



## Bleaching, energetics, and coral mortality risk: Effects of temperature, light, and sediment regime

Anthony, Kenneth R. N., Sean R. Connolly, Ove Hoegh-Guldberg

Limnol. Oceanogr., 52(2), 2007, 716-726 | DOI: 10.4319/lo.2007.52.2.0716

**ABSTRACT:** The most severe outcome of coral bleaching is colony mortality. However, the risk of mortality is one of the least understood consequences for reef corals under climate-change scenarios. Specifically, links among combinations of temperature anomalies, varying solar irradiance, reduced water quality, and mortality risks are unclear. Here, we analyze the effects of high temperature, irradiance, and sediment loading on coral survivorship in a controlled tank experiment using *Acropora intermedia* from the inner Great Barrier Reef lagoon. Survival analyses based on the fate of 1600 subcolonies revealed that temperature and sediment exerted strong effects on coral mortality risk. As expected, high temperature increased mortality risk at all light and sediment levels. However, high sediment reduced mortality under high temperature and/or high light, potentially by alleviating light pressure and by providing an alternative food source for bleached corals. A survivorship model using coral energy status (lipid stores) as a predictor variable provided an excellent fit to the data, suggesting that much of the variation in survivorship among treatments and over time can be explained by colony energetics. Our study provides a new framework for predicting coral mortality risk under complex bleaching scenarios in which multiple environmental variables are involved.

### Article Links

[Download Full-text PDF](#)

[Return to Table of Contents](#)

### Please Note

Articles in L&O appear in PDF format. Open access articles may be freely downloaded by anyone. Other articles are available for download to subscribers only, or may be purchased for \$10 per article. All L&O articles are moved into Open Access after three years.

