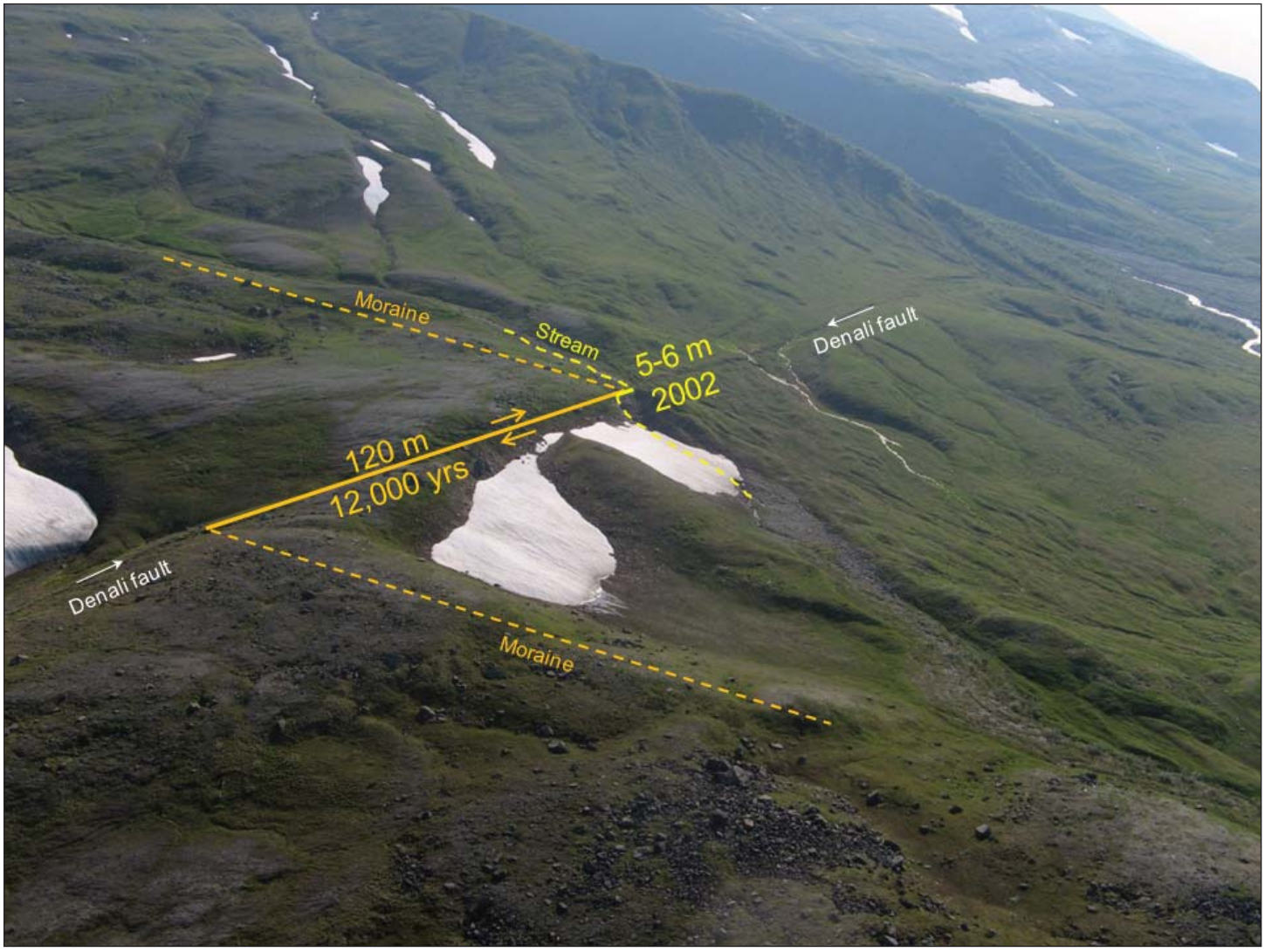
Alaska Seismic Hazards Safety Commission

Report to the Governor and State Legislature
FEBRUARY 2010



Northeast-looking aerial view of the Denali fault about 25 miles northeast of Paxson. By measuring the offset of landforms and knowing their geologic age, scientists can estimate the fault's long-term slip rate. This image shows a stream that was offset right-laterally 5-6 meters (16-20 feet) during the 2002 M7.9 earthquake. It also shows a moraine that has been offset about 120 meters (nearly 400 feet) through multiple events since it was deposited by a glacier near the end of the last ice age about 12,000 years ago. These measurements, along with others, indicate that the Denali fault has had an overall slip rate of about 10 millimeters (0.4 inch) per year during that period. Additionally, assuming the 2002 event is characteristic of earthquakes on this fault, the data suggest an average recurrence interval of 500-600 years. This is one example of many measurements that were made along the Denali fault following the 2002 earthquake to constrain its postglacial slip rates. The measurements and the methods used to date the landforms are documented in an article by Matmon and others in the August 2006 issue of Geology. Photo by Rod Combellick.

ASHSC Alaska Seismic Hazards Safety Commission

ALASKA SEISMIC HAZARDS SAFETY COMMISSION

Report to the Governor and Legislature
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EXECUTIVE SUMMARY

This annual report to the Governor and Legislature from the Alaska Seismic Hazards Safety Commission (ASHSC) reiterates the priority issues and goals of the Commission and identifies its 2009 accomplishments. The report updates the history and status of the Commission, identifies the current membership, lists the accomplishments to date, describes various committee functions, and presents the Commission's recommendations to improve seismic safety in Alaska.

The Commission operates under the powers and duties prescribed by its enacting legislation (Appendix A) and is guided by its Charter (Appendix B), which provides a clear understanding of the Commission's roles and expectations, empowers Commission members, and provides operating guidelines agreed to by all members.

During the past year the Commission has invited numerous governmental and private organizations to give presentations describing their approaches to seismic risk mitigation. These briefings have provided the members of the Commission with opportunities to gain an understanding of current programs and various approaches to seismic risk mitigation, identify areas of concern, and focus initial mitigation efforts in these areas. These briefings are available for viewing on the Commission web site (http://www.dggs.dnr.state.ak.us/seismic_hazards_safety_commission.htm).

The Commission's efforts in 2009 have reinforced its belief that seismic risk mitigation issues can be addressed in an economical way that will result in improving the quality of life and public safety in Alaska. The Commission continues to address the following policy recommendations:

- Structural stability of critical facilities
- Earthquake insurance necessity and availability
- Approaches to seismic risk mitigation in future construction
- Response and recovery practices to mitigate future seismic risk
- Hazard identification and public education

These policy recommendations are currently being addressed through the following standing committees:

- Insurance
- Schools
- Earthquake Scenarios
- Education and Outreach
- Hazards Identification
- Response and Recovery
- Partnership

The 2009 activities of these committees are described in more detail in subsequent paragraphs.

Our basic public-policy goal areas remain unchanged from the 2008 Commission report:

- Education
- Guidance
- Assistance
- Implementation

INTRODUCTION

The Alaska Seismic Hazards Safety Commission ("the Commission") is charged by statute (AS 44.37.067; Appendix A) to recommend goals and priorities for seismic hazard mitigation to the public and private sectors; recommend policies to the governor and the legislature, including needed research, mapping, and monitoring programs; review the practices for recovery and reconstruction after a major earthquake; recommend improvements to mitigate losses from similar future events; and to gather, analyze, and disseminate information of general interest on seismic hazard mitigation, among other duties to reduce the state's vulnerability to earthquakes. The Commission consists of eleven members appointed by the Governor from the public and private sectors for three-year terms. It is administered by the Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS).

Commission members include: A representative from the University of Alaska, three representatives from local government; a representative from the Department of Natural Resources; a representative of the Division of Homeland Security and Emergency Management; a representative from an appropriate federal agency; a representative of the insurance industry; and three members of the public who are experts in the fields of geology, seismology, hydrology, geotechnical engineering, structural engineering, emergency services, or planning. Six members constitute a quorum. The Commission membership elects its own chair and vice-chair. There is no executive director, although DGGS provides administrative, travel, and publication support.

HISTORY AND STATUS OF THE COMMISSION

In 2002, the 22nd Alaska Legislature passed, and the Governor signed into law, House Bill 53 establishing the Alaska Seismic Hazards Safety Commission with nine members. The legislation originally placed the Commission in the Office of the Governor, but in January 2003, Governor Frank Murkowski issued Executive Order Number 105 transferring the Commission to the Department of Natural Resources. Governor Murkowski appointed nine members to the Commission in 2005.

In 2005, the House of Representatives passed House Bill 83 (HB 83) to extend the Commission to June 30, 2008, add tsunami risks to its purview, and provide two additional Commission positions representing local government. In 2006, the Senate passed a substitute version of HB 83 including the two additional local government positions but omitting specific mention of tsunamis in the Commission's powers and duties. The Senate bill extended the Commission through June 30, 2012. The House concurred with the Senate version and Governor Murkowski signed the bill into law at a Commission meeting on June 16, 2006. Although the revised statute does not specifically include tsunami hazards in the Commission's powers and duties, the definitions in AS 44.37.069 include tsunami inundation as a seismic hazard. Consequently the Commission addresses tsunamis in its discussions and recommendations. As a result of passage of HB 83, the Commission currently has 11 members.

The Commission first met on October 28, 2005, at which time it elected a Chair and Vice Chair, listened to briefings from the California Seismic Safety Commission and various state and local agencies in

Alaska with responsibilities in earthquake-risk mitigation, and began developing goals and priorities for its activities. There were twelve meetings of the Commission through December 2006, six of which were via teleconference. Since 2006, the Commission has held nine meetings annually, seven of which have been via teleconference. The Commission published its first annual report to the governor and legislature on April 18, 2006, and has since published reports annually during the state legislative sessions. A Commission Web site posts basic information about its mission, earthquake risk in Alaska, meeting agendas, minutes, presentations, and appropriate links. The Web site address is:

http://www.dggs.dnr.state.ak.us/seismic_hazards_safety_commission.htm.

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EARTHQUAKE RISK IN ALASKA

Alaska has more earthquakes than any other region of the United States and is, in fact, one of the most seismically active areas of the world. The recent earthquake in Haiti is a grim reminder of what can happen when a society is not prepared for the furies of nature. The second largest earthquake ever recorded occurred on the Prince William Sound portion of the Alaska-Aleutian megathrust in southern Alaska on March 27th, 1964, with a moment magnitude of 9.2. The largest on-land earthquake in North America in almost 150 years occurred on the Denali fault in central Alaska on November 3rd, 2002, with a magnitude of 7.9. In 2009 alone, the Alaska Earthquake Information Center recorded 23,537 earthquakes, including 269 events with magnitude 4.0 or greater, 41 events of magnitude 5.0 or greater and four events of magnitude 6.0 or greater. It is not possible to predict the time and location of the next big earthquake, but the active geology of Alaska guarantees that major, potentially damaging earthquakes will continue to occur. The risks to public safety and infrastructure from these future events can be greatly reduced through proper planning, design, and construction.

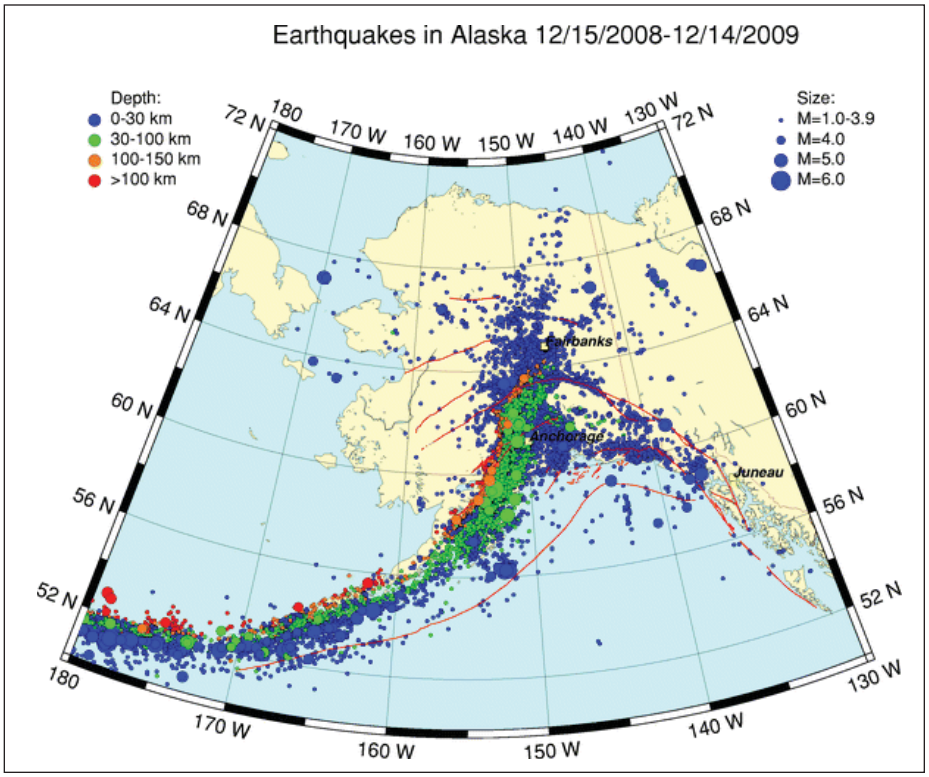
Alaska has changed significantly since the great 1964 earthquake. The population has more than doubled, but many new buildings are designed to prevent collapse during intense shaking. Some older buildings have been reinforced, and development has been discouraged in some particularly hazardous areas. However, despite these improvements, and because practices to reduce vulnerability to earthquakes and tsunamis are not applied uniformly in regions of high risk, future earthquakes may still cause life-threatening damage to buildings, cause items within buildings to be dangerously tossed about, and disrupt the basic utilities and critical facilities that we take for granted.

With the occurrence of the 1964 Prince William Sound and 2002 Denali fault events in recent decades, damaging earthquakes in the near future may be more likely to occur on other geologic sources. These include the Castle Mountain fault in lower Matanuska-Susitna valley, the Wadati-Benioff zone beneath Anchorage, the active belt of faulting and folding in northern Cook Inlet, the Fairbanks seismic zone, and the Yakataga seismic gap near Yakutat, among others. While the seismic provisions of current Alaska building codes are largely geared toward preventing collapse from the types of shaking that occurred in 1964, earthquakes on these other sources may affect structures differently, in ways that may or may not be ameliorated by the current codes.

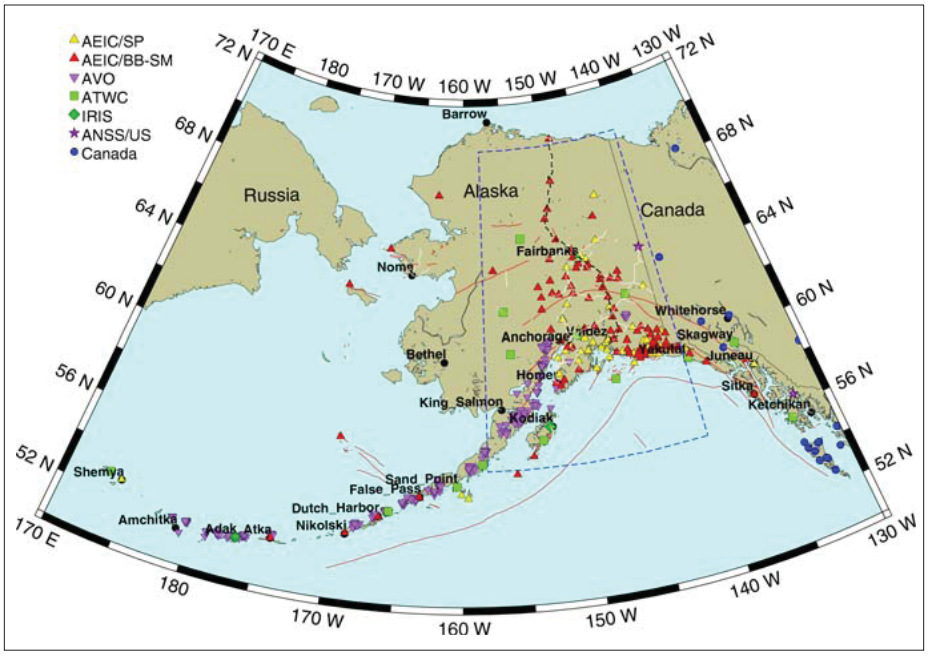
As discussed below, earthquakes of magnitudes that could cause major structural damage and injury to residents continue to occur in Alaska.

EARTHQUAKE ACTIVITY IN 2009

For the period between December 15, 2008 and December 14, 2009 the Alaska Earthquake Information Center (AEIC) reported a total of 23,537 events within the combined seismic network (see attached maps below, first for seismicity, followed by the current seismic station map). The events range in depth from 0 to 280 km, with the deepest earthquakes located in the central Aleutian arc. The magnitude range of reported events is between -0.27 and 6.5. There were 269 events with magnitude 4.0 or above (~22 events per month on average), 41 events had magnitude 5.0 or above (~3.5 events per month on average) and four events had magnitude 6.0 or above. The largest earthquakes (M_W 6.5) occurred on October 12, 2009 in the Fox Islands region of the Aleutian Islands. It was a megathrust (or subduction zone) event (see below for complete summary). The magnitude of completeness of the AEIC earthquake catalog for the reported time period is estimated to be ~1.4 for the network core area and ~2.5 for the Aleutians.



Earthquakes in Alaska 2009.



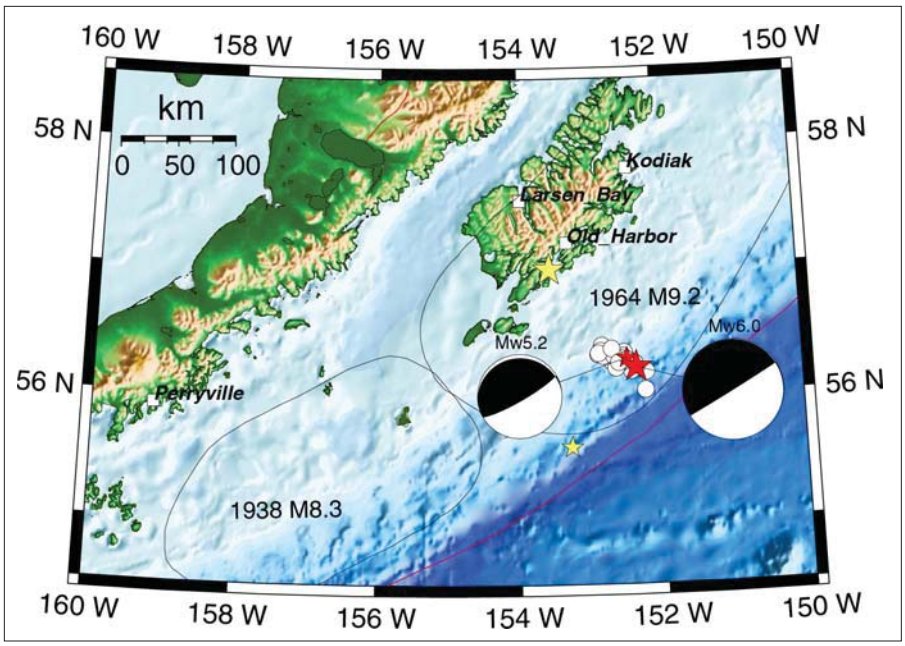
Seismic instrument locations in Alaska.

Note the continued seismic activity in Northern Alaska along the pipeline corridor as reported last year. The AEIC pipeline monitoring project for Alyeska reported no earthquakes with significant impact to the TransAlaska Oil Pipeline for the past year.

Earthquake activity in Alaska is determined by examining information from seismic instrumentation located throughout the state. Work continues on updating this instrumentation and for providing additional coverage statewide.

The following paragraphs describe a few characteristic earthquakes that occurred in Alaska in 2009.

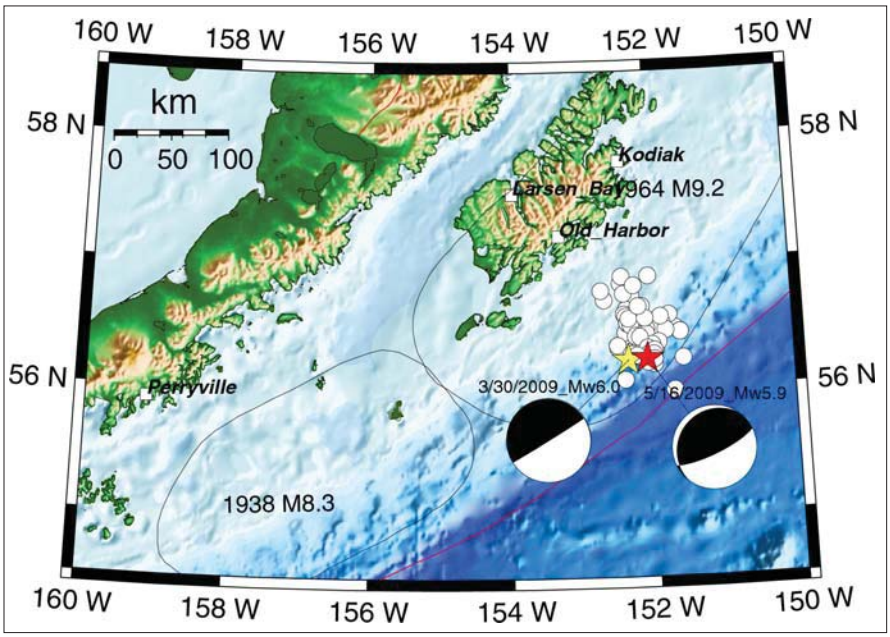
M6.0 March 30, 2009 Kodiak Island Earthquake



March 30, 2009 M6.0 Kodiak Island earthquake.

The Alaska Earthquake Information Center located a strong earthquake that occurred on March 30, 2009 at 7:13 am UTC (March 29, 11:13 pm AKDT) in the Kodiak Island region (larger red star on the above map). This event was felt widely on Kodiak Island and as far as Anchorage. It was preceded by a magnitude 5.2 foreshock at 3:42 am UTC (March 29, 7:42 pm AKDT). The AEIC located a total of 19 earthquakes in this cluster on March 30 and 6 aftershocks magnitude 4.9 occurred at 17:38 UTC on March 30. This is the largest event to occur in the region since the M6.9 earthquake on January 10, 2001 (larger yellow star). A magnitude 5.9 earthquake occurred on May 25, 2008 (smaller yellow star) in the vicinity of the March 30 cluster.

M5.9 May 16, 2009 Kodiak Island Earthquake



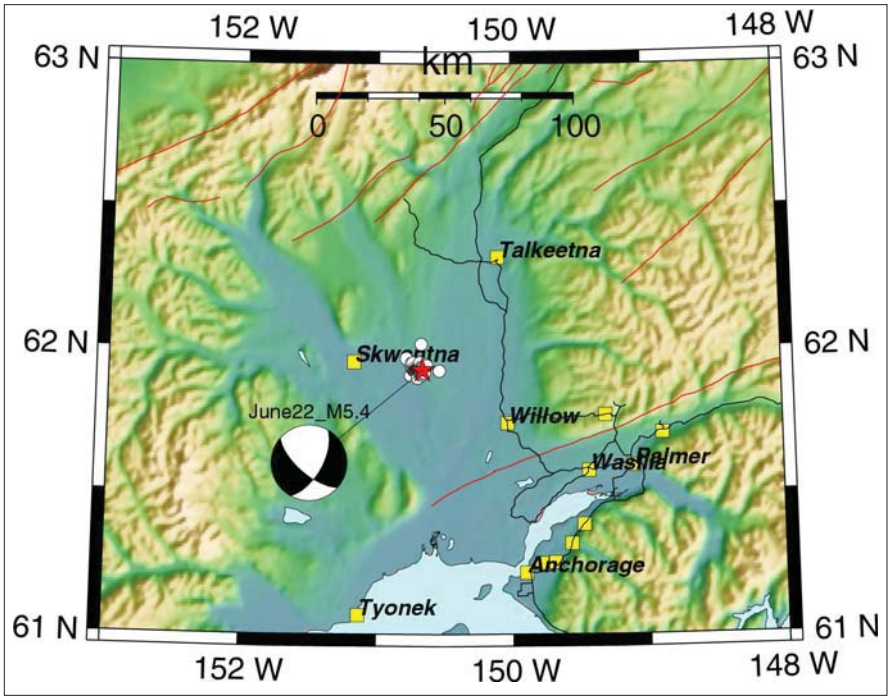
May 16, 2009 M5.9 Kodiak Island earthquake.

The Alaska Earthquake Information Center reported a moderate earthquake, magnitude 5.9, that occurred on May 16, 2009 at 18:22 UTC (10:22 am AKDT) in the Kodiak Island region (red star on the above map). It was located about 80 miles SE of the nearest population center of Old Harbor. No reports of this event being felt have been received. The main shock was preceded by a magnitude 5.0 foreshock one minute earlier. This sequence started one day

earlier with a M4.2 earthquake on May 15 at 17:38 UTC (9:38 am ADT). The AEIC located a total of 83 earthquakes in this cluster through the end of May. Due to the offshore location of the cluster, only events with magnitudes of about 2.0 and higher can be detected.

M5.4 June 22, 2009 Skwentna Earthquake

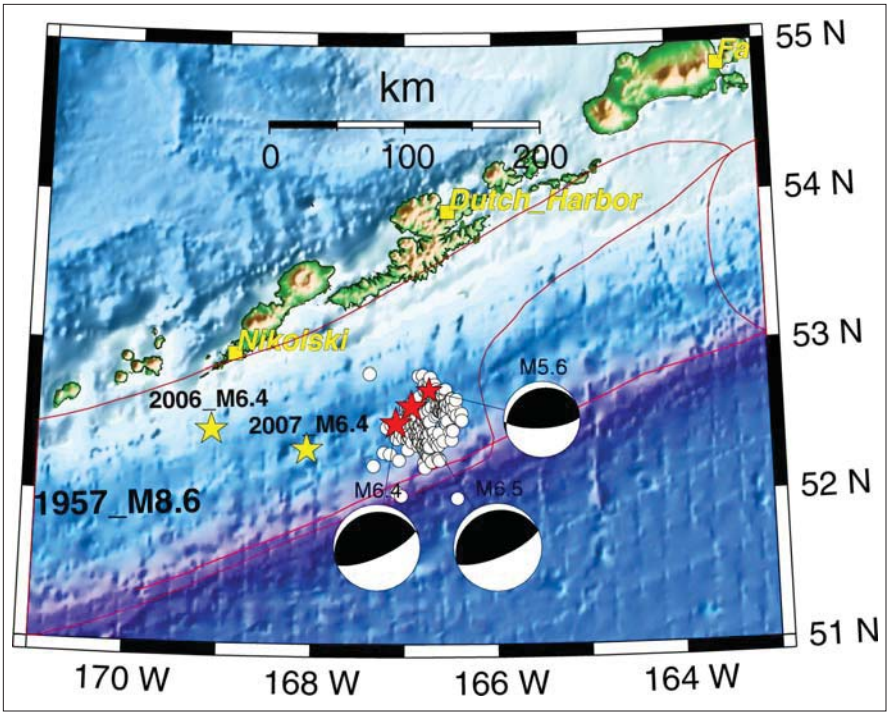
On June 22, 2009 at 11:28 am AKDT (19:28 UTC) the Alaska Earthquake Information Center located a magnitude 5.4 earthquake, 38 miles (62 km) deep, about 17 miles east of Skwentna (red star on the above map). AEIC staff have located about 50 aftershocks through 9 am AKDT on June 26 (white circles on the above map). The largest aftershocks were three magnitude 4.1 events that occurred half-hour, 21 hours, and 4 days after the main shock, respectively.



June 22, 2009 M5.4 Skwentna earthquake.

M6.5 and M6.4 October 13, 2009 Fox Islands Earthquakes

A magnitude 6.5 earthquake occurred on Monday, October 12, 2009 at 9:37 pm AKDT (October 13, 05:37 am UTC) in Fox Islands region of Alaska (red star on the map). It was located 136 km (85 miles) ESE of Nikolski and 146 km (91 miles) S of Dutch Harbor. Another strong earthquake of magnitude 6.4 occurred on Tuesday, October 13 at 12:21 pm AKDT (20:21 UTC) in the same area (red star on the map). 380 aftershocks were located (open circles) during the first week of this sequence, nine of which had magnitudes 4 or greater. The largest aftershock of magnitude 5.6 (small red star) occurred on Wednesday, October 15 at 4:13 pm AKDT (October 16, 00:13 UTC).



October 13, 2009 M6.5 & M6.4 Fox Islands earthquakes.

SOME ADDITIONAL EARTHQUAKE STATISTICS FOR ALASKA

- Eleven percent of the world's recorded earthquakes have occurred in Alaska.
- Alaska has more frequent earthquakes than the entire rest of the United States.
- Three of the eight largest earthquakes in the world were in Alaska.
- Seven of the ten largest earthquakes in the United States were in Alaska.

Since 1900, Alaska has had an average of:

- One "great" (magnitude 8 or larger) earthquake every 13 years.
- One magnitude 7 to 8 earthquake every two years.
- Six magnitude 6 to 7 earthquakes per year.
- Fifty magnitude 5 to 6 earthquakes per year.
- Three hundred magnitude 4 to 5 earthquakes per year.
- Approximately 2,000 earthquakes recorded in Alaska each month.

It is not possible to predict the time and location of the next big earthquake, but the active geology of Alaska guarantees that major potentially damaging earthquakes will continue to occur. Scientists have estimated where large earthquakes are most likely to occur, and the probable levels of ground shaking to be expected in the state. With this information, as well as information on soil properties and landslide potential, it is possible to estimate earthquake risks in any given area. It is also possible to estimate the potential for earthquakes to generate tsunamis, and to model the extent to which tsunamis will inundate coastal areas.

The Federal Emergency Management Agency (FEMA) has estimated that with the present infrastructure and policies, Alaska will have the second highest average annualized earthquake-loss ratio (ratio of average losses to infrastructure) in the country. Reducing these losses requires public commitment to earthquake-conscious siting, design, and construction. The Seismic Hazards Safety Commission is committed to addressing these issues. Earthquake-risk mitigation measures developed by similar commissions in other states have prevented hundreds of millions of dollars in losses and significant reductions in casualties when compared to other seismically active areas of the world that do not implement effective mitigation measures.

COMMISSION ACCOMPLISHMENTS IN 2009

The Commission's schools, earthquake scenario, and hazards identification committees were particularly active in 2009. The loss of education and outreach, insurance, and response and recovery committee chair-persons put a damper on activities in those areas. It is anticipated that activity in these committees will increase with the recent appointment of new Commission members to fill vacancies.

2009 accomplishments include:

- Held seven telephonic and two face-to-face (two day) meetings of the Commission.
- Heard briefings on seismic risk mitigation from the following agencies and discussed the Commission's activities as they relate to work being accomplished elsewhere:
    - Utah State Office of Education schools mandate.
    - Department of Homeland Security and Emergency Management (DHS&EM) emergency response exercise presentation.

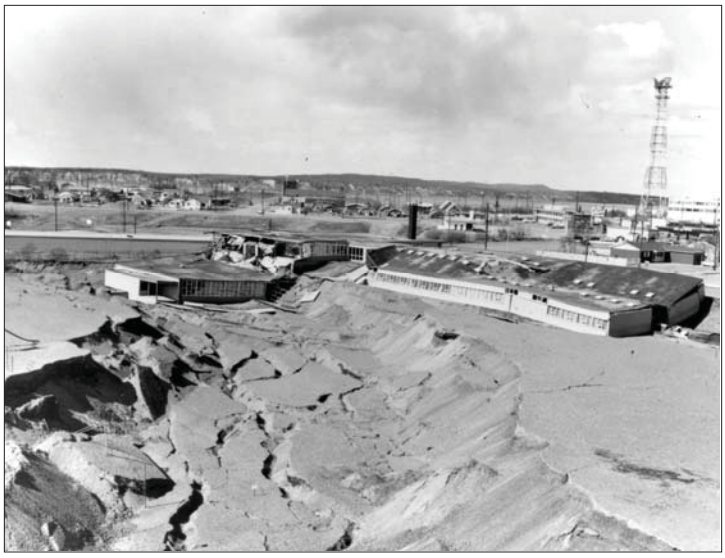
    - Wenchuan, China Earthquake presentation by Dr. Joey Yang.
    - Port of Anchorage expansion project presentation by Dr. Ivan Wong.
    - Western States Seismic Policy Council (WSSPC) activity update by John Madden (DHS&EM).
    - Overview of the Alaska Partnership for Infrastructure Protection (APIP) presentation by Lisa Witzleben (DHS&EM). The Commission is now participating in APIP meetings.
- The State of Alaska Board of Education assigned Sam Kito as a liaison between the Board and the Commission to work with the Schools Committee.
- The Commission Chair traveled to Juneau on February 19-20, 2009 to discuss Commission activities with several members of the legislature.
- The Commission Chair gave a presentation of Commission activities before a well attended joint meeting of the State Senate Finance and Education Committees on February 20, 2009.
- Developed and delivered a document titled *Recommendation for Evaluating Existing Public Schools for Seismic Safety* to Sam Kito of the Alaska Department of Education and Early Development.
- Developed and published the fourth annual report to the Legislature in February, 2009.
- Sponsored the Kodiak Island Borough School District winning Awards in Excellence from the Western States Seismic Policy Council (WSSPC).
- The Commission's 2008 formal request, through the hazards identification committee, that the Division of Geological and Geophysical Surveys (DGGS) consider the mapping of existing earthquake faults, was satisfied with the hiring of Dr. Rich Koehler, who specializes in neotectonics and paleoseismology.
- Developed a proposal to the Alaska Division of Homeland Security & Emergency Management for support of a scenario in the Anchorage region. The proposal was not funded.
- Four members of the earthquake scenario committee participated in a scenario-development workshop sponsored by the Earthquake Engineering Research Institute, involving about 80 participants from around the U.S. The purpose of the workshop was to gather ideas, share experiences, and compile resources for the benefit of organizations planning earthquake scenarios. Scenario committee chair Rod Combellick served on the steering committee for this workshop.
- The Commission endorsed a proposal by a private company to the National Earthquake Hazards Reduction Program to develop an earthquake scenario, also for the Anchorage region. Late in 2009, the Commission learned that this proposal also was not funded.
- The response and recovery committee drafted a procedure for rapidly convening the Commission directly after a major seismic event.
- The commission Chair was made a member of the State Hazard Mitigation Advisory Committee (SHMAC).
- The Commission toured the State Emergency Coordination Center.
- The Commission held re-chartering activities to consider next year's goals and measurements of success.

COMMITTEE ACTIVITIES

Schools Committee

The Commission considers assessing and minimizing loss due to structural instability of critical facilities in the event of a major seismic incident a paramount priority. This includes schools, hospitals, clinics, and fire, rescue and police stations, as well as jails and detention facilities. Also at possible

risk are large Federal, State, and private complexes including military bases, airports, education complexes, harbors, and utility systems (communications, electric, oil, transportation, water, and wastewater).



Government Hill School, 1964 earthquake (USGS photo).

In an effort to begin mitigating earthquake risk to critical facilities, the approaches for addressing the issue include:

- Assist in prioritizing the identification and mitigation of non-life-safe facilities, initially focusing on schools, due to high occupancies and common use as emergency shelters.
- Develop work plan(s) in collaboration with state and local agencies/ governments.
- Advocate cost-benefit analyses for both existing and new construction.
- Identify current legislation/programs, including those adopted by other states/countries. Foster contacts with successful proponents.
- Identify pertinent code and construction requirements and potential limitations.
- Recommend improvements including policy changes, legislation, and public outreach.

As noted, school buildings have been a primary concern. These are considered critical public facilities because, in addition to supporting students on a daily basis throughout the school year, most Alaskan schools serve the public in various capacities after school hours and many are designated as emergency shelters in the case of a natural disaster. Furthermore, schools are often some of the highest occupancy buildings in a community.

Schools Committee Activities in 2009

The committee continued to address standards, policies, and legislation for existing, renovated, and new school facilities. A major goal was to establish an active program that begins the screening process for identifying schools that may be vulnerable to seismic hazards and pose a potential life-safety threat to their occupants. Activities included:

- Appointment of a new committee member by the Alaska Department of Education and Early Development (ADEED).
- Recommended prioritizing the screening of schools by regions of highest seismicity first, and suggested using the most current version of Maximum Considered Ground Motion maps for Alaska, as published in the International Building Code.
- Developed a map showing school locations in relation to seismic zones. See the centerfold map titled *Public Schools and Earthquake Hazards in Alaska*.
- Worked to nominate the Kodiak Island Borough School District (KIBSD) for the 2009 Awards In Excellence sponsored by the Western States Seismic Policy Council (WSSPC). The KIBSD won the category for which it was nominated, and received WSSPC's *Overall Award in Excellence* at a February 2009 joint WSSPC-Earthquake Engineering Research Institute conference.

Schools Committee Plan for 2010

The committee will continue to work on schools' seismic safety issues and to address other critical facilities. Activities will include:

- Continue to assist in the development of approaches regarding the design, review, and construction of schools and other critical facilities.
- Continue to work closely with the ADEED on the prioritization of potentially at-risk facilities.
- Review of States' approaches to seismic design of educational facilities.
- Foster contacts with other localities that are addressing the issues involved with at-risk facilities.
- Continue to seek funding to identify earthquake-damage-prone school facilities.
- Recommend improvements in facility earthquake-risk mitigation including policy changes, legislation, and public outreach.

Earthquake Scenario Committee

An earthquake scenario is a planning tool that helps people understand earthquakes and plan for the future. Earthquake scenarios have been used successfully in several areas of the U.S. to identify weaknesses in the built environment as well as vulnerable interdependencies among utility and transportation systems that could result in multiple or cascading failures even if only one system fails. Communities, state and federal agencies, private industry, and emergency response organizations use scenarios as tools to increase public awareness, develop risk-reduction strategies, and for response and mitigation planning. The Western States Seismic Policy Council, in its adopted Policy Recommendation 09-1, recommends "that each member state, province, and territory establish an active program to produce Earthquake Planning Scenarios for areas with high risk of earthquake losses."

Nonstructural partition wall, ceiling and lighting damage, Northridge, CA, earthquake, 1994 (FEMA photo)

Earthquake scenarios begin by defining a hypothetical but geologically realistic earthquake suitable for the purpose of the scenario. Depending on the complexity and desired results, a scenario may describe the types and severity of shaking and ground breakage likely to result; the likely impacts to facilities, including types and extent of damage to buildings according to building type and age; and disruptions to utilities and transportation systems. A scenario may describe secondary effects such as tsunamis, fire, and toxic materials release; estimate the numbers of deaths, injuries, and dollar value of losses by building type; and estimate the long-term business losses and socioeconomic consequences. The resulting information provides the basis for planning earthquake response exercises, prioritizing and pre-locating response resources, and developing mitigating measures for reducing vulnerability to future earthquakes.

Ruptured fuel tank in Anchorage, 1964 Earthquake (USGS photo).

Developing an earthquake scenario requires assembling pertinent geologic and seismologic data for a realistic event, compiling and updating building and utility system inventory information for the affected region, assigning seismic fragilities to the building stock, and assembling current data on population demographics. Loss-estimation technology such as HAZUS software is often used to model the event, incorporating all the compiled data. The results are then documented in one or more reports and presentations to all interested groups. If done effectively, a scenario helps decision makers visualize specific impacts that are based on currently accepted scientific and engineering knowledge, providing a powerful tool for members of private industry, government officials, and the general public to develop effective mitigation policies and programs.

Scenario Committee Activities in 2009

The Earthquake Scenario Committee is working on ways to promote the development of scenarios that help identify and mitigate seismic risk in Alaska. During 2009, the committee performed the following tasks:

- Developed a proposal to the Alaska Division of Homeland Security & Emergency Management for support of a scenario in the Anchorage region. The proposal was not funded.
- Three members of the scenario committee participated in a scenario-development workshop sponsored by the Earthquake Engineering Research Institute, involving about 80 participants from around the U.S. The purpose of the workshop was to gather ideas, share experiences, and compile resources for the benefit of organizations planning earthquake scenarios. Scenario committee chair Rod Combellick served on the steering committee for this workshop.
- Endorsed a proposal by a private company to the National Earthquake Hazards Reduction Program to develop an earthquake scenario, also for the Anchorage region. Late in 2009, the Commission learned that this proposal also was not funded.

Scenario Committee Plan for 2010

The scenario committee will develop plans to coordinate a community approach to scenario development, involving scientists, engineers, policy makers, and emergency managers, soliciting as much volunteer support as possible. This approach was used successfully in the Puget Sound region to develop earthquake scenarios for the Seattle area. The committee will consider submitting proposals to the National Earthquake Hazard Reduction Program and Earthquake Engineering Research Institute in 2010.

Hazards Identification Committee

The goals of the Hazards Identification Committee are to promote:

- Identification and characterization of seismic hazards in Alaska
- Definition and description of seismic risks
- Seismic risk and hazard research
- Dissemination of seismic hazard and risk information to the state and local governments, the public, business and industry, and the scientific and professional communities.

Hazards Identification Committee Activities in 2009

In 2009 the Hazards Identification Committee focused its efforts on improving the understanding of Alaska's seismic hazards and the state's seismic risks. This effort included gathering information and continued discussion of the present state of knowledge regarding seismic sources. This effort is directed toward the development of a comprehensive overview of the seismic hazards and risks in Alaska and an approach to effectively communicate this information to private and public users.

One of the primary goals of the ASHSC is reduction of future earthquake losses in Alaska. In 2008 the commission recognized the urgent need to better understand sources of potentially damaging earthquakes in Alaska to meet this goal. The Hazards Identification Committee responded to this need by opening dialog with the State Geologist to encourage resurrecting a previously initiated program by the Alaska Division of Geological and Geophysical Surveys (ADGGS) to develop an inventory and database of active and potentially active faults in the state, and to initiate a field program aimed at evaluating fault hazards affecting infrastructure development. These efforts were addressed by ADGGS with the addition of a new position to their professional staff. A highly qualified Ph.D. specializing in neotectonics and paleoseismology, Richard Koehler, was hired to fill the position in 2009. One of the principal charges to the new addition to ADGGS professional staff is to complete the database of active and potentially active faults in Alaska.

Paleoseismologist Dr. Richard Koehler at work (photo by Rod Combellick).

Hazards Identification Committee Plan for 2010

To further address its goals the committee has started the development of a comprehensive White Paper summarizing the present state of knowledge of the state's seismic hazards and risks. A draft of this paper is in progress and partially completed. Completion of the White Paper will be one of the principal objectives of the committee in the coming year.

PUBLIC SCHOOLS AND EARTHQUAKE HAZARDS IN ALASKA

This map shows locations of communities with public school facilities in relation to potential ground-shaking as a percent of gravity, taking into account known earthquake sources. The colors represent peak bedrock ground acceleration (PGA) that has a 10-percent probability of being equaled or exceeded in a 50-year period, or an average of once every 475 years. PGA is useful for identifying general areas of low and high earthquake hazard. The PGA value of 10% g is considered the approximate threshold at which damage occurs to buildings not constructed to resist earthquakes. These values are represented on the map by the areas of yellow, orange, red, and brown. However, PGA cannot be used to directly predict the damage potential of an earthquake for specific structures without considering the duration and frequency of the ground motion, the proximity to the epicenter, and various site and building characteristics. Geologists also believe that unidentified active faults exist in many areas of Alaska. The scale of this map is not adequate for determining bedrock PGA at any given site. It should not be used in place of site-specific assessment of earthquake hazards by appropriately qualified professionals.

LEGEND

- City School District Location
- Borough School District Location
- Regional Educational Attendance Area (REAA) District Headquarters
- REEA or Borough School Location
- Closed School Location
- SCHOOL DISTRICT BOUNDARY
- MAIN ROADS

Peak Ground Acceleration (% g)
475-YEAR AVERAGE RETURN PERIOD

- 80 to 100
- 60 to 80
- 40 to 60
- 30 to 40
- 25 to 30
- 20 to 25
- 15 to 20
- 10 to 15
- 9 to 10
- 8 to 9
- 7 to 8
- 6 to 7
- 5 to 6
- 4 to 5
- 3 to 4
- 2 to 3
- 1 to 2
- 0 to 1

See Schools Committee section, p. 9-11, for further explanation.

ALEUTIAN ISLANDS (CONT.)
-- NO SCHOOLS AT PRESENT

DATA SOURCES:

INFORMATION COMPILED FROM THE "SEISMIC-HAZARD MAPS FOR ALASKA AND THE ALEUTIAN ISLANDS," US GEOLOGICAL SURVEY, 1999, THE "PROBABILISTIC SEISMIC HAZARD MAP OF ALASKA," US GEOLOGICAL SURVEY (OPEN FILE REPORT 99-36), THE ALASKA DEPARTMENT OF EDUCATION & EARLY DEVELOPMENT DIVISION OF SCHOOL FINANCE AND FACILITIES SCHOOL DATABASE, 2007, AND THE "ALASKA SCHOOL MAP," ALASKA DEPARTMENT OF EDUCATION AND EARLY DEVELOPMENT, REVISED 2003.

THE ACCELERATION VALUES CONTOURED ARE THE RANDOM HORIZONTAL COMPONENT. REFERENCE SITE CONDITION IS FIRM ROCK, DEFINED AS HAVING AN AVERAGE SHEAR-WAVE VELOCITY OF 760 M/SEC IN THE TOP 30 METERS, CORRESPONDING TO THE BOUNDARY BETWEEN NEHRP SITE CLASSES B AND C. IN SOME SITUATIONS, PARTICULARLY IN AREAS OF HIGH GROUND-MOTIONS (E.G. ALONG THE COAST OF SOUTHEAST ALASKA) THERE ARE DISCONTINUOUS CHAINS, OR ISLANDS, OF HIGH GROUND MOTION VALUES. THIS IS AN ARTIFACT OF THE GRID SPACING USED IN THE CALCULATIONS. IN MOST CASES THESE CHAINS SHOULD BE REPLACED WITH CONTINUOUS BANDS OF HIGH GROUND-MOTION VALUES ENCLOSING THE CHAINS.

ADDITIONAL INFORMATION, INCLUDING GRIDDED VALUES AND ARC/INFO COVERAGES USED TO MAKE THE MAPS IS AVAILABLE AT: HTTP://EARTHQUAKE.USGS.GOV/RESEARCH/HAZMAPS/. ALASKA STATE BOUNDARY, MAIN ROADS AND SCHOOL ARC/INFO COVERAGES WERE OBTAINED FROM THE ALASKA STATE GEOSPATIAL CLEARINGHOUSE AT HTTP://WWW.ASGDC.STATE.AK.US/ ON APRIL, 2007.

MAP PROJECTION: ALBERS EQUAL AREA CONIC, STANDARD PARALLELS 55° N AND 65° N, CENTRAL MERIDIAN 160°W.

SEE ABOVE INSET FOR CONTINUED COVERAGE OF THE ALEUTIAN ISLANDS

ADEED SCH-PGA.dwg

11/15/2007 (REV. 11/24/2009)

ASHSC Alaska Seismic Hazards Safety Commission

The Association of Environmental and Engineering Geologists (AEG) will hold its annual national meeting in Anchorage in 2011. The chair of the Hazards Identification Committee, in collaboration with the newly hired ADGGS paleoseismologist, plan to sponsor and co-chair a technical session and symposium on seismic hazards and risks in Alaska at this national meeting. Preparation for this meeting will be one of the active undertakings of the committee chair in 2010.

Hazards Identification Committee Challenges

One of the principal challenges to seismic hazard identification and risk definition in Alaska is the limited database and lack of a comprehensive inventory of information concerning seismic sources and their characteristics. The size and limited access in much of the state and the very small community of earthquake scientists and engineers working in the state also presents a significant challenge to meeting the goals of the ASHSC Hazards Identification Committee.

Response and Recovery Committee

Among the powers and duties assigned to the Commission by enacting legislation are to "offer advice on coordinating disaster preparedness and seismic mitigation activities of government at all levels, review the practices for recovery and reconstruction after a major earthquake, and recommend improvements to mitigate losses from future similar events.

Response and Recovery Committee Activities 2009

Activities for 2009 included:

- Drafted procedure for convening the Commission rapidly in the event of a significant seismic event in the State to provide immediate advice to the Governor during the incident response and recovery phase.
- Reviewed and sent forward to the entire Commission for comment, the seismic sections of the draft State of Alaska Emergency Operations Plan 2009 update.
- Provided a mechanism for the Commission to review the seismic sections of community Emergency Operations Plans as requested.

Vacant Four Seasons apartment building in Anchorage, destroyed during the 1964 Earthquake (USGS photo).

- Provided the State of Alaska with advice and review of the State's Post Disaster Damage Assessment (PDDA) training program.
- Provided an opportunity for Commissioners to enroll in and complete the National Incident Management System (NIMS) training in Incident Command System course 100 (ICS 100) in a step to bring the Commission into compliance with federal and State NIMS accreditation requirements.
- Facilitated a physical visit and tour of the Alaska State Emergency Coordination Center (SECC) and orientation to the "Real Time Seismic Display" system that provides rapid seismic information to seven key Emergency Centers around the State.

- Added the Chairman of the Seismic Hazards Safety Commission to membership on the State Hazard Mitigation Advisory Committee (SHMAC) that advises the Governor's Disaster Policy Cabinet on use of State mitigation funds, policy, and planning.
- Cooperated with the Commission's Scenario Committee to produce a proposal for a statewide response exercise.
- Coordinated the Commission's presentation to the statewide seismic preparedness conference in October 2009.
- Coordinated a presentation to the Commission from the Alaska Partnership for Infrastructure Protection (APIP), an Alaska Emergency Management – Private Sector stakeholder partnership.

Response and Recovery Committee Plan for 2010

The following items will be addressed in 2010:

- Refine the procedure for convening the Commission rapidly in the event of a significant seismic event in the State including a "Standard Operating Procedure."
- Draft a "Continuity of Operations" (COOP) plan to provide for continuing critical Commission functions in the event of an interruption of standard Commission operation.
- Review the seismic sections of the 2010 update of the State Hazard Mitigation Plan.
- Continue the Commission's review and consultation of the State's PDDA program.
- Continue the Commission's availability for review of seismic sections of community emergency operations plans.
- Continue the Commission's availability for consultation on emergency response exercises to seismic events.
- See all Commissioners successfully complete the ICS 100 course.
- Develop a post-earthquake data clearinghouse process that sets in place a procedure, structure, and organization to capture – for Alaska State use – all data, photos, records, and notes produced from post-earthquake investigations conducted in Alaska following a significant seismic event.
- Test the Commission's significant earthquake incident procedure during the March 2010 tsunami warning "live code" test during Tsunami Awareness week – the week of the anniversary of the 1964 Alaskan earthquake.
- Implement the Commission's significant event procedure and protocol during the 2010 federal and State seismic exercise: April 29 - May 6, 2010.

Education and Outreach Committee

The committee continues to focus on developing information for the Governor's office, legislators, administrative agencies, local governments, local emergency planning groups, and industry groups.

Education and Outreach Committee Activities in 2009

Activities included:

- On February 20th, 2009, chairman John Aho and ADEED representative Sam Kito met for 50 minutes in Juneau with the State Legislature's Finance and Education committees for a presentation followed by a question/answer session. A map similar to that shown in this report and a discussion of the need to mitigate loss of schools and other critical infrastructure was included. Chairman Aho also had informal meetings with Senate President Gary Stephens,

Senator Kim Elton, who is on the Finance Committee, and Senator Elton's staffer Dana Owen, as well as Senators Bettye Davis and Charlie Huggins and Representative Les Gara. These meetings were important for developing a better understanding by state representatives of the mission and objectives of the Commission. Following the presentation, Chairman Aho met with Senator Olson, Representative Austerman, and again with Senator Huggins. The meetings confirmed the need for the ASHSC to meet with legislators on a regular basis to keep them informed of commission activities.

- Heard briefings on seismic risk mitigation from the following agencies and discussed the Commission's activities as they relate to work being accomplished elsewhere:
    - Utah State Office of Education schools mandate.
    - Department of Homeland Security and Emergency Management (DHS&EM) emergency response exercise presentation.
    - Wenchuan, China earthquake presentation by Dr Joey Yang.
    - Port of Anchorage expansion project presentation by Dr. Ivan Wong.
    - Western States Seismic Policy Council (WSSPC) activity update by John Madden (DHS&EM).
    - Overview of the Alaska Partnership for Infrastructure Protection (APIP) presentation by Lisa Witzleben (DHS&EM). The Commission is now participating in APIP meetings.
- Continued to work with the Earthquake Engineering Research Institute on sponsorship of the 2014 National Conference on Earthquake Engineering to be held in Anchorage, Alaska.

Committee Plan for 2010

The committee will address the following items:

- Continue to have briefings from outside interests that are concerned with seismic risk mitigation issues.
- Develop a periodic newsletter to inform the Governor and legislators of Commission activities.
- Develop a concise brochure that describes the Commission and its activities.
- Continue to consider developing a speakers bureau with expertise in seismic risk mitigation issues.
- Invite Arthur Frankel to Alaska to deliver the Joyner Lecturer series on developing seismic zoning to interested community members
- Consider model legislation that addresses the design and construction of schools in Alaska.

Partnership Committee

Commission enacting legislation charges it to "establish and maintain necessary working relationships with other public and private agencies." The purpose of the ASHSC Partnership Committee is to investigate potential relationships.

The basic goals of developing partnerships are to:

- Promote combined efforts to reduce the loss of life and property
- Conduct education efforts to motivate key decision makers to reduce risks associated with earthquakes

- Foster productive linkages between scientists, critical infrastructure providers, businesses, and government agencies to improve the viability of communities after an earthquake event.

Partnership Committee Activities in 2009

The committee was involved in the following activities:

- Continued to address planning aspects for the 2014 National Conference on Earthquake Engineering.
- Became active in the Alaska Partnership for Infrastructure Protection (APIP).
- Worked with the Earthquake Scenario Committee to advise an outside firm on a proposal to develop an earthquake scenario for Anchorage.

Partnership Plan for 2010

The following tasks will be addressed in 2010:

- Will continue to seek partnership opportunities with organizations, agencies, and public entities.
- Will make formal contact with seismic safety commissions in other areas of the United States.
- Work will continue on the 2014 National Conference on Earthquake Engineering expected to draw 1,000-1,500 professionals from around the world to Anchorage.
- Continue to develop relationships within the Alaska Partnership for Infrastructure Protection (APIP).
- Contact the Pacific Northwest Economic Region for assistance in partnership development.
- Seek funding to hold a planning meeting of seismic safety commission members from around the country.

SEISMIC-RISK ISSUES BEING ADDRESSED BY THE ALASKA SEISMIC HAZARDS SAFETY COMMISSION

The following issues relating to seismic risk mitigation have served as a guide to developing the path forward for the Commission and for the formation of standing committees.

1. Assess the Structural Stability of Critical Facilities

Description of the Issue: Some existing critical buildings in the state may not be constructed in a manner to withstand future earthquake and tsunami events. A specific concern is school buildings. Hospitals, clinics, and fire, rescue, and police stations across the state are also vulnerable to failure. Also at possible risk are large Federal, State and private complexes such as military bases, Coast Guard stations, airports, college campuses, harbors, power-generating stations, communication centers, water and waste-water treatment facilities, jails and detention facilities, pipelines, and highways and bridges.

Importance of the Issue: If attention is not brought to bear on this issue before a damaging earthquake or tsunami, communities in the State could see massive structural failure of important community facilities, resulting in human casualties, economic loss, and environmental damage.

Furthermore, Alaska's remote nature and extreme weather conditions can cause delays in response efforts and put displaced building occupants at severe risk from exposure. Adequate preparedness is imperative to timely rapid response and recovery from a significant seismic event.

Benefits of Addressing the Issue: Some private and public entities have taken important steps to improve the seismic resistance of key facilities and infrastructure. For example, prior to constructing the Trans-Alaska Pipeline System, Alyeska hired geologists and engineers to specifically address seismic hazards. The resulting design and earthquake-resistant construction prevented the spillage of any oil during the M7.9 Denali fault earthquake of November 3, 2002. The Alaska Department of Transportation and Public Facilities is undertaking a seismic retrofit program for State-owned bridges, and is focusing on upgrading bridges that provide critical access to communities. Some boroughs and cities across the State have taken the initiative to identify and begin retrofitting seismically vulnerable school buildings and other essential facilities.

Despite the newness of most construction in Alaska and implementation of modern building codes, many buildings and key infrastructure remain vulnerable due to proximity to seismic hazards, some that are known and others that are poorly understood. Building codes continue to change and have been significantly upgraded in the period between 1976 and 1997. The Federal Emergency Management Agency (FEMA) and earthquake consortia such as the Cascadia Regional Earthquake Workgroup (CREW) in the Pacific Northwest have long recognized that addressing the problems prior to a catastrophic event can have long-standing benefits in the future. However, building codes are often inadequately implemented and recommendations of advisory bodies are often ignored.

How the Commission Can/Will Address the Issue: The Commission will encourage mitigation efforts by presenting information about earthquake hazards and risk and by suggesting approaches to addressing the strengthening of at-risk critical facilities. Public education must include the correct mix of information on potential damage and suggestions of effective actions to be taken.

2. Address the Importance of Earthquake Insurance

Description of the Issue: Catastrophic natural perils, particularly earthquakes, are unpredictable, relatively infrequent, and can be financially disastrous. Earthquake risk is especially difficult to insure against because insurers are unable to accumulate adequate reserves for such high severity, low frequency losses.

Importance of the Issue: Insurers are unwilling to provide insurance in a market where premium rates are inadequate to create the reserves necessary to pay for damages in the event of a major earthquake. This can create a severe deficiency in availability of insurance as existing insurers withdraw from the market and new insurers are unwilling to enter.

Benefits of Addressing the Issue: Improved pre-loss mitigation efforts, such as retrofitting existing structures; emergency planning to speed post-loss recovery; and actuarially sound earthquake insurance rates encourage additional insurers to enter the market. This in turn improves availability of insurance products and results in more competitive premiums.

How the Commission Can/Will Address the Issue: The Commission can encourage development of public-private partnerships that provide education and mitigate the potential impact of future

events. We will examine the seismic-hazard information needs of the insurance industry and provide recommendations for improvement.

3. Approaches to Seismic Risk Mitigation in Future Building Construction

Description of the Issue: Sustainable development entails maintaining environmental quality, improving a community's quality of life, and fostering social equity while maintaining a healthy economy. Therefore, sustainable development includes incorporating disaster resilience and mitigation into a community's decisions and actions. Building codes normally have a performance goal of life safety, which is considered a minimum safety level, but are typically the maximum level to which buildings are designed. Codes do not appropriately address the effects of ground failure, ground-shaking amplification, or provide guidance to designers and construction contractors.

Importance of the Issue: Communities need to know the potential earthquake risk and impacts at a structure site and should implement appropriate standards to mitigate the identified risk so new buildings are not subjected to the effects of massive ground failure and strong ground shaking.

Benefits of Addressing the Issue: The results of addressing the issue are more effective mitigation and an assurance that countermeasures are not only adequate but the cost of implementation is not prohibitive.

How the Commission Can/Will Address the Issue: The Commission will encourage continued Federal, State, and private partnerships in updating ground failure susceptibility mapping of Anchorage, ground shaking characterization in high-risk Alaskan communities, and determination of structural response of buildings and bridges. We will work with the technical community and the construction industry to inform, educate, and work with communities to provide guidance to improve building and land-use codes.

4. Response and Recovery Practices to Mitigate Future Seismic Risk

Description of the Issue: Communities don't have a good understanding of the costs and resources needed for response and recovery. First responders to a damaging earthquake in one of Alaska's major cities will be overwhelmed in the initial hours following the event. Damage to transportation systems will make movement of people and goods difficult. Demand for emergency shelter, food, and water will strain a community's resources. Disruptions to lifeline systems will complicate recovery.

Importance of the Issue: An understanding of response and recovery issues is critical to assessing the impacts to State and local resources.

Benefits of Addressing the Issue: Implementing effective response and recovery practices will reduce economic and social costs of recovery and will help mitigate risks from future events.

How the Commission Can/Will Address the Issue: The Commission will promote and assist in the development and use of "earthquake planning scenarios" to define the impact of future damaging earthquakes and will communicate lessons learned from past events to provide guidance to communities on recovery planning and preparation.

5. Hazard Identification and Public Education

Description of the Issue: A damaging earthquake has not affected a major population region in Alaska since 1964. The majority of the population is unaware of the consequences of a major seismic event. The 2002 Denali fault earthquake resulted in relatively minor damage to smaller rural communities but had little effect in larger communities such as Anchorage and Fairbanks. It was evident, during damage assessment evaluations after the Denali fault event, that the residents of the smaller at-risk communities had little understanding of the earthquake hazard, had not implemented measures to mitigate damage, and were unprepared to respond to the consequences of damage. It is important that the population of Alaska be aware of the earthquake hazard and be informed of the measures that can be taken to mitigate risk.

Importance of the Issue: There is a high probability that Alaskans will experience the results of a damaging earthquake in the future. All Alaskans will be better prepared to take measures ahead of time to reduce losses and casualties and to respond to the event if they are informed of, and truly understand, the hazard and the resultant risk.

Benefits of Addressing the Issue: An educated public has a greater potential of responding appropriately before, during, and after a damaging earthquake. Improved knowledge and public awareness of hazard and risk can change behavior and lead to more cost-effective mitigation.

How the Commission Can/Will Address the Issue: The Commission will examine the need for greater public investment in identification and assessment of earthquake hazards, and the most effective ways of communicating this information to the public. The Commission will examine and promote the concept of seismic resilience of communities, addressing reduced failure probabilities, reduced consequences of failure, and reduced time to recovery..

6. Recommended Public-policy Goals of the Commission

a. Education
   - Develop an effective public education and outreach program.
   - Convey scientific and technical information from credible authorities.
   - Communicate information in a manner that is understandable by the public.

b. Guidance
   - Provide advice on seismic risk mitigation and recommend policies to improve preparedness.
   - Recommend goals and priorities for risk mitigation to public and private sectors.
   - Recommend needed research, mapping, and monitoring programs.
   - Offer advice on coordinating disaster preparedness and seismic risk mitigation.

c. Assistance
   - Review seismic and tsunami hazard notifications and recommend appropriate response.
   - Review predictions and warnings and suggest appropriate responses.

d. Implementation
   - Establish and maintain working relationships with other private and public agencies.
   - Gather, analyze, and disseminate information.
   - Conduct public hearings.
   - Appoint committees from Commission membership and/or external advisory committees to address risk mitigation issues.
   - Accept grants, contributions, and appropriations.

APPENDIX A

Alaska Seismic Hazards Safety Commission statute

Sec. 44.37.065. Commission established; membership.

(a) The Alaska Seismic Hazards Safety Commission is established in the Department of Natural Resources. The Department of Natural Resources shall provide staff support to the commission.

(b) The commission is composed of 11 members appointed by the governor for terms of three years. A vacancy is filled for the unexpired term.

(c) The governor shall appoint to the commission

(1) a representative from the University of Alaska;

(2) three representatives, each from a local government in a separate seismically active region of the state;

(3) a representative from the Department of Natural Resources;

(4) a representative from the Department of Military and Veterans' Affairs;

(5) a representative from an appropriate federal agency;

(6) a representative of the insurance industry; and

(7) three representatives of the public who are expert in the fields of geology, seismology, hydrology, geotechnical engineering, structural engineering, emergency services, or planning.

(d) The commission shall elect annually from its members a chair and vice-chair. A majority of the commission may vote to replace an officer of the commission.

(e) Six members constitute a quorum.

(f) Members of the Alaska Seismic Hazards Safety Commission serve without compensation but are entitled to per diem and travel expenses authorized for boards and commissions under AS 39.20.180.

Sec. 44.37.067. Powers and duties.

(a) The commission shall

(1) recommend goals and priorities for seismic hazard mitigation to the public and private sectors;

(2) recommend policies to the governor and the legislature, including needed research, mapping, and monitoring programs;

(3) offer advice on coordinating disaster preparedness and seismic hazard mitigation activities of government at all levels, review the practices for recovery and reconstruction after a major earthquake, and recommend improvements to mitigate losses from similar future events;

(4) gather, analyze, and disseminate information of general interest on seismic hazard mitigation;

(5) establish and maintain necessary working relationships with other public and private agencies;

(6) review predictions and warnings issued by the federal government, research institutions, and other organizations and persons and suggest appropriate responses at the state and local levels; and

(7) review proposed seismic hazard notifications and supporting information from state agencies, evaluate possible socioeconomic consequences, recommend that the

governor issue formal seismic hazard notifications when appropriate, and advise state and local agencies of appropriate responses.

(b) The commission may

(1) advise the governor and the legislature on disaster preparedness and seismic hazard mitigation and on budgets for those activities and may recommend legislation or policies to improve disaster preparedness or seismic hazard mitigation;

(2) conduct public hearings;

(3) appoint committees from its membership and appoint external advisory committees of ex-officio members; and

(4) accept grants, contributions, and appropriations from public agencies, private foundations, and individuals.

Sec. 44.37.069. Definitions.

In AS 44.37.065 - 44.37.069,

(1) "commission" means the Alaska Seismic Hazards Safety Commission;

(2) "disaster preparedness" means establishing plans and programs for responding to and distributing funds to alleviate losses from a disaster as defined in AS 26.23.900 ;

(3) "seismic hazard" means an earthquake-induced geologic condition that is a potential danger to life and property; in this paragraph, "geologic condition" includes strong ground shaking, landslide, avalanche, liquefaction, tsunami inundation, fault displacement, and subsidence;

(4) "seismic hazard mitigation" or "mitigation" mean activities that prevent or alleviate the harmful effects of seismic hazards to persons and property, including identification and evaluation of the seismic hazards, assessment of the risks, and implementation of measures to reduce potential losses before a damaging event occurs;

(5) "tsunami" means a large ocean wave produced by an earthquake, landslide, or volcanic eruption.

APPENDIX B

JANUARY 2010

ASHSC Alaska Seismic Hazards Safety Commission

Charter

Purpose

To provide a vehicle through which statewide seismic risk issues can be addressed and solutions can be proposed that will reduce life and property losses from a future damaging earthquake.

Vision

Eliminate losses from future earthquakes and tsunamis. Promote public and government awareness of Alaska's seismic hazards and seismic risk mitigation.

Mission

Make recommendations to the governor and legislature for reducing the State's vulnerability to seismic hazards. Advise the public and private sectors on approaches for mitigating earthquake and tsunami risk.

Act in an Advisory Capacity

Advise the Governor, the Legislature, and the public on Alaska's seismic hazards and risk mitigation.

Provide Information and Technical Guidance

Recommend studies, policies, and programs that will mitigate the risks associated with seismic hazards.

Recommend Educational Programs

Recommend and participate in programs that will disseminate information to government agencies and the public.

Encourage Seismic Hazards Risk Mitigation Efforts

Encourage efforts to address issues related to seismic hazards risk mitigation.

By achieving this mission, we create an opportunity to be an effective body in mitigating the potential damaging effects of major seismic events.

Core Values

- Honesty
- Integrity
- Trust
- Diligence
- Service to the State
- Responsibility for One's Own work
- Support to Other Commission Members
- Commitment to Complete Accepted Assignments
- Provide Value to Stakeholders
- Be Objective and Reasonable
- Advocate for Seismic Risk Mitigation Efforts
- Recognize Exemplary Seismic Risk Mitigation Efforts

Key Success Factors and Measures of Success

Success Factor	Measure
• Stakeholder Satisfaction	• Facilitate Governor's and Legislature's understanding of seismic risk mitigation issues; • Meet or exceed SOA expectations; • Advice is sought; • Advice is accepted; • SOA endorsement; and; • Positive feedback from staff.
• Advocate of Risk Mitigation	• Provide advocacy for seismic risk mitigation programs; • Create opportunities for seismic risk mitigation advocacy; • Become familiar with current existing programs; and • Develop stakeholder support.
• Advocate Public Outreach Programs	• Encourage social environment where seismic risk mitigation is accepted; • Examine existing programs within the State; and • Be available for public education presentations.
• Promote Development of Earthquake Scenarios	• Complete earthquake scenarios for realistic events in high-risk areas; • Use scenario results to reduce earthquake risk; and • Seek community involvement in scenario development and application of results.
• Facilitate Partnerships for Seismic Risk Reduction	• Identify potential partners to assist in addressing Commission goals; and • Involve Federal, State, Municipal, and Private sector in addressing goals.

Key Success Factors and Measures of Success (continued)

Success Factor	Measure
• Critical Facilities Earthquake Risk Reduction	• Assist in prioritization and identification and mitigation of facilities with life safety issues; • Develop work plans in collaboration with State and local agencies/governments; • Identify current legislation/programs adopted by other states/countries; • Foster contacts with proponents who have had seismic risk mitigation successes; • Identify pertinent code and construction requirements and potential limitations; and • Recommend improvements including policy changes, legislation, and public outreach.
• Earthquake Insurance in Alaska	• Review current trends and provide advice; • Review existing "white paper" and update as appropriate; and • Develop "pros and cons" brochure describing earthquake insurance issues.
• Promote Seismic Hazard Identification	• Identification and characterization of seismic risk hazards; • Definition and description of seismic risks; • Seismic risk and hazard research; and • Dissemination of seismic risk and hazard information to State and local governments, the public, and industry and scientific and professional community.

ENDORSEMENT

We, the members of the Alaska Seismic Hazards Safety Commission, enthusiastically and fully endorse this Commission Charter for guiding and enhancing efforts in natural hazards risk mitigation.

John Aho/Chair _____

Laura Kelly/Vice Chair _____

Gary Carver _____

David Cole _____

Rod Combellick _____

Gay Dunham _____

Roger Hansen _____

David Miller _____

Mark Roberts _____

Gayle White _____

This publication was released by the Department of Natural Resources. Its purpose is to report the findings and recommendations of the Alaska Seismic Hazards Safety Commission to the Governor and to the Legislature of Alaska. It was printed at the Division of Geological & Geophysical Surveys office in Fairbanks, Alaska. This publication is required by AS 44.37.067.