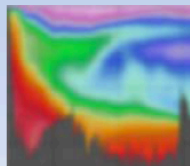


# How to use ODV

## Ocean Data View



<https://odv.awi.de>

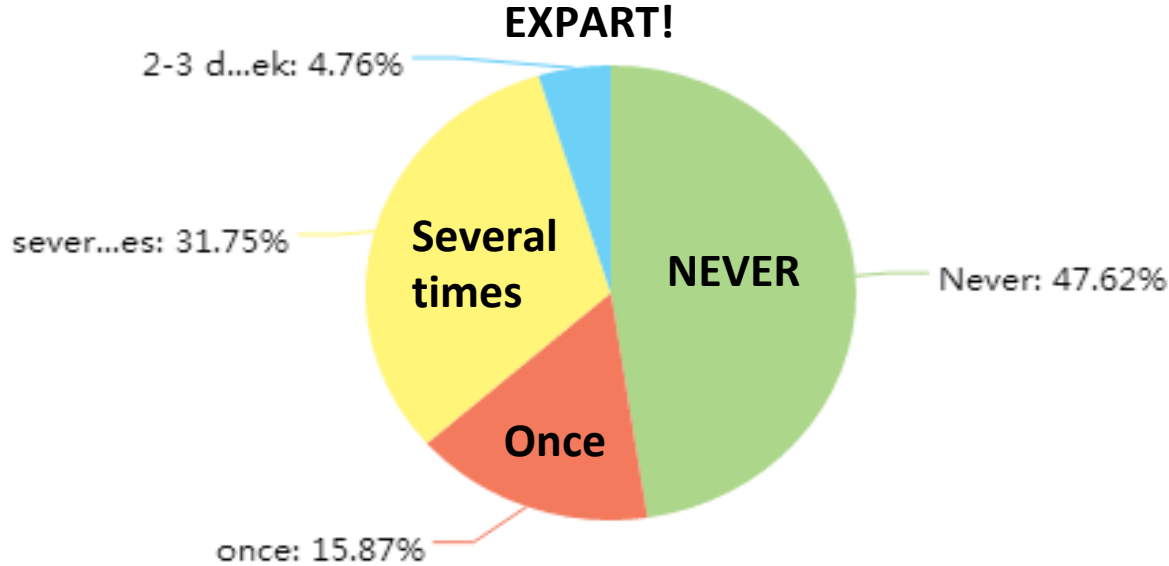
© 2018 Reiner Schlitzer

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

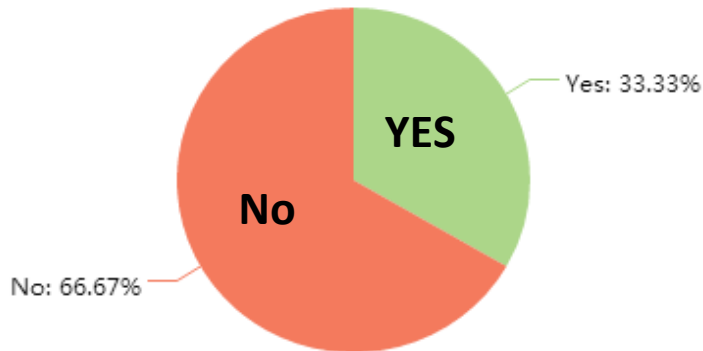
<http://odv.awi.de/>

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

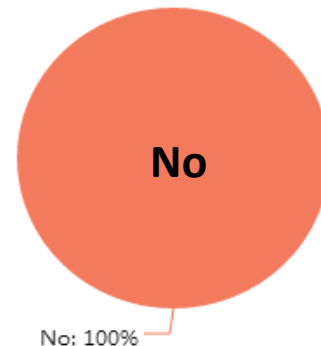
# Have you ever used ODV software before?

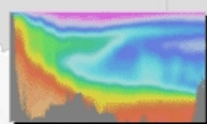


**Have you ever created own data spreadsheet for ODV and import into ODV?**



**Have you ever imported netCDF format data file into ODV?**





# What is ODV?

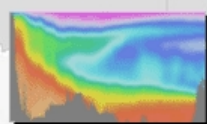
- “Ocean Data View (ODV) is a software package for the interactive exploration, analysis and visualization of oceanographic and other geo-referenced profile, time-series, trajectory or sequence data. ODV runs on Windows, Mac OS X, Linux, and UNIX (Solaris, Irix, AIX) systems. ODV data and configuration 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..**

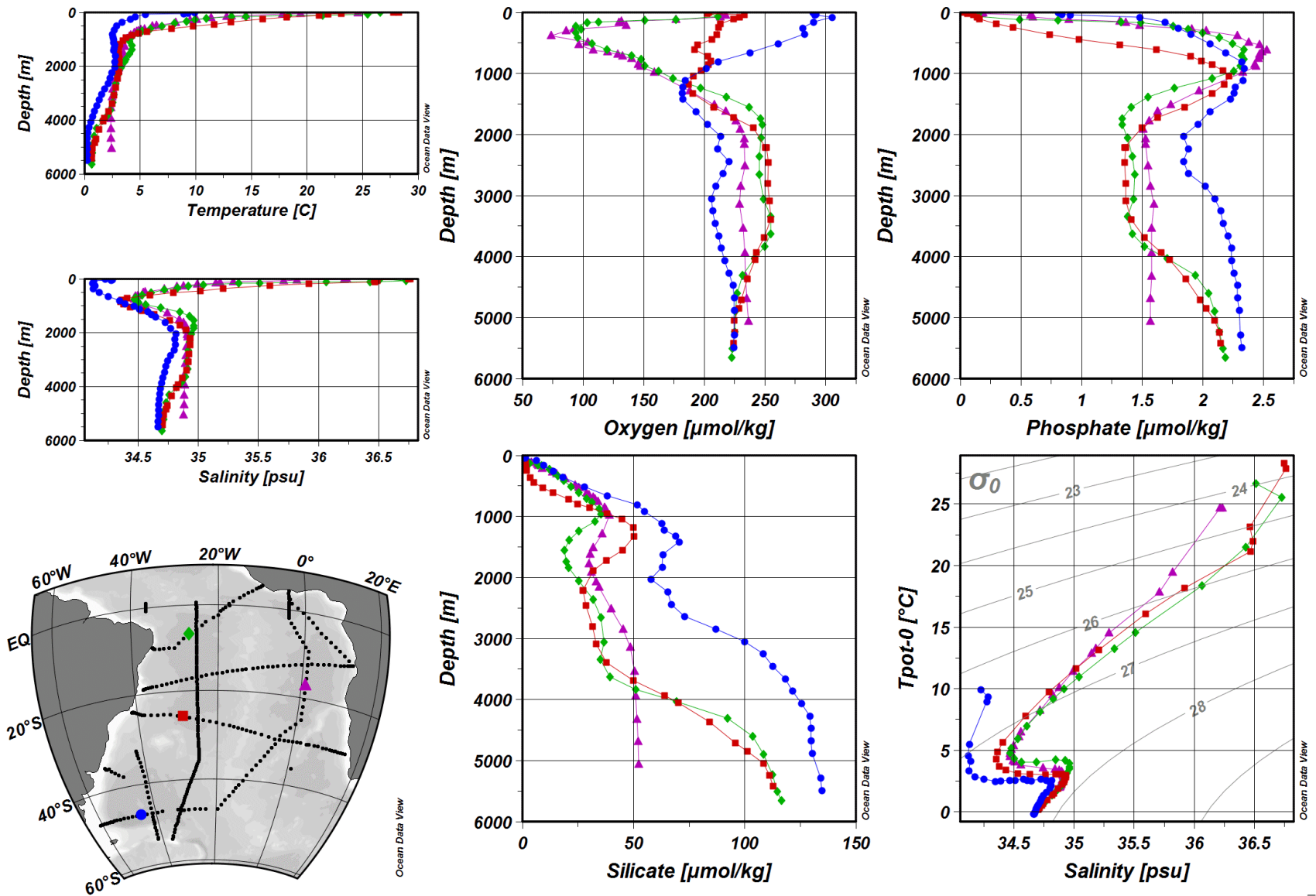


# What can you do with ODV?

- [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.](#)

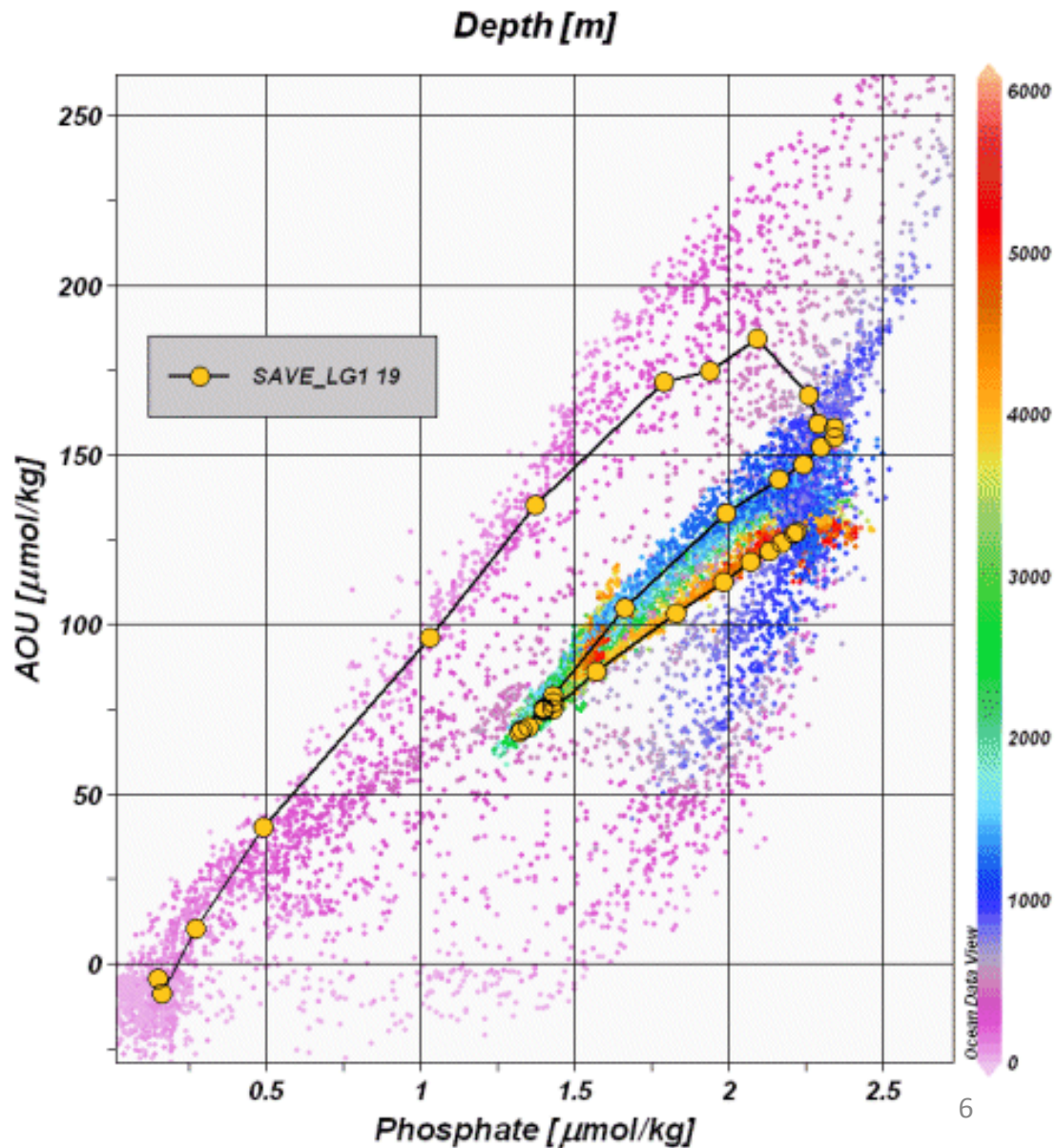
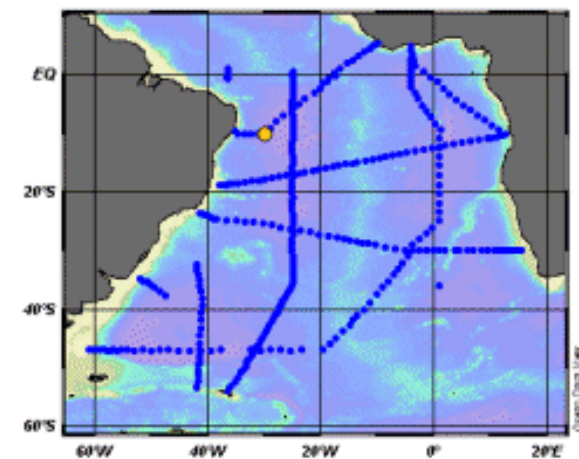
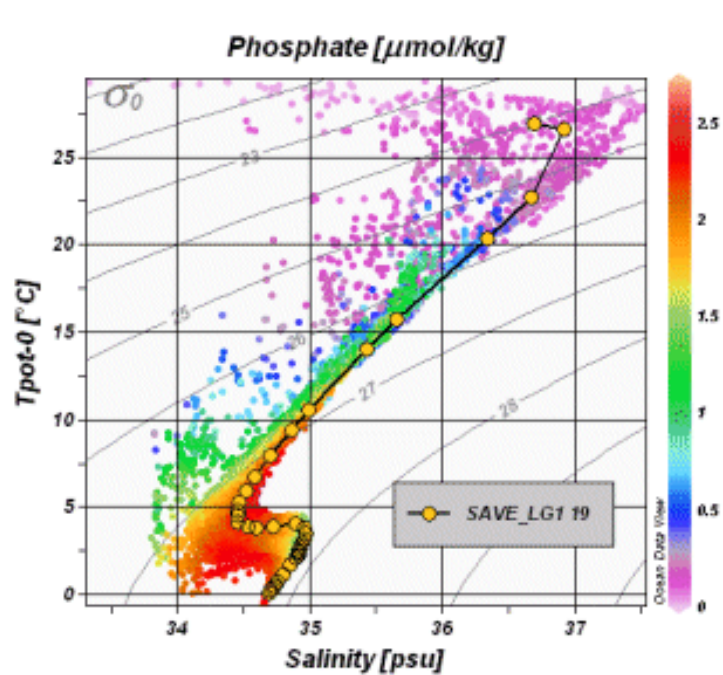


# Example. property/property plots of selected stations



**Example.**

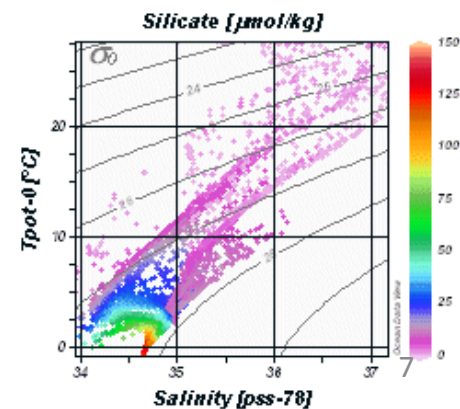
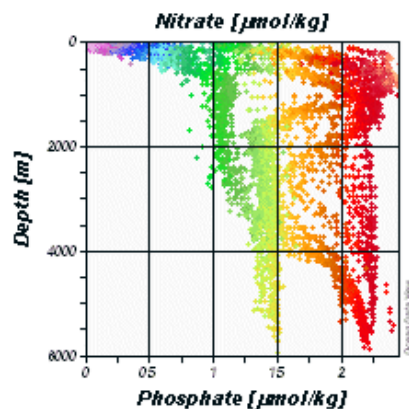
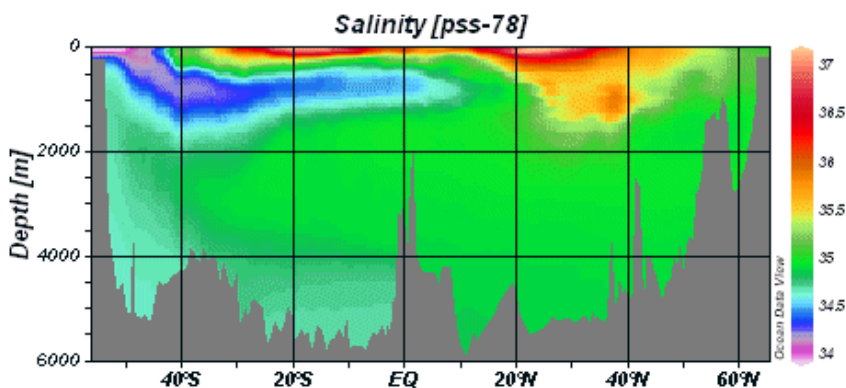
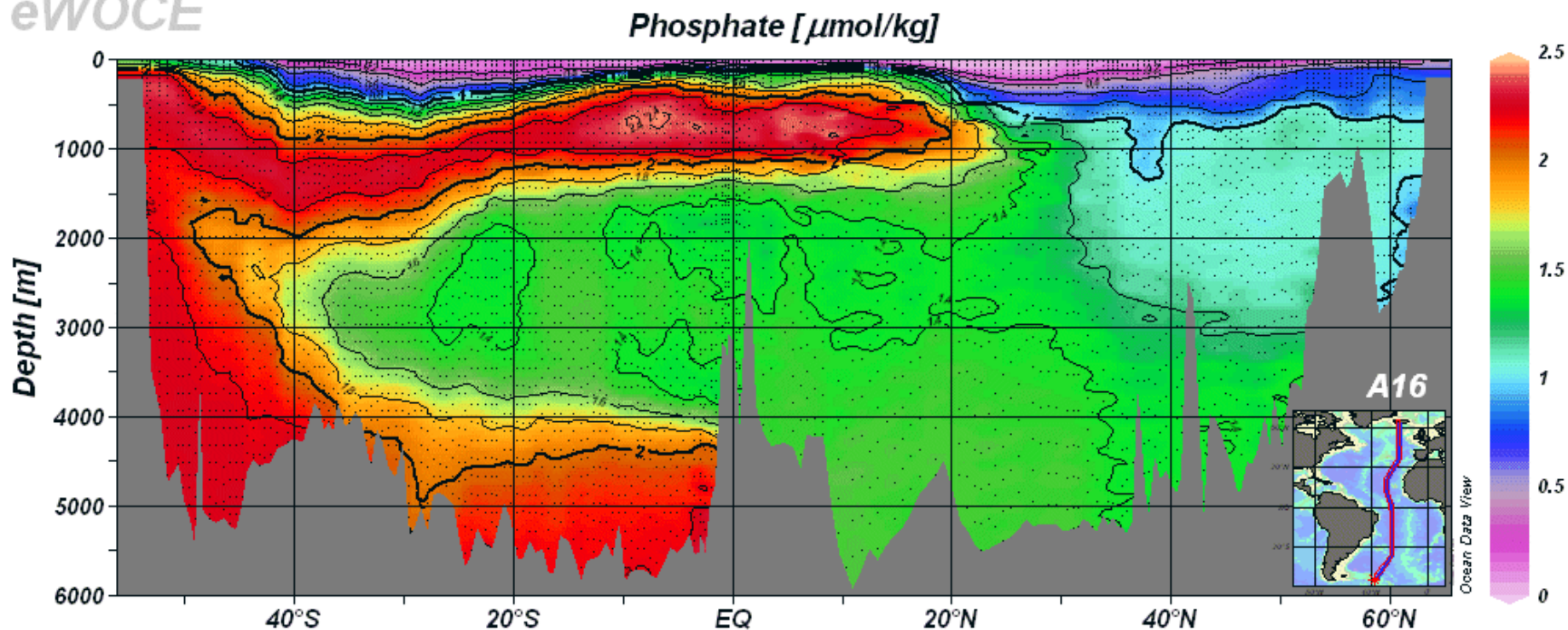
scatter plots for sets of stations





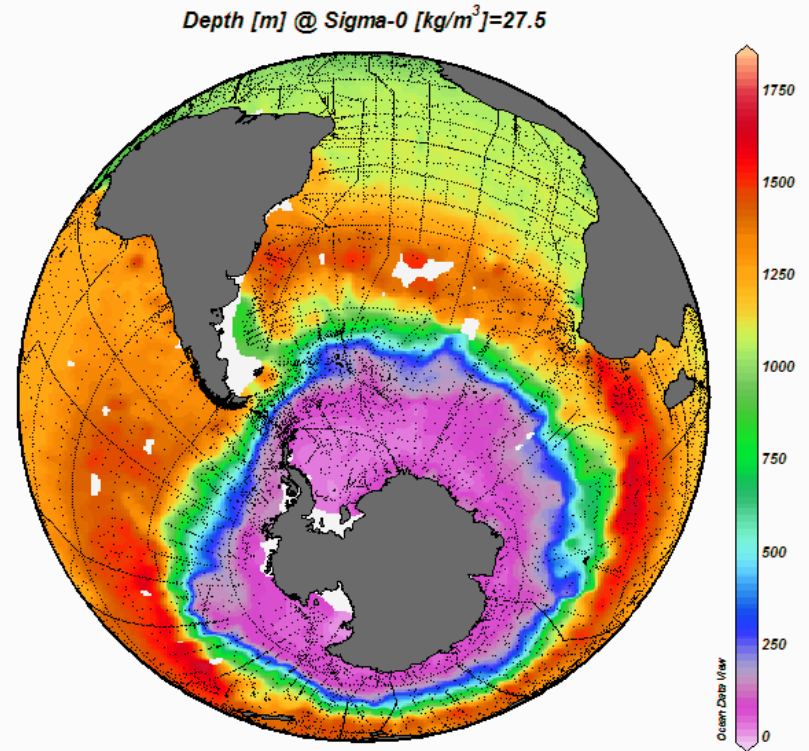
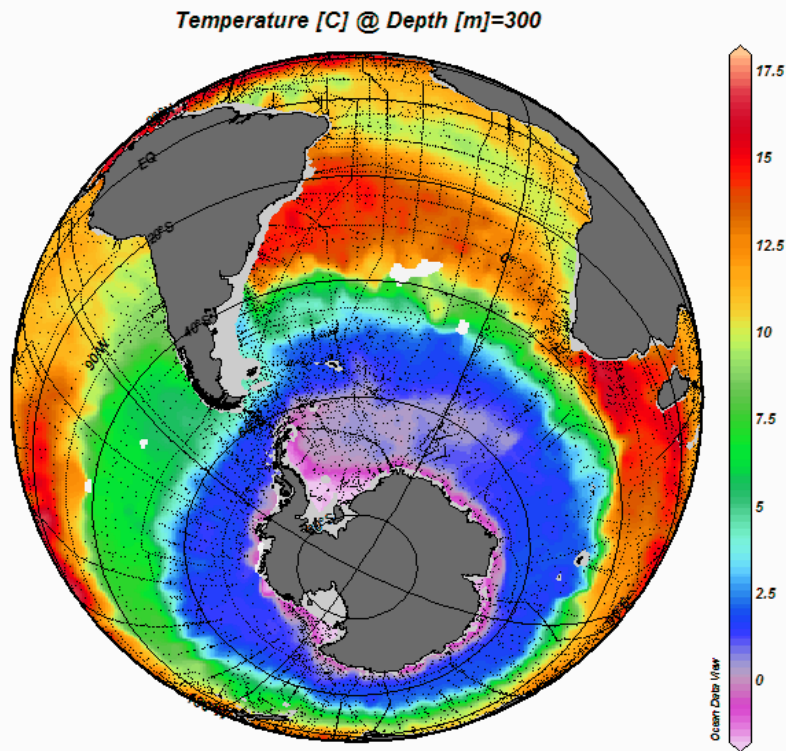
**Example.** color sections along arbitrary cruise tracks

eWOCE



**Example.**

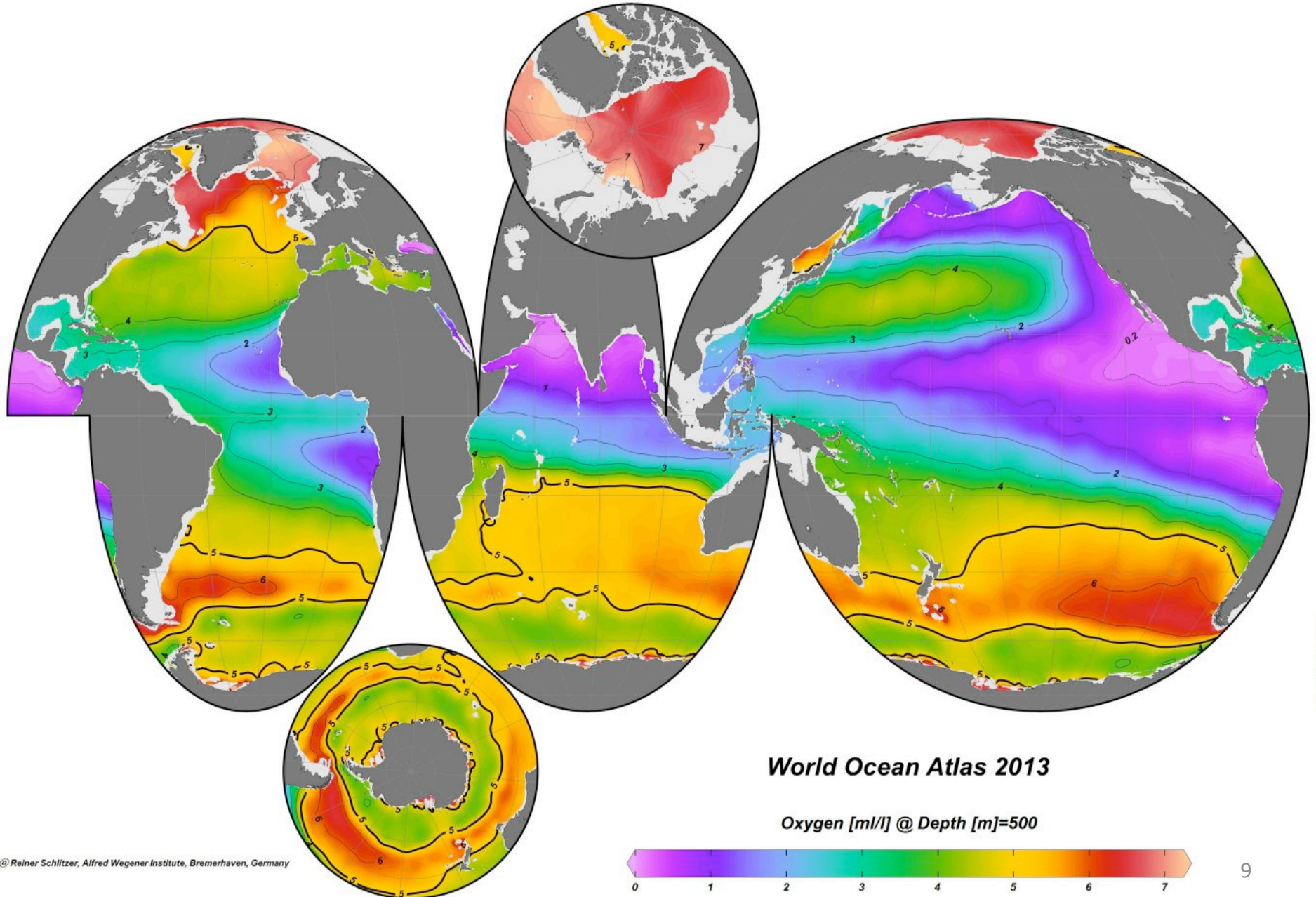
color distributions on general isosurfaces





**Example.**

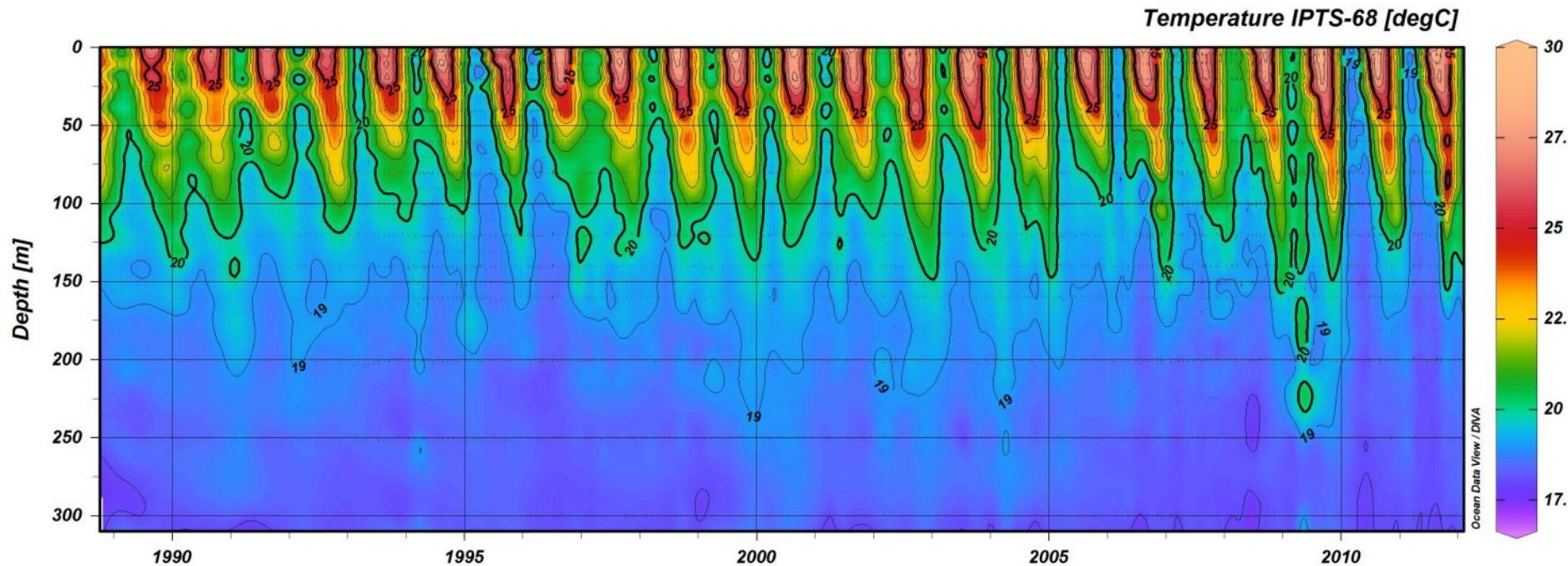
interrupted maps



**Example.**

# temporal evolution plots of tracer fields

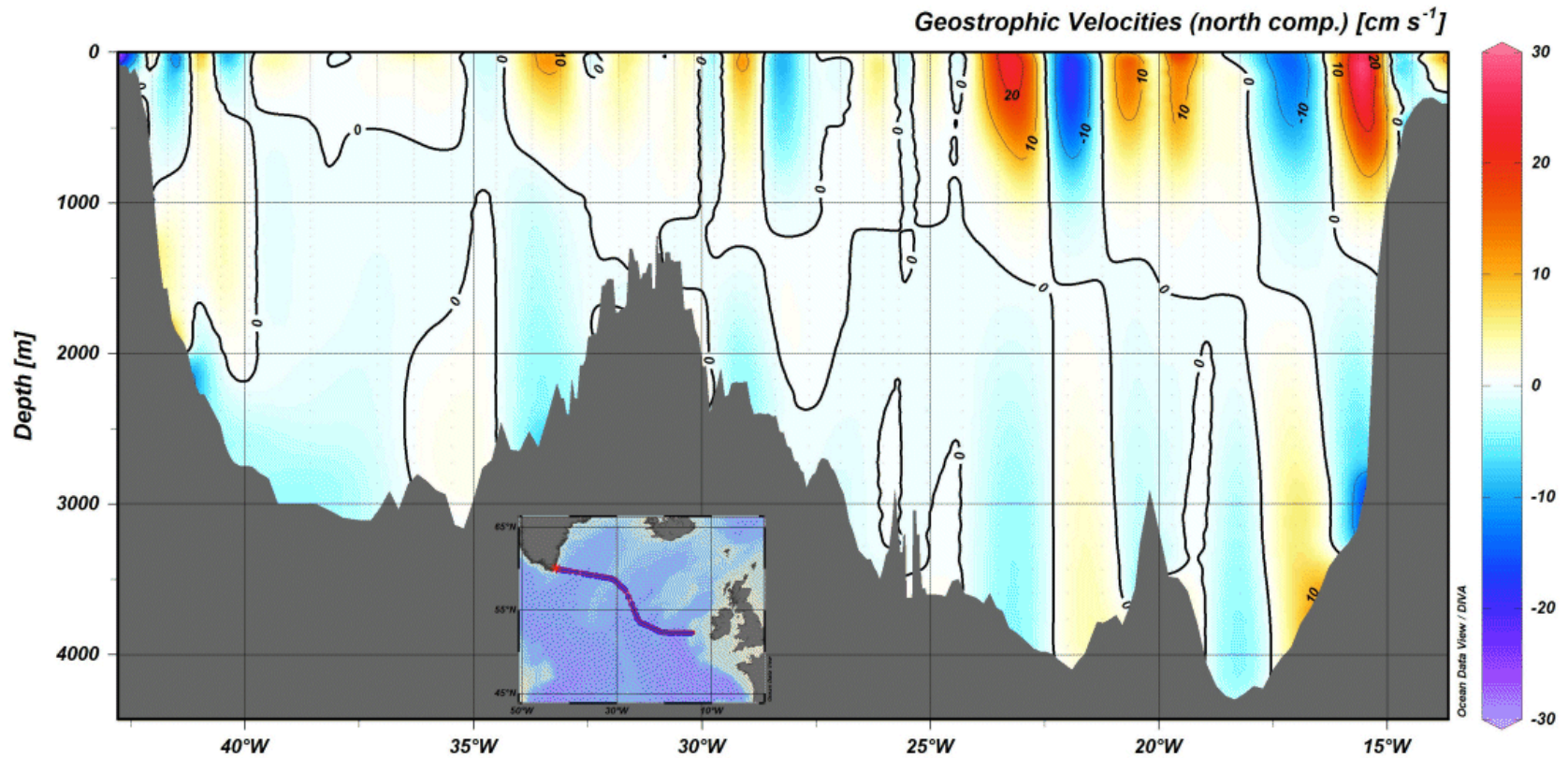
- Time-series data at BATS station





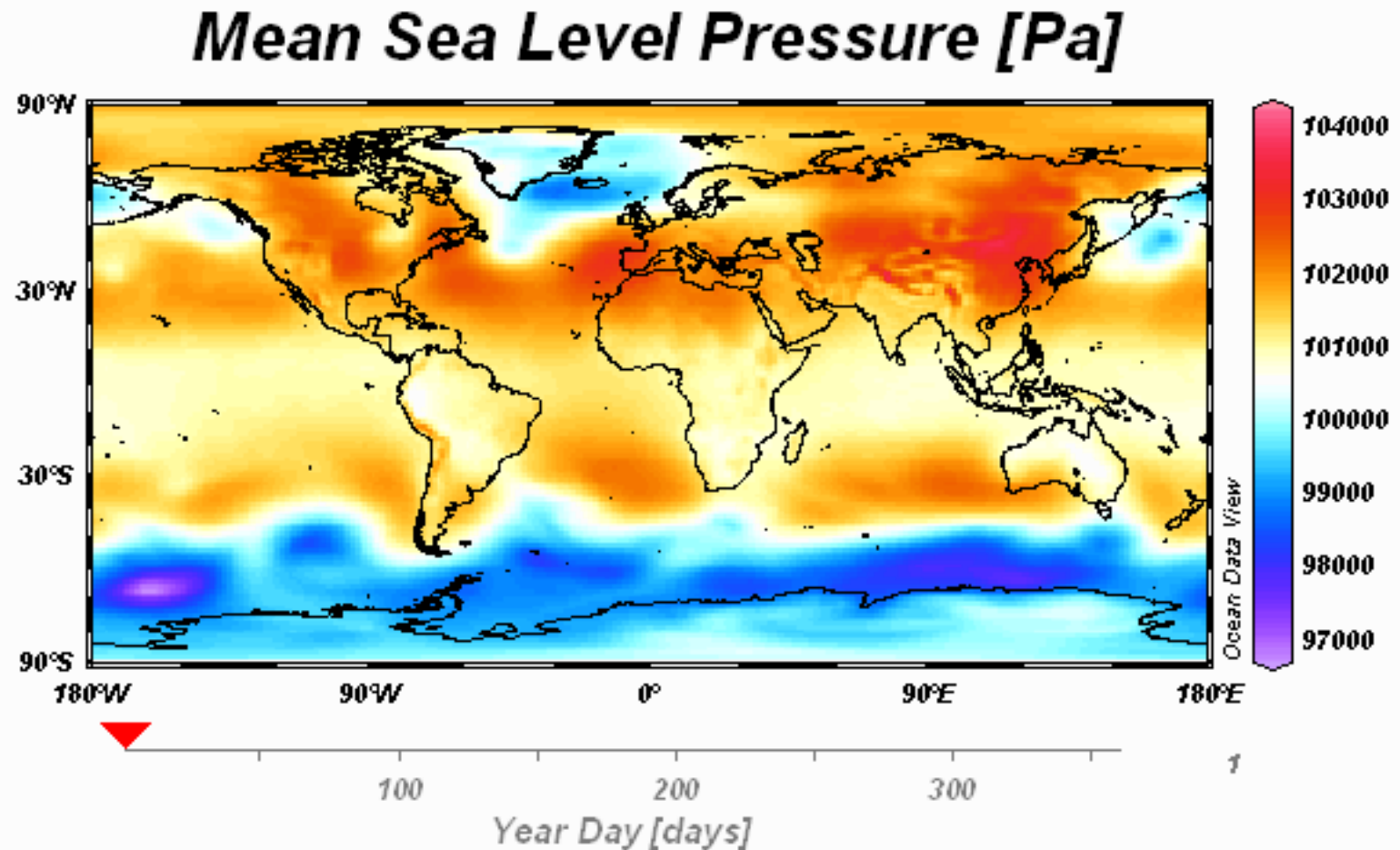
**Example.**

## Geostrophic velocity sections



**Example.**

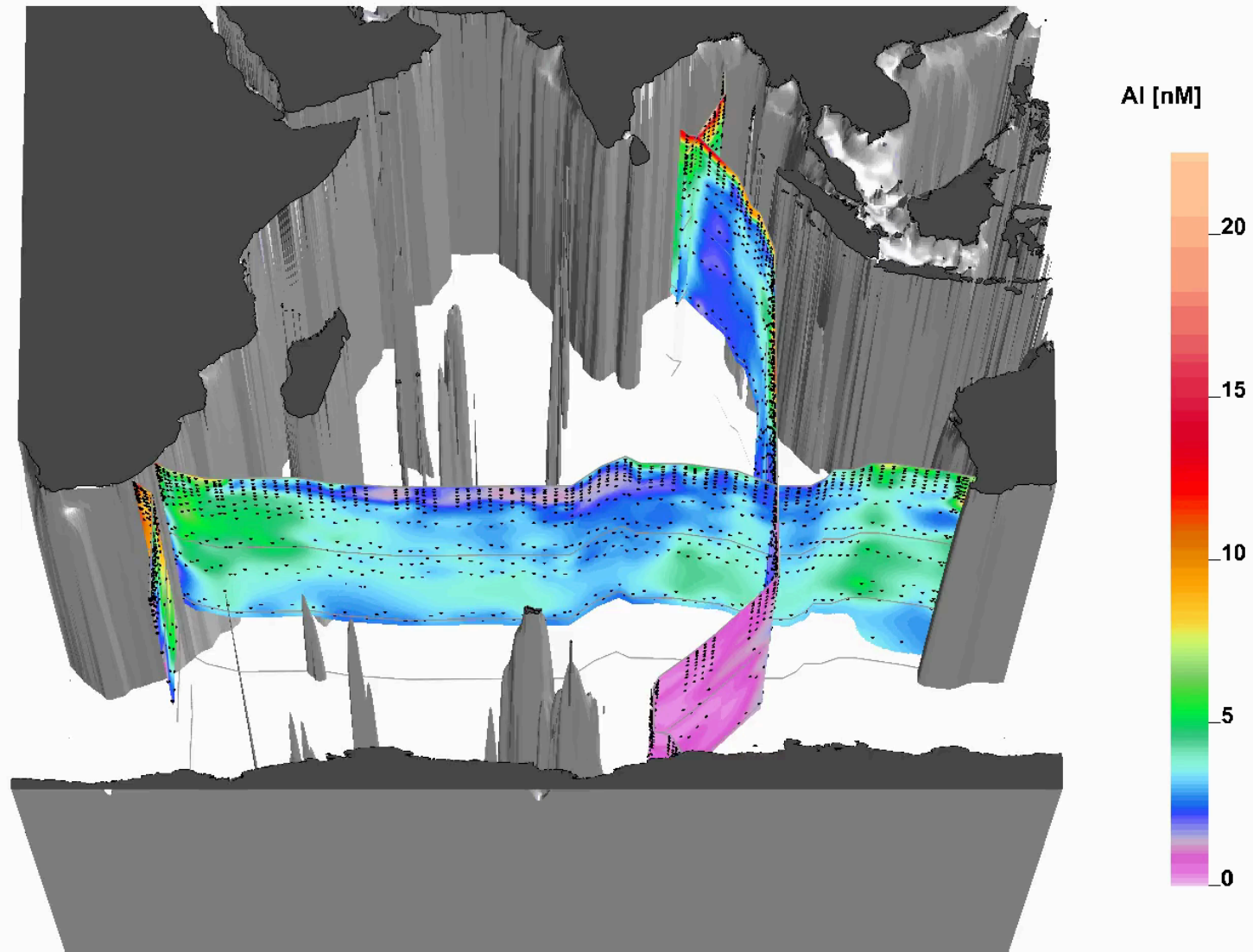
animations





**Example.**

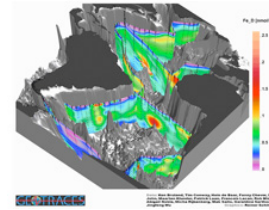
animation 2



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

**Example.**

animation 2



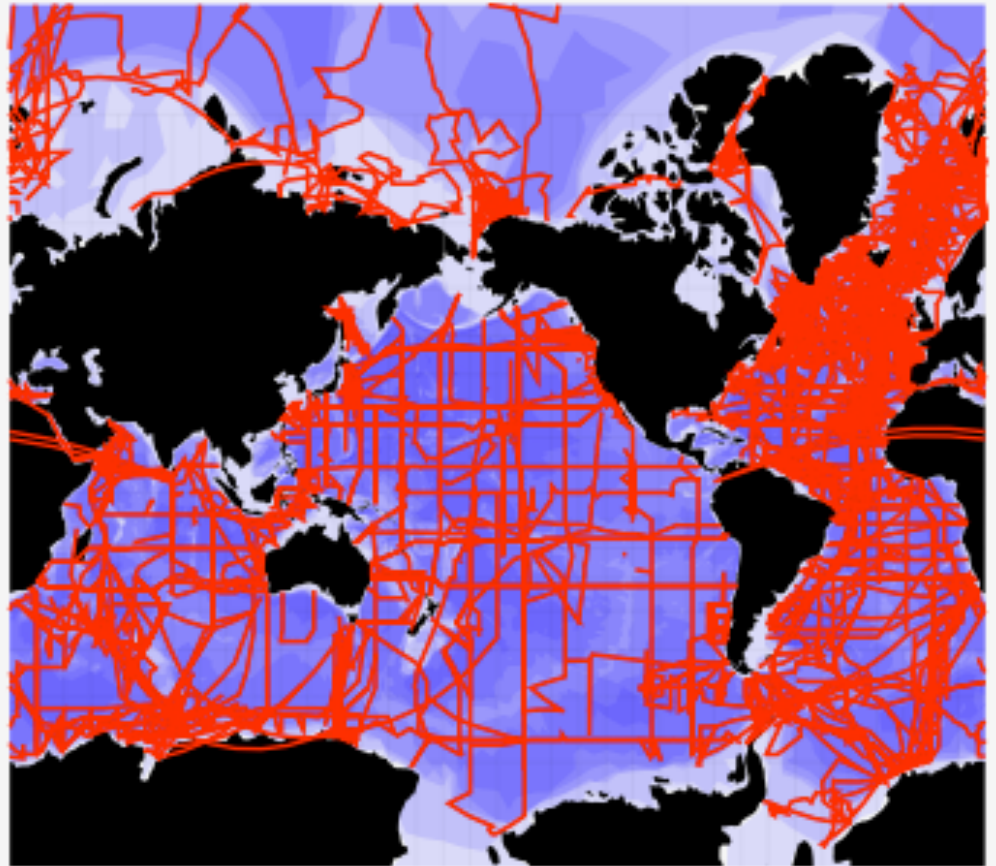
- <http://www.geotrases.org/dp/idp2014>



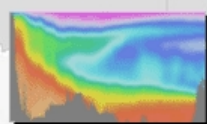
Data sets are able to be downloaded in ODV format  
- CCHDO website (<http://cchdo.ucsd.edu/>)

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>

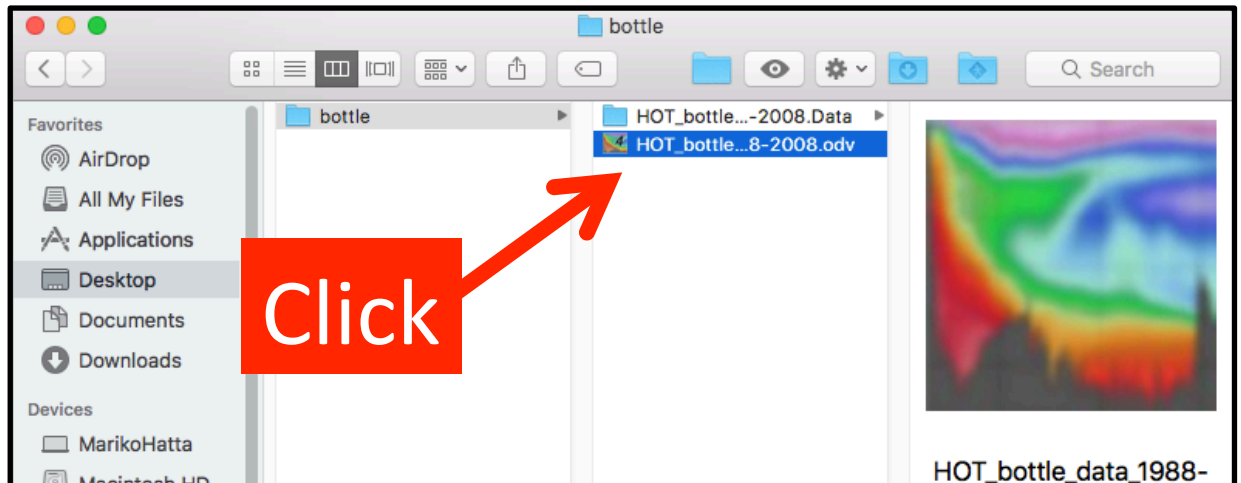
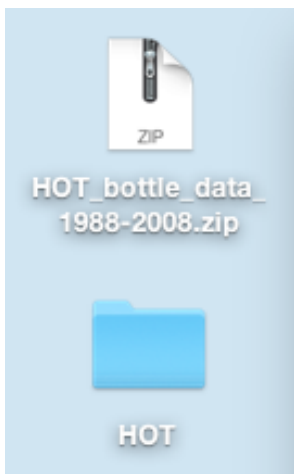


# Let's get started

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.



HOT\_bottle\_data\_1988-2008.odv

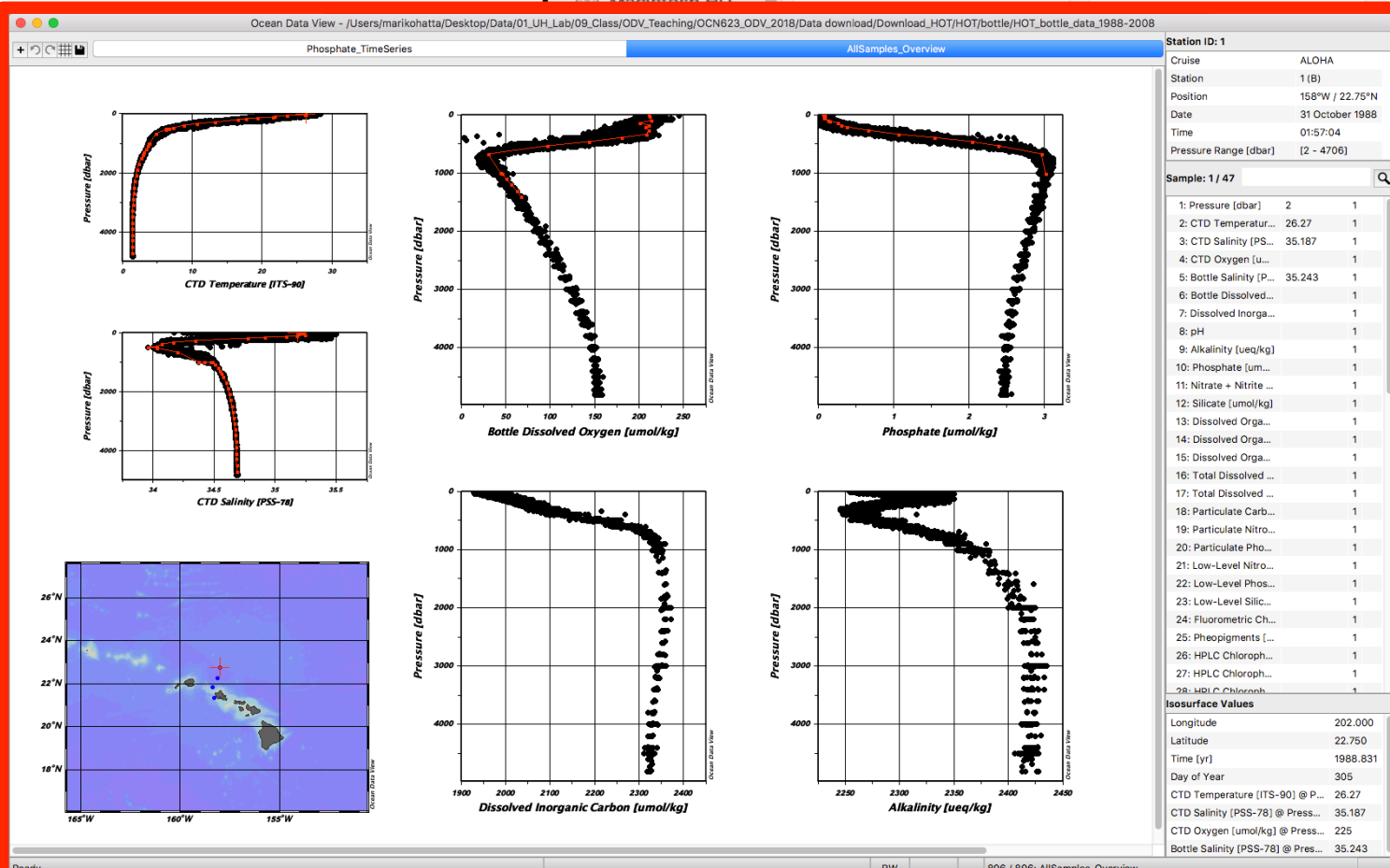
5 KB

Created 3/4/10, 8:51 AM

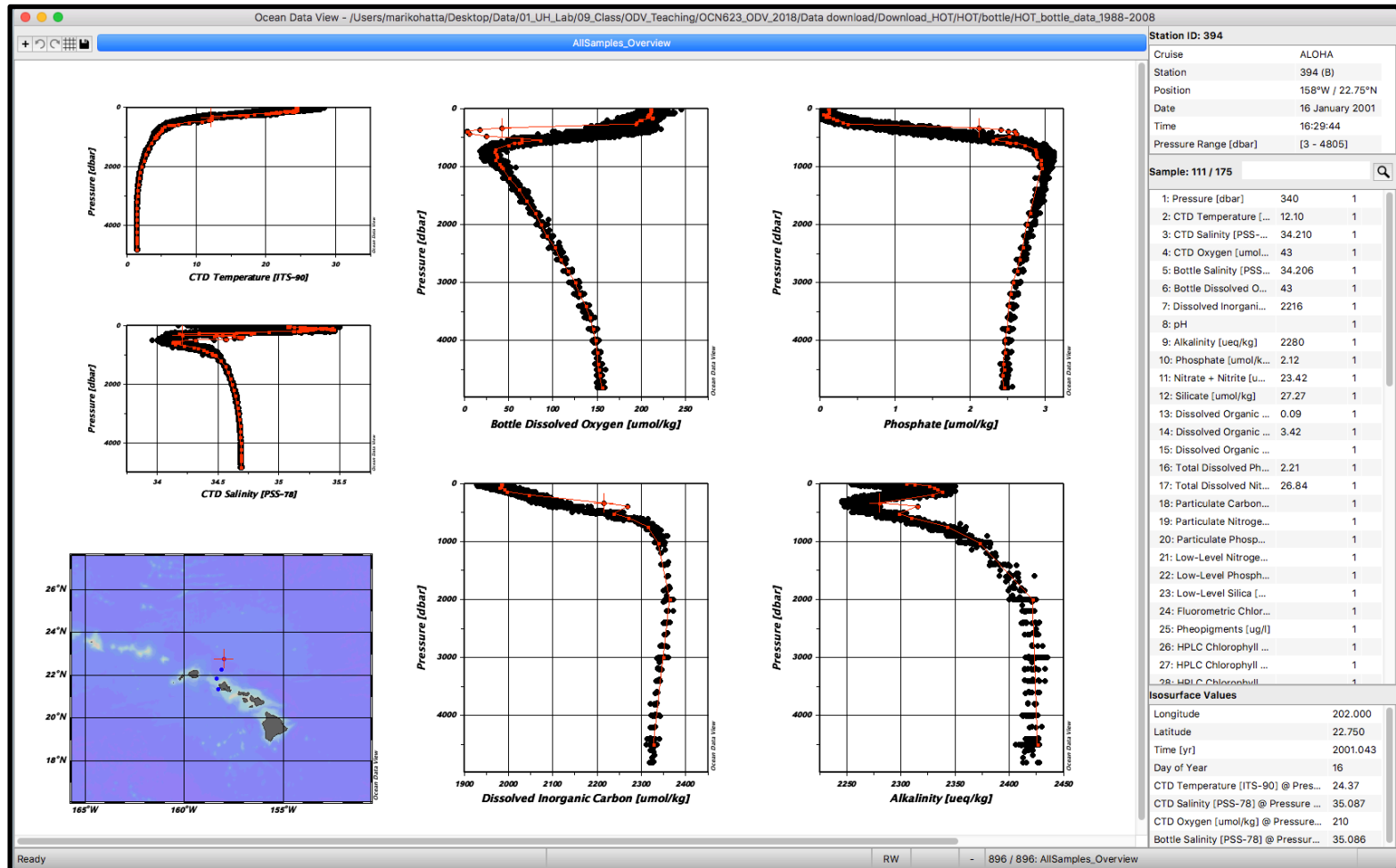
Modified 3/4/10, 8:51 AM

Last opened Today, 3:17 PM

[Add Tags...](#)

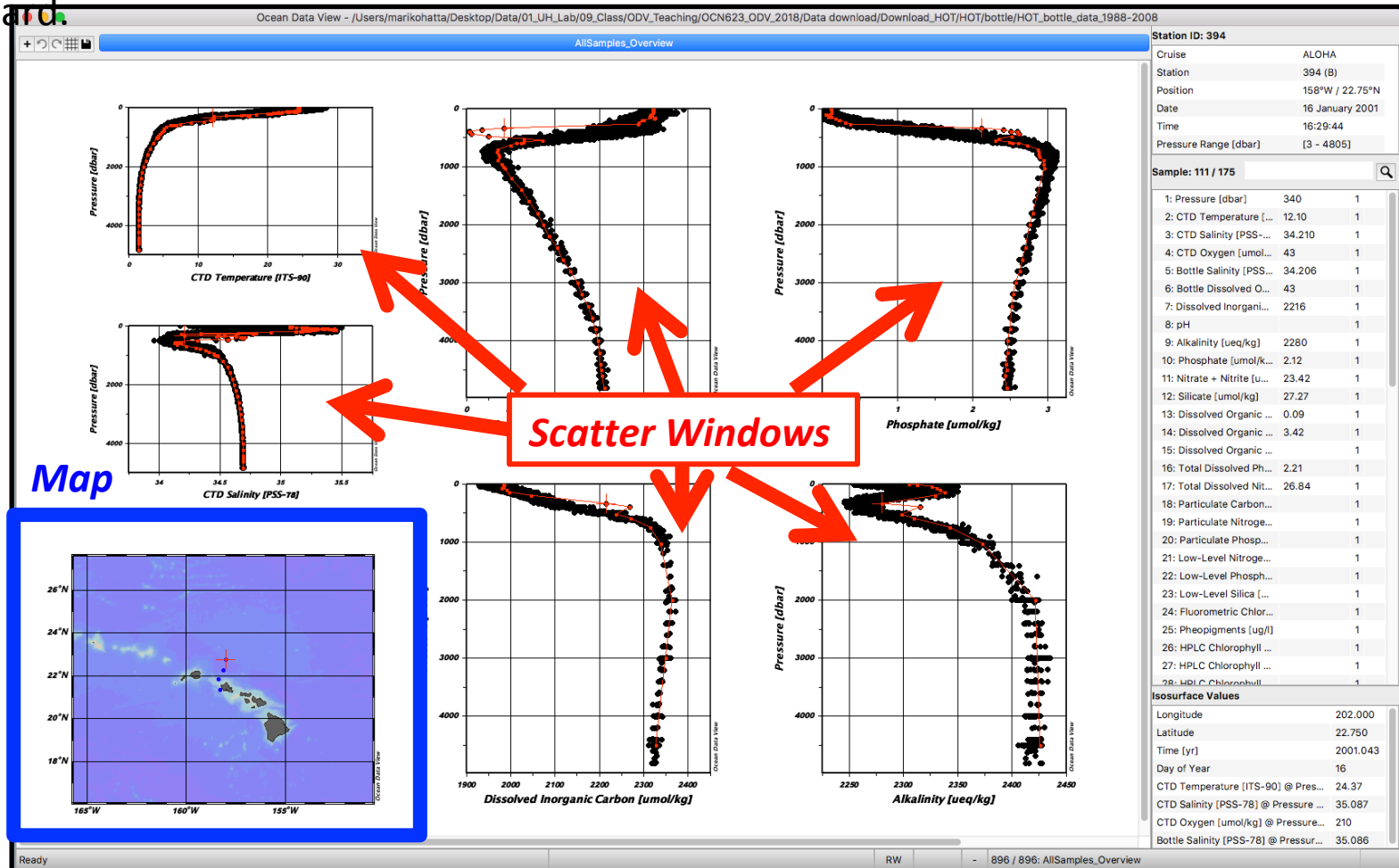


# “6 Scatter Windows” mode



# “6 Scatter Windows” mode

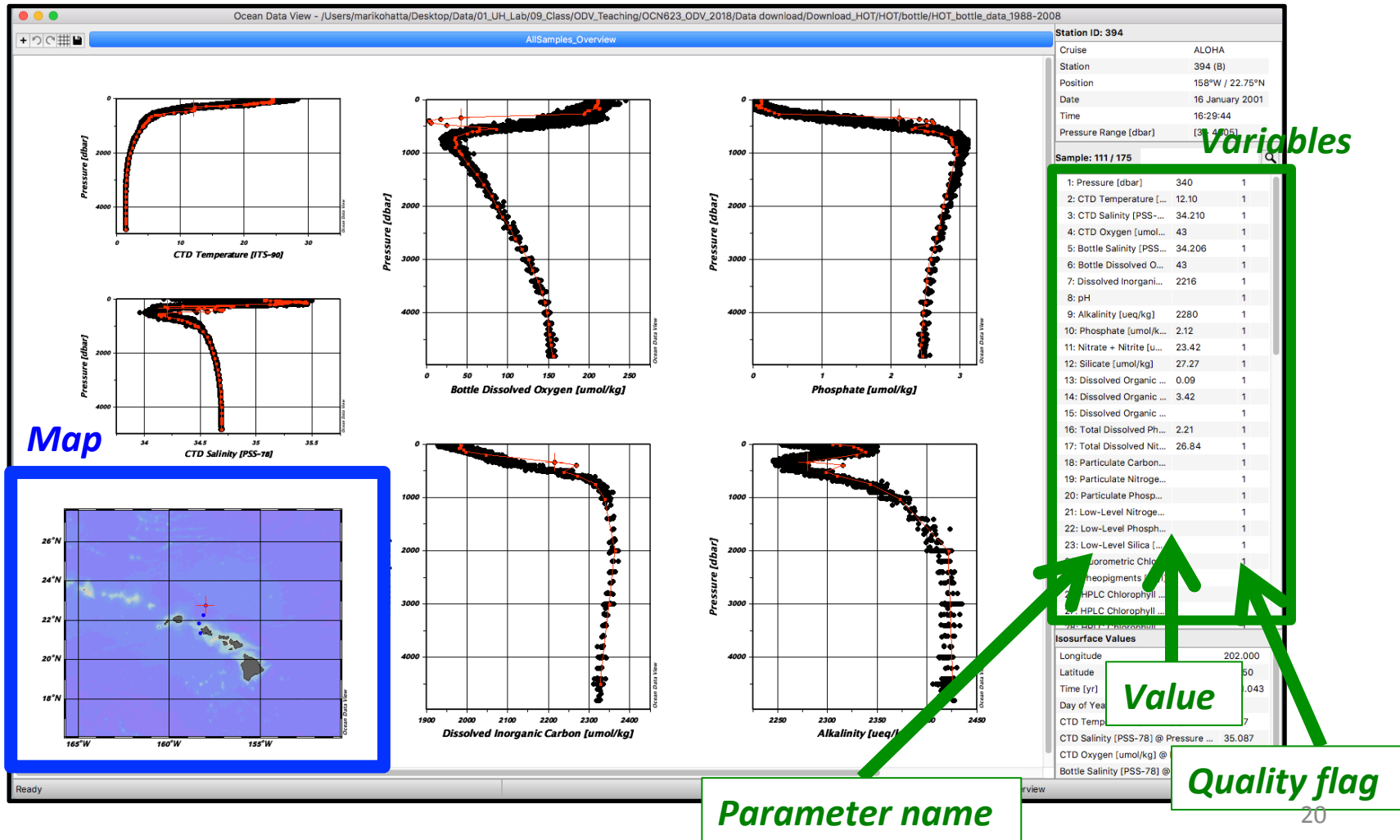
In scatter mode, all data within the map are shown. Clicking on a particular station, will highlight that station's data in red. If the station has multiple occupations, like HOT, then you can scroll between different occupations with the left and right arrows on your keyboard.





# “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.

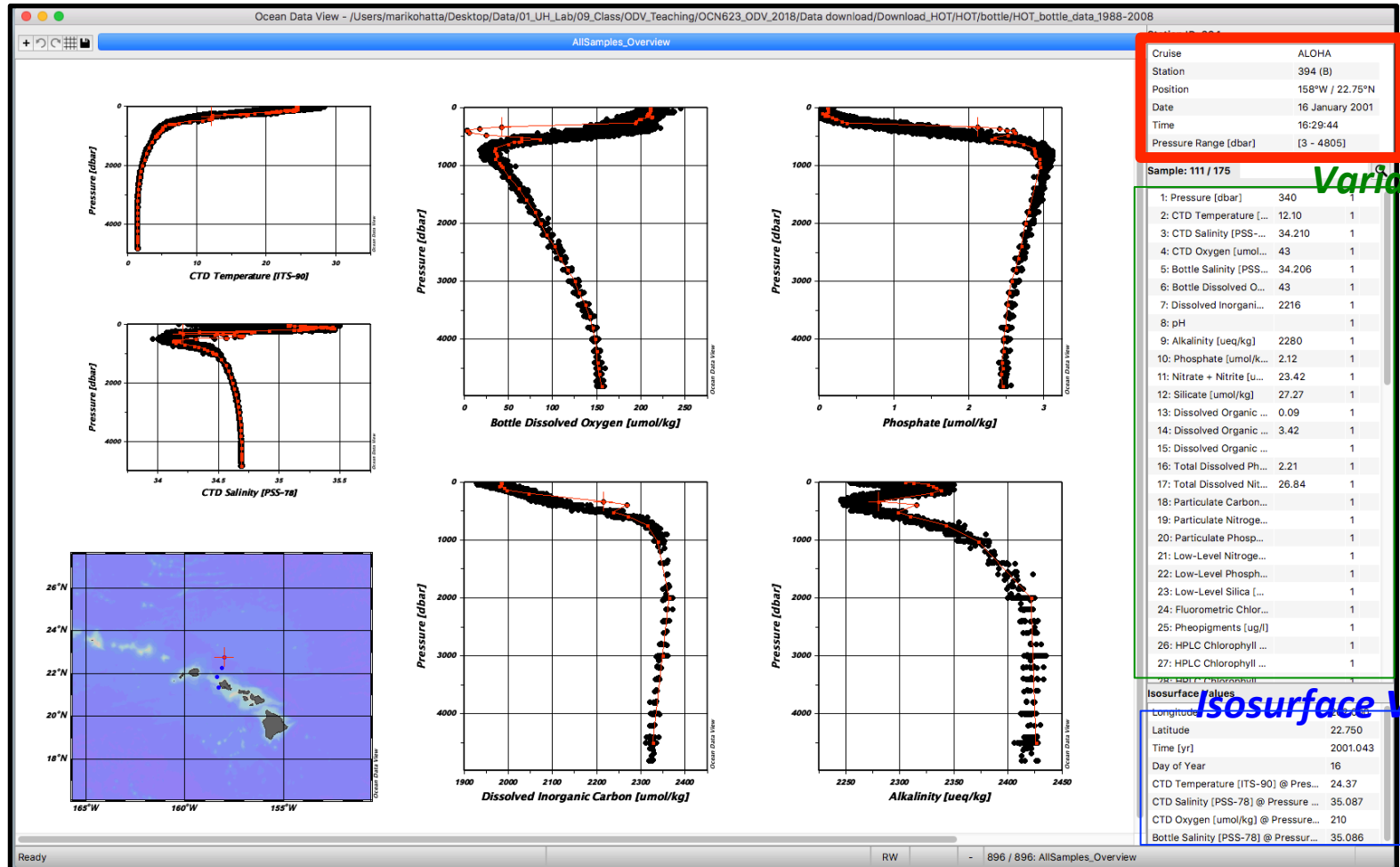
-You use the flag to identify data quality, you can then isolate bad data from your figure!

- 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**



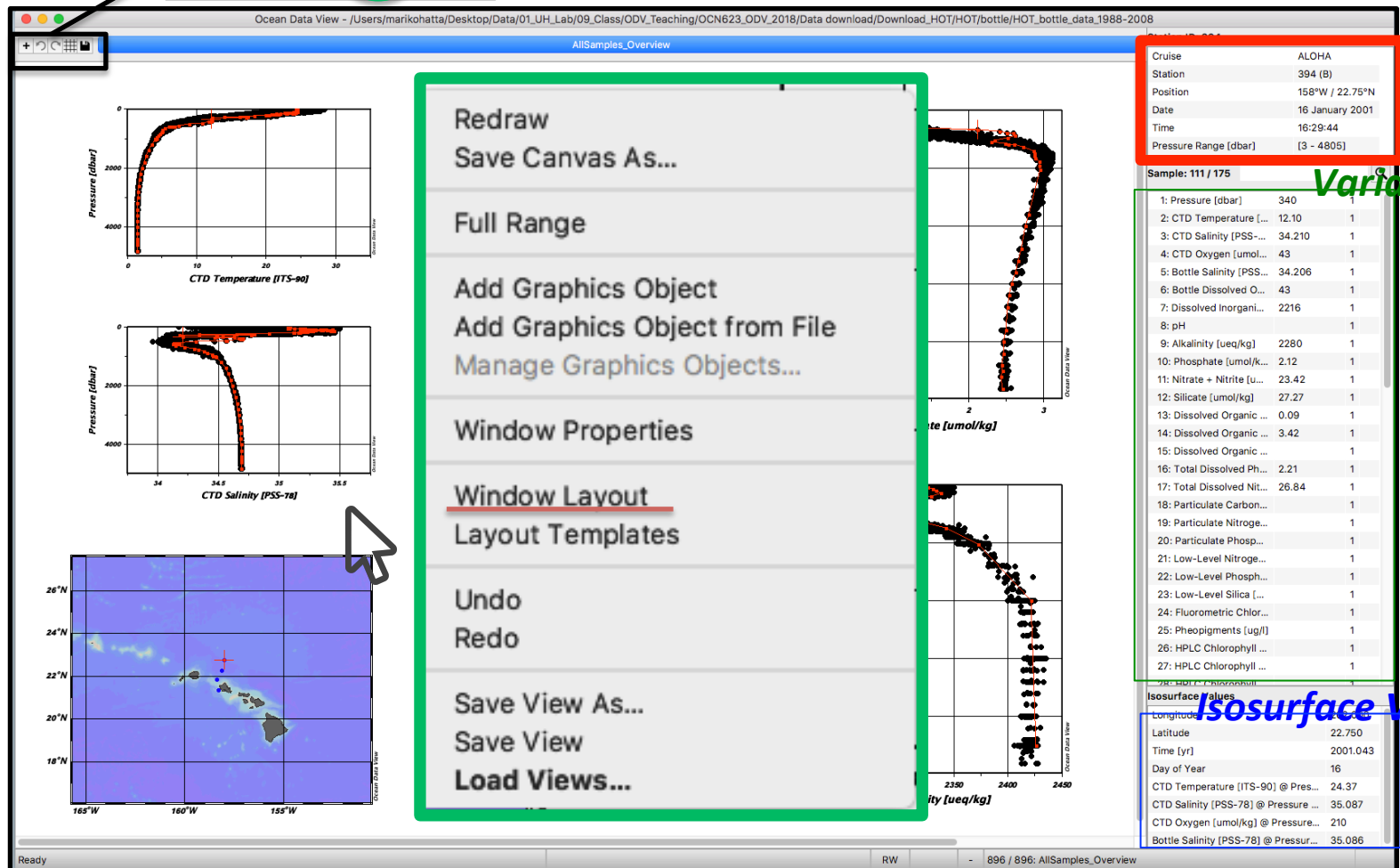
“Isosurface values” show the calculated/selected values at the selected station. (see detail in the ODV manual)

# Let's change the layout of the canvas



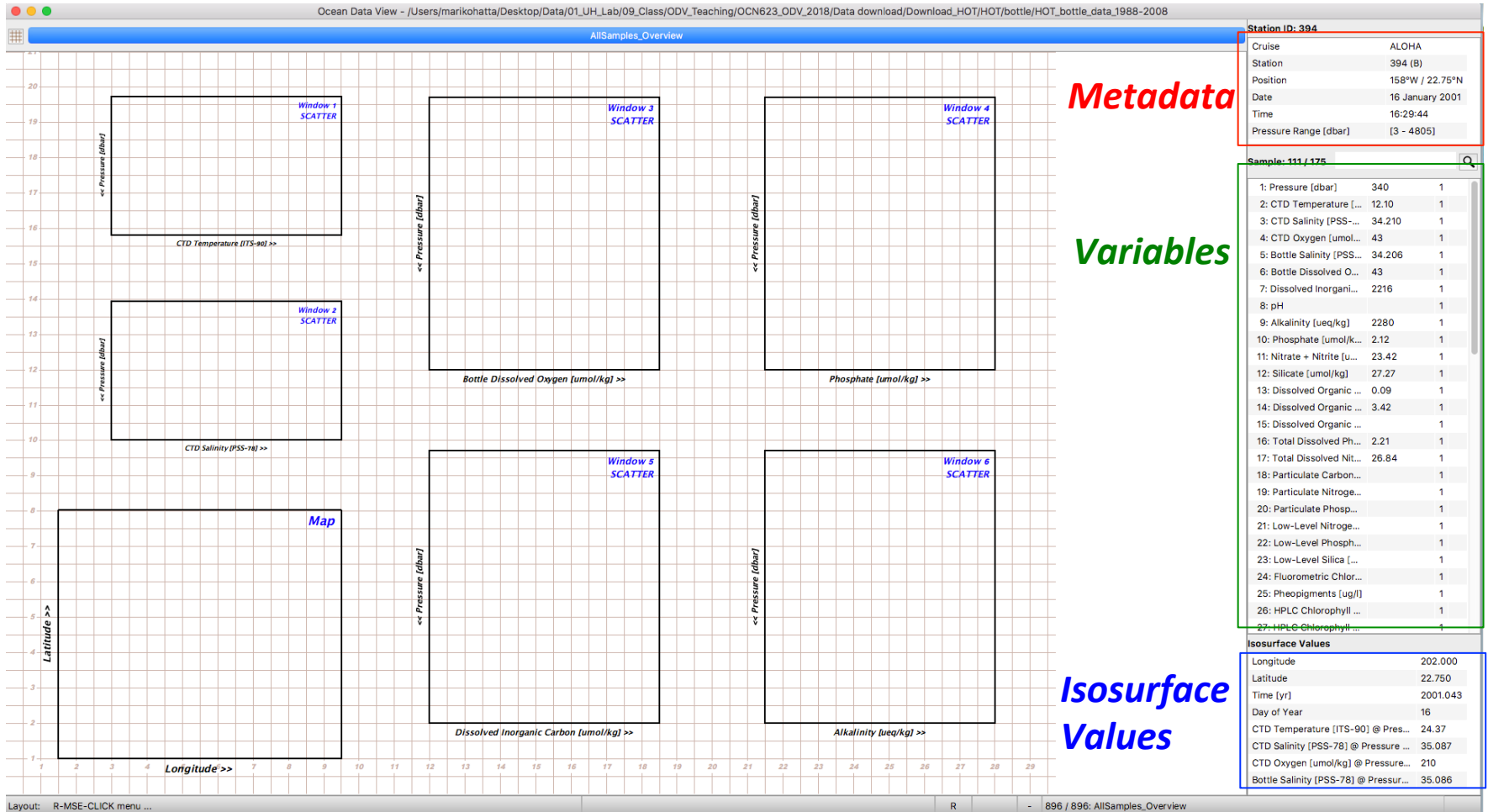
Click the icon.

*Metadata*



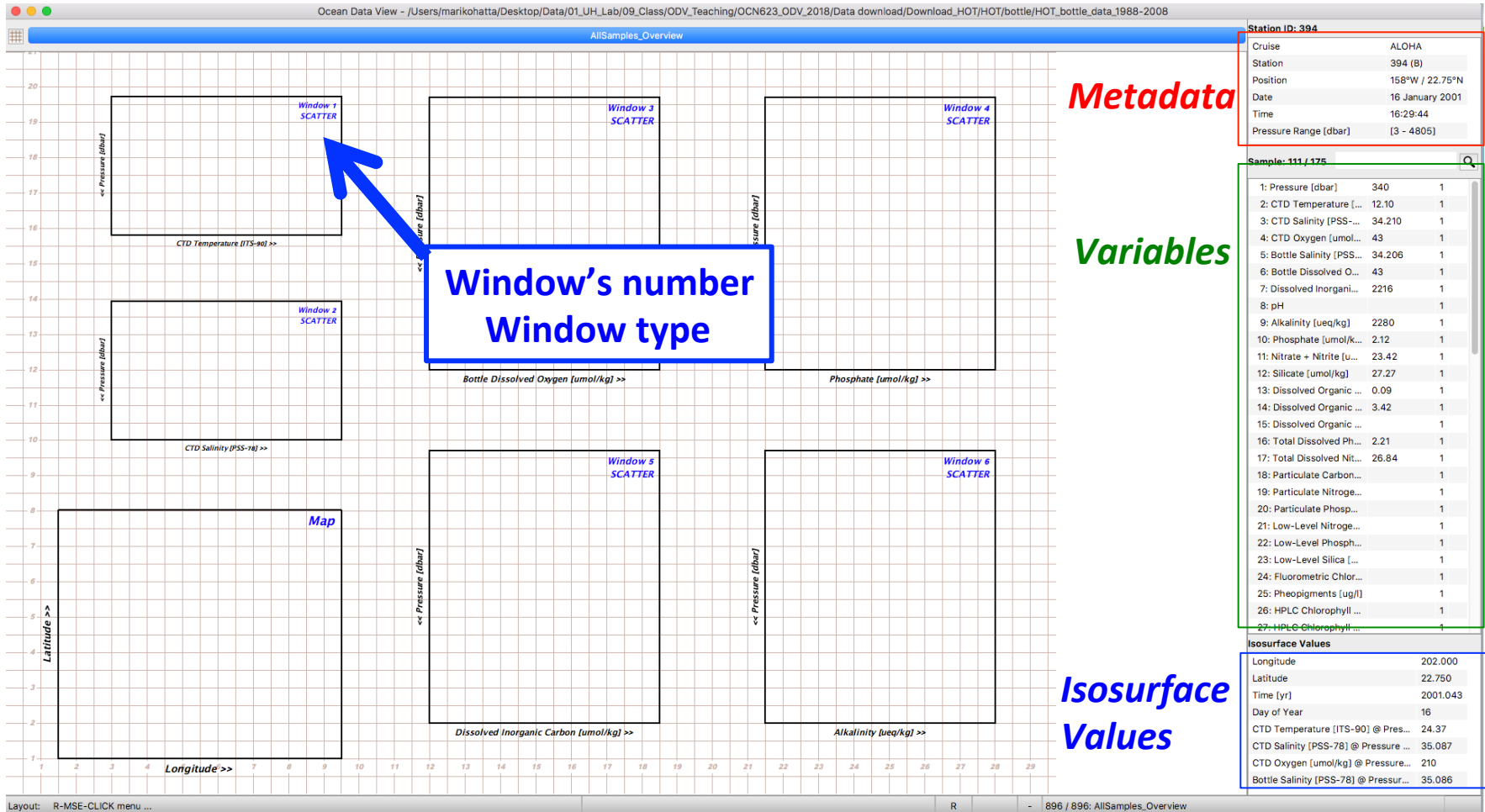
Or Move your cursor in the white part (it **should not** be on the map or on any scatter window)  
Right click ("control" + click if you are Mac user), and select "Window Layout".

# “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).

**Move / Resize** ← **Change the size of windows**

**Delete Window**

**Create New Window** ← **Add the new windows**

**Create Overlay Window**

**Move to Foreground**

**Move to Background**

**Properties...**

**X-Variable**

**Y-Variable**

**Z-Variable**

**Accept**

**Cancel**

**Metadata**

Date	16 January 2001
Time	16:29:44
Pressure Range (dbar)	(3 - 4805)

**Variables**

Variable	Value
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 <sub>2</sub>	43
7: Dissolved Inorganic N	2216
8: pH	1
9: Alkalinity [ueq/kg]	2280
10: Phosphate [umol/kg]	2.12
11: Nitrate + Nitrite [u...	23.42
12: Silicate [umol/kg]	27.27
13: Dissolved Organic ...	0.09
14: Dissolved Organic ...	3.42
15: Dissolved Organic ...	1
16: Total Dissolved Ph...	2.21
17: Total Dissolved Nit...	26.84
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

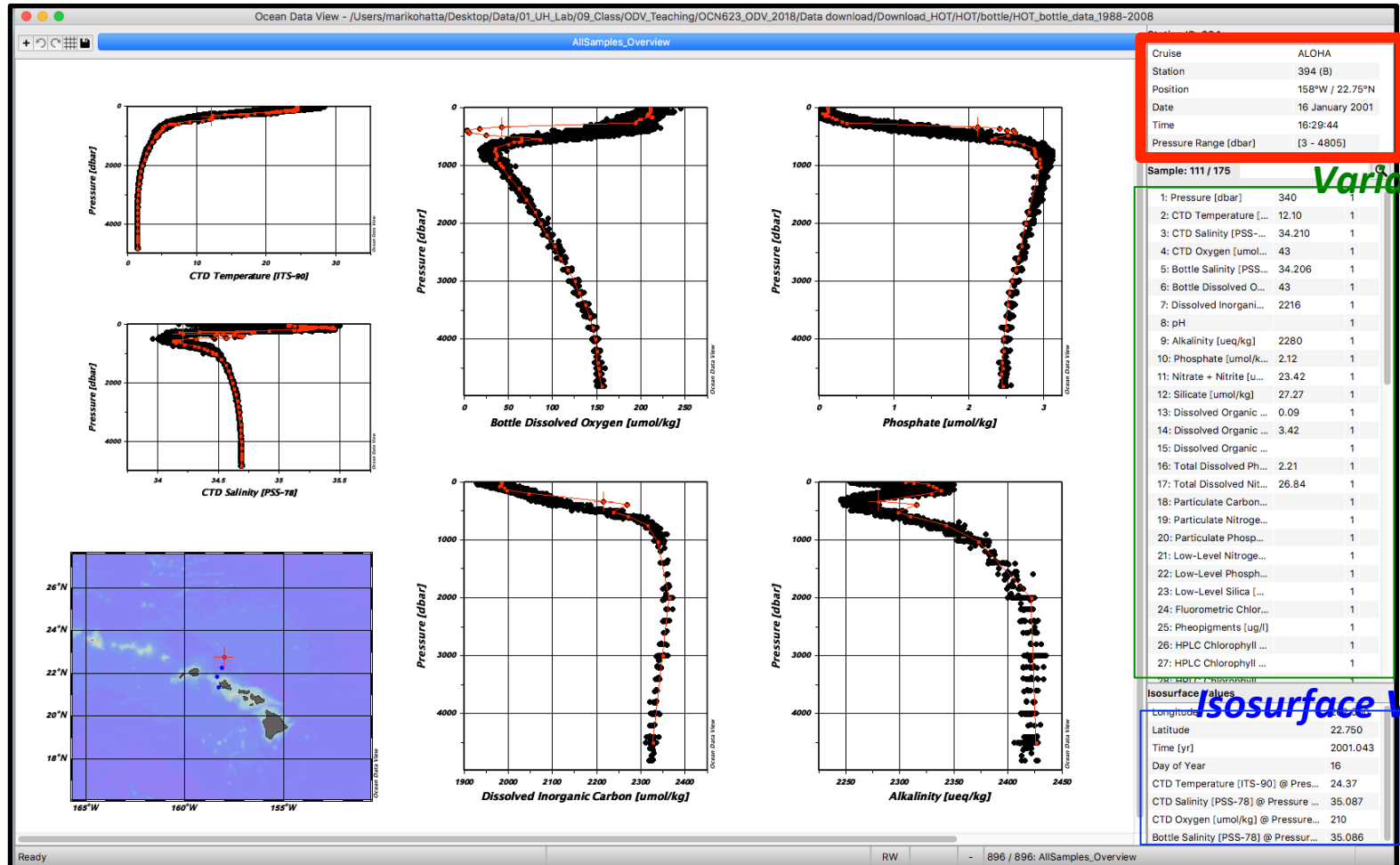
**Isosurface Values**

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

After you change the layout, select “Accept”.

# “6 Scatter Windows” mode

*Metadata*



# 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 displays the Ocean Data View interface. A context menu is open over a plot, listing options: 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..., and Properties.... The Properties... option is highlighted with a red box. To the right, the metadata table is shown with a red border. Below it, the variables list is shown with a green border. At the bottom right, the isosurface values table is shown with a blue border.

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

Variables	
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 <sub>2</sub>	43
7: Dissolved Inorganic N	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	0.09
14: Dissolved Organic Nitrogen	3.42
15: Dissolved Organic Phosphorus	1
16: Total Dissolved Phosphorus	2.21
17: Total Dissolved Nitrogen	26.84
18: Particulate Carbon	1
19: Particulate Nitrogen	1
20: Particulate Phosphorus	1
21: Low-Level Nitrogen	1
22: Low-Level Phosphorus	1
23: Low-Level Silica	1
24: Fluorometric Chlorophyll	1
25: Pheopigments [ug/l]	1
26: HPLC Chlorophyll	1
27: HPLC Chlorophyll	1

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

Properties Window 1

General **Data** Display Style Contours Color Mapping DIVA Settings

Scope: SCATTER: Data of all stations shown in the map

X-Axis: 2: CTD Temperature [ITS-90]

Y-Axis: 1: Pressure [dbar] Y-Axis Settings ☒ Reverse range

Z-Axis: (none) Colorbar Settings ☐ Reverse range

☐ Apply to all windows

Help OK Cancel

**Metadata**

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

**Variables**

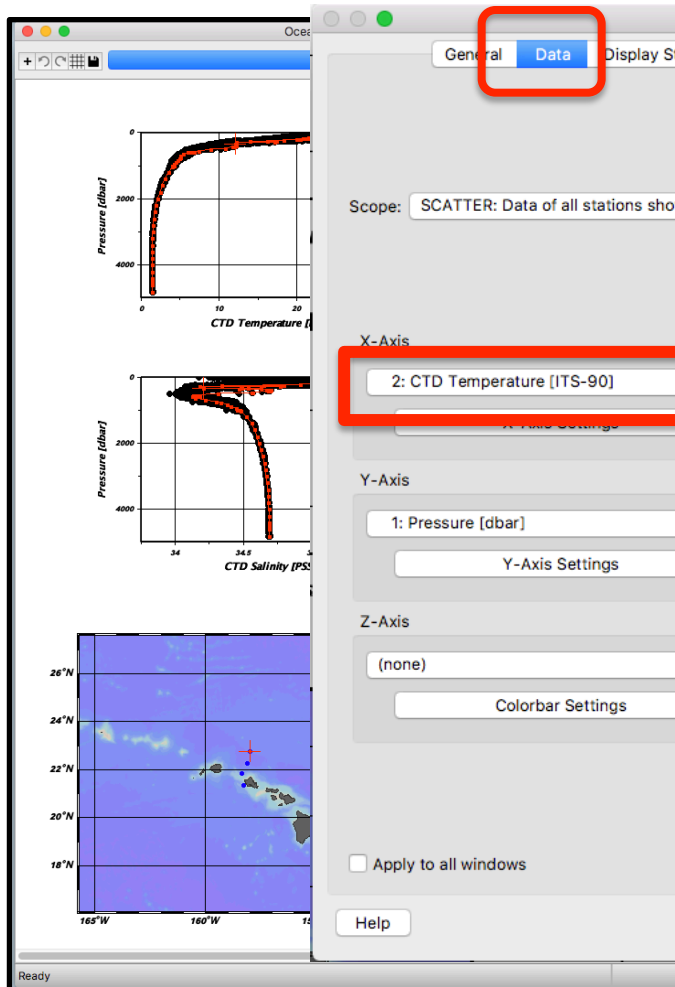
Sample: 111 / 175	Variable	Value	Unit
1:	Pressure [dbar]	340	
2:	CTD Temperature [ITS-90]	12.10	1
3:	CTD Salinity [PSS-78]	34.210	1
4:	CTD Oxygen [umol/kg]	43	1
5:	Bottle Salinity [PSS-78]	34.206	1
6:	Bottle Dissolved O <sub>2</sub>	43	1
7:	Dissolved Inorganic Nitrogen	2216	1
8:	pH	1	1
9:	Alkalinity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

**Isosurface Values**

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

# 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 [umol/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  $\alpha$ -Carotene [ng/l]
- 40: HPLC  $\beta$ -Carotene [ng/l]
- 41: HPLC Carotenoids [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:  $\delta^{15}\text{N}$  of PN [permil]
- 60: TD-700 Chlorophyll a [ug/l]
- 61: TD-700 Chlorophyll b [ug/l]

pH.

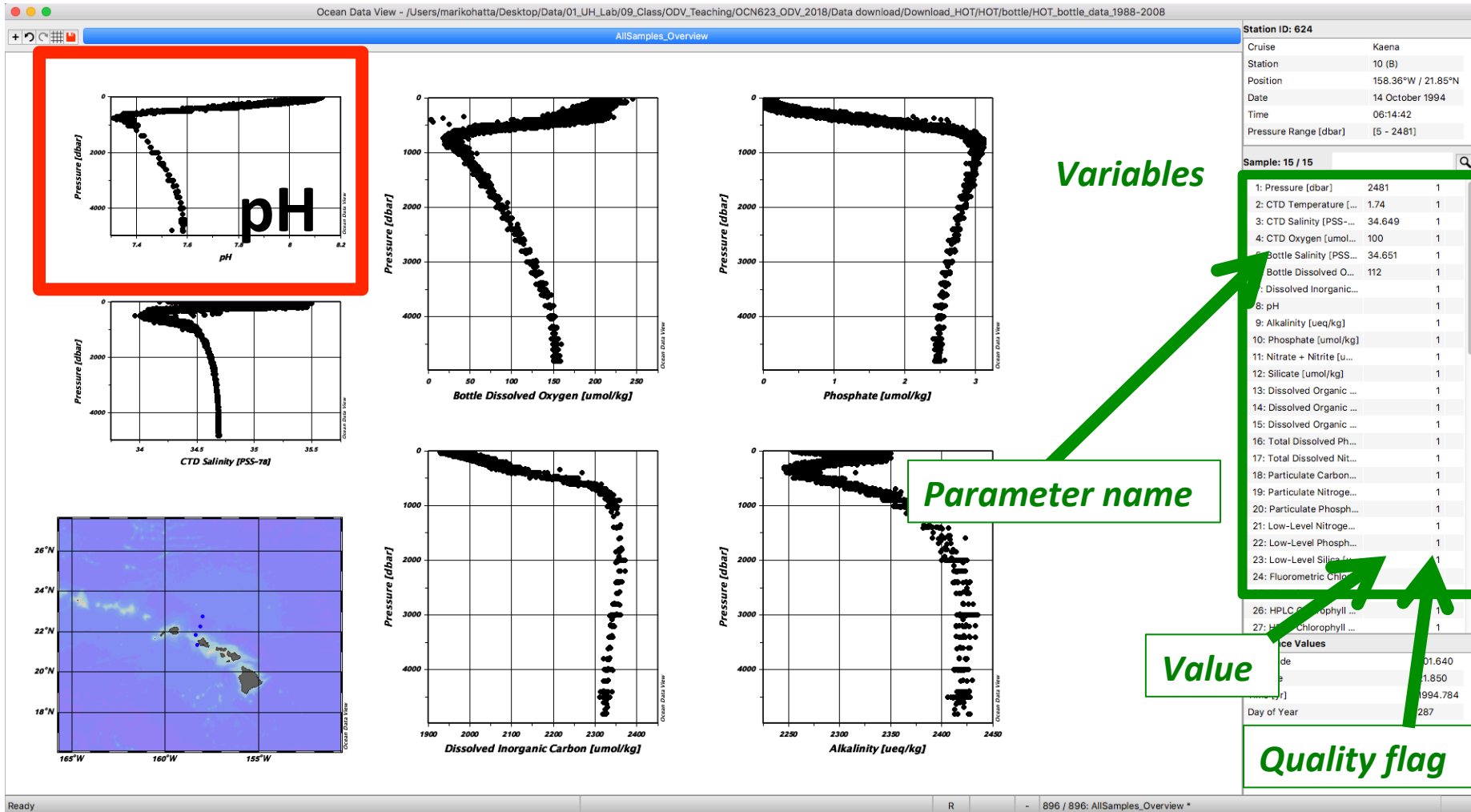
Metadata

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 shows the Ocean Data View interface. On the left, there are three scatter plots: pH vs Pressure, CTD Salinity vs Pressure, and a map view. A context menu is open over the pH plot, listing various actions. On the right, a panel shows the list of variables available for selection, with green arrows pointing to specific parts of the list.

**Context Menu Options:**

- 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...

**Variables List:**

Variable	Value	Quality flag
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 f...		1
24: Fluorometric Chlo...		1
26: HPLC Chlorophyll ...		1
27: HPLC Chlorophyll ...		1

**Annotations:**

- Variables:** Points to the list of variables.
- Parameter name:** Points to the variable name (e.g., "pH").
- Value:** Points to the numerical value (e.g., "2481").
- Quality flag:** Points to the quality flag (e.g., "1").

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

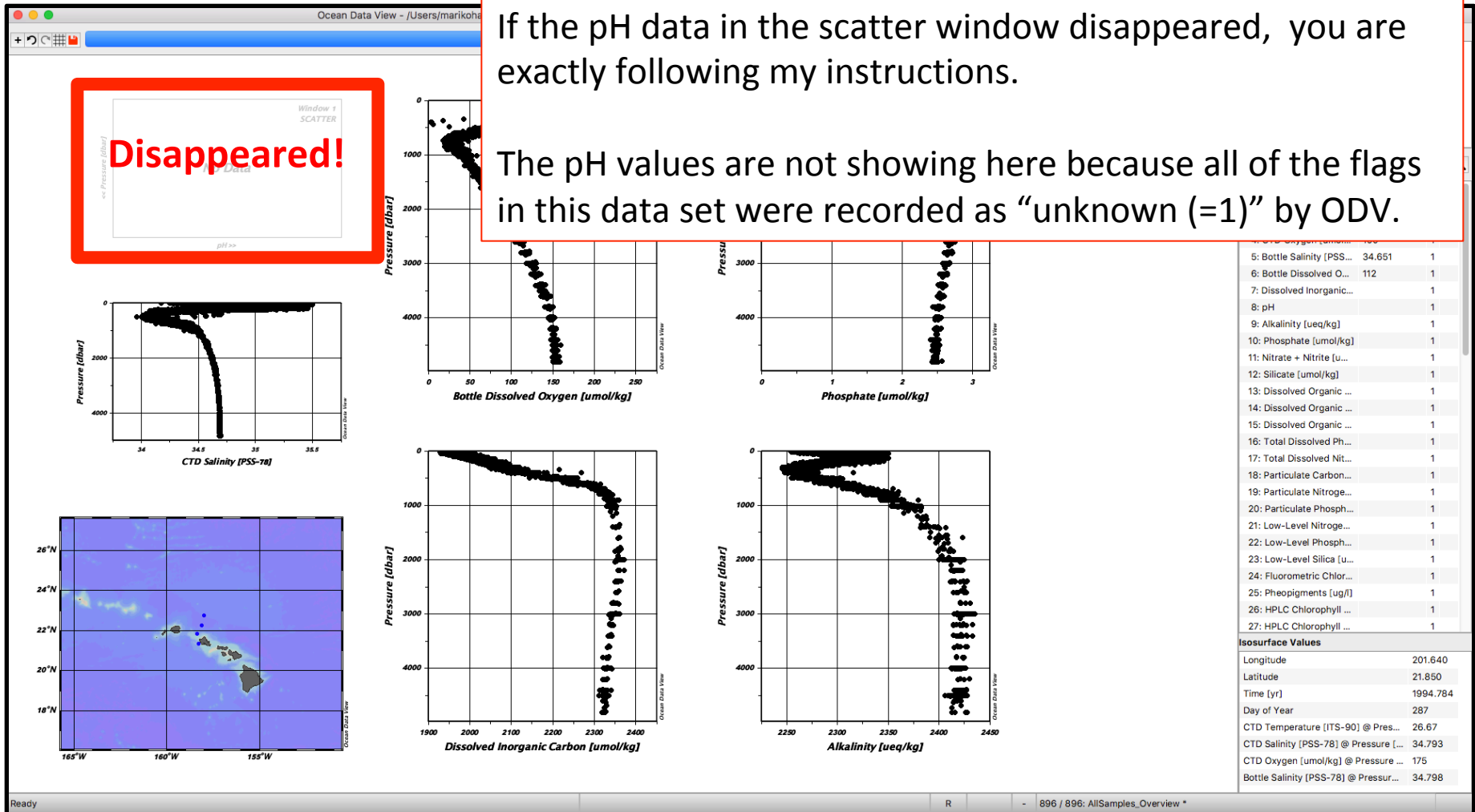
In Quality tab, select “Variable” that you want to modify the selection criteria.

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

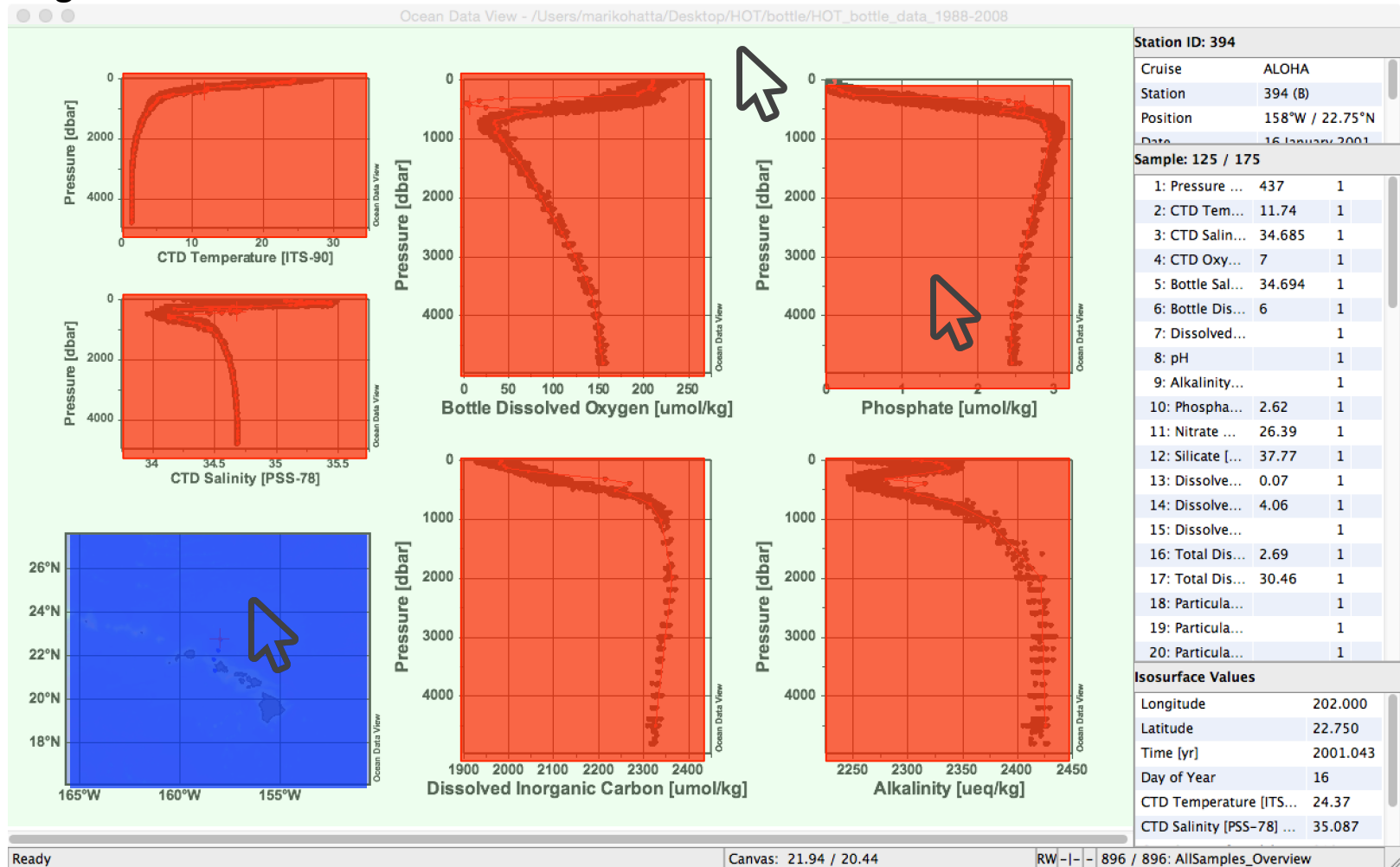
Select only “0:good quality” here.

# “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

The image displays three distinct pop-up menus for different window types in a software application. Each menu is highlighted with a colored border: blue for Map, green for Background, and red for Scatter Windows. Red arrows point from descriptive text at the bottom to specific menu items.

- Map Menu (Blue border):**
  - Redraw
  - Save Map As...
  - Save As Interrupted Map...
  - Zoom
  - Auto-Zoom In
  - Auto-Zoom Out
  - Valid Domain
  - Full Domain
  - Global Map
  - Current Station by
  - Station Selection Criteria...
  - Manage Pick List
  - Manage Section
  - Extras
  - Properties...
- Background Menu (Green border):**
  - Redraw
  - Save Canvas As...
  - Full Range
  - Add Graphics Object
  - Add Graphics Object from File
  - Manage Graphics Objects...
  - Window Properties
  - Window Layout
  - Layout Templates
  - Undo
  - Redo
  - Save View As...
  - Save View
  - Load Views...
- Scatter Windows Menu (Red border):**
  - 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...

**Show window layout** (Arrow points to 'Window Layout' in Background menu)

**Change the scale of Map** (Arrow points to 'Zoom' in Map menu)

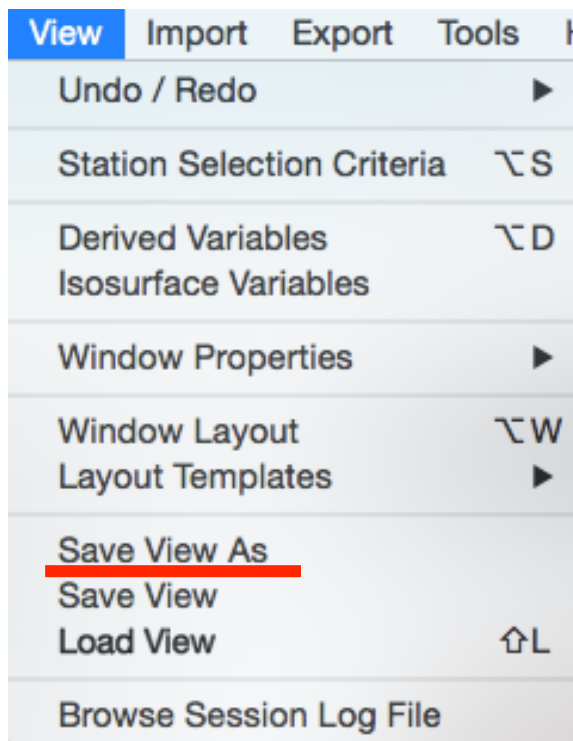
**Change the properties of the window** (Arrow points to 'Properties...' in Scatter Windows menu)

Additional text on the right side of the image: **ables**



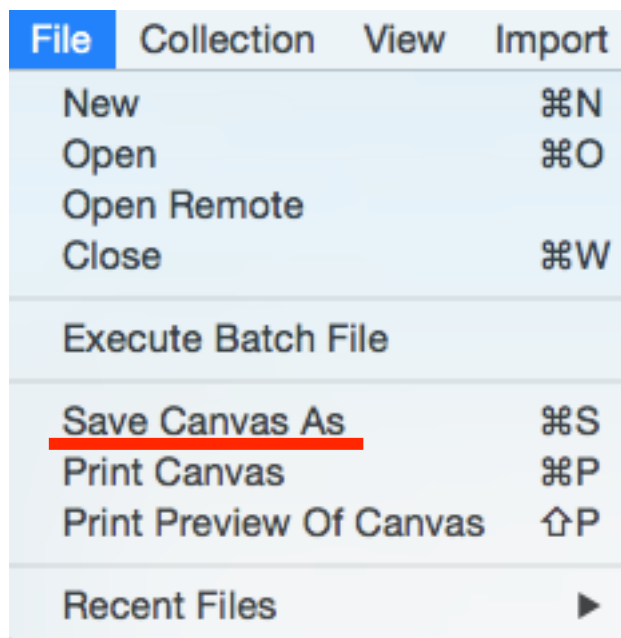
# How to save figures and views

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”.



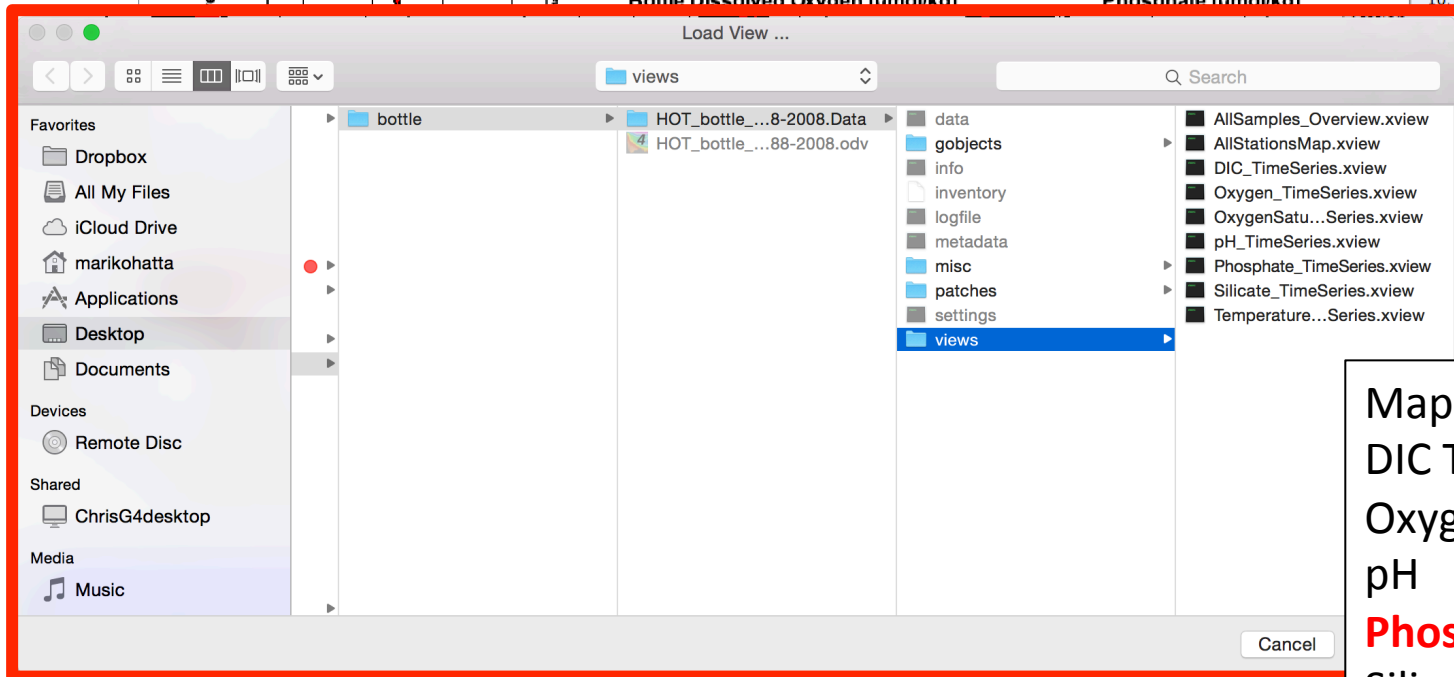
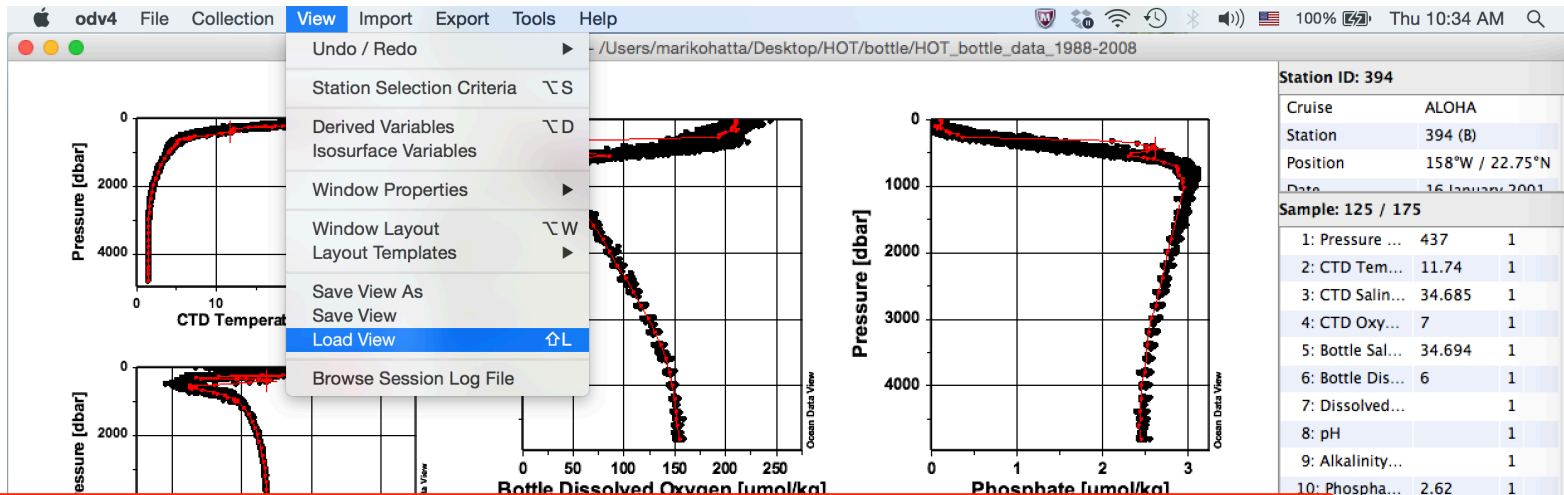
How to save figures:

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



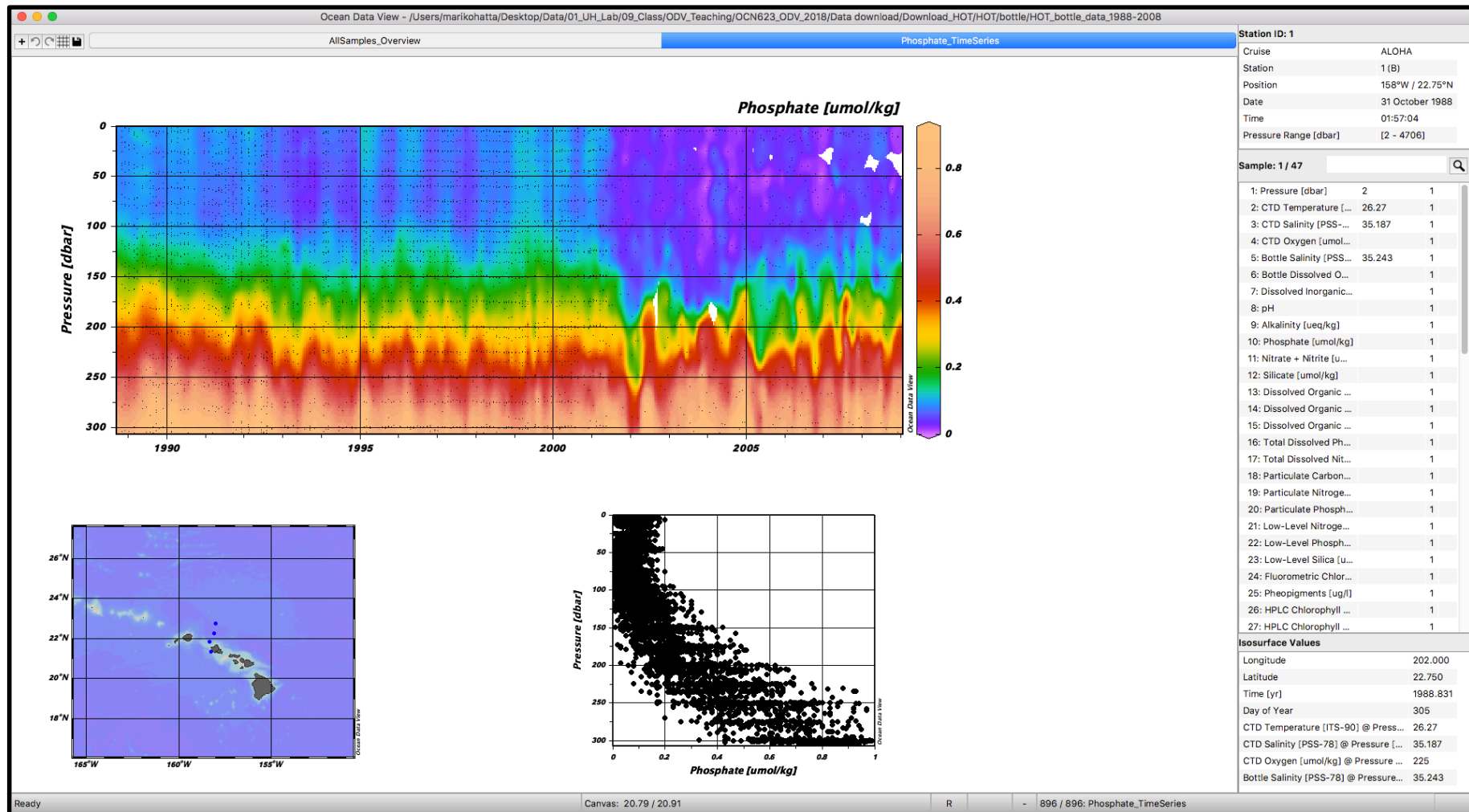
*Tip: The highest resolution of the canvas you can save is 499, which would be important for a publication. Also when you print the Canvas, it would take a long time to print. Save as the canvas, and then print it (faster!).*

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](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)

The screenshot shows an Excel spreadsheet with the following header row:

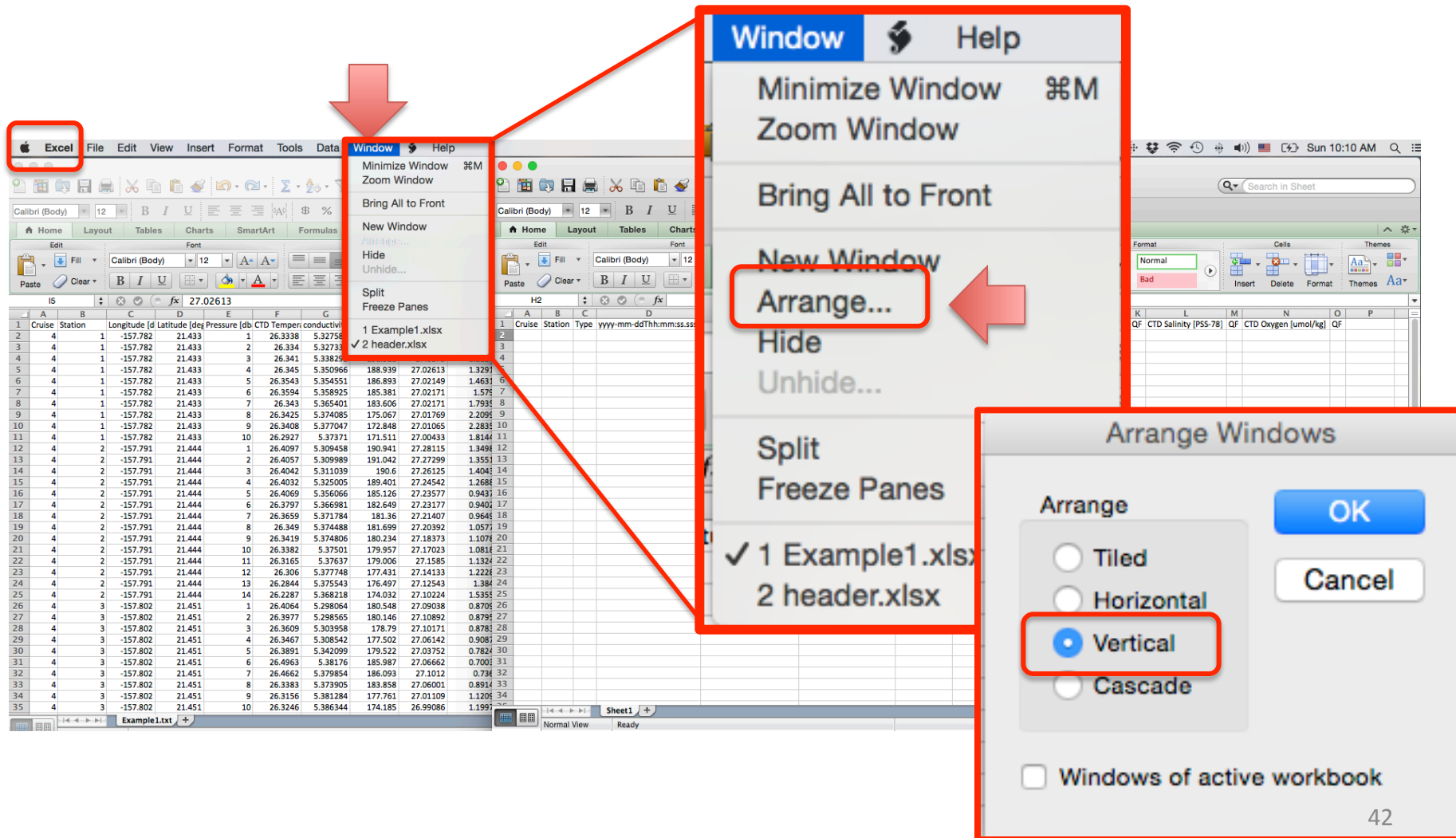
	Cruise	Station	Type	Latitude	Longitude	Pressure	QF	Variable#1 QF	Variable#2 QF
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									

Red arrows point from the labels above to the corresponding cells in the header row. The last two columns, "Variable#1 QF" and "Variable#2 QF", are circled in red. A red box at the bottom contains the following text:

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 is titled 'header.xlsx' and the right is titled 'Example1.xlsx'. Both spreadsheets have a red box around their respective column headers. A red arrow points from cell I5 in 'Example1.xlsx' to cell H2 in 'header.xlsx'.

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

A	B	C	D	E	F	G	H	I	J
Cruise	Station	Longitude [d	Latitude [deg	Pressure [db	CTD Temper	conductivity	oxygen	CTD Oxygen	Fluoror
1	4	1	-157.782	21.433	1	26.3338	5.327588	191.079	27.04528
2	4	1	-157.782	21.433	2	26.334	5.327333	191.199	27.02925
3	4	1	-157.782	21.433	3	26.341	5.338292	191.321	27.0275
4	4	1	-157.782	21.433	4	26.345	5.350966	188.939	27.02613
5	4	1	-157.782	21.433	5	26.3543	5.354551	186.893	27.02149
6	4	1	-157.782	21.433	6	26.3594	5.358925	185.381	27.02171
7	4	1	-157.782	21.433	7	26.343	5.365401	183.606	27.02171
8	4	1	-157.782	21.433	8	26.3425	5.374085	175.067	27.01769
9	4	1	-157.782	21.433	9	26.3408	5.377047	172.848	27.01065
10	4	1	-157.782	21.433	10	26.2927	5.37371	171.511	27.00433
11	4	2	-157.791	21.444	1	26.4097	5.309458	190.941	27.28115
12	4	2	-157.791	21.444	2	26.4057	5.309989	191.042	27.27299
13	4	2	-157.791	21.444	3	26.4042	5.311039	190.6	27.26125
14	4	2	-157.791	21.444	4	26.4032	5.325005	189.401	27.24542
15	4	2	-157.791	21.444	5	26.4069	5.356066	185.126	27.23577
16	4	2	-157.791	21.444	6	26.3797	5.366981	182.649	27.23177
17	4	2	-157.791	21.444	7	26.3659	5.371784	181.36	27.21407
18	4	2	-157.791	21.444	8	26.349	5.374488	181.699	27.20392
19	4	2	-157.791	21.444	9	26.3419	5.374806	180.234	27.18373
20	4	2	-157.791	21.444	10	26.3382	5.37501	179.957	27.17023
21	4	2	-157.791	21.444	11	26.3165	5.37637	179.006	27.1585
22	4	2	-157.791	21.444	12	26.306	5.377748	177.431	27.14133
23	4	2	-157.791	21.444	13	26.2844	5.375543	176.497	27.12543
24	4	2	-157.791	21.444	14	26.2287	5.368218	174.032	27.10224
25	4	3	-157.802	21.451	1	26.4064	5.298064	180.548	27.09038
26	4	3	-157.802	21.451	2	26.3977	5.298565	180.146	27.10892
27	4	3	-157.802	21.451	3	26.3609	5.303958	178.79	27.10171
28	4	3	-157.802	21.451	4	26.3467	5.308542	177.502	27.06142
29	4	3	-157.802	21.451	5	26.3891	5.342099	179.522	27.03752
30	4	3	-157.802	21.451	6	26.4963	5.38176	185.987	27.06662
31	4	3	-157.802	21.451	7	26.4662	5.379854	186.093	27.1012
32	4	3	-157.802	21.451	8	26.3383	5.373905	183.858	27.06001
33	4	3	-157.802	21.451	9	26.3156	5.381284	177.761	27.01109
34	4	3	-157.802	21.451					



When you have finished, it should look like this.

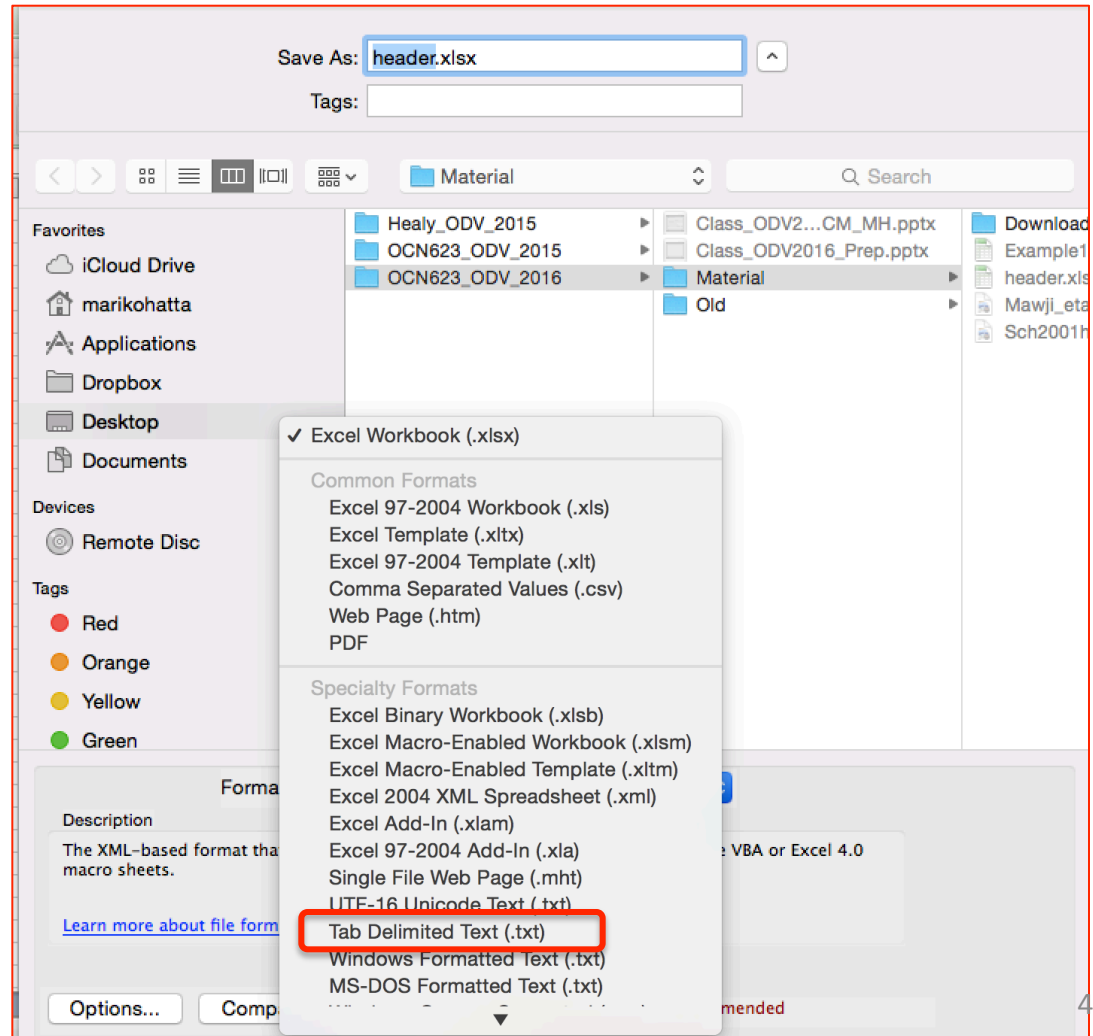
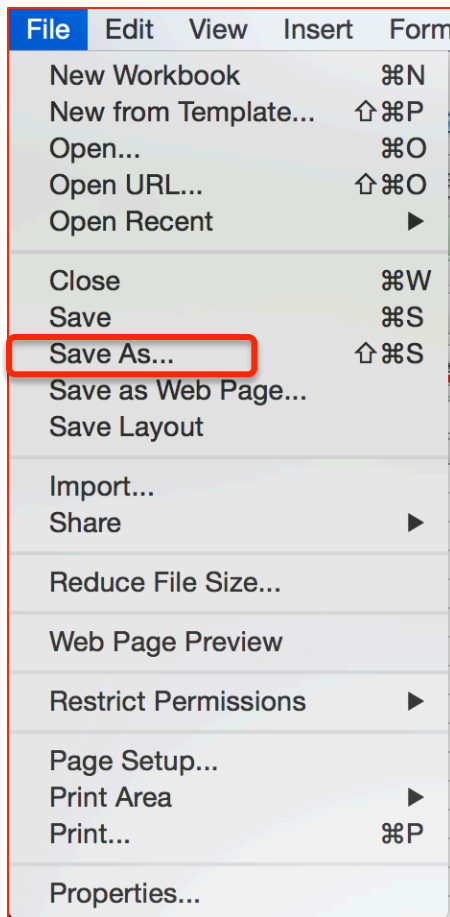
header.xlsx

Calibri (Body) 12 B I U \$ % , .00 .00														
Home Layout Tables Charts SmartArt Formulas Data Review														
Edit Font Alignment Number Format Cells														
Paste	Fill	Calibri (Body)	12	A	A	abc	Wrap Text	General				Normal	Bad	Insert Delete Format
P3														
	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”.

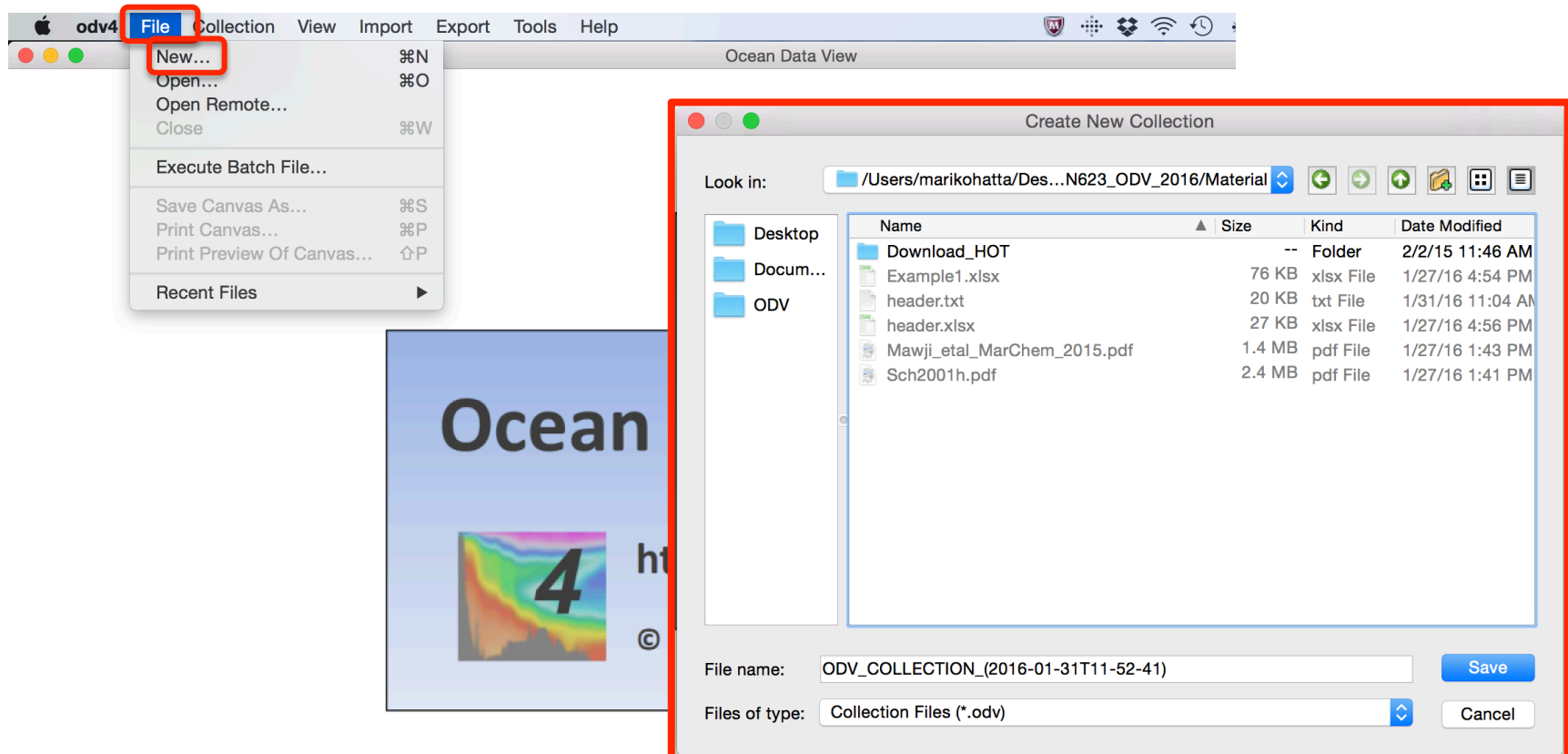
ODV will only recognize files in the tab delimited format (.txt).



## *Exercise 2.*

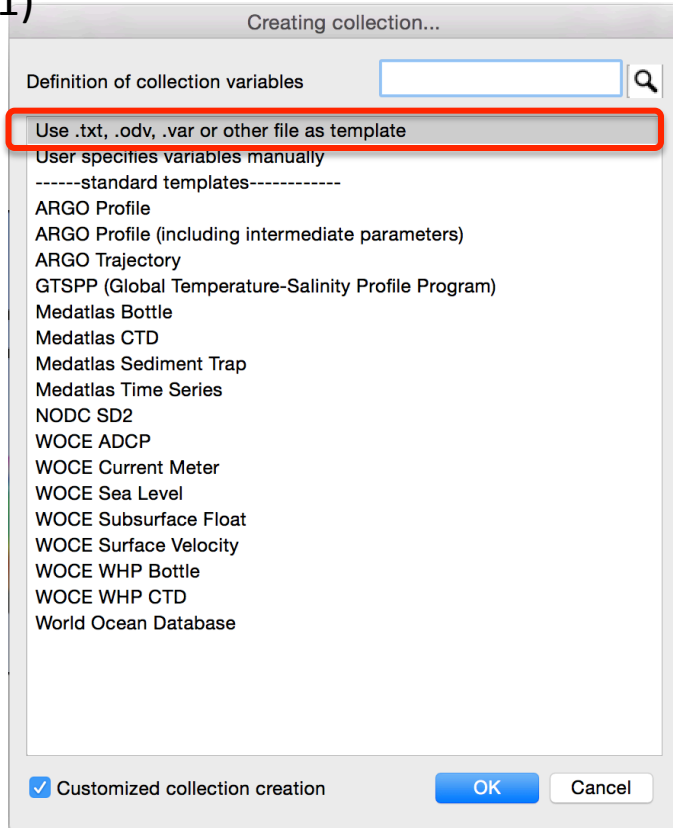
Let's create your own ODV file & figures

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.

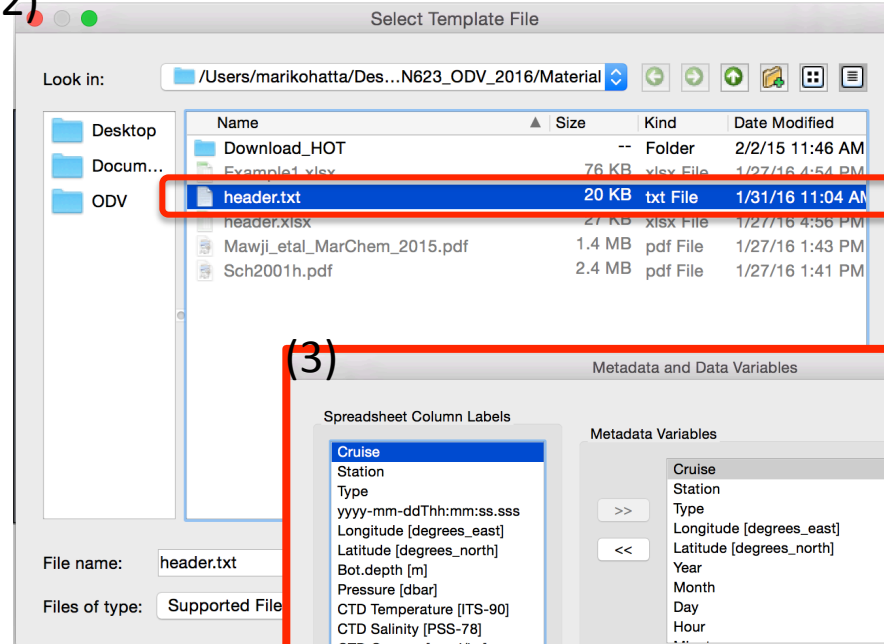


2. Choose “Definition of collection variables”. Select “Use .txt,.odv,.var or other file as template” and select your file that you made (“header.txt”).

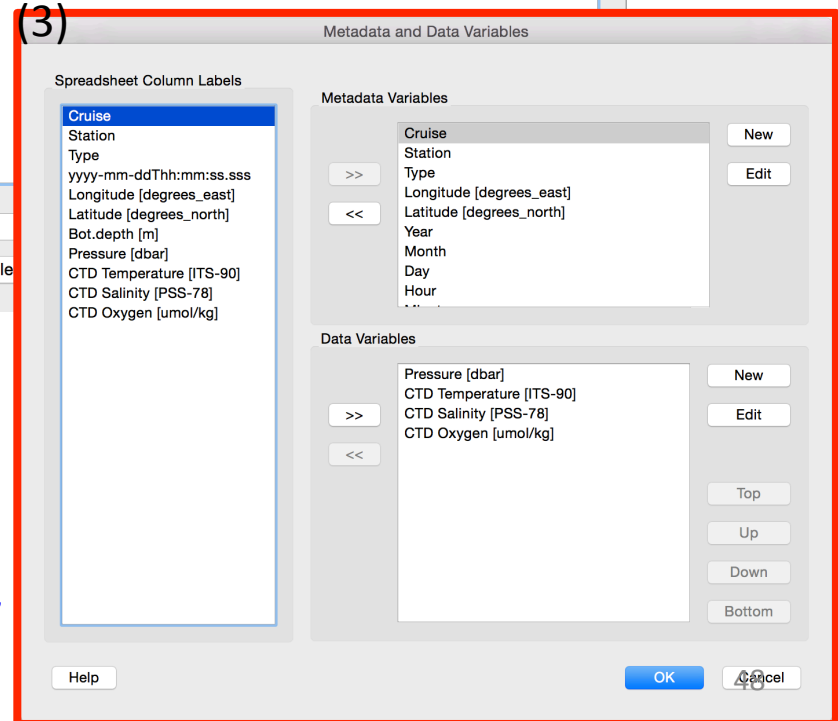
(1)



(2)



(3)



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

Collection Properties

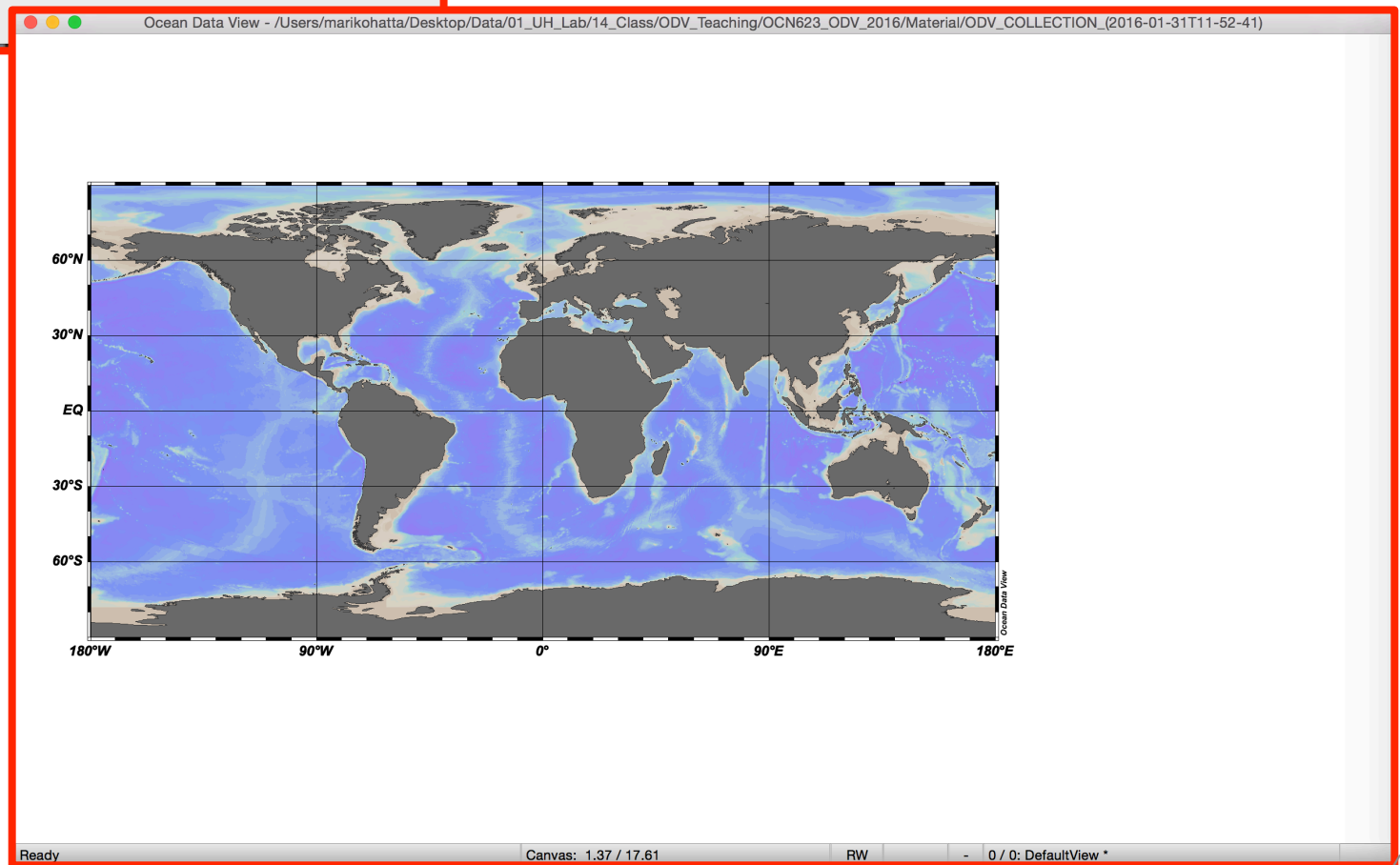
Data Field: GeneralField

Data Type: GeneralType

Primary Variable: Pressure [dbar]

Help OK Cancel

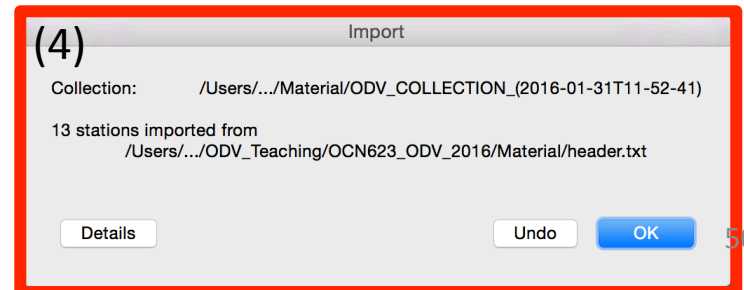
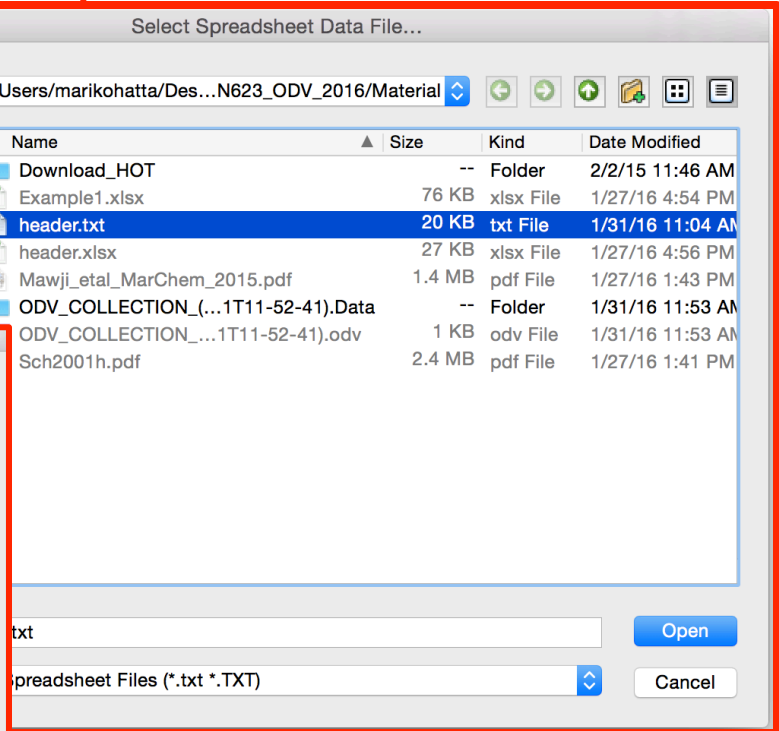
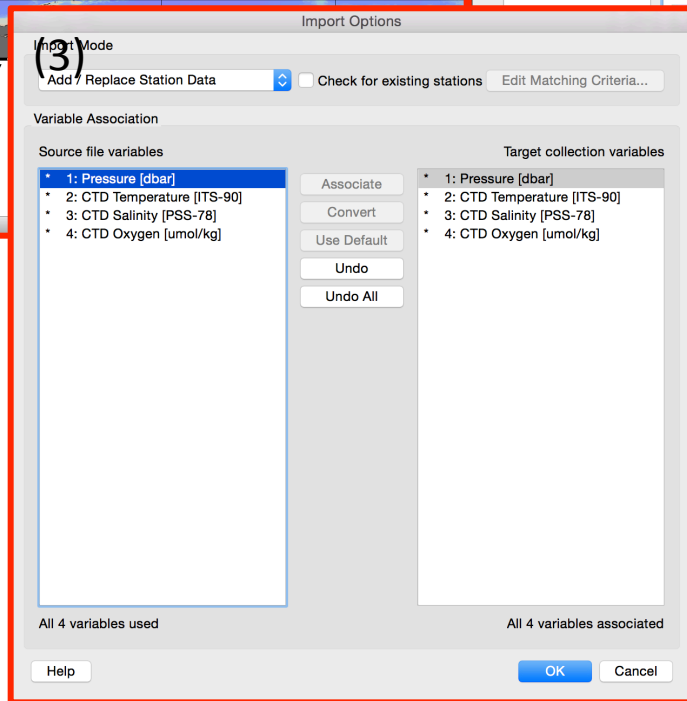
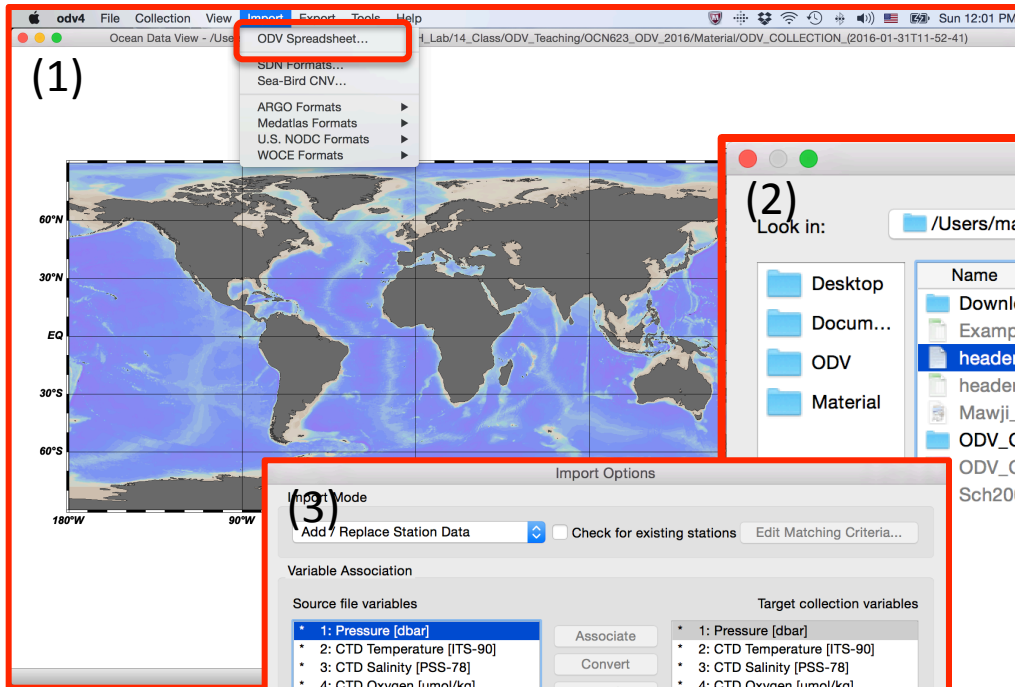
Now you made a new ODV file with your parameters in the header. Next, you have to import your data!





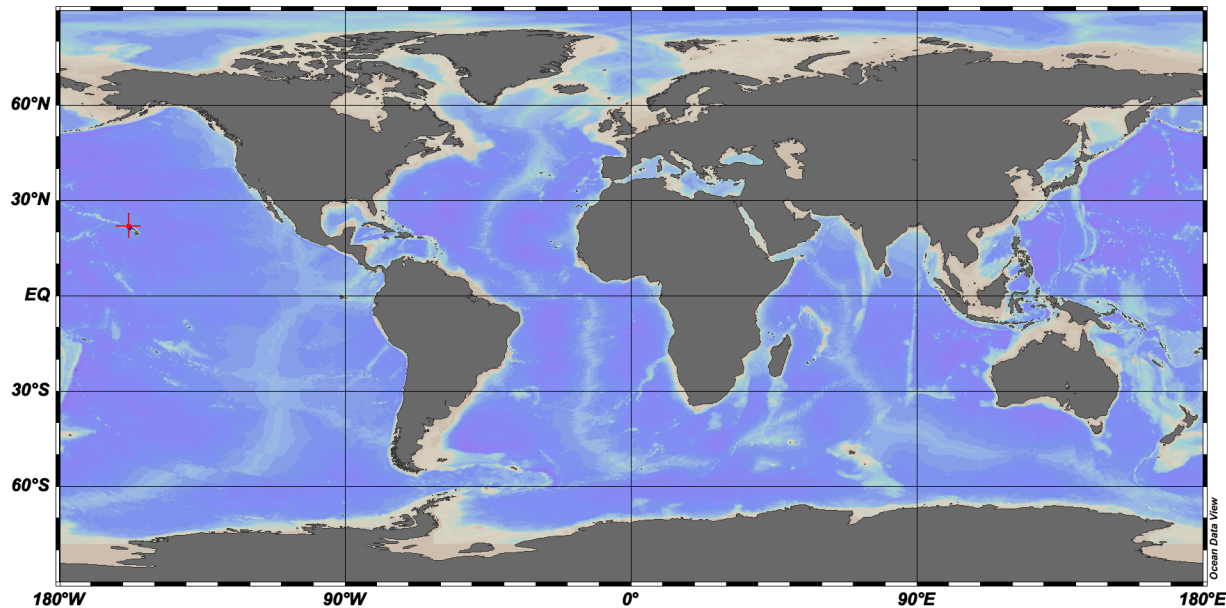
3. Click “Import”, and select “ODV spreadsheet” and select the txt file that you made.

*This step actually imports your data into ODV.*



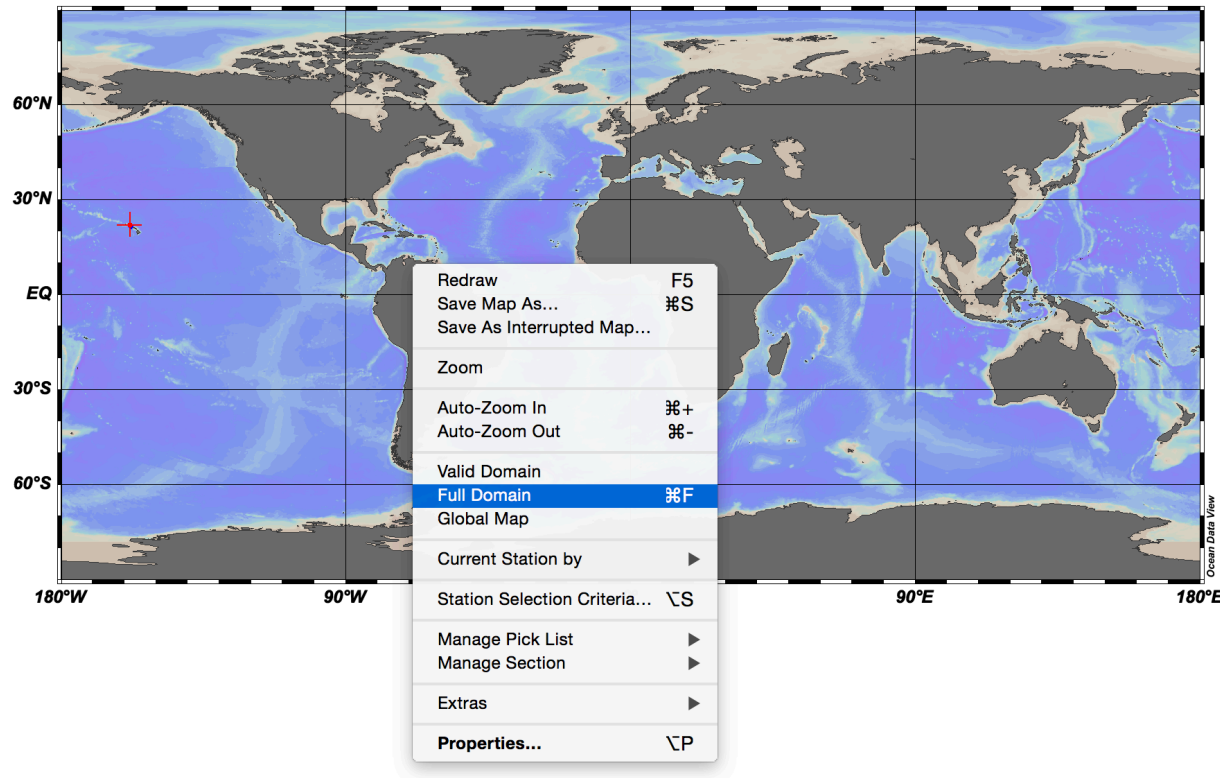
*Now you can see your data on the screen!*

Use a magnifying glass!



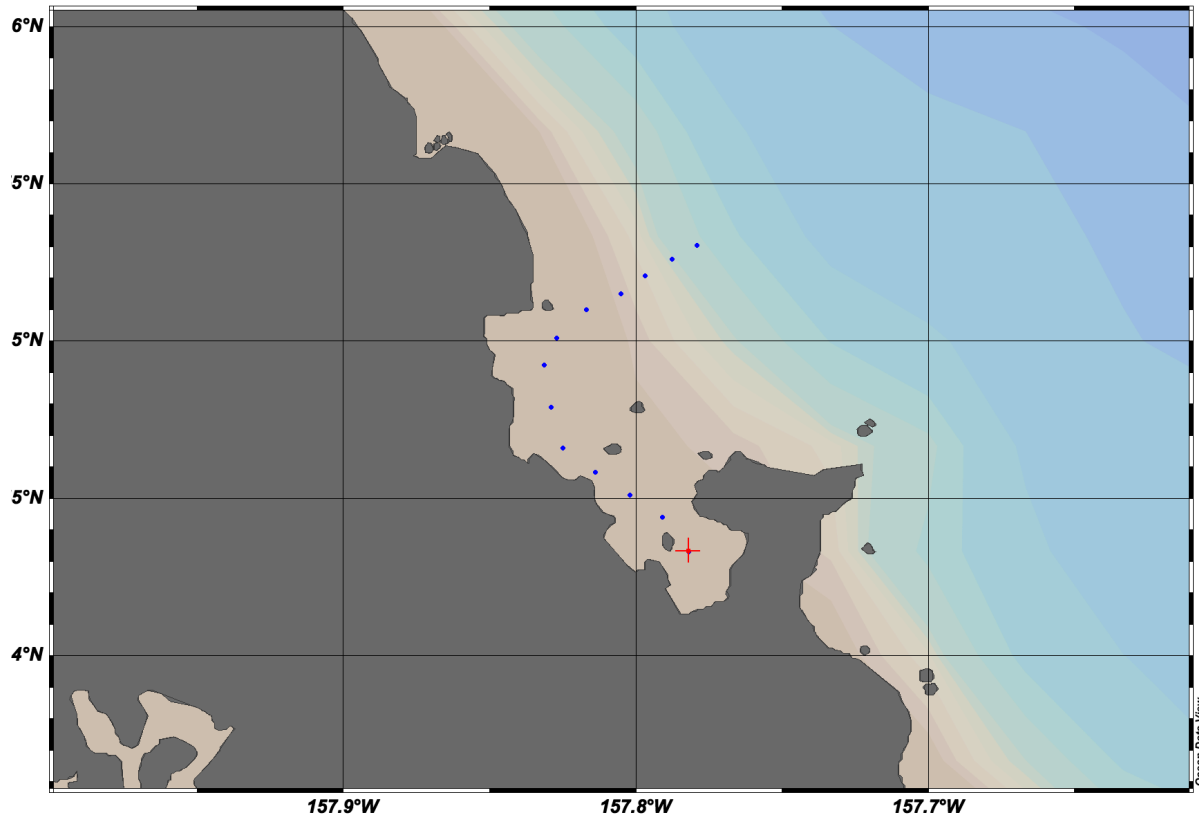
Station ID: 1			
Accession N...	1		
Cruise	4		
Station	1 (B)		
Position	157.782°W / 21.433°N		
Date			
Time			
Pressure Ra...	[1.00 - 10.00]		
Bot.depth [m]			
Sample: 1 / 10			
1: Pressure [d...	1.00	1	
2: CTD Tempe...	26.33	1	
3: CTD Salinit...	34.14	1	
4: CTD Oxyge...	27.05	1	
Isosurface Values			
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]	
<b>Sample: 1 / 10</b>	
1: Pressure [d...	1.00 1
2: CTD Tempe...	26.33 1
3: CTD Salinit...	34.14 1
4: CTD Oxyge...	27.05 1
<b>Isosurface Values</b>	
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

**View** Import Export Tools Help

Undo / Redo

Station Selection Criteria...  $\backslash S$

Derived Variables...  $\backslash D$

Isosurface Variables...

Window Properties

Window Layout  $\backslash W$

**Layout Templates**  $\blacktriangleright$

Save View As...

Save View

Load View...  $\uparrow L$

Browse Session Log File

Full Screen Map F8

1 STATION Window

2 STATION Windows

6 STATION Windows F9

1 SCATTER Window

**2 SCATTER Windows F10**

6 SCATTER Windows

1 SECTION Window

2 SECTION Windows

3 SECTION Windows

5 SECTION Windows

6 SECTION Windows F11

1 SURFACE Window

2 SURFACE Windows

3 SURFACE Windows

5 SURFACE Windows

8 SURFACE Windows

11 SURFACE Windows F12

1 SURFACE + 1 SCATTER Windows

5 MIXED Windows

From View File

**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]	

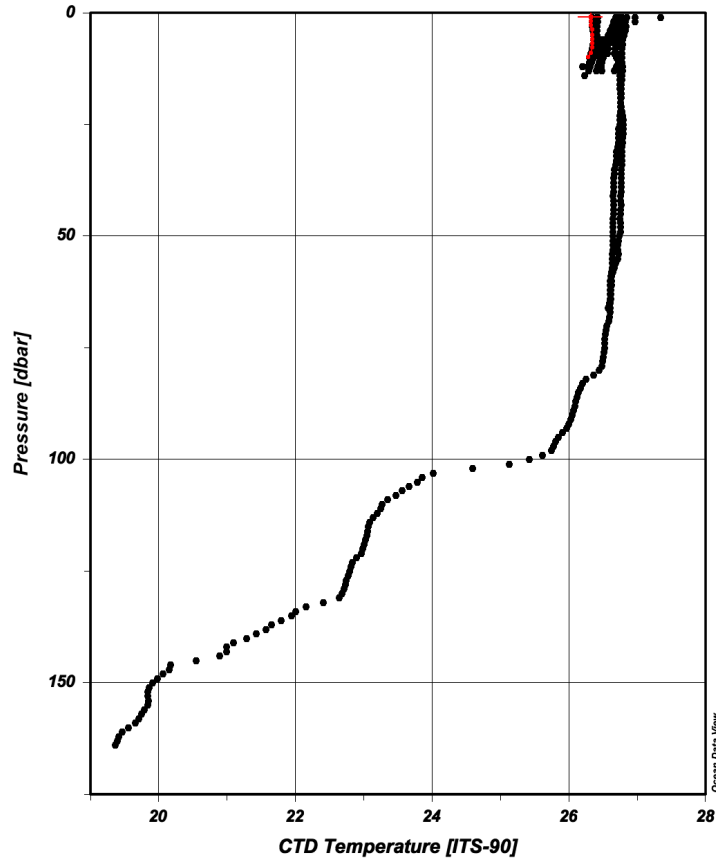
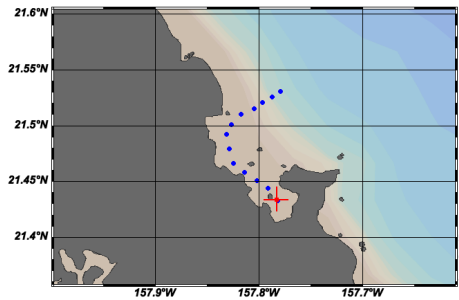
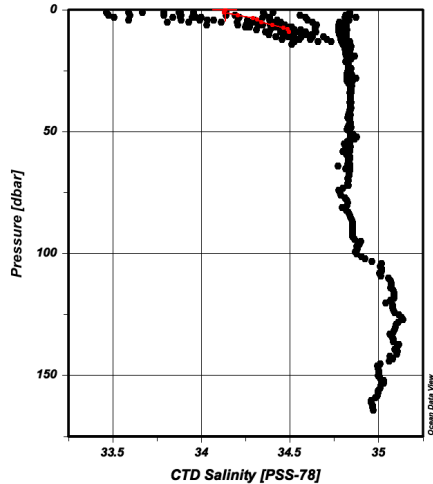
**Sample: 1 / 10**

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]	

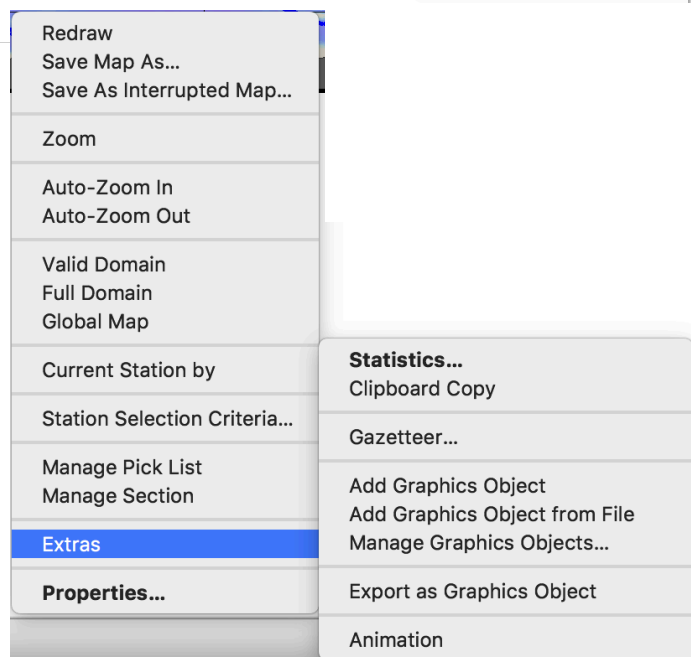
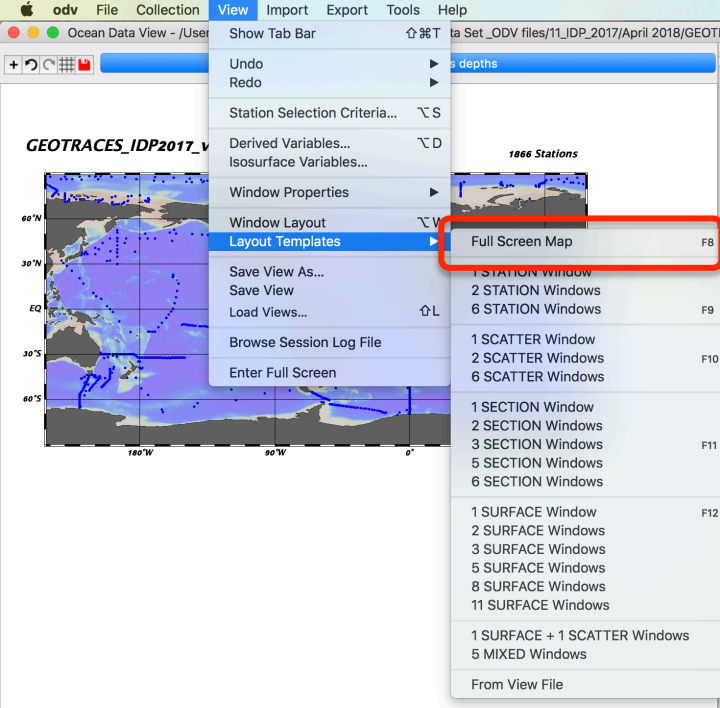
## Sample: 1 / 10

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

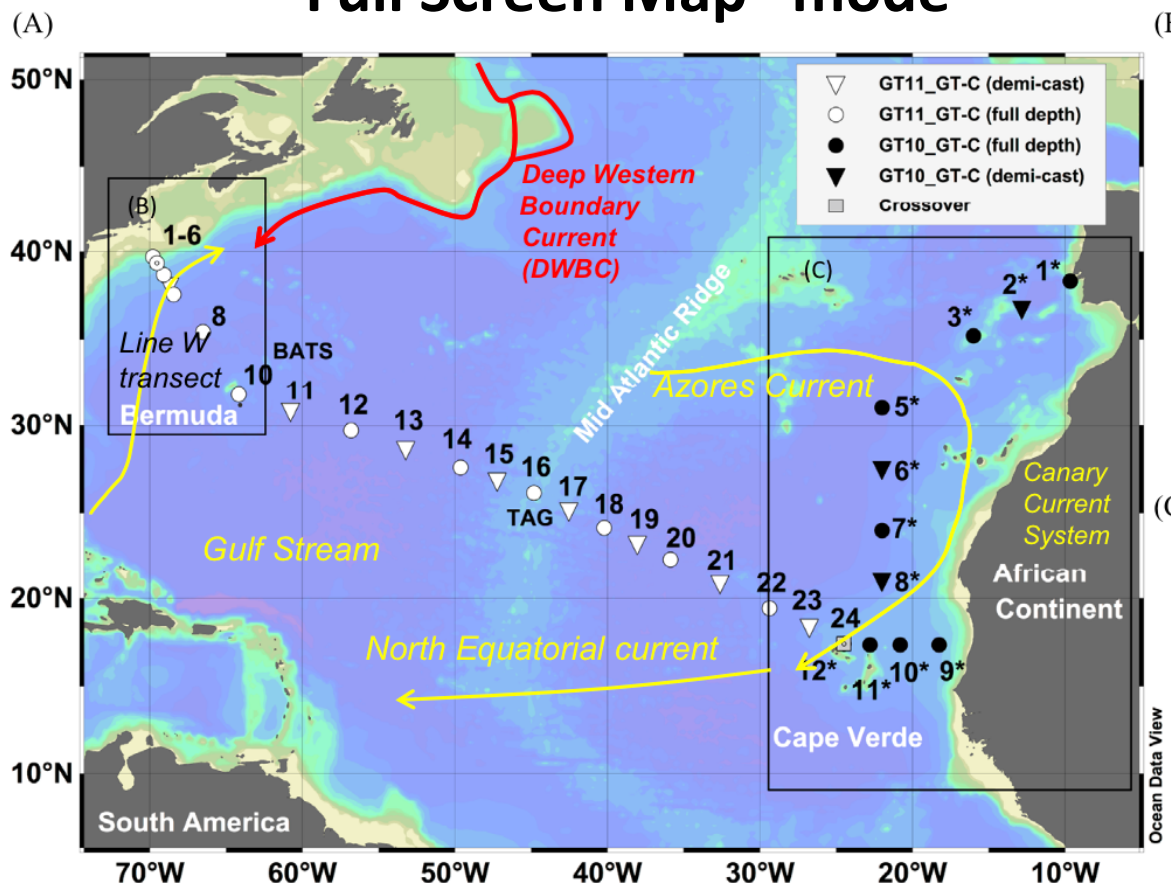
## Isosurface Values

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

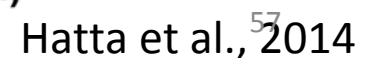


Hatta et al., 2014 & Measures et al., 2014

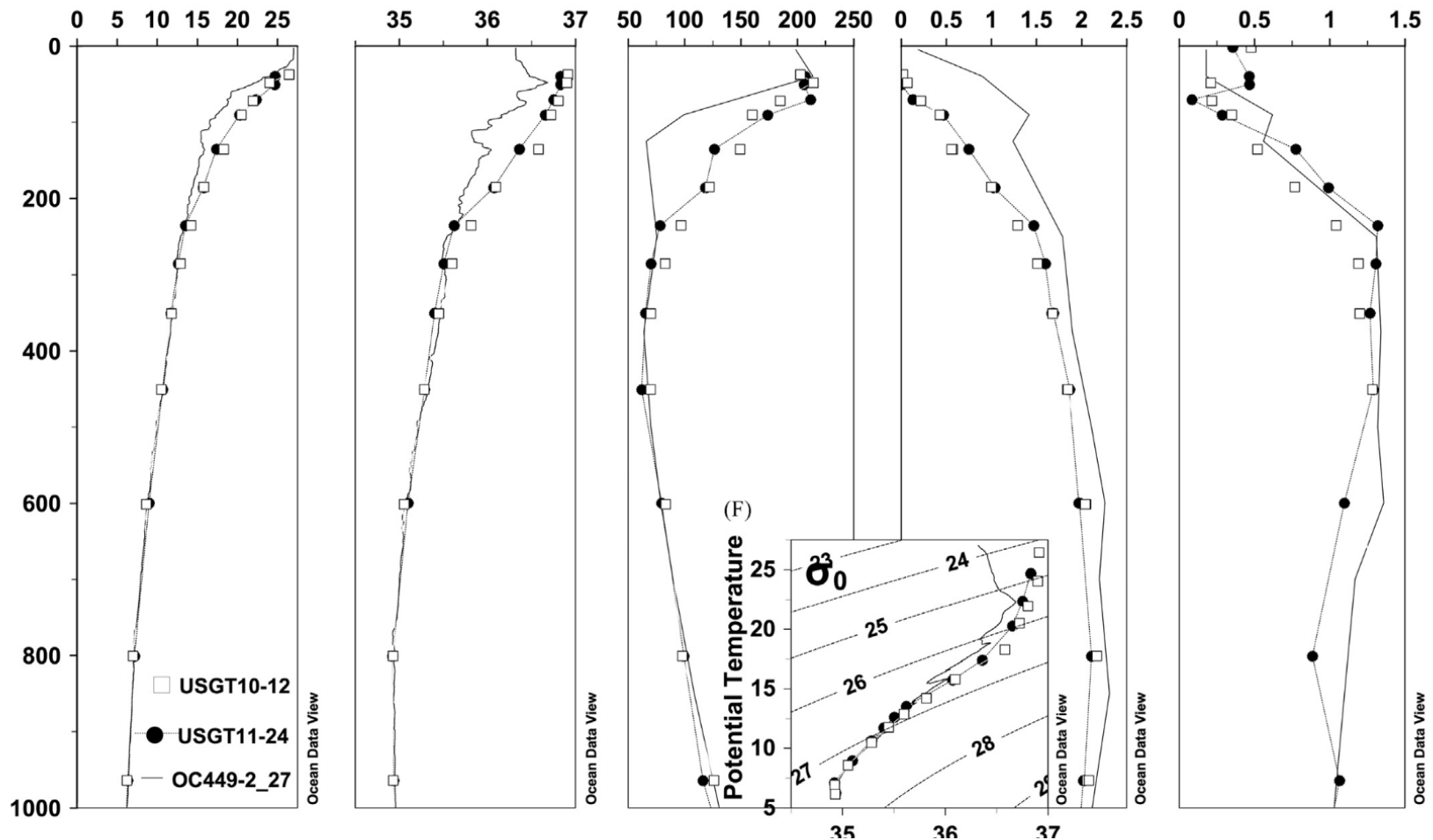
Move your cursor on the Map window, and then **Right click** (“control” + click if you are Mac user). Select “Extras”, and “Add Graphics Object.”

## “Section Windows” mode

(B)

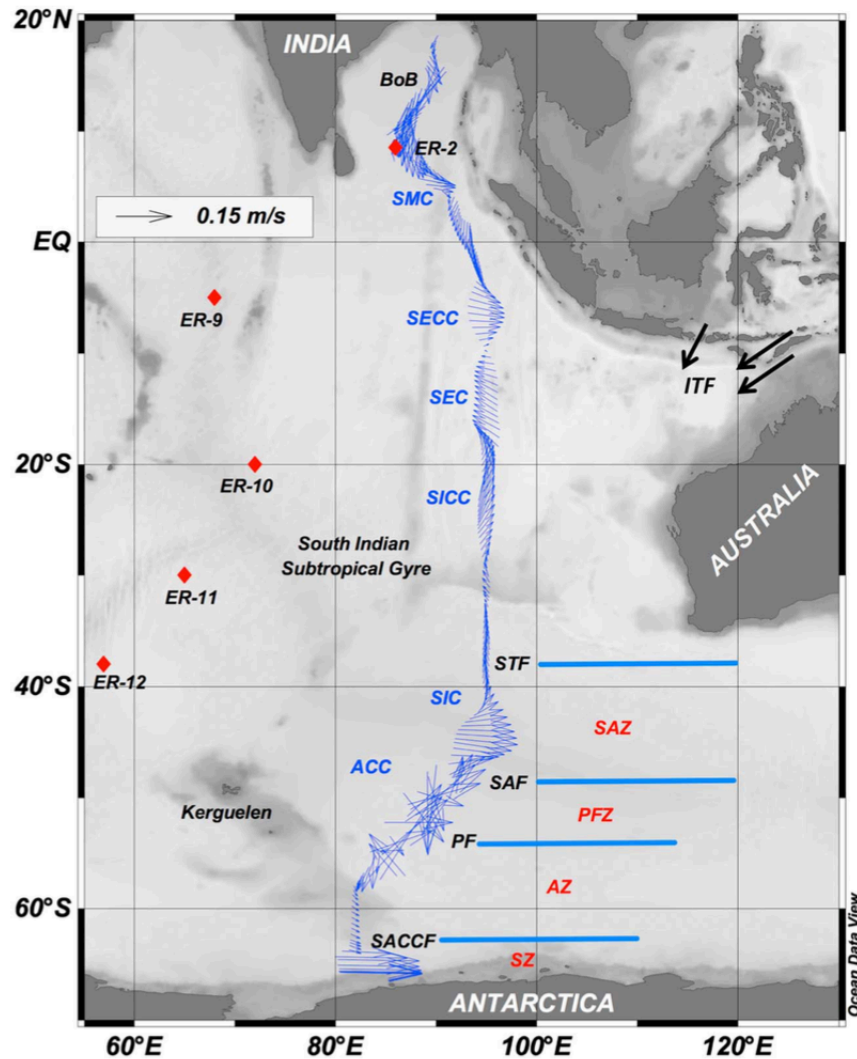


# Vertical Profiles + T-S diagram “Station Windows” mode



# “SURFACE Windows” mode

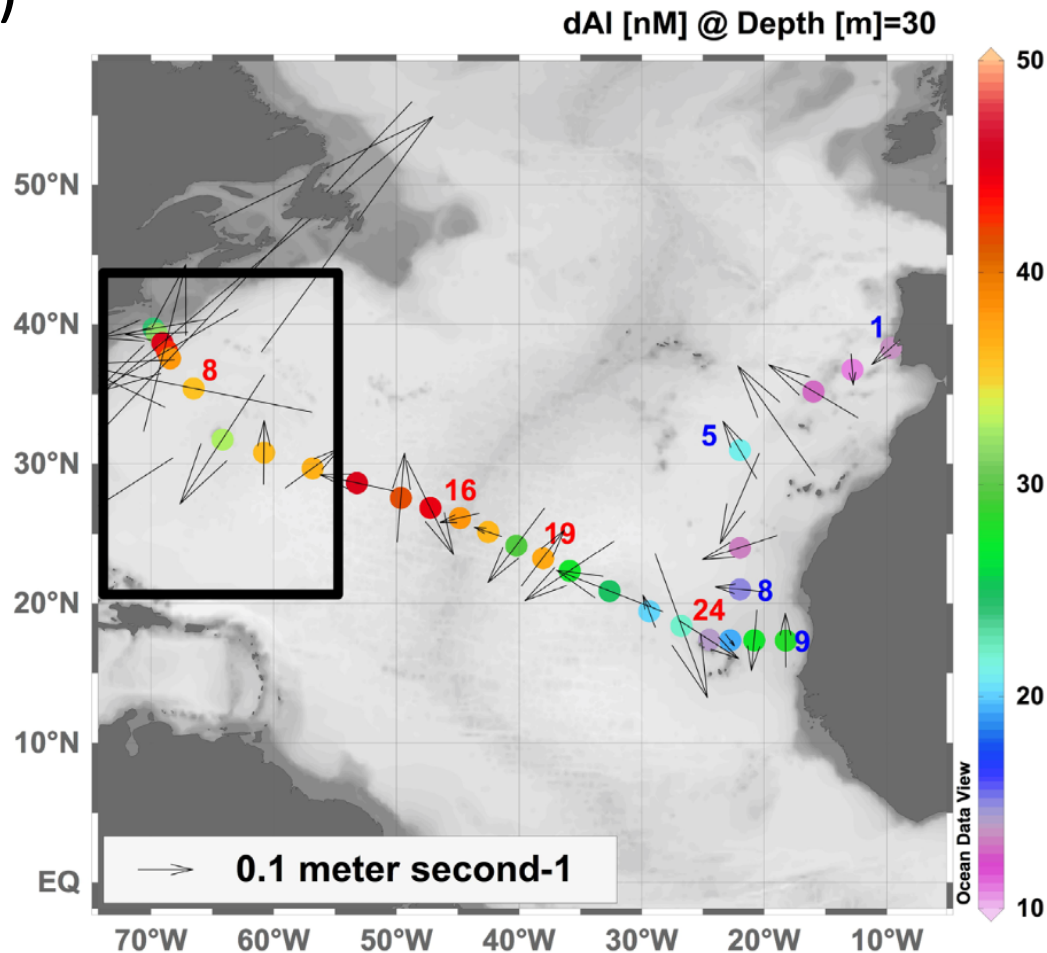
ADCP data during the cruise



Grand et al., 2015

# “SURFACE Windows” mode

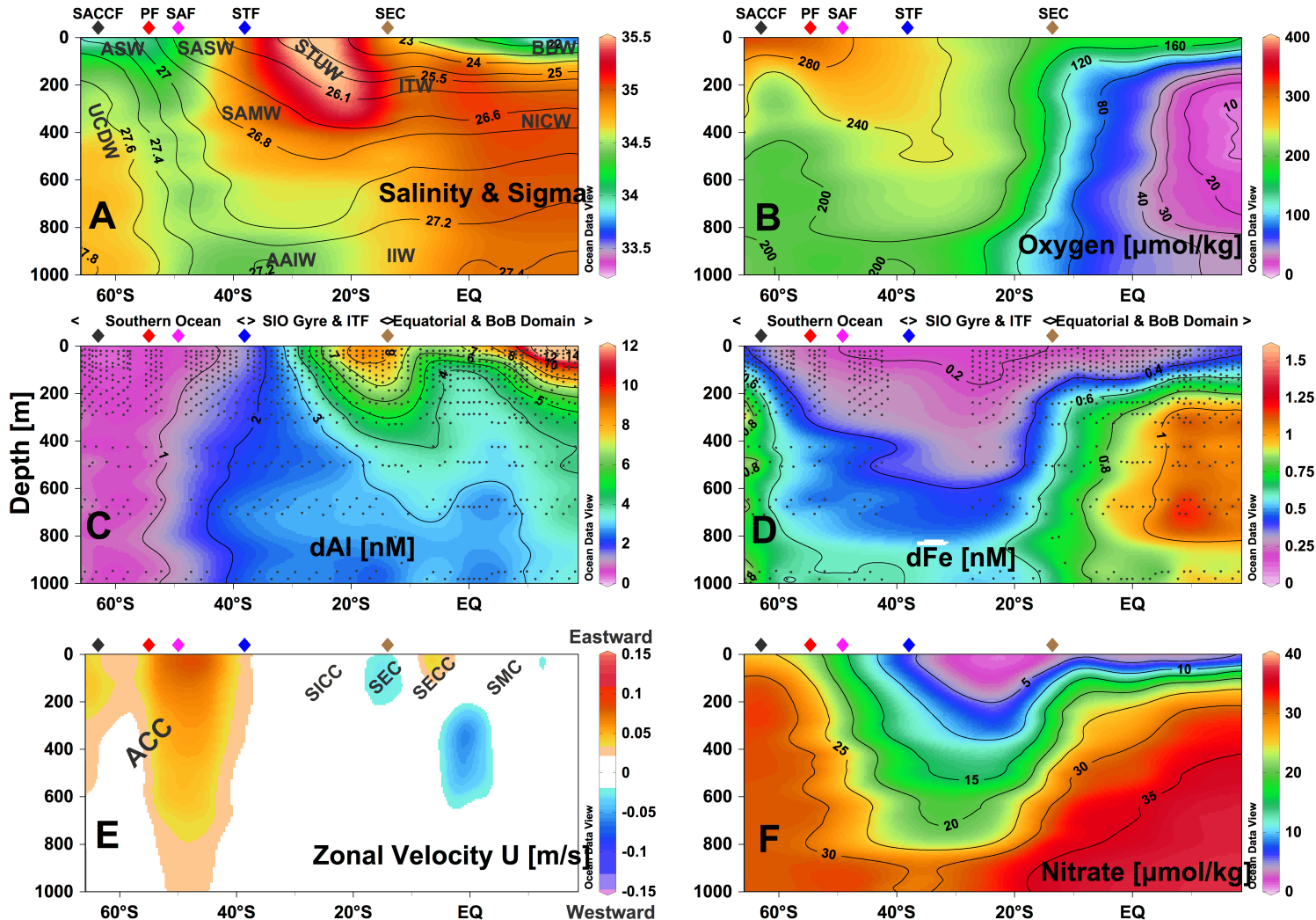
Concentrations with color as well as flow direction  
(ADCP data)





# “Section Windows” mode

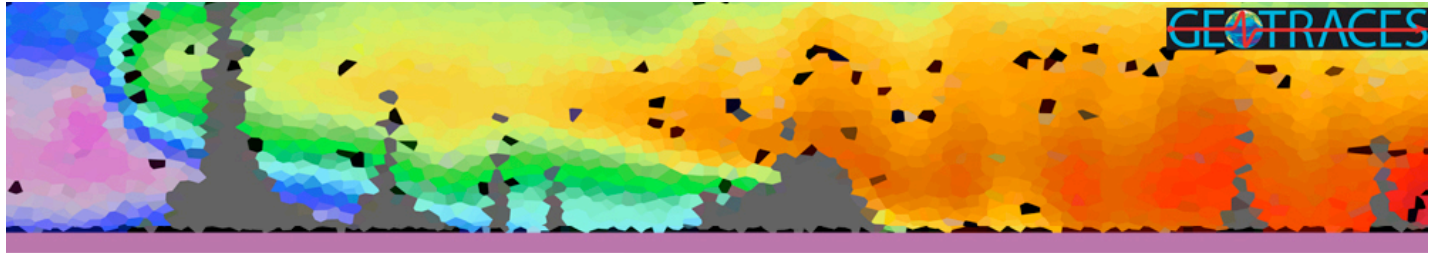
## Temperature overlaid with Salinity



ADCP



# Goldschmidt meeting 2016



## Exploring *GEOTRACES* Data with *Ocean Data View*

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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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