

## Enhancing prediction of tropical Atlantic climate and its impacts (EU-PREFACE)

Noel Keenlyside (1,2,3)

(1) University of Bergen, Geophysical Institute, MatNat, Bergen, Norway (noel.keenlyside@gfi.uib.no), (2) Nansen Environmental and Remote Sensing Center, Bergen , Norway, (3) Bjerknes Centre for Climate Research, Bergen, Norway

In this era of climate change, society calls for the development of climate services to ensure sustainable development. The need for climate services is particularly great for regions such as Africa that have a strong socio-economic dependence on their environment. The EU-PREFACE project brought together an interdisciplinary team of African and European scientists to achieve a step-wise improvement in our understanding and modelling of the tropical Atlantic climate and its impacts. The closing of data gaps and numerical modelling has achieved a greater understanding of the mechanisms for climate variability in the tropical Atlantic. In particular, we now better understand the importance of remote versus local processes in driving Benguela Niño events, as well as the role of dynamical versus thermodynamical ocean-atmosphere interaction for Atlantic Niño variability. The prominence of the tropical Atlantic in the climate system has been demonstrated. It is now clear that the Atlantic Niño strongly influences the El Niño Southern Oscillation during periods when the Atlantic Intertropical Convergence Zone is close to the equator, and these periods are strongly related to Atlantic multidecadal variability. Our ability to simulate and predict tropical Atlantic climate has been greatly improved. The cause of the long-standing tropical Atlantic model bias and their impact on variability and predictability has been understood. Critically, there are now models that are able to skilfully predict equatorial Atlantic SST a few months advance and there is skill in predicting Atlantic multi-decadal variability. Both of these offer the potential to predict continental climate. Beyond this and of potentially greater immediate benefit, there has been a great advance in our understanding of how environmental factors influence the marine ecosystem. We have understood how short and long-term variations cause shifts in important fish stock of eastern boundary coastal systems. These achievements provide the scientific basis for the development of climate services in the region. In addition, the project has contributed to the training of new generation of scientists capable of realising and further developing it.