

# Spain

February 2010

**National Contact:** **Gregorio Parrilla**  
[gregorio.parrilla@md.ieo.es](mailto:gregorio.parrilla@md.ieo.es)

## Summary of operational and planned GOOS participation

### Observations

### Comments

Moorings                      Deep sea Network: 13 Seawatch (currents, T(w), Sal and Met) and 3 WaveScan.  
Coastal Network: waves, T(w). 24 sites  
Near shore currents with T(w), Sal: 3 sites  
[http://www.puertos.es/en/oceanografia\\_y\\_meteorologia/redes\\_de\\_medida/index.html](http://www.puertos.es/en/oceanografia_y_meteorologia/redes_de_medida/index.html)

ESTOC (With IFM Kiel) visited monthly. Redeployed November 2007 but removed April 2008.  
<http://www.soc.soton.ac.uk/animate/data/estoc/estocdata.php>

VULCAN (Climate Variability in the North Atlantic)  
Two moorings at 43,48N – 3,47W (3500m) and 43N-11W (3000m) with Aanderaa current meters.  
See TS Hydrography below – RADIALES PROFUNDOS

EBC4 (IEO and ULPGC, 2 current meter moorings at 29°N between Canary Is. and African coast (operating since 1997)).

XCTD/XBT/TSG              ESTOC XBT lines operated by Instituto Canario de Ciencias Marinas (ICCM). Finished as a systematic activity, now relies on sporadic ships of opportunity.

ARGO                              2 active floats February 2010.

Sea Level                      3 GLOSS MSL stations (Ceuta, La Coruna, Las Palmas de G.C.), 1 MedGLOSS station (Palma de Mallorca, Baleares)  
<http://indamar.ieo.es/> Latest data posted by GLOSS Center – 2008 as of October 2009. Ceuta, Las Palmas and La Coruna are also FAST delivery stations and ESEAS participants. December 2009 data posted at the Hawaii FAST Center as of 3/2/2010.

REDMAR harbor tide gauge network composed of 14 SONOR acoustic sensors, 7Aanderaa pressure sensors and 12 MIROS radar sensors. Some data are sent daily to GLOSS and MedGLOSS  
[www.puertos.es](http://www.puertos.es)

Radar Sensors installed at Santander and Algeciras with one additional station planned

Sea Also

[http://www.gloss-sealevel.org/publications/national\\_reports.html](http://www.gloss-sealevel.org/publications/national_reports.html)  
13 GPS positioned stations, 2 are GLOSS- Ceuta and Las Palmas.  
<http://www.sonel.org/spip.php?page=cgps>

New stations established/upgraded in 2009: Menorca, Palma de Mallorca, Alcudia, Ibiza, Formentera , Tarifa and Algeciras. Upgrade of Bonanza station (Bonanza2: radar sensor)

## TS Hydrography

RADIALES PROFUNDOS (IEO). Time series cruise every 6 months in N and NW Spain in blue waters. Reaches some 100 nm from the coast. Started Spring 2003. Includes Bio/Chem measurements.  
<http://www.vaclan-ieo.es/proyecto04.html>

RAPROCAN (deep hydrograph section 29N Lanzarote Canal to west of La Palma) twice yearly in the WOCE mode.  
[www.oceanografia.es/raprocan](http://www.oceanografia.es/raprocan)

Latest and next Repeat Hydrographic sections (standard WOCE sampling).

A5, 24N – RAPID program 2010 with UK.

OVIDE (A25) Iberian Peninsula-Greenland 2008 and with France 2010.

FICARAM, Ushuaia-Cartagena WOCE A17, 2006 and 2013.

[http://www.go-ship.org/RefSecs/Table\\_RefSecs1.4.pdf](http://www.go-ship.org/RefSecs/Table_RefSecs1.4.pdf)

See also Bio/Chem below and moorings above

## Waves

See Moorings above

Sea also WaMos <http://www.oceanwaves.de/> for the Extreme Wave Monitoring Network in Spain

## Bio/Chem

IEO operates 8 transects along Spanish shelf (RADIALES) (physical, chemical and biological measurements)  
<http://www.seriestemporales-ieo.net/en/index.htm>

Spanish North Coast Bottom trawl Surveys, 2001-4, 450 reported.  
[http://www.go-ship.org/RefSecs/Table\\_RefSecs1.4.pdf](http://www.go-ship.org/RefSecs/Table_RefSecs1.4.pdf)

## Carbon

FICARAM Spain - Argentina 2001, 2 and 3. Planned 2009

Underway measurements:

Cartajena-Las Palmas 2/yr, 2005-

Quima VOS line, UK – Cape Town, monthly. 2005-

Coastal zone Gulf of Cadiz – 4/yr, 2006-2007

Canary Is.- Italy, 2007-

OVIDA Greenland -Lisbon (with France), every 2 years, 2002-2010

ICCABA 2007, Canary Isl-Italy

Time Series Stations:

MINAS 2005 onward, CARIOCA buoy with CO<sub>2</sub>, O<sub>2</sub>, S and T

GIFT 2005 onward, Strait of Gibraltar, seasonal

ESTOC, monthly since 1995. See moorings above

Coastal

Met network: 30 AWS in 21 port authorities

VOS

Potential 46, none reported active and on GTS February 2010.

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