2018 M7.0 Anchorage, Alaska, Earthquake

**RESPONSE**

Date and Time: November 30, 2018, 8:29:29 am  
Location: N 61.323°, W 149.923° (7 miles north of Anchorage)  
Area of Effect: Strong to very strong shaking felt from northern Kenai Peninsula to Matanuska-Susitna Valley; light to moderate shaking felt throughout southcentral and interior Alaska. Initial earthquake followed 6 minutes later by M5.7 aftershock.  
Fatalities: 0  
Damage: Power outages and gas leaks; damage to roads, railroads, and buildings; and closures of schools, businesses, and government offices throughout Anchorage bowl and Mat-Su Valley.  
Tsunami: Tsunami warnings were sent out within minutes of the earthquake. No tsunami waves reported.  

Lateral spreading disrupted Vine Road near Wasilla. Many failures of engineered materials occurred on or adjacent to water-saturated lowlands. (Photo credit: U.S. Geological Survey)
Points to Ponder

Proximity matters
- The Anchorage earthquake occurred 7 miles north of Anchorage and caused extensive damage, while the 2002 M7.9 Denali earthquake, which occurred about 170 miles north of Anchorage, caused no damage in the area.
- Anchorage population is approximately 325,00, Mat-Su 104,000 & Kenai Borough 50,000= 479,000
- Entire state population is 710,000

Earthquake-resilient construction saves lives
- The population affected by the Anchorage earthquake generally reside in structures built in accordance with seismic building codes or using construction techniques that are resistant to earthquake shaking, and no lives were lost.
- Areas where codes were not enforced saw higher damage as a result

Infrastructure is vulnerable to earthquake damage
- Construction codes for roads and embankments are not as successful as building codes for structures. Roads, railroads, and embankments suffered extensive damage; many were made impassible.
- Port of Alaska receives 84% of all goods for entire state. Current expected lifespan-12 years remaining.

Earthquake preparedness training is effective
- Alaska students followed training and implemented the immediate safety action of Drop, Cover, and Hold On!
• https://www.youtube.com/watch?v=NJZqREPC9k0
2018 Nov Cook Inlet Earthquake

Situation Brief
Initial Operational Period

11/30/2018 to
Key Updates

- Governor declared State Disaster and requesting Federal Assistance
- Port of AK
  - COTP – Open
  - Tanker shut-in pending hydrostatic test for fueling
  - Structural assessment at low tide Sat AM
  - Inbound cargo ships expected Sunday & Monday requesting bar survey (USACE pends)
- Hospitals Anchorage & Matsu – Open and accepting patients
- Anchorage International – Operational
- 0 fatalities reported
- Eagan & Dena’ia Centers open as shelter
## Current Power Outages

<table>
<thead>
<tr>
<th>Company</th>
<th>#Out</th>
<th># Served</th>
<th>%Out</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matanuska Electric Association</td>
<td>30093</td>
<td>64831</td>
<td>46.42%</td>
</tr>
<tr>
<td>Chugack Electric Association</td>
<td>928</td>
<td>68000</td>
<td>1.36%</td>
</tr>
<tr>
<td>Municipal Light &amp; Power</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Homer Electric Association</td>
<td>7</td>
<td>31890</td>
<td>0.02%</td>
</tr>
</tbody>
</table>
Pipeline Status as of 1220L

- **Alyeska Pipeline** – TAPS shutdown, no problems ID, CC evac’d
- **Enstar Pipeline** - Gas main distribution lines holding pressure, numerous house fires (responders working), no injuries/fatalities
- **Tesoro Alaska Pipeline Company** - Kenai to Anchorage pipeline shutdown and holding pressure. Terminal shut down & evac’d.
- **ASIG** - Jet fuel pipeline is shut down and holding pressure.
- **Hilcorp pipelines** - Shut down and holding pressure, and no damage reported.
- **Titan Alaska** - No damage and LNG plant at Pt. MacKenzie operational. This plant supplies LNG and thus natural gas to Fairbanks. Roads from plant to Fairbanks reported usable and open.
Anchorage Field Reports:

• Anchorage School District closed
• Land/Mud Slide @ McHugh Creek
• 3 CAP in air to respond to distressed individuals (Investigating 2 ELTs)
• Structural Issues
  • Collapse on International Road
  • Structural Fire @ 76th & C St
  • Frontier Bldg structural damage – evac’d
  • Fish & Game bldg. burning on Minnesota
  • Damage to Merrill Field ATC
  • ANC International - Operational
    • Broken water pipes
Anchorage Road Report

- Railroad
  - Closed pending damage assessment

- Road Closures
  - Glenn Hwy @ N Eagle River @ Milepost 15
    - Detour through ER is possible

- Damage
  - Minnesota drive
  - New Seward (rock slides)
  - Eagle River Bridge
Taken from 511
2018 Nov Cook Inlet Earthquake

Taken from 511
After tsunami warning issued
Mat-Su Field Report:

- Several Fire Stations damaged
- Schools closed (shelter in place until parents arrive)
- Gas leaks at schools and homes
- Hospital ready to receive patients
- Road severed
  - Vine Rd
  - Pittman Road
• Based on engineering observations it appears that the majority of infrastructure damage resulting from this event occurred due to geotechnical issues – principally localized liquefaction in the granular fills beneath structures (particularly beneath residential and small commercial structures in swampy areas), slope instabilities in native slopes and anthropogenic fills, and bearing capacity failures in organic soil deposits due to cyclic softening.
2018 Cook Inlet Earthquake

State of Alaska
Emergency Operations Center

Current Situation
as of: 12/03/2018 08:00
Current Lifeline Status

- ENERGY (POWER & FUEL)
- COMMUNICATIONS
- TRANSPORTATION
- HEALTH AND MEDICAL
- FOOD, WATER, SHELTERING
- SAFETY AND SECURITY
- HAZARDOUS WASTE

2018 Cook Inlet Earthquake
## Energy (Power & Fuel)

<table>
<thead>
<tr>
<th>Power</th>
<th>Nat Gas</th>
<th>Pipelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chugach Electric</td>
<td>ENSTAR</td>
<td>Trans Alaska Pipeline System (TAPS)</td>
</tr>
<tr>
<td>ML&amp;P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Matanuska Electric</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Homer Electric</td>
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</tr>
</tbody>
</table>

Enstar is reporting no issues with their distribution system. Reporting 250 outstanding service calls.
## Transportation

<table>
<thead>
<tr>
<th>Airports</th>
<th>Ted Stevens Int'l Airport</th>
<th>JBER</th>
<th>Palmer Airport</th>
<th>Merrill Field</th>
<th>Birchwood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ports</td>
<td>Port of Alaska</td>
<td>Fully operational. Received cargo 12/2/2018</td>
<td>Port McKenzie</td>
<td>Road and rail access to port is limited.</td>
<td>Seward Port</td>
</tr>
<tr>
<td>Railroad</td>
<td>Alaska Railroad (North)</td>
<td>North bound rail closed due to reports of damage at mileposts 138 and 170. Repairs are ongoing, Anticipate possibly opening Tuesday.</td>
<td>Alaska Railroad (South)</td>
<td>Traffic re-commenced Sunday evening.</td>
<td></td>
</tr>
<tr>
<td>Highways</td>
<td>Alaska Hwy</td>
<td></td>
<td>Parks Hwy</td>
<td>Richardson Hwy</td>
<td>Glenn Hwy NE (MP 118-189)</td>
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### 2018 Cook Inlet Earthquake

#### Food, Water, Shelter

<table>
<thead>
<tr>
<th>Shelters</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egan Center</td>
<td>Shelter closed at 18:00 12/1/2018.</td>
</tr>
<tr>
<td>Menard Sports Center</td>
<td>Shelter closed at 10:00am 12/1/2018.</td>
</tr>
<tr>
<td>Fairview Recreation Center</td>
<td>Open and operational, 52 PAX overnight</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Water</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anchorage Water / Waste Water Util</td>
<td>Assessing water leaks, no major outages reported, <a href="#">Boil water notice lifted</a></td>
</tr>
<tr>
<td>City of Wasilla Water System</td>
<td>Reporting system functioning normally</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Food</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Food retails are resuming normal operations</td>
</tr>
<tr>
<td></td>
<td>and sales.</td>
</tr>
<tr>
<td>Health and Medical</td>
<td></td>
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<tr>
<td>-------------------</td>
<td></td>
</tr>
<tr>
<td>Hospitals</td>
<td></td>
</tr>
<tr>
<td>Blood Bank</td>
<td></td>
</tr>
<tr>
<td>Dialysis</td>
<td></td>
</tr>
<tr>
<td>Pharmaceutical</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Hazardous Waste</th>
</tr>
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<table>
<thead>
<tr>
<th>Safety and Security</th>
</tr>
</thead>
</table>

Schools Update

UAA
• ANC, ER and Mat-Su Campuses closed until further notice

ASD and Mat-Su School Districts
• All ASD schools closed until 12/10/2018
• Mat-Su schools closed until 12/5/2018
Buildings and homes inspected by Municipality of Anchorage for earthquake damage

Key:
- Green: Safe to occupy
- Yellow: Caution, building damaged
- Red: Do not occupy

Breakdown as of Monday, Dec. 10:
- North of Anchorage: 127
- Anchorage: 10
- Turnagain Arm: 6

Poor construction practices - No enforcement

Ground failure
The Rivers Edge Condominiums are seen next to Eagle River on Thursday, Dec. 13, 2018. Eight homes in the development were red-tagged by the municipality due to structural damage that occurred when part of a slope slid into the homes.
State of Alaska
Emergency Operations Operations Center

Operations Briefing

Current Situation
as of: 12/13/2018 08:00
## Incident Objectives

<table>
<thead>
<tr>
<th>Objective Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ensure the safety and security of responders as well as maximize the protection of public health and welfare.</td>
</tr>
<tr>
<td>7a</td>
<td>Conduct life safety &amp; immediate need mass care operations for survivors.</td>
</tr>
<tr>
<td>2</td>
<td>Support local emergency response operations through the coordination of information, situational reporting and resource requests.</td>
</tr>
<tr>
<td>3</td>
<td>Keep the public, stakeholders and the media informed of response activities.</td>
</tr>
<tr>
<td>4</td>
<td>Obtain local damage assessment information - focus on individual and residential damages first, public infrastructure second.</td>
</tr>
<tr>
<td>5</td>
<td>Implement State of Alaska Individual Assistance, Public Assistance, and Temporary Housing Programs</td>
</tr>
<tr>
<td>6b</td>
<td>Conduct Joint Preliminary Damage Assessments</td>
</tr>
</tbody>
</table>
Anchorage Weather

**Today**
- Snow likely before 9am, then isolated snow showers between 9am and 3pm. Mostly cloudy, with a high near 22.
- Northeast wind around 5 mph becoming east in the afternoon. Chance of precipitation is 60%. Total daytime snow accumulation of less than one inch possible.

**Tonight**
- Snow likely, mainly after midnight. Cloudy, with a low around 11. North wind 5 to 15 mph. Chance of precipitation is 60%.
- Total snow accumulation of around an inch possible.

**Friday**
- Scattered snow showers, mainly after 3pm. Cloudy, with a high near 19. North wind 10 to 15 mph. Chance of precipitation is 40%.

**Friday Night**
- Scattered snow showers. Cloudy, with a low around 12. North wind 10 to 15 mph. Chance of precipitation is 30%.

**Saturday**
- Partly sunny, with a high near 24. North wind around 10 mph.
Statewide Weather Update

Winter weather advisory until 1500 Thu for snow and blowing snow 1 to 3", and High Surf Advisory for north facing shores through 1800 Thu.
Current Lifeline Status
https://www.youtube.com/watch?v=Uq-CKDL0xM
State of Alaska Individual Assistance Applications

Matanuska-Susitna Borough and Municipality of Anchorage

• 4600 applications for assistance received

Joint Preliminary Damage Assessments

Matanuska-Susitna Borough and Municipality of Anchorage

• 397 sites visited

Individual Assistance Shelter Recipients

Matanuska-Susitna Borough and Municipality of Anchorage

• 26 housed individuals
A big earthquake could send a tsunami up Cook Inlet. Would it reach Anchorage?

Size vs. strength: Comparing earthquakes

Were you in an area that shook the hardest? Researchers map shaking felt across Anchorage in big quake

When do tremors stop being aftershocks and start being new earthquakes?
Public Information

Key Messages

• Do not walk or climb on damaged ground or enter severely damaged buildings until they have been inspected by a qualified inspector. Ground may be unstable and shift if walked or climbed on. Damaged building may contain falling hazards objects and/or collapse if stress is put upon the weakened structure.

• Aftershocks will continue to occur. Be prepared to drop, cover and hold on and follow the direction of local officials to remain safe.

• Public safety is our highest priority but you may be the help until help arrives. If it is safe, check on your neighbors who may require assistance such as infants, children, older adults, people with disabilities and others with access and functional needs.
Key Messages

• Donations - Those who wish to donate are asked to donate cash. Material donations must be managed and may not be need by disaster victims when they are donated. Cash can be used to meet most disaster survivors needs and is the most versatile type of donation.

• If you have applied for disaster assistance and it is for personnel property, please be patient as we are working with those applicants who’s homes have been made unlivable.
Current Status

Individual Assistance Applications- Matanuska-Susitna Borough and Municipality of Anchorage
12,600 applications for assistance received

Preliminary Damage Assessments- 832 sites visited

Current damage estimates- $76 million (expected to double)
*Updated 1/29 $130 million*
Dealing with Misconceptions

• That wasn’t so bad
• I survived a 7.0
• Government didn’t help
• Everything is back to normal
• EQ insurance good/bad?

Reality

• We got lucky- consider this your warning
  • If this lasted as long as the 1964 event- we would be dealing with major loss of life and infrastructure
• Anchorage is a single point of failure for entire state
• Impacts will be long lasting and impact for years
  • Many signs of PTSD starting to be reported
• Building codes and enforcement worked and saved lives
• Education is still best action to take!
Here is the big question-
What will be discovered when the snow melts in the spring?