Reef degradation and coral biodiversity in indonesia: Effects of land-based pollution, destructive fishing practices and changes over time

Evan N. Edinger[a, b], Jamaluddin Jompad[c], Gino V. Limmone[a], Wisnu Widjatmoko[f] and Michael J. Risk[c, a]

a School of Geography and Geology, McMaster University, Hamilton, Ontario, Canada L8S 4M1
b Environmental Studies Centre, Research Institute, Diponegoro University, Semarang, Indonesia
c Biology Department, McMaster University, Hamilton, Canada
d Faculty of Fisheries and Marine Science, Hasanuddin University, Ujung Pandang, Indonesia
e Faculty of Fisheries and Marine Science, Pattimura University, Ambon, Indonesia
f Faculty of Fisheries and Marine Science, Diponegoro University, Semarang, Indonesia

Abstract

Species-area curves calculated from line-intercept transect surveys on 15 reefs in three regions of Indonesia allow estimation of the relative decrease in within-habitat coral species diversity associated with different types of reef degradation. Reefs subject to land-based pollution (sewage, sedimentation, and/or industrial pollution) show 30–50% reduced diversity at 3 m, and 40–60% reduced diversity at 10 m depth relative to unpolluted comparison reefs in each region. Bombed or anchor damaged reefs are ca 50% less diverse in shallow water (3 m depth) than are undamaged reefs in the same region, but at 10 m depth the relative decrease is only 10%. Comparison reefs in the Java Sea are ca 20% less diverse than their counterparts in Ambon, Maluku. The results, compared with a previous survey in the Spermonde Archipelago found a 25% decrease in generic diversity of corals on two reefs resampled after 15 years. The decreased diversity on reefs subject to land-based pollution implies a dramatic, rapid decrease in Indonesian reef-based fisheries resources.

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