



Wave Propagation Details

- Figure 5-4 (pg 103) from the book shows water level in Hilo Bay shortly before and during the tsunamis
- Figure 5-30 (pg 117) shows the approximate time-'till-arrival numbers for Hawaii for a Chilean and Alaskan quake
- Hilo had 15 hours warning before the waves arrived
- Small reported wave heights in Tahiti resulted in complacency in the general populace

Historical Hilo Tsunami

- Hit by damaging tsunami in: 1837, 1841, 1868 (twice), 1869, 1872, 1877, 1883, 1906, 1918, 1923, 1933, 1946, 1957, 1960, 1975
- All but three of the above were caused by distant earthquakes
- There have been 15 additional non-damaging tsunami in the above time-frame at Hilo
- (0 tsunami in the last 30 years)

Hilo Layout

- The shape of the Big Island and Hilo Bay itself means that tsunamis coming from any direction in the Pacific are refracted directly into Hilo



Source of the Tsunami

- Largest earthquake ever recorded struck Chile May 22, 1960 (9.5 Richter scale magnitude)
- 1,000 km break along subduction zone
- Coastal mountains dropped 2m and offshore islands were raised by up to 6m
- Approximately 2000 Chileans were killed by the earthquake and resulting tsunami
- After striking Hawaii, the tsunami went on to kill 185 people in Honshu, Japan

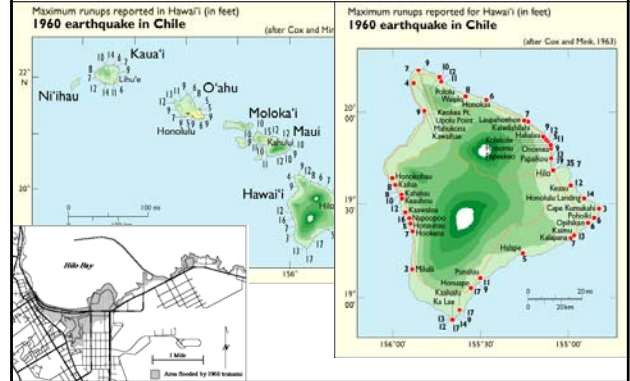
Hilo Layout cont...



Hilo Layout cont...



The Tsunami in Hilo Bay cont...



Hilo Layout cont...



Images from the 1960 tsunami

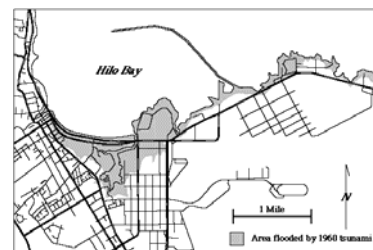


The Tsunami in Hilo Bay

- Warning sirens sound at 8:30pm
- 9pm news reports that Tahiti only saw waves approximately 3ft high
- The first wave, at about 12:15am is only a little over 3ft high
- People begin returning after the first wave
- Second wave arrives at 12:45 and is about 9ft tall
- Thinking the tsunami was over, many people return to inspect damage caused by the second wave
- At 1:08am, the third and largest swell of the tsunami breaks, at a height of 14 ft
- 61 people are killed and 282 people were severely injured

Devastation

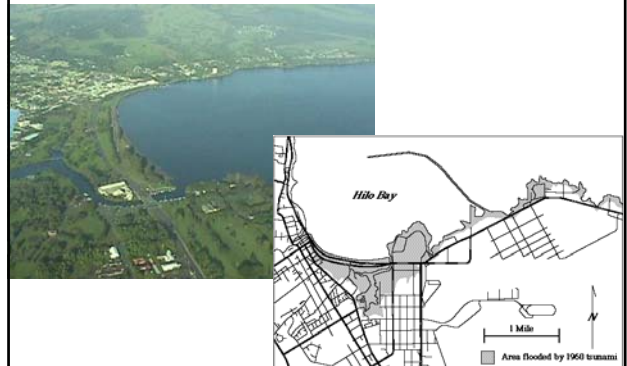
- 541 homes and businesses destroyed
- Damages total \$23 million



Changing the Scope of the Disaster

- In 1960, complacency, ignorance, and idiocy combined to make the casualty list unnecessarily large
 - News reports beforehand gave the impression that the incoming waves would be very small (they did not take into account the refractory nature of Hilo Bay or the large reefs outside Tahiti)
 - Tourists *flocked* to the beachfront so they could see the tsunami up close
 - Most people were unaware that tsunami involve more than a single wave (ie, they returned home after the small first wave)

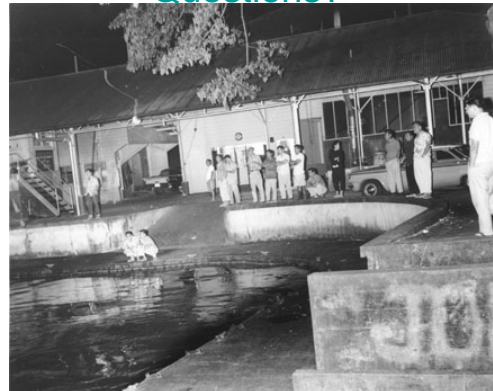
Hilo Today cont...



Hilo Today

- Most susceptible areas now a beautiful park
- Effective warning system with sirens located throughout the city (in addition to all other susceptible parts of the Islands)
- Effective law enforcement plans, including police roadblocks
- Inundation maps and evacuation instructions placed inside phonebooks for all residents
- People are warned by TV, radio, and large sirens next to their houses

Questions?



Evacuation Maps

- These maps can be found inside any Hilo phonebook

