

Illegal destruction of coral reefs worsened impact of tsunami

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The illegal mining of corals off the southwest coast of Sri Lanka permitted far more onshore destruction from the 26 December 2004 tsunami than occurred in nearby areas whose coral reefs were intact. This is the principal finding of a team of researchers from the United States and Sri Lanka who studied the area earlier this year.

Their report is published in the 16 August issue of Eos, the newspaper of the American Geophysical Union.

Some of the differences were startling. Lead author Harindra Fernando of Arizona State University reports that in the town of Peraliya, a wave of 10-meter [30-foot] height swept 1.5 kilometers [one mile] inland, carrying a passenger train about 50 meters [200 feet] off its tracks, with a death toll of 1,700. Yet, a mere three kilometers [two miles] south, in Hikkaduwa, the tsunami measured just 2-3 meters [7-10 feet] in height, traveled only 50 meters [200 feet] inland, and caused no deaths.

The researchers found that this pattern of patchy inundation to be characteristic of the study area and was not related to such coastline features as headlands, bays, and river channels. Rather, the key factor was the presence or absence of coral and rock reefs offshore. At Hikkaduwa, the hotel strip is fronted by a rock reef and further protected by coral reefs that the local hoteliers protect and nurture, the researchers report. Relatively little damage and few deaths were recorded from there to Dodanduwa, around six kilometers to the south.

From Hikkaduwa north to Akuralla, however, damage and loss of life

was extensive. Local residents, interviewed by the authors, say that coral reefs in that area had been decimated by illegal mining, especially by use of explosives that result in harvests of both coral and fish.

Some eyewitnesses to the tsunami described a visible reduction in the height of the water wall and its deflection parallel with the shore as it approached the coral reef. The researchers conclude that waves that had been blocked by the reef caused even more inundation and damage where they found low resistance gaps due to removal of coral by humans.

The scientists note that the brunt of the tsunami had hit Sri Lanka's eastern shore, but that the southwestern, or leeward, side had also been hit hard. Their analysis of the available data concludes that two or three waves hit the area within an hour, having been channeled and bent around the southern tip of the island, and that another wave struck around two hours later, having bounced back after hitting India or the Maldives. They say that existing computer models cannot adequately explain or predict the wave amplitudes in southwest Sri Lanka, likely due to small scale ocean processes, including topographic variations due to coral removal, that are not yet well understood.

The authors note that low-lying Maldives islands directly in the path of the tsunami escaped destruction. They suggest that this may have been due to the presence of healthy coral reefs surrounding the islands. Apparently, in Sri Lanka, very little healthy coral was damaged by the tsunami.

Source: American Geophysical Union

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