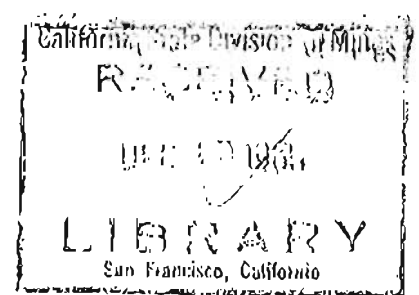


State of Alaska
Department of Natural Resources
DIVISION OF MINES & MINERALS
Box 1391, Juneau, Alaska 99801

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THE GREAT ALASKA EARTHQUAKE, MARCH 27, 1964

Late in the afternoon on Good Friday, March 27, 1964, one of the largest earthquakes ever witnessed by modern man occurred in Alaska. This great earthshock and resultant landslides and tsunami (seismic sea waves) wrought devastation in many of the cities and towns of south central Alaska, killing 114 persons and causing an estimated \$750,000,000 in property damage.

Earthquakes are natural and recurring geologic phenomena resulting from movement along faults in the earth's crust. Although earthquakes occur the world over, they are more frequent in zones of active mountain building, such as the zone around the Pacific Ocean along which a major part of the State of Alaska lies. In response to forces deep within the earth, the rocks in these active zones are under constant stress and are slowly being warped and folded. Should the stress exceed the strength of the rocks, the rocks instead of bending, break suddenly along a fault surface and an earthquake is generated. The Great Alaska Earthquake was only the culmination of a long period of increasing stress beginning many years ago deep beneath the waters of Prince William Sound.

The following preliminary data on the Great Alaska Earthquake have been made available by various seismograph stations throughout the United States:

Origin time: 5:36:14 PM, Alaska Standard Time, March 27, 1964

Epicenter ^{1/}: Near College Fiord along north shore of Prince William Sound (61.0° N. Lat., 147.7° W. Long.)

Depth: Approximately 20 miles

Magnitude ^{2/}: 8.4 to 8.6

The earthquake was felt throughout half the State of Alaska and at least as far southeast as Seattle, Washington, an area of more than 1,000,000 square miles. In Anchorage and other towns near the epicenter, exceedingly

^{1/}Epicenter: Point on the earth's surface directly above the break or earthquake focus.

^{2/}Magnitude: Measure of energy released by earthquake. Scale is logarithmic, hence a magnitude 8 earthquake is relatively 10 times stronger than a magnitude 7 earthquake.

strong ground motion continued from 1 to 4 minutes.

No evidence of the fault, along which the break and earthquake occurred, has been observed at the earth's surface. Presumably the fault is sloping and intersects the surface under the waters of Prince William Sound south of the epicenter. The distribution of the epicenters of the hundreds of aftershocks which followed the major earthquake also indicate that the surface trace of the fault is submarine and describes an arcuate path extending from the mouth of Prince William Sound to south of Kodiak Island.

Principal damage in Alaska was caused by the landslides and tsunami triggered or generated by the earthquake. Lesser damage is attributable to the actual strong rolling ground motion of the earthquake shear waves.

In Anchorage, Alaska's largest city, landslide movement devastated large sections of the downtown business and suburban residential districts. All the slides occurred in glacial sediments along steep bluffs facing Knik Arm and the streams flowing into Knik Arm. The slides moved mainly laterally with little or no vertical movement or rotation. The plane along which the slides moved is apparently a nearly liquid, water-saturated layer in the Bootlegger Cove Clay which lies at shallow depths under much of the City of Anchorage. The largest of the Anchorage slides in the exclusive Turnagain residential district moved more than 200 acres of ground including over 100 homes as far as 500 feet out into Knik Arm. The slides in downtown Anchorage moved a maximum of about 15 feet, and damage was restricted to the narrow pull-away trough at the head of the slides and the buckled compression ridges along the toe.

South of Anchorage landslides and rock slides did considerable damage to the Alaska Railroad between Anchorage and Seward and the Anchorage-Seward Highway. In the seaport towns of Seward and Valdez large submarine landslides and the local large waves generated by them destroyed much of the commercial waterfront districts. At Homer a small submarine landslide caused the disappearance of the small boat harbor, and at Whittier a disturbance of unknown origin in the bay damaged dock facilities.

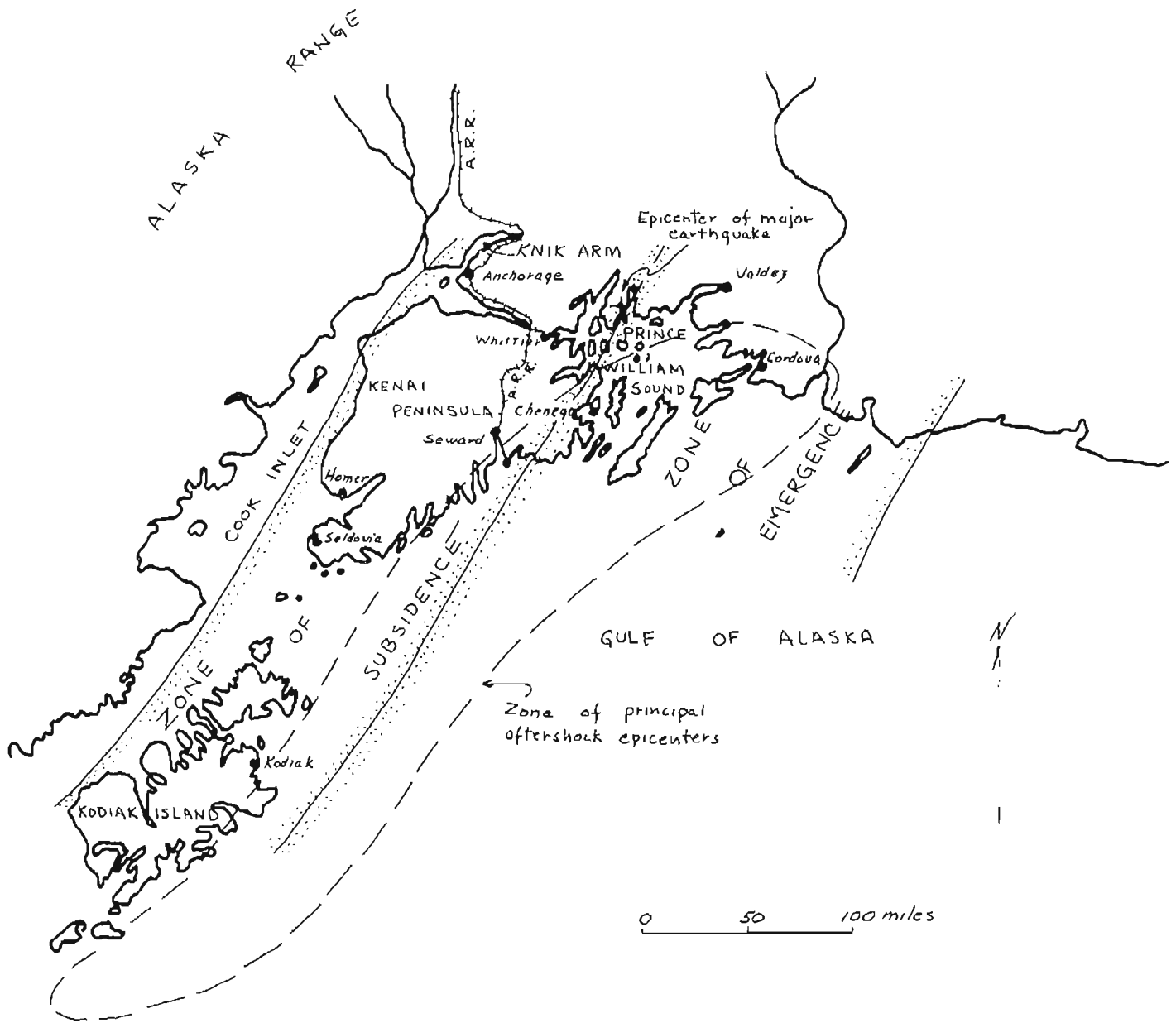
Tsunamis, commonly but incorrectly called tidal waves, are long-period water waves generated by the submarine displacement of a large volume of water. The tsunami formed by the Great Alaska Earthquake was principally responsible for the heavy death toll. Hardest hit were the towns of Whittier, Chenega, Seward, and Kodiak. At Chenega, where 27 people were killed, the largest wave was reported to be 90 feet high. The tsunami also damaged Valdez and other towns in Prince William Sound and towns along Cook Inlet. Outside of Alaska the tsunami still contained destructive energy as far distant as Crescent City, California and Hilo, Hawaii.

The strong ground motion of the earthquake severely damaged many

structures, railroad beds, highways and bridges throughout the epicentral region. Tall office and apartment buildings in Anchorage were subjected to strong swaying with resultant structural damage. Poorly constructed buildings and many buildings in the process of construction were destroyed.

Regionally, a large area of Alaska has subsided and a smaller area elevated as a result of the earthquake. The land from Anchorage southwest to Kodiak Island and including most of the Kenai Peninsula has subsided as much as 6 feet. East of this zone, including much of the Prince William Sound area, the land has risen as much as 10 feet. Low-lying towns and many miles of highway and railbed have been covered by high tides in the subsidence area.

The Great Alaska Earthquake is awesome testimony to the powerful forces bound within the earth. Unleashed, these forces have brought death to scores of people and devastation to their cities. However, these phenomena are the consequence of natural geologic process which will continue to reshape the earth in the future. We cannot hide from or prevent these powerful forces, but can learn from experiences such as this to minimize the danger by taking proper precautions in the location and construction of our communities.



Map of south central Alaska showing some of the regional effects of the Great Alaska earthquake and localities mentioned in text.