



10 – 11 May 2011

Institute for Coastal Marine Environment – CNR

Oristano, Italy

# Sustainable fisheries in the Mediterranean Sea: an overview on recent CNR research initiatives



**Bernardo Patti**  
**Consiglio Nazionale delle Ricerche,**  
**Istituto per l'Ambiente Marino Costiero (IAMC-CNR),**  
**sede di Capo Granitola,**  
**Campobello di Mazara (TP), Italy**



Consiglio Nazionale delle Ricerche

Dipartimento Terra e Ambiente

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venerdì 27 marzo 2009, 10:46:00

Progetti Internazionali  
(attivi)

ESF

Frame Programme - FP7

Frame Programme - FP6

Frame Programme - FP5

GIIDA

Focus on ...



**Conferenza 15 Aprile 2009**

**La ricerca per la gestione  
dei rifiuti secondo  
gli standard europei**

**OceanObs'09** *Ocean information for society:  
sustaining the benefits,  
realizing the potential*  
21-25 September 2009, Venice, Italy

#### Istituti

Scritto da Administrator  
martedì 13 febbraio 2007

#### Istituti Afferenti

**IAMC** - Ist. per l'Ambiente Marino Costiero

**IBAF** - Ist. di Biologia Agro-Ambientale e Forestale

**IDPA** - Ist. per la Dinamica dei Processi Ambientali

**IGAG** - Ist. di Geologia Ambientale e Geoingegneria

**IGG** - Ist. di Geoscienze e Georisorse

**IIA** - Ist. sull'Inquinamento Atmosferico

**IMAA** - Ist. di Metodologie per l'Analisi Ambientale

**IRPI** - Ist. di Ricerca per la Protezione Idrogeologica

**IRSA** - Ist. di Ricerca sulle Acque

**ISAC** - Ist. di Scienze dell'Atmosfera e del Clima

**ISE** - Ist. per lo Studio degli Ecosistemi

**ISMAR** - Ist. di Scienze Marine

**IVALSA** - Ist. per la valorizzazione del Legno e delle Specie Arboree

#### LOGIN FORM

Username

Password

Ricordami

[Password dimenticata?](#)

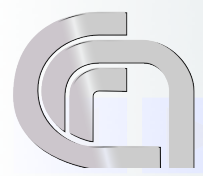


Consiglio Nazionale delle Ricerche





# IAMC – CNR Capo Granitola lab



*Istituto per l' Ambiente Marino Costiero – Consiglio Nazionale delle Ricerche  
U.O.S. CAPO GRANITOLA (Tp), Sicily , Italy*



### Skills (Capo Granitola lab):

- Oceanography
- Fishery ecology
- Geo-chemistry
- Sedimentology
- Hydroacoustics
- Remote sensing
- ICT for marine and maritime applications

### Research topics:

- Physical-biological interactions in the pelagic ecosystem
- Ecology of small pelagic fish species



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U.O.S. CAPO GRANITOLA (Tp), Sicily , Italy***

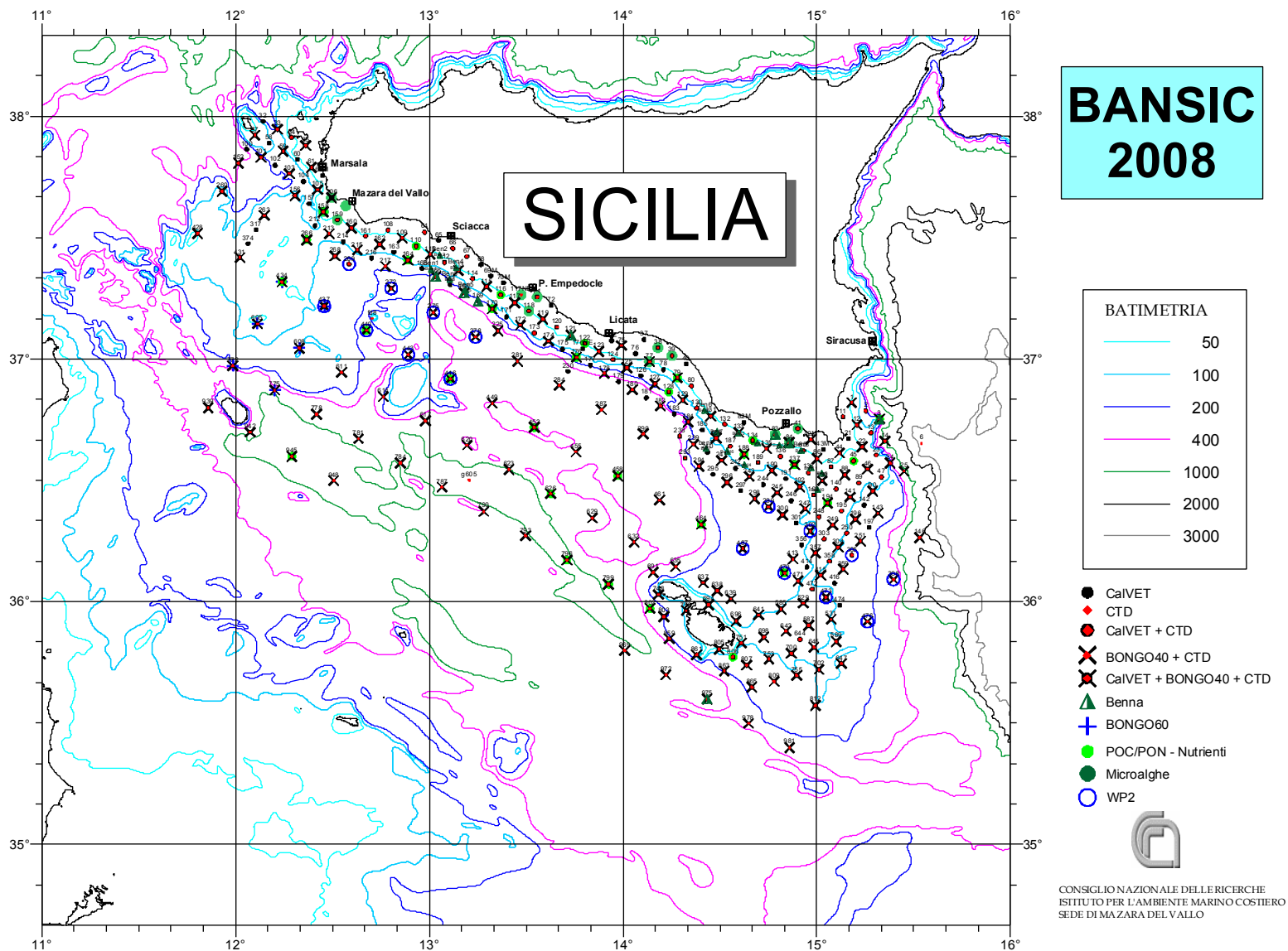
## Biological oceanography

- Oceanographic and ichthyoplanktonic surveys carried out aboard the O/V “Urania” since 1998 (Total length: 62 m, Gross tonnage: 1000 t).

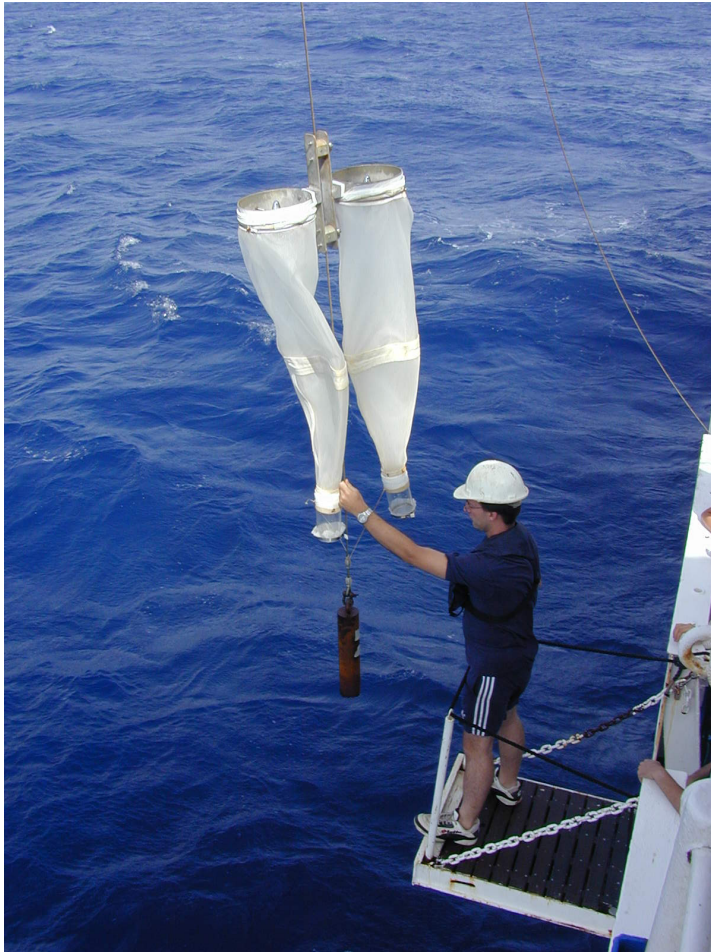


# Survey BANSIC08 (July 2008)

## Study area and sampling stations.



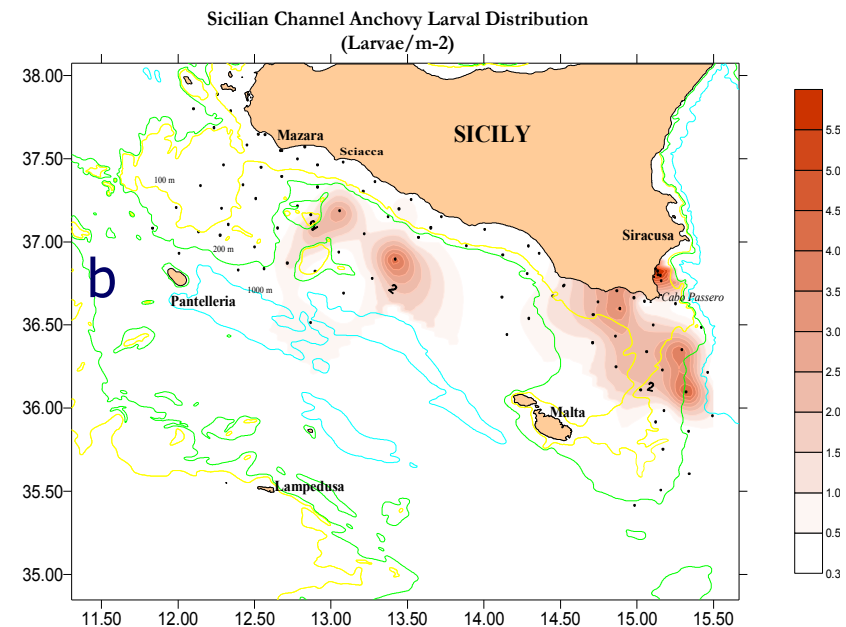
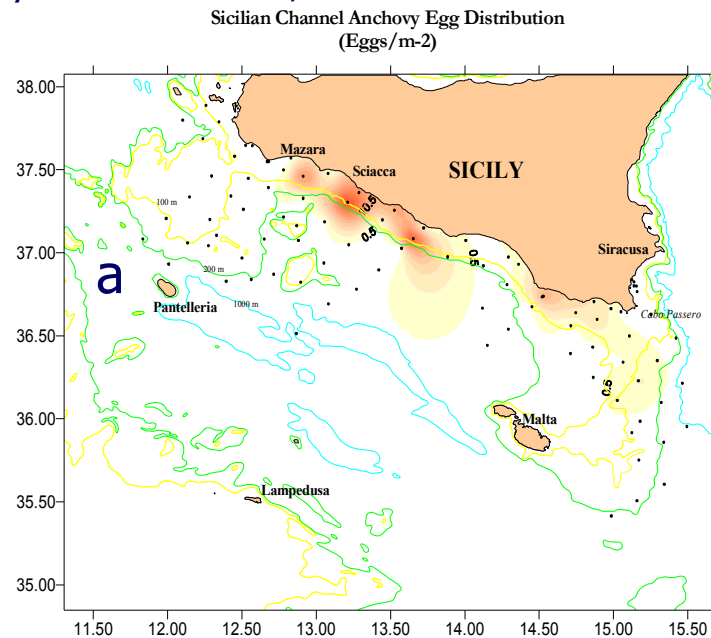
**CalVET net (left) and N/O Urania Lab (right)**



# Biology and ecology of small pelagic fish: anchovy egg and larval distribution

The development from egg to larval stage is temperature dependent, for anchovy in this area the process takes about 24-36 hours (Holden & Raitt, 1975). Consequently, the presence of eggs indicates the **location of spawning grounds**.

The **spatial non-coincidence of spawning and nursery areas**, due to transport by surface current, is hereafter evidenced.



(a) Anchovy egg distribution during the period 19 July-8 August 1997 (egg m<sup>-2</sup>);

(b) Anchovy larvae distribution (larvae m<sup>-2</sup>) during the period 19 July-8 August 1997.



# Applied hydroacoustics for the evaluation of small pelagic fish resources



## Nave Oceanografica "G. Dallaporta"

Total length	36 m
Scientific crew	11 people
Vessel crew	6-7 people

## Echosurveys

EU Mediterranean Coordinated Survey on Small Pelagic fish “**MEDIAS**” (E.U. states):

In the Mediterranean 5 direct **echosurveys** on small pelagic fish are regularly held at least during the last decade:

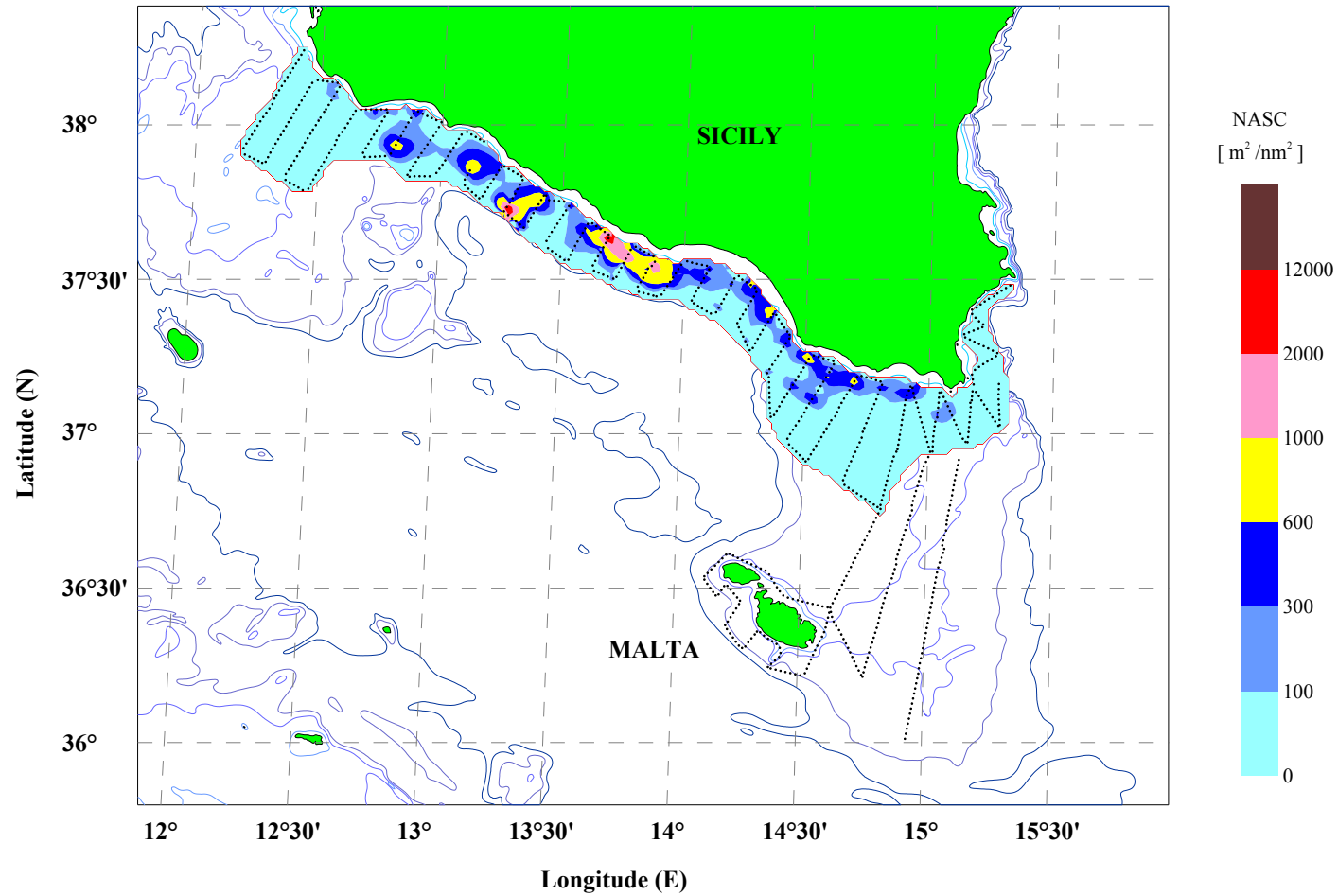
- **Iberian coast (IEO)** **ECOMED**
- **Gulf of Lions (IFREMER)** **PELMED**
- **Adriatic Sea (ISMAR)**
- **Sicilian channel & Malta (IAMC)** **ANCHEVA**
- **Aegean Sea (HCMR)** **ANCHOVY**



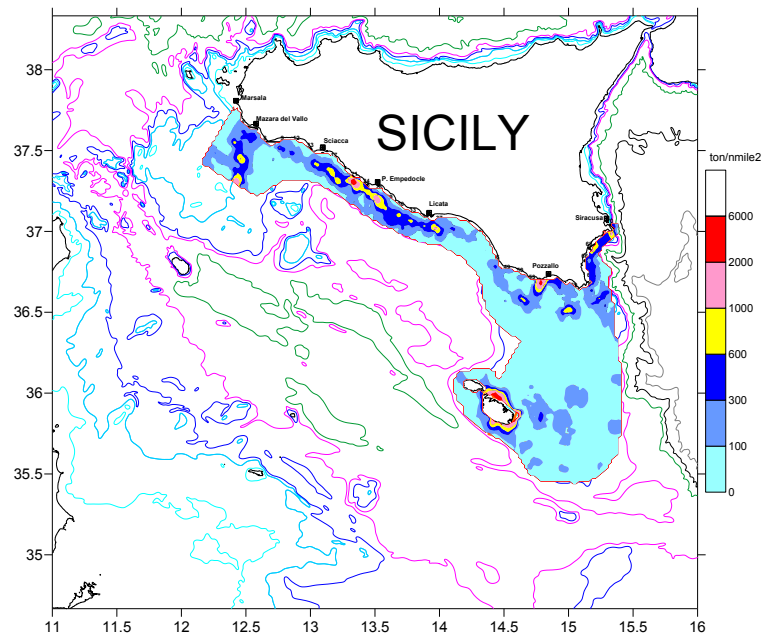
# Fish distribution patterns

## Echosurvey ANCHEVA08 (July 2008) - SARDINE

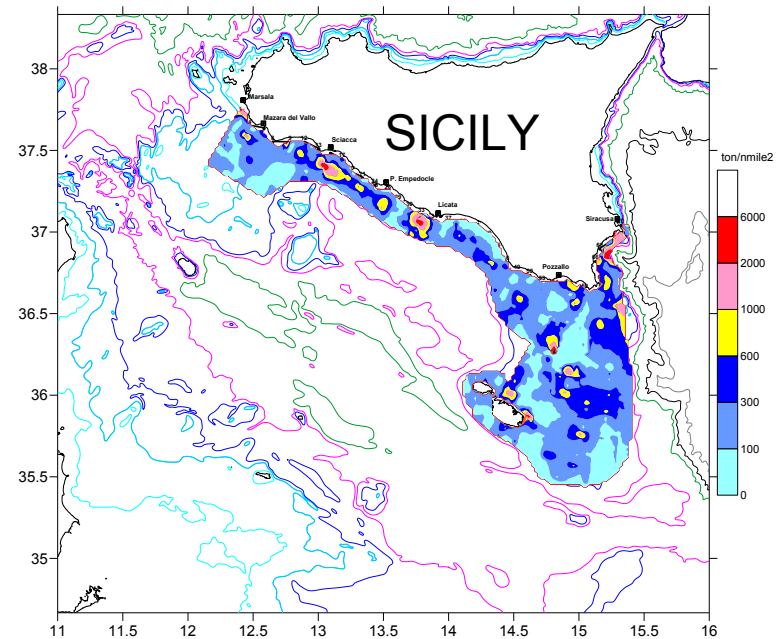
On the area 2238 nm<sup>2</sup> the sardina biomass calculated by formula  $TS=20\text{Log}L-70.51$  is 12152 tons



# Analysis on the influence of sea water circulation on fish distribution patterns

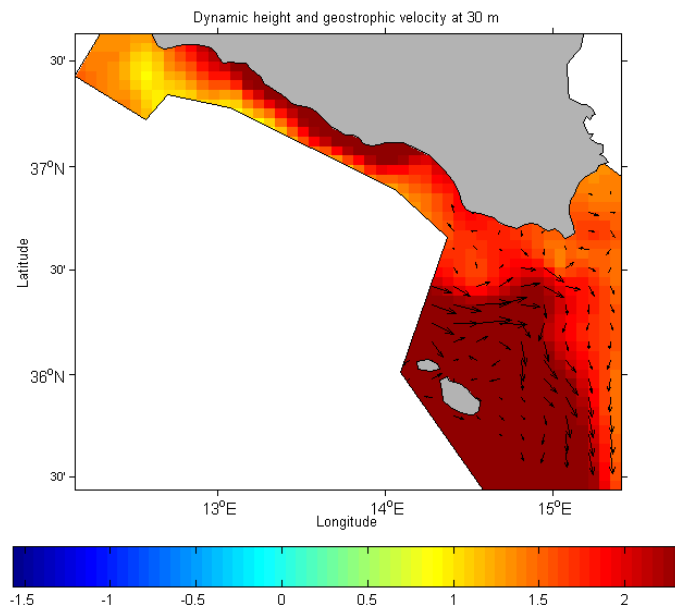


NASC Fish ( $\text{m}^2/\text{nmile}^2$ ) distribution, echosurvey "JUVENILE04".

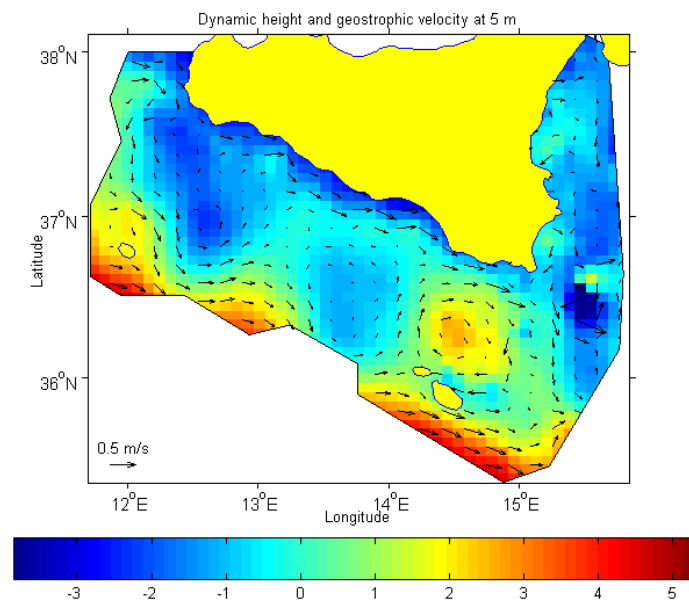


NASC Fish ( $\text{m}^2/\text{nmile}^2$ ) distribution, echosurvey "ANCHEVA 2005".

# Analysis on the influence of sea water circulation on fish distribution patterns



Dynamic height and geostrophic velocity, echosurvey "JUVENILE04".



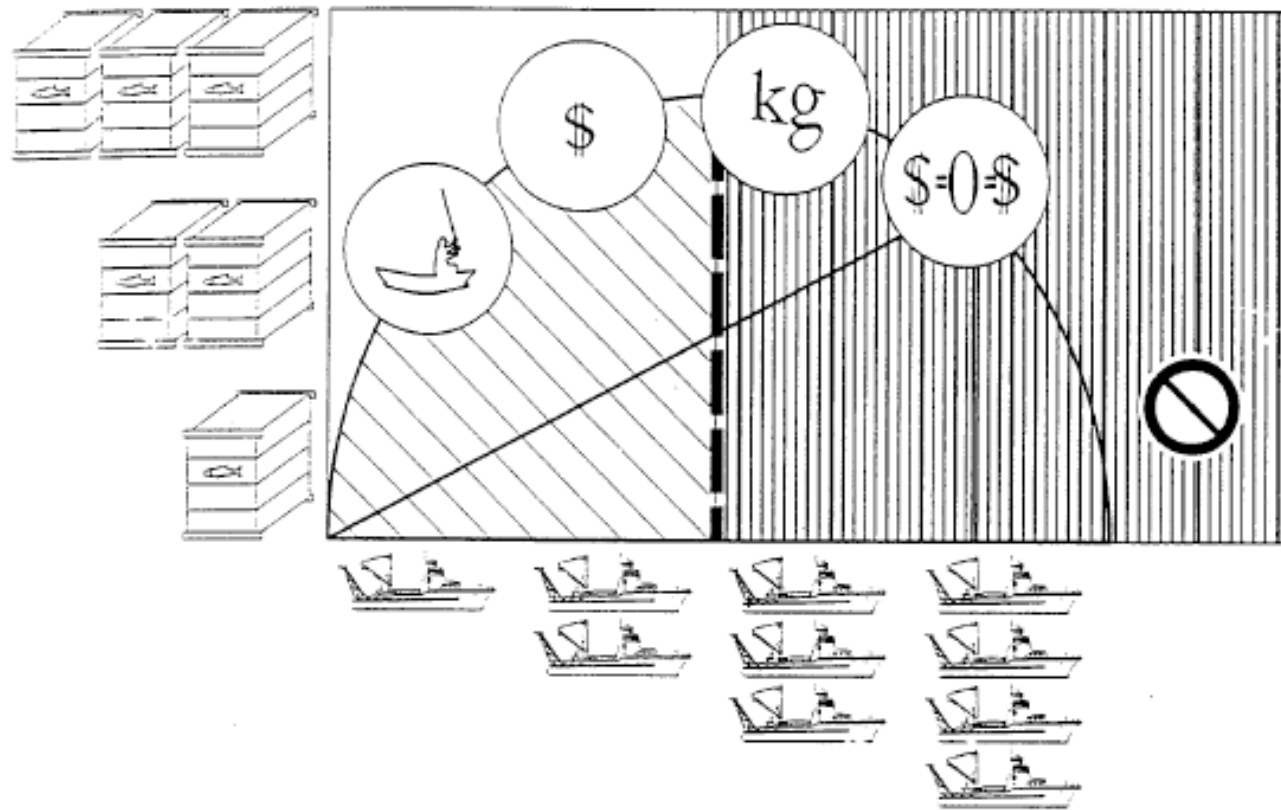
Dynamic height and geostrophic velocity, echosurvey "ANCHEVA 2005".



**... the Italian fisheries are in **crisis** ... the main causes are:**

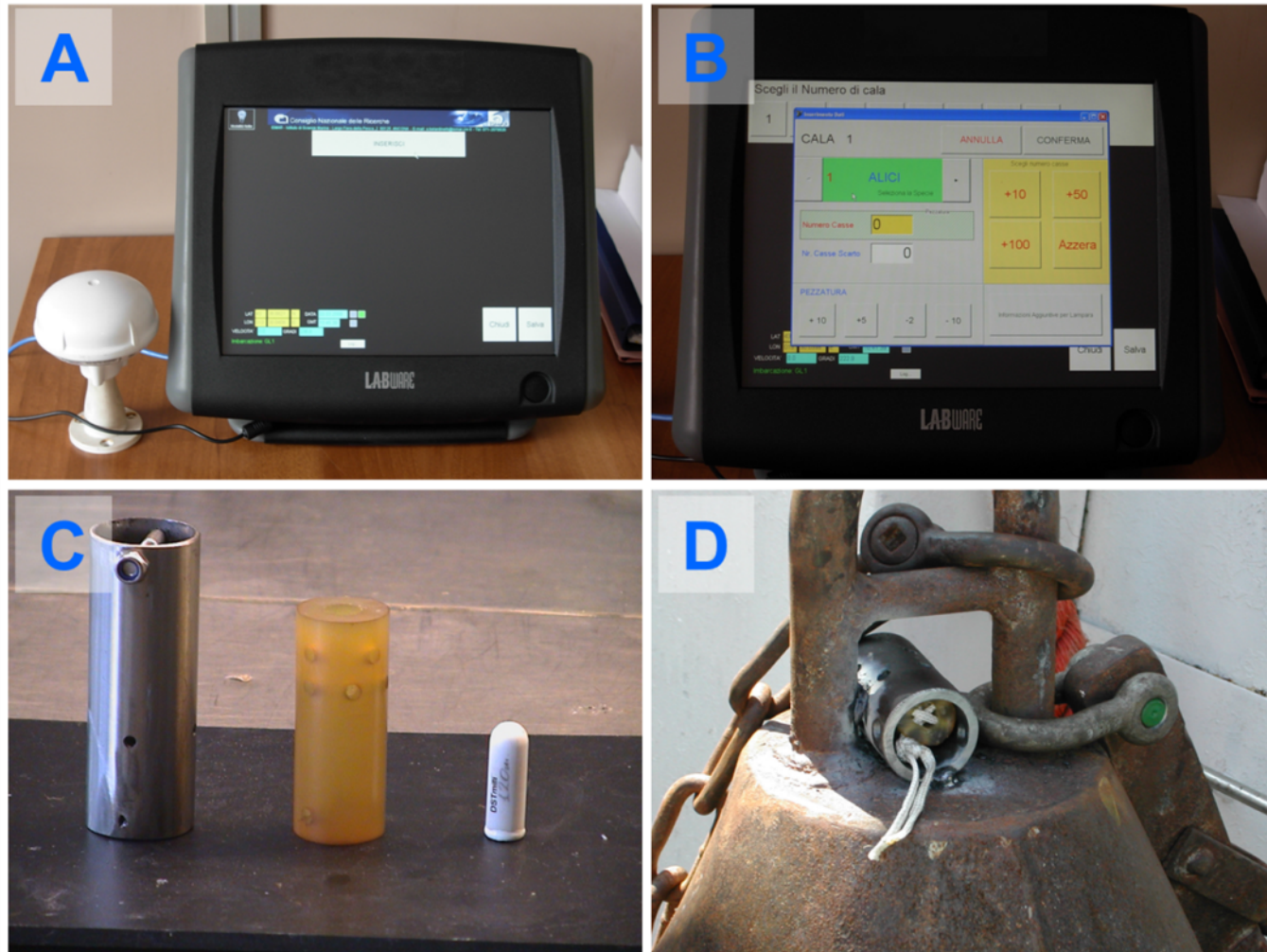
- the over-exploitation of the main fish stocks,
- 
- the age of vessels,
- the inadequacy of the catch processes,
- the shortcomings of the system of preservation, processing and marketing
- the difficulties of effective supply chain management in its entirety.

...the ecological sustainability of catch processes as a prerequisite for fisheries profitability ...



From Caddy (2009)

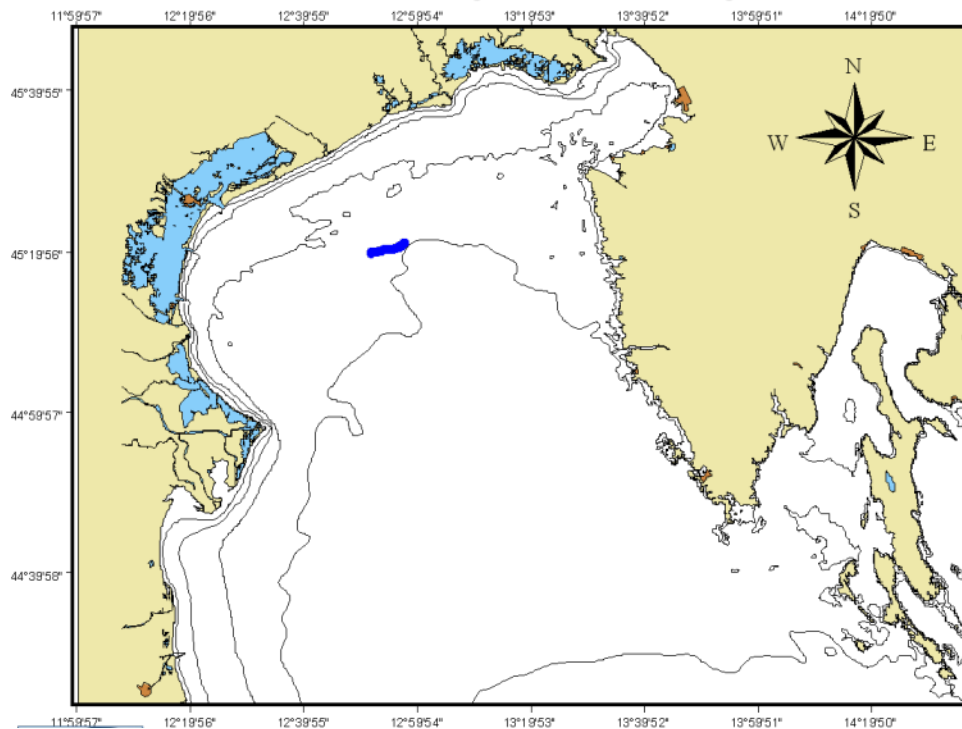
# FISHERY OBSERVING SYSTEM:



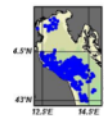
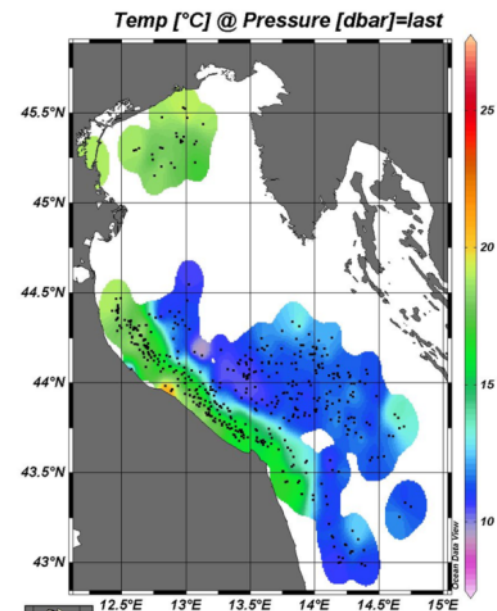
Logbook electronic touch screen and GPS antenna connected (A); dedicated software on which you can type for each haul the kind, quantity and size of fish catch (B) T / P sensor (C), applied to the fishing net in various locations depending on the vessel (e.g. D).



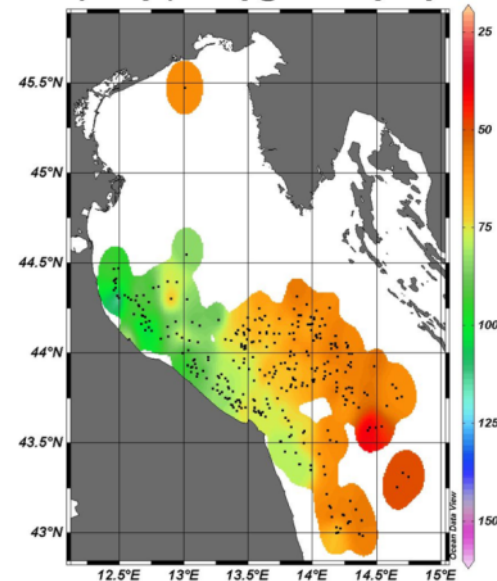
## Dati di cattura georeferenziati, associati con dati di temperatura e profondità



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



Anchovy Size [n per box] @ Pressure [dbar]=last



Database Adriatico centro-settentrionale  
(ISMAR-CNR Ancona)

[a.belardinelli@an.ismar.cnr.it](mailto:a.belardinelli@an.ismar.cnr.it)

[m.martinelli@an.ismar.cnr.it](mailto:m.martinelli@an.ismar.cnr.it)





# ICT-E3 Project

**“Piano ICT per l’eccellenza nella Sicilia Occidentale del settore innovazione imprenditoriale a partire dalla ricerca marina”**

**Principal Investigator:  
Dr. Salvatore Mazzola  
(Director of IAMC-CNR)**



***Istituto per l’Ambiente Marino Costiero – Consiglio Nazionale delle Ricerche  
U.O.S. CAPO GRANITOLA (Tp)***



PARTNERSHIP:



**CNR**

**COAST GUARD**

**MUNICIPALITY**

# ICT-E3 PROJECT

**ENTERPRISES**

**HOSPITAL**

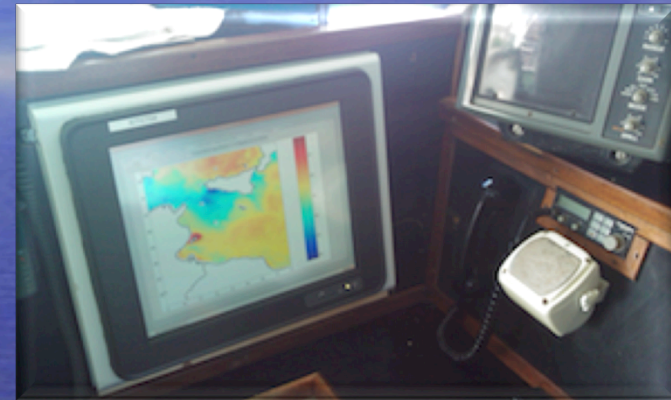


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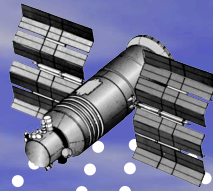
IAMC-CNR

Installation of ICT-KIT aboard FV "Aristeus" (Mazara del Vallo bottom trawl fishery)

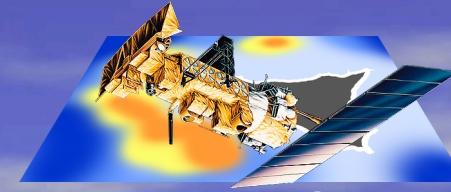


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U.O.S. CAPO GRANITOLA (Tp)*





COMMUNICATION  
SATELLITE  
CHANNEL



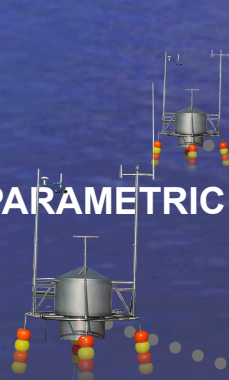
SATELLITE  
IMMAGES/DATA



FISHING  
VESSELS  
EQUIPPED WITH  
ICT-KIT

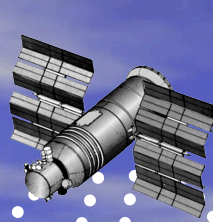


MULTIPARAMETRIC BUOYS



ICT-E3 DATA CENTER  
IAMC-CNR - U.O.S. CAPO GRANITOLA

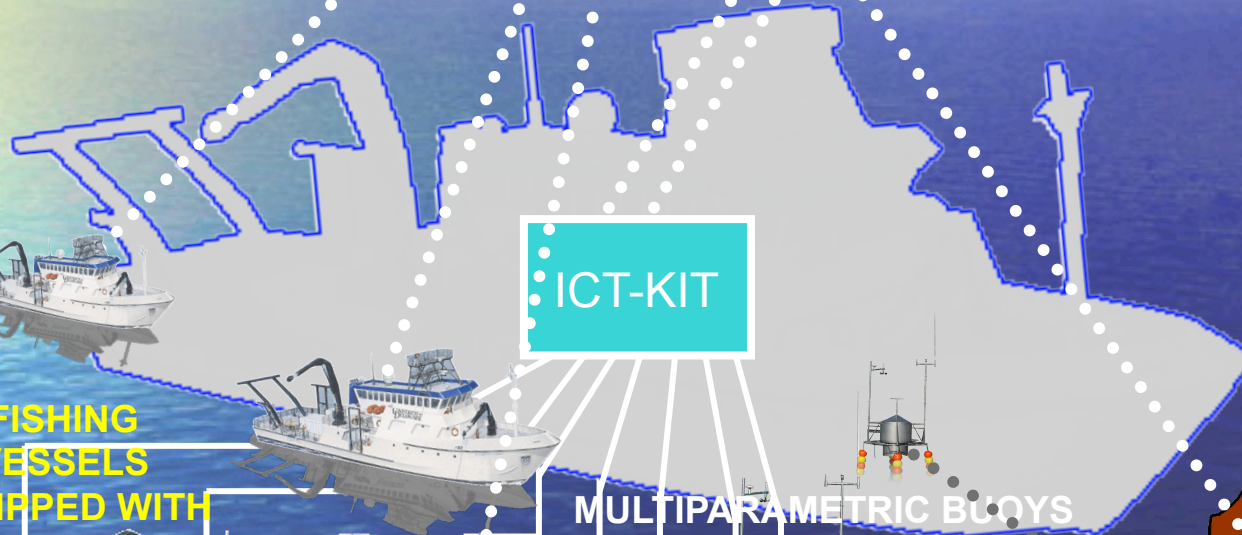




COMMUNICATION  
SATELLITE  
CHANNEL



SATELLITE  
IMMAGES/DATA



ICT-KIT

FISHING  
VESSELS  
EQUIPPED WITH  
ICT-KIT

MULTIPARAMETRIC BUOYS

OTHER RESEARCH  
SENSORS

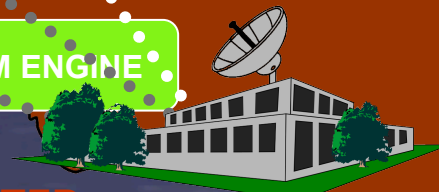
RPM ENGINE

TEMPERATURE  
SENSOR

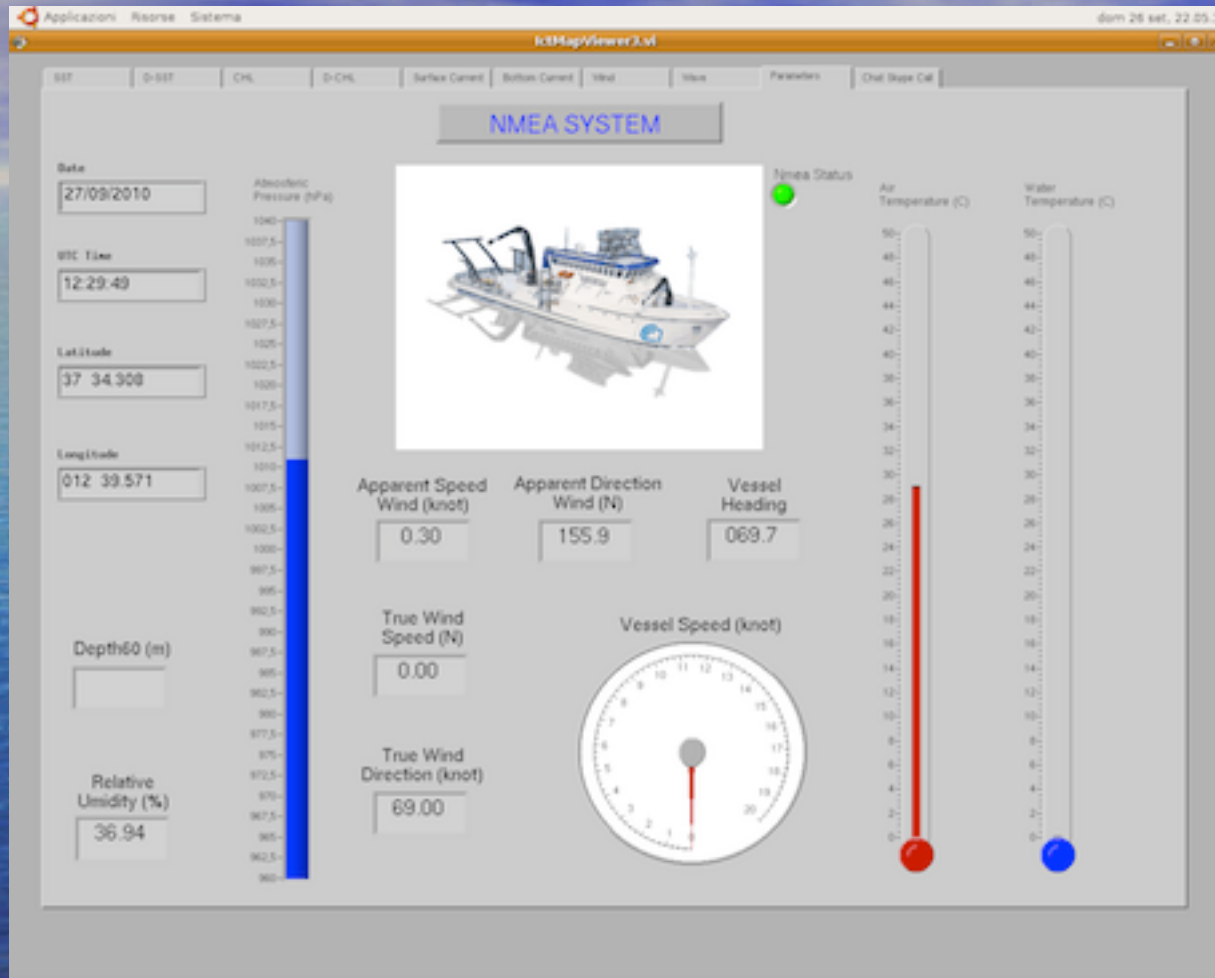
ANEMOMETER

ICT-E3 DATA CENTER

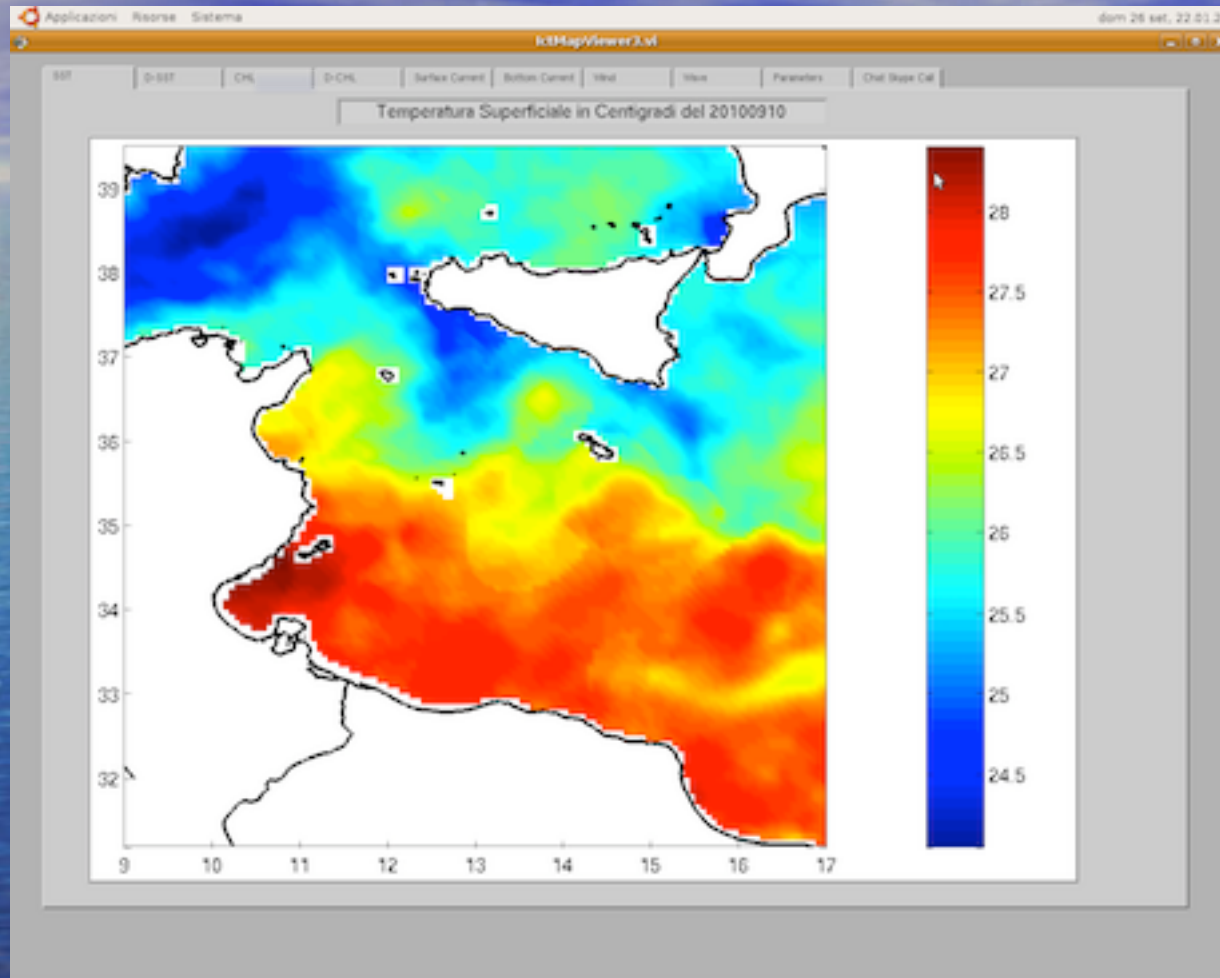
IAMC-CNR - U.O. CAPO GRANITOLA



## Control Panel (Navigation and Meteo parameters)

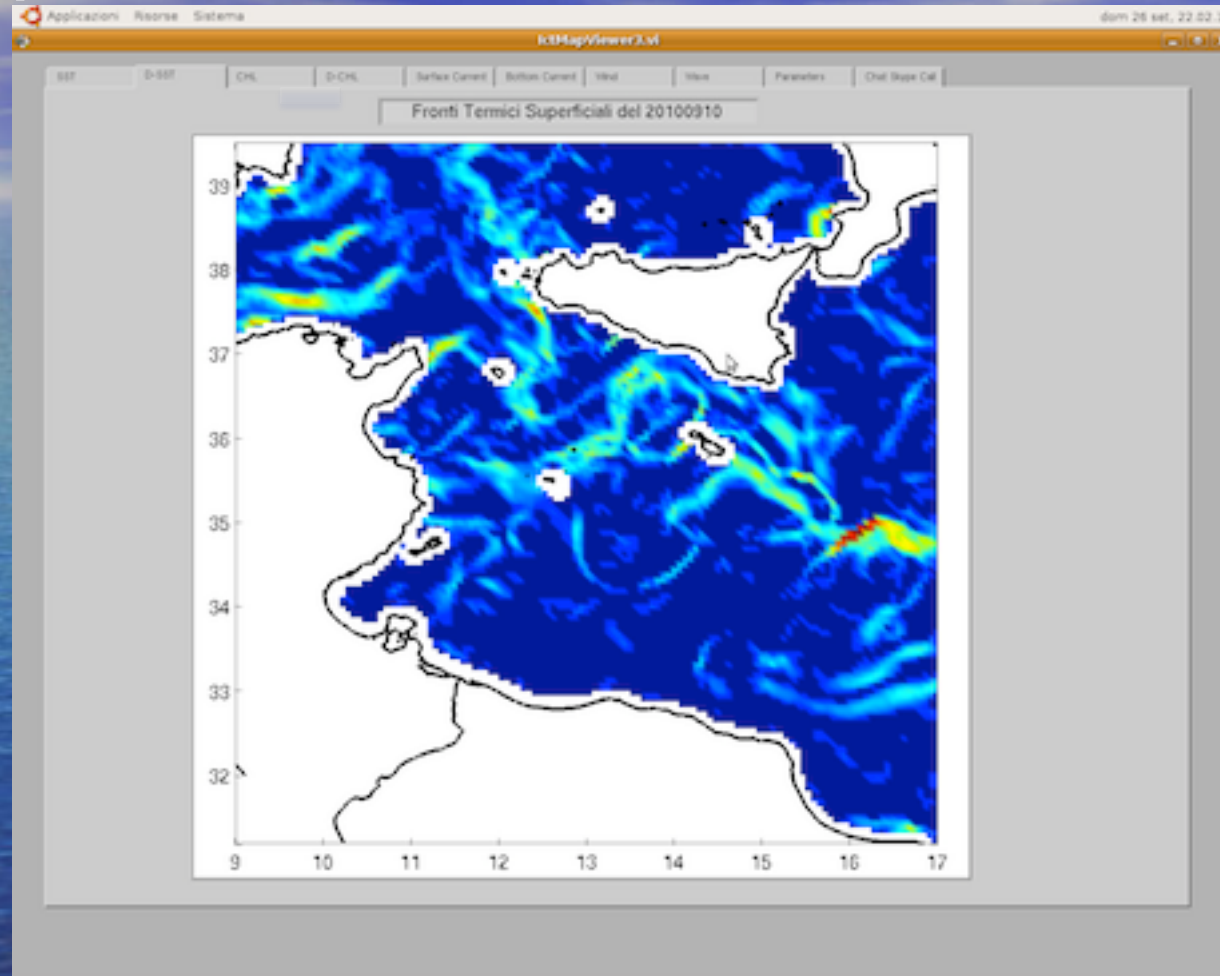


## Sea Surface Temperature (SST)

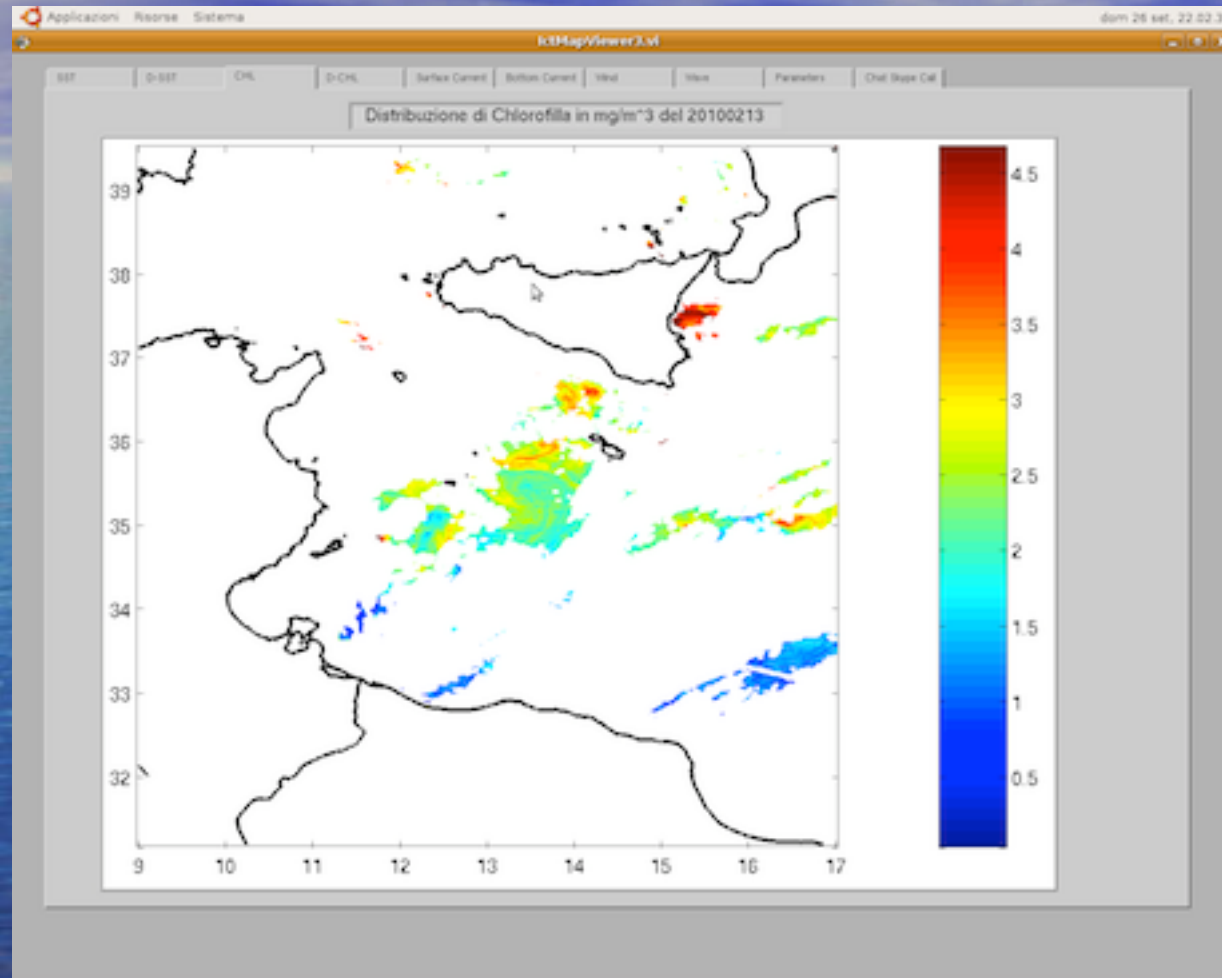




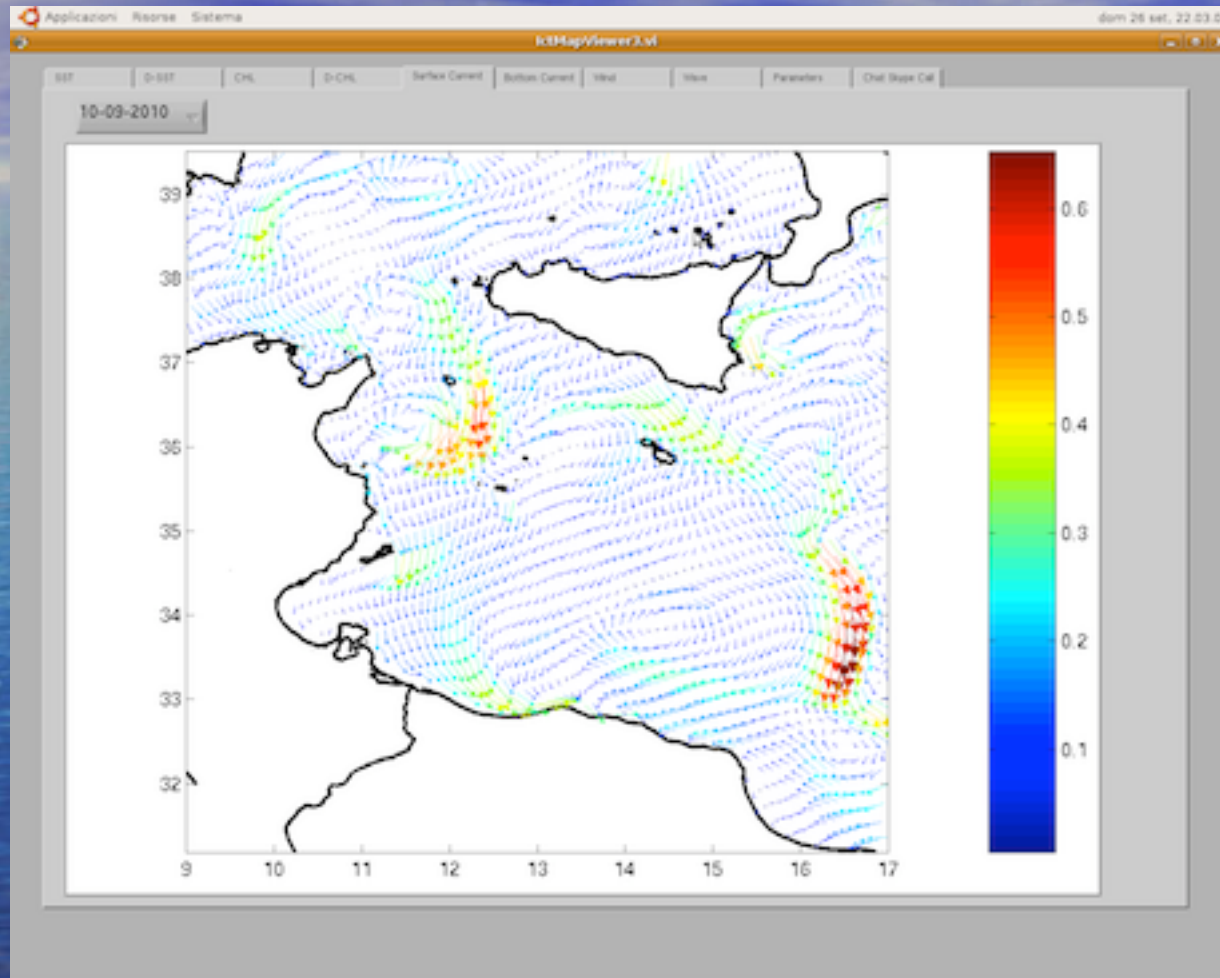
## Sea Surface Temperature gradient

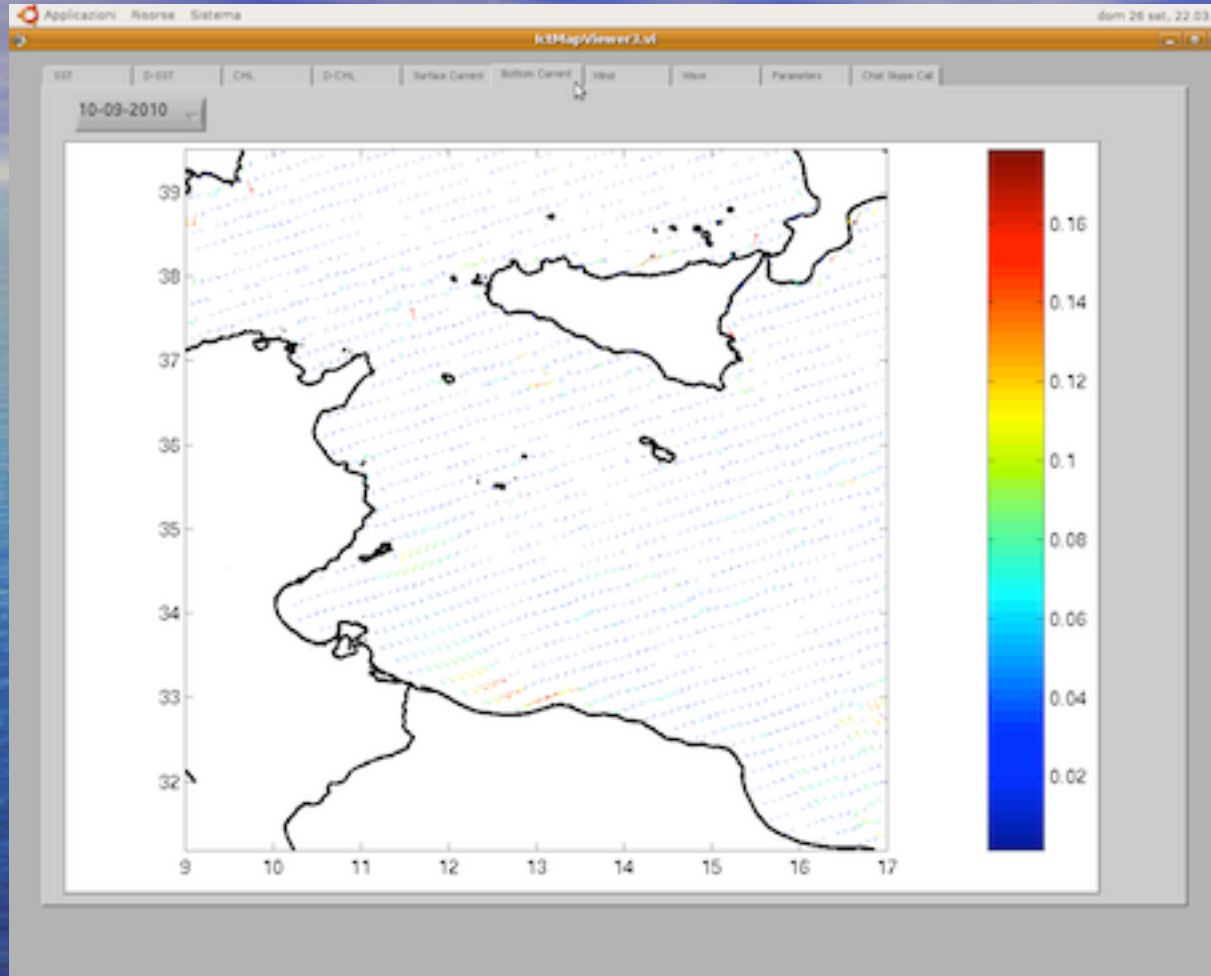


## Chlorophyll-a

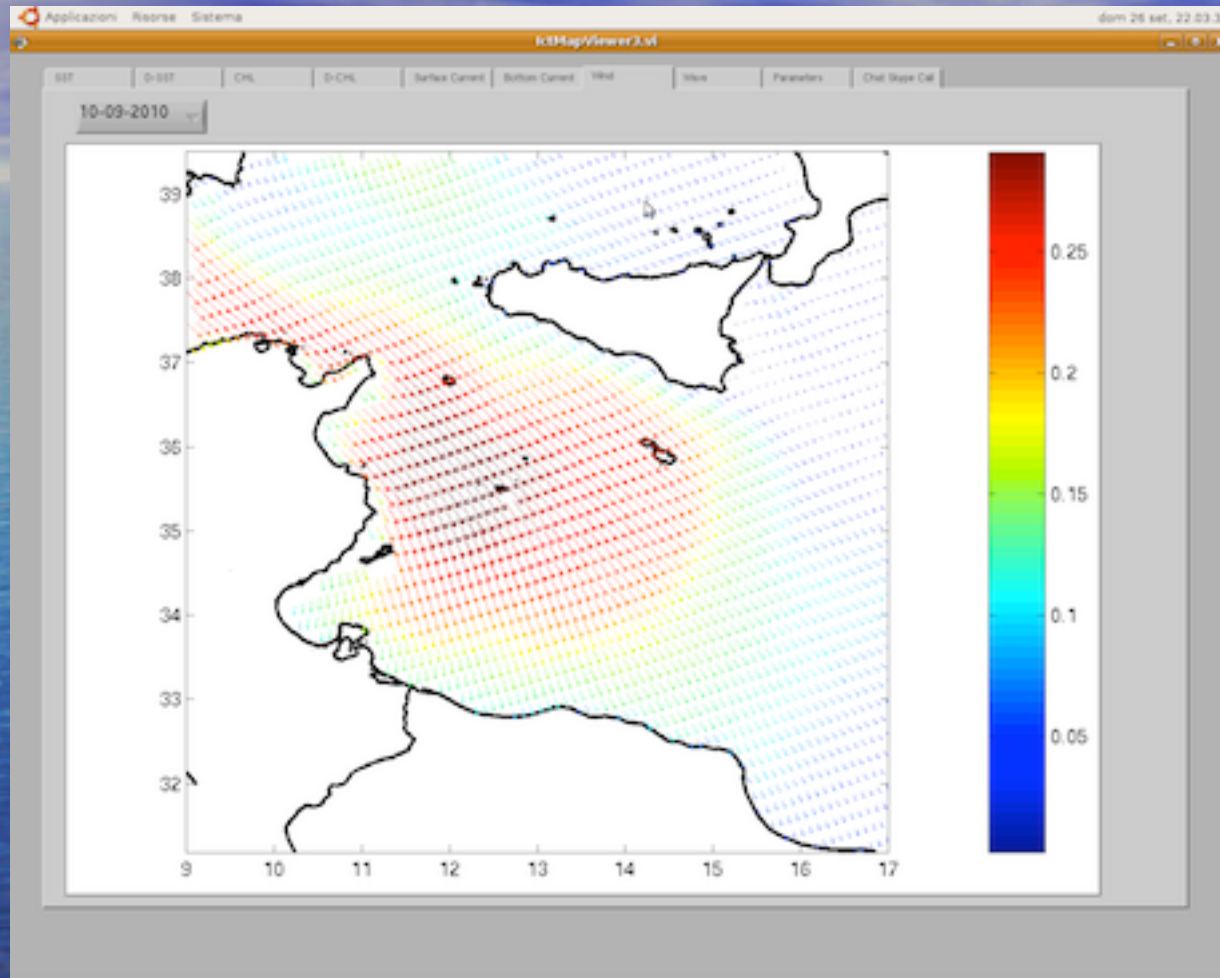


Sea surface current

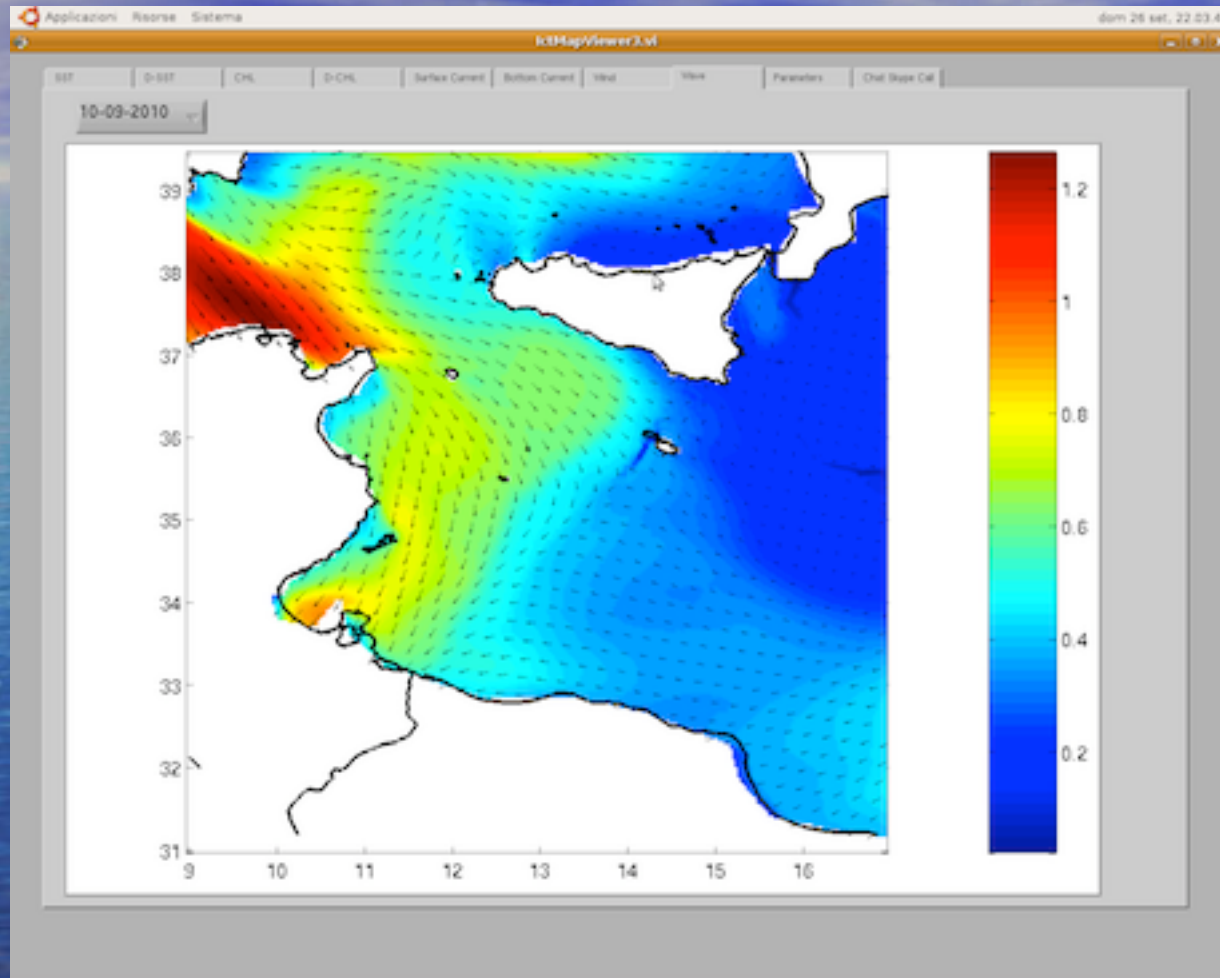




## Wind Stress



Wave height



# EXAMPLE of webGIS application

**LIVELLI**

**IAMC-CNR**

**MEDITERRANEAN**

**SST**

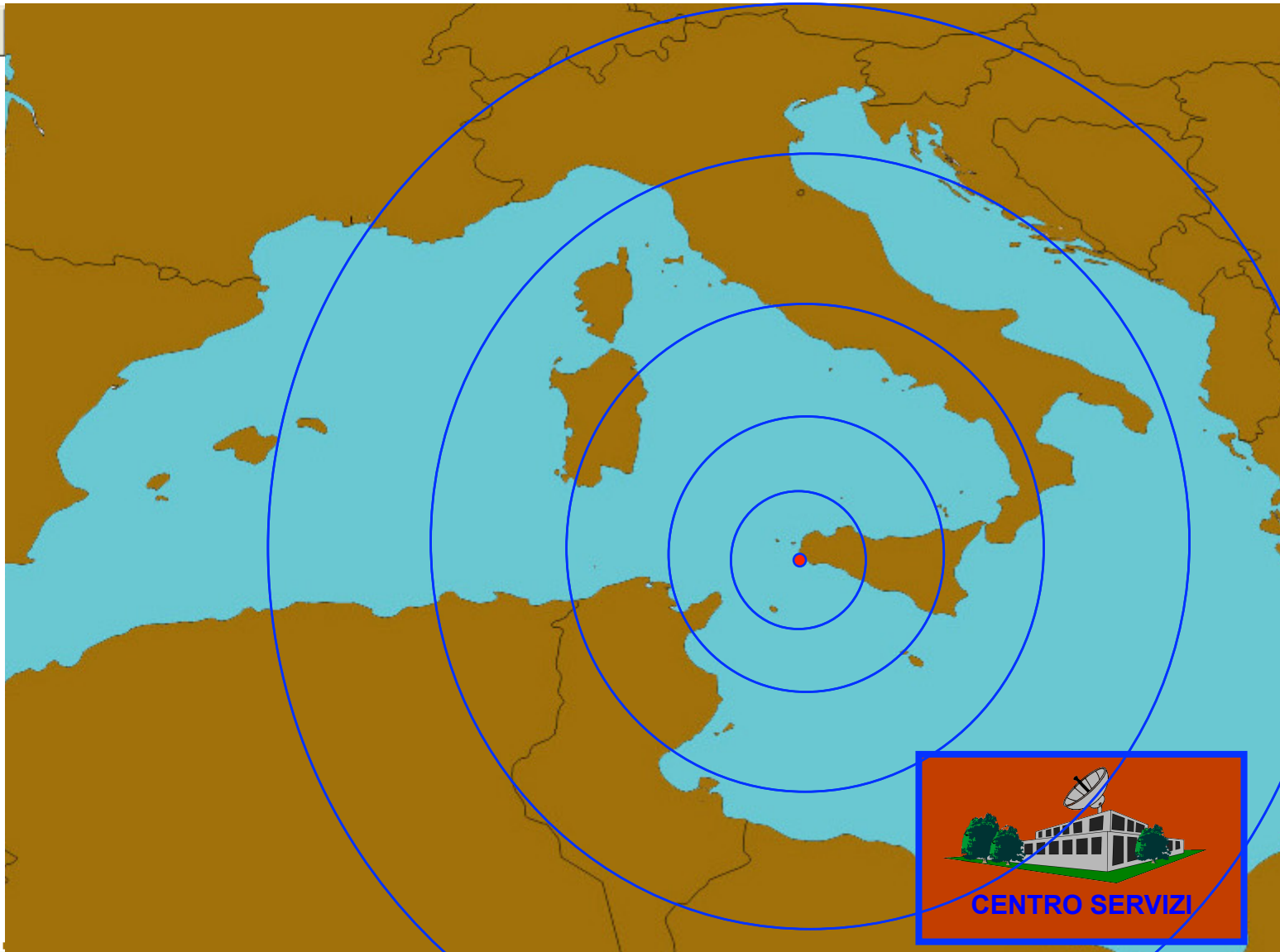
**SALINITY**

**SENSORS  
KIT-ICT**

**IN SITU  
TEMPERATURE**

**OUTPUT**

**TEMPERATURE  
GRADIENT**



**CENTRO SERVIZI**

Internet 100%

# SST - STRAITS OF SICILY

**LIVELLI**

IAMC-CNR

**MEDITERRANEAN**

**SST**

**SALINITY**

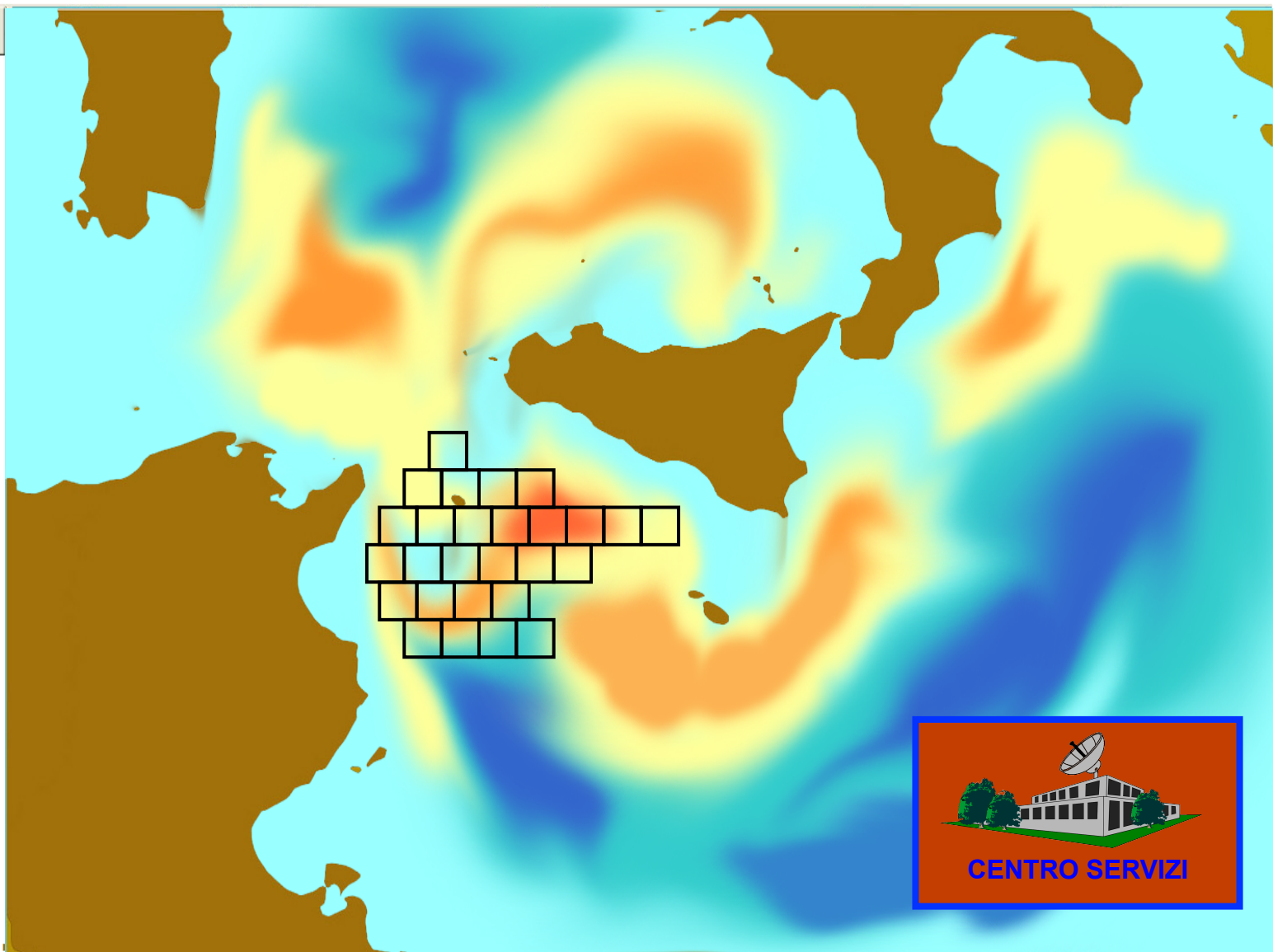
**SENSORS  
KIT-ICT**

**IN SITU  
TEMPERATURE**

**OUTPUT**

**TEMPERATURE  
GRADIENT**

◀ ▶



Navigation icons: Home, Back, Forward, Zoom In (+), Zoom Out (-), Full Screen, Info, Print, Refresh, Download (DL)





# AREA SELECTION - SST

## LIVELLI

IAMC-CNR

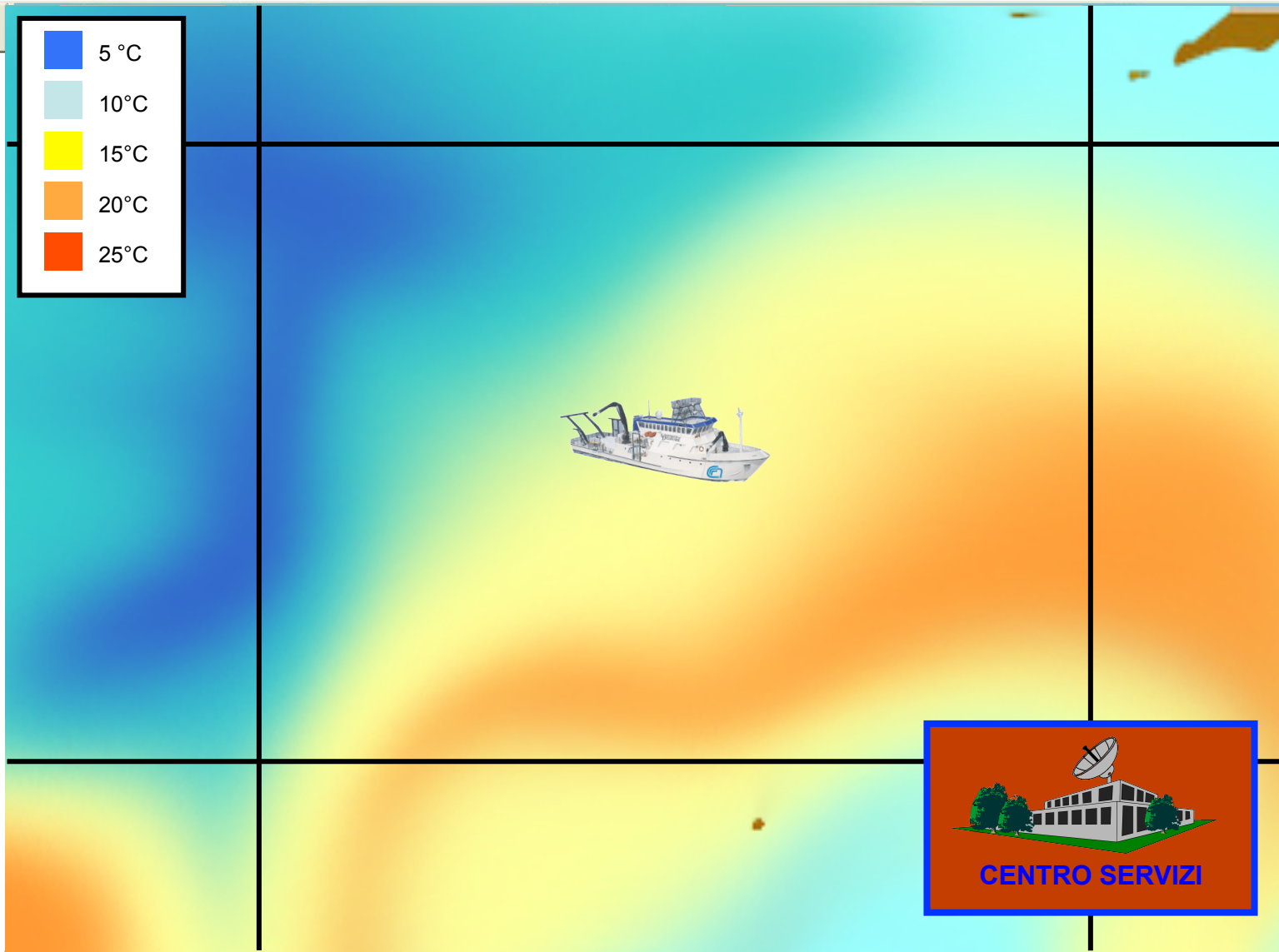
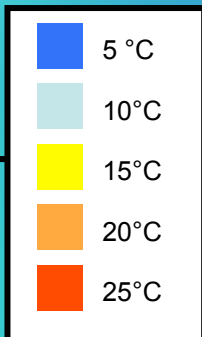
- MEDITERRANEAN
- SST
- SALINITY

## SENSORS KIT-ICT

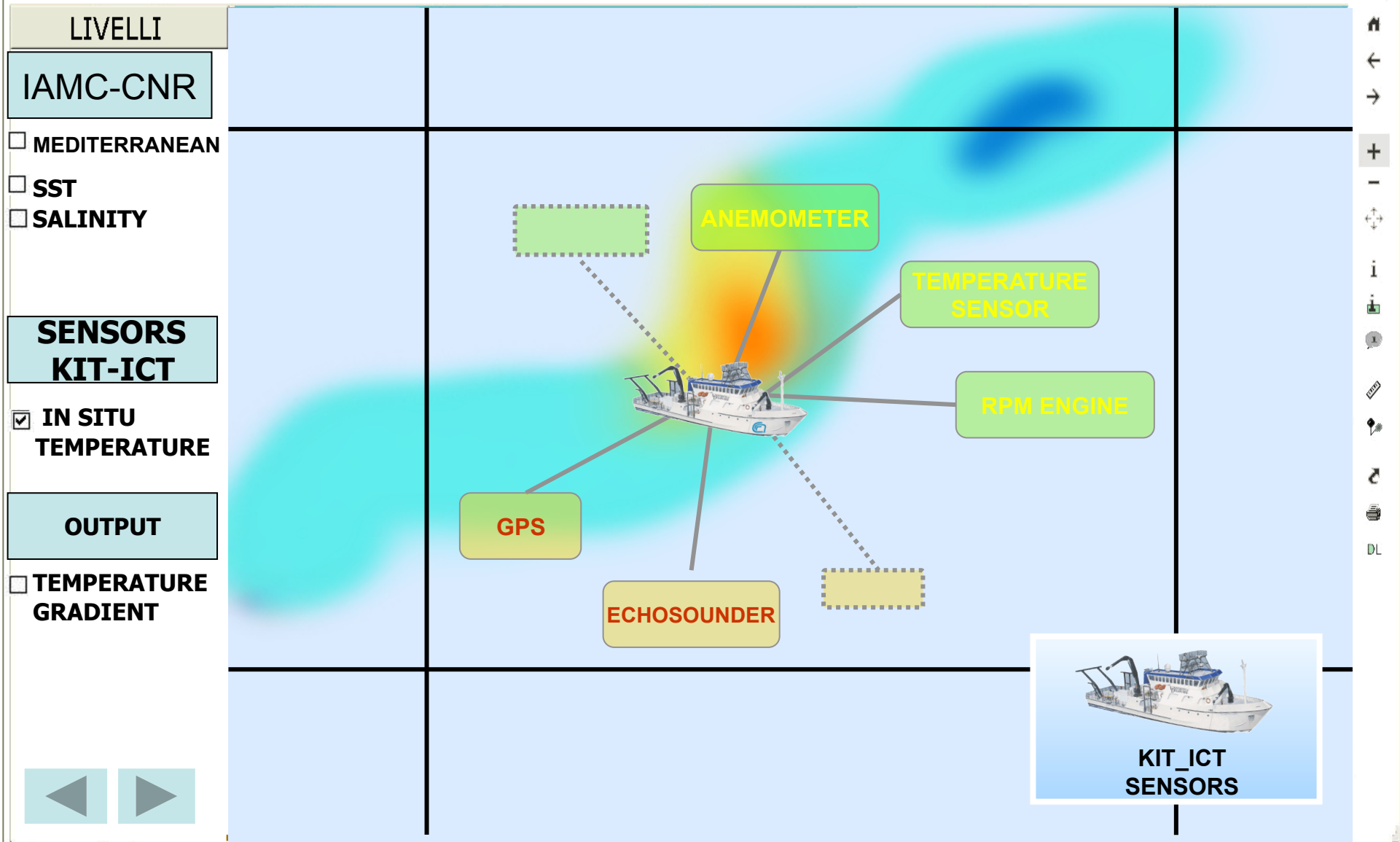
- IN SITU  
TEMPERATURE

## OUTPUT

- TEMPERATURE  
GRADIENT

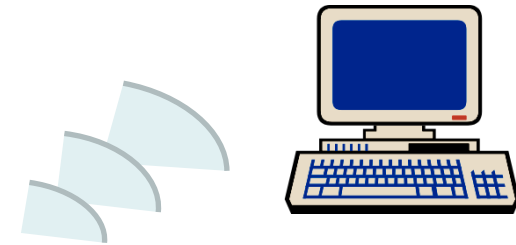


# IN SITU SST



# Future development of fishery information devices:

**A) Use of a new generation sensors that can collect various environmental parameters relating to the water column (e.g., temperature, pressure, conductivity and fluorescence) and forward them to the modular system at the end of each fishing haul**



**B) Extension of installations on Italian fishing vessels, creation of a network for the monitoring of marine environment**



**Project:**

**Sistema di supporto alle decisioni per la gestione sostenibile  
della pesca nelle regioni del Mezzogiorno d'Italia**

*(Decision support system for sustainable management of  
fisheries in the regions of Southern Italy)*

**Consiglio Nazionale delle Ricerche  
Dipartimento Terra e Ambiente**

...the **strategic framework** of the project...

- the **National Strategic Plan**, drafted in 2007 under Reg. EC 1198/2006 (European Fisheries Fund-EFF), which identifies the measures to modernize the fishing industry in Italy in 2007-2013
- **Integrated Maritime Policy (IMP)** of 2007 and the **Strategy Framework Directive for the marine environment** of 2008, which recognized the need to harmonize by staff in the context of environmental sustainability which takes into account the different activities taking place in Europe's seas ,
- The **new European Commission Green Paper**, published in 2009, which identifies the lines of action to reform the Common Fisheries Policy (CFP) since 2013;
- the package of "**Regulations on the control to ensure compliance with the rules of the Common Fisheries Policy**", covering the following regulations, highly integrated with each other (the EU Council Regulation (EC) No 1005/2008 of 29 September 2008 Regulation (EC) No 1006/2008 of 29 September 2008 and Regulation (EC) No 1224/2009 of 20 November 2009.

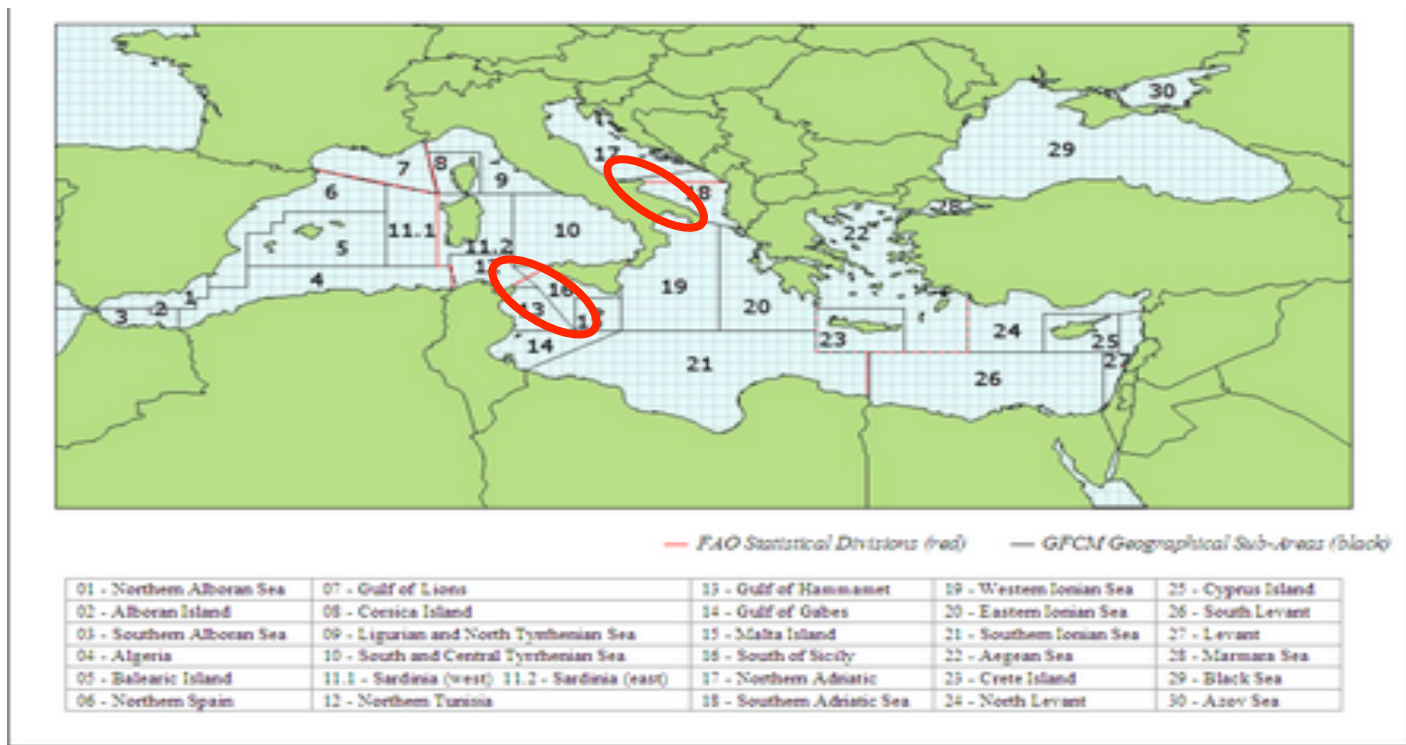
## ...the general objectives of the project ...

- 1) to study the **dynamics of fishing resources** in terms of abundance, demography and spatial distribution, depending on the **ecological conditions** of the environment (water column, bottom and biotic communities) and of **removal** from fishing;
- 2) provide knowledge to the industry, **to optimize the catch processes**, reducing negative environmental impacts and improving the economic performance of fishing activities;
- 3) to provide technical and scientific advice to the **management authorities** (Ministry of Agriculture, Food and Forestry Departments and local counterparts) and **supervisory control** (Coastal Guard) for effective management of fishing effort and activities.

## The intervention area...

..two southern Italian regions whose economies are highly dependent on fisheries:

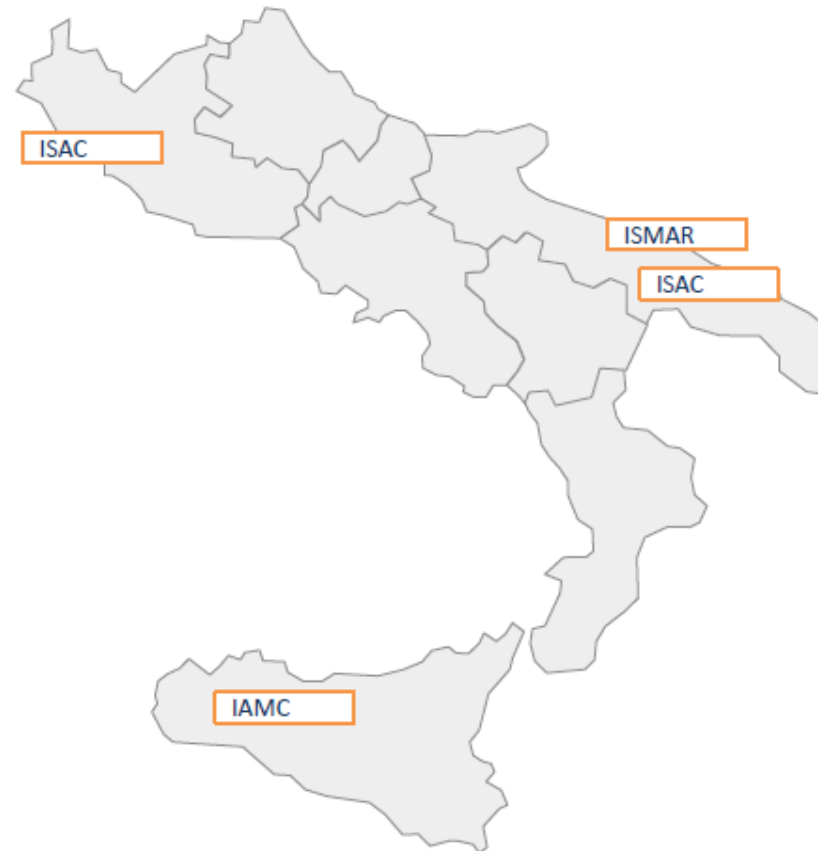
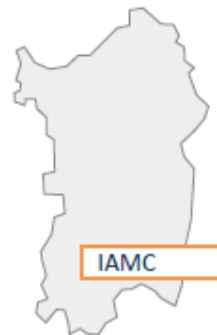
- Sicily, with 27% of national income (287 M €) and 28% of employment (8300 fishermen) ...
- Puglia, with 16% of revenues (173 M €) and 14% (4000 fishermen) of employment



# ...Partnership and collaborations...

## CNR

- Mazara del Vallo, Capo Granitola, Messina e Oristano | IAMC
- Foggia | ISMAR
- Lecce e Roma | ISAC



## Network esterni

- Cooperative di pescatori
- Associazioni di categoria
- MIPAAF
- Capitanerie di Porto
- Assessorati regionali per la pesca



**Thank you  
for your attention**