European Commission

Climate Change

PREFACE

At a glance

Title: Enhancing prediction of tropical Atlantic climate and its impacts

Instrument: Collaborative project

Total Cost: 12 170 345€

EC Contribution: 8 999 433€

Duration: 48 months

Start Date: 01/11/2013

Consortium: 28 partners from 18 countries

Project Coordinator: University of Bergen (NO)

Project Web Site: http://www.preface-project.eu

Key Words:

Climate processes, variability and change; Climate prediction; Climate models; Climate impacts; Ocean observations; Tropical Atlantic; Marine ecosystems; Fisheries; Africa; Vulnerability.

The challenge

Tropical Atlantic climate recently experienced shifts of great socio-economic importance. The oceanic changes were largest in the eastern boundary upwelling systems, globally important regions for marine productivity and climate. African countries bordering the Atlantic depend upon their ocean - societal development, fisheries, and tourism. They were strongly affected by these changes and will face important adaptation challenges associated with global warming.

Paradoxically, the Tropical Atlantic is a region of key uncertainty in the earth-climate system: state-of-the-art climate models exhibit large systematic error, climate change projections are highly uncertain, and it is largely unknown how climate change will impact marine ecosystems.

Project Objectives

PREFACE aims to address these interconnected issues, and has the following goals:

- To reduce uncertainties in our knowledge of the functioning of Tropical Atlantic climate.

- To improve climate prediction and the quantification of climate change impacts in the region.

- To improve understanding of the cumulative effects of the multiple stressors of climate variability, greenhouse induced climate change, and fisheries on marine ecosystems, and ecosystem services (*e.g.*, fisheries, coastal vulnerability).

- To assess the socio-economic vulnerabilities and evaluate the resilience of Atlantic African fishing communities to climate-driven ecosystem shifts and global markets.

Research and Innovation

Methodology

To meet these objectives PREFACE will go beyond the state-of-the-art by bringing together European and African expertises in climate modelling and prediction, oceanography, and fisheries and its management. To close key knowledge gaps PREFACE will enhance observations, analyse underutilised observations, and use advanced ocean and climate modelling capabilities.

PREFACE work is split into four research areas:

- The role of ocean processes in climate variability;
- The evaluation of current climate models and bias reduction;
- Climate prediction in the Tropical Atlantic;
- The impacts of climate change on pelagic functional diversity in the Tropical Atlantic with effects on western African fisheries economies.

Expected Results

PREFACE is a bold and ambitious project that targets one of the regions that will be more affected by climate change and its consequences. The project will provide the first comprehensive assessment of the Tropical Atlantic climate, from observations to predicting its socio-economic impacts. This is expected to lead to a number of high impact results for this region:

- Improved understanding of variability in the Gulf of Guinea and the African Eastern Boundary Upwelling regions;
- Improved climate modelling and prediction capabilities;
- Better understanding of the function of marine ecosystem so that socio-economic impacts can be better predicted;
- Enhance cooperation between European and African researchers working on Tropical Atlantic climate and its impacts, by fostering existing collaborations and improving project synergy.

Project Partners	
Universitetet i Bergen (NO)	Fundacio Institut Catala de Ciencies del Clima (ES)
Kobenhavns Universitet (DK)	Universidad Complutense de Madrid (ES)
Centre Européen de Recherche et de Formation Avancée en Calcul Scientifique (FR)	The University of Reading (GB)
Institut de Recherche pour le Développement (FR)	Instituto Nacional de Investigacao Pesqueira (Angola, AO)
Météo-France (FR)	Ministry of Fisheries and Marine Resources (Nambia, NA)
Université Pierre et Marie Curie (FR)	University of Cape Town (South Africa, ZA)
Helmholtz Zentrum für Ozeanforschung Kiel (DE)	Instituto Nacional de Desenvolvimento das Pescas (Cape Verde, CV)
Institut für Ostseeforschung Warnemünde an der Universität Rostock (DE)	Institut National de Recherche Halieutique (Morocco, MA)
Johann Heinrich von Thünen-Institut, Bundesforschungsinstitut für Ländliche Räume, Wald und Fischerei (DE)	Institut Senegalais de Recherches Agricoles (Senegal, SN)
Christian-Albrechts-Universitaet Zu Kiel (DE)	Universite Cheikh Anta Diop de Dakar (Senegal, SN)
Università Cá Foscari Venezia (IT)	Universite D'abomey-Calavi (Benin, BJ)
Wageningen University (NL)	Centre de Recherches Oceanologiques (Côte d'Ivoire, CI)
Havforskningsinstituttet (NO)	University of Nigeria (Nigeria, NG)
Uni Research As (NO)	Universite Libre de Bruxelles (BE)