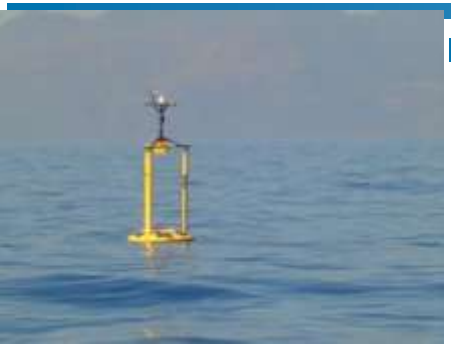
JOINT EUROPEAN RESEARCH INFRASTRUCTURE NETWORK FOR COASTAL OBSERVATORIES

HCMR FIXED PLATFORMS

Best practices

FIXED PLATFORM NETWORK – POSEIDON BUOYS

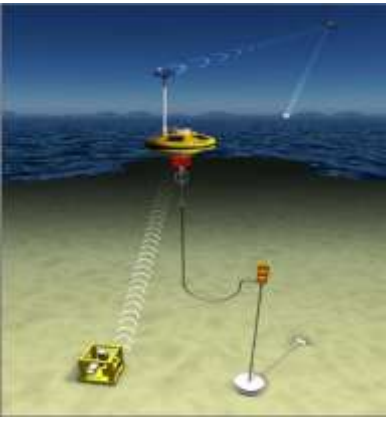


SeaWatch buoys

Limited number of parameters

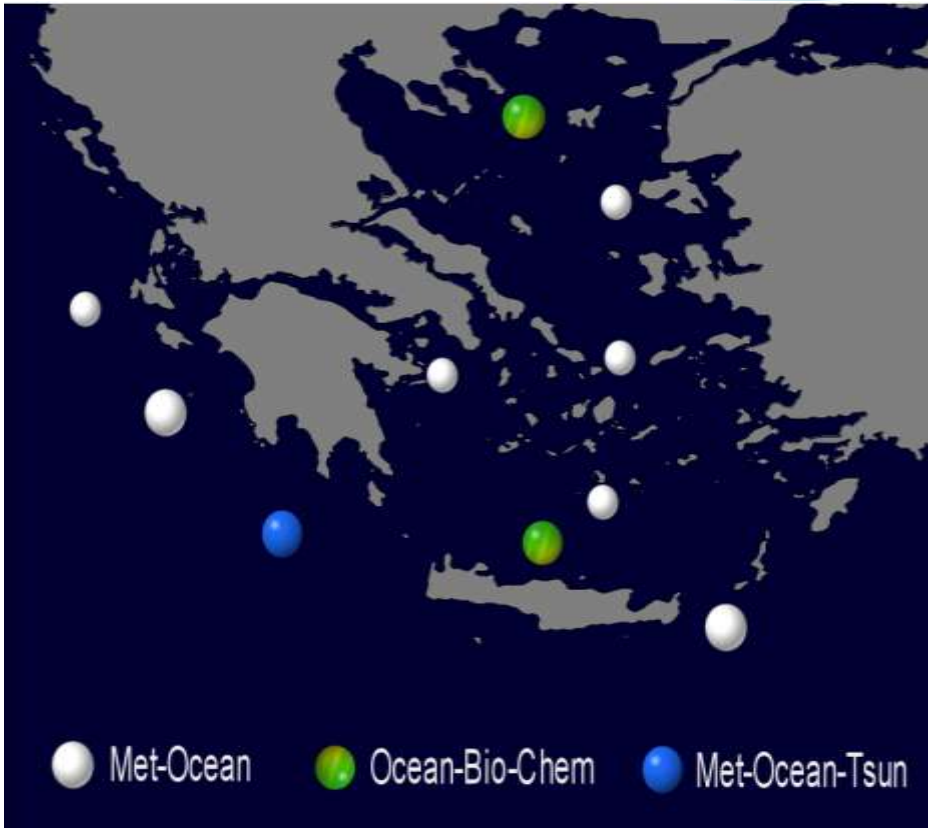
Wavescan buoys

Supporting deep sea monitoring including ecosystem variables



Deep Sea platform

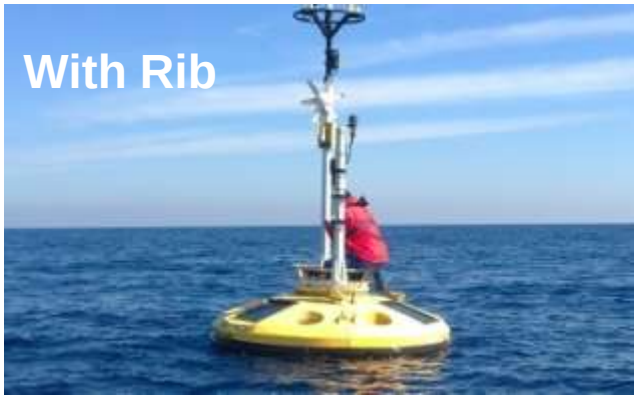
Tsunami detection with acoustic link to surface buoy

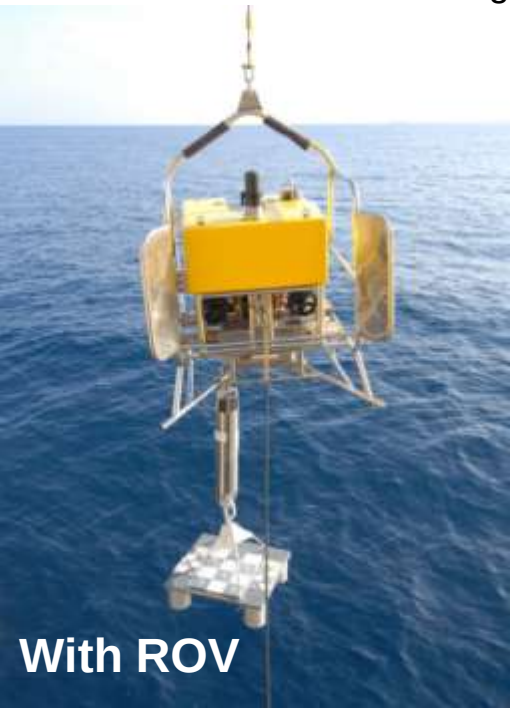


www.poseidon.gr

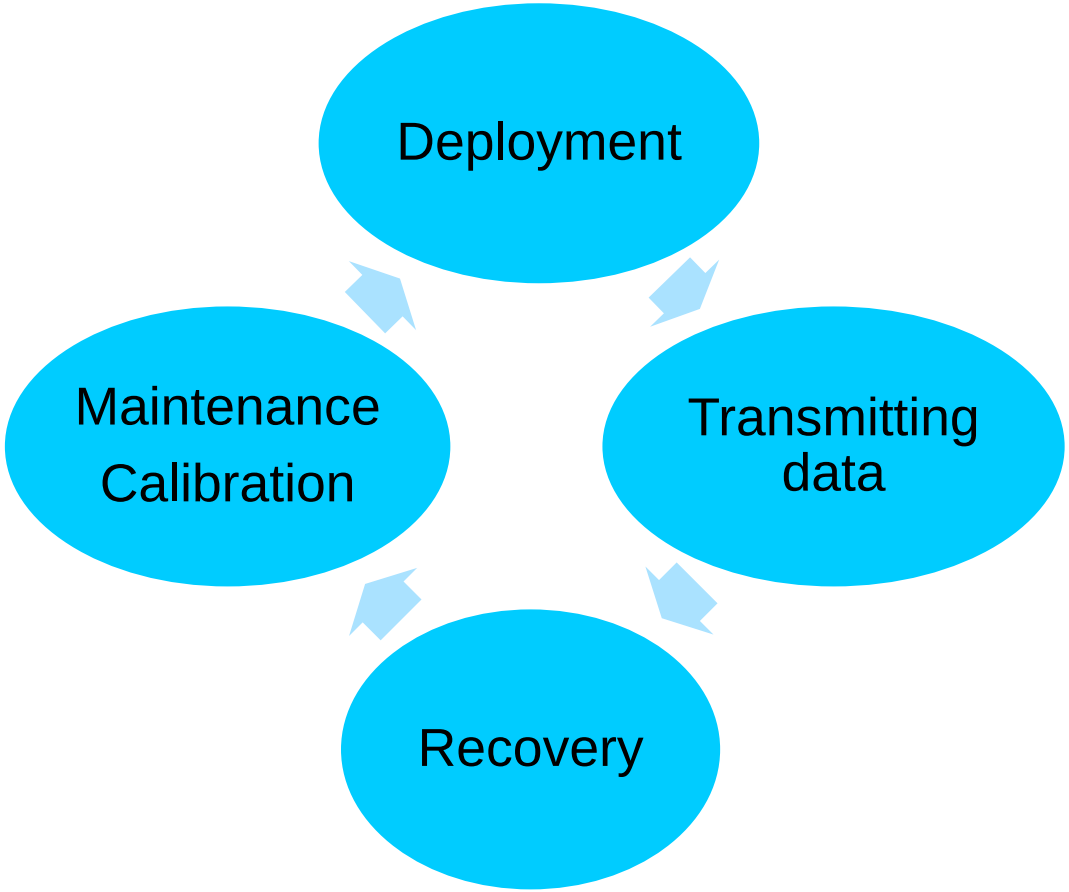
NETWORK OPERATION - SUPPORT MEANS

- buoy replacement
- sensor replacement
- sensor maintenance and field validation
- emergency visits with inflatable

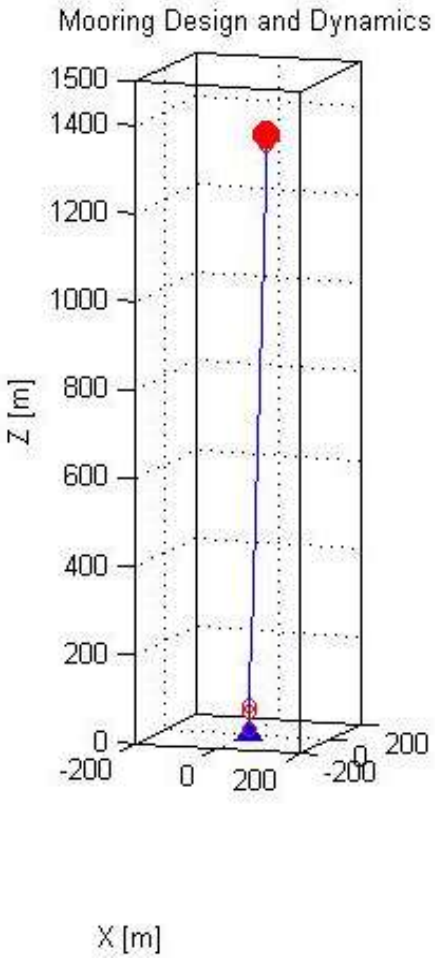


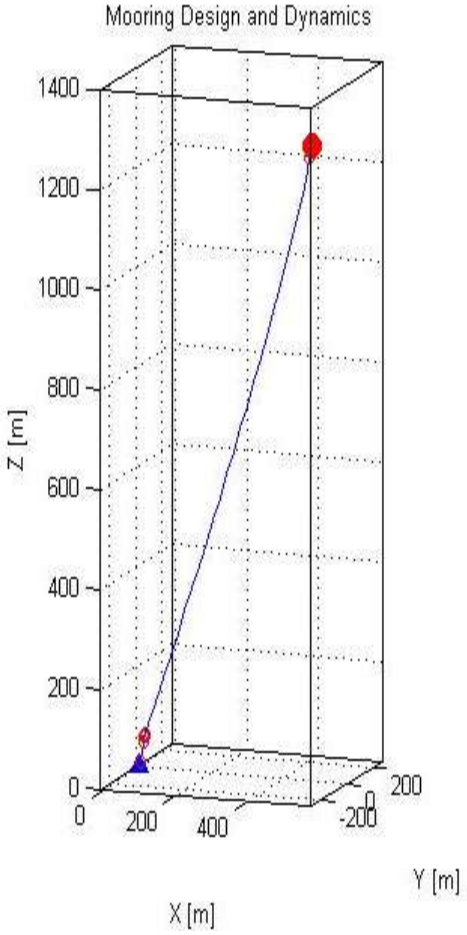


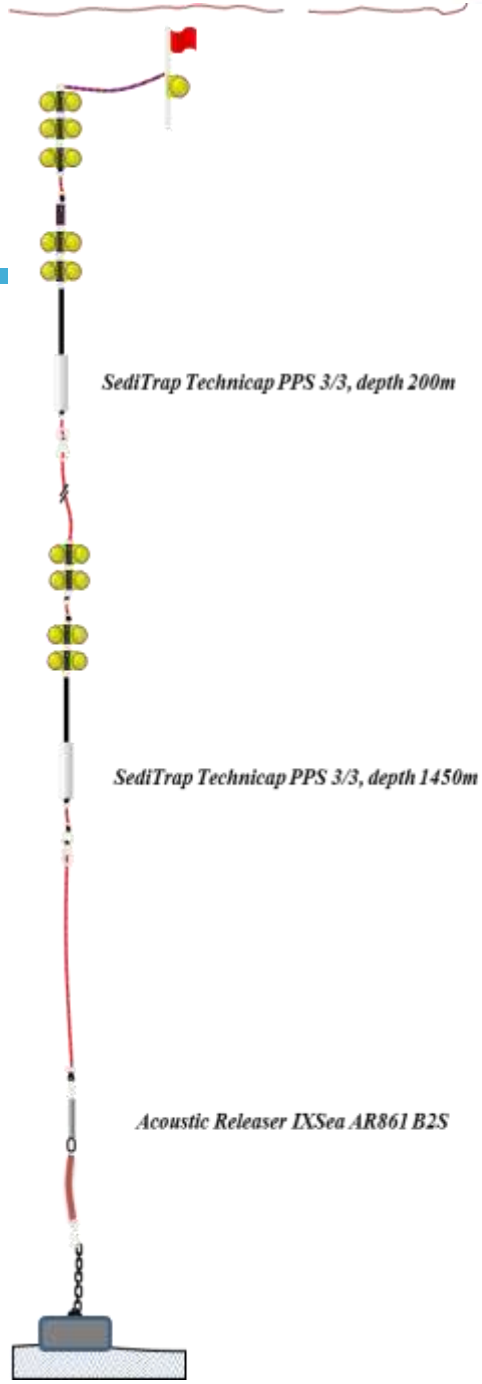
FIXED PLATFORM (BUOY) OPERATIONAL CYCLE



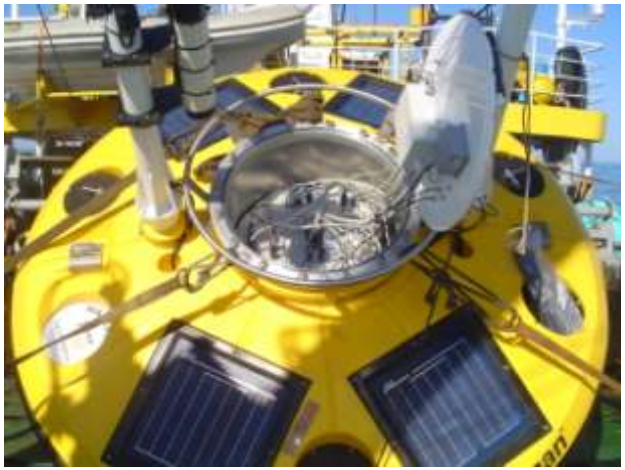
MOORING DESIGN USING MOORING DYNAMICS (MATLAB)







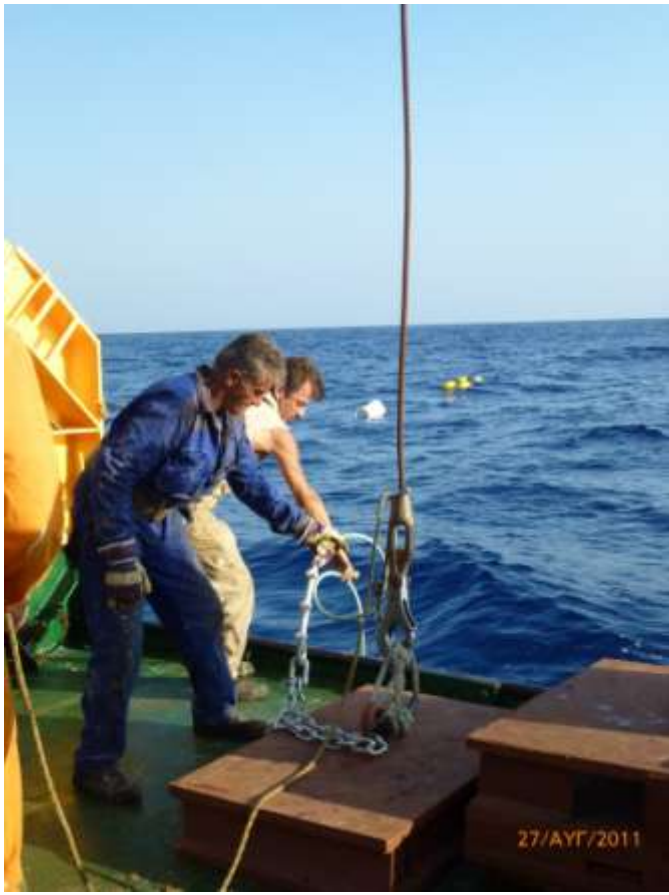
DEPLOYMENT PROCEDURE



Check and test everything (buoy, sensors, mooring line components, releaser) just before deployment.

A successful data transmission ON BOARD the R/V is required.

DEPLOYMENT ISSUES – SOME ECONOMICS



Mooring anchor

- Weld steel plates: (density 7600 kg/m^3)
- Reinforced concrete: (density 2300 kg/m^3)

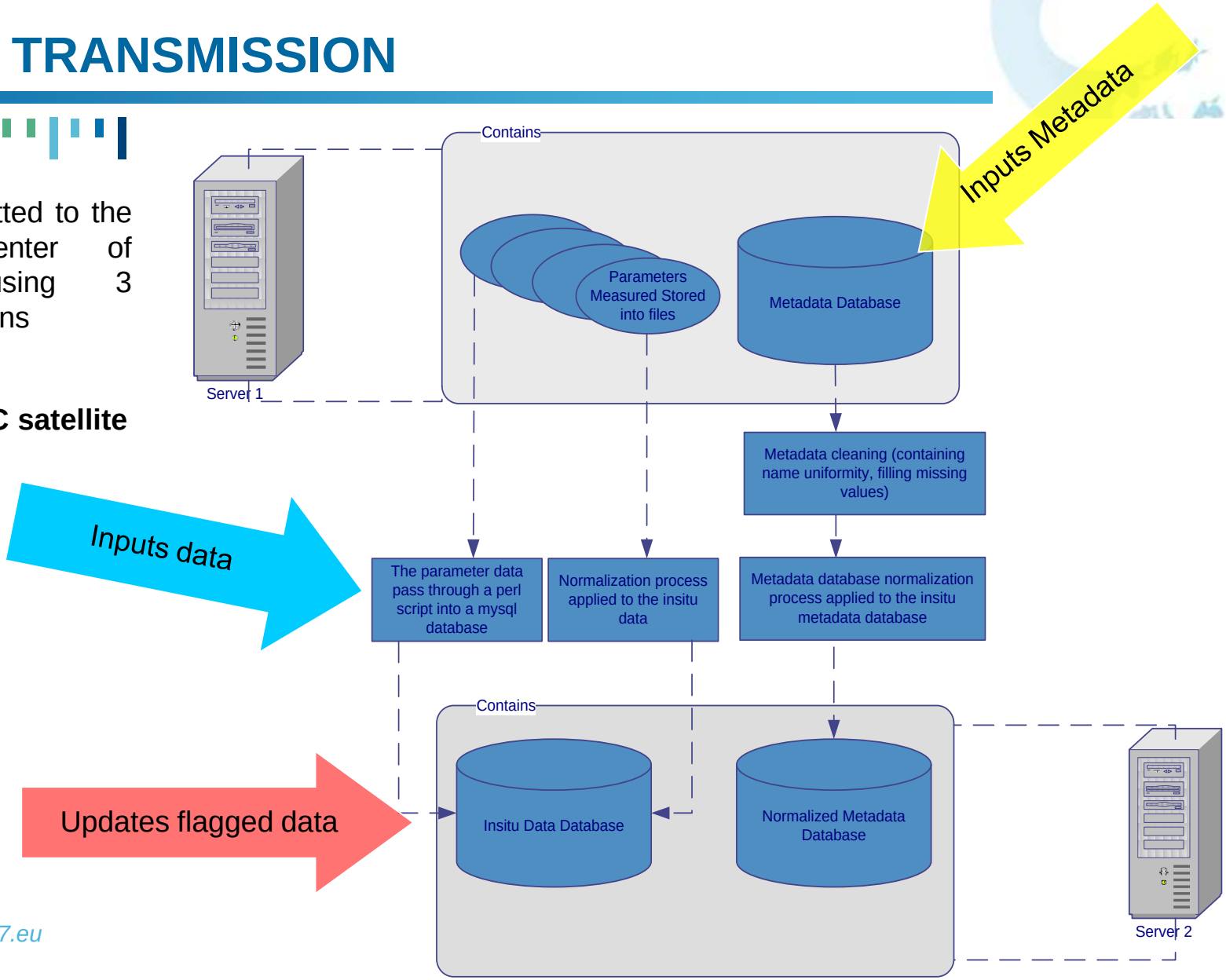
Although the steel is the most convenient solution (less volume on board) the cost is very high.

- 1000 kg of welded steel ≈ 1000 euros
- 2300 kg of reinforced concrete ≈ 60 euros

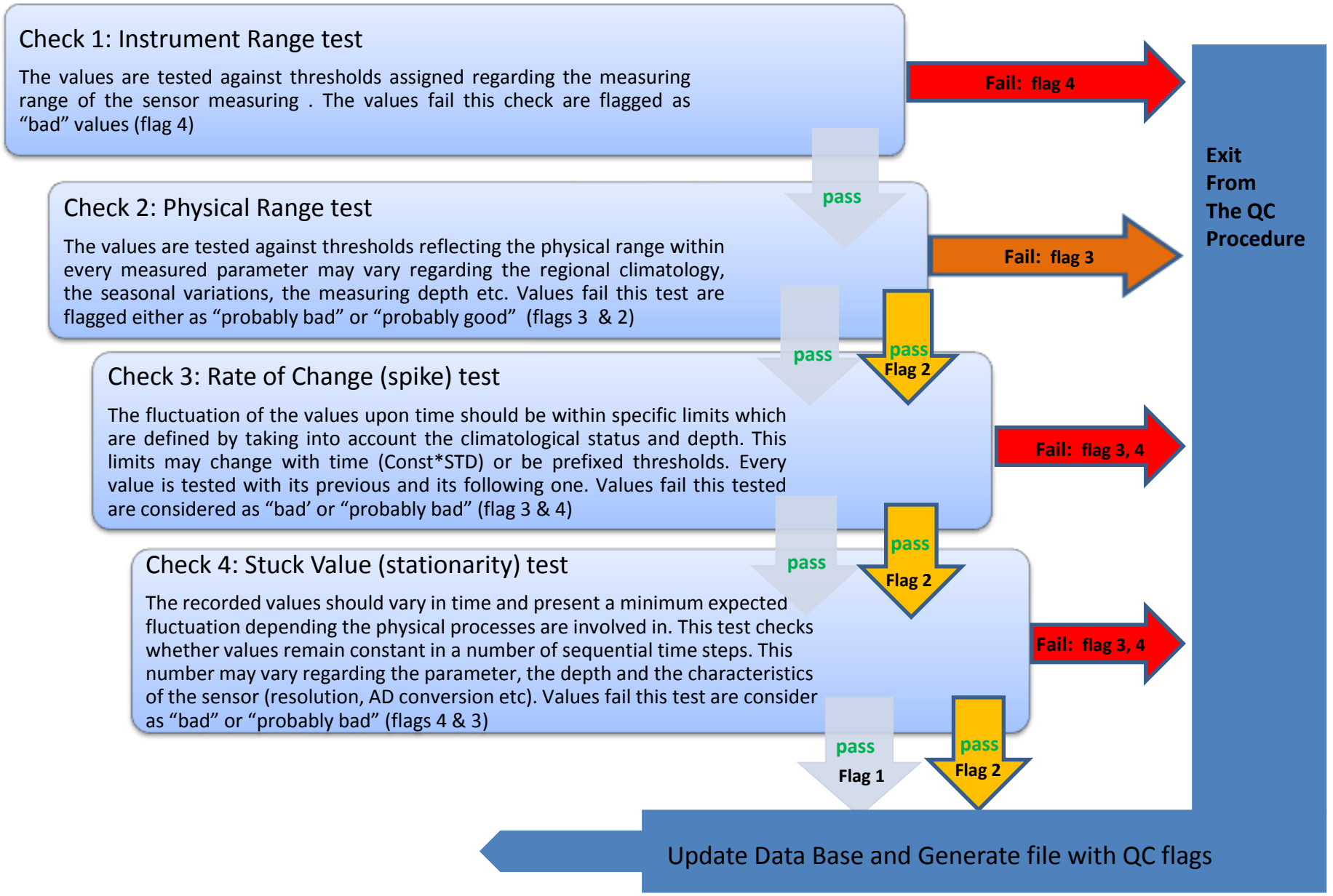
DATA TRANSMISSION

Data are transmitted to the Operational Center of POSEIDON using 3 telecommunications systems:

- **-INMARSAT-C satellite**
- **- GPRS**
- **- Irridium**



Quality control procedures



FIELD SURVEY - M3A EXAMPLE

M3A buoy

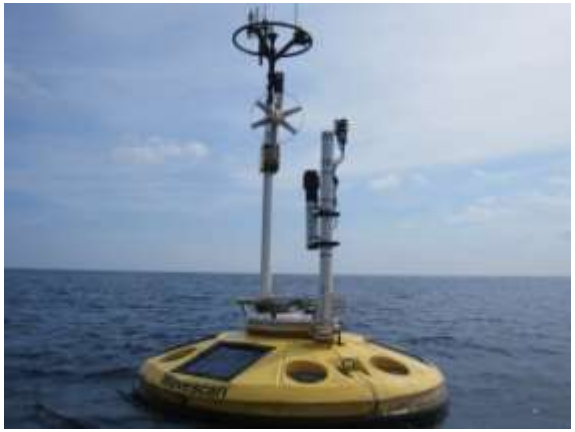
M3A monthly sampling

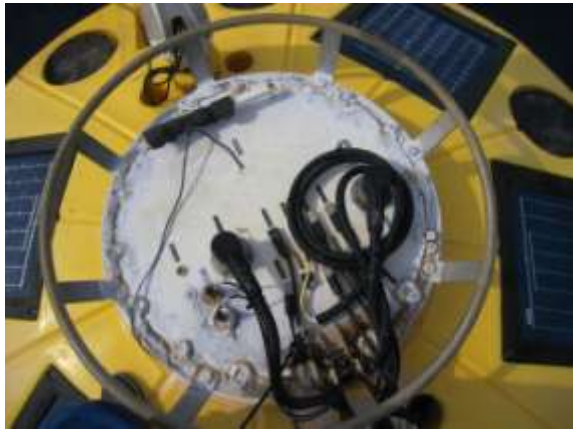
- CTD casting
- Water sampling
- Zooplankton sampling

Advantages

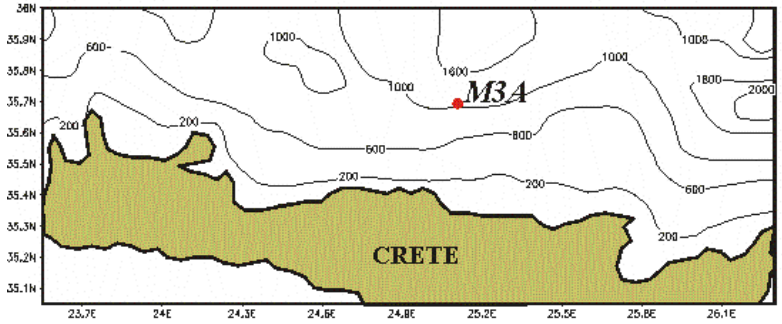
- Monitoring sensor behavior on the field
- Performing data corrections

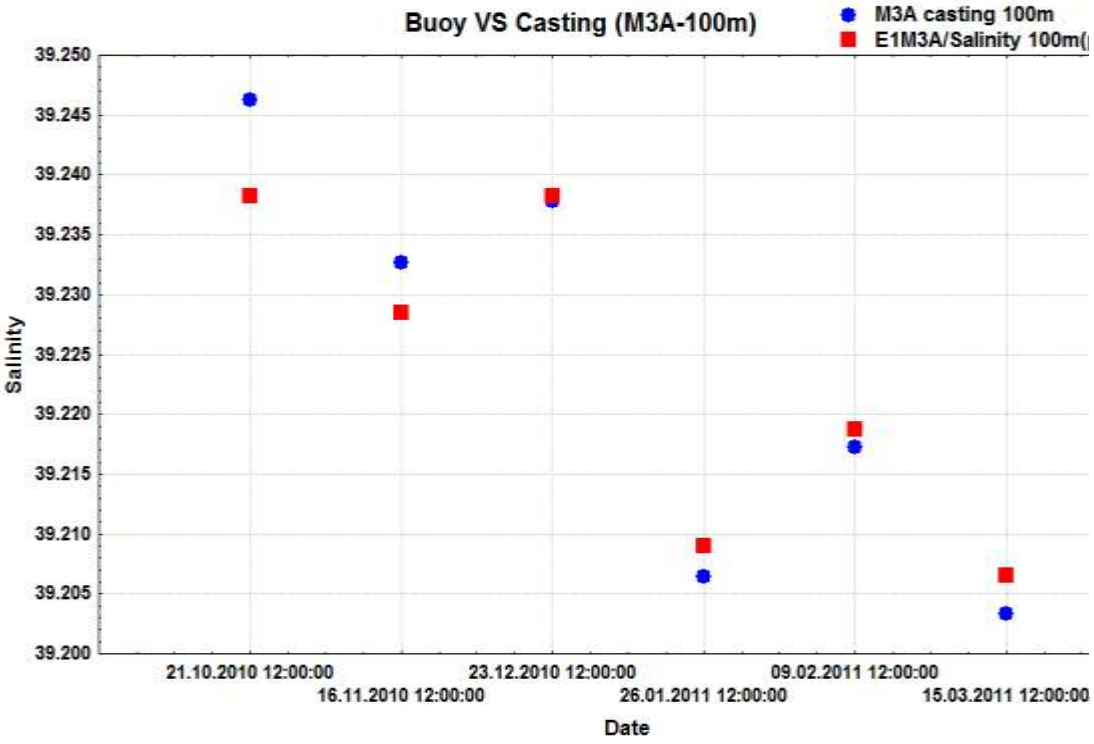
And emergency visits in case of malfunction

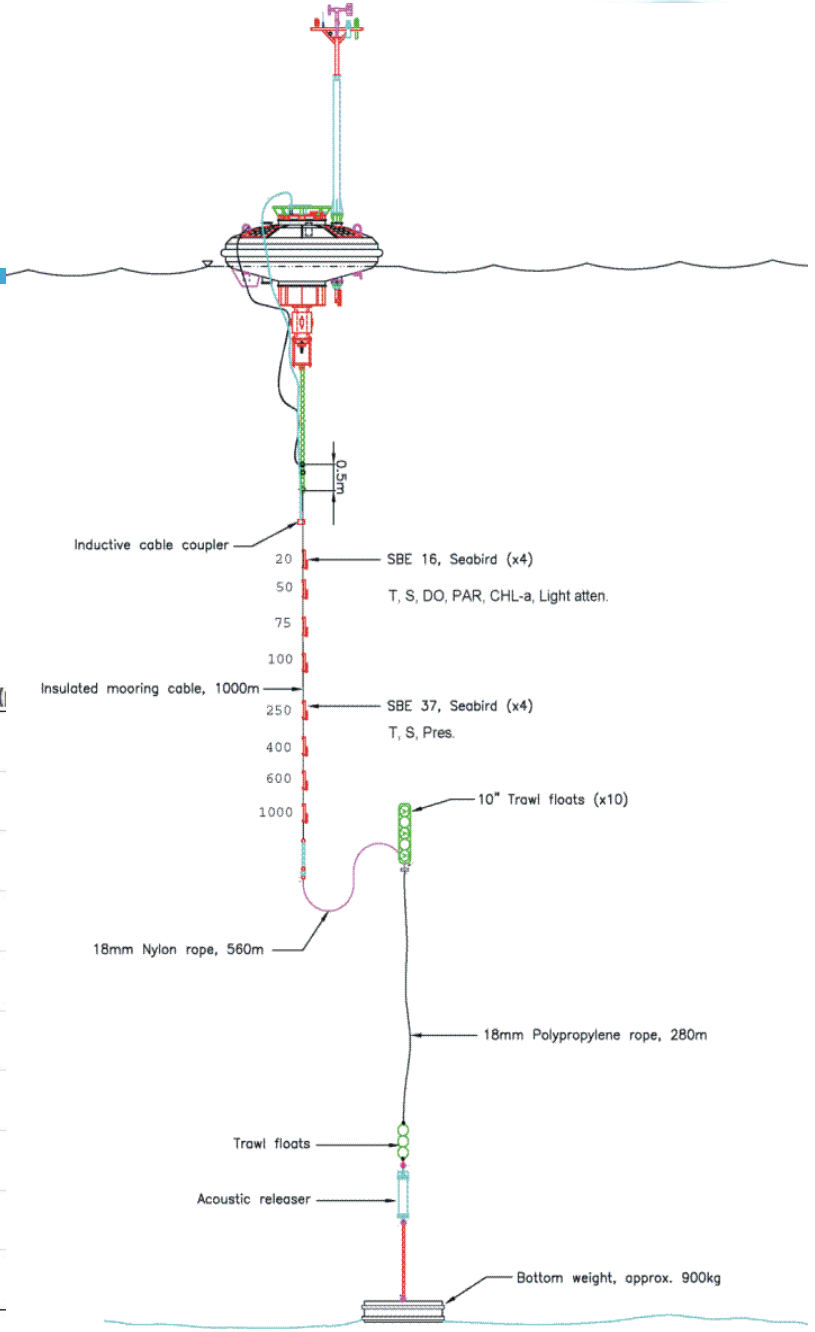




FIELD SURVEY - M3A EXAMPLE







SENSORS RECOVERY

On board maintenance

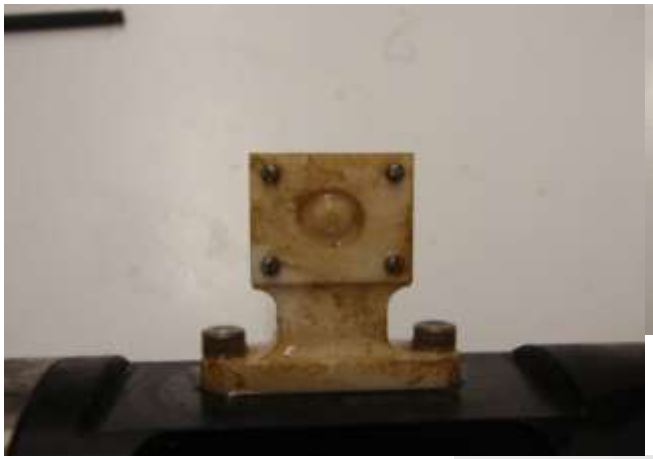
- Cleaning all the equipment with fresh water.
- Download data
- Conductivity cells and optical sensors immersed in deionized water
- Seabird electrochemical sensors sealed with tubes.

SENSORS MAINTENANCE

Lab maintenance

- Deep cleaning of the conductivity cells and the rest of the sensors.
- Batteries and spare parts replacement
- Functionality test

Usually the sensor manual cover all this procedure. Some companies provide even more – SEABIRD video tutorials at SBE webpage.



SENSORS CALIBRATION

Calibration procedure

- First define the acceptable residual thresholds in order to change calibration coefficients and then perform the calibration as described to the calibration manuals. ******* JERICO webpage hosts some calibration manuals, we NEED even more.

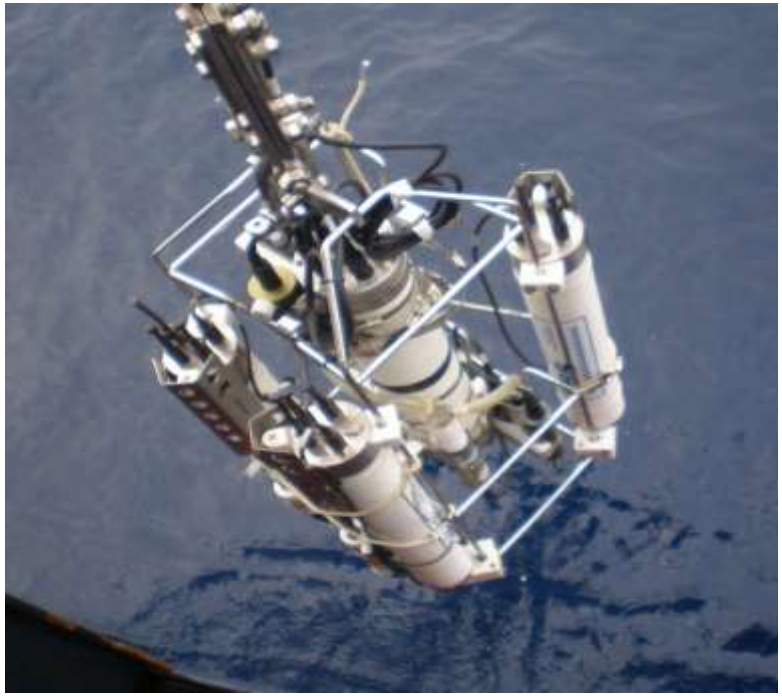
- Generally we try to use the same sets of sensors in each spot and calibrate them according to the spot climatology .

Validation before next deployment.

- On the lab, in one of the tanks with fresh sea water and 2-3 calibration steps.

- On the field, CTD casting and water sampling

Final product: Calibration report containing
- serial number and date
- previous cal coefficients
- new coefficients
- table with measurement of calibration steps
- graph and table with previous and new residuals
- graph and table with validation test with new residuals



SENSORS RECOVERY - BIOFOULING

Main body of the buoy, fouling doesn't affect the data.

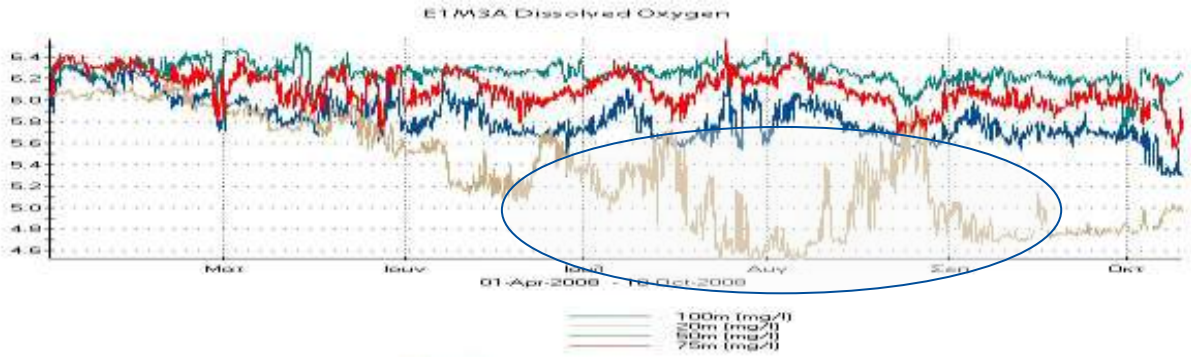
Current Meter

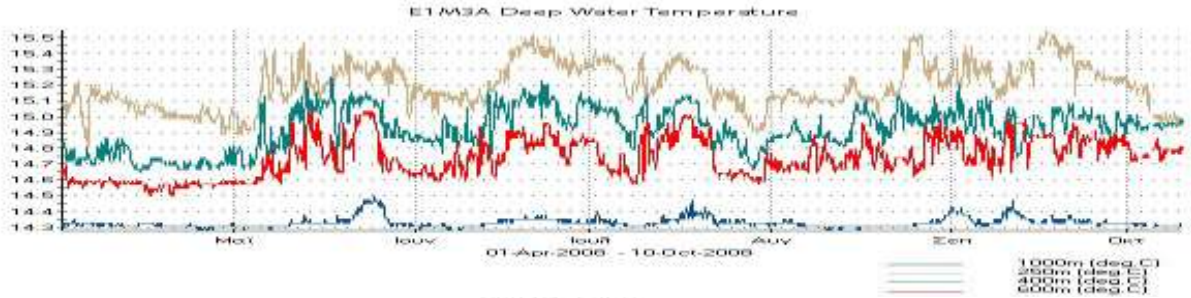
Conductivity sensor

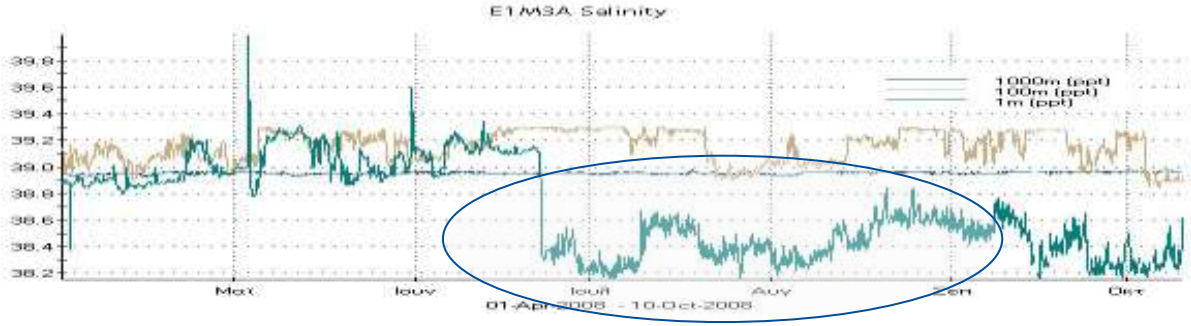
Sensor fouling – data affected

DO sensor

BIOFOULING AFFECT TO DATA







SENSORS RECOVERY - SOME BAD EXPERIENCES…….

Inductive cable destroyed

Seabird CTD 16plus as recovered

RECOVERY - SOME BAD EXPERIENCES…….

Buoyancy sphere explode at 2500 meters

What if the releaser doesn't respond, but you have a ROV