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Interdecadal variation of the lower trophic ecosystem in the Northern Pacific between 1948 and 2002, using a 3-D physical-NEMURO coupled model-

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Regime shifts, consisting of decadal-scale oscillations in atmosphere-ocean systems, have recently been the focus of many marine ecosystem studies. These ‘regime shifts’ effects the sea surface temperature and mixed layer depth (MLD), changing the environment for marine ecosystems. We simulated changes in the marine ecosystem caused by interdecadal climate variability, using data from 1948 to 2002 to drive a global three-dimensional physical-biological coupled model, ‘3D-NEMURO’.

The results were consistent with observations. Comparing before and after the late 1970s regime shift, primary production and biomass of phytoplankton increased in the North Central Pacific but decreased in the sub-tropical Western and Eastern Northern Pacific. This corresponds to the Pacific Decadal Oscillation index (PDO) that indicates interdecadal climate variability in the sub-tropical and tropical pacific. In the North central Pacific biomass correlates positively with PDO, while that in the East and West North Pacific correlates negatively with PDO.