BMF

Beach Monitoring Facility

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www.socib.eu

What's BMF but the people…

A. Orfila
A. Amaya-Álvarez
L. Gómez-Pujol
+
ETD team + DC team + Sonia +
+ Adm. (Maria & Marian) +SIAS (David)

OUTLINE

1. GENERAL OBJECTIVES
2. MAJOR ACOMPLISHMENTS SO FAR 2013-2014
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4. MAJOR NEEDS
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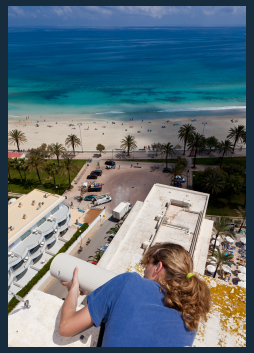
1 GENERAL OBJECTIVES

- A continuous, **large and high-resolution dataset on coastline evolution, nearshore waves and currents, sediments and beach bathymetry** is a key issue in order to characterize and manage coastal systems properly (IPCC, Nicholls et al., 2007). But, there are very few multi-decadal, high-resolution coastal monitoring programmes currently in operation worldwide.

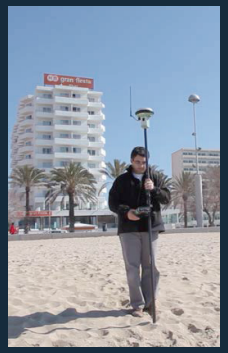
SITE	SURVEYS UNDERTAKEN	PUBLICATIONS
Duck (USA)	1981 – present, biweekly beach profiles 1986 – present, ARGUS intertidal bathymetries	Kroon et al., 2008
Rhode Island (USA)	1962 – present, monthly beach profiles	Lacey and Peck, 1998
Noordwijck (The Netherlands)	1964 – present, annual beach profiles 1995 – to present, ARGUS intertidal bathymetries 2001 – 2004 monthly 3D dGPS	Kroon et al., 2008
Lubiatowo (Poland)	1983 – present, monthly beach profiles	Rozynski, 2005
Collaroy-Narrabeen (Australia)	1976 – present, monthly beach profiles 2004 – to present, ARGUS intertidal bathymetries 2005 – to present, monthly 3D RTK-GPS	Harley et al., 2011
Moruya (Australia)	1972 – present, monthly beach profiles	McLean and Shen 2006
Hasaki (Japan)	1987 – present, daily beach profiles	Kuriyama et al., 2008

1 GENERAL OBJECTIVES

- The aim of the SOCIB's Beach Monitoring Facility is to contribute to this issue by means of the Modular Beach Integral Monitoring System (MOBIMS), which consists of:



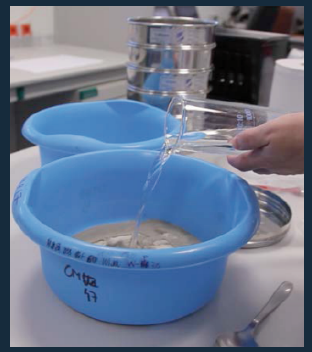
VIDEOMONITORING (SIRENA)



RTK SURVEY

ECHOSOUNDING BATHYMETRY

NEARSHORE WAVE & CURRENT MEASURING



SEDIMENT ANALYSIS

WEATHER STATION

MODULAR BEACH INTEGRAL MONITORING SYSTEM (MOBIMS)

	Platja de Palma	Cala Millor	Son Bou	Santa Eulària
Length	5 km	2 km	2.5 km	0.5 km
Operating	Set 2011	May 2011	Oct 2011	n.a.
Type	Urban	Urban	Natural	Inlet

1 GENERAL OBJECTIVES

The objectives of the Beach Monitoring Facility deals with different types of scopes, from scientific and technological development to education or services to society.

- **Scientific objectives**
  - In the large temporal scale, to build up a continuous and coherent time series related to beach morphology, waves and currents and sediment budgets in order to address effects and processes related with climate variability.
  - In the short temporal scale, to provide data and physical variables that allow the study of coastal processes and the development of new models and scientific theories that improve the understanding of coastal and nearshore systems.

- **Technological objectives**
  - Development and improving of coastal videomonitoring technology in terms of software and analytical tools for coastal issues.

- **Services to Society**
  - To offer products and services that contribute to safety and coastal management based on technological development and scientific knowledge.

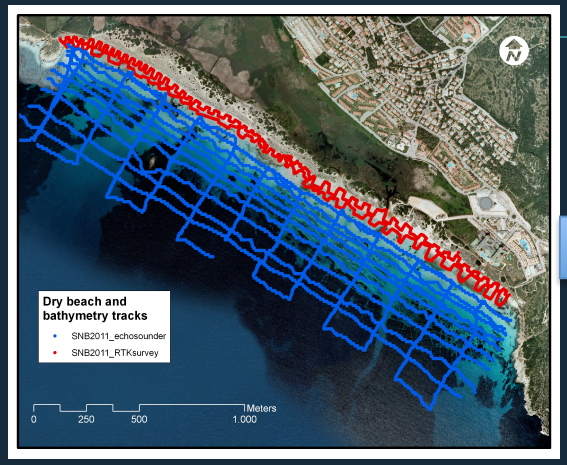
- **Outreach and education**
  - To offer datasets, products and reports to the public in order to improve they coastal knowledge.
  - To contribute to the formation of MSc and PhD students dealing with beach dynamics and coastal issues.

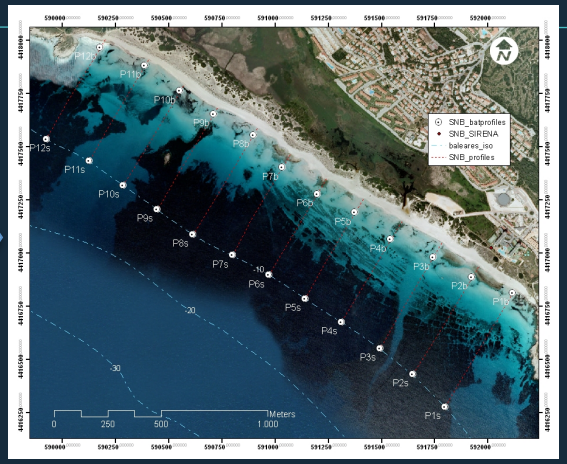
2 MAJOR ACOMPLISHMENTS SO FAR 2013-2014

The main achievements related to technological objectives are:

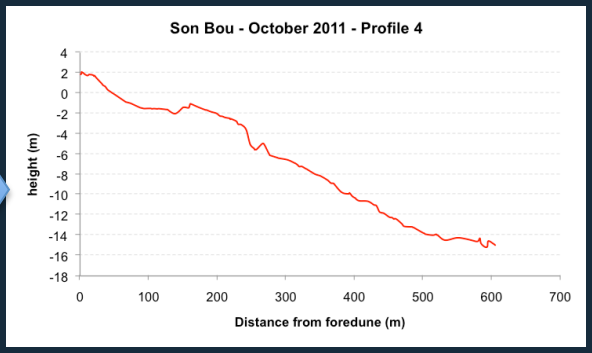
Training in AZTI of 1 BMF technician	Nov2010
Purchase of equipment and MOBIMS' components	Dec 2010
Laser granulometer installed	Apr2011
Integration of real-time beach images data streams (BEAMON apps)	May2011
Integration of weather stations data streams	Jun2011
3 MOBIMS sites installed and fully operative	Oct 2011
Integration of zabbix and remote control tools at SIRENA stations	Jun 2012
Development of semi-automatic coastline extraction tools	Sep2012
Implementation of a beach wave propagation model	Sep2012
Integration of near real-time wave and currents data streams (AWAC)	Nov2012
Implementation of a wave-forecasting tool for the Balearic Sea (with PE)	Mar2013
Lineage of videomonitoring datastream (from cameras to erosion maps)	Aug2014

2 MAJOR ACOMPLISHMENTS SO FAR 2013-2014



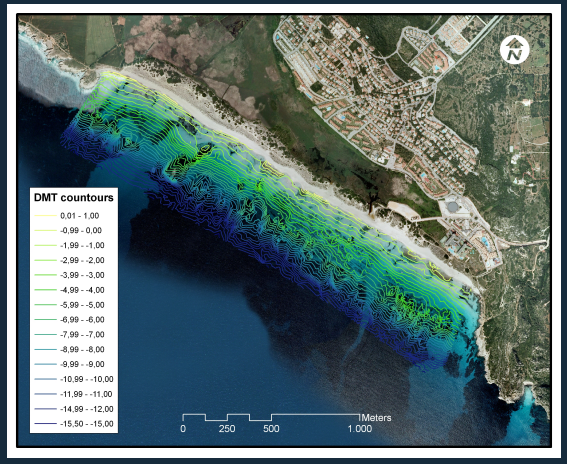


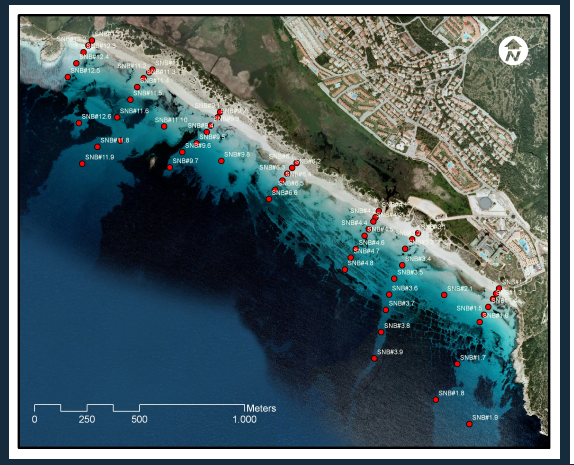
DEM (GIS)

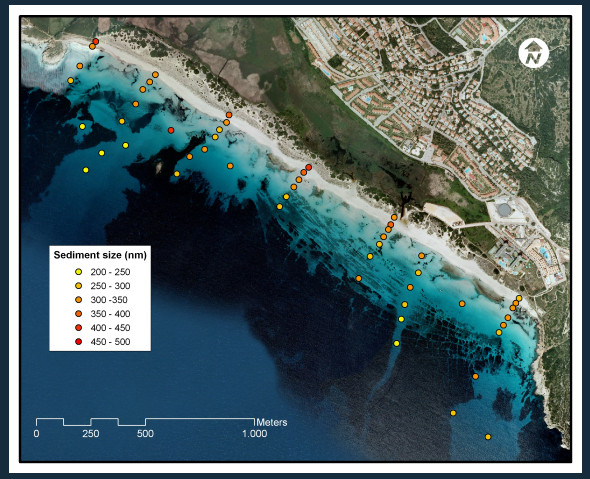


BEACH PROFILES

DEM (GIS)



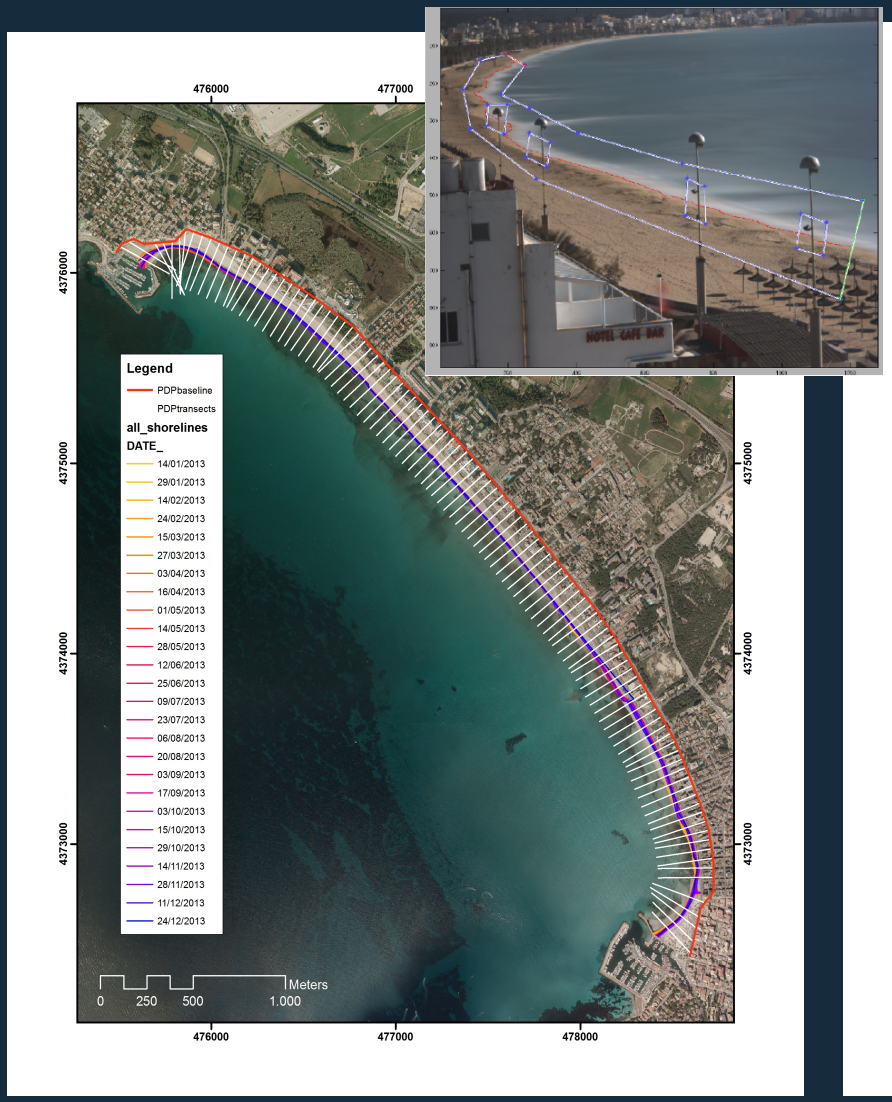


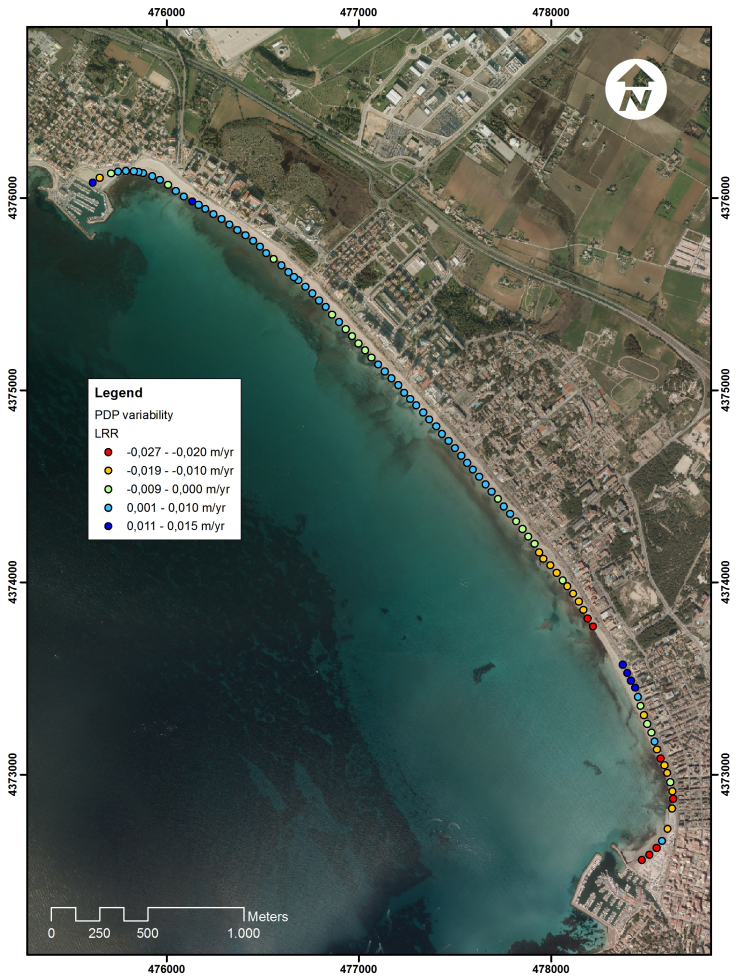


SEDIMENT SIZE CHARACTERIZATION

Information on sediment budgets and sediment properties

2 MAJOR ACOMPLISHMENTS SO FAR 2013-2014





Information on shoreline evolution and dynamics

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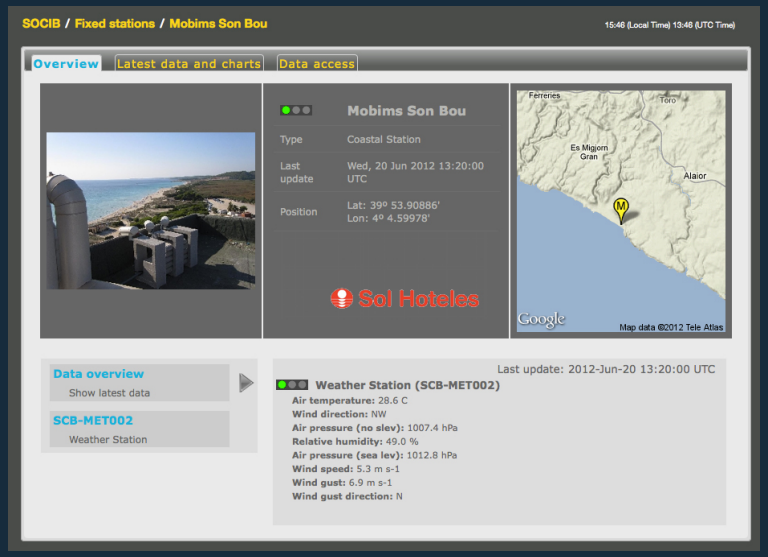

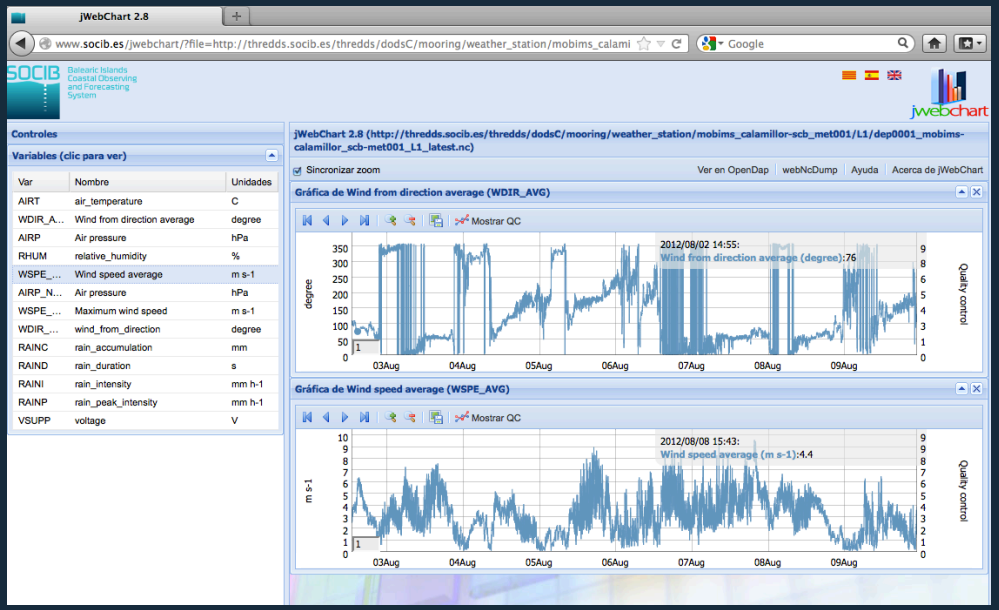

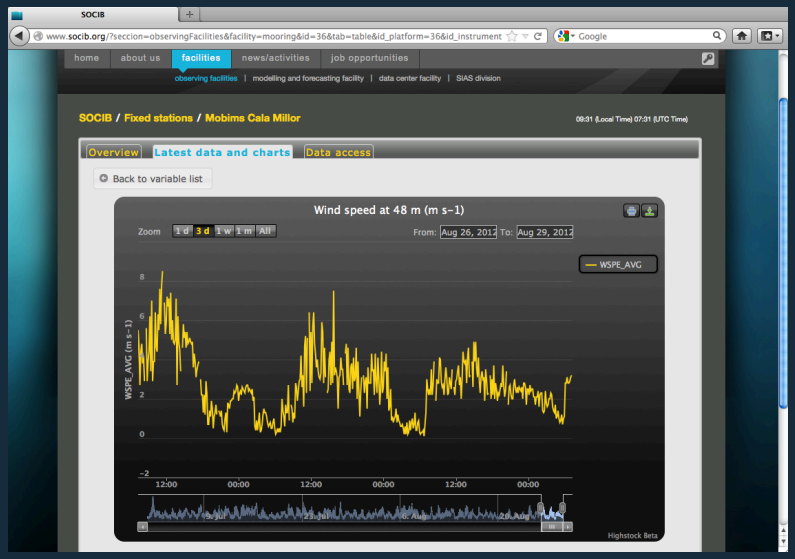

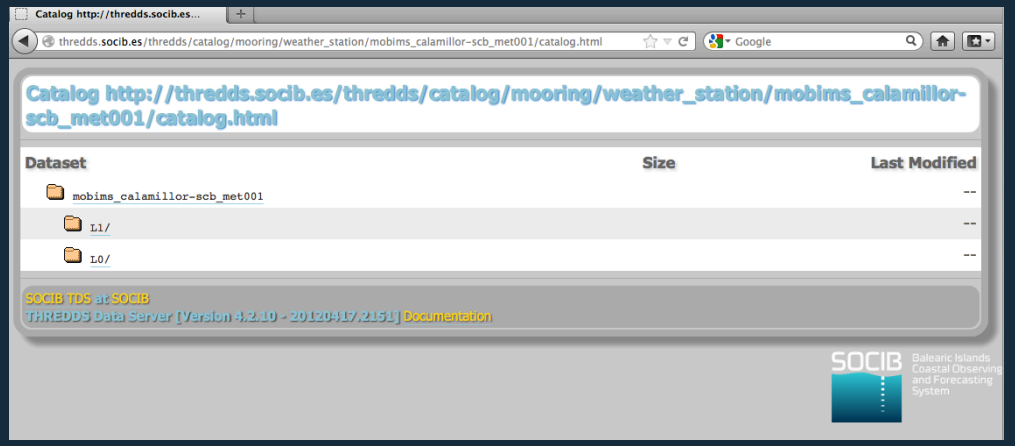

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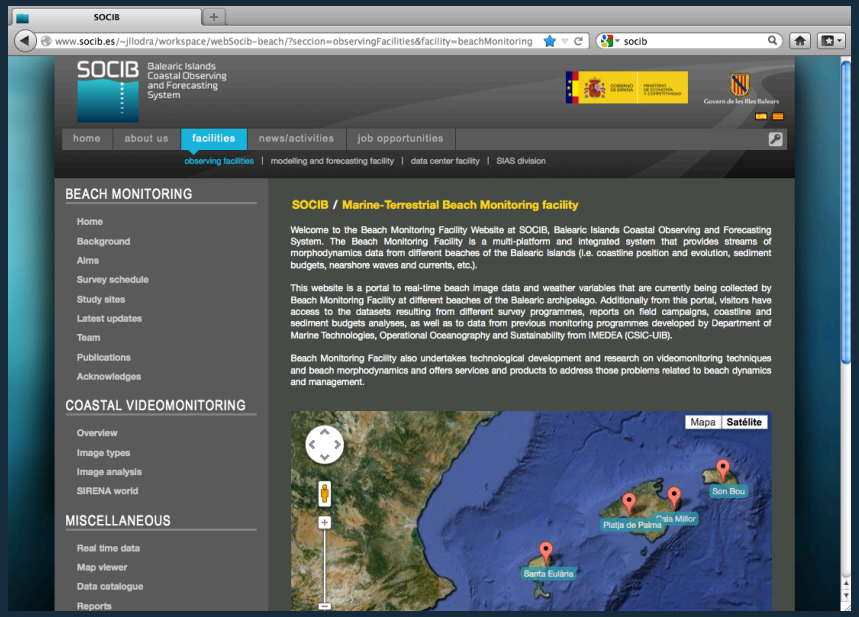


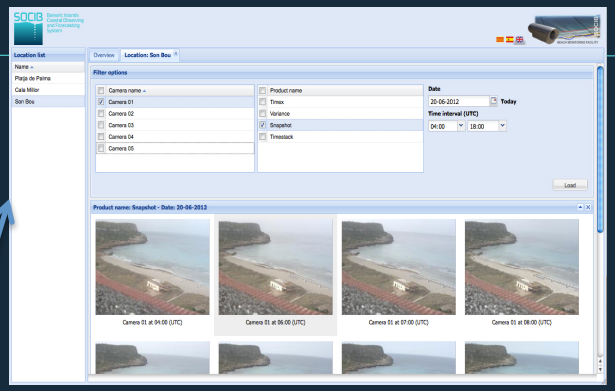
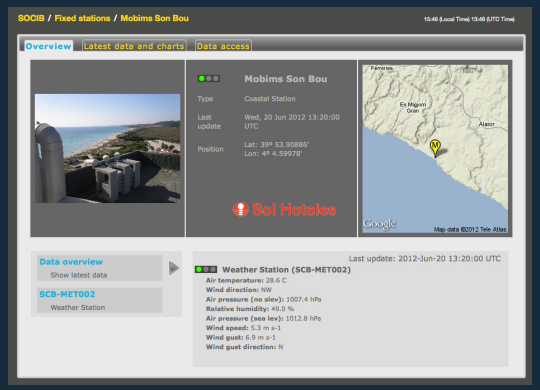
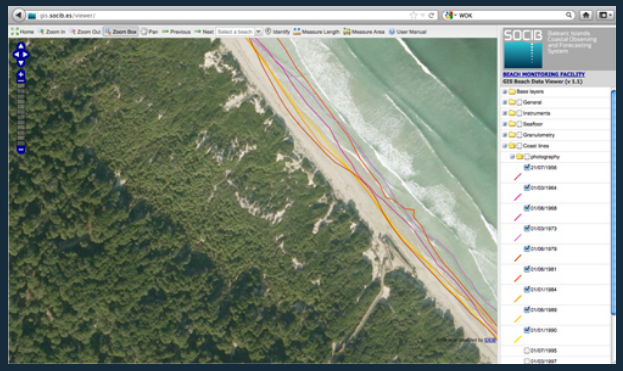


image application

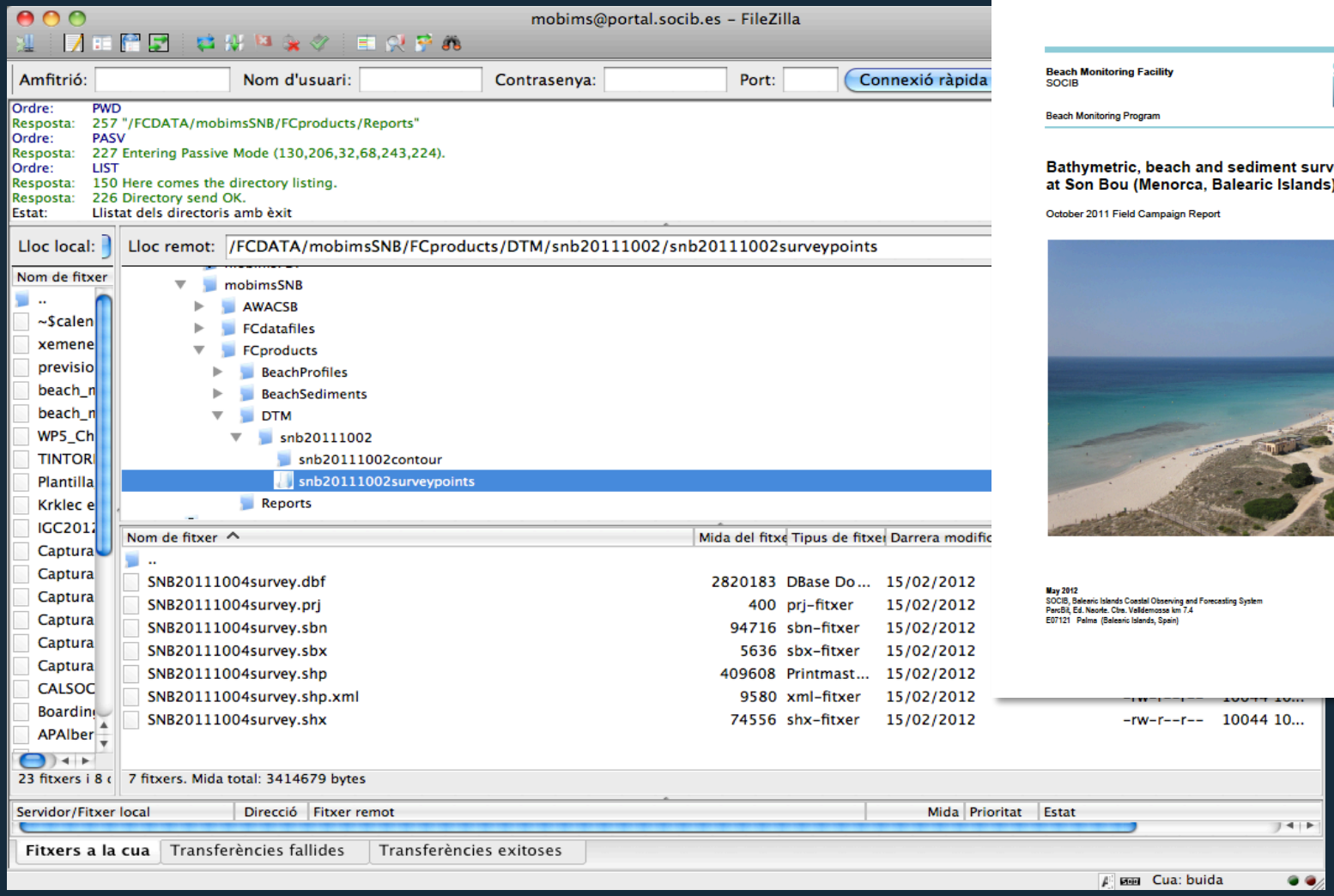


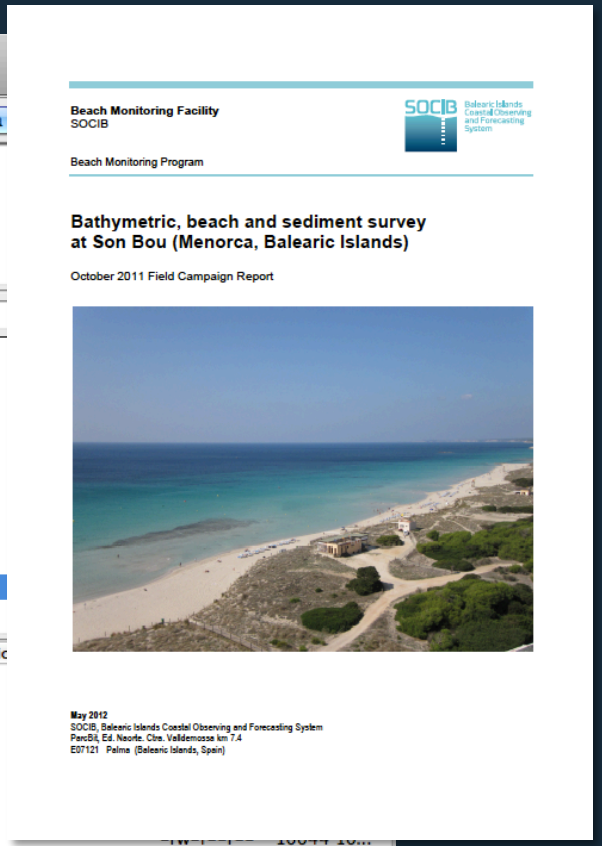
Weather & wave application



GIS beach maps and data application

2 MAJOR ACOMPLISHMENTS SO FAR 2013-2014





2 MAJOR ACOMPLISHMENTS SO FAR 2013-2014

The main achievements related with scientific objectives are:

Initiation of biannually beach survey and sediment sampling CLM	May2011
Initiation of biannually beach survey and sediment sampling SNB	Oct2011
Initiation of biannually beach survey and sediment sampling PDP	Feb2012
Weekly coastline extraction from video-monitoring images	Dec2012
Analysis of coastline and bar evolution	Sep2012
Study on seagrass banquettes accumulation and beach erosion	Jan2013
Development of RISKBEACH experiment	Apr2014
Regional beach characterization (basic properties) by GIS	Aug2014
Regional beach safety characterization	Oct2014

2 MAJOR ACOMPLISHMENTS SO FAR 2013-2014

The main achievements related to society service:

Collaboration agreement with Melia International Hotels	Oct2011
Development of a mapserver with historical datasets for coastal management	Feb2012
Dissemination of videomonitoring images links to beach sport users	Nov2012
Seabord and Be Proud of your Hotel campaign	May 2013
Contact and collaboration with DG Emergencias (CAIB)	Mar2014

The main achievements related to outreach and education:

Oganization in Palma of 1st Spanish Coastal Videomonitoring Workshop	Mar2011
Supervision of a MSc (UIB) thesis using SOCIB's beach images	Oct2011
Development and publication of a video documentary on BMF (web access)	Dec2012
Supervision of a French Intership BSc student during 6 months	Mar2012
BSc final project on videomonitoring issues	Nov2012
Supervision of two Dutch Intership BSc students during 4 months	Apr2013
Supervision of one training MSc AGPAL (UIB) student for 3 months	May 2013
Training period 1 student of Physics (UIB)	Jul2013
Training period 4 students of Geography (UIB)	2014
Supervision of one training MSc MARECOL (UIB) student for 3 months	May 2014

2 MAJOR ACOMPLISHMENTS SO FAR 2013-2014

The main achievements related to international and dissemination:

Participation in 6th Spanish Coastal Geomorphology Meeting, Tarragona	Sep2011
Participation in 33rd Int. Conference in Coastal Engineering, Santander	Jul2012
Participation in 32nd International Geographical Congress, Köln	Aug2012
Presentation of BMF activities and datasets to Rutgers Coastal Geomorphology Lab and discussion on survey protocols (Dr. Psuty)	Aug 2012
Participation in 12th International Coastal Symposium, Plymouth	Apr2013
Tribute to R.A. Darymple (RAI)	Oct2014

3 OBJECTIVES FOR 2015

1. The specific scientific and technological objectives under this are:
   - On the long term, maintain and explore the meaning and trends of sediment budget analysis and beach profile evolution.
   - In the short-time scale, maintain and explore weekly shoreline evolution as well as characterize bar position and displacement and beach cross-shore sediment transport.
   - Address the integration and effects of local winds in beach wave forecasting models and incorporate these effects in tools related to beach wave forecasting.
   - Development of tools related to Beach Wave Forecasting System (SIPOP2) capabilities (information on wave at Balearic Islands Beaches, Safety Forecasting Alerts, etc.).
   - Updating of products at the different dissemination platforms (thredds, NCfiles, GIS Beach viewer).

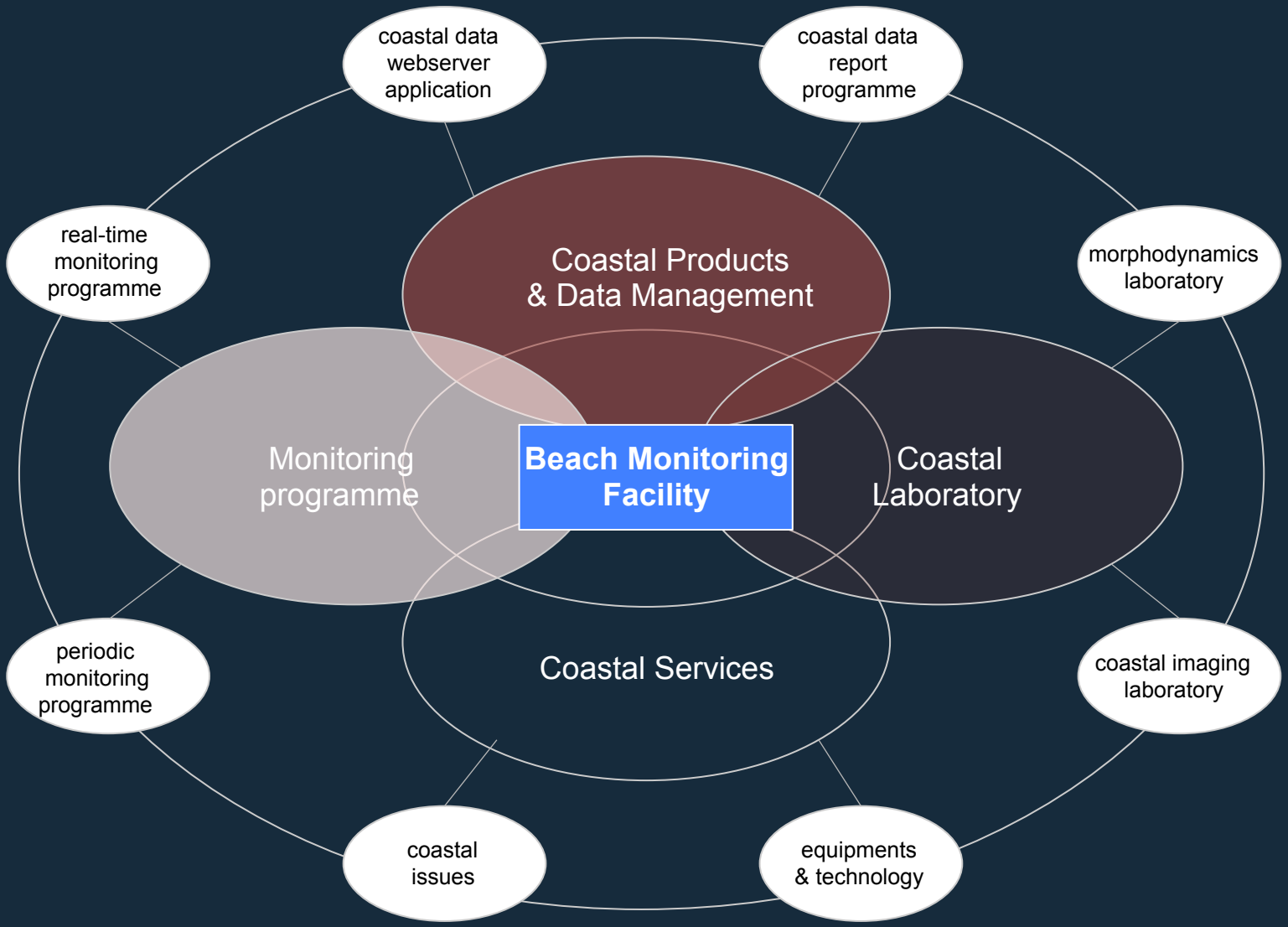
2. The specific society service aims under this are:
   - Develop a policy of data dissemination and end-users, stakeholders, to assure users exploit the full capabilities of the facility.
   - Develop web-based applications related to beach users security and risk forecasting in kind collaboration with Conselleria d'Interior from Balearic Islands Government.
   - Integrate in the BMF web a services list related with their equipment (laser granulometer, expertise in videomonitoring, etc.)

3 OBJECTIVES FOR 2015

3) The specific society service and international collaboration aims under this are:

- To establish agreements with academic institutions in order to facilitate the enrolments in BSc and MSc training schedule or internship visits to the BMF and offer, in annually basis, training projects at the different academic institutions related with the BMF projects.
- Disseminate and socialize BMF advances and results to beach-coastal stakeholders and general public.
- Participate in the reference coastal meetings in order to visualize SOCIB and to disseminate their products, tools and services.
- Collaborate with institutions of reference in order to know, introduce to the BMF the newest technologies and the international recognized standards and processes.
- Publication of research and technological works in appropriate forums and scientific-technological journals.

3 OBJECTIVES FOR 2015



3 OBJECTIVES FOR 2015

BMF mission is organized in different projects in order to achieve the former aims. During 2013 it deals with two different types of projects: the FRAME projects (FP) that relate with the main tasks of coastal videomonitoring and implies a long-life time span, and MOBIMs products, and the specific projects (SP):

Otherwise, during THE PERIOD 2014-2016 we expect to develop some specific projects resulting from the 2013 specific projects such as:

- RISKBEACH#2. This action will consist on the analysis and exploitation of datasets on bar position rips dynamics, and sediment transport patterns obtained at the field experiment RISKBEACH to develop in the first trimester of 2014.
- SIPOP#3. Development of a web-based tool for wave and beach safety risk forecasting at Balearic Islands. In collaboration with Conselleria d'Interior, CAIB.
- DRIPS, Dynamics of Rips (2016). This action will consist in the validation of wave data from the beach wave forecasting system and addressing the role of winds in this system. Additionally different bathymetric surveys and coastal modeling are will be develop for unraveling rips dynamics.

4 MAJOR NEEDS

- **BMF products visibility**

  (access to dataset through specific tools and data catalogues, we do not mean mass media visibility)

- **Lack of a full time computer technician for software maintenance and development.**
  Most of the international reference facilities, such as UNSW Coastal Imaging (Australia), Duck (USA) or Noordwijck (The Netherlands) use as clients owner coastal video-monitoring systems. This is not the case of SOCIB and it results in less expensive system. Otherwise if SOCIB wants to become a reference centre in videomonitoring –being different from the international scenario– an additional devoted highly qualified computer engineer is required.

- TIME… we need time!!!

  (time to finish task and works as we would like)

- USERS…