A year after the Indian Ocean tsunami, nations along the coast have created the framework for a regionwide warning system

Girding for the Next Killer Wave

BANGKOK—At 10:42 p.m. on Sunday, 24 July, a strong undersea earthquake rattled the Nicobar Islands, 660 kilometers west of Thailand. Minutes after the 7.3-magnitude quake struck, Thailand's National Disaster Warning Center (NDWC) swung into action. Director Plodprasop Suraswadi appeared on national television to issue the country's first-ever tsunami watch: If the quake generated a tsunami, he warned, the wave would hit the resort island of Phuket at 12:12 a.m.

The advisory, broadcast on all Thai channels, was not an evacuation order. But with memories of the devastating 26 December 2004 Indian Ocean tsunami still fresh, hundreds of people on Phuket and along the Andaman Sea coast of the Malay Peninsula grabbed what they could and fled to higher ground. A crucial piece of data came in just before midnight: Off the Similan Islands, 50 kilometers from the Andaman coast, a tide gauge measuring sea level had barely bobbed. There would be no tsunami. Suraswadi took to the airwaves to sound the all clear.

If the NDWC had been operational last year, thousands of lives might have been spared. The Indian Ocean tsunami killed 5396 people in Thailand; another 2951 people are still listed as missing. Warnings could have saved countless lives elsewhere. Some 230,000 people died in a dozen nations, including 168,000 in Indonesia's Aceh province at the tip of the island of Sumatra.

The lesson in ill-preparedness has sparked a mad dash to create a tsunami warning system for the Indian Ocean. As the first anniversary of the disaster approaches, an alarm network is beginning to emerge—a loose web of deep ocean sensors, tide gauges, and seismic stations operated by individual countries, along with mechanisms for sharing data and disseminating public warnings. Last month, for example, Indonesia, the country deemed most vulnerable to the next big Indian Ocean tsunami, deployed two sea-floor pressure sensors and associated buoys, the vanguard of a 10-sensor network. "We want to show the world that we are ready," says Jan Sopaheluwakan, deputy chair of earth sciences at the Indonesian Institute of Sciences in Jakarta.

By establishing warning centers, Thailand and other countries have begun to fill a lethal void. They will issue tsunami advisories more often, and in most instances the resulting wave will be puny or nonexistent—ratcheting up anxiety and prompting people to flee the seaside needlessly. "People are going to have to be understanding about this," says NDWC's Cherdsak Virapat, director of Thailand's International Ocean Institute in Bangkok.

Big heave. The 26 December 2004 quake exposed coral off Simeulue Island in Aceh province. Dudi Prayudi of the Indonesian Institute of Sciences and Aron Meltzner of Caltech measure the uplift at 1.2 meters.

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Asleep at the wheel

The Indian Ocean tsunami last December caught governments woefully off-guard. The trigger was a monster earthquake at a magnitude of 9.3, centered west of Aceh, on the northwestern tip of Sumatra. The quake struck at 7:59 a.m. Indonesia time, and within 40 minutes a wave, the first of three destructive moving mounds of seawater, had inundated the city of Banda Aceh. Nearly 2 hours after the earthquake, the first wave barreled into Phuket and neighboring seaside provinces of Thailand. It was a Sunday morning; most government offices were closed. Staff in a meteorological office in northern Thailand saw the seismic report but had no idea that a tsunami might be imminent, says Virapat. "Every year, someone would ask, 'What should we do if there is a tsunami?' " The possibility seemed remote, he says.

Minutes later, the Nicobar Islands, including an Indian Air Force base at Car Nicobar, were pummeled. It took another 90 minutes for the tsunami to travel across the Bay of Bengal. But no one sounded the alarm, and the waves claimed 15,000 in India and 31,000 in Sri Lanka.

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