Gaps in Med Observing Capacity

Pierre-Marie Poulain
OGS, Trieste

Review organized as a function of observational platforms, partially based on Perseus review (Deliverable 3.1)

In-situ:

➢Research vessels
➢Ships of opportunity
➢Mobile autonomous systems
➢Fixed moorings & buoys
➢Cabled networks
➢Coastal stations/observatories

Remote sensing:

➢Radars

➢Aircrafts

➢Satellites

Kostas Nittis Scientific and Strategic Workshop, Athens, 26-27 May 2015

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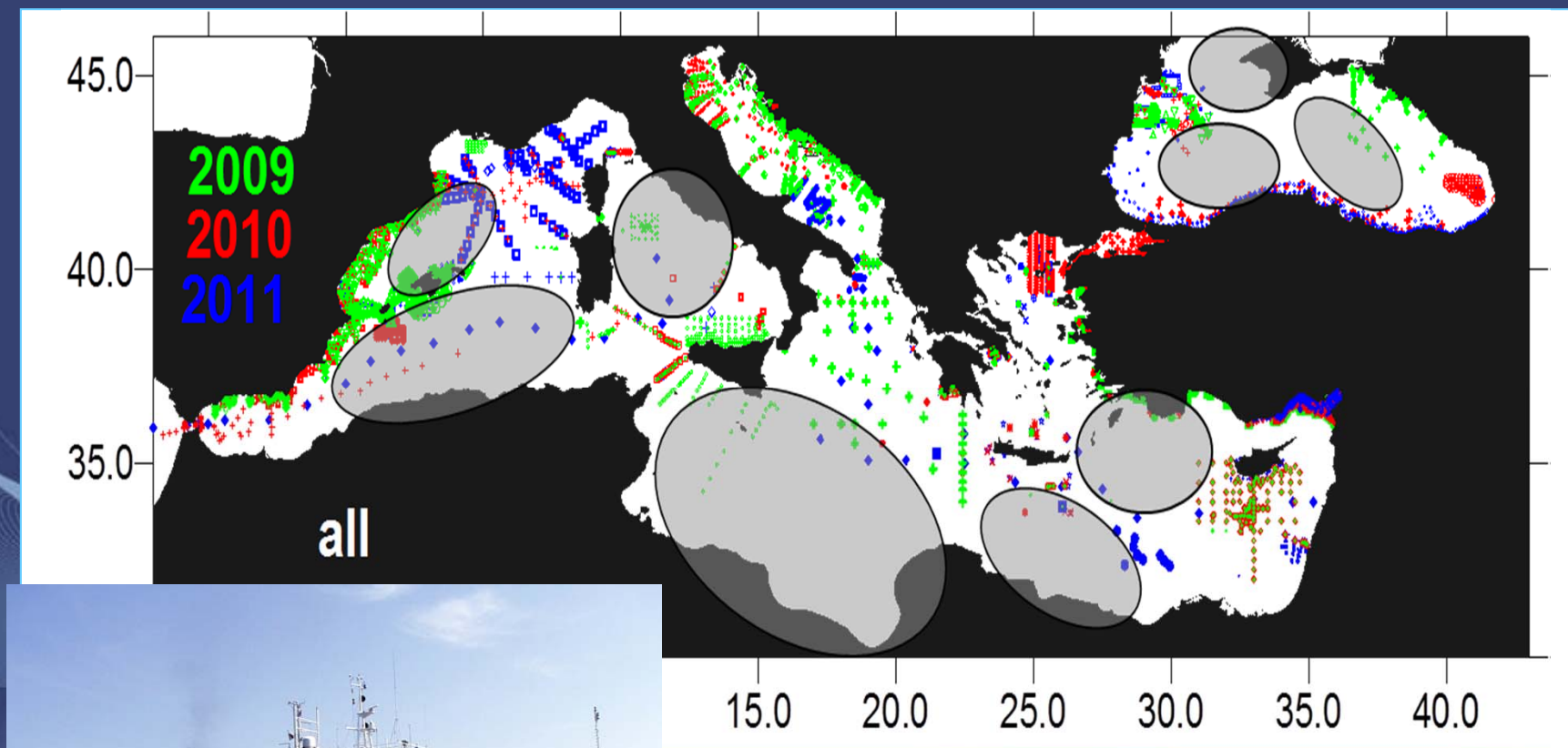➤ Cabled networks
➤ Coastal stations/observatories

Remote sensing:

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Research Vessels

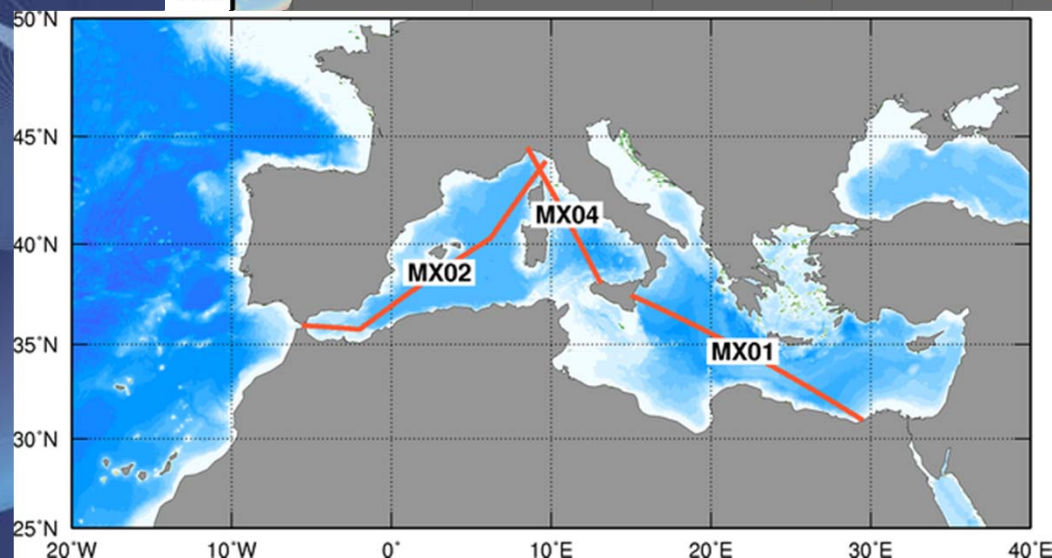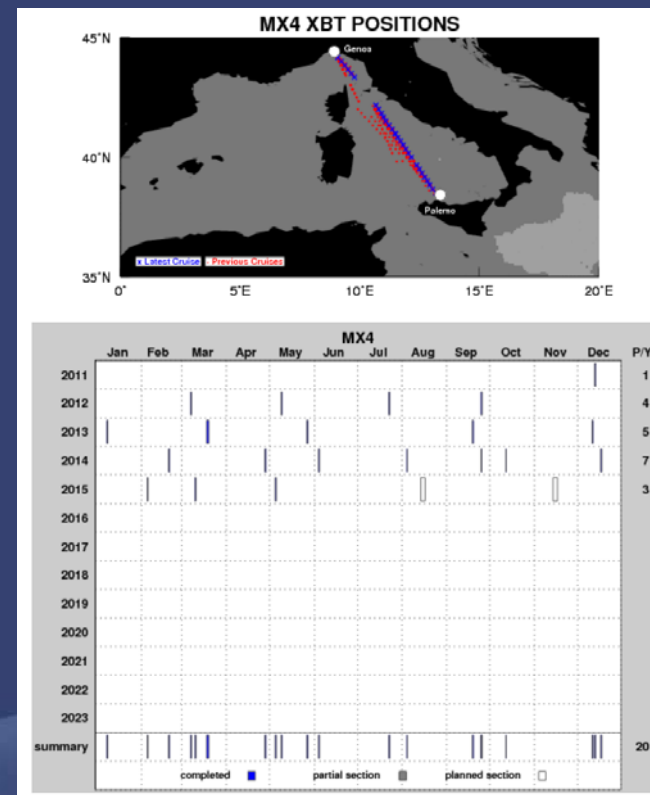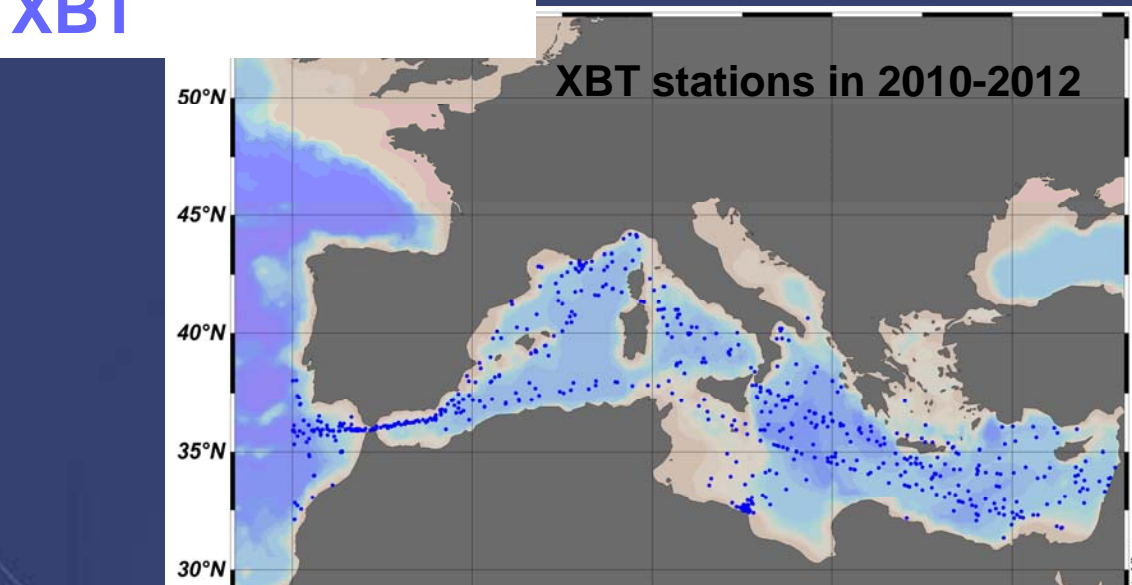## Oceanographic Cruises

All oceanographic parameters

Gaps:
Southern Med, central Black Sea
Sampling frequency (seasonal!)
Data availability & quality!

Ships of Opportunity

T profiles

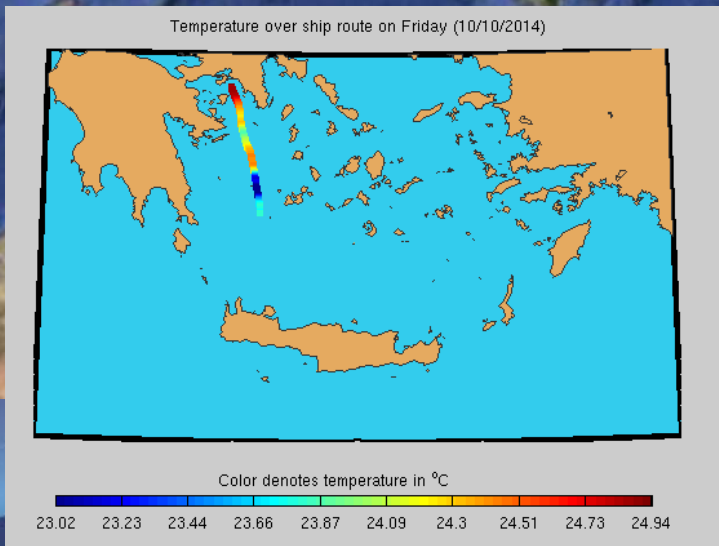**XBT**

XBT stations in 2010-2012

MX4 XBT POSITIONS

XBT's array has decreased over the last decade.
Obvious spatial gaps but maybe obsolete tecnique to be replaced by profiling floats and gliders!!!

Ships of Opportunity   T&S, DO, CHL, etc.

FerryBox

Temperature over ship route on Friday (10/10/2014)

Color denotes temperature in °C

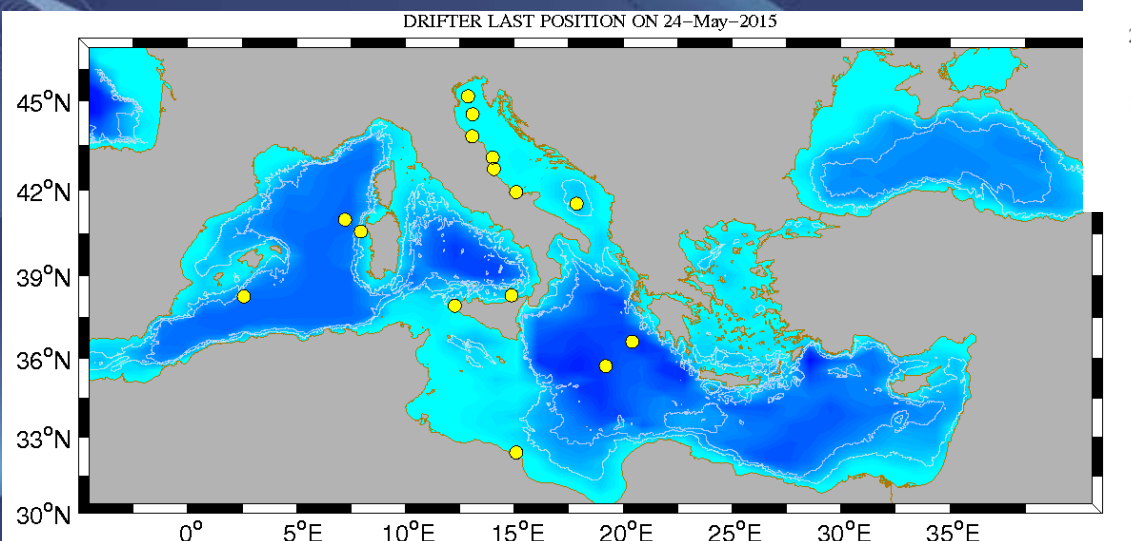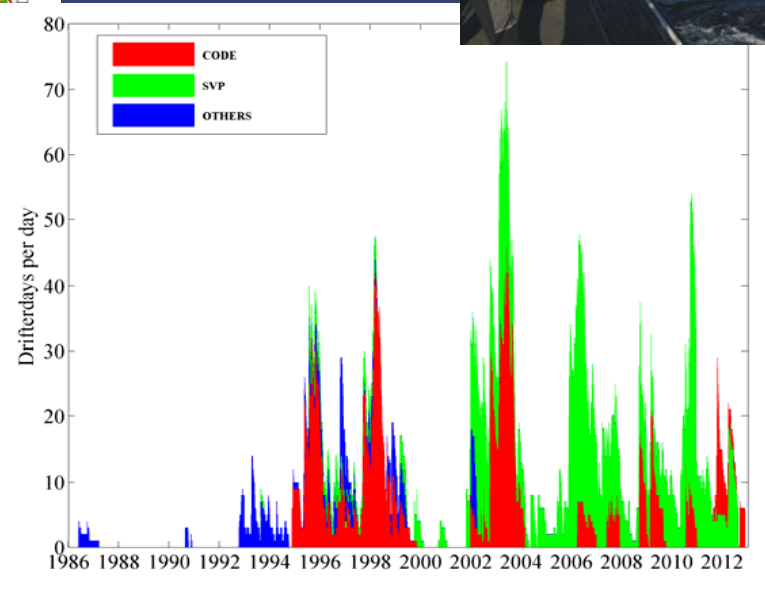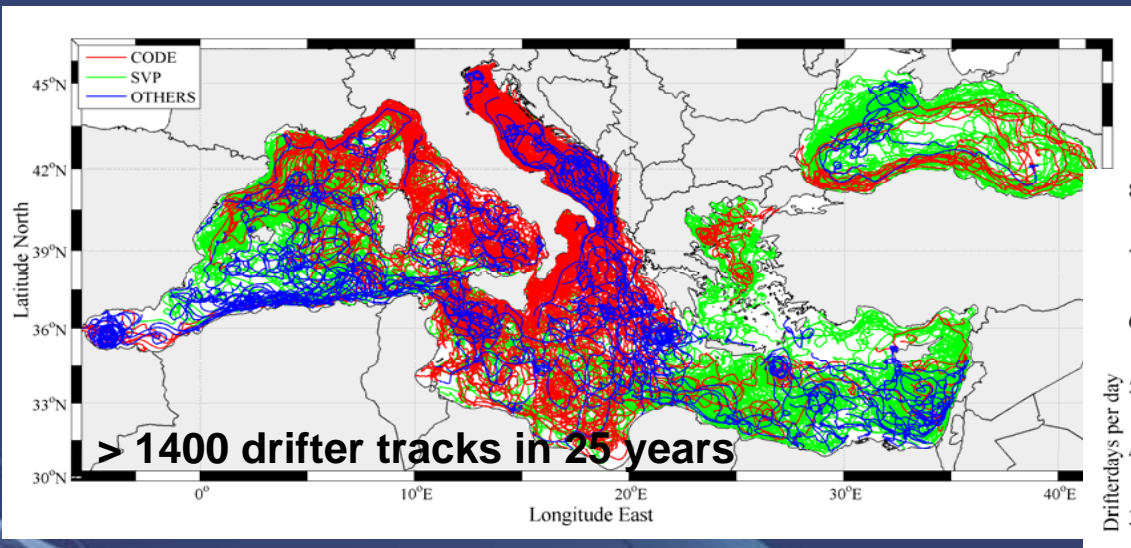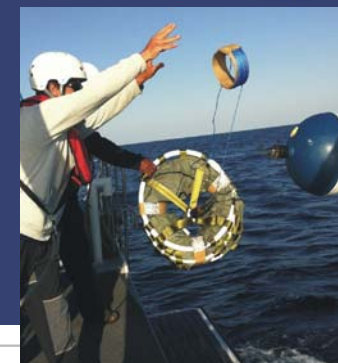| 23.02 | 23.23 | 23.44 | 23.66 | 23.87 | 24.09 | 24.3 | 24.51 | 24.73 | 24.94 |

Gaps:
Very limited coverage!
No observations in most Med Sea and Black Sea

Mobile Autonomous Systems

Surface Drifters Currents, SST, etc.

> 1400 drifter tracks in 25 years
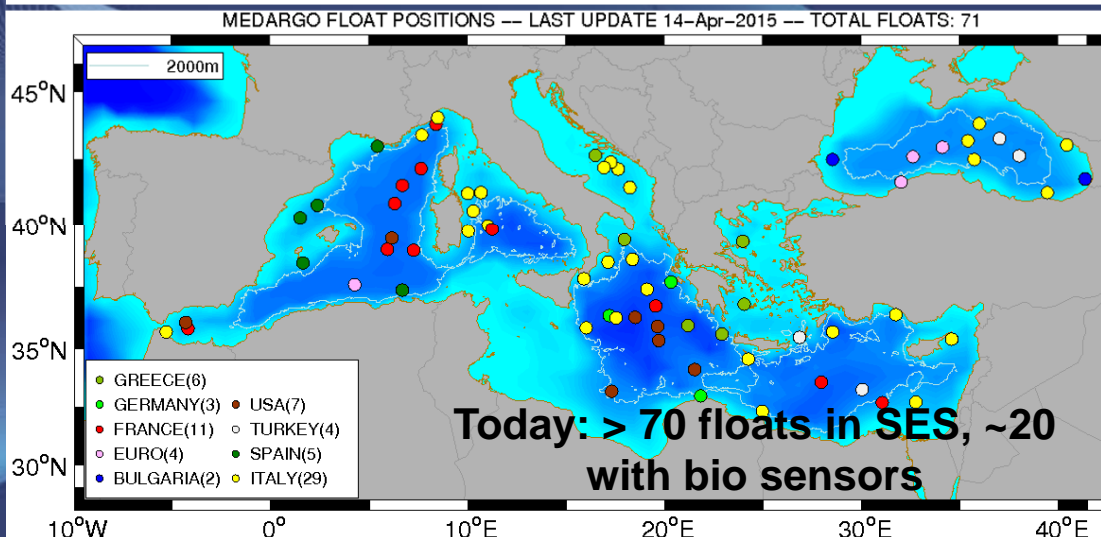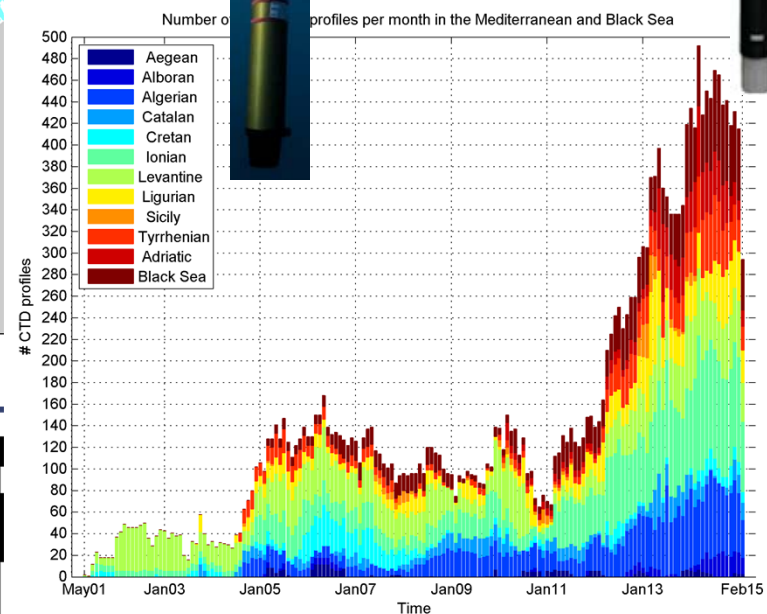
DRIFTER LAST POSITION ON 24–May–2015

Today's array should be increased (50 drifters!)
Gaps:
No observations in some sub-basins, including the Black Sea

Mobile Autonomous Systems

Profiling floats

T/S profiles, currents, biogeochemical, optics.

Argo floats: 2000-2015

> 24000 CTD profiles in less than 15 years

MEDARGO FLOAT POSITIONS -- LAST UPDATE 14-Apr-2015 -- TOTAL FLOATS: 71

Today: > 70 floats in SES, ~20 with bio sensors

GREECE(6)
GERMANY(3)   USA(7)
FRANCE(11)   TURKEY(4)
EURO(4)   SPAIN(5)
BULGARIA(2)   ITALY(29)
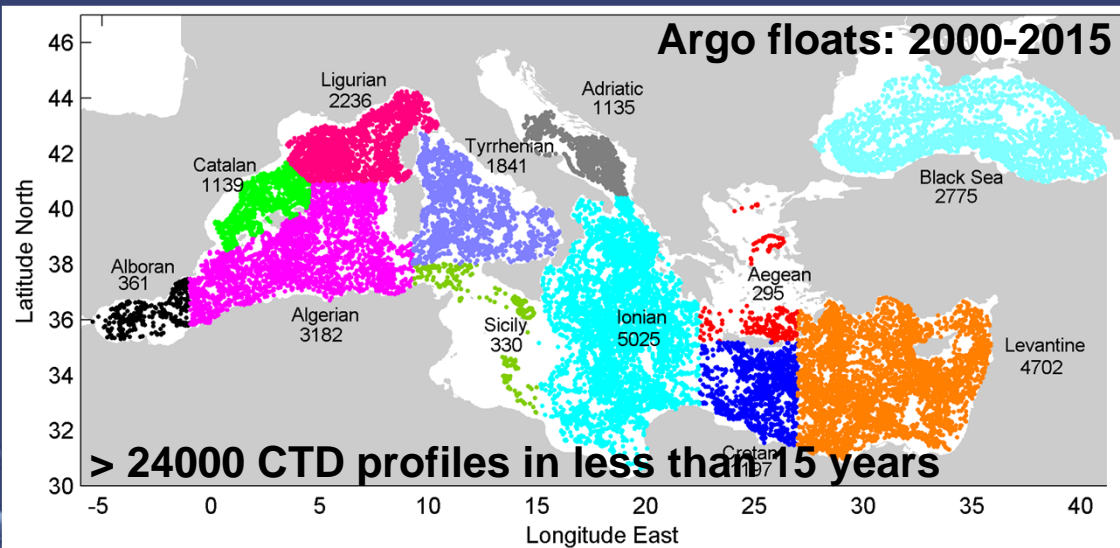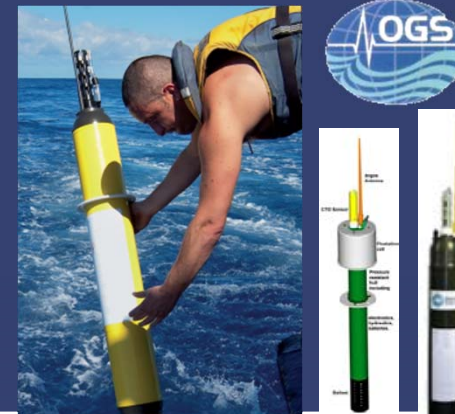
Today's fleet should be maintained
Gaps:
Southern Med, bio-geochemical parameters, bellow 2000m

Mobile Autonomous Systems

Profiling floats

T/S profiles, currents, biogeochemical, optics.

MEDARGO FLOAT SENSOR TYPES –– LAST UPDATE 18–May–2015 –– TOTAL FLOATS: 70
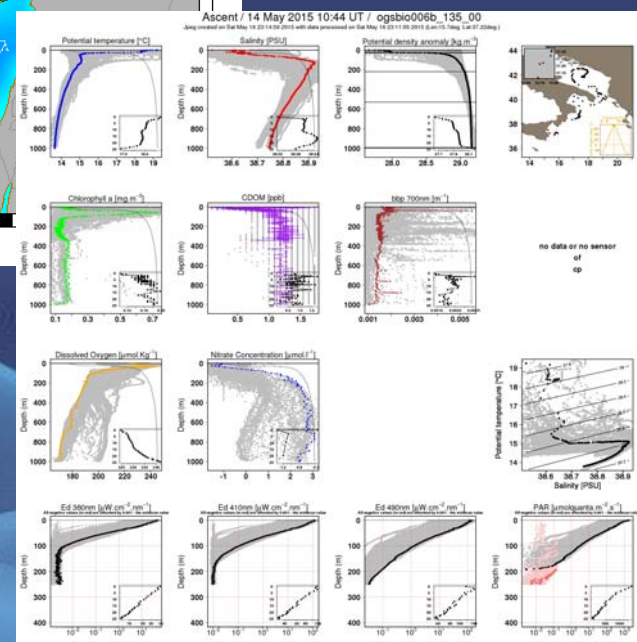
20 bio floats in Med and Black Sea (30%)

- CTD (50)
- DO (11)
- BIO (4)
- BIO–DO (2)
- BIO–DO–NUT (3)
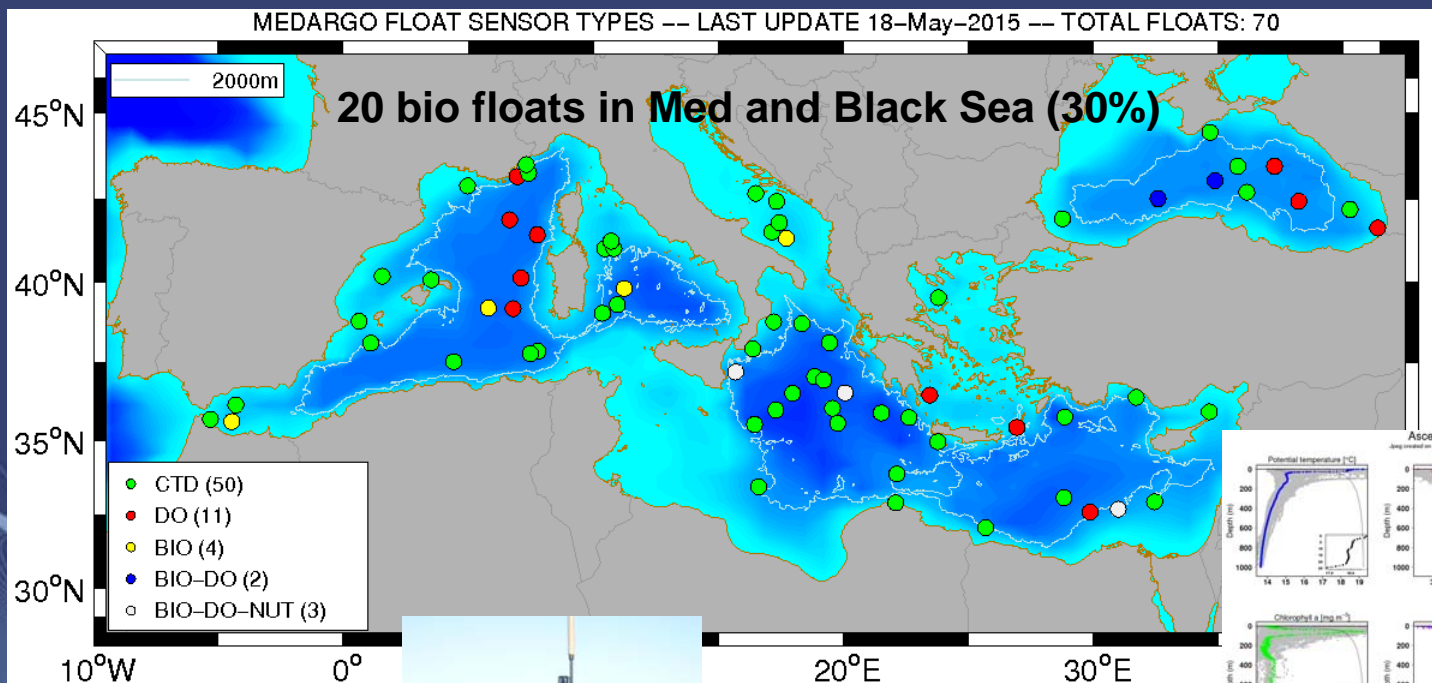
Mobile Autonomous Systems

Gliders

T/S profiles, currents, biogeochemical, optics.
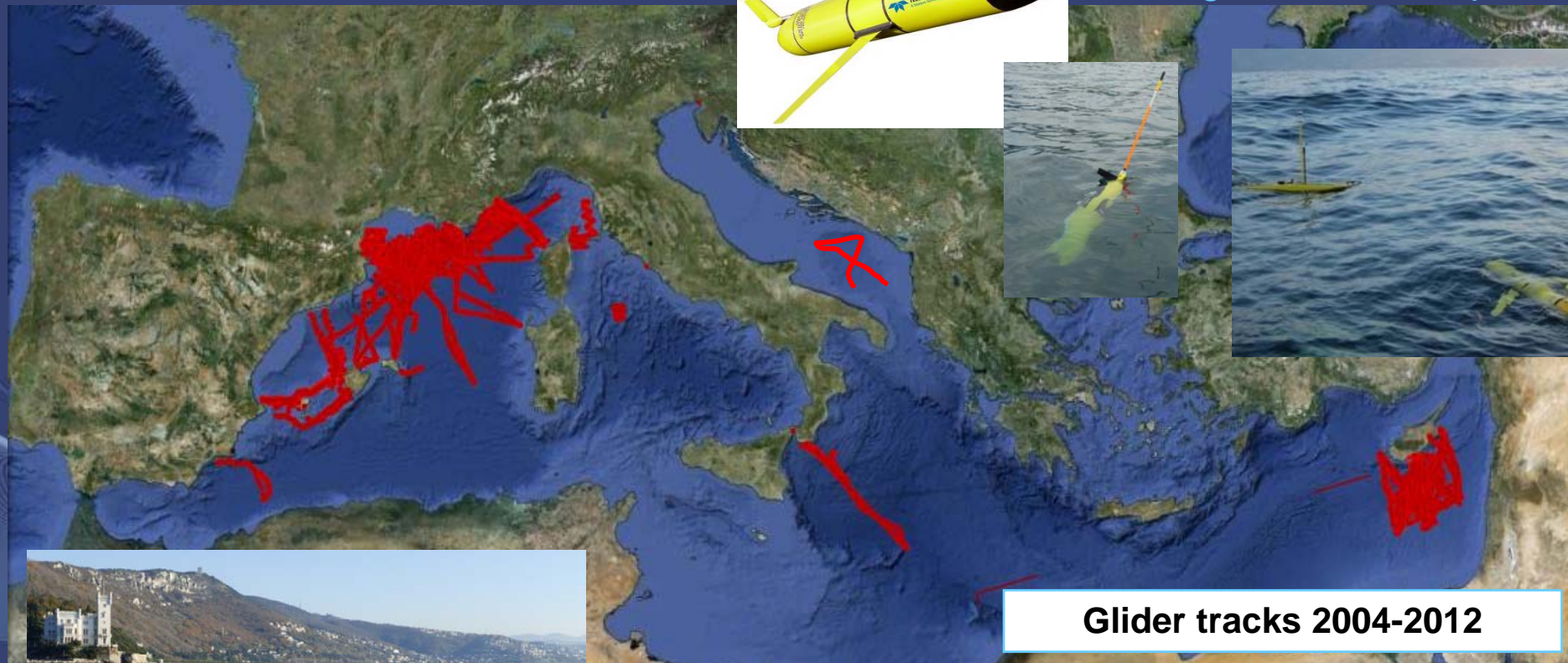
Glider tracks 2004-2012

Today's fleet should be increased (20 gliders!)
Gaps:
Southern Mediterranean, Black Sea

Fixed Moorings

Open sea moorings

T/S profiles, currents, biogeochemical, optics.

W1-M3A

ANTARES

DYFAMED

E2-M3A

FluSO

Pylos

E1-M3A

Today's array should be upgraded (new parameters) & maintained
Gaps:
Lack of standards for data management
Data availability & quality!

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Radars

HF coastal radars   Currents, waves
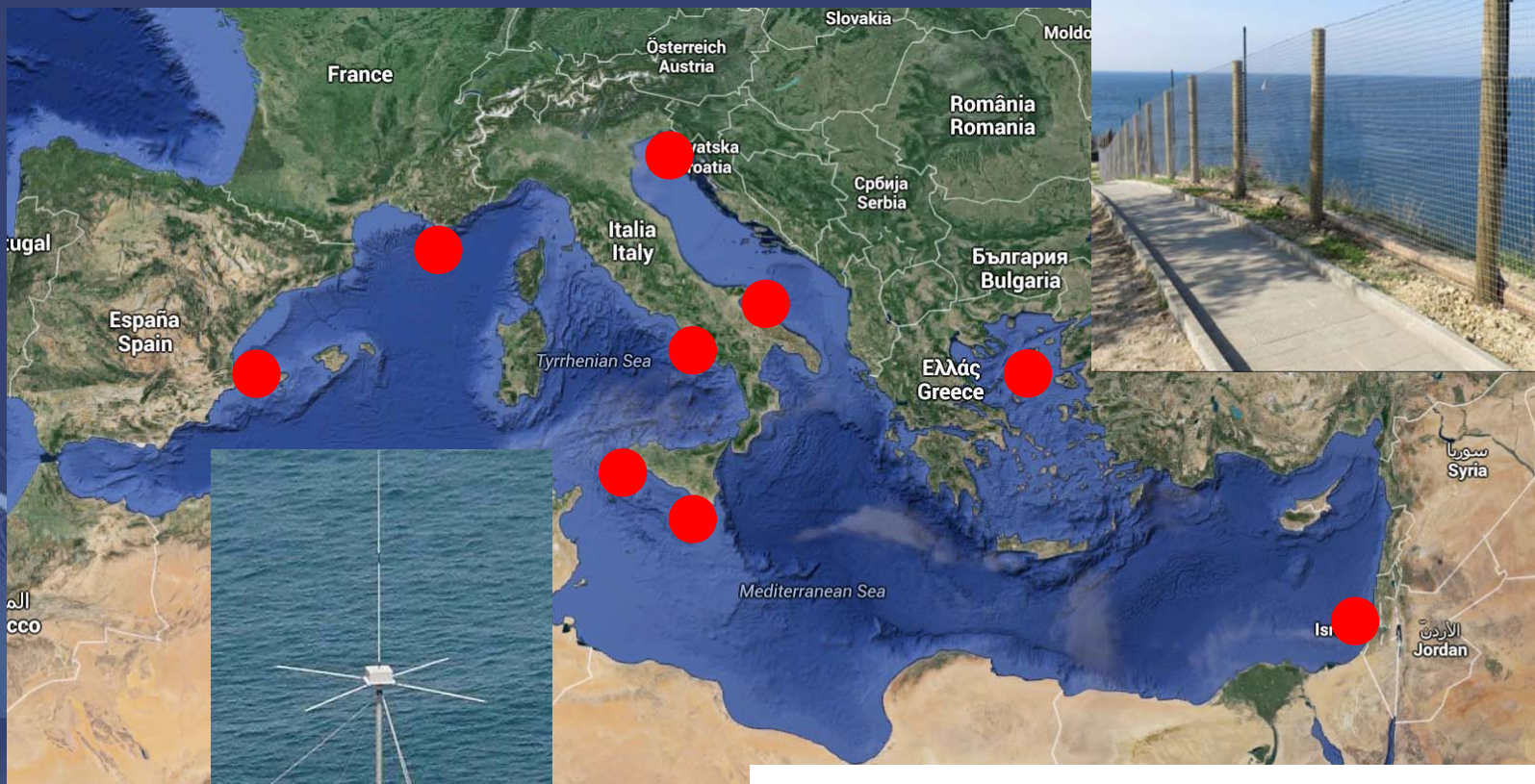
Today's array should be upgraded & sustained
Gaps:
Lack of standards for data management
Data availability!

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Some Conclusions

As part of PERSEUS there was an assessment of existing observing systems in the Med and Black Sea, including:

- mobile autonomous platforms (drifters, floats and gliders),
- moored instruments,
- oceanographic cruises onboard research vessels,
- coastal/local observing networks
- and satellite measurements,

gaps and needs were identified in order to expand the present observing capacity towards fulfillment of the scientific and society needs.

Main gaps were identified in terms of **geographical coverage** (for instance observations are scarce in the southern areas of the Mediterranean), adequate **sampling frequency** (from daily to interrannual) and scarcity of **multi-parametric observations** (need more biogeochemical observations).

Recommendations to fill the gaps of the present observing system include the:
- **complementary use** of different kinds of observations to study **multi-scales processes**
- **Integration** and combination of the different monitoring capabilities/systems in a **cost-effective way** to measure **key parameters** and understand **key factors**.
- **Collaboration** with all/new Med and Black Sea countries (capacity building).

Some Conclusions

SPATIAL GEOGRAPHICAL GAPS

PARAMETER GAPS

MED SEA

TEMPORAL GAPS

BLACK SEA

INTEGRATED MONITORING

DATA AVAILABILITY & QUALITY

COLLABORATION WITH PARTNERS FROM DEVELOPING COUNTRIES CAPACITY BUILDING

Some Conclusions

INTER-CALIBRATION & DATA QUALITY

Photo courtesy of F. d'Ortenzio, LOV

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