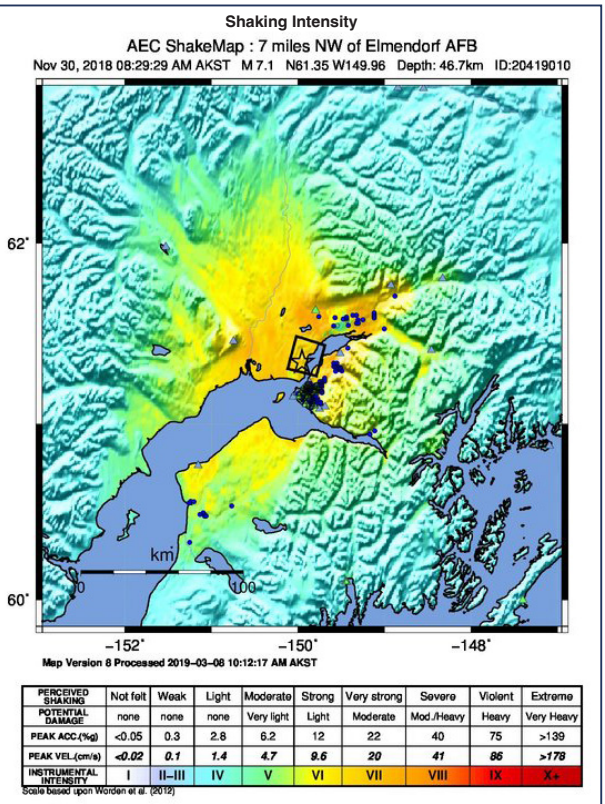
2018 M7.1 Anchorage, Alaska Earthquake

Points to Ponder



PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Mod./Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<0.05	0.3	2.8	6.2	12	22	40	75	>139
PEAK VEL.(cm/s)	<0.02	0.1	1.4	4.7	9.6	20	41	86	>178
INSTRUMENTAL INTENSITY	I	II–III	IV	V	VI	VII	VIII	IX	X+

Alaska Earthquake Center

Earthquake Facts

Date and Time:
November 30, 2018, 8:29:29 am

Magnitude:
M_W 7.1

Location:
N 61.346°, W 149.955° (7 miles north of Anchorage, 29 miles deep)

Damage:
Power outages and gas leaks; damage to roads, railroads, and buildings; closures of schools, businesses, and government offices throughout the Anchorage bowl and Mat-Su Valley

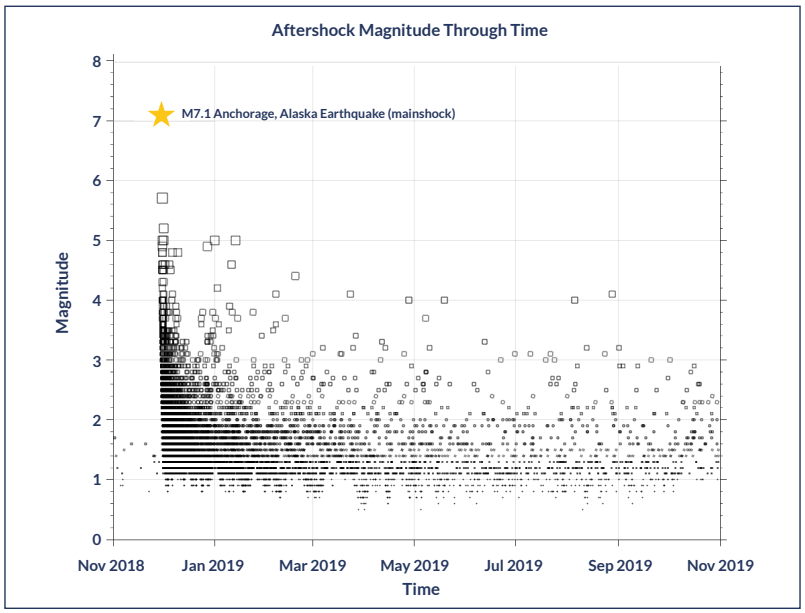
Aftershocks:
~10,500 as of November, 2019 (*right*)

Instrumentation

- The earthquake occurred under the most densely-instrumented part of the Alaska regional seismic network, including the Anchorage strong motion network—one of the most comprehensive urban networks in the US.
- Availability of real-time data ensured timely and accurate reporting of the earthquake and aftershock locations, as well as the intensity of ground shaking during the event (*left*).
- Maps of shaking intensities (*left*) were used to direct emergency responders and damage inspectors to the most heavily damaged areas in the hours and days after the main shock.
- Mainshock and aftershock data (*see below*) are being used by seismologists and engineers to improve our understanding of seismic hazards in southcentral Alaska.

Response

- The State Emergency Operation Center (SEOC) responded to reports of residential, infrastructure, and road damage with state and federal contractors trained in ATC-20 Post-Seismic Assessment.
- In the days after the event, responders quickly evaluated earthquake impacts, damages, and estimated costs and provided this information to the Disaster Policy Cabinet that ultimately requested a State Emergency Declaration.



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Issues

Importance of Earthquake Resilient Critical Infrastructure

- **The State of Alaska has no plan or requirement for identifying or mitigating existing at-risk critical infrastructure,** including ports, schools, hospitals, firehouses, airports, road and rail corridors, power generating facilities and related transmission lines, water supply and transmission infrastructure, or police stations/holding facilities.
- **Many schools and critical facilities were constructed prior to modern seismic codes and include known hazards.** These can be corrected through a seismic retrofit process.
- Additionally, **numerous non-structural elements failed** and further impacted schools and hospitals for days and weeks after the earthquake.

Recommendation

The state should follow the examples of other earthquake prone regions (for example, Oregon, Washington, and British Columbia), and prioritize the identification and mitigation of at-risk infrastructure. Homeowners should be encouraged, as well, to retrofit homes that pre-date modern codes or are in areas where codes were not followed. The use of screening-level site response evaluation and Rapid Visual Screening (followed by a detailed structural evaluation for those identified as vulnerable) should be integrated into state and local hazard mitigation planning. Investing in mitigation now will substantially reduce future loss.

Importance of Code Adoption and Enforcement

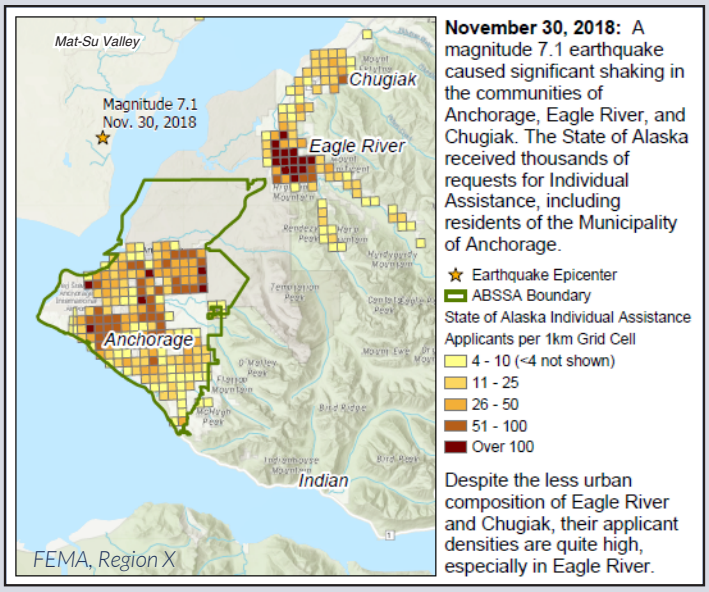
- In many parts of Alaska there are no requirements for new construction to be built to code. Even where code is required there is often no enforcement.
- Codes consider site-specific characteristics of a building site and make businesses, homes, and communities safer and stronger.
- Structures built according to the proper codes performed better during this earthquake and clearly demonstrate the value of code enforcement.

Recommendations

- The State of Alaska should consider expanding code adoption and enforcement.
- The Municipality of Anchorage should expand code enforcement to cover the entire population, and other large communities should conform to similar standards.
- Communities should take advantage of the FEMA BRIC program that can provide grant funding to support code adoption and enforcement.

Case Study: Anchorage vs. Chugiak/Eagle River

- Within the Municipality of Anchorage (MOA), the building code is adopted everywhere but only enforced in some areas:
  - In the Anchorage Building Safety Service Area (ABSSA) there are strict inspection requirements to verify code compliance
  - Chugiak/Eagle River does not require any inspections
- Following the November Earthquake, the MOA tagged 40 structures that suffered structural failure; 38 of these were located in Chugiak/Eagle River (source: FEMA, Region X)



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Learn more about the Alaska Seismic Hazards Safety Commission: www.seismic.alaska.gov