

Impacts of Climate Change on North Atlantic Currents indicated by Changes in the Coastal Zones of Ocean Islands

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We propose to study the impacts of changes in the North Atlantic ocean currents (NAOC) by considering temporal changes in the land surface cover of ocean islands along the major current systems of this ocean. The NAOC are dominated by the Gulf Stream. Observed changes have already impacts on the dynamic sea surface topography, which lead to significant regional variations in coastal sea levels (e.g., Ezer et al., 2013). The changes in current velocity imply a significant change in heat transport from the lower to higher latitudes in all areas of the North Atlantic. It can be expected that the impacts of heat transport variations and changes in coastal dynamics are larger on ocean islands than along continental coasts.

We propose to use the background mission observations for all islands in the North Atlantic included in the proposed list to aim at a correlation of observed changes with variations in the strength of the different segments of the NAOC, particularly the Gulf Stream, and the changes in sea level partly induced by changes in surface dynamic topography.

The list of islands to be included in the study comprises:

Navassa Island, Caribbean
Cat Island, Bahamas
Bermuda Island
Madeira
Azores
Canary
Jan Mayen
Svalbard
Iceland islands
Novaya Zemlya
Wrangel Island

These islands cover a wide range of latitudes, and climates. They are located in different segments of the NAOC and exhibit a range of population densities and land uses.

The study should be based on a diversity of datasets. Of particular interest are RADARSAT-2 data and Cosmo-Skymed observations.

The study will be carried out as part of the CZCP activities. Project leadership will be provided by the Old Dominion University (ODU), Norfolk, VA, USA. The Climate Change and Sea Level Rise Initiative (CCSLRI) at ODU has the capacity to process the satellite data and the correlate the identified changes with sea level, current strength and other climatic parameters. The CCSLRI is engaged in a broader climate change and sea level rise network and the project will be open for participation from other institutions engaged in the CZCP.

REFERENCES

Ezer, T., Atkinson, L.P., Corlett, W.B., Blanco, J.L., 2013. gulf stream's induced sea level rise and variability along the U.S. mid-Atlantic coast. *J. Geophys. Res. Ocean*, **118**, 685-697, DOI: 10.1002/jgrc.20091.