

# Widely used marine seismic survey air gun operations negatively impact zooplankton

. 2017 Jun 22;1(7):195.

doi: 10.1038/s41559-017-0195.

[Robert D McCauley](#)<sup>1</sup>, [Ryan D Day](#)<sup>2</sup>, [Kerrie M Swadling](#)<sup>3</sup>, [Quinn P Fitzgibbon](#)<sup>2</sup>, [Reg A Watson](#)<sup>2</sup>, [Jayson M Semmens](#)<sup>2</sup>

Affiliations

PMID: **28812592**

DOI: [10.1038/s41559-017-0195](https://doi.org/10.1038/s41559-017-0195)

## Abstract

Zooplankton underpin the health and productivity of global marine ecosystems. Here we present evidence that suggests seismic surveys cause significant mortality to zooplankton populations. Seismic surveys are used extensively to explore for petroleum resources using intense, low-frequency, acoustic impulse signals. Experimental air gun signal exposure decreased zooplankton abundance when compared with controls, as

measured by sonar (~3-4 dB drop within 15-30 min) and net tows (median 64% decrease within 1 h), and caused a two- to threefold increase in dead adult and larval zooplankton. Impacts were observed out to the maximum 1.2 km range sampled, which was more than two orders of magnitude greater than the previously assumed impact range of 10 m. Although no adult krill were present, all larval krill were killed after air gun passage. There is a significant and unacknowledged potential for ocean ecosystem function and productivity to be negatively impacted by present seismic technology.