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New climate guide to ocean food web studies

Ocean science has a new guide to future investigation of climate change impacts on the marine food web, based on research released today in the journal *Nature Climate Change*.

The guide enables quick identification of regions experiencing complex climate change and gives an initial assessment of the effects of changing properties on phytoplankton such as temperature, light, salinity, and access to iron. It also highlights knowledge gaps of phytoplankton responses to the changes.

Led by the University of Tasmania's Professor Philip Boyd, from the Institute for Marine and Antarctic Studies, the research will be utilised in Southern Ocean studies next year as part of Australia's \$24m Antarctic Gateway Partnership, announced last month.

Prof Boyd, a marine biogeochemist, leads a Southern Ocean project to better understand the differences in sensitivity to environmental change of open water versus sea ice microbial foodwebs. These much-needed insights into influences on marine life from midwater microbes to seafloor communities will be generated using a suite of observation instruments, laboratory culture experiments, and regional analyses.

Prof Boyd said climate change is altering oceanic conditions in a complex manner. "So far, Earth system modelling studies have focused on how alteration of individual properties will affect marine life, but none have simulated the impact of multiple biologically influential property changes."

"Although Earth system model experiments have been pivotal to better understanding the ramifications of climate change on the ocean, this rich source of information has been under-used as the basis for the design of studies to manipulate conditions for marine life."

"In a future ocean, regions will encounter different permutations of change which will probably alter the dominance of key phytoplankton groups and modify regional productivity, ecosystem structure, and ocean chemistry."

"Understanding regionally-distinct patterns or hotspots of oceanic change can help guide laboratory and field studies for the oceanographic modelling and environmental manipulation communities as well as the interpretation of interactive influences in global models," he said.

The paper was co-authored by German and long-term US collaborators.

Australia's Antarctic Gateway Partnership: [http://www.imas.utas.edu.au/right-column-content/whats-new3/news/\\$24-million-a-key-to-unlocking-tasmanias-place-as-gateway-to-the-antarctic](http://www.imas.utas.edu.au/right-column-content/whats-new3/news/$24-million-a-key-to-unlocking-tasmanias-place-as-gateway-to-the-antarctic)

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