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SeaDataNet

PAN-EUROPEAN INFRASTRUCTURE
FOR OCEAN & MARINE DATA
MANAGEMENT

Regional Product Elaboration: Quality Check based on SDN1 experience (part1)

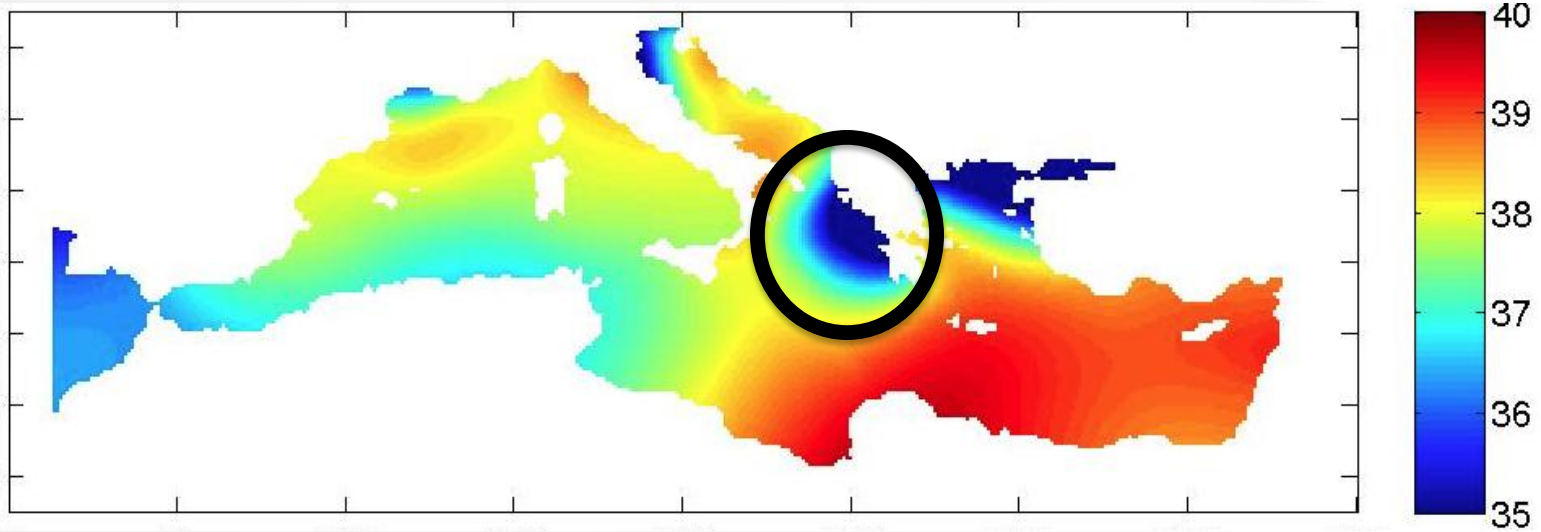
Objective: production of gridded climatologies

- The quality of the data have an impact on the gridded climatologies

- Examples of the QC procedures with ODV

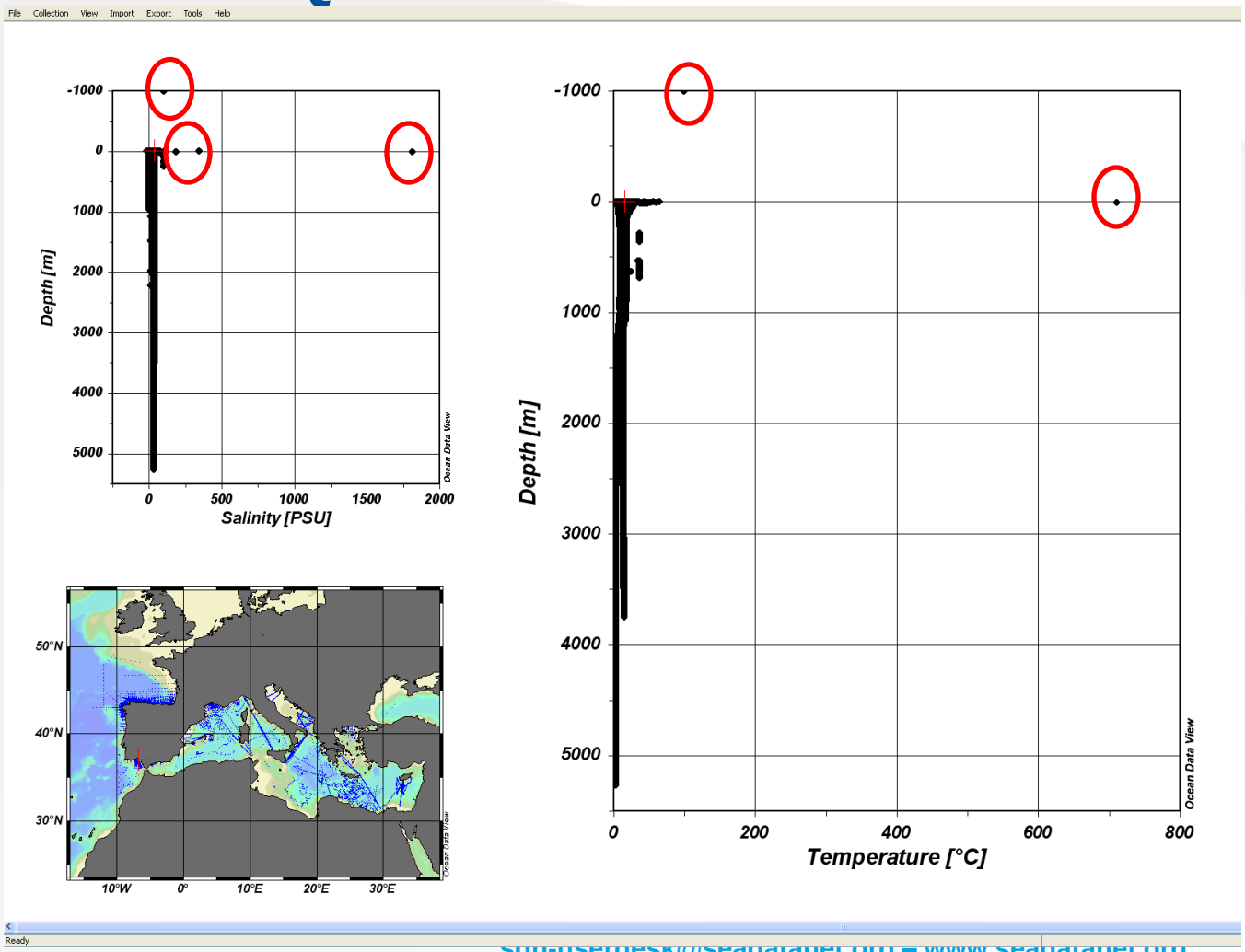
- Conclusion

Example of gridded climatological field with unrealistic structure



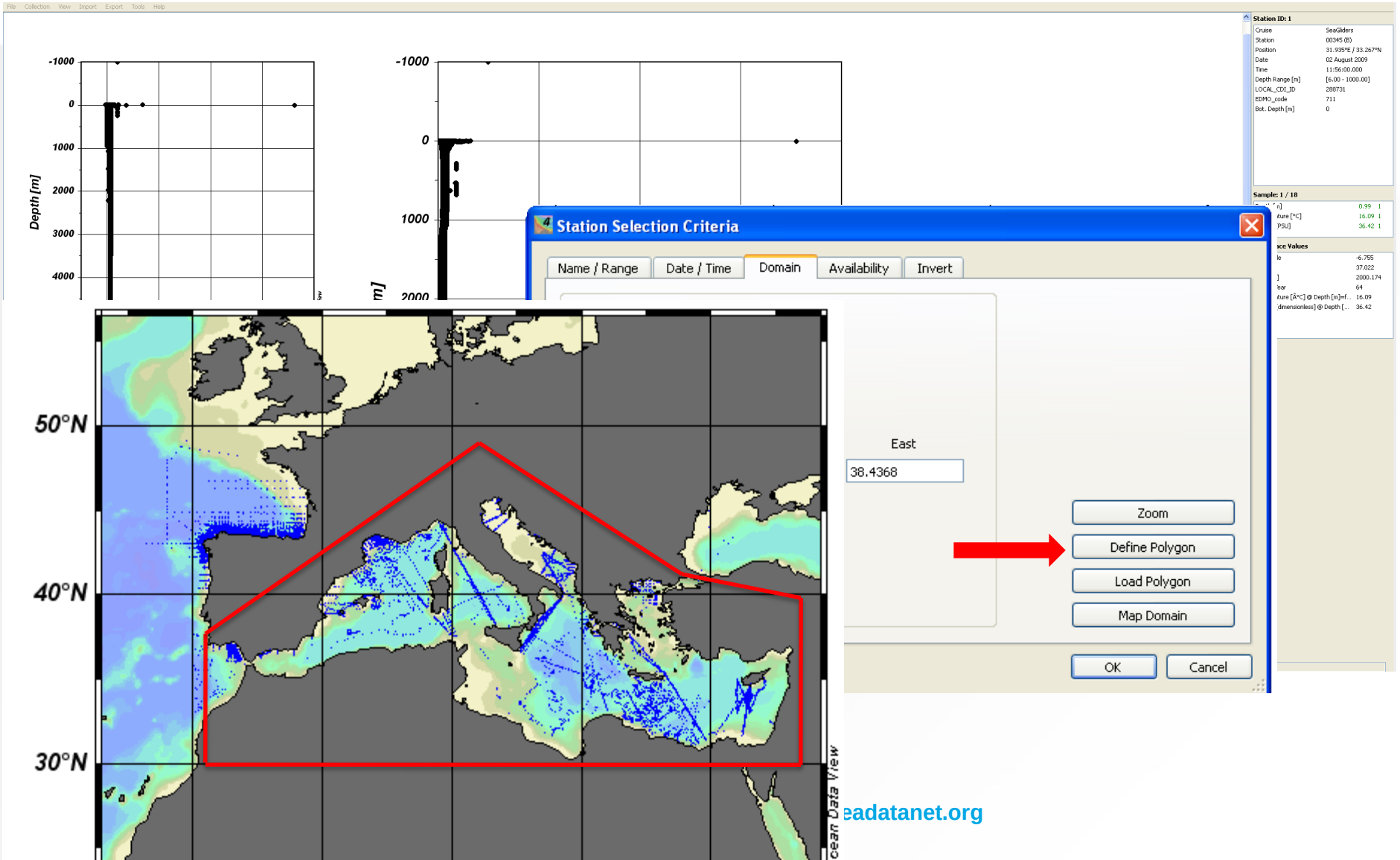
Unrealistic salinity profile in the Ionian sea: bubble of low salinity

ODV QC: row data set downloaded from CDI

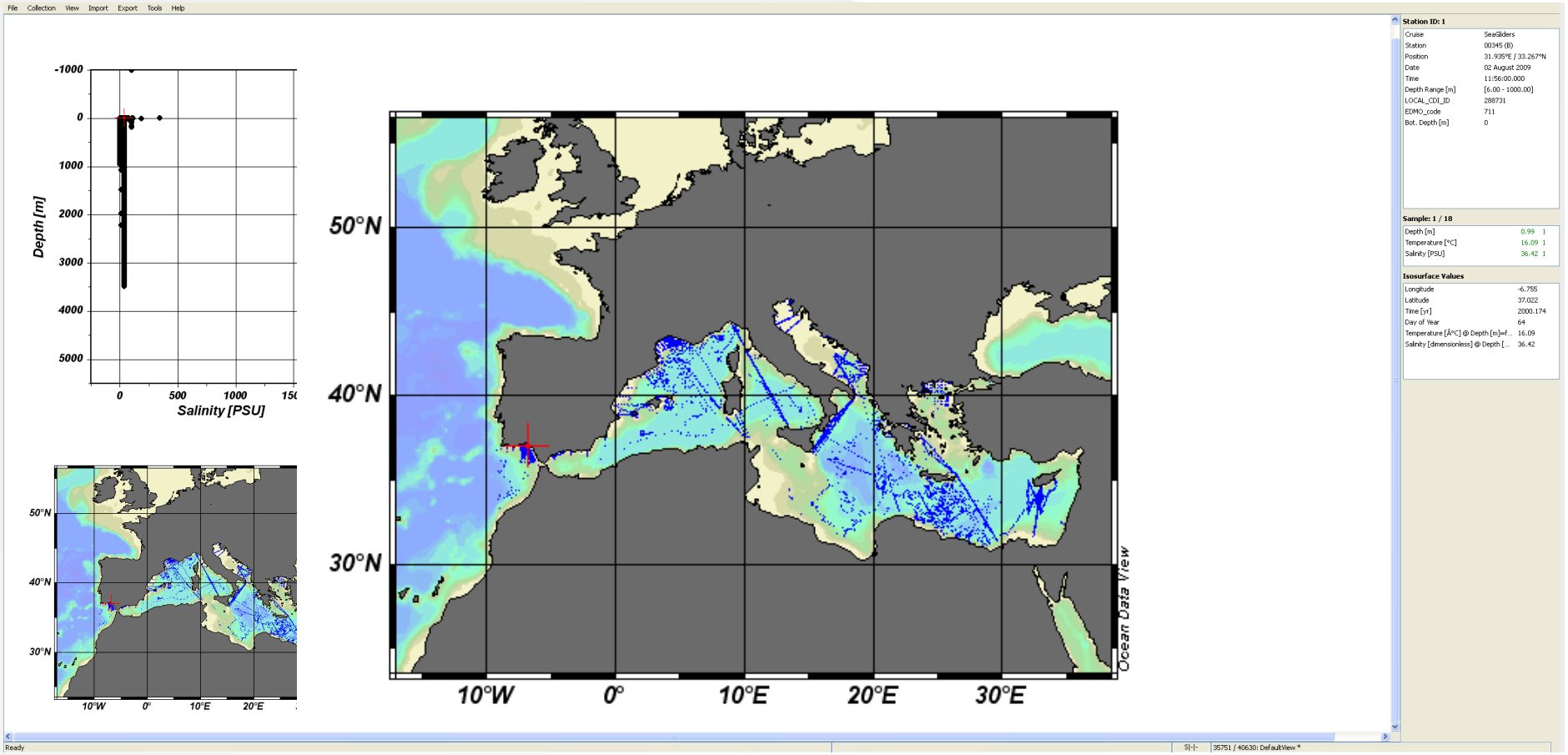


Measurements with wrong value

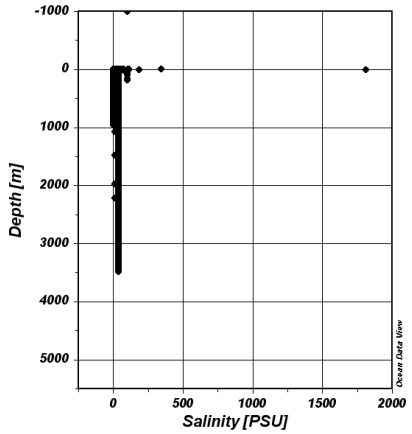
ODV: Domain selection

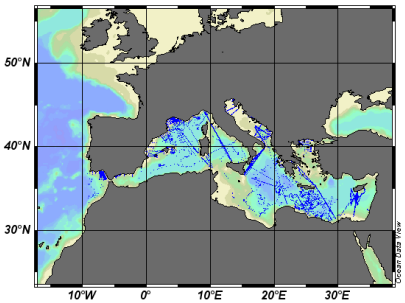


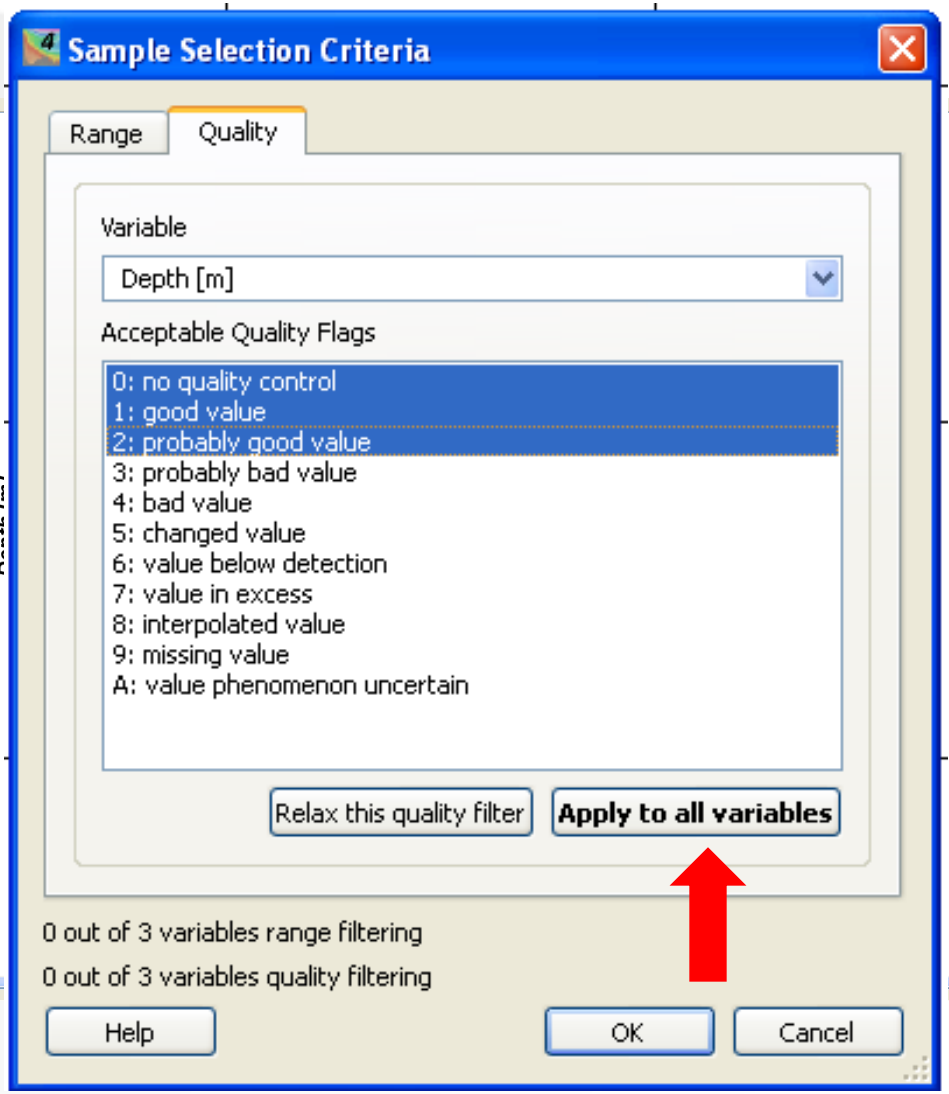
ODV: Dataset after domain selection



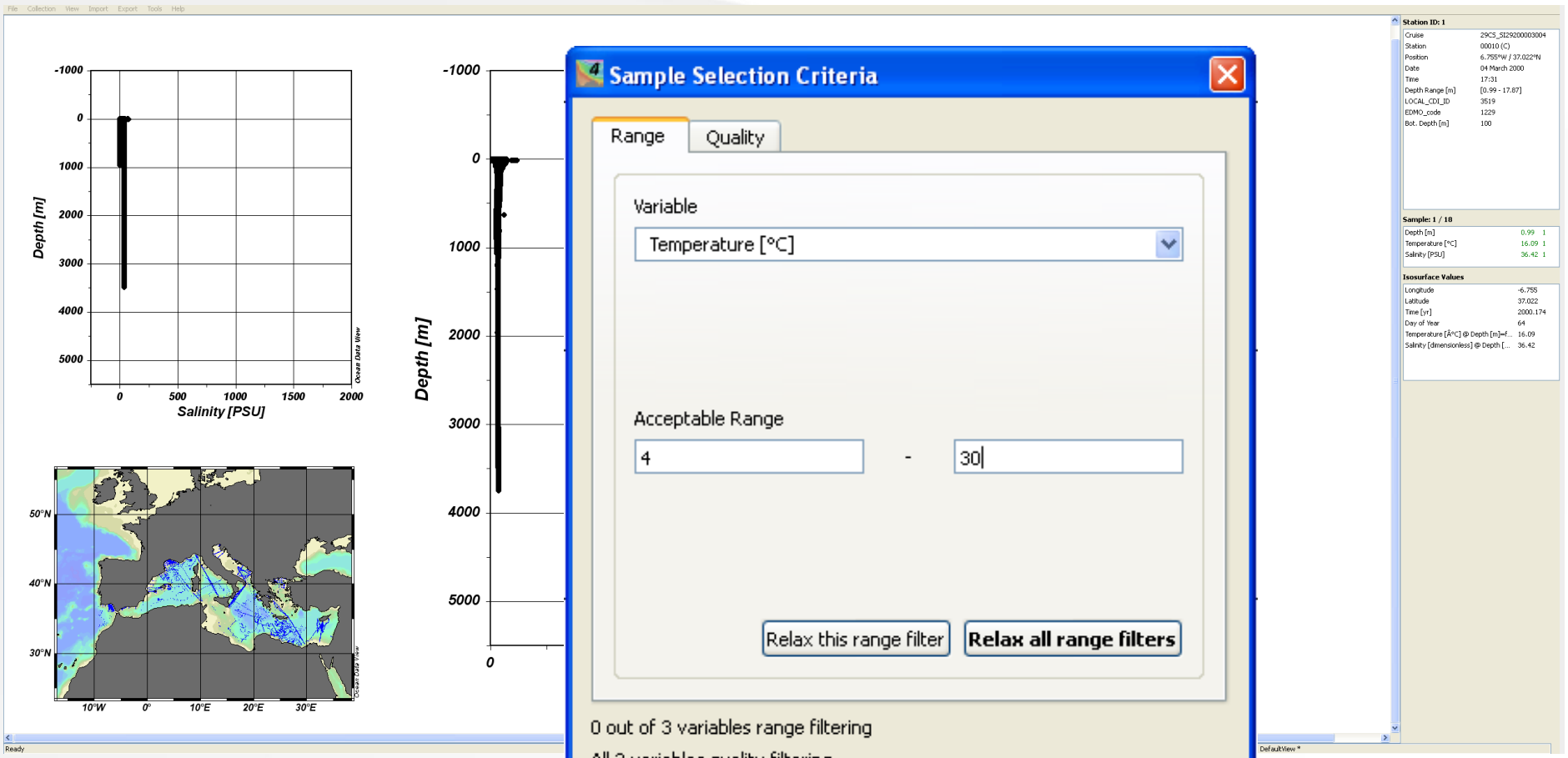
ODV: Quality Flag selection



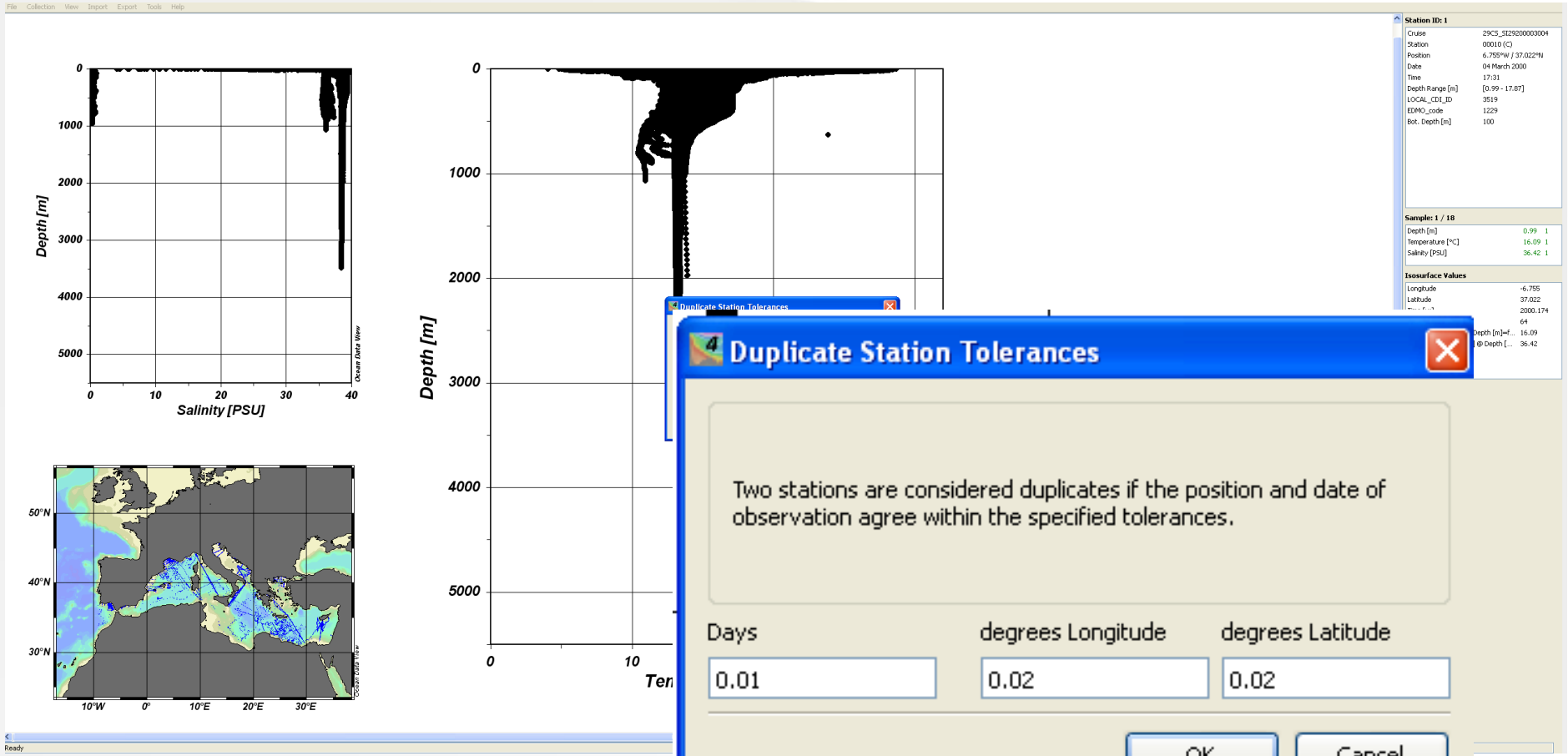




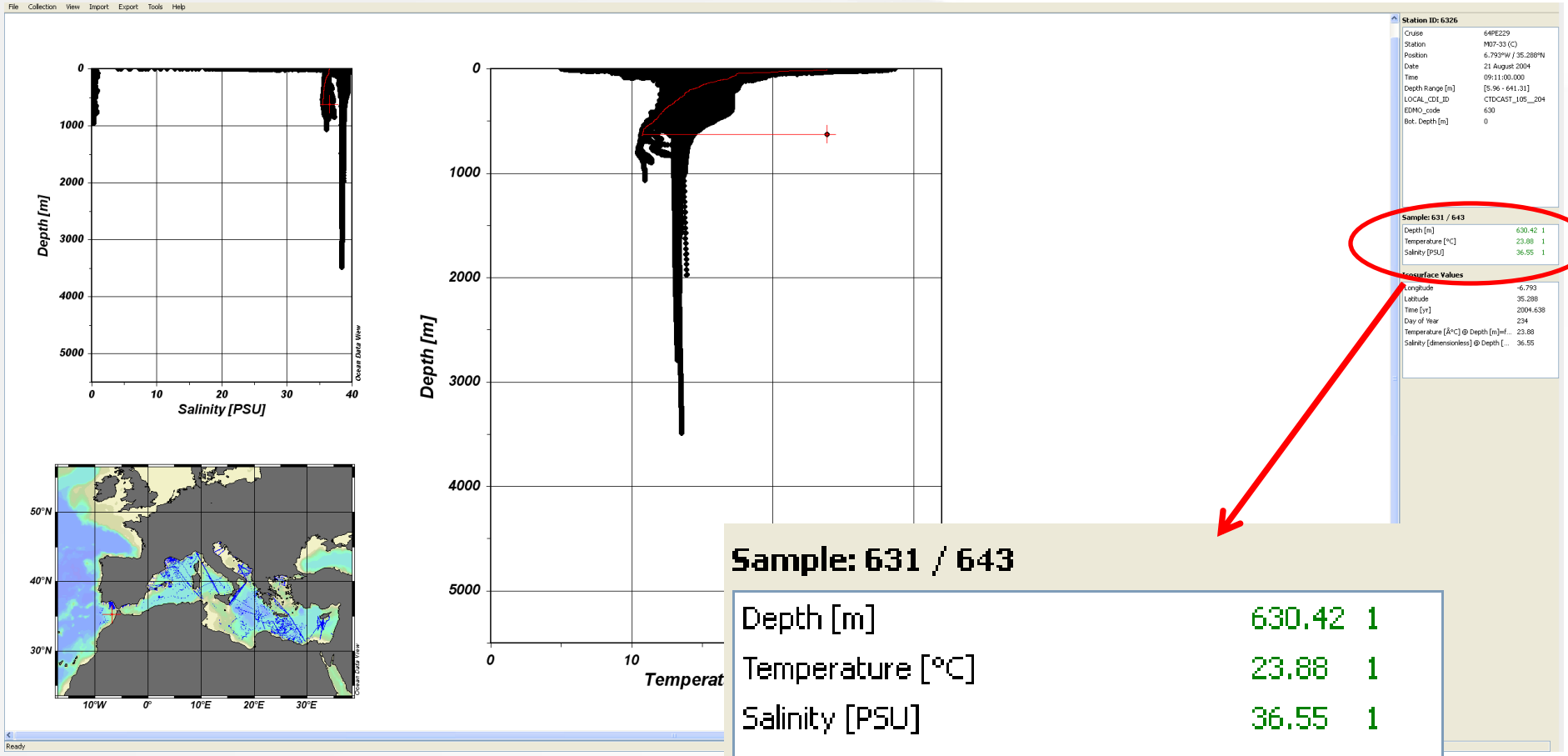
ODV: Data range selection



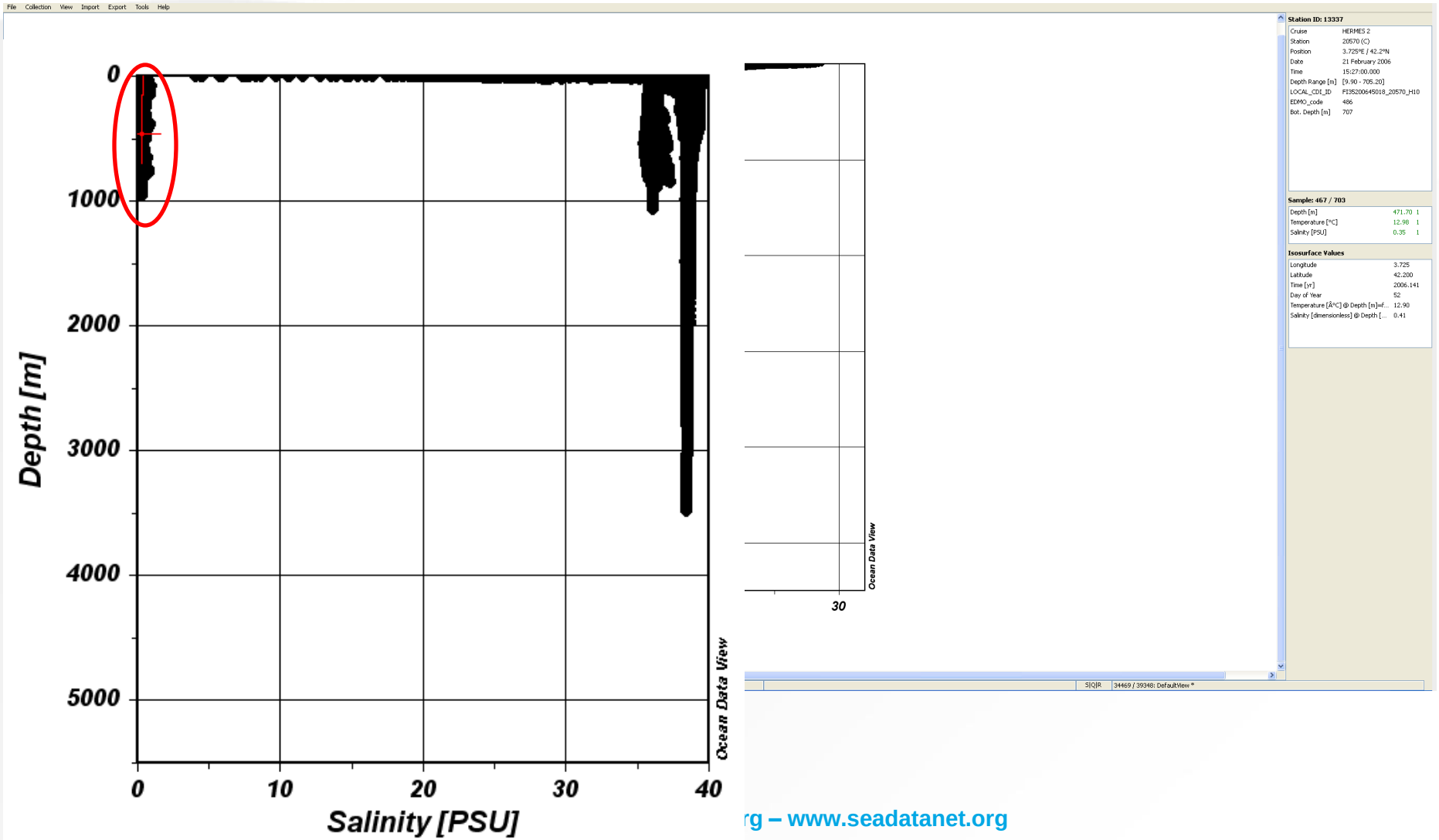
ODV: Check for duplicates



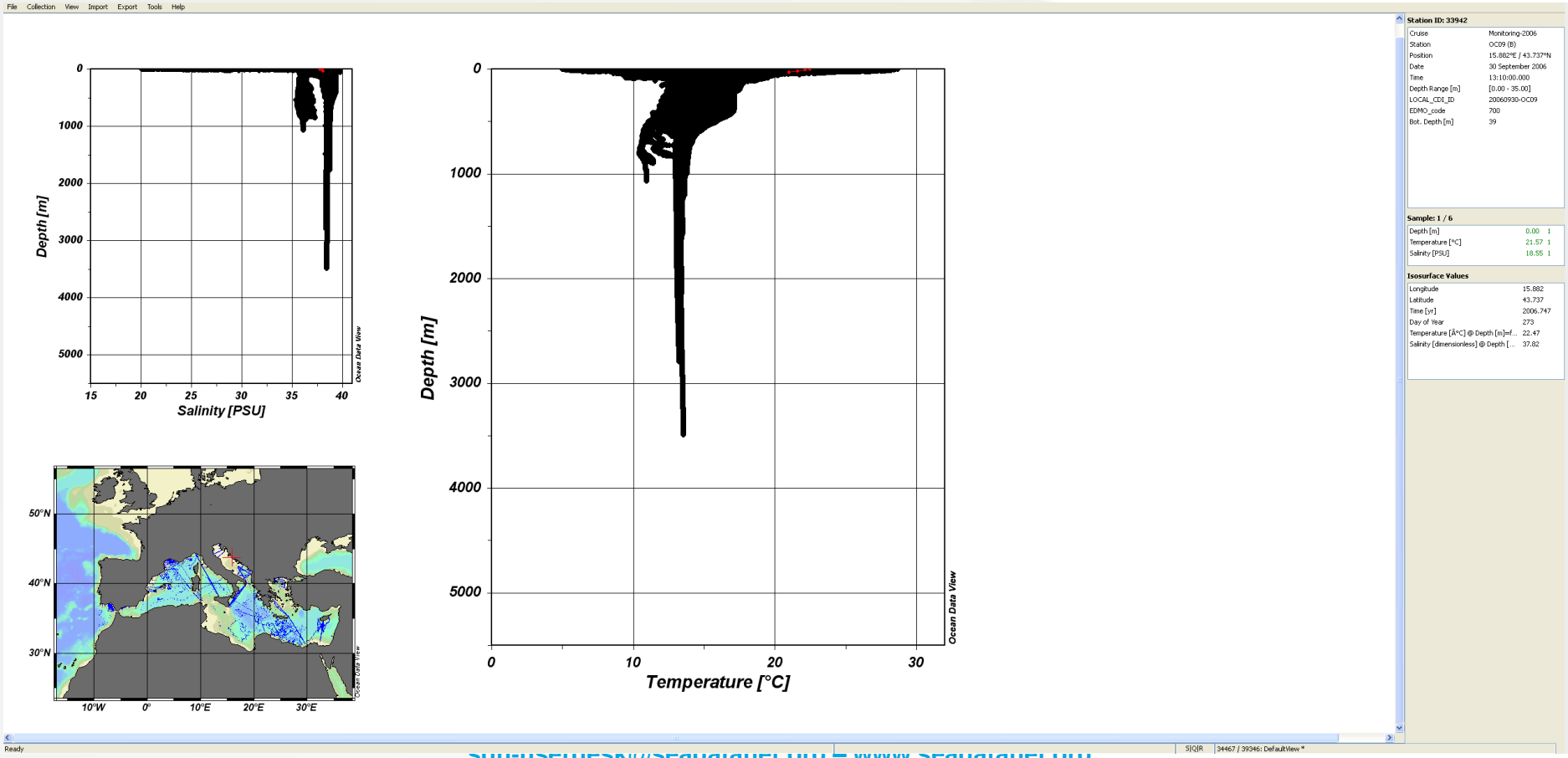
ODV: Spike detection



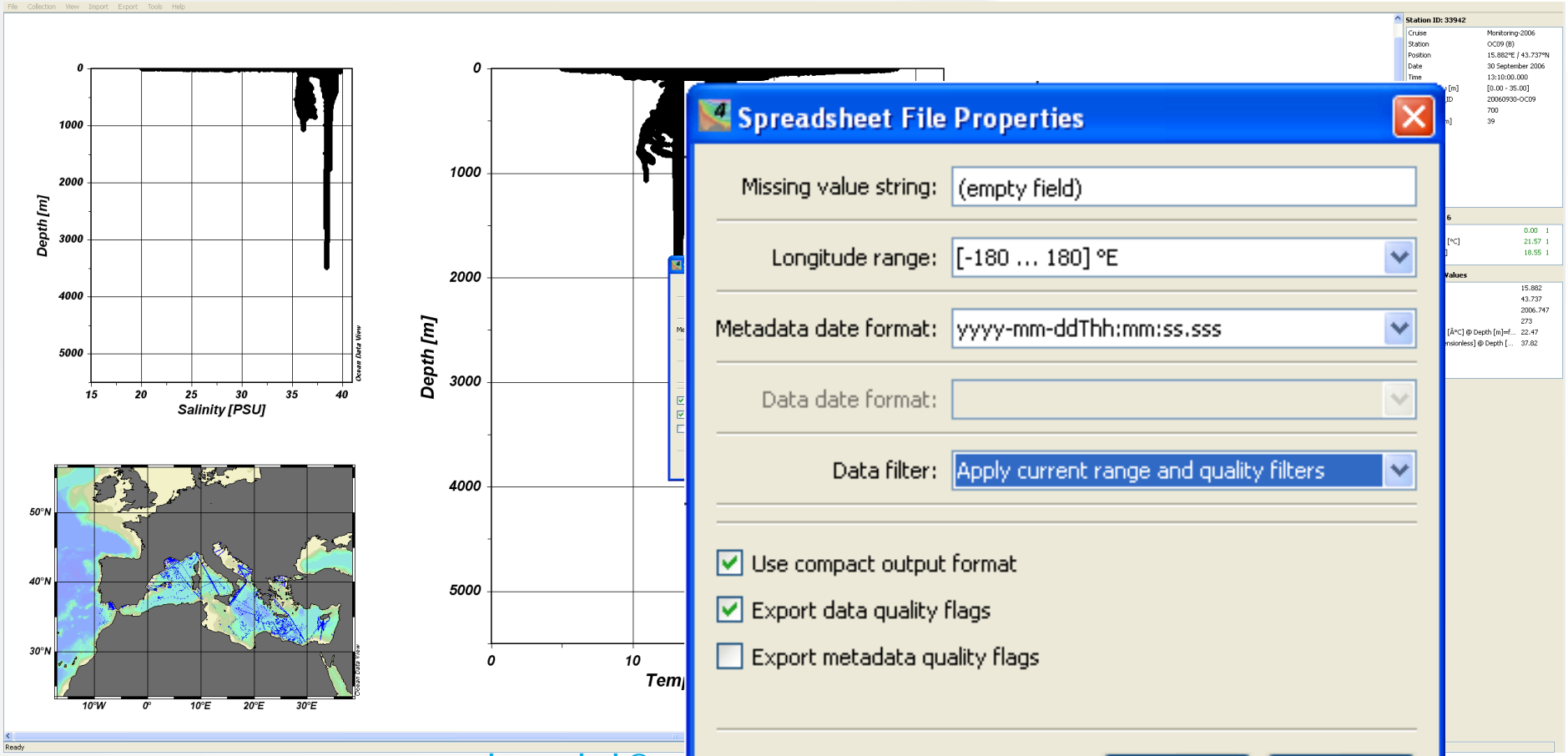
ODV: Visual QC



ODV: dataset ready for DIVA



ODV: dataset extraction for DIVA (ODV spreadsheet)



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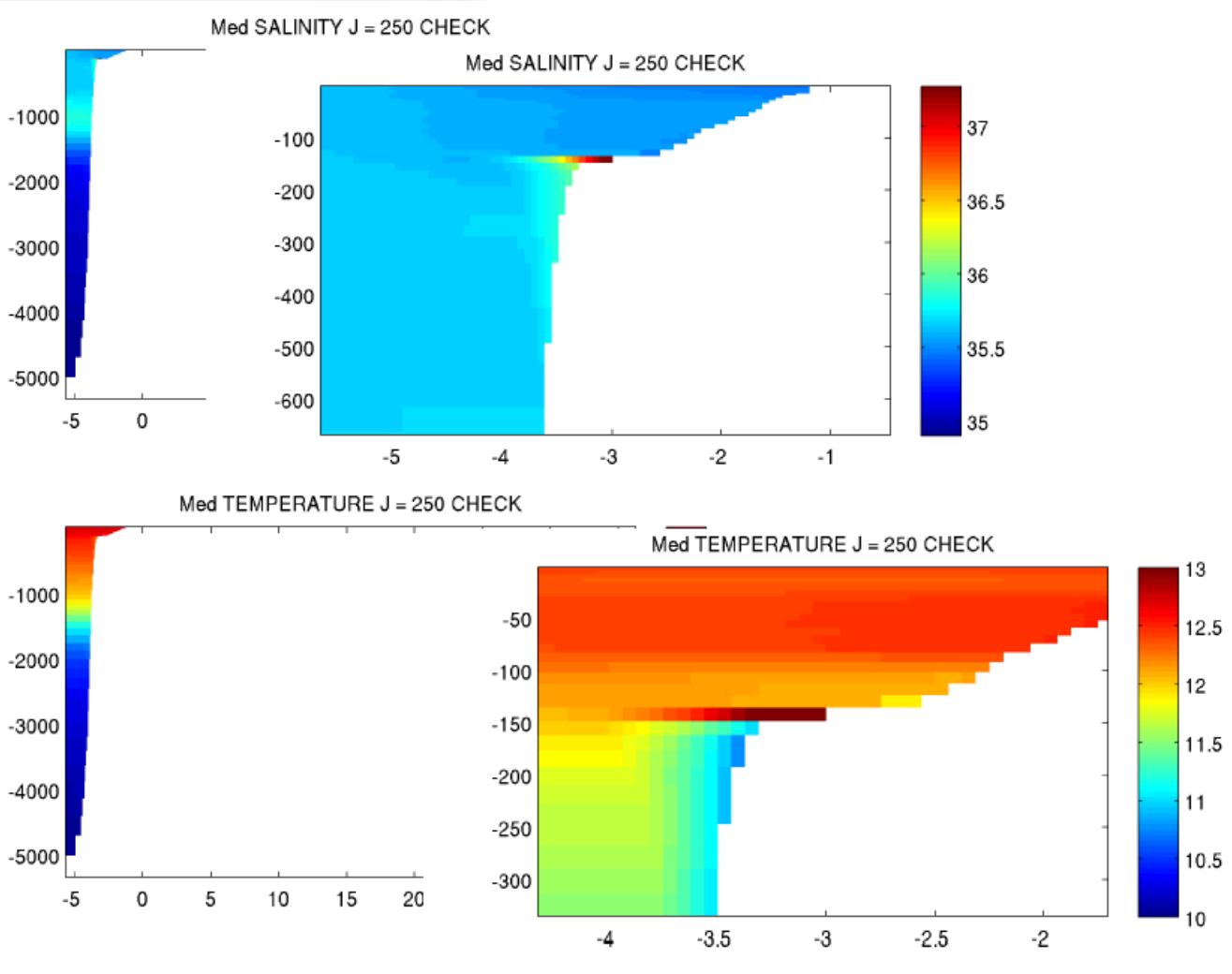
Regional Product Elaboration: Quality Check based on SDN1 experience (part2)

Discontinuities due to data gaps

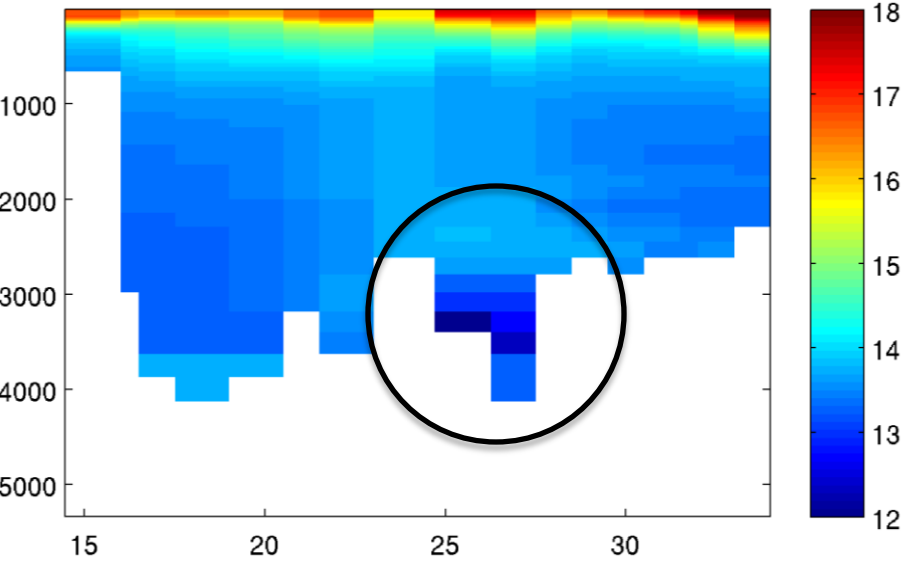
- Low number of data
- Specific topographic structures
- Backgroud computation methodologies
- …..

→ unrealistic values in the gridded fields

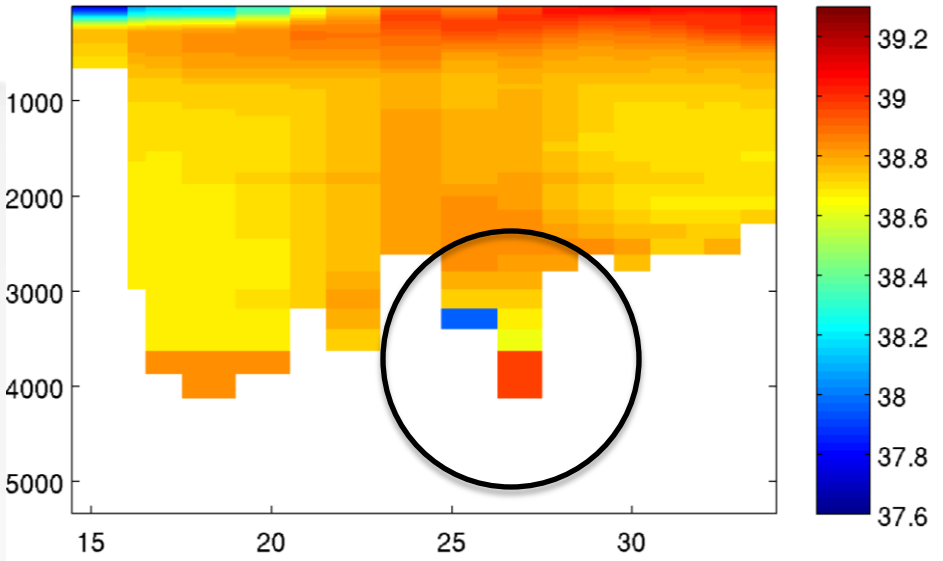
Discontinuities due to data gaps: an example



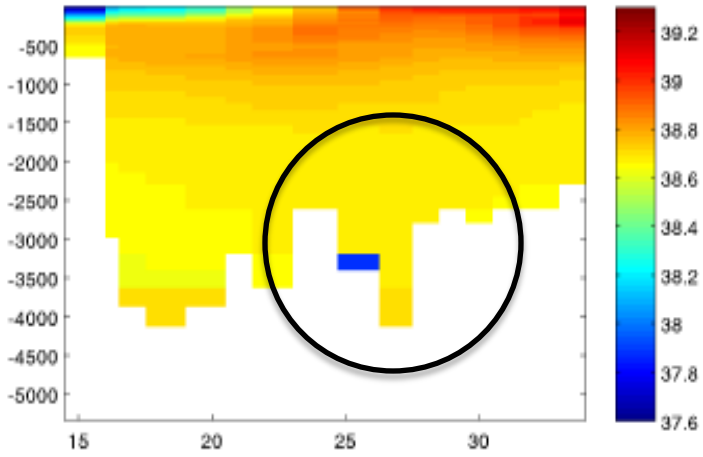
Temperature METEOR TRANSECT SDN$_V$3



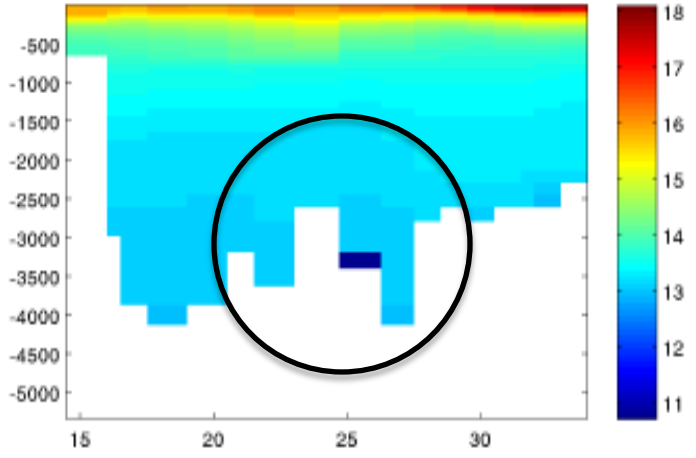
Salinity METEOR TRANSECT SDN$_V$3



METEOR TRANSECT S SDN$_V$2a

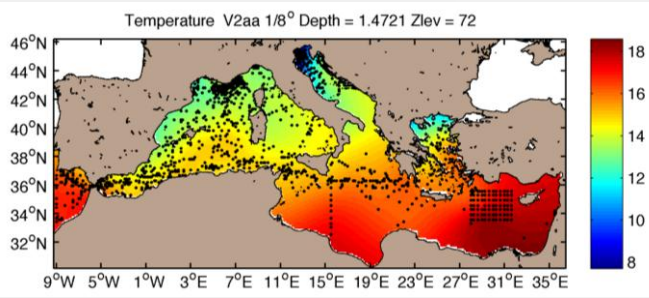


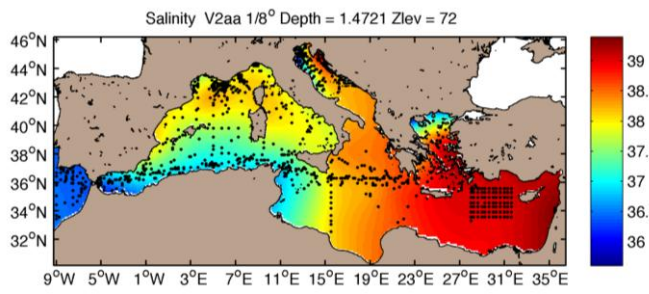
METEOR TRANSECT T SDN$_V$2a



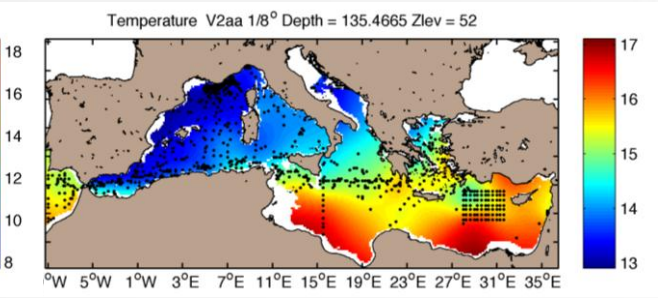
SDN_V2a and V2aa January : T and S maps and data distribution

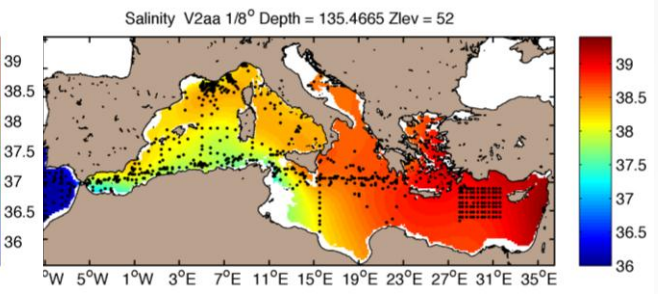
SURFACE



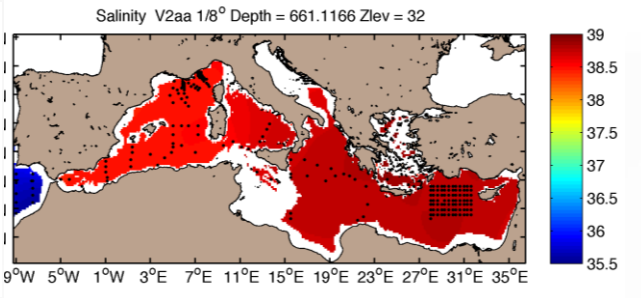


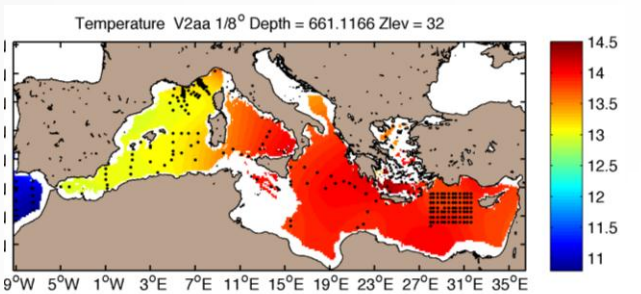
135m





661m





T&S observations in January are more abundant and better distributed in the western basin, while in the eastern basin are very sparse and totally absent in many regions. Initialization procedure in this case takes into account the background fields (T seasonal - S annual).

Procedure applied to the Med Sea: an example to solve discontinuities due to data gaps

1. Range Check: 2<T<31 ; 15<S<40
2. Duplicates values along the profiles identification and elimination
3. Bottom Check: compute the difference between model bathymetry and the last observation depth at observation location (ΔB)
4. **Observations** were **linearly interpolated on the 72 NEMO model z levels**
5. **Extrapolation** at the **surface** (tuned for January conditions)

Steps:

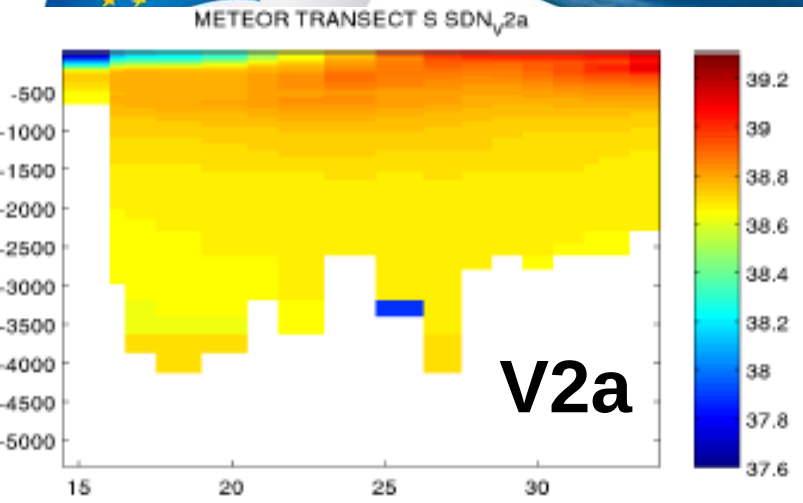
6. **Extrapolation** on the **bottom** (tuned for January conditions)

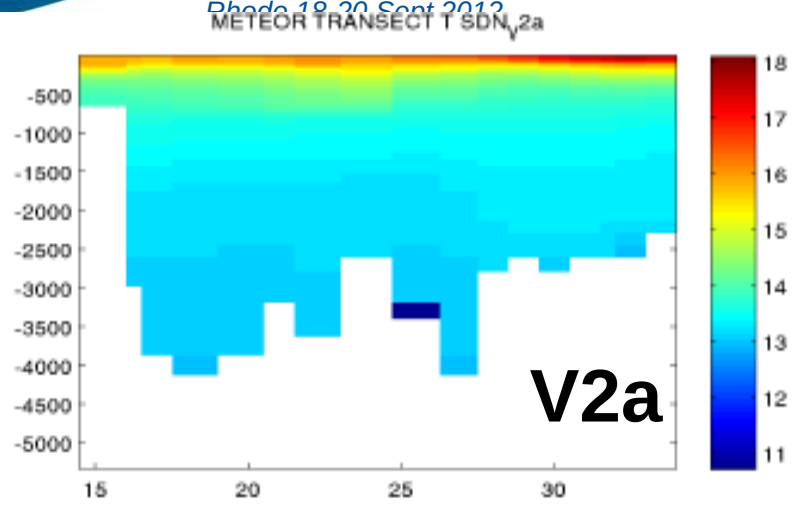
Divide the water column in 5 layers and apply different criteria to extrapolate the bottom value

50-100m	100-200m	200-500m	500-1500m	>1500m
If ΔB<20m bring the last value down	If ΔB<100m bring the last value down	If ΔB<100m bring the last value down	If ΔB<200m bring the last value down	Always bring the last value down

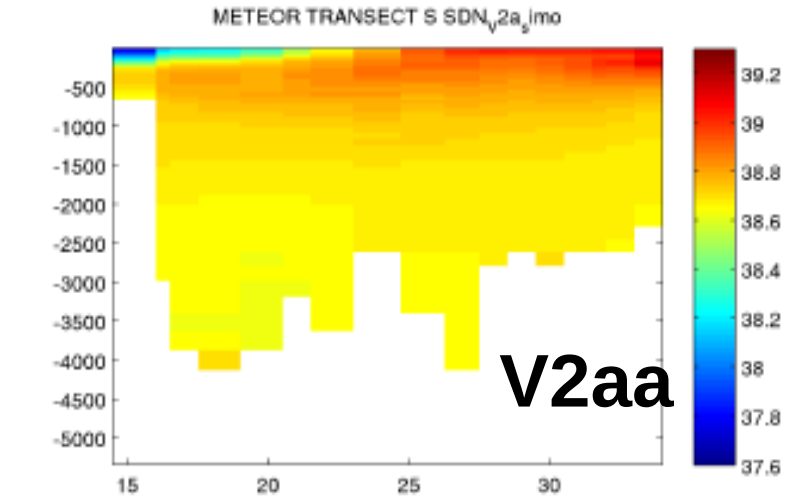
Data written in the DIVA input format

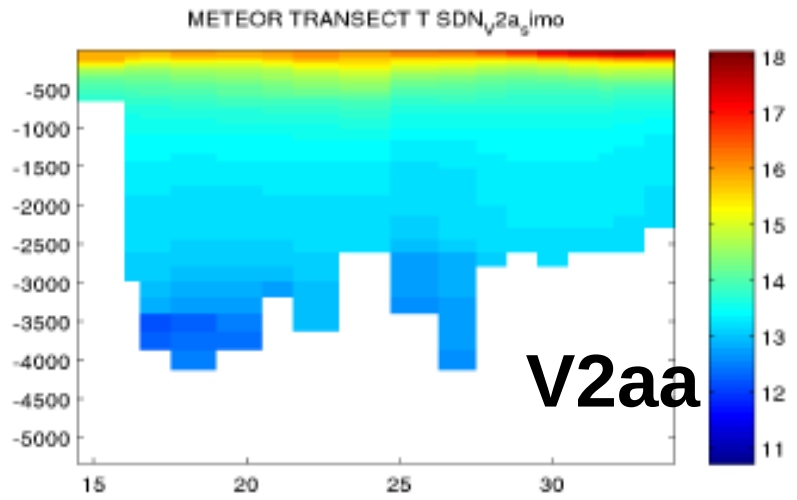
METEOR TRANSECT





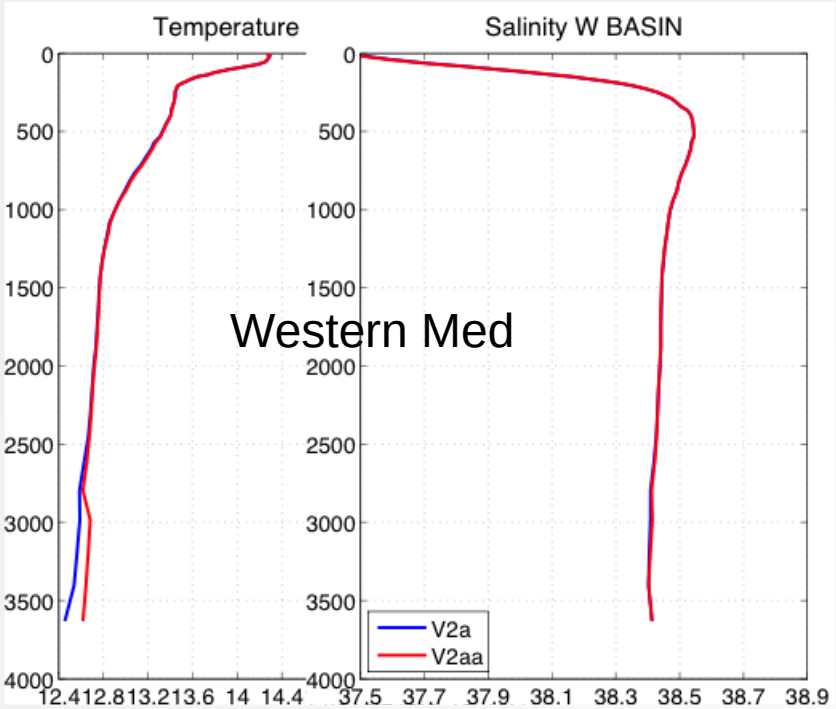
Results after pre-processing procedure

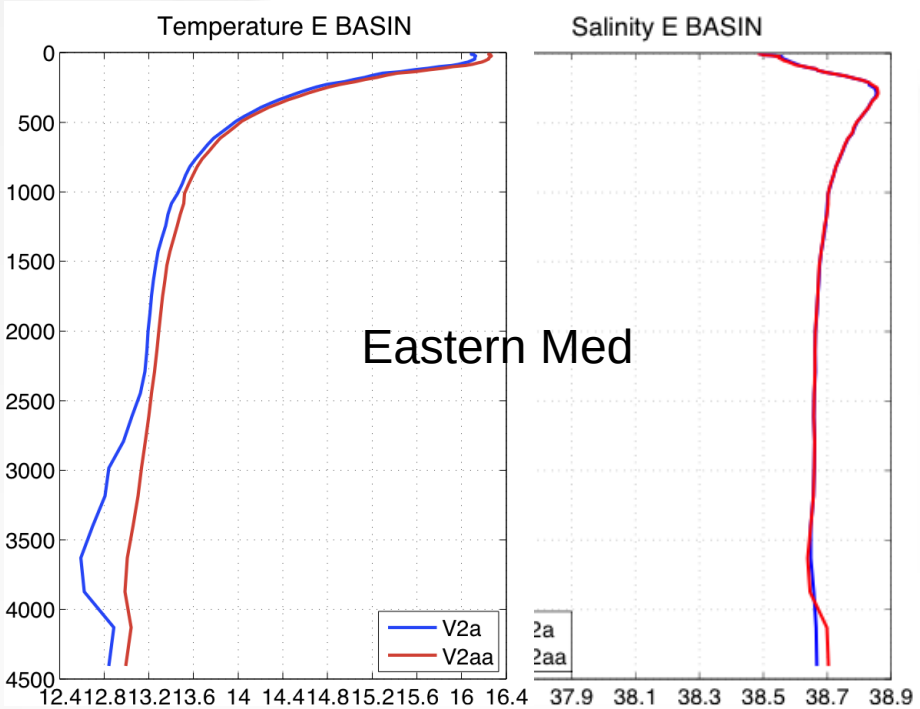




METEOR transect confirms the improvement of the IC estimation avoiding discontinuities in the bottom layer

V2a (no vertical correction) and V2aa (yes vertical correction)Jan Climatology: mean profiles





The averaged profiles for the W and E Mediterranean show that the initialization procedure substantially improves the deep field estimate

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Regional Product Elaboration: ideas for climatological gridded fields production in SDN2

Why we compute a pre-EMT climatology?

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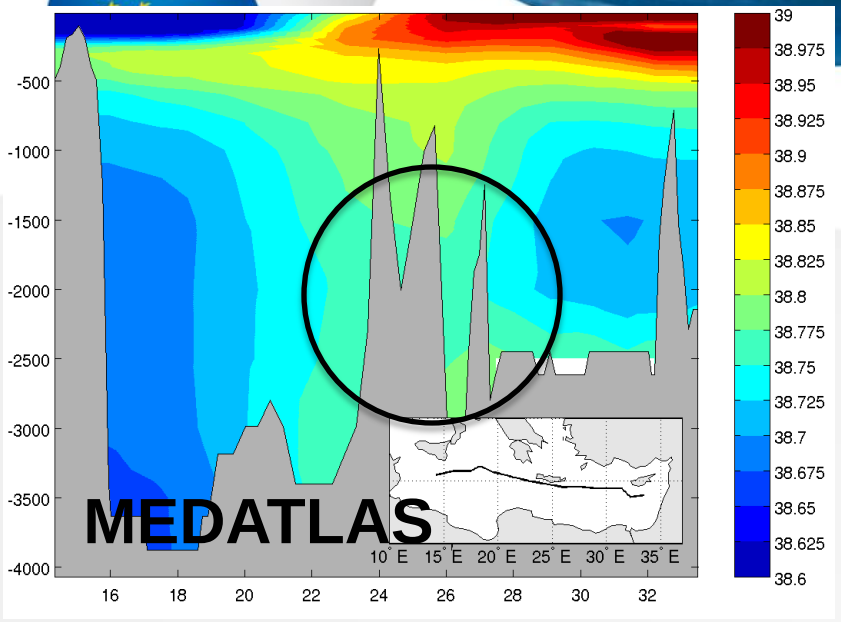
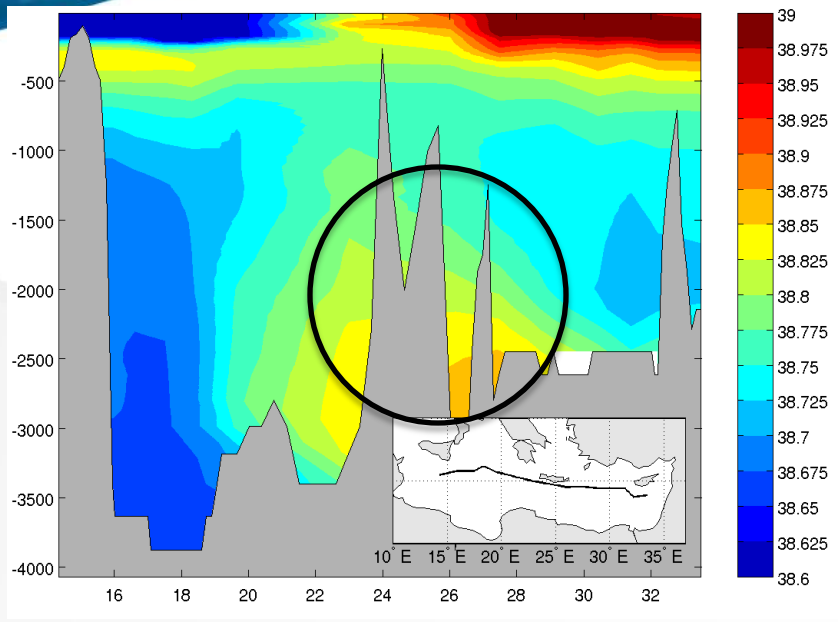
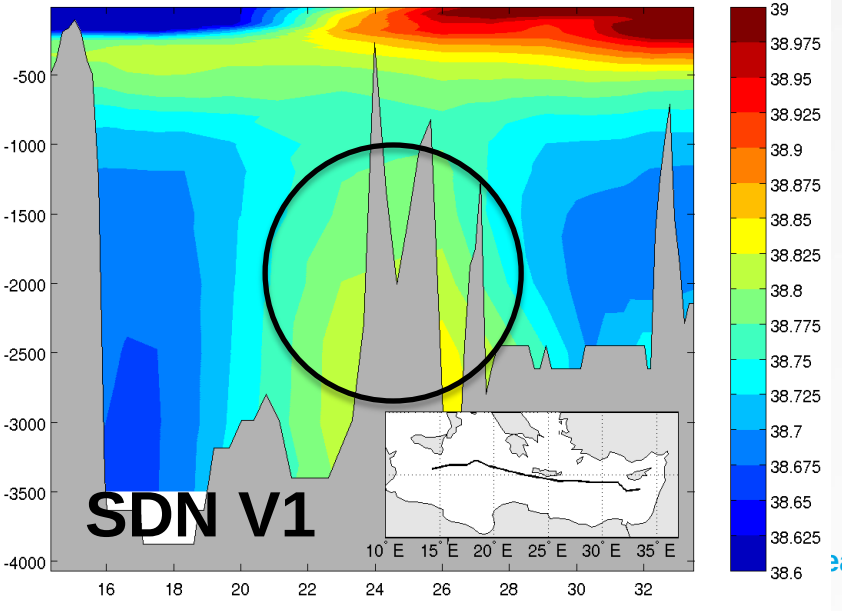






METEOR TRANSECT
Obs Jan/Feb 1995

January salinity

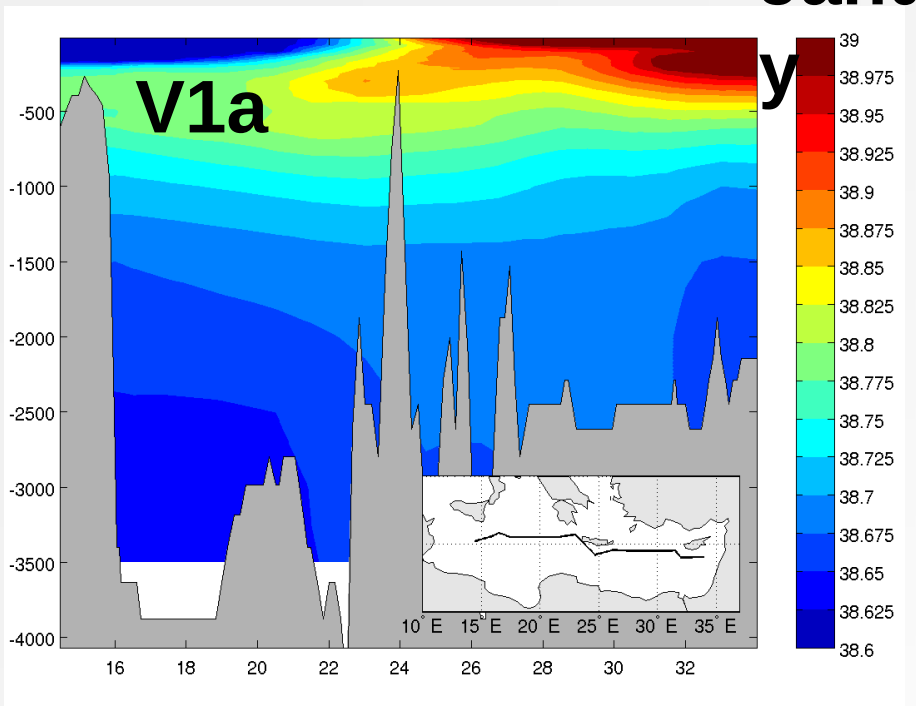
(from Tonani et al, EGU 2009)

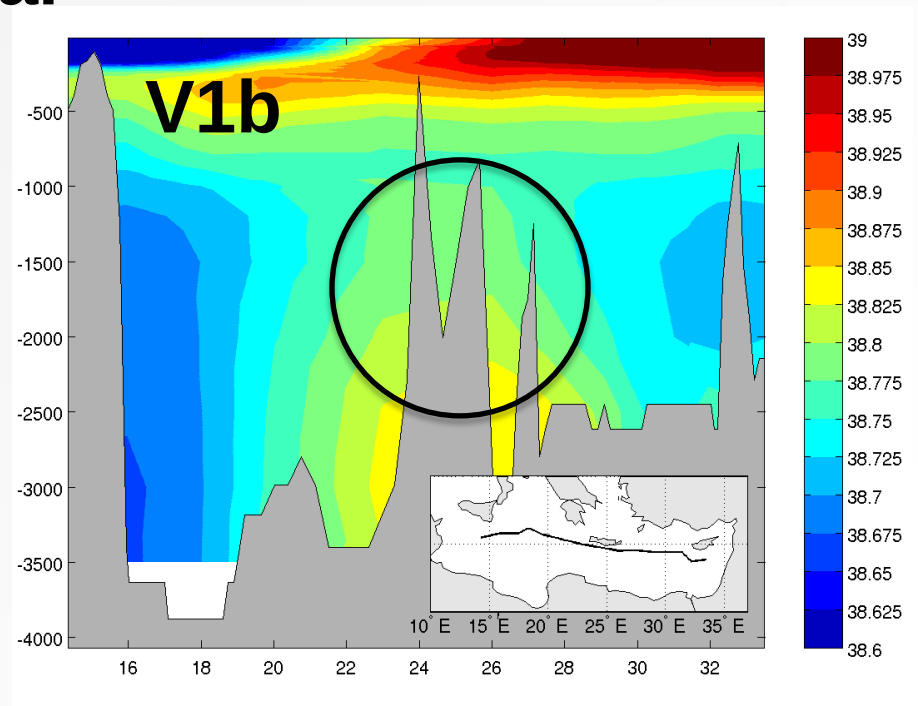
Why we compute a pre-EMT climatology?

Two different climatologies have been produced to take into account the changement due to the EMT:

- SDN V1a: data up to December 1987
- SDN V1b: data from January 1990 to December 2008

Januar



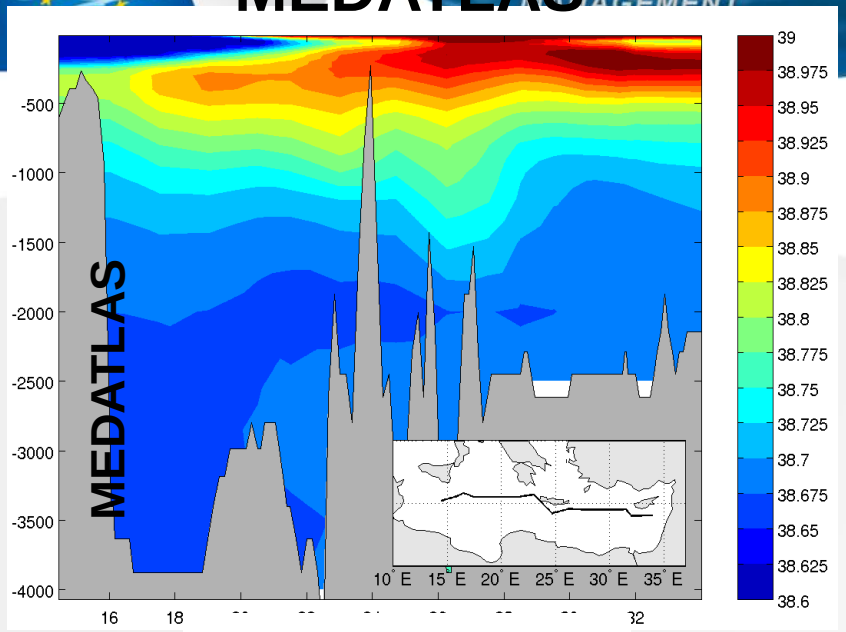


→ At depth V1a has less salt then V1b, no influence of the data of the Meteor 95

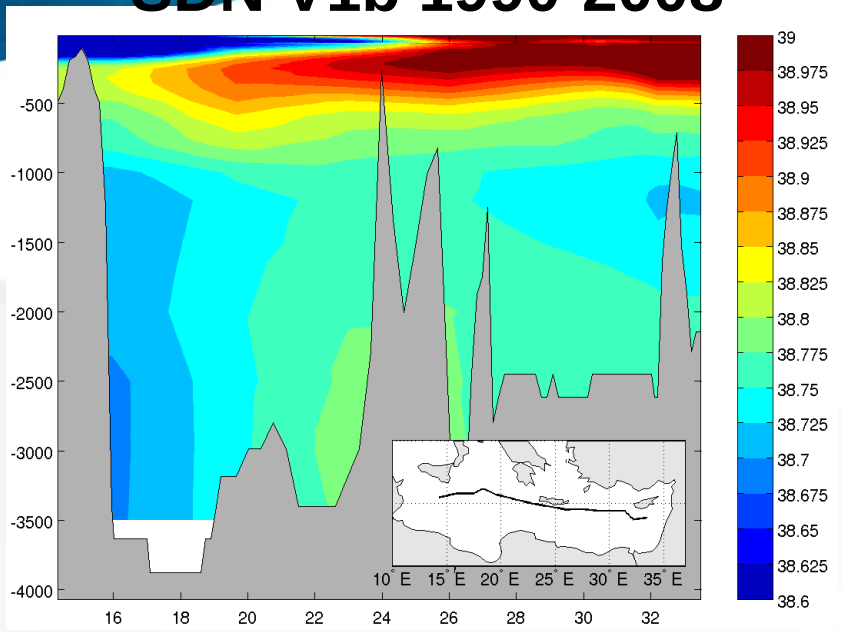
(from Tonani et al, EGU 2009)

SALINITY

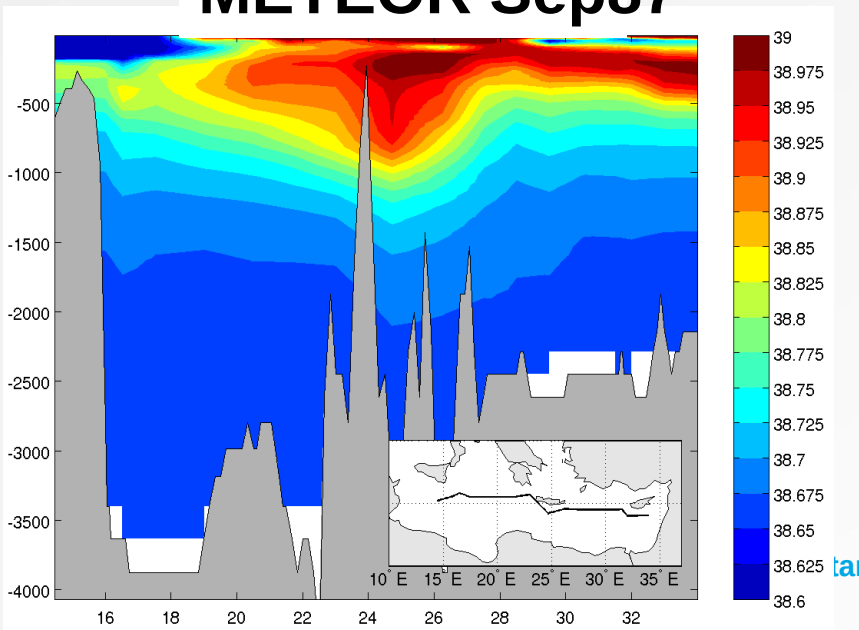
MEDATLAS



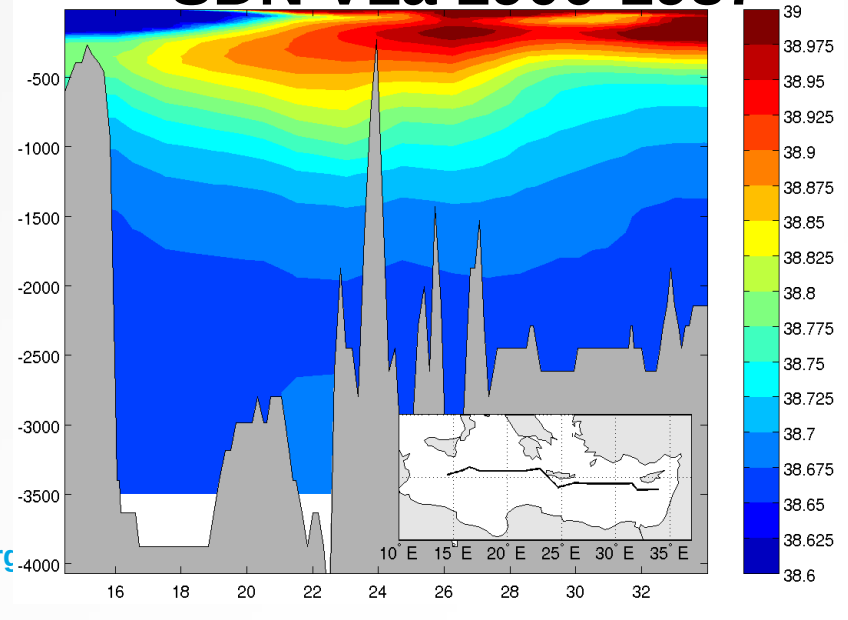
SDN V1b 1990-2008



METEOR Sep87



SDN V1a 1900-1987



Conclusion

- It’s important to take into account:
  - the characteristics of each regional seas
  - the numeber of observations available and their spatial and temporal distribution
  - the user needs (do we know who are the users?)