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Environmental Impacts on the Marine Ecosystems of the North Sea, highlights from a new book chapter

Geir Ottersen and Keith Brander

A multi-authored comprehensive North Sea Region Climate Change Assessment (NOSCCA) has been carried out and the results will soon be published in the form of a book. The book consists of four main parts; I - Recent Climate Change, II - Future Climate Change, III - Impacts of Recent and Future Climate Change on Ecosystems, and IV - Climate Change Impacts on Socio-Economic Sectors. Here we give a brief overview of the main results of the chapter on *Environmental Impacts – Marine Ecosystems* with Keith Brander and Geir Ottersen as lead authors. Examples of the impacts of climate change on the biota of the North Sea, with a focus on fish stocks, are presented. We see how in particular rising NS temperatures is affecting biological processes and organisation at all scales, including the physiology, reproduction, growth, survival, behavior and transport of individuals; the distribution, dynamics and evolution of populations; and the trophic structure and coupling of ecosystems. For instance, first quarter International Bottom Trawl Survey (IBTS) data show that over the period 1985 to 2006, species richness increased from around 60 species to almost 90 and the increase is positively related to the increase in sea-bottom temperature. Further, temperature has been shown to regulate recruitment to several NS fish stocks, including cod. Cod recruitment has been low in the NS during recent warm years and the stock biomass may remain low unless cooler conditions return. The information presented shows that North Sea marine ecosystems are clearly affected by climate change.

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