

Progress in assessing climate-related impacts on marine biota and ecosystem services, and in coping with these changes through adaptation frameworks and strategies

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Abstract

Estimating the ecological and socio-economic effects of climate-related changes in marine settings and developing effective adaptation strategies to cope with such changes is a profound challenge for coastal states throughout the world. Empirical data are often scanty and system dynamics at most scales are complex, poorly-known, and will occupy novel space in the future. The uncertainty of projections further compounds with each transition between physical, biological, and human systems. Planning is needed, to prevent unforeseen degradation or collapses in ecosystem functions and services, especially in such non-stationary systems, but the expense of such planning is problematic. I describe efforts on several fronts to meet the general challenge from both science and policy realms. Examples from this project include the development of two international working groups on (1) modelling approaches for estimating marine climate change impacts (PICES/ICES working group on Forecasting Climate Change Impacts on Fish and Fisheries), (2) the development of adaptation approaches to cope with marine impacts (IMAGINE – International Marine Adaptation Group for Innovative Examples). A framework is proposed for efficiently assessing and adapting to climate impacts on marine ecosystems. Other components of this project focus on what is known about climate impacts on the marine ecosystems of Canada's Pacific region, in partnership with CPAWS and WWF, as well as on an integrated ecosystem planning initiative on the West Coast of Vancouver Island to accomplish multiple objectives with a Coastal and Ocean Plan, in partnership with West Coast Aquatic.