

Warming in the Tasman Sea a global warming hot spot

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Oceanographers have identified a series of ocean hotspots around the world generated by strengthening wind systems that have driven oceanic currents, including the East Australian Current, polewards beyond their known boundaries.

The hotspots have formed alongside [ocean currents](#) that wash the east coast of the major [continents](#) and their warming proceeds at a rate far exceeding the average rate of [ocean surface](#) warming, according to an international science team whose work is published in the journal *Nature Climate Change* today.

Paper co-author, CSIRO's Dr Wenju Cai, said that while the finding has local ecological implications in the region surrounding the hotspots, the major influence is upon the ocean's ability to take up heat and carbon from the atmosphere.

In Australia's case, scientists report intensifying east-west winds at [high latitudes](#) (45°-55°S) pushing southward and speeding up the gyre or swirl of currents circulating in the South Pacific, extending from South America to the Australian coast. The resulting changes in ocean circulation patterns have pushed the East Australian Current around 350 kilometres further south, with temperatures east of Tasmania as much as two degrees warmer than they were 60 years ago. "We would expect natural change in the oceans over decades or centuries but change with such elevated sea surface temperatures in a growing number of locations and in a synchronised manner was definitely not expected," said

CSIRO's Dr Wenju Cai.

"Detecting these changes has been hindered by limited observations but with a combination of multi-national ocean watch systems and computer simulations we have been able to reconstruct an ocean history in which warming over the past century is 2-3 times faster than the global average ocean warming rate," says Dr Cai, a climate scientist at CSIRO's Wealth from Oceans Research Flagship.

The changes are characterised by a combination of currents pushing nearer to the polar regions and intensify with systematic changes of wind over both hemispheres, attributed to increasing greenhouse gases.

Dr Cai said the increase of carbon dioxide and other greenhouse gases in the [atmosphere](#) has been the major driver of the surface warming of the Earth over the 20th century. This is projected to continue.

He said the research points to the need for a long-term monitoring network of the western boundary currents. In March next year, Australian scientists plan to deploy a series of moored ocean sensors across the East Australian Current to observe change season-to-season and year-to-year.

Provided by CSIRO

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