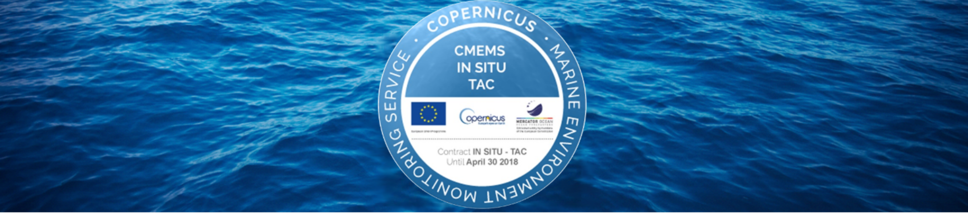


marine.copernicus.eu

CMEMS User & Training Workshop – IBI region

In Situ TAC

Fernando Manzano, Charles Troupin

Puertos del Estado, SOCIB

Lisboa, 11 December 2015

1. Ocean Data View

2. Python

1. Ocean Data View

1.1– Objective 1: time series

1.2– Objective 2: CORA dataset

2. Python

2.1– ipython notebooks

2.2– Example 1: plotting

Ocean
Data View

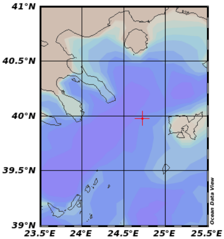
ODV in 3 lines

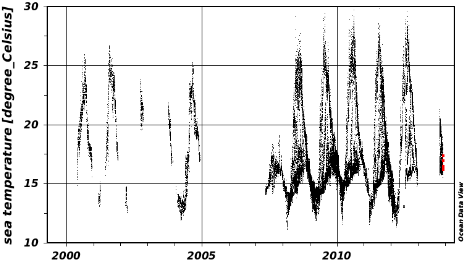
> 40000 registered users
Data analysis + visualisation
Almost every format supported

Working with ODV on Time Series

Objective: plotting time series

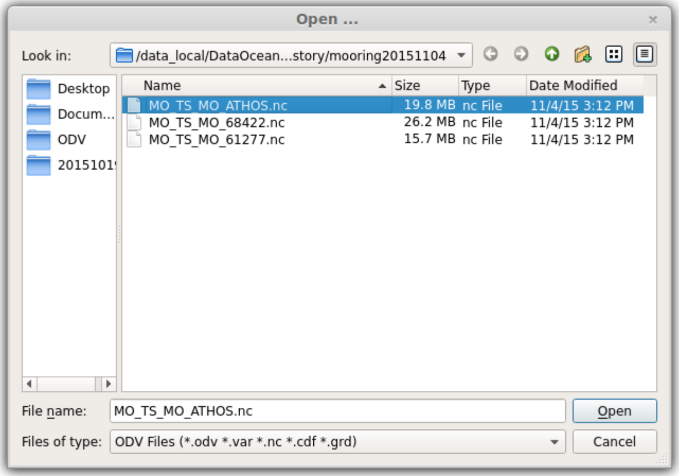
Temperature at mooring Athos





Opening the netCDF file

File → Open → netcdf



Look in: /data_local/DataOcean...story/mooring20151104

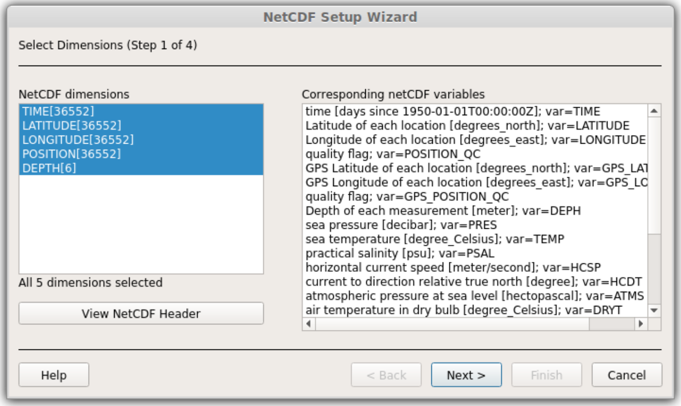
Name	Size	Type	Date Modified
MO_TS_MO_ATHOS.nc	19.8 MB	nc File	11/4/15 3:12 PM
MO_TS_MO_68422.nc	26.2 MB	nc File	11/4/15 3:12 PM
MO_TS_MO_61277.nc	15.7 MB	nc File	11/4/15 3:12 PM

File name: MO_TS_MO_ATHOS.nc

Files of type: ODV Files (*.odv *.var *.nc *.cdf *.grd)

Opening the netCDF file

Dimension and variables : Next



NetCDF Setup Wizard

Select Dimensions (Step 1 of 4)

NetCDF dimensions

```
TIME[36552]
LATITUDE[36552]
LONGITUDE[36552]
POSITION[36552]
DEPTH[6]
```

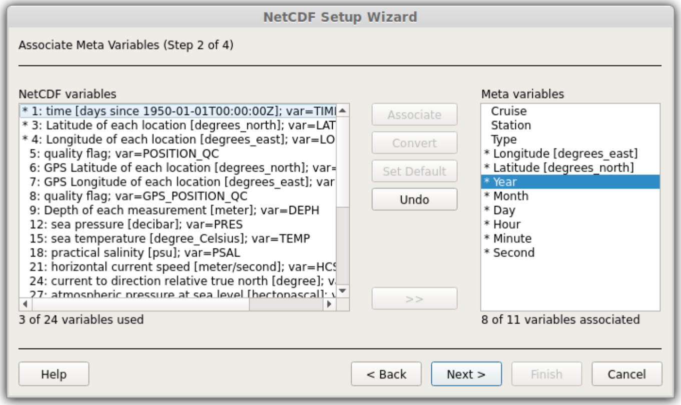
All 5 dimensions selected

Corresponding netCDF variables

```
time [days since 1950-01-01T00:00:00Z]; var=TIME
Latitude of each location [degrees_north]; var=LATITUDE
Longitude of each location [degrees_east]; var=LONGITUDE
quality flag; var=POSITION_QC
GPS Latitude of each location [degrees_north]; var=GPS_LAT
GPS Longitude of each location [degrees_east]; var=GPS_LC
quality flag; var=GPS_POSITION_QC
Depth of each measurement [meter]; var=DEPH
sea pressure [decibar]; var=PRES
sea temperature [degree_Celsius]; var=TEMP
practical salinity [psu]; var=PSAL
horizontal current speed [meter/second]; var=HCSP
current to direction relative true north [degree]; var=HCDT
atmospheric pressure at sea level [hectopascal]; var=ATMS
air temperature in dry bulb [degree_Celsius]; var=DRYT
```

Opening the netCDF file

Variable association : Next



NetCDF Setup Wizard

Associate Meta Variables (Step 2 of 4)

NetCDF variables

```
* 1: time [days since 1950-01-01T00:00:00Z]; var=TIMI
* 3: Latitude of each location [degrees_north]; var=LAT
* 4: Longitude of each location [degrees_east]; var=LO
  5: quality flag; var=POSITION_QC
  6: GPS Latitude of each location [degrees_north]; var=
  7: GPS Longitude of each location [degrees_east]; var
  8: quality flag; var=GPS_POSITION_QC
  9: Depth of each measurement [meter]; var=DEPH
  12: sea pressure [decibar]; var=PRES
  15: sea temperature [degree_Celsius]; var=TEMP
  18: practical salinity [psu]; var=PSAL
  21: horizontal current speed [meter/second]; var=HCS
  24: current to direction relative true north [degree]; v
  27: atmospheric pressure at sea level [hectopascal]; v
```

3 of 24 variables used

Meta variables

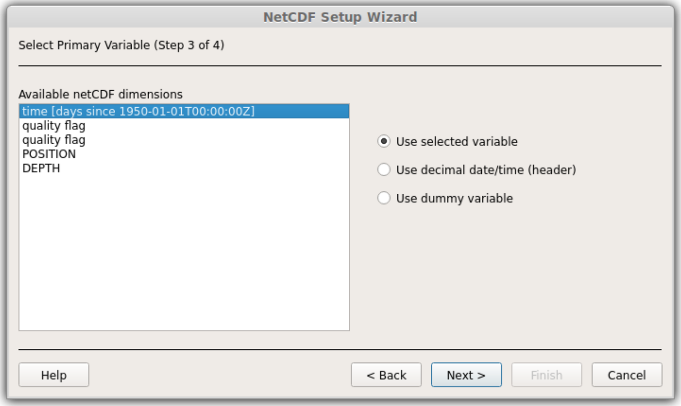
```
  Cruise
  Station
  Type
* Longitude [degrees_east]
* Latitude [degrees_north]
* Year
* Month
* Day
* Hour
* Minute
* Second
```

8 of 11 variables associated

✍ Quality Control variables not visible at this stage

Opening the netCDF file

Primary variables : Next



Select Primary Variable (Step 3 of 4)

Available netCDF dimensions

time [days since 1950-01-01T00:00:00Z]
quality flag
quality flag
POSITION
DEPTH

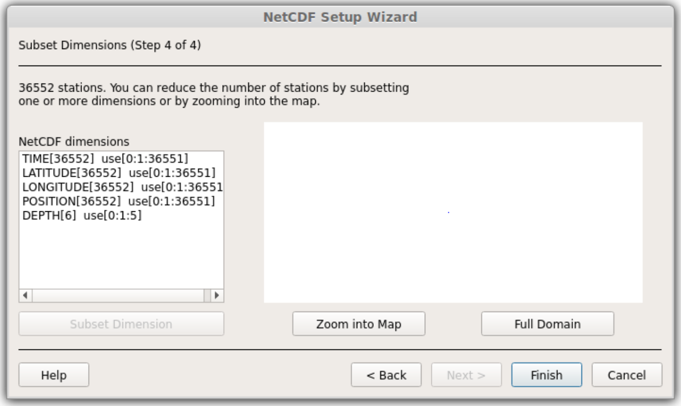
● Use selected variable

○ Use decimal date/time (header)

○ Use dummy variable

Opening the netCDF file

Subset dimensions : Finish



NetCDF Setup Wizard

Subset Dimensions (Step 4 of 4)

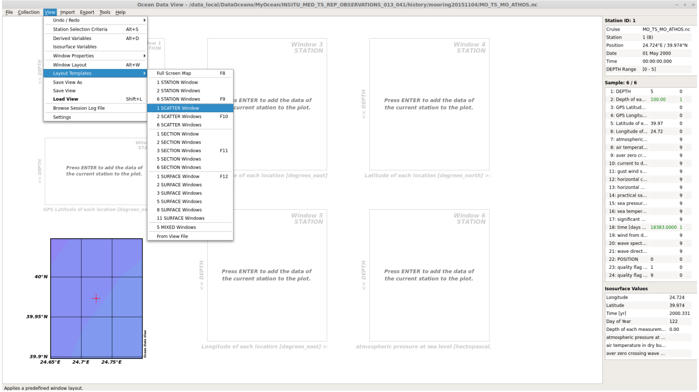
36552 stations. You can reduce the number of stations by subsetting one or more dimensions or by zooming into the map.

NetCDF dimensions

```
TIME[36552]  use[0:1:36551]
LATITUDE[36552]  use[0:1:36551]
LONGITUDE[36552]  use[0:1:36551
POSITION[36552]  use[0:1:36551]
DEPTH[6]  use[0:1:5]
```

Plot the time series

View → Layout template → Scatter window



Station ID: 1

Cruise	MO_TS_MO_ATHOS.nc
Station	1 (B)
Position	24.724°E / 39.974°N
Date	01 May 2000
Time	00:00:00.000
DEPTH Range	[0 - 5]

Sample: 6 / 6

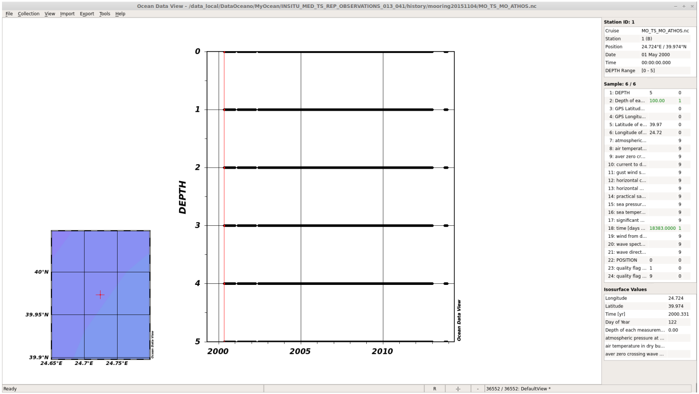
1: DEPTH	5	0
2: Depth of ea...	100.00	1
3: GPS Latitud...		0
4: GPS Longitu...		0
5: Latitude of e...	39.97	0
6: Longitude of...	24.72	0
7: atmospheric...		9
8: air temperat...		9
9: aver zero cr...		9
10: current to d...		9
11: gust wind s...		9
12: horizontal c...		9
13: horizontal ...		9
14: practical sa...		9
15: sea pressur...		9
16: sea temper...		9
17: significant ...		9
18: time [days ...	18383.0000	1
19: wind from d...		9
20: wave spect...		9
21: wave direct...		9
22: POSITION	0	0
23: quality flag ...	1	0
24: quality flag ...	9	0

Isosurface Values

Longitude	24.724
Latitude	39.974
Time [yr]	2000.331
Day of Year	122
Depth of each measurem...	0.00
atmospheric pressure at ...	
air temperature in dry bu...	
aver zero crossing wave ...	

Plot the time series

Right-click on plot:
Change X and Y variable (temperature vs. time)



Ocean Data View - /data_local/DataOceano/MyOcean/INSITU_MED_TS_REP_OBSERVATIONS_013_041/history/mooring20151104/MO_TS_MO_ATHOS.nc

Station ID: 1

Cruise	MO_TS_MO_ATHOS.nc
Station	1 (B)
Position	24.724°E / 39.974°N
Date	01 May 2000
Time	00:00:00.000
DEPTH Range	[0 - 5]

Sample: 6 / 6

1: DEPTH	5	0
2: Depth of ea...	100.00	1
3: GPS Latitud...		0
4: GPS Longitu...		0
5: Latitude of e...	39.97	0
6: Longitude of...	24.72	0
7: atmospheric...		9
8: air temperat...		9
9: aver zero cr...		9
10: current to d...		9
11: gust wind s...		9
12: horizontal c...		9
13: horizontal ...		9
14: practical sa...		9
15: sea pressur...		9
16: sea temper...		9
17: significant ...		9
18: time [days ...	18383.0000	1
19: wind from d...		9
20: wave spect...		9
21: wave direct...		9
22: POSITION	0	0
23: quality flag ...	1	0
24: quality flag ...	9	0

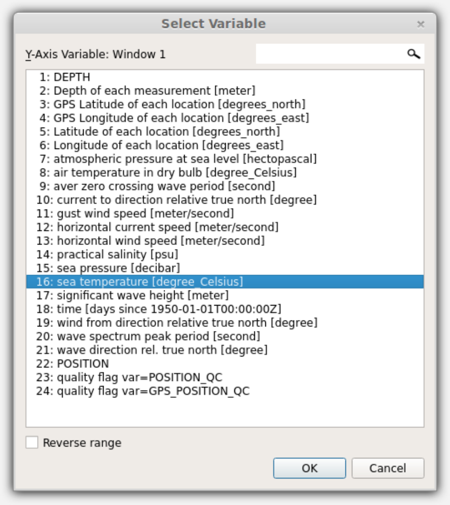
Isosurface Values

Longitude	24.724
Latitude	39.974
Time [yr]	2000.331
Day of Year	122
Depth of each measurem...	0.00
atmospheric pressure at ...	
air temperature in dry bu...	
aver zero crossing wave ...	

36552 / 36552: DefaultView *

Plot the time series

🖱 Right-click on plot:
Change X and Y variable (temperature vs. time)



Select Variable

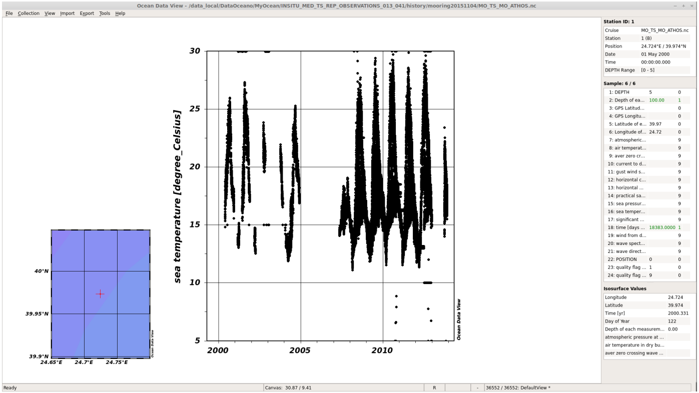
Y-Axis Variable: Window 1

1: DEPTH
2: Depth of each measurement [meter]
3: GPS Latitude of each location [degrees_north]
4: GPS Longitude of each location [degrees_east]
5: Latitude of each location [degrees_north]
6: Longitude of each location [degrees_east]
7: atmospheric pressure at sea level [hectopascal]
8: air temperature in dry bulb [degree_Celsius]
9: aver zero crossing wave period [second]
10: current to direction relative true north [degree]
11: gust wind speed [meter/second]
12: horizontal current speed [meter/second]
13: horizontal wind speed [meter/second]
14: practical salinity [psu]
15: sea pressure [decibar]
16: sea temperature [degree_Celsius]
17: significant wave height [meter]
18: time [days since 1950-01-01T00:00:00Z]
19: wind from direction relative true north [degree]
20: wave spectrum peak period [second]
21: wave direction rel. true north [degree]
22: POSITION
23: quality flag var=POSITION_QC
24: quality flag var=GPS_POSITION_QC

☐ Reverse range

Plot the time series

Right-click on plot:
Change X and Y variable (temperature vs. time)


Ocean Data View - /data_local/DataOceano/MyOcean/INSITU_MED_TS_REP_OBSERVATIONS_013_041/history/mooring20151104/MO_TS_MO_ATHOS.nc
File
Collection
View
Import
Export
Tools
Help
40°N
39.95°N
39.9°N
24.65°E
24.7°E
24.75°E
Ocean Data View
30
25
20
15
10
5
sea temperature [degree_Celsius]
2000
2005
2010
Ocean Data View
Ready
Canvas: 30.87 / 9.41
R
-
36552 / 36552: DefaultView *

Station ID: 1

Cruise	MO_TS_MO_ATHOS.nc
Station	1 (B)
Position	24.724°E / 39.974°N
Date	01 May 2000
Time	00:00:00.000
DEPTH Range	[0 - 5]

Sample: 6 / 6

1: DEPTH	5	0
2: Depth of ea...	100.00	1
3: GPS Latitud...		0
4: GPS Longitu...		0
5: Latitude of e...	39.97	0
6: Longitude of...	24.72	0
7: atmospheric...		9
8: air temperat...		9
9: aver zero cr...		9
10: current to d...		9
11: gust wind s...		9
12: horizontal c...		9
13: horizontal ...		9
14: practical sa...		9
15: sea pressur...		9
16: sea temper...		9
17: significant ...		9
18: time [days ...	18383.0000	1
19: wind from d...		9
20: wave spect...		9
21: wave direct...		9
22: POSITION	0	0
23: quality flag ...	1	0
24: quality flag ...	9	0

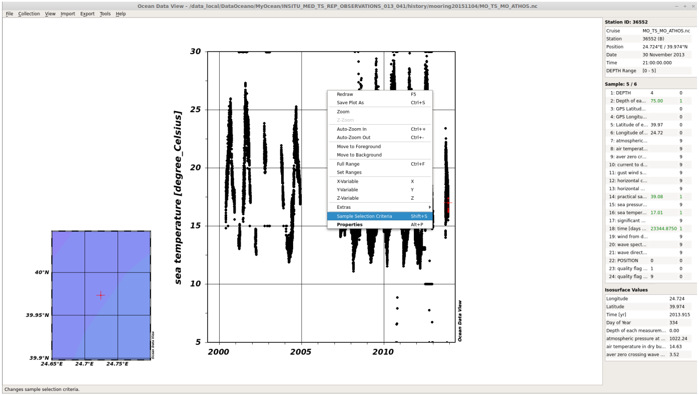
Isosurface Values

Longitude	24.724
Latitude	39.974
Time [yr]	2000.331
Day of Year	122
Depth of each measurem...	0.00
atmospheric pressure at ...	
air temperature in dry bu...	
aver zero crossing wave ...	

Bad values: will be treated later

Plot the time series

🖱 Right-click on plot: Sample Select Criteria
→ depth range



Station ID: 36552

Cruise	MO_TS_MO_ATHOS.nc
Station	36552 (B)
Position	24.724°E / 39.974°N
Date	30 November 2013
Time	21:00:00.000
DEPTH Range	[0 - 5]

Sample: 5 / 6

1: DEPTH	4	0
2: Depth of ea...	75.00	1
3: GPS Latitud...		0
4: GPS Longitu...		0
5: Latitude of e...	39.97	0
6: Longitude of...	24.72	0
7: atmospheric...		9
8: air temperat...		9
9: aver zero cr...		9
10: current to d...		9
11: gust wind s...		9
12: horizontal c...		9
13: horizontal ...		9
14: practical sa...	39.08	1
15: sea pressur...		9
16: sea temper...	17.01	1
17: significant ...		9
18: time [days ...	23344.8750	1
19: wind from d...		9
20: wave spect...		9
21: wave direct...		9
22: POSITION	0	0
23: quality flag ...	1	0
24: quality flag ...	9	0

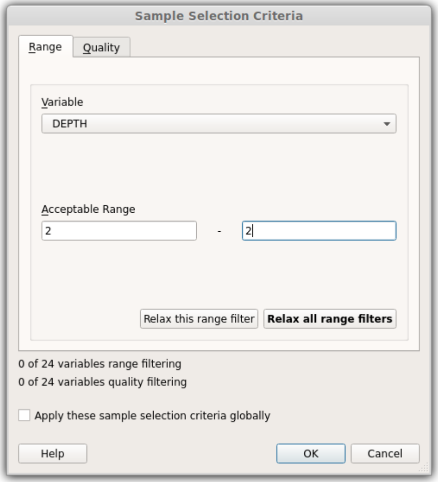
Isosurface Values

Longitude	24.724
Latitude	39.974
Time [yr]	2013.915
Day of Year	334
Depth of each measurem...	0.00
atmospheric pressure at ...	1022.24
air temperature in dry bu...	14.63
aver zero crossing wave ...	3.52

Changes sample selection criteria.

Plot the time series

🖱 Right-click on plot: Sample Select Criteria
→ depth range



Sample Selection Criteria

Variable: DEPTH

Acceptable Range: 2 - 2

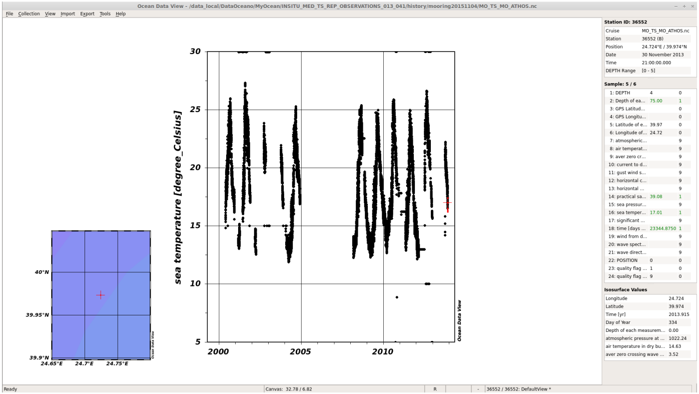
0 of 24 variables range filtering

0 of 24 variables quality filtering

□ Apply these sample selection criteria globally

Plot the time series

Right-click on plot: Sample Select Criteria
→ depth range



Ocean Data View - /data_local/DataOceano/MyOcean/INSITU_MED_TS_REP_OBSERVATIONS_013_041/history/mooring20151104/MO_TS_MO_ATHOS.nc

Station ID: 36552

Cruise	MO_TS_MO_ATHOS.nc
Station	36552 (B)
Position	24.724°E / 39.974°N
Date	30 November 2013
Time	21:00:00.000
DEPTH Range	[0 - 5]

Sample: 5 / 6

1: DEPTH	4	0
2: Depth of ea...	75.00	1
3: GPS Latitud...		0
4: GPS Longitu...		0
5: Latitude of e...	39.97	0
6: Longitude of...	24.72	0
7: atmospheric...		9
8: air temperat...		9
9: aver zero cr...		9
10: current to d...		9
11: gust wind s...		9
12: horizontal c...		9
13: horizontal ...		9
14: practical sa...	39.08	1
15: sea pressur...		9
16: sea temper...	17.01	1
17: significant ...		9
18: time [days ...	23344.8750	1
19: wind from d...		9
20: wave spect...		9
21: wave direct...		9
22: POSITION	0	0
23: quality flag ...	1	0
24: quality flag ...	9	0

Isosurface Values

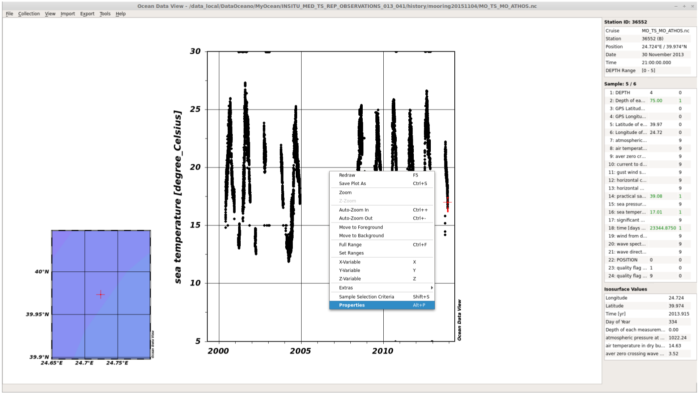
Longitude	24.724
Latitude	39.974
Time [yr]	2013.915
Day of Year	334
Depth of each measurem...	0.00
atmospheric pressure at ...	1022.24
air temperature in dry bu...	14.63
aver zero crossing wave ...	3.52

Ready | Canvas: 32.78 / 6.82 | 36552 / 36552: DefaultView *

Now we have the series at 2 depth

Improve the plot

- Right-click on plot: Properties



Station ID: 36552

Cruise	MO_TS_MO_ATHOS.nc
Station	36552 (B)
Position	24.724°E / 39.974°N
Date	30 November 2013
Time	21:00:00.000
DEPTH Range	[0 - 5]

Sample: 5 / 6

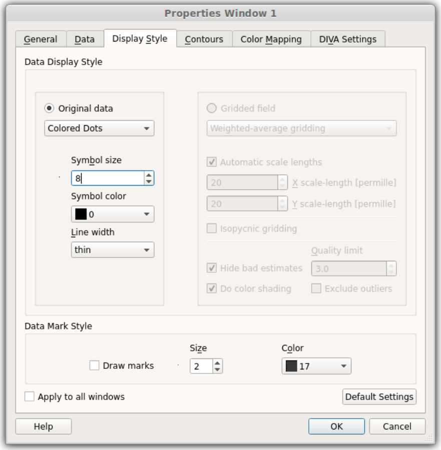
1: DEPTH	4	0
2: Depth of ea...	75.00	1
3: GPS Latitud...		0
4: GPS Longitu...		0
5: Latitude of e...	39.97	0
6: Longitude of...	24.72	0
7: atmospheric...		9
8: air temperat...		9
9: aver zero cr...		9
10: current to d...		9
11: gust wind s...		9
12: horizontal c...		9
13: horizontal ...		9
14: practical sa...	39.08	1
15: sea pressur...		9
16: sea temper...	17.01	1
17: significant ...		9
18: time [days ...	23344.8750	1
19: wind from d...		9
20: wave spect...		9
21: wave direct...		9
22: POSITION	0	0
23: quality flag ...	1	0
24: quality flag ...	9	0

Isosurface Values

Longitude	24.724
Latitude	39.974
Time [yr]	2013.915
Day of Year	334
Depth of each measurem...	0.00
atmospheric pressure at ...	1022.24
air temperature in dry bu...	14.63
aver zero crossing wave ...	3.52

Improve the plot

Display Style: modify Symbols Size



Data Display Style

● Original data

Colored Dots

Symbol size: 8

Symbol color: ■ 0

Line width: thin

○ Gridded field

Weighted-average gridding

☑ Automatic scale lengths

20 X scale-length [permille]

20 Y scale-length [permille]

□ Isopycnic gridding

Quality limit

☑ Hide bad estimates 3.0

☑ Do color shading □ Exclude outliers

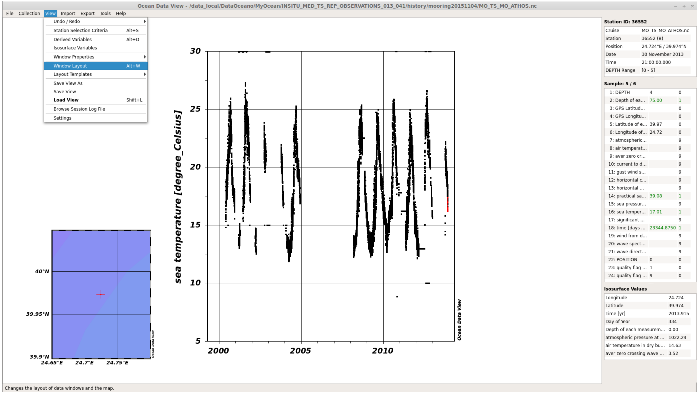
Data Mark Style

□ Draw marks Size: 2 Color: ■ 17

□ Apply to all windows

Improve the plot

View → Window Layout



Ocean Data View - /data_local/DataOceano/MyOcean/INSITU_MED_TS_REP_OBSERVATIONS_013_041/history/mooring20151104/MO_TS_MO_ATHOS.nc

Station ID: 36552

Cruise	MO_TS_MO_ATHOS.nc
Station	36552 (B)
Position	24.724°E / 39.974°N
Date	30 November 2013
Time	21:00:00.000
DEPTH Range	[0 - 5]

Sample: 5 / 6

1: DEPTH	4	0
2: Depth of ea...	75.00	1
3: GPS Latitud...		0
4: GPS Longitu...		0
5: Latitude of e...	39.97	0
6: Longitude of...	24.72	0
7: atmospheric...		9
8: air temperat...		9
9: aver zero cr...		9
10: current to d...		9
11: gust wind s...		9
12: horizontal c...		9
13: horizontal ...		9
14: practical sa...	39.08	1
15: sea pressur...		9
16: sea temper...	17.01	1
17: significant ...		9
18: time [days ...	23344.8750	1
19: wind from d...		9
20: wave spect...		9
21: wave direct...		9
22: POSITION	0	0
23: quality flag ...	1	0
24: quality flag ...	9	0

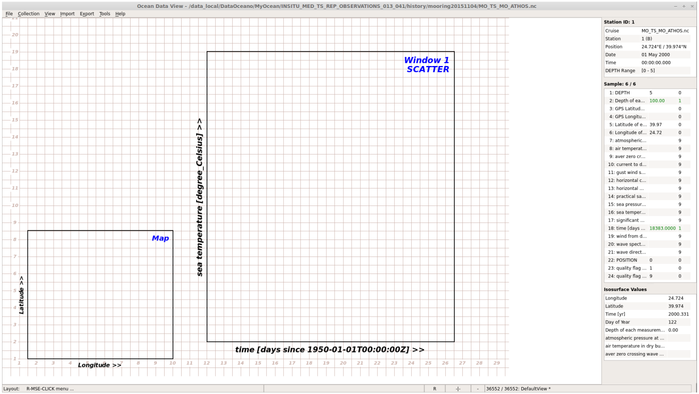
Isosurface Values

Longitude	24.724
Latitude	39.974
Time [yr]	2013.915
Day of Year	334
Depth of each measurem...	0.00
atmospheric pressure at ...	1022.24
air temperature in dry bu...	14.63
aver zero crossing wave ...	3.52

Changes the layout of data windows and the map.

Improve the plot

Adapt size of the Scatter window


Ocean Data View - /data_local/DataOceano/MyOcean/INSITU_MED_TS_REP_OBSERVATIONS_013_041/history/mooring20151104/MO_TS_MO_ATHOS.nc
File Collection View Import Export Tools Help
Window 1
SCATTER
sea temperature [degree_Celsius] >>
time [days since 1950-01-01T00:00:00Z] >>
Map
Latitude >>
Longitude >>
Layout: R-MSE-CLICK menu ...
R
-|-
-
36552 / 36552: DefaultView *

Station ID: 1

Cruise	MO_TS_MO_ATHOS.nc
Station	1 (B)
Position	24.724°E / 39.974°N
Date	01 May 2000
Time	00:00:00.000
DEPTH Range	[0 - 5]

Sample: 6 / 6

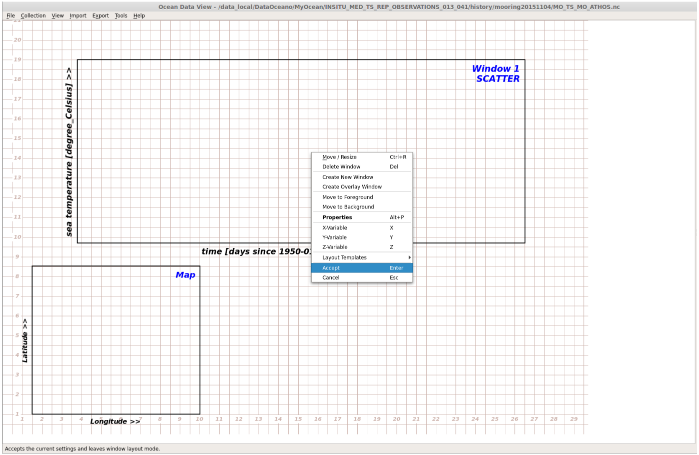
1: DEPTH	5	0
2: Depth of ea...	100.00	1
3: GPS Latitud...		0
4: GPS Longitu...		0
5: Latitude of e...	39.97	0
6: Longitude of...	24.72	0
7: atmospheric...		9
8: air temperat...		9
9: aver zero cr...		9
10: current to d...		9
11: gust wind s...		9
12: horizontal c...		9
13: horizontal ...		9
14: practical sa...		9
15: sea pressur...		9
16: sea temper...		9
17: significant ...		9
18: time [days ...	18383.0000	1
19: wind from d...		9
20: wave spect...		9
21: wave direct...		9
22: POSITION	0	0
23: quality flag ...	1	0
24: quality flag ...	9	0

Isosurface Values

Longitude	24.724
Latitude	39.974
Time [yr]	2000.331
Day of Year	122
Depth of each measurem...	0.00
atmospheric pressure at ...	
air temperature in dry bu...	
aver zero crossing wave ...	

Improve the plot

Accept the change (Enter ↵)

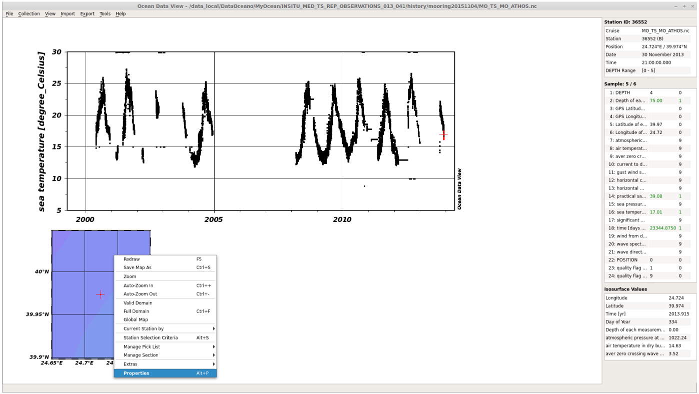


Ocean Data View - /data_local/DataOceano/MyOcean/INSITU_MED_TS_REP_OBSERVATIONS_013_041/history/mooring20151104/MO_TS_MO_ATHOS.nc

Accepts the current settings and leaves window layout mode.

Improve the plot

Right-click on plot: Properties → Domain



Station ID: 36552

Cruise	MO_TS_MO_ATHOS.nc
Station	36552 (B)
Position	24.724°E / 39.974°N
Date	30 November 2013
Time	21:00:00.000
DEPTH Range	[0 - 5]

Sample: 5 / 6

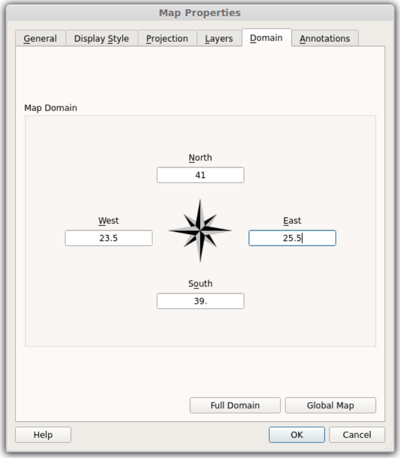
1: DEPTH	4	0
2: Depth of ea...	75.00	1
3: GPS Latitud...		0
4: GPS Longitu...		0
5: Latitude of e...	39.97	0
6: Longitude of...	24.72	0
7: atmospheric...		9
8: air temperat...		9
9: aver zero cr...		9
10: current to d...		9
11: gust wind s...		9
12: horizontal c...		9
13: horizontal ...		9
14: practical sa...	39.08	1
15: sea pressur...		9
16: sea temper...	17.01	1
17: significant ...		9
18: time [days ...	23344.8750	1
19: wind from d...		9
20: wave spect...		9
21: wave direct...		9
22: POSITION	0	0
23: quality flag ...	1	0
24: quality flag ...	9	0

Isosurface Values

Longitude	24.724
Latitude	39.974
Time [yr]	2013.915
Day of Year	334
Depth of each measurem...	0.00
atmospheric pressure at ...	1022.24
air temperature in dry bu...	14.63
aver zero crossing wave ...	3.52

Improve the plot

Enlarge the map domain



Map Properties

Map Domain

North: 41

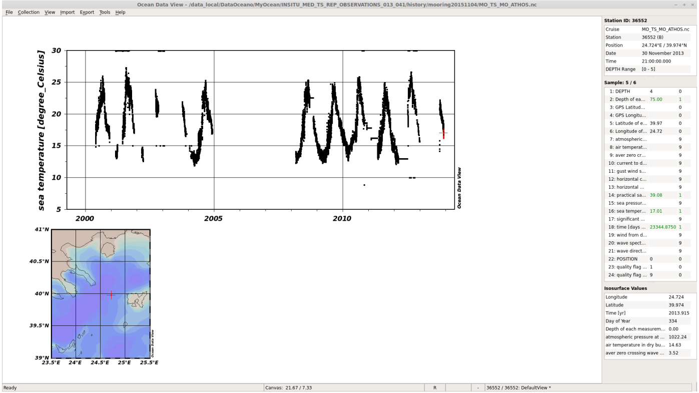
West: 23.5

East: 25.5

South: 39.

Improve the plot

Enlarge the map domain



Ocean Data View - /data_local/DataOceano/MyOcean/INSITU_MED_TS_REP_OBSERVATIONS_013_041/history/mooring20151104/MO_TS_MO_ATHOS.nc

Station ID: 36552

Cruise	MO_TS_MO_ATHOS.nc
Station	36552 (B)
Position	24.724°E / 39.974°N
Date	30 November 2013
Time	21:00:00.000
DEPTH Range	[0 - 5]

Sample: 5 / 6

1: DEPTH	4	0
2: Depth of ea...	75.00	1
3: GPS Latitud...		0
4: GPS Longitu...		0
5: Latitude of e...	39.97	0
6: Longitude of...	24.72	0
7: atmospheric...		9
8: air temperat...		9
9: aver zero cr...		9
10: current to d...		9
11: gust wind s...		9
12: horizontal c...		9
13: horizontal ...		9
14: practical sa...	39.08	1
15: sea pressur...		9
16: sea temper...	17.01	1
17: significant ...		9
18: time [days ...	23344.8750	1
19: wind from d...		9
20: wave spect...		9
21: wave direct...		9
22: POSITION	0	0
23: quality flag ...	1	0
24: quality flag ...	9	0

Isosurface Values

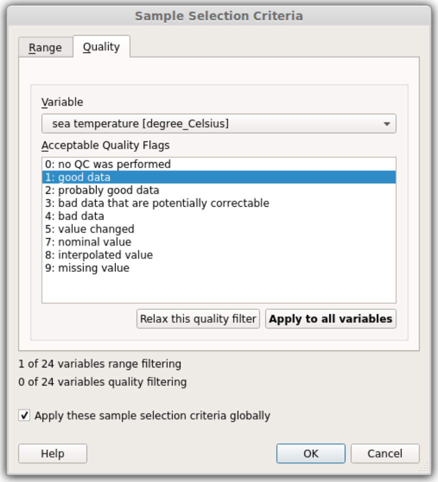
Longitude	24.724
Latitude	39.974
Time [yr]	2013.915
Day of Year	334
Depth of each measurem...	0.00
atmospheric pressure at ...	1022.24
air temperature in dry bu...	14.63
aver zero crossing wave ...	3.52

Ready | Canvas: 21.67 / 7.33 | R | - | 36552 / 36552: DefaultView *

Apply quality flags

🖱 Right-click on plot: Sample Select Criteria → depth range

Select good data only



Sample Selection Criteria

Variable

sea temperature [degree_Celsius]

Acceptable Quality Flags

0: no QC was performed
1: good data
2: probably good data
3: bad data that are potentially correctable
4: bad data
5: value changed
7: nominal value
8: interpolated value
9: missing value

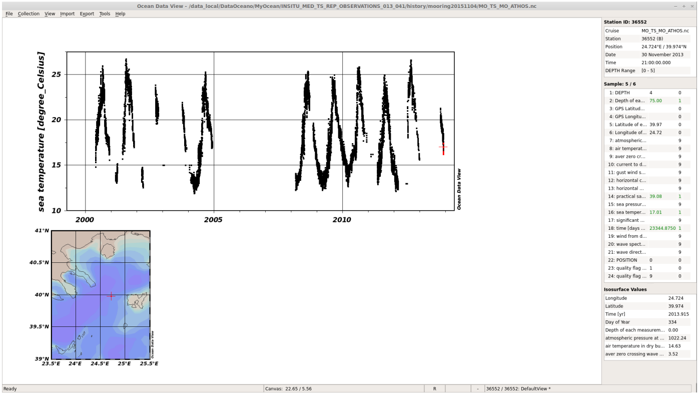
1 of 24 variables range filtering

0 of 24 variables quality filtering

☑ Apply these sample selection criteria globally

Apply quality flags

🖱 Right-click on plot: Sample Select Criteria → depth range
Select good data only



Ocean Data View - /data_local/DataOceano/MyOcean/INSITU_MED_TS_REP_OBSERVATIONS_013_041/history/mooring20151104/MO_TS_MO_ATHOS.nc

Station ID: 36552

Cruise	MO_TS_MO_ATHOS.nc
Station	36552 (B)
Position	24.724°E / 39.974°N
Date	30 November 2013
Time	21:00:00.000
DEPTH Range	[0 - 5]

Sample: 5 / 6

1: DEPTH	4	0
2: Depth of ea...	75.00	1
3: GPS Latitud...		0
4: GPS Longitu...		0
5: Latitude of e...	39.97	0
6: Longitude of...	24.72	0
7: atmospheric...		9
8: air temperat...		9
9: aver zero cr...		9
10: current to d...		9
11: gust wind s...		9
12: horizontal c...		9
13: horizontal ...		9
14: practical sa...	39.08	1
15: sea pressur...		9
16: sea temper...	17.01	1
17: significant ...		9
18: time [days ...	23344.8750	1
19: wind from d...		9
20: wave spect...		9
21: wave direct...		9
22: POSITION	0	0
23: quality flag ...	1	0
24: quality flag ...	9	0

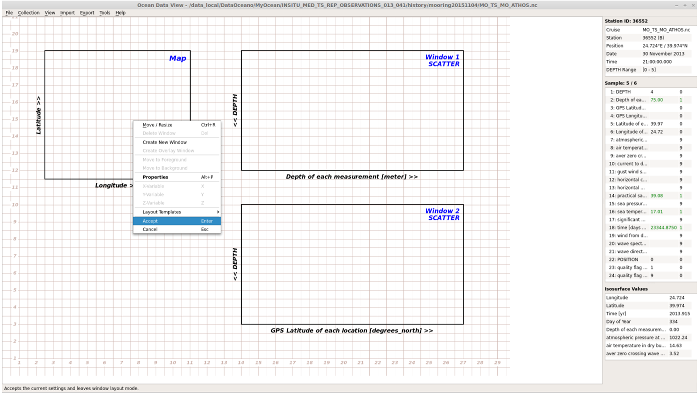
Isosurface Values

Longitude	24.724
Latitude	39.974
Time [yr]	2013.915
Day of Year	334
Depth of each measurem...	0.00
atmospheric pressure at ...	1022.24
air temperature in dry bu...	14.63
aver zero crossing wave ...	3.52

Ready | Canvas: 22.65 / 5.56 | R | - | 36552 / 36552: DefaultView *

Apply quality flags

Configure Window Layout to have the 2 time series (with and without QC



Station ID: 36552

Cruise	MO_TS_MO_ATHOS.nc
Station	36552 (B)
Position	24.724°E / 39.974°N
Date	30 November 2013
Time	21:00:00.000
DEPTH Range	[0 - 5]

Sample: 5 / 6

1: DEPTH	4	0
2: Depth of ea...	75.00	1
3: GPS Latitud...		0
4: GPS Longitu...		0
5: Latitude of e...	39.97	0
6: Longitude of...	24.72	0
7: atmospheric...		9
8: air temperat...		9
9: aver zero cr...		9
10: current to d...		9
11: gust wind s...		9
12: horizontal c...		9
13: horizontal ...		9
14: practical sa...	39.08	1
15: sea pressur...		9
16: sea temper...	17.01	1
17: significant ...		9
18: time [days ...	23344.8750	1
19: wind from d...		9
20: wave spect...		9
21: wave direct...		9
22: POSITION	0	0
23: quality flag ...	1	0
24: quality flag ...	9	0

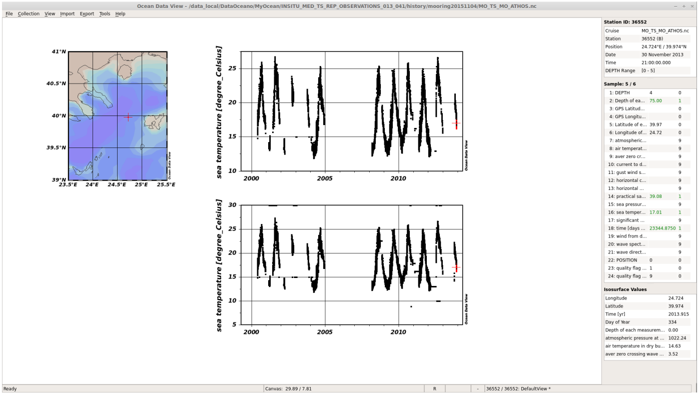
Isosurface Values

Longitude	24.724
Latitude	39.974
Time [yr]	2013.915
Day of Year	334
Depth of each measurem...	0.00
atmospheric pressure at ...	1022.24
air temperature in dry bu...	14.63
aver zero crossing wave ...	3.52

Accepts the current settings and leaves window layout mode.

Apply quality flags

Configure Window Layout to have the 2 time series (with and without QC



Ocean Data View - /data_local/DataOceano/MyOcean/INSITU_MED_TS_REP_OBSERVATIONS_013_041/history/mooring20151104/MO_TS_MO_ATHOS.nc

Station ID: 36552

Cruise	MO_TS_MO_ATHOS.nc
Station	36552 (B)
Position	24.724°E / 39.974°N
Date	30 November 2013
Time	21:00:00.000
DEPTH Range	[0 - 5]

Sample: 5 / 6

1: DEPTH	4	0
2: Depth of ea...	75.00	1
3: GPS Latitud...		0
4: GPS Longitu...		0
5: Latitude of e...	39.97	0
6: Longitude of...	24.72	0
7: atmospheric...		9
8: air temperat...		9
9: aver zero cr...		9
10: current to d...		9
11: gust wind s...		9
12: horizontal c...		9
13: horizontal ...		9
14: practical sa...	39.08	1
15: sea pressur...		9
16: sea temper...	17.01	1
17: significant ...		9
18: time [days ...	23344.8750	1
19: wind from d...		9
20: wave spect...		9
21: wave direct...		9
22: POSITION	0	0
23: quality flag ...	1	0
24: quality flag ...	9	0

Isosurface Values

Longitude	24.724
Latitude	39.974
Time [yr]	2013.915
Day of Year	334
Depth of each measurem...	0.00
atmospheric pressure at ...	1022.24
air temperature in dry bu...	14.63
aver zero crossing wave ...	3.52

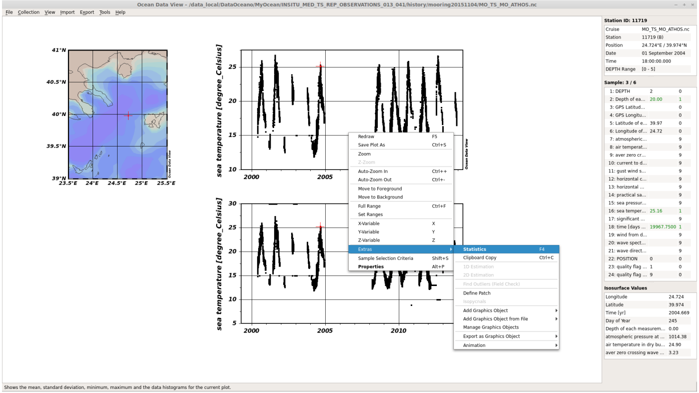
Ready | Canvas: 29.89 / 7.81 | R | - | 36552 / 36552: DefaultView *

✍ Extreme values are removed

Apply quality flags

Compare histograms:

🖱 Right-click on plot → Extra → Statistics



Ocean Data View - /data_local/DataOceano/MyOcean/INSITU_MED_TS_REP_OBSERVATIONS_013_041/history/mooring20151104/MO_TS_MO_ATHOS.nc

Station ID: 11719

Cruise	MO_TS_MO_ATHOS.nc
Station	11719 (B)
Position	24.724°E / 39.974°N
Date	01 September 2004
Time	18:00:00.000
DEPTH Range	[0 - 5]

Sample: 3 / 6

1: DEPTH	2	0
2: Depth of ea...	20.00	1
3: GPS Latitud...		0
4: GPS Longitu...		0
5: Latitude of e...	39.97	0
6: Longitude of...	24.72	0
7: atmospheric...		9
8: air temperat...		9
9: aver zero cr...		9
10: current to d...		9
11: gust wind s...		9
12: horizontal c...		9
13: horizontal ...		9
14: practical sa...		9
15: sea pressur...		9
16: sea temper...	25.16	1
17: significant ...		9
18: time [days ...	19967.7500	1
19: wind from d...		9
20: wave spect...		9
21: wave direct...		9
22: POSITION	0	0
23: quality flag ...	1	0
24: quality flag ...	9	0

Isosurface Values

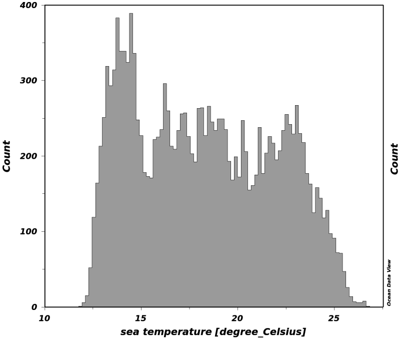
Longitude	24.724
Latitude	39.974
Time [yr]	2004.669
Day of Year	245
Depth of each measurem...	0.00
atmospheric pressure at ...	1014.38
air temperature in dry bu...	24.90
aver zero crossing wave ...	3.23

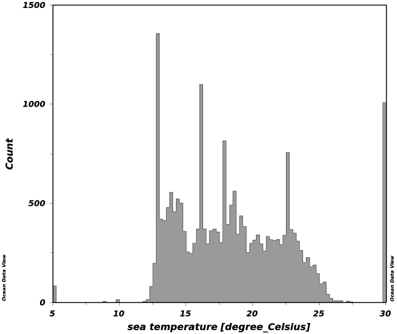
Shows the mean, standard deviation, minimum, maximum and the data histograms for the current plot.

Apply quality flags

Compare histograms:

🖱 Right-click on plot → Extra → Statistics



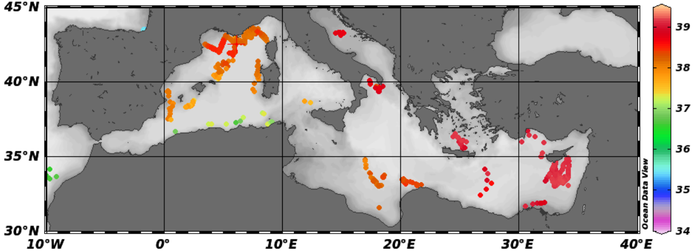


✍ Distribution is improved

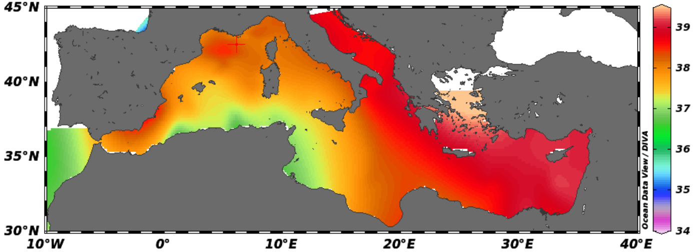
Working with ODV on CORA data set

Objective: process CORA dataset

Salinity (S78 - PSS) (interpolated on Z_levels) [none] @ depth [m]=0

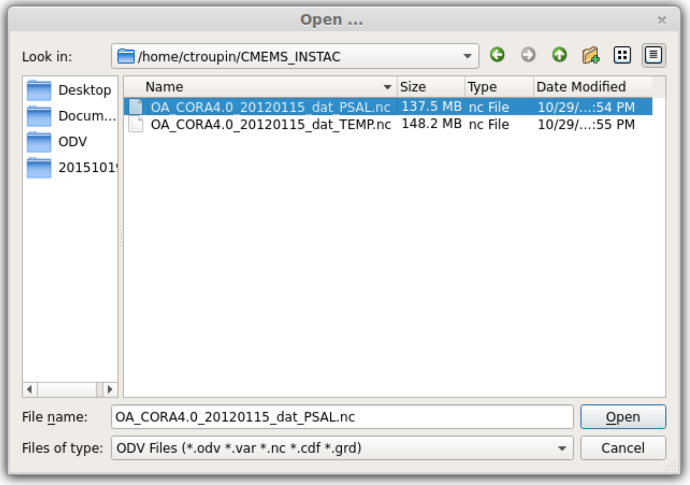


Salinity (S78 - PSS) (interpolated on Z_levels) [none] @ depth [m]=0



Opening the netCDF file

File → Open → Select the netCDF file



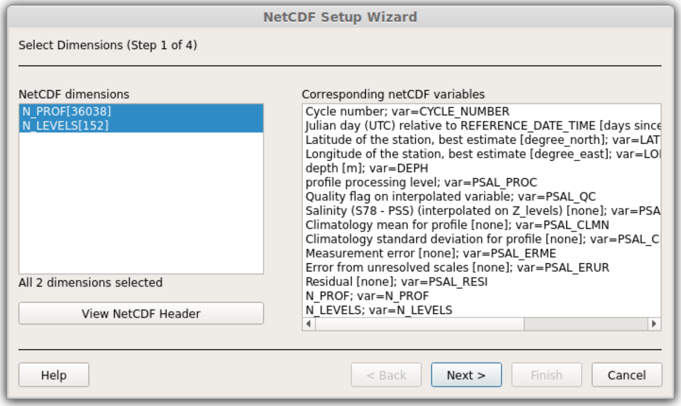
Name	Size	Type	Date Modified
OA_CORA4.0_20120115_dat_PSAL.nc	137.5 MB	nc File	10/29/...:54 PM
OA_CORA4.0_20120115_dat_TEMP.nc	148.2 MB	nc File	10/29/...:55 PM

File name: OA_CORA4.0_20120115_dat_PSAL.nc

Files of type: ODV Files (*.odv *.var *.nc *.cdf *.grd)

Opening the netCDF file

Dimension and variables : Next



NetCDF Setup Wizard

Select Dimensions (Step 1 of 4)

NetCDF dimensions

N_PROF[36038]
N_LEVELS[152]

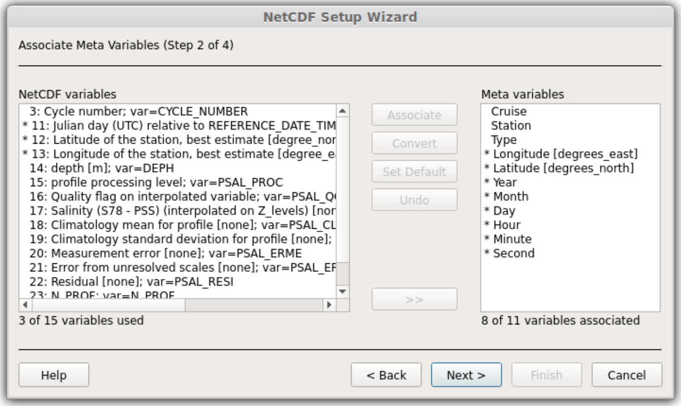
All 2 dimensions selected

Corresponding netCDF variables

Cycle number; var=CYCLE_NUMBER
Julian day (UTC) relative to REFERENCE_DATE_TIME [days since
Latitude of the station, best estimate [degree_north]; var=LAT
Longitude of the station, best estimate [degree_east]; var=LOI
depth [m]; var=DEPH
profile processing level; var=PSAL_PROC
Quality flag on interpolated variable; var=PSAL_QC
Salinity (S78 - PSS) (interpolated on Z_levels) [none]; var=PSA
Climatology mean for profile [none]; var=PSAL_CLMN
Climatology standard deviation for profile [none]; var=PSAL_C
Measurement error [none]; var=PSAL_ERME
Error from unresolved scales [none]; var=PSAL_ERUR
Residual [none]; var=PSAL_RESI
N_PROF; var=N_PROF
N_LEVELS; var=N_LEVELS

Opening the netCDF file

Variable association : Next



NetCDF Setup Wizard

Associate Meta Variables (Step 2 of 4)

NetCDF variables

```
  3: Cycle number; var=CYCLE_NUMBER
* 11: Julian day (UTC) relative to REFERENCE_DATE_TIM
* 12: Latitude of the station, best estimate [degree_nor
* 13: Longitude of the station, best estimate [degree_e
  14: depth [m]; var=DEPH
  15: profile processing level; var=PSAL_PROC
  16: Quality flag on interpolated variable; var=PSAL_Q
  17: Salinity (S78 - PSS) (interpolated on Z_levels) [nor
  18: Climatology mean for profile [none]; var=PSAL_CL
  19: Climatology standard deviation for profile [none];
  20: Measurement error [none]; var=PSAL_ERME
  21: Error from unresolved scales [none]; var=PSAL_EF
  22: Residual [none]; var=PSAL_RESI
  23: N_PROF: var=N_PROF
```

3 of 15 variables used

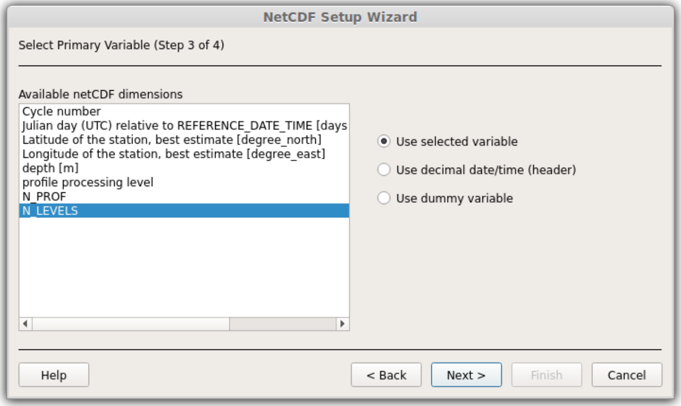
Meta variables

```
  Cruise
  Station
  Type
* Longitude [degrees_east]
* Latitude [degrees_north]
* Year
* Month
* Day
* Hour
* Minute
* Second
```

8 of 11 variables associated

Opening the netCDF file

Primary variables : Next



NetCDF Setup Wizard

Select Primary Variable (Step 3 of 4)

Available netCDF dimensions

- Cycle number
- Julian day (UTC) relative to REFERENCE_DATE_TIME [days
- Latitude of the station, best estimate [degree_north]
- Longitude of the station, best estimate [degree_east]
- depth [m]
- profile processing level
- N_PROF
- N_LEVELS

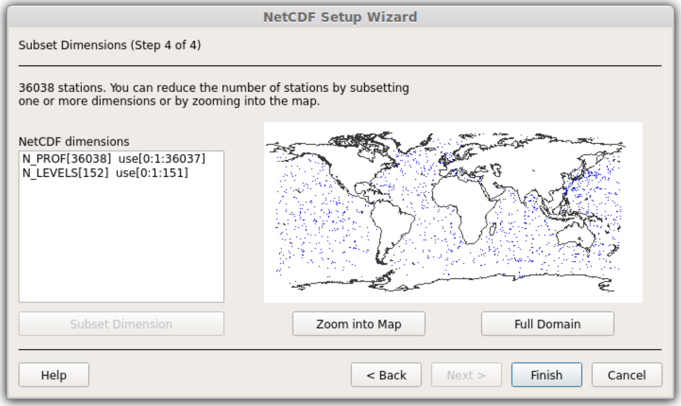
● Use selected variable

○ Use decimal date/time (header)

○ Use dummy variable

Opening the netCDF file

Subset dimensions : Finish



Subset Dimensions (Step 4 of 4)

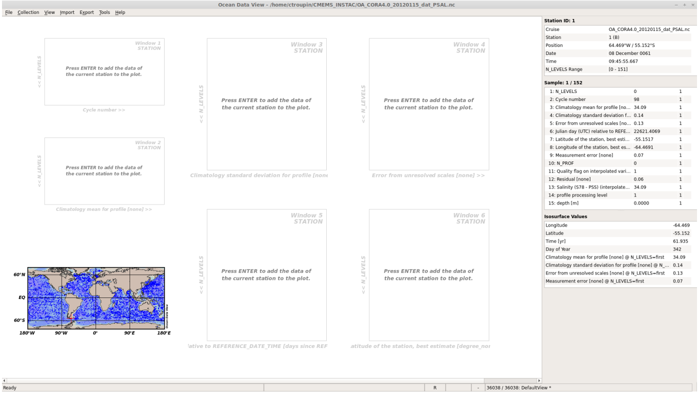
36038 stations. You can reduce the number of stations by subsetting one or more dimensions or by zooming into the map.

NetCDF dimensions

```
N_PROF[36038]  use[0:1:36037]
N_LEVELS[152]  use[0:1:151]
```

Opening the netCDF file

We get this window



Ocean Data View - /home/ctroupin/CMEMS_INSTAC/OA_CORA4.0_20120115_dat_PSAL.nc
File Collection View Import Export Tools Help
Window 1 STATION
Press ENTER to add the data of the current station to the plot.
<< N_LEVELS
Cycle number >>
Window 2 STATION
Press ENTER to add the data of the current station to the plot.
<< N_LEVELS
Climatology mean for profile [none] >>
Window 3 STATION
Press ENTER to add the data of the current station to the plot.
<< N_LEVELS
Climatology standard deviation for profile [none
Window 4 STATION
Press ENTER to add the data of the current station to the plot.
<< N_LEVELS
Error from unresolved scales [none] >>
Window 5 STATION
Press ENTER to add the data of the current station to the plot.
<< N_LEVELS
'ative to REFERENCE_DATE_TIME [days since REF
Window 6 STATION
Press ENTER to add the data of the current station to the plot.
<< N_LEVELS
atitude of the station, best estimate [degree_no
60°N
EQ
60°S
180°W
90°W
0°
90°E
180°E
Ocean Data View
Ready
R
36038 / 36038: DefaultView *

Station ID: 1

Cruise	OA_CORA4.0_20120115_dat_PSAL.nc
Station	1 (B)
Position	64.469°W / 55.152°S
Date	08 December 0061
Time	09:45:55.667
N_LEVELS Range	[0 - 151]

Sample: 1 / 152

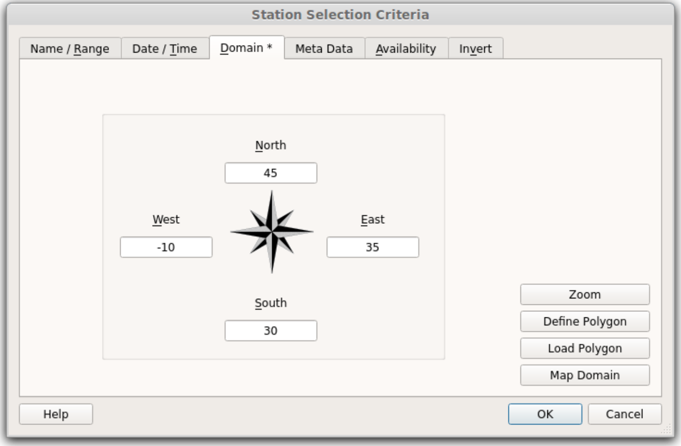
1: N_LEVELS	0	1
2: Cycle number	98	1
3: Climatology mean for profile [no...	34.09	1
4: Climatology standard deviation f...	0.14	1
5: Error from unresolved scales [no...	0.13	1
6: Julian day (UTC) relative to REFE...	22621.4069	1
7: Latitude of the station, best esti...	-55.1517	1
8: Longitude of the station, best es...	-64.4691	1
9: Measurement error [none]	0.07	1
10: N_PROF	0	1
11: Quality flag on interpolated vari...	1	1
12: Residual [none]	0.06	1
13: Salinity (S78 - PSS) (interpolate...	34.09	1
14: profile processing level	1	1
15: depth [m]	0.0000	1

Isosurface Values

Longitude	-64.469
Latitude	-55.152
Time [yr]	61.935
Day of Year	342
Climatology mean for profile [none] @ N_LEVELS=first	34.09
Climatology standard deviation for profile [none] @ N_...	0.14
Error from unresolved scales [none] @ N_LEVELS=first	0.13
Measurement error [none] @ N_LEVELS=first	0.07

Region selection and basic statistics

🖱 Right-click on image → Station Selection Criteria → Domain



Station Selection Criteria

North: 45

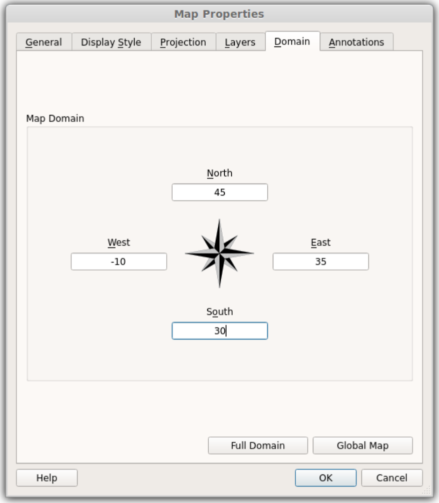
West: -10

East: 35

South: 30

Region selection and basic statistics

- Right-click on image → Properties → Domain



Map Properties

Map Domain

North: 45

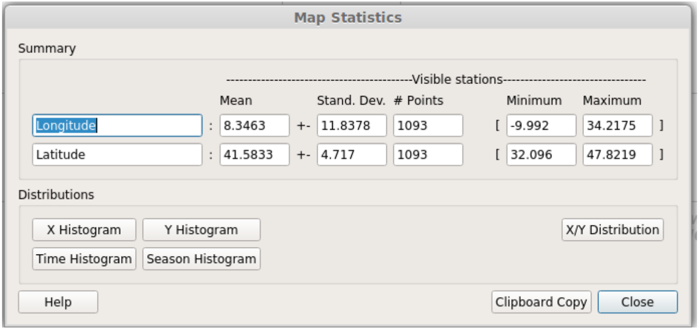
West: -10

East: 35

South: 30

Region selection and basic statistics

- Right-click on image → Extra → Statistics



Map Statistics

Summary

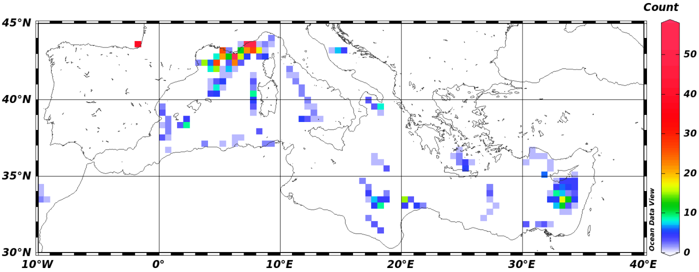
---Visible stations--------------------------------

		Mean		Stand. Dev.	# Points		Minimum	Maximum	
Longitude	:	8.3463	+-	11.8378	1093	[	-9.992	34.2175	]
Latitude	:	41.5833	+-	4.717	1093	[	32.096	47.8219	]

Distributions

Region selection and basic statistics

Figure → X/Y Distribution

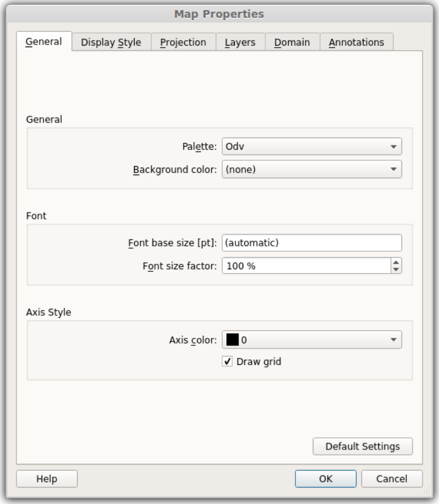


☒ Data scarcity and inhomogeneous distribution

Map improvement

Right-click on map → **Properties**

General: palette, colors etc



Map Properties

General | Display Style | Projection | Layers | Domain | Annotations

General

Palette: Odv

Background color: (none)

Font

Font base size [pt]: (automatic)

Font size factor: 100 %

Axis Style

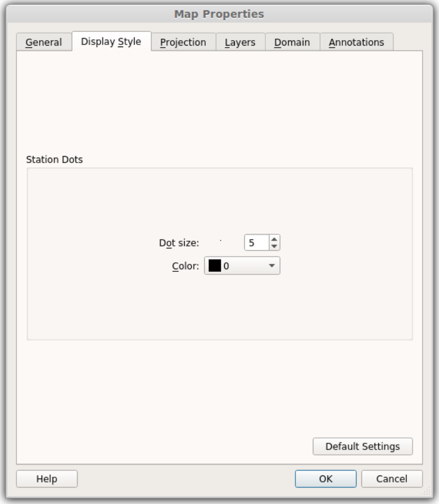
Axis color: ■ 0

☑ Draw grid

Map improvement

Right-click on map → **Properties**

Display style: increase dot size, change color



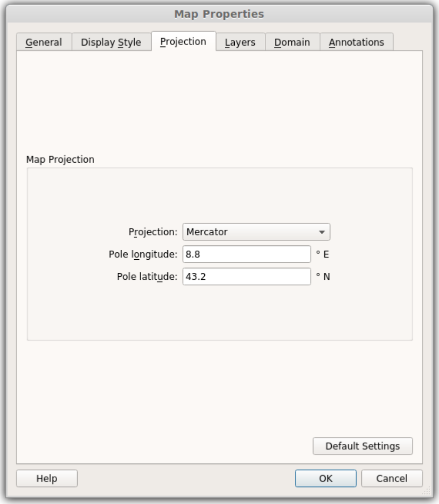
Dot size: 5

Color: ■ 0

Map improvement

🖱 Right-click on map → **Properties**

Projection: modify according to preference



Map Properties

Map Projection

Projection: Mercator

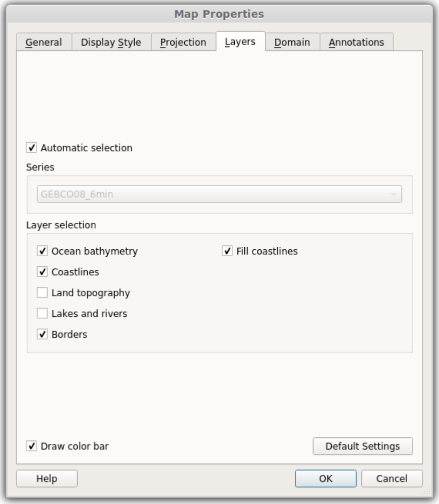
Pole longitude: 8.8 ° E

Pole latitude: 43.2 ° N

Map improvement

🖱 Right-click on map → **Properties**

Layers: bathymetry + coastlines



☑ Automatic selection

Series

GEBCO08_6min

Layer selection

☑ Ocean bathymetry

☑ Fill coastlines

☑ Coastlines

☐ Land topography

☐ Lakes and rivers

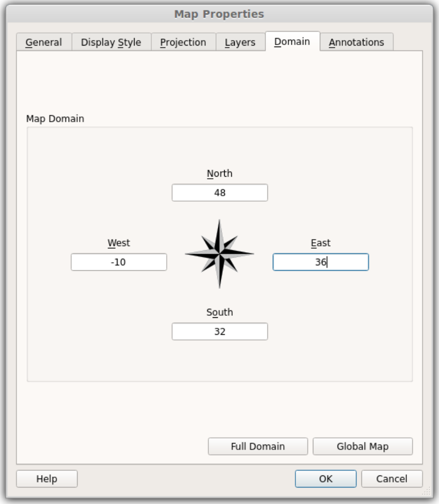
☑ Borders

☑ Draw color bar

Map improvement

- Right-click on map → **Properties**

Domain: adjust limits (already done)



North: 48

West: -10

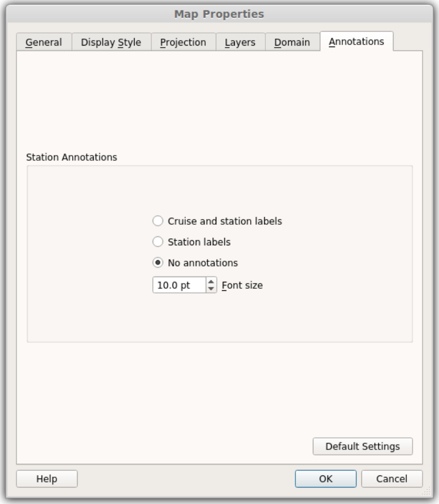
East: 36

South: 32

Map improvement

Right-click on map → **Properties**

Annotations: not necessary



Map Properties

Station Annotations

○ Cruise and station labels

○ Station labels

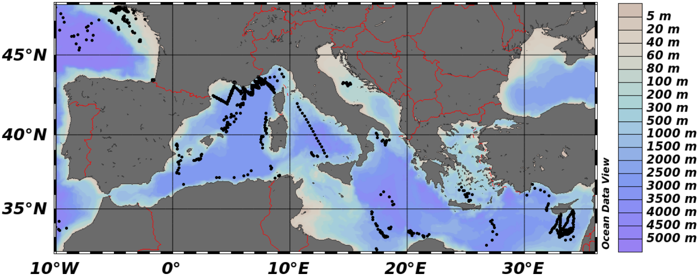
● No annotations

10.0 pt Font size

Map improvement

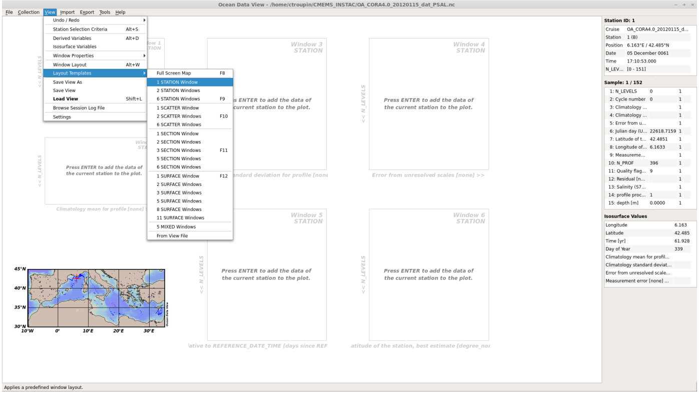
🖱 Right-click on map → **Properties**

View → Layout template → Full Screen Map F8



Station window

View → Layout template → Station window



Station ID: 1

Cruise	OA_CORA4.0_20120115_d...
Station	1 (B)
Position	6.163°E / 42.485°N
Date	05 December 0061
Time	17:10:53.000
N_LEV...	[0 - 151]

Sample: 1 / 152

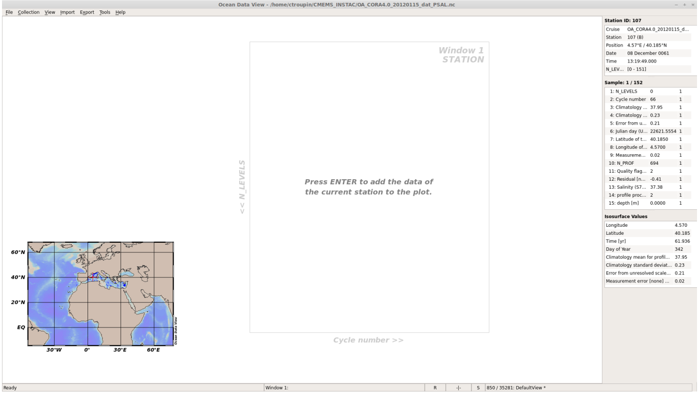
1: N_LEVELS	0	1
2: Cycle number	0	1
3: Climatology ...		1
4: Climatology ...		1
5: Error from u...		1
6: Julian day (U...	22618.7159	1
7: Latitude of t...	42.4851	1
8: Longitude of...	6.1633	1
9: Measureme...		1
10: N_PROF	396	1
11: Quality flag...	9	1
12: Residual [n...		1
13: Salinity (S7...		1
14: profile proc...	1	1
15: depth [m]	0.0000	1

Isosurface Values

Longitude	6.163
Latitude	42.485
Time [yr]	61.928
Day of Year	339
Climatology mean for profil...	
Climatology standard deviat...	
Error from unresolved scale...	
Measurement error [none] ...	

Station window

View → Layout template → Station window



Ocean Data View - /home/ctroupin/CMEMS_INSTAC/OA_CORA4.0_20120115_dat_PSAL.nc

Window 1
STATION

Press ENTER to add the data of the current station to the plot.

Station ID: 107

Cruise	OA_CORA4.0_20120115_d...
Station	107 (B)
Position	4.57°E / 40.185°N
Date	08 December 0061
Time	13:19:49.000
N_LEV...	[0 - 151]

Sample: 1 / 152

1: N_LEVELS	0	1
2: Cycle number	66	1
3: Climatology ...	37.95	1
4: Climatology ...	0.23	1
5: Error from u...	0.21	1
6: Julian day (U...	22621.5554	1
7: Latitude of t...	40.1850	1
8: Longitude of...	4.5700	1
9: Measureme...	0.02	1
10: N_PROF	694	1
11: Quality flag...	2	1
12: Residual [n...	-0.41	1
13: Salinity (S7...	37.38	1
14: profile proc...	2	1
15: depth [m]	0.0000	1

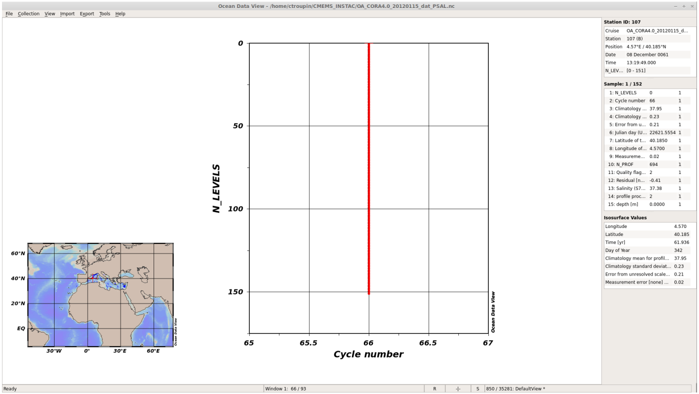
Isosurface Values

Longitude	4.570
Latitude	40.185
Time [yr]	61.936
Day of Year	342
Climatology mean for profil...	37.95
Climatology standard deviat...	0.23
Error from unresolved scale...	0.21
Measurement error [none] ...	0.02

Ready | Window 1: | R | -|- | S | 850 / 35281: DefaultView *

Station window

Enter ↵



Station ID: 107

Cruise	OA_CORA4.0_20120115_d...
Station	107 (B)
Position	4.57°E / 40.185°N
Date	08 December 0061
Time	13:19:49.000
N_LEV...	[0 - 151]

Sample: 1 / 152

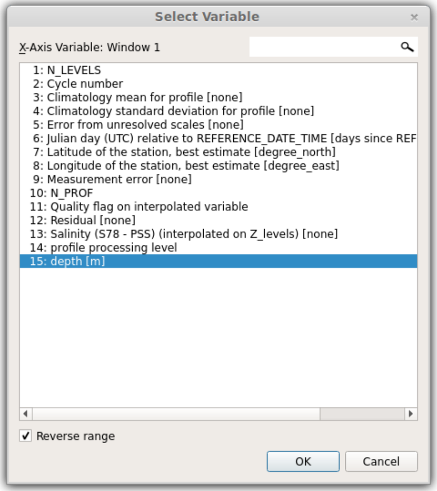
1: N_LEVELS	0	1
2: Cycle number	66	1
3: Climatology ...	37.95	1
4: Climatology ...	0.23	1
5: Error from u...	0.21	1
6: Julian day (U...	22621.5554	1
7: Latitude of t...	40.1850	1
8: Longitude of...	4.5700	1
9: Measureme...	0.02	1
10: N_PROF	694	1
11: Quality flag...	2	1
12: Residual [n...	-0.41	1
13: Salinity (S7...	37.38	1
14: profile proc...	2	1
15: depth [m]	0.0000	1

Isosurface Values

Longitude	4.570
Latitude	40.185
Time [yr]	61.936
Day of Year	342
Climatology mean for profil...	37.95
Climatology standard deviat...	0.23
Error from unresolved scale...	0.21
Measurement error [none] ...	0.02

Station window

Right-click on map:
Change X and Y variable (salinity vs. depth)
Y variable → Check the reverse range box

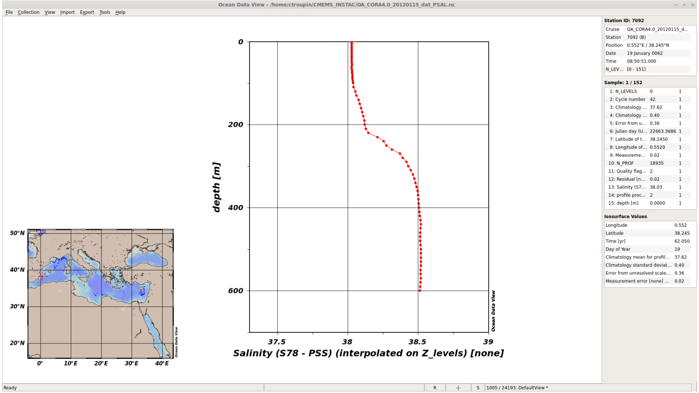


1: N_LEVELS
2: Cycle number
3: Climatology mean for profile [none]
4: Climatology standard deviation for profile [none]
5: Error from unresolved scales [none]
6: Julian day (UTC) relative to REFERENCE_DATE_TIME [days since REF
7: Latitude of the station, best estimate [degree_north]
8: Longitude of the station, best estimate [degree_east]
9: Measurement error [none]
10: N_PROF
11: Quality flag on interpolated variable
12: Residual [none]
13: Salinity (S78 - PSS) (interpolated on Z_levels) [none]
14: profile processing level
15: depth [m]

☑ Reverse range

Station window

Double click on the map (left) to get profiles at different locations



Ocean Data View - /home/ctroupin/CMEMS_INSTAC/OA_CORA4.0_20120115_dat_PSAL.nc

Station ID: 7092

Cruise	OA_CORA4.0_20120115_d...
Station	7092 (B)
Position	0.552°E / 38.245°N
Date	19 January 0062
Time	08:50:51.000
N_LEV...	[0 - 151]

Sample: 1 / 152

1: N_LEVELS	0	1
2: Cycle number	42	1
3: Climatology ...	37.62	1
4: Climatology ...	0.40	1
5: Error from u...	0.36	1
6: Julian day (U...	22663.3686	1
7: Latitude of t...	38.2450	1
8: Longitude of...	0.5520	1
9: Measureme...	0.02	1
10: N_PROF	18935	1
11: Quality flag...	2	1
12: Residual [n...	0.02	1
13: Salinity (S7...	38.03	1
14: profile proc...	2	1
15: depth [m]	0.0000	1

Isosurface Values

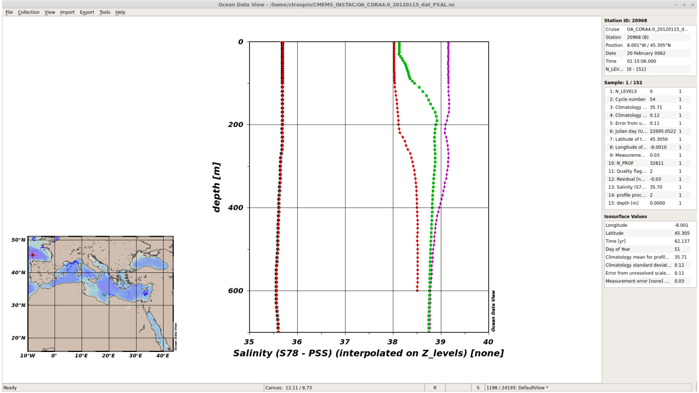
Longitude	0.552
Latitude	38.245
Time [yr]	62.050
Day of Year	19
Climatology mean for profil...	37.62
Climatology standard deviat...	0.40
Error from unresolved scale...	0.36
Measurement error [none] ...	0.02

✉ Very different properties according to the basin

✍ Maybe needed to adjust range, otherwise not visible

Station window

Compare profiles in different sub-regions



Ocean Data View - /home/ctroupin/CMEMS_INSTAC/OA_CORA4.0_20120115_dat_PSAL.nc

Station ID: 20968

Cruise	OA_CORA4.0_20120115_d...
Station	20968 (B)
Position	8.001°W / 45.305°N
Date	20 February 0062
Time	01:15:06.000
N_LEV...	[0 - 151]

Sample: 1 / 152

1: N_LEVELS	0	1
2: Cycle number	54	1
3: Climatology ...	35.71	1
4: Climatology ...	0.12	1
5: Error from u...	0.11	1
6: Julian day (U...	22695.0522	1
7: Latitude of t...	45.3050	1
8: Longitude of...	-8.0010	1
9: Measureme...	0.03	1
10: N_PROF	32811	1
11: Quality flag...	2	1
12: Residual [n...	-0.03	1
13: Salinity (S7...	35.70	1
14: profile proc...	2	1
15: depth [m]	0.0000	1

Isosurface Values

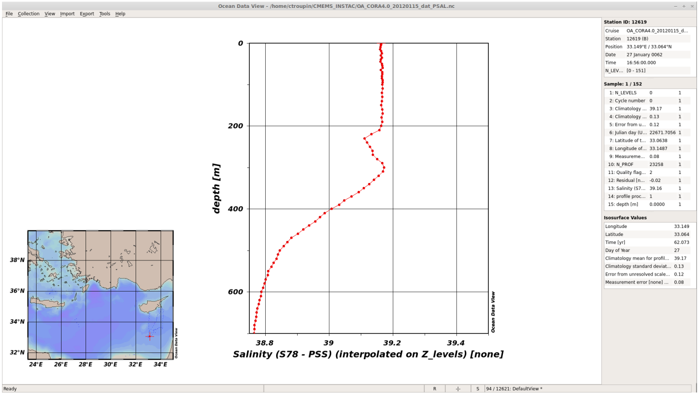
Longitude	-8.001
Latitude	45.305
Time [yr]	62.137
Day of Year	51
Climatology mean for profil...	35.71
Climatology standard deviat...	0.12
Error from unresolved scale...	0.11
Measurement error [none] ...	0.03

Ready | Canvas: 12.11 / 8.73 | R | S | 1198 / 24193: DefaultView *

✍ To remove stations: Manage Pick List → Remove all Stations

Station window

What happens with this profile south of Cyprus?



Ocean Data View - /home/ctroupin/CMEMS_INSTAC/OA_CORA4.0_20120115_dat_PSAL.nc

94 / 12621: DefaultView *

Station ID: 12619

Cruise	OA_CORA4.0_20120115_d...
Station	12619 (B)
Position	33.149°E / 33.064°N
Date	27 January 0062
Time	16:56:00.000
N_LEV...	[0 - 151]

Sample: 1 / 152

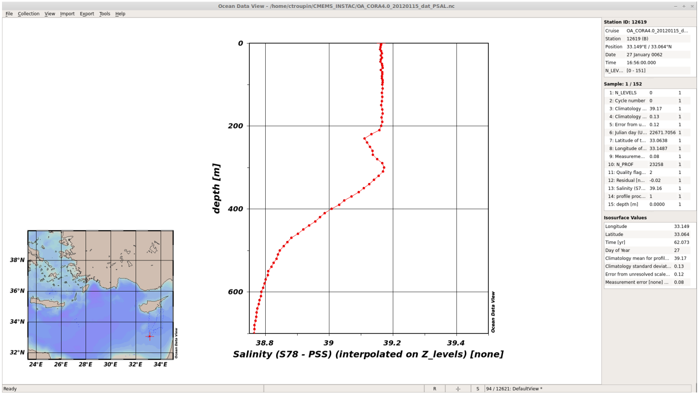
1: N_LEVELS	0	1
2: Cycle number	0	1
3: Climatology ...	39.17	1
4: Climatology ...	0.13	1
5: Error from u...	0.12	1
6: Julian day (U...	22671.7056	1
7: Latitude of t...	33.0638	1
8: Longitude of...	33.1487	1
9: Measureme...	0.08	1
10: N_PROF	23258	1
11: Quality flag...	2	1
12: Residual [n...	-0.02	1
13: Salinity (S7...	39.16	1
14: profile proc...	1	1
15: depth [m]	0.0000	1

Isosurface Values

Longitude	33.149
Latitude	33.064
Time [yr]	62.073
Day of Year	27
Climatology mean for profil...	39.17
Climatology standard deviat...	0.13
Error from unresolved scale...	0.12
Measurement error [none] ...	0.08

Station window

What happens with this profile south of Cyprus?



Ocean Data View - /home/ctroupin/CMEMS_INSTAC/OA_CORA4.0_20120115_dat_PSAL.nc
File
Collection
View
Import
Export
Tools
Help
0
200
400
600
depth [m]
38.8
39
39.2
39.4
Salinity (S78 - PSS) (interpolated on Z_levels) [none]
Ocean Data View
38°N
36°N
34°N
32°N
24°E
26°E
28°E
30°E
32°E
34°E
Ocean Data View
Ready
R
S
94 / 12621: DefaultView *

Station ID: 12619

Cruise	OA_CORA4.0_20120115_d...
Station	12619 (B)
Position	33.149°E / 33.064°N
Date	27 January 0062
Time	16:56:00.000
N_LEV...	[0 - 151]

Sample: 1 / 152

1: N_LEVELS	0	1
2: Cycle number	0	1
3: Climatology ...	39.17	1
4: Climatology ...	0.13	1
5: Error from u...	0.12	1
6: Julian day (U...	22671.7056	1
7: Latitude of t...	33.0638	1
8: Longitude of...	33.1487	1
9: Measureme...	0.08	1
10: N_PROF	23258	1
11: Quality flag...	2	1
12: Residual [n...	-0.02	1
13: Salinity (S7...	39.16	1
14: profile proc...	1	1
15: depth [m]	0.0000	1

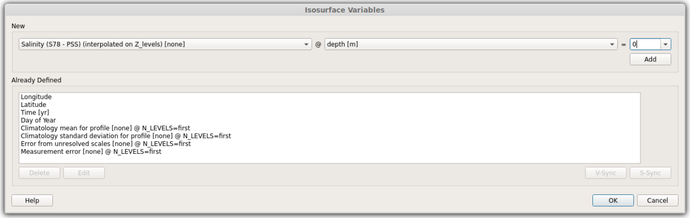
Isosurface Values

Longitude	33.149
Latitude	33.064
Time [yr]	62.073
Day of Year	27
Climatology mean for profil...	39.17
Climatology standard deviat...	0.13
Error from unresolved scale...	0.12
Measurement error [none] ...	0.08

🖂 Mixed-layer depth

Surface window

Define new isosurface variables:
View → Isosurface Variables → salinity at depth = 0
Click on ”Add”



Isosurface Variables

New

Salinity (S78 - PSS) (interpolated on Z_levels) [none] @ depth [m] = 0

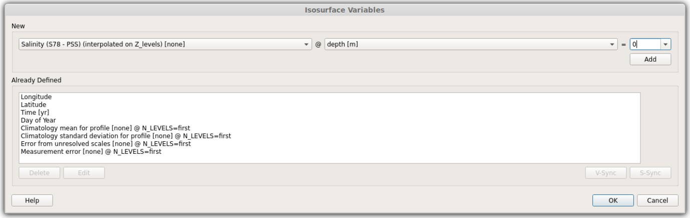
Already Defined

Longitude
Latitude
Time [yr]
Day of Year
Climatology mean for profile [none] @ N_LEVELS=first
Climatology standard deviation for profile [none] @ N_LEVELS=first
Error from unresolved scales [none] @ N_LEVELS=first
Measurement error [none] @ N_LEVELS=first

Surface window

Define new isosurface variables:

Same at depth = 200



Isosurface Variables

New

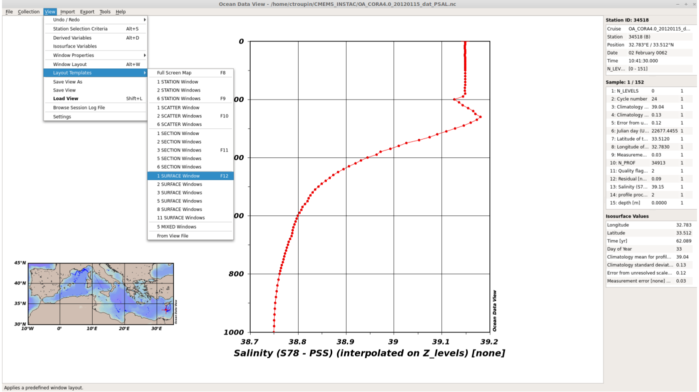
Salinity (S78 - PSS) (interpolated on Z_levels) [none] @ depth [m] = 0

Already Defined

Longitude
Latitude
Time [yr]
Day of Year
Climatology mean for profile [none] @ N_LEVELS=first
Climatology standard deviation for profile [none] @ N_LEVELS=first
Error from unresolved scales [none] @ N_LEVELS=first
Measurement error [none] @ N_LEVELS=first

Surface window

View → Layout Template → SURFACE Window



Ocean Data View - /home/ctroupin/CMEMS_INSTAC/OA_CORA4.0_20120115_dat_PSAL.nc

Station ID: 34518

Cruise	OA_CORA4.0_20120115_d...
Station	34518 (B)
Position	32.783°E / 33.512°N
Date	02 February 0062
Time	10:41:30.000
N_LEV...	[0 - 151]

Sample: 1 / 152

1: N_LEVELS	0	1
2: Cycle number	24	1
3: Climatology ...	39.04	1
4: Climatology ...	0.13	1
5: Error from u...	0.12	1
6: Julian day (U...	22677.4455	1
7: Latitude of t...	33.5120	1
8: Longitude of...	32.7830	1
9: Measureme...	0.03	1
10: N_PROF	34913	1
11: Quality flag...	2	1
12: Residual [n...	0.09	1
13: Salinity (S7...	39.15	1
14: profile proc...	2	1
15: depth [m]	0.0000	1

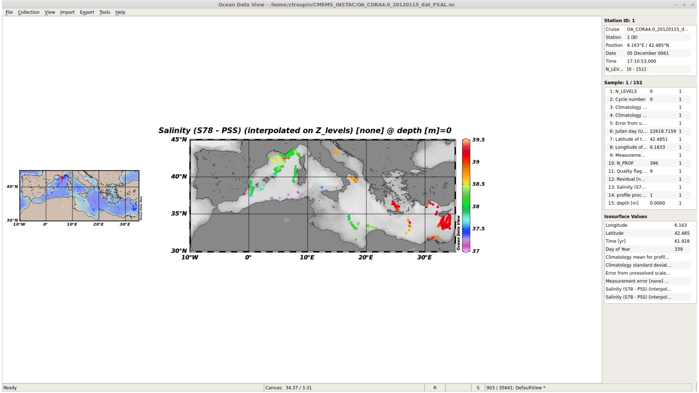
Isosurface Values

Longitude	32.783
Latitude	33.512
Time [yr]	62.089
Day of Year	33
Climatology mean for profil...	39.04
Climatology standard deviat...	0.13
Error from unresolved scale...	0.12
Measurement error [none] ...	0.03

Applies a predefined window layout.

Surface window

🖱 Right-click Z-variable → select newly created variable



Ocean Data View - /home/ctroupin/CMEMS_INSTAC/OA_CORA4.0_20120115_dat_PSAL.nc
File
Collection
View
Import
Export
Tools
Help
Salinity (S78 - PSS) (interpolated on Z_levels) [none] @ depth [m]=0
45°N
40°N
35°N
30°N
10°W
0°
10°E
20°E
30°E
39.5
39
38.5
38
37.5
37
Ocean Data View
R
S

Station ID: 1

Cruise	OA_CORA4.0_20120115_d...
Station	1 (B)
Position	6.163°E / 42.485°N
Date	05 December 0061
Time	17:10:53.000
N_LEV...	[0 - 151]

Sample: 1 / 152

1: N_LEVELS	0	1
2: Cycle number	0	1
3: Climatology ...		1
4: Climatology ...		1
5: Error from u...		1
6: Julian day (U...	22618.7159	1
7: Latitude of t...	42.4851	1
8: Longitude of...	6.1633	1
9: Measureme...		1
10: N_PROF	396	1
11: Quality flag...	9	1
12: Residual [n...		1
13: Salinity (S7...		1
14: profile proc...	1	1
15: depth [m]	0.0000	1

Isosurface Values

Longitude	6.163
Latitude	42.485
Time [yr]	61.928
Day of Year	339
Climatology mean for profil...	
Climatology standard deviat...	
Error from unresolved scale...	
Measurement error [none] ...	
Salinity (S78 - PSS) (interpol...	
Salinity (S78 - PSS) (interpol...	

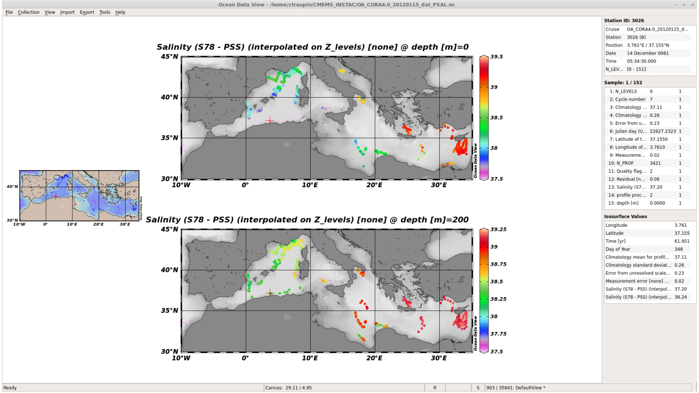
Ready | Canvas: 34.37 / 3.31 | 903 / 35641: DefaultView *

✉ higher salinity values in the Eastern Basin

✍ Adapt the range for the selected variable

Surface window

Also possible to have several Surface Windows



Ocean Data View - /home/ctroupin/CMEMS_INSTAC/OA_CORA4.0_20120115_dat_PSAL.nc
File
Collection
View
Import
Export
Tools
Help
Salinity (S78 - PSS) (interpolated on Z_levels) [none] @ depth [m]=0
45°N
40°N
35°N
30°N
10°W
0°
10°E
20°E
30°E
39.5
39
38.5
38
37.5
Ocean Data View
Salinity (S78 - PSS) (interpolated on Z_levels) [none] @ depth [m]=200
39.25
39
38.75
38.5
38.25
38
37.75
37.5
Ready
Canvas: 29.11 / 4.95
R
S
903 / 35641: DefaultView *

Station ID: 3026

Cruise	OA_CORA4.0_20120115_d...
Station	3026 (B)
Position	3.761°E / 37.155°N
Date	14 December 0061
Time	05:34:30.000
N_LEV...	[0 - 151]

Sample: 1 / 152

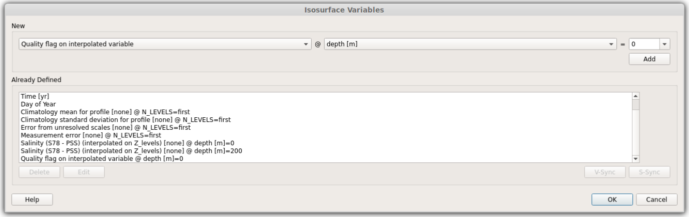
1: N_LEVELS	0	1
2: Cycle number	7	1
3: Climatology ...	37.11	1
4: Climatology ...	0.26	1
5: Error from u...	0.23	1
6: Julian day (U...	22627.2323	1
7: Latitude of t...	37.1550	1
8: Longitude of...	3.7610	1
9: Measureme...	0.02	1
10: N_PROF	3421	1
11: Quality flag...	2	1
12: Residual [n...	0.06	1
13: Salinity (S7...	37.20	1
14: profile proc...	2	1
15: depth [m]	0.0000	1

Isosurface Values

Longitude	3.761
Latitude	37.155
Time [yr]	61.951
Day of Year	348
Climatology mean for profil...	37.11
Climatology standard deviat...	0.26
Error from unresolved scale...	0.23
Measurement error [none] ...	0.02
Salinity (S78 - PSS) (interpol...	37.20
Salinity (S78 - PSS) (interpol...	38.24

Surface window: quality flag

View → Isosurface Variables → Quality flag on interpolated variable at depth = 0

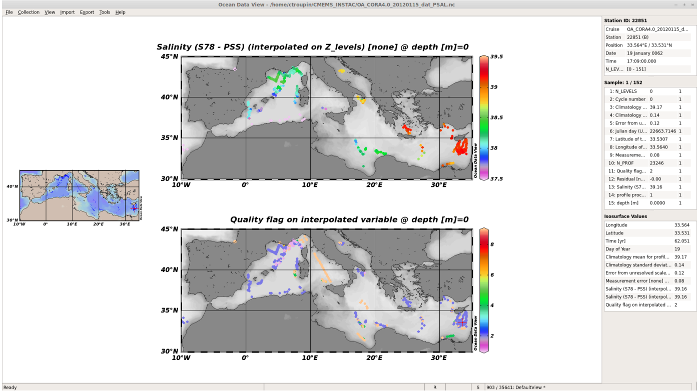


Quality flag on interpolated variable @ depth [m] = 0

Time [yr]
Day of Year
Climatology mean for profile [none] @ N_LEVELS=first
Climatology standard deviation for profile [none] @ N_LEVELS=first
Error from unresolved scales [none] @ N_LEVELS=first
Measurement error [none] @ N_LEVELS=first
Salinity (S78 - PSS) (interpolated on Z_levels) [none] @ depth [m]=0
Salinity (S78 - PSS) (interpolated on Z_levels) [none] @ depth [m]=200
Quality flag on interpolated variable @ depth [m]=0

Surface window: quality flag

Quality flag: integer value reflecting the confidence in the observations



Ocean Data View - /home/ctroupin/CMEMS_INSTAC/OA_CORA4.0_20120115_dat_PSAL.nc

Station ID: 22851

Cruise	OA_CORA4.0_20120115_d...
Station	22851 (B)
Position	33.564°E / 33.531°N
Date	19 January 0062
Time	17:09:00.000
N_LEV...	[0 - 151]

Sample: 1 / 152

1: N_LEVELS	0	1
2: Cycle number	0	1
3: Climatology ...	39.17	1
4: Climatology ...	0.14	1
5: Error from u...	0.12	1
6: Julian day (U...	22663.7146	1
7: Latitude of t...	33.5307	1
8: Longitude of...	33.5640	1
9: Measureme...	0.08	1
10: N_PROF	23246	1
11: Quality flag...	2	1
12: Residual [n...	-0.00	1
13: Salinity (S7...	39.16	1
14: profile proc...	1	1
15: depth [m]	0.0000	1

Isosurface Values

Longitude	33.564
Latitude	33.531
Time [yr]	62.051
Day of Year	19
Climatology mean for profil...	39.17
Climatology standard deviat...	0.14
Error from unresolved scale...	0.12
Measurement error [none] ...	0.08
Salinity (S78 - PSS) (interpol...	39.16
Salinity (S78 - PSS) (interpol...	39.16
Quality flag on interpolated ...	2

903 / 35641: DefaultView *

Surface window: quality flag

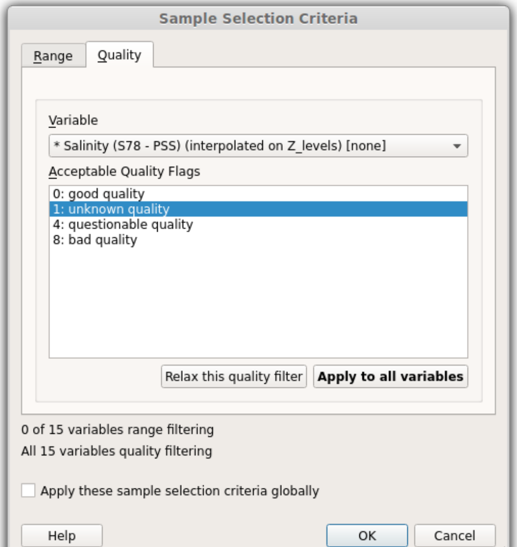
CORA Quality flags:

1	good
2	rather good
3	quite good
4	acceptable
5	bad quality interpolation
6, 7, 8	not used
9	not interpolated

✍ ODV definitions for the flags are different!

Surface window: quality flag

🖱 Right-click Sample Selection Criteria → Quality → Accepted quality flags = 1



Sample Selection Criteria

Variable: * Salinity (S78 - PSS) (interpolated on Z_levels) [none]

Acceptable Quality Flags

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

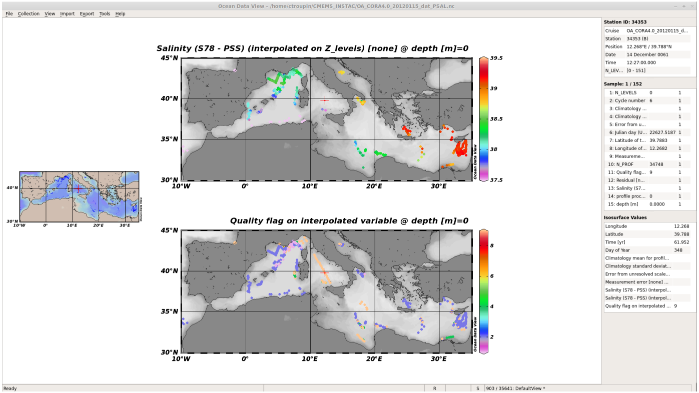
0 of 15 variables range filtering

All 15 variables quality filtering

□ Apply these sample selection criteria globally

Surface window: quality flag

Right-click Sample Selection Criteria → Quality → Accepted quality flags = 1



Ocean Data View - /home/ctroupin/CMEMS_INSTAC/OA_CORA4.0_20120115_dat_PSAL.nc
File
Collection
View
Import
Export
Tools
Help
Salinity (S78 - PSS) (interpolated on Z_levels) [none] @ depth [m]=0
45°N
40°N
35°N
30°N
10°W
0°
10°E
20°E
30°E
39.5
39
38.5
38
37.5
Ocean Data View
Quality flag on interpolated variable @ depth [m]=0
8
6
4
2

Station ID: 34353

Cruise	OA_CORA4.0_20120115_d...
Station	34353 (B)
Position	12.268°E / 39.788°N
Date	14 December 0061
Time	12:27:00.000
N_LEV...	[0 - 151]

Sample: 1 / 152

1: N_LEVELS	0	1
2: Cycle number	6	1
3: Climatology ...		1
4: Climatology ...		1
5: Error from u...		1
6: Julian day (U...	22627.5187	1
7: Latitude of t...	39.7883	1
8: Longitude of...	12.2682	1
9: Measureme...		1
10: N_PROF	34748	1
11: Quality flag...	9	1
12: Residual [n...		1
13: Salinity (S7...		1
14: profile proc...	0	1
15: depth [m]	0.0000	1

Isosurface Values

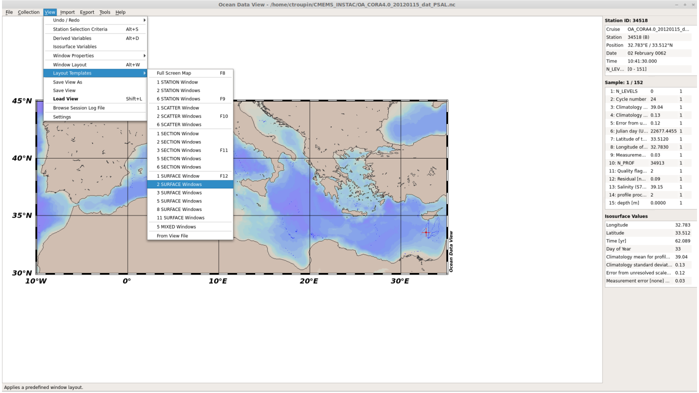
Longitude	12.268
Latitude	39.788
Time [yr]	61.952
Day of Year	348
Climatology mean for profil...	
Climatology standard deviat...	
Error from unresolved scale...	
Measurement error [none] ...	
Salinity (S78 - PSS) (interpol...	
Salinity (S78 - PSS) (interpol...	
Quality flag on interpolated ...	9

Ready R S 903 / 35641: DefaultView *

✉ higher salinity values in the Eastern Basin

Surface window: gridding

View → Layout Template → SURFACE Window (× 2)



Station ID: 34518

Cruise	OA_CORA4.0_20120115_d...
Station	34518 (B)
Position	32.783°E / 33.512°N
Date	02 February 0062
Time	10:41:30.000
N_LEV...	[0 - 151]

Sample: 1 / 152

1: N_LEVELS	0	1
2: Cycle number	24	1
3: Climatology ...	39.04	1
4: Climatology ...	0.13	1
5: Error from u...	0.12	1
6: Julian day (U...	22677.4455	1
7: Latitude of t...	33.5120	1
8: Longitude of...	32.7830	1
9: Measureme...	0.03	1
10: N_PROF	34913	1
11: Quality flag...	2	1
12: Residual [n...	0.09	1
13: Salinity (S7...	39.15	1
14: profile proc...	2	1
15: depth [m]	0.0000	1

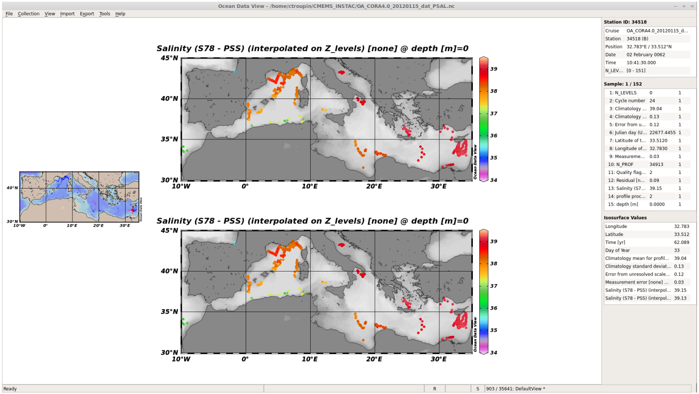
Isosurface Values

Longitude	32.783
Latitude	33.512
Time [yr]	62.089
Day of Year	33
Climatology mean for profil...	39.04
Climatology standard deviat...	0.13
Error from unresolved scale...	0.12
Measurement error [none] ...	0.03

Applies a predefined window layout.

Surface window: gridding

Set Z variable to be Salinity at 0 m


Ocean Data View - /home/ctroupin/CMEMS_INSTAC/OA_CORA4.0_20120115_dat_PSAL.nc
File
Collection
View
Import
Export
Tools
Help
40°N
30°N
10°W
0°
10°E
20°E
30°E
Ocean Data View
Salinity (S78 - PSS) (interpolated on Z_levels) [none] @ depth [m]=0
45°N
40°N
35°N
30°N
10°W
0°
10°E
20°E
30°E
39
38
37
36
35
34
Ocean Data View
Salinity (S78 - PSS) (interpolated on Z_levels) [none] @ depth [m]=0
45°N
40°N
35°N
30°N
10°W
0°
10°E
20°E
30°E
39
38
37
36
35
34
Ocean Data View
Ready
R
S

903 / 35641: DefaultView *

Station ID: 34518

Cruise	OA_CORA4.0_20120115_d...
Station	34518 (B)
Position	32.783°E / 33.512°N
Date	02 February 0062
Time	10:41:30.000
N_LEV...	[0 - 151]

Sample: 1 / 152

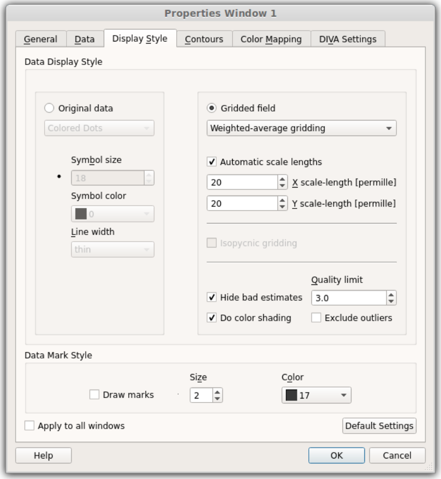
1: N_LEVELS	0	1
2: Cycle number	24	1
3: Climatology ...	39.04	1
4: Climatology ...	0.13	1
5: Error from u...	0.12	1
6: Julian day (U...	22677.4455	1
7: Latitude of t...	33.5120	1
8: Longitude of...	32.7830	1
9: Measureme...	0.03	1
10: N_PROF	34913	1
11: Quality flag...	2	1
12: Residual [n...	0.09	1
13: Salinity (S7...	39.15	1
14: profile proc...	2	1
15: depth [m]	0.0000	1

Isosurface Values

Longitude	32.783
Latitude	33.512
Time [yr]	62.089
Day of Year	33
Climatology mean for profil...	39.04
Climatology standard deviat...	0.13
Error from unresolved scale...	0.12
Measurement error [none] ...	0.03
Salinity (S78 - PSS) (interpol...	39.15
Salinity (S78 - PSS) (interpol...	39.13

Surface window: gridding

Right-click Properties → Display style → Gridded → Weighted-Average gridding (default parameters 20 X 20)



Properties Window 1

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

Data Display Style

○ Original data

Colored Dots

Symbol size

18

Symbol color

0

Line width

thin

● Gridded field

Weighted-average gridding

☑ Automatic scale lengths

20 X scale-length [permille]

20 Y scale-length [permille]

□ Isopycnic gridding

Quality limit

☑ Hide bad estimates 3.0

☑ Do color shading □ Exclude outliers

Data Mark Style

□ Draw marks Size 2 Color 17

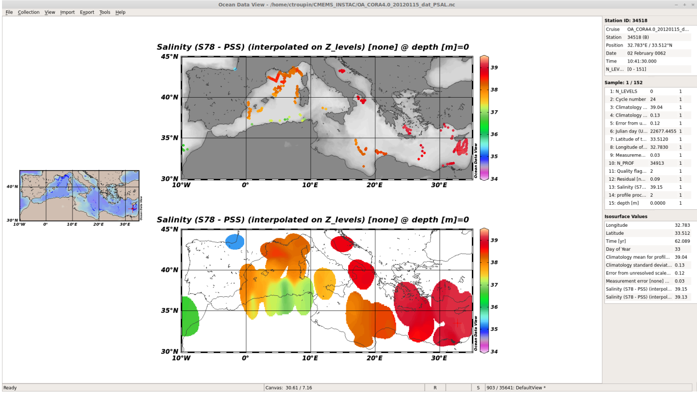
□ Apply to all windows

Default Settings

Help | OK | Cancel

Surface window: gridding

Gridded field of salinity


Ocean Data View - /home/ctroupin/CMEMS_INSTAC/OA_CORA4.0_20120115_dat_PSAL.nc
File
Collection
View
Import
Export
Tools
Help
Salinity (S78 - PSS) (interpolated on Z_levels) [none] @ depth [m]=0
45°N
40°N
35°N
30°N
10°W
0°
10°E
20°E
30°E
39
38
37
36
35
34
Ocean Data View
Salinity (S78 - PSS) (interpolated on Z_levels) [none] @ depth [m]=0
Ready
Canvas: 30.61 / 7.16
R
S
903 / 35641: DefaultView *

Station ID: 34518

Cruise	OA_CORA4.0_20120115_d...
Station	34518 (B)
Position	32.783°E / 33.512°N
Date	02 February 0062
Time	10:41:30.000
N_LEV...	[0 - 151]

Sample: 1 / 152

1: N_LEVELS	0	1
2: Cycle number	24	1
3: Climatology ...	39.04	1
4: Climatology ...	0.13	1
5: Error from u...	0.12	1
6: Julian day (U...	22677.4455	1
7: Latitude of t...	33.5120	1
8: Longitude of...	32.7830	1
9: Measureme...	0.03	1
10: N_PROF	34913	1
11: Quality flag...	2	1
12: Residual [n...	0.09	1
13: Salinity (S7...	39.15	1
14: profile proc...	2	1
15: depth [m]	0.0000	1

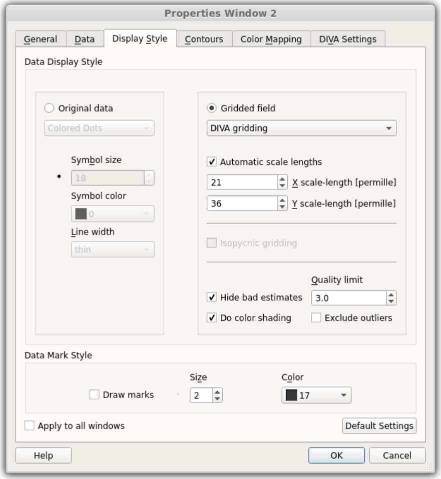
Isosurface Values

Longitude	32.783
Latitude	33.512
Time [yr]	62.089
Day of Year	33
Climatology mean for profil...	39.04
Climatology standard deviat...	0.13
Error from unresolved scale...	0.12
Measurement error [none] ...	0.03
Salinity (S78 - PSS) (interpol...	39.15
Salinity (S78 - PSS) (interpol...	39.13

✍ Normal interpolation does not consider boundaries!

Surface window: gridding

Change Griddin method to DIVA Gridding



Data Display Style

○ Original data

Colored Dots

Symbol size: 18

Symbol color: 0

Line width: thin

● Gridded field

DIVA gridding

☑ Automatic scale lengths

21 X scale-length [permille]

36 Y scale-length [permille]

□ Isopycnic gridding

Quality limit: 3.0

☑ Hide bad estimates

☑ Do color shading

□ Exclude outliers

Data Mark Style

□ Draw marks

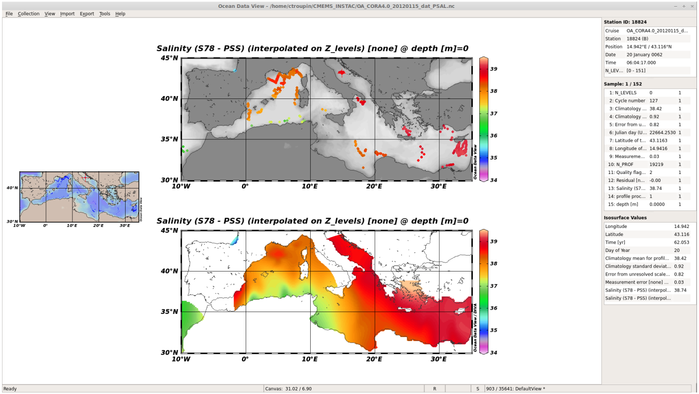
Size: 2

Color: 17

□ Apply to all windows

Surface window: gridding

DIVA gridded field of salinity



Ocean Data View - /home/ctroupin/CMEMS_INSTAC/OA_CORA4.0_20120115_dat_PSAL.nc

Station ID: 18824

Cruise	OA_CORA4.0_20120115_d...
Station	18824 (B)
Position	14.942°E / 43.116°N
Date	20 January 0062
Time	06:04:17.000
N_LEV...	[0 - 151]

Sample: 1 / 152

1: N_LEVELS	0	1
2: Cycle number	127	1
3: Climatology ...	38.42	1
4: Climatology ...	0.92	1
5: Error from u...	0.82	1
6: Julian day (U...	22664.2530	1
7: Latitude of t...	43.1163	1
8: Longitude of...	14.9416	1
9: Measureme...	0.03	1
10: N_PROF	19219	1
11: Quality flag...	2	1
12: Residual [n...	-0.00	1
13: Salinity (S7...	38.74	1
14: profile proc...	1	1
15: depth [m]	0.0000	1

Isosurface Values

Longitude	14.942
Latitude	43.116
Time [yr]	62.053
Day of Year	20
Climatology mean for profil...	38.42
Climatology standard deviat...	0.92
Error from unresolved scale...	0.82
Measurement error [none] ...	0.03
Salinity (S78 - PSS) (interpol...	38.74
Salinity (S78 - PSS) (interpol...	

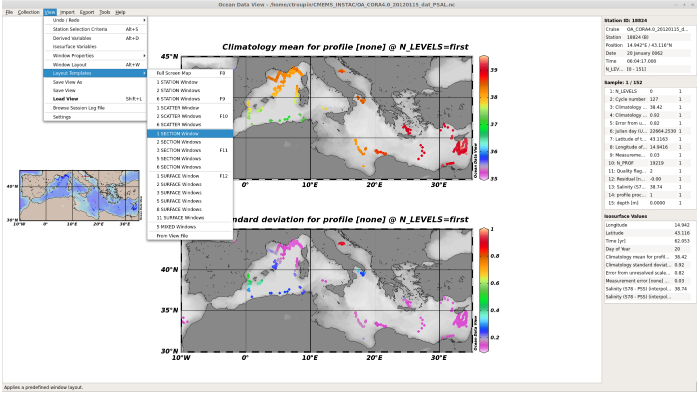
Ready | Canvas: 31.02 / 6.90 | R | S | 903 / 35641: DefaultView *

✍ Field with error above threshold is masked

🖂 Interpolation technique is crucial with in situ data

Section window

View → Layout Template → SECTION Window



Station ID: 18824

Cruise	OA_CORA4.0_20120115_d...
Station	18824 (B)
Position	14.942°E / 43.116°N
Date	20 January 0062
Time	06:04:17.000
N_LEV...	[0 - 151]

Sample: 1 / 152

1: N_LEVELS	0	1
2: Cycle number	127	1
3: Climatology ...	38.42	1
4: Climatology ...	0.92	1
5: Error from u...	0.82	1
6: Julian day (U...	22664.2530	1
7: Latitude of t...	43.1163	1
8: Longitude of...	14.9416	1
9: Measureme...	0.03	1
10: N_PROF	19219	1
11: Quality flag...	2	1
12: Residual [n...	-0.00	1
13: Salinity (S7...	38.74	1
14: profile proc...	1	1
15: depth [m]	0.0000	1

Isosurface Values

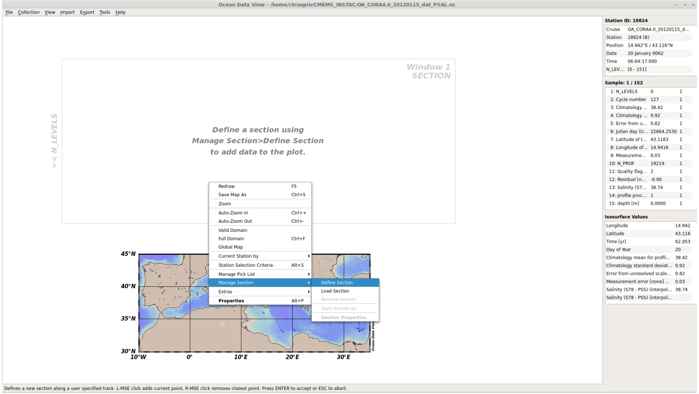
Longitude	14.942
Latitude	43.116
Time [yr]	62.053
Day of Year	20
Climatology mean for profil...	38.42
Climatology standard deviat...	0.92
Error from unresolved scale...	0.82
Measurement error [none] ...	0.03
Salinity (S78 - PSS) (interpol...	38.74
Salinity (S78 - PSS) (interpol...	

Applies a predefined window layout.

Section window

Right-click Manage Section → Define Section

Draw line along section



Ocean Data View - /home/ctroupin/CMEMS_INSTAC/OA_CORA4.0_20120115_dat_PSAL.nc

Define a section using Manage Section>Define Section to add data to the plot.

Station ID: 18824

Cruise	OA_CORA4.0_20120115_d...
Station	18824 (B)
Position	14.942°E / 43.116°N
Date	20 January 0062
Time	06:04:17.000
N_LEV...	[0 - 151]

Sample: 1 / 152

1: N_LEVELS	0	1
2: Cycle number	127	1
3: Climatology ...	38.42	1
4: Climatology ...	0.92	1
5: Error from u...	0.82	1
6: Julian day (U...	22664.2530	1
7: Latitude of t...	43.1163	1
8: Longitude of...	14.9416	1
9: Measureme...	0.03	1
10: N_PROF	19219	1
11: Quality flag...	2	1
12: Residual [n...	-0.00	1
13: Salinity (S7...	38.74	1
14: profile proc...	1	1
15: depth [m]	0.0000	1

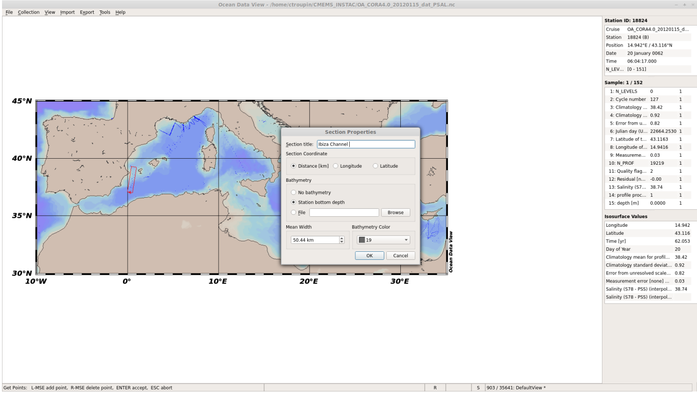
Isosurface Values

Longitude	14.942
Latitude	43.116
Time [yr]	62.053
Day of Year	20
Climatology mean for profil...	38.42
Climatology standard deviat...	0.92
Error from unresolved scale...	0.82
Measurement error [none] ...	0.03
Salinity (S78 - PSS) (interpol...	38.74
Salinity (S78 - PSS) (interpol...	

Defines a new section along a user specified track. L-MSE click adds current point, R-MSE click removes closest point. Press ENTER to accept or ESC to abort.

Section window

Edit Section Properties



Section Properties

Section title: Ibiza Channel

Section Coordinate: ● Distance [km] ○ Longitude ○ Latitude

Bathymetry:
○ No bathymetry
● Station bottom depth
○ File

Mean Width: 50.44 km

Bathymetry Color: 19

Station ID: 18824

Cruise	OA_CORA4.0_20120115_d...
Station	18824 (B)
Position	14.942°E / 43.116°N
Date	20 January 0062
Time	06:04:17.000
N_LEV...	[0 - 151]

Sample: 1 / 152

1: N_LEVELS	0	1
2: Cycle number	127	1
3: Climatology ...	38.42	1
4: Climatology ...	0.92	1
5: Error from u...	0.82	1
6: Julian day (U...	22664.2530	1
7: Latitude of t...	43.1163	1
8: Longitude of...	14.9416	1
9: Measureme...	0.03	1
10: N_PROF	19219	1
11: Quality flag...	2	1
12: Residual [n...	-0.00	1
13: Salinity (S7...	38.74	1
14: profile proc...	1	1
15: depth [m]	0.0000	1

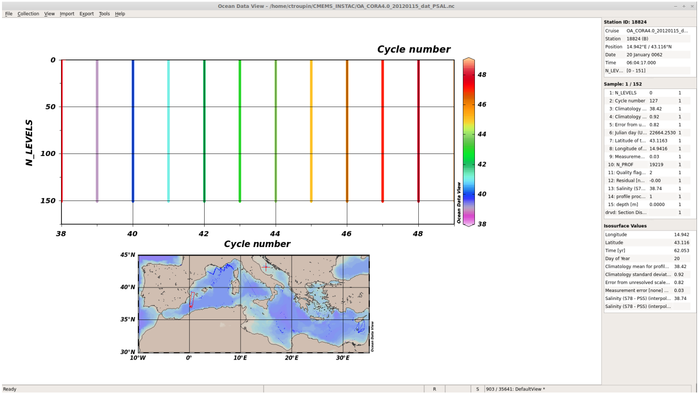
Isosurface Values

Longitude	14.942
Latitude	43.116
Time [yr]	62.053
Day of Year	20
Climatology mean for profil...	38.42
Climatology standard deviat...	0.92
Error from unresolved scale...	0.82
Measurement error [none] ...	0.03
Salinity (S78 - PSS) (interpol...	38.74
Salinity (S78 - PSS) (interpol...	

Get Points: L-MSE add point, R-MSE delete point, ENTER accept, ESC abort | R | S | 903 / 35641: DefaultView *

Section window

Change X, Y and Z variables
→ Distance, Depth and Salinity



Ocean Data View - /home/ctroupin/CMEMS_INSTAC/OA_CORA4.0_20120115_dat_PSAL.nc

Station ID: 18824

Cruise	OA_CORA4.0_20120115_d...
Station	18824 (B)
Position	14.942°E / 43.116°N
Date	20 January 0062
Time	06:04:17.000
N_LEV...	[0 - 151]

Sample: 1 / 152

1: N_LEVELS	0	1
2: Cycle number	127	1
3: Climatology ...	38.42	1
4: Climatology ...	0.92	1
5: Error from u...	0.82	1
6: Julian day (U...	22664.2530	1
7: Latitude of t...	43.1163	1
8: Longitude of...	14.9416	1
9: Measureme...	0.03	1
10: N_PROF	19219	1
11: Quality flag...	2	1
12: Residual [n...	-0.00	1
13: Salinity (S7...	38.74	1
14: profile proc...	1	1
15: depth [m]	0.0000	1
drvd: Section Dis...		1

Isosurface Values

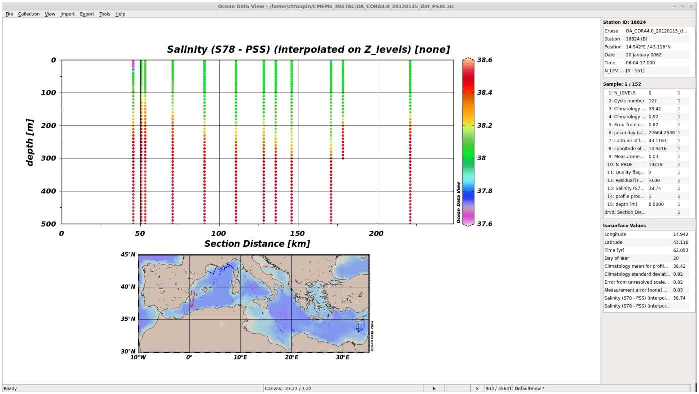
Longitude	14.942
Latitude	43.116
Time [yr]	62.053
Day of Year	20
Climatology mean for profil...	38.42
Climatology standard deviat...	0.92
Error from unresolved scale...	0.82
Measurement error [none] ...	0.03
Salinity (S78 - PSS) (interpol...	38.74
Salinity (S78 - PSS) (interpol...	

Ready

903 / 35641: DefaultView *

Section window

Set Z range between 0 and 500 m



Station ID: 18824

Cruise	OA_CORA4.0_20120115_d...
Station	18824 (B)
Position	14.942°E / 43.116°N
Date	20 January 0062
Time	06:04:17.000
N_LEV...	[0 - 151]

Sample: 1 / 152

1: N_LEVELS	0	1
2: Cycle number	127	1
3: Climatology ...	38.42	1
4: Climatology ...	0.92	1
5: Error from u...	0.82	1
6: Julian day (U...	22664.2530	1
7: Latitude of t...	43.1163	1
8: Longitude of...	14.9416	1
9: Measureme...	0.03	1
10: N_PROF	19219	1
11: Quality flag...	2	1
12: Residual [n...	-0.00	1
13: Salinity (S7...	38.74	1
14: profile proc...	1	1
15: depth [m]	0.0000	1
drvd: Section Dis...		1

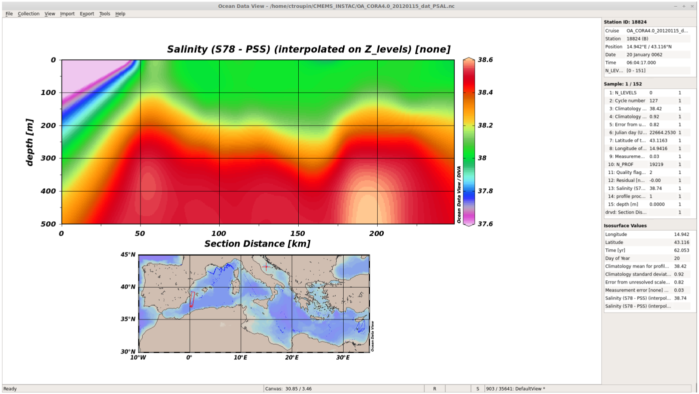
Isosurface Values

Longitude	14.942
Latitude	43.116
Time [yr]	62.053
Day of Year	20
Climatology mean for profil...	38.42
Climatology standard deviat...	0.92
Error from unresolved scale...	0.82
Measurement error [none] ...	0.03
Salinity (S78 - PSS) (interpol...	38.74
Salinity (S78 - PSS) (interpol...	

Ready | Canvas: 27.21 / 7.22 | R | S | 903 / 35641: DefaultView *

Section window

Grid using DIVA interpolation



Station ID: 18824

Cruise	OA_CORA4.0_20120115_d...
Station	18824 (B)
Position	14.942°E / 43.116°N
Date	20 January 0062
Time	06:04:17.000
N_LEV...	[0 - 151]

Sample: 1 / 152

1: N_LEVELS	0	1
2: Cycle number	127	1
3: Climatology ...	38.42	1
4: Climatology ...	0.92	1
5: Error from u...	0.82	1
6: Julian day (U...	22664.2530	1
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Salinity (S78 - PSS) (interpol...	

Ready

Canvas: 30.85 / 3.46

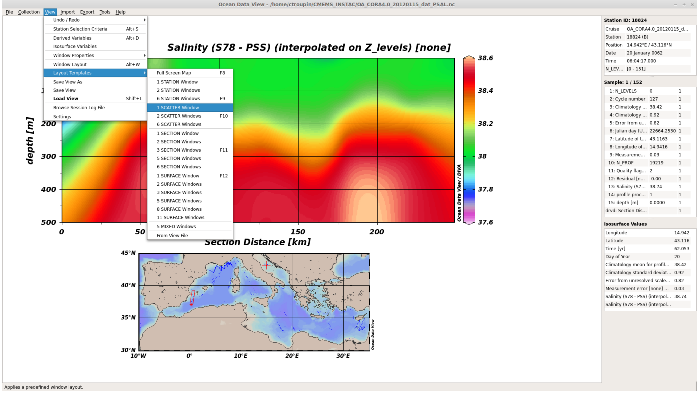
R

S

903 / 35641: DefaultView *

Scatter window

View → Layout Template → SECTION Window



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Station	18824 (B)
Position	14.942°E / 43.116°N
Date	20 January 0062
Time	06:04:17.000
N_LEV...	[0 - 151]

Sample: 1 / 152

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2: Cycle number	127	1
3: Climatology ...	38.42	1
4: Climatology ...	0.92	1
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drvd: Section Dis...		1

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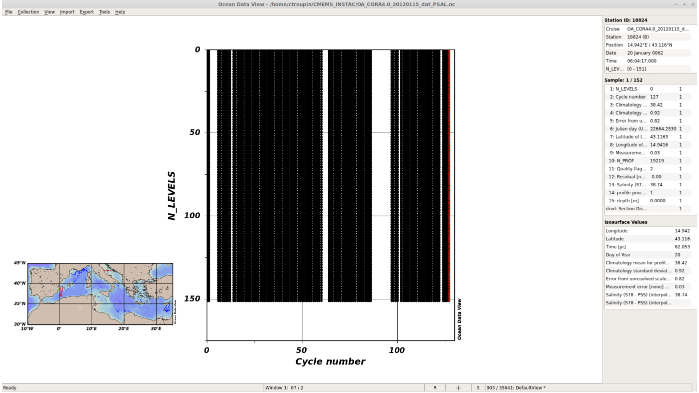
Measurement error [none] ...	0.03
Salinity (S78 - PSS) (interpol...	38.74
Salinity (S78 - PSS) (interpol...	

Applies a predefined window layout.

Scatter window

Change X, Y and Z variables



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Cruise	OA_CORA4.0_20120115_d...
Station	18824 (B)
Position	14.942°E / 43.116°N
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N_LEV...	[0 - 151]

Sample: 1 / 152

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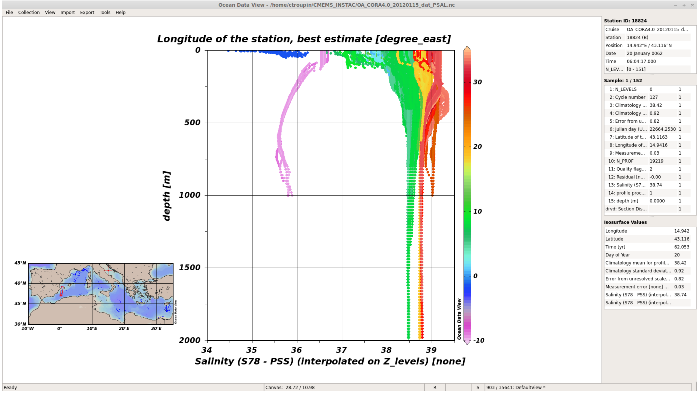
🖂 Usually: Salinity vs. Temperature (*T-S diagram*)

Scatter window

Scatter plot: Salinity, Depth and Longitude


Ocean Data View - /home/ctroupin/CMEMS_INSTAC/OA_CORA4.0_20120115_dat_PSAL.nc
File
Collection
View
Import
Export
Tools
Help
Longitude of the station, best estimate [degree_east]
0
500
1000
1500
2000
depth [m]
34
35
36
37
38
39
Salinity (S78 - PSS) (interpolated on Z_levels) [none]
30
20
10
0
-10
Ocean Data View
45°N
40°N
35°N
30°N
10°W
0°
10°E
20°E
30°E
Ready
Canvas: 28.72 / 10.98
R
S
903 / 35641: DefaultView *

Station ID: 18824

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🖂 Lower salinity near Atlantic

Working on data using Python

What is an ipython notebook?

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IPython notebook: web-based interactive computational environment
combining code, text, figures, . . .
http://ipython.org/notebook.html

How to get the code?

The code is made available through github:

https://github.com/ctroupin/OceanData_NoteBooks

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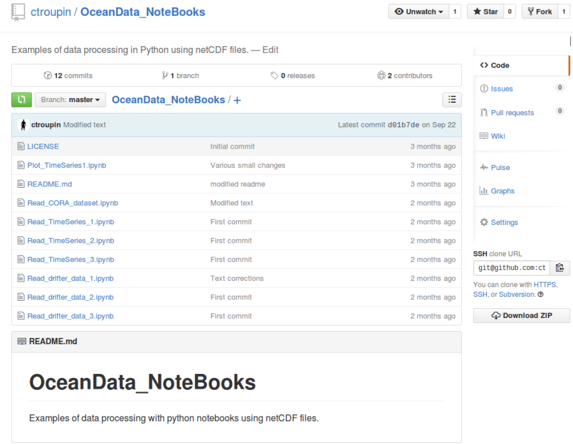

ctroupin / **OceanData_NoteBooks**

Examples of data processing in Python using netCDF files. — Edit

12 commits **1** branch **0** releases **2** contributors

ctroupin Modified text — Latest commit `d01b7de` on Sep 22

LICENSE	Initial commit	3 months ago
Plot_TimeSeries1.ipynb	Various small changes	3 months ago
README.md	modified readme	3 months ago
Read_CORA_dataset.ipynb	Modified text	2 months ago
Read_TimeSeries_1.ipynb	First commit	2 months ago
Read_TimeSeries_2.ipynb	First commit	2 months ago
Read_TimeSeries_3.ipynb	First commit	2 months ago
Read_drifter_data_1.ipynb	Text corrections	2 months ago
Read_drifter_data_2.ipynb	First commit	2 months ago
Read_drifter_data_3.ipynb	First commit	2 months ago

SSH clone URL

`git@github.com:ct`

You can clone with HTTPS, SSH, or Subversion.

README.md

OceanData_NoteBooks

Examples of data processing with python notebooks using netCDF files.

How to get the code?

1. Download the zipped archive on your computer (in `~/CMEMS_INSTAC_Training`)

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unzip OceanData_NoteBooks-master.zip
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How to run a notebook?

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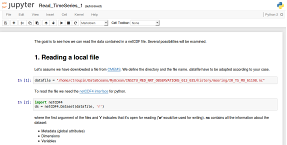
```

You should obtain something like that:



The goal is to see how we can read the data contained in a netCDF file. Several possibilities will be examined.

1. Reading a local file

Let's assume we have downlowded a file from CMEMS. We define the directory and the file name. *datafile* have to be adapted according to your case.

```
In [1]: datafile = "/home/ctroupin/DataOceano/MyOcean/INSITU_MED_NRT_OBSERVATIONS_013_035/history/mooring/IR_TS_MO_61198.nc"
```

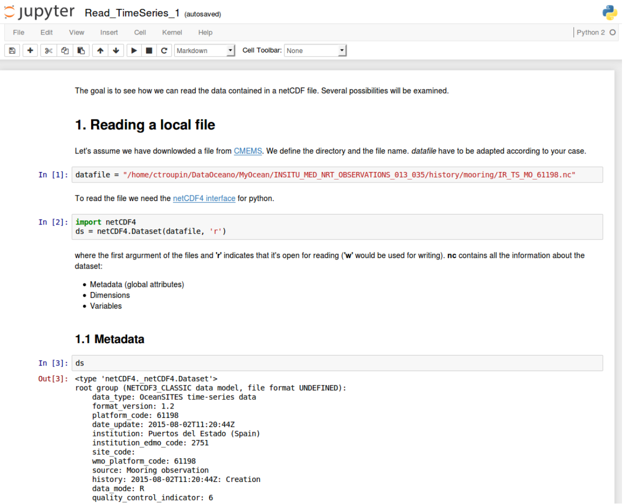
To read the file we need the netCDF4 interface for python.

```
In [2]: import netCDF4
        ds = netCDF4.Dataset(datafile, 'r')
```

where the first argurment of the files and '**r**' indicates that it's open for reading ('**w**' would be used for writing). **nc** contains all the information about the dataset:

- Metadata (global attributes)
- Dimensions
- Variables

Structure of a notebook



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1.1 Metadata

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In [3]: ds
```

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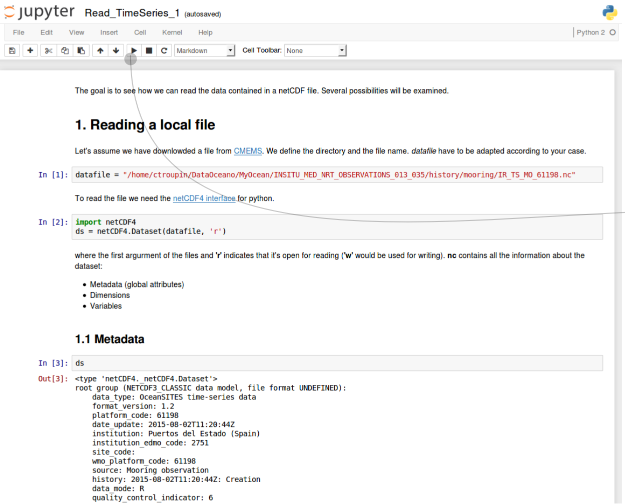
Out[3]: <type 'netCDF4._netCDF4.Dataset'>
        root group (NETCDF3_CLASSIC data model, file format UNDEFINED):
            data_type: OceanSITES time-series data
            format_version: 1.2
            platform_code: 61198
            date_update: 2015-08-02T11:20:44Z
            institution: Puertos del Estado (Spain)
            institution_edmo_code: 2751
            site_code:
            wmo_platform_code: 61198
            source: Mooring observation
            history: 2015-08-02T11:20:44Z: Creation
            data_mode: R
            quality_control_indicator: 6
```

Structure of a notebook



Markdown

Cell Toolbar: None

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Run current cell

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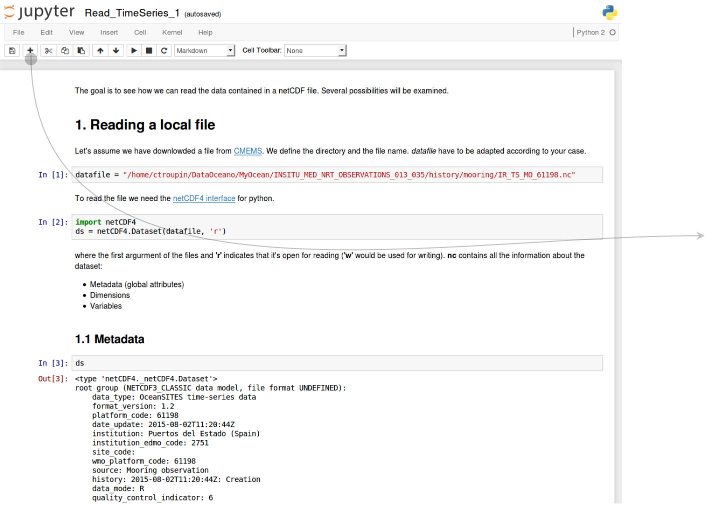

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Run current cell
Add a new cell

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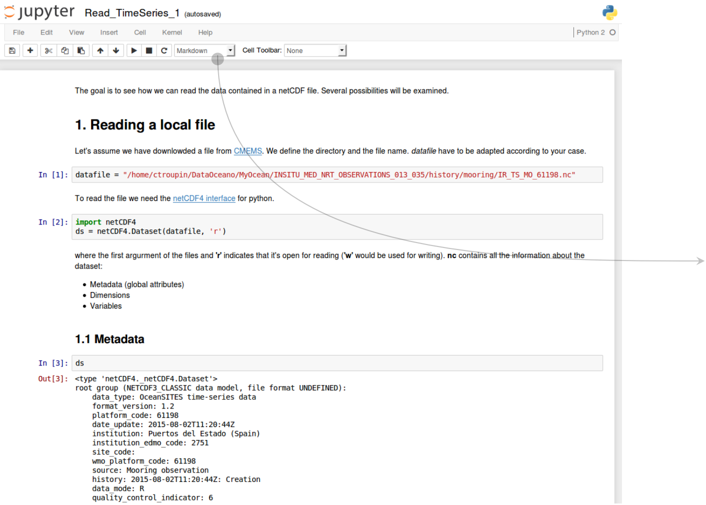

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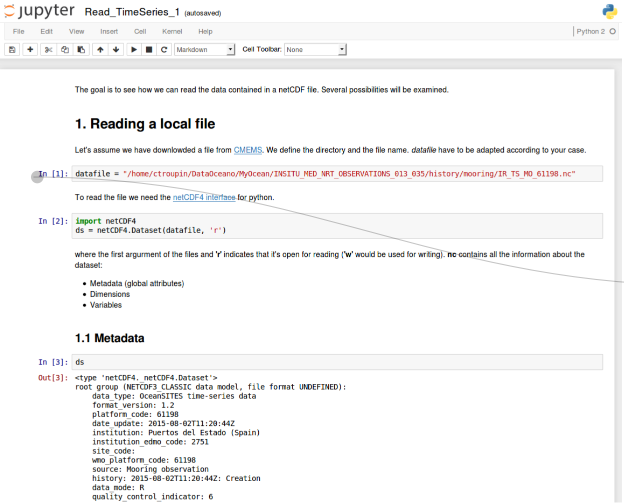
Run current cell
Add a new cell
Select type of cell

Structure of a notebook



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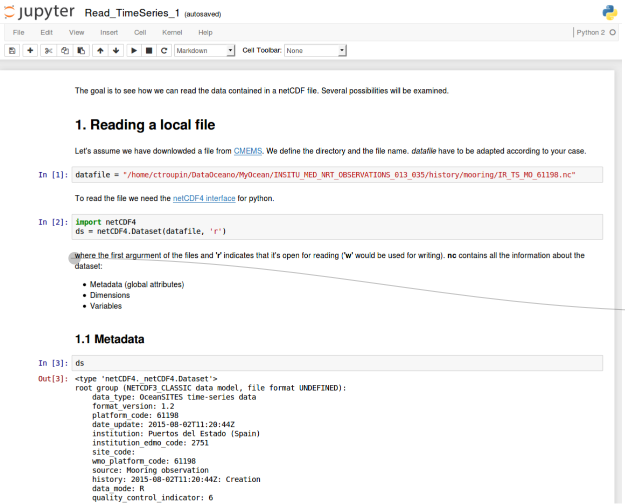
Run current cell
Add a new cell
Select type of cell
Code cell

Structure of a notebook



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Run current cell
Add a new cell
Select type of cell
Code cell
Text cell

Structure of a repository

In the directory containing the notebooks, type:

```
ipython notebook
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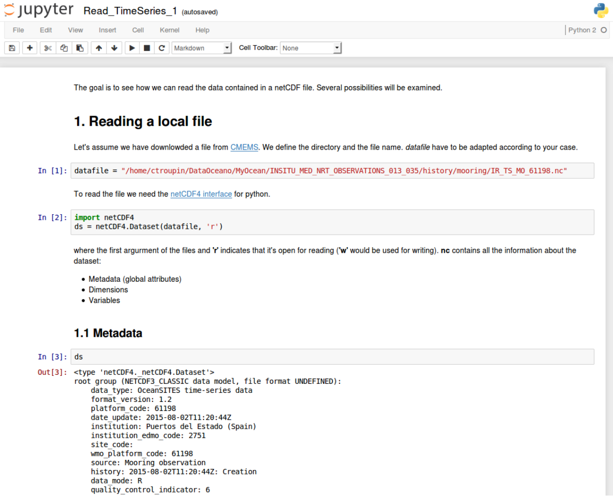
You should get:



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In [1]:
```
datafile = "/home/ctroupin/DataOceano/MyOcean/INSITU_MED_NRT_OBSERVATIONS_013_035/history/mooring/IR_TS_MO_61198.nc"
```

To read the file we need the netCDF4 interface for python.

In [2]:
```
import netCDF4
ds = netCDF4.Dataset(datafile, 'r')
```

where the first argurment of the files and **'r'** indicates that it's open for reading (**'w'** would be used for writing). **nc** contains all the information about the dataset:

- Metadata (global attributes)
- Dimensions
- Variables

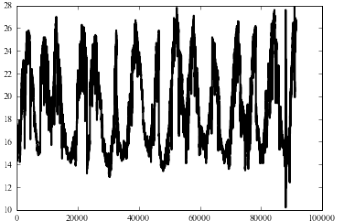
1.1 Metadata

In [3]:
```
ds
```

Out[3]:
```
<type 'netCDF4._netCDF4.Dataset'>
root group (NETCDF3_CLASSIC data model, file format UNDEFINED):
    data_type: OceanSITES time-series data
    format_version: 1.2
    platform_code: 61198
    date_update: 2015-08-02T11:20:44Z
    institution: Puertos del Estado (Spain)
    institution_edmo_code: 2751
    site_code: 
    wmo_platform_code: 61198
    source: Mooring observation
    history: 2015-08-02T11:20:44Z: Creation
    data_mode: R
    quality_control_indicator: 6
```

What’s inside the repository?

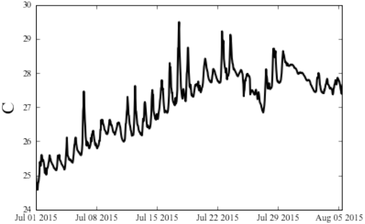
Read_TimeSeries_1.ipynb: reading a local netCDF file



What’s inside the repository?

Read_TimeSeries_1.ipynb: reading a local netCDF file

Read_TimeSeries_2.ipynb: reading a remote netCDF using OPeNDAP protocol

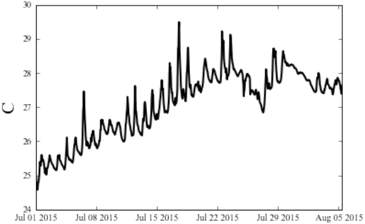


What's inside the repository?

Read_TimeSeries_1.ipynb: reading a local netCDF file

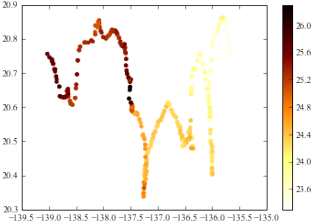
Read_TimeSeries_2.ipynb: reading a remote netCDF using OPeNDAP protocol

Read_TimeSeries_3.ipynb: reading a netCDF using the CF module



What’s inside the repository?

Read_TimeSeries_1.ipynb:	reading a local netCDF file
Read_TimeSeries_2.ipynb:	reading a remote netCDF using OPeNDAP protocol
Read_TimeSeries_3.ipynb:	reading a netCDF using the CF module
Read_drifter_data_1.ipynb:	basic plot of a drifter trajectory



What’s inside the repository?

Read_TimeSeries_1.ipynb:	reading a local netCDF file
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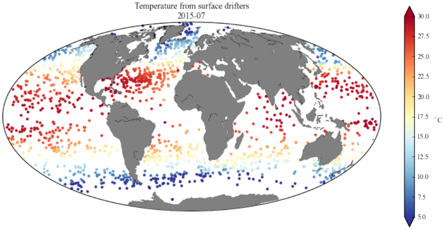
Read_TimeSeries_3.ipynb:	reading a netCDF using the CF module
Read_drifter_data_1.ipynb:	basic plot of a drifter trajectory
Read_drifter_data_2.ipynb:	plotting temperature observations from drifters



What’s inside the repository?

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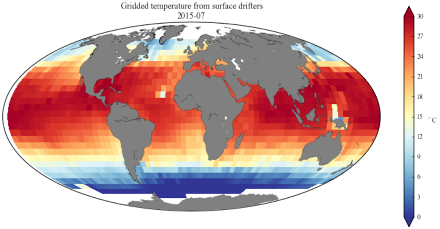
Read_TimeSeries_2.ipynb: reading a remote netCDF using OPeNDAP protocol

Read_TimeSeries_3.ipynb: reading a netCDF using the CF module

Read_drifter_data_1.ipynb: basic plot of a drifter trajectory

Read_drifter_data_2.ipynb: plotting temperature observations from drifters

Read_drifter_data_3.ipynb: gridding temperature observations from drifters



Gridded temperature from surface drifters
2015-07

What's inside the repository?

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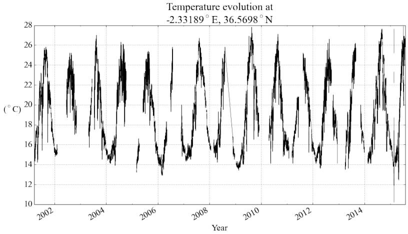
Read_drifter_data_2.ipynb: plotting temperature observations from drifters

Read_drifter_data_3.ipynb: gridding temperature observations from drifters

Plot_TimeSeries1.ipynb: plotting temperature from a mooring



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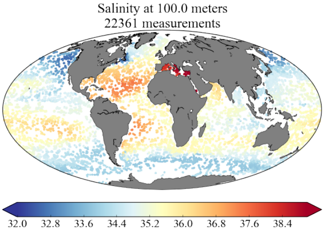
Read_drifter_data_1.ipynb: basic plot of a drifter trajectory

Read_drifter_data_2.ipynb: plotting temperature observations from drifters

Read_drifter_data_3.ipynb: gridding temperature observations from drifters

Plot_TimeSeries1.ipynb: plotting temperature from a mooring

Read_CORA_dataset.ipynb: reading and plotting data from CORA dataset



Example: plotting a time series

Notebook file:	Plot_TimeSeries1.ipynb
Product:	Mediterranean Sea near real-time observations (INSITU_MED_NRT_OBSERVATIONS_013_035)
Data file:	IR_TS_MO_61198.nc Mooring managed by Puertos del Estado (Spain)

Example: plotting a time series

Notebook file: Plot_TimeSeries1.ipynb

Product: Mediterranean Sea near real-time observations
(INSITU_MED_NRT_OBSERVATIONS_013_035)

Data file: IR_TS_MO_61198.nc Mooring managed by Puertos del Estado (Spain)

Objectives:

1. Read a netCDF file
2. Apply the quality flags to the observations
3. Generate high-quality plot

Example: plotting a time series

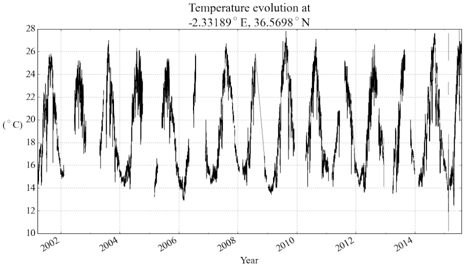
Notebook file: Plot_TimeSeries1.ipynb

Product: Mediterranean Sea near real-time observations
(INSITU_MED_NRT_OBSERVATIONS_013_035)

Data file: IR_TS_MO_61198.nc Mooring managed by Puertos del Estado (Spain)

Objectives:

1. Read a netCDF file
2. Apply the quality flags to the observations
3. Generate high-quality plot


Temperature evolution at
-2.33189 ° E, 36.5698 ° N
(° C)
Year