

# Data processing and visualization at the Balearic Islands Coastal Observing and Forecasting System (SOCIB)

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Charles Troupin, Balearic Islands Coastal Observing and Forecasting System (Spain), [ctroupin@socib.es](mailto:ctroupin@socib.es)

Joan Pau Beltran, Balearic Islands Coastal Observing and Forecasting System (Spain),  
[jbeltran@socib.es](mailto:jbeltran@socib.es)

Biel Frontera, Balearic Islands Coastal Observing and Forecasting System (Spain), [bfrontera@socib.es](mailto:bfrontera@socib.es)

Sonia Gómara, Balearic Islands Coastal Observing and Forecasting System (Spain), [sgomara@socib.es](mailto:sgomara@socib.es)

Miquel Gomila, Balearic Islands Coastal Observing and Forecasting System (Spain), [mgomila@socib.es](mailto:mgomila@socib.es)

Andreas Kriemeyer, Balearic Islands Coastal Observing and Forecasting System (Spain),  
[akriemeyer@socib.es](mailto:akriemeyer@socib.es)

Cristian Muñoz, Balearic Islands Coastal Observing and Forecasting System (Spain), [cmunyo@socib.es](mailto:cmunyo@socib.es)

Miquel Àngel Rujula, Balearic Islands Coastal Observing and Forecasting System (Spain),  
[mrujula@socib.es](mailto:mrujula@socib.es)

Imma Serra, Balearic Islands Coastal Observing and Forecasting System (Spain), [iserra@socib.es](mailto:iserra@socib.es)

Joaquín Tintoré, Balearic Islands Coastal Observing and Forecasting System (Spain), [jtintore@socib.es](mailto:jtintore@socib.es)

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## Multi-platform observing system

The Balearic Islands Coastal Ocean Observing and Forecasting System (SOCIB, <http://www.socib.es>), is a multi-platform Marine Research Infrastructure that provides free, open, standardized and quality-controlled data from near-shore to the open sea.

In order to properly capture oceanographic processes taking place at different spatial and temporal scales, a multi-platform approach is necessary. In our case, this involves a coastal research vessel, a high-frequency (HF) radar system, weather stations, tide gauges, moorings, drifting buoys, ARGO profilers, and gliders (autonomous underwater vehicles). Recently the system has recently begun incorporating oceanographic sensors attached to sea turtles, providing trajectories provided by the animals. High-resolution numerical models provide forecast for hydrodynamics (ROMS) and waves (SAPO).

## Data processing

The Data Center is responsible for all the steps between the data acquisition to their visualization and access by the users. In order to cope with a wide range of platform, automatic management and processing are necessary.

In this work we will present some the applications developed to perform the oceanographic data management. The main tools are:

- *Instrumentation*, a database that contains the inventory of materials, the activities performed with them and the processing applied on the collected datasets.

- *Processing*, an application designed to extract meta-data of the deployed equipment from *Instrumentation* and to perform the data ingestion, processing, quality control and standardization.
- Glider toolbox ([https://github.com/socib/glider\\_toolbox](https://github.com/socib/glider_toolbox)), a complete set of MATLAB/Octave scripts that automates glider data processing function, including thermal lag correction, quality control and graphical outputs.

## Visualization

The general objective is to allow the scientific and the general public to visualize and explore the data without having to download them, through a set of tools, among which:

- DAPP (Deployments application, <http://apps.socib.es/dapp/>), a web application to display information related to mobile platform trajectories.
- LW4NC2 (<http://thredds.socib.es/lw4nc2>), a web application for multidimensional (grid) data from netCDF files (numerical models, HF radar).
- LEAFLET TIMEDIMENSION (<https://github.com/socib/Leaflet.TimeDimension>): a free, open-source Leaflet.js plugin that enables visualization of spatial data with a temporal dimension.

## Applications

Based on the available data and using a set of web services, several applications were build:

- SEABOARD (<http://seaboard.socib.es>), a dashboard combining different sources of information in real time for different types of users.
- Smart-phone apps to access data, platform trajectories and forecasts in real-time.
- “Medcllic: the Mediterranean in one click” (<http://www.medcllic.es/en/>), a web dedicated to the Mediterranean Sea monitoring, with scientific and an outreach components.