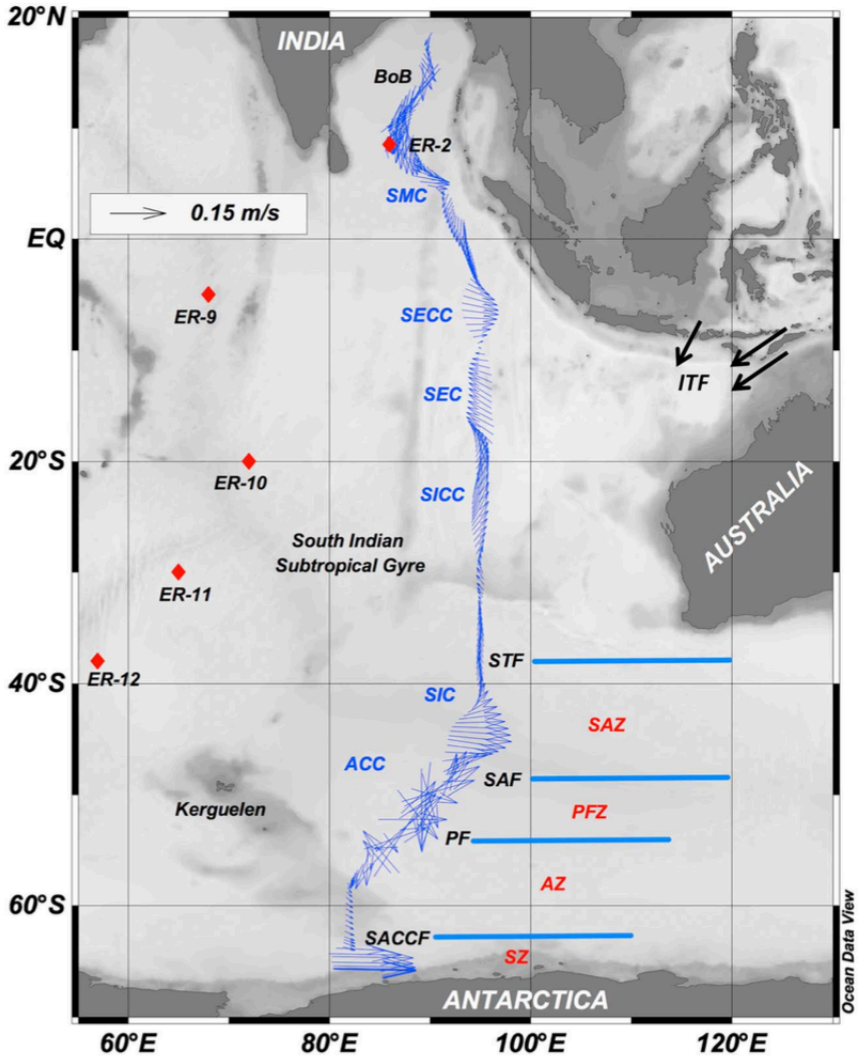
Hatta et al., 2014

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



Hatta et al., 2014

“SURFACE Windows” mode

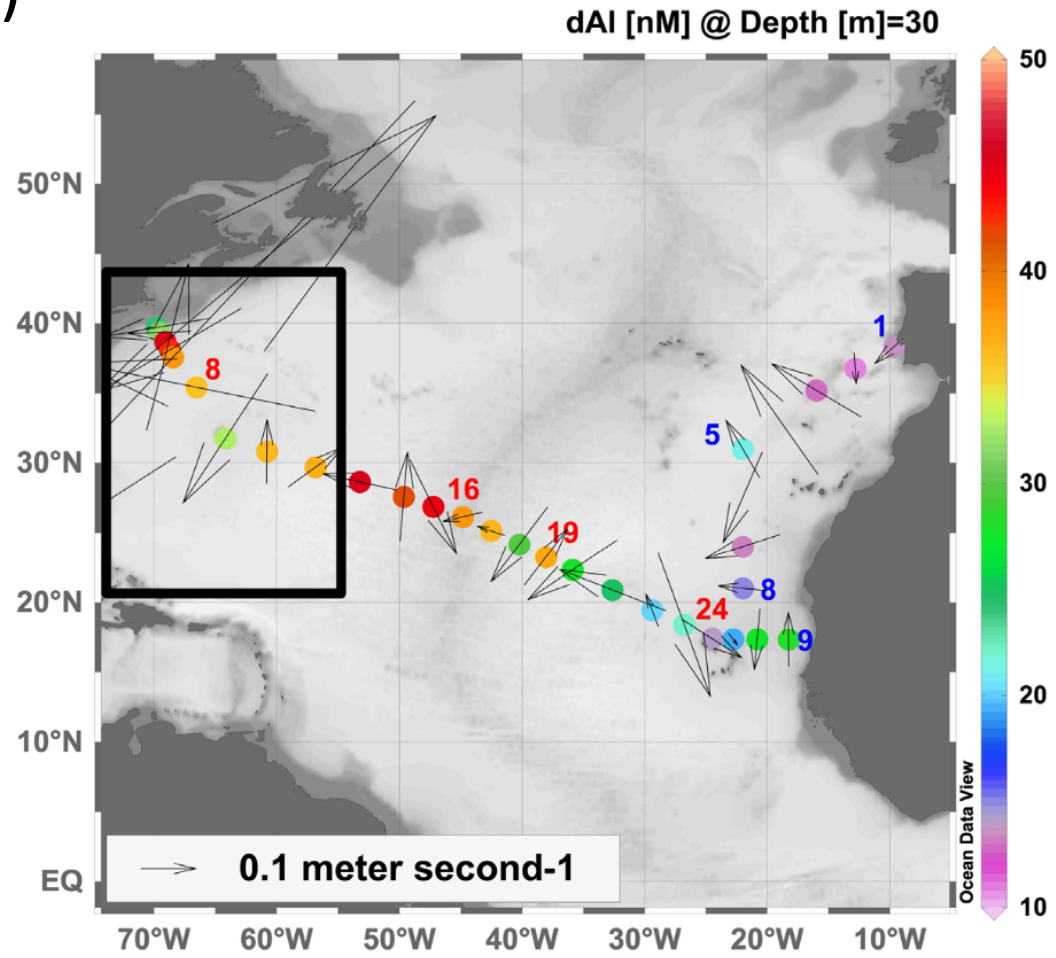


ADCP data during the cruise

Grand et al., 2015

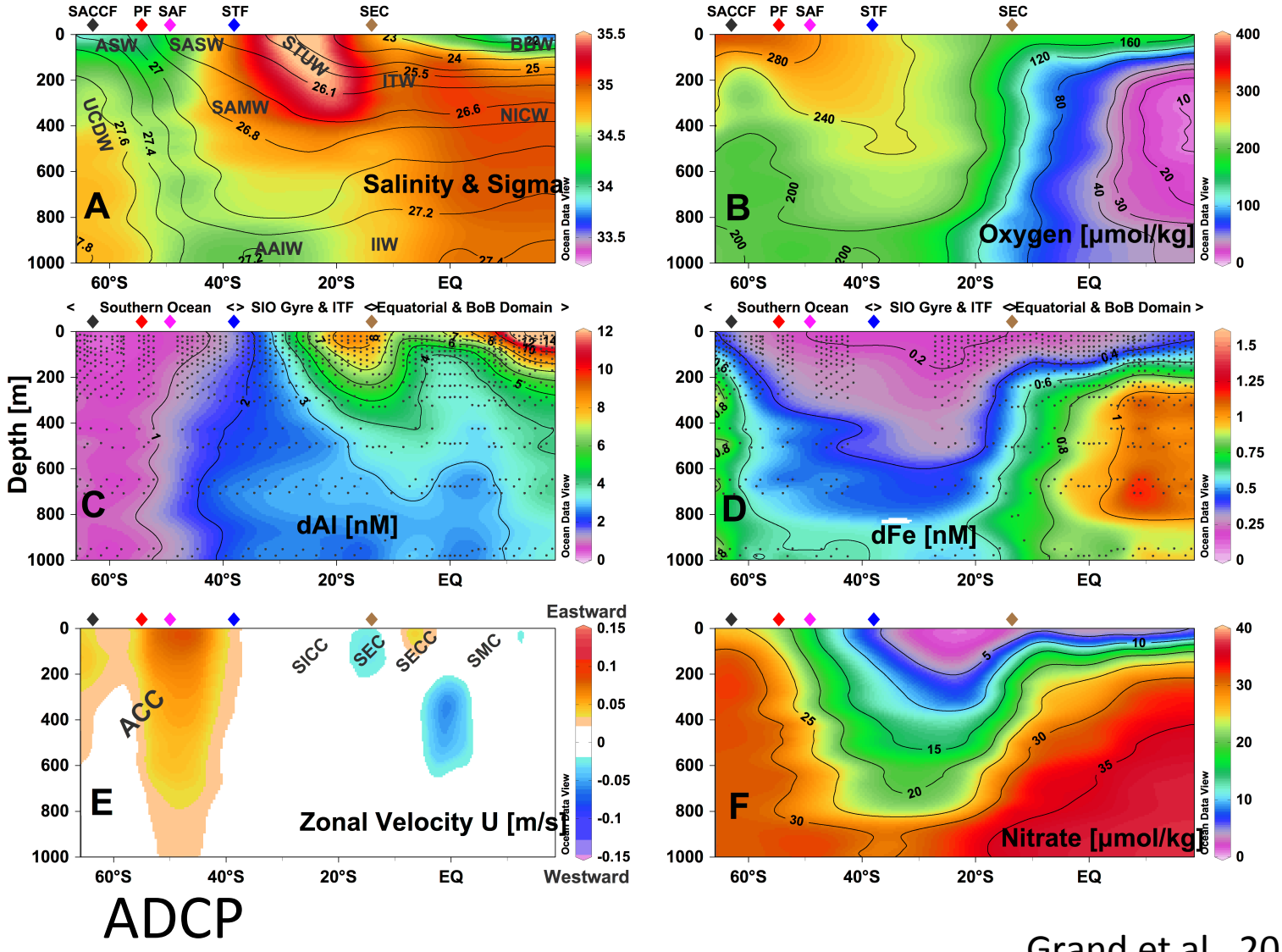
“SURFACE Windows” mode

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



Measures et al., 2014

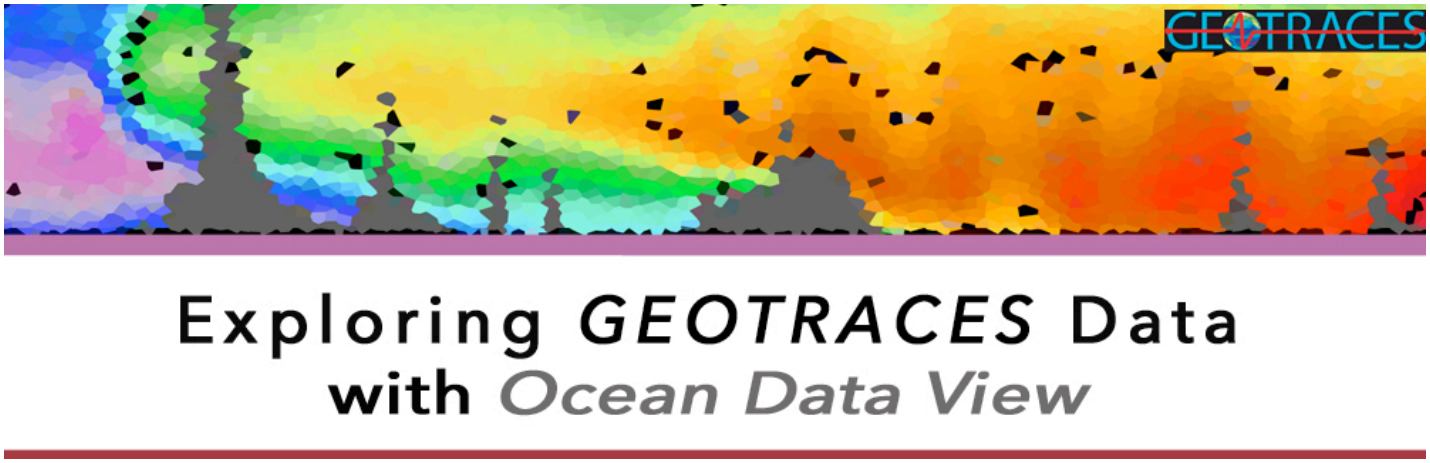
Temperature overlaid with Salinity



ADCP

Grand et al., 2015

Goldschmidt meeting 2016



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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