



SCIENCE OF TSUNAMI HAZARDS

The International Journal of The Tsunami Society

Volume 23 Number 2

Published Electronically

2005

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THE TSUNAMI SOCIETY
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OCEAN-WIDE TSUNAMIS, MAGNITUDE THRESHOLDS, AND 1946 TYPE EVENTS

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SUMMARY

An analysis of magnitudes and runups in Hawaii for more than 200 tsunamigenic earthquakes along the margins of the Pacific reveals that all of the earthquakes with moment magnitudes of 8.6 or greater produced significant Pacific-wide tsunamis. Such findings can be used as a basis for early warnings of significant ocean-wide tsunamis as a supplement to, or in the absence of, more comprehensive data from other sources. Additional analysis of magnitude and runup data suggests that 1946 type earthquakes and tsunamis may be more common than previously believed.

EFFECTS OF MEDU AND COASTAL TOPOGRAPHY ON THE DAMAGE PATTERN DURING THE RECENT INDIAN OCEAN TSUNAMI ALONG THE COAST OF TAMILNADU

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ABSTRACT

Effects of Medu (naturally elevated landmass very close to the seashore and elongated parallel to the coast) and coastal topography on the damage pattern during the deadliest Indian Ocean tsunami of December 26, 2004 is reported. The tsunami caused severe damage and claimed many victims in the coastal areas of eleven countries bordering the Indian Ocean. The damage survey revealed large variation in damage along the coastal region of Tamilnadu (India).

The most severe damage was observed in the Nagapattinam district on the east coast and the west coast of Kanyakumari district. Decrease of damage from Nagapattinam to Kanchipuram district was observed. Intense damage again appeared to the north of Adyar River (from Srinivaspuri to Anna Samadhi Park). Almost, no damage was observed along the coast of Thanjavur, Pudukkottai and Ramnathpuram districts in Palk Strait, situated in the shadow zone of Sri Lanka.

It was concluded that the width of continental shelf has played a major role in the pattern of tsunami damage. It was inferred that the width of the continental shelf and the interference of reflected waves from Sri Lanka and Maldives Islands with direct waves and receding waves was responsible for intense damage in Nagapattinam and Kanyakumari districts, respectively. During the damage survey authors also noted that there was almost no damage or much lesser damage to houses situated on or behind the Medu. Many people observed the first arrival. The largest tsunami amplitude occurred as the first arrival on the eastern coast and in the second arrival on the western coast.

KEY WORDS

Indian Ocean tsunami, effects of Medu and costal topography, damage pattern along the coast of Tamilnadu (INDIA).

2004 INDIAN OCEAN TSUNAMI ON THE MALDIVES ISLANDS: INITIAL OBSERVATIONS

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ABSTRACT

Post-tsunami field surveys of the Maldives Islands were carried out to document the effects of the tsunami inundation. The study area was situated in the islands of South Male Atoll that were some of the most heavily damaged islands of the Maldives Islands. The tsunami damaged the natural environment, vegetation, man-made structures, and residents. The maximum tsunami wave height was 3-4 m. This level of inundation exceeded the height of most residents. The wave height was greatest on the eastern rim of the South Male Atoll (closest to the tsunami source) and these islands were completely flooded. The islands within the interior of the atoll saw the lowest wave heights, and these were only marginally flooded.

Surveys of flood lines left on the exterior and interior of structures were measured but proved to be substantially less than that reported by survivors. It appears that the highest inundation was not preserved as flood lines. We suggest that the turbulence associated with the tsunami inundation erased the highest lines or that they did not form due to an absence of debris and organic compounds that acted as adhesion during the initial flooding.

Significant erosion was documented. Deposition took place in the form of sand sheets while only desultory deposition of coral clasts in marginal areas was found. Seasonal erosion, and storms are likely to remove most or all of the traces of the tsunami within these islands.