

June, 6-7th 2012

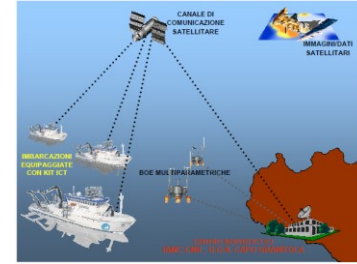
Venue: IAMC-CNR, Capo Granitola, Italy

Fishing Vessel Monitoring Systems (VMS) as a tool in support to the Ecosystem Approach to Fisheries Management

Bernardo Patti
CNR-IAMC, Capo Granitola,
Campobello di Mazara (TP), Italy

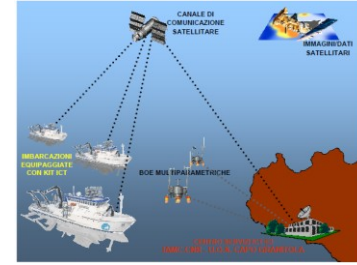


Fishing Vessel Monitoring Systems (VMS) as a tool in support to the Ecosystem Approach to Fisheries Management

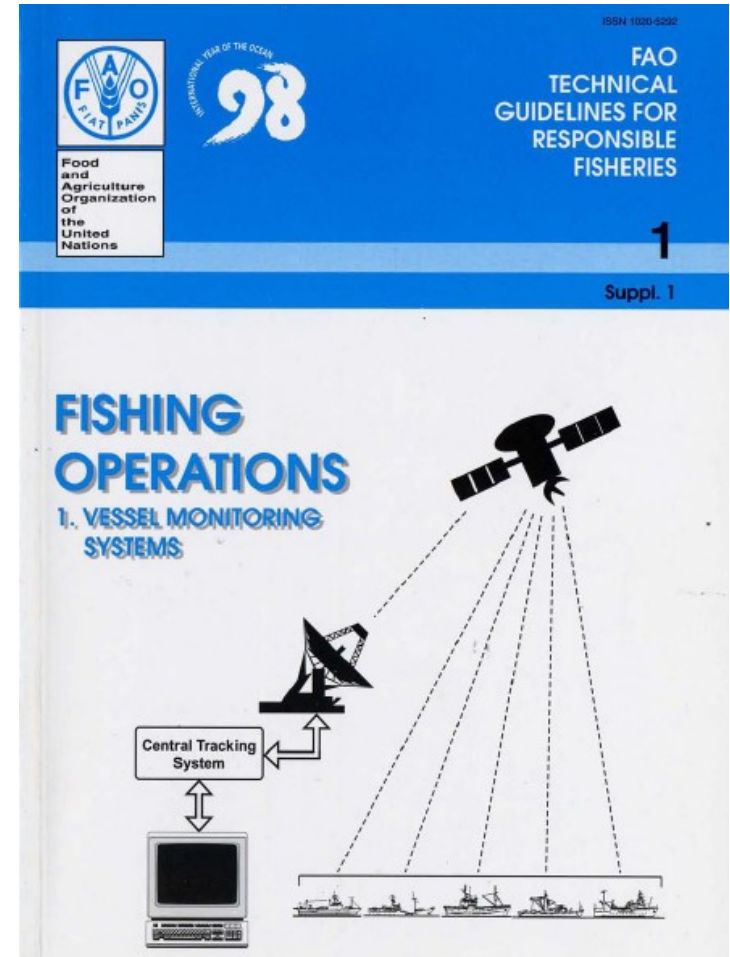


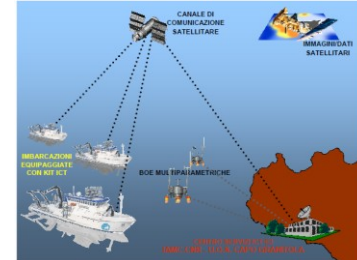
- ❑ Fishing Vessel monitoring systems (VMS) are useful tools for the monitoring, control and surveillance (MCS) of fisheries activities. VMS is intended principally for fisheries management, though important applications also include safety and enforcement.
- ❑ Among the objectives of the CNR national project SSD-Pesca and of the RITMARE Flagship Programme (“The Italian research for the sea”) is the development of **enhanced VMS**, to be used for scientific research and improved fish stock assessment.
- ❑ This presentation aims at giving a short overview of the features of the VMS devices currently under development in the framework of the above-mentioned programs, indicating their possible role in support to the Ecosystem Approach to Fisheries management.

Fishing Vessel Monitoring Systems (VMS) as a tool in support to the Ecosystem Approach to Fisheries Management



The idea of Vessel Monitoring System (VMS) is not new ...

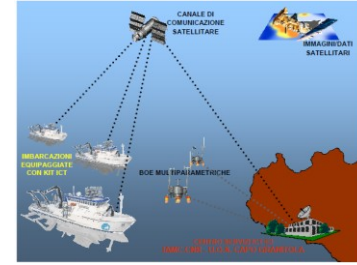




... however, VMS are increasing in importance due to the enforcement of EC regulations:

- Council Regulation (EC) No **1224/2009** of 20 November 2009 establishing a Community control system for ensuring compliance with the rules of the common fisheries policy, amending Regulations (EC) No 847/96, (EC) No 2371/2002, (EC) No 811/2004, (EC) No 768/2005, (EC) No 2115/2005, (EC) No 2166/2005, (EC) No 388/2006, (EC) No 509/2007, (EC) No 676/2007, (EC) No 1098/2007, (EC) No 1300/2008, (EC) No 1342/2008 and repealing Regulations (EEC) No 2847/93, (EC) No 1627/94 and (EC) No 1966/2006
- Commission Implementing Regulation (EU) No **404/2011** of 8 April 2011 laying down detailed rules for the implementation of Council Regulation (EC) No 1224/2009 establishing a Community control system for ensuring compliance with the rules of the Common Fisheries Policy

Fishing Vessel Monitoring Systems (VMS) as a tool in support to the Ecosystem Approach to Fisheries Management



As far as concerns the Med Sea, in particular, GFCM recently organized two events dedicated to VMS.



**GENERAL FISHERIES COMMISSION FOR
THE MEDITERRANEAN**
**COMMISSION GÉNÉRALE DES PÊCHES
POUR LA MÉDITERRANÉE**



SCIENTIFIC ADVISORY COMMITTEE (SAC)

**Report of the Workshop on the Implementation of a
Vessel Monitoring System (VMS) in the Mediterranean and the Black Sea**

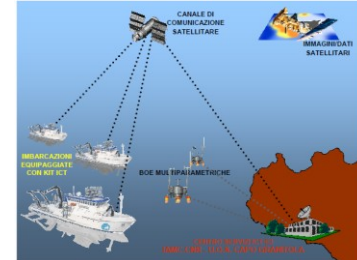
Zagreb, Croatia, 28-30 November 2011



GFCM - General Fisheries Commission for the Mediterranean

**VMS Expert Meeting on a
Technical Framework for Cooperation in the GFCM Area**

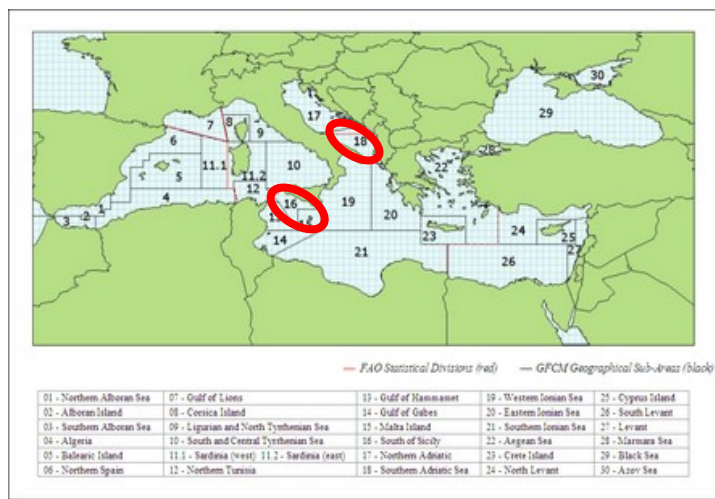
GFCM HQs, Rome, Italy, 25-26 Aprile 2012

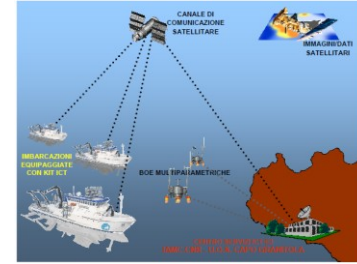


SSD-PESCA

“Decision support system for sustainable management of fisheries in the southern regions of Italy”

- Italian CNR project on fisheries
- Start: July, 1st 2011
- Duration: 3 years
- Budget: about 3 mln €
- Study areas: Strait of Sicily, Southern Adriatic

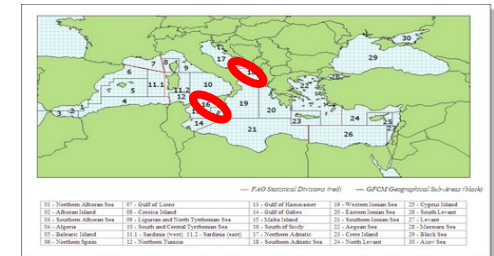




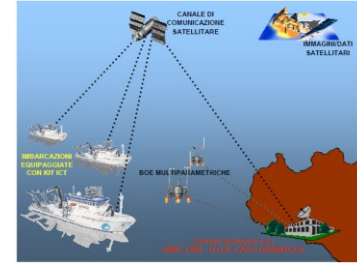
SSD-PESCA

“Decision support system for sustainable management of fisheries in the southern regions of Italy”

General objectives:

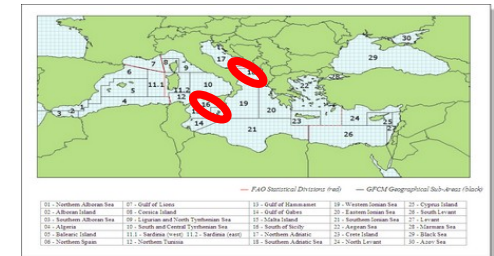


- to study the dynamics of fishing resources, in terms of abundance, demography and spatial distribution, depending on environmental conditions (water column and bottom biocenoses) and of the sampling carried out;
- provide knowledge to the industry to optimize the processes of capture, reducing negative environmental impacts and improving the economic performance of fisheries;
- provide technical and scientific support to the management (Ministry of Agriculture, Food and Forestry Departments counterparts in the southern regions) and supervisory control (Harbour) for efficient management of fishing effort and in particular fisheries in general.



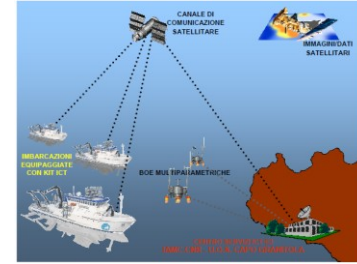
SSD-PESCA

“Decision support system for sustainable management of fisheries in the southern regions of Italy”

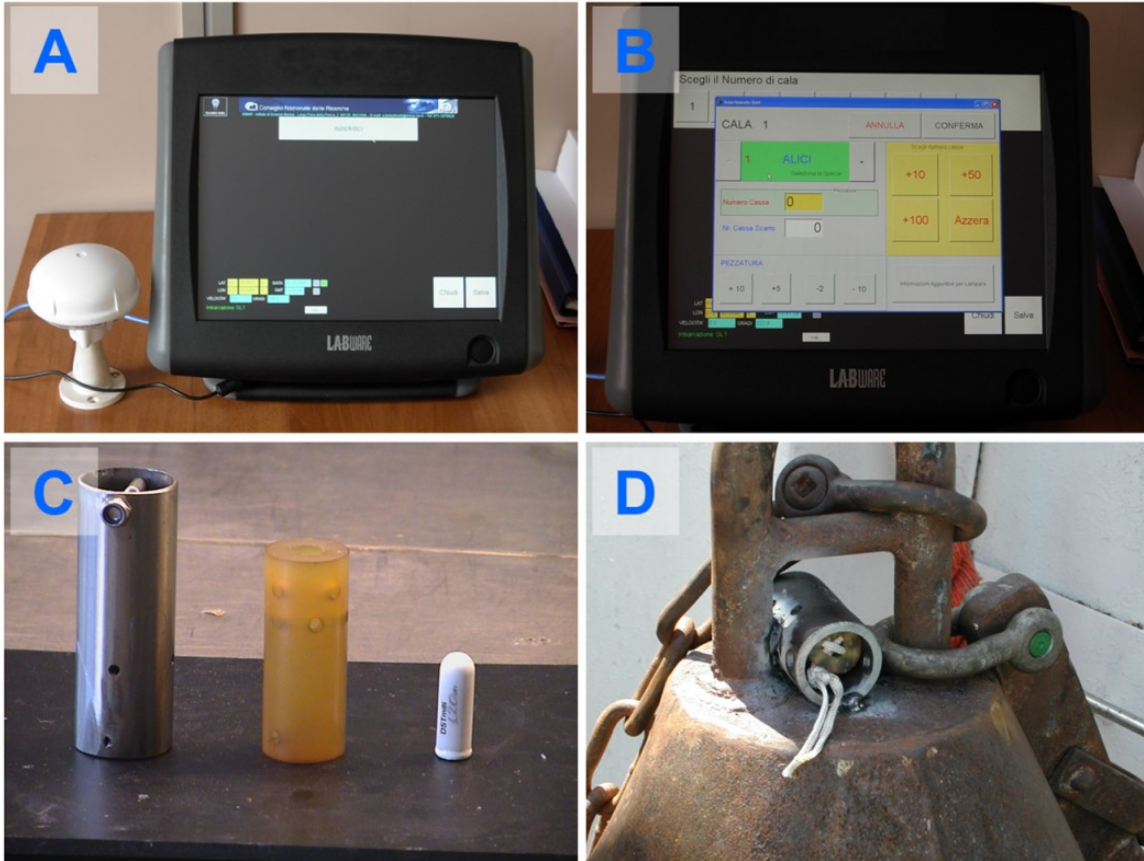


Specific objective of WP3:

- Design, development, implementation and testing of **interactive VMS devices** for the collection and transmission/reception of environmental and fisheries data, to be installed on board of fishing vessels.

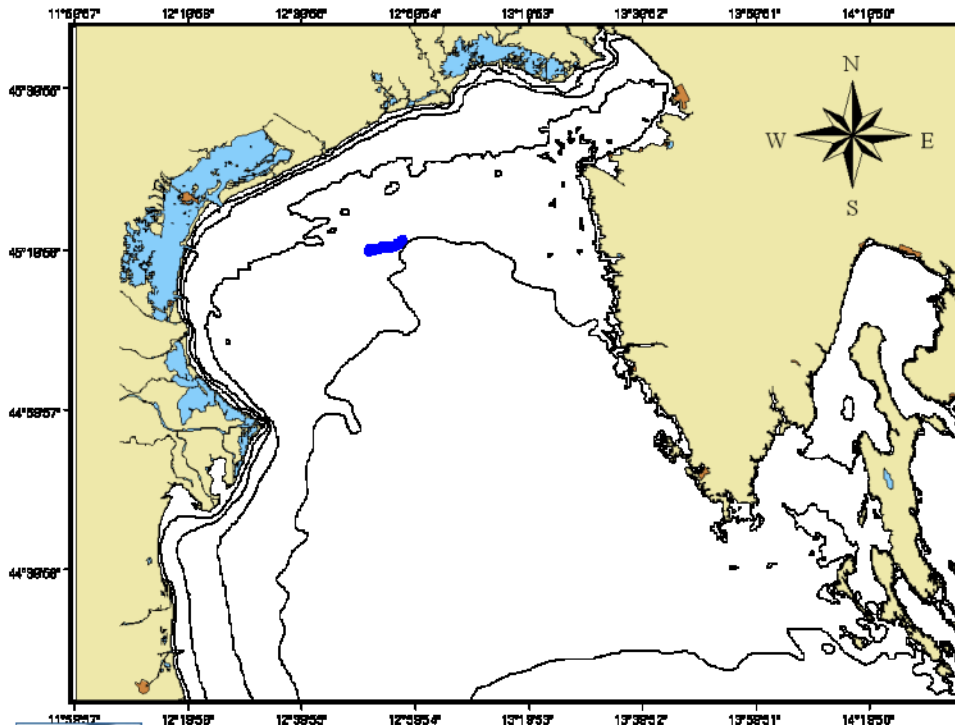
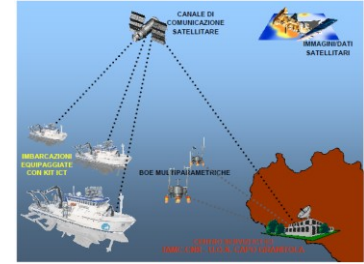


FISHERY OBSERVING SYSTEM:

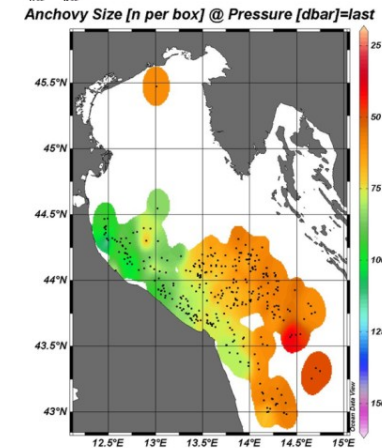
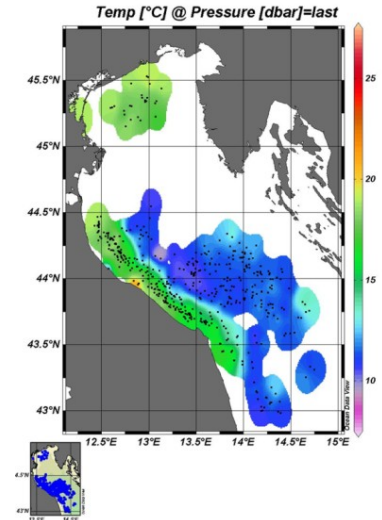


Electronic logbook with touch screen and GPS antenna connected (A); software for the input of species, quantity and size of fish, discards (B); sensor T/P (C), attached on the fishing net (D).

Geo-referenced Catch data, associated to temperature and depth



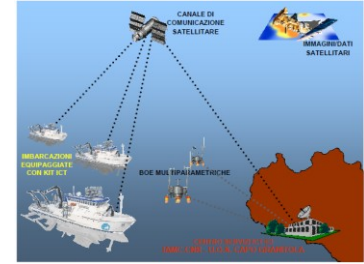
VESSEL	CH1
GEAR TYPE	VOLANTE
DATE	25/07/2007
LONStart	12.96
LATStart	45.35
LONEnd	12.86
LATEnd	45.33
SMean	4.88
MEAN T	21.22
STDEV T	0.43
MEAN P	2.14
STDEV P	0.03
DUR	59
DIST	4.8
ALICI CASSE	250
ALICI CASSE SCARTO	0
LANZARDI CASSE	0
LANZARDI CASSE SCARTO	0
SARDE CASSE	0
SARDE CASSE SCARTO	0
SGOMBRI CASSE	0
SGOMBRI CASSE SCARTO	0
SURI CASSE	0
SURI CASSE SCARTO	0



Northern-Central Adriatic Sea Database

a.belardinelli@an.ismar.cnr.it

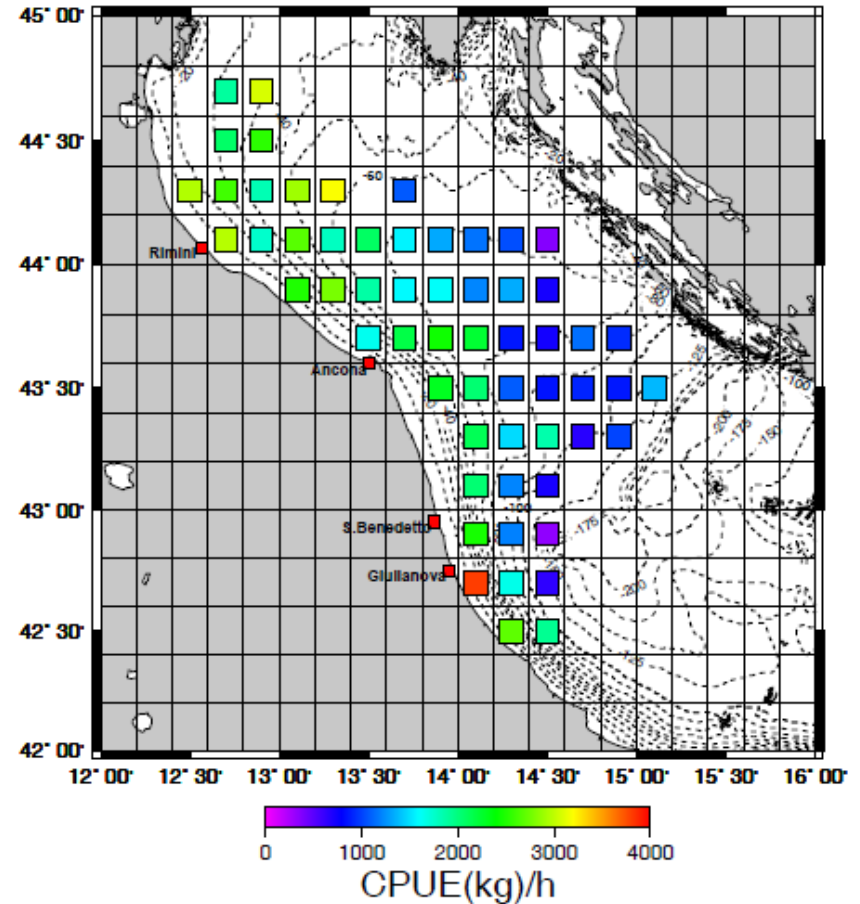
m.martinelli@an.ismar.cnr.it

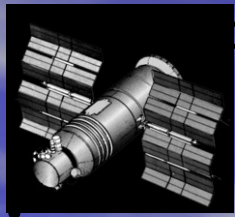


Integration of collected data

CPUE estimates for sardine in the Adriatic Sea (Falco *et al.* 2007)

CPUE = "Catch per Unit Effort"





COMMUNICATION
SATELLITE
CHANNEL



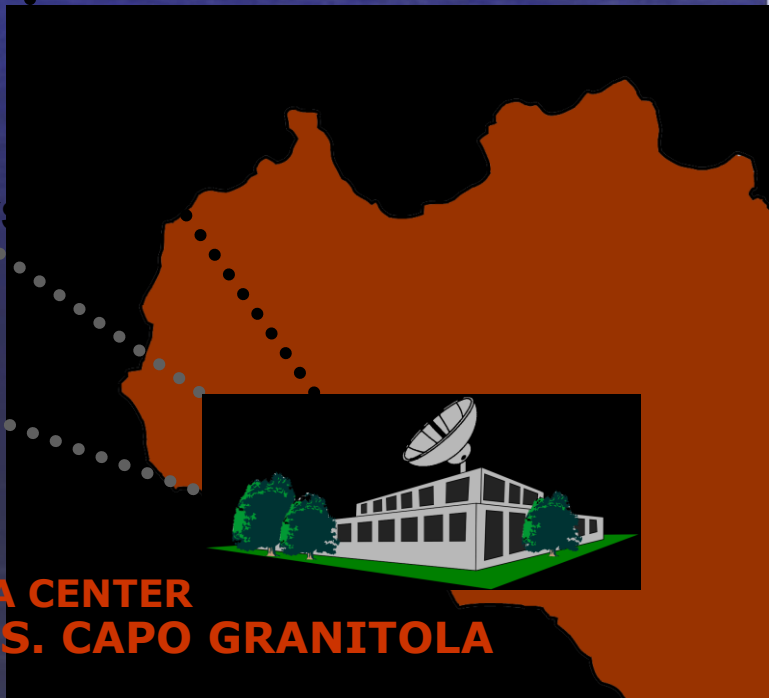
SATELLITE
IMAGES/DATA



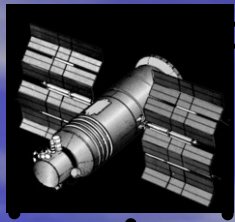
FISHING
VESSELS
EQUIPPED WITH
ICT-KIT



MULTIPLE BUOYS



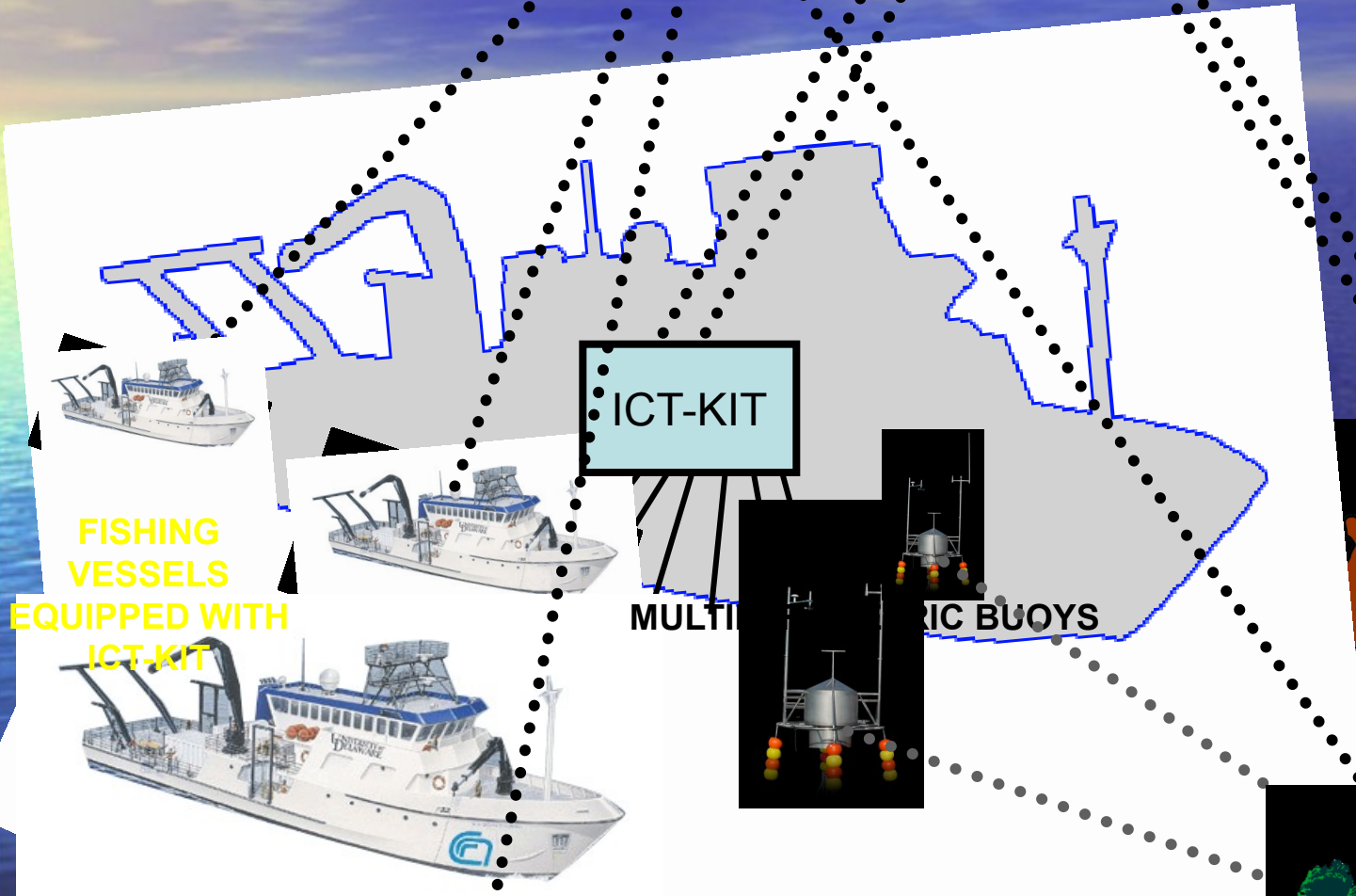
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COMMUNICATION
SATELLITE
CHANNEL



SATELLITE
IMAGES/DATA

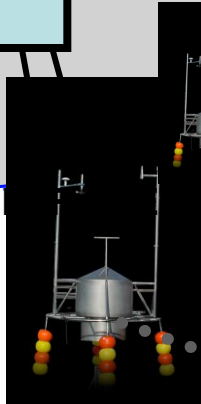


ICT-KIT

MULTI-POINT BUOY

MULTI-POINT BUOY

FISHING
VESSELS
EQUIPPED WITH
ICT-KIT

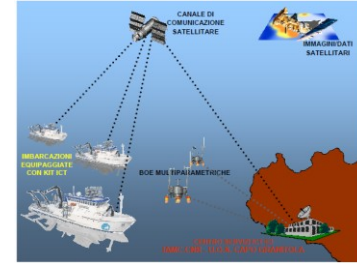


RESEARCH
SENSORS

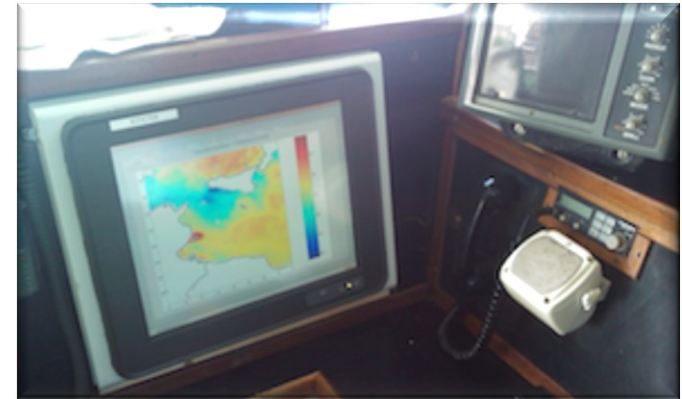


DATA CENTER
IAMC-CNR - U.O. CAPO GRANITOLA

Fishing Vessel Monitoring Systems (VMS) as a tool in support to the Ecosystem Approach to Fisheries Management



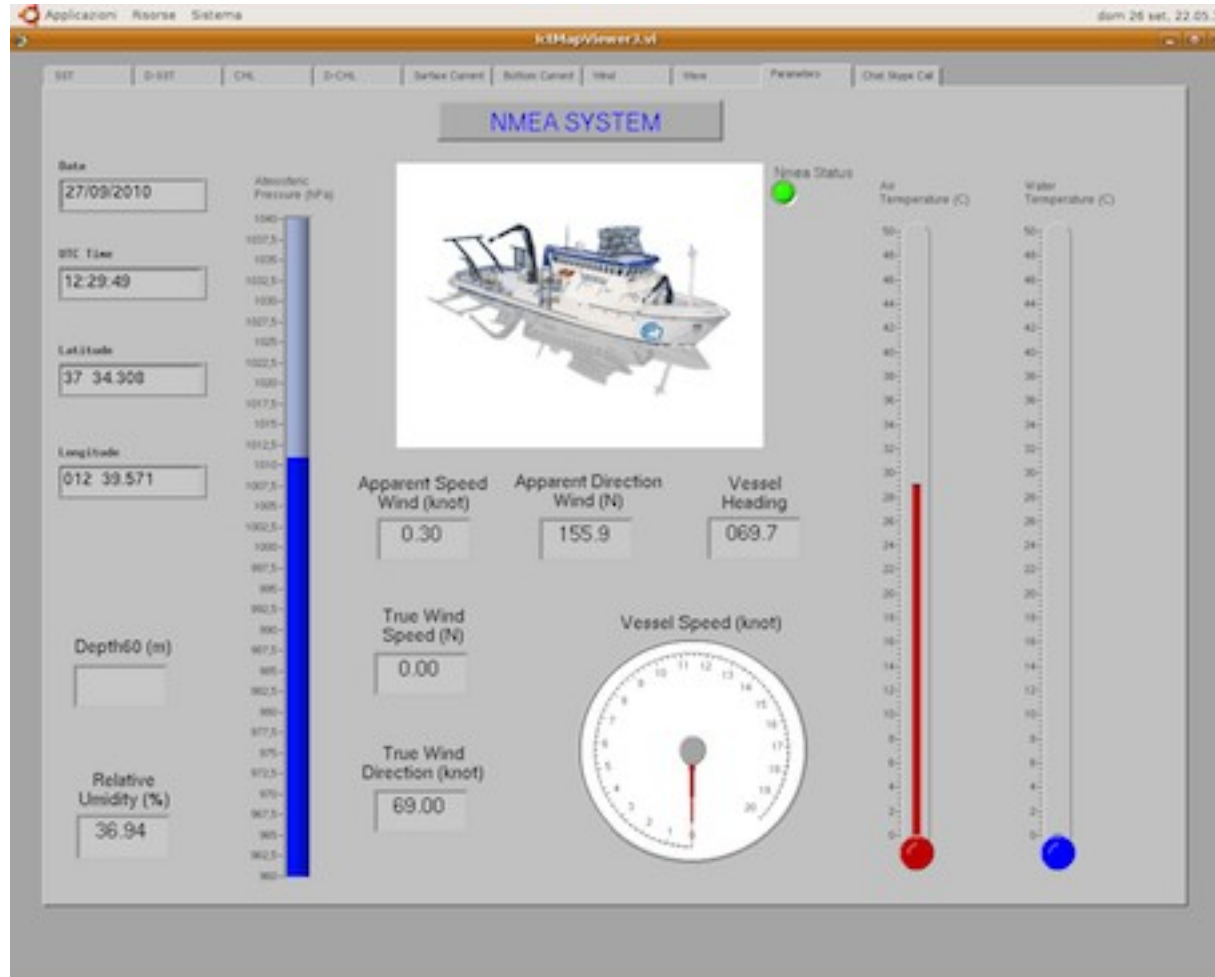
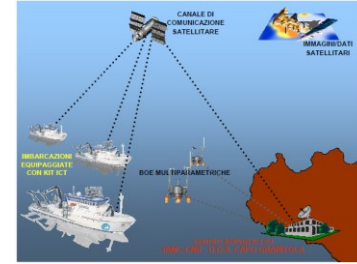
Installation aboard FV "Aristeus" (Mazara del Vallo bottom trawl fishery)



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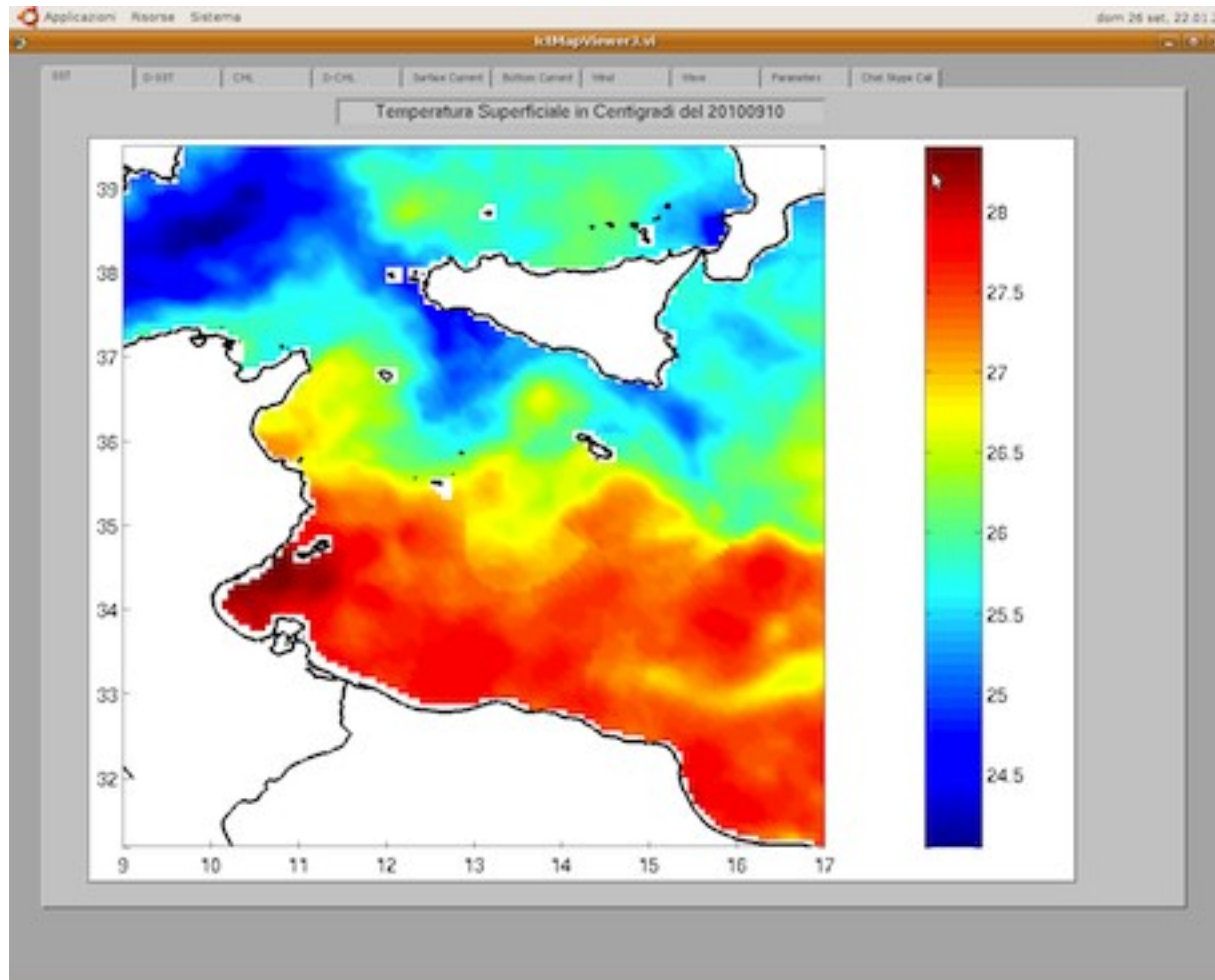
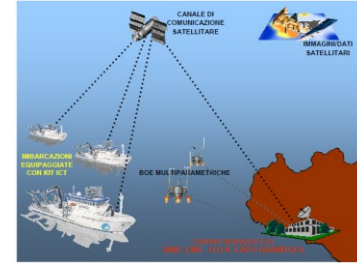
Navigation and Meteo parameters



Fishing Vessel Monitoring Systems (VMS) as a tool in support to the Ecosystem Approach to Fisheries Management



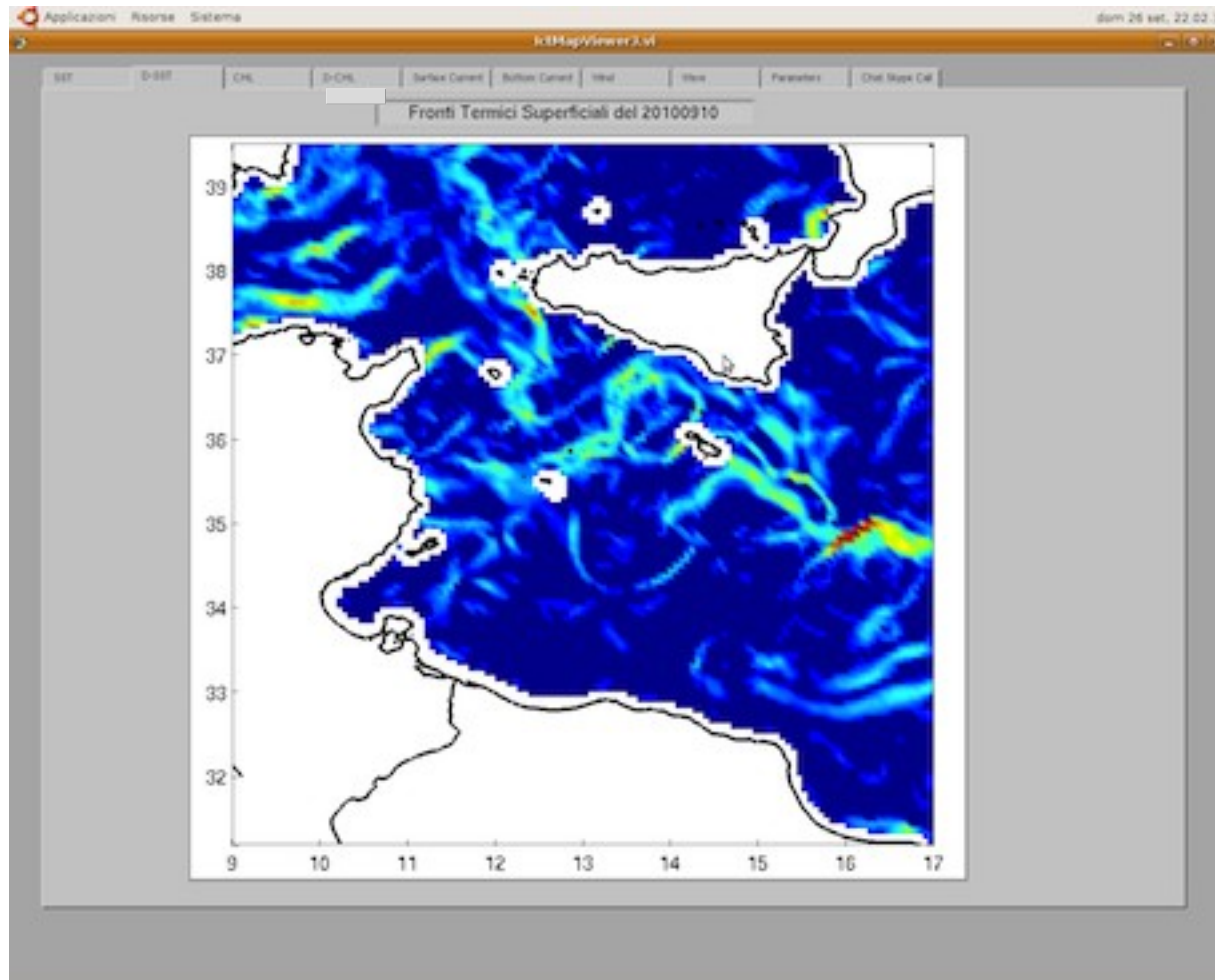
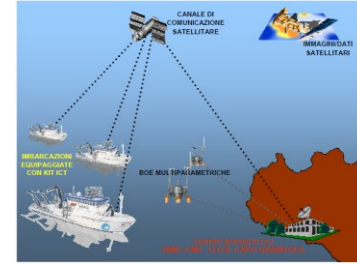
Sea Surface Temperature (SST)



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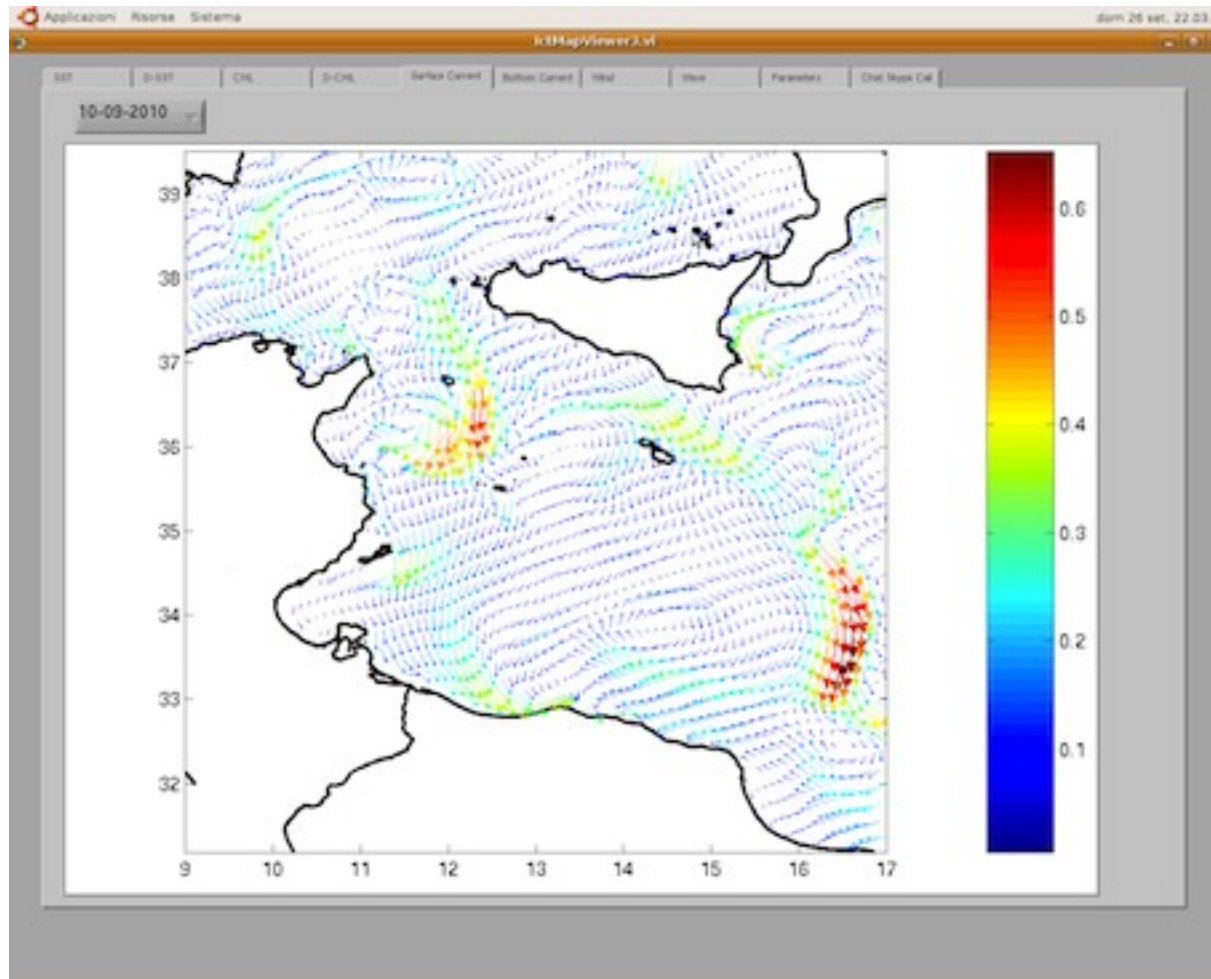
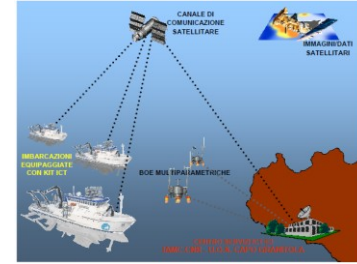
Sea Surface Temperature gradient



Fishing Vessel Monitoring Systems (VMS) as a tool in support to the Ecosystem Approach to Fisheries Management



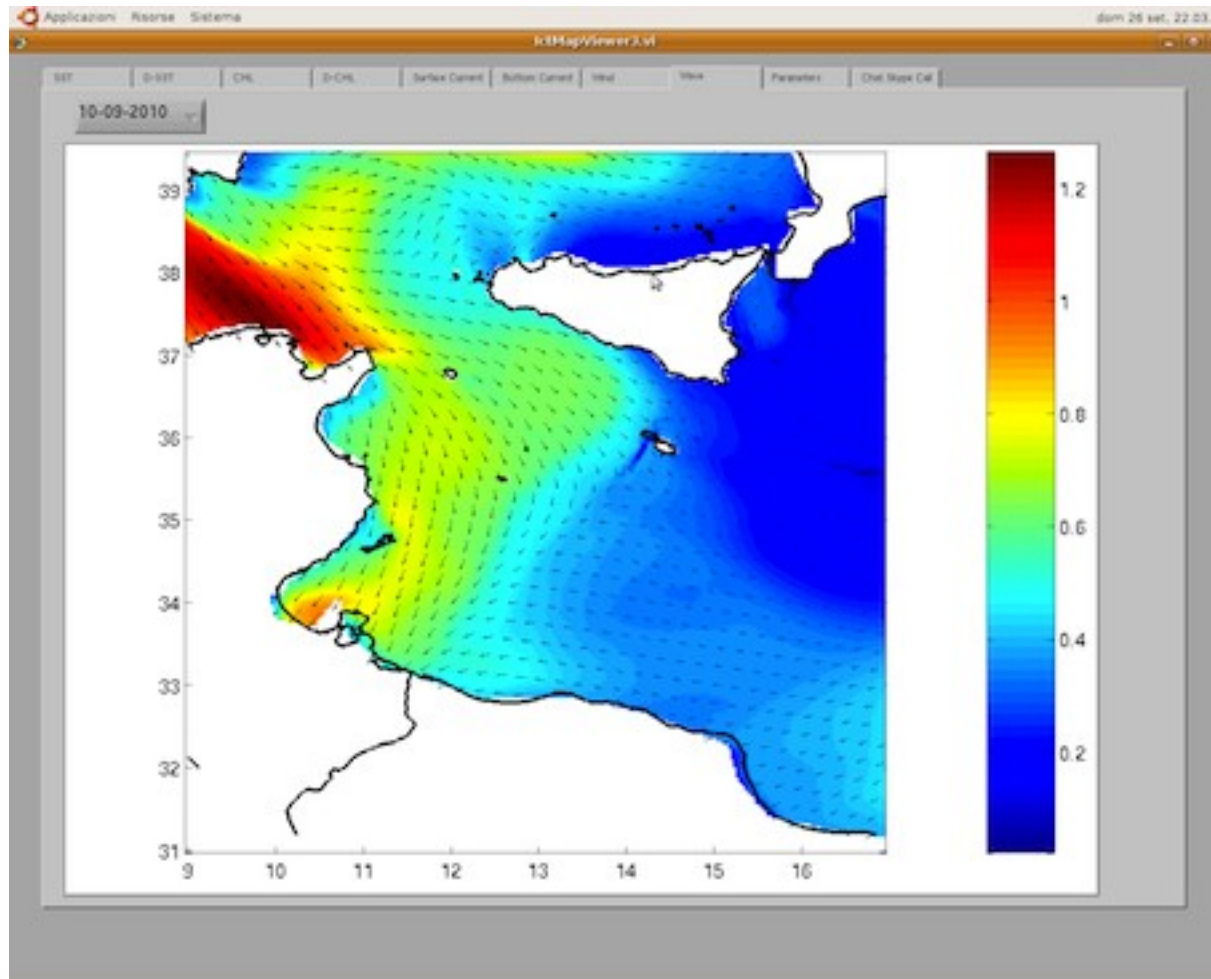
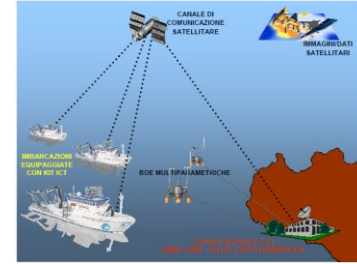
Sea surface current



Fishing Vessel Monitoring Systems (VMS) as a tool in support to the Ecosystem Approach to Fisheries Management



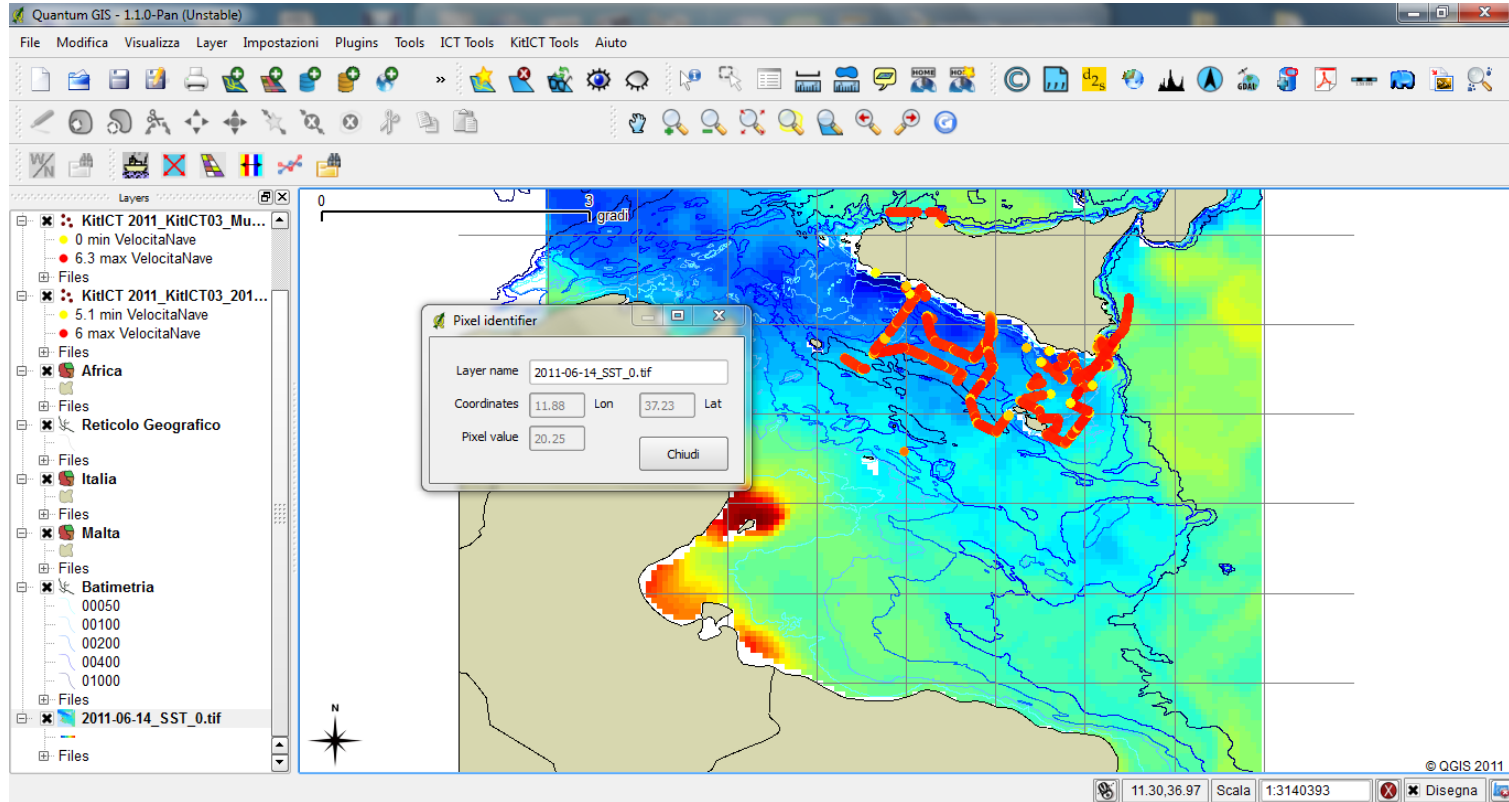
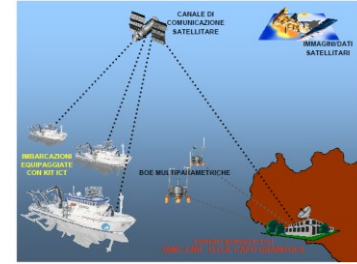
Wave height

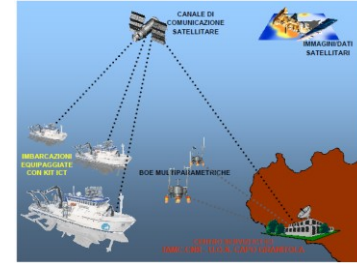


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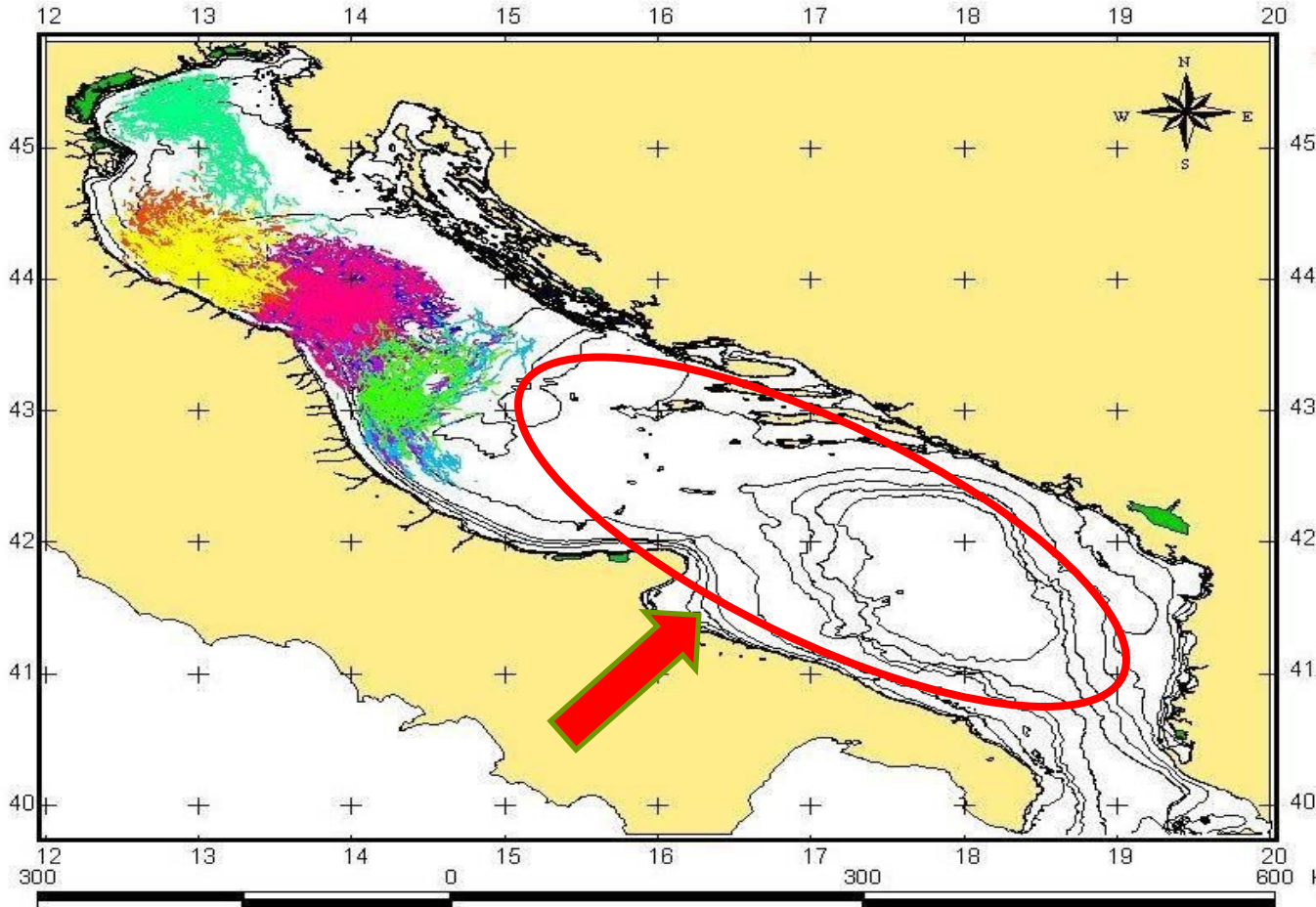
webGIS application





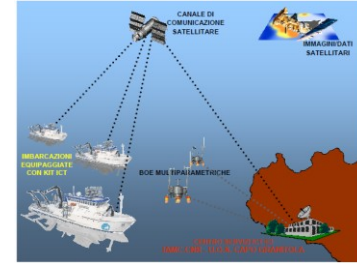
Current development :

A) Geographical extension:



Tracking of fishing vessels (2003-2008) :

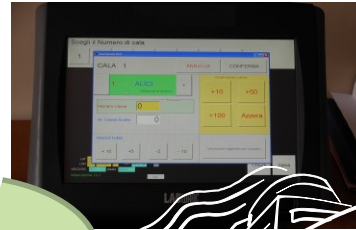




Current development:

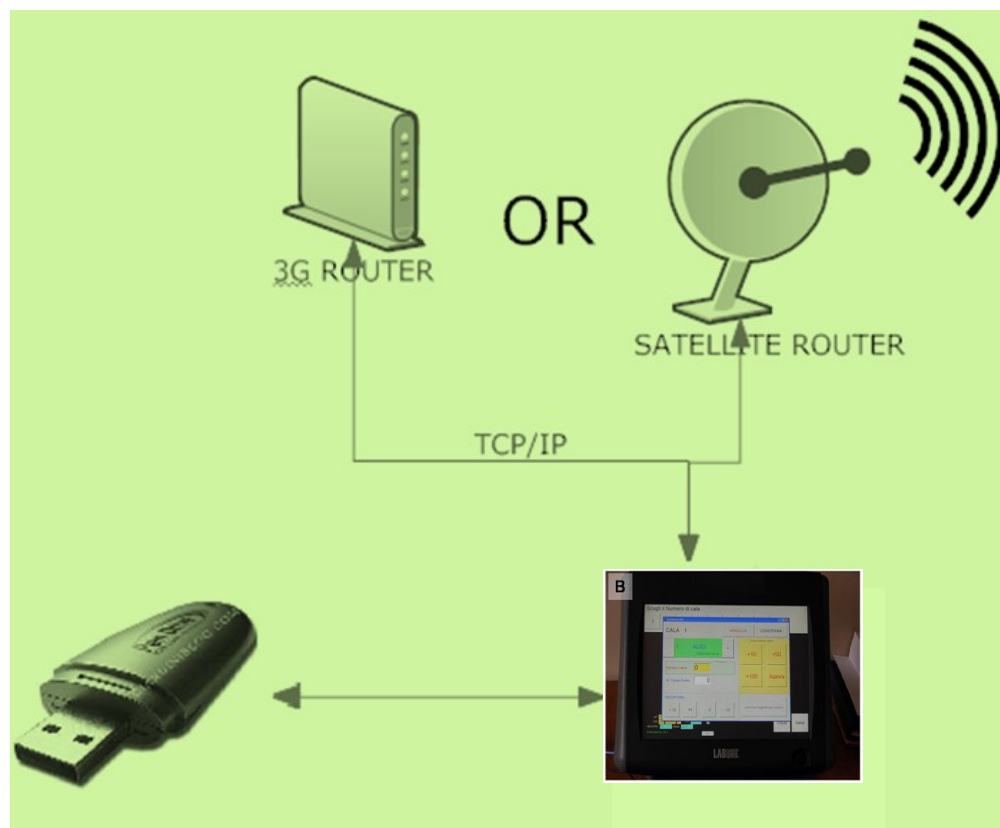
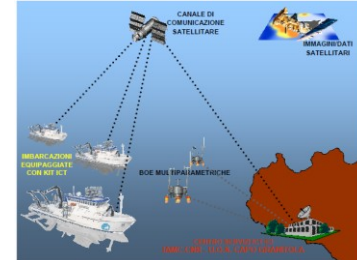
A) Technological:

Use of new generation sensors able to collect various environmental parameters relating to the water column (temperature, pressure, conductivity and fluorescence) and to transmit them to the modular system at the end of each single fishing haul



The system is designed in such a way as to allow info uploading to the data center via a **GPRS** module or by a **satellite** connection.

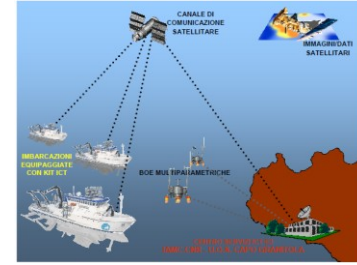
DATA TRANSMISSION



Control PC



SENSORS



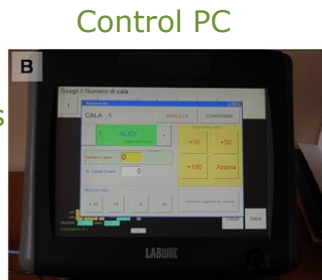
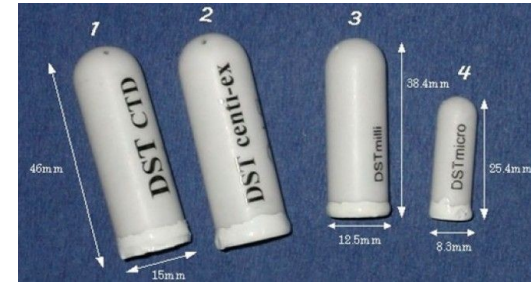
NKE probes

Radio link

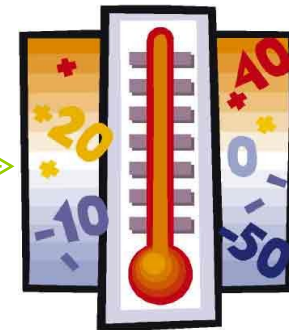


RS 232 after changes commissioned to NKE (cable connection)

STAR ODDI (delayed time)



Control PC

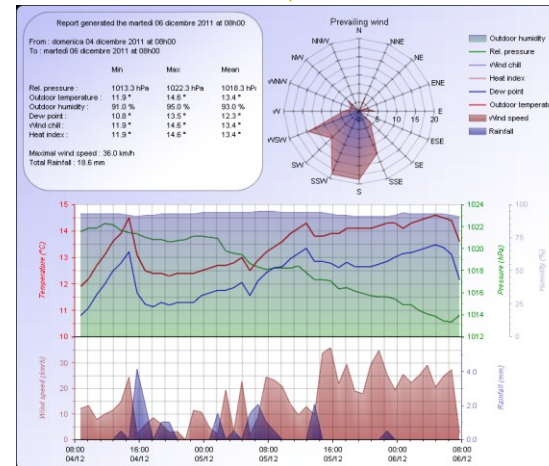


Other sensors



WEATHER DATA

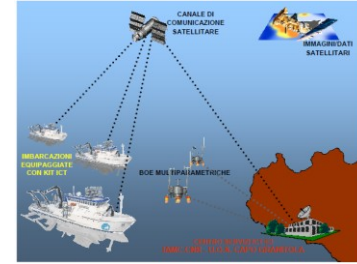
AIRMAR PB200 Weather station



Real time data

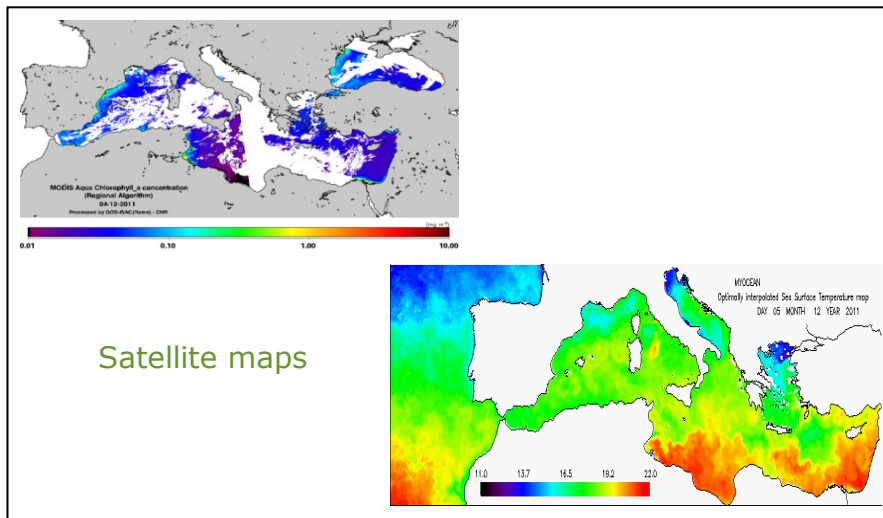


Control PC

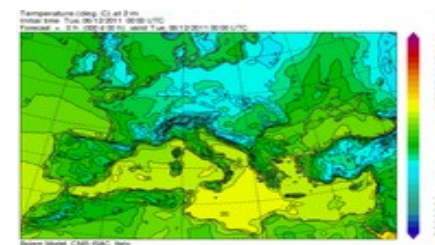
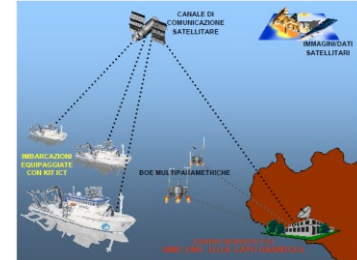


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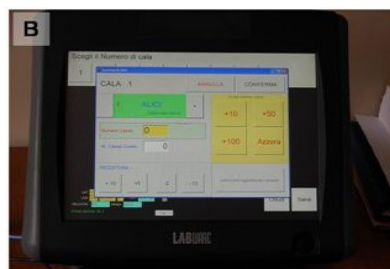
MAPS



Satellite maps

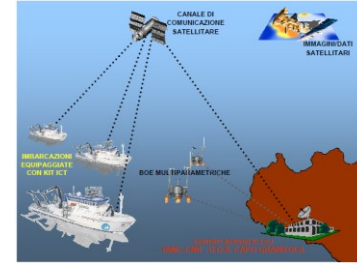


forecasts

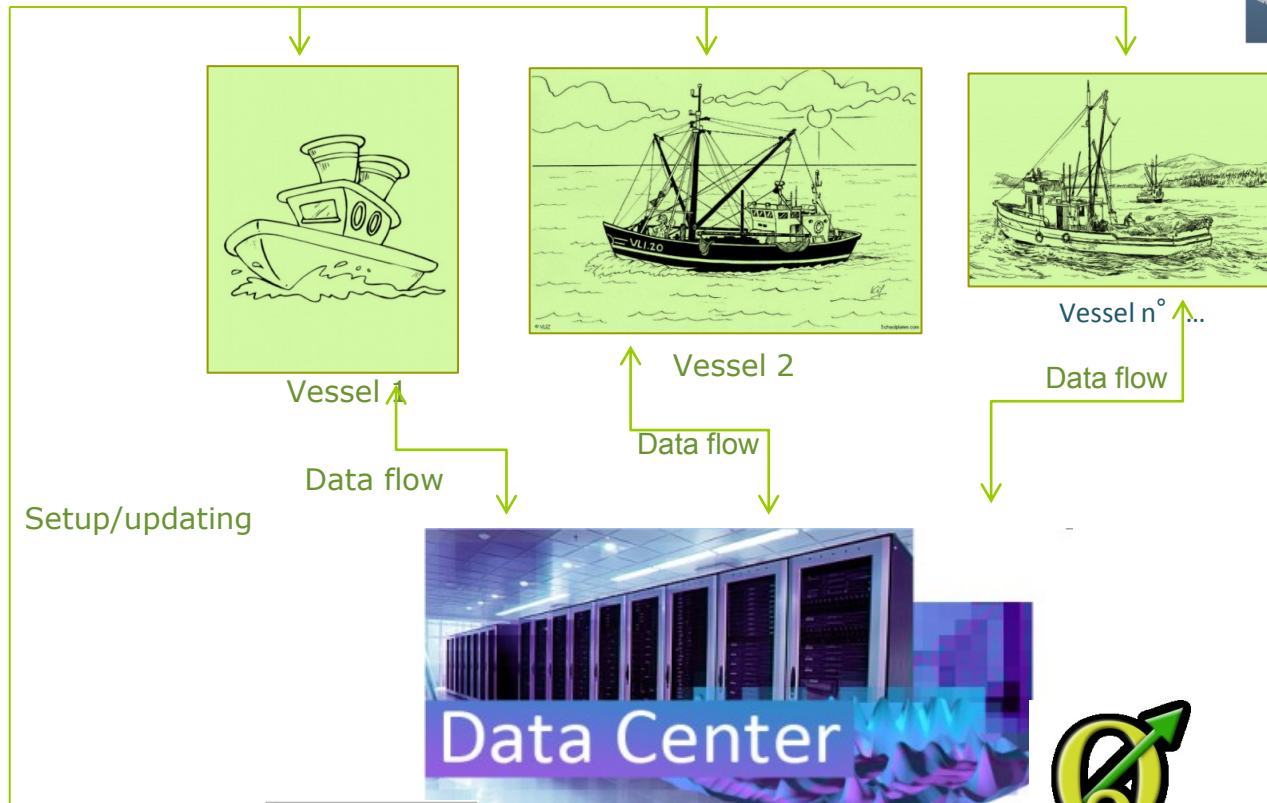


Control PC

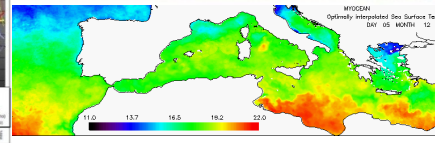
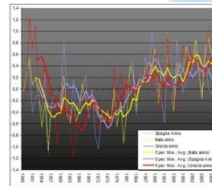


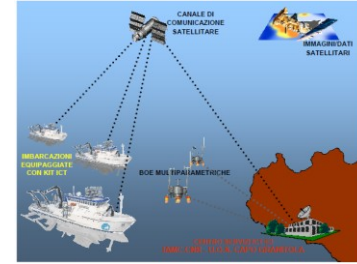


DATA CENTER

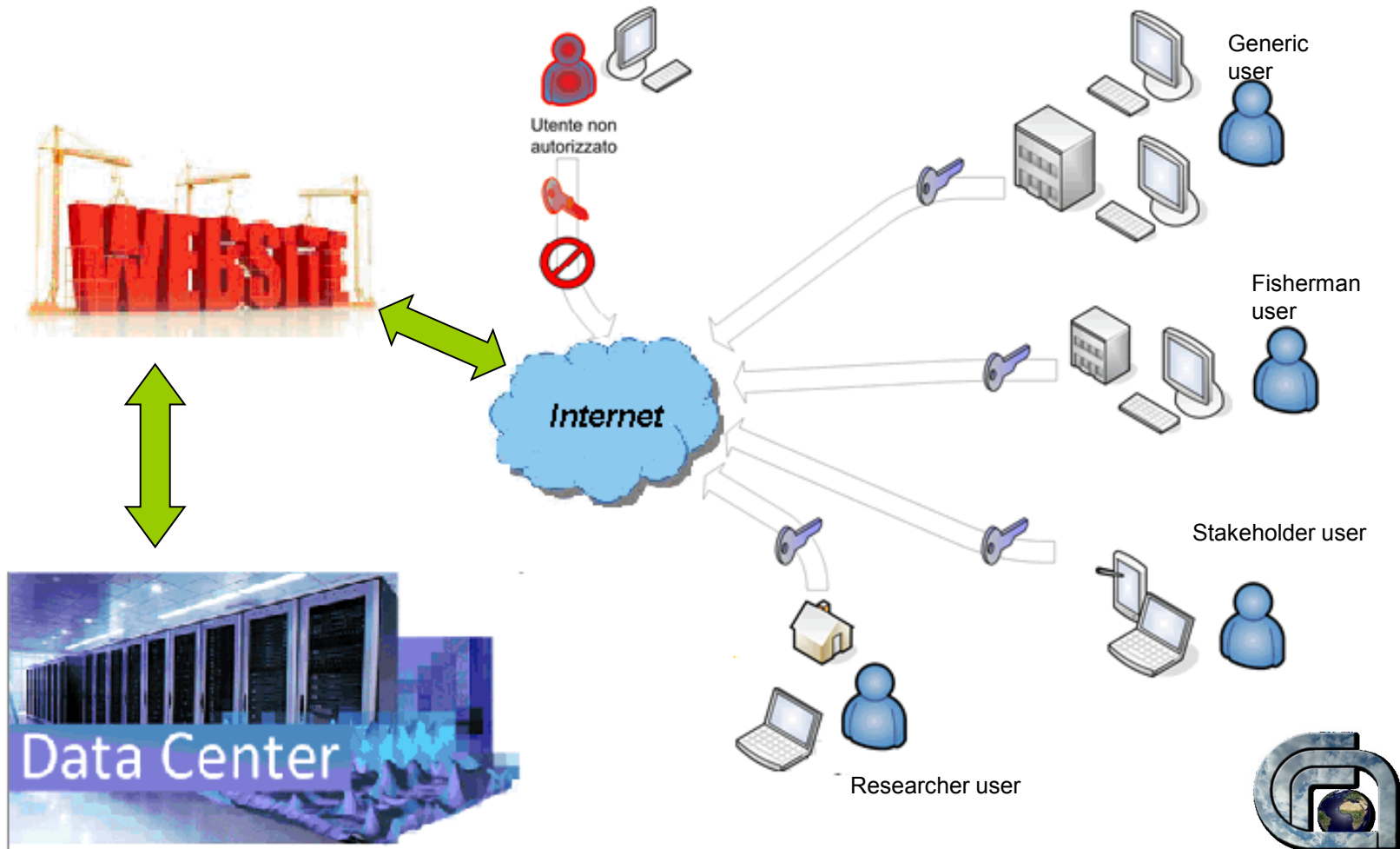


System Administrators

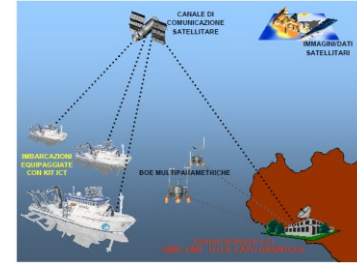




DATA CENTER



RITMARE Programme “The Italian research for the sea”



- National programme of scientific and technological research for the sea.
- Start: January 2012
- Total budget: 250 mln €
- Duration: 5 years

Sub-project on “***Technologies for a sustainable fisheries***”

- budget: 26 mln €
- Objective:
Research and development of advanced technologies for the management of fishery resources in the perspective of **sustainable fishing** and **safety** at sea

Fishing Vessel Monitoring Systems (VMS) as a tool in support to the Ecosystem Approach to Fisheries Management



SHIP SAFETY

Remocean

- hardware/software system originally developed by IREA-CNR (Institute for Electromagnetic Sensing of the Environment, Naples);
- uses mandatory X-band radars to analyze sea state parameters with high spatial resolution in a range of 3 Nautical Miles from the radar sensor;
- Black box attached to an existing radar;
- post-processing of data for various needs, such as navigation support and security enhancement. Data is displayed through the user interface on a touch-screen monitor.

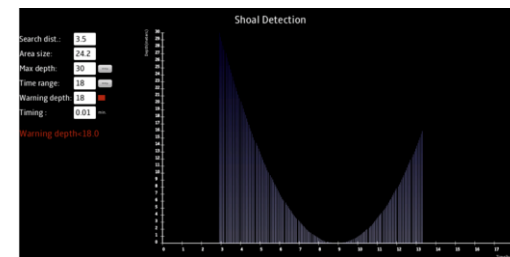
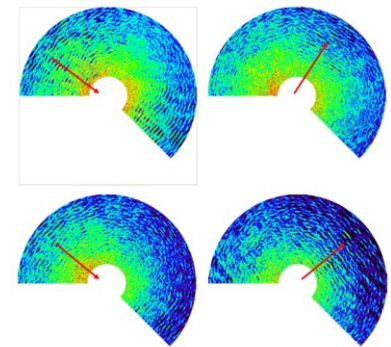
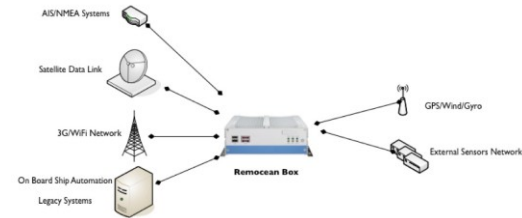
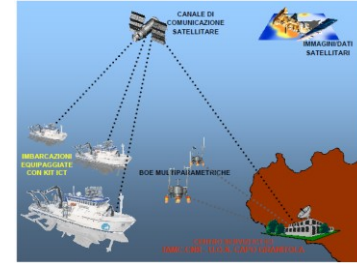
Features:

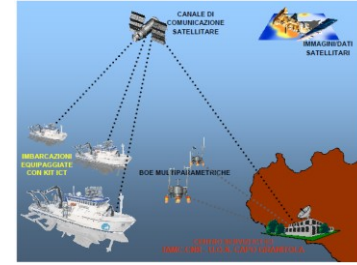
Real time monitoring of the following sea state parameters:

- length, period and direction of dominant waves;
- significant wave height; surface currents;
- space-time reconstruction of wave height;
- ship speed.

The Ship Safety solution adds the following advanced features to the Core Service:

Shoal Detection: the system provides alarms on the presence of a shoal within 3 nautical miles from the ship's bow. The system allows to set all the parameters related to the monitoring area size, distance from the ship, time interval and alert threshold.





Thank you for your attention!

