United Nations Educational, Scientific and Cultural Organization

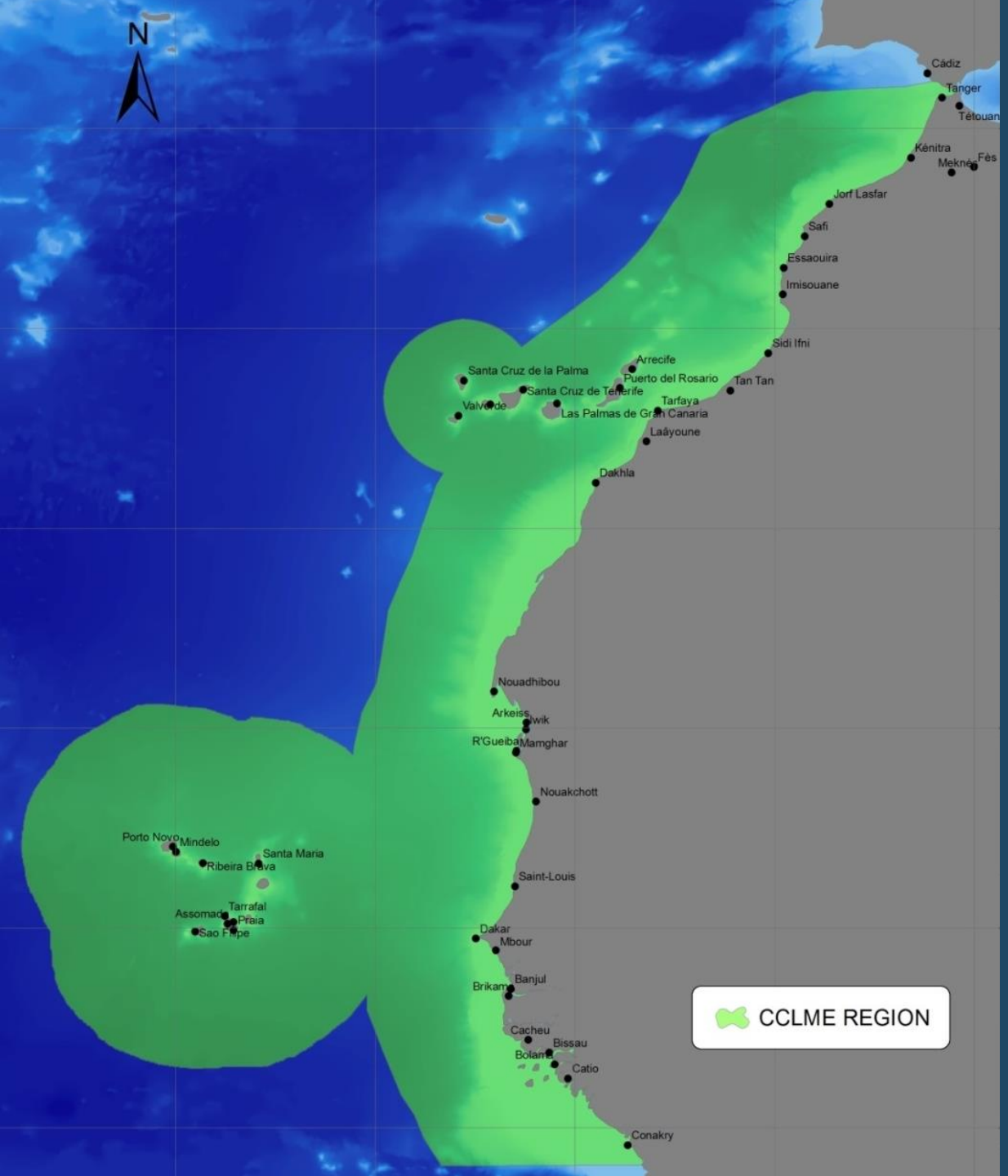
Intergovernmental Oceanographic Commission

GOBIERNO DE ESPAÑA

cooperación española

IOC relevant efforts in the North-West Africa Region

Itahisa Déniz González, Project Specialist – 10 March 2020



Project “Enhancing oceanography capacities in the Canary Current Large Marine Ecosystem (CCLME) Western Africa countries”

The Project: Phases I & II

Project:
ENHANCING OCEANOGRAPHY CAPACITIES IN THE CCLME WESTERN AFRICA COUNTRIES

Implementing Body:
IOC-UNESCO

Partner:
Instituto Español de Oceanografía -IEO-

Funding:
100% Spanish Agency for International Development Cooperation -AECID-

Period:
Phase I: March 2013 – April 2015
Phase II: May 2015 – September 2017

Phase I & II Overall goal

To **improve our understanding** of the oceanographic features and processes in the **Canary Current LME region** and increase the delivery of services to end users.

Phase I & II Overall goal

making **existing data accessible**;

Phase I: **developing data and information products** required for integrated ecosystem based management of the ocean and coastal areas of West Africa;
Phase II: **developing a GIS dynamic analytic tool** aimed to create meaningful data products at regional scale, adding value to raw data and producing new scientific knowledge on the ocean and coastal areas of the CCLME countries;

enhancing oceanographic capacities in the region.

Product I: Inventory of metadata

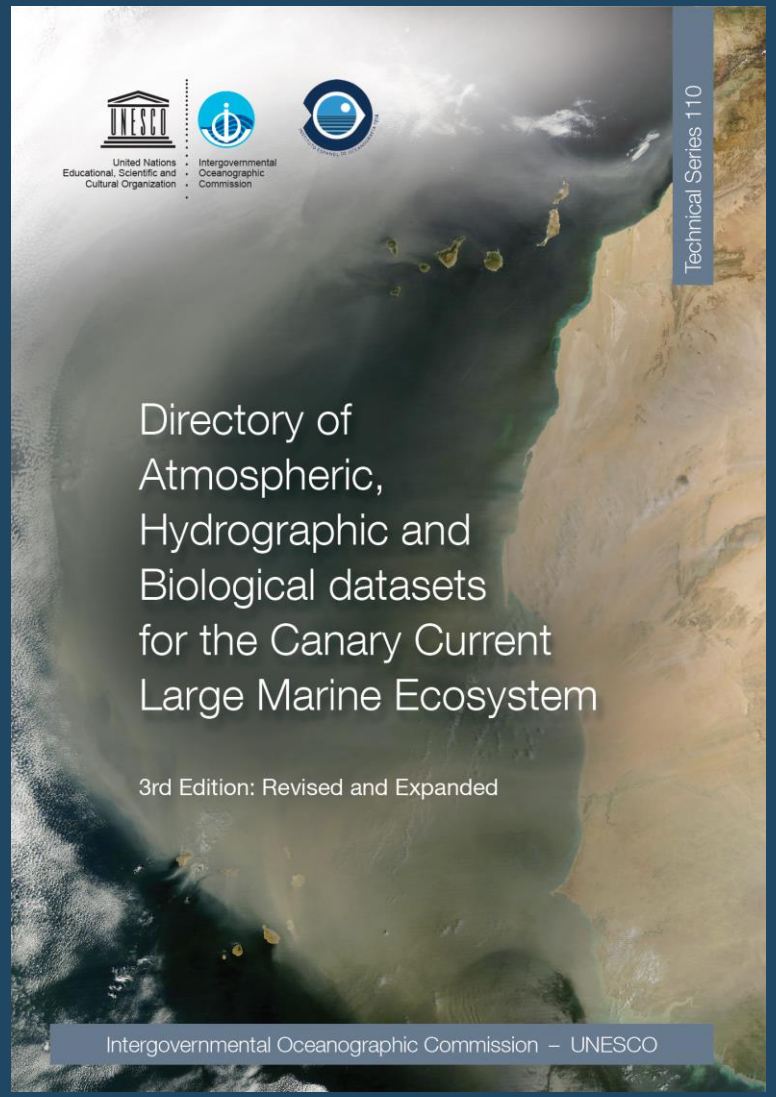
Directory of Atmospheric, Hydrographic and Biological datasets for the Canary Current Large Marine Ecosystem, IOC Technical Series 110 (2014)

2nd Edition: Revised and Expanded (2016)
3rd Edition: Revised and Expanded (2017)

2 versions:

- Printed document
- On-line version

http://www.unesco.org/new/ioc_ts110



The Directory Outline

Metadata sheets were organised as follows:

1) **Remote sensing;**
2) **Atmospheric data;**
3) **Tide-gauges, moorings and Argo float network;**
4) **Ocean observatories and ship based repeat hydrography;**
5) **Biological surveys;**
6) **Databases**

2 updates undertaken in 2016 and 2017
(Revised and Expanded editions)

Need to ensure that **new data from research cruises but also recovered by the countries in the region** are identified and updated.

3rd Edition Revised and Expanded so far…

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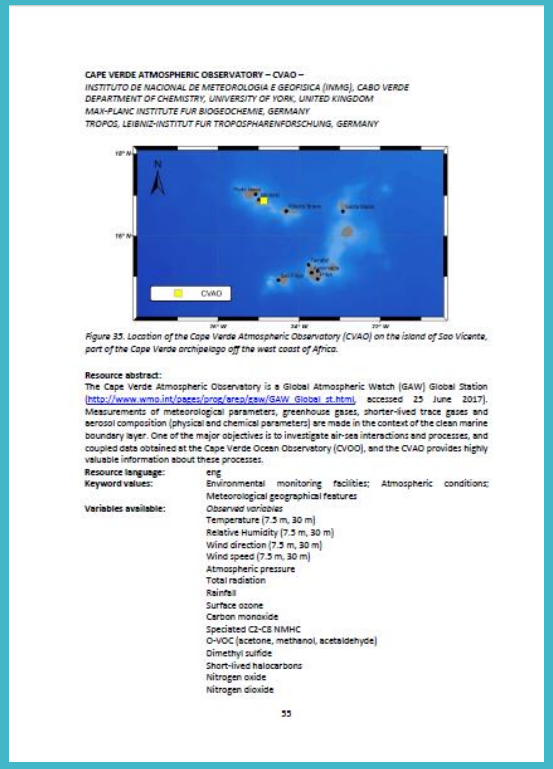
118 metadata sheets referring :

- **449 datasets**
- **34 databases**
- **26 time-series sites**

+ Discussion:
further data to be prospected in the future **& lessons learnt**



CAPE VERDE ATMOSPHERIC OBSERVATORY – CVAO –
INSTITUTO DE NACIONAL DE METEOROLOGIA E GEOFISICA (INMG), CABO VERDE
DEPARTMENT OF CHEMISTRY, UNIVERSITY OF YORK, UNITED KINGDOM
MAX-PLANC INSTITUTE FUR BIOGEOCHEMIE, GERMANY
TROPOS, LEIBNIZ-INSTITUT FUR TROPOSPHARENFORSCHUNG, GERMANY

Figure 35. Location of the Cape Verde Atmospheric Observatory (CVAO) on the island of Sao Vicente, part of the Cape Verde archipelago off the west coast of Africa.

Resource abstract:
The Cape Verde Atmospheric Observatory is a Global Atmospheric Watch (GAW) Global Station (http://www.wmo.int/pages/prog/arep/gaw/GAW_Global_st.htm), accessed 25 June 2017). Measurements of meteorological parameters, greenhouse gases, shorter-lived trace gases and aerosol composition (physical and chemical parameters) are made in the context of the clean marine boundary layer. One of the major objectives is to investigate air-sea interactions and processes, and coupled data obtained at the Cape Verde Ocean Observatory (CVOO), and the CVAO provides highly valuable information about these processes.

Resource language: eng
Keyword values: Environmental monitoring facilities; Atmospheric conditions; Meteorological geographical features
Variables available: *Observed variables*
Temperature (7.5 m, 30 m)
Relative Humidity (7.5 m, 30 m)
Wind direction (7.5 m, 30 m)
Wind speed (7.5 m, 30 m)
Atmospheric pressure
Total radiation
Rainfall
Surface ozone
Carbon monoxide
Speciated C2-C8 NMHC
O-VOC (acetone, methanol, acetaldehyde)
Dimethyl sulfide
Short-lived halocarbons
Nitrogen oxide
Nitrogen dioxide

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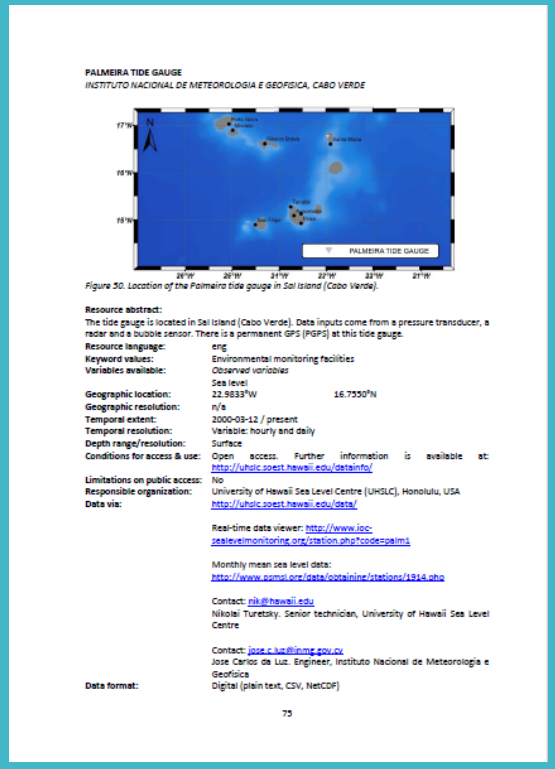

PALMEIRA TIDE GAUGE
INSTITUTO NACIONAL DE METEOROLOGIA E GEOFISICA, CABO VERDE

Figure 50. Location of the Palmeira tide gauge in Sal Island (Cabo Verde).

Resource abstract:
The tide gauge is located in Sal Island (Cabo Verde). Data inputs come from a pressure transducer, a radar and a bubble sensor. There is a permanent GPS (PGPS) at this tide gauge.

Resource language: eng
Keyword values: Environmental monitoring facilities
Variables available: *Observed variables*
Sea level
Geographic location: 22.9833°W 16.7550°N
Geographic resolution: n/a
Temporal extent: 2000-03-12 / present
Temporal resolution: Variable: hourly and daily
Depth range/resolution: Surface
Conditions for access & use: Open access. Further information is available at: http://uhslc.soest.hawaii.edu/datainfo/
Limitations on public access: No
Responsible organization: University of Hawaii Sea Level Centre (UHSLC), Honolulu, USA
Data via: http://uhslc.soest.hawaii.edu/data/

Real-time data viewer: http://www.ioc-sealevelmonitoring.org/station.php?code=palm1

Monthly mean sea level data:
http://www.pomsl.org/data/obtainine/stations/1914.php

Contact: nik@hawaii.edu
Nikolai Turetsky. Senior technician, University of Hawaii Sea Level Centre

Contact: jose.c.luz@inmg.gov.cv
Jose Carlos da Luz. Engineer, Instituto Nacional de Meteorologia e Geofisica
Data format: Digital (plain text, CSV, NetCDF)

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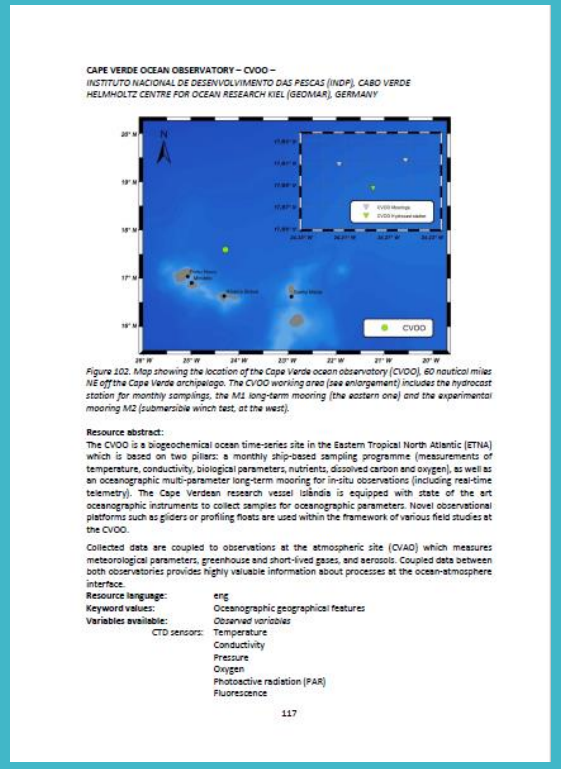

CAPE VERDE OCEAN OBSERVATORY – CVOO –
INSTITUTO NACIONAL DE DESENVOLVIMENTO DAS PESCAS (INDP), CABO VERDE
HELMHOLTZ CENTRE FOR OCEAN RESEARCH KIEL (GEOMAR), GERMANY

Figure 102. Map showing the location of the Cape Verde ocean observatory (CVOO). 60 nautical miles NE off the Cape Verde archipelago. The CVOO working area (see enlargement) includes the hydrocast station for monthly samplings, the M1 long-term mooring (the eastern one) and the experimental mooring M2 (submersible winch test, at the west).

Resource abstract:
The CVOO is a biogeochemical ocean time-series site in the Eastern Tropical North Atlantic (ETNA) which is based on two pillars: a monthly ship-based sampling programme (measurements of temperature, conductivity, biological parameters, nutrients, dissolved carbon and oxygen), as well as an oceanographic multi-parameter long-term mooring for in-situ observations (including real-time telemetry). The Cape Verdean research vessel Islandia is equipped with state of the art oceanographic instruments to collect samples for oceanographic parameters. Novel observational platforms such as gliders or profiling floats are used within the framework of various field studies at the CVOO.

Collected data are coupled to observations at the atmospheric site (CVAO) which measures meteorological parameters, greenhouse and short-lived gases, and aerosols. Coupled data between both observatories provides highly valuable information about processes at the ocean-atmosphere interface.

Resource language: eng
Keyword values: Oceanographic geographical features
Variables available: *Observed variables*
CTD sensors: Temperature
Conductivity
Pressure
Oxygen
Photoactive radiation (PAR)
Fluorescence

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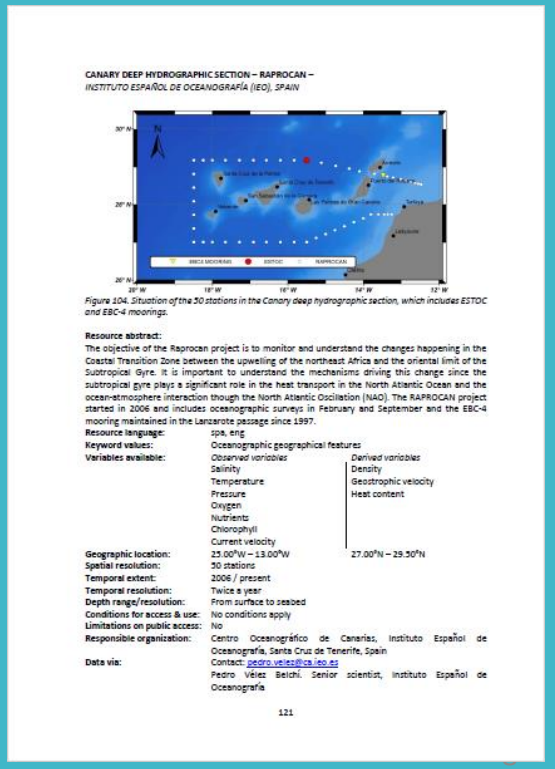

CANARY DEEP HYDROGRAPHIC SECTION – RAPROCAN –
INSTITUTO ESPAÑOL DE OCEANOGRAFÍA (IEO), SPAIN

Figure 104. Situation of the 50 stations in the Canary deep hydrographic section, which includes ESTOC and EBC-4 moorings.

Resource abstract:
The objective of the Raprocan project is to monitor and understand the changes happening in the Coastal Transition Zone between the upwelling of the northeast Africa and the oriental limit of the Subtropical Gyre. It is important to understand the mechanisms driving this change since the subtropical gyre plays a significant role in the heat transport in the North Atlantic Ocean and the ocean-atmosphere interaction though the North Atlantic Oscillation (NAO). The RAPROCAN project started in 2006 and includes oceanographic surveys in February and September and the EBC-4 mooring maintained in the Lanzarote passage since 1997.

Resource language: spa, eng
Keyword values: Oceanographic geographical features
Variables available: *Observed variables*
Salinity
Temperature
Pressure
Oxygen
Nutrients
Chlorophyll
Current velocity
Derived variables
Density
Geostrophic velocity
Heat content
Geographic location: 25.00°W – 13.00°W 27.00°N – 29.30°N
Spatial resolution: 50 stations
Temporal extent: 2006 / present
Temporal resolution: Twice a year
Depth range/resolution: From surface to seabed
Conditions for access & use: No conditions apply
Limitations on public access: No
Responsible organization: Centro Oceanográfico de Canarias, Instituto Español de Oceanografía, Santa Cruz de Tenerife, Spain
Data via: Contact: pedro.velez@ca.ieo.es
Pedro Vélez Belchí. Senior scientist, Instituto Español de Oceanografía

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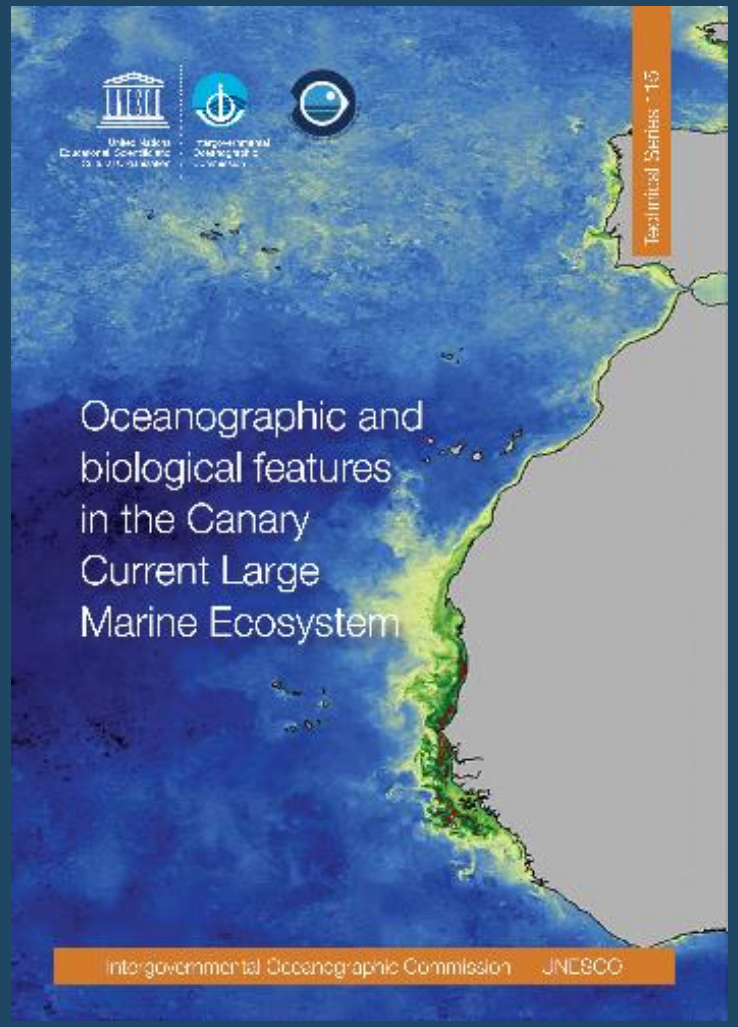
Product II: Data analysis

Oceanographic and biological features in the Canary Current Large Marine Ecosystem,
IOC Technical Series 115 (20150

2 versions:

- Printed document
- On-line version
- Offprints also available!

http://www.unesco.org/new/en/ioc/ts115



The IOC Technical Series 115 Outline

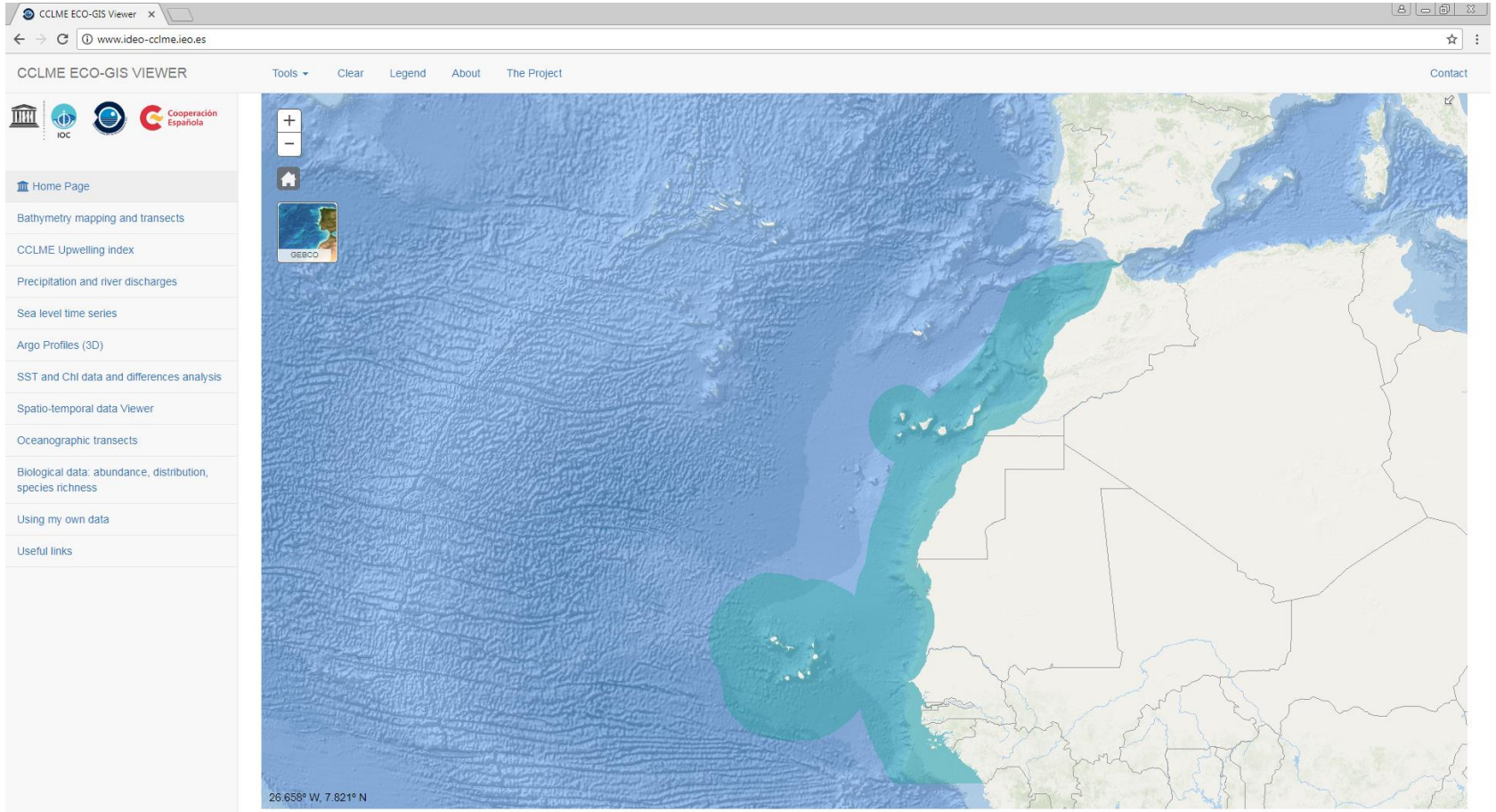
- **54 scientists** from **25 institutions**

- 28 articles structured as follows:

(i) the ocean geomorphology and geological materials
(ii) the hydrographic structure and the ocean circulation
(iii) the biogeochemical characteristics of the marine environment
(iv) the life in the sea
(v) the interannual, interdecadal and long-term variability

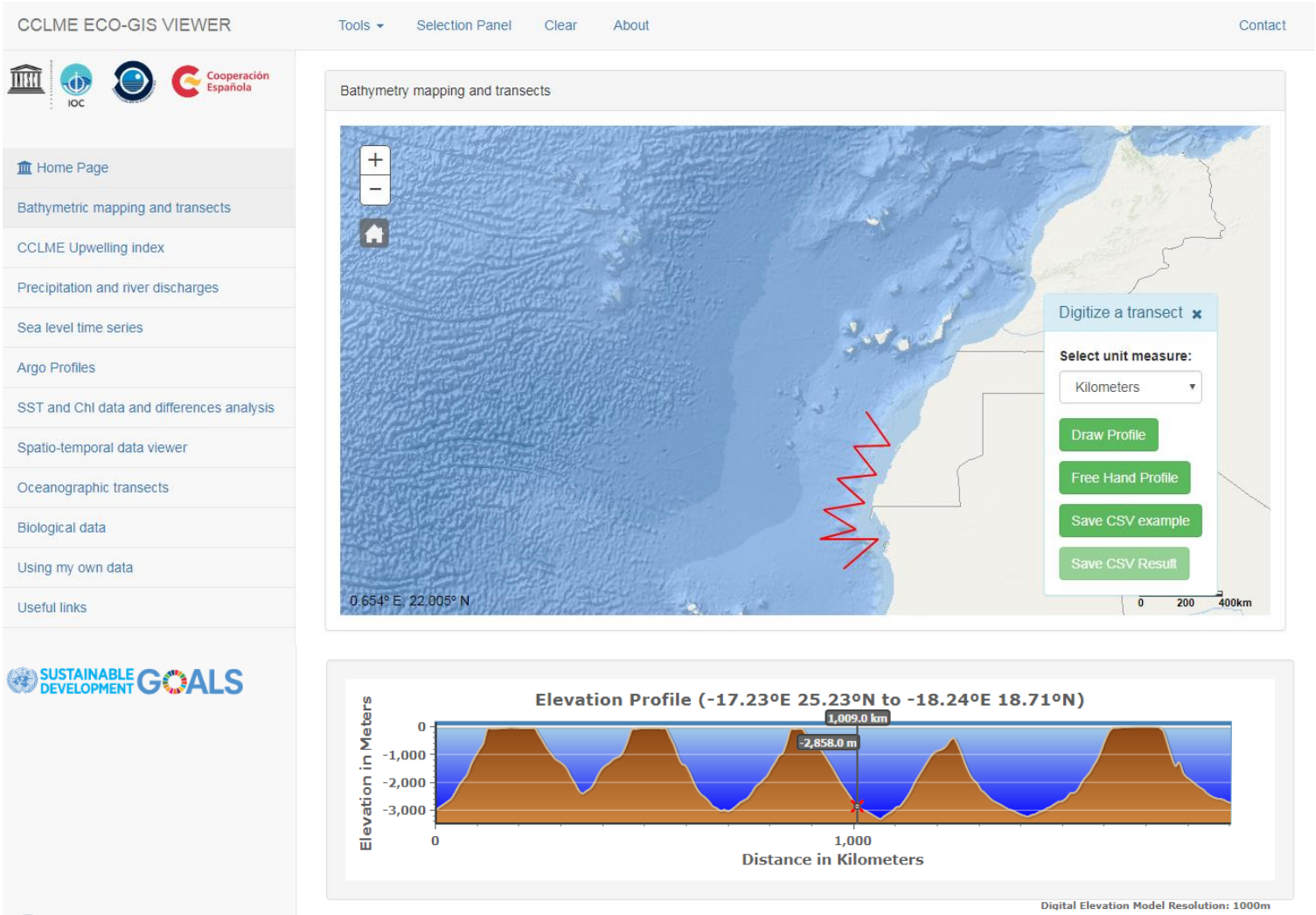
Product III Data analytic viewer

CCLME Eco-GIS Viewer: http://www.ideo-cclme.ieo.es



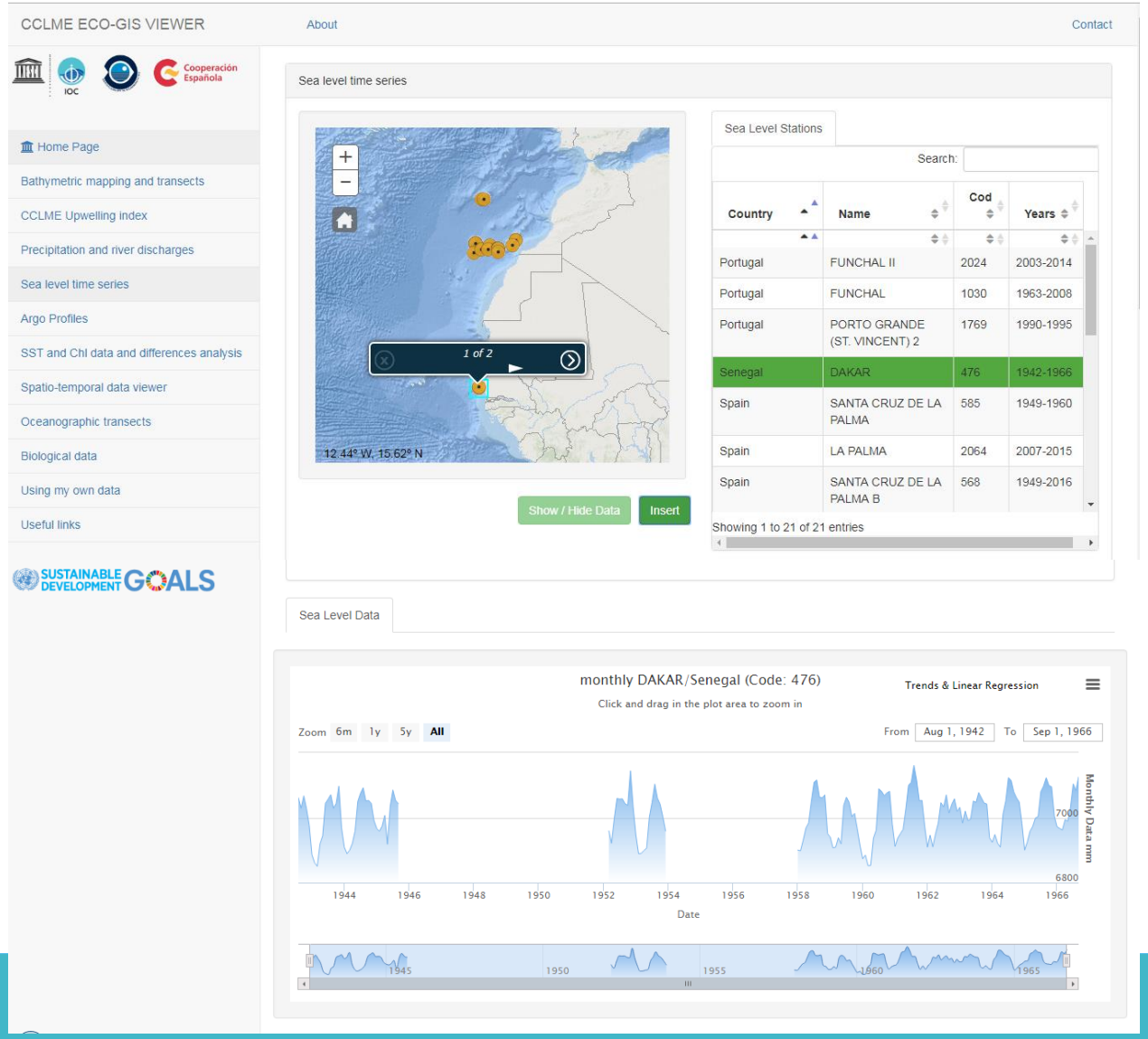
IOC-UNESCO

CCLME Eco-GIS Viewer



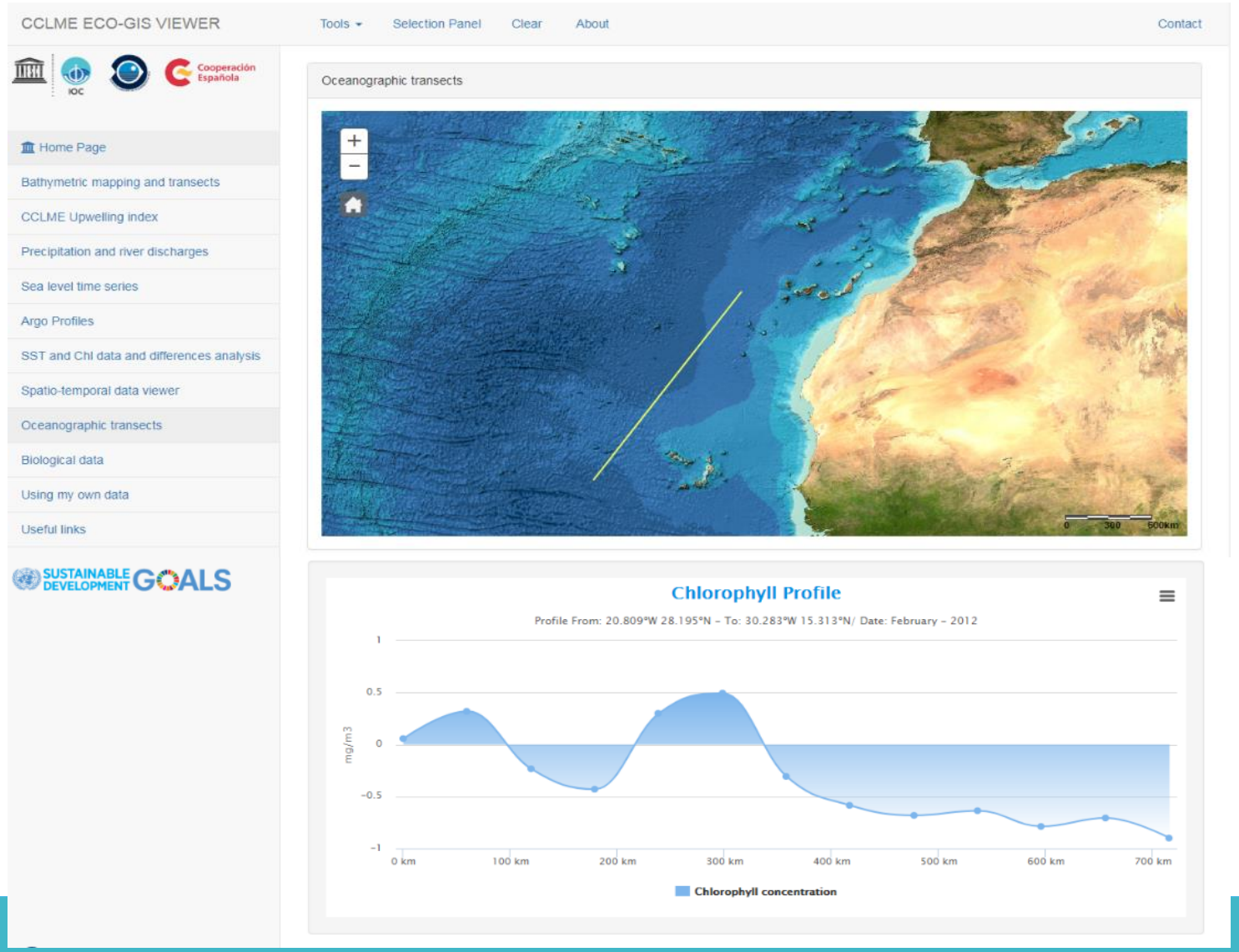
IOC-UNESCO

CCLME Eco-GIS Viewer



IOC-UNESCO

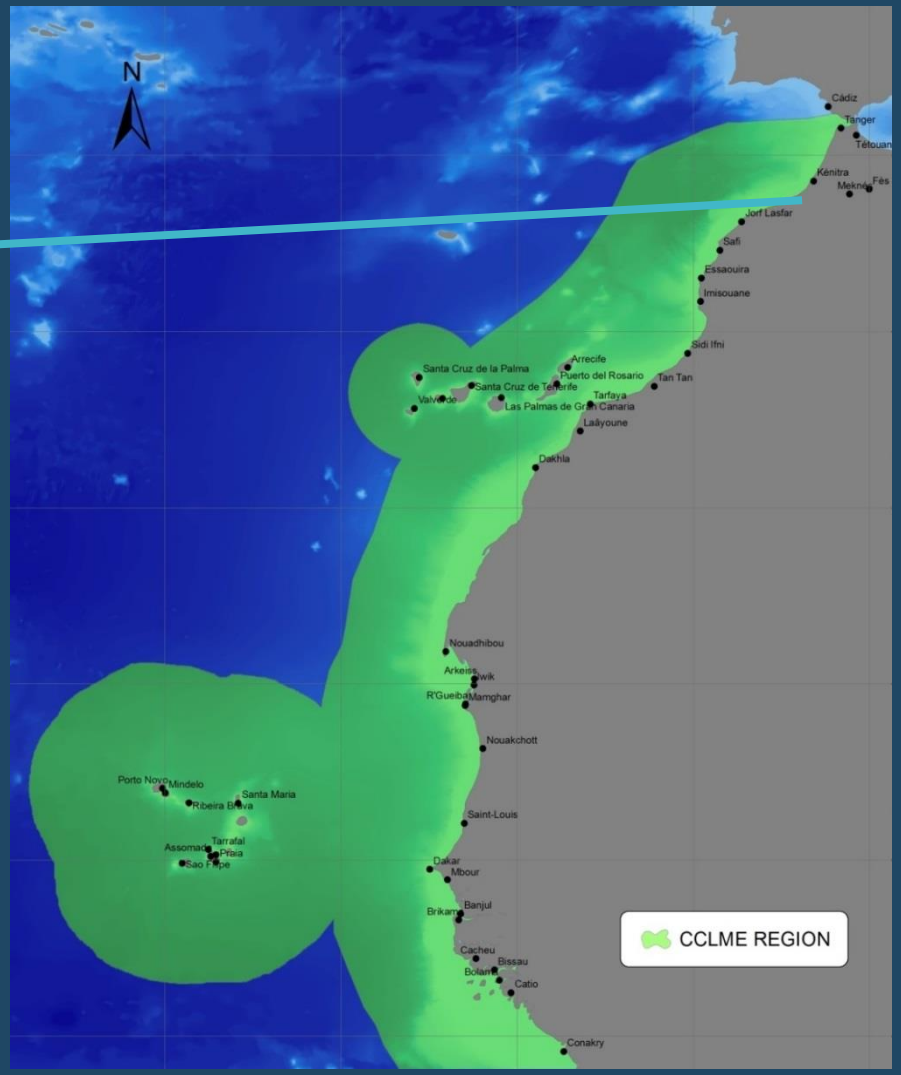
CCLME Eco-GIS Viewer



IOC-UNESCO

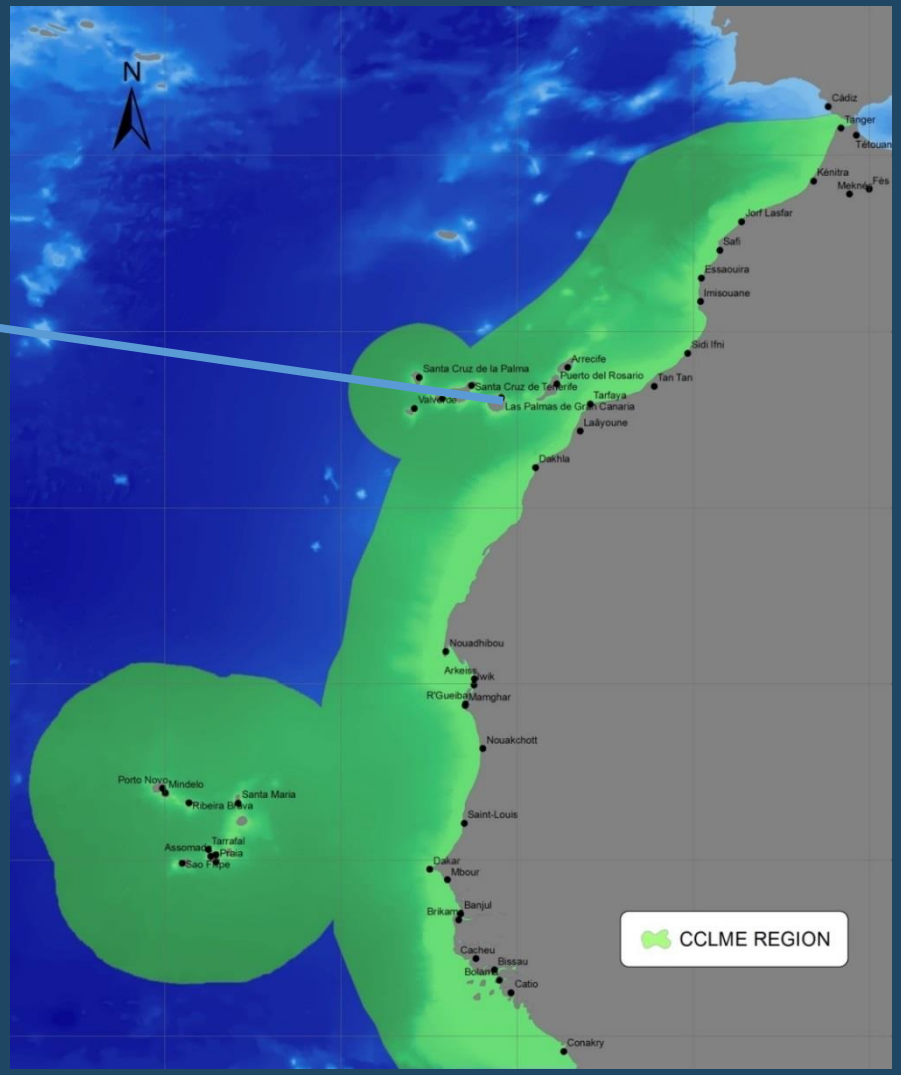
Workshops (I)

Workshop on “Upwelling and environmental indicators”, held in Casablanca, Morocco (8-10 April 2014)



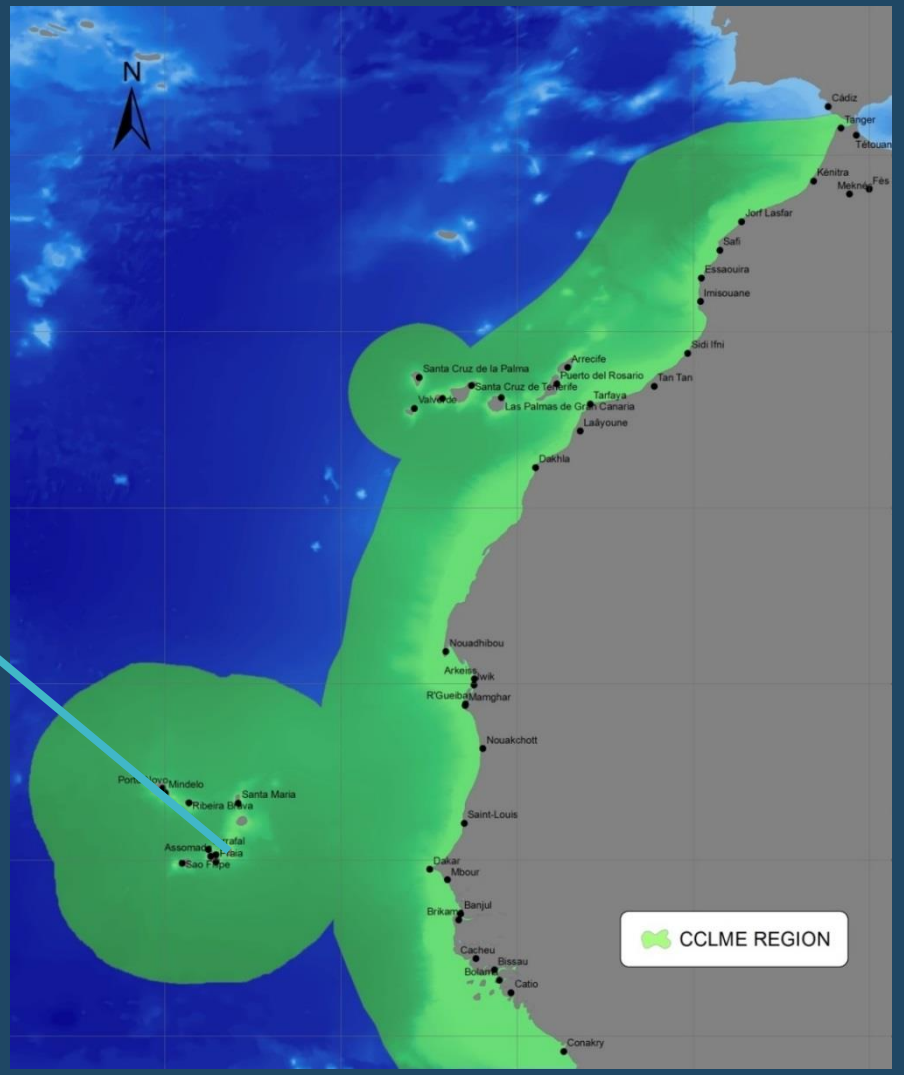
Workshops (II)

Workshop on “Oceanographic and biological features and trends in the Canary Current Large Marine Ecosystem”, held in Las Palmas de Gran Canaria,
Spain (27-29 January 2015)



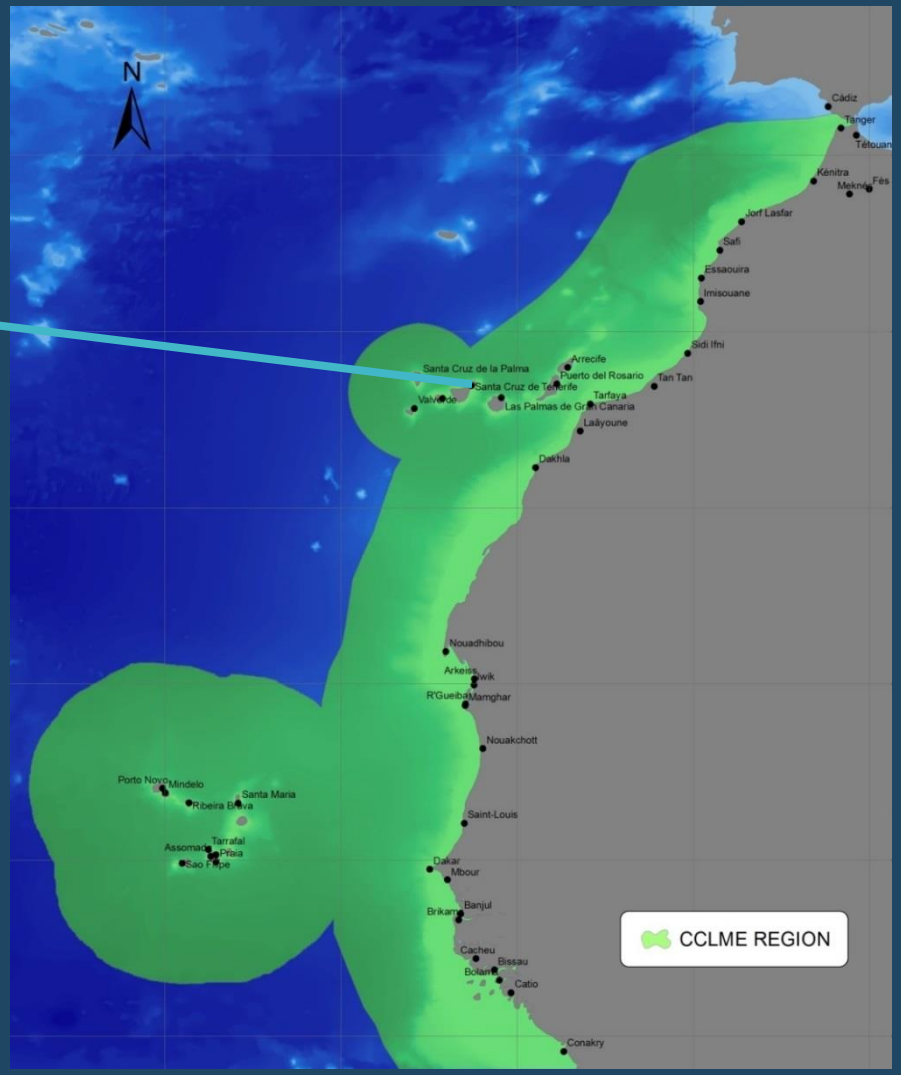
Workshops (III)

Workshop on the “Update of metadata, data availability and application needs for a CCLME Eco-GIS viewer”
held in Praia, Cabo Verde
(3-5 November 2015)



Workshops (IV)

Hands-on Workshop on “The use of the CCLME Eco-GIS Viewer”
held in Santa Cruz de Tenerife, Spain (11-13 July 2017)



The Project: Phase III

Project:
ENHANCING OCEANOGRAPHY CAPACITIES IN CCLME WESTERN AFRICA COUNTRIES

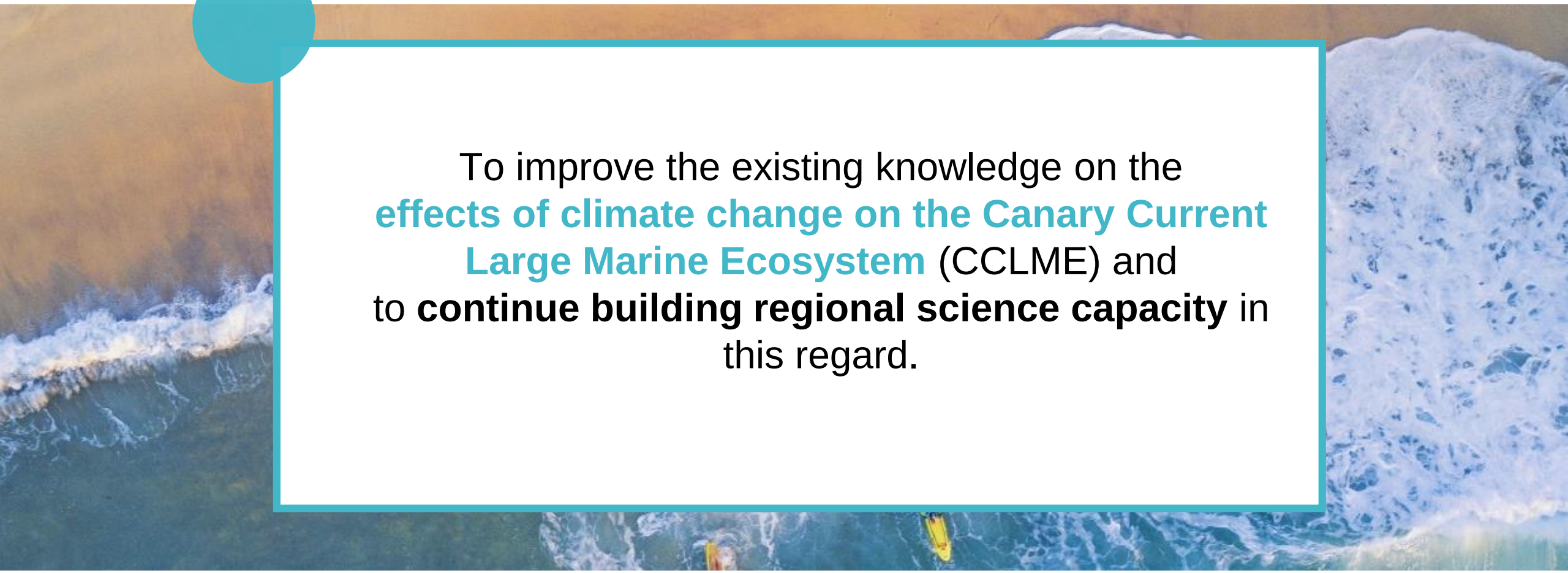
Implementing Body:
IOC-UNESCO

Partner:
Instituto Español de Oceanografía -IEO-

Funding:
100% Spanish Agency for International Development Cooperation -AECID-

Period:
January 2018 – April 2020

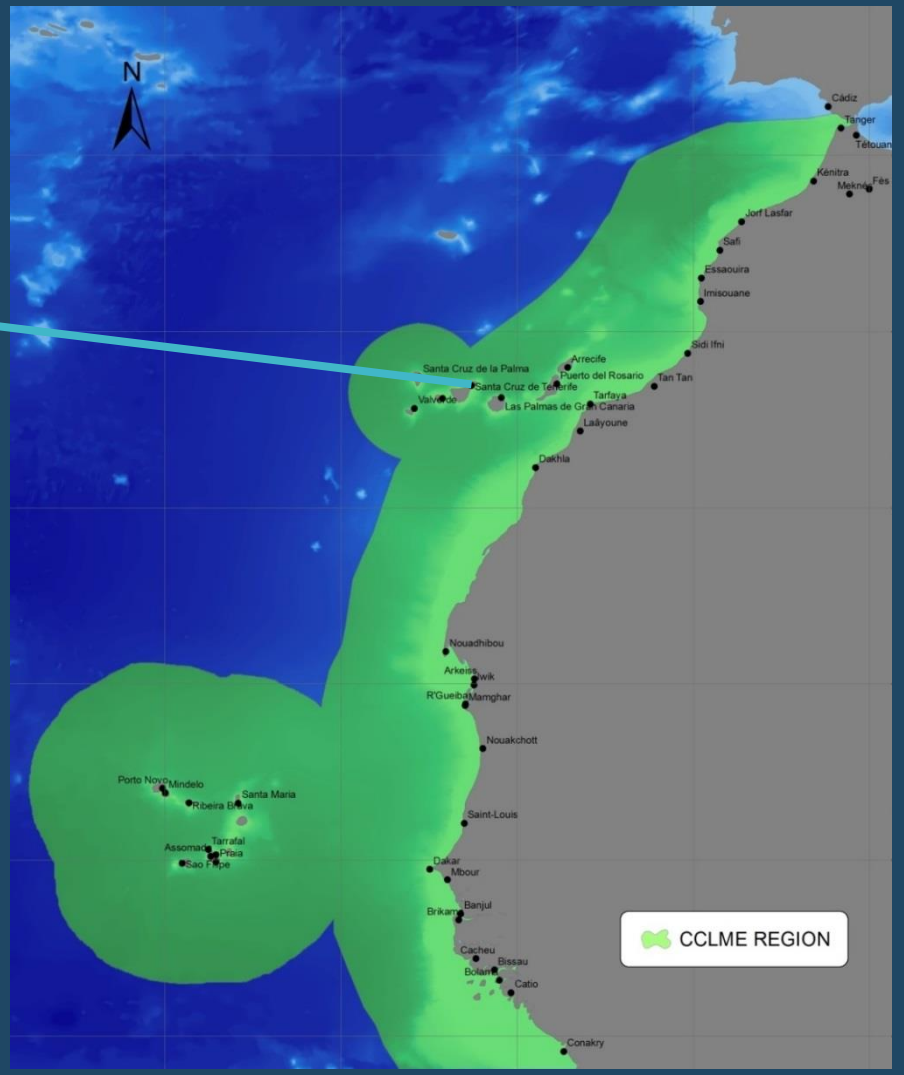
Phase III Overall goal



To improve the existing knowledge on the **effects of climate change on the Canary Current Large Marine Ecosystem** (CCLME) and to **continue building regional science capacity** in this regard.

Workshop (I)

Workshop on “The effects of climate change on the productivity of the CCLME”
held in Santa Cruz de Tenerife, Spain (18-20 September 2018)



Workshop (I)

Research and Capacity Development Plan

Research Agenda

Goal

Address **fundamental scientific knowledge gaps** in the CCLME through regional cooperation in research activities, with a focus on:
(i) **total primary productivity and functional diversity**;
(ii) and **physical forcing**.

Strategy

To set up a specific regional productivity model for the CCLME and **cross validate the existing upwelling indices** including:
(i) data gathering and provisional access;
(ii) coordination of new research efforts;
(iii) data analysis and modelling;
(iv) communication of results.

Research Agenda

Working packages	Objectives
Data gathering and provisional access	To gather all *in situ* data available
	To gather and recover new remote sensing data
Coordination of new research efforts	To provide a platform for coordination efforts in the adoption of a harmonized set of variables for new sampling efforts on primary productivity in situ measurements and essential parameters measurements

Research Agenda

Working packages	Objectives
Data analysis and modelling	To design a regional productivity model, including the intercalibration of data
	To cross-validate existing upwelling indices
Communication of results	To disseminate the results (data paper, web interface, etc.)

Capacity Development Agenda

Goal

Develop a **common capacity development** (CD) **agenda** and related **implementation strategy** for the coastal nations in the CCLME region.

Strategy

To set up a series of activities aimed at **boosting the development of relevant capacities** for the CCLME according to different levels of capacity development (individual and organizational)

Capacity Development Agenda

Levels of Capacity Development	Objectives
Organizational level	To develop an adapted training strategy for capacity development
	To evaluate the feasibility of setting up transboundary strategies for specific technical solutions
	To develop simplified sampling methodologies

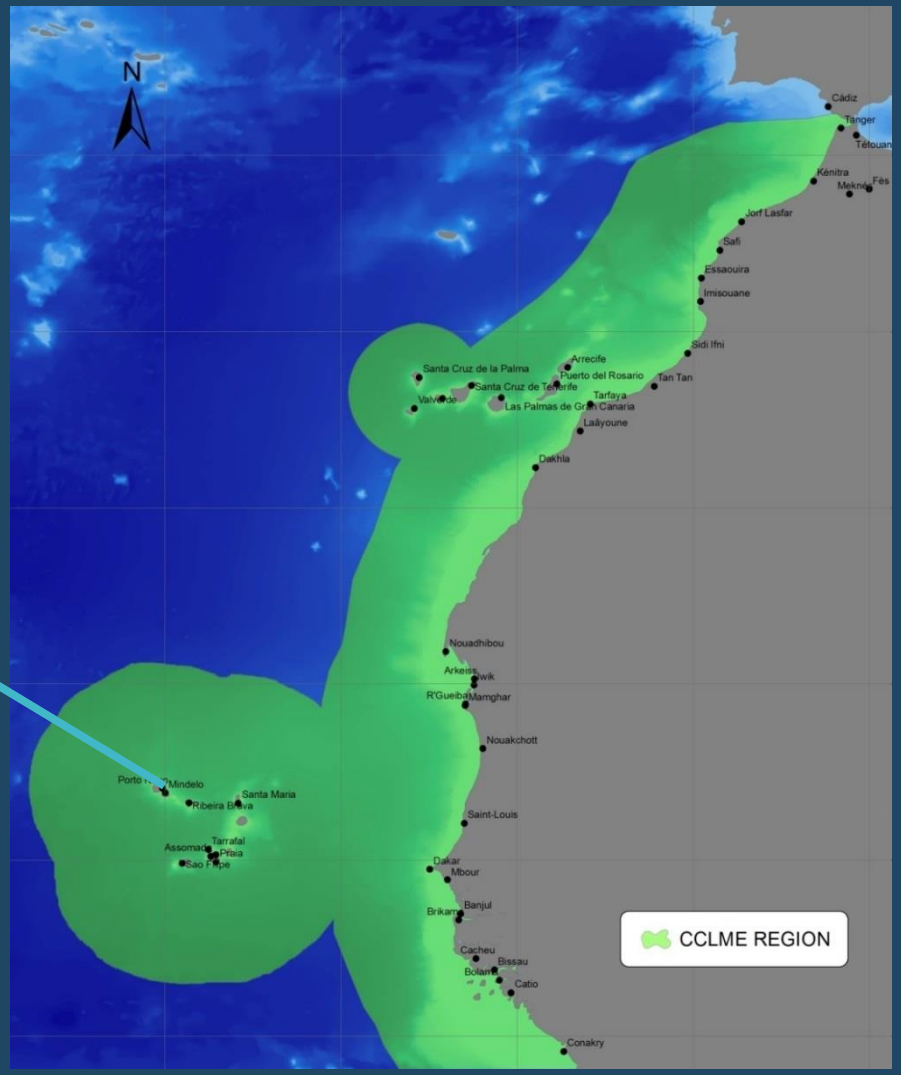
Capacity Development Agenda

Levels of Capacity Development	Objectives
Individual level	To gather information on international capacity development programmes
	To organize science focused thematic trainings
	To organize skills focused thematic trainings
	To communicate about the CCLME Eco-GIS Viewer

Workshop (II)

OSCM
Ocean Science Centre Mindelo

Workshop on “The Canary Current Large Marine Ecosystem”
held in Mindelo, Cabo Verde
(10-12 March 2020)



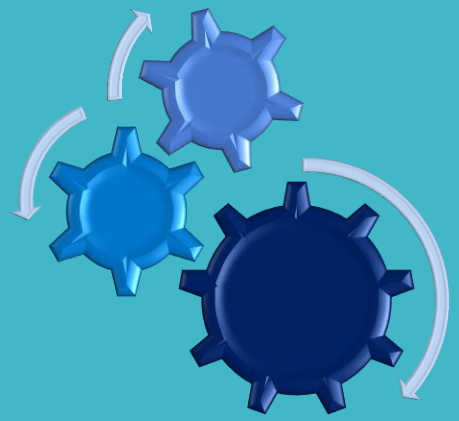
Future work

Project:
STATUS AND TRENDS OF THE CANARY CURRENT AND OTHER EASTERN BOUNDARY UPWELLING SYSTEMS (EBUS) IN LIGHT OF CLIMATE CHANGE: IMPLICATIONS AND APPLICATIONS FOR SUSTAINABLE DEVELOPMENT

Implementing Body: **IOC-UNESCO**

Partner: **Instituto Español de Oceanografía -IEO-**

Funding: **100% Spanish Agency for International Development Cooperation -AECID-**



Preparation in progress

Phase IV: Main pillars

Continue providing **a platform for collaboration in the CCLME**

- **Ocean Science Conference** (OSC) **on EBUS** in 2021
- Co-sponsoring the organization of **SCOR Working Group 155 Summer School on EBUS in 2020**

Gender equality; strategy for the mobilization and engagement of **(young) female scientists in the OSC**

Work on EBUS Some key events

Workshop on the Canary Current EBUS
Mindelo (Cabo Verde)
10-12 March 2020

Open Science Conferences on EBUS: Past, Present and Future
Lima (Peru)
5-9 September 2021

SCOR WG 155 Summer School Changes in coastal upwelling systems and their impact on marine resources
Dakar (Senegal)
4-12 May 2020

Further information about the project at:

http://www.unesco.org/new/en/natural-sciences/ioc-oceans/sections-and-programmes/ocean-sciences/canary-current-large-marine-ecosystem-project-cclme/

United Nations Educational, Scientific and Cultural Organization

Intergovernmental Oceanographic Commission

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THANK YOU 

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