Examples

Etopo1 bathymetry

- Go to File > Open and select the nc file etopol.nc
- Go through the 4 steps of netcdf setup and include the **bandl** (which is the bathymetry) to the meta variable list on RHS.
- Subset the dimensions in step 3 to Use All the increments of the data



U wind from NCEP

- Go to File > Open and select the nc file uwind_monthly_mean.nc
- Go thought the 4 steps of netcdf setup and include the uwind variable to the meta variable list on RHS.
- Use time as primary selected variable
- After plotting, right click and Save as Interrupted Map.

Interrupted	Map Properties			
Title:	Zonal winds			
Label:	NCEP			
Copyright:	Linta			
FontSize:	100 % 🜩	Resolutio	n:	499 dpi 🜲
🗹 Draw so	uth polar map	Draw I	nort	h polar map
Transpa	rent background			
		ОК		Cancel



Cyclone track from JTWC

- Go to File > Open and select the csv file ockhi_cyclone_track.csv
- Associate the variable and assign data fields.
- Create isosurface variable of pressure at time equals first



Additional options in ODV

Part 1: Basic Statistics

- Open previously created osd_wod_india.odv
- To view the basic statistics, make a scatter plot of Chlorophyll vs oxygen
- Right click on the figure, select Extras
 > Statistics
- Select Y Histogram to see the distribution of chlorophyll
- Select X/Y distribution to see the data distribution
- For curve fitting, select Linear Least Square fit, construct curve and show curve
- After closing the statistics toolbox, to remove the fitted line from the figure, right click on the line and select delete object





Part 2: Quality control

- To edit the data in a single profile, right click on the values in the Sample window on the right middle and select Edit Data.
- Change Value or change quality flag for the profile.
- Select Edit sample to modify all the variables for the specific location.
- We can also assign quality flags for the currents sample or all samples of the profile

t Data - (Oxygen [µmc	ol/kg]				Edit Data - Oxygen [µmol/kg]	7
ita						Da Da	
Dep	th [m]	Oxygen	[µmol/kg]	Errors Oxygen [µ QF ^		Select new quality flag for 1 samples	
3 10 4 20		207 205		0		4 1: range outlier (outside of broad range check) 2: failed inversion check	
5 25 5 30		214		0		 ⁹ 3: failed gradient check 6 4: observed level bulksye flag and zero gradient check 5: combined gradient and inversion checks 	
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10 75 11 98		44.9	Oxygen (rnew da ? ×	Change Error Value	1 1	ange E
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7 196		3.9		0		1	
18 200 19 295		3.9		0		1	
20 393 L of 31 sa	amples selecter	3 5 d					
Se	elect All			Invert Selection			
Help					OK Cancel	OK Cancel	

Station ID: 497						
Accession Num	ber	497		^		
Cruise		WOD18	US016131			
Station		405450 (405450 (B)			
Position		67.95°E /	67.95°E / 19.98°N			
Date		20 Augu	20 August 1963			
Time		23:12	23:12			
Depth Range [m	n]	[0 - 3049]			
Bot. Depth [m]		3091	3091			
OCL Cruise Nur	nber	16131		ľ		
Originator's Cru	iise					
Originator's Sta	tion			~		
Sample: 3 / 31			(2		
1: Depth [m]		10	0	^		
2: Temperatur	e [degree	27.56	0			
3: Salinity [psu	J.	36.430	0			
4: Oxygen [Edit Dat	a	Shift+E			
5: Phospha	Edit San	nple Data				
6: Silicate [J	Assian	Quality Flag				
7: Nitrate [µm	оі/кдј	200mcy ring	U	-		
8: Nitrite [µmo	ol/kg]		0			
9: pH			0			
10: Chlorophyl	ll [µg/l]	0.23	0			
11: Plankton/B	liomass		0			
12: Alkalinity [meq/l]		0			
13: NO2+NO3	[µmol/kg]		0			
14: pCO2 [µatr	n]		0			
15: tCO2 [mm	ol/l1		0	Y		
Isosurface Valu	es					
Longitude			67.950	^		
Latitude			19.980			
Time [yr]			1963.636			
Day of Year			232			
Depth [m] @ De	epth [m]=fir	st	0			
Temperature [d	egrees_C] @	Depth [27.54			
1000 F 10	D 11 1	C +	26,424	~		

- To perform quality control first plot a depth vs salinty scatter plot
- Go to Tools > Find Outliers. Give a range 30 to 33 psu for salinity and select find values outside this range.
- An outlier list will be generated, which can be viewed later in notepad.
- Select View and Edit outliers and Flag them and Keep them, Apply to all. You can also delete them, which is not recommended.
- Inspect the profiles to see the flagged data points

Find Outli	iers	
Scan Var	riable	
	1: Depth [m] 2: Temperature [degrees_C] 3: Salinity [psu] 4: Oxygen [~\$m~#mol/kg] 5: Phosphate [~\$m~#mol/kg] 6: Silicate [~\$m~#mol/kg] 7: Nitrate [~\$m~#mol/kg] 8: Nitrite [~\$m~#mol/kg] 9: pH 10: Chlorophyll [~\$m~#g/] 11: Plankton/Biomass 12: Alkalinity [meq/] 13: NO2+NO3 [~\$m~#mol/kg] 14: pCO~_2 [~\$m~#mtm] 15: tCO~_2 [mm~#mtm]	
	17: Helium [nmol/kq]	~
Range:	: 30 - 33	
Action:	find values outside range	•
Sample R Depth [r	Range [m]: 0 - [4500	
	ОК С	ancel

Identifying Ou	ıtliers			
36195 outlier (s) found.			
View outlier	r list			
Inspect and	d edit outliers			
		ОК	Cancel	
Outlier Action				
Station - [4: WOD 18, US	032030 1357476	9 (B)] Sample-	-1 Value-37	3 OF-0
368001-[4. WOD10_03	032939 1337470	s (b)] Sample-	-i value=37	.5 Qi =0
	an outline (outsid	a of broad ran	a deada	
	ge outlier (outsia	e of broad rang	je cneckj	•
 Delete value 				
Apply	Apply to All	Кеер		Cancel

Part 3: Export data

- Export the data using Export > Station Data > ODV Spreadsheet file
- Export the QC modified data in the scatter window using Export > XYZ Window data, into a text document
- Make a gridded surface plot of salinity at 300 m and save this isosurface data into a text file using Export > Isosurface data

Part 4: Ocean Data Calculator

- Go to File > Tools and select Ocean Calculator
- Select variables form the RHS and provide input variable values on LHS to get the specified derived variables at specific locations.
- You can type any values under the Input values tab.

🝯 Ocean Calculator		?
Input values		Variable
Pressure [dbar]	Value 1100	HCO3-(ALK,DIC) [umol/kg] In situ Density Anomaly g [kg/m³] In situ Temperature [degC]
Temperature [degC]	29	Latent Heat of Evaporation [k]/kg] Latent Heat of Melting [k]/kg]
Practical Salinity [psu]	33	Neutral Density γn [kg/m³] Omega_A(ALK,DIC)
Lonaitude [deaE]	-28	Omega_C(ALK,DIC) Oxygen Saturation [%]
Latitude [degN]	30	Oxygen Saturation [mol/kg] pCO2(ALK,DIC) [uatm] pH(ALK,DIC)
		Potential Temperature θ [degC] Practical Salinity from Absolute Salinity [psu] Practical Salinity from Conductivity [psu] Preformed Salinity S* [g/kg] Pressure from Depth [dbar] Reference Salinity SR [g/kg] Revelle Factor(ALK,DIC) Saline Contraction Coefficient β 0 [10-3 kg/g] SF6 Partial Pressure [pptv] SF6 Saturation [%] SF6 Saturation [%] SF6 Saturation [%] SF6 Saturation [%] Specific Heat Capacity Cp [J/(kg degC)] Specific Volume Anomaly δ [10-6 m3/kg] Spiciness n Thermal Expansion Coefficient α 0 [10-6 K-1] Thermobaric Coefficient TOb [10-12 1/(K Pa)]
		Description
		Specific heat capacity C~_p for seawater at given Pressure/Depth, Temperature and Salinity.
Decult 3087 29121	Evaluate	Ref.: IOC, SCOR and IAPSO, 2010. The international thermodynamic equation of seawater - 2010: Calculation and use of thermodynamic properties. Intergovernmental Oceanographic Commission, Manuals and Guides No. 56, UNESCO (English), 196 pp.
Sec. 3907.30121	Evaluate	J
Help Settin	ngs	Close

Part 5: Overlay plots

- Open the osd_wod collection previously created.
- Define a new section along a thickly data populated region. A section can be a curve or any zigzagged feature.
- Plot temperature as Z variable and interpolate data using weighted average gridding.



- To overplot salinity contours on temperature, go to File > View > Window Layout
- Or alternatively, click on the # icon on the menu bar.
- Now right click on the image, select Create overlay window.
- Go back to figure, again right click, select properties, make sure the data tab shows the new variable – salinity
- Go to contours, select **do contours** and add a range of contours, with increments
- Go back to the figure, right click and select Accept



OK

Cancel

Properties Window 2

Alread	ly Defined	1				New		Start
31 32 33 34 35				>>		0.1		Increment End
						Line very thin 176	L • [abels few labels 🔹
				<< auto-cre	eate	solid Fill (none)	•	

Apply to all windows with this Z-variable	
3: Salinity [psu]	

Help

Delete Window Del							
Create New Window							
Create Overlay Window							
Move to Foreground							
Move to Background							
Properties	Alt+P						
X-Variable	х						
Y-Variable	γ						
Z-Variable	Z						
Accept	Enter						
Cancel	Esc						

Ctrl+R

Move / Resize

23: CFC11 [pmol/kg] 24: CFC12 [pmol/kg]

25: CFC113 [pmol/kg] Reverse range

OK

Cancel

Q

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Cean Data View - C:\Users\user\Documents\ODV\data\ODV_COLLECTION_(2019-08-08T14-58-52)

File Collection View Import Export Tools Help



– 0 X

- Overlay window will be active only after data interpolation.
- To go back to the filled plot of temperature contours to change its properties, now it can only be accessed through File > View > Window properties > Window 1.
- For the window 2 (salinity contours) remove the colorbar from Properties > Data > colorbar settings > Position > No colorbar.

Task:

• Repeat the same for a surface plot, Reject the outliers.



File Collection View Import Export Tools Help



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Hovmoller Diagram

- Try a surface temperature plot with gridding.
- Change the y variable to time in years and zoom into the figure to get the desired filled region.
- This is similar to a Hovmoller (timelongitude) diagram, but without area averaging.

