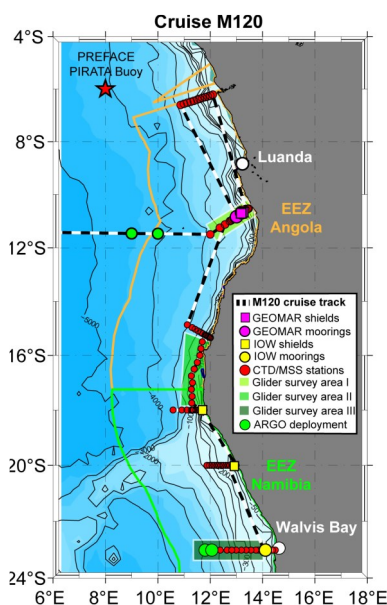


## PREFACE HIGHLIGHT

The first comprehensive analysis of long-term coastal observations combined with new measurements obtained during PREFACE have enabled a first complete description of the Angola Current.

PREFACE scientists have shown that the current has a pronounced semi-annual cycle with a main downwelling season from Feb. to Apr. in which the current is strongest and extends furthest south, and a main upwelling season from June to Sept. Secondary downwelling occurs in Oct. and Nov. and secondary upwelling in Dec. to Jan.



These variations, in connection with systematic warming of the coastal waters, have been linked to the distribution of small pelagic fish in Angolan waters and it was shown that in the past 20 years, there has been a southern expansion of the sardinella spawning grounds from the long recognised main spawning area off Congo-Gabon towards the Angolan Tropical Upwelling Region, south of the Congo River.

Image: Stephanie von Neuhoff



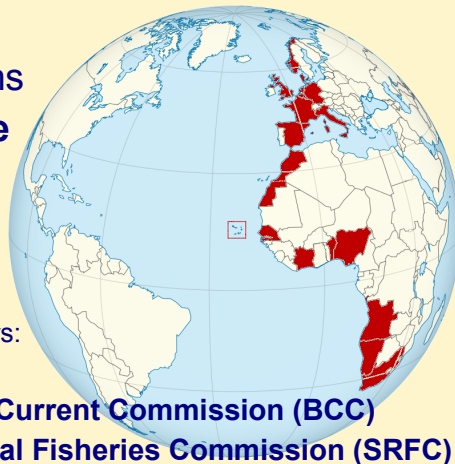
Such information together with improvements in climate prediction in this region have the potential to improve sustainable management of fisheries in this region.

## WHO WE ARE

28 institutions  
from **Europe**  
and **Africa**

Supported by 2  
associate partners:

**The Benguela Current Commission (BCC)**  
**The Subregional Fisheries Commission (SRFC)**



**PREFACE is coordinated by University of Bergen (Norway)**  
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## Enhancing **PRE**diction of **T**ropical **A**tlantic **C**limat**E** and its **I**mpacts



Co-funded by the European Union  
under FP7-ENVIRONMENT  
Project ID: 603521



November 2013 - April 2018

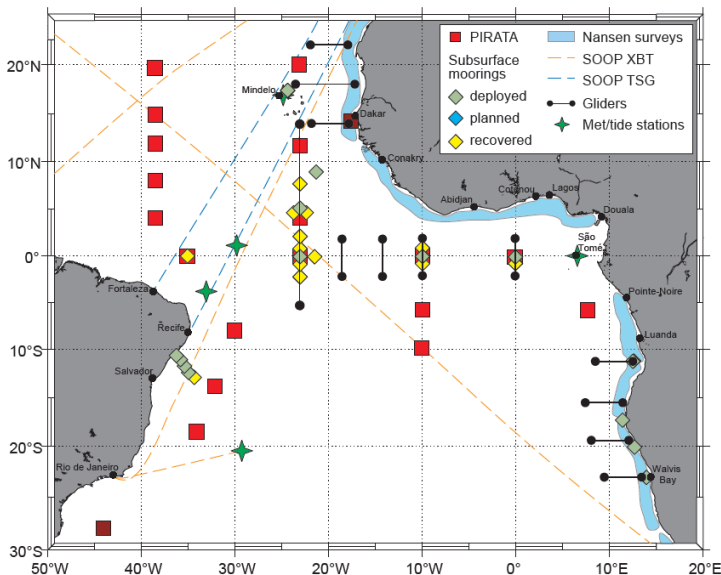
**www.preface-project.eu**

## OCEAN OBSERVATIONS

Ocean observations allow us to better understand the ocean. This is necessary for improving climate models and also for better understanding the functioning of marine ecosystems, to achieve their sustainable management.

A main goal of PREFACE was to enhance the ocean observing system in the eastern tropical Atlantic, a region of key uncertainty in the earth-climate system and encompassing 3 large marine ecosystems of great socio-economic importance, but so far not covered by adequate measurements.

### Ocean observing system with PREFACE enhancement



The observational work in PREFACE enabled the establishment of close relationships and capacity building activities between Africa and Europe by scientists, students and technicians exchanges between institutes, workshops and summer schools, participation on ocean surveys, academic education (MSc & PhD) and meetings with local policy-makers and stakeholders. It is our hope that this collaboration grows beyond PREFACE.



Image: Stephanie von Neuhoff

Our several research cruises in the coastal regions of Northwest and Southwest Africa as well as in the equatorial Atlantic involved large participation of scientists, students, and technicians from different African coastal countries to strengthen the ocean climate research agenda of African coastal states and enhance European-African cooperation in the Atlantic.

The cruises were used to deploy long-term moorings measuring currents, temperature, salinity and various biogeochemical parameters, including moorings at the shelf break off Angola (first continuous measurements of the Angola current, an important eastern boundary current), and on the shelf off Namibia (enhancement and continuation from previous programs).

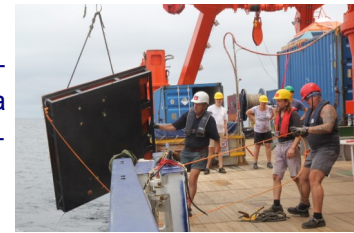


Image: Toralf Heene

PREFACE has enhanced the PIRATA surface buoy array (southeastern extension) by installation of a new buoy at 6°S, 8°E, located strategically in an area problematic to ocean-atmosphere coupled models, offshore of the Congo River plume and upstream of the Angola Current, making it a unique measuring platform which has continuously worked in real time since May 2013.

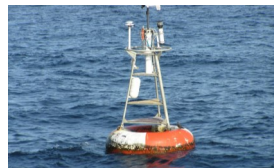


Image: Bernard Bourlès

Another unique mooring owing thanks to PREFACE is MELAX, set up by the ECLAIRS international laboratory. Installed in the heart of the Senegal-Mauritania upwelling, it is the first of its kind, equipped with oceanographic and meteorological sensors to measure short and long-term changes in climate, atmosphere and the marine environment.

PREFACE has compiled a seasonal mixed-layer climatology from an unprecedented collection of hydrographic data from public data repositories, non-public datasets contributed by our African partners and PREFACE-related cruises and autonomous platforms.

PREFACE process studies include first use of autonomous gliders for high-resolution measurements of hydrographic parameters and microstructure (for mixing studies) in the coastal upwelling region, ScanFish measurements, and shipboard microstructure measurements.

Image: Rockland Scientific International Inc.



SLOCUM glider with attached microstructure probe.

With PREFACE, the historical data acquired in the frame of the EAF-Nansen project executed by the FAO is at last exploited comprehensively; this involves analysis of 20 years of hydrographic and current data in close cooperation between African and European partner institutes.

