

CH 3 - TSUNAMIS (pp. 72 - 95)

1. The Indonesian Tsunami of December 26, 2004, killed about _____ people, injured _____, and displaced _____ of people over dozens of countries.
2. This tsunami occurred in the _____ Ocean and was caused by the largest earthquake on Earth in the last _____ decades.
3. There was no _____ in place at all.
4. The earthquake was triggered by a huge motion of the sea floor along a _____ zone, involving shifts of about _____ m horizontally, and _____ meters vertically, along a _____ km section of the sea floor.
5. Warnings could have saved tens of thousands, since the tsunami took _____ hours to reach some areas.
6. Many did not know how to _____ that a tsunami was approaching, nor _____ if one occurred. Some were _____ by the approaching waves; others ran in _____.
7. In Thailand, a British girl saved _____ people by warning that a tsunami was approaching. She noticed the sea _____, which often occurs just before a tsunami. In Thailand, elephants saved people on their backs by racing to _____, apparently because of a sensitivity to _____ sound or vibration.
8. Tsunamis seldom produce one _____, but in fact are a _____ of waves, with later ones _____ than earlier ones.
- 3.1 9. Tsunamis are produced by the sudden _____ displacement of water during _____, underwater _____.

submarine volcanic _____ or extraterrestrial _____.

The most common cause is _____.

10. Earthquakes can trigger a tsunami when:

1) water is pushed _____ by the motion of the sea floor;

2) the tsunami moves rapidly, at speeds up to _____ km/hr, with spacing between waves of _____ km and wave heights of _____ m. This is why sailors often do not _____ tsunamis passing beneath them.

3) As the tsunami approaches land, it slows to ~ _____ km/hr, still too fast to _____, but is pushed _____ by the sea bed, increasing the wave _____.

4) The _____ of the wave may arrive first, exposing the _____.
But when the tsunami makes landfall, it _____ everything in its path.
It arrives not as a giant breaking wave, but as a sudden rise in _____.

11. The movement inland is called the _____ of the wave, and is defined as the furthest horizontal and vertical _____ of the _____ wave.

12. After runup, the water _____ to the sea in a _____ flow.

13. The second or third tsunami can be _____ than the first, and the waves can arrive over a period of _____ hours.

14. Tsunamis are especially problematic for low-lying nations such as the Maldives, where the highest point in the country is only _____ m. above sea level.

15. A famous landslide-induced giant wave occurred in Alaska in 1958, when an earthquake caused a _____ of rock into a bay. The displaced water rose _____ m above normal, picked up a _____ and carried it over a spit of land, above the tree tops, out into the sea.

3.2 16. Regions at greatest risk are those located around _____.

17. Pacific Ocean regions of high risk include the Pacific _____ in the U.S.,

_____ South America, and the coasts of _____.

18. The Global Tsunami Hazard Map is based on risk of a _____ m runup. It is only a generalization because runup varies considerably with offshore and shoreline _____.

3.3 19. The primary effect of tsunamis include flooding and _____, tearing up beaches, _____, homes and _____.

20. Secondary effects can occur _____ later, and include _____, polluted _____ supplies, rotting _____ carcasses and plants, and _____ outbreaks.

21. The huge volumes of natural and human-made debris left behind can make it difficult for rescue workers to _____.

22. Linkages with other natural hazards include earthquakes, _____, _____ explosions, and impacts of _____.

23. Erosion and _____ of a coast can cause it to scarcely _____ what it once was.

3.5 24. Humans cannot _____, _____ or _____ tsunamis, but we can reduce the damage from future events by taking such measures as planting _____ of trees.

3.6 25. We have a successful tsunami warning system in the _____ Ocean.

26. Such a warning system has three parts: a network of _____, automated _____, and a network of _____ connected to _____.

27. Surface buoys with a bottom sensor called a _____, detect small changes in _____ from a _____ passing overhead. This data is relayed by _____ to a warning center.

28. For local tsunami that strike land rapidly after an earthquake near shore, there may be lit-

tle _____ time. If these people feel an earthquake, they should _____ immediately.

29. Even tsunamis _____ m high have such power that houses and small buildings cannot withstand their impact. But larger structures can be _____ to reduce or minimize the damage. Unfortunately, in most areas current _____ are not adequate.

30. Following a tsunami, it is important to produce _____ maps.

31. These maps can show the area that is likely to be _____ by a given _____ of tsunami.

32. In the 2004 Indonesian tsunami, some villages were spared destruction by coastal _____ or rows of _____.

33. Studies show advantages to locating villages behind a _____.

34. Risk from tsunami can be defined as the product of the _____ of an event occurring and the _____ should it occur.

35. Education can inform people to recognize that earthquakes and _____ seawater are warning signs, that a tsunami _____ indicates an earthquake has occurred, and a tsunami _____ means an actual tsunami has been _____. People also need to know to move to _____, and that tsunamis come in _____ over several hours.

36. Community preparedness means a community should: 1) establish an _____ with 24-hour capability, 2) have ways to receive _____, 3) have ways to _____, 4) develop a preparedness plan with emergency _____, 5) promote an awareness program to _____ the public.

3.7 37. If you can see the wave, you are _____.