



National Research Council of Italy

# NEW HULL-MOUNTED INSTRUMENTATION ON RV “URANIA”

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*and*

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**15<sup>th</sup> European Research Vessel Operators Annual Meeting**

**5 – 6 June 2013**

**IFREMER, Brittany Research Center**

**Plouzané (France)**

**29.03.2013**

# The Project

## The goal:

**install two complementary multibeam systems**

- High resolution in shallow water (< 1000 m)
- Full Mediterranean depth (down to 3500 m)

## The problem:

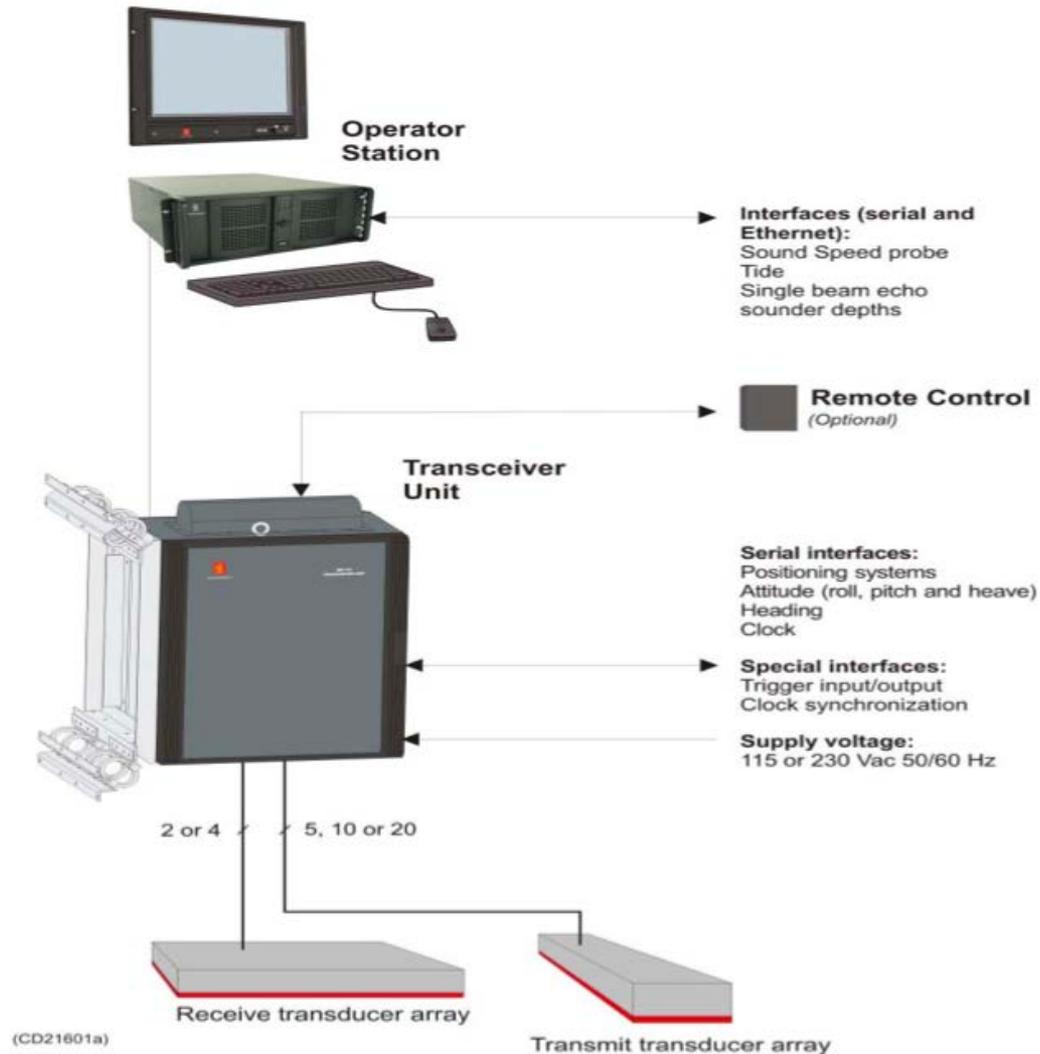
**medium-size vessel (63m) with limited hull space**

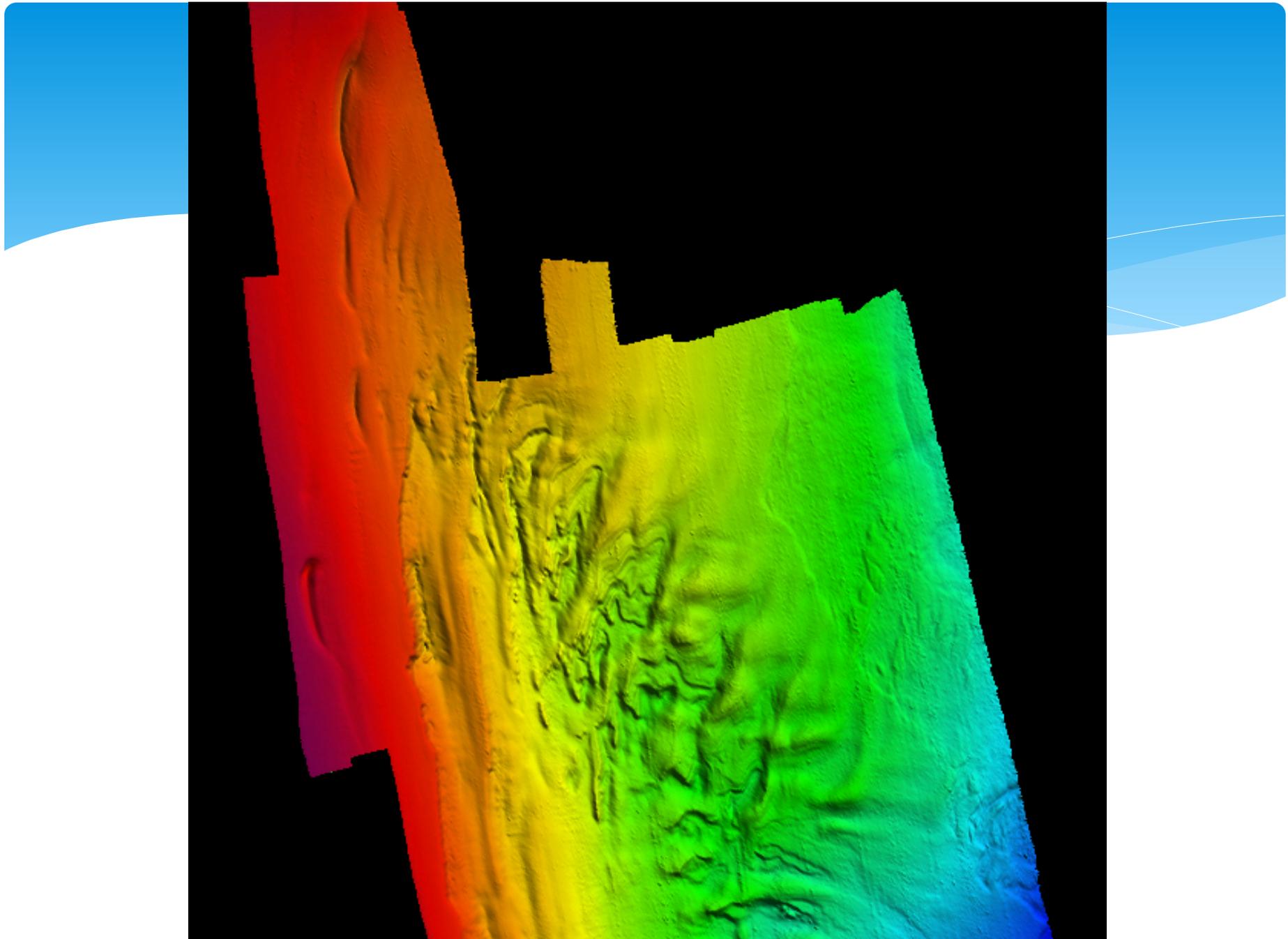
## The solution:

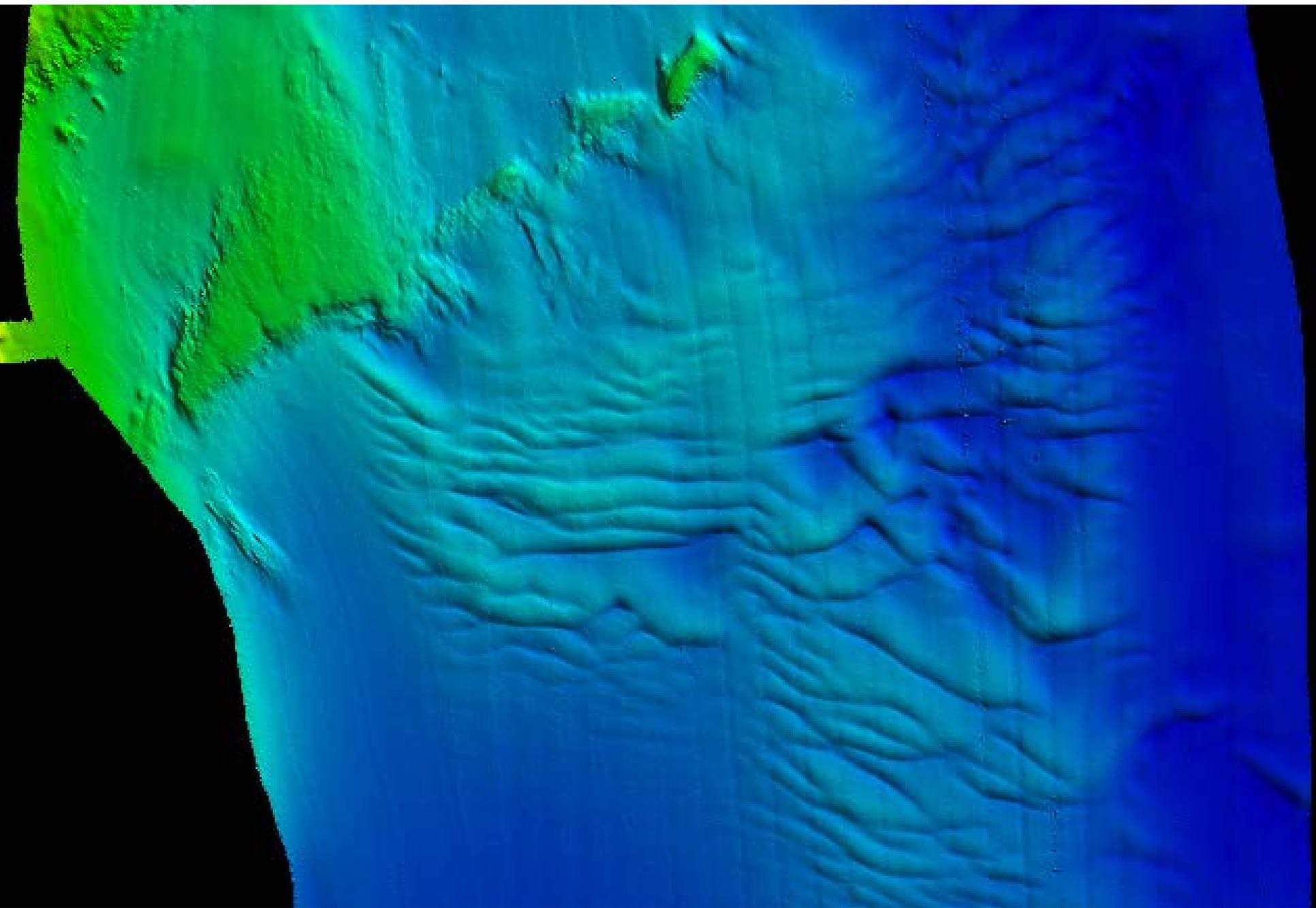
**detached blister**

## The result

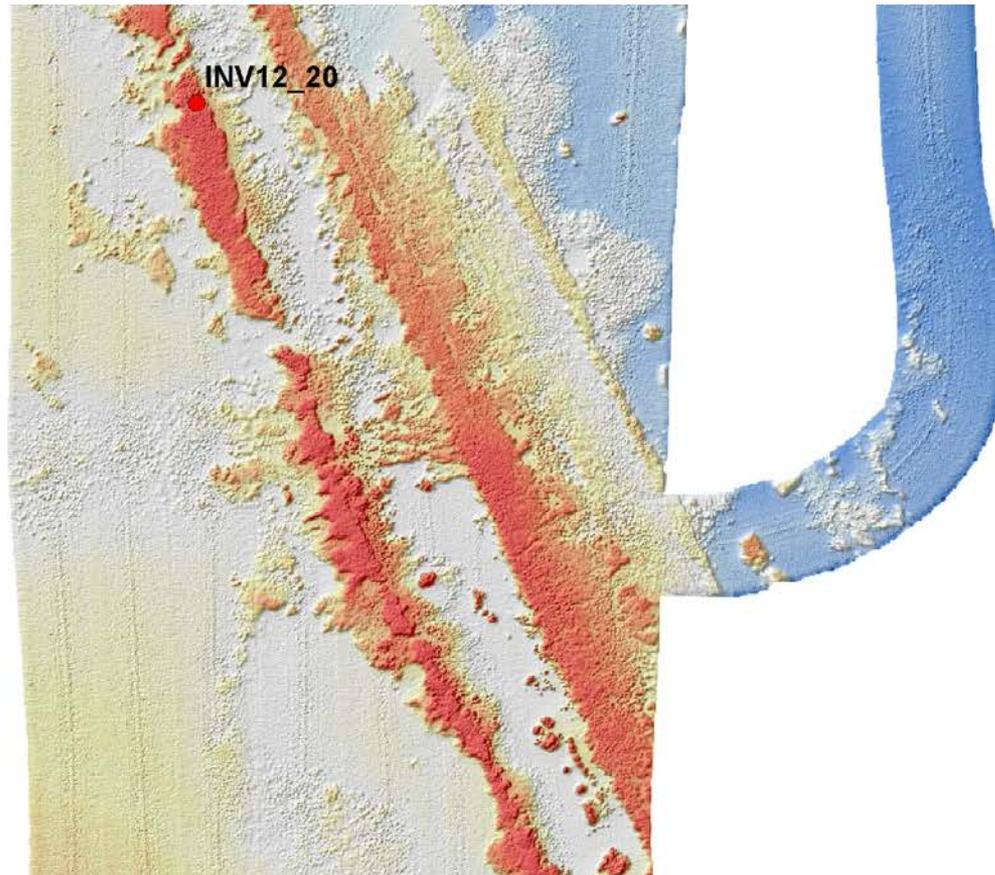
# Kongsberg EM 710 (1x1) Multibeam echo sounder



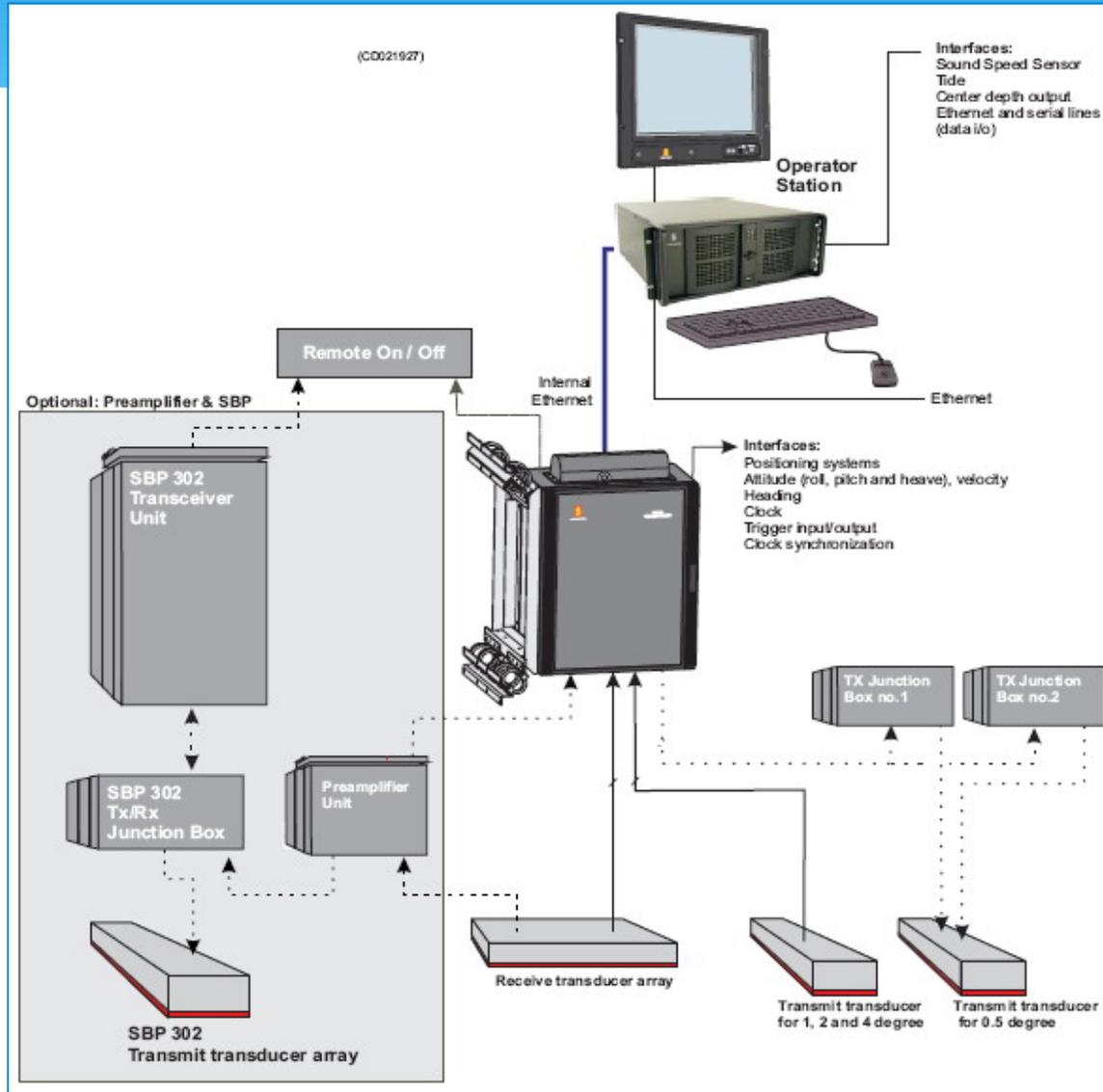




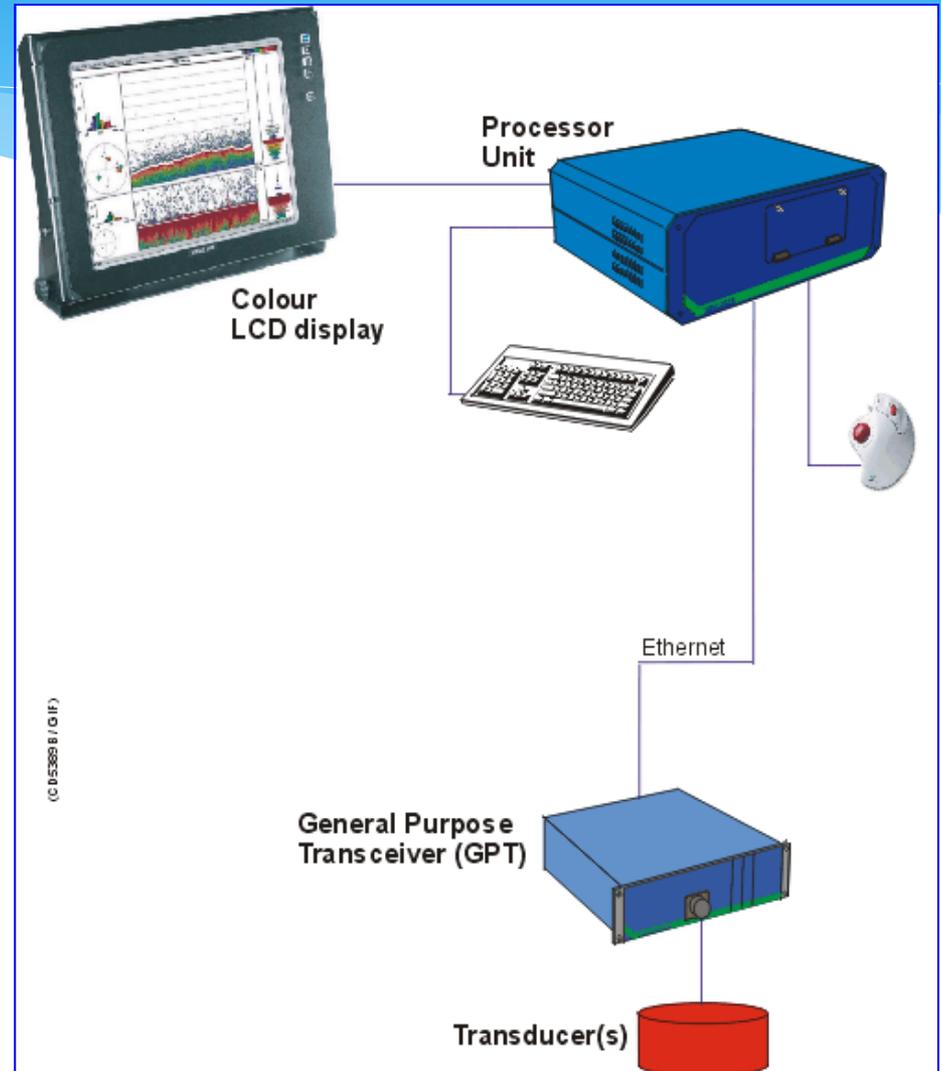
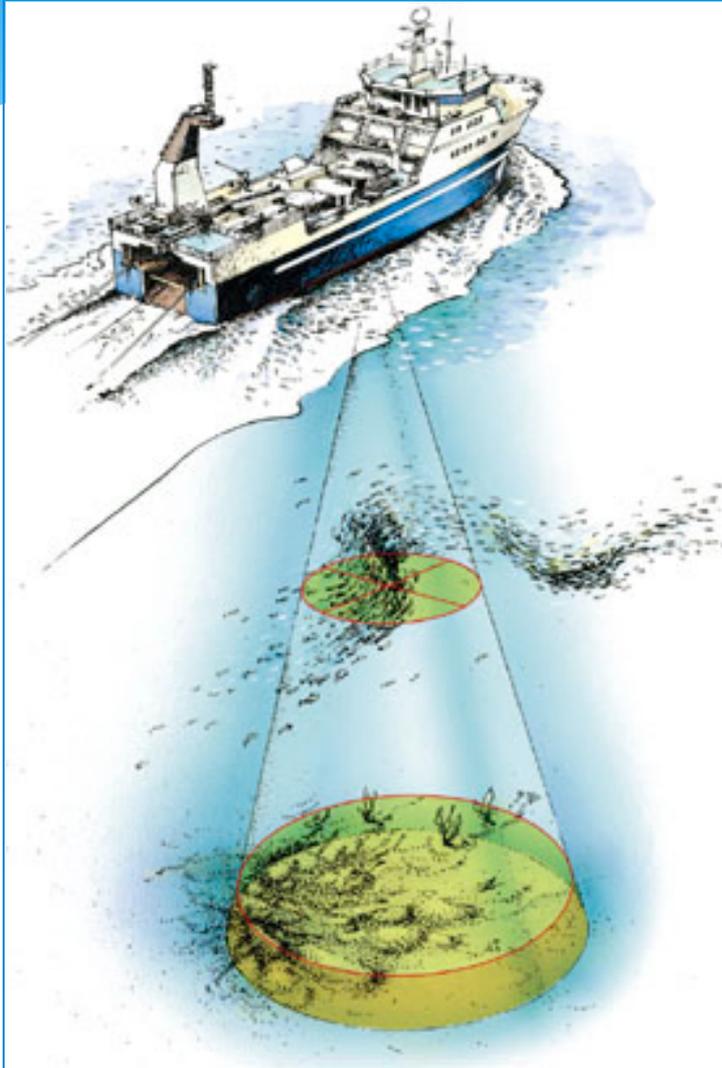
# Backscatter and Habitat mapping



# Kongsberg EM 302 (1x2) Multibeam echo sounder



# Simrad EK60 Scientific Sounder system



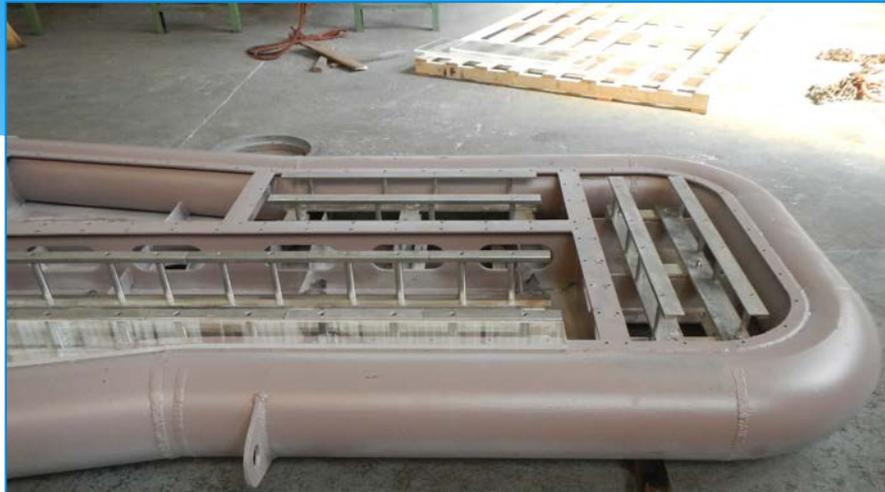
# OLD INSTALLATION

2009

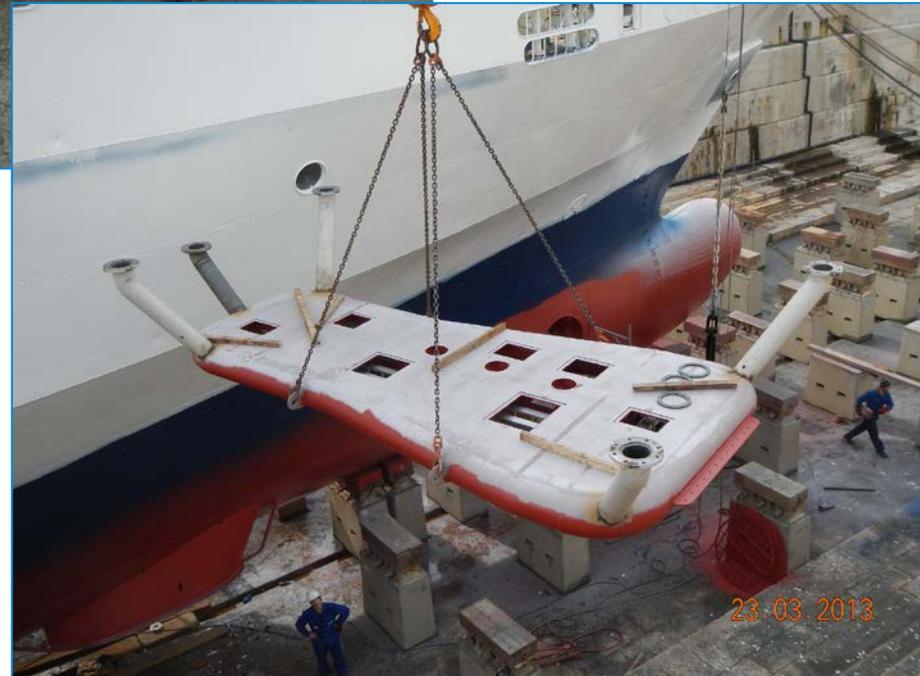


# NEW INSTALLATION

21-23/03/2013



23.03.2013



23.03.2013

# NEW INSTALLATION

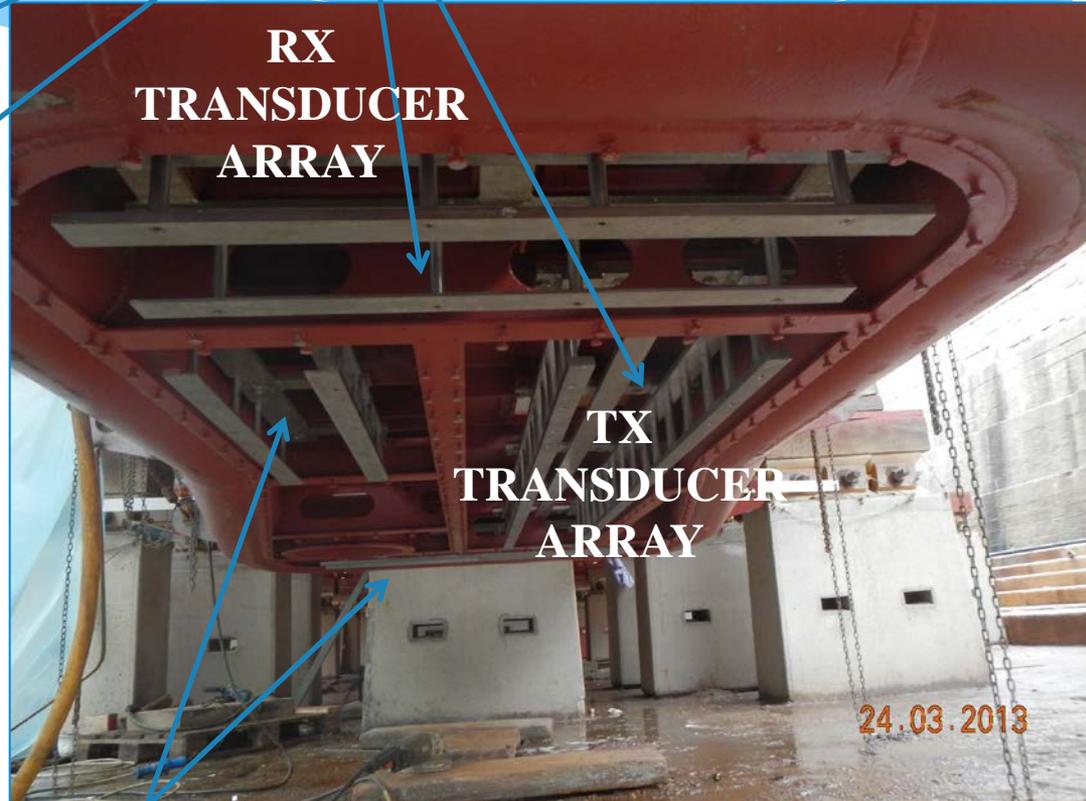
23/03/2013



# NEW INSTALLATION

24/03/2013

EM 302



RX  
TRANSDUCER  
ARRAY

TX  
TRANSDUCER  
ARRAY

EM 710

# NEW INSTALLATION

25/03/2013



# NEW INSTALLATION

26/03/2013



# NEW INSTALLATION

27/03/2013



27.03.2013



27.03.2013

# NEW INSTALLATION

28-29/03/2013

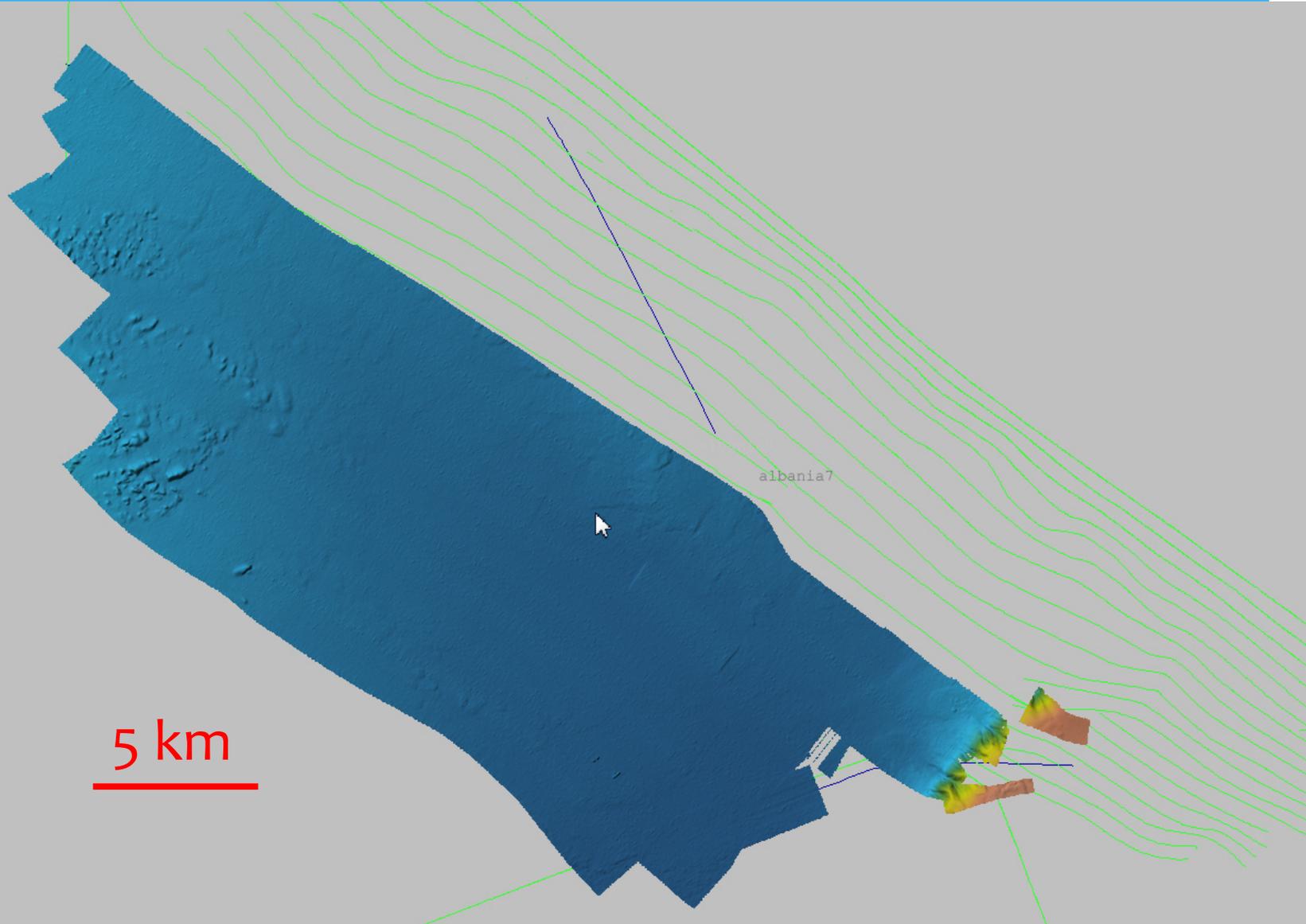


# NEW INSTALLATION

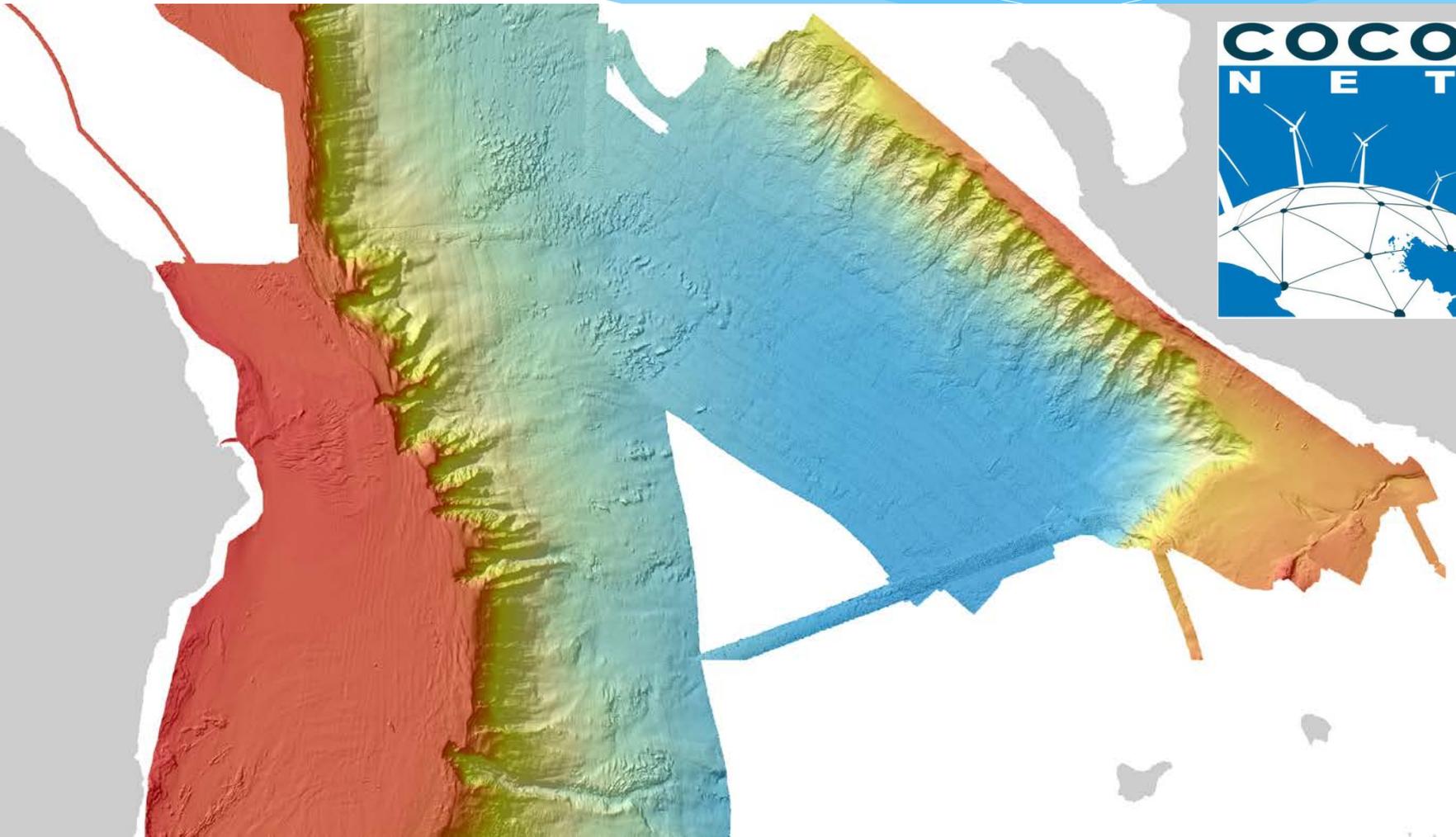
29/03/2013



# CALIBRATION AND PRELIMINARY RESULTS



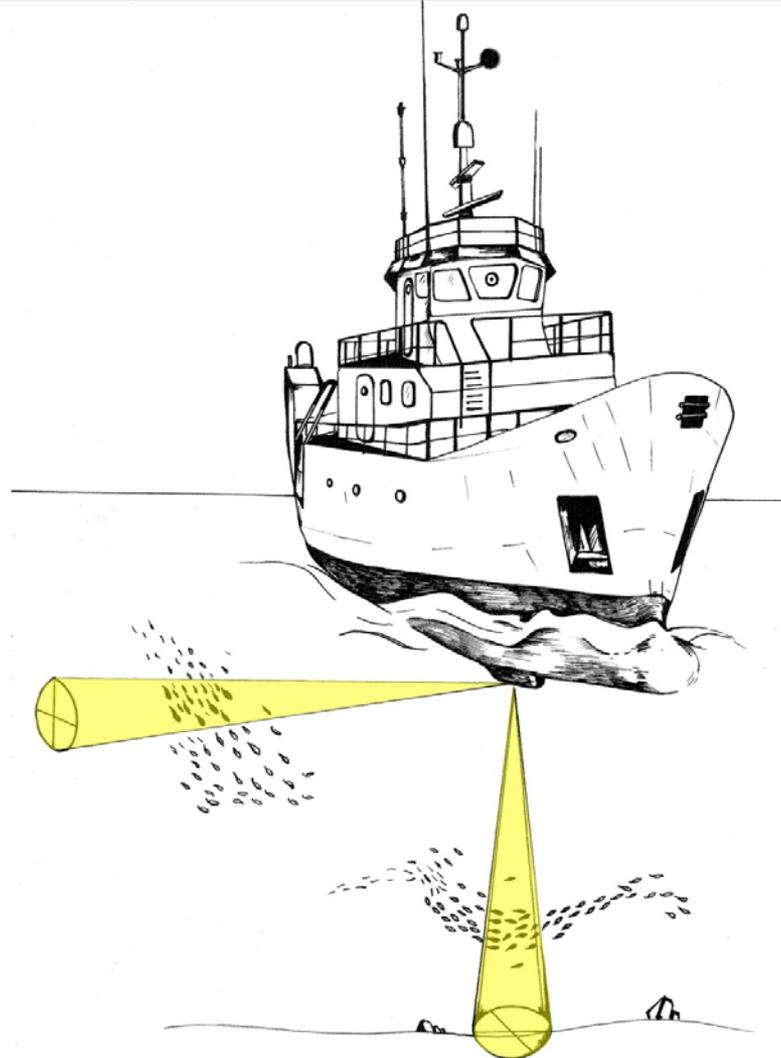
# COCONET “transnation” mapping



# R/V G. Dallaporta blister upgrade

Leonori I.<sup>1</sup>, De Felice A.<sup>1</sup>, Biagiotti I.<sup>1</sup>, Bonanno A.<sup>2</sup>, Buglioni G.<sup>1</sup>, Canduci G.<sup>1</sup>,  
Giuliani G.<sup>1</sup>

(1) CNR-ISMAR Ancona, (2) CNR-IAMC Mazara del Vallo (TP)



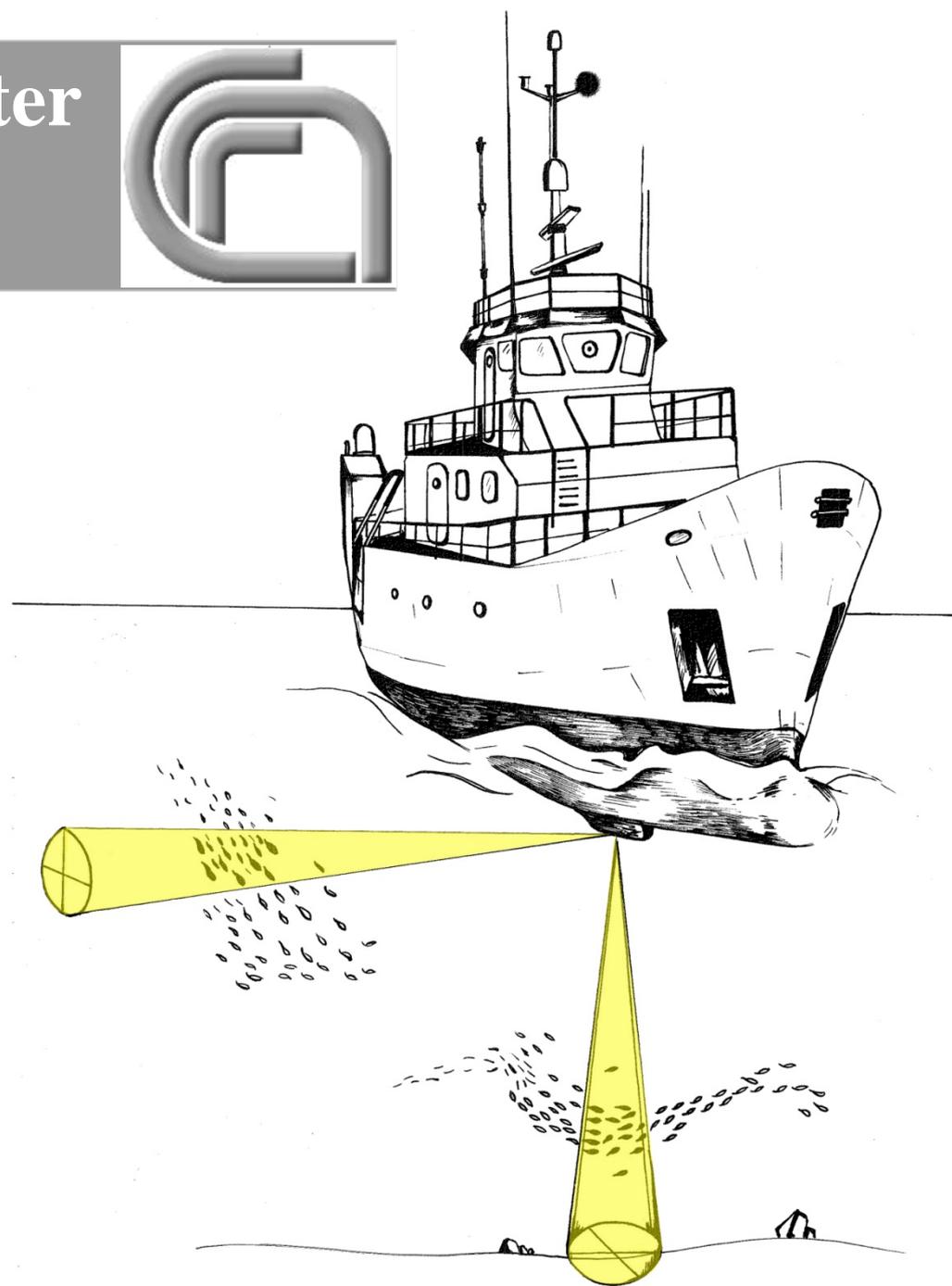
# R/V G. Dallaporta blister upgrade



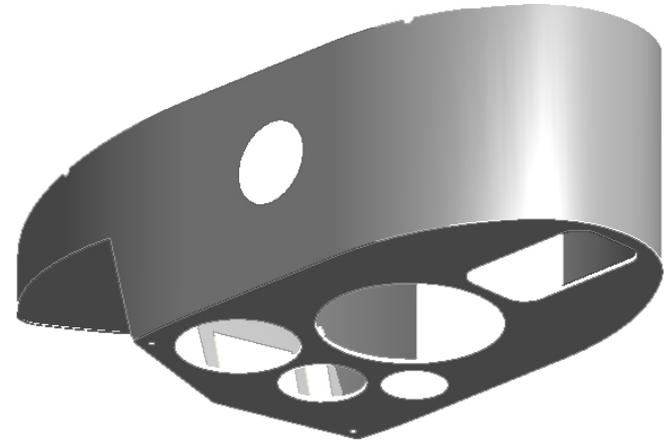
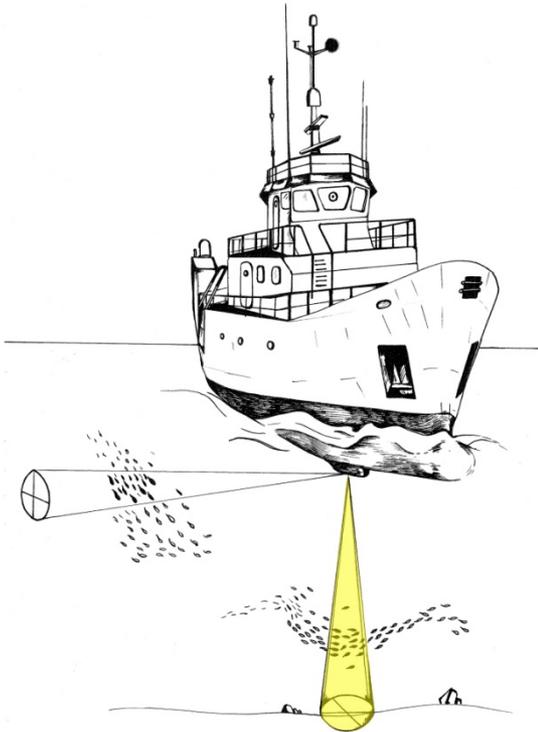
The new configuration in the blister of R/V G. Dallaporta has four transducers pointing downward (38, 70, 120 and 200 kHz), so that it is now possible to generate four acoustic beams in the water column and one (120 kHz) pointing starboard side.

The more frequencies are in use the more possibilities we have to get a typical fingerprint for a certain group of organisms, for example fish with swimbladder, from the rest of organisms. Using multifrequency approach has also the potential in time to distinguish at species level inside a certain group, for example anchovy among small pelagic fish with swimbladder, even if the precision of this highly depend on the number of frequencies involved.

In this context the new configuration with four frequencies is a big upgrade respect to the previous one with only three.

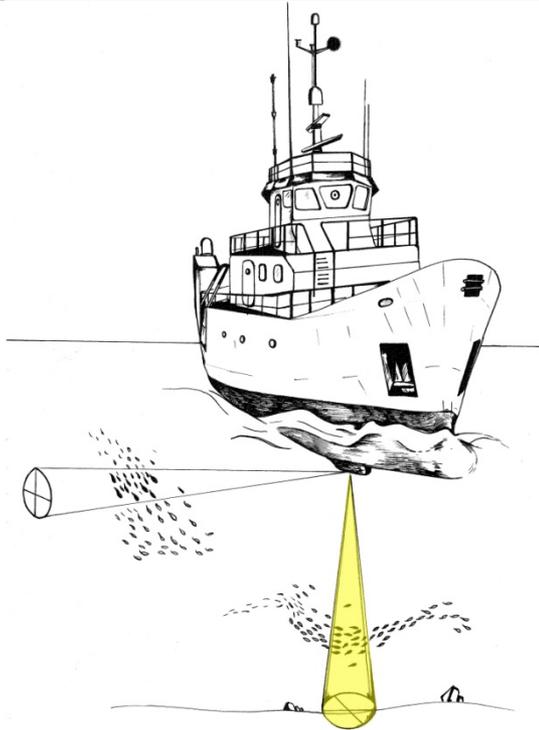


# Upgrades in vertical beaming

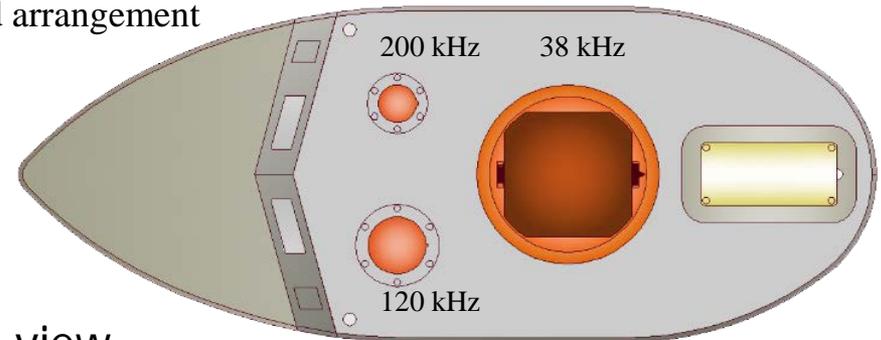


70 kHz transducer was added to cover the gap between 38 and 120 kHz.

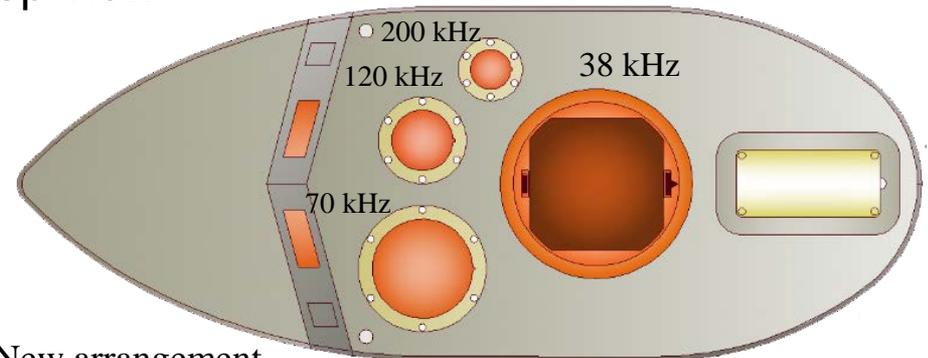
# Upgrades in vertical beaming



Old arrangement



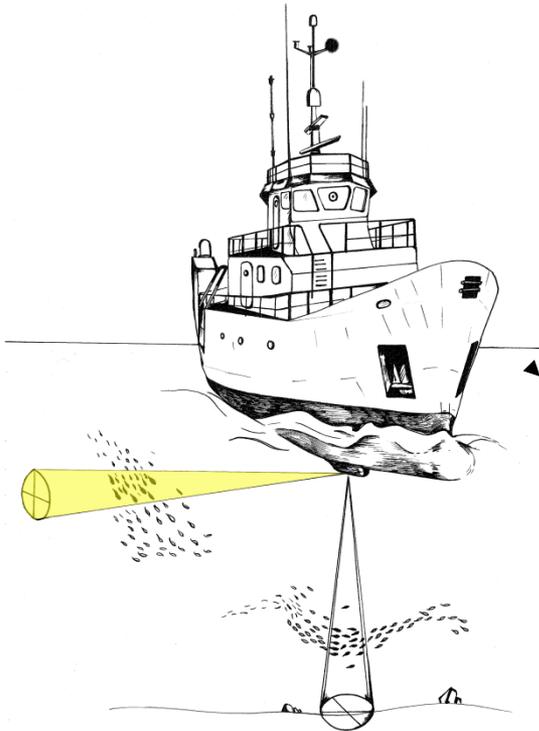
Top view



New arrangement

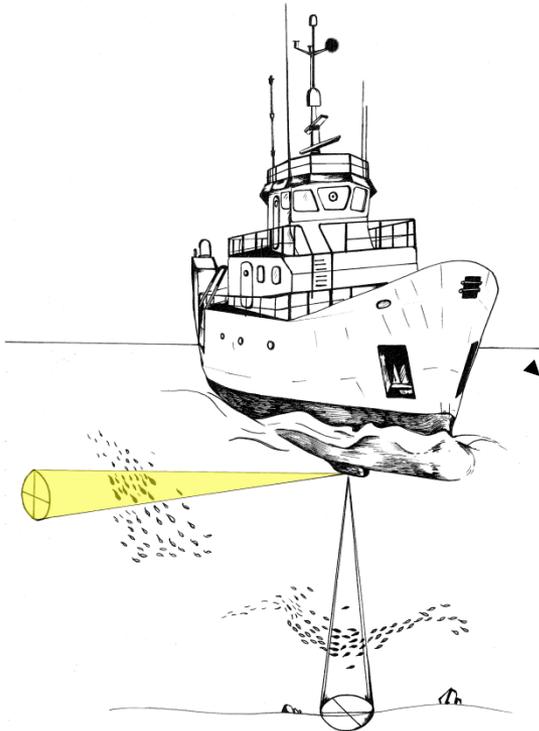
Transducers arrangement was done targeting maximum beams overlapping, a fundamental requirement for multifrequency analysis (Korneliussen *et al.*, 2008).

# Side beaming



The addition of side-beaming at 120 kHz allows the acoustic investigation at a side of the ship with the main aim to fill the gap given by the transducer installation depth (draft) plus the Fresnel zone (interference from the transducer to the generation of the acoustic beam) that consist in a permanent blind zone that in the case of R/V Dallaporta is around 7 meters at 38 kHz.

# Side beaming



The information taken through this transducer will give an idea of fish presence in the first meters of the water column that normally are missed, possibly improving the data acquisition in the future; moreover the observation of animals like tunas and dolphins will be highly improved due to their prevalent localization in the surface layer.



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# Thanks for your attention!

## Any comments?

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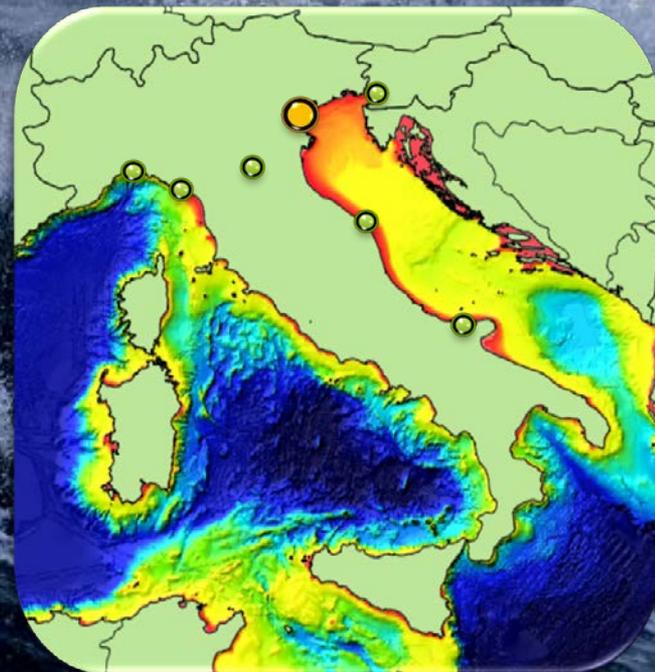
**ISMAR**

**Headquarter in Venezia, 6 regional sections**

**People: 175 (98 researchers, 57 technicians,  
20 admin)**

**Students: circa 90 (PhD, post-doc)**

**Pubblications: circa 150 on ISI journals**





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**ARSENALE**

**NEW FACILITY**



**RIVA DEI SETTE MARTIRI**

**SCHOOL  
OF MARINE SCIENCES**

# ISMAR OBSERVING SYSTEM

- Buoys, platforms, moorings
- Repeated hydrological transects (3-6 months)
- LTER stations
- *Fishery observing system*

