

Ocean life under threat from climate change

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The extent of this algal bloom near Tasmania can only be seen using special sensors on ocean-observing satellites. Credit: CSIRO

The international science community must devote more resources to research into the effects climate change is having on ocean environments, according to a paper published today in the journal *Science* by researchers at CSIRO's Climate Adaptation National Research Flagship.

"Marine ecosystems are undoubtedly under-resourced, overlooked and under threat and our collective knowledge of impacts on marine life is a mere drop in the ocean," wrote Dr Anthony Richardson, from The University of Queensland and CSIRO, and his co-author, Dr Elvira

Poloczanska from CSIRO in Hobart.

"There is an overwhelming bias toward land-surface studies which arise in part because investigating the ocean realm is generally difficult, resource-intensive and expensive," they said.

The disparity in focus on land-based compared to marine impacts was highlighted in the Intergovernmental Panel on Climate Change's (IPCC's) Fourth Assessment Report (2007), which included 28,500 significant biological changes in terrestrial systems but only 85 in marine systems.

The paper argues that the collection of marine environment data over 20 years or more – a requirement for inclusion in IPCC assessments – suffered in the mid-1980s due to government funding cutbacks for international marine science research, just as ocean warming began accelerating.

The authors advocate change in the existing IPCC process to better assess the impacts.

"Climate change is affecting ocean temperatures, the supply of nutrients from the land, ocean chemistry, food chains, shifts in wind systems, ocean currents and extreme events such as cyclones," Dr Poloczanska said. "All of these in turn affect the distribution, abundance, breeding cycles and migrations of marine plants and animals, which millions of people rely on for food and income. Development of the Integrated Marine Observing System, announced in 2006, is an important step forward but securing data over the time scales relevant for climate assessment will not occur until near 2030."

Dr Richardson said the situation is made more urgent as emerging evidence suggests marine organisms may be responding faster to climate

change than land-based plants and animals. "As the climate is warming, marine plants and animals are shifting towards the poles and their timing of peak abundance is occurring earlier in the year," he said. "The slower dynamics of the ocean also means that some changes such as ocean acidification will be irreversible this century.

"While understanding impacts of climate change in the oceans is important, ultimately we need to develop adaptation options as the knowledge-base expands," Dr Richardson said.

Source: CSIRO Australia

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