Using SeaDataNet Management System to preserve the XBT Data-Set of the Mediterranean Sea

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SeaDataNet: A EUROPEAN INFRASTRUCTURE FOR OCEAN & MARINE DATA MANAGEMENT

SeaDataNet II (2011-2015) is a EU project funded by FP7 (Seventh Framework Programme for Research). It started in 2006 and has developed an efficiently distributed Marine Data Management Infrastructure for diverse sets of European data, deriving from in situ observations of seas and oceans. Forty-four institutions, active in data collection, are involved as project partners and 10 as associate partners, for a total number of 35 countries.

SeaDataNet: DATA SERVICES

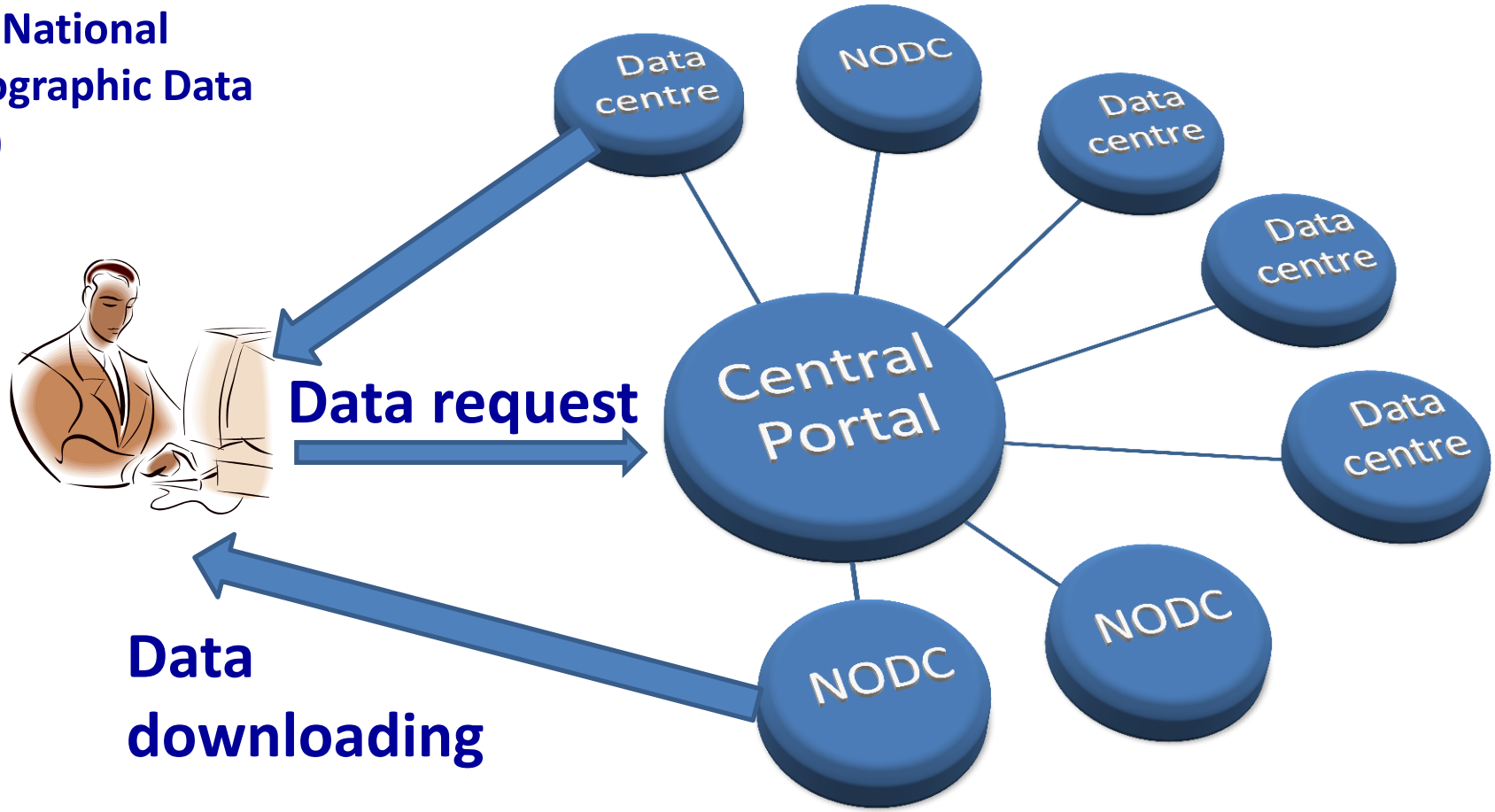
Discovering, visualisation, access and data downloading

http://www.seadatanet.org

SeaDataNet architecture:

An infrastructure based on a semi-distributed system

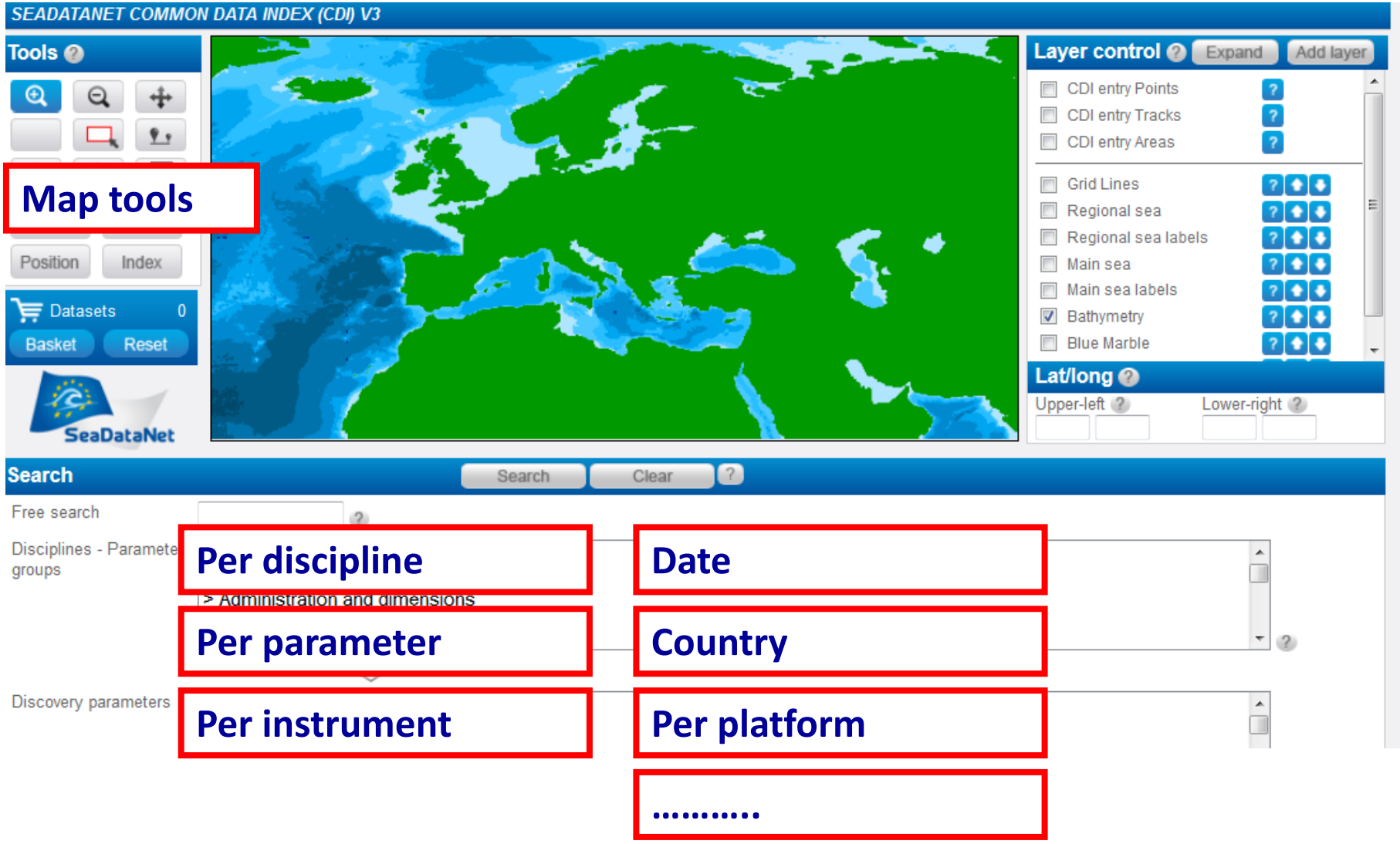
NODC (National Oceanographic Data Centre)



SeaDataNet: DATA SERVICES

Data discovery interface

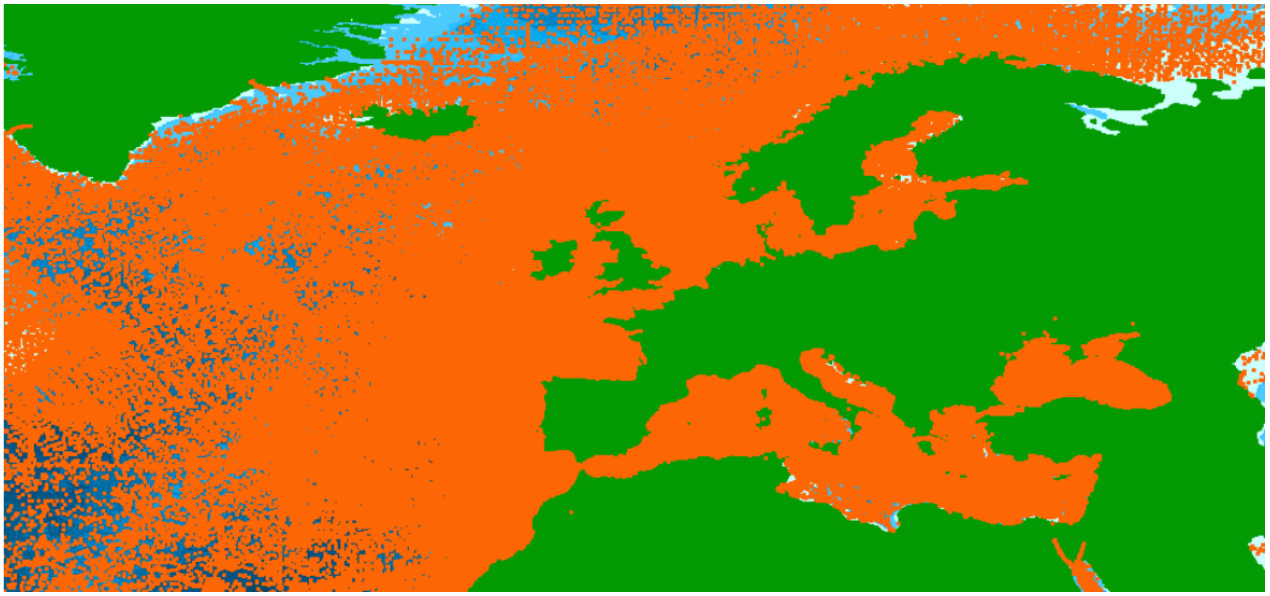
LONG TERM ARCHIVING
DATA RE-USE



Map tools

What kind of data are available?

Multidisciplinary data is available in common data formats using standardised vocabularies.
More than 1.7 million of on-line data of standardised quality from European seas and Black Sea.



Example of the visualisation service: the distribution of point data casts

- **Physical Oceanography**
- **Chemistry**
- **Geophysics**
- **Geology**
- **Biology**

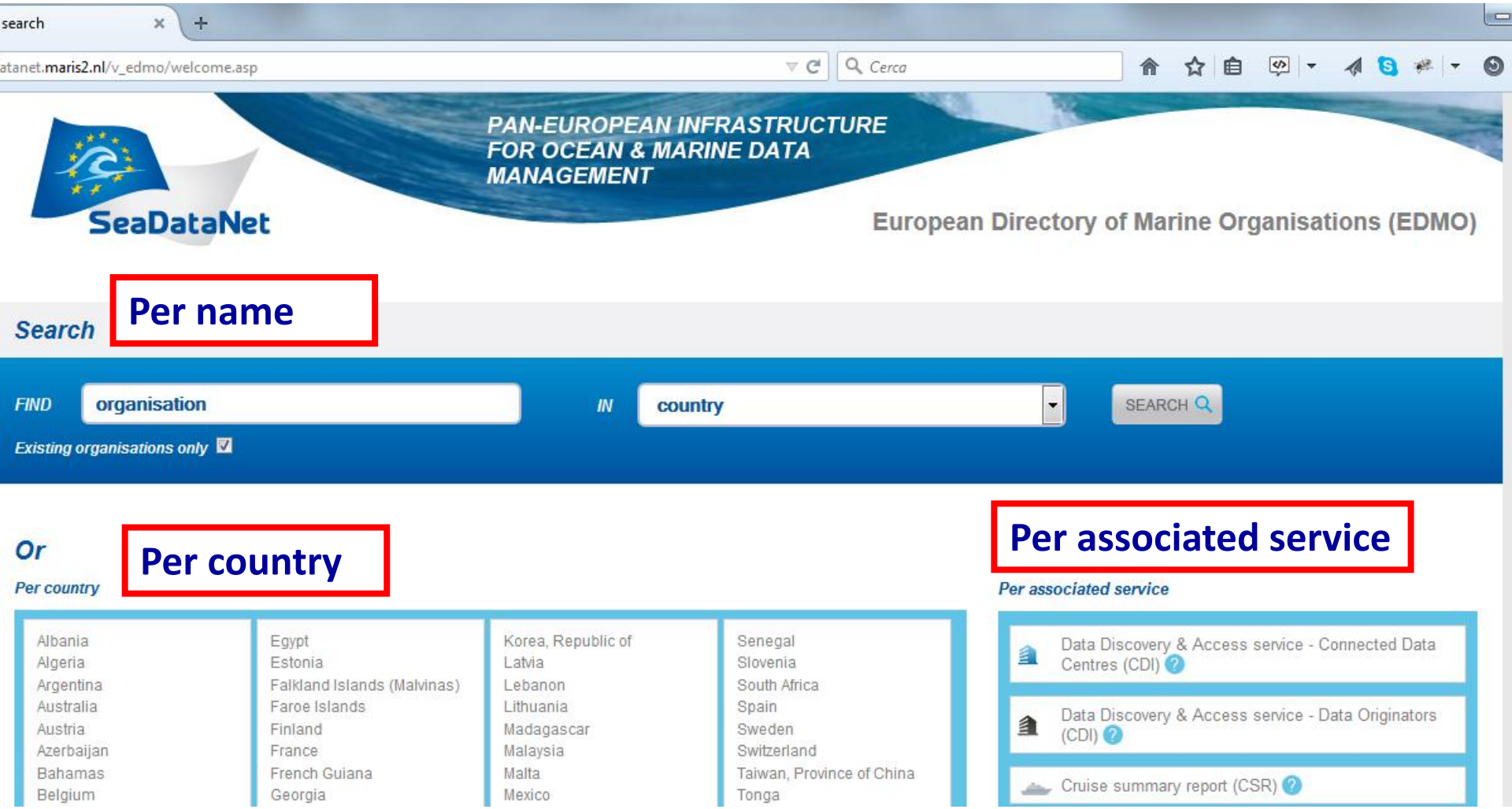
SeaDataNet: METADATA SERVICES

EDMO (European Directory of Marine Organisations)
An up-to-date overview of marine data centres in Europe and the main marine research institutes.
CSR (Cruise Summary Reports)
An inventory for current and historical data collection activities made during cruises.
EDMED (European Directory of Marine Environmental Data)
Devoted to large data sets descriptions
EDMERP (European Directory of Marine Environmental Research Projects)
A catalogue of research projects related to the marine environment.

SeaDataNet: METADATA SERVICES

EDIOS (European Directory of Oceanographic Observing Systems)
An inventory giving an insight into marine monitoring programmes in Europe, relevant for the Marine Strategy Framework Directive (MSFD).
CDI (Common Data Index)
The data discovery and access service enabling the users to have a complete overview of the availability and geographical distribution of marine data in SeaDataNet. The CDI follows the ISO 19139 Schema.

METADATA SERVICES: EDMO



Operational Oceanography in the Mediterranean Sea

Monitoring activities funded by:

MFS-VOS
Mediterranean Forecasting System
Volunteer Observing Ships PORTAL

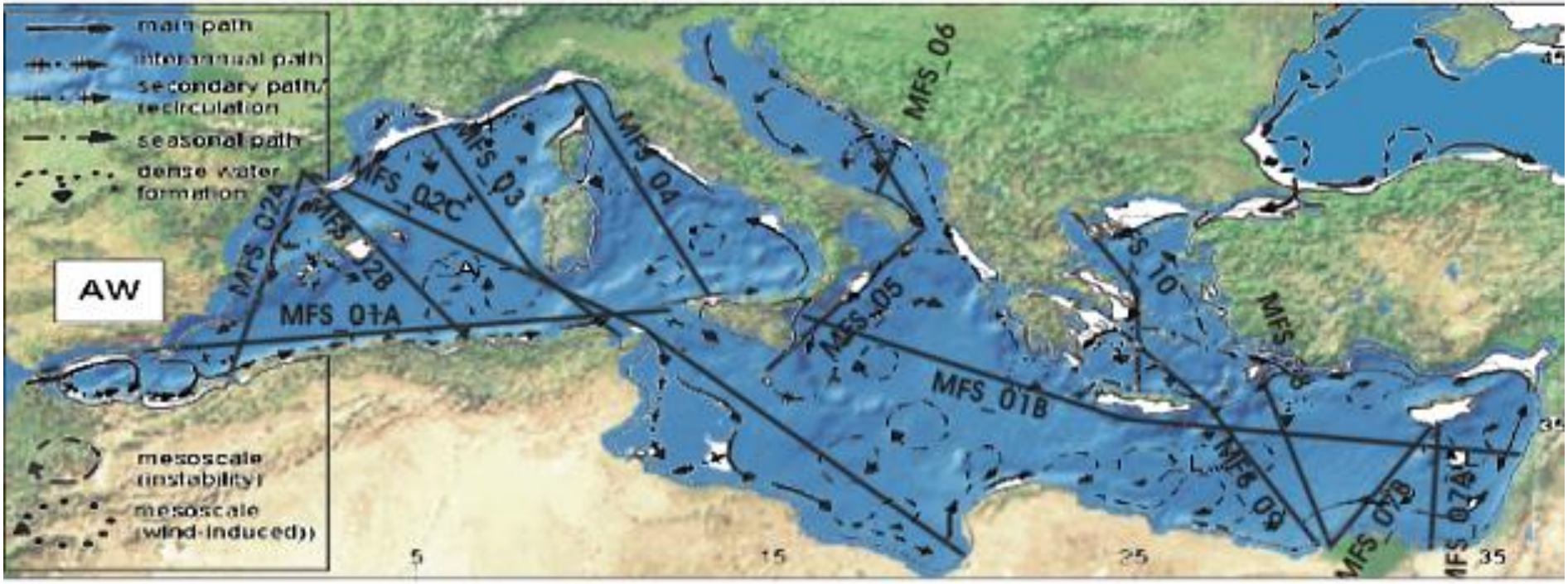
1999-2000 MFSPP Mediterranean Forecasting System- Pilot Project

2004-2005 MFSTEP Mediterranean Forecasting System- Toward Environmental Prediction

Since 2006 national initiatives and regional projects (e.g ADRICOSM Pilot Project, IONIO..)

The XBT data collection

- A significant amount of XBT data has been collected in the Mediterranean Sea using ferries, cargo and commercial ships (Ship of Opportunity Program– SOOP, component of the Global Ocean Observing System-GOOS).
- During MFS-PP (1999-2000) and MFS-TEP (2004-2005) projects, XBT probes have been deployed along 6 fixed transects from North to South and in 1 transect crossing the whole basin from East to West.



XBT MEASUREMENTS

XBT (eXpendable BathyThermograph) probes measures the temperature of the water column and provide a large coverage of ocean observations since the middle of 60s

Transects operated in the Mediterranean in MFSPP

Genoa-Palermo, Ploce-Malta, Haifa-Gibraltar, Sete-Tunisi, Barcellona-Arzew, Limassol-Port Said, Thessaloniki-Alessandria, Pireo-Alessandria

YEAR/MONTH DISTRIBUTION FOR SELECTED STATIONS

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
2000	499	430	523	564	315	191	70	182	108	72	29	67	3050
Total	499	430	523	564	315	191	70	182	108	72	29	67	3050

Transects operated in the Mediterranean more frequently

Genoa-Gibraltar, Genoa-Palermo,
Strait of Messina – Cape Tainaron

Click on (or near station) to query data OR select Polyline/Polygon and click on vertex to draw

YEAR/MONTH DISTRIBUTION FOR SELECTED STATIONS

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
2013	27	0	52	40	27	30	0	0	29	16	0	0	221
Total	27	0	52	40	27	30	0	0	29	16	0	0	221

XBT DATA FLOW AND MANAGEMENT

Data Acquisition

- XBTs deployed from ship of opportunities

Data Processing

- 1 mt. reduction
- Quality check
- Production of 1 file per profile
- Production of xml metadata file for remote access

Data Archiving

- Storage at ENEA server

CDI Metadata Archiving

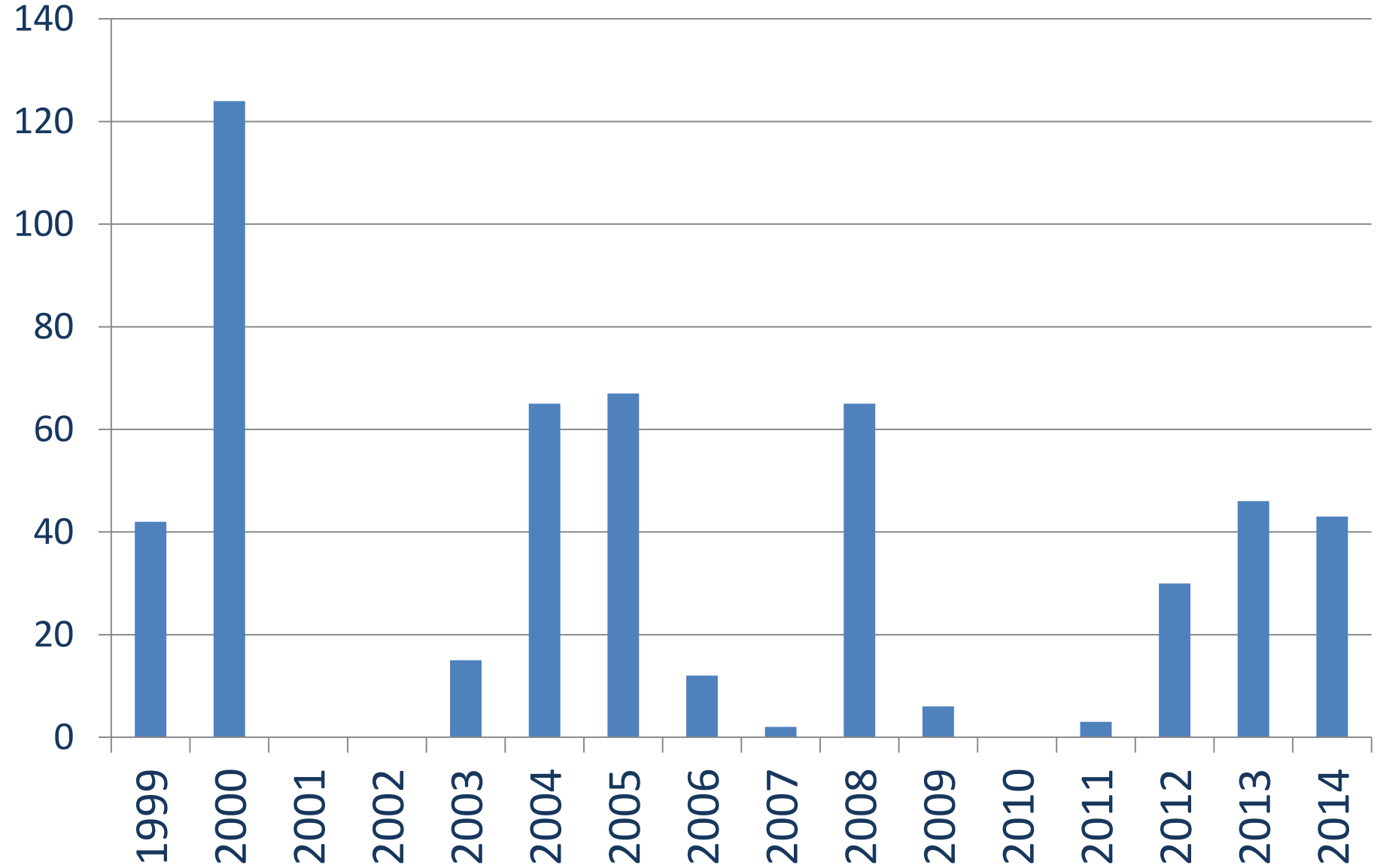
- Upload to SeaDataNet portal

LONG TERM ARCHIVING

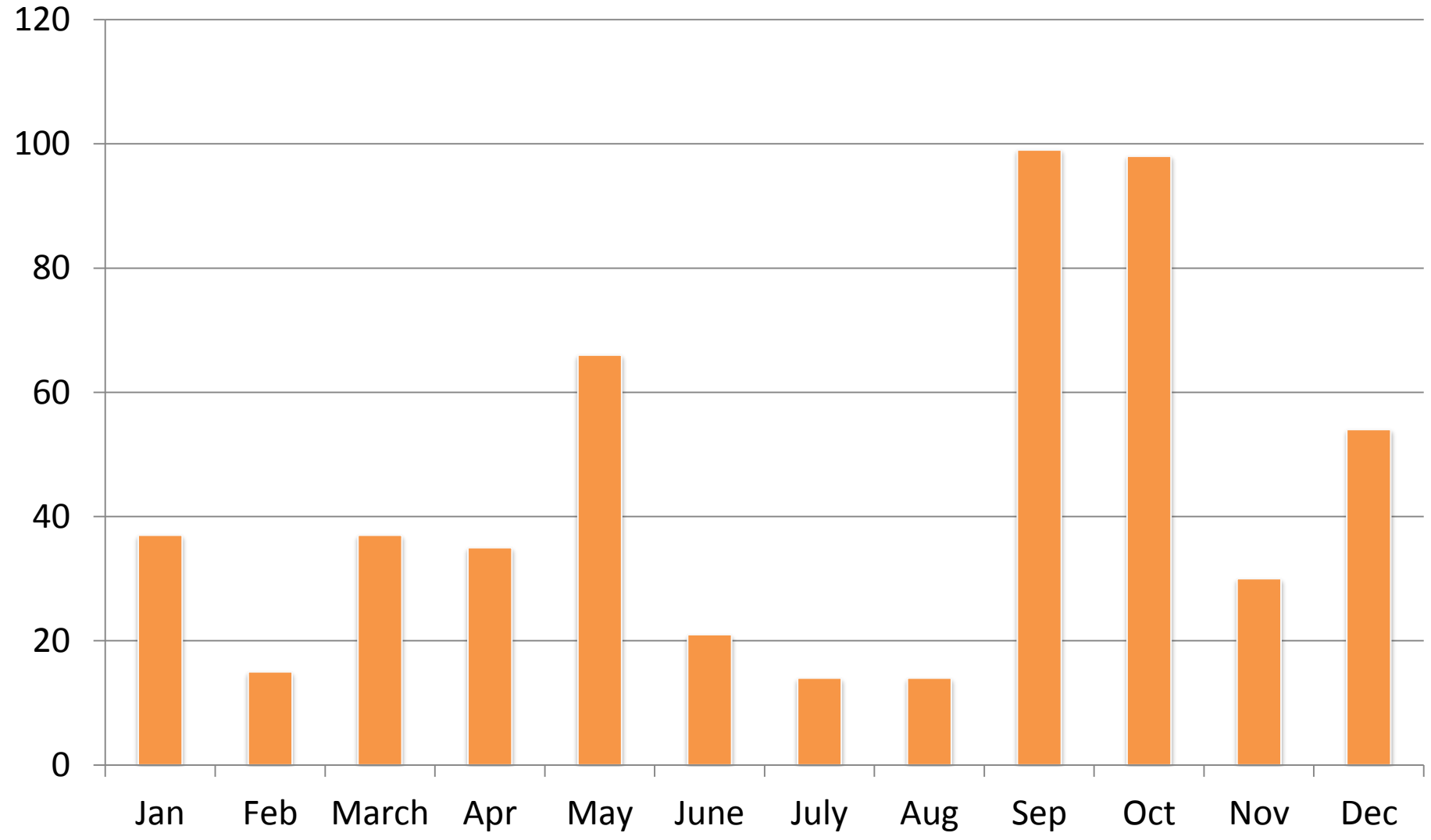
XBT OUTPUT

*IE4820130406013502 Data Type=H13 Ship Name=EXCELLENT CallSign=IBBE
*DATE=06042013 TIME=0135 LAT=N36 23.18 LON=W 2 29.75 DEPTH=-999. QC=1119
*NB PARAMETRES=02 RECORD LINES=00889
*DEPT SEA DEPTH min. sea level=0 (METER) def.= -999.9
*TEMP SEA TEMPERATURE (CELSIUS DEGREE) def.= 99.999
*GLOBAL PROFILE QUALITY FLAG=1 GLOBAL PARAMETERS QC FLAGS=11
*DC HISTORY=XBTs; ACQUISITION TIME(s)=140.5;Z(T)=AT-BT^2: A=6.691000;B=0.002250;
*XBT TYPE= DB;MANUF.= LM SIPPICAN-USA;SERIAL= 1151376;RECORDER= MK21;
*DM HISTORY=QC IN NEAR REAL TIME - MFS SOFTWARE (Version 2007.01)
*
*COMMENT:PROJECT=MOON ;LAUNCH H(m)=10;SHIP SPEED(kn)=21;WIND SPEED(kn)=15;
*IMO NUMBER=09143441;CALIBRATION RECORDER_(XBT-TESTER)(°C)=-0.060;
*SURFACE SAMPLES=
*
*DEPT(M) TEMP(°C)
  4.0 15.011 11
  5.0 15.011 11
  6.0 15.012 11
  7.0 15.012 11
  8.0 15.010 11
  9.0 15.010 11

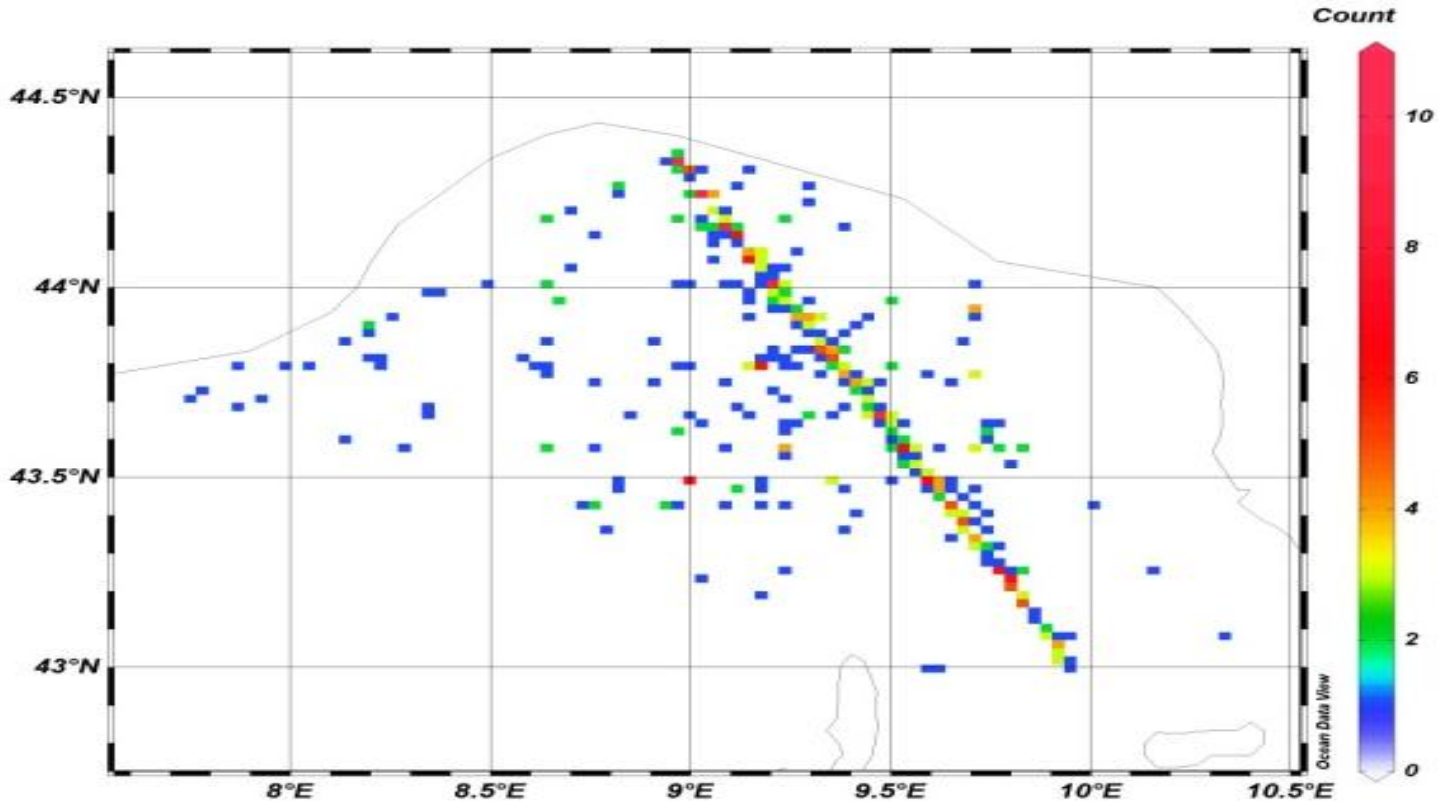
XBT PROFILES IN THE LIGURIAN SEA 1999-2014 PER YEAR



XBT PROFILES IN THE LIGURIAN SEA 1999-2014 PER MONTH

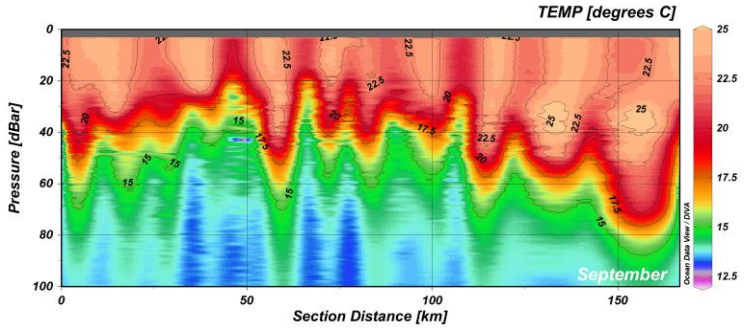


A COMPILED PRODUCTS BASED ON XBT: THE CASE OF LIGURIAN SEA CLIMATOLOGY

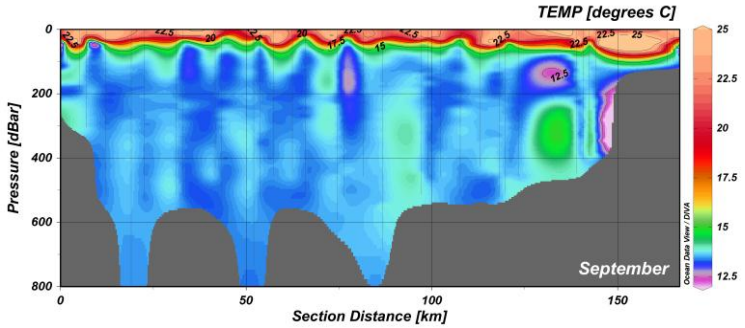


Distribution of XBT profiles in the Ligurian Sea available from SeaDataNet website

A COMPILED PRODUCTS BASED ON XBT: THE CASE OF LIGURIAN SEA CLIMATOLOGY

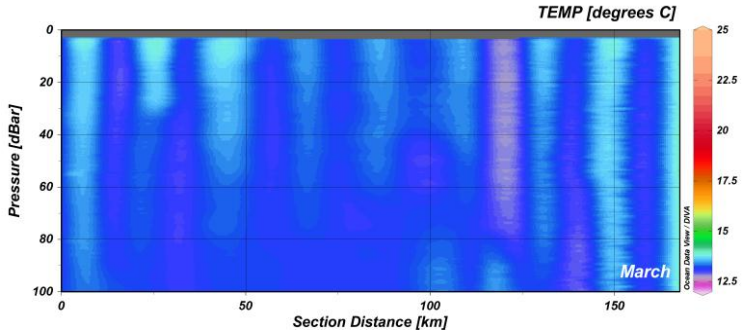


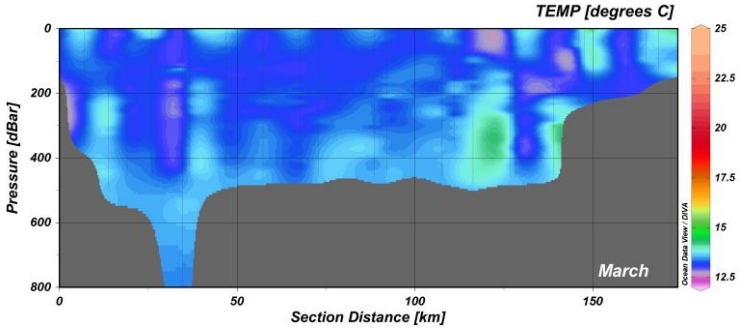
(a)



(b)

Temperature section during September from Genoa to Capraia ((a), the upper 100 metres, (b) the data from surface down to the maximum depth) and in March (below)





CONCLUSIONS

The use of SeaDatanet infrastructure guarantees

THE USE OF STANDARD QUALITY CHECK PROCEDURE

THE DATA INTEROPERABILITY BY MEAN OF COMMON VOCABULARIES AND STANDARD FOR DATA AND METADATA

RE-USE OF DATA FROM XBT IN DIFFERENT APPLICATIONS

LONG TERM PRESERVATION

DATA AVAILABILITY FOR A WIDE PUBLIC