ALASKA SEISMIC HAZARDS SAFETY COMMISSION

A LOOK AT CURRENT ACTIVITIES WITH AN EMPHASIS ON SCHOOLS

Presented at a joint Meeting of the Senate Education and Finance Committees

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ASHSC Alaska Seismic Hazards Safety Commission

Presentation Summary

- A Brief History of the Alaska Seismic Hazards Safety Commission (ASHSC)
- ASHSC Standing Committees (with an emphasis on schools)
- An Historic Perspective of School Failures and a Look at Resultant Mitigation Legislation
- An Alaskan Communities' Experience
- Presentation Closure and Next Steps Forward
  - http:www.dggs.dnr.state.ak.us/seismic_hazards_safety_commission.htm

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History of ASHSC

- HB 53 established ASHSC in 2002
- 11 Members
- Policy Recommendations
- ASHSC Goals
- Standing Committees
- Administered by DNR

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ASHSC Standing Committees

- Insurance
- **Schools**
- Earthquake Scenarios
- Education & Outreach
- Hazards Identification
- Response, Recovery, & Loss Estimation
- Post-Earthquake Planning
- Partnership

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Schools Committee Tasks

- Identify previously accomplished work
- Identify legislation affecting design & construction
- Examine current plan review/inspection procedures
- Examine Code provisions relating to schools
- Identify seismically at-risk facilities
- Identify and interview stakeholders
- Develop conclusions/recommendations and way forward

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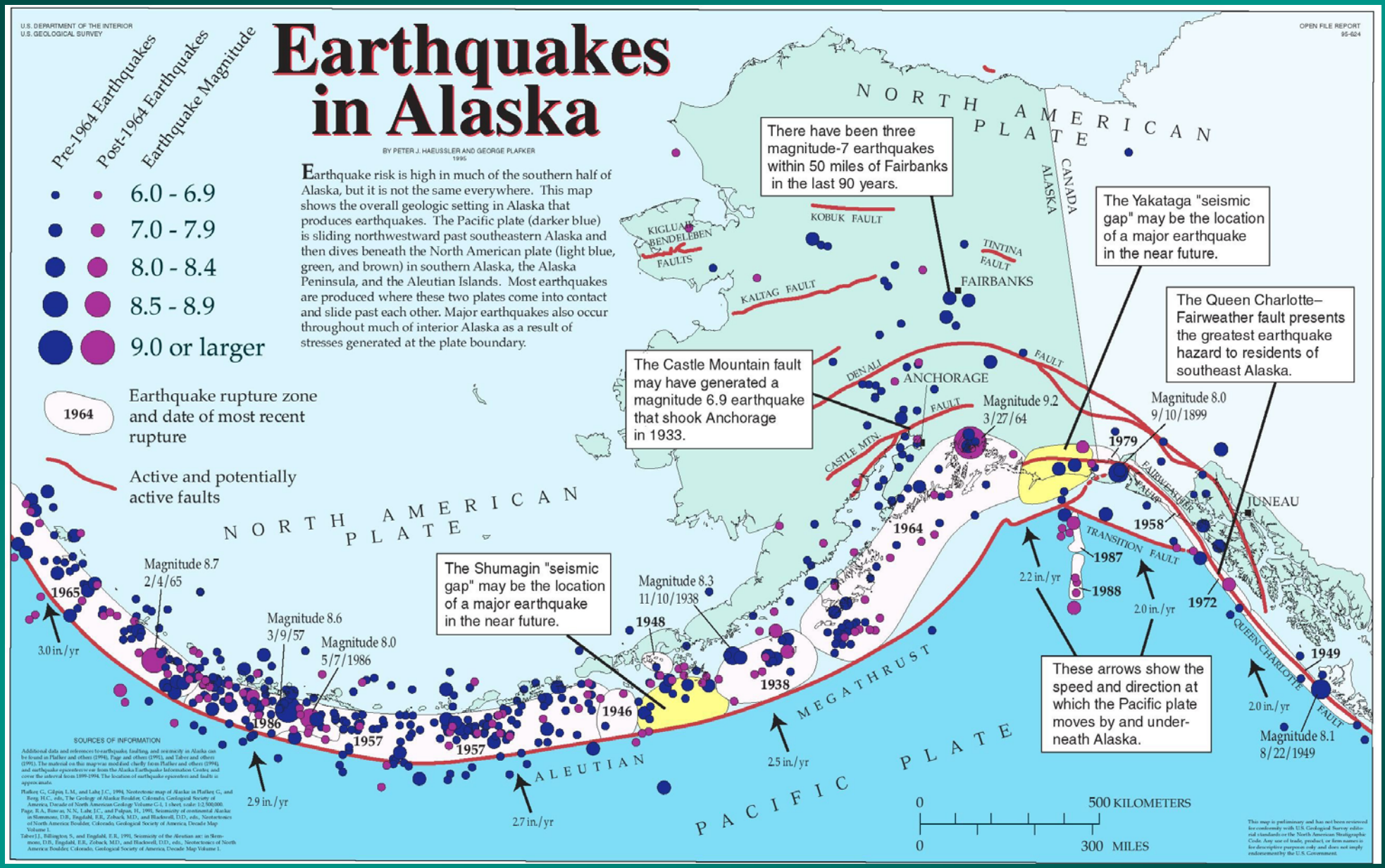
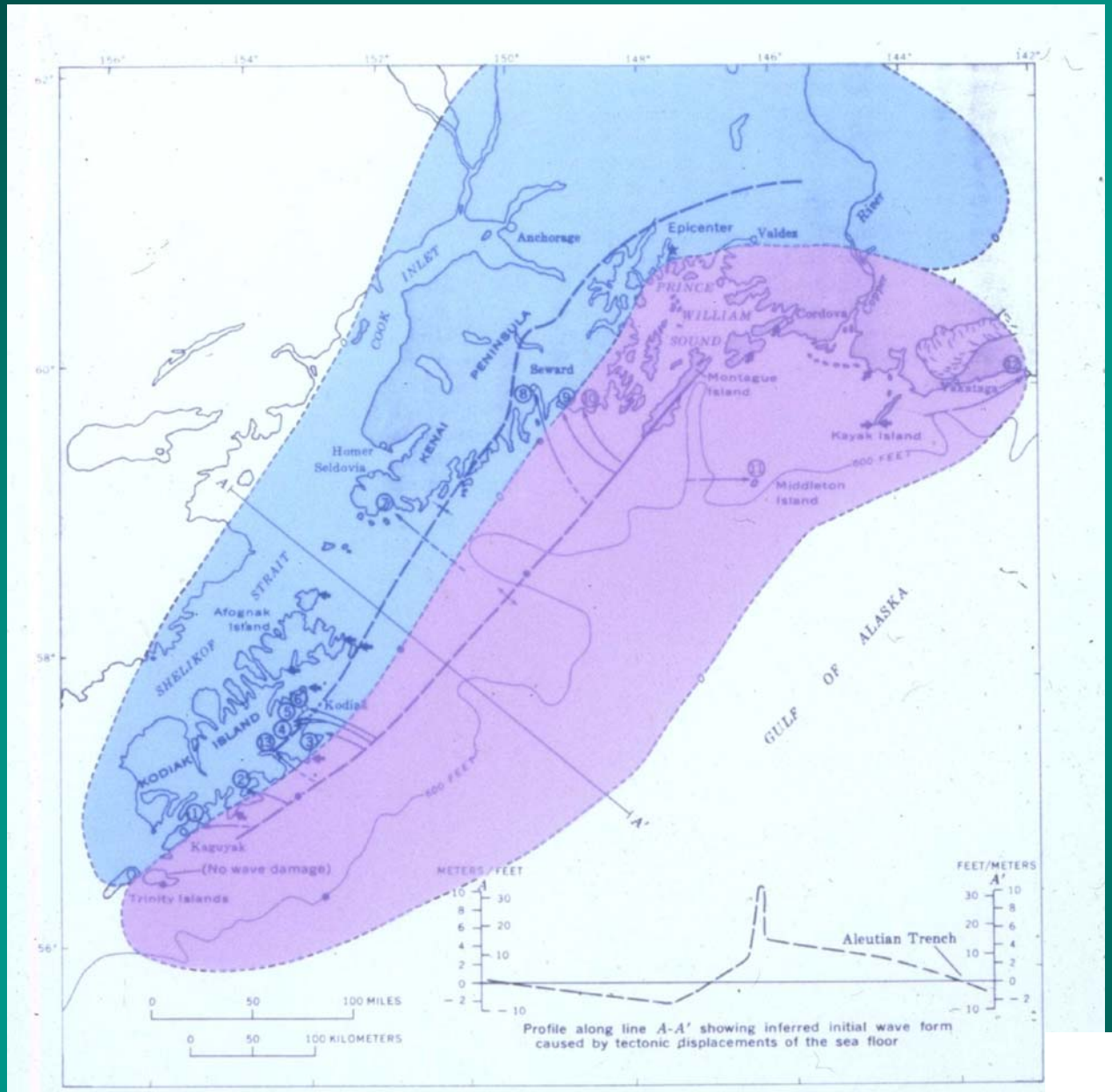

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY
OPEN FILE REPORT
95-624
Earthquakes in Alaska
BY PETER J. HAEUSSLER AND GEORGE PLAFKER
1995
Earthquake risk is high in much of the southern half of Alaska, but it is not the same everywhere. This map shows the overall geologic setting in Alaska that produces earthquakes. The Pacific plate (darker blue) is sliding northwestward past southeastern Alaska and then dives beneath the North American plate (light blue, green, and brown) in southern Alaska, the Alaska Peninsula, and the Aleutian Islands. Most earthquakes are produced where these two plates come into contact and slide past each other. Major earthquakes also occur throughout much of interior Alaska as a result of stresses generated at the plate boundary.
Pre-1964 Earthquakes
Post-1964 Earthquakes
Earthquake Magnitude
6.0 - 6.9
7.0 - 7.9
8.0 - 8.4
8.5 - 8.9
9.0 or larger
1964
Earthquake rupture zone and date of most recent rupture
Active and potentially active faults
There have been three magnitude-7 earthquakes within 50 miles of Fairbanks in the last 90 years.
The Yakataga "seismic gap" may be the location of a major earthquake in the near future.
The Queen Charlotte–Fairweather fault presents the greatest earthquake hazard to residents of southeast Alaska.
The Castle Mountain fault may have generated a magnitude 6.9 earthquake that shook Anchorage in 1933.
The Shumagin "seismic gap" may be the location of a major earthquake in the near future.
These arrows show the speed and direction at which the Pacific plate moves by and underneath Alaska.
NORTH AMERICAN PLATE
PACIFIC PLATE
ALEUTIAN MEGATHRUST
CANADA
ALASKA
KOBUK FAULT
KIGLUAIK
BENDELEBEN
FAULTS
KALTAG FAULT
TINTINA FAULT
FAIRBANKS
DENALI FAULT
ANCHORAGE
CASTLE MTN. FAULT
FAIRWEATHER FAULT
TRANSITION FAULT
QUEEN CHARLOTTE FAULT
JUNEAU
Magnitude 9.2
3/27/64
Magnitude 8.0
9/10/1899
Magnitude 8.7
2/4/65
Magnitude 8.6
3/9/57
Magnitude 8.0
5/7/1986
Magnitude 8.3
11/10/1938
Magnitude 8.1
8/22/1949
1965
1986
1957
1957
1946
1948
1938
1964
1979
1958
1987
1988
1972
1949
3.0 in./yr
2.9 in./yr
2.7 in./yr
2.5 in./yr
2.2 in./yr
2.0 in./yr
2.0 in./yr
0
500 KILOMETERS
0
300 MILES
SOURCES OF INFORMATION
Additional data and references to earthquakes, faulting, and seismicity in Alaska can be found in Plafker and others (1994), Page and others (1991), and Tabor and others (1991). The material on this map was modified chiefly from Plafker and others (1994), and earthquake epicenters are from the Alaska Earthquake Information Center, and cover the interval from 1899-1994. The location of earthquake epicenters and faults is approximate.
Plafker G, Gilpin L.M., and Lahr J.C., 1994, Neotectonic map of Alaska in Plafker G, and Berg, H.C., eds., The Geology of Alaska: Boulder, Colorado, Geological Society of America, Decade of North American Geology Volume G-1, 1 sheet, scale 1:2,500,000.
Page, R.A., Biswas, N.N., Lahr, J.C., and Pulpan, H., 1991, Seismicity of continental Alaska in Slemmons, D.B., Engdahl, E.R., Zoback, M.D., and Blackwell, D.D., eds., Neotectonics of North America: Boulder, Colorado, Geological Society of America, Decade Map Volume 1.
Tabor, J.L., Billington, S, and Engdahl, E.R., 1991, Seismicity of the Aleutian arc: in Slemmons, D.B., Engdahl, E.R., Zoback, M.D., and Blackwell, D.D., eds., Neotectonics of North America: Boulder, Colorado, Geological Society of America, Decade Map Volume 1.
This map is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards or the North American Stratigraphic Code. Any use of trade, product, or firm names is for descriptive purposes only and does not imply endorsement by the U.S. Government.



Profile along line *A-A'* showing inferred initial wave form caused by tectonic displacements of the sea floor

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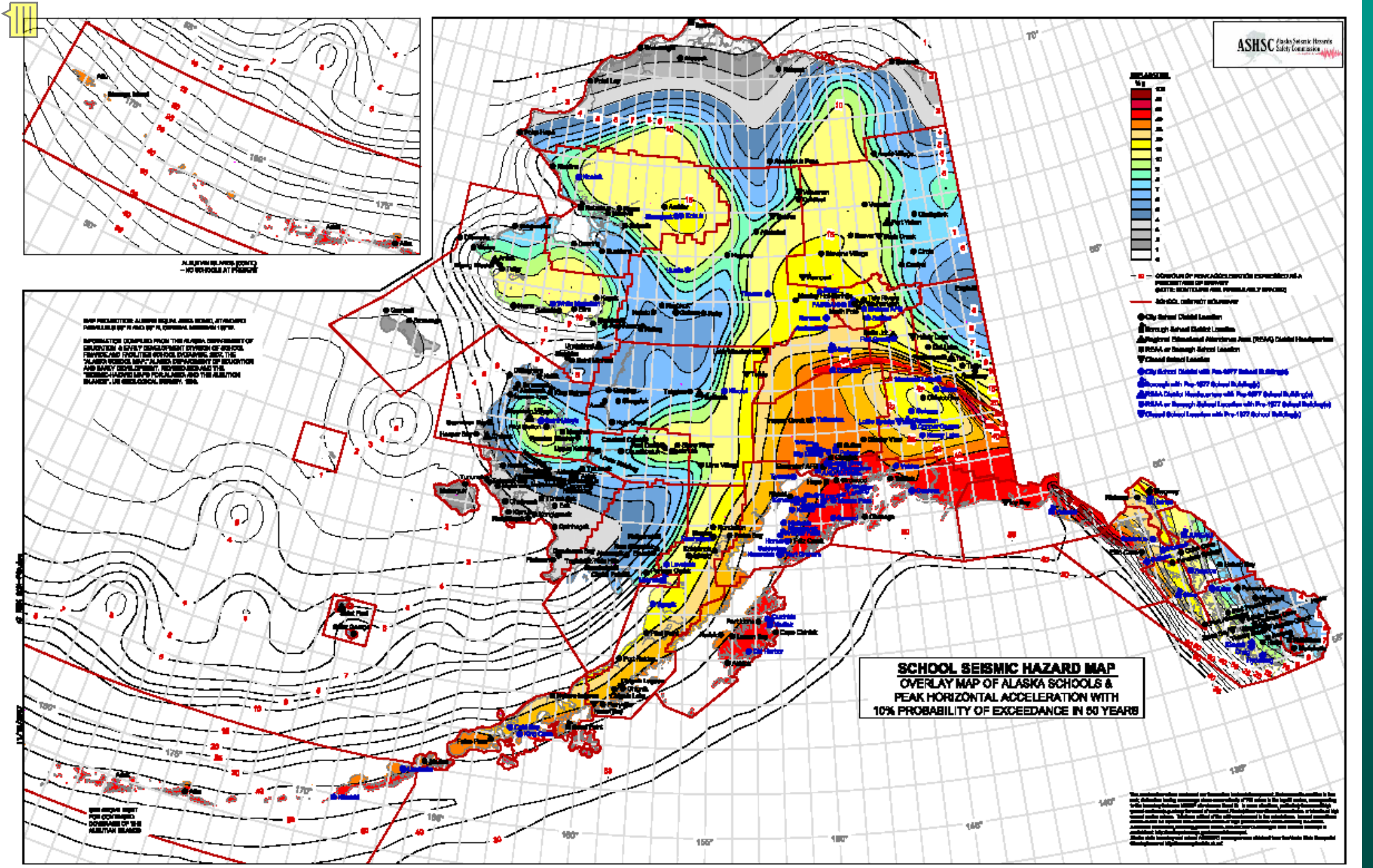
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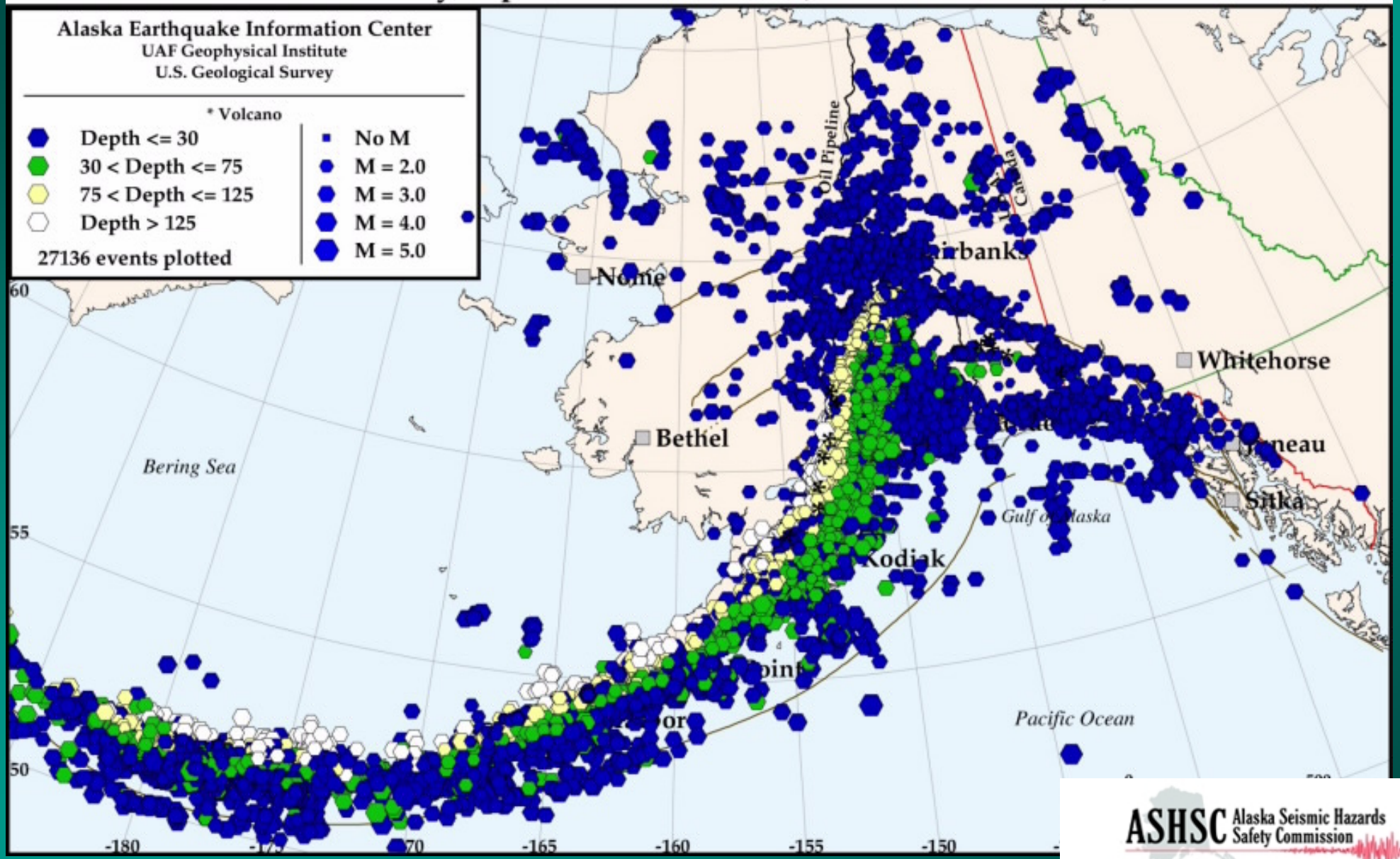
SCHOOL SEISMIC HAZARD MAP
OVERLAY MAP OF ALASKA SCHOOLS &
PEAK HORIZONTAL ACCELERATION WITH
10% PROBABILITY OF EXCEEDANCE IN 50 YEARS

AEIC Seismicity Report for December 01, 2007 - November 15, 2008



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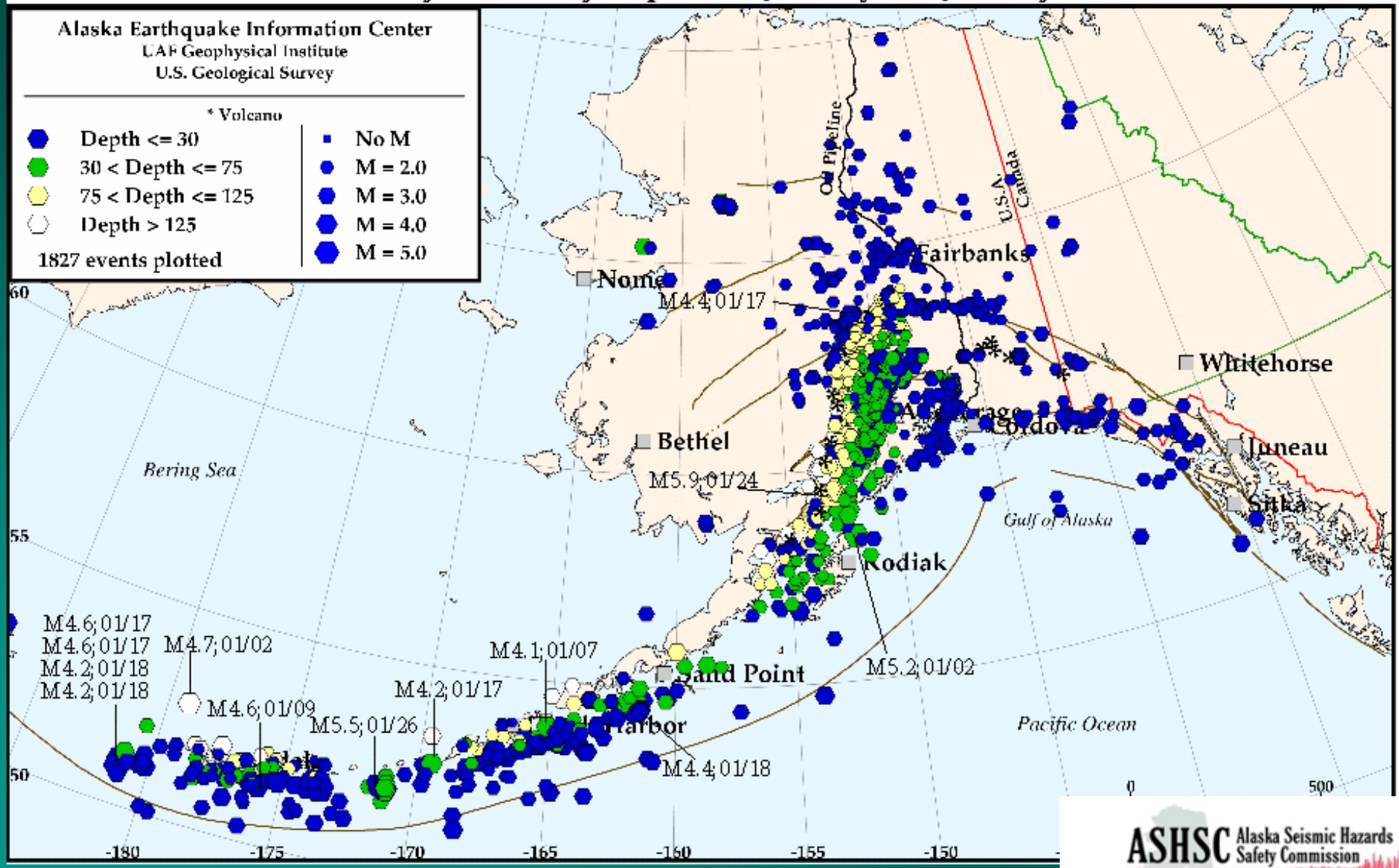
AEIC Monthly Seismicity Report for January 01 - January 31, 2009



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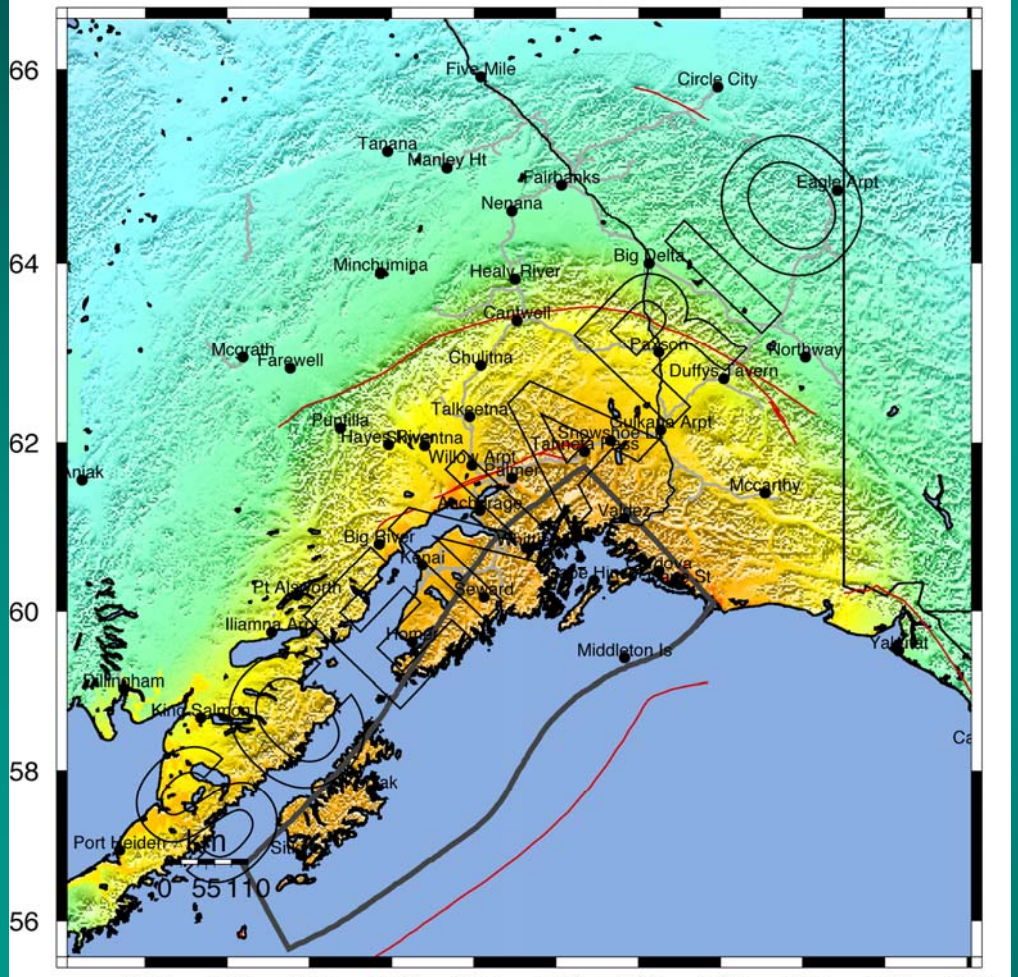
-- Earthquake Planning Scenario --

Rapid Instrumental Intensity Map for 1964 Anchorage Scenario

Scenario Date: Wed Mar 27, 1964 05:36:14 PM GST M 9.2 N61.00 W147.80 Depth: 25.0km



PLANNING SCENARIO ONLY -- PROCESSED: Tue Feb 18, 2003 10:52:15 PM GST

PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<.17	.17-1. 4	1.4-3. 9	3.9-9. 2	9.2-18	18-34	34-65	65-124	>124
PEAK VEL.(cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-16	16-31	31-60	60-116	>116
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

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Pertinent Legislation

- FEMA's Hazard Mitigation Grant Program (HMGP)
- FEMA's Pre-Disaster Mitigation Grant Program (PDM)
- National Earthquake Hazards Reduction Program (NEHRP)
- California (Field Act)
- Oregon, Washington, Nevada, Utah

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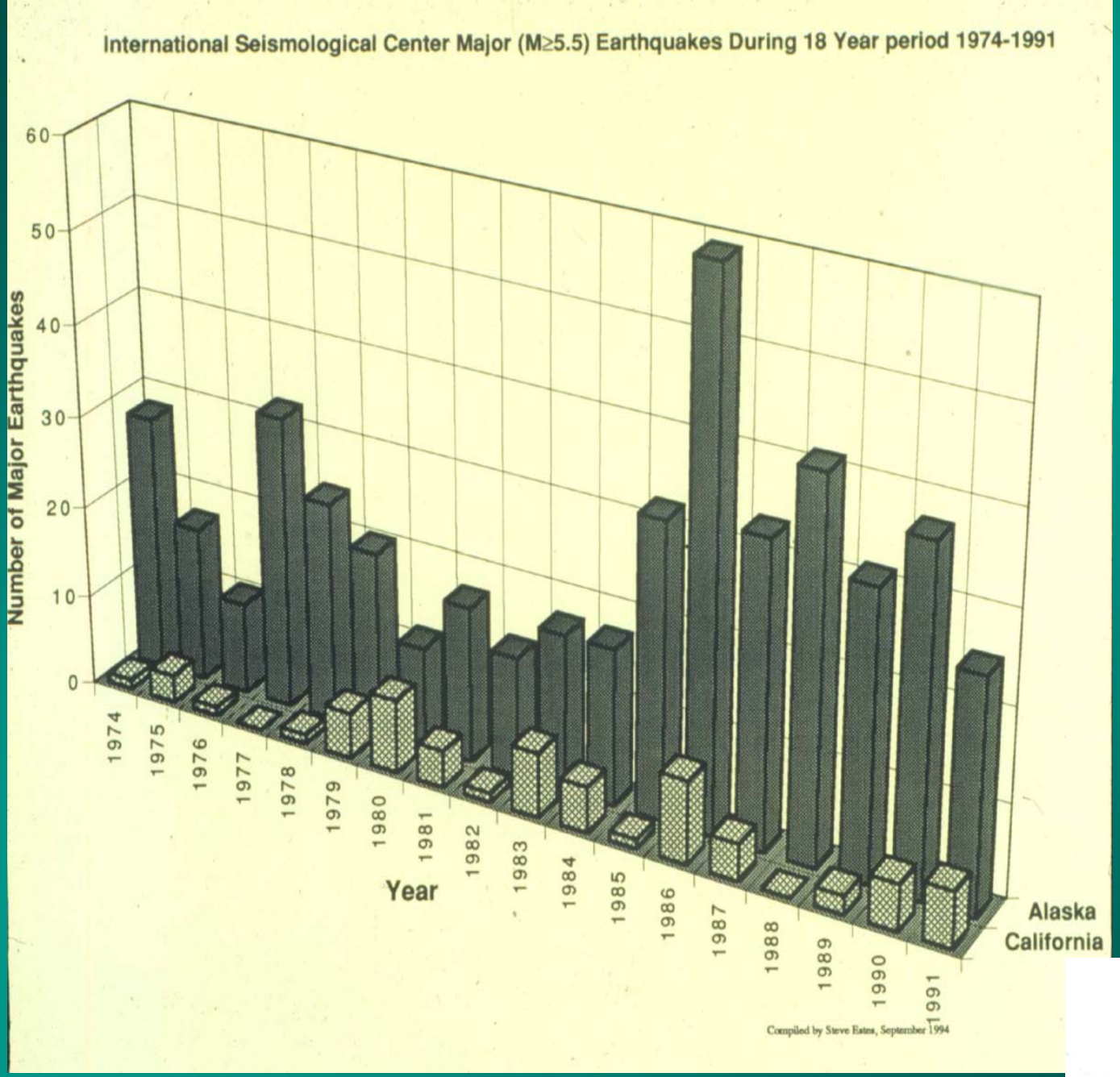

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The Kodiak Island Borough Experience

- Seismic Vulnerability Assessment for 13 Schools
- Evaluated 6 Seismic Hazards
- Recommended Structural Seismic Upgrades
- Recommended Higher Standard for New Construction
- Considered Non-Structural Hazards
- Performed Benefit cost Analysis

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Lessons Learned

- Recognition of the Problem
- Identification of Structures at Risk
- Prioritization of Mitigation
- Final Determination of Mitigation Projects

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Closure and Next Steps

- ASHSC to Refine Tasks & Continue Its Efforts Identifying Existing At-Risk Schools
- Currently Working on a School's Brochure
- Studying Seismic Requirements that Would Be Particular to Schools
- For New Schools & Major Renovations
  - » Require independent peer review of lateral force resisting element design
  - » Require resident observation of construction.

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QUESTIONS?

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