SeaDataNet

PAN-EUROPEAN INFRASTRUCTURE FOR OCEAN & MARINE DATA MANAGEMENT

SeaDataNet II data products : the North Atlantic Ocean Region

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IMDIS, Gdansk, October 2016

- **SeaDataNet II (SDN) EU-project**

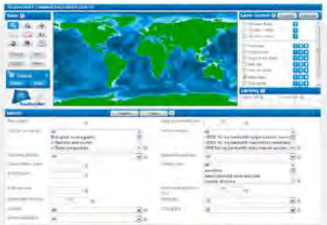
- Implementation of a quality control (QC) strategy, continuously reviewed to improve the quality of the global dataset for creation of the best products.
- Strategy developed in collaboration with MyOcean In-Situ Thematic Assemble Centre (INS-TAC) at regional levels
- Temperature and salinity historical data collections were created by sea basins, as aggregated datasets and climatology products, and covering the time period 1900-2013.

- **Specific QC procedure**

➢ Implementation of a specific procedure to assure and certify the best quality for the datasets :

- After the dataset harvesting from the central CDI catalogue, QC has been performed at regional levels in a coordinate way, using the ODV software as a common and basic QC analysis tool.
- Those datasets have also been scrutinized by the MyOcean regional coordinators, which have sent feedbacks to the SDN regional partners.

Aggregation dataset – different steps

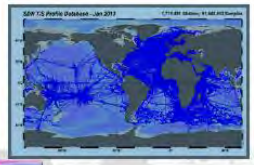


CDI extraction of all the datasets SeaDataNet Licence
(CDI : Discovery and data access)

AWI

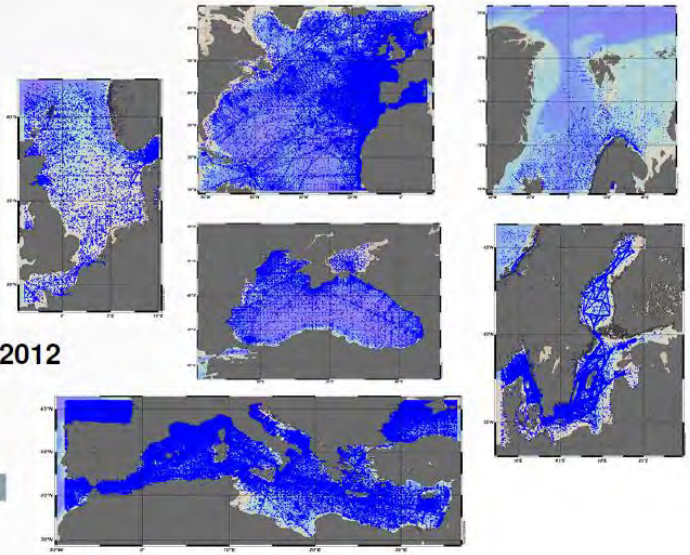
Check of duplicates

Correction by EDMO source



Ocean Data View

Regional subsets collection

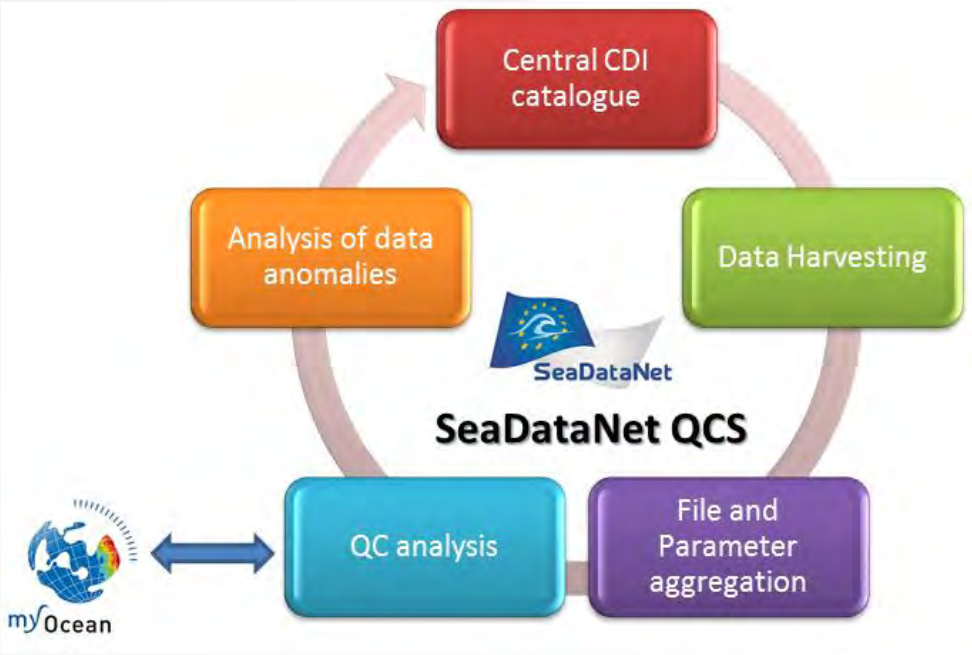


To deliver to MyOcean In situ TAC:
the raw aggregated data set **for the time period 1990-2012**
a list of outliers with the ranges defined for depth, temperature and salinity;
a report which briefly describes the data collection (maps, histograms, scatter plots)

To send to the NODCs:
a list of data with QC=0 (no QC analysis performed) **for the entire time period 1900-2012**
a list of outliers **for the entire time period 1900-2012**
a report with the general description of the entire data collection (**1900-2012**)

Quality Check Strategy implemented during SDN project

This loop allowed to highlight doubtful data and to organize the data anomalies in lists that have been sent to each concerned data originator together with a guideline to explain the expected corrections. This implemented QC strategy involved the National Oceanographic Data Centers (NODC), on the base of those lists, to check and eventually correct the original data and then to resubmit the corrected data in the SDN dataflow. The QC procedure has also been designed to be iterative in order to facilitate the update and improvement of SDN database content.



Detailed descriptions for the North Atlantic Ocean

- General description of the dataset,
- Data quality assessment procedure and results

During SDN, several releases have been produced and the insertion of new data has showed a large increase of the data collection for the North Atlantic Area. Regarding the number of stations, only a small number of data have been detected as bad.

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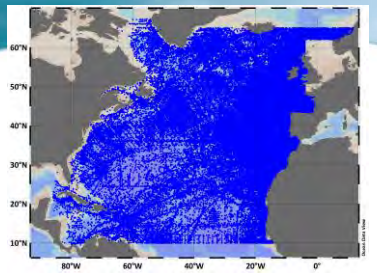


Dataset (2015) V2

Dataset (2013) V1

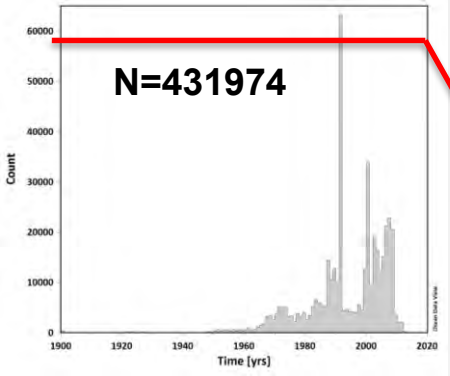
V1 → V1.1

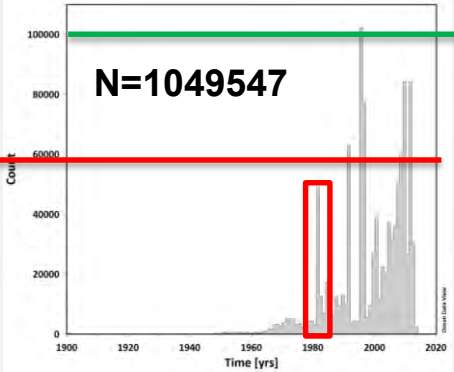
Dataset (2014) V1.1

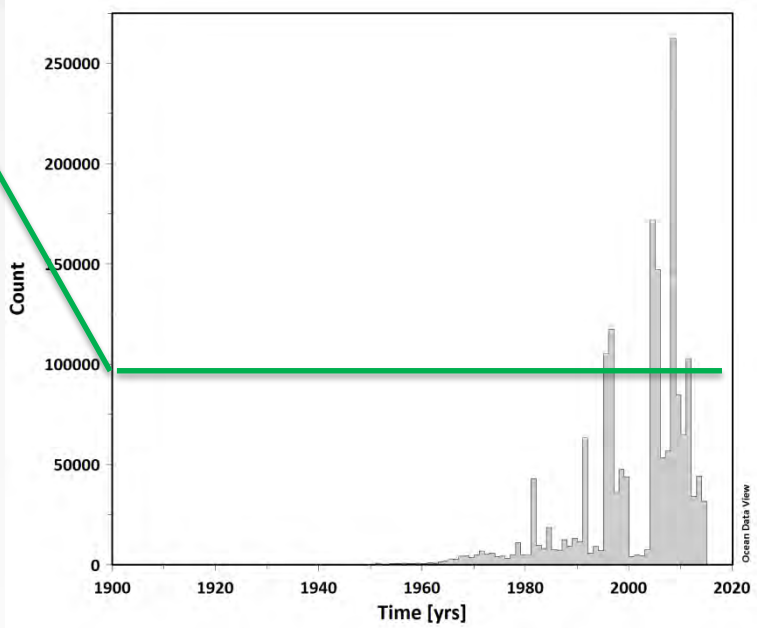
V2

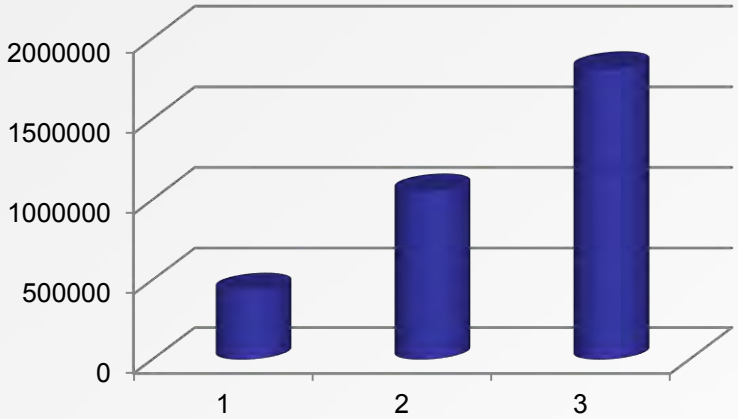
~72% more/V1.1

N=1807266









PAR	# stations
	1807266
T	1693840
S	785476
TS	784015

Increase of the dataset

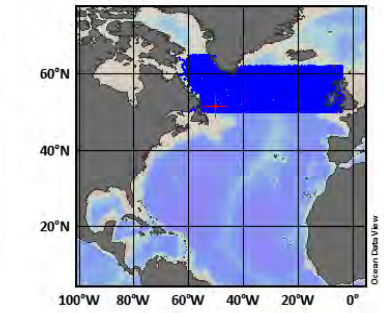
tanet.org

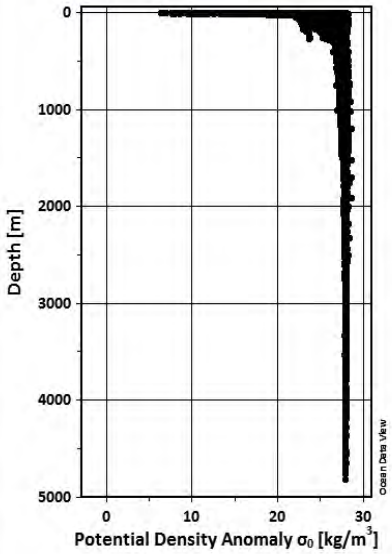
1980-1984

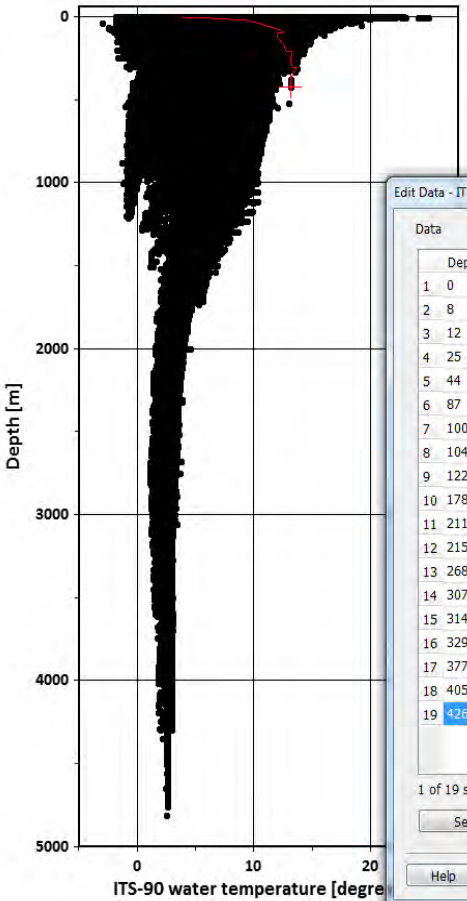
V2

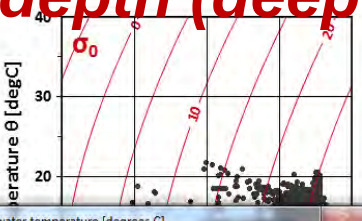
QF 0,1& 2

Ex of anomalies : inversion in depth (deeper=surface) ??









Edit Data - ITS-90 water temperature [degrees C]

Data

	Depth [m]	ITS-90 wate	Errors IT	QF
1	0	3.9		1
2	8	3.9		1
3	12	6.4		1
4	25	9.4		1
5	44	10.6		1
6	87	12.3		1
7	100	12.5		1
8	104	12		1
9	122	12		1
10	178	12.6		1
11	211	12.8		1
12	215	13.3		1
13	268	13.2		1
14	307	13.3		1
15	314	13.7		1
16	329	13.5		1
17	377	13.2		1
18	405	13.2		1
19	426	13.2		1

1 of 19 samples selected

Select All | Invert Selection

Change Value | Change Error Value | Delete Value(s) | Delete Error Value(s) | Change Quality Flag(s)

Help | OK | Cancel

Station ID: 1650313

Accession N...	1650313
Cruise	HM-17...
Station	8174295 (C)
Position	50.117°W / 51.6°N
Date	21 October 1979
Time	12:00:00.000
Depth Rang...	[0.0 - 426.0]
Bot. Depth ...	1100
LOCAL_CDI...	8174295
EDMO_code	540
Instrument ...	SDN:P01::ADEPZZ01 SDN:L22::TOOL0435 ...
Reference	http://seadatanet.maris2.nl/v_cdi_v3/print...
Data set na...	8174295_XB
Discipline	Administration and dimensions;Physical oce...
Category	Administration and dimensions;Water colu...
Variables m...	Temperature of the water column;Vertical ...
Data format	ODV
Data format...	0.4
Data size	
Data set cr...	20141218
Latitude 1	51.60
Latitude 2	51.60
Longitude 1	-50.12
Longitude 2	-50.12
Datum	
Measuring a...	point
Water dept...	
Depth refer...	
Minimum ins...	
Maximum in...	
Start date	19791021

Sample: 19 / 19

1: Depth [m]	426.0	1
2: ITS-90 water temperature ...	13.20	1
3: Water body salinity [per mille]		9
drvd: Potential Density Anomaly ...		1
drvd: Potential Temperature θ [...		1

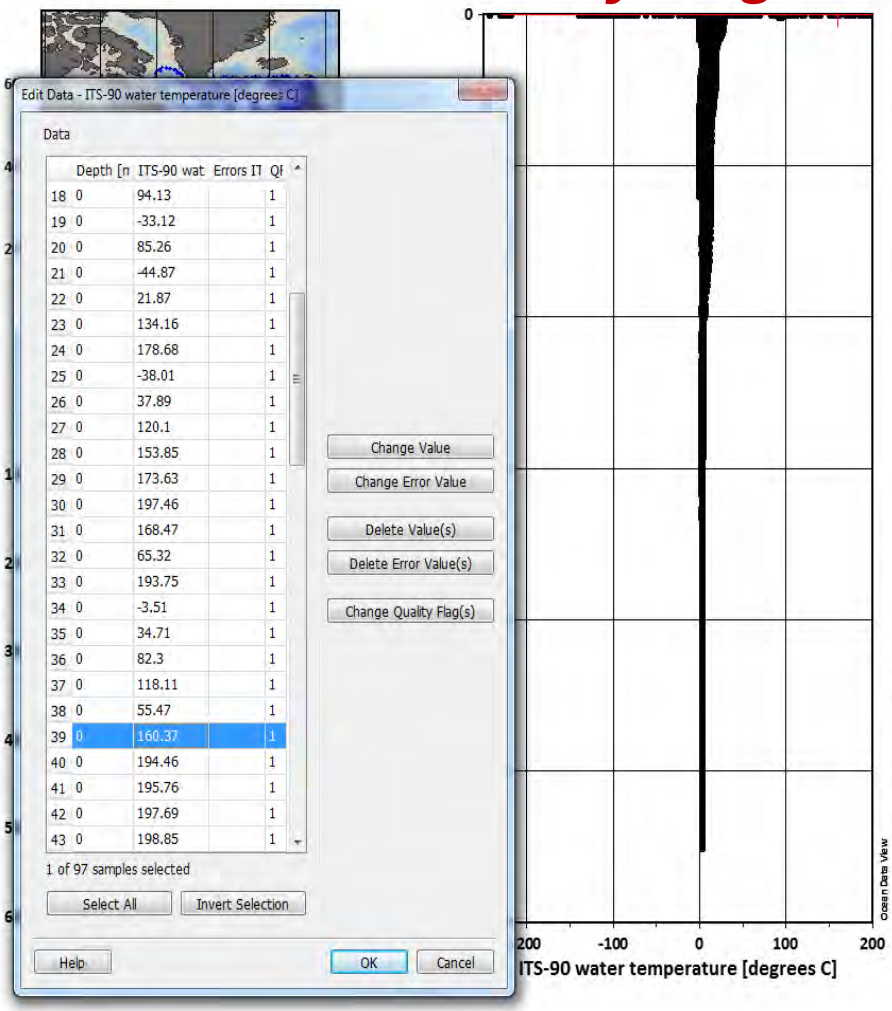
Isosurface Values

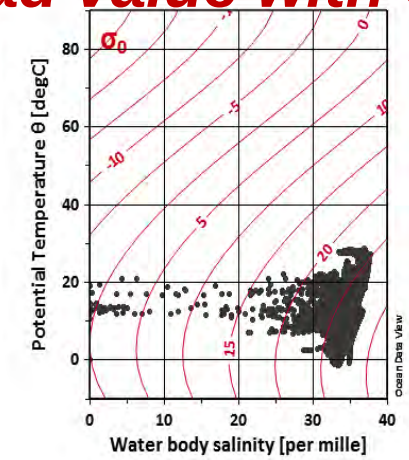
Longitude	-50.117
Latitude	51.600
Time [yr]	1979.804

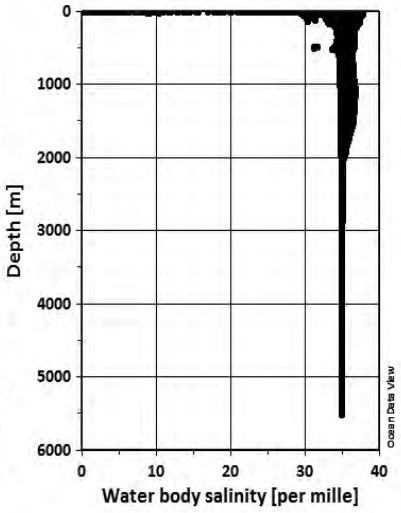
Ready

RW -|- S 909676 / 1807266: DefaultView *

Ex of anomalies : very huge bad value with QC 1 ???







Station ID: 1236588

Accession ...	12365
Cruise	Kish Bank lighthouse 1
Station	Tide Gauge (C)
Position	5.922°W / 53.312°N
Date	12 November 2006
Time	14:00:00.000
Depth Rang...	[0.0 - 0.0]
Bot. Depth ...	2
LOCAL_CDI...	KishBank1
EDMO_code	396
Instrument ...	
Reference	
Data set na...	Kish Bank Lighthouse 1
Discipline	Administration and dimensions;Atmosphere...
Category	Administration and dimensions;Meteorology...
Variables m...	Air pressure;Date and time;Sea level;Temp...
Data format	ODV
Data format...	0.4
Data size	
Data set cr...	20140401
Latitude 1	53.31
Latitude 2	53.31
Longitude 1	-5.92
Longitude 2	-5.92
Datum	ED50 / UTM zone 29N
Measuring a...	point
Water dept...	1.50
Depth refer...	Malin Ordnance Datum
Minimum ins...	0.00
Maximum in...	0.00
Start date	20060728

Sample: 39 / 97

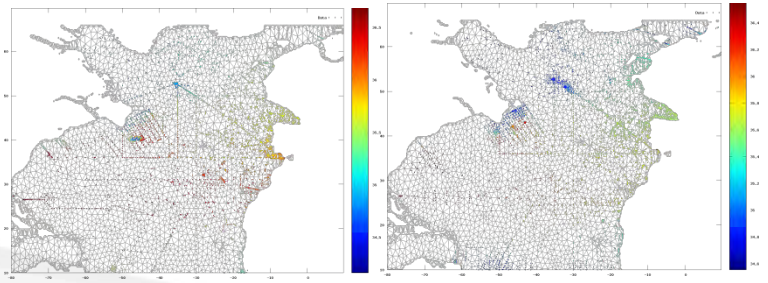
1: Depth [m]	0.0	1
2: ITS-90 water temperature ...	160.37	1
3: Water body salinity [per mille]		9
drvd: Potential Density Anomaly ...		1
drvd: Potential Temperature θ [...		1

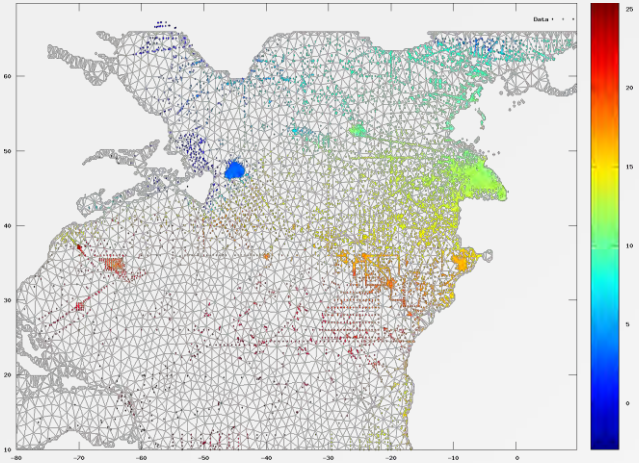
Isosurface Values

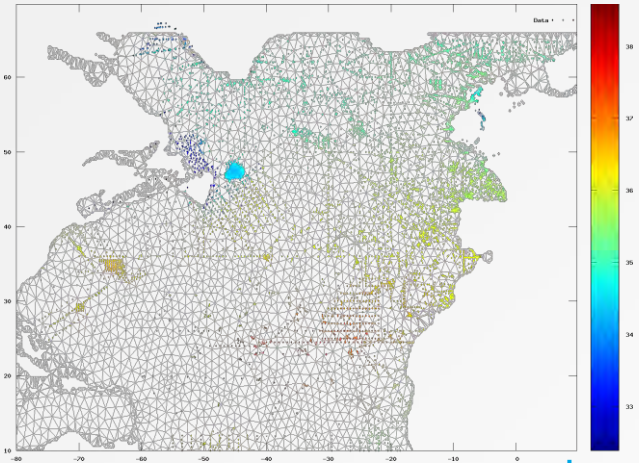
Longitude	-5.922
Latitude	53.312
Time [yr]	2006.865

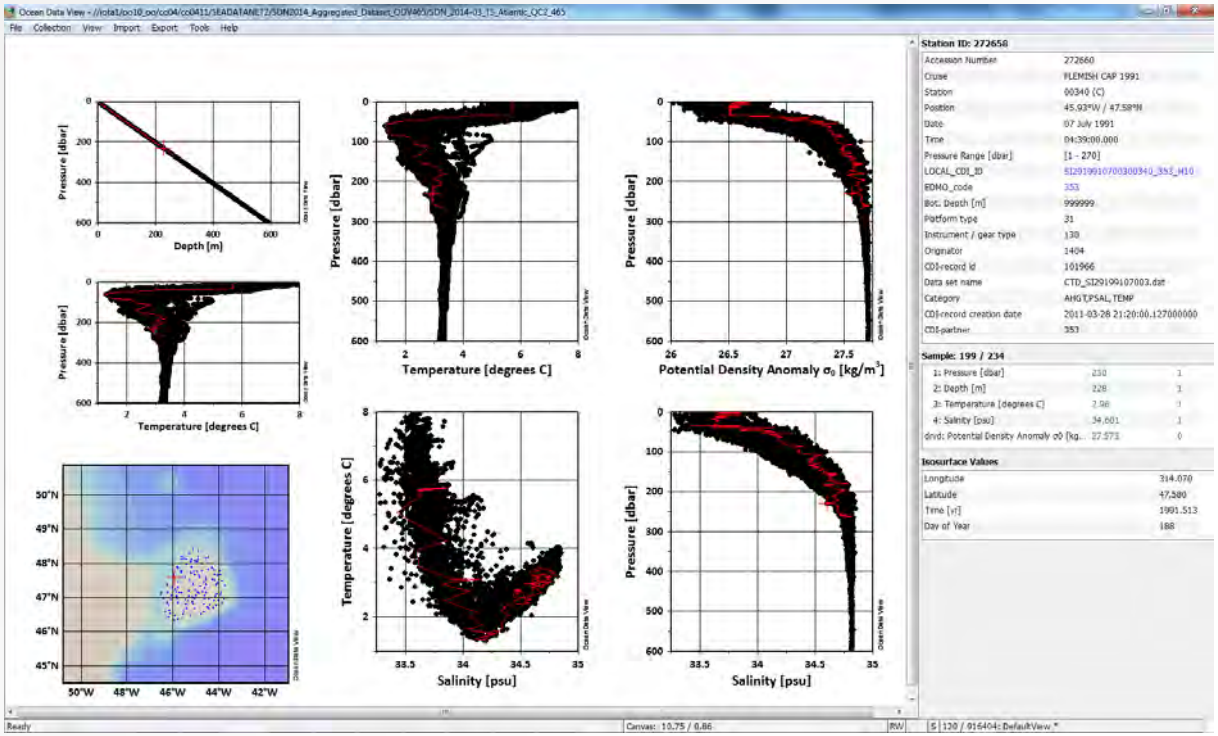
Ready

First run and first bad data









In terms of %

	TOT	QF0	QF1	QF2	QF:3-9
T	73877673	1200693 **1,62%**	72438070 **98,05%**	374 **0,0005%**	238536 **0,33%**
T after correction	73877673	988646 **1,34%**	72109310 **97,6%**	374 **0,0005%**	779337 **1,05%**

	TOT	QF0	QF1	QF2	QF:3-9
S	34036664	1301510 **3,82%**	32244014 **94,73%**	46811 **0,13%**	444329 **1,30%**
S after correction	34036664	1301510 **3,82%**	31814244 **93,47%**	46811 **0,13%**	874099 **2,57%**

1990 to 2011

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Time-space resolution

Climatology - DIVA

- Diva 4.6.9
- Reference field

(semi-normed analysis)

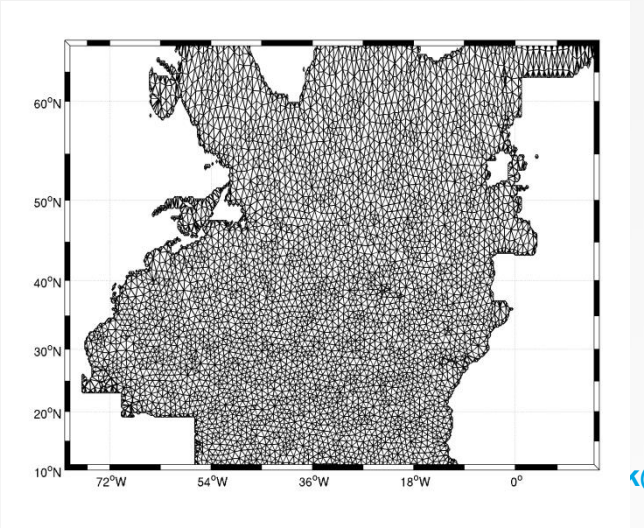
- Error field defined

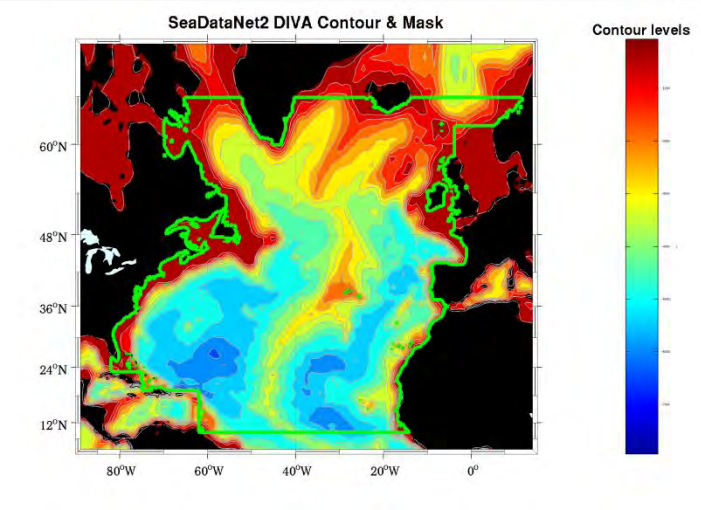
as “clever mean error field” (ispec=111)

- Variable : Temperature & Salinity
- Year : 1900 to 2013
- Monthly : 01 to 12
- Season : 1202 – 0305 – 0608 – 0911
- Depth : (IODE) 33 levels - 0 to 5500
- used 0 to 4000)

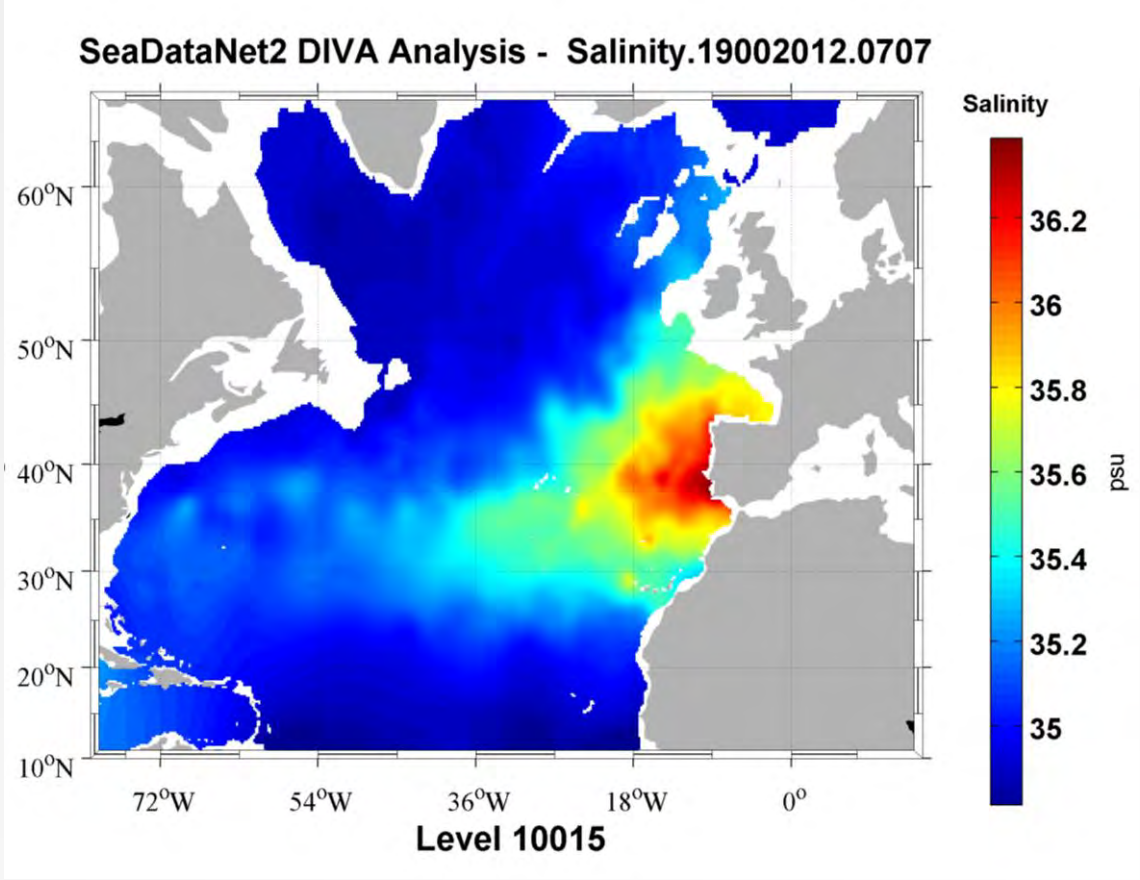
(5500,5000,4500,4000,3500,3000,2500 ,2000,1750,1500,1400,1300, 1200,1100,1000,900, 800,700,600,500, 400,300,250, 200,150, 125,100,75,50,30, 20,10,0)

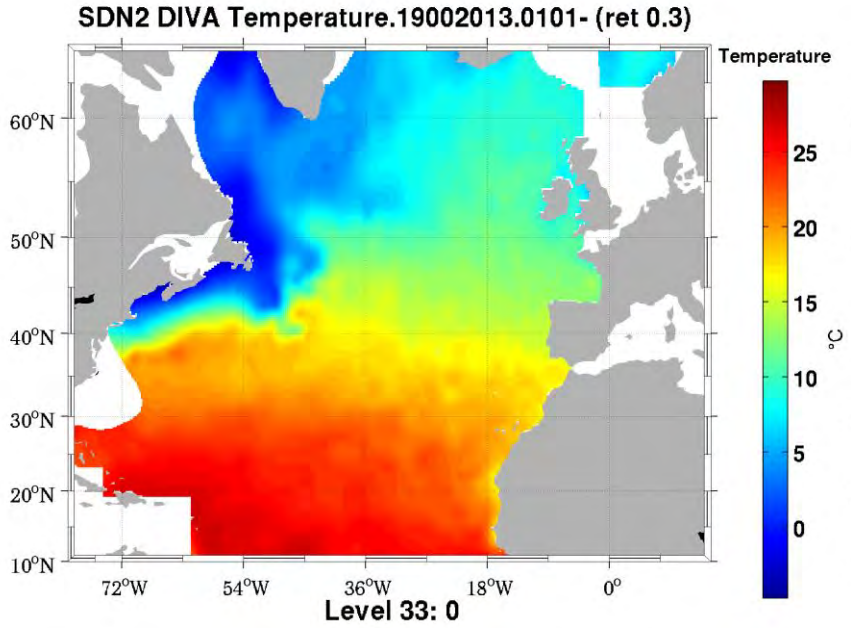
- Data : public and restricted

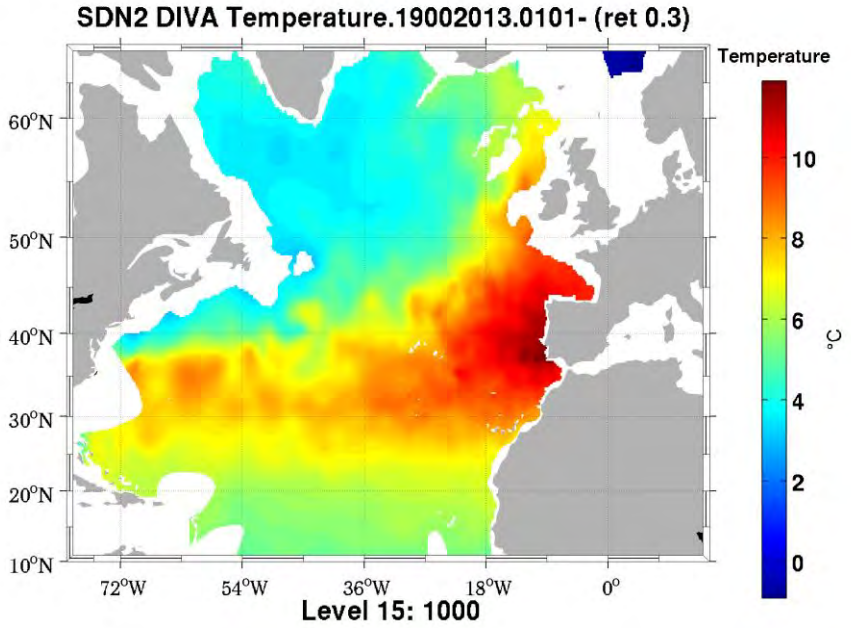




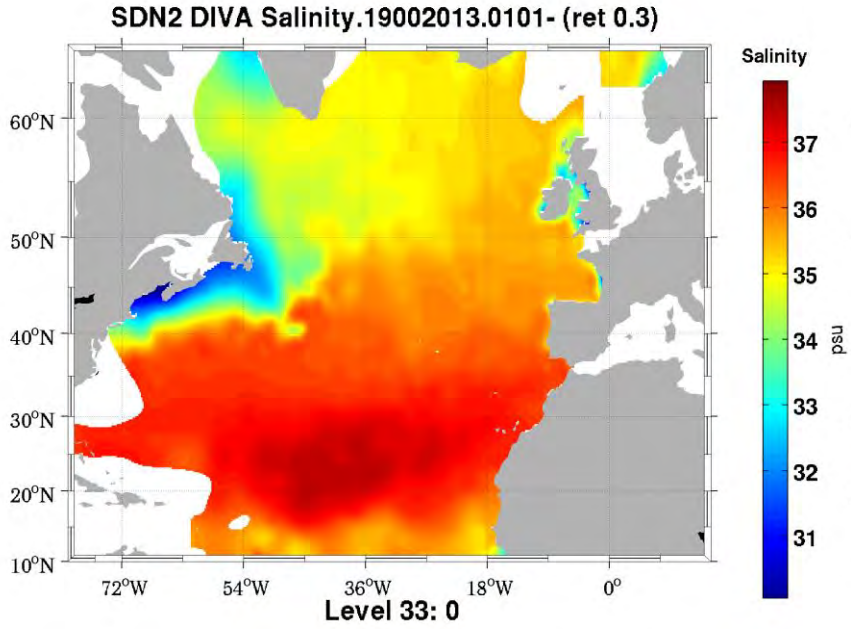
Salinity maximum at 1000m showing the Mediterranean outflow.

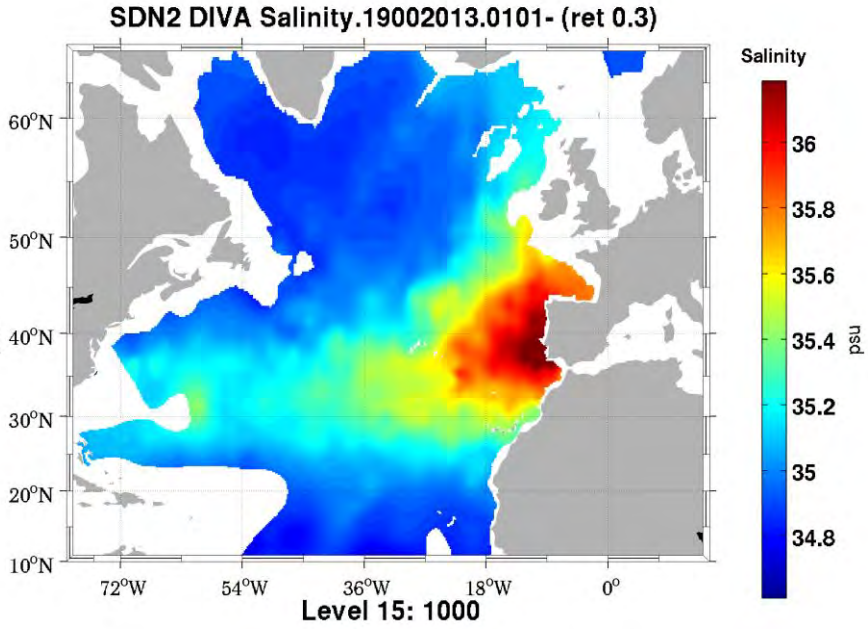






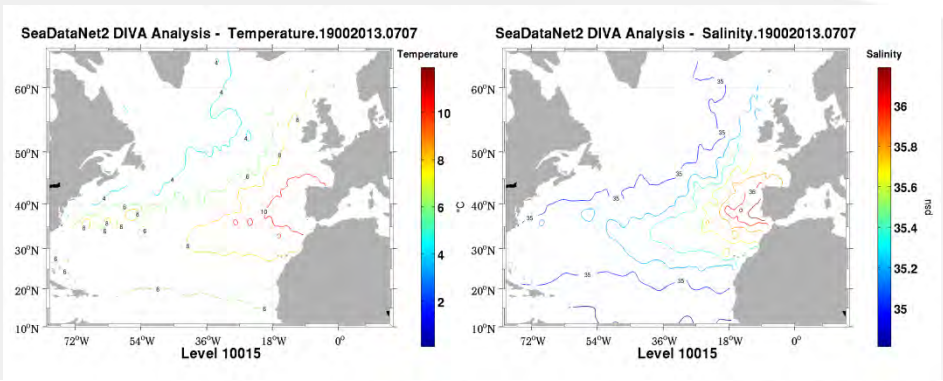
DIVA (error masking - 30% threshold)





Validation

Tomczak, Matthias & J Stuart Godfrey: Regional Oceanography: an Introduction - 2nd edition (2003))



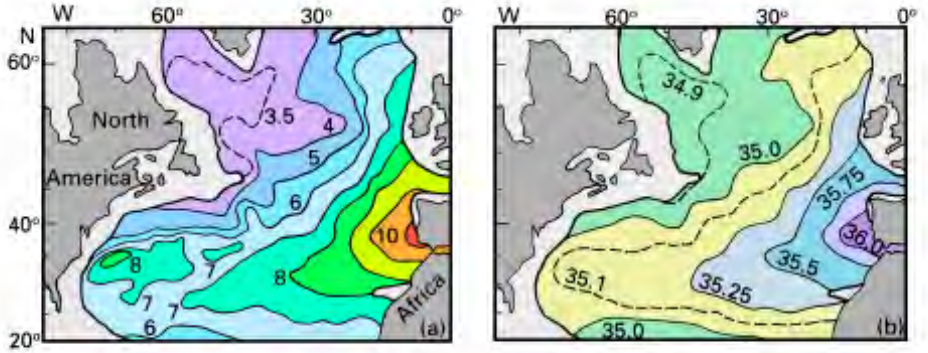
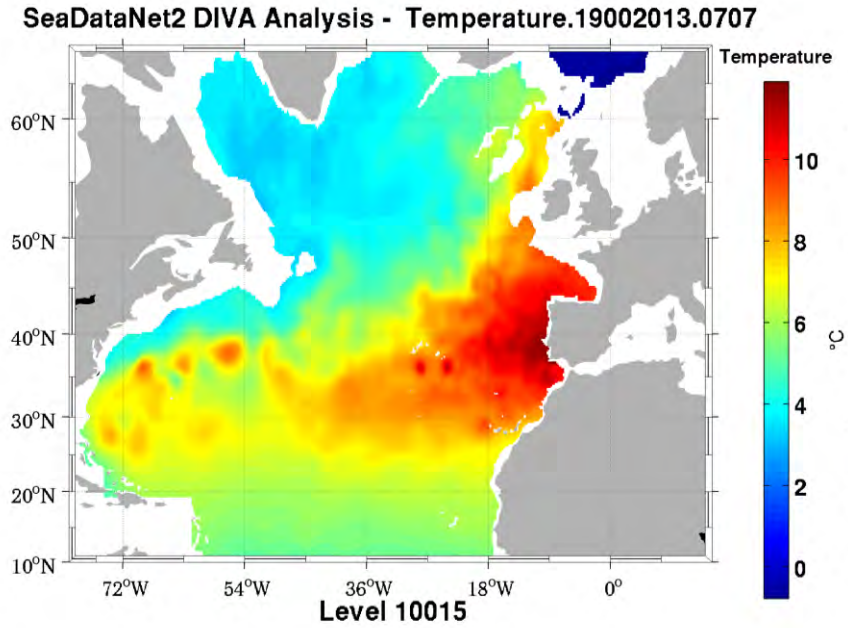
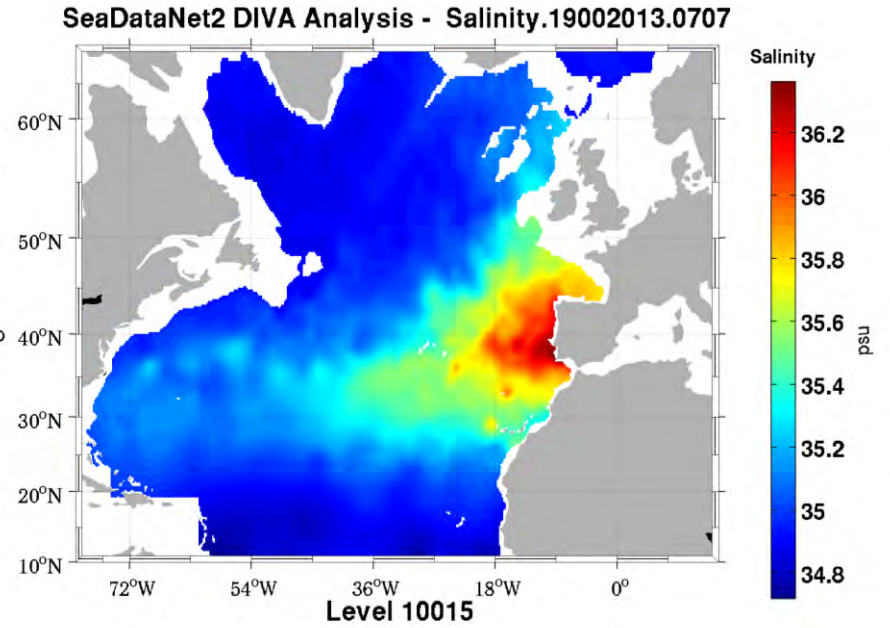


Fig. 15.4. Temperature (°C) (a) and salinity (b) in the North Atlantic Ocean at 1000 m depth.





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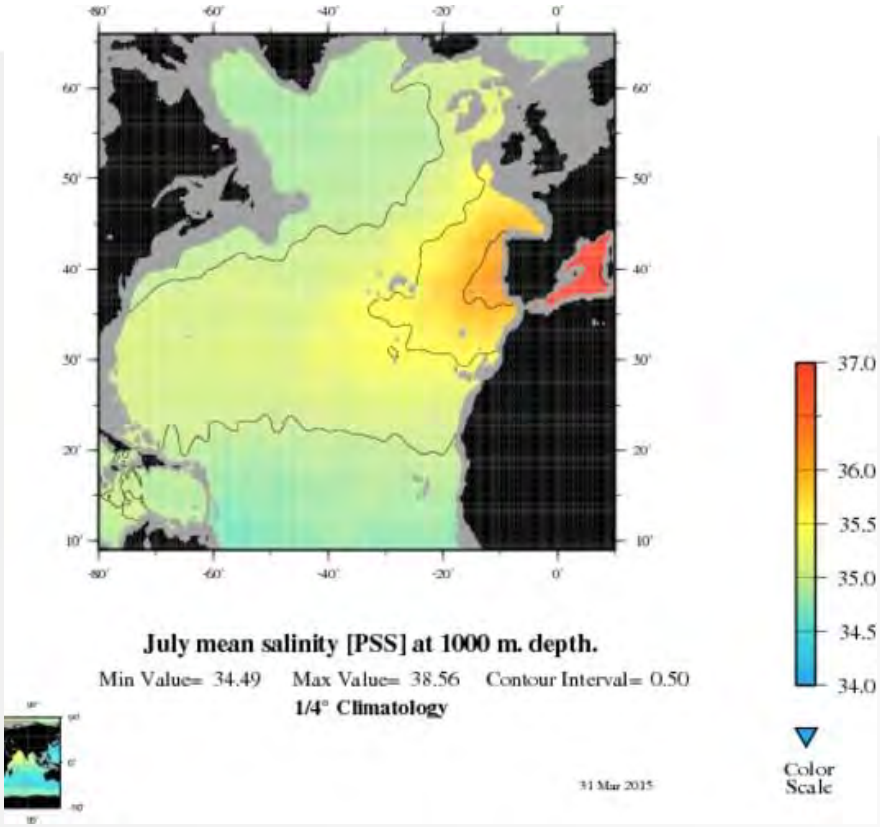

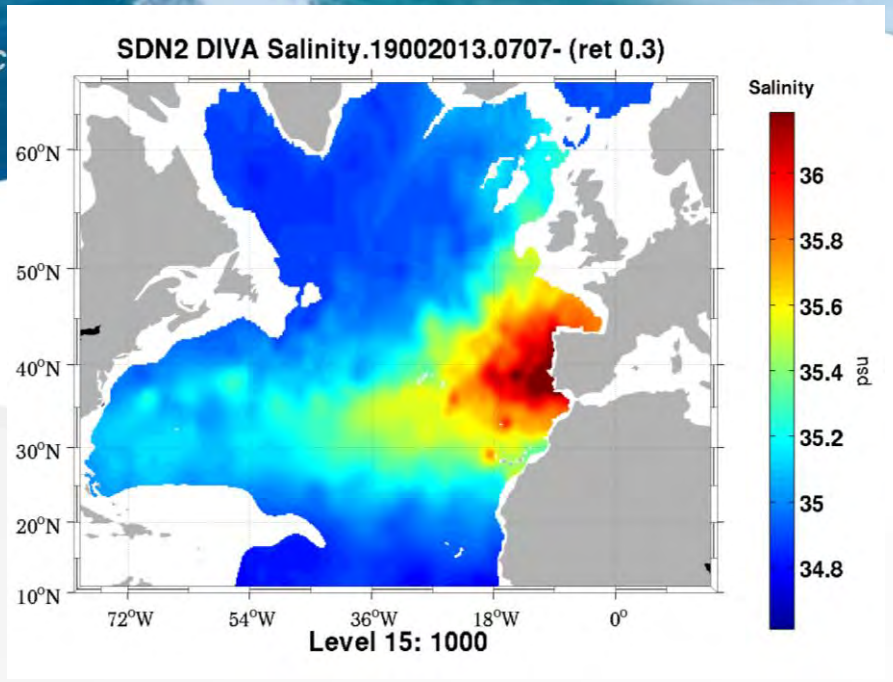

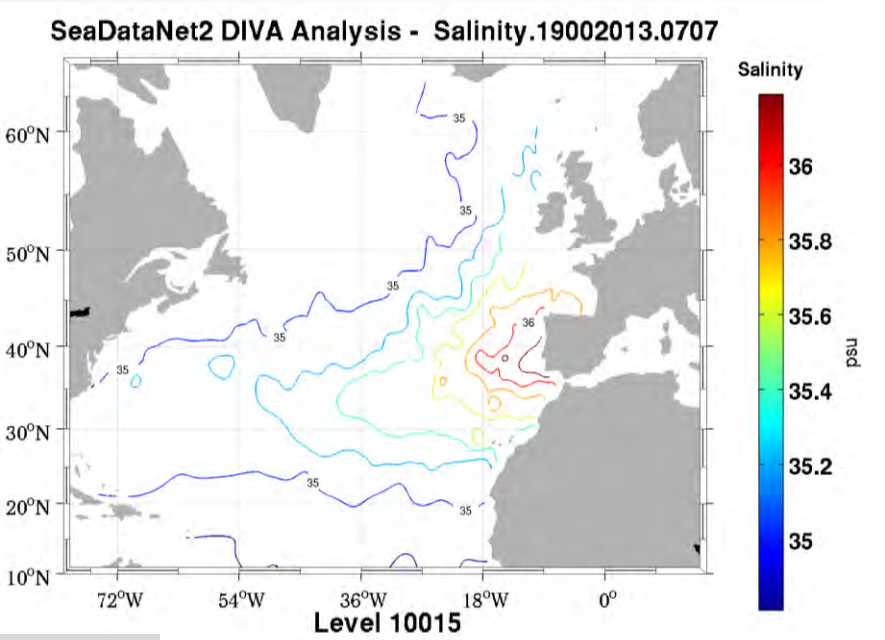

Zweng, M.M, J.R. Reagan, J.I. Antonov, R.A. Locarnini, A.V. Mishonov, T.P. Boyer, H.E. Garcia, O.K. Baranova, D.R. Johnson, D.Seidov, M.M. Biddle, 2013. *World Ocean Atlas 2013, Volume 2: Salinity.* S. Levitus, Ed., A. Mishonov Technical Ed.; NOAA Atlas NESDIS 74, 39 pp.

http://www.nodc.noaa.gov/OC5/SELECT/woaselect/woaselect.html

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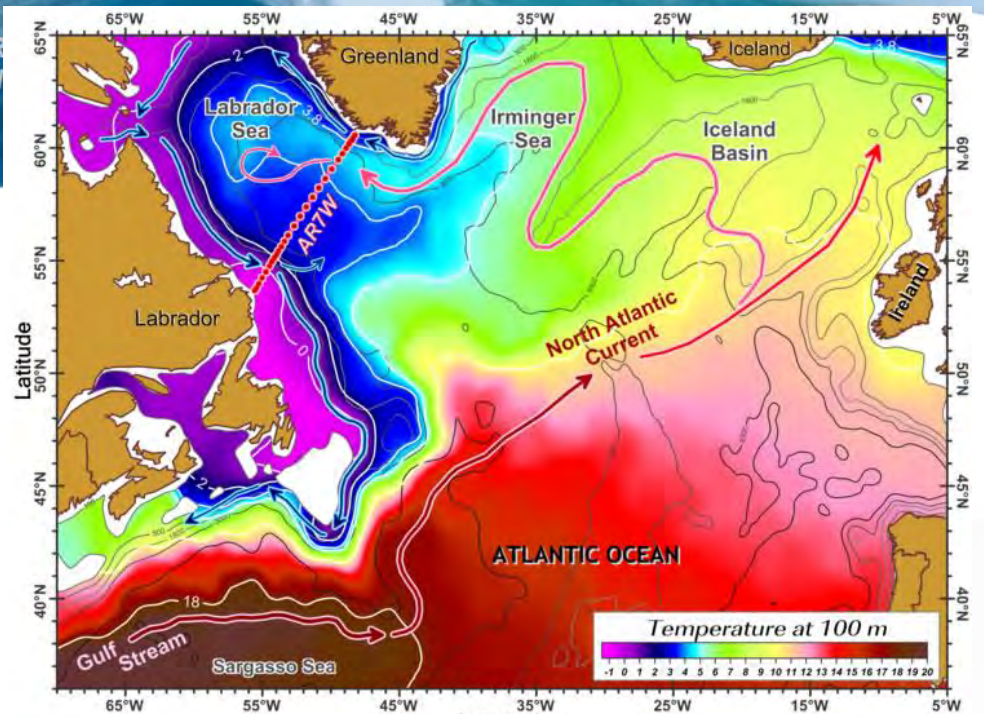
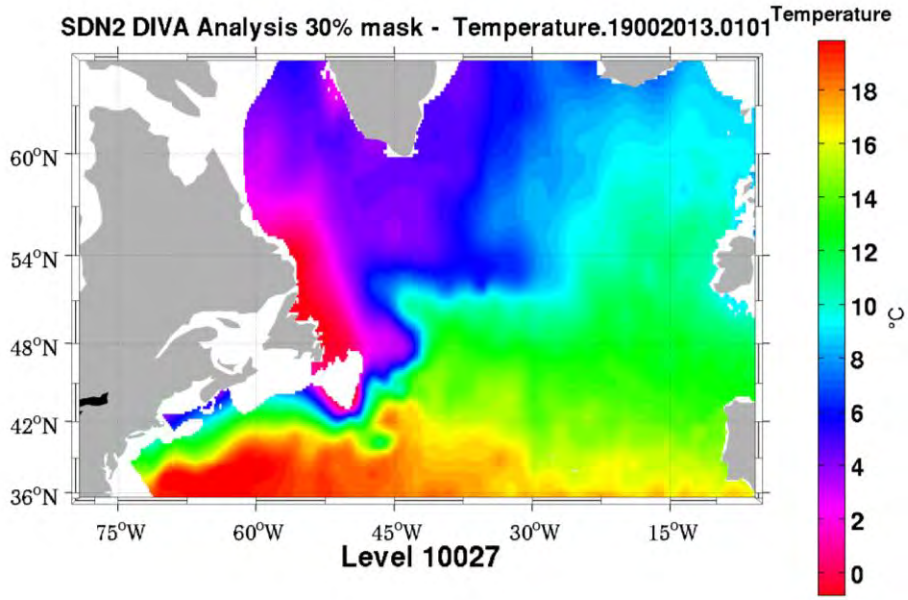
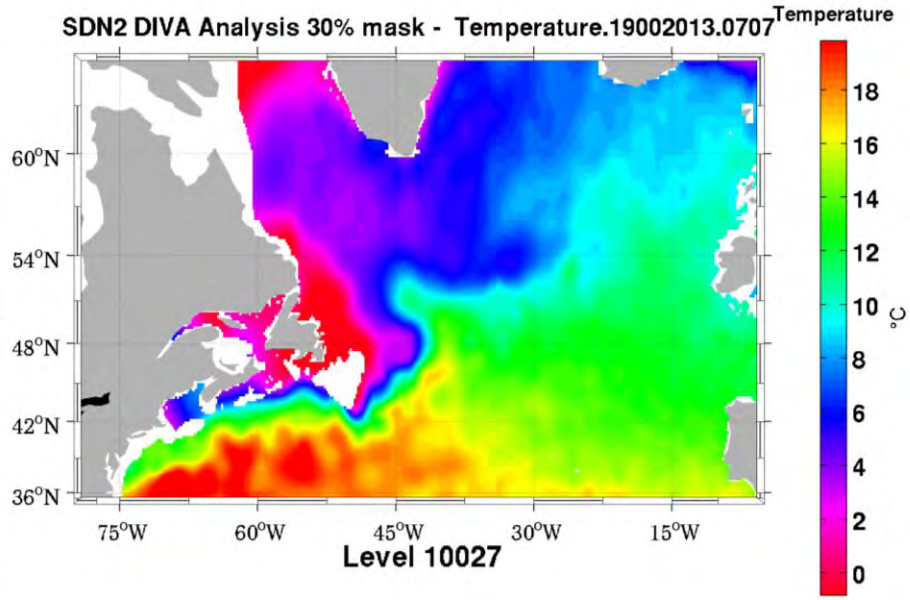
Map of annual-mean temperature at 100m below the surface in the NW Atlantic with a schematic representation of circulation



Yashayaev, I. 2007. Hydrographic changes in the Labrador Sea, 1960-2005. Progress in Oceanography, Vol.73, No. 3-4, 242-276. doi:10.1016/j.pocean.2007.04.015.



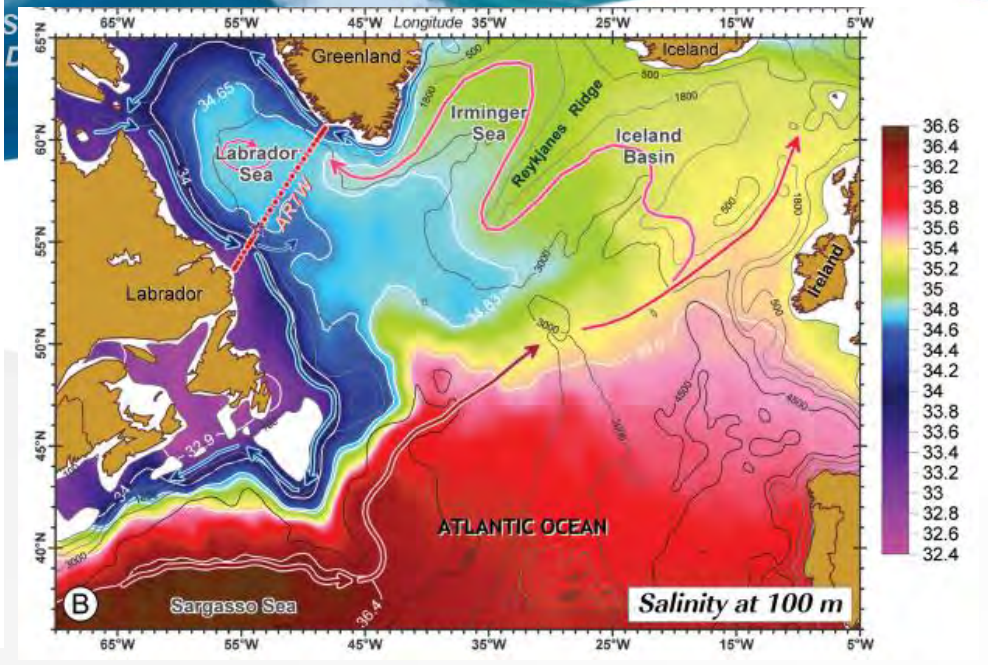


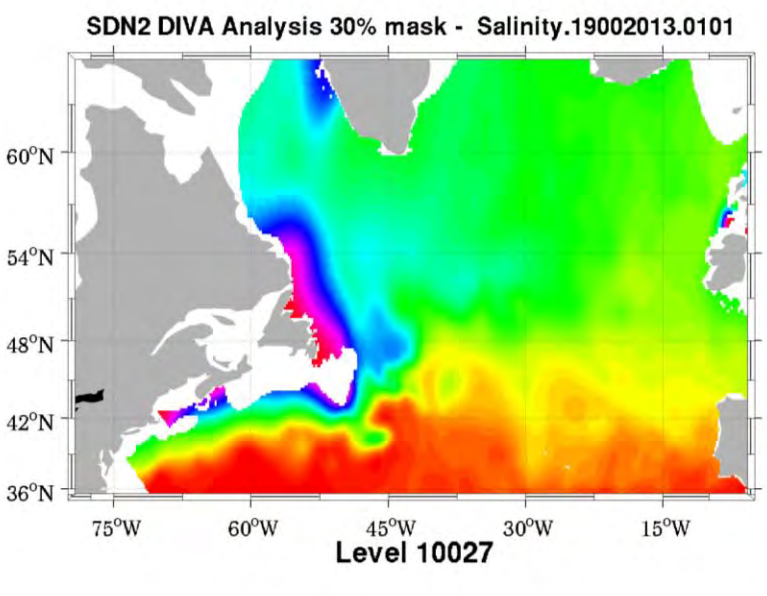
Level at 100m depth

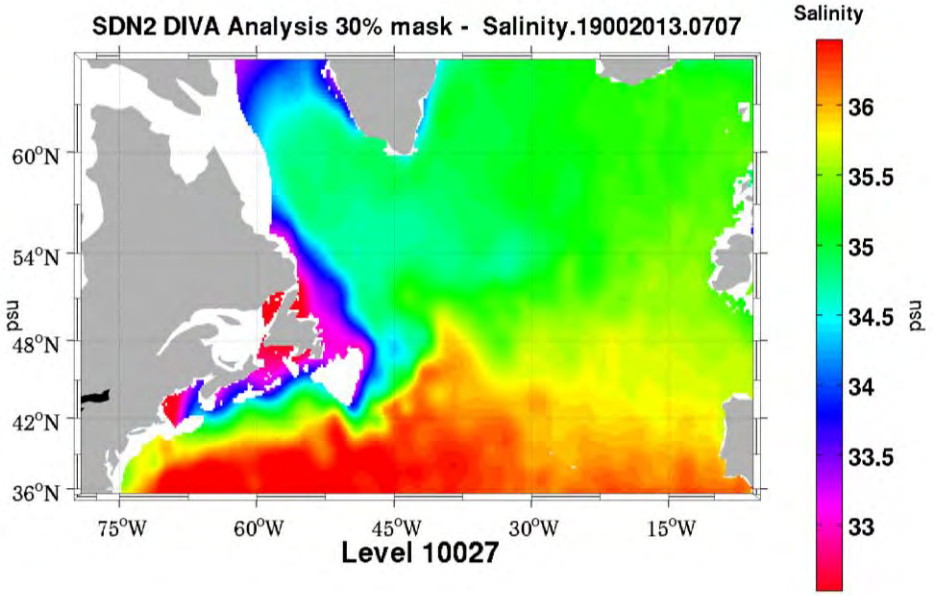
Distributions of salinity at 100 m below the surface in the northern North Atlantic.

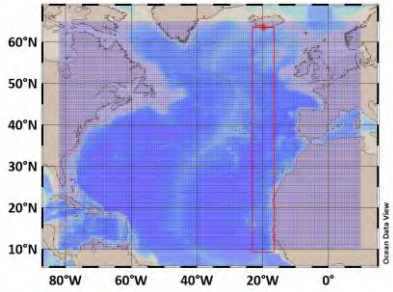
Red arrows indicate the Gulf Stream and associated North Atlantic Current, which transport warm saline surface water.

Blue arrows indicate the East and West Greenland and Labrador Currents, which carry relatively cold and fresh water southward,









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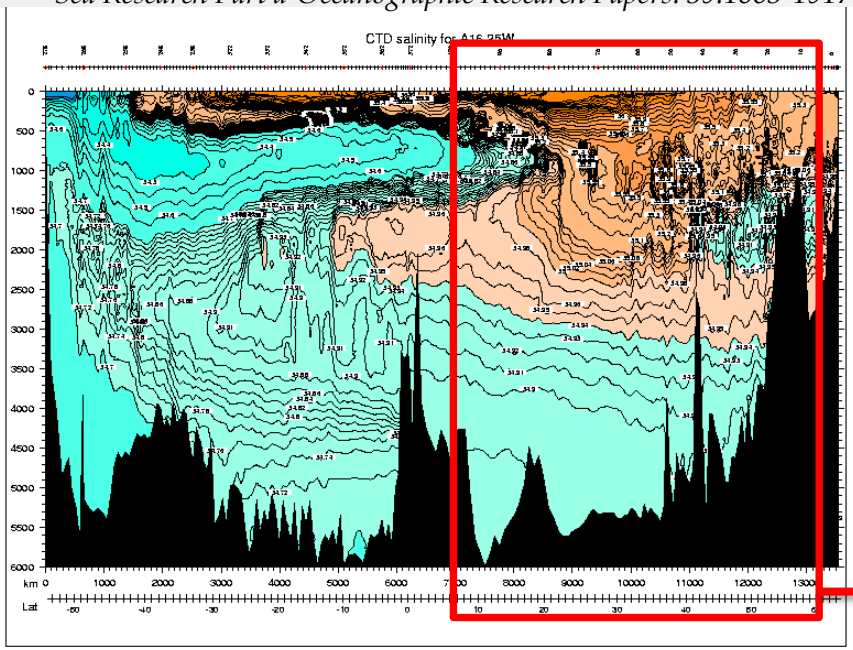
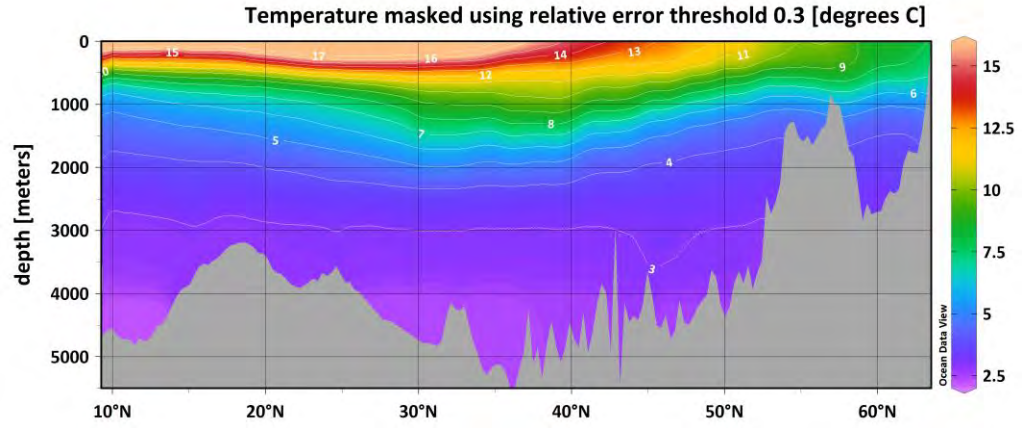
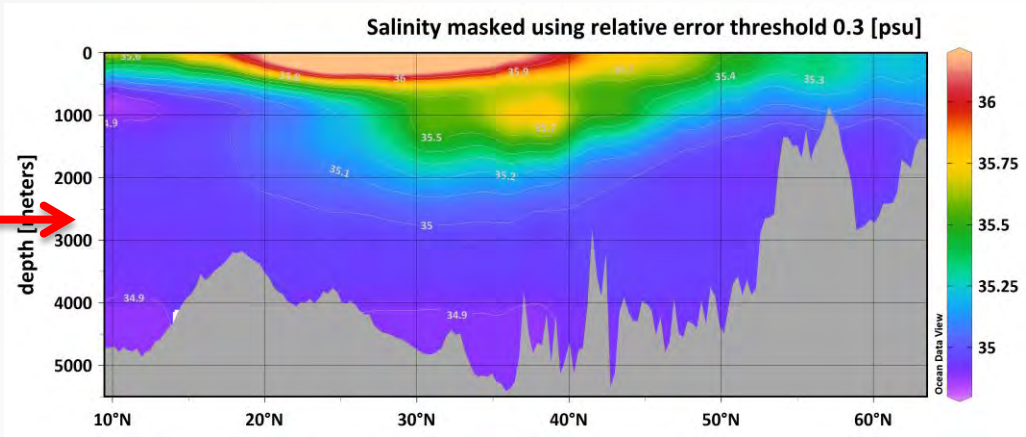
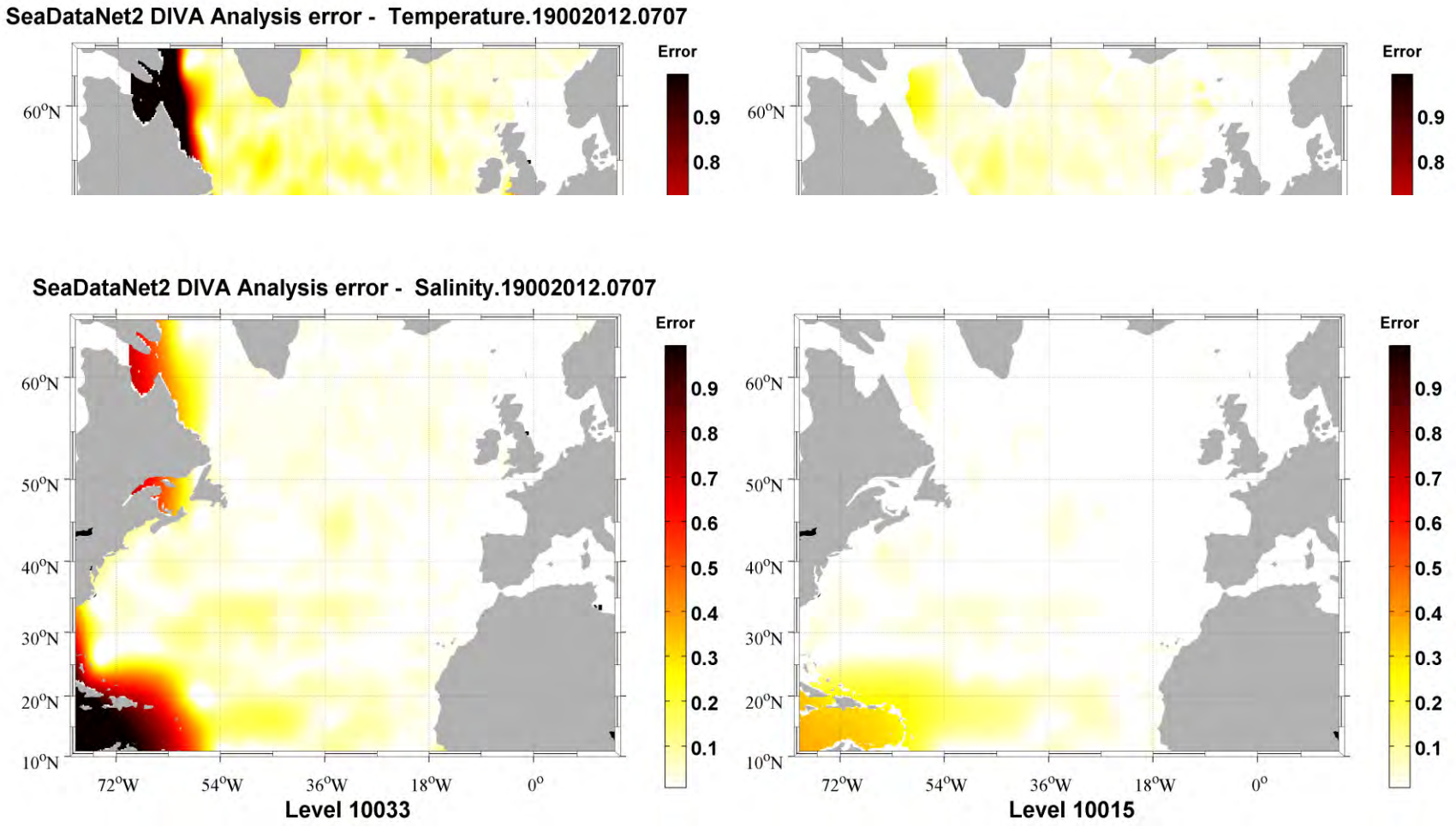
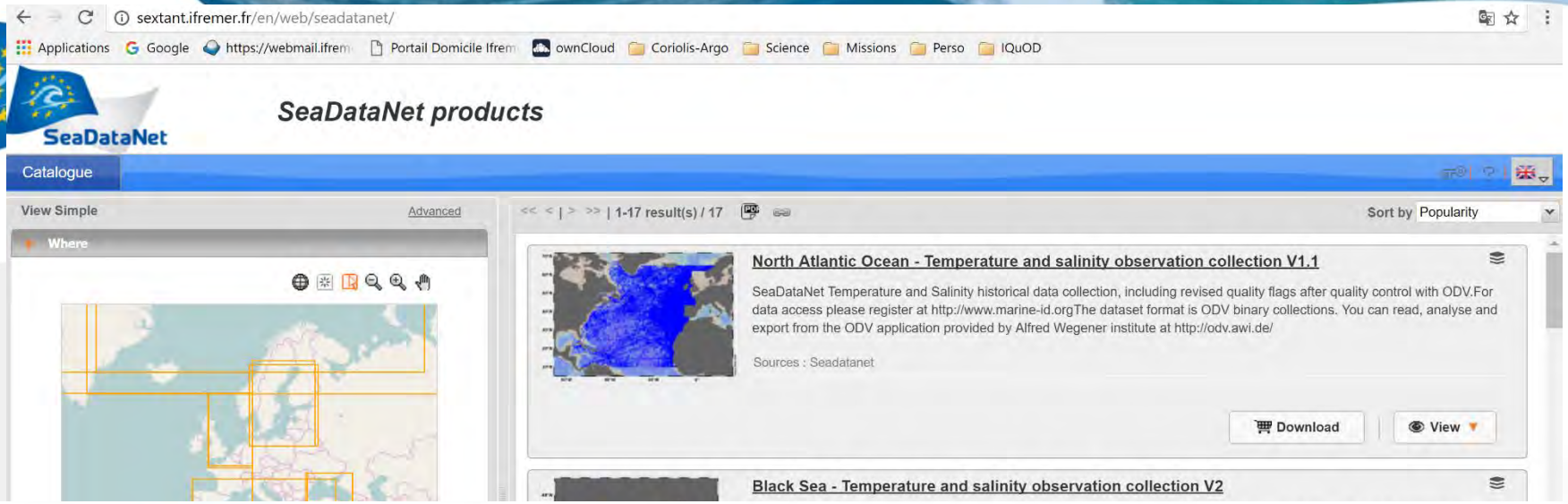


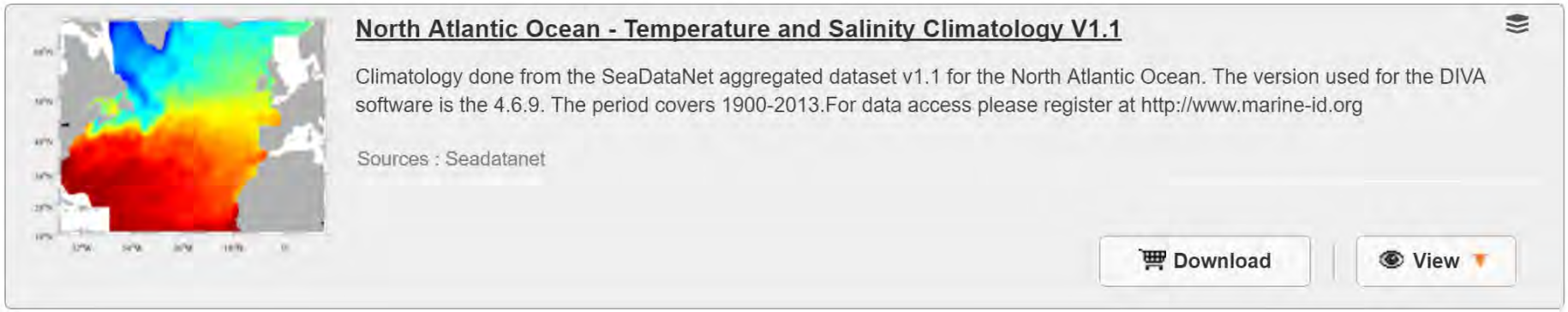




Error field need more data

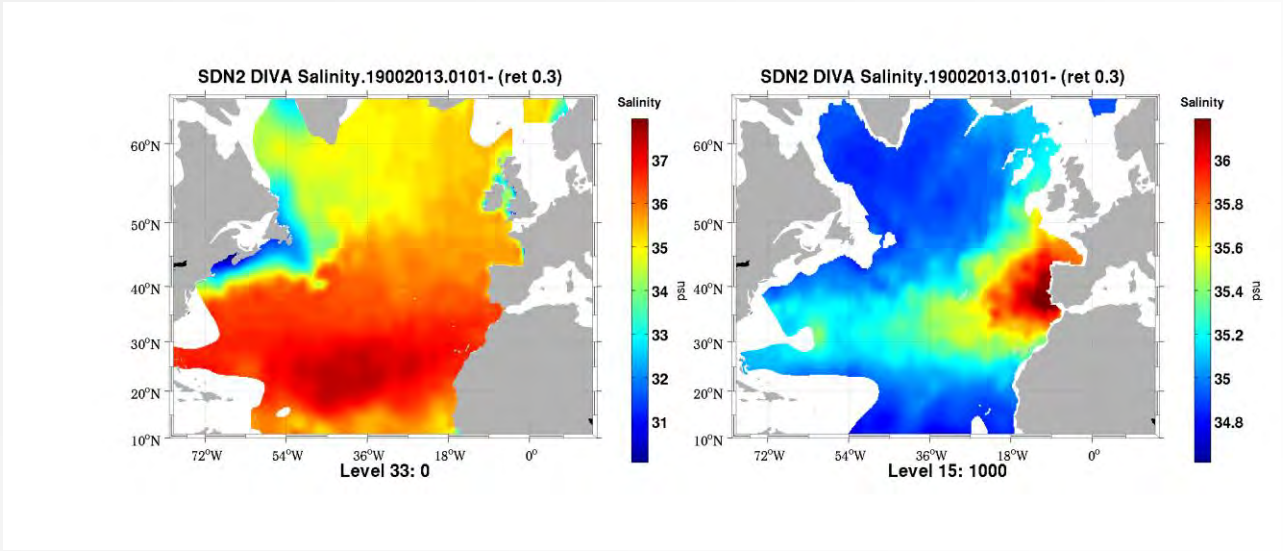






- Future releases (SeaDataCloud) should have to more sustain the QC strategy and encourage NODCs to provide new data and take into account the data quality assessment outcomes.
  (*already seen from the end of SDN II: data submission always increasing*)

Thank you !!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37
36
35
34
33
32
31
psu
60°N
50°N
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30°N
20°N
10°N
72°W
54°W
36°W
18°W
0°
Level 33: 0
SDN2 DIVA Salinity.19002013.0101- (ret 0.3)
Salinity
36
35.8
35.6
35.4
35.2
35
34.8
psu
Level 15: 1000