

Four years on: Insights on forecasting a fish stock decline

Juan P. Zwolinski and David A. Demer

The ocean's inertia is prone to create cyclical and persisting patterns in meso- and macro-scale conditions that are measured in scales of months to years. Retrospective analysis of such patterns and their effects on marine ecosystems abound in the literature, and while they are often used to justify and comprehend past events, forward prediction of oceanic conditions to anticipate changes in fisheries productivity are rarely found. Supported by research spanning multiple decades, we observed and published in 2012 that the onset of a cold regime in the northeast Pacific was likely affecting the productivity of the Pacific sardine stock, and we further concluded that the stock was likely to decline precipitously. Four years on, the stock contracted considerably, prompting the closure of a multi-million dollar fishery off Vancouver Island. Soon after, the US sardine fisheries were closed, and the fisheries off Mexico provided the lowest yields in decades. Here, we revisit our original analyses in view of recently available observations and highlight the most foretelling indicators of the collapse. We will show that the strong environmental dependency of the sardine stock allows for short- and mid-term forecasts that can provide foresight, for tactical and strategic fisheries planning, respectively.

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Contact author: Juan P. Zwolinski, Institute of Marine Sciences, University of California, Santa Cruz, jzwolins@ucsc.edu, +1 858 545 5654