COMMITTEE REPORT

HOUSE

(11) FURTHER:

5/11/83 Date: 6/17/83

Mr. Speaker:

The Committee on FINANCE has had HB 379

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

under consideration and reports it back as follows:

[X] do pass [ ] do not pass

[ ] do pass with attached amendments(s)

[ ] replace with CS for _____ [ ] same title [ ] new title

and recommends _____

[ ] AND attaches a "Letter of Intent" [ ] New Fiscal Note [X] Zero Fiscal Note Attached

[ ] reports it back without recommendation

[ ] referred to the _____ Committee

MEMBERS SIGNING
DO PASS

MEMBERS HAVING
OTHER RECOMMENDATIONS:

CHAIRMAN

H 60

Introduced: 4/26/83
Referred: Resources and Finance

IN THE HOUSE BY FLOOD AND HAYES

HOUSE BILL NO. 379

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 paragraphs to read:

(6) collect, record, evaluate, archive and distribute data on seismic events and engineering geology of the state;

(7) identify potential seismic hazards that might affect development in the state;

(8) inform public officials and industry about potential seismic hazards that might affect development in the state.

* Sec. 3. This Act takes effect July 1, 1983.

THE LEGISLATURE OF THE STATE OF ALASKA
THIRTEENTH LEGISLATURE

FISCAL NOTE

I. REQUEST
Bill/Resolution No. HB 379
Title Establishing a seismic harzard program in DNR
Requested by House Finance Committee Date 6/12/83

II. FISCAL DETAIL
Agency Affected Department of Natural Resources
Program Category Affected
BRU, Program, Or Subprogram(s) Affected
(Note: If more than one budget component is affected, separate line-item amounts and funding for each component in the analysis section.)

EXPENDITURES (Thousands of Dollars)

	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88
100 PERSONAL SERVICES						
200 TRAVEL						
300 CONTRACTUAL						
400 COMMODITIES						
500 EQUIPMENT						
600 LAND & STRUCTURES						
700 GRANTS,CLAIMS,ETC.						
TOTAL						

FUNDING (Thousands of Dollars)

GENERAL FUND						
FEDERAL FUNDS						
OTHER (Specify Source)						

POSITIONS

FULL TIME						
PART TIME						
TEMPORARY						

III. ANALYSIS (See Fiscal Note Preparation Instruction, Section III)

$500,000 is provided in the FY 84 capital budget for establishment of a seismic hazard program in the Department of Natural Resources. Therefore, additional funding will not provided in this fiscal note.

IV. DATE 6/12/83 PREPARED BY Al Adams, Chair APA
AGENCY House Finance Committee
PHONE 465-3706

Original: Legislative Finance
cc: Budget and Management
Prime Sponsor (First Legislator Named)

33-001 (Rev. 12/82)

The following individuals may testify on HB 379:

Representative Joe Flood, prime sponsor

A representative of DNR

HB 379

SEISMIC DATA PROGRAM - FY 84 + FY 85 FUNDING REQUIREMENTS

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

HAYES' REMARKS TO EARTHQUAKE ENGINEERING RESEARCH INSTITUTE 10/20/82

IT SEEMS PARTICULARLY APPROPRIATE THAT YOUR MEETING IS BEING HELD IN ALASKA, AND IN A CITY WHICH WAS DEVASTATED BY ONE OF THE HISTORICALLY GREAT EARTHQUAKES EVER RECORDED. NO COMMUNITY ON EARTH HAS A GREATER INTEREST IN YOUR CONCERNS THAN ANCHORAGE. THAT INTEREST IS HEIGHTENED BY THE FACT THAT ANCHORAGE AND ALASKA ARE IN WHAT IS PROBABLY ONLY THE BEGINNING OF A CONSTRUCTION PERIOD WHICH MAY RIVAL ANY WE'VE EVER SEEN. THE PROBABILITY OF A NEW CAPITAL CITY AT WILLOW: THE LIKELIHOOD THAT WE WILL BE EXPANDING TRACKAGE FOR THE ALASKA RAILROAD: THE FACT THAT WE ARE CONSTRUCTING PUBLIC AND PRIVATE BUILDINGS IN VIRTUALLY EVERY COMMUNITY IN THE STATE: THAT NEW HARBORS, AIRPORTS, ROADS AND BRIDGES ARE IN THE OFFING IN MANY LOCATIONS: THAT WE ARE PRESENTLY PREPARING TO BUILD THE KNIK ARM CROSSING: NOT TO MENTION THE TREMENDOUS PLANS WE HAVE FOR HYDROELECTRIC DEVELOPMENT, INCLUDING THE GIANT SUSITNA PROJECT, AND THE PROBABILITY OF NEW PIPELINE PROJECTS, ALL MAKE THE RESULTS OF YOUR RESEARCH EFFORTS OF PRIMARY IMPORTANCE TO ALASKA.

AS AN ENGINEER, I CAN APPRECIATE THE SPECIAL IMPORTANCE OF YOUR WORK. I THINK ANYONE WHO IS NOT AN ENGINEER OR IN A RELATED DISCIPLINE, OR WHO WAS NOT IN ANCHORAGE IN MARCH OF 1964, CANNOT FULLY COMPREHEND THE AWESOME FORCES PENT UP IN THE EARTH WHICH IT IS YOUR MISSION TO UNDERSTAND AND TO PROTECT AGAINST IN CONSTRUCTION.

BOTH SEISMIC PREDICTION AND ENGINEERING DEFENSIVELY AGAINST SEISMIC DISRUPTION HAVE COME OF AGE. COMPUTERS HAVE GIVEN US THE CAPABILITY NOT ONLY OF USING PROBABILITY PREDICTION WITH RESPECT TO OCCURRENCE OF QUAKES, BUT ALSO TO MODEL POTENTIAL CONSEQUENCES. EVEN PREVIOUSLY UNACCOUNTABLE ANIMAL BEHAVIOUR IS BEING STUDIED AS A KEY TO SEISMIC UPSET.

ALTHOUGH I AM NOT PROFESSIONALLY QUALIFIED TO SPEAK ON THE MORE TECHNICAL ASPECTS OF YOUR UNDERTAKINGS, I DO HAVE AN ENGINEER'S APPRECIATION OF THEIR VALUE. YOUR RELATIVELY ESOTERIC AND TREMENDOUSLY EXCITING FIELD IS OF IMPORTANCE TO EVERY ALASKAN, FROM HOMEOWNERS TO ROAD BUILDERS, FROM INVESTORS TO CIVIL AUTHORITIES AT EVERY LEVEL. AS AN ENGINEER IN PUBLIC OFFICE, I HAVE A VERY SPECIAL INTEREST IN YOUR WORK AND IN THIS CONFERENCE, PARTICULARLY BECAUSE OF THE UNDERSTANDING I DO HAVE OF YOUR FIELD, AND OF THE INTEREST GOVERNMENT MUST NECESSARILY HAVE IN IT. IT IS OBVIOUS TO ME THAT YOUR INTEREST IN MY PARTICIPATION HERE IS THE DUAL ROLE I HAVE OF ENGINEER AND ELECTED OFFICIAL. I CAN APPRECIATE THE IMPORTANCE OF YOUR WORK MORE THAN THE AVERAGE LAYMAN MIGHT, AND I WILL HAVE AT LEAST SOMETHING TO SAY ABOUT HOW AND TO WHAT EXTENT STATE GOVERNMENT AFFECTS YOUR EFFORTS AND INTENTIONS.

BEING ON THE CONSERVATIVE SIDE OF THE POLITICAL SPECTRUM, I TEND TO RESIST GOVERNMENT INVOLVEMENT IN AREAS IN WHICH IT IS NOT ESSENTIAL, BELIEVING THAT GOVERNMENT BEST WHICH GOVERNS LEAST. IN THIS LATTER HALF OF THE TWENTIETH CENTURY, HOWEVER, GOVERNMENT IS NECESSARILY AND UNAVOIDABLY INVOLVED MORE AND MORE IN ALL OUR LIVES. AS MANKIND PROBES FURTHER INTO THE MYSTERIES OF THE EARTH AND OF THE UNIVERSE, WE FIND MORE AND MORE INTERESTS WHICH ARE BEYOND THE FINANCIAL CAPABILITIES OF PRIVATE FUNDING, AND WHICH ARE OF SUFFICIENT BROAD PUBLIC INTEREST AND IMPORTANCE THAT THEY BECOME A CONCERN OF GOVERNMENT. REGULATION FOR STANDARDIZATION, FOR THE SAKE OF BOTH PUBLIC AND PRIVATE SAFETY, HAVE COME TO BE LEGITIMATE CONCERNS OF GOVERNMENT. IT BECOMES THE RESPONSIBILITY OF THE CONSERVATIVE, IT SEEMS TO ME, TO REGULATE THE REGULATORS: TO BE SURE THAT REQUIREMENTS IMPOSED BY GOVERNMENTS ARE NOT SOMETHING WHICH MIGHT BETTER, MORE EFFICIENTLY, OR MORE

PROPERLY BE ACCOMPLISHED BY THE PRIVATE SECTOR.

IN THAT CONNECTION, THERE ARE TWO AREAS I WOULD LIKE TO DISCUSS WITH YOU. BOTH ARE SUGGESTIONS FOR YOUR CONSIDERATION. NEITHER IS A PROMISE OR A GUARANTEE.

IN ONE OF THE MOST EARTHQUAKE-PRONE REGIONS OF THE WORLD, WE DO NOT HAVE DESIGN, ENGINEERING OR CONSTRUCTION STANDARDS WHICH ARE CONSISTENT AND RELIABLE FOR BOTH PUBLIC AND PRIVATE ENTERPRISES. WE HAVE SOME VERY GENERALIZED GUIDELINES AND BASIC STANDARDS WHICH ARE COMMONLY OBSERVED, BUT NO RULE BOOK UPON WHICH ALL MAY RELY AND TO WHICH ALL MAY TURN FOR THE ANSWERS TO SOME VERY IMPORTANT QUESTIONS. THE ESTABLISHMENT OF EARTHQUAKE CONSTRUCTION STANDARDS, WHICH DOUBTLESS WOULD DIFFER IN MANY LOCAL REGIONS, GIVEN THE WIDE VARIETY OF GEOLOGY IN ALASKA AND IN THE COUNTRY, WOULD BE OF INTEREST AND VALUE TO A NUMBER OF DIVERSE CONCERNS. ARCHITECTS, ENGINEERS AND BUILDERS OBVIOUSLY WOULD HAVE A PRIMARY INTEREST. IN ADDITION, HOWEVER, INSURANCE COMPANIES, REAL ESTATE BROKERS AND FINANCIAL INSTITUTIONS WOULD HAVE AN INTEREST. AT THE CORE OF GOVERNMENT INTEREST IS PUBLIC SAFETY AND THE FINANCIAL STAKE IN THE BROAD VARIETY OF PUBLIC FACILITIES WHICH THIS STATE PRESENTLY OWNS AND OPERATES, AND THE MAJOR ADDITIONS TO THAT INDUSTRY WHICH WE WILL BE CREATING IN COMING DECADES AS ALASKA ATTEMPTS TO CATCH UP WITH ITS OLDER SISTER STATES IN DEVELOPING ITS PUBLIC INSTITUTIONS AND SERVICE SYSTEMS. OTHER STATES AS WELL, CONTINUE TO ERECT PUBLIC BUILDINGS AND FACILITIES WHICH ARE SUBJECT TO EARTHQUAKES.

OUR STATE GOVERNMENT, IN PARTICULAR THE LEGISLATURE, HAS A VESTED INTEREST IN THESE CONCERNS. IT WOULD BE OUR RESPONSIBILITY TO CONSIDER FINANCIAL ASSISTANCE FOR THE RESEARCH REQUIRED TO ESTABLISH SUCH STANDARDS.

IT WOULD BE OUR JOB TO "REGULATE THE REGULATORS" IN DETERMINING WHETHER OR HOW MUCH CONTROL, BY WAY OF STANDARDS ENFORCEMENT, WOULD BE APPROPRIATE, NECESSARY, AND NOT UNDULY RESTRICTIVE. IT WOULD BE OUR DUTY TO MONITOR THE USE OF SUCH CONTROLS, PERHAPS THROUGH THE DEVICE OF OUR SUNSET LAWS, AND BY PERIODIC AMENDMENT WHICH MIGHT BE APPROPRIATE. GIVEN THE MAGNITUDE OF THE EFFECTS OF SUCH INFORMATION AS YOUR RESEARCH CAN PRODUCE -- WHICH ALL OF US WHO WERE HERE IN 1964 CAN APPRECIATE -- IT SEEMS ENTIRELY APPROPRIATE THAT THE LEGISLATURE SHOULD BE INVOLVED ON BEHALF OF THE CITIZEN-STOCKHOLDER OF THE STATE OF ALASKA.

MY OWN RECOLLECTIONS OF THE 1964 EARTHQUAKE, IF I MAY DIGRESS, ARE VARIED: THEY RANGE FROM CONSTERNATION TO TERROR TO A LITTLE HUMOR. A SECRETARY, FLEEING THE TWO-STORY BUILDING IN WHICH MY OFFICE WAS HOUSED, WENT THROUGH A STREET DOOR JUST AS THE SECOND-STORY CONCRETE BLOCK WALL FOLDED ON ITS RE-BAR HINGES AND PINNED HER AGAINST THE WALL OF THE FIRST STORY. WHEN OTHER EMPLOYEES FROM THE BUILDING MANAGED TO SWING THE WALL BACK TO FREE HER, THEY SAW HER IMAGE IN BLOOD ON THE LOWER WALL. SHE WAS PROBABLY ONE OF THE MOST SERIOUSLY-INJURED OF THE QUAKE SURVIVORS. I HAD AN AUTOMOBILE WHICH DIED OF A CRACKED DISTRIBUTOR CAP IN FLIGHT FROM A POTENTIAL TIDAL WAVE ZONE, BUT I SURVIVED WITH FAMILY INTACT. ALMOST IMMEDIATELY AFTER THE QUAKE I WAS ASSIGNED TO A TEAM WHICH MET DAILY TO REPORT MONITORING OF POTENTIAL BUILDING SLIPPAGE, WHICH WE CHECKED WITH ELECTRONIC MEASURING INSTRUMENTS. I WAS ASSIGNED TO ANOTHER TEAM RESPONSIBLE FOR CHECKING AND CERTIFYING THE SAFETY OF PUBLIC BUILDINGS BEFORE THEIR BEING REOCCUPIED. I WAS IN THE CEILING CRAWL SPACE OF A THEATRE BUILDING A FEW DAYS LATER, WORMING ALONG ON MY BACK CHECKING TRUSS JOINTS WITH THE AID OF A FLASHLIGHT, WHEN ANOTHER QUAKE OCCURRED. I AM VERY GRATEFUL TO

THIS DAY THAT MY CLAUSTROPHOBIA QUOTIENT IS MINOR. I WOULD PROBABLY OTHERWISE HAVE HAD A HEART ATTACK. THE INEVITABLE HUMOR WHICH ARISES IN SUCH SITUATIONS WAS PROVIDED BY ONE OF MY BUSINESS PARTNERS AT THE TIME. HE RECALLS HAVING DIVED UNDER A DESK OR CONFERENCE TABLE WITH A CLIENT WHO WAS IN THE OFFICE AT THE TIME OF THE QUAKE. YEARS LATER, HIS MOST VIVID RECOLLECTION OF THE EARTHQUAKE WAS THAT THE CLIENT HAD HAD A GENEROUS PORTION OF GARLIC AT LUNCH THAT DAY.

MY OWN RECOLLECTIONS NOTWITHSTANDING, I RETURN TO CONSIDERATION OF STATE PARTICIPATION IN YOUR EFFORTS. FOR THE REASONS CITED, I INVITE YOUR INSTITUTE -- PERHAPS EVEN AT THIS WEEK'S MEETING, TO CONSIDER PROPOSING STATE-ENDORSED EARTHQUAKE ENGINEERING STANDARDS, AND A PROPOSAL FOR STATE FINANCIAL ASSISTANCE FOR YOUR RESEARCH EFFORTS, UPON WHICH SUCH STANDARDS WOULD NECESSARILY BE BASED.

I DELIBERATELY REFER TO "STATE ENDORSED" STANDARDS, AS OPPOSED TO PERHAPS "STATE ENFORCED" STANDARDS, FOR A NUMBER OF REASONS. AS TO STATE CONSTRUCTION, OF COURSE, AND PROJECTS INVOLVING STATE LOANS OR PARTICIPATION, SUCH STANDARDS COULD BE EXPECTED TO BE A MATTER OF SPECIFICATION. VENTURES MADE POSSIBLE THROUGH THE LOAN GUARANTEES OF THE ALASKA INDUSTRIAL DEVELOPMENT AUTHORITY WOULD PROBABLY ALSO BE AFFECTED. THE STANDARDS WOULD ALMOST CERTAINLY BE USED BY MANY PRIVATE ENTERPRISES AS WELL. THE DISTINCTION BETWEEN ENFORCEMENT AND ENDORSEMENT WOULD ALSO PROTECT THE OPTIONS AND CONTROL OF LOCAL GOVERNMENTS WITHIN THE STATE. IF OUR JOINT EFFORTS -- THOSE OF YOUR INSTITUTE AND OF STATE GOVERNMENT -- WERE TO MAKE SUCH WELL-RESEARCHED AND DEFENSIBLE STANDARDS AVAILABLE, THEY WOULD PROBABLY BECOME A BENCHMARK FOR THE CONSTRUCTION INDUSTRY, SIMPLY BECAUSE OF THE EFFECTS THEY WOULD HAVE

IN THE MARKET. SUCH STANDARDS WOULD INFLUENCE INSURANCE, FINANCING, SALE AND RESALE, AND MOST OTHER CONSIDERATIONS INVOLVING BUILDING CONSTRUCTION. THEY SHOULD, WE MAY HOPE PROMOTE REDUCTIONS IN INSURANCE PREMIUMS WHERE EARTHQUAKE INSURANCE IS AVAILABLE AND USED, AND THEY SHOULD PROMOTE EXTENSIONS OF THE LIFE EXPECTANCY OF BOTH PUBLIC AND PRIVATE CONSTRUCTION IN LARGER PROJECTS THEY SHOULD IMPROVE PUBLIC AND PRIVATE SAFETY -- AND IF EVEN ONE HUMAN LIFE WERE TO BE SAVED BY THEIR IMPLEMENTATION, THEIR VALUE WOULD HAVE BECOME IMPOSSIBLE TO QUANTIFY.

SHOULD YOUR INSTITUTE ELECT TO SEEK THE ESTABLISHMENT OF SUCH STANDARDS WITH THE ASSISTANCE OF THE LEGISLATURE, I CAN ASSURE YOU OF THE COMPETE AND WILLING COOPERATION OF MY OFFICE AND OTHER LEGISLATIVE AGENCIES. I WOULD CERTAINLY USE MY OFFICE AND ITS INFLUENCE TO HELP YOU GAIN THE COOPERATION OF APPROPRIATE ADMINISTRATIVE AGENCIES. I WOULD LOOK WITH FAVOR UPON A PROPOSAL FOR FINANCIAL PARTICIPATION IN YOUR RESEARCH EFFORTS BY THE STATE, AND WOULD EXPECT TO BE ABLE TO SUPPORT A REASONABLE PROPOSAL. SUCH A MOVE WOULD CERTAINLY BE TO THE BENEFIT OF ALL THE STATES REPRESENTED AT THIS MEETING, AND PRESUMABLY TO MOST OTHER STATES AND TO MANY FOREIGN NATIONS.

THE UNITED STATES' TRADITIONAL ROLE AS A LEADER IN PURE RESEARCH IN MANY DISCIPLINES MAKES IT APPROPRIATE THAT WE SHOULD PURSUE SUCH A COURSE, AND ALASKA'S POSITION IN THE VANGUARD OF AREAS NEEDING AND PURSUING PRIVATE, PUBLIC AND COMMERCIAL DEVELOPMENT PROPERLY PLACES IT IN THE FOREFRONT OF SUCH INVESTIGATION. I WILL LOOK FORWARD TO WORKING WITH THE APPROPRIATE COMMITTEES OF YOUR INSTITUTE, AND TO HEARING FROM YOU SHOULD YOU ELECT TO ACCEPT MY INVITATION. IF THE EFFECTS OF OUR JOINT EFFORTS REACH AS FAR AS I THINK THEY MIGHT, AND IF THEY SERVE WELL THE GOOD INTENTIONS I KNOW YOU HAVE, THEY MIGHT EVEN BE CALLED EARTHSHAKING. THANK YOU.

BACKGROUND INFORMATION - HB 379

Notes by John Davies
State Seismologist
ADNR

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.

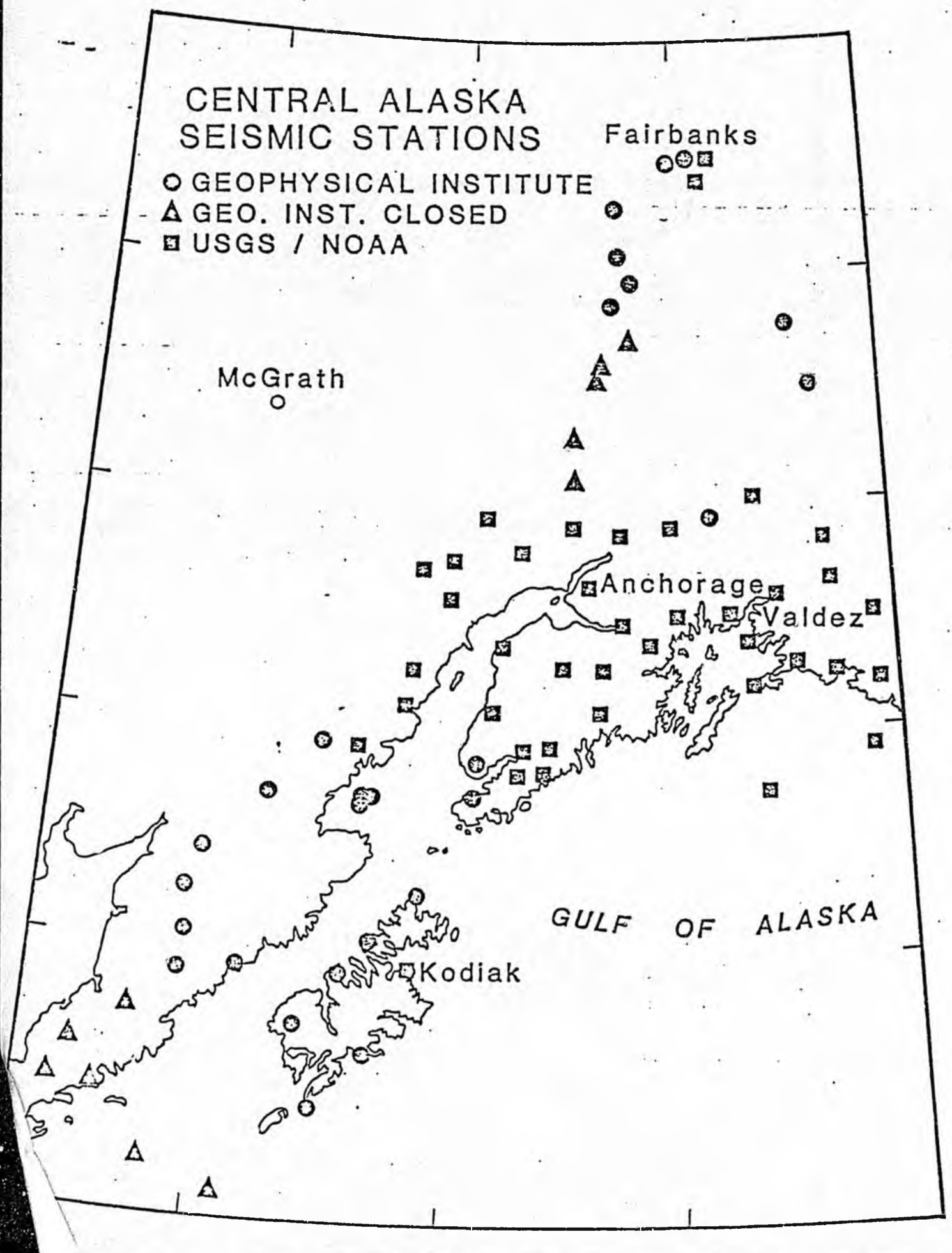
This fact was dramatically demonstrated by the damage patterns of the 1964 Good Friday Earthquake in Anchorage. Most of the damage in Anchorage by that earthquake was not done as a direct result of the shaking, but as a result of the failure or liquifaction of sandy soils in the Bootlegger Clay Formation (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.


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

FIGURE

Introduced: 4/26/83
Referred: Resources and Finance

IN THE HOUSE BY FLOOD AND HAYES

HOUSE BILL NO. 379

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 paragraphs to read:

(6) collect, record, evaluate, archive and distribute data on seismic events and engineering geology of the state;

(7) identify potential seismic hazards that might affect development in the state;

(8) inform public officials and industry about potential seismic hazards that might affect development in the state.

* Sec. 3. This Act takes effect July 1, 1983.