

Alaska earthquake



**ASSIGN
BUSTER**

On March 27, 1964 the most powerful earthquake recorded in North America struck in the heart of Prince William Sound at 5: 36pm. Buildings fell and entire towns were washed away by the tsunami that followed in the aftermath of the powerful earthquake. However, considering the sheer magnitude of the earthquake, Alaska suffered minimal damage to its residents and economy for a number of reasons. On the contrary, the Alaskan economy temporarily prospered from the '64 earthquake by receiving additional federal support and funding in a time when military presence was declining, unemployment was growing, and before the drilling of oil in Prudhoe Bay. " I recall during one tremor, the ground under the driveway opened up and we watched the big Plymouth slide slowly backward into the crevasse. Then the ground shifted again, noisily crushing the car as the crevasse closed." Julie Persons account of the ' Great Earthquake of '64' is one of many devastating reminders of the tragedy that occurred on the Good Friday over forty years ago. However, casualties were significantly low for such a powerful disaster, both physically and economically. The purpose of this paper is to provide a general overview of the 1964 Alaskan earthquake and describe the economic effects that followed. The extensive geological disruption and strength has caused the '64 earthquake to become one of the most studied earthquakes in history. However, the continual research being conducted has lead to a wide array of contradictory information. Because no seismic instruments capable of recording strong ground motions were in Alaska before the earthquake, most measurements were calculated from tele-seismic records. According to a book sanctioned by the Committee on the Alaska Earthquake of the Division of Earth Sciences National Research Council in 1970, the magnitude of the '64 earthquake on <https://assignbuster.com/alaska-earthquake/>

the Richter scale ranged between 8.3 and 8.6. Although these two numbers do not appear to range significantly, the amount of energy released by an 8.6 strength earthquake is double of that released by an 8.3. Newer research has estimated the strength of the Alaskan earthquake at a 9.2 on the Moment Magnitude scale, making it the third strongest earthquake in the world and strongest in the Northern Hemisphere. More recent research in the late 1980's and 1990's has shed light on the cause of the '64 earthquake. Dr. George Pararas-Carayannis, one of the nation's foremost authorities on earthquakes and tsunamis, states " The Pacific tectonic plate movement caused the crust of southern Alaska to be compressed and warped, with some areas along the coast being depressed while other areas inland are being uplifted. At time intervals ranging from tens to hundreds of years, this compression is relieved by the sudden motions of large portions of the coastal portion of Alaska moving back in a southeastern direction over the subducting Pacific plate." In short, the Pacific plate was being pushed under the North American plate. The Epicenter, location on the earth's surface directly above focus, of the '64 earthquake is located in the northern part of the Prince William Sound; specifically 61.04° N- 147.73° W, approximately 75 miles east of Anchorage. The focus, or depth of the earthquake, is estimated at 25 miles below the epicenter. In general, the lower the earthquake occurs below the surface of the earth, the weaker it is; 25 miles is relatively close to the surface compared to most earthquakes that occur in Alaska. Another component of research modified as science improved is the total land area affected by the '64 earthquake. Early research by the National Committee on the Alaska Earthquake reported a total damage zone to be about 80,500 kilometers² and the total area felt by the earthquake to be

<https://assignbuster.com/alaska-earthquake/>

about 850, 000 kilometers². Current research states the damage area was about 130, 000 kilometers² and the total area felt by the earthquake about 1, 300, 000 kilometers². The Yukon Territory in Canada and the State of Washington both felt the effects of the '64 earthquake. One of the most notable aspects of the '64 earthquake is the duration. The lack of seismic instruments in Alaska at the time has resulted in the length of the earthquake to be estimated from a variety of personal accounts. Although most early accounts of the earthquake range from 2 to 6 minutes, recent research has concurred that the earthquake lasted about 4 minutes (240 sec.) from beginning to end. One survivor who was wintering at the Ward Cannery in Kenai estimated the duration of the earthquake at half an hour; however, this may be due to the several immense aftershocks that followed. Of the 52 large aftershocks, the first 11 rated 6. 0 or higher on the Richter scale during the first 24 hours after the main earthquake. During the next three weeks, nine earthquakes of the same magnitude followed. Thousands of smaller earthquakes pursued for a year in the same 250 kilometer area where the main earthquake took place. No other earthquake recorded has had more geologic disruption than Alaska in 1964. Vertical displacements, either uplift or subsidence, affected an area over 520, 000 kilometers². Areas near the epicenter of the earthquake uplifted permanently as much as 15 meters. Montague Island suffered an uplift of 11. 5 meters. Subsidence occurred over an area of 285, 000 kilometers², causing areas of Kodiak, most of the Kenai Peninsula, and the north and west parts of Prince William Sound to subside as much as 9 meters. A Geological Survey by Hanson and others in 1966 reported that the Native villages of Chenga, Kaguyak, Old Harbor, and Afognak were all forced to relocate because the areas in which the

villages were located subsided significantly. The '64 earthquake caused extensive structural and geological damage; however, 90% of the 131 lives lost were caused by the tsunamis that followed. Within minutes of the earthquake, 5 tsunamis were created by seafloor disruption. The first tsunami arrived in Seward about 20 minutes after the earthquake ended, causing the annihilation of 13 structures. The largest wave height recorded occurred at Soup Bay in the Valdez Inlet measuring about 67 meters (219ft). The tsunamis along with a submarine slide off the delta on which Valdez was built caused all port facilities as well as most of the other structures in the vicinity of the water to be destroyed. Thirty-two deaths occurred in Valdez as a result of the tsunami. Areas within the Prince William Sound area along with Kodiak suffered the most severe damage from the tsunami, resulting in over \$84 million dollars worth of damage. However, tsunami waves caused by the '64 earthquake reached as far south as California. The tsunami resulted in a total of 17 deaths along the California and Oregon coast and caused over \$10 million in damage. Seiches, a sloshing of a closed body of water, were reported as far away as South Africa as a result of the '64 earthquake and tsunamis. Although the geological destruction of the '64 earthquake is rated as one of the worst disasters in recorded history, resulting in over \$300 million dollars in damage, the Alaskan economy did not suffer the same fate. In contrast, the state received aid that improved the Alaskan economy slightly until the Prudhoe Bay oil boom in the late 1960' and 1970's. Dr. George Pararas-Carayannis, Director of the International Tsunami Information Center, claims a natural disaster could not have hit Alaska at a better time to limit the casualties and prolong our economic stability. Factors such as population and employment have major

impact on a state economy and statistics from the U. S. Bureau of Census and Department of Labor demonstrate an overall steady decline in the Alaskan economy before the '64 earthquake. In the 1940's and 1950's population and employment relied heavily on annual expenditures of the U. S. Department of Defense because of Alaska's strategic location during the World War II. By 1954 to 1966 the Department of Defenses annual expenditure in Alaska dropped from \$416. 9 million to \$315. 3 million. As the world threat declined so did the militaries reliance on Alaska's strategic location. Although Alaska's population continued to grow during the decline of military presence, it did so at a much lower rate in the 1960's before the '64 earthquake. The military personnel were encouraged to bring their families to the state in an effort to promote growth; therefore, when the military presence began to decline the population of Alaska did not grow at its usual rate. In 1952 through 1955 there were roughly 50, 000 military personal residing in Alaska; by 1963 the military population dropped to about 34, 000 personnel. While the military population continued to decline, the civilian population grew more dramatically after the '64 earthquake.

According to the U. S. Bureau of Census, in 1963-64 the civilian population increased by 7, 000 citizens. After the earthquake until July 1, 1965, the immigration rate of Alaska almost doubled taking in about 13, 000 new citizens. Much of this growth is due to the reconstruction efforts in Alaska after the earthquake. Employment depends heavily on how a population of a state will affect its economy. The employment statistics provided by the Department of Labor show similar trends to the population, but to a greater degree. Many aspects of employment relied heavily on government programs such as military and construction, roughly 58% of individual employed in Alaska were

based on government programs. Government based employment continued to grow at a less steady rate from 1958-1963, declining in some years, compared to employment growths from 1950-57. The statistics being reported from are not based on percentages but from total number of those employed. In 1952 the total number employed was about 112, 200 citizens, and by 1961 the number dropped to 99, 000 employed. During this time the total population of Alaska was growing, even if at lower rate than usual, and the total number of citizens employed was declining. These statistics demonstrate the decline in the Alaskan economy and prove employment's reliance on the Government and military. The employment totals in Alaska are correlated with the military decline; as the military presence declined in the state of Alaska so did the employment opportunities. At the time of the earthquake, the Alaska legislature was preparing on one of the disappointing budgets in state history. The revenue anticipation was over \$12 less than the year before and the state was short \$2. 4 million in state operations funds for the coming year starting June 30, 1964. Because employment was down, taxes were too. Alaska was in a slump, and the private sector of employment suffered much worse than the governmental. From 1950 through 1963 the civilian employment showed a steady decrease; however, civilian employment increased by 5. 3 percent in 1964 after the earthquake, especially in the construction division. In the month directly after the earthquake, construction employment grew by 85% compared to the month before the earthquake. Although the economy did not improve greatly after the '64 earthquake, it did improve slightly due to the money provided by the federal government for reconstruction. Immediately after the '64 earthquake President Lyndon B. Johnson established the Federal Reconstruction and

Development Planning Commission for Alaska (FRDPCA) on April 2. Over the reconstruction phase, ending September 1966, the FRDPCA provided Alaska with \$321 million of federal money. The federal money was used in all aspects of relief and reconstruction from income compensation to the reconstruction of buildings. The Alaskan employment total would have increased more, but due to lack of labor skill, tools, and materials, many of the resources needed to rebuild were imported from other areas. One major priority in reconstructing Alaska involved replacing the facilities and equipment used by the fishing industry. The fishing industry began to decline before the '64 earthquake but was still of major importance to the civilian economy. Fear of losing a year of fishing prompted the FRDPCA for immediate action, resulting in a replacement of boats, gear, and shore facilities before the '64 fishing season. In summary, the fishing industry was not affected by the '64 earthquake. Just as the economic boost from reconstruction was beginning to wear off two momentous events struck Alaska that would change its economy forever; discovery of the Prudhoe Bay oil field and the return of the salmon runs. In 1967, just one year after earthquake reconstruction was completed; the largest oil field in North America was discovered on mostly state and federal owned lands at Prudhoe Bay. Since its discovery the state of Alaska has taken in more than \$55 billion in revenue, not to mention the population growth and job market the oil discovery has provided. The Prudhoe Bay oil discovery led to the construction of the Alaskan Pipeline in 1973, which promoted another huge economical boost. The sell of the Prudhoe Bay leasing rights earned the state over \$900 million dollars, three times the cost of damage caused by the '64 earthquake. The oil pumped directly out of Prudhoe Bay is not the only

aspect of the discovery to promote the economy. Because of the money generated by the new found oil fields, the population grew tremendously. With more people coming to live in Alaska, the cost of shipping to Alaska was spread out over a larger population, gradually decreasing the cost of living in the State. When the 1964 earthquake struck, Alaska was on the verge of major economic boom that still sustain the state economy. However, before the '64 earthquake, Alaska was suffering its worst fiscal year since statehood due largely to a decrease in employment. The earthquake on March 27, 1964 struck Alaska at the perfect time to break the fall of a failing economy just long enough for oil to take over the state. Although many of the laborers and equipment were imported from outside the state, and increases in population would mean an increase in employment for the support services such as hotels, food industry, transportation, and retail. As the employment ratio began to grow, so did the incoming taxes. Swift actions by the federal government led to a complete recovery in the fishing industry. Even though the earthquake struck in early spring, virtually all fishing equipment was fixed or replaced by the summer season. In fact, many positive outcomes in the reconstruction of Alaska, such as funding to hold over a poor state, and fast reconstruction are the result of a fast moving federal government led by Lyndon B. Johnson. Reference List Cohen, Stan, 8. 6 the Great Alaska Earthquake (Missoula: Pictorial Histories Publishing CO., Inc.), 1996. Committee on the Alaska Earthquake of the Division of Earth Sciences National Research Council, The Great Alaska Earthquake of 1964: National Academy of Science: Washing D. C. 1970. Griffin, Joy and others, eds. Alaska earthquake 1964: Where were you?: Wizard Works. Anchorage, 1996. Leask, Linda and Mary Killorin and Stephanie Martin, " Trends in <https://assignbuster.com/alaska-earthquake/>

Alaska's People and Economy," Institute of Social and Economic Research, University of Anchorage, Alaska, October 2001, [www. uaa. alaska. edu](http://www.uaa.alaska.edu) (accessed November 10, 2005). Pararas-Carayannis, George. " The March, 27 1964, Great Alaska Earthquake," [http://www. drgeorgepc. com/Earthquake1964Alaska. html](http://www.drgeorgepc.com/Earthquake1964Alaska.html) (Accessed November 2, 2005). Rogers, George W. " Economic Effects of the Earthquake," The Great Alaska Earthquake of 1964: National Academy of Sciences: Washington D. C., 1970. Rogers, George W. " Impact of the Earthquake on the Economy of Alaska," The Great Alaska Earthquake of 1964: National Academy of Sciences: Washington D. C., 1970. Sokolowski, Thomas J. " The Great Alaskan Earthquake & Tsunami of 1964," Online journal of the West Coast & Alaska tsunami Warning Center of the National Oceanic and Atmospheric Administration, [http://wcatwc. arh. noaa. gov/64quake. htm](http://wcatwc.arh.noaa.gov/64quake.htm) (accessed November 2, 2005). The Earthquake Museum, 1964 Alaska Earthquake [www. olympus. net/personal/ gofamily/quake/famous/1964. html](http://www.olympus.net/personal/gofamily/quake/famous/1964.html) (accessed October 30, 2005).