

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

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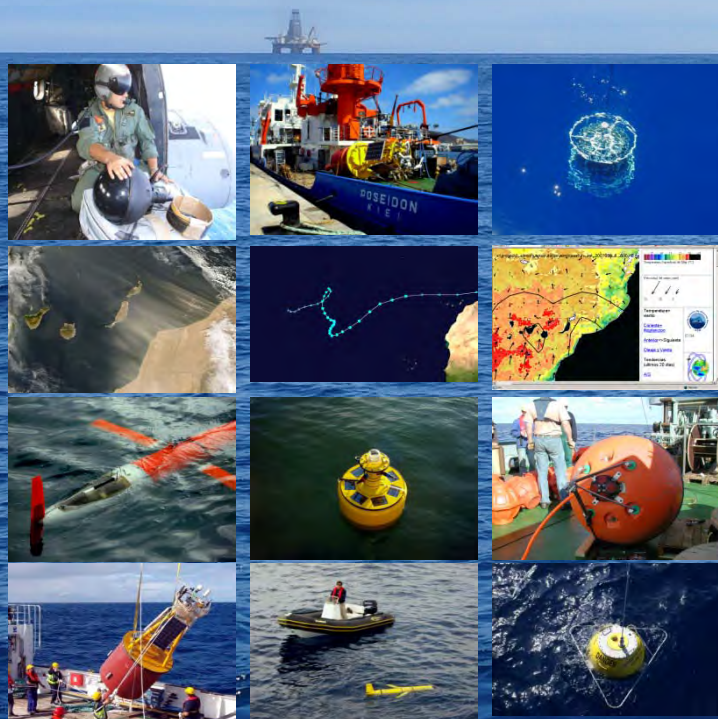
<sup>(1)</sup> Oceanography Department. Instituto Canario de Ciencias Marinas (ICCM). Las Palmas. Spain.

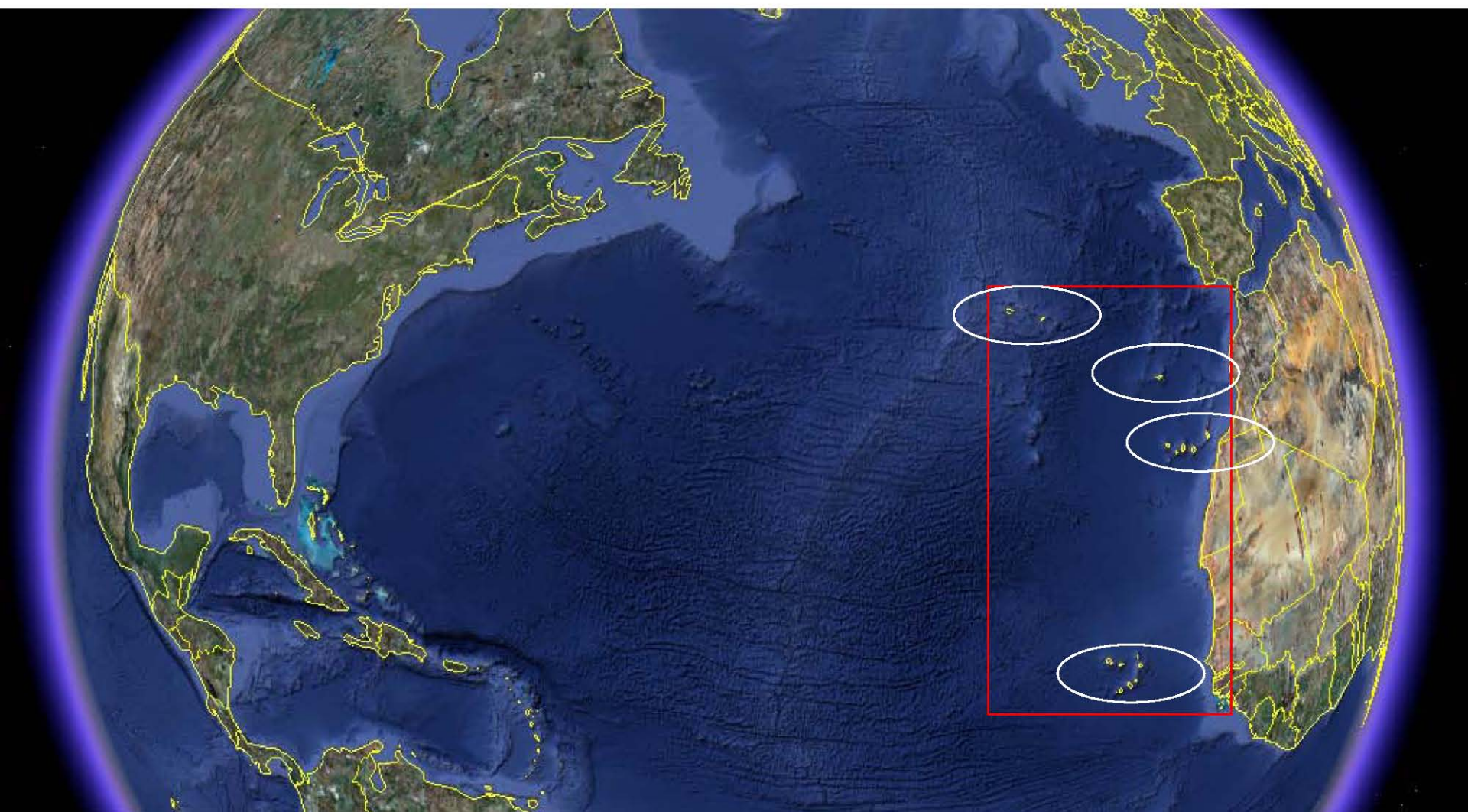
<sup>(2)</sup> Chemistry Department. Universidad de Las Palmas de Gran Canaria (ULPGC). Las Palmas. Spain.

<sup>(3)</sup> Observatorio do Ambiente dos Açores (OAA). Açores. Portugal.

<sup>(4)</sup> Plataforma Oceanica de Canarias (PLOCAN). Las Palmas. Spain

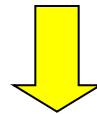
**OCEANS '09** Biloxi, MS (USA) 29th October 2009



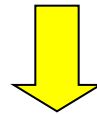


# ... the GOAL

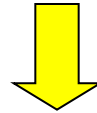
NRT Coastal Monitoring Network in the Macaronesian region (1998)



Instituto Canario de Ciencias Marinas (ICCM)- *Canarian Government*



Increase the Marine Environmental Observations Quality and Quantity

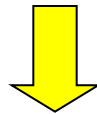


Understand and Forecast

**PROCESSES AND PHENOMENA**

**ENVIRONMENTAL + SOCIO-ECONOMICAL  
EFFECTS AND REPERCUSSIONS**

## Integrator System



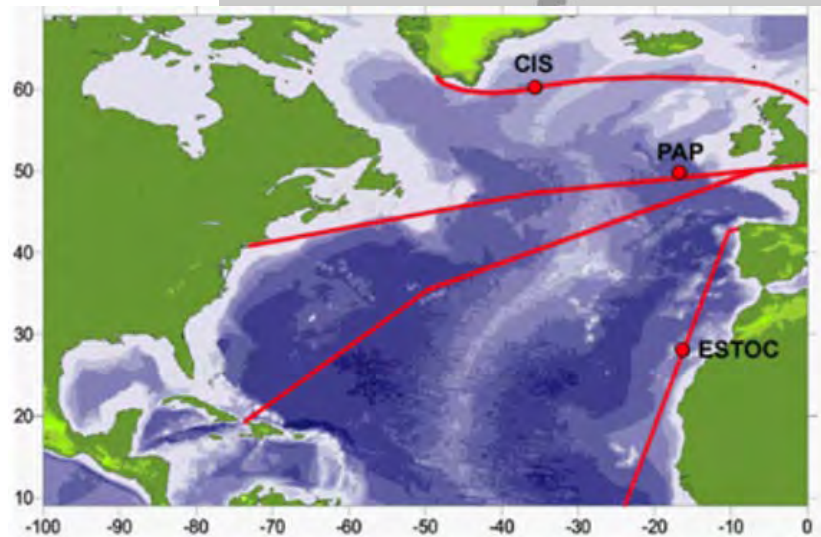
To make compatible and accessible the **ALL INFORMATIONS** on the Canarian marine environment, independently of the data provider institution or monitoring source.

+

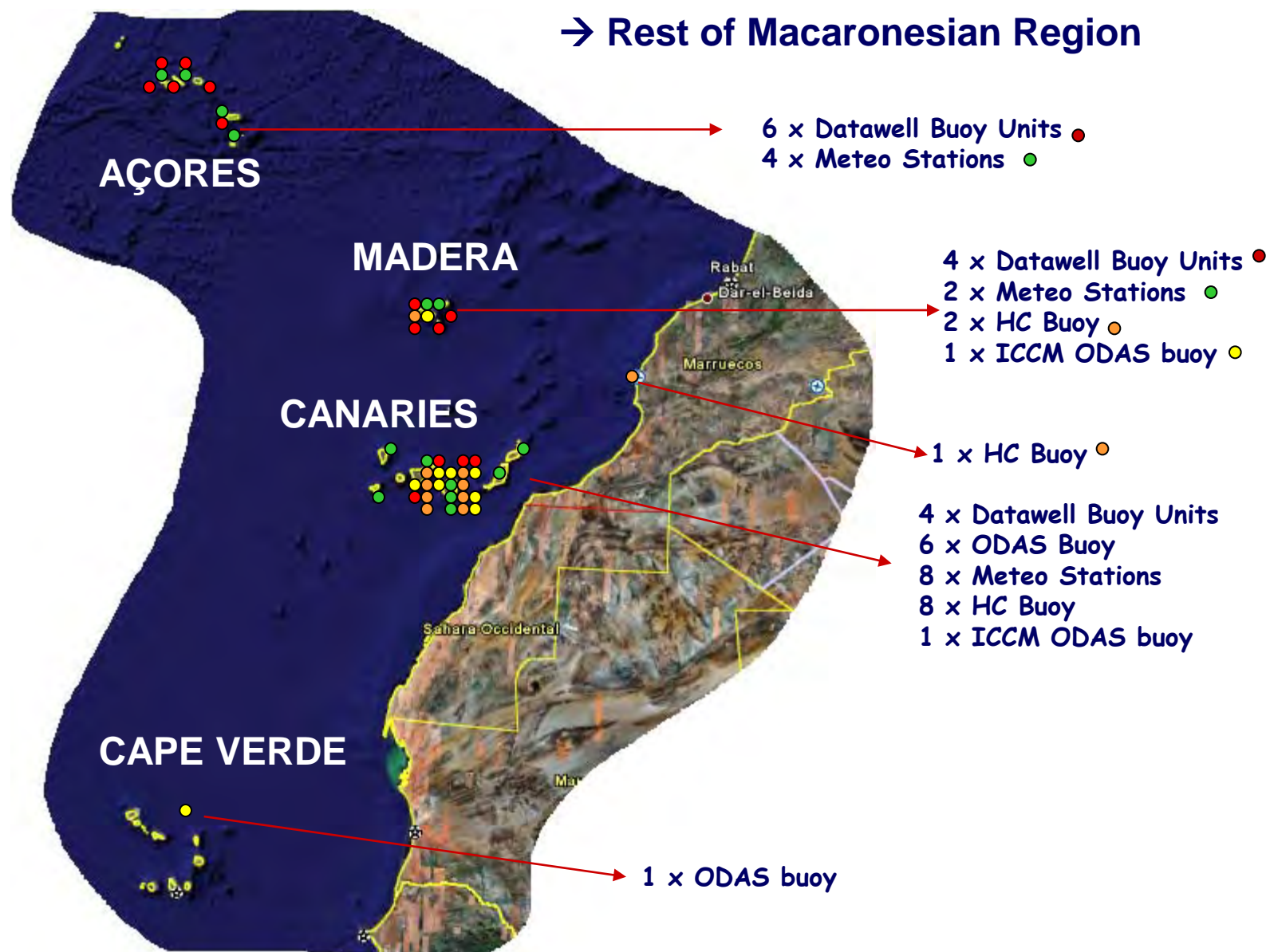
To promote and encourage specific direct /indirect **FINAL USERS** for each kind of observation and location.

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.

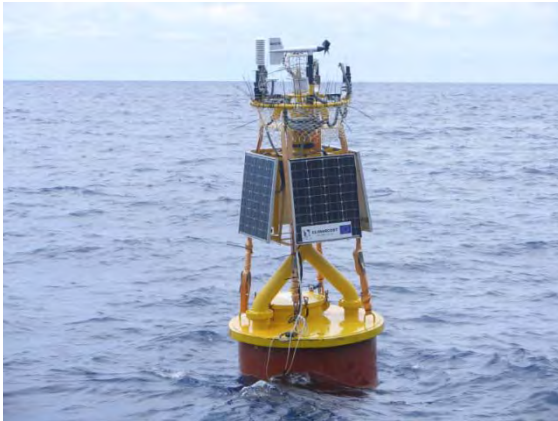
- ANIMATE (FP5)
- MERSEA (FP6)
- ALERMAC (Interreg)
- CLIMARCOST (Interreg)
- AMASS (FP7)
- EuroSITES (FP7)
- PLOCAN



## → Rest of Macaronesian Region



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. 29° 10 N

Long. 015° 30 W

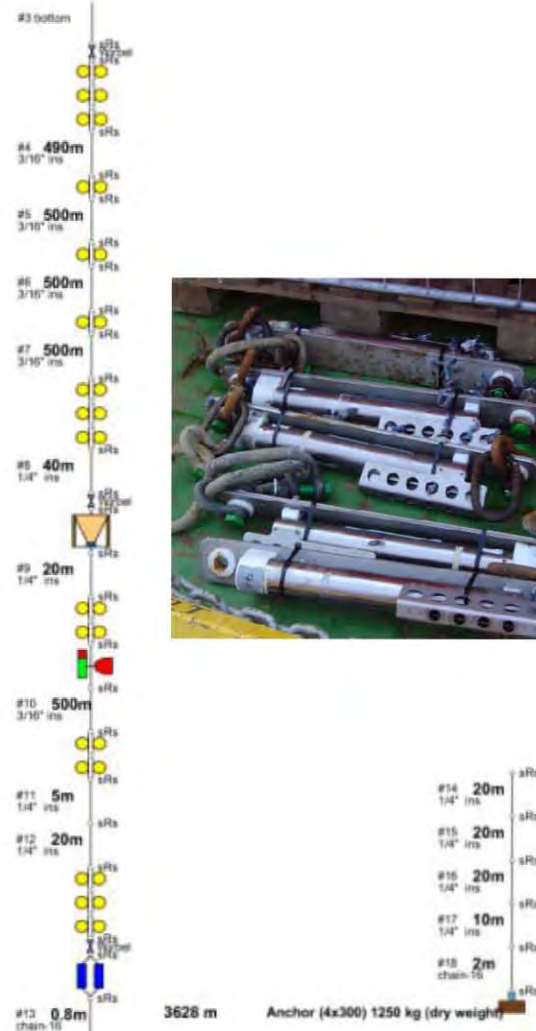


## animate / estoc with particle traps

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

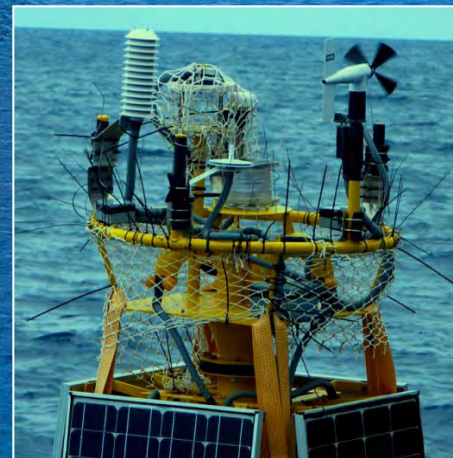
depth (incl. stretch)	component	S/N	rope # & Length	Distance from lower rope end	in/out of water comment
--------------------------	-----------	-----	--------------------	---------------------------------	----------------------------

14 m	Sphere 11"		#1 top 25m PinckRope 6mm	951 m	6Benthos
29 m	MCP-IM		#1 bottom	10	
				1445 m	2Benthos
				1947 m	2Benthos
				2449 m	2Benthos
			#2 top 114m PinckRope 6mm	2952 m	6Benthos
60 m	MCP-IM			96	
90 m	MCP-IM			66	
150 m	MC-IM		#2 bottom	6	
157 m	Workhorse+F45"		#3 top 790m 3/16" int	WD5596 (glass tube)	3017 m
240 m	MC-IM			709	
400 m	MCP-IM			549	
650 m	MC-IM			300	
945 m	MC-IM			5	



## Coastal moorings

- Met: ws/wd, at, rh, ap, sr, GPS,
- Ocean: wt, c, do, hc, cs, cd, t..
- GSM/RF

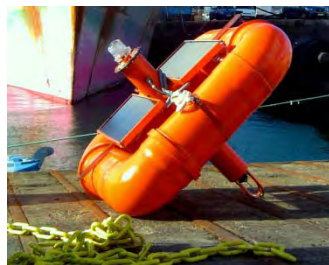


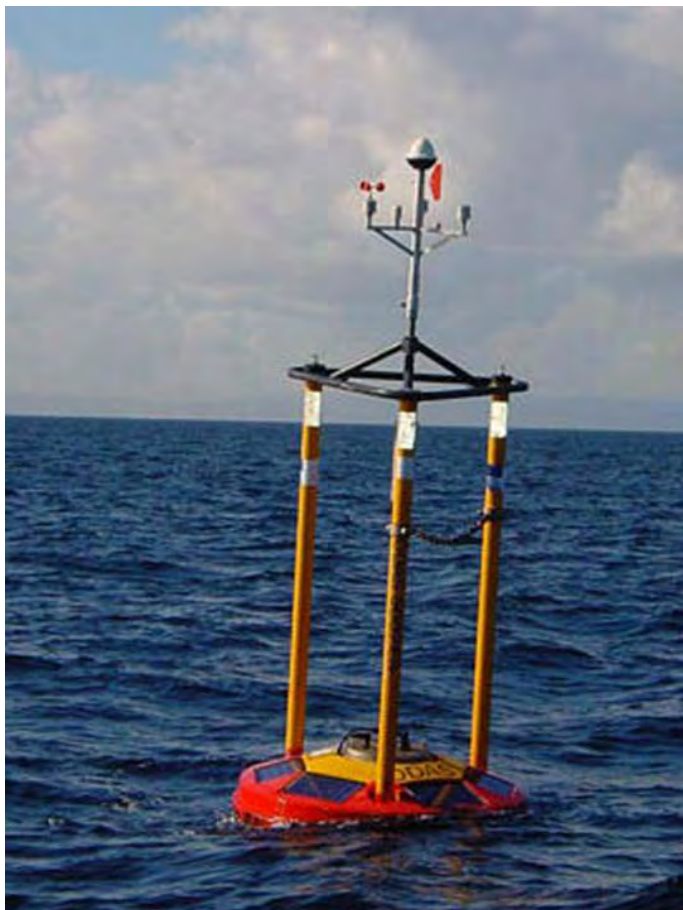


## Hydrocarbon Detection System (*worldwide patent*)

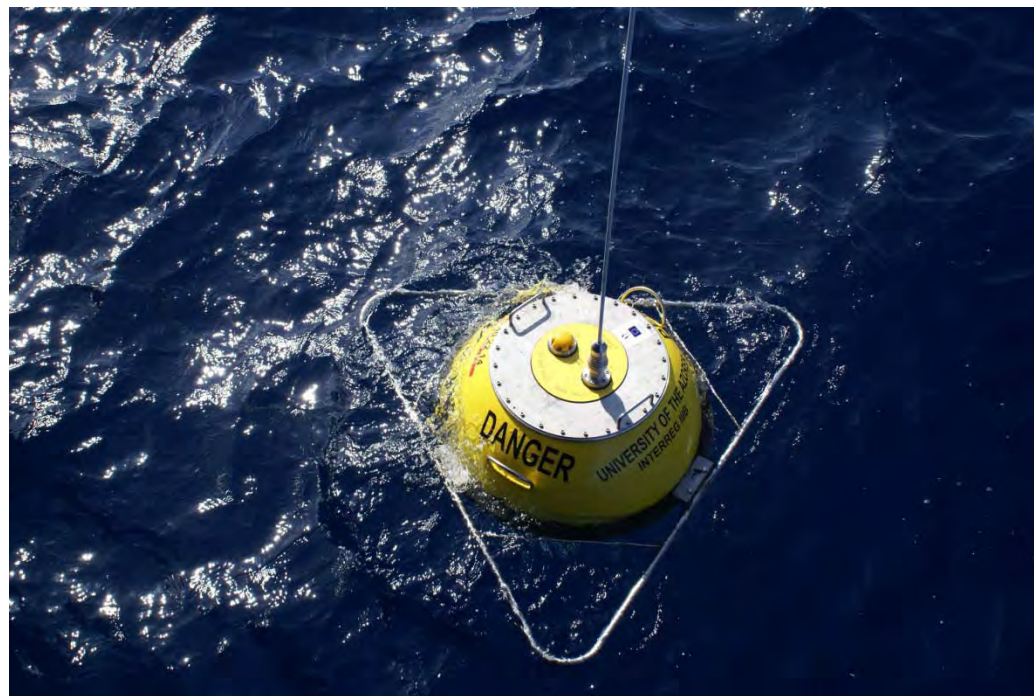
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**Additional Sensors** (*Wind Speed and direction, water temperature, current,...*)



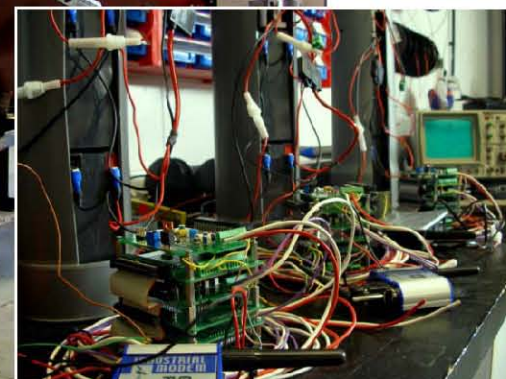


**Spanish Deep-Water  
Monitoring Network**  
(Canary Islands)



**Datawell Network**  
(Canaries, Madera and  
Açores Archipelagos)

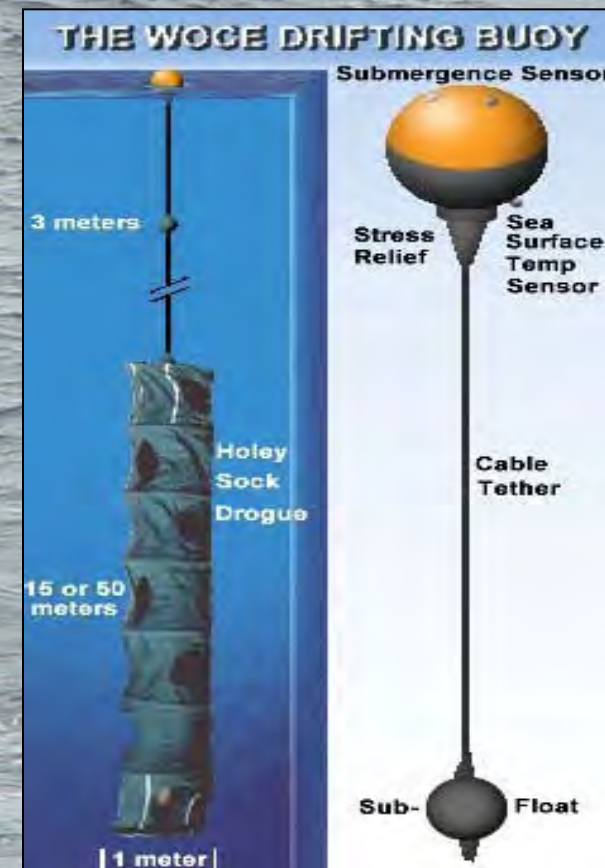
The obvious need to increase the acquired information quantity and quality, has involved directly the proposal with **TECHNOLOGICAL DEVELOPMENTS** on wide range of devices and tools, with the aim to bring out them more accessible both technically and economically.



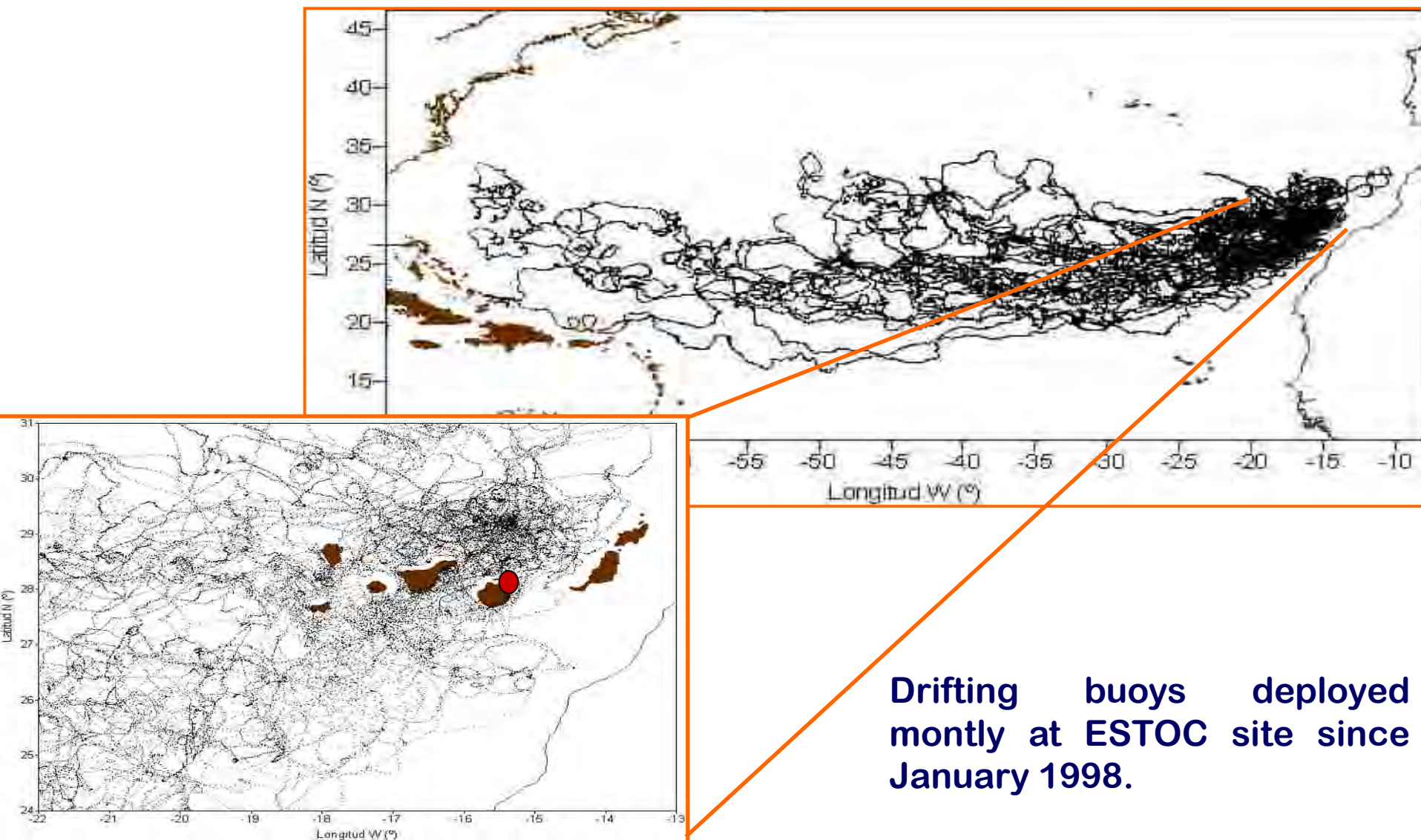




**CLEARWATER**  
**PACIFIC GYRE**  
**METOCEAN**

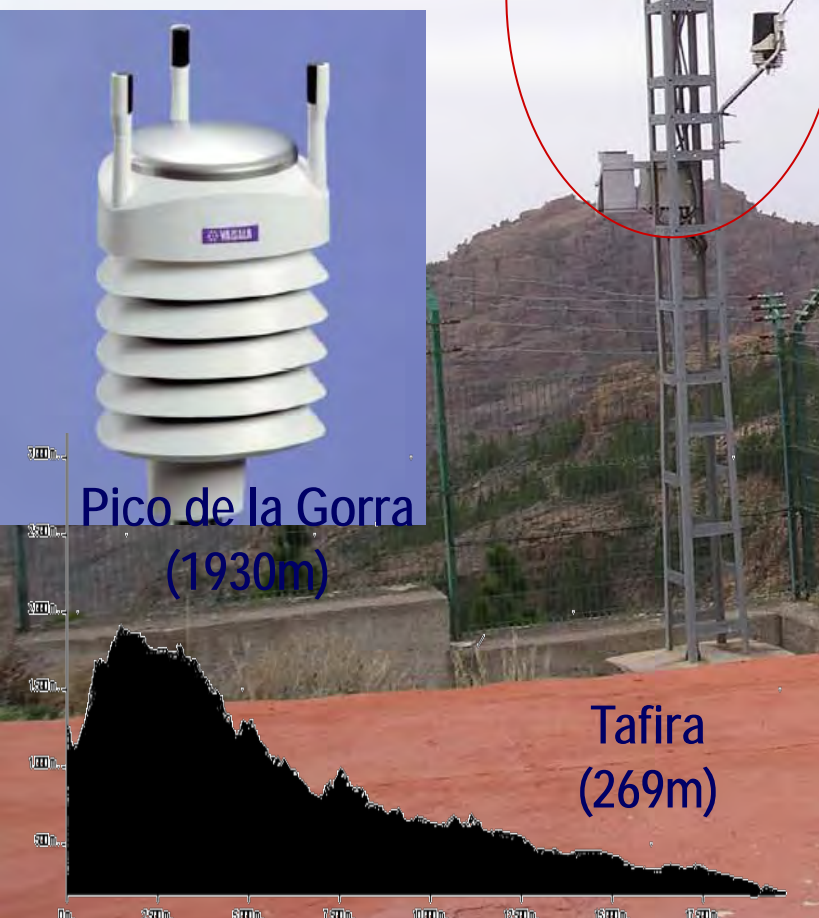


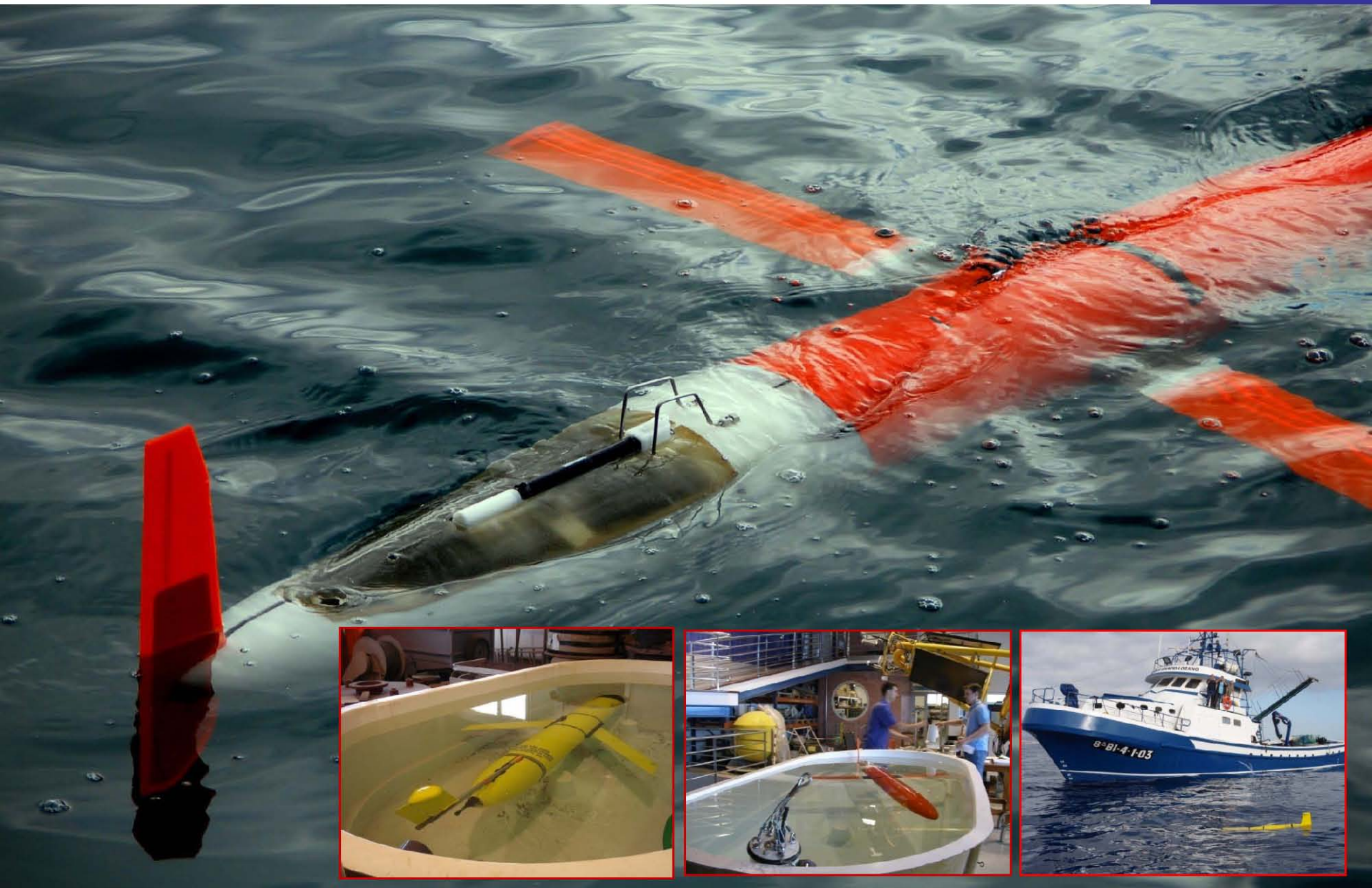
**Agreement with NOAA since 1998.**



## MET station

## Total Suspended Particles (TSP) Samplers





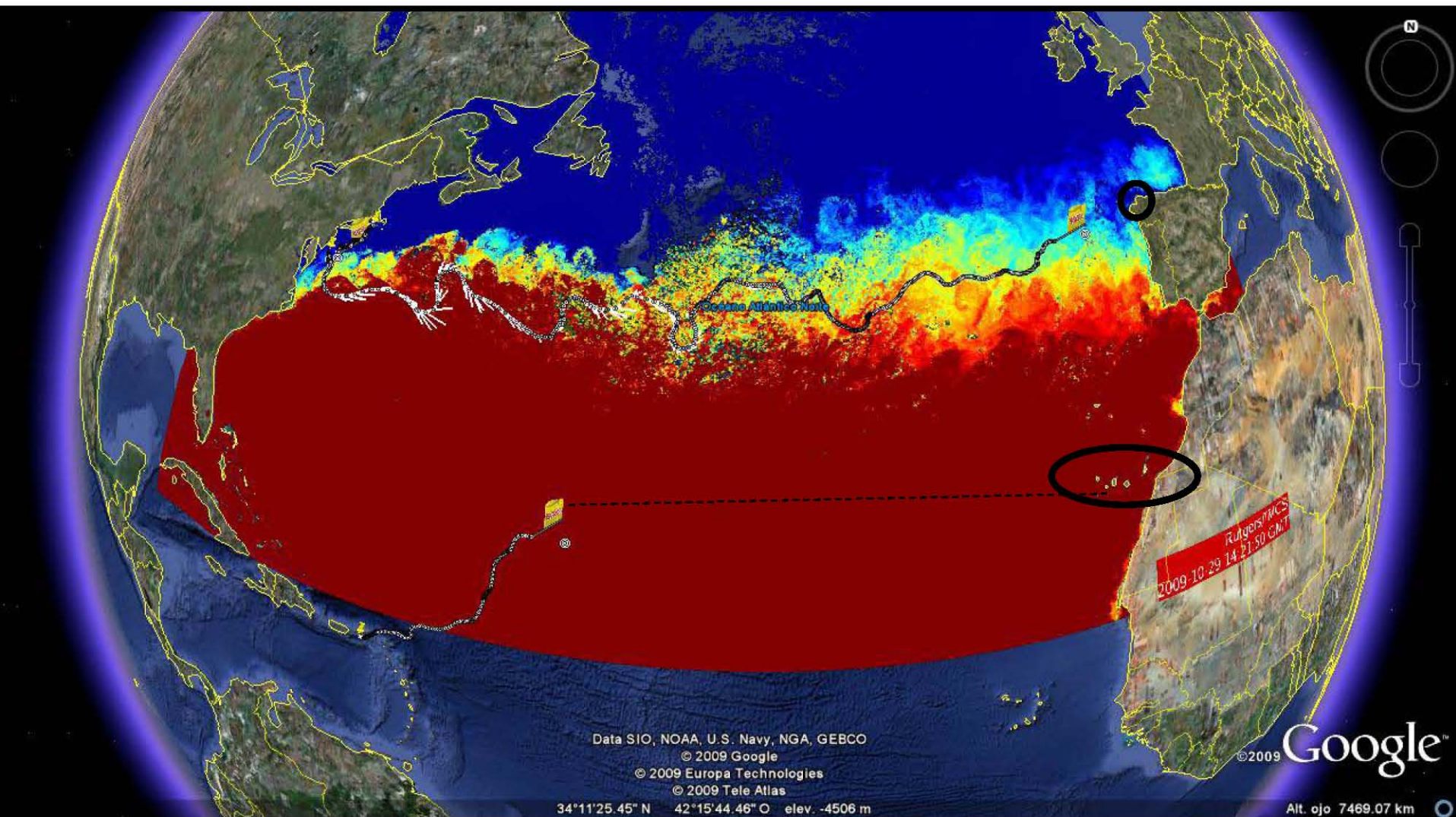


Transects between shore and  
ESTOC site (100 nm) and Gran  
Canaria and Morocco coast

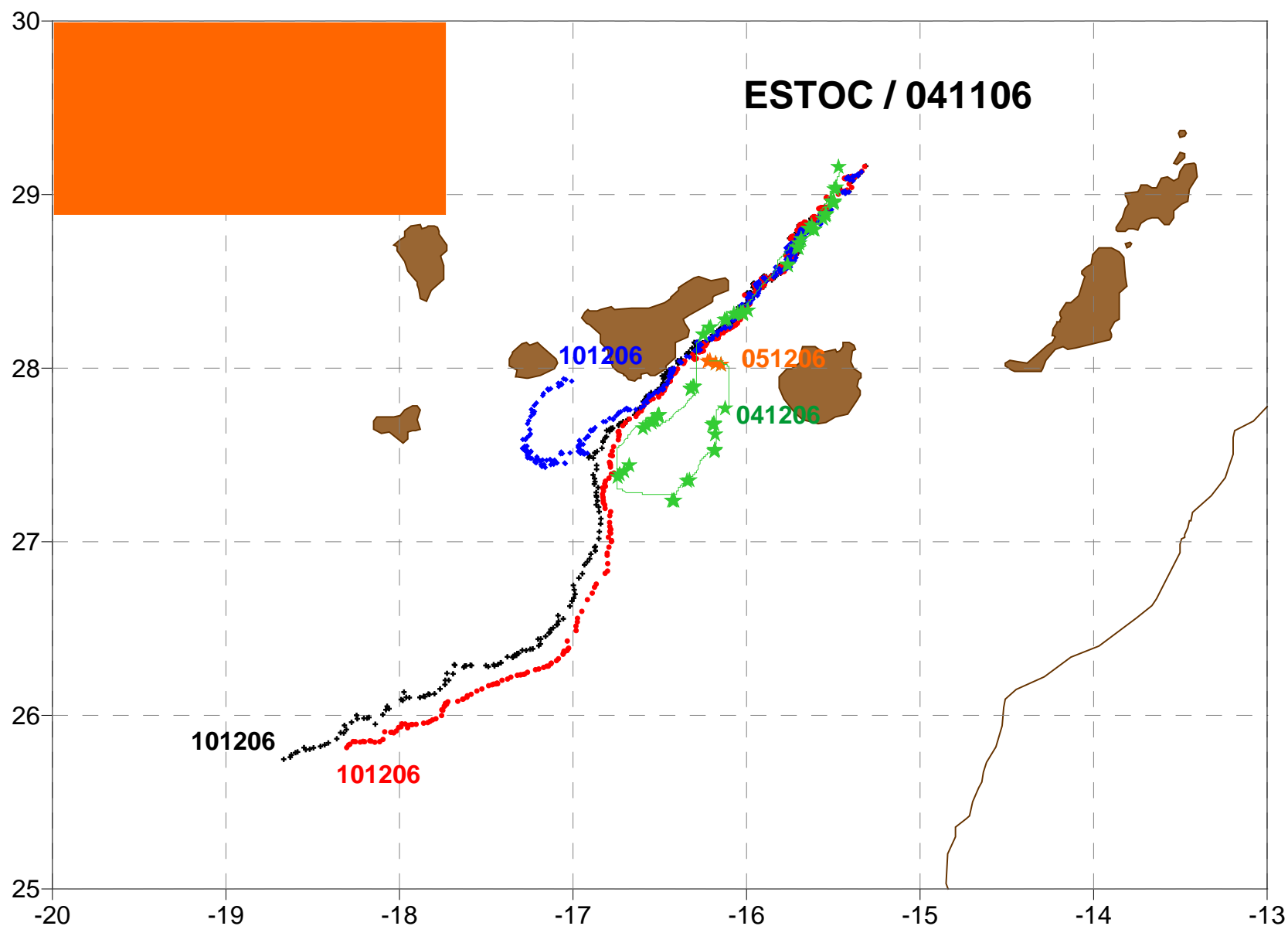


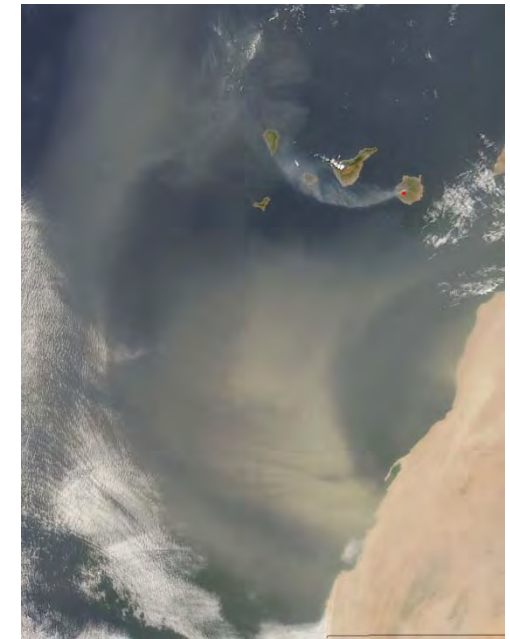
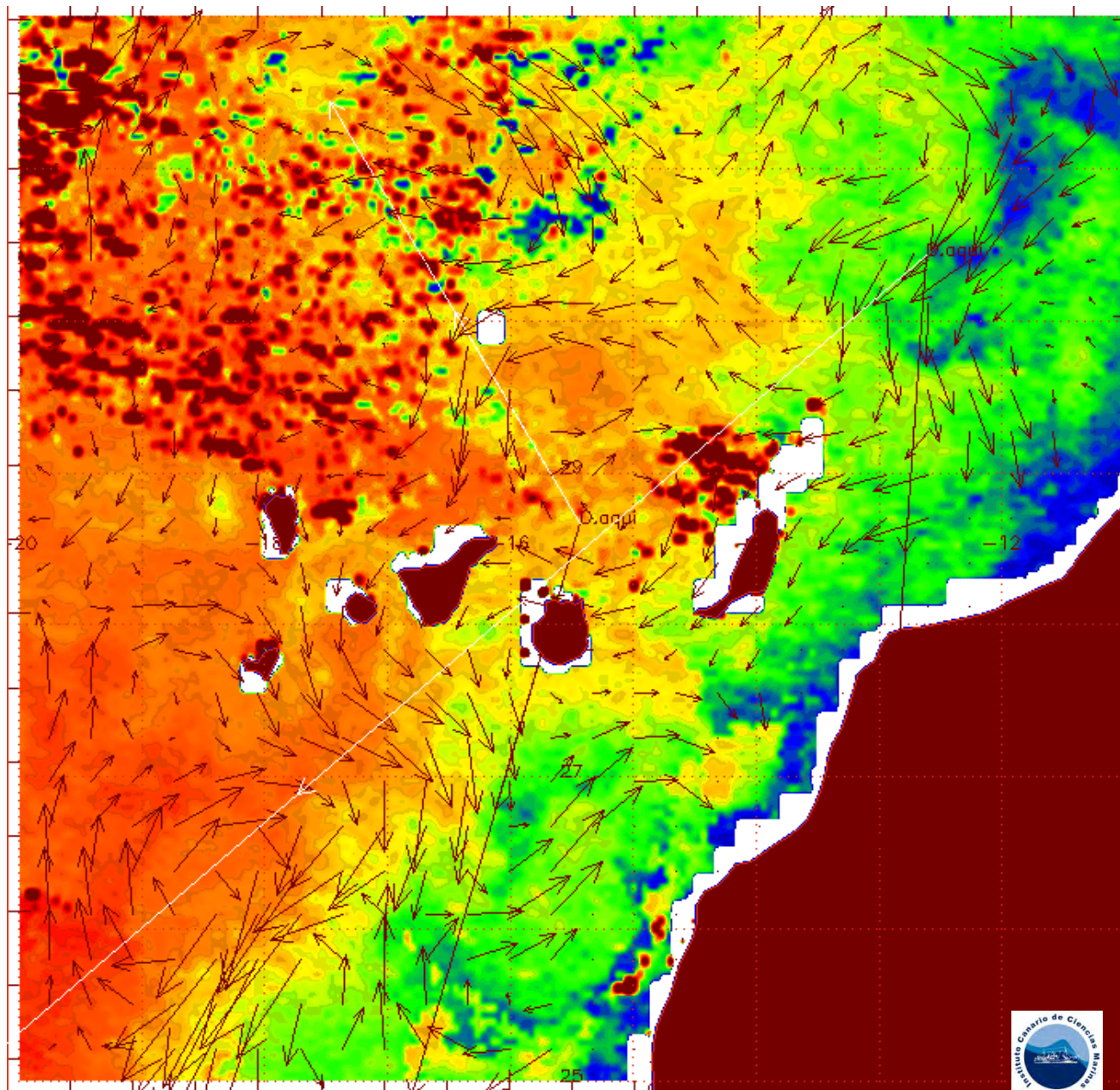
**Bellamite** slocum glider from NOCS was deployed last 17th September at the East coast of Gran Canaria for real time transects between Canaries and Morocco, under the frame of **RAPID project**.

# Partnership RU COOL and PLOCAN - Transatlantic glider Missions









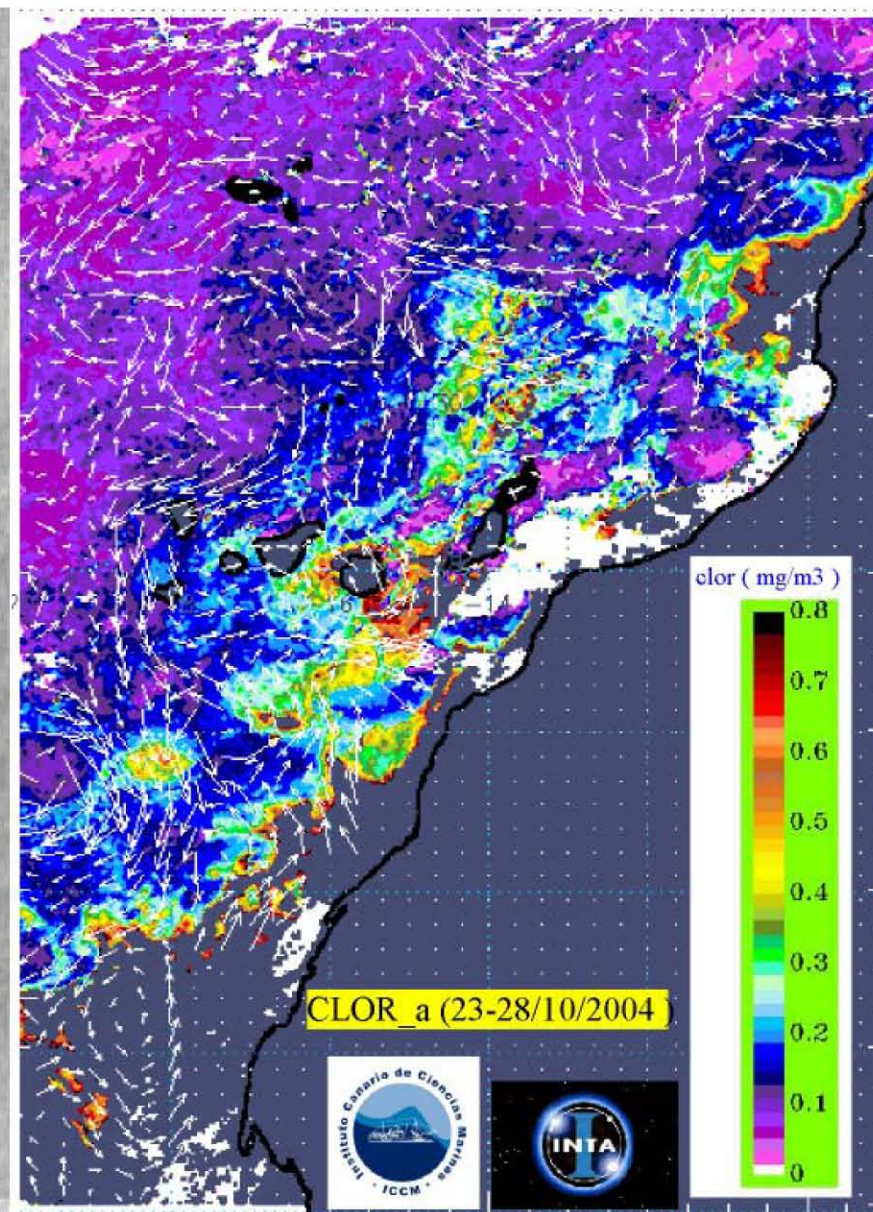
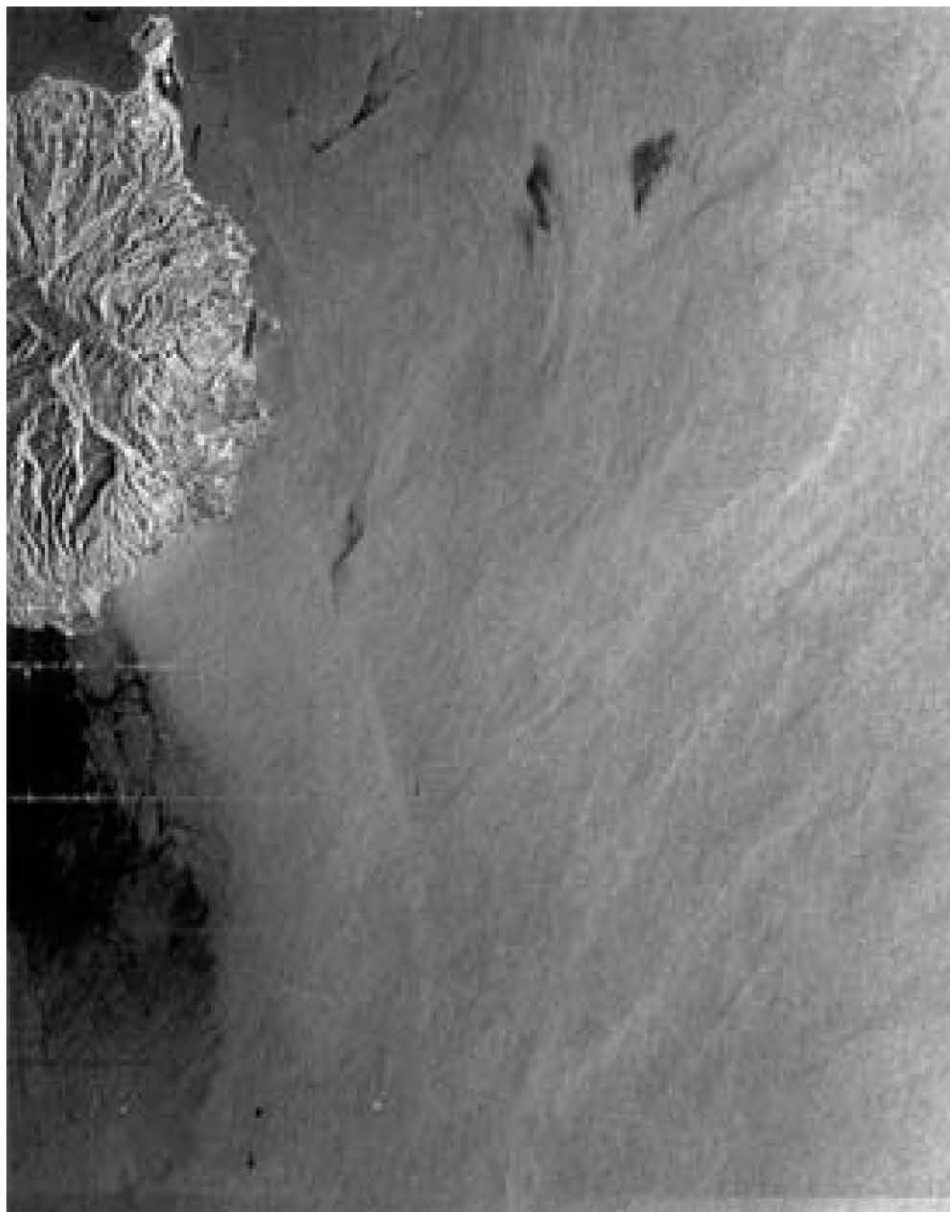
AVHRR

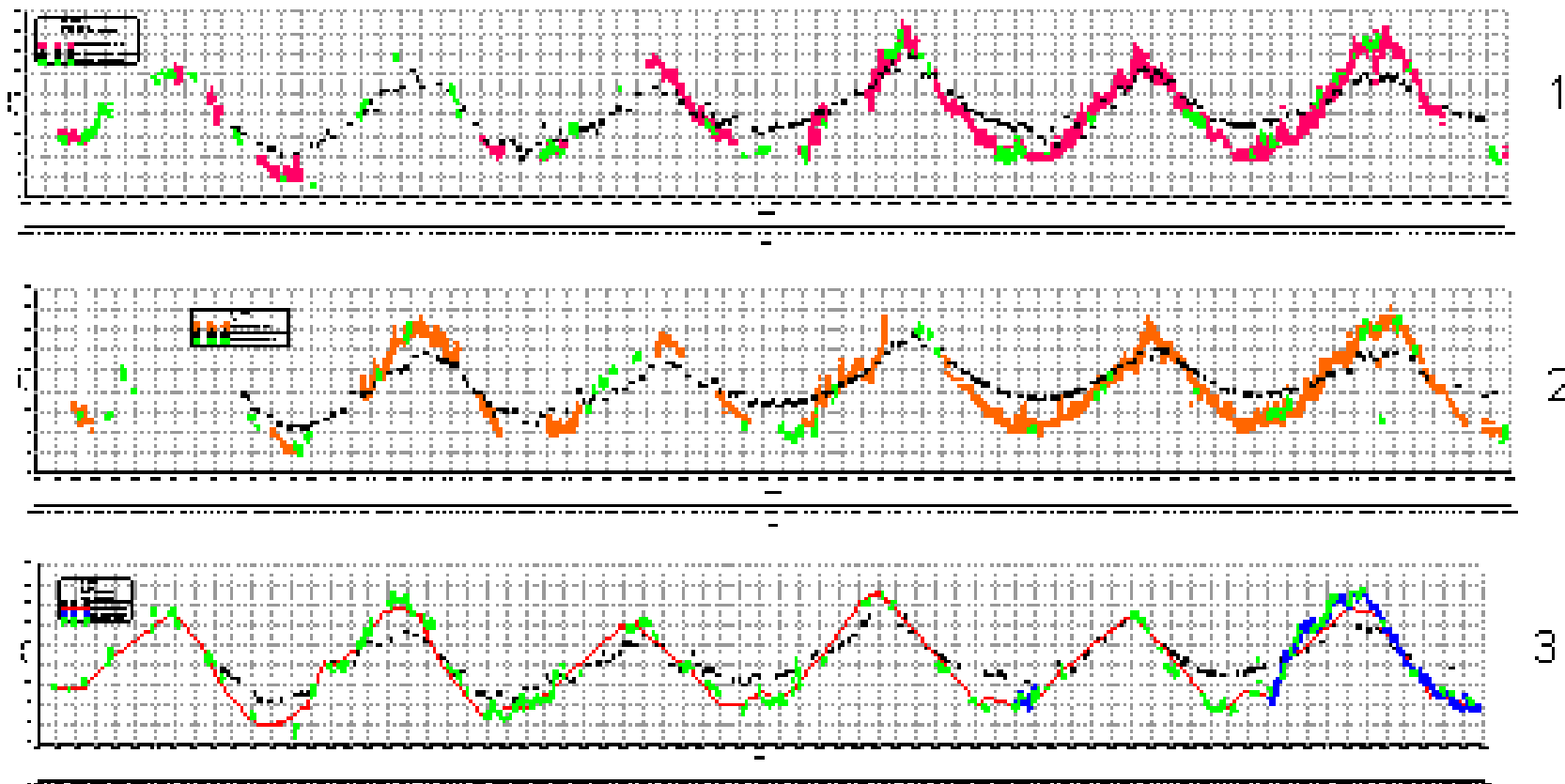
SAR

MODIS

SeaWifs

...

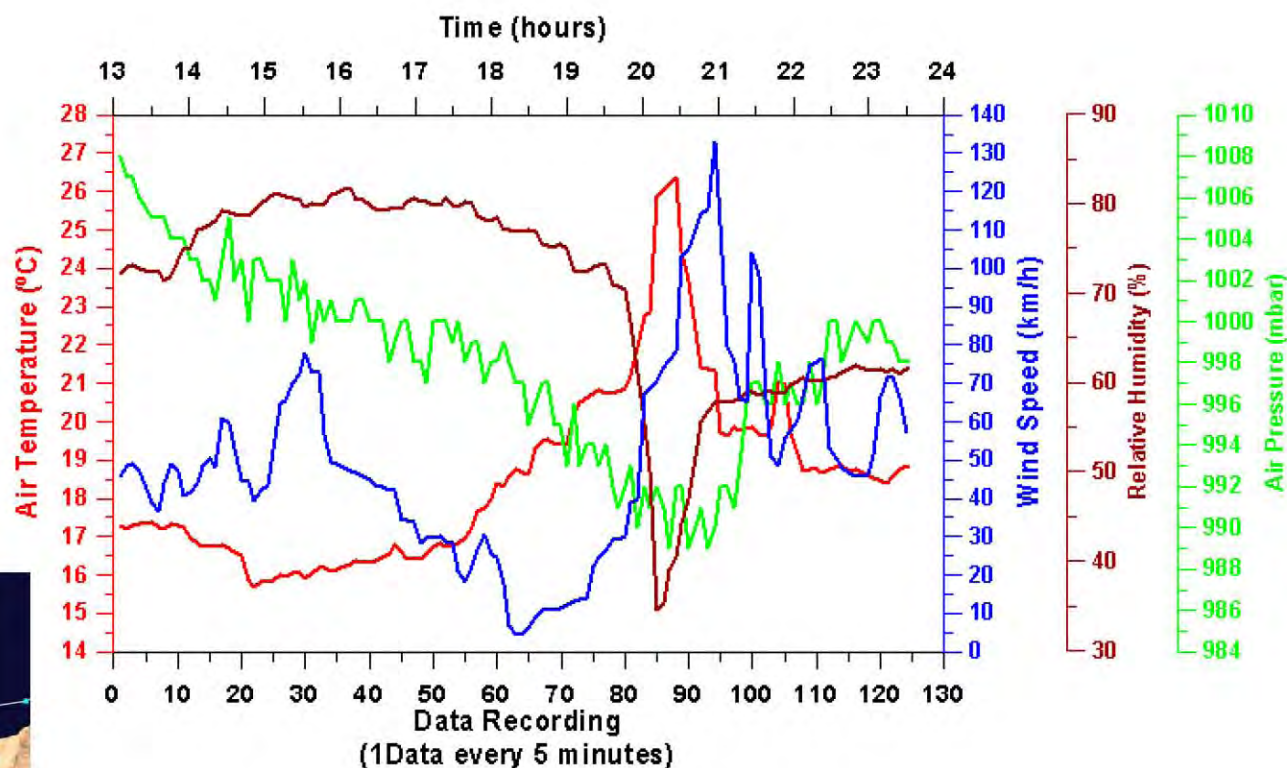


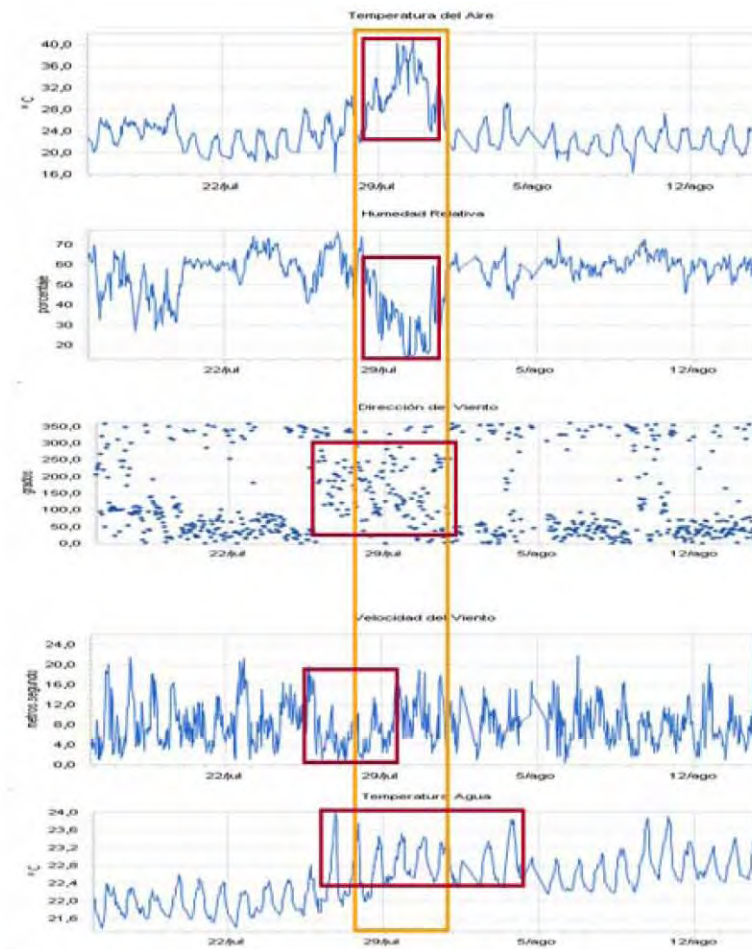
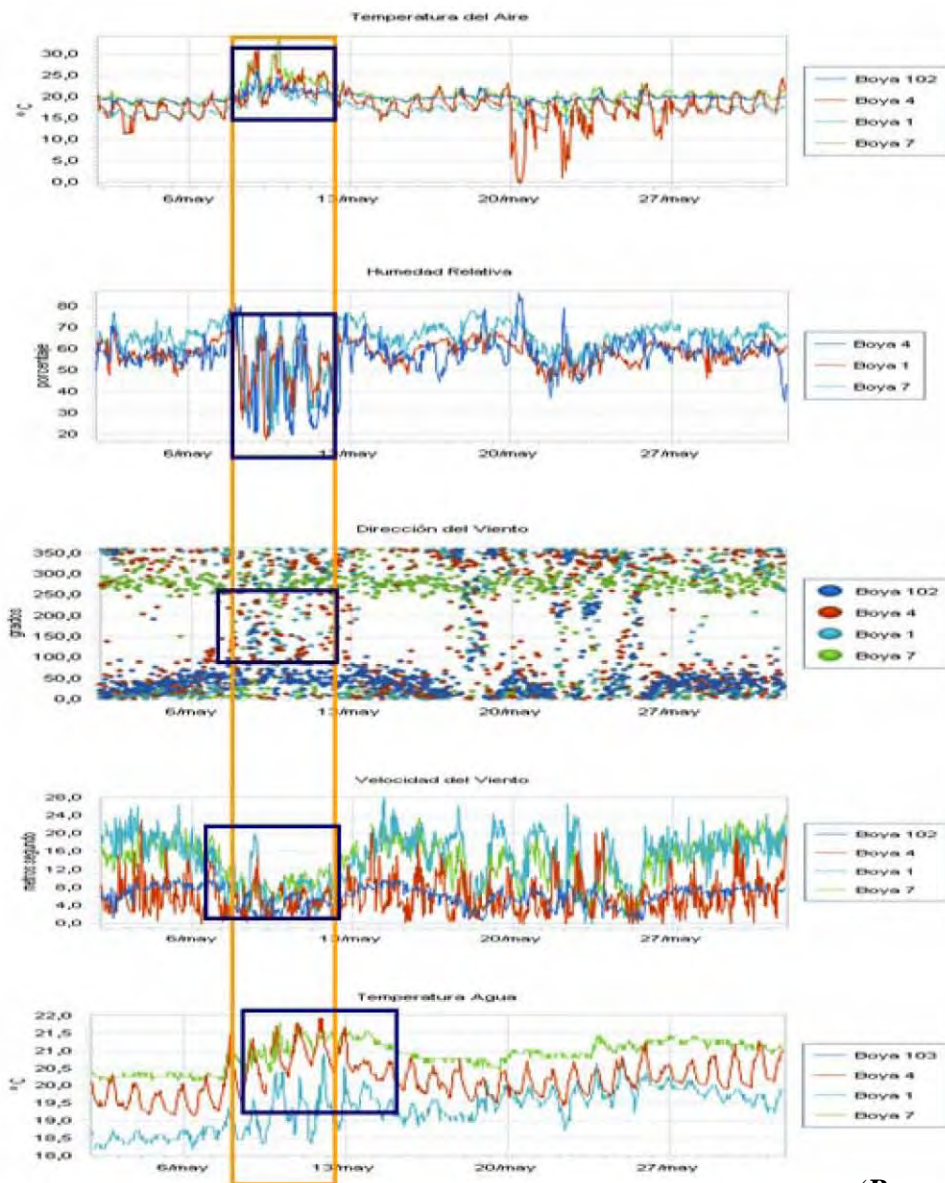


6-years SST time-series at three different sites around Canaries. (1) NE-Gran Canaria; (2) SE Tenerife and (3) ESTOC.



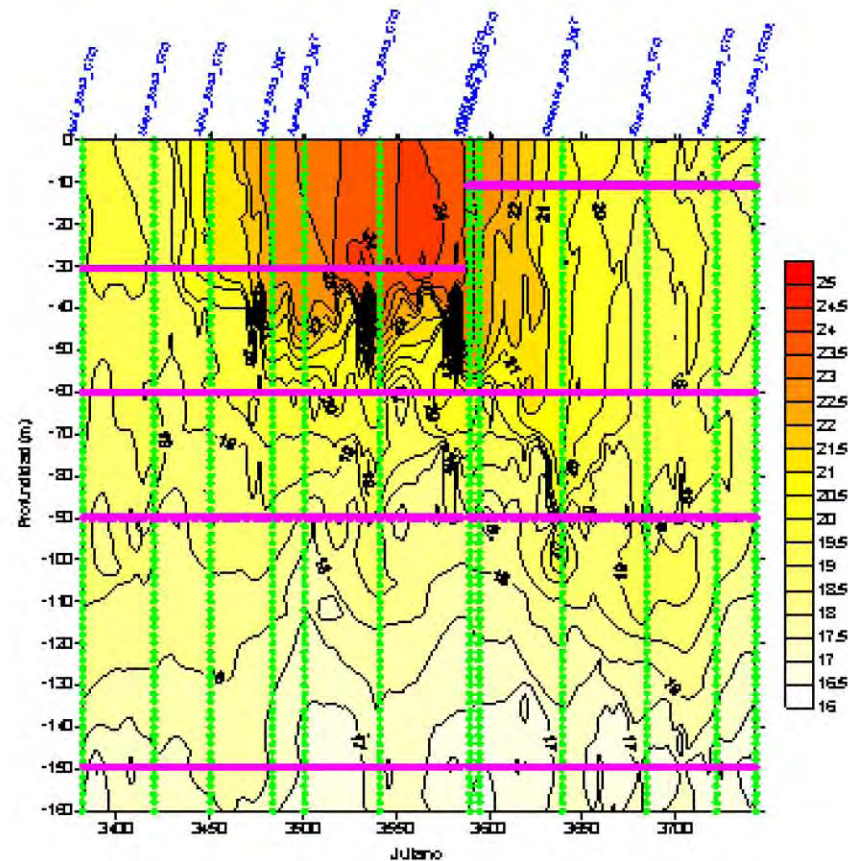
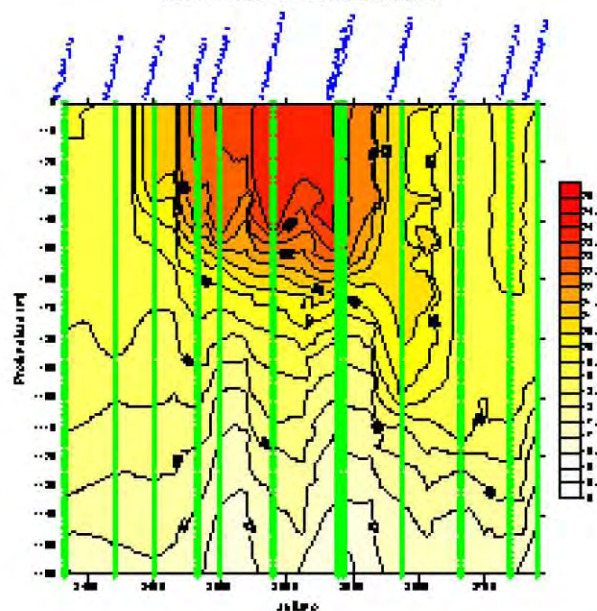
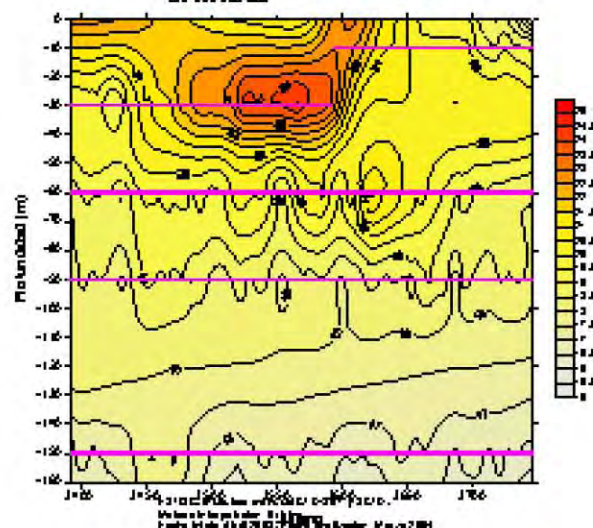
# DELTA Tropical Storm. Canary Islands. November 2006





(Barrera et al. 2008 Journal Operational Oceanography)

1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262. 263. 264. 265. 266. 267. 268. 269. 270. 271. 272. 273. 274. 275. 276. 277. 278. 279. 280. 281. 282. 283. 284. 285. 286. 287. 288. 289. 290. 291. 292. 293. 294. 295. 296. 297. 298. 299. 300. 301. 302. 303. 304. 305. 306. 307. 308. 309. 310. 311. 312. 313. 314. 315. 316. 317. 318. 319. 320. 321. 322. 323. 324. 325. 326. 327. 328. 329. 330. 331. 332. 333. 334. 335. 336. 337. 338. 339. 340. 341. 342. 343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359. 360. 361. 362. 363. 364. 365. 366. 367. 368. 369. 370. 371. 372. 373. 374. 375. 376. 377. 378. 379. 380. 381. 382. 383. 384. 385. 386. 387. 388. 389. 390. 391. 392. 393. 394. 395. 396. 397. 398. 399. 400. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839. 840. 841. 842. 843. 844. 845. 846. 847. 848. 849. 850. 851. 852. 853. 854. 855. 856. 857. 858. 859. 860. 861. 862. 863. 864. 865. 866. 867. 868. 869. 870. 871. 872. 873. 874. 875. 876. 877. 878. 879. 880. 881. 882. 883. 884. 885. 886. 887. 888. 889. 890. 891. 892. 893. 894. 895. 896. 897. 898. 899. 900. 901. 902. 903. 904. 905. 906. 907. 908. 909. 910. 911. 912. 913. 914. 915. 916. 917. 918. 919. 920. 921. 922. 923. 924. 925. 926. 927. 928. 929. 930. 931. 932. 933. 934. 935. 936. 937. 938. 939. 940. 941. 942. 943. 944. 945. 946. 947. 948. 949. 950. 951. 952. 953. 954. 955. 956. 957. 958. 959. 960. 961. 962. 963. 964. 965. 966. 967. 968. 969. 970. 971. 972. 973. 974. 975. 976. 977. 978. 979. 980. 981. 982. 983. 984. 985. 986. 987. 988. 989. 990. 991. 992. 993. 994. 995. 996. 997. 998. 999. 1000.



[www.oceanografiaiccm.es](http://www.oceanografiaiccm.es)

Grupo de Oceanografía Operativa y Descriptiva - Windows Internet Explorer

http://www.oceanografiaiccm.es/

Archivo Edición Ver Favoritos Herramientas Ayuda

Favoritos Grupo de Oceanografía Operativa y Descriptiva

Thurs day, October 29, 2009

Text Size



# ceanografía

Grupo de Oceanografía Operativa y Descriptiva (GOOD)

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## OCEANOGRAFÍA

- Miembros
- Investigación
- Infraestructuras
- O. Operacional

## PROYECTOS

-  netbiome  
En ejecución
- Finalizados

## CRUCEROS

## GRUPO DE OCEANOGRAFÍA OPERATIVA Y DESCRIPTIVA

**La Red ACOMAR Canarias presentada en el Congreso OCEANS'09 Biloxi (MS, USA)**



26 de Octubre de 2009. El evento congrega a numerosos investigadores y las principales empresas del sector a nivel internacional.

**Participación (Proyecto NET-BIOME) en la 1ª Conferencia del Grupo de Expertos de la Convención de Berna sobre Diversidad Biológica de las Islas Europeas**



1 al 3 de Octubre 2009, Sta. Cruz de Tenerife.

La conferencia titulada "NET-BIOME: Soporte Europeo a la Investigación sobre

**5ª Reunión del Project Steering Committe del Proyecto AMASS**



21 al 23 de Octubre, Praga, República Checa.

**Nuevo modelo de Boya ODAS (v.2009-2)**



1 de Octubre de 2009.

La primera unidad formara parte del fondo EuroSITES en la estación ESTOC.

## TO CHANGE:

-  English Web

## WEBS DE INTERÉS

-  PLOCAN  
Plataforma Oceánica de Canarias
-  Oceanografía Operacional
-  PAP

Inicio

Bandeja de entr... 20091026\_OCEA... SquirrelMail 1.4... Grupo de Ocea... Microsoft Power... Dibujo - Paint

jueves, 29 de octubre de 2009 ES 15:56

[www.plocan.eu](http://www.plocan.eu)

Plataforma Oceánica de Canarias - Windows Internet Explorer

http://www.plocan.eu/es/

Archivo Edición Ver Favoritos Herramientas Ayuda

Favoritos Plataforma Oceánica de Canarias

Jueves, Octubre 29, 2009

Text Size RSS

# PLOCAN consorcio

GOBIERNO DE ESPAÑA MINISTERIO DE CIENCIA E INNOVACIÓN GOBIERNO DE CANARIAS FEDER

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## PLOCAN

- Descripción
- S.I.G. PLOCAN
- Cronología
- Financiación
- Consorcio
- Colaboradores
- Divulgación
- Perfil del contratante

## PROYECTOS

- MaReS
- WELCOME

## PLATAFORMA OCEÁNICA DE CANARIAS

### Visita al National Data Buoy Center (NDBC) de la NOAA en Mississippi (USA)



26-10-2009. Miembros de PLOCAN presentaron la iniciativa a directivos y responsables de la mencionada institución.

### Reunión de Constitución del Comité de actividades socioeconómicas de PLOCAN



9-10-2009. Por unanimidad se eligió a D. José Regidor, Rector de la Universidad de Las Palmas de Gran Canaria, como presidente y a D. Arturo González, Director General de la Fundación INNOVAMAR como secretario.

### La Provincia, 25/10/2009: Entrevista a Dña. Cristina Garmendia, Ministra de Ciencia e Innovación.



25-10-2009. ¿Qué papel cree que puede jugar la Plataforma Oceánica de Canarias en el campo de la investigación marina?

### Consejo de Ministros en Las Palmas de Gran Canaria



9-10-2009. El Consejo de Ministros celebró una reunión extraordinaria el día 9 de octubre en Las Palmas de Gran Canaria.

## VIDEO DE PRESENTACIÓN



### BOYA ODAS - PLOCAN

- Fondeo ODAS - PLOCAN
- DATOS



### RUTGERS UNIVERSITY -

Inicio Bandeja de entr... Escritorio SquirrelMail 1.4... Plataforma Oc... Microsoft Power... OO - Paint ES 15:58



## Boya 2



TIPO Boya Compleja

UBICACIÓN Emisario Puerto de las Palmas

POSICIÓN 28°05,44N 15°24,02W

GESTOR Puertos de Las Palmas

FECHA DE INSTALACIÓN 16 de septiembre de 2006

ULTIMO FONDEO 6 de septiembre de 2007

VALORACIÓN en mantenimiento

OPERATIVA

CONTACTO carlos@iccm.rcanaria.es

PROFUNDIDAD DE 38 m

FONDEO

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 ° C

PRESIÓN ATMOSFÉRICA 1022,90 milibares

TURBIDEZ -1000,0 unidades FTU

TEMPERATURA AGUA 24,66 ° C

DIRECCIÓN 290,00 grados

COMPONENTE X 0,06000 metros.segundo

CORRIENTE

COMPONENTE Y -6,00000 metros.segundo

CORRIENTE

http://193.146.82.16/buoyager/iccm.aspx

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Google Ir Marcadores 53 bloqueados Corrector ortográfico Enviar a Configuración

BUOYager - Concentrador de Boyas Científicas del ICCM

Página Herramientas



Boyas disponibles en selección actual:

[Buoya 1](#) Isleta ALERMAC Puerto de las Palmas de GC

[Buoya 3](#) La Hondura ALERMAC Puerto de Sta. Cruz de TF

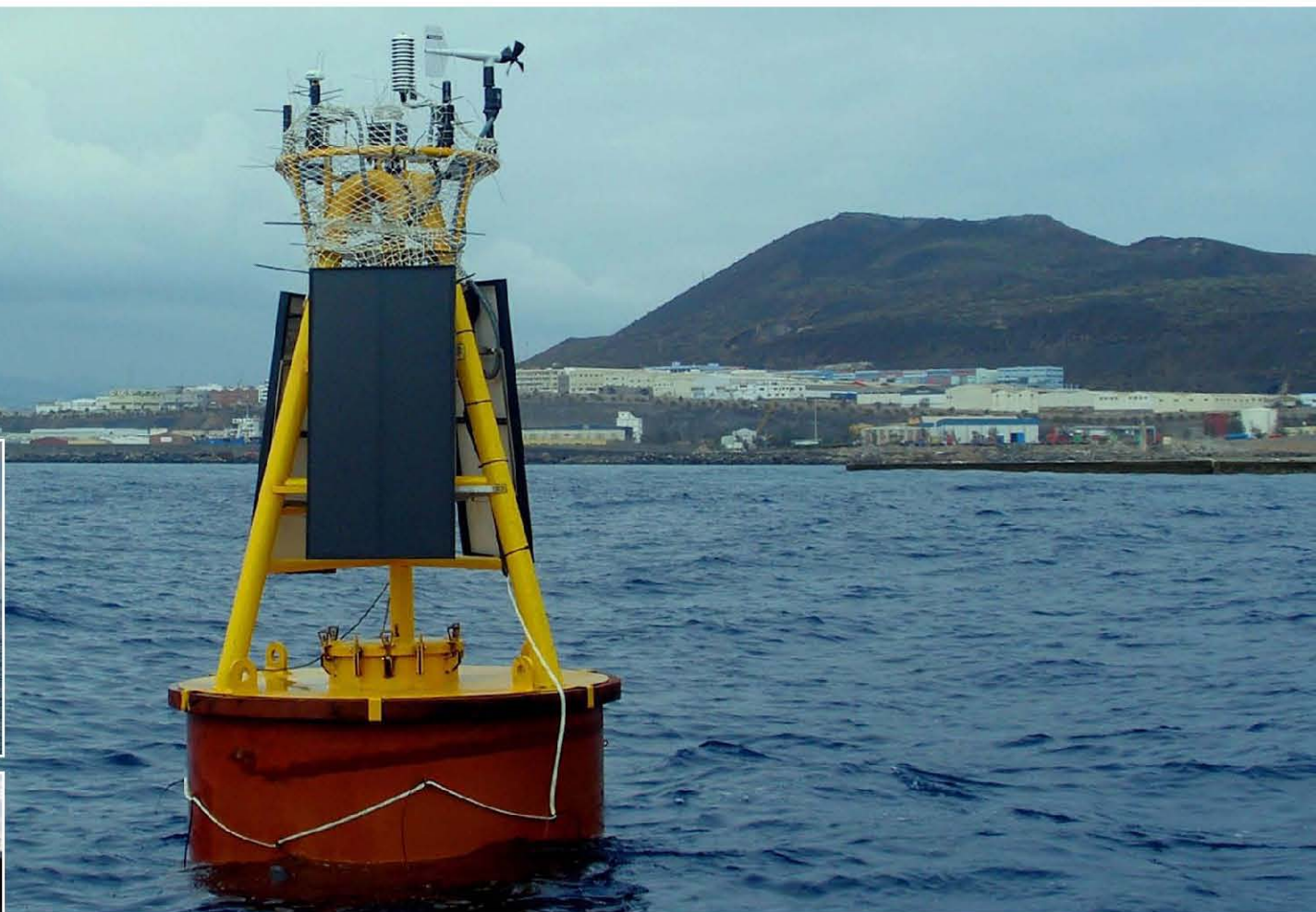
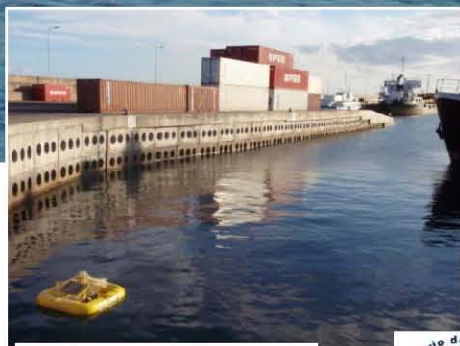
[Buoya 4](#) Dársena ALERMAC Puerto de Sta. Cruz de TF

[Buoya 7](#) odas

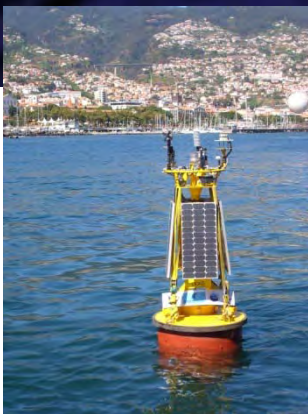
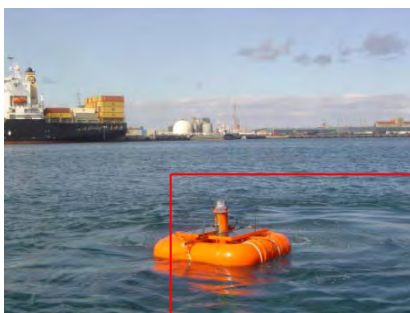
The network has been build from up to down, starting from **SPECIFIC FINAL USERS** towards general users, and at the same time, holding the aims established by national and international agencies and organizations, focused on to understand the processes and phenomena at global scale.

- 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

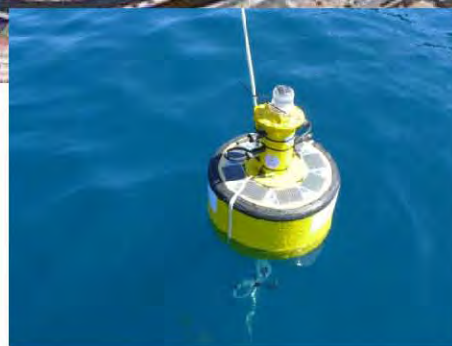
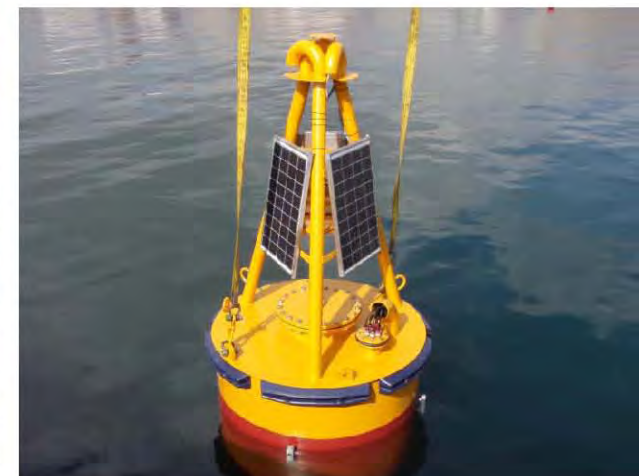
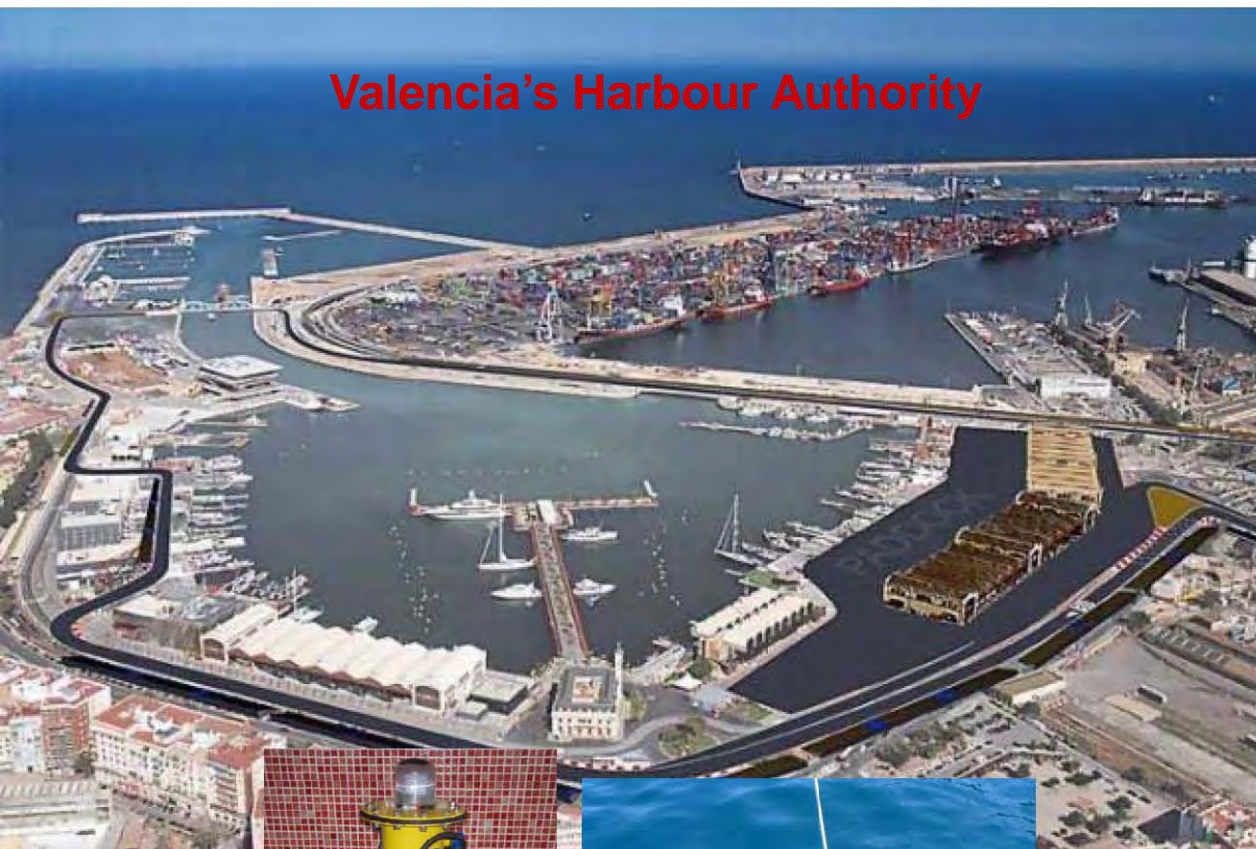


# Harbours

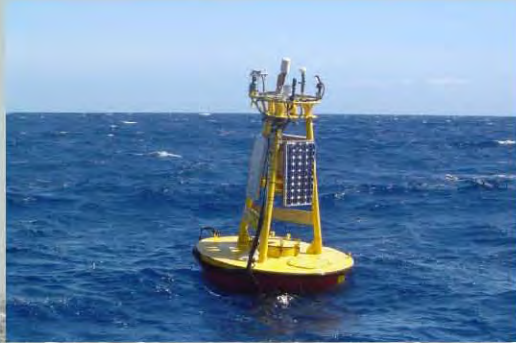


# Harbours

## Valencia's Harbour Authority

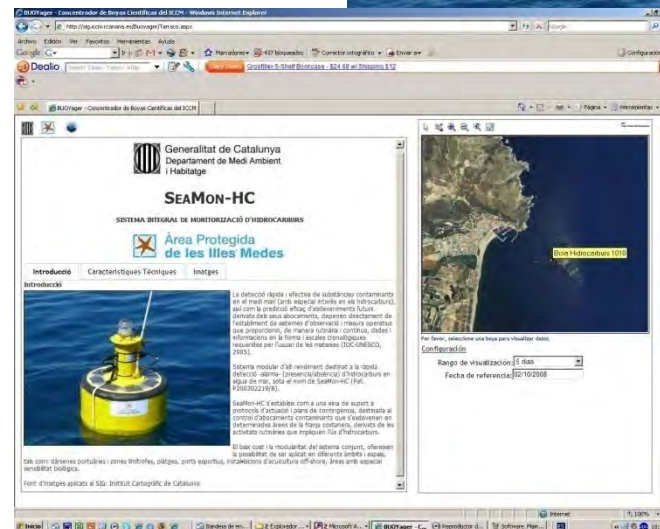


## Aquaculture- Fishfarming



# Marine Protected Areas

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



XBT/XCTD probes

Gliders

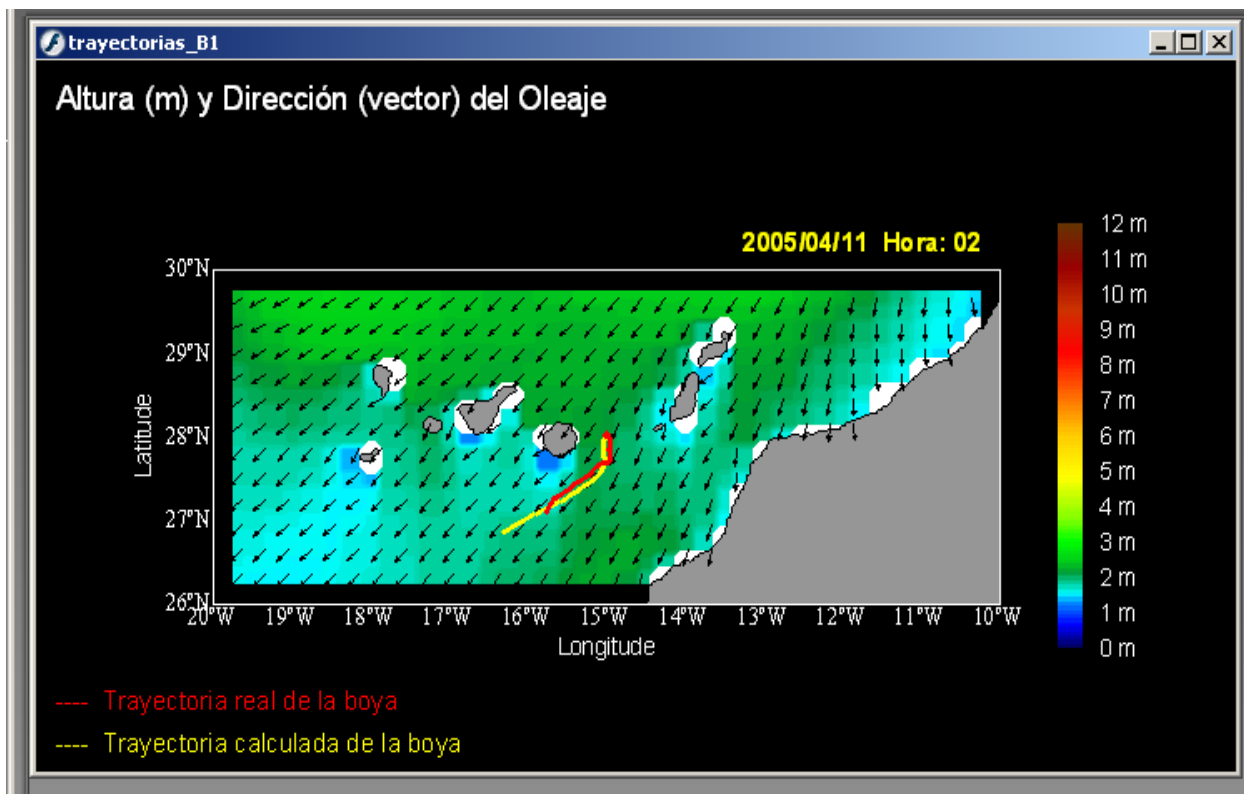
Drifting buoys

Turtles

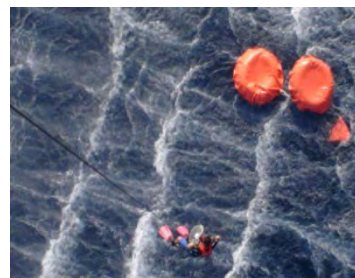
## Search and Rescue Exercises

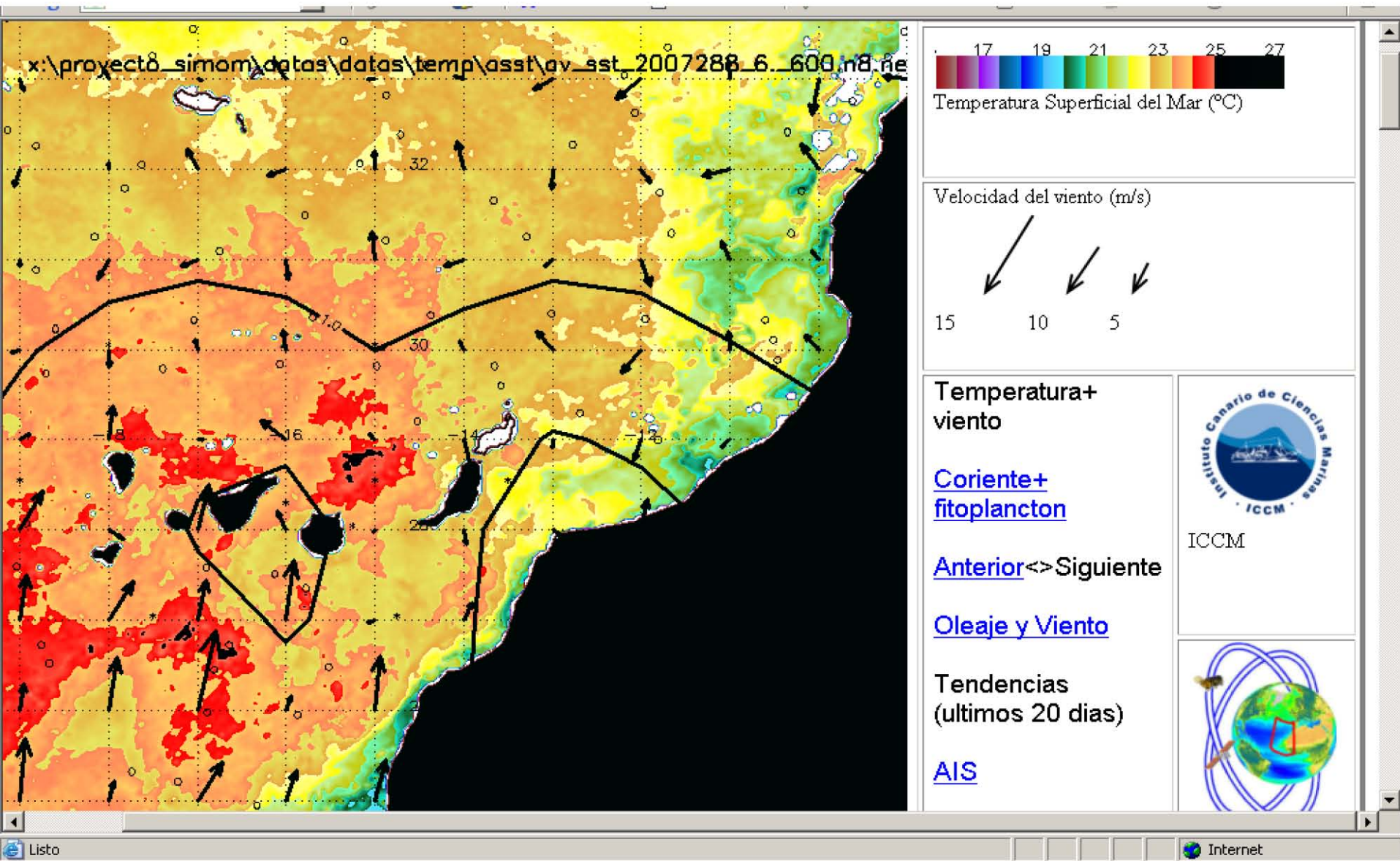


# Search and Rescue



Theoretical and real exercises.





Listo

Internet

Información de las Playas - Microsoft Internet Explorer


Archivo Edición Ver Favoritos Herramientas Ayuda

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




Seleccione la isla, para acceder a la información de sus playas, datos de temperatura del mar, velocidad y dirección 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 menú principal.

Resolucion optima: 1024x768.


|   | 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         |

[<< Anterior <<](#) Fecha: 16/10/2007 >> [Siguiente >>](#)




Tenerife

←←





volver al menú

→→



**Situacion Sinoptica sobre el estado de la mar**

Internet

# The Red ACOMAR Canarias Network

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

By Carlos Barrera  
Researcher  
Dr. Oreste Linares  
Researcher

Dr. María José Rueda  
Researcher and Department Head  
Oceanography Department  
Instituto Canario de Ciencias Marítimas  
Las Palmas, Spain

Through its oceanography department—Grupo de Oceanografía Costanera y Descriptiva (GOCOD)—the Instituto Canario de Ciencias Marítimas, 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 (SeamMon). There are presently six moored buoys that transmit together as a real-time monitoring network called Red Allen and Marine Control (ACOMAR Canarias), with a wide range of specific applications for the assets of the Canary Islands Archipelago.

Red ACOMAR (from other autonomous instrumentation currently deployed in the area, the Spanish Deep Water Moored Buoy Network, the meteorological moorings of the Operational Data Transmission in the Ocean and Large-Area Acoustic Network), surface buoys under the Marine Environment and Security for the European Area project, the World Ocean Circulation Experiment/Tropical Ocean-Global Atmosphere 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 areas, fisheries and shell fish activities, and protected marine areas in the Canarian marine environment areas, 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 GOCOD an earlier 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 pronounced 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 built-in well-established procedures or manufactured software. Their time, experience and technical development has allowed the group to create new systems while trying to adapt the system to new proposed applications. Already in its fourth incarnation, the Red ACOMAR is presently formed by six SeamMon units (two more are scheduled for deployment before the end of this year).

**Buoy Design and Instrumentation**

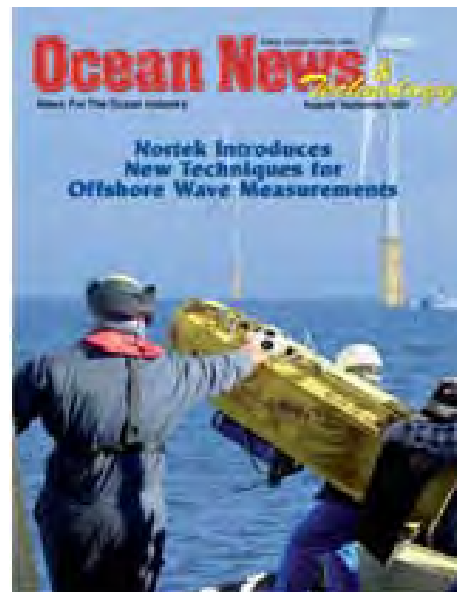
Currently, there are numerous designs for autonomous systems used for meteorological and oceanographic monitoring with different integration degrees. In spite of this, GOCOD has maintained clear criteria regarding the initial integration degree for the development



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

www.iadn.org.com

DECEMBER 2006 / 47



**SeaTechnology**  
December 2006

**Ocean News & Technology**  
November 2007

**JOO**  
March 2008



**Hydro**  
February 2009

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 Optrotec,  
in collaboration with the following organisations:

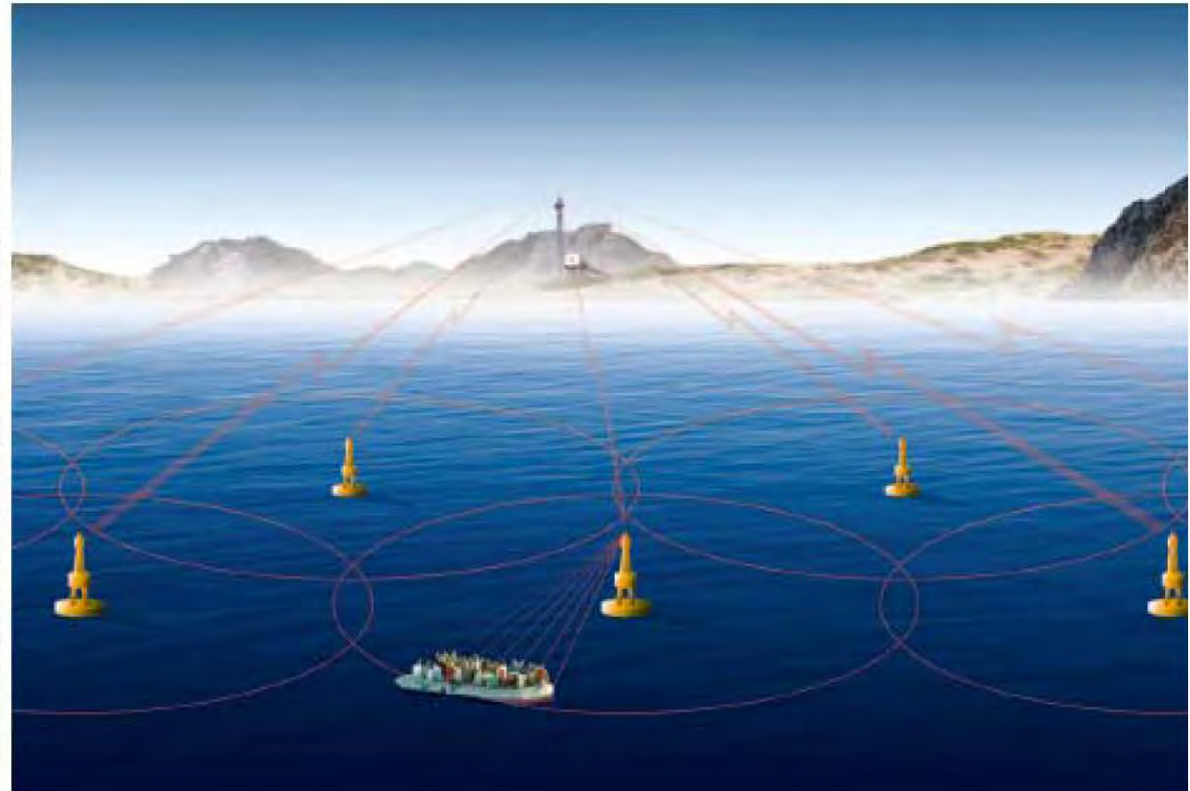
Armed Forces of Malta  
Cable Consulting Ltd  
Fraunhofer-Institut für Informations- und Bildverarbeitung (ITE)  
Fugro-OCEANOR  
HSP spol.s r.o.  
Instituto Canario de Ciencias Marinas  
IQ Wireless  
OBS Centium Technol (Mondia)  
Universidad de Las Palmas de Gran Canaria

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

[www.amaas-project.eu](http://www.amaas-project.eu)



© 2011 Carl Zeiss Optrotec. All rights reserved. The design and concept of the system and the use of the system are subject to change without notice.



## 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 Optoelectronics 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 ITE, Instituto Canario de Ciencias Marítimas 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 elusive 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.

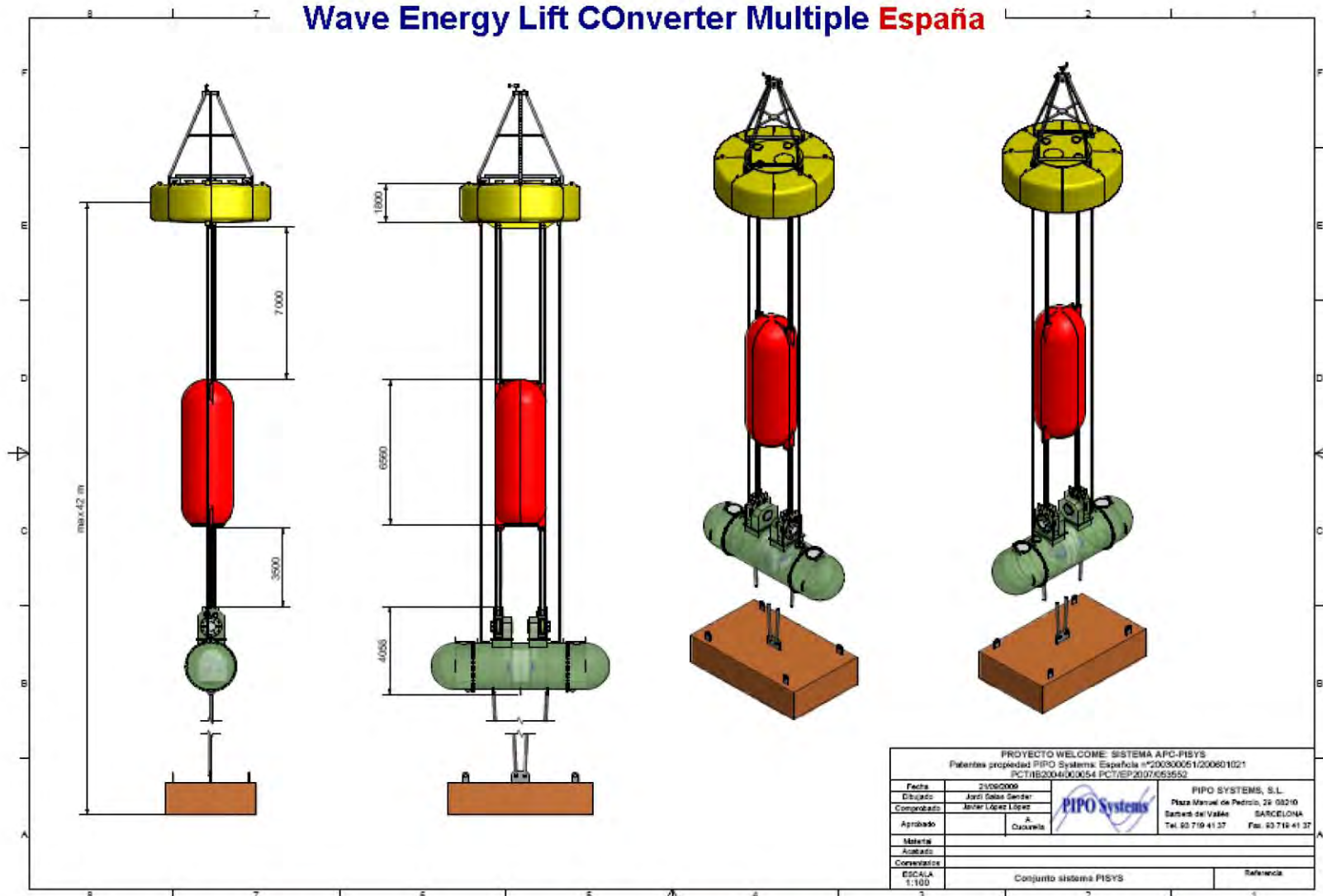
### Always on guard

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.



# WELCOM<sup>E</sup>

## Wave Energy Lift CONverter Multiple España



# WELCOM<sup>E</sup>

## Wave Energy Lift CONverter Multiple **España**

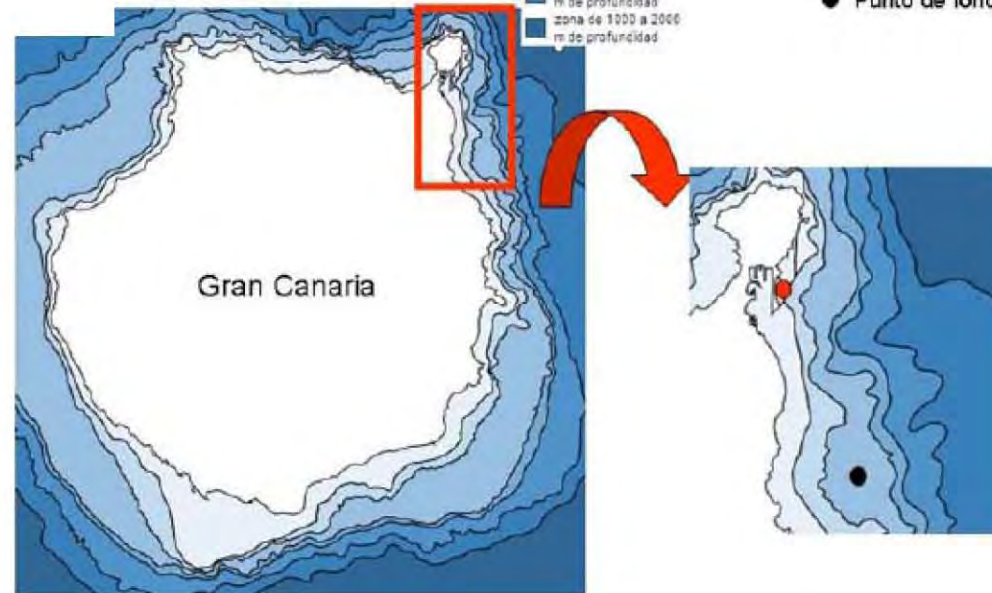


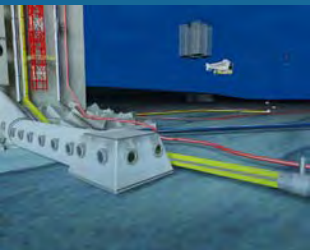
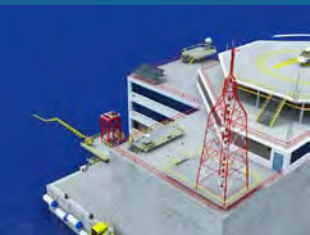
Mapa mundial mostrando la energía media de olas en KW/metro de frente de ola.

- zona de 0 a 30 m de profundidad
- zona de 30 a 50 m de profundidad
- zona de 50 a 100 m de profundidad
- zona de 100 a 200 m de profundidad
- zona de 200 a 500 m de profundidad
- zona de 500 a 1000 m de profundidad
- zona de 1000 a 2000 m de profundidad
- zona de 2000 m de profundidad

● Puerto de Las Palmas.  
Ensamblaje y test inicial

● Punto de fondeo.





2007-2011



The Deep-Ocean Gate





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



# Thank you for listening



## ...Any questions?