

Life in our oceans is changing rapidly: latest audit

A new 'report card' issued by a team of leading scientists from across Australia demonstrates that climate change is already having significant impacts on our marine ecosystems.



Credit: CSIRO

The [report card](#) provides information about the current and possible future state of Australia's marine climate and its impact on marine biodiversity. It also outlines actions that are underway to help our marine ecosystems adapt to climate change.

Led by CSIRO, more than 80 Australian marine scientists from 34 universities and research organisations contributed to the project, which draws on peer-reviewed research results from hundreds of other researchers.

'Australia has some of the world's most unique marine ecosystems,' said CSIRO's Dr Elvira Poloczanska, the project's leader.

'They are enjoyed recreationally, generate considerable economic wealth through fisheries, aquaculture, and tourism, and provide irreplaceable services including coastal defence, oxygen production, nutrient recycling and climate regulation.

'Our knowledge of observed and likely impacts of climate change has greatly advanced since the first report card in 2009.

'Although there are some concerning findings in the 2012 report card, the information we've compiled is helping to ensure that ocean managers and policy makers are best placed to respond to the challenge of managing the impact that climate change is having on these systems.'

Key findings show that:

1. warming sea temperatures are influencing the distribution of marine plants and animals, with species currently found in tropical and temperate waters **likely to move south**
2. new research suggests winds over the Southern Ocean and current dynamics are strongly influencing foraging of seabirds that breed in south-east Australia and feed close to the Antarctic each summer
3. some tropical fish species have a greater ability to acclimatise to rising water temperatures than previously thought
4. the Australian science community is widely engaged in research, monitoring and observing programs to increase our understanding of climate change impacts and inform management
5. adaptation planning is happening now, from seasonal forecast for fisheries and aquaculture, to climate-proofing of breeding sites for turtles and seabirds.

Aspects of marine climate that were analysed for the report card include changes in sea temperature, sea level, the East Australian Current, the Leeuwin Current, and El Niño-Southern Oscillation.



Credit: © Graham Blight

Complicating matters is the fact that the east-west orientation of Australia's temperate coastline predisposes flora and fauna to potential species extinctions as climate change forces them south.

As macroalgae are foundation species that support a myriad of unique marine life, the decline in temperate macroalgae in response to climate change is likely to resonate across entire temperate marine ecosystems.

Researchers also assessed what has been happening in the area of marine biodiversity, including impacts on coral reefs; tropical, temperate and pelagic fish; marine mammals; marine reptiles; seabirds; mangroves; tidal wetlands; seagrass; algae; marine microbes; phytoplankton and zooplankton.

Two new sections included in the 2012 report card focus on the smallest and largest organisms in the oceans: microbes and whales.

The project has been funded by the Marine Biodiversity and Resources Marine Adaptation Network, Fisheries Research and Development Corporation, and CSIRO's Climate Adaptation National Research Flagship.

From ECOS online <http://www.ecosmagazine.com/?paper=EC12394>