Red ACOMAR: Real-time networking activities in the Macaronesian region as a contribution to the Coastal Ocean Observations Panel (COOP)

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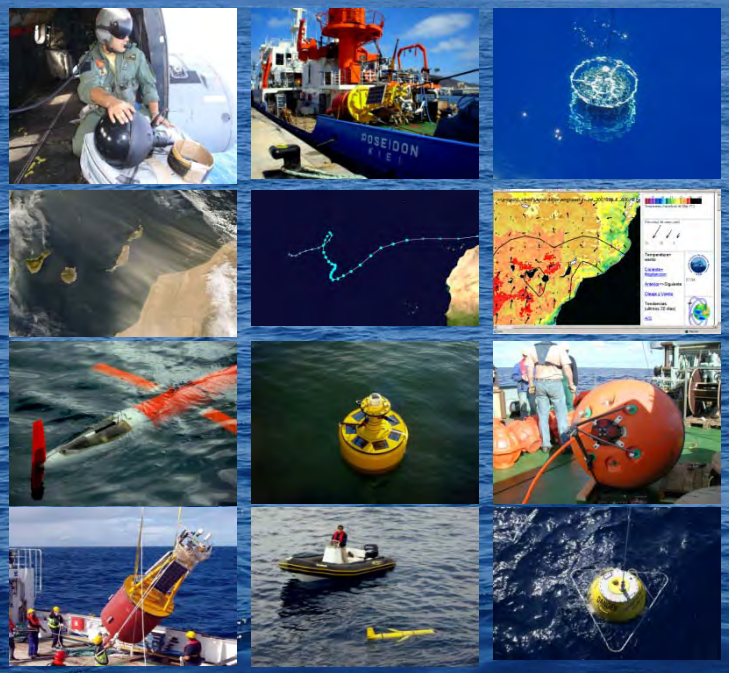
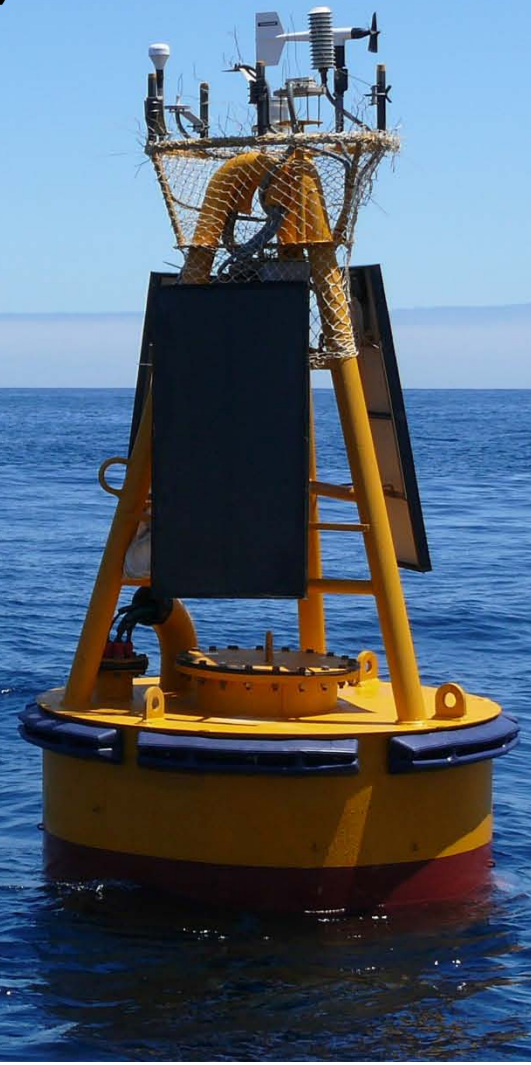
[2] Chemistry Department. Universidad de Las Palmas de Gran Canaria (ULPGC). Las Palmas. Spain.

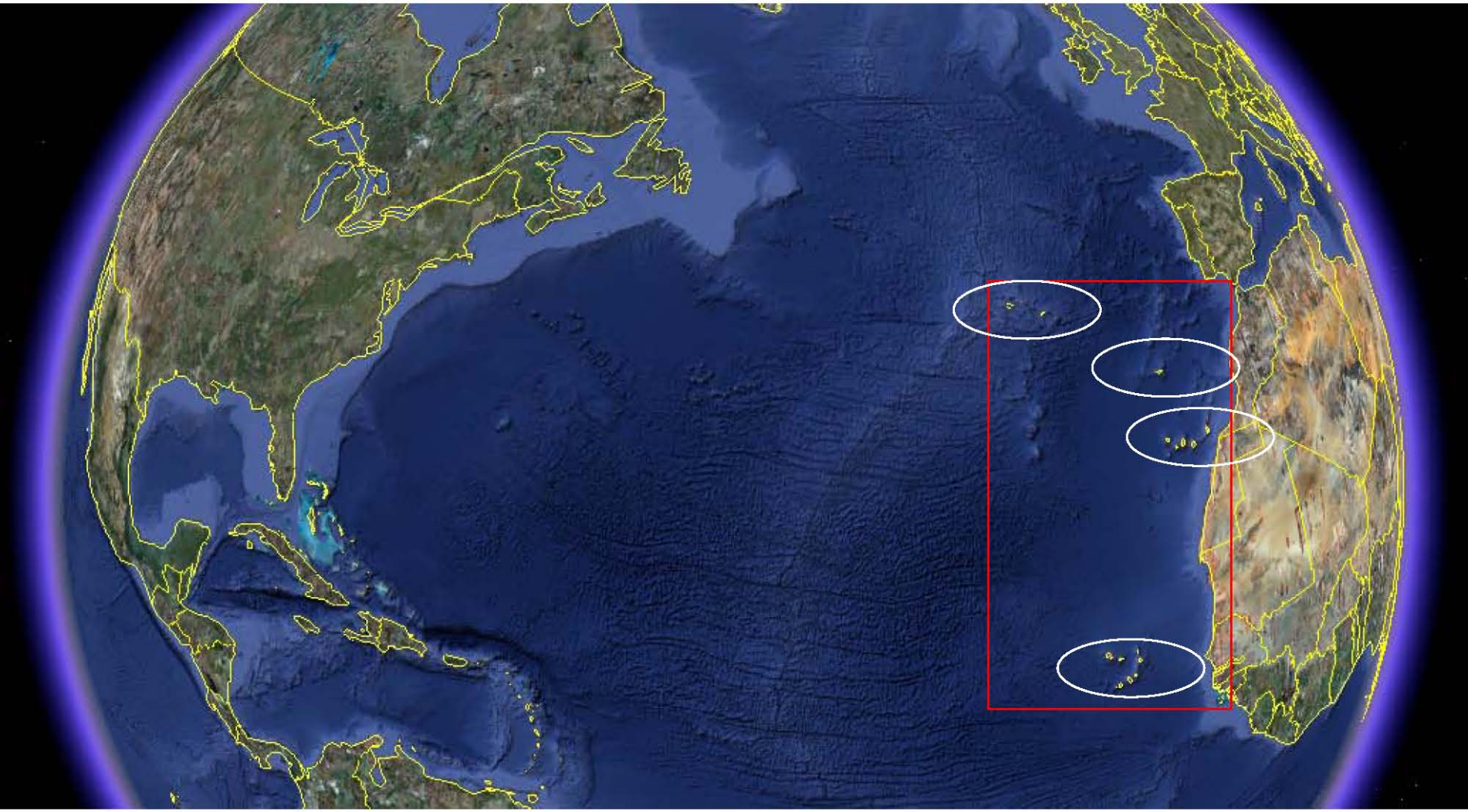
[3] Observatorio do Ambiente dos Açores (OAA). Açores. Portugal.

[4] Plataforma Oceanica de Canarias (PLOCAN). Las Palmas. Spain

OCEANS '09 Biloxi, MS (USA) 29th October 2009







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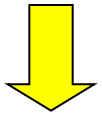
… the GOAL

NRT Coastal Monitoring Network in the Macaronesian region (*1998*)



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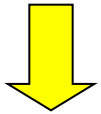
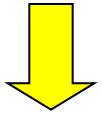


Increase the Marine Environmental Observations Quality and Quantity



Understand and Forecast

PROCESSES AND PHENOMENA

ENVIRONMENTAL + SOCIO-ECONOMICAL EFFECTS AND REPERCUSSIONS

Integrator System

To make compatible and accessible the ALL INFORMATIONS on the Canarian marine enviroment, independently of the data provider institution or monitoring source.

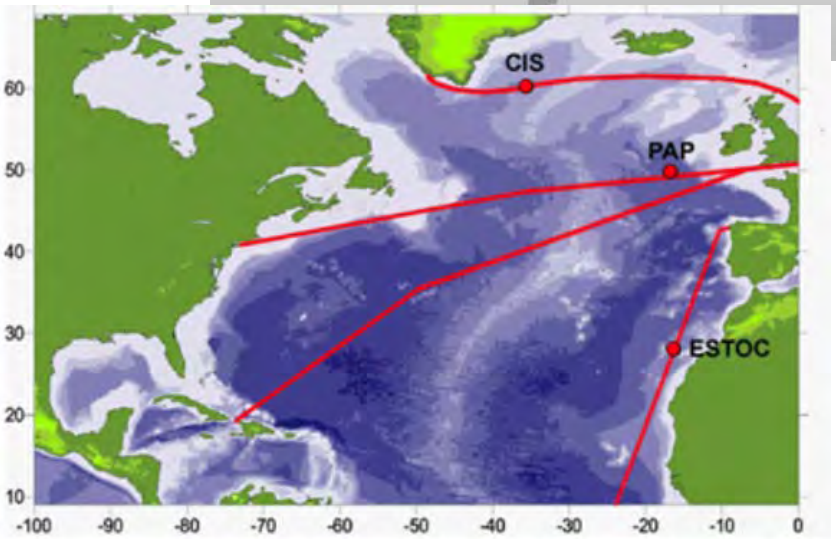
+

To promote and encourage specific direct /indirect FINAL USERS for each kind of observation and location.

Real-time monitoring network with final users in the coastal area and directly linked with open-ocean EU-Operational Oceanography projects with ICCM as a partner.

- ANIMATE (FP5)
- MERSEA (FP6)
- ALERMAC (Interreg)
- CLIMARCOST (Interreg)
- **AMASS (FP7)**
- **EuroSITES (FP7)**

- **PLOCAN**



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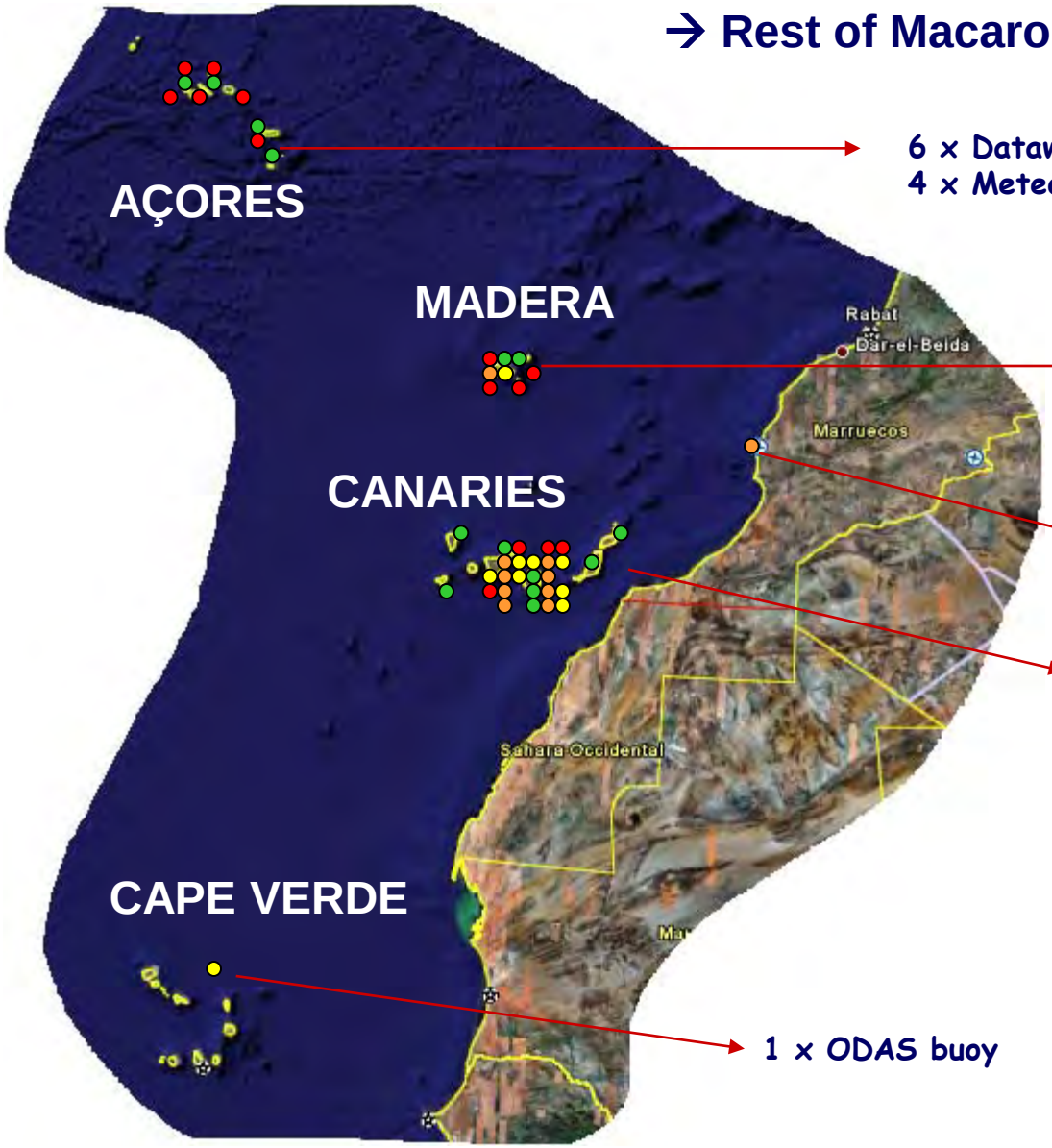
→ Rest of Macaronesian Region



6 x Datawell Buoy Units
4 x Meteo Stations

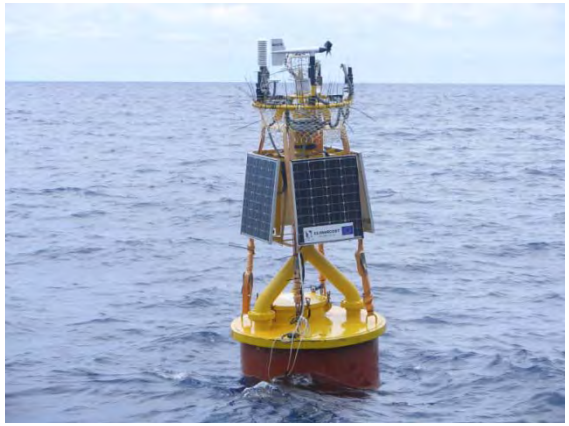
4 x Datawell Buoy Units
2 x Meteo Stations
2 x HC Buoy
1 x ICCM ODAS buoy

1 x HC Buoy

4 x Datawell Buoy Units
6 x ODAS Buoy
8 x Meteo Stations
8 x HC Buoy
1 x ICCM ODAS buoy

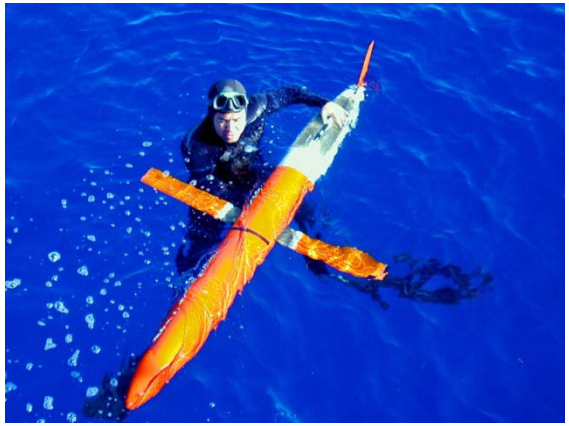
1 x ODAS buoy

Moored Buoys



Drifters

Gliders



Met Stations

Remote Sensing

Turtles

The integration spreads over the instrumental approach, because the aim is to add and make available the "*in-situ*" observations from both moored and drifting devices, on surface or undulate through the water column, and remote sensing as well.

Deep-ocean moorings

ESTOC Mooring

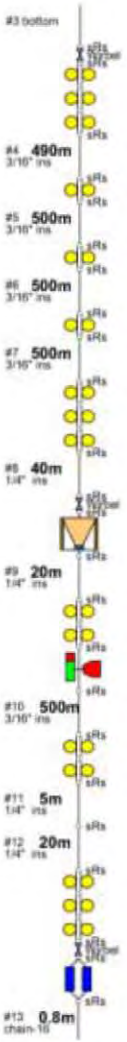
Lat. 29º 10 N

Long. 015º 30 W

animate / estoc with particle traps

24-Mar-2003
21:24
Page # 1 / 4

depth (incl. stretch)	component	S/N	rope # & Length	Distance from lower rope end		in/out of water comment
14 m	Sphere 11"		#1 top 25m Pinck/Rope 6mm		951 m	6Benthos
29 m	MCP-IM			10		
			#1 bottom		1445 m	2Benthos
					1947 m	2Benthos
					2449 m	2Benthos
			#2 top 114m Pinck/Rope 6mm		2952 m	6Benthos
60 m	MCP-IM			96		
90 m	MCP-IM			66	2996 m	TRAP McLane
150 m	MC-IM			6	3017 m	4Benthos
			#2 bottom		3019 m	RCM-8
157 m	Workhorse+F45"		sRs WD5506 (glass tube) sRs			
			#3 top 790m 3/16" ins		3522 m	4Benthos
240 m	MC-IM			709		
400 m	MCP-IM			549		
					3549 m	6Benthos
650 m	MC-IM			300		
					3553 m	AR-2
945 m	MC-IM			5		



3628 m Anchor (4x300) 1250 kg (dry weight)

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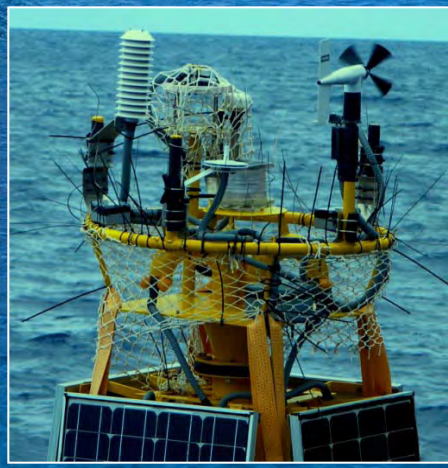
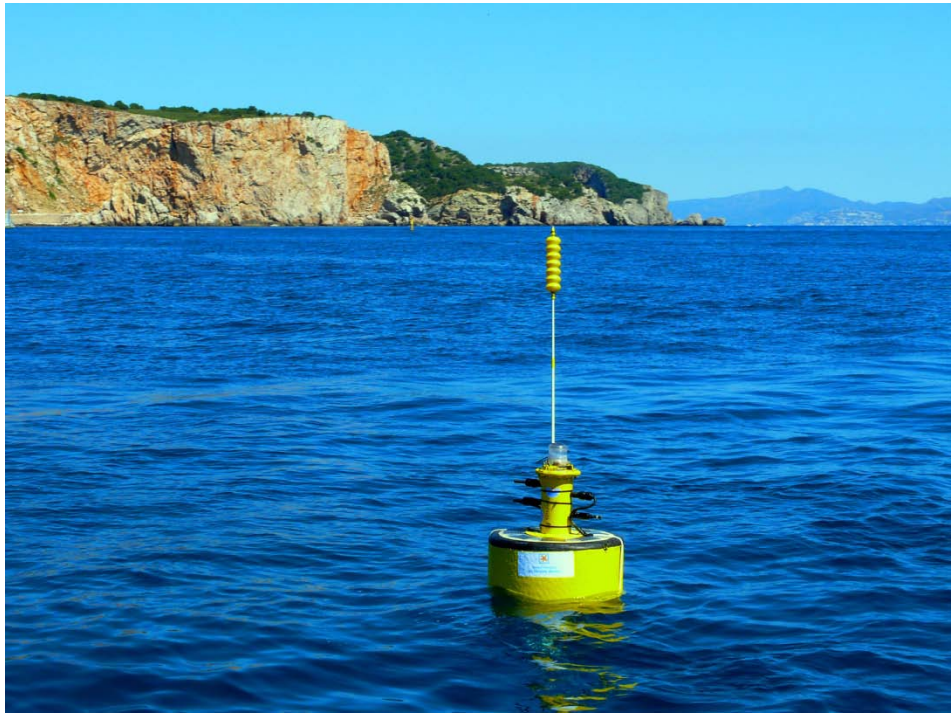
Coastal moorings

→ Met: ws/wd, at, rh, ap, sr, GPS,

→ Ocean: wt, c, do, hc, cs, cd, t..

• GSM/RF





Hydrocarbon Detection System

(*worldwide patent*)

+

Aditional Sensors *(Wind Speed and direction, water temperature, current,…)*

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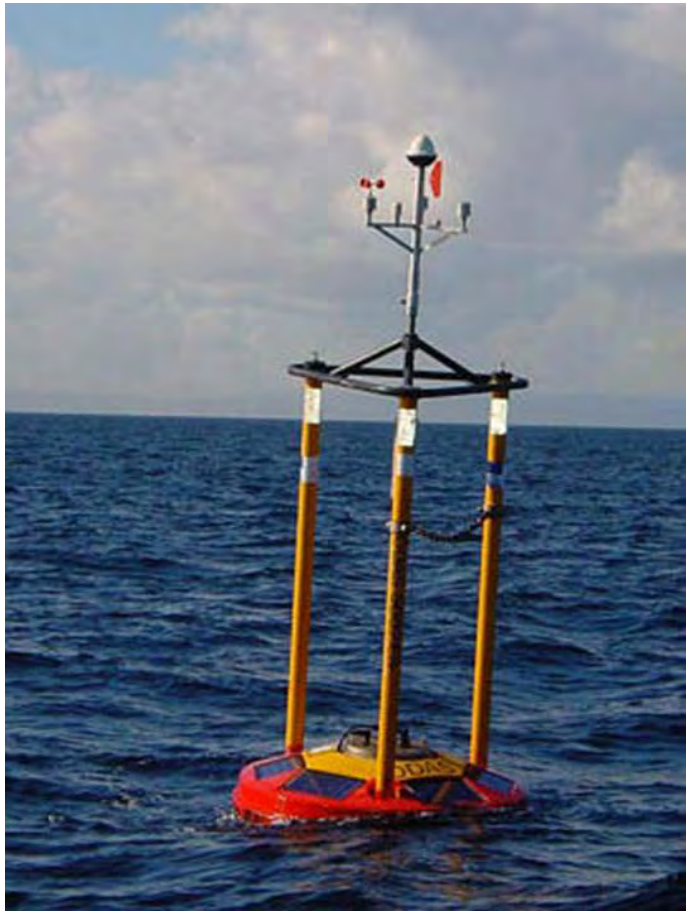
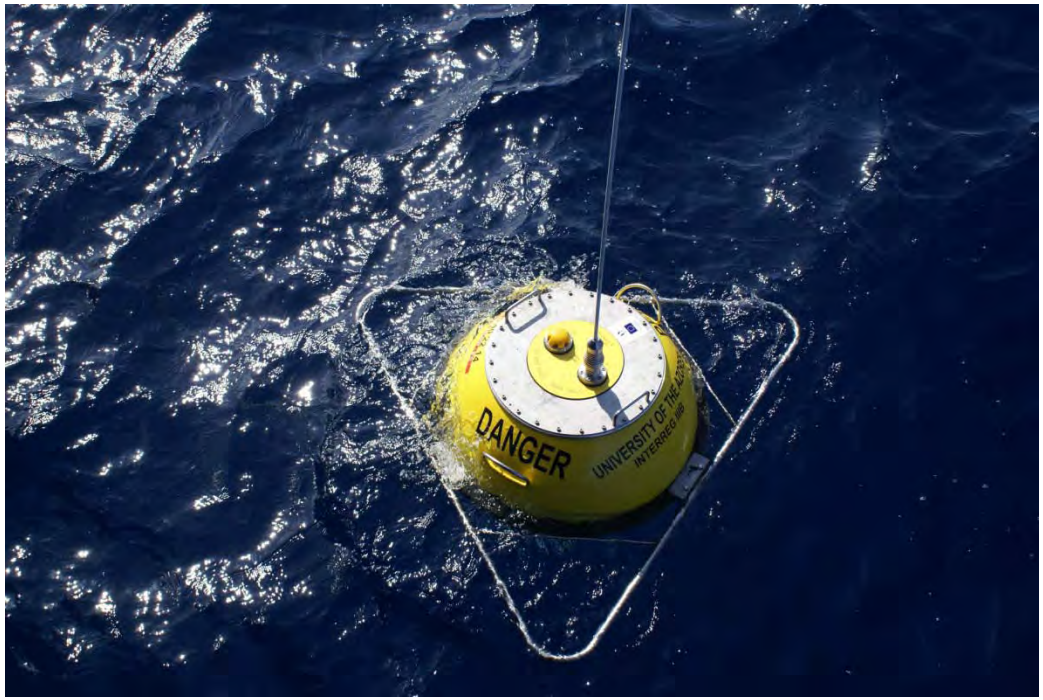
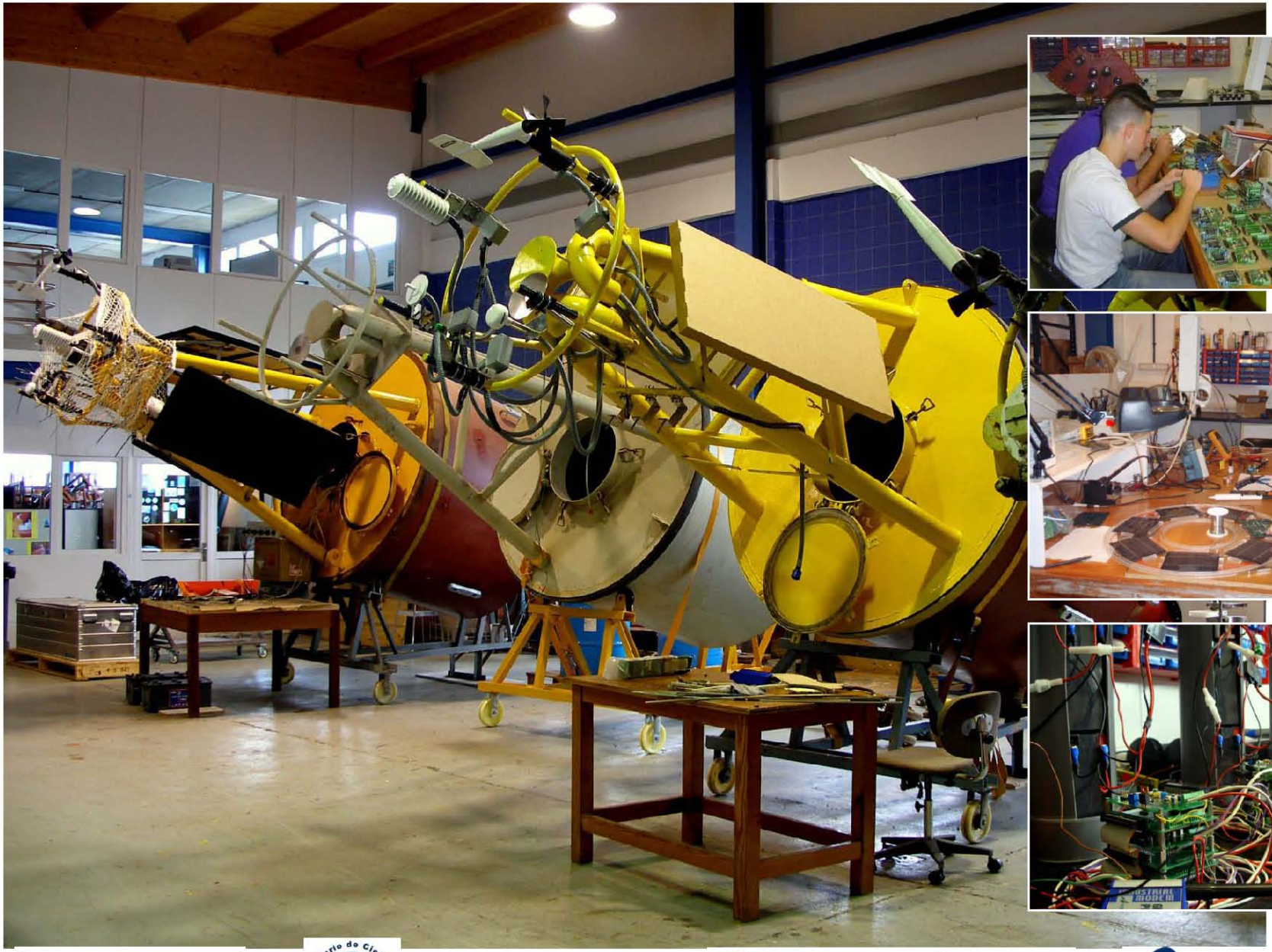


Spanish Deep-Water Monitoring Network
(Canary Islands)



Datawell Network
(Canaries, Madera and Açores Archipelagos)

The obvious need to increase the acquired information quantity and quality, has involved directly the proposal with TECHNOLOGICAL DEVELOPMENTS on wide range of devices and tools, with the aim to bring out them more accessible both technically and economically.



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gmv INNOVATING SOLUTIONS

DUARRY

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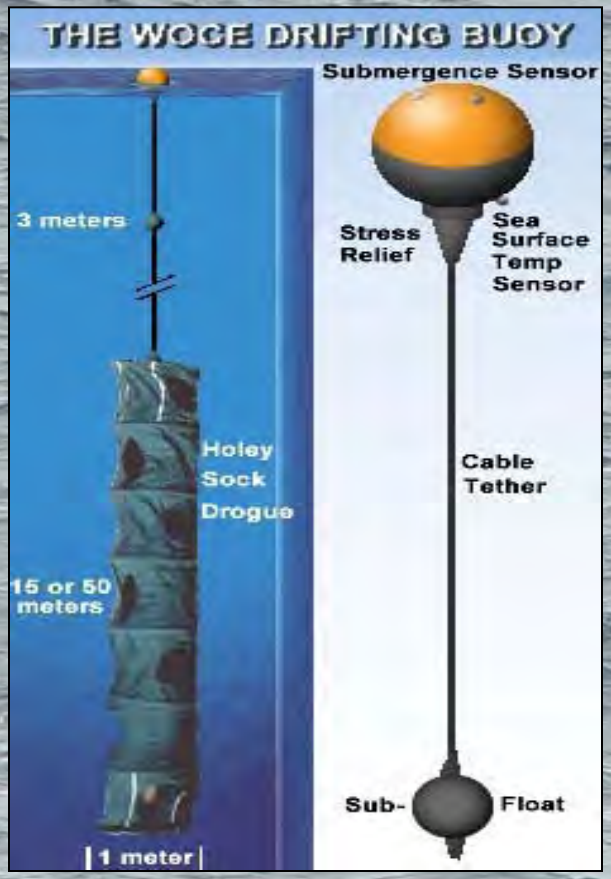
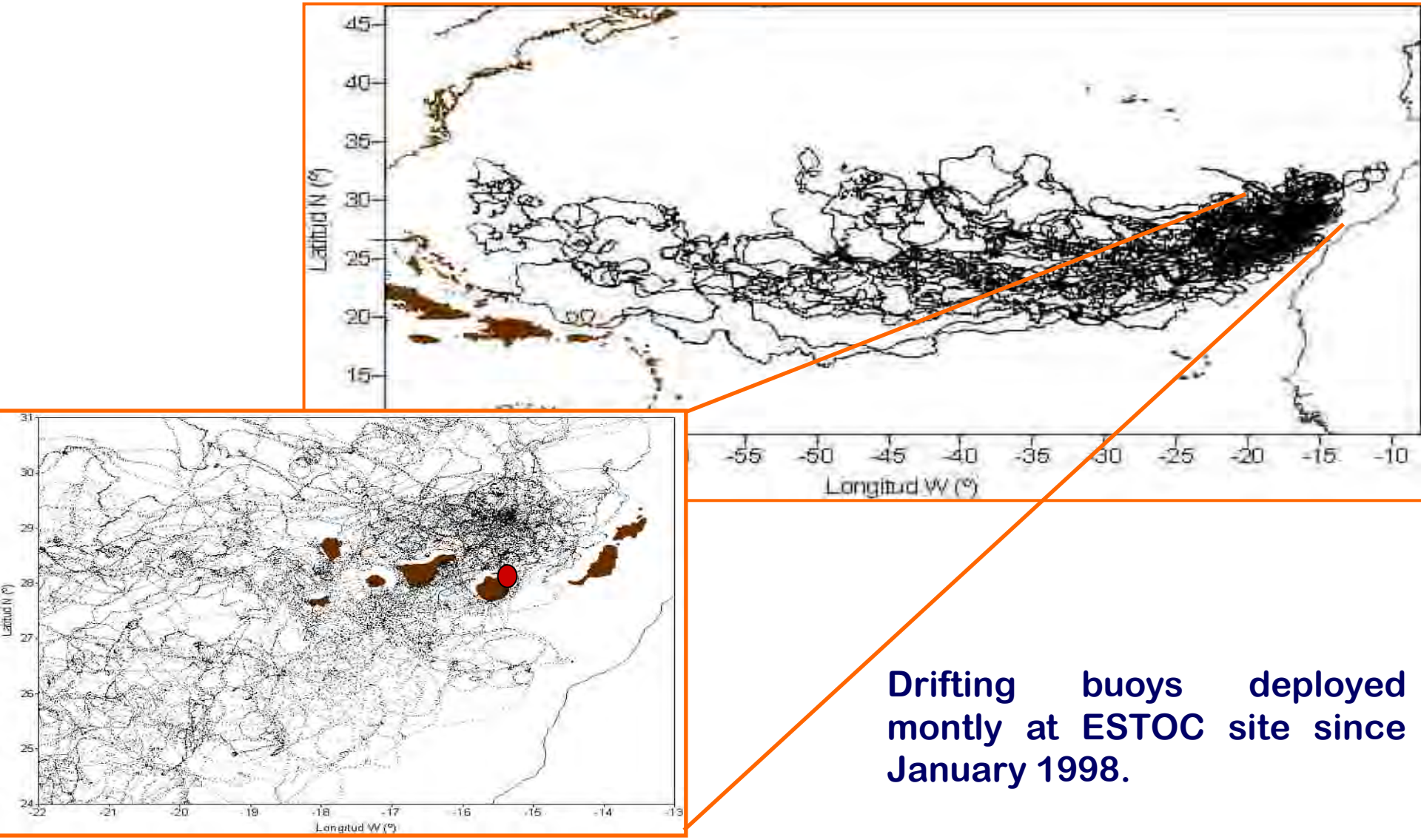
CLEARWATER

PACIFIC GYRE

METOCEAN



Agreement with NOAA since 1998.



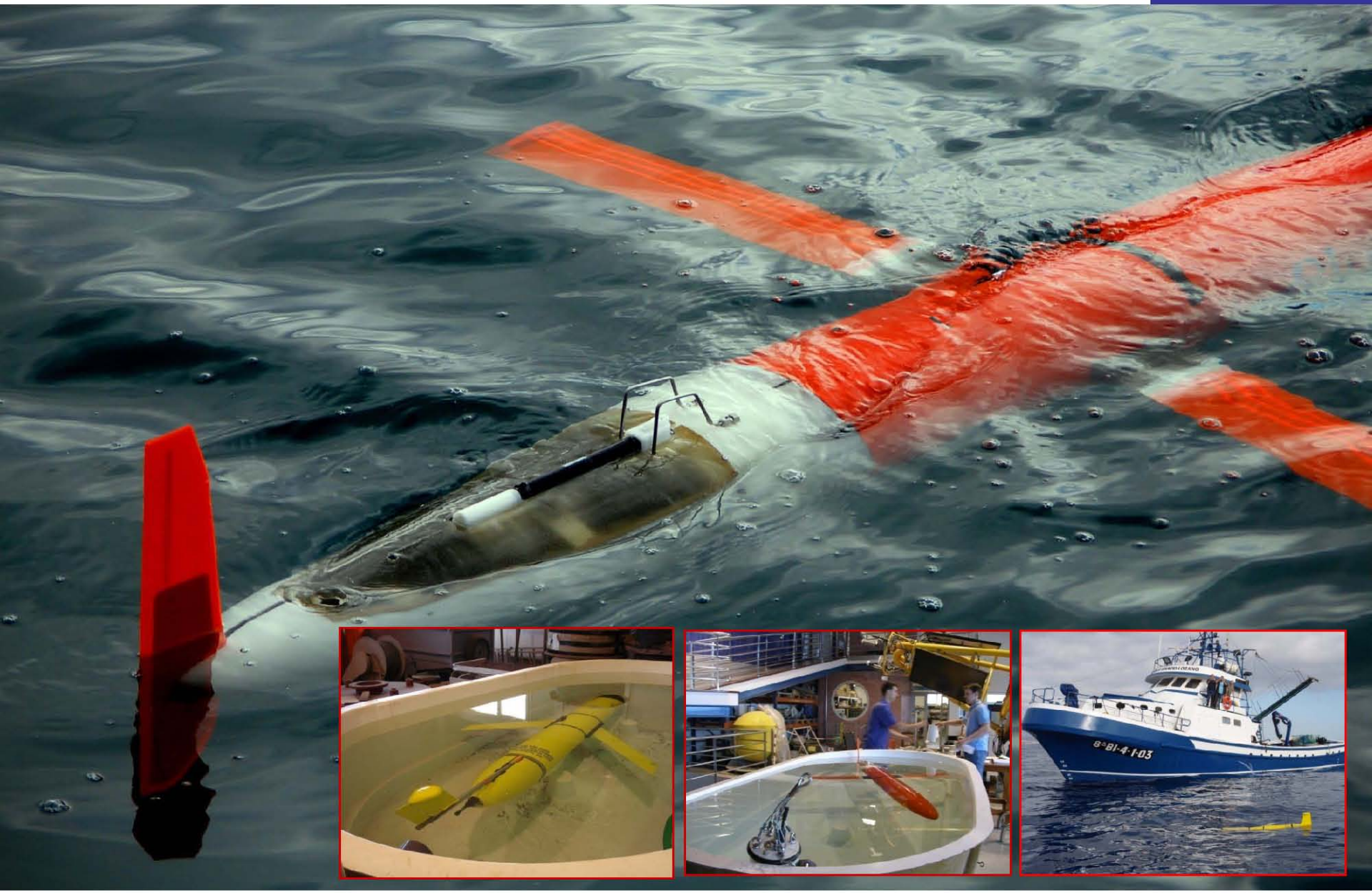
Drifting buoys deployed montly at ESTOC site since January 1998.

MET station

Pico de la Gorra
(1930m)

Tafira
(269m)

Total Suspended Particles (TSP) Samplers



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Transects between shore and ESTOC site (100 nm) and Gran Canaria and Morocco coast

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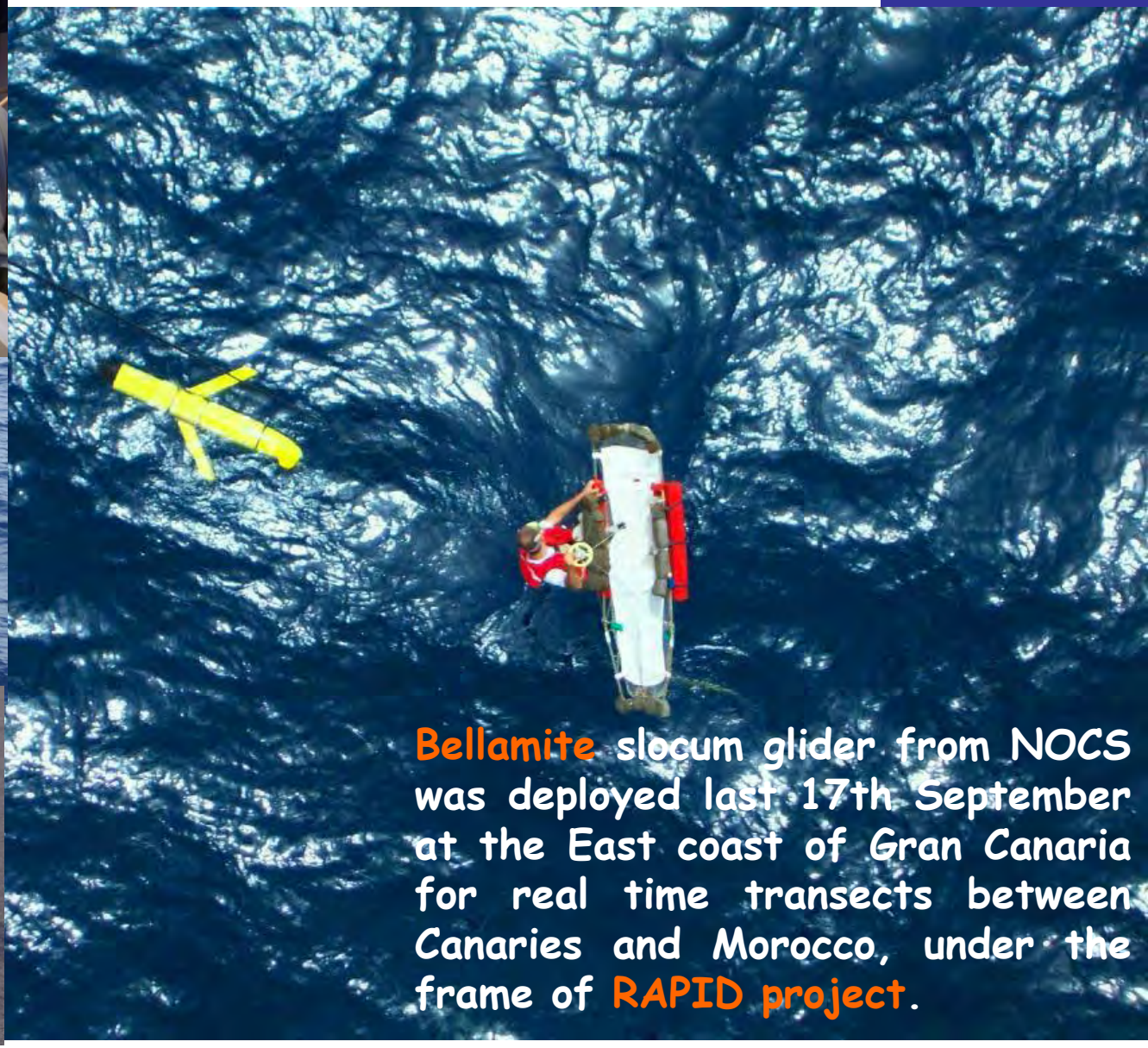
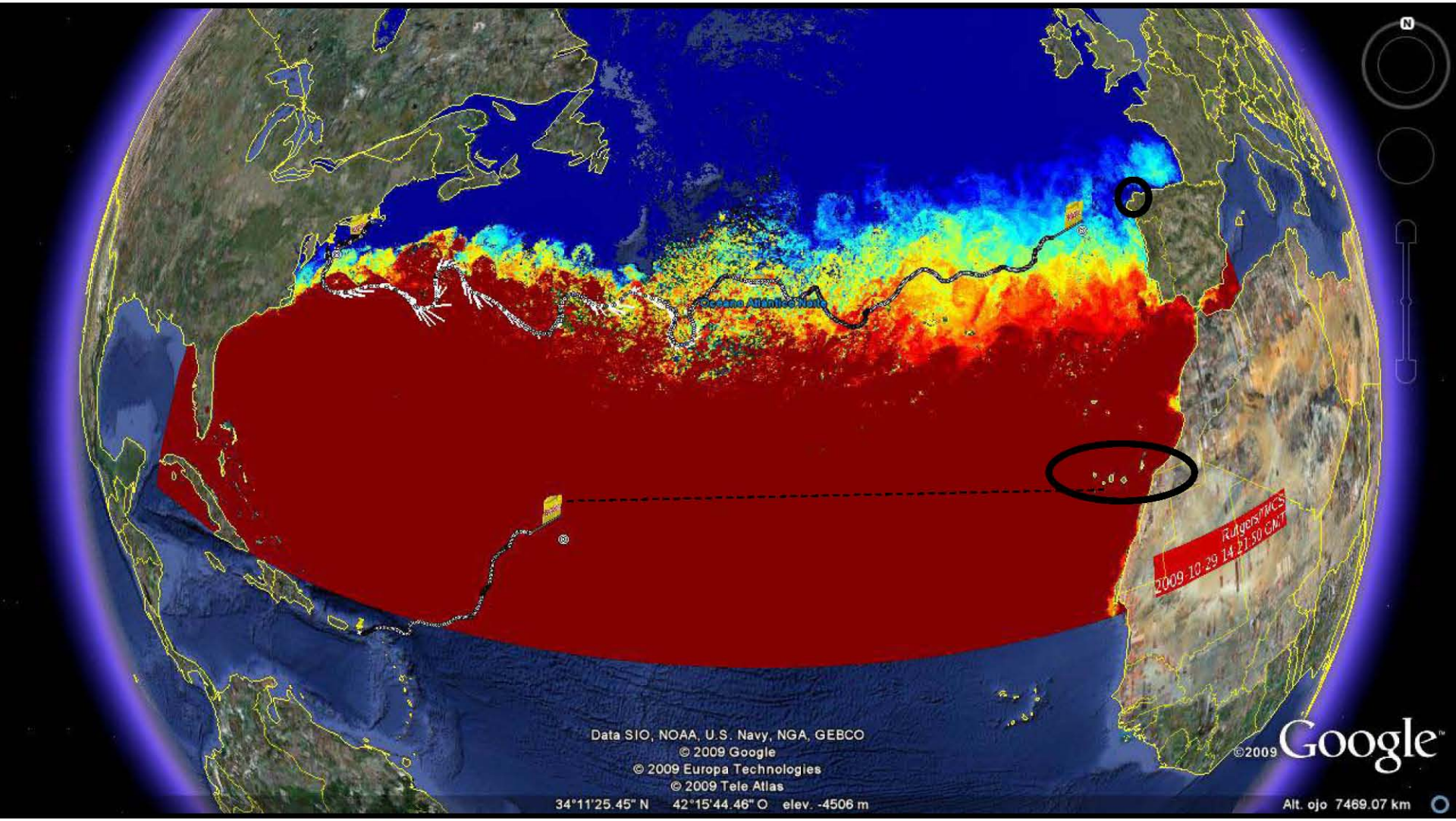


Bellamite slocum glider from NOCS was deployed last 17th September at the East coast of Gran Canaria for real time transects between Canaries and Morocco, under the frame of **RAPID project**.

Partnership RU COOL and PLOCAN - Transatlantic glider Missions



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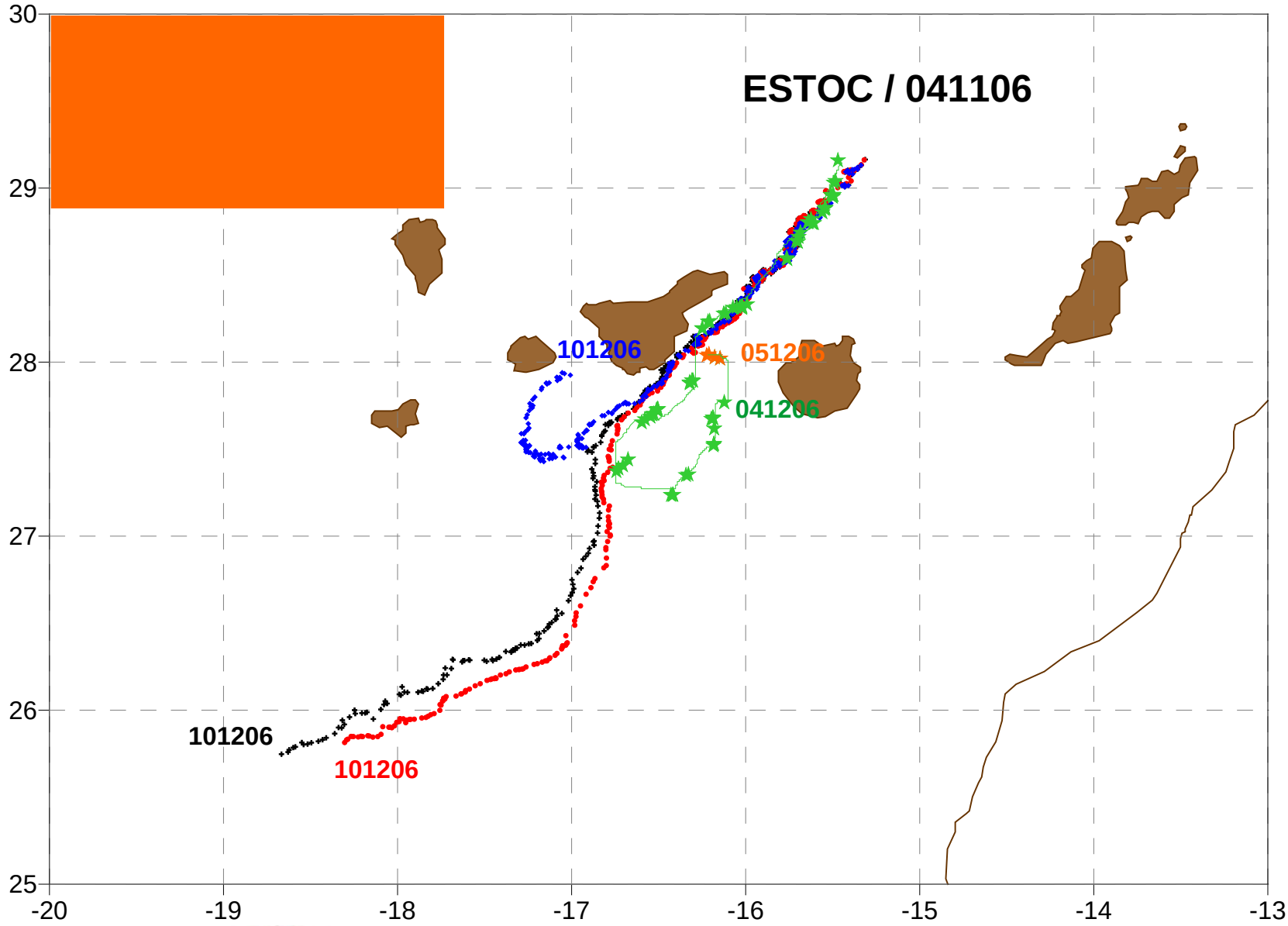
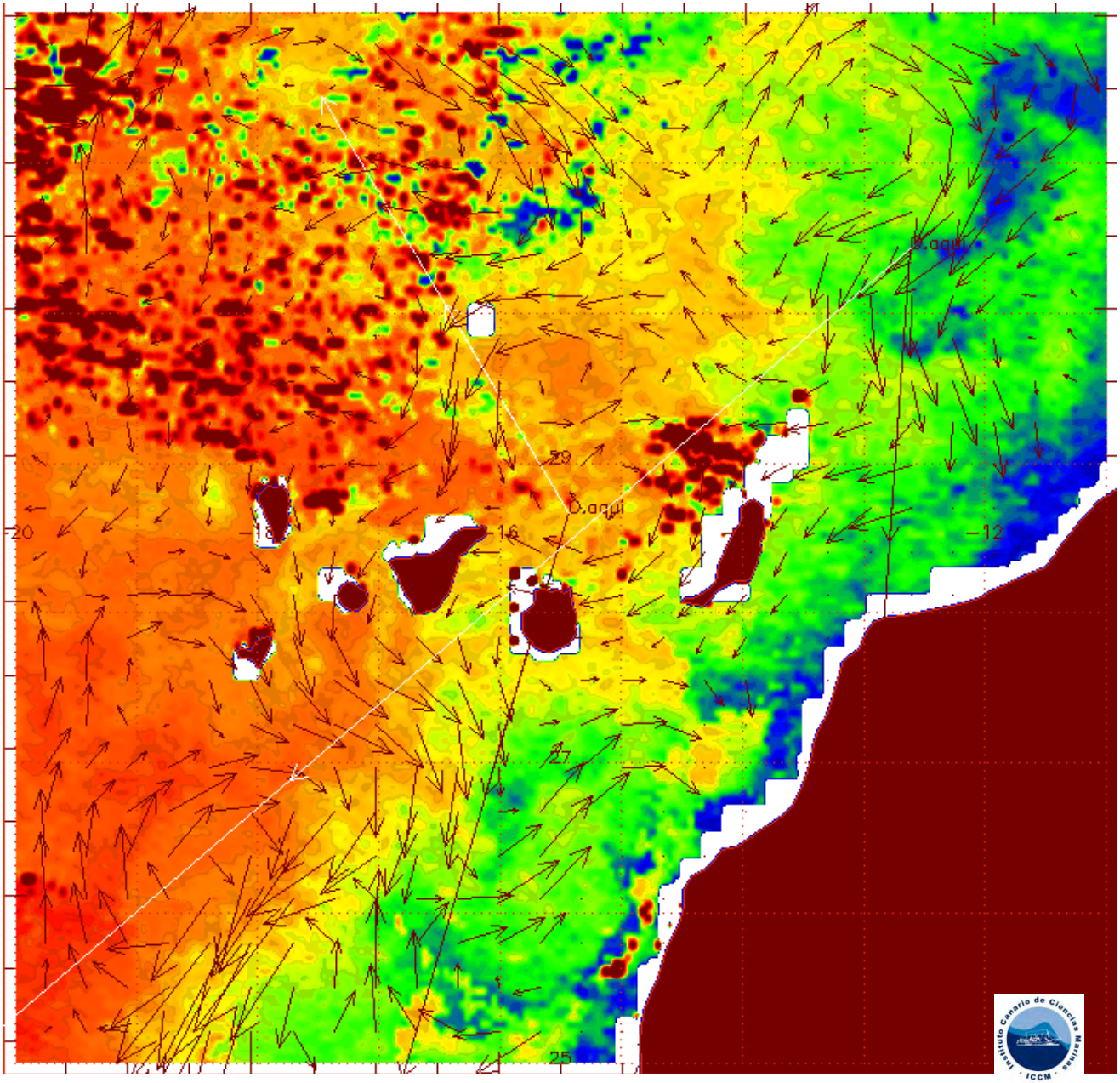
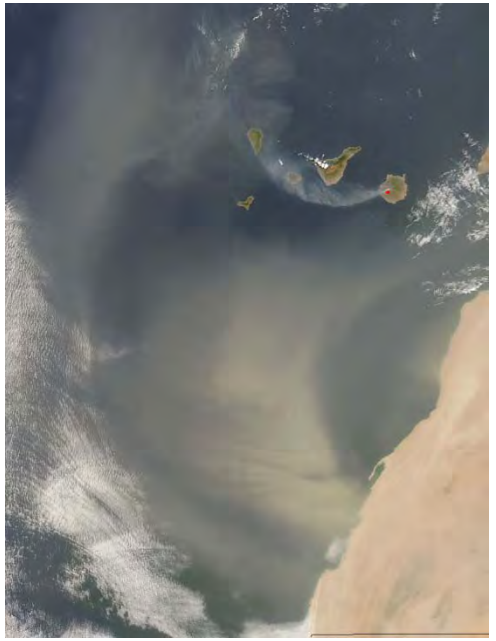






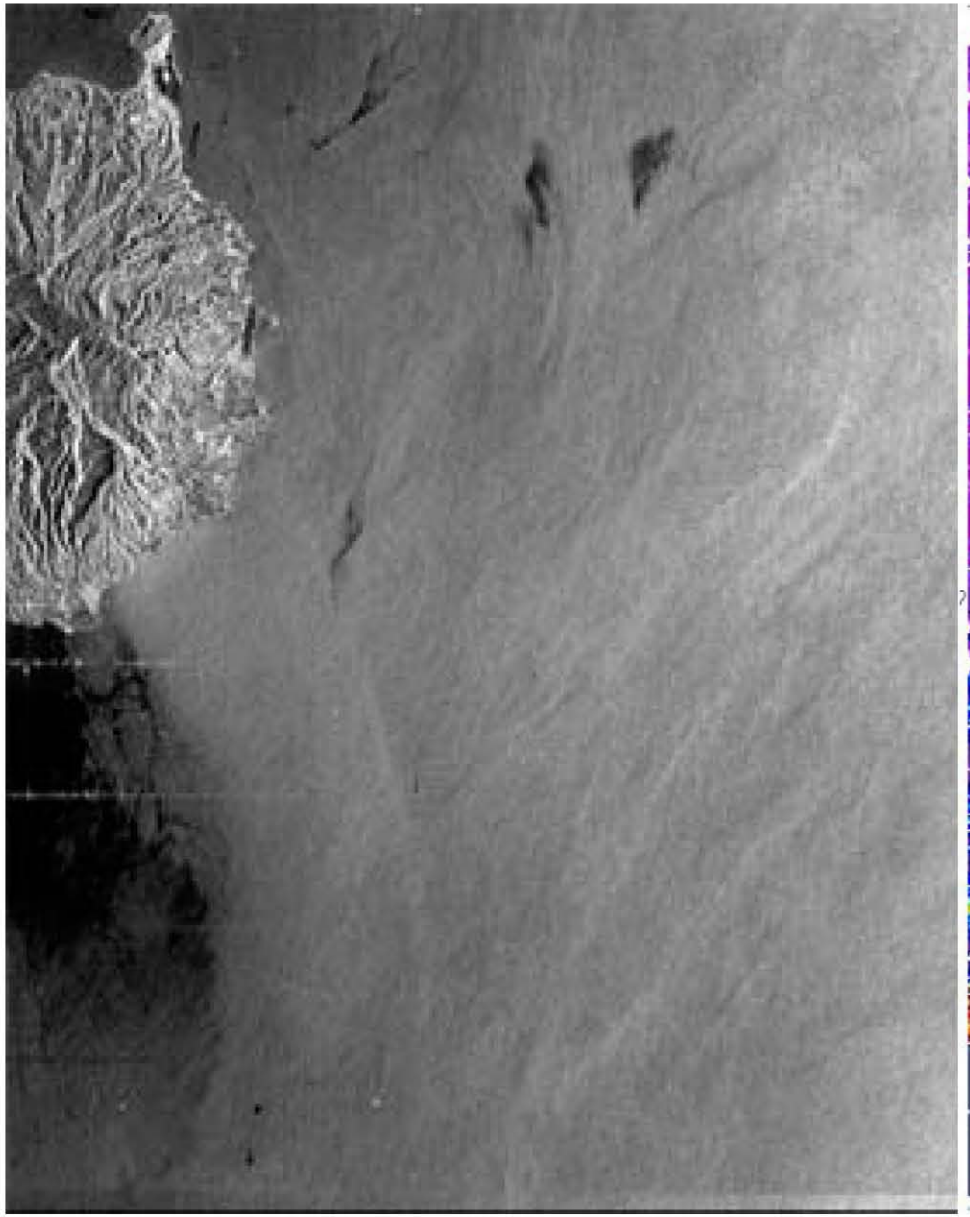
AVHRR

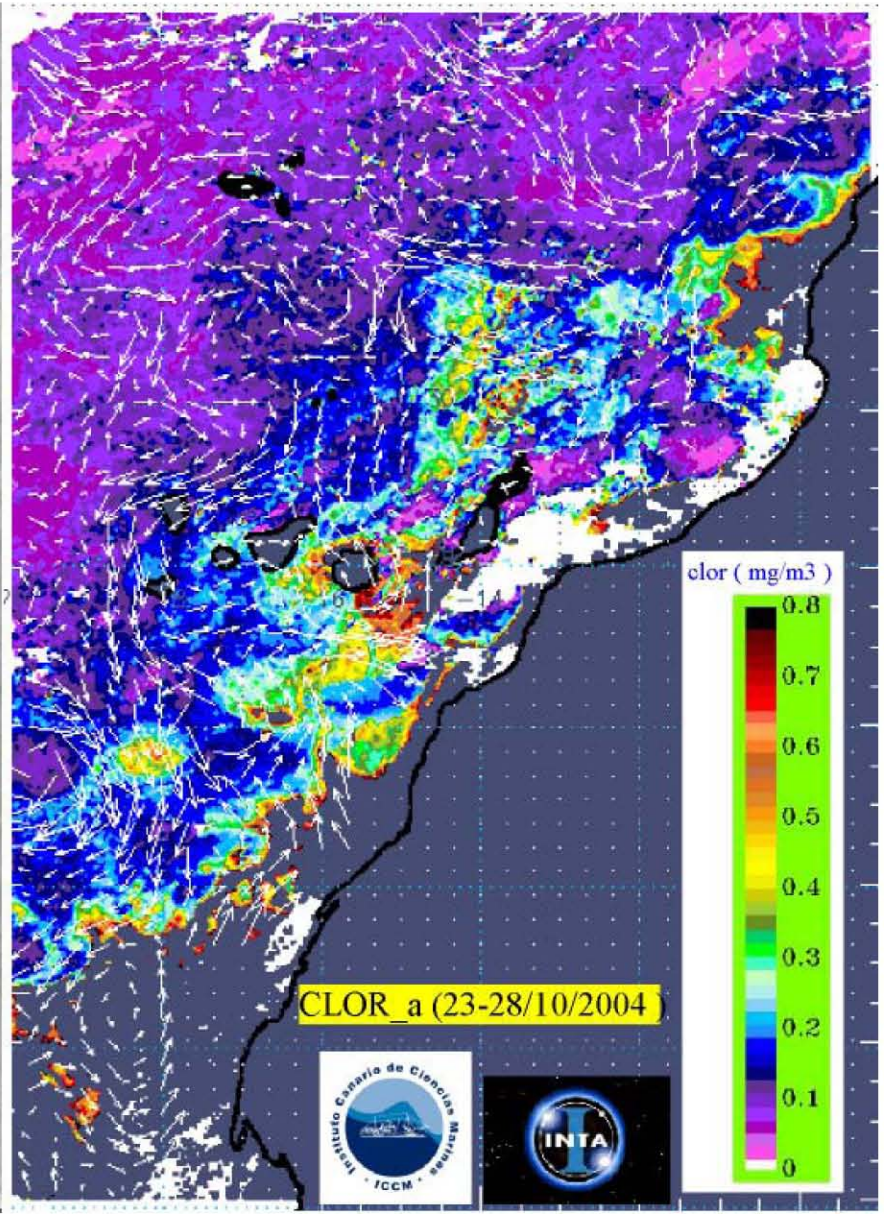
SAR

MODIS

SeaWifs

…





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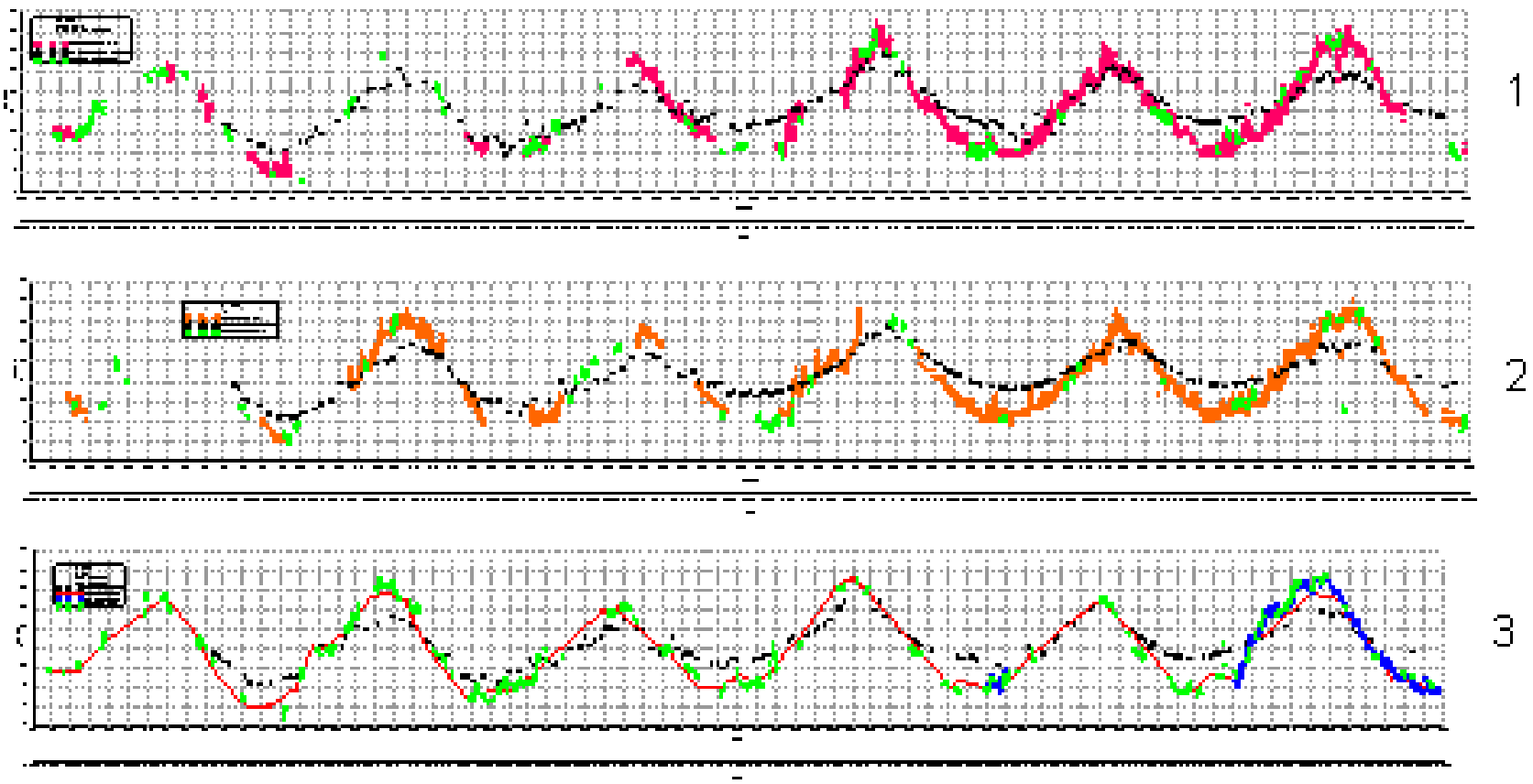
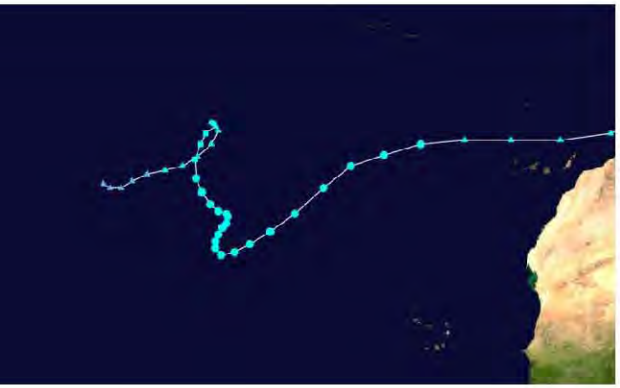
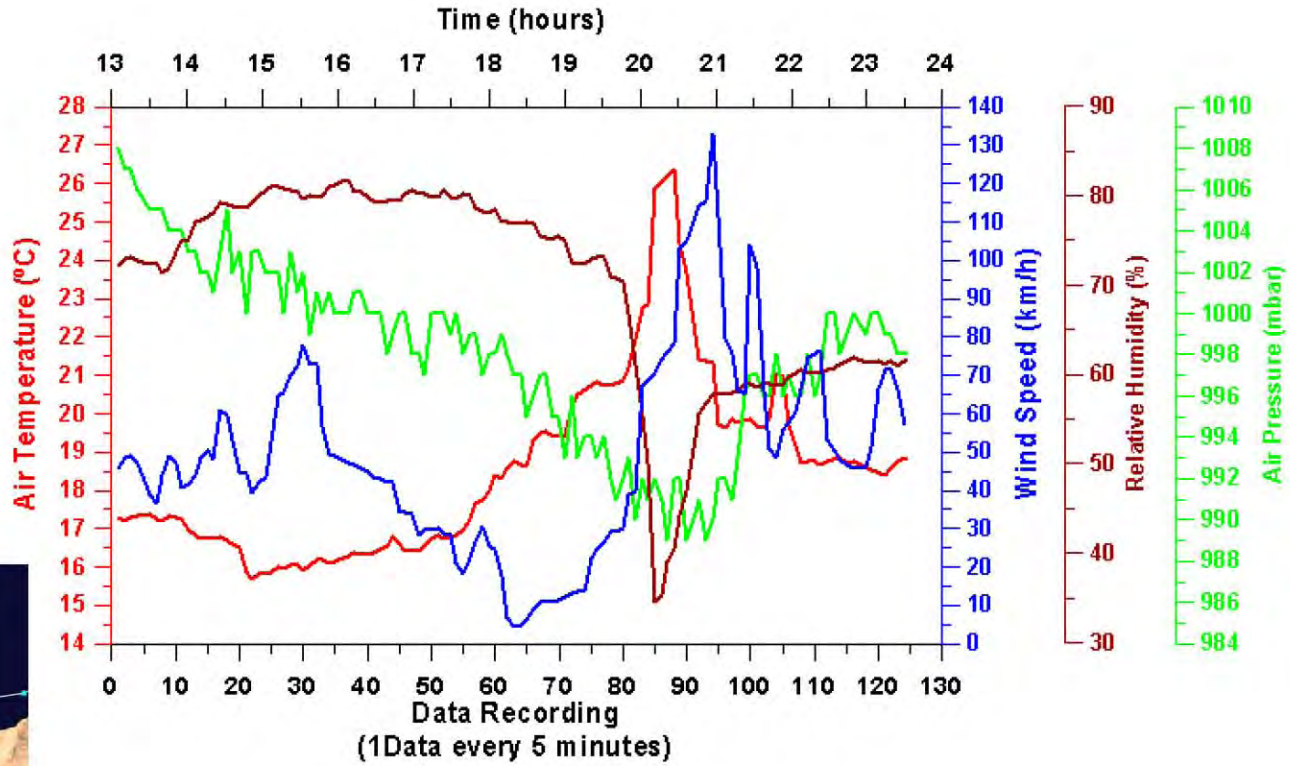


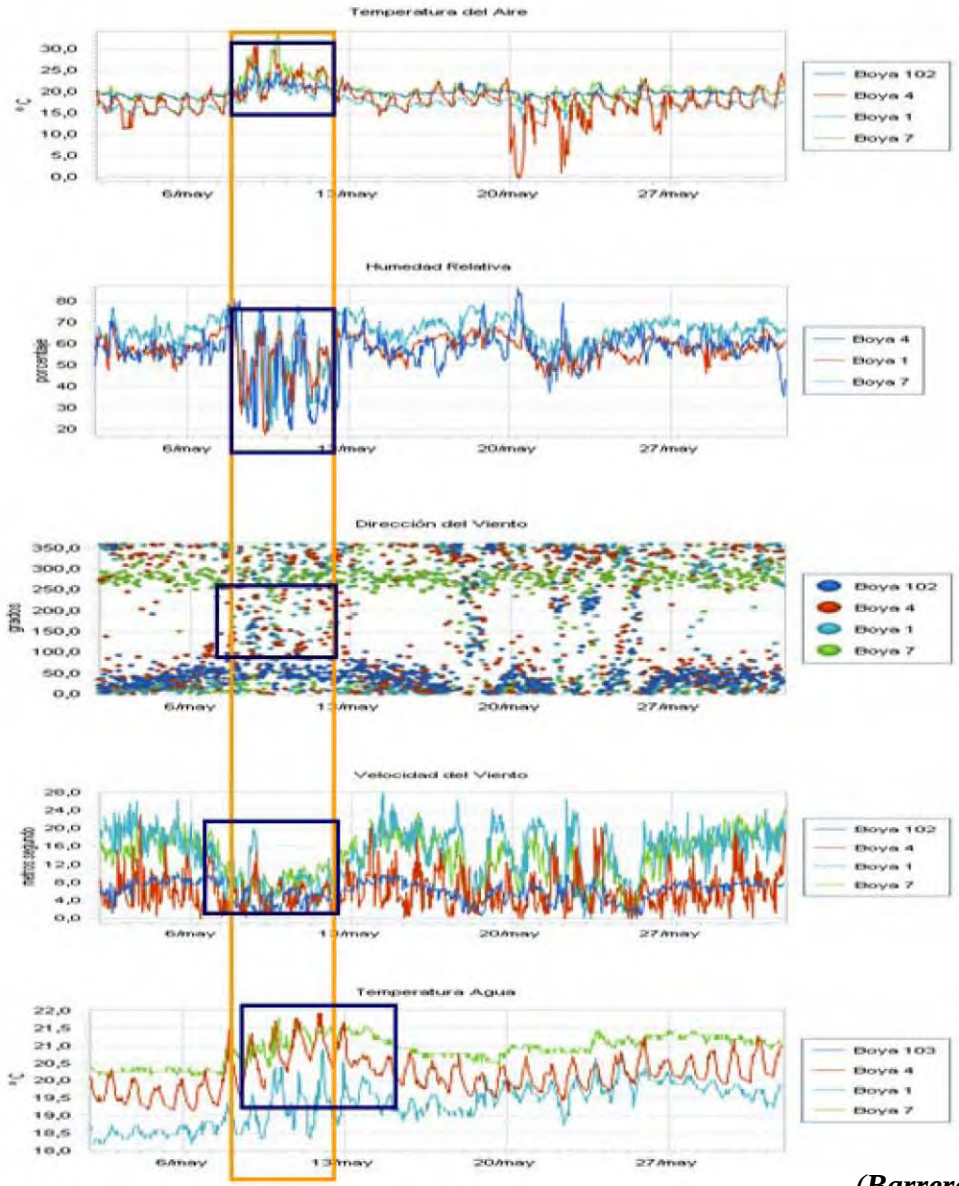
6-years SST time-series at three different sites around Canaries. (1) NE-Gran Canaria; (2) SE Tenerife and (3) ESTOC.

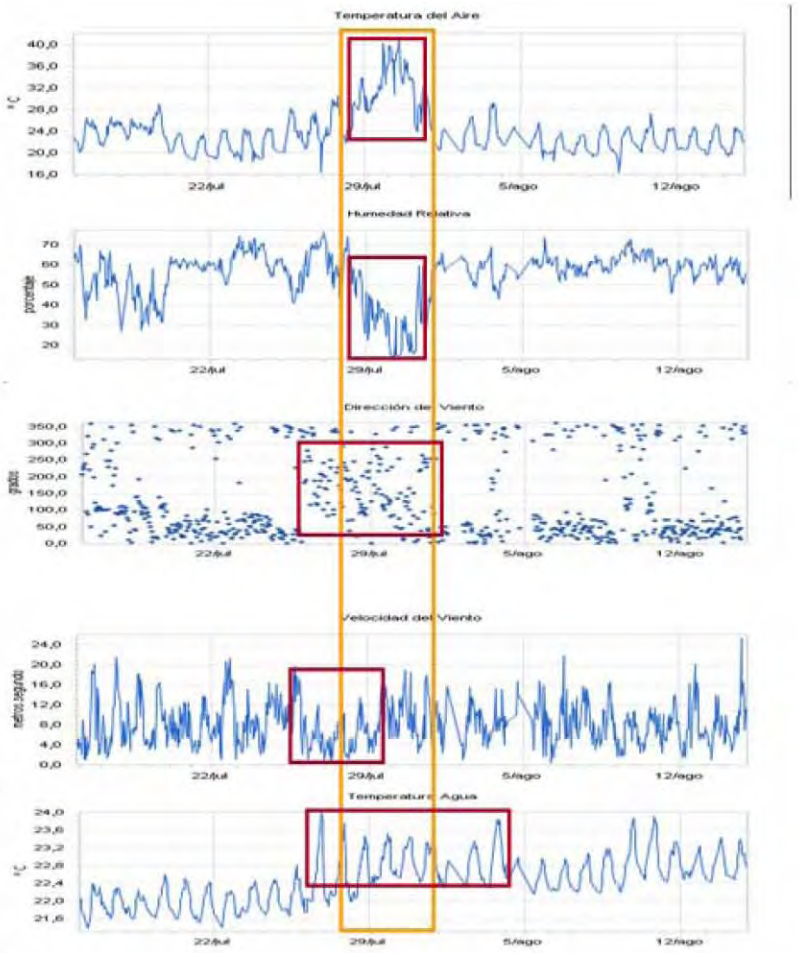
- Moored Buoy
- Moored Buoy
- Moored Buoy
- AVHRR
- NOAA drifter
- CTD cast

DELTA Tropical Storm. Canary Islands. November 2006









*(**Barrera et al. 2008** Journal Operational Oceanography)*

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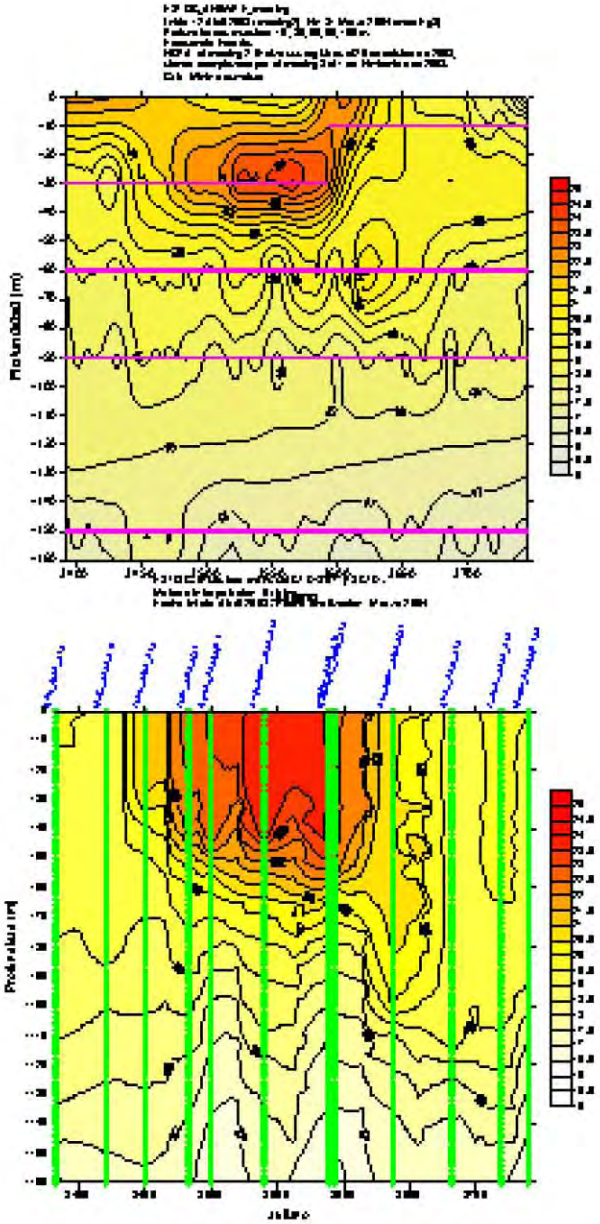

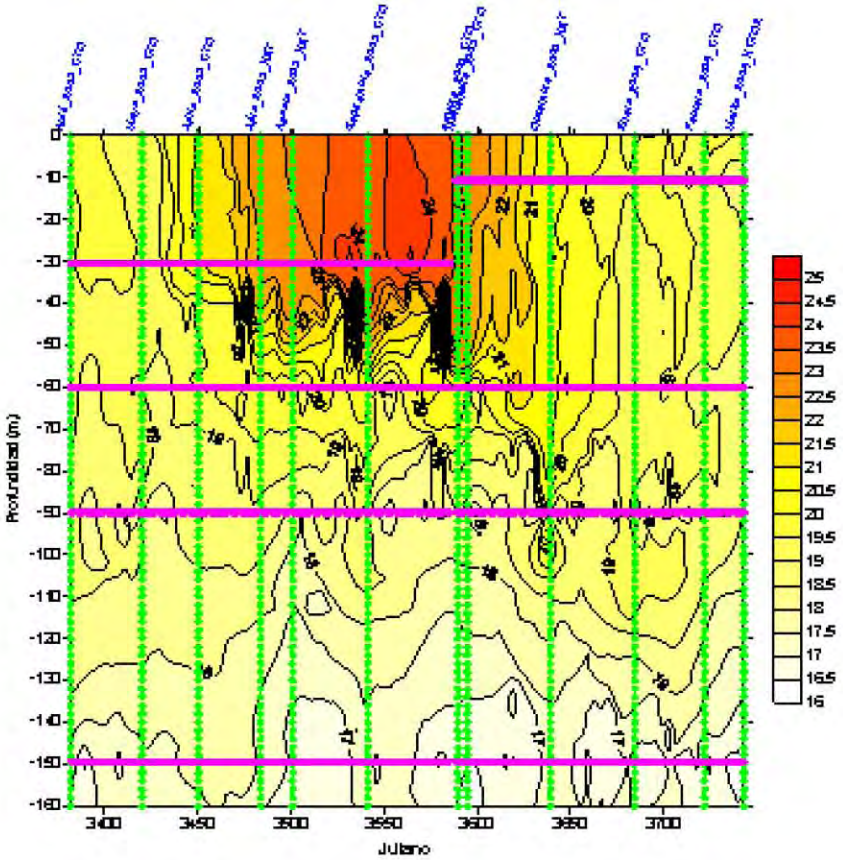
Profundidad (m)
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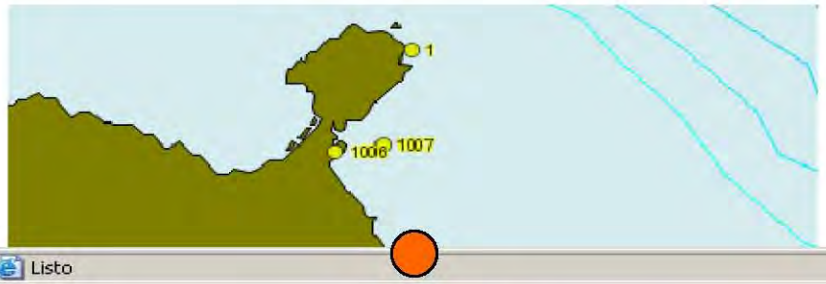
Boya 2



TIPO	Boya Compleja
UBICACIÓN	Emisario Puerto de las Palmas
POSICIÓN	28º05,44N 15º24,02W
GESTOR	Puertos de Las Palmas
FECHA DE INSTALACIÓN	16 de septiembre de 2006
ULTIMO FONDEO	6 de septiembre de 2007
VALORACIÓN OPERATIVA	en mantenimiento
CONTACTO	carlos@iccm.rcanaria.es
PROFUNDIDAD DE FONDEO	38 m
ALTITUD	n/a

Último reporte recibido 09-10-2007 00:42

HIDROCARBUROS	1 presencia/ausencia ?
HUMEDAD RELATIVA	72,10 porcentaje
TEMPERATURA DEL AIRE	22,35 º C
PRESIÓN ATMOSFÉRICA	1022,90 milibares
TURBIDEZ	-1000,0 unidades FTU
TEMPERATURA AGUA	24,66 º C
DIRECCIÓN	290,00 grados
COMPONENTE X CORRIENTE	0,06000 metros.segundo
COMPONENTE Y CORRIENTE	-6,00000 metros.segundo

Listo Internet

BUOYager - Concentrador de Boyas Científicas del ICCM - Windows Internet Explorer

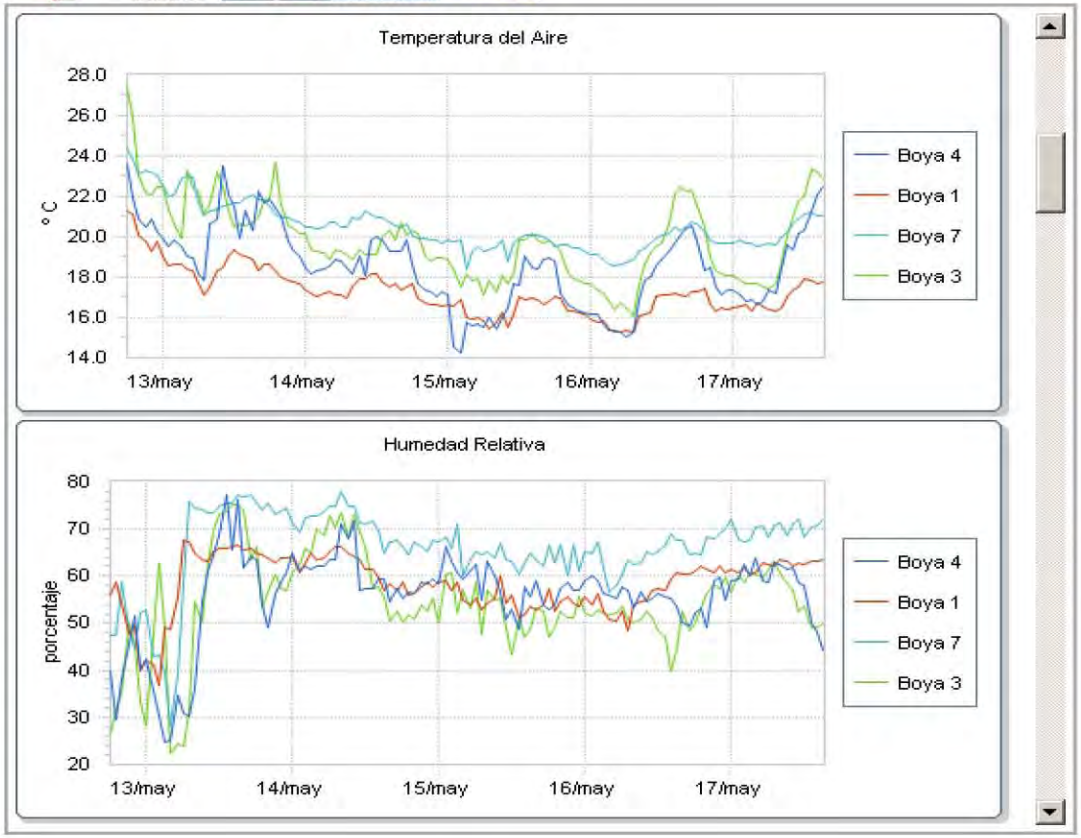
http://193.146.82.16/buoyager/iccm.aspx

Archivo Edición Ver Favoritos Herramientas Ayuda

Google Ir Marcadores 53 bloqueados Corrector ortográfico Enviar a Configuración

BUOYager - Concentrador de Boyas Científicas del ICCM

Página Herramientas



ICCM
Departamento de Oceanografía

Boyas disponibles en selección actual:

Boya 1 Isleta ALERMAC Puerto de las Palmas de GC

Boya 3 La Hondura ALERMAC Puerto de Sta. Cruz de TF

Boya 4 Dársena ALERMAC Puerto de Sta. Cruz de TF

Boya 7 odas

Internet 100%

17:08

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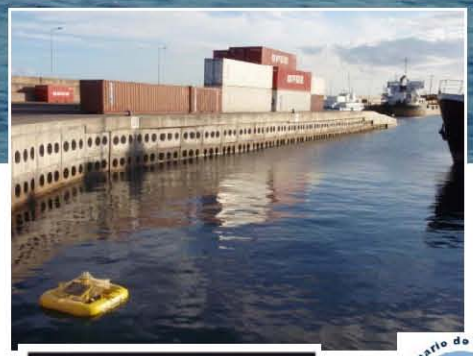
The network has been build from up to down, starting from SPECIFIC FINAL USERS towards general users, and at the same time, holding the aims established by national and international agencies and organizations, focused on to understand the processes and phenomena at global scale.

- Harbours (commercial and sportive).
- Sailing and Fisher Community.
- Aquaculture (Fish-farming).
- Windsurf riders community.
- Tourist and local beach users.
- Search and Rescue Agency (SAR).
- Military.
- Scientific community.
- Government agencies.
- …

Harbours



FUNDACION PUERTOS DE LAS PALMAS

Puertos de Tenerife
Autoridad Portuaria de Santa Cruz de Tenerife

PORTOS DA MADEIRA

ENAPOR

ANP
Agence Nationale des Ports

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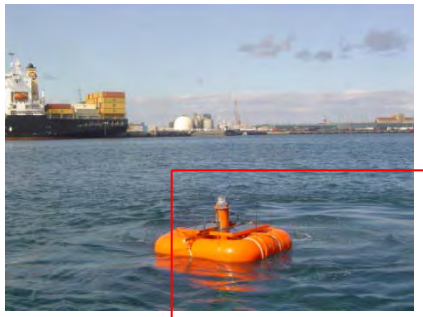
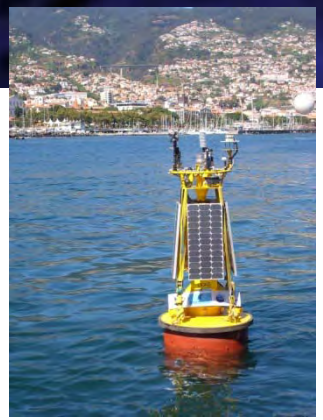
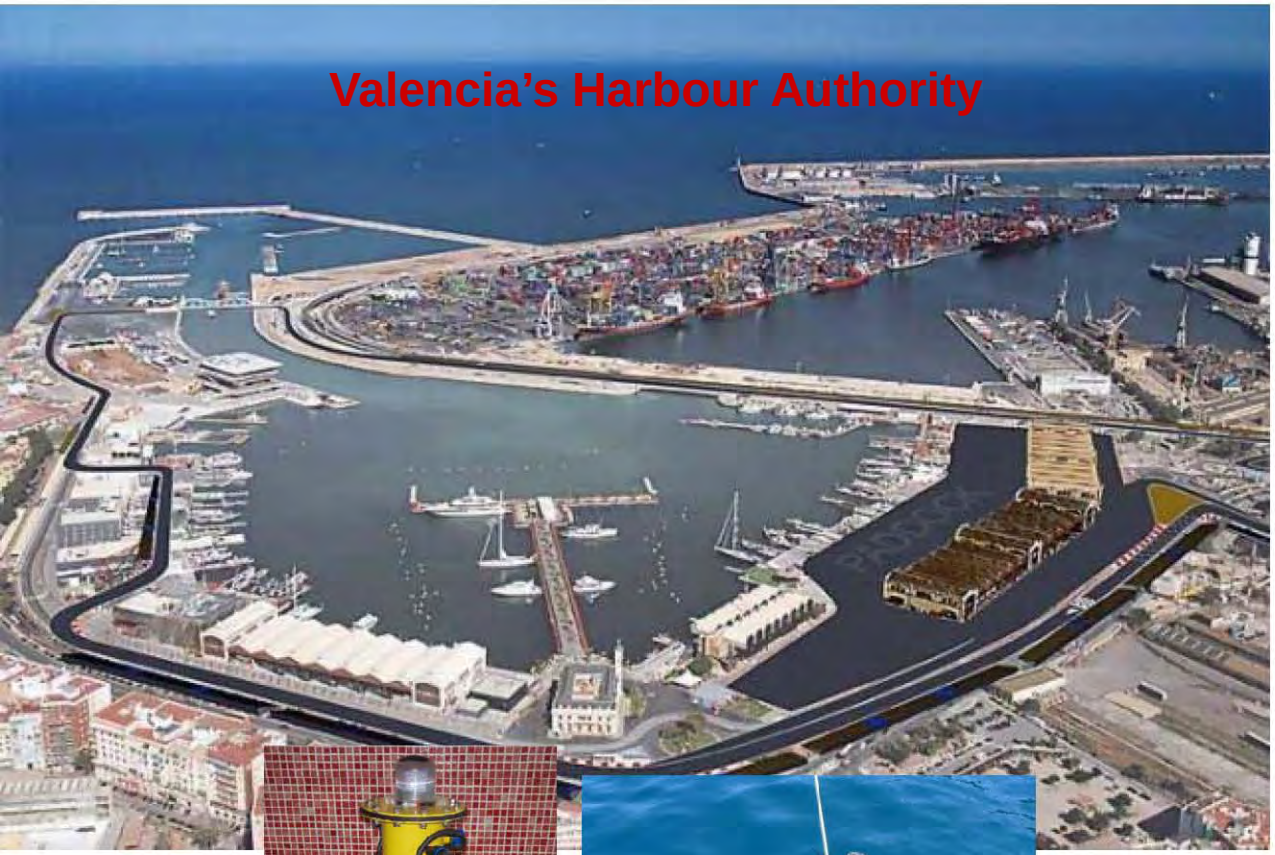
AMBIENTE

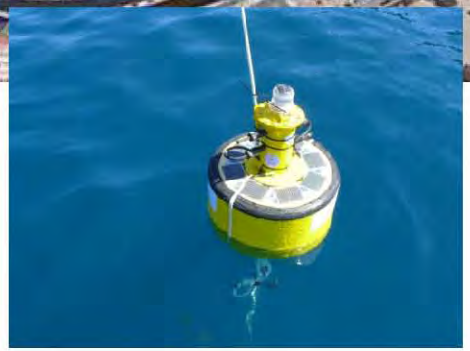
Harbours



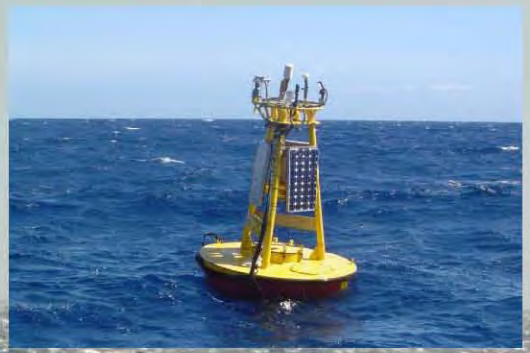


Harbours





Aquaculture- Fishfarming

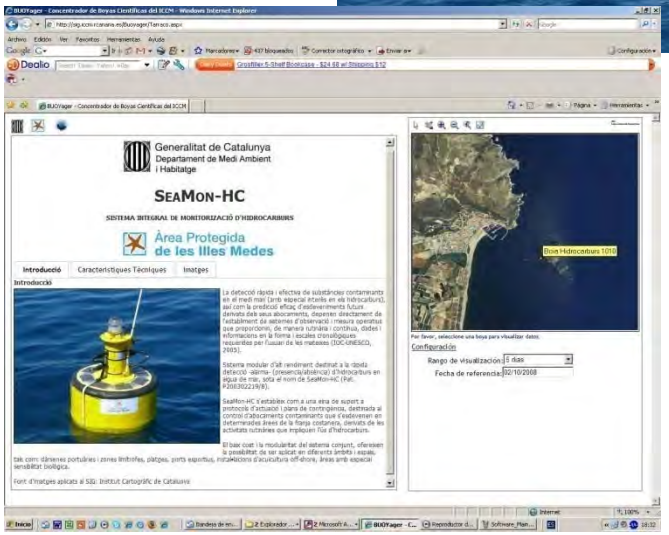


Marine Protected Areas

- Garajau (Madeira. PT)
- Illes Medes. (Girona. SP)

Generalitat de Catalunya
Departament de Medi Ambient i Habitatge
Àrea Protegida de les Illes Medes

SRA
AMBIENTE E RECURSOS NATURAIS



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XBT/XCTD probes

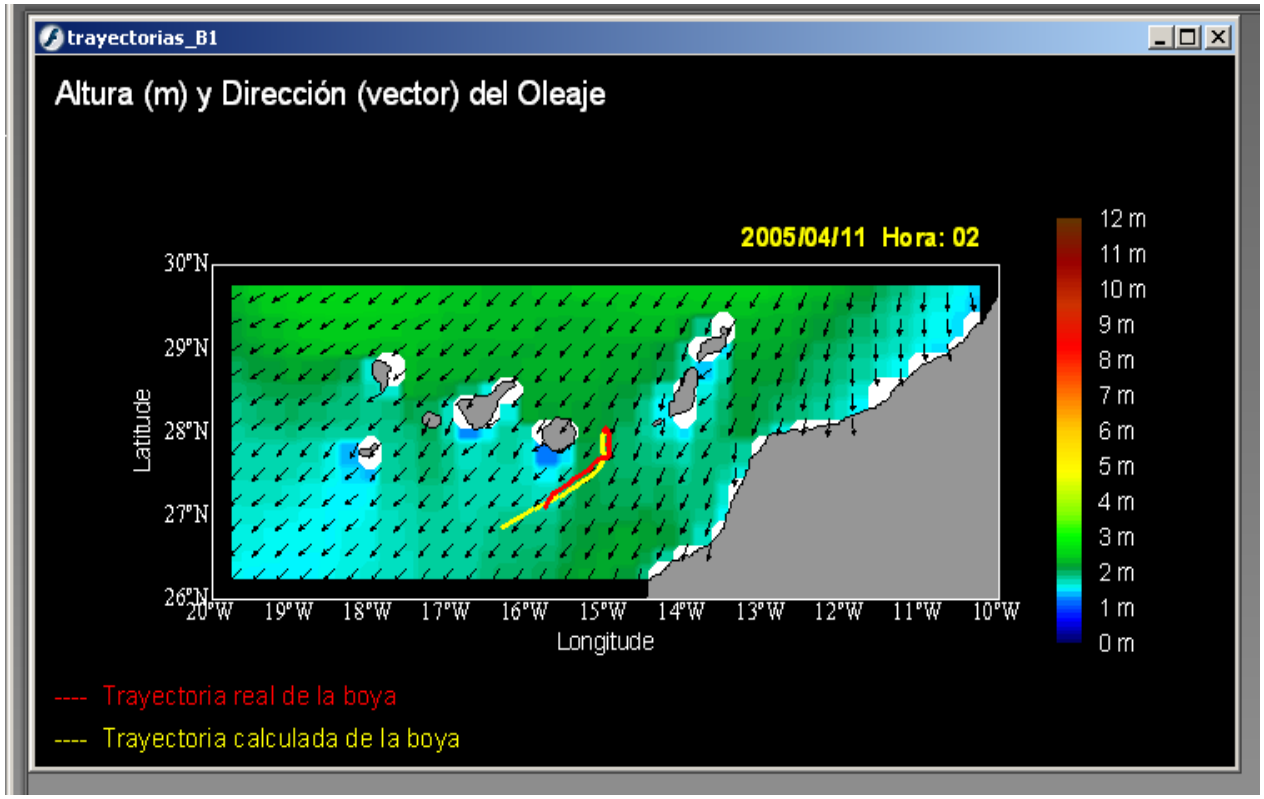
Gliders

Drifting buoys

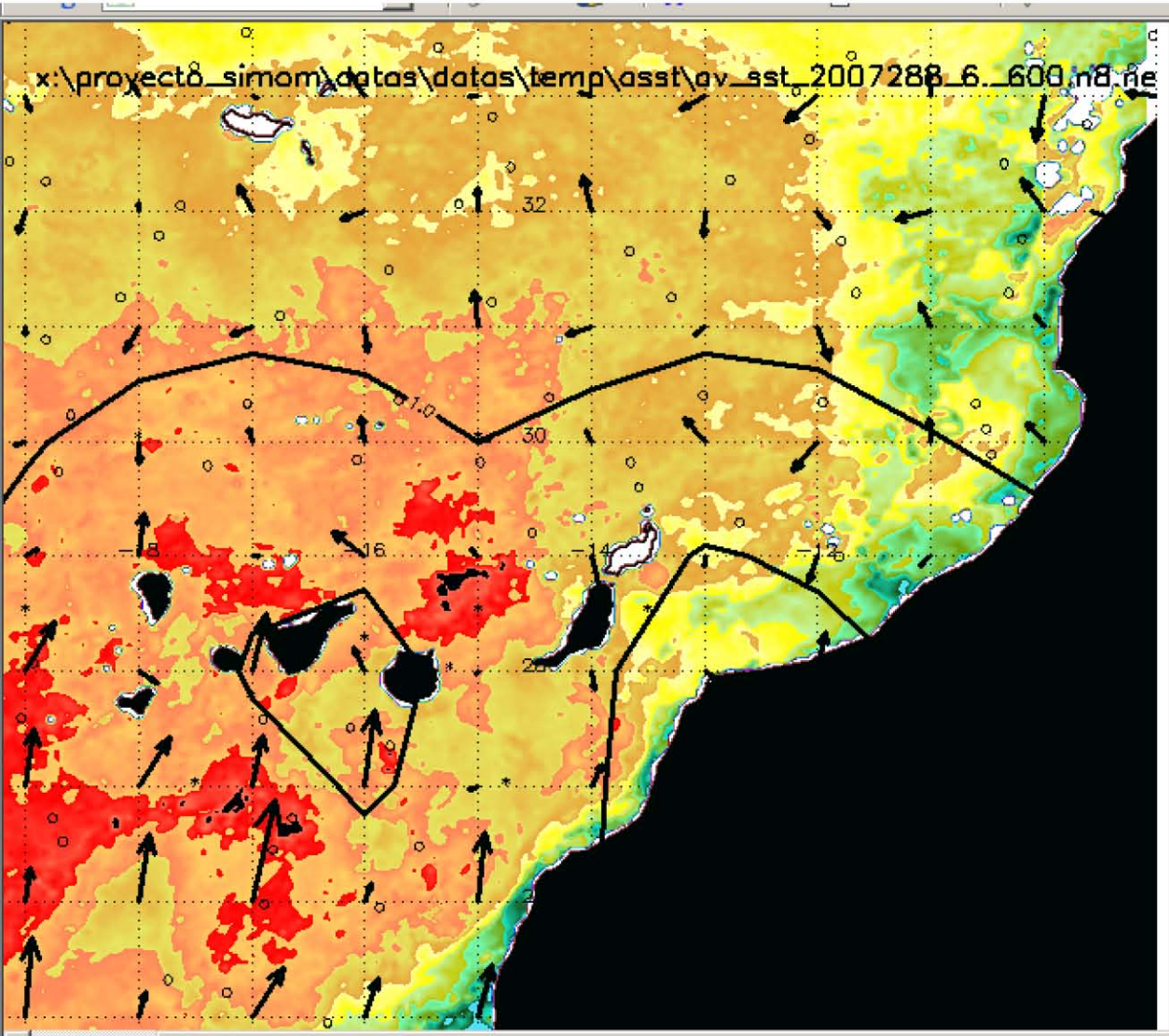
Turtles

Search and Rescue Exercises

Search and Rescue



Theoretical and real exercises.



17 19 21 23 25 27

Temperatura Superficial del Mar (°C)

Velocidad del viento (m/s)

15 10 5

Temperatura+ viento

Coriente+ fitoplancton

Anterior<>Siguiente

Oleaje y Viento

Tendencias (ultimos 20 dias)

AIS

ICCM

Listo

Internet

Información de las Playas - Microsoft Internet Explorer

Archivo Edición Ver Favoritos Herramientas Ayuda

Atrás Búsqueda Favoritos

Dirección http://www-pre.iccm.rcanaria.es/boletines/webplayas/index.html Ir Vínculos

Google Ir Marcadores 23 bloqueados Corrector ortográfico Enviar a Configuración

Información de las Playas

	Temperatura	Viento	Dir. Viento
Zona Norte Icod de los vinos (El Gomero, S. Marcos, St Domingo, ...)	23.4 °C	4.9 m/s (3 Bé)	NNE
Zona Norte (Puerto de la Cruz, Tejina, ...)	25.3 °C	4 m/s (3 Bé)	N
Noreste (Las Teresitas, La Hornilla, El Puertillo, ...)	25.3 °C	5.7 m/s (4 Bé)	NNE
Zona Sureste (El Medano, Poris, ...)	25.4 °C	4.9 m/s (3 Bé)	NNE
Zona Suroeste (Los Cristianos, Las Américas Fañabe, S. Juan, ...)	25.4 °C	4.9 m/s (3 Bé)	NNE

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Seleccione la isla, para acceder a la informacion de sus playas, datos de temperatura del mar, velocidad y direccion del viento, determinado por zonas.

Una vez en los datos puedes recorrer isla por isla con los botones de avance y retroceso, o volver al menu principal.

Resolucion optima: 1024x768.

<< Anterior << Fecha: 16/10/2007 >> Siguiente >>

Tenerife

volver al menú

Situacion Sinoptica sobre el estado de la mar

Gobierno de Canarias

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Gobierno de Canarias

The Red ACOMAR Canarias Network

A Real-Time Moored Buoy Network for Coastal Monitoring in The Canary Islands Archipelago

By Carlos Barrera
Researcher
Dr. Octavio Llinás
Researcher
and
Dr. María José Rueda
Researcher and Department Head
Oceanography Department
Instituto Canario de Ciencias Marinas
Las Palmas, Spain

A typical SeaMon buoy design, moored in Las Palmas de Gran Canaria Bay, off Spain.

Through its oceanography department—Grupo de Oceanografía Operativa y Descriptiva (GOOD)—the Instituto Canario de Ciencias Marinas, a research institute under the Canarian government in Spain, is the main organization designing and developing an autonomous system for meteorological and oceanographic monitoring, the Sea Monitoring Buoy (SeaMon). There are presently six moored buoys that interact together as a real-time monitoring network called Red Alert and Marine Control (ACOMAR) Canarias, with a wide range of specific applications for the coasts of the Canary Islands Archipelago.

Red ACOMAR joins other autonomous instrumentation currently deployed in the area: the Spanish Deep Water Moored Buoy Network, the oceanic moorings of the Operational Data Transmissions in the Ocean and Lateral Acoustic Network-I surface buoy unit; the Marine Environment and Security for the European Area projects; the World Ocean Circulation Experiment/Tropical Ocean-Global Atmospheric drifters, satellites and monitoring coastal stations; and the European Station for Time-Series in the Ocean Canary Islands. These projects have two basic objectives: to obtain information in real time for activities in offshore aquaculture; coastal waste water management; oil spills; harbours and sailing ports; beaches and recreational areas; sailing races; fisheries and shell-fish activities; and protected marine areas to the Canarian; marine environment users; and to contribute to worldwide efforts and initiatives on ocean climate observation programmes, such as the Global Ocean Observing System (GOOS), under each project's own protocols and standards as a coastal or regional module (such as the Canarian or Macaronesian GOOS).

Since GOOD set up the first buoy prototype in 1996 (and considering the wide range of applications that can be offered), the Red ACOMAR system has been specifically designed with a pro-sourced modular aspect to guarantee optimum behaviour in all of its uses. The system allows for integration and operation with a wide configuration range of sensors and devices, from both well-established providers or manufactured inhouse. Over time, experience and technical development has allowed the group to create new updates while trying to adapt the system to its proposed application. Already in its fourth incarnation, the Red ACOMAR is presently formed by six SeaMon units (two more are scheduled for deployment before the end of this year).

Buoy Design and Instrumentation

Currently, there are numerous designs for autonomous systems used for meteorological and oceanographic monitoring with different integration degrees. In spite of this, GOOD has maintained clear criteria regarding the initial integration degree for the devel-

www.sea-technology.com

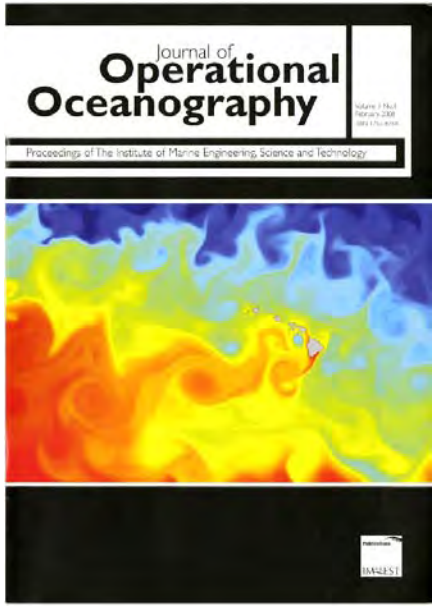
DECEMBER 2006 / ST 47

SeaTechnology

December 2006

Ocean News & Technology

November 2007



JOO

March 2008

Hydro

February 2009

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The ACOMAR Network should be understud as a regional proposal to promote socio-economical approaches in the maritime sector through OPERATIONAL OCEANOGRAPHY ACTIVITIES and their DERIVED PRODUCTS.

AMASS

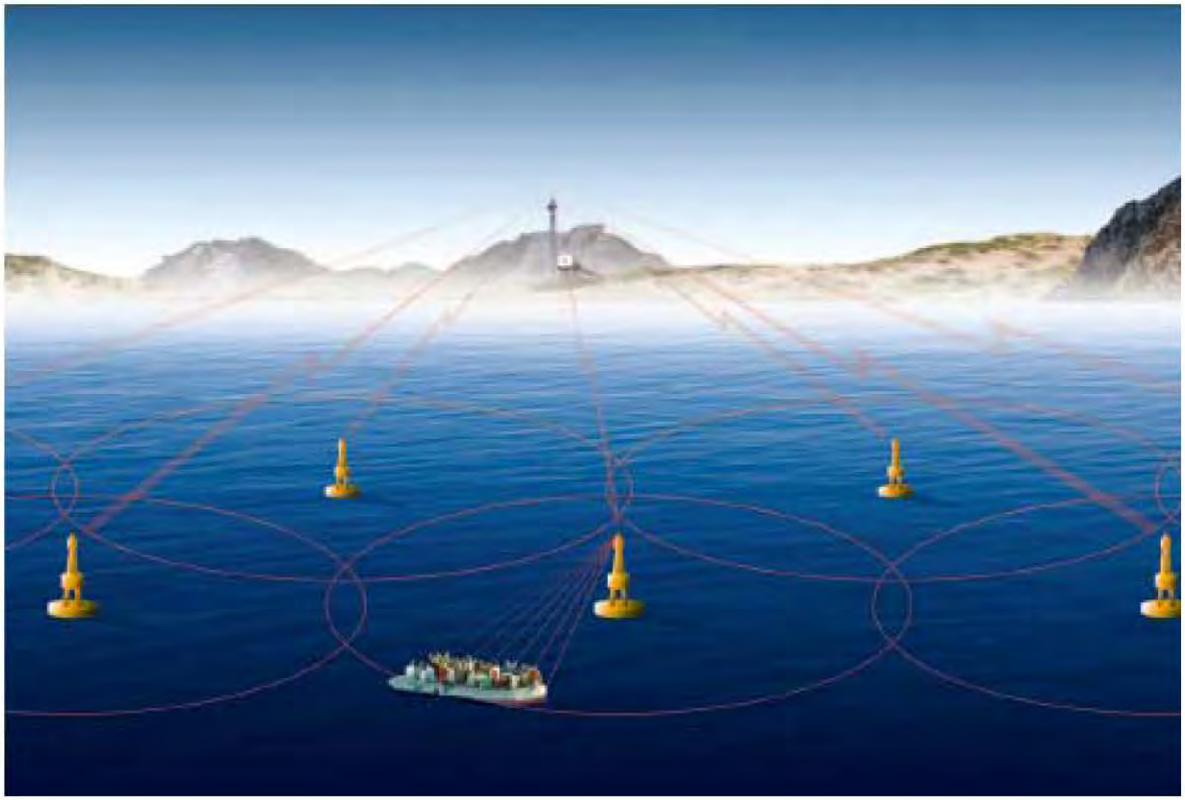
Autonomous Maritime Surveillance System

The AMASS project is led by Carl Zeiss Optronics, in collaboration with the following organisations:

Armed Forces of Malta
Crabbe Consulting Ltd
Fraunhofer-Institut für Informations- und Bildverarbeitung IITB
Fugro OCEANOR
HSF spol. s r.o.
Instituto Canario de Ciencias Marinas
IQ Wireless
OBR Centrum Technik Morskiej
Universidad de Las Palmas de Gran Canaria

Would you like to know more about this pioneering project? Then visit our Website

www.amass-project.eu



More accurate, more cost-effective monitoring of your shores

Benefits at a glance

- Reliable, around-the-clock surveillance
- Improved situational awareness
- Highly cost-efficient
- Functional in all weather conditions
- Better use of human resources
- Greater safety for all concerned

Coastline control: a complex and costly challenge

Illegal immigration by sea has become a major headache in recent years. In fact, EU member states detected more than 48,000 cases in 2007 alone (source: Frontex annual report). It is difficult to monitor – and is dangerous, often ending in tragedy. Other criminal activities, such as drug smuggling and terrorism, are also harder to police at sea. In short, controlling blue borders is a complex and costly challenge.

Until now, border agencies have relied on ships, planes or helicopters to patrol and protect coastlines. But this approach is not completely reliable – and is a drain on vital resources such as money and manpower. That's why the EU is seeking a more effective response to the challenge.

Europe unites in pioneering project

Now, Carl Zeiss Optronics is leading the development of a new, groundbreaking solution for monitoring maritime borders: AMASS – the Autonomous Maritime Surveillance System. Commissioned in 2008, the initiative is partially funded by the EU, and has seen Carl Zeiss team up with nine technology specialists and border agencies from across Europe – including Fraunhofer-Institut für Informations- und Bildverarbeitung IITB, Instituto Canario de Ciencias Marinas and the Armed Forces of Malta.

In a trailblazing project, the EU-backed consortium is creating an innovative system to enable the early detection and location of small and midsize vessels. Their aim? To provide authorities with early warning of illegal activities at sea and improve overall protection of European shores.

The nuts and bolts: how it works

AMASS comprises a network of unmanned platforms located a considerable distance from shore. Each platform is fitted with cutting-edge sensors and operates self-sufficiently, i.e. without the need for manual intervention. Data captured by the sensors is transmitted to a central command centre, where an operator views it on screen. If a suspicious entity is detected, a crew can be dispatched to investigate or other action taken.

Always on guard

The leading-edge technology behind AMASS provides reliable, 24/7 surveillance – giving border agencies the early, accurate warnings they need. But that's not all. The sensors offer a 360-degree view of the area above water – significantly improving situational awareness for coast patrols. What's more, the platforms remain fully functional in all weather conditions. AMASS is also significantly more economical to operate than patrol ships, and frees up human resources for other tasks – providing an all-round more cost-efficient solution. But most importantly, AMASS helps border agencies protect their own personnel and save the lives of immigrants. The upshot? Safer, more secure European coastlines.

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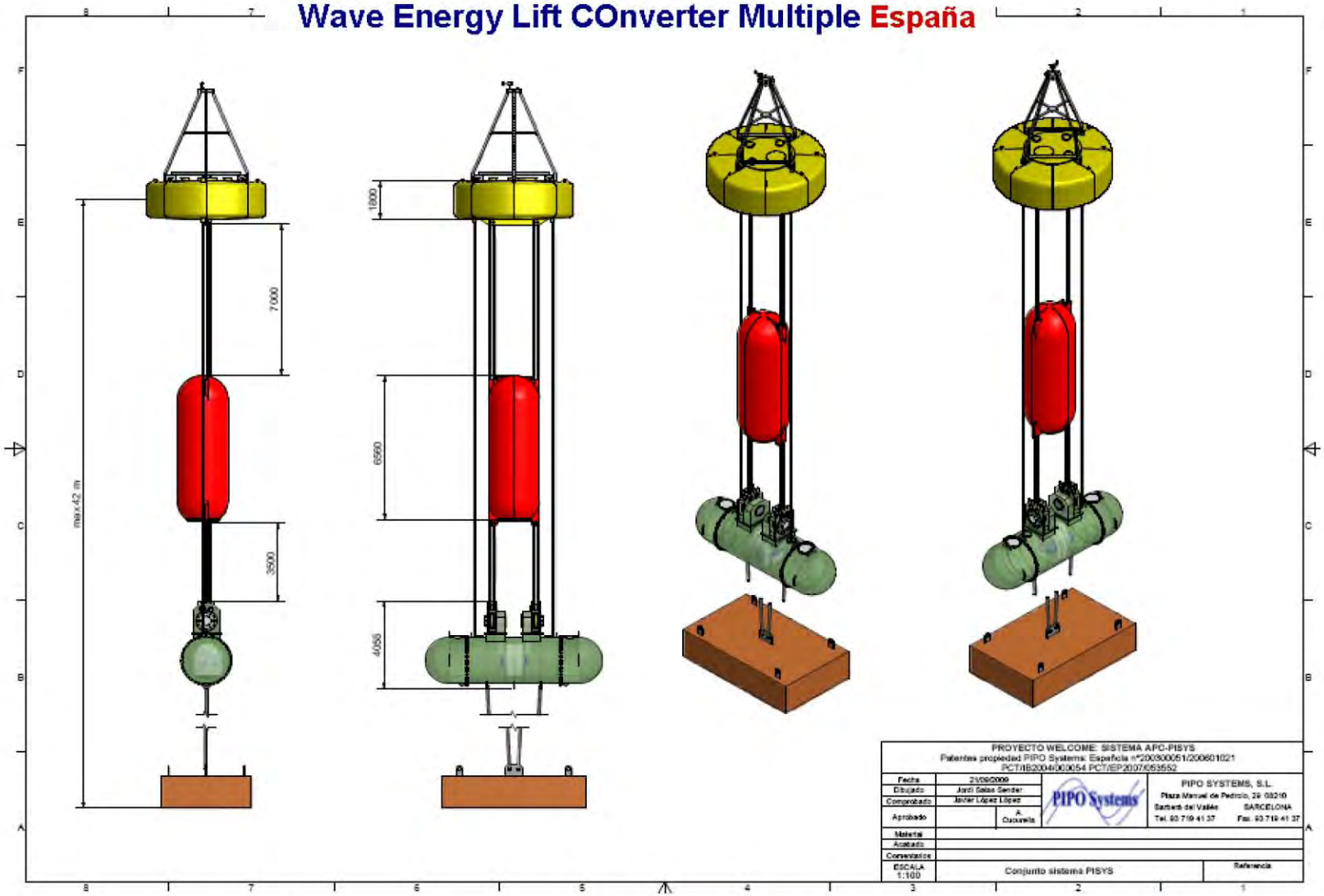
WELCOMÉ

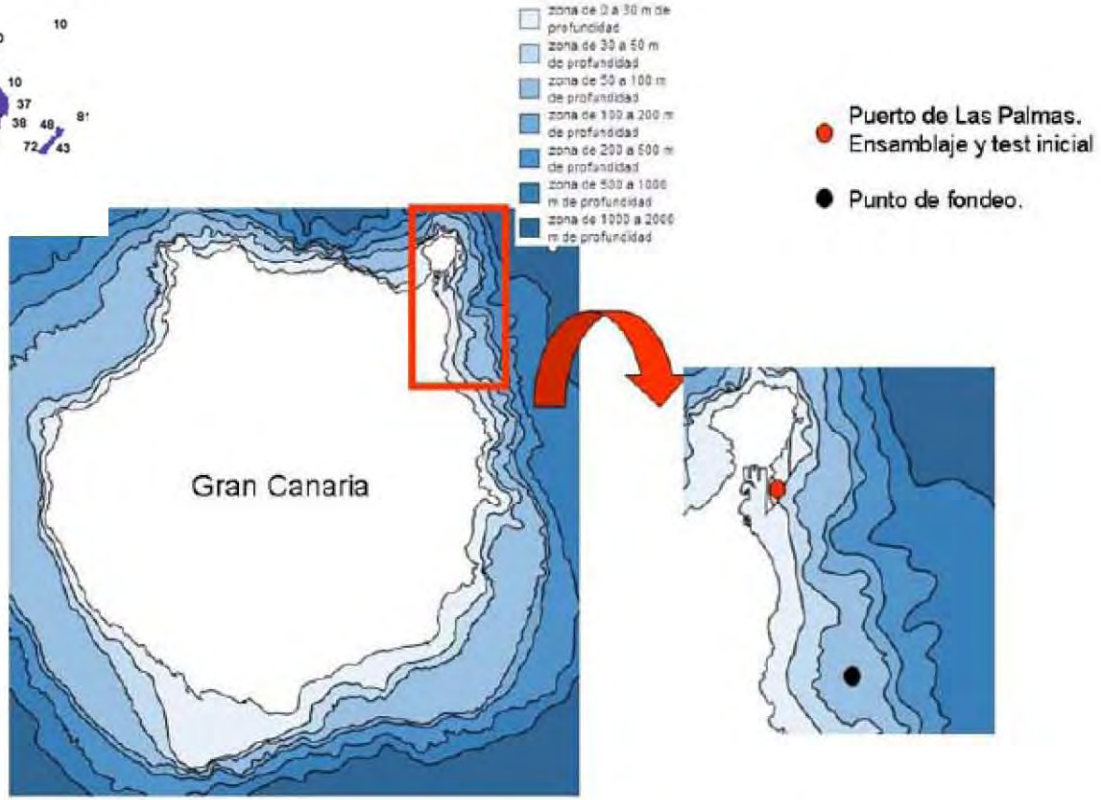
Wave Energy Lift COnverter Multiple España

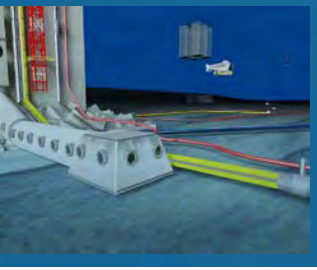


WELCOMÉ

Wave Energy Lift COnverter Multiple España

Mapa mundial mostrando la energía media de olas en KW/metro de frente de ola.





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2007-2011

The Deep-Ocean Gate


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de Canarias

- OBSERVATORY
- BASE FOR UNDERWATER VEHICLES AND INSTRUMENTS
- TECHNOLOGICAL TEST BED
- SOCIO-ECONOMIC INNOVATION PLATFORM

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Thank you for listening

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...Any questions?