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tsunami hazards for Eastern coastal regions of India and Sri Lanka: a predictive approach to risk mitigation

The method of tsunami splitting is applied to analyse tsunami hazards along the eastern Indian coastal regions, specifically the states of West Bengal, Odisha, Andhra Pradesh, Tamil Nadu, the Andaman and Nicobar Islands, as well as Sri Lanka. This approach involves segmenting the tsunami event into distinct phases—deformation, propagation, and inundation—and simulating each phase using Finite Difference Models. For this, coastal areas divide into high-resolution grids for detailed analysis, providing forecasts of maximum wave heights and inundation extents for both realistic and worst-case scenarios. The analysis includes 45 high-resolution grids (with resolutions finer than 1 arcsecond) for the Eastern Indian Coast, 13 grids for the Andaman and Nicobar Islands, and 17 grids for Sri Lanka. The forecast anticipates potential maximum wave heights and inundation levels, revealing that Tamil Nadu could experience waves reaching up to 5.5 m with velocities of up to 20 km/h. The Andaman & Nicobar Islands may see wave heights as high as 15.5 m, with speeds up to 45 km/h, while Sri Lanka might encounter waves up to 11.4 m at speeds of 130 km/h. This assessment provides essential data to enhance preparedness, guide mitigation strategies and strengthen coastal resilience in vulnerable areas.

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