

REPORT OF ONGOING SOLAS ACTIVITIES IN SPAIN

March 2007

Prepared by Rafel Simó
and the Spanish SOLAS community



The SOLAS-Spain committee

- Is a sub-committee under the IGBP committee
- Constituted in 2006
- Rafel Simó (co-ordinator, rsimo@icm.csic.es) – ICM-CSIC – *DMS, aerosols*
- Javier Arístegui - ULPGC – *plankton metabolism*
- Jordi Dachs - IIQAB-CSIC – *aerosols, pollutants, VOC*
- Melchor González-Dávila - ULPGC – *air-sea exchange of CO₂*
- Xosé-Ánxelu G. Morán - IEO – *food-web processes, N₂ fixation*
- and Aida F. Ríos (IIM-CSIC) as President of the IGBP-Spain Committee
- and Isabel Cacho (UB) as member of the SOLAS International SSC

Funding?

At present no direct (explicit) funding to carry out SOLAS science from national grants.

However, because ocean-atmosphere interactions and Global Change are among the research priorities in the Spanish Research Plan, our community is very proactive in SOLAS-related research, and a number of activities at both national and international levels are being conducted.

In a meeting in late March, the co-ordinator will suggest to submit a proposal for a small grant to fund co-ordination meetings, students meetings and the participation of young researchers in the Summer School.

SOLAS RESEARCH ACTIVITIES

FOCUS 1.

PLANKTON METABOLISM AND CO₂ FLUXES

The Biological Oceanography Groups at the ULPGC and the Univ Vigo, the groups of the IMEDEA-CSIC and the IIQAB-CSIC, and the IEO investigate the relative roles of atmospheric nutrient deposition and mesoscale vertical advection in plankton net metabolism and CO₂ fluxes. Subtropical NE Atlantic.

Javier Arístegui et al., Carlos Duarte et al., Jordi Dachs et al., Emilio Marañón et al., Xosé Anxelu G. Morán et al.

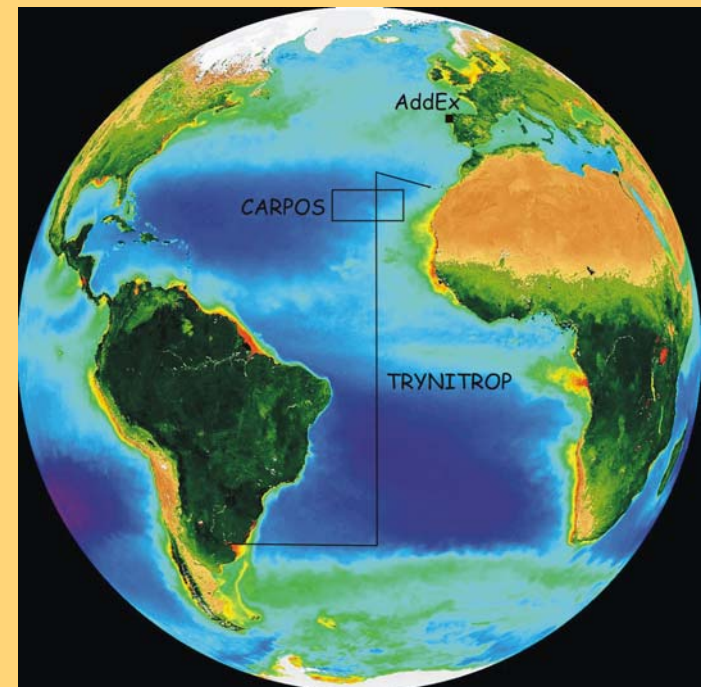
FOCUS 1.

N₂ FIXATION

The Biological Oceanography Group at the Univ Vigo and the IEO investigate the factors that control the distribution and activity of *Trichodesmium*, and its long term impact in the food web. Across the Atlantic.

Emilio Marañón et al.

Xosé Anxelu G. Morán et al.



FOCUS 1.

UVR EFFECTS ON C FLUXES

The IMEDEA group examines the effects of UV radiation on primary production and phytoplankton survival, net metabolism, and CO₂ and VOC fluxes.

Cruises in the subtropical N Atlantic, Mediterranean, Arctic and Antarctic.

Susana Agustí, Carlos Duarte et al.

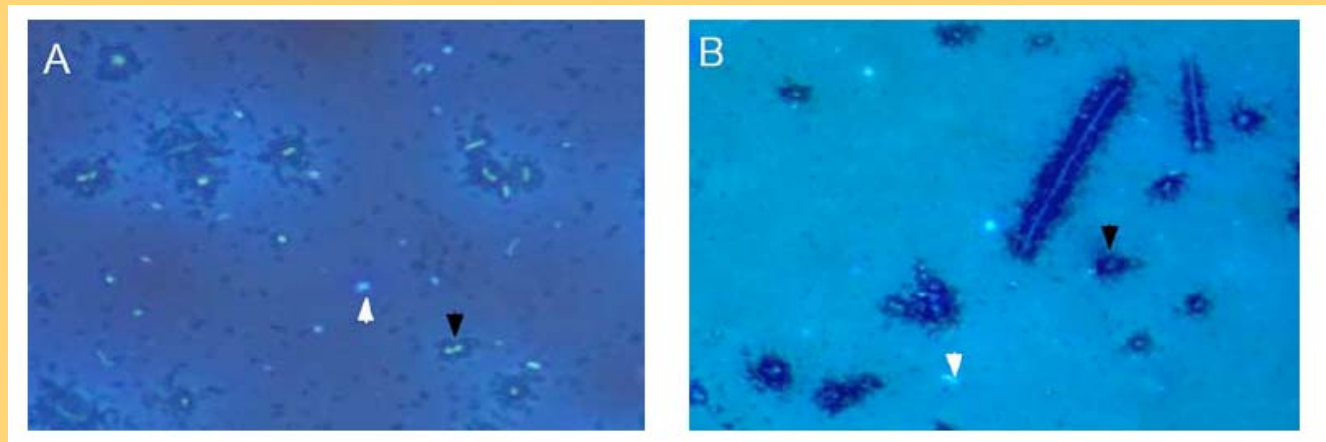
FOCUS 1.

BIOLOGICAL AND BIOGEOCHEMICAL CONTROLS ON DMS EMISSION

The Group Oceanic Biogeochemistry and Global Change at the ICM-CSIC applies molecular biology techniques for microbial diversity, single-cell biogeochemistry methods, “grazing dilution” experiments, time series, and lagrangian studies to investigate what controls the dynamics of DMS emission.

Cruises to the Mediterranean, N Atlantic, Arctic and Antarctic.

Rafel Simó et al.



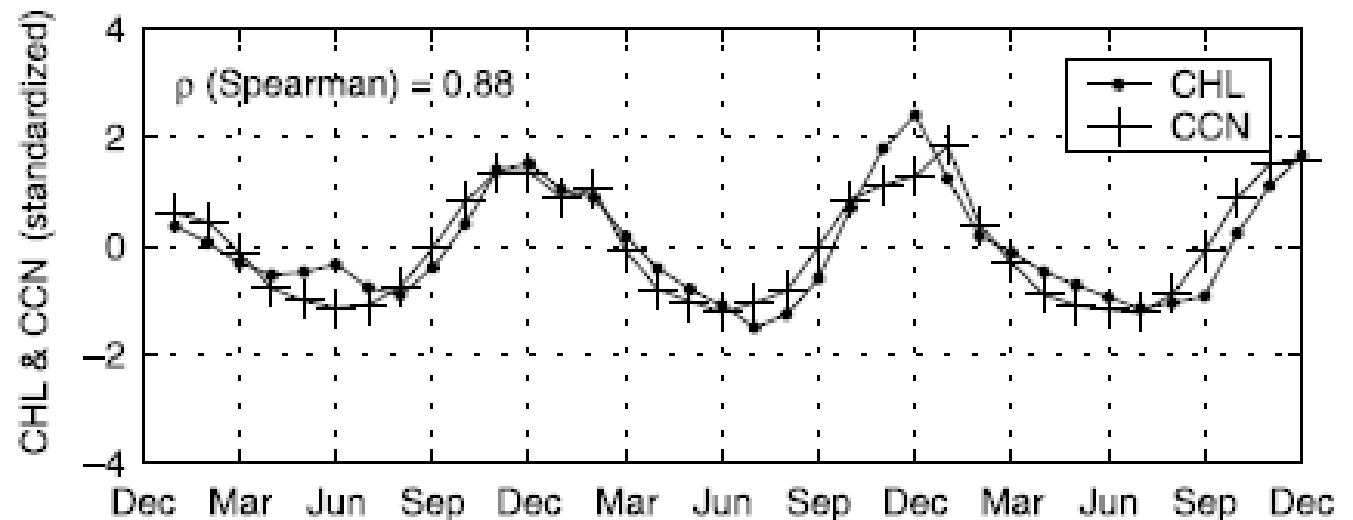
FOCUS 1.

BIOGENIC SULFUR, AEROSOLS AND CLOUDS. GLOBAL OBSERVATION AND MODELING

The Groups at the ICM-CSIC and the IIQAB-CSIC address the relationship of ocean-leaving DMS, aerosols, clouds, and sunlight with the use of new-generation satellite data (SST, Chla, wind, aerosol and cloud optical properties).

In the next future, an atmospheric chemistry model will be implemented.

Rafel Simó et al.
Jordi Dachs et al.



SOLAS RESEARCH ACTIVITIES

FOCUS 2.

FACTORS AFFECTING AIR-SEA EXCHANGE RATES

The groups at the IMEDEA-CSIC and IIQAB-CSIC study the role of plankton metabolism just below the ocean skin in controlling the variability of the fluxes of CO₂ and volatile organic carbon.

They also study the role of organic matter in modulating air-sea exchange rates at the air-sea interface.

Carlos Duarte, Jordi Dachs, Susana Agustí et al.

The group at the IIQAB investigates the aerosol deposition and diffusive fluxes of persistent organic pollutants.

Jordi Dachs et al.

SOLAS RESEARCH ACTIVITIES

FOCUS 3.

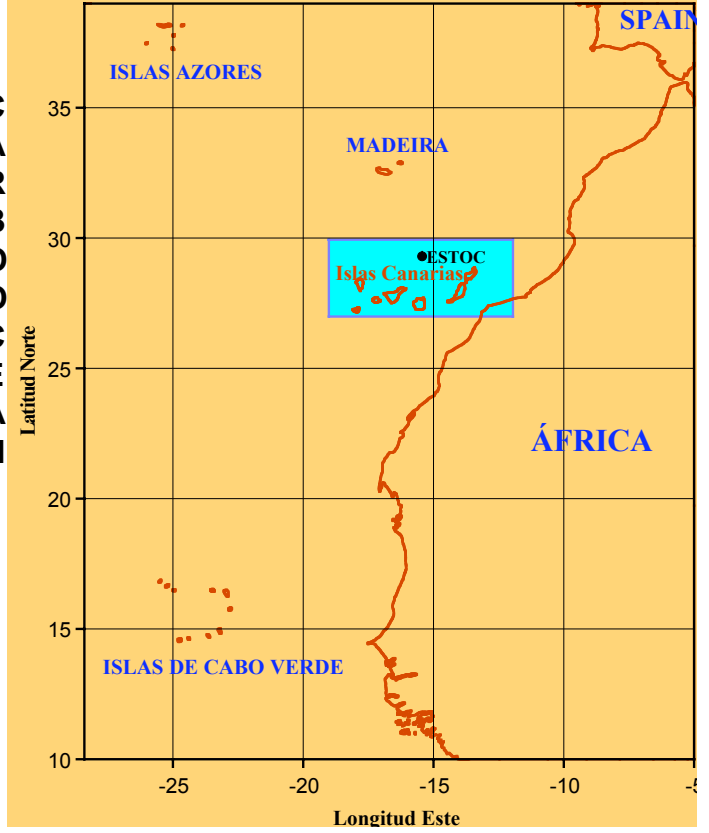
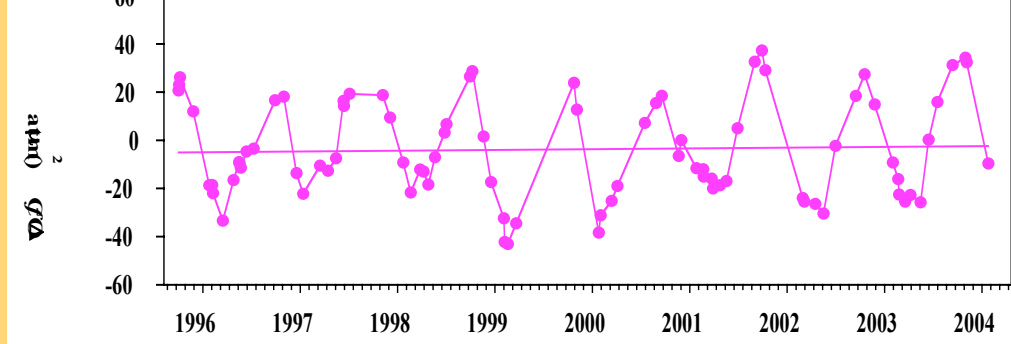
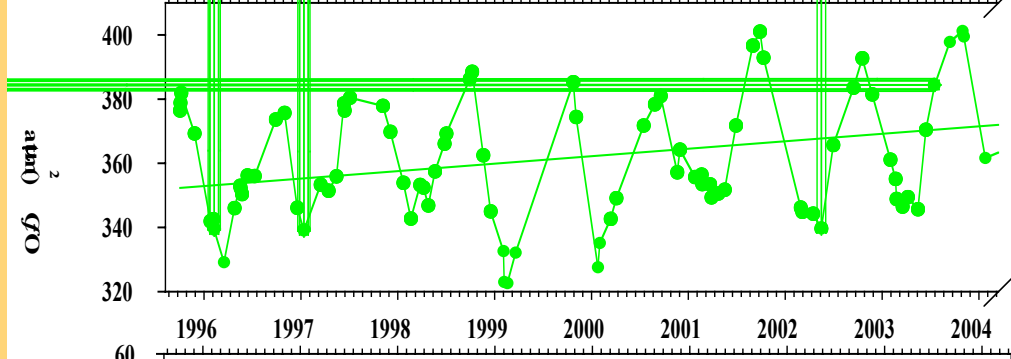
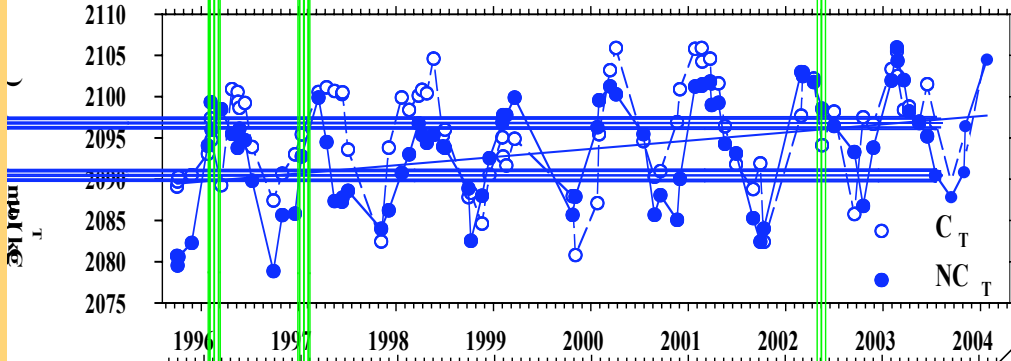
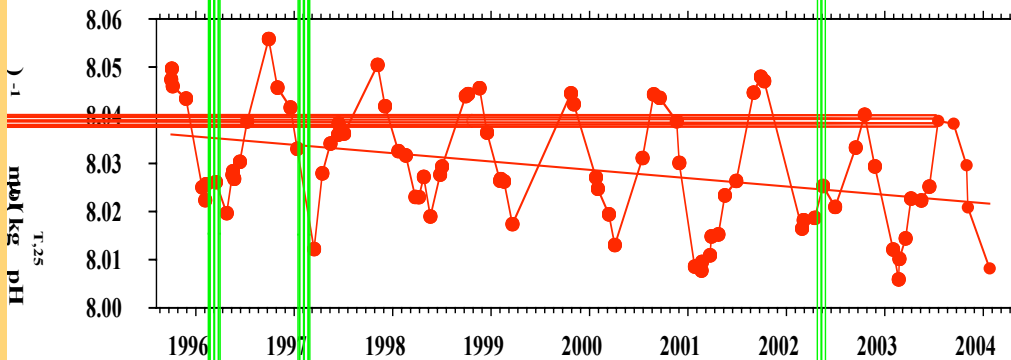
TIME SERIES

ESTOC: EUROPEAN STATION FOR TIME SERIES IN THE OCEAN AT THE CANARY ISLANDS

Since 1995, hydrographic properties, $f\text{CO}_2$, pHT, TA, and TC have been measured in surface waters on monthly cruises.

Future work is oriented to convert ESTOC in an operational station with continuous (daily resolution) subsurface data record.

*Marine Chemistry Group, Univ. Las Palmas de Gran Canarias
Melchor González-Dávila, J. Magdalena Santana-Casiano et al.*



FOCUS 3.

TIME SERIES

GIFT: GIBRALTAR FIXED TIME SERIES PERMANENT TIME SERIES

It has been established to measure and calculate the fluxes of carbon associated with the two water bodies that meet in the strait, the Mediterranean outflow and the Atlantic inflow. All variables involved in the carbon cycle are being monitored.

*Oceanography of Ecosystems group, ICMAN-CSIC
Javier Ruiz, Emma Huertas et al.*

FOCUS 3.

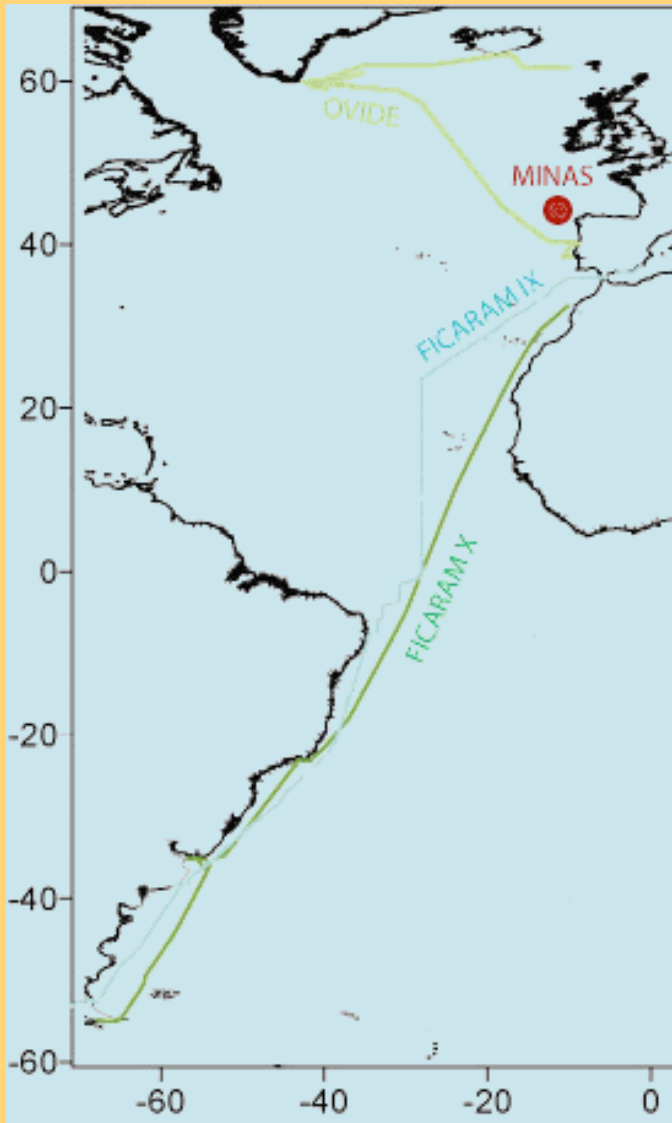
CARBOOCEAN

The Marine Chemistry group at ULPGC keeps working a new voluntary observing ship, monthly VOS-line from UK to Cape Town, which records surface SST, SSS, O₂, Chlorophyll and *f*CO₂.

Melchor González-Dávila, J. Magdalena Santana-Casiano et al.

The IIM-CO₂ group made underway measurements of pCO₂ during three oceanic cruises throughout 2006: FICARAM IX, FICARAM X, and OVIDE 2006. During 2007, further two cruises will be performed: FICARAM XI and FICARAM XII. Furthermore, a CARIOCA buoy will be moored in the vicinity of 43°N 11°W.

IIM-CSIC - Aida F. Rios, Fiz F. Pérez et al.



MINAS STATION



MARIA S. MERIÁN



BIO LAS PALMAS



FOCUS 3.

CARBOOCEAN / SESAME

The Oceanography of Ecosystems group at ICMAN-CSIC has been measuring monthly ocean pCO₂ and air-sea CO₂ fluxes in the Gulf of Cádiz from 2003 to 2006.

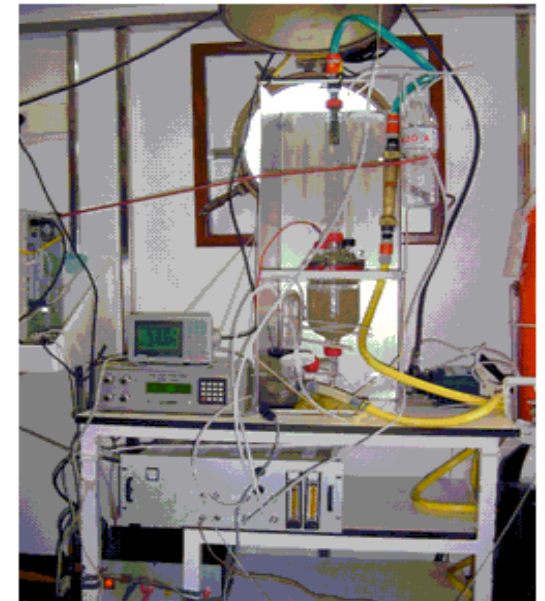
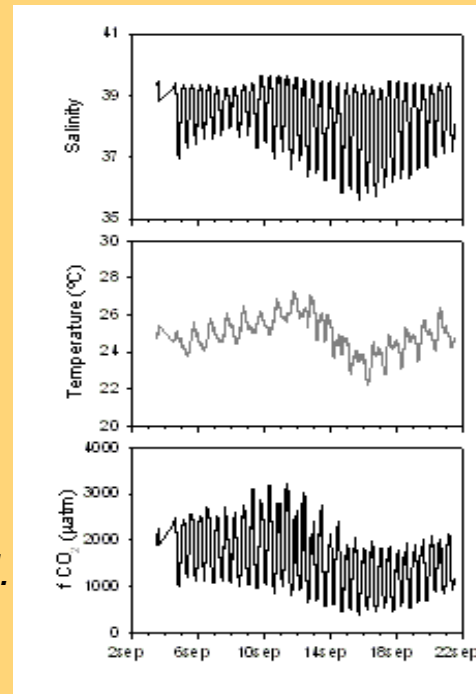
Javier Ruiz, Emma Huertas et al.

FOCUS 3.

AIR-SEA EXCHANGE OF CO₂, CH₄ and N₂O

The Physical Chemistry Dept group at the Univ Cadiz has characterized gas exchange fluxes of greenhouse gases in shallow coastal systems. Now being extended to the coastal Gulf of Cadiz (up to 20 miles off-shore).

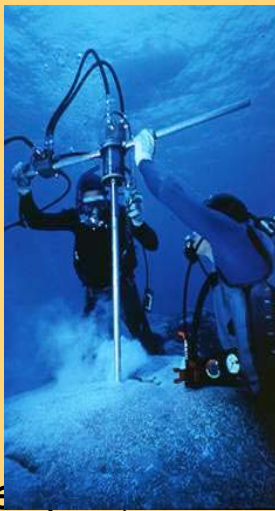
Jesús Forja, Abelardo Gómez-Parra et al.



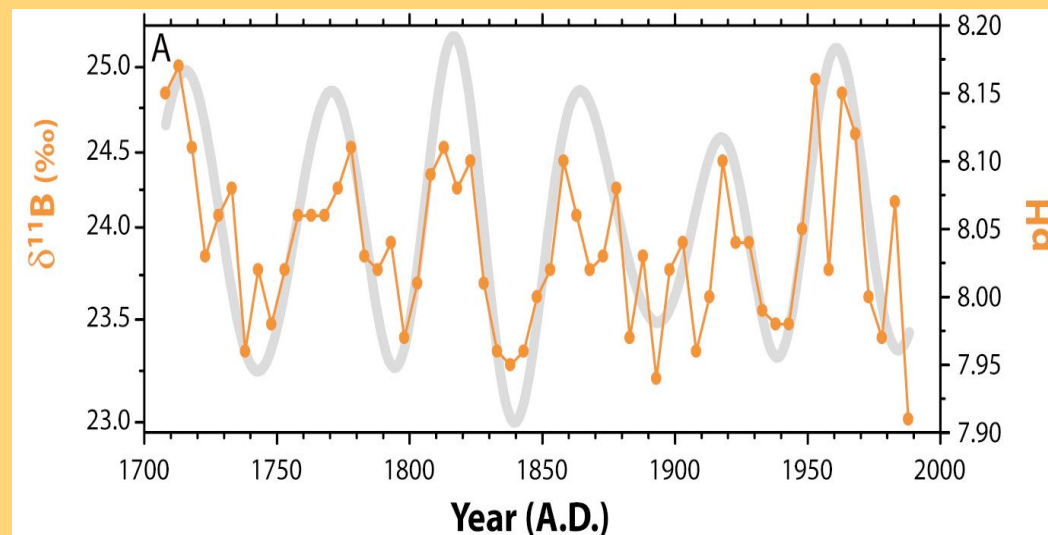
FOCUS 3.

MARINE ORGANISMS AND OCEAN ACIDIFICATION

The Group of Oceanic Biogeochemistry and Global Change at the ICM-CSIC has just begun a new research to assess the effects of progressive acidification on marine ecosystems, and use boron isotopes in calcifying organisms as proxies of past seawater pH.



Carles Pedregal, ICM-CSIC



FOCUS 3. (next future)

Project ICCABA: a new VOS-line connecting weekly the Canary Islands and Italy is being established for a first CO₂ monitoring of the Western Mediterranean Sea.

Melchor González-Dávila, J. Magdalena Santana-Casiano et al.

The working plan of the IIM-CO₂ group for the next future group involves the establishment of a long-term time series station off Cape Finisterre (43°N, 11°W): the Multidisciplinary Iberian North Atlantic Station (MINAS). A CARIOCA buoy will be deployed.

IIM-CSIC - Aida F. Rios, Fiz F. Pérez et al.