Develop EuroGOOS marine climate service with a seamless earth system approach

Jun She[1], Uldis Bethers[2], Vanessa Cardin[3], Kai Håkon Christensen[4], Tomasz Dabrowski[5], Frank Janssen[6], Haapala Jari[7], Arneborg Lars[8], Inga Lips[9], Sebastian Legrand[10], Vidar Lien[11], Marie Maar[12], Julien Mader[13], Sara Morucci[14], Antonio Novellino[15], Alejandro Orfila[16], George Patihakis[9], Manuel Ruiz[17], Joanna Staneva[18], and George Triantafyllou[19]

[1]Danish Meteorological Institute, Denmark
[2]University of Latvia, Latvia
[3]Istituto Nazionale di Oceanografia e di Geofisica Sperimentale, Italy
[4]MetNoway, Norway
[5]Marine Institute, Ireland
[6]The Federal Maritime and Hydrographic Agency, Germany
[7]Finnish Meteorological Institute, Finland
[8]Swedish Meteorological and Hydrological Institute, Sweden
[9]European Global Ocean Observing System, Belgium
[10]Institut Royal des Sciences Naturelles de Belgique, Belgium
[11]The Institute of Marine Research, Norway
[12]Aarhus University, Denmark
[13]FUNDACIÓN AZTI, Spain
[14]Institute for Environmental Protection and Research, Italy
[15]ETT SpA, Italy
[16]Agencia Estatal Consejo Superior de Investigaciones Científicas, Spain
[17]Instituto Español de Oceanografía, Spain
[18]Helmholtz-Zentrum Geesthacht, Germany
[19]Hellenic Centre for Marine Research, Greece

Corresponding author: Jun She, js@dmi.dk

Abstract

The ocean is an important pathway to a low-carbon and climate resilient society, e.g. in areas of blue carbon, green shipping, offshore renewable energy, aquaculture, fishery and coastal adaptation. 26 EU member states have made their National Adaptation Strategy (NAS) and/or National Strategy Plan (NAP) which needs a strong climate information service. For the marine, the service should be robust and quality assured and developed through following steps: first to generate marine climate projections with sufficient resolution and uncertainty quantification to identify potential marine climate change and related impacts, then to identify adaptation options and solutions addressing regional and local scale user needs and finally to develop end user products and deliver services. This fits nicely into national, ROOS (Regional Operational Oceanographic System) and EuroGOOS strategy on providing marine climate information service. In Europe, ROOSs have more than two decades history to work together on providing marine service for the regional seas and national waters. It is now time to think what we can do for building up a low carbon and climate resilient future. As focal points of national ocean, climate and/or weather services, ROOS members have extensive experiences in working with citizens, stakeholders and decision-makers at national, regional and municipality levels. They have collaborated on developing operational oceanographic service in the last two decades, mainly based on a volunteer basis. Marine climate service has been evolved in recent years as a service area by ROOS members and some of them have developed high resolution downscaling ocean-ice-wave-biogeochemical

projections for national “Green Transition” and adaptation activities. ROOS members have a strong wish to form a critical mass on marine climate and to fill the current gaps and integrate our existing best practices. This paper will review current marine climate service capacity in ROOS members, identify gaps in modelling, products and service and propose a seamless earth system approach for developing EuroGOOS and ROOS marine climate service capacities.