

Potential tsunami hazard for upper Cook Inlet (UCI)—Study Summary

Until now, there has been no thorough study of tsunami potential in upper Cook Inlet (UCI)

- The new study was conducted under NOAA's National Tsunami Hazard Mitigation Program (NTHMP). Partners include the Alaska Earthquake Center (AEC), the Alaska Division of Geological & Geophysical Surveys (DGGs), and the Alaska Division of Homeland Security & Emergency Management (DHS&EM).
- The final Report of Investigation has been peer reviewed by independent experts and is available via DGGs, along with poster-sized PDF map sheets, GIS data, and additional multimedia resources, at doi.org/10.14509/31018. The interactive online maps are available at tsunami.alaska.edu.

New results explain why the 1964 Great Alaska Earthquake tsunami went undetected in UCI, leading to the misconception that the Anchorage area is immune to tsunamis

- UCI has one of the largest tidal ranges in the U.S., with a mean daily tide range of ~8 m (~26 ft). The average difference between highest and lowest tide of the year is ~12 m (~40 ft).
- We simulate the magnitude 9.2 1964 Great Alaska Earthquake and tsunami in combination with the recorded tide swings of late March, 1964.
- The 1964 tsunami was 3 m (10 ft) and reached Anchorage around 2 am, approximately 8.5 hours after the earthquake. However, low tide near Anchorage occurred at 12:51 am, only an hour before the tsunami arrival, so the impacts were minimal and the highest wave went unnoticed in the middle of the night.

New results indicate a rare, but real, tsunami hazard in low-lying areas around UCI

- A rare combination of earthquake magnitude, location, and timing must be satisfied for tsunami wave energy to reach UCI coincident with a natural high tide.
- Maximum predicted overland flow depths in UCI reach ~10 m (~33 ft) for the lowest-lying tidal areas at the coast approximately 4.5 hours after the earthquake. The worst inundation in developed areas is near river mouths and water bodies that flow directly into the ocean. Wave currents could be as strong as 4 meters per second (7.8 knots).
- Water levels may remain elevated above normal high tide for several hours at a time. Dangerous waves and currents could persist in Upper Cook Inlet for up to 72 hours, during which time the sea could repeatedly advance and recede. The first wave may not be the largest.
- Tsunami hazard in UCI is limited to low-lying areas adjacent to the coast and most Anchorage residents are not at risk from tsunami inundation. Potential inundation zones can still be used safely because there will be hours of warning before a tectonic tsunami would reach UCI.
- Because earthquake-triggered landslides could cause a tsunami, if you are near the coast and feel strong shaking (that lasts more than 20 seconds or makes it difficult to stand), immediately seek higher ground.

More information can be found at tsunami.gov, tsunami.alaska.edu, and ready.alaska.gov or contact:

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