

Algae declines in the water off Sydney

March 10 2014



Electron microscope image of mixed phytoplankton taken from the coastal waters of southeastern Australia. Credit: Dr Penelope Ajani.

(Phys.org) —One of the longest time-series of phytoplankton (microalgae) data in the Southern Hemisphere has revealed that phytoplankton are declining in the waters off Sydney.

Phytoplankton are microscopic plants whose growth produces almost

half of the world's oxygen, and supports the entire marine food chain. They can also result in blooms, including 'red tides'. They are closely linked to the climate system due to their sensitivity to ocean circulation and nutrient availability. Global warming may cause changes in phytoplankton abundance and diversity, and as such they are important indicators of climate-change effects on marine ecosystems.

"We know that the [coastal waters](#) of southeast Australia have undergone significant climate-related changes over the past 60 years", says Dr Penelope Ajani from Macquarie University.

"We wanted to assess the effects of these changes on the phytoplankton".

For more than 10 years, Dr Ajani and colleagues have been collecting phytoplankton data from a monitoring station offshore from Sydney.

"We examined 11 years of samples. Our data confirmed the seasonal pattern of peak diversity in winter, and also that [phytoplankton blooms](#) occur most consistently in March, September and December.

"Unexpectedly, we also observed a significant decline in total phytoplankton numbers over this eleven-year period. This decline in abundance was associated with a decline in water temperature."

Fellow researcher Dr Andrew Allen said: "What these findings tell us is that, although there has been a long-term increase in water temperature in our coastal waters, shorter-term fluctuations can and do occur.

"Such fluctuations significantly affect the [phytoplankton](#), and therefore may have important implications for the entire marine ecosystem".

The phytoplankton dataset collected and analysed for this study

represents one of the longest time series in the Southern Hemisphere. It therefore represents an important baseline for assessing the effects of future climate change on [marine ecosystems](#).

More information: The paper "A decadal decline in relative abundance and a shift in microphytoplankton composition at a long-term coastal station off southeast Australia," in *Limnology and Oceanography* is available here: aslo.org/lo/toc/vol_59/issue_2/0519.pdf

Provided by Macquarie University

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