M9.0 Sumatra - Andaman Islands Earthquake of 26 December 2004

The devastating earthquake of 26 December 2004 occurred in the Indian Ocean, as shown in the map below, and led to a series of destructive tsunamis. The earthquake was a result of the convergence of the India and Australia plates with respect to the interior of the Eurasia plate. The 26 December earthquake caused widespread damage and loss of life throughout Southeast Asia.

The earthquake's magnitude was 9.1, making it one of the most powerful earthquakes recorded in this region. It occurred at a depth of 30 km. The epicenter was located near the coast of Sumatra, Indonesia, at coordinates 3.295° N., 95.982° E.

The earthquake and subsequent tsunamis caused significant destruction and loss of life. At least 228,448 people were killed by the earthquake and tsunami, with the highest number of deaths occurring in Indonesia, where 127,000 people died. Tsunamis killed at least 30,959 people in Sri Lanka, 10,749 in Thailand, and 529 in India.

The earthquake caused widespread destruction, with buildings collapsed and infrastructure damaged. In India, 5,388 people were killed, 15,000 were injured, and 100,000 homes were destroyed. In Thailand, 4,200 were killed, 22,000 were injured, and 100,000 homes were destroyed. In Sri Lanka, 3,000 were killed, 5,000 were injured, and 60,000 homes were destroyed.

In a broad sense, the India and Australian plates move toward the interior of the Eurasia plate. The accumulated stress for centuries from ongoing subduction of the India plate under the Eurasia plate has caused this convergence, which is expressed as plate motion of about 60 mm/year in the region of the earthquake.

The earthquake is partitioned into thrust-faulting, which occurs on the interface between the India and Burma microplates, and into strike-slip faulting, which occurs on the eastern boundary of the Cocos Basin. Both forms of faulting are expressed through a subduction zone that bends to the northward (11° dip) and continues northward beneath India, with an average dip of 15°.

This earthquake and tsunami are one of the most significant disasters in modern history, with significant long-term effects on the region's economy and infrastructure. The disaster has led to increased efforts in disaster preparedness and mitigation, including improved early warning systems and emergency management strategies.