HB

379

HB 379

John Davies
Hbx - came to town spoke with Jim Palmer
474-6166

Introduced:
Referred:

BY

IN THE HOUSE

HOUSE BILL NO.

IN THE LEGISLATURE OF THE STATE OF ALASKA

THIRTEENTH LEGISLATURE - FIRST SESSION

A BILL

For an Act entitled: "An Act establishing a seismic hazard program within the Department of Natural Resources, and providing for an effective date."

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

* Section 1. AS 41.08.017 is amended to read:

Sec. 41.08.017. HYDROLOGICAL AND SEISMIC HAZARD DATA DECLARED TO BE OF PUBLIC INTEREST. (a) Systematic collection, recording, evaluation, and distribution of data on the quantity, location and quality of water of the state in the ground, on the surface of the ground, or along the coasts, are in the public interest and necessary to the orderly domestic and industrial development of the state.

(b) Systematic collecting, recording, evaluation, archiving and distribution of data on seismic events and engineering geology, and identification of potential seismic hazards throughout the state are in the public interest and necessary to orderly, safe and cost-effective development in the state.

* Sec. 2. AS 41.08.020 (b) is amended by adding new subsections to read:

(5) collect, record, evaluate, archive and distribute data on seismic events and engineering geology of Alaska;

(6) identify potential seismic hazards which might affect development of Alaska;

(7) inform public officials and industry about potential seismic hazards which might affect development of Alaska;

* Sec. 3. This Act takes ef ect July 1, 1983.

Purpose:

To establish a State of Alaska program in seismic hazards mitigation which will provide, in a timely manner, basic information that is critical to the safe and cost effective development of Alaska's economic, natural and recreational resources.

Background:

- Declining federal support has resulted in the closing of over 25% of the seismic stations in Alaska over the past two years.
- Present distribution of stations is uneven and not adequate for state's needs.
- Present lack of coordination results in information from Alaska seismic stations being scattered among archives in New York, Colorado, California and 4 places in Alaska.
- Future development of Alaska will require information about geologic hazards that must be collected continuously and over the long term - industry cannot and will not collect such information - it is the appropriate function of state government [Hayes].
- Wassilla Workshop on Alaskan Seismology called for DGGS program of the scope proposed.
- Hayes speech at EERI symposium promised support for seismic hazard mitigation research.

Objectives:

Listed in Table 1 are the costs to establish or maintain various seismic monitoring and/or hazard assessment projects. Together this

package would be a resonable seismic hazard mitigation program for the State of Alaska and would go a long way toward meeting the State's responsibility to assess one of the major geological hazards in Alaska. Below are brief descriptions of each of the projects:

1. Cook Inlet - Kodiak Seismic Network

Of about 25 seismic stations established by UAGI in this area under various federal (DOE, NOAA, NSF) research grants and contracts (circles and triangles, lower left of Figure 1) 6 are now closed and 19 are now maintained under a grant from the Governor's Office (derived from the Federal Budget Impact Fund). These stations are important for monitoring the seismic and volcanic activity of the lower Cook Inlet and Kodiak Island areas. In addition to that in the subduction zone (area of contact beween the Pacific and Alaskan plates) these stations monitor possible activity on three major fault systems which are important to seismic hazards assessment in the greater Anchorage area: (1) the Bruin Bay-Castle Mtn. system; (2) the Border Ranges-Eagle River system; (3) the offshore Kodiak-Montegue Island system. This network also provides a means to monitor the activity of the following volcanoes: Katmai group, Mt. Douglas, Augustine, Illiamna and Redoubt.

Useful support can be given at any level of funding between $80,000 and $250,000. Costs for various portions of this network are as follows: $80 K, Cook Inlet; $75 K, Kodiak Island; $60 K, Alaska Peninsula. The remaining $35 K would be used for preparation of a comprehensive seismic hazards assessment of the greater Cook Inlet region.

2. Interior Alaska Seismic Network

This network consists of about 15 stations (5 now closed) generally located along the Glen, Parks and Alaska (between Glennallen and Fairbanks)

Highways (see upper right portion of Figure 1). It monitors seismic activity in the Mat-Su Valleys, the Talkeetna Mountains, the Railbelt and major highway routes into the interior and the Fairbanks-Nenana region. Major fault systems monitored include the northeastern most corner of the Pacific-Alaska plate interface (subduction zone), the Denali and Castle Mountain Fault systems, numerous other smaller faults north of the Alaska Range and the Fairbanks seismic zone.

The Interior Alaska Seismic Network includes some of the original stations established immediately following the 1964 Good Friday Earthquake. It has been supported under grants and contracts from the federal government as well as unrestricted funds allocated to the Geophysical Institute of the University of Alaska. These latter funds now are the sole source of support for the Interior Network. The $50 K sought would not cover all of the costs of this network but would ease the burden on the Institute overhead.

A more permanent solution to supporting this network would be to fund it through the University of Alaska, Fairbanks as a seismic laboratory for the purpose of graduate and undergraduate student education. The total annual costs of this network are about $125 K.

3. Stations in SE and SW Alaska

One of the consequences of relying upon federal research grants and contracts for seismic networks to monitor earthquakes in Alaska is that the coverage is uneven and changes depending upon the priorities of the federal programs and not necessarily the needs of Alaska. Two examples of this situation are in SE and SW Alaska.

Until recently DOE and NOAA supported networks operated by Columbia University in the Pribilof Islands and around Dutch Harbor. All of these stations have been closed, save one in Dutch Harbor which is barely

supported by the Alaska Division of Geological and Geophysical Surveys (DGGS). The second example is the Hyder-Ketchikan area of southeastern-most Alaska. Notwithstanding the fact that this area is adjacent to a major plate boundary fault - the Queen Charlotte-Fairweather system - it has never been adequately instrumented to monitor the local seismic events.

The $50 K sought here would allow the maintenance of two stations, one each in Dutch Harbor and the Kantishna Mining District and the installation and maintenance of two stations in the Hyder-Ketchikan area. The cost per station is somewhat high because DGGS does not now operate enough seismic stations to be most efficient.

4. Seismic Instrumentation in Anchorage Buildings

One of the most effective ways to save lives and property in the event of a major earthquake is to have designed large buildings to an appropriate level of seismic resistance and to have carefully chosen the sites for both public buildings and private dwellings so as to avoid those areas that pose special seismic risks. Two essential kinds of data for the seismic engineering of large structures are provided by strong-motion accelerographs. These instruments can measure exactly how hard the ground vibrated at a given location and exactly how severely a given building may have been shaken in response. Ordinary seismic stations are designed to locate as many small earthquakes as possible and so are far too sensitive to measure the strong ground motion and building response during a large earthquake at distances close enough to the epicenter to cause serious damage.

A very serious problem in Alaska is the lack of strong motion accelerograph data. The seismic designs of the Trans Alaska Pipeline

System and of offshore platforms as well as the State Office Building in Anchorage have had to rely upon extrapolations from data collected in California and Japan. The geologic environment of Alaska is different enough from these regions that it is important to have data collected in Alaska to use in the design of Alaskan structures.

The Municipality of Anchorage recently took a big step forward in reinstating the Uniform Building Code requirement that certain large buildings must have strong motion accelerographs installed when they are built. To assure that the data from these instruments are maximally useful, the Division of Geological and Geophysical Surveys has proposed to the Municipality a joint program for the maintenance and processing of data from these instruments. This proposal also calls for the installation of some additional instruments to augment those that will be installed under the new Municpal Building Code.

The $18 K sought here would support the states share of this joint program: $16 K is for the purchase of instruments and $1.6 K is for 1/2 the installation and maintenance costs of the first year of the program. The annual maintenance costs are expected to total about $5 K to $6 K with the state share being about half of this figure. The additional FY 85 funds shown would be to initiate similar programs in other municipalities such as Valdez, Kodiak, Seward, Whittier, Juneau, Palmer and Fairbanks, for examples.

Note that a major assumption in this program is that data from the various short period networks are available. These data will be important to pinpoint the specific fault which caused the strong ground motion and building response recorded by the strong motion accelerographs. Without this information much of the utility of these strong motion data will be lost.

5. Cook Inlet Volcano Observatory

Seismic stations are located on or nearby each of the four major volcanoes which line the western shore of Cook Inlet; viz., Augustine, Illiamna, Redoubt and Spurr. Potentially these stations could be used to warn the communities along the Inlet of an impending volcanic eruption - an event that is expected at least every 20 years from one of these four volcanoes. Such eruptions have posed serious hazards in the past, particularly to aviation and to tidewater communities.

These stations, however, are operated by three different agencies, are recorded at three different locations, for three different purposes. Since all of the stations and associated transmission equipment already exist, it is a relatively trivial matter to relocate the recording facility for some of these stations such that they are all recorded at a common place. Once this is done, then it is quite easy to monitor the activity of all of the volcanoes along Cook Inlet.

It has been proposed that the "Cook Inlet Volcano Observatory" be established at the USGS offices in Gould Hall on the Alaska Pacific University campus. A tentative agreement has been reached between all of the agencies involved: USGS, DGGS, ATWC, ADES, NWS and UAGI. Since the USGS already has assigned a person to monitor some of these volcanoes and since most of the facilities and equipment already exist, the incremental operational costs for establishing this "observatory" are minimal. The $5 K sought here should be reduced in future years to about $1 K or $2 K for the DGGS share of the annual maintenance.

6. Alaska Seismological Data Center

Seismic stations are operated in Alaska by 13 different agencies. The data from these stations are archived in 12 different locations

ranging from New York to California and from Colorado to Fairbanks. There is no agency in Alaska (or otherwise) which can provide ready access to all of this data. Consequently, when a specific project is proposed, as the State Office Building in Anchorage, e.g., one of the first tasks of the consultant hired to assess the seismic risks is to travel to a number of these different archival sites to collect the basic data needed for the study. Indeed, some studies simply have not been done because of the difficulties involved in assembling the data.

The total annual cost of the seismic monitoring effort in Alaska exceeds two million dollars. What we propose is to spend less than five percent of this amount to assure that the data collected is readily available in Alaska for all Alaskans to use. This is the only project in this package which requires the hiring of new personnel. The personnel service funds sought here would support 1 (full-time) geological assistant and 1 (two-thirds time) graduate student intern. The geological assistant would be charged with continously acquiring new data, maintaining the seismic data archive, and providing routine data products such as bulletins and maps. The student intern would provide special purpose analyses of the data on an as-requested basis. Supervision and facilities for the data center would be provided through existing DGGS and UAGI program support.

7. Engineering Geological Studies in Municipal Areas.

One of the questions most often asked of DGGS is a variation on "Is this site where I plan to build safe from earthquakes?" The answer to this question of course depends upon a detailed knowledge of the seismic history of the area, but it also depends, equally importantly upon an understanding of both the general geology and specific soil properties of the site in question.

This fact was dramatically demonstrated by the damage patterns of the 1964 Good Friday Earthquake in Anchorage. Most of the damage in Anchorage by that earthquake was not done as a direct result of the shaking, but as a result of the failure or liquifaction of sandy soils in the Bootlegger Clay Formation (a soil horizon found under most of the city of Anchorage). The importance of a detailed knowledge of the engineering geology of a given site was vividly illustrated by the contrast of homes which were unscathed by the 1964 earthqauke standing next to piles of rubble which previously had been neighboring dwellings.

It is not, in general, the province of DGGS to do site-specific geologic studies. What we propose is a series of area-wide studies in a number of municipalities to map soil horizons, do engineering studies to characterize the general seismic properties of these soils, and to integrate this type of information with other knowledge such as water table height, slope, and expected level of seismic shaking to arrive at area-wide, general maps of the potential for foundation soil failure during future earthquakes.

Priorities

It is difficult to assign priorities to these projects because they are all important for different reasons. Some level of support for the Cook Inlet-Kodiak seismic network is most urgent because without this support it will close this summer. Next, I would place the Alaska Seismological Data Center since it will help to utilize those data which are being collected. Third, I would place the strong motion accelerograph program in Anchorage. Fourth I would place the support for the Interior Network and the installation and maintenance of stations in SE and SW.

Last, would be the Cook Inlet Volcano Observatory and the Engineering Geological Studies, only because these are derivative operations which require the existence of data collected and made available through the projects listed above.

	PROJECT	FY	100	200	300	400	500	TOTALS
1.	Cook Inlet Kodiak Seismic Network RSA to Support Existing UAGI Stations	84			250			250
		85			262.5			262.5
2.	Interior Alaska Seismic Network RSA to Support Existing UAGI Stations	84			50			50
		85			52.5			52.5
3.	Stations in SE and SW Alaska Install 2 and Maintain 2 DGGS Stations	84		10	12.6	3.2	24.2	50
		85		10.5	13.2	3.4	25.4	52.5
4.	Seismic Instrumentation in Anch. Bldg. And other Areas in '85	84		.6	1	0	16	17.6
		85		1.5	2	1.2	10	14.7
5.	Cook Inlet Volcano Observatory Cooperate with USGS, UAGI, DES, NOAA	84		.6	2.4	1	1	5
		85		.6	2.5	1.1	1.1	5.3
6.	Alaska Seismological Data Center Cooperate with UAGI (Fairbanks)	84	56.9	0	37	1.1	5	100
		85	59.7	0	38.8	1.2	5.3	105
7.	Engineering Geological Studies in Various Municipal Areas	84		6	22	1	1	30
		85		6.3	23.0	1.1	1.1	31.5
	TOTALS	84	56.9	17.2	375	6.3	47.2	502.6
		85	59.7	18.9	394.5	8.0	42.0	524.0

TABLE 1

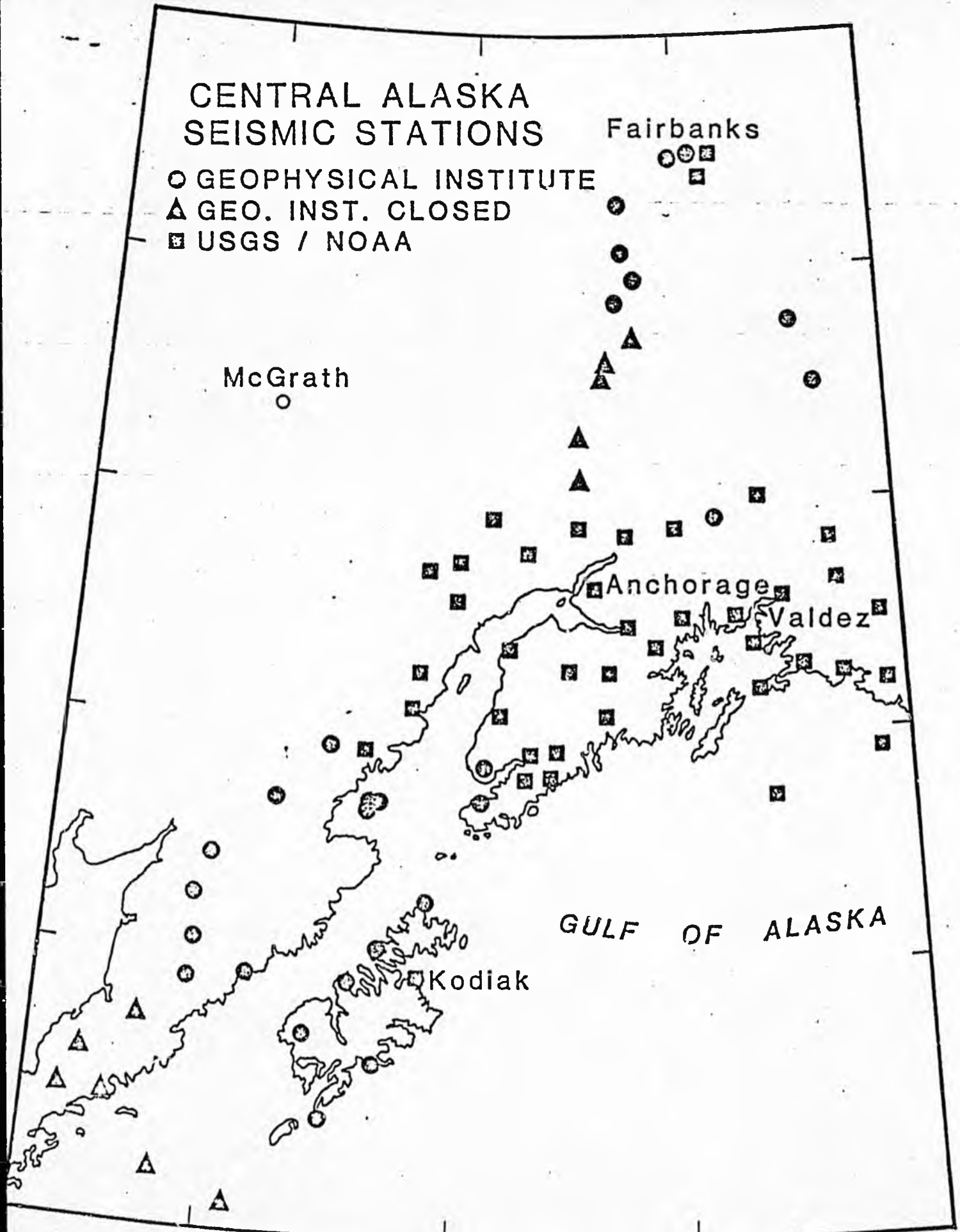
CENTRAL ALASKA
SEISMIC STATIONS
GEOPHYSICAL INSTITUTE
GEO. INST. CLOSED
USGS / NOAA
Fairbanks
McGrath
Anchorage
Valdez
GULF OF ALASKA
Kodiak

FIGURE 1

Alaska State Legislature

POUCH V
STATE CAPITAL
JUNEAU, ALASKA 99811
(907) 465-3634
(907) 465-3835

Senate

Committee on Resources

JUNE 23, 1983

Memo

To: Senate Resources Committee Members

From: Senate Resources Committee Staff

Subject: Committee Hearing, HB 379, Seismic Hazard Program, June 23, 3:00pm

HB 379 directs the DNR to establish a program of identification and evaluation of seismic events (e.g. earthquakes) and hazards similar to that now done for hydrological information. The work would be done by the Division of Geological and Geophysical Surveys (DGGS) utilizing the University of Alaska.

The current conference committee capital budget contains $500,000 for a "Seismic Hazard Program". This legislation would be the authorization bill for this appropriation.

Attached are letters and information related to the need for this program.

APPENDIX IV

Major Problems in Alaska:

1. Uneven statewide coverage

   - especially western Alaskan and OCS

2. Data archival in many locations outside of Alaska

   - 12 locations in Florida, New York, Colorado, California, Texas and Alaska

3. Very little strong ground motion accellerograph data (SMA)

   - only 30 records, all at very small levels (< .20)

4. No significant SMA data from building

5. Not one building in Alaska is adequately instrumented

6. Tsunami warning program not focused on Alaska

   - communication system to Alaskan coastal communities is inadequate in most cases, no systematic preparation

7. No systematic statewide program in mapping and characterizing foundation soils in municipal areas

8. No systematic statewide program in identifying seismic hazards such as active faults, potential landslide areas

9. No systematic program to monitor volcanoes close to populated areas

10. Federal support is declining at alarming rate

SOURCE: JOHN DAVIES, GEOPHYSICAL INSTITUTE, UNIVERSITY OF ALASKA 5/25/83

STATE OF ALASKA

DEPARTMENT OF NATURAL RESOURCES

OFFICE OF THE COMMISSIONER

BILL SHEFFIELD, GOVERNOR

POUCH M
JUNEAU, ALASKA 99811
PHONE: 465-2400

June 24, 1983

The Honorable Bettye Fahrenkamp
Senator
Alaska State Legislature
Pouch V
Juneau, AK 99811

Dear Senator Fahrenkamp:

The Department of Natural Resources supports the legislation (HB 379) to create a State seismic hazards program in the Division of Geological and Geophysical Surveys, although within a given funding limit we may have difficulty allowing for the program. I understand that the money for the seismic hazards has been added to the Department's budget for FY 84.

Thank you for considering the bill. Please contact me if you need more information.

Sincerely,

Robert D. Arnold
Deputy Commissioner

cc: The Honorable Joe L. Hayes
Peter McDowell, Office of the Governor

fairbanks north star borough

p.o. box 1267 520 fifth ave. fairbanks, alaska 99707 907-452-4761

Copy

May 13, 1983

Governor Bill Sheffield
Office Of The Governor
Third Floor, State Capitol
Pouch A
Juneau, Alaska 99811

Dear Governor Sheffield:

The Fairbanks North Star Borough Assembly at its Regular Meeting of April 28, 1983, voiced full support of HB 379 and HB 380, establishing and funding a statewide program to mitigate seismic hazards.

We are concerned that declining federal support for earthquake monitoring in Alaska will result in the closing of seismic stations important to the cost-effective and safe development of the Interior as well as other regions of Alaska. Further, we are concerned that the absence of a statewide program for mitigation of seismic hazards results in the inefficient use of seismic data which are being collected. HB 379 and HB 380 represent a good beginning to remedy this serious situation.

We hope that upon examination of the merits of these bills you will give them your full and enthusiastic support.

Sincerely,

Jerome W. Norum
Presiding Officer
F.N.S.B. Assembly

JWN:mgc

Municipality of Anchorage

POUCH 6-650
ANCHORAGE, ALASKA 99502-0650
(907) 264-4111

TONY KNOWLES.
MAYOR

DEPARTMENT OF PLANNING

May 9, 1983

House of Resources Committee
Pouch V
Juneau, Alaska 99811

Attention: Rep. John Ringstad, Chairman

Gentlemen:

It has come to our attention that legislation regarding the establishment of a seismic hazards program within the Department of Natural Resources is currently on your committee agenda. As a technical advisory commission for the Municipality of Anchorage, which routinely deals with geotechnical matters such as seismic hazards, we respectfully request that you support HB No. 379 and HB No. 380. The continuous monitoring and evaluation of earthquake activity throughout the State and the archiving and distribution of that data is fundamental to the process of seismic hazard evaluation and earthquake resistant design. It is extremely important that the record of earthquake activity be uninterrupted, if a meaningful data base is to be secured for our unique seismic environment. Furthermore, that information must be processed and made available to the Alaskan engineering community, if safe and economically prudent design criteria are to be incorporated into present and future developments in one of the most seismically active regions of the world.

Our endorsement of this legislation is wholly that of the members of this Commission. Due to the rescheduling of the hearing for these bills, and to their own full schedules, the Mayor and the Assembly have not yet reviewed and commented on this legislation.

If you or your staff have any questions concerning the technical aspects of this matter, please call.

Very truly yours,

ANCHORAGE GEOTECHNICAL
ADVISORY COMMITTEE

John Aho
CH2M Hill

John Lambe
John Lambe & Associates

Donald Bruggers
Harding Lawson Associates

Thomas Smith
Maynard and Partch Architects

Robert Hickel
Hickel Investment

Michael Swalling
Swalling Construction

Alan Krause
Golder Associates

Rupert Tart
Woodward-Clyde Consultants

David A. Cole, Jr., Chairman
DOWL Engineers - 562-2000

cc: Rep. Dick Shultz, Co-Chairman
Rep. Rick Uehling
Rep. John Cowdery
Rep. Peter Goll
Rep. Ron Larson
Rep. John Liska
Rep. Tony Vaska

DAC:kf

May 1, 1983

Rep. Joe Flood:

With seismicity increasing worldwide, we in Alaska have a great need for a good monitoring system. Since 1900 seismicity has been steadily increasing and now it is reaching alarming proportions and if the trend is charted for the next 10-15 years, it may reach staggering levels. Also it is obvious that those seisms over 6.0 are those that are increasing.

Why I am writing this letter is to alert our representatives of the potential disaster hanging on the horizon for Alaska. Many mountain and coastal communities are highly vulnerable to landslides from the steep cliff sides surrounding the communities and bays. The potential loss of life and property can easily reach awesome proportions in Alaska. Yet we have at present an inadequate monitoring system in Alaska.

Hyder is a coastal village surrounded by steep cliffsides in a narrow valley at the head of Portland Canal. A moderate quake could easily bury the town under a landslide or throw a Tsunamai from the bay by landslide in the bay (reminescent of the Lituya Bay disaster). We feel vulnerable here. Small tremors are being felt here in the town. These tremors have been occurring for the past two years. A 5.3 quake was registered on Prince of Wales Island last month west of here. A friend in Craig, AK, was shook from her sleep by this quake. Last year an app. 4.5 quake was registered on the Queen Charlotte Islands. Obviously activity is increasing in this area.

The ability to understand and predict E.Q.s is a distinct growing possibility. Accurate prediction of E.Q.s may be a reality in a few years. But we have to have the monitoring equipment in place. We have been asking for Hyder to be a monitoring site in the monitoring network planned by the Dept. of Seismology under Dr. John Davies. This is a most intelligent move in face of such increasing worldwide seismicity and the especially potential danger for the people of Alaska. Thank you. We look for your continous support of HB 380, and 379.

Eddy Dolsky

Eddy Dolsky

Chairman of Hyder Seismograph Committee
Hyder Community Assoc.

cc Gov. Sheffield
cc Sen. Ziegler
cc Rep. McBride
cc Rep. Joe Hays
cc Dr. John Davies

HOUSE BILL NO. 379 by Representatives Flood and Hayes, entitled:

"An Act establishing a seismic hazard program within the Department of Natural Resources; and providing for an effective date."

was read the first time and referred to the Resources Committee and the Finance Committee.

The Resources Committee considered HOUSE BILL NO. 379 (seismic hazard program within the Department of Natural Resources) and a majority of the committee recommended do pass. The report was signed by Senator Fahrenkamp, Chairman and concurred in by Senators Sturgulewski, Vic Fischer, Eliason and Paul Fischer.

The Committee attached:

"LETTER OF INTENT
HB 379

It is the intent of the Committee that seismic information gathered, evaluated and disseminated under this program would include information regarding seismic hazards in the Hyder, Alaska area.

It is also the intent of the Committee that this program be conducted in concert with other on-going related programs and not duplicate or conflict with similar efforts by the federal government, the University of Alaska or other agencies or organizations."

Senator Bennett, Co-Chairman, moved and asked unanimous consent that the Finance Committee referral be waived. Without objection, it was so ordered.

HOUSE BILL NO. 379 was referred to the Rules Committee.

Supplemental Cal