

**CoCliME: Co-development of Climate services for adaptation to changing Marine Ecosystems**

**Authors:** Bengt Karlson, C. Cusack, G. Appéré, L. Arneborg, E. Berdalet, A. Cembella, P. Guillotreau, M. Gröger, P. Hess, S. Hefferman, U. John, K. Klemm, V. Le Bihan, R. Lemeé, B. Morineau, L. Naustvoll, E. O'Rourke, B. Siemering, E. Stoica, J. Thomas, M. Travers, J. West, G. Vulturius

**Abstract**

Most climate service development has focused on land based or physical coastal climate impacts. Unfortunately, the effects of a changing climate on marine ecosystems are less well understood and require further scientific study to fully examine potential impacts. A marine ecosystem climate service, with coastal ecosystem indicators, useful to management and policy concerns, and directly relevant to human health, wellbeing and coastal economies is the focus of CoCliME. Our case studies, which cover all European regional seas, have selected a number of ecological indicators including harmful algal blooms, marine biotoxins, pathogens and marine microbial diversity. Change in environmental drivers, such as temperature or ocean circulation, can affect the dynamics, succession and occurrence of these ecological indicators with resulting impacts on marine ecosystem services. The foundation of the CoCliME services is co-development and engagement with our end users to ensure the usability and relevance of the services developed. CoCliME uses a transdisciplinary approach to develop regional climate change services and involves case study specific data analyses, ranging from genetic research, laboratory experiments, field studies, analysis of time series, marine climate modelling, and economic impact modelling. Here, we share our experiences in this novel area of marine ecosystem climate service development. What have we learned so far? What have the users taught us? We will share with you what's next for the prototype services we aim to deliver.

**Keywords:** Climate change, aquaculture, microalgae, blue growth, safe seafood

**Contact author:** Bengt Karlson, Research & Development, Oceanography, Swedish Meteorological and Hydrological Institute, Sven Källfelts gata 15, 426 71 Västra Frölunda, Sweden