

Towards more resilient oceans:

Predicting and projecting future changes in the ocean and their impacts on human societies

The oceans provide a range of goods and services. However, marine ecosystems are changing at unprecedented rates, driven by a combination of climate pressures and anthropogenic impacts like fishing and coastal development. These impacts are modifying the productivity and biodiversity of marine ecosystems in ways that threaten their resilience and sustainability. The effects of both natural and anthropogenic pressures are expected to continue, and probably intensify, in many regions. Social-ecological models and related indicators, provide information to enable us to anticipate potential change in marine environments. Modelling social-ecological systems interactions, taking into consideration the combined effects of multiple drivers, will help us understand and project these potential impacts for the future, and ultimately deal with this change to the best of our ability. Social-ecological models are thus, critical for developing workable, yet flexible, management approaches and policy decisions.

Programme

ClimEco5 will focus on ways to model environmental and anthropogenic problems that beset the world's oceans and related ecosystem services. Aspects of climate and environmental change will be outlined and linked to important social, economic, and policy issues with the goal of maintaining sustainable and productive oceans.

Lectures will examine a range of modelling approaches (including spatial modelling), monitoring, data analysis, indicators, and management advice and communication from a theoretical perspective as well as using case studies from coastal and upwelling systems around the world.

Participants will apply the concepts discussed in the lectures during "hands-on" sessions where a range of models, indicators, and analytical methods will be used.

Participants

This interdisciplinary summer school welcomes applications from researchers who are interested in modelling and interpreting change in global oceans. Students and early-career scientists with an interest in a broad range of topics like, oceanography, biogeochemistry, fisheries, climate change and social and economic aspects of marine ecosystems are encouraged to apply. Those with an interest in finding out more about practical ways to deal with the challenges arising from working across social and natural science disciplines are especially encouraged to participate in the summer school.

Registration fees

Students 250 €, others 350 €

Topics to be covered

Climate change and impacts on marine ecosystems

- Biogeochemical and oceanographic processes
- Marine ecological systems and processes of change
- Climate processes and pressures on marine ecosystems
- Impacts of climate and change in marine systems on society

Modelling approaches for natural and social sciences data

- Integrated Earth system models
- Global/regional socio-economic models
- Bayesian and qualitative models
- Agent-based and network models

Spatial modelling

- End to end models
- Overview of Ecopath and Ecosim and Ecospace models
- Spatial modelling of ecosystem services (inVEST)

Indicators, data analysis and applied statistical methods

- Indicator basics
- Translation into decision criteria
- Detecting trends, thresholds, non linearity and tipping points
- Basic non parametric statistics (PCA – clusters, etc.)

Using science in management

- Psychology of communication: what works and what doesn't
- Communication science
- Social psychology and behavioural economics

Conveners

Ronaldo Angelini, UFRN, Brazil

Laurent Bopp, LSCE, France

Adriana Carvalho, UFRN, Brazil

Christopher Cvitanovic, U.Tas, Australia

Beth Fulton, CSIRO, Australia

Maria Grazia Pennino, IEO, Spain

Priscila Lopes, UFRN, Brazil

Rashid Sumaila, UBC, Canada

Paul Suprenand, Mote Marine Laboratory, USA

Ingrid van Putten, CSIRO and U.Tas, Australia

How to apply

Complete the [Application Form](#) and send it, with a short CV (in English, two pages max.) and a reference letter from your supervisor or employer, to the IMBER International Project Office imber@imr.no before **31 March 2016**.