

Abstract Submitted
for the DFD05 Meeting of
The American Physical Society

Modeling Reef Hydrodynamics to Predict Coral Bleaching

JAMES BIRD, Harvard University, CRAIG STEINBERG, Australian Institute of Marine Science, TOM HARDY, Australian Maritime College — The aim of this study is to use environmental physics to predict water temperatures around and within coral reefs. Anomalously warm water is the leading cause for mass coral bleaching; thus a clearer understanding of the oceanographic mechanisms that control reef water temperatures will enable better reef management. In March 1998 a major coral bleaching event occurred at Scott Reef, a 40 km-wide lagoon 300 km off the northwest coast of Australia. Meteorological and coral cover observations were collected before, during, and after the event. In this study, two hydrodynamic models are applied to Scott Reef and validated against oceanographic data collected between March and June 2003. The models are then used to hindcast the reef hydrodynamics that led up to the 1998 bleaching event. Results show a positive correlation between poorly mixed regions and bleaching severity.

Howard Stone
Harvard University

Date submitted: 12 Aug 2005

Electronic form version 1.4