



An Alaska perspective on earthquakes and Antelope

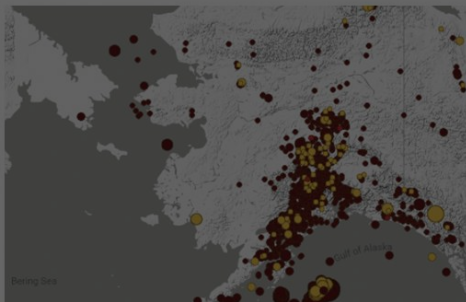
NORTH & WEST

INTERIOR

SOUTH-CENTRAL

SOUTHEAST

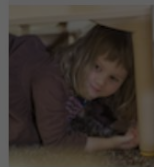
AK PENN & ALEUT



Latest Earthquakes

- M2.0** at 11:03 PM, 34 mi W of Karluk
- M2.3** at 10:29 PM, 11 mi N of Elfin Cove
- M1.3** at 10:13 PM, 32 mi N of Yakutat
- M1.7** at 09:56 PM, 24 mi S of Cantwell
- M1.3** at 09:47 PM, 39 mi NW of Tatitlek

Learn and



Michael West
Research Professor
State Seismologist

Tips on what to do to keep
yourself safe during an
earthquake

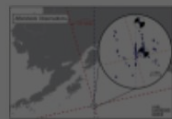
Latest News

Tsunami observations from the Offshore Kodiak earthquake



We spend a lot of time at the Earthquake Center anticipating what will happen during large earthquakes. The earthquakes occurring off the coast, such as the one in the Gulf of Alaska, are one of our greatest hazards. Together with state agencies DGGG and DHS&EM we have devoted many years to modeling the

More Stories



Seismology vs. Geodesy: Competing observations from the Offshore Kodiak Earthquake

When a large earthquake occurs, geophysicists have many tools at their disposal to determine the properties of the fault (or faults) that ruptured during the earthquake.

[Read more >](#)



Introducing the Revamped Recent Earthquakes Map

You may have noticed that we've launched an

MANAGE_PAYMENTDB(1)

User Commands

MANAGE_PAYMENTDB(1)

NAME

manage_paymentdb - GUI to track activity for a database of payments

SYNOPSIS

manage_paymentdb dbname

DESCRIPTION

manage_paymentdb allows the user to easily enter information about paid bills and received payments for a bill-paying collective (e.g. watercooler fees).

AUTHOR

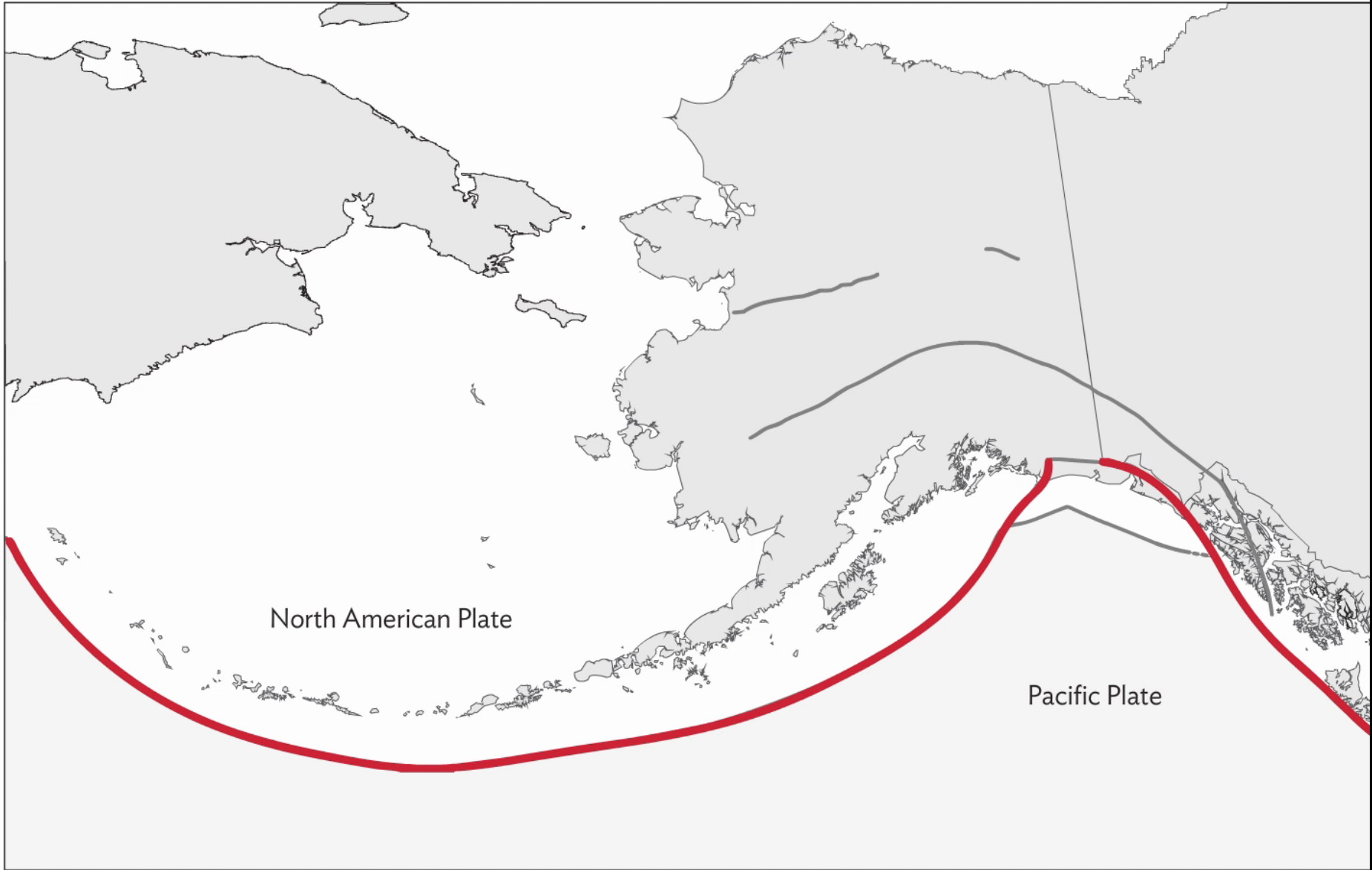
Kent Lindquist

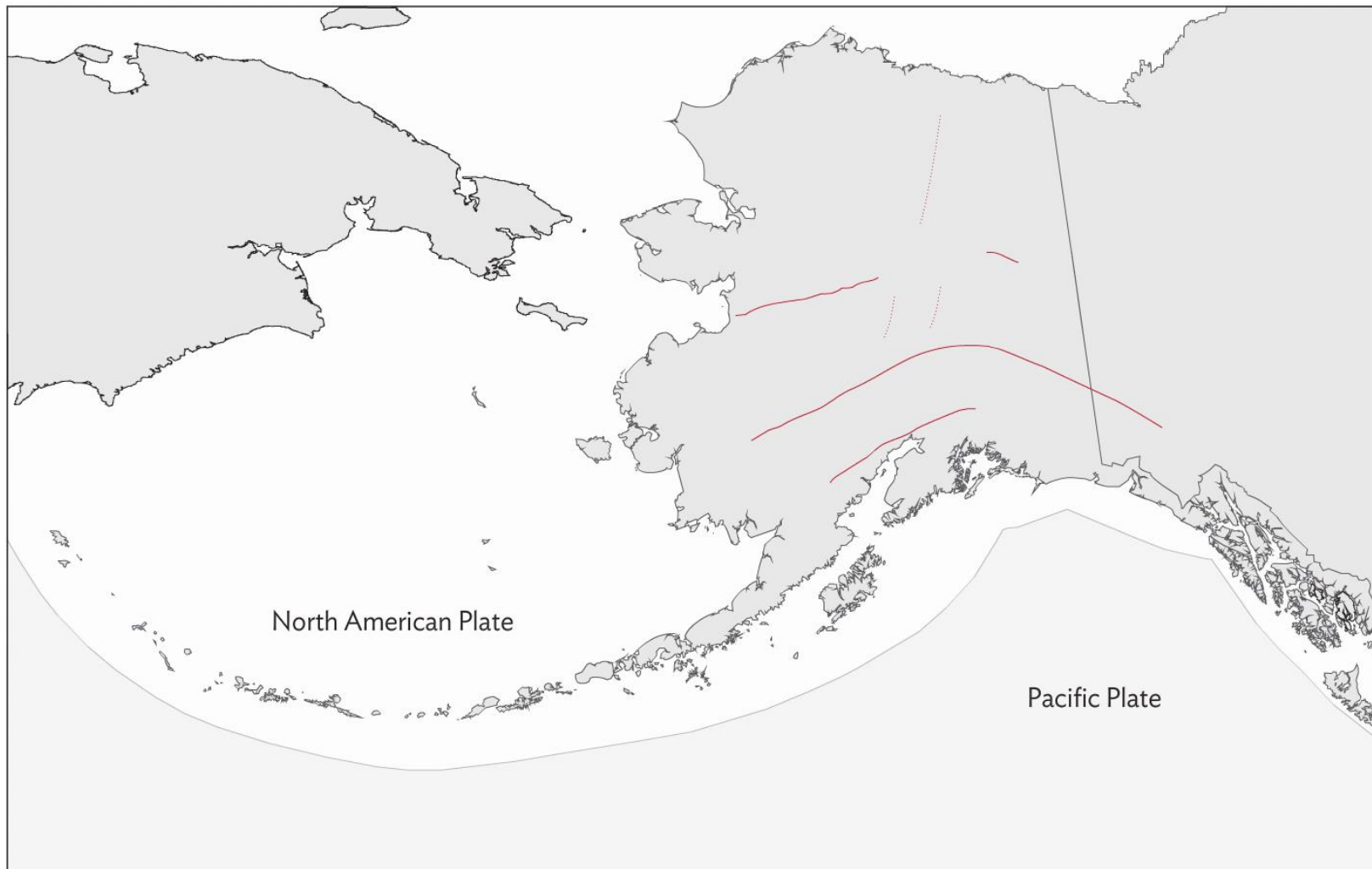
BRTT Antelope 5.7

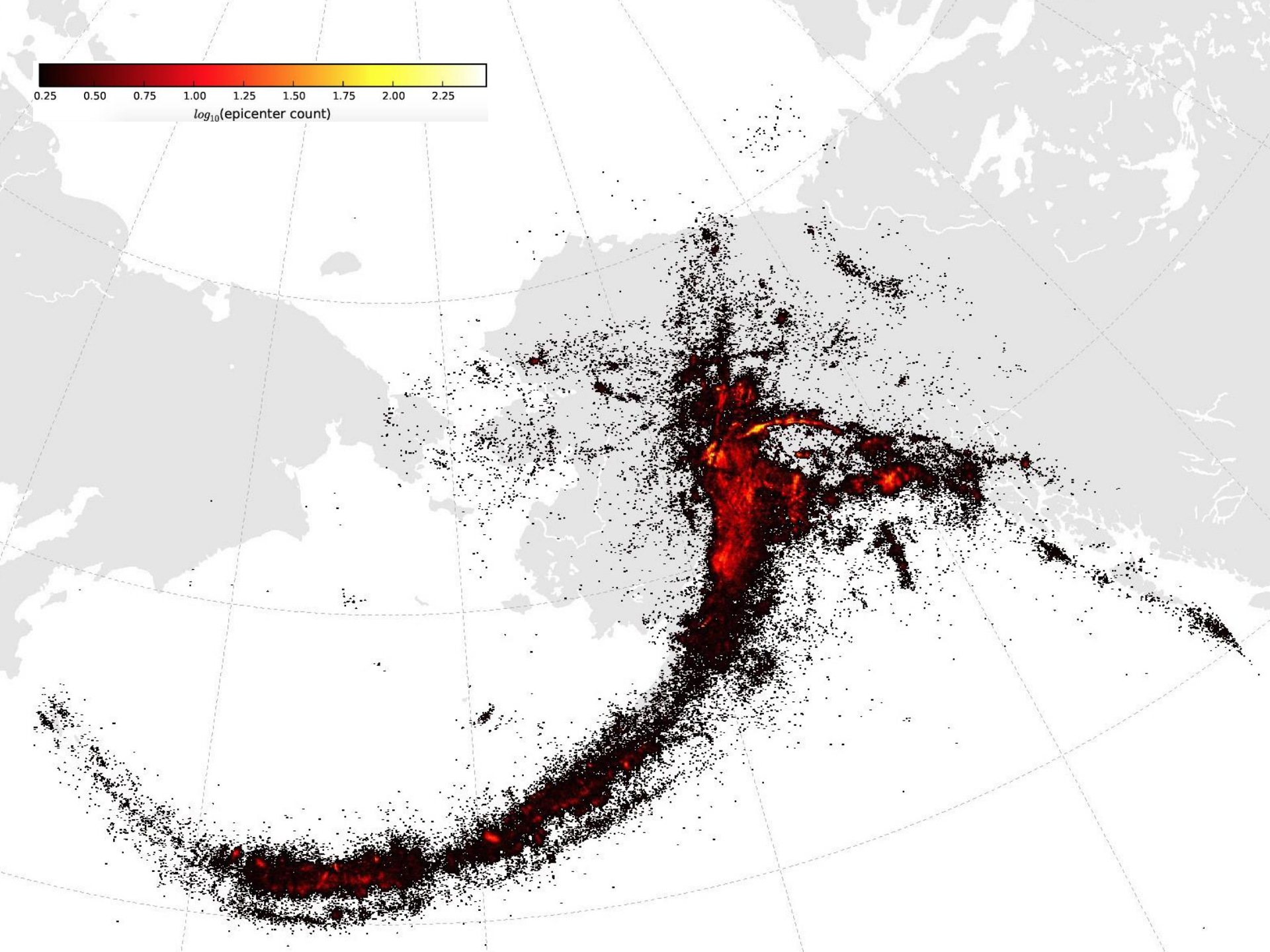
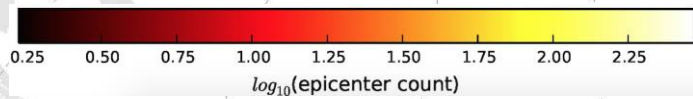
2017-01-20

MANAGE_PAYMENTDB(1)

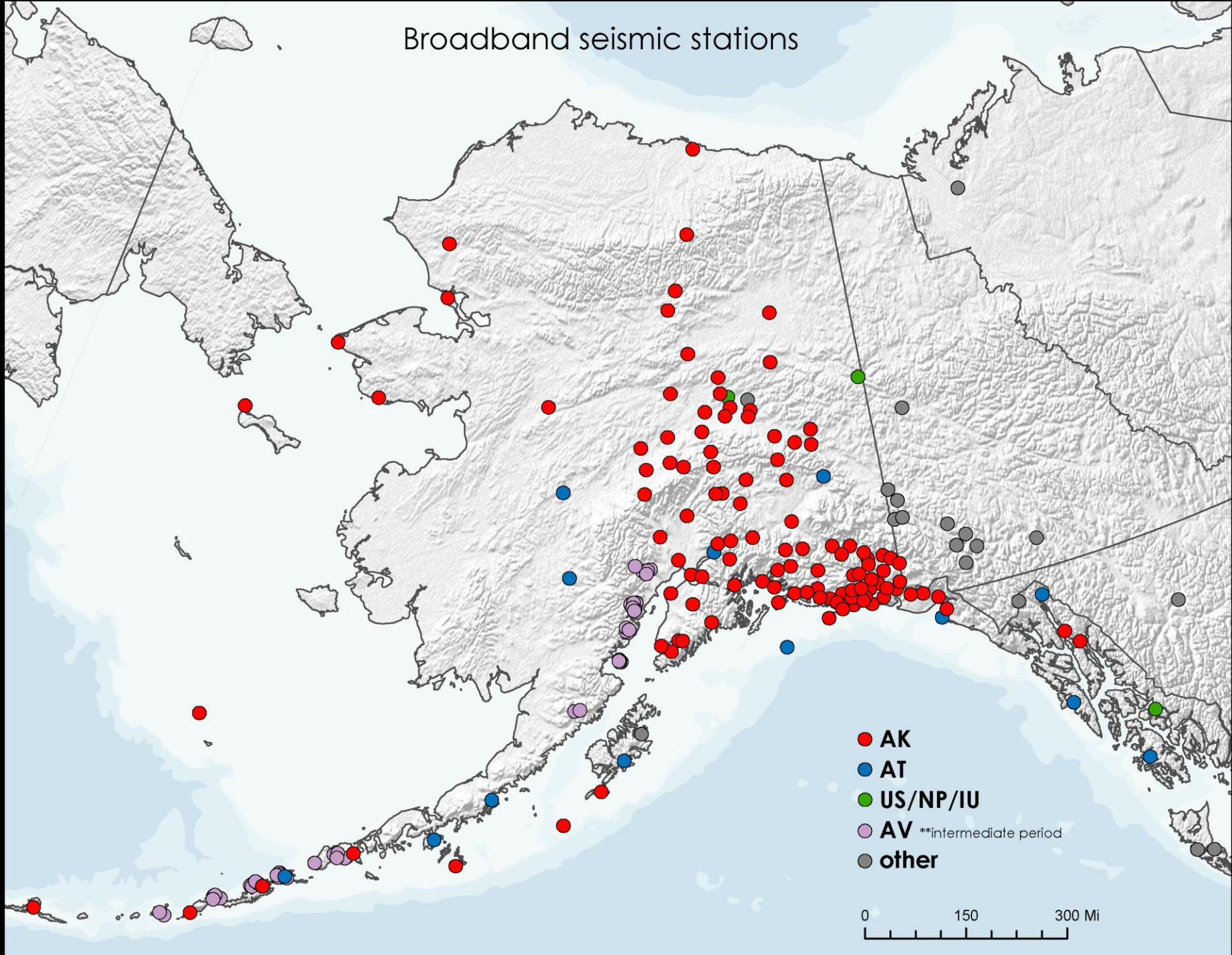
(END)





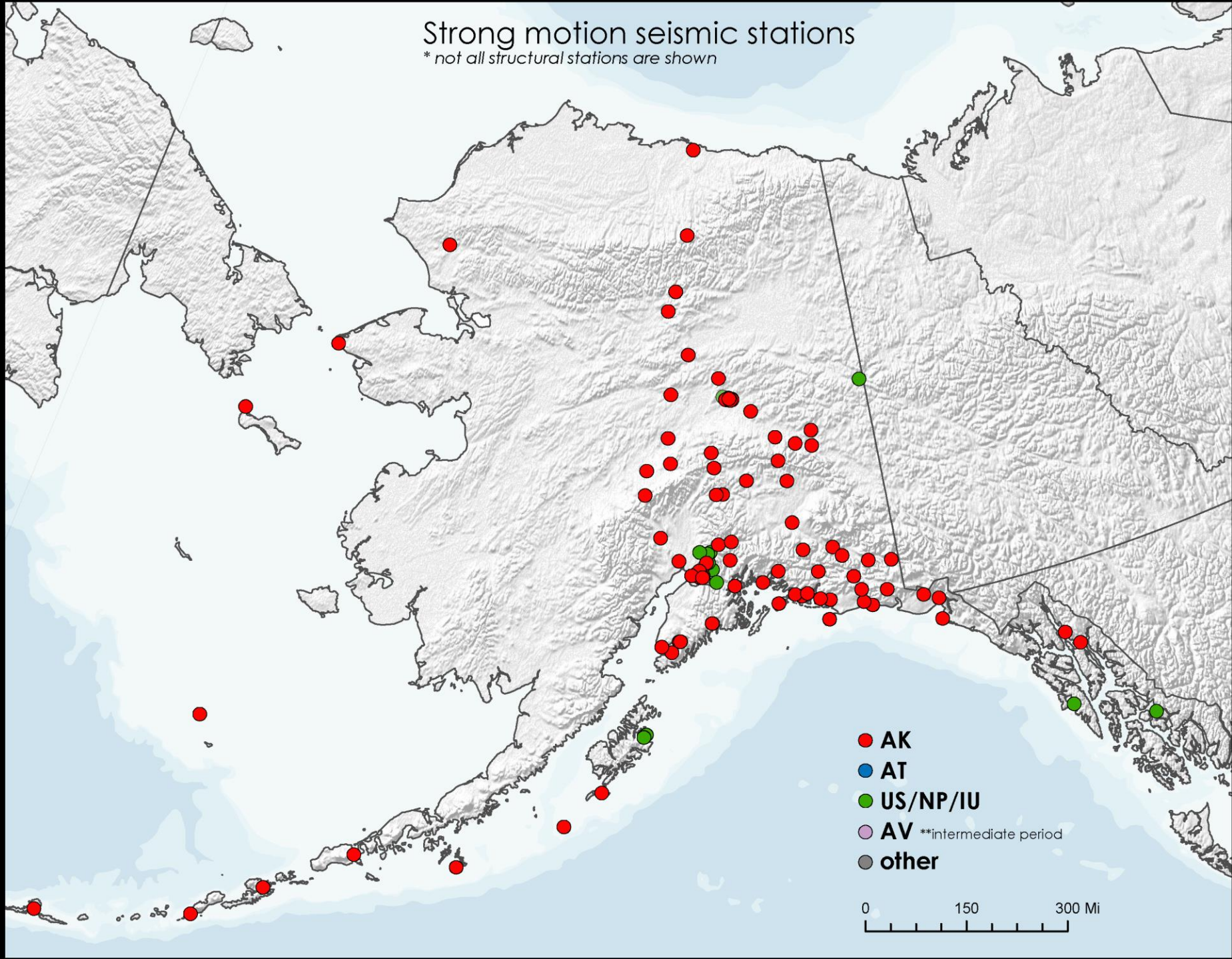


Broadband seismic stations

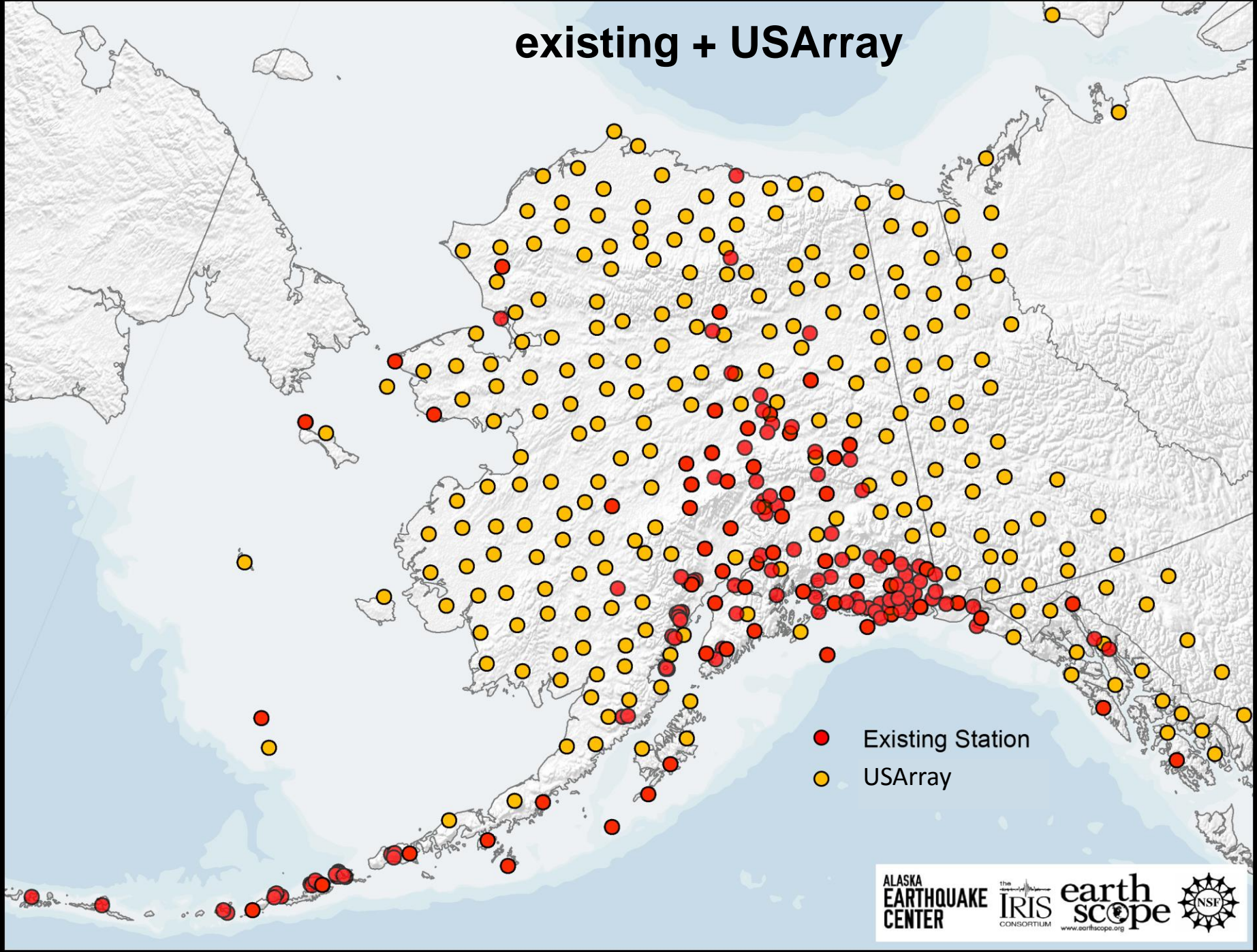


Strong motion seismic stations

* not all structural stations are shown



existing + USArray

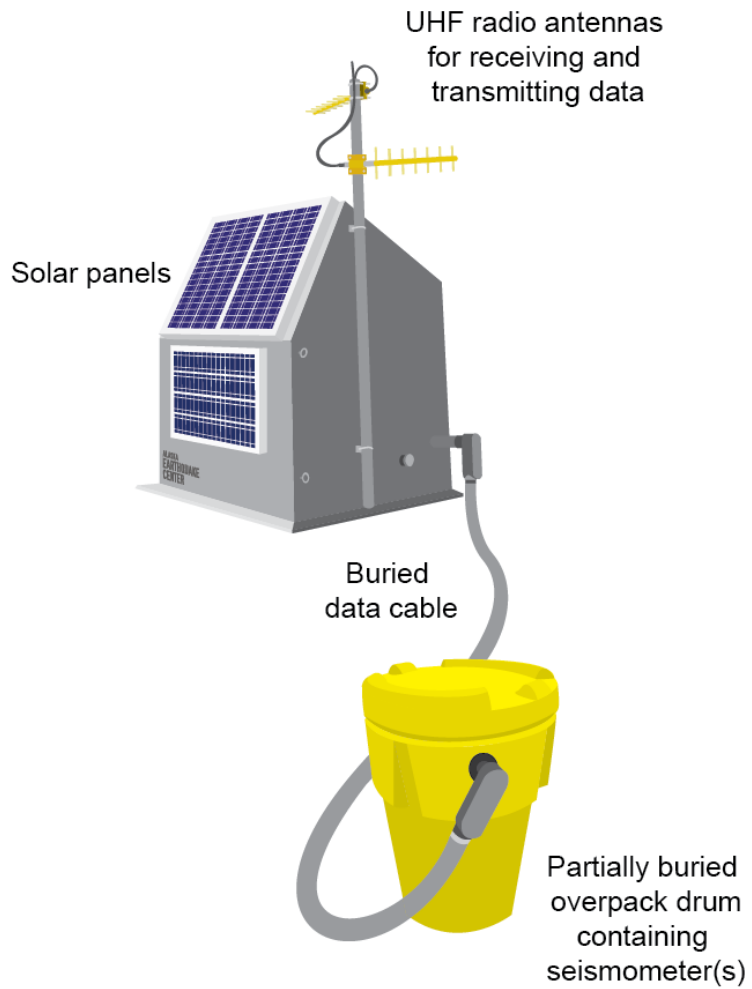


- Existing Station
- USArray

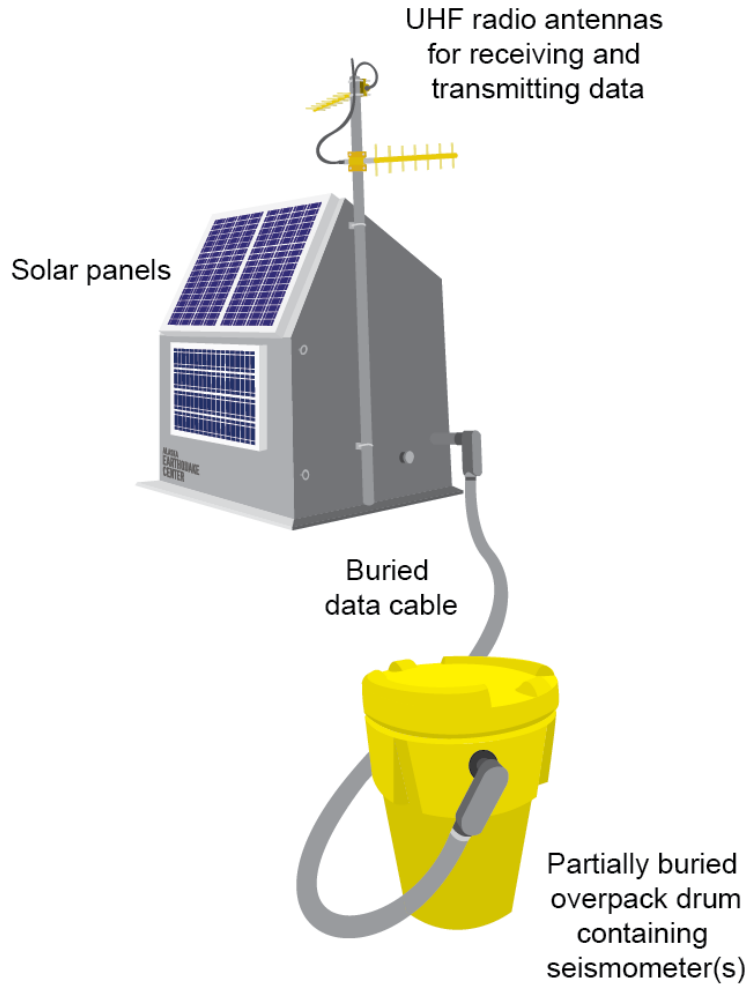




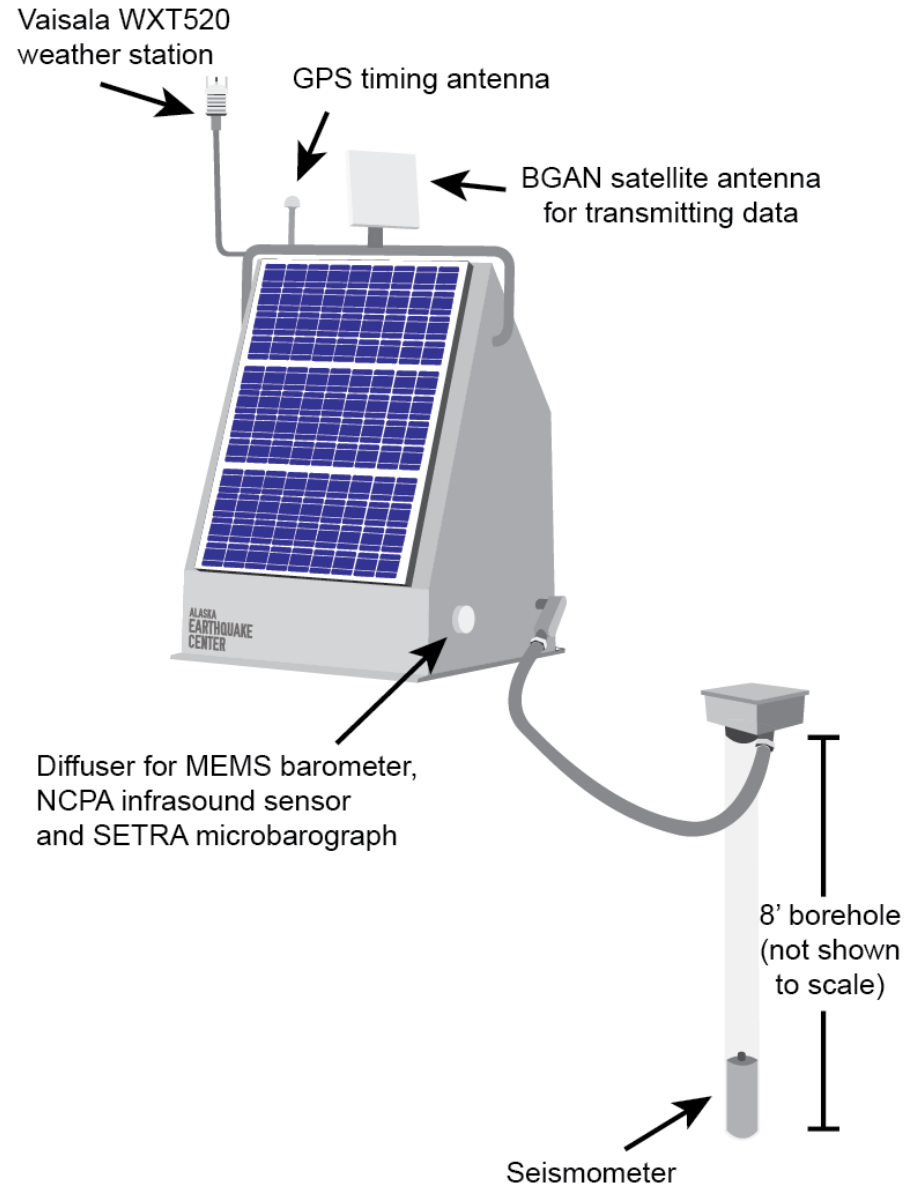
Alaska Earthquake Center



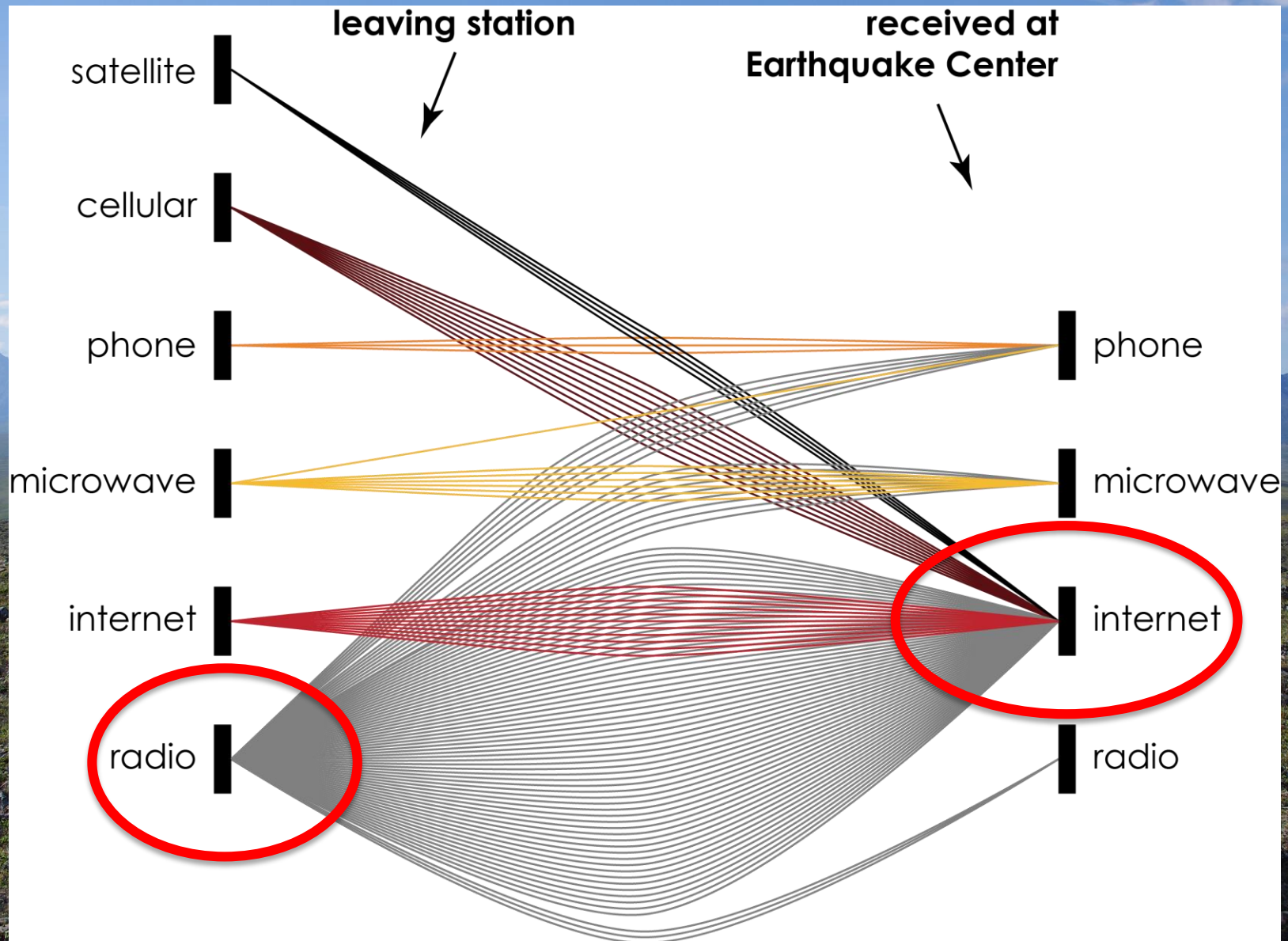
Alaska Earthquake Center



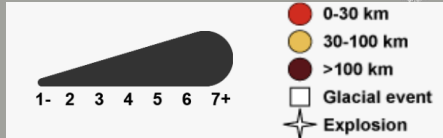
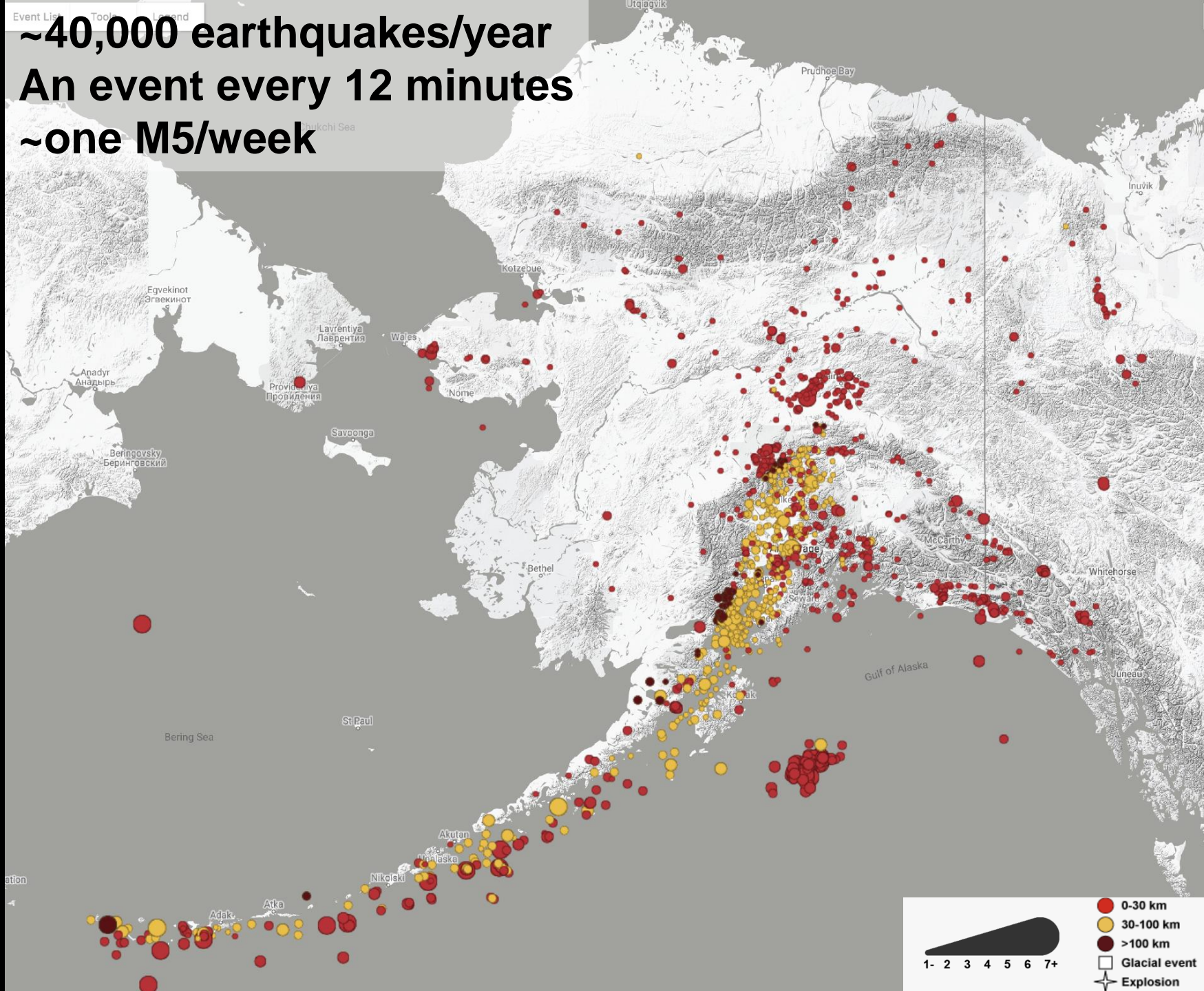
USArray Alaska

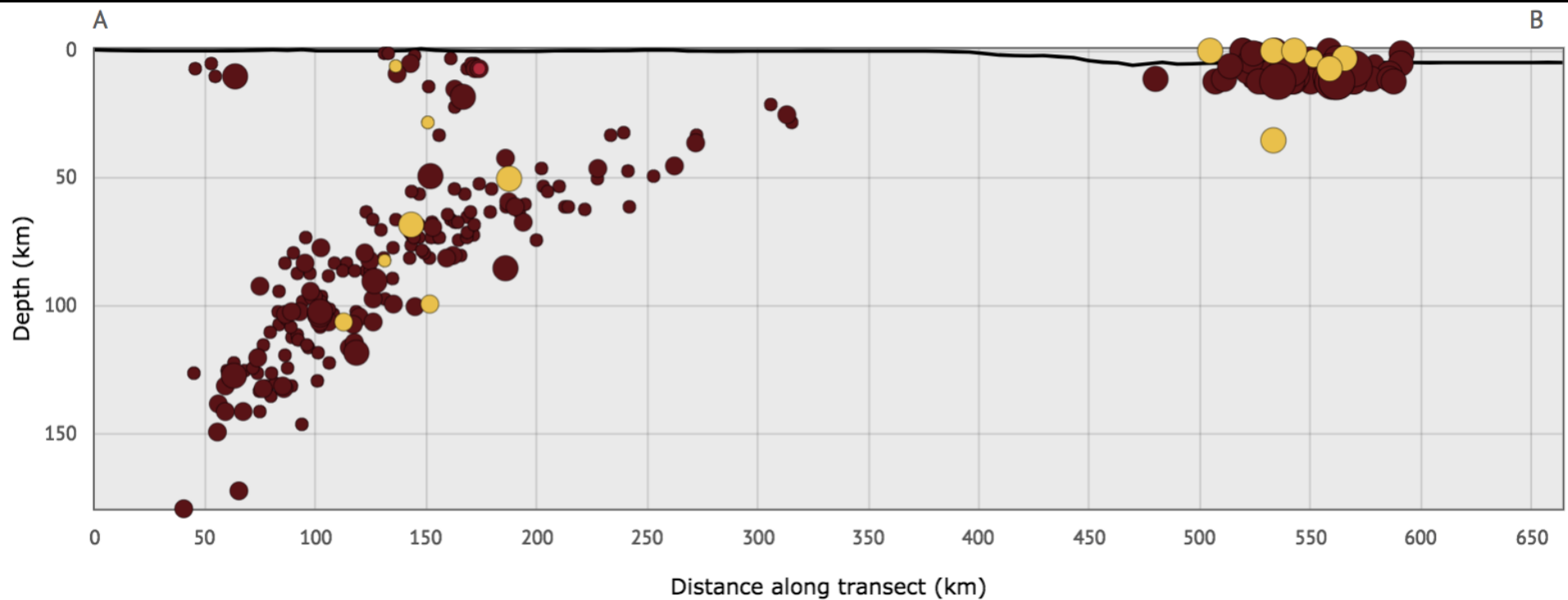
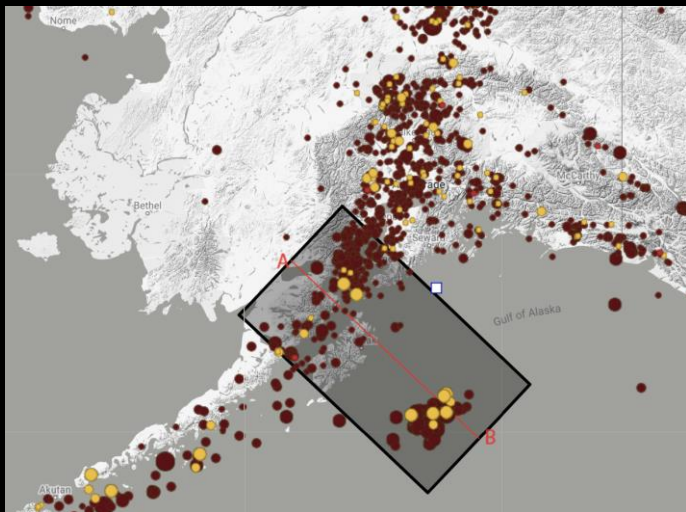


Telemetry



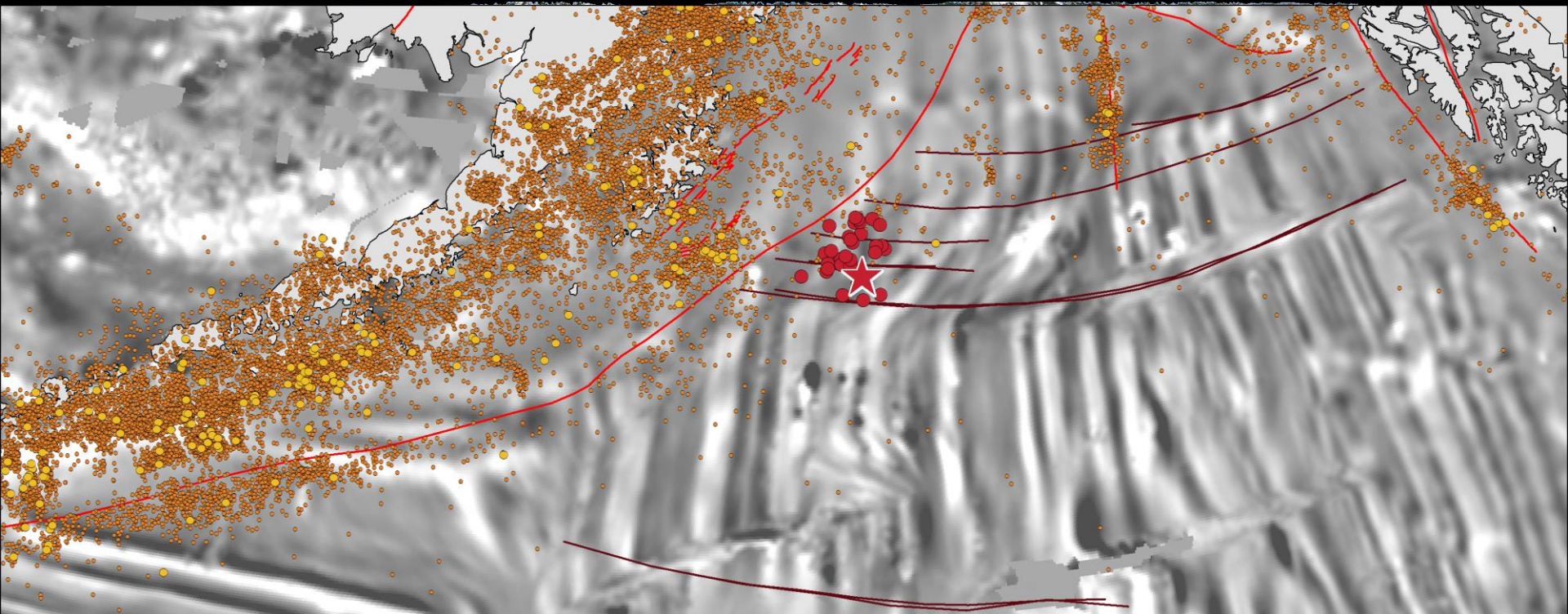
~40,000 earthquakes/year
An event every 12 minutes
~one M5/week










M7.9 Offshore Kodiak Earthquake

23 January 2018

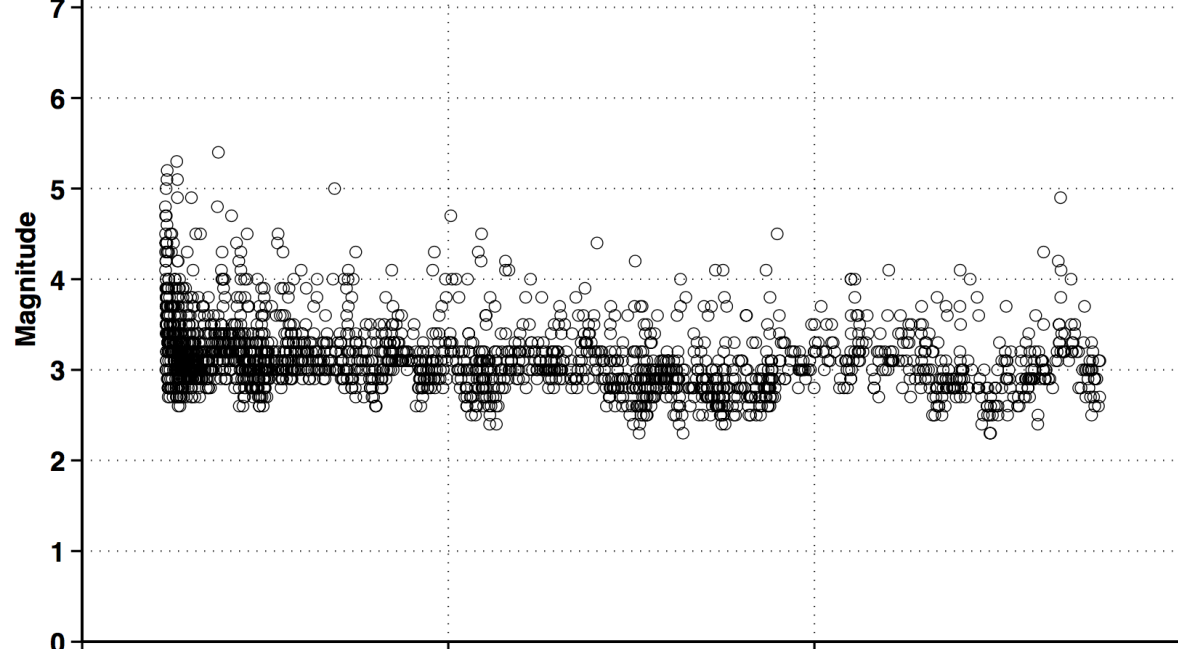


-  Magnitude 7.9 Mainshock
-  First 12 hours of reviewed aftershocks

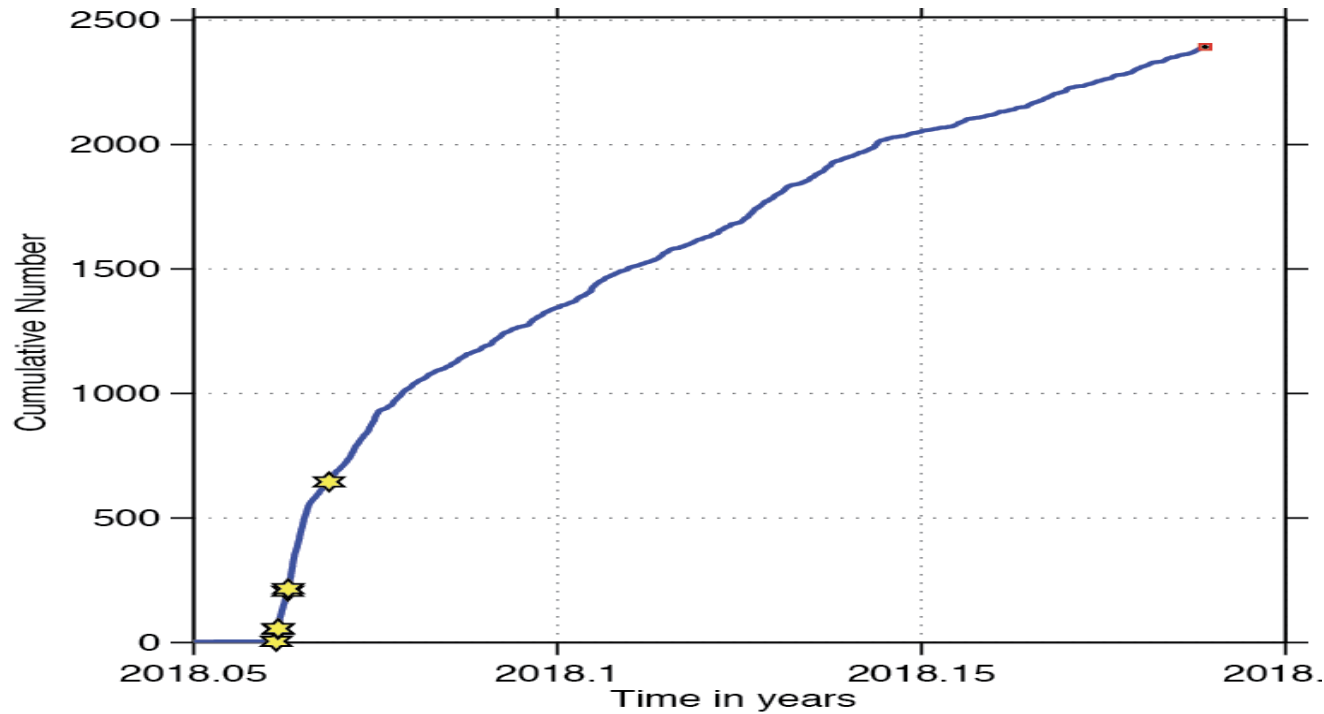
- Background Seismicity 1990-present:
-  M>2.5
 -  M>5

-  Faults
-  Sea Floor Fracture Zone

Sea floor fracture data available at
<http://www.soest.hawaii.edu/PT/GSFML/SF/index.html>.
Earth magnetic anomaly data available at
<http://www.geomag.org/models/emag2.html>.
Fault data available at
<http://maps.dggs.alaska.gov/>



~2 months



Things we record and track

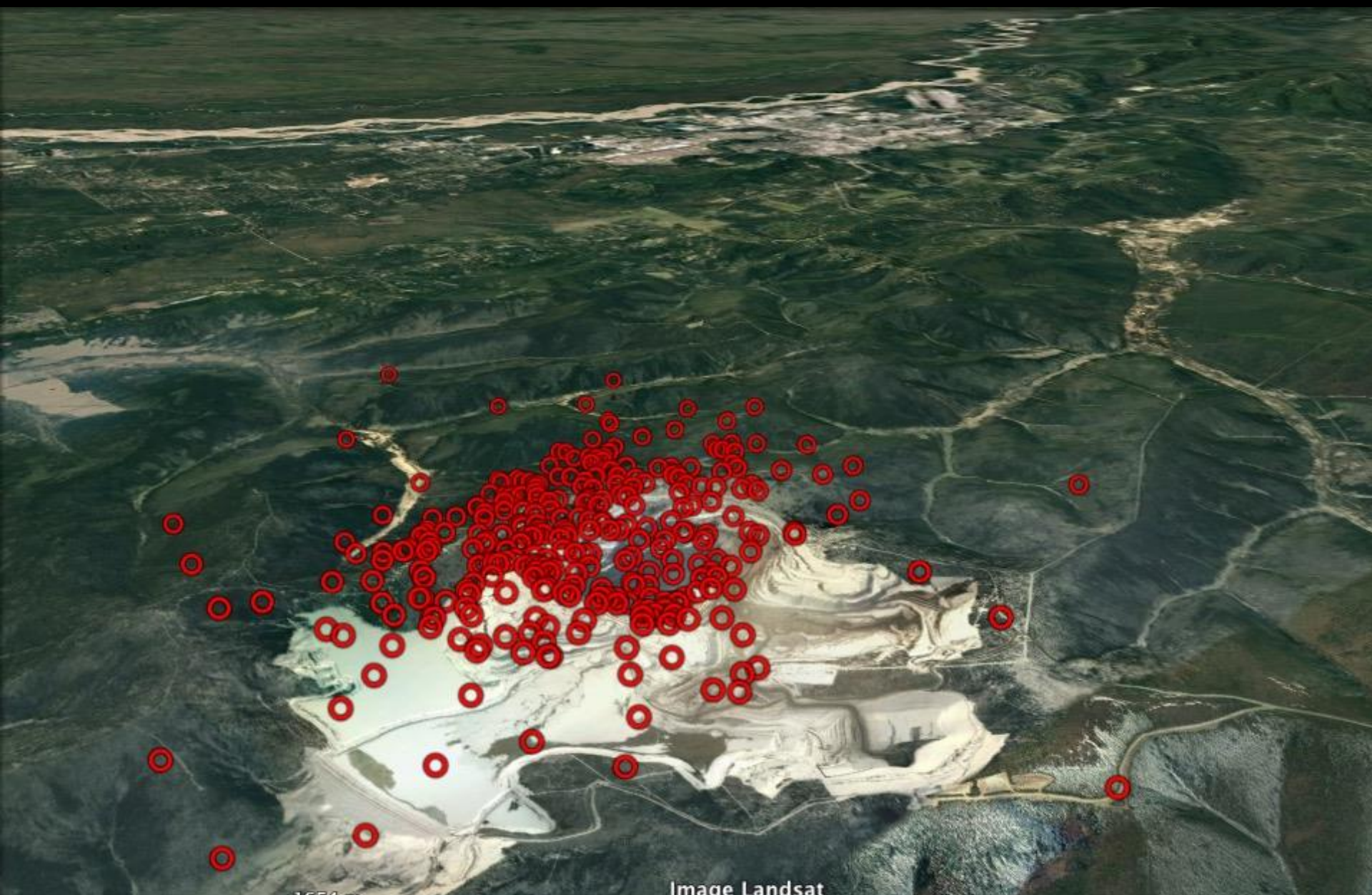
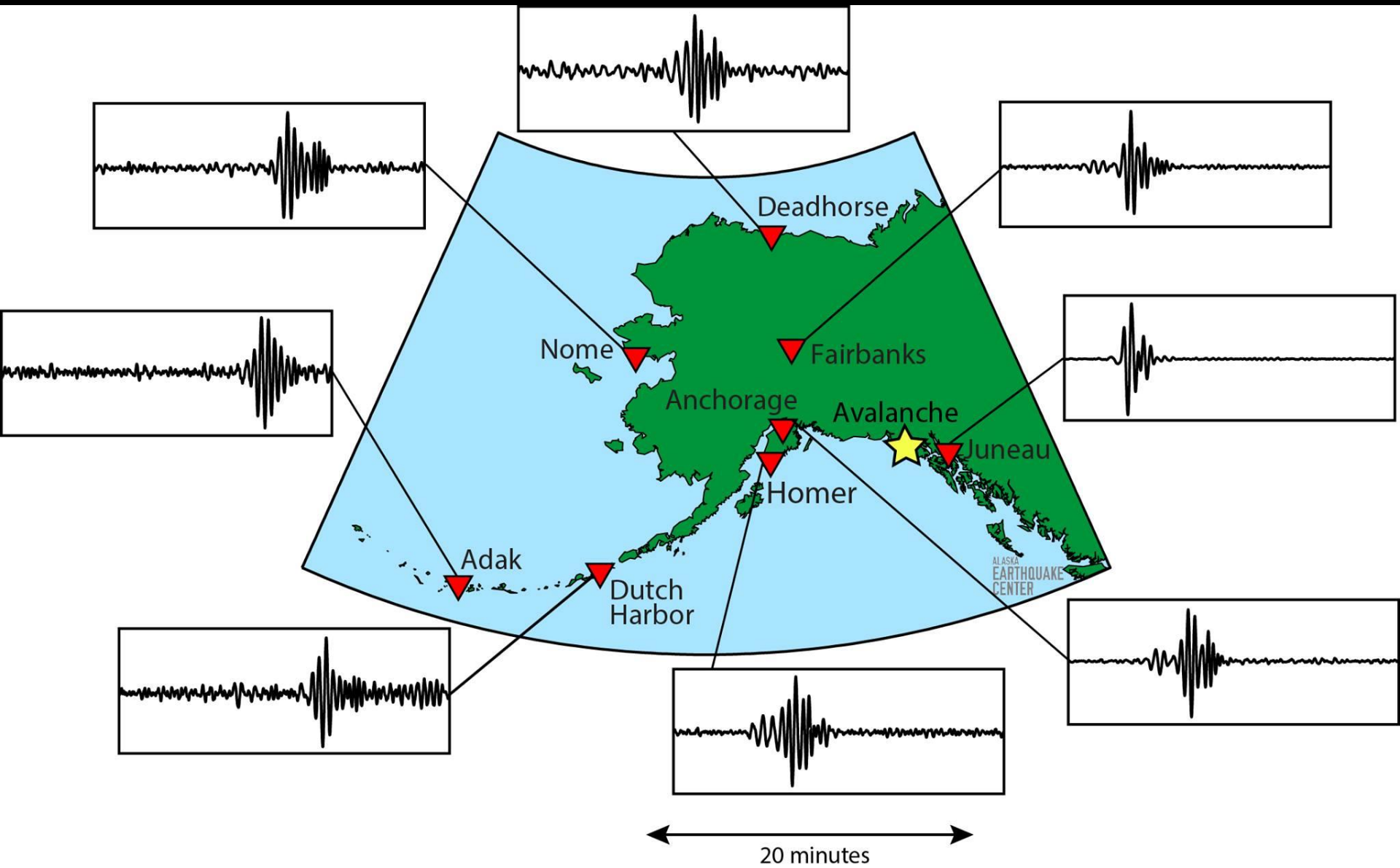


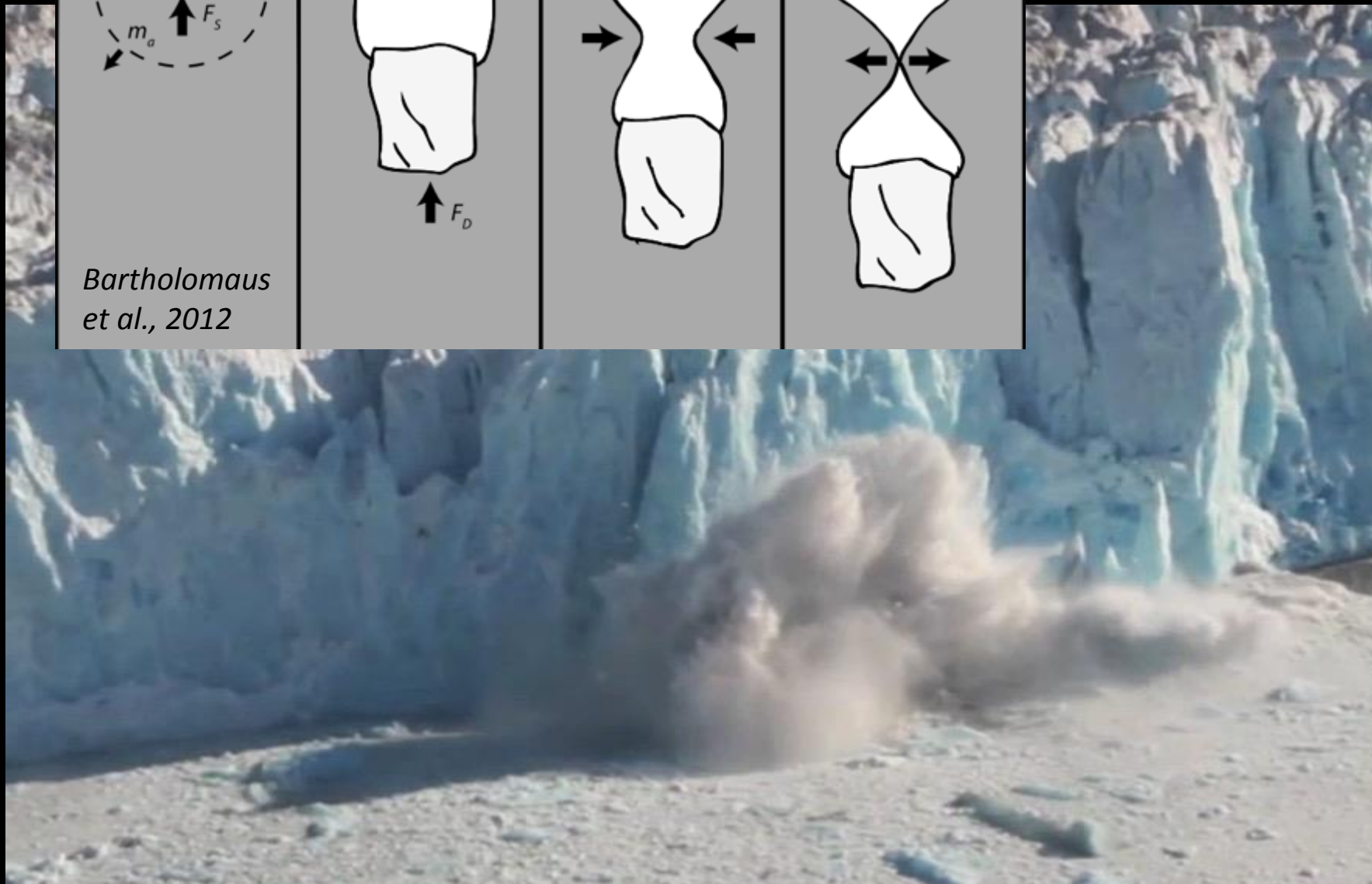
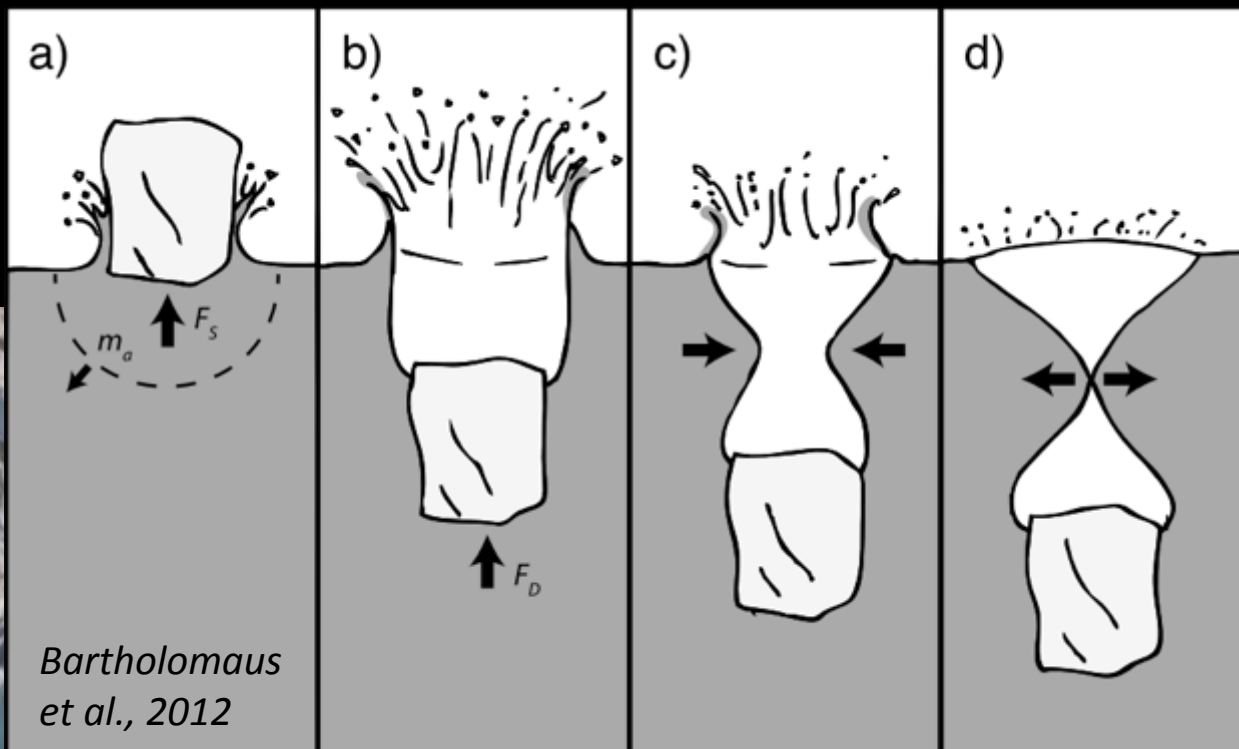
Image Landsat

landslides

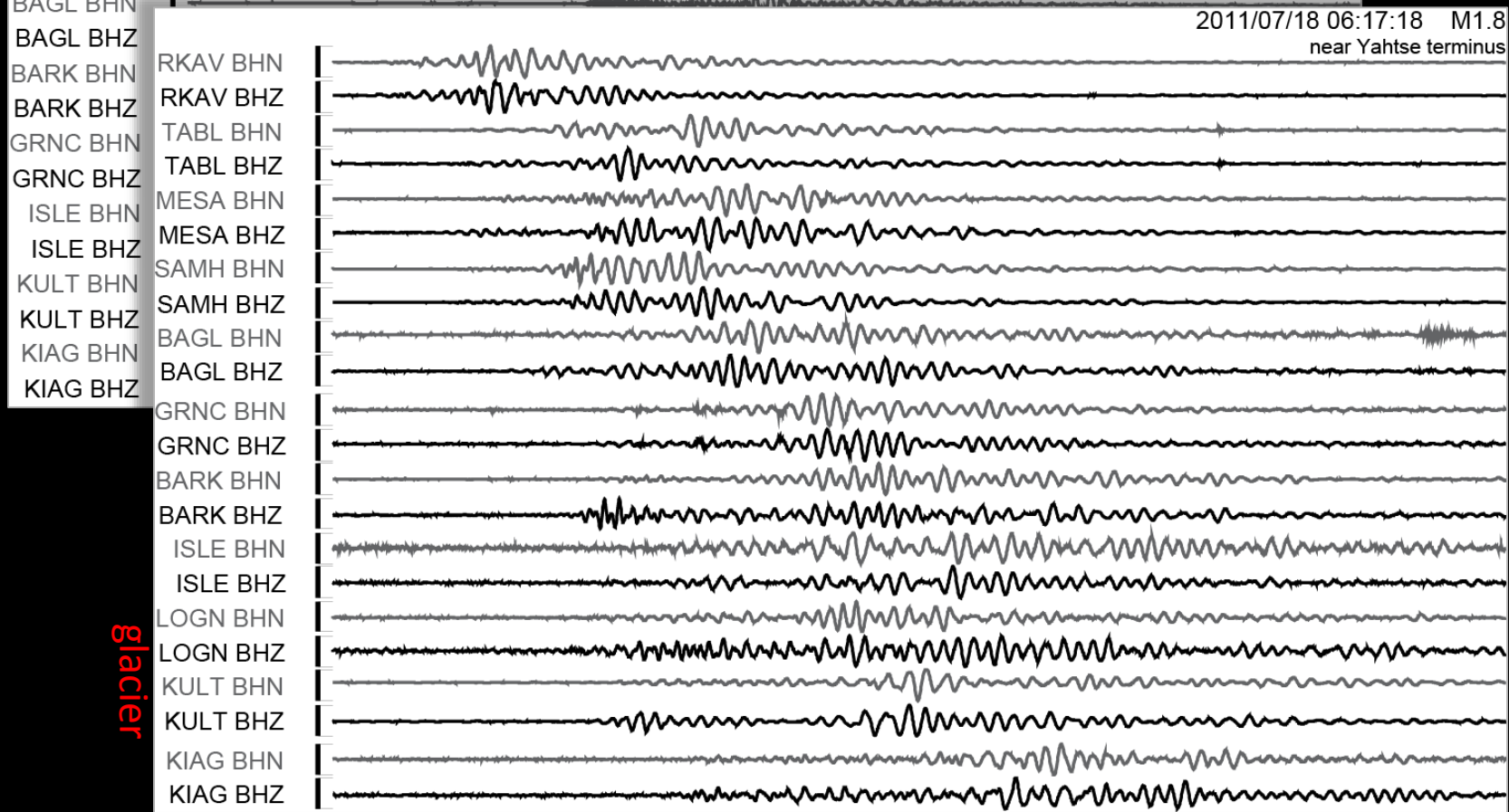
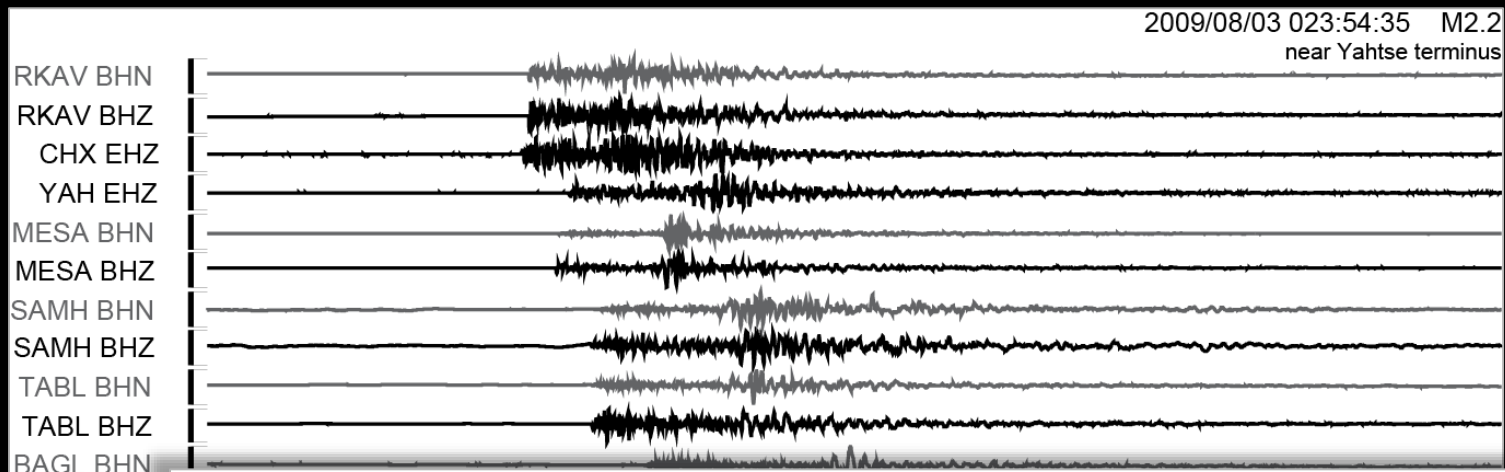


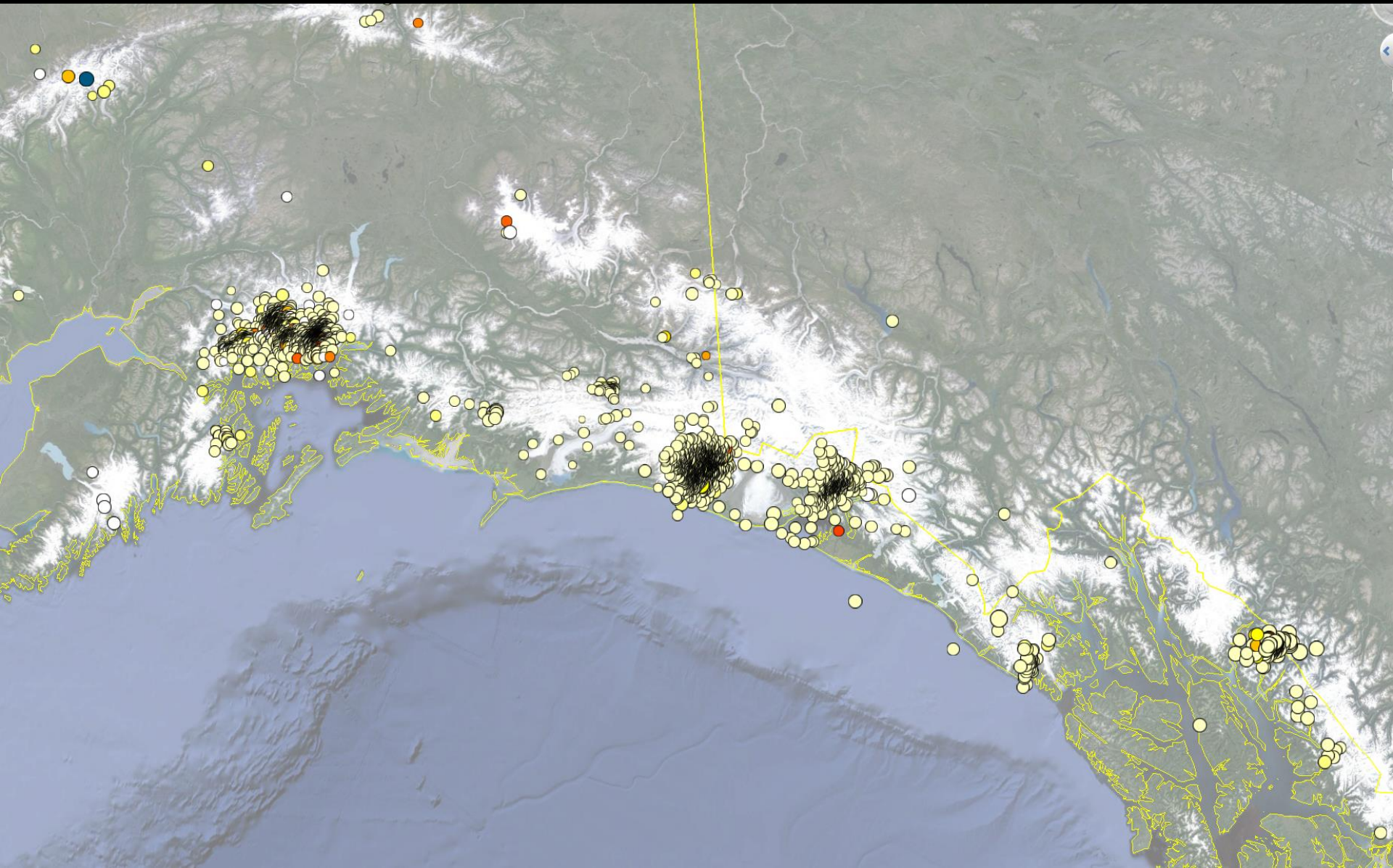
landslides



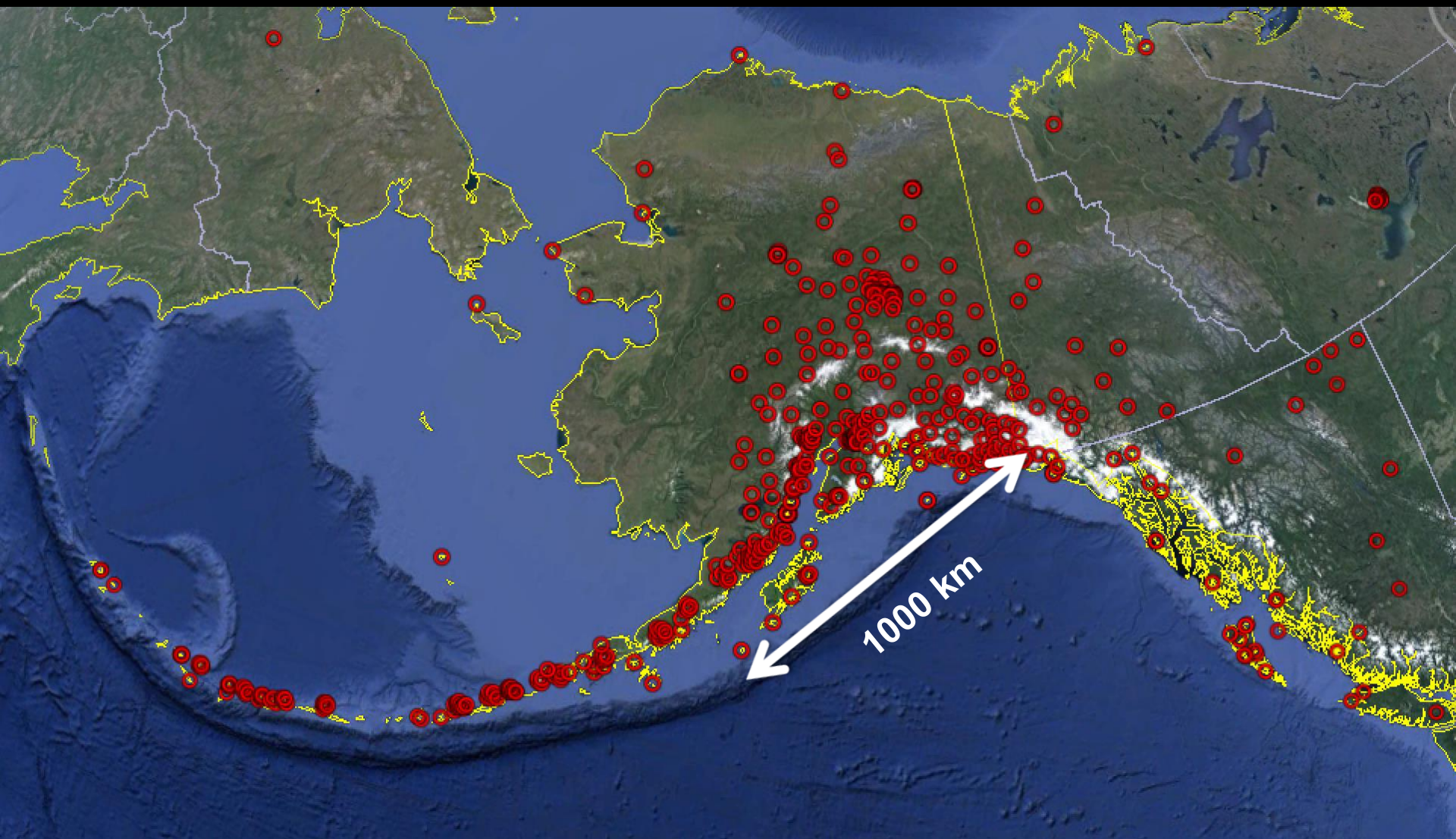


60 s

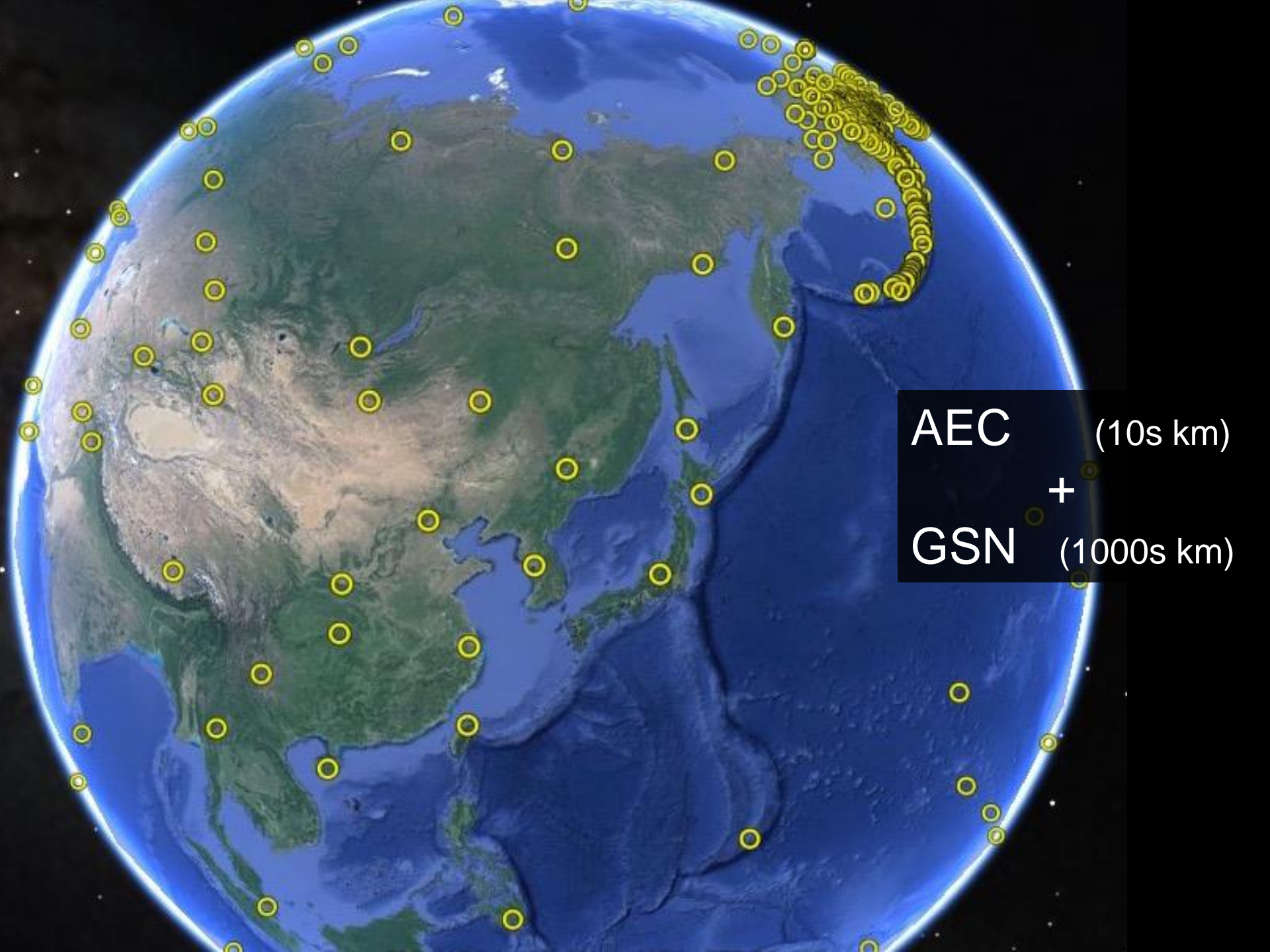




global earthquake detection



span 10% of globe



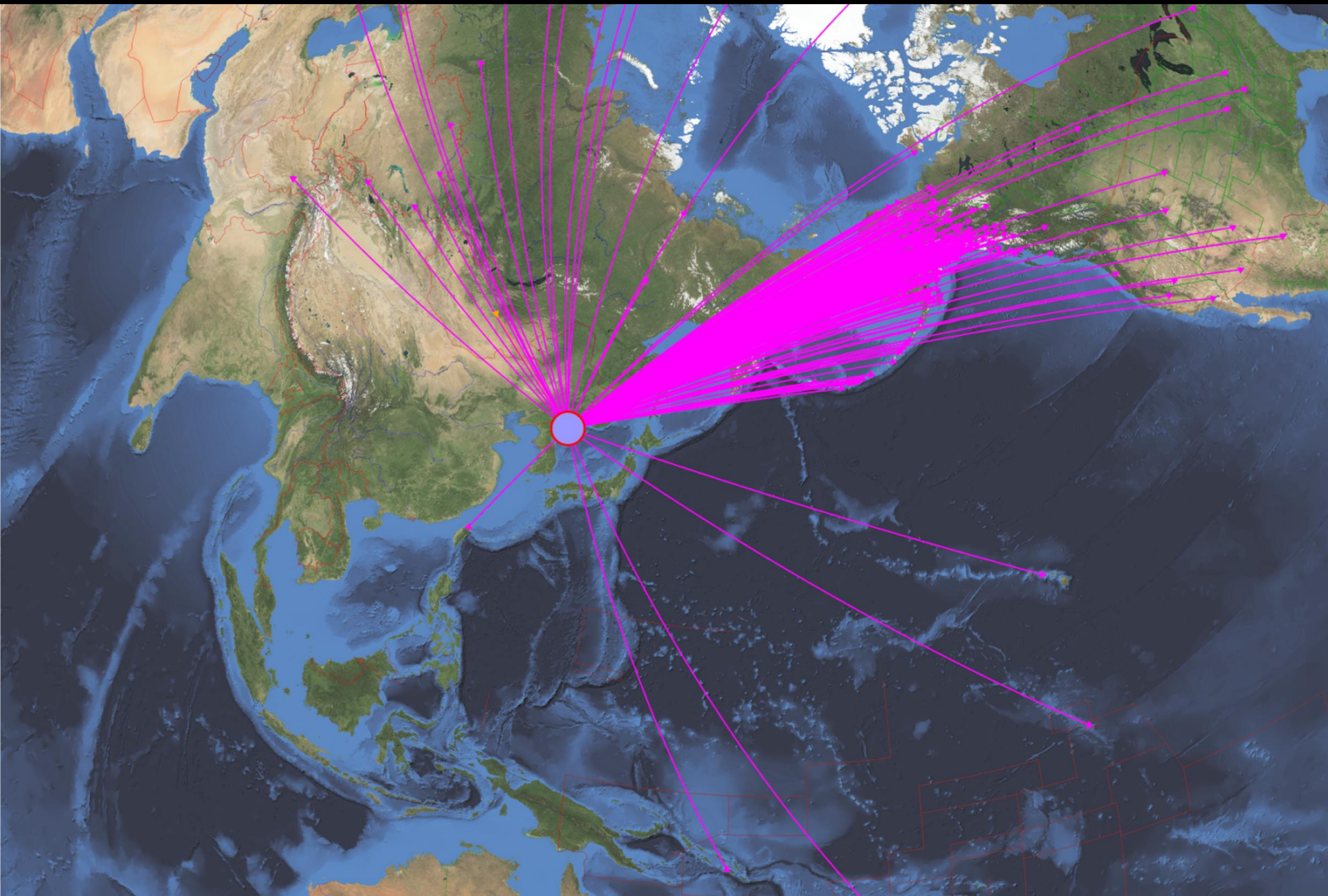
AEC (10s km)
+
GSN (1000s km)

orid	latency ▲	auth	magnitude	time	latitude	longitude	depth	ndef	nass
20221371	8:39 minutes	oa_opDbgMbMl		2017246 09/03 03:30:02.522	41.3264	129.0110	0.42	23	23
20221372	9:08 minutes	oa_opDbgMbMl		2017246 09/03 03:30:02.457	41.3339	129.0544	0.01	33	33
20221374	9:22 minutes	oa_opDbgMbMl	6.13 (mb)	2017246 09/03 03:30:02.668	41.3211	129.0966	0.14	46	46
20221376	9:35 minutes	oa_opDbgMbMl	6.25 (mb)	2017246 09/03 03:30:02.783	41.3159	129.1082	0.06	57	57
20221377	9:49 minutes	oa_opDbgMbMl	6.25 (mb)	2017246 09/03 03:30:02.835	41.3147	129.1119	0.02	69	69
20221378	10:04 minutes	oa_opDbgMbMl	6.25 (mb)	2017246 09/03 03:30:02.906	41.3130	129.1156	0.03	81	81
20221379	10:22 minutes	oa_opDbgMbMl	6.28 (mb)	2017246 09/03 03:30:02.962	41.3125	129.1161	0.04	91	91
20221381	10:39 minutes	oa_opDbgMbMl	6.28 (mb)	2017246 09/03 03:30:03.042	41.3113	129.1193	0.04	102	102
20221382	10:57 minutes	oa_opDbgMbMl	6.28 (mb)	2017246 09/03 03:30:03.062	41.3113	129.1195	0.10	115	115
20221383	11:16 minutes	oa_opDbgMbMl	6.28 (mb)	2017246 09/03 03:30:03.035	41.3104	129.1179	0.03	127	127
20221384	11:36 minutes	oa_opDbgMbMl	6.28 (mb)	2017246 09/03 03:30:03.050	41.3096	129.1192	0.01	141	141
20221385	11:59 minutes	oa_opDbgMbMl	6.29 (mb)	2017246 09/03 03:30:03.212	41.3228	129.1231	0.03	154	155
20221386	12:20 minutes	oa_opDbgMbMl	6.29 (mb)	2017246 09/03 03:30:03.262	41.3216	129.1248	0.25	165	165
20221387	12:47 minutes	oa_opDbgMlMb	6.28 (mb)	2017246 09/03 03:30:03.266	41.3214	129.1249	0.26	174	174
20221388	13:12 minutes	oa_opDbgMlMb	6.28 (mb)	2017246 09/03 03:30:03.223	41.3216	129.1239	0.02	184	184
20221389	13:37 minutes	oa_opDbgMlMb	6.28 (mb)	2017246 09/03 03:30:03.237	41.3207	129.1242	0.07	195	195
20221390	14:06 minutes	oa_opDbgMlMb	6.28 (mb)	2017246 09/03 03:30:03.268	41.3206	129.1253	0.13	208	208
20221392	14:35 minutes	oa_opDbgMlMb	6.29 (mb)	2017246 09/03 03:30:03.308	41.3201	129.1270	0.18	217	218
20221394	15:07 minutes	oa_opDbgMlMb	6.29 (mb)	2017246 09/03 03:30:03.319	41.3202	129.1279	0.09	226	227
20221396	15:42 minutes	oa_opDbgMlMb	6.29 (mb)	2017246 09/03 03:30:03.349	41.3196	129.1286	0.12	239	240
20221397	16:15 minutes	oa_opDbgMlMb	6.28 (mb)	2017246 09/03 03:30:03.368	41.3174	129.1263	0.44	252	253
20221398	16:49 minutes	oa_opDbgMlMb	6.28 (mb)	2017246 09/03 03:30:03.390	41.3180	129.1276	0.35	264	265
20221399	17:28 minutes	oa_opDbgMlMb	6.28 (mb)	2017246 09/03 03:30:03.367	41.3187	129.1279	0.07	273	274
20221400	18:05 minutes	oa_opDbgMlMb	6.28 (mb)	2017246 09/03 03:30:03.407	41.3195	129.1293	0.11	284	285
20221426	18:42 minutes	oa_opDbgMlMb	6.28 (mb)	2017246 09/03 03:30:03.418	41.3199	129.1287	0.03	293	294
20221428	19:27 minutes	oa_opDbgMlMb	6.28 (mb)	2017246 09/03 03:30:03.365	41.3087	129.1284	0.08	307	309
20221430	20:04 minutes	oa_opDbgMb	6.28 (mb)	2017246 09/03 03:30:03.275	41.3104	129.1122	0.01	320	321
20221433	20:44 minutes	oa_opDbgMb	6.28 (mb)	2017246 09/03 03:30:03.321	41.3026	129.1278	0.19	327	328
20221434	21:13 minutes	oa_opDbgMb	6.29 (mb)	2017246 09/03 03:30:03.241	41.2783	129.1349	0.27	325	325
20221435	21:48 minutes	oa_opDbgMb	6.29 (mb)	2017246 09/03 03:30:03.183	41.2751	129.1258	0.02	300	300
20221436	22:28 minutes	oa_opDbgMb	6.27 (mb)	2017246 09/03 03:30:05.591	41.1897	128.9374	19.08	100	100

time

magnitude

depth



schemas !

stress points with css3.0

Preferred magnitudes

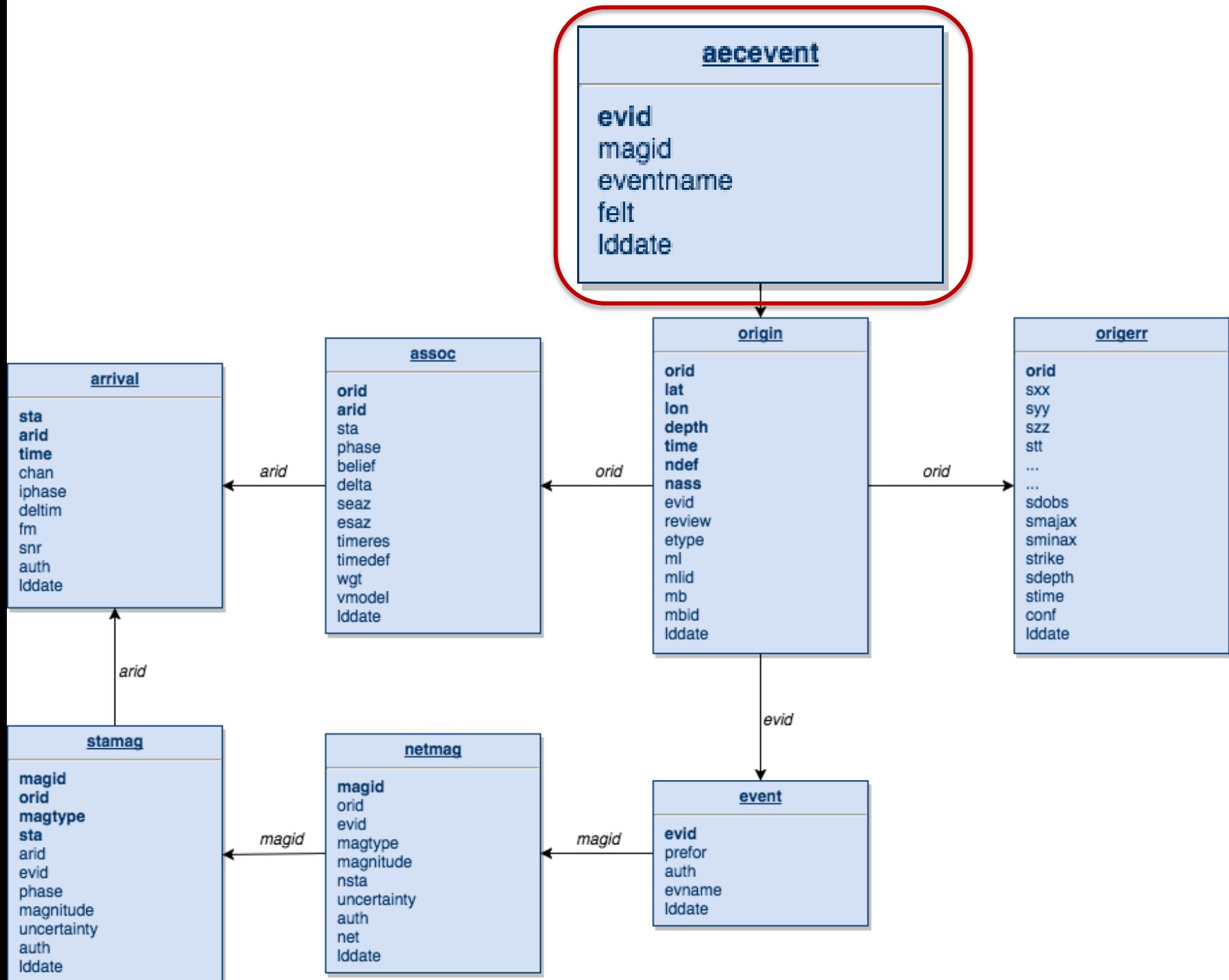
Ml, mb, Ms, Mw, Mw_{xx},
even from different authors

Permanent event names

not event.evid
event.evname was too limiting
including solutions from partners

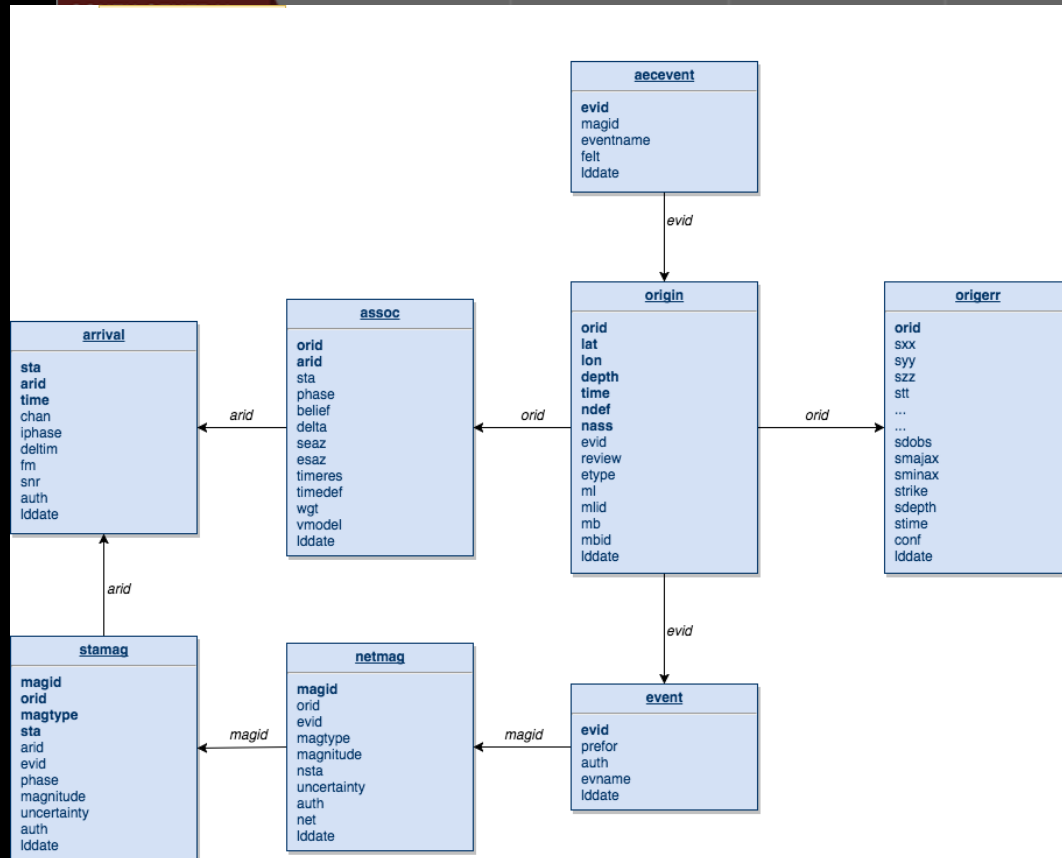
<http://earthquake.alaska.edu/event/017eslge3o>

Track whether an earthquake was felt



Internal (Datasclope)

Web (MySQL)

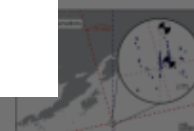


```

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    time decimal(17,5)
    latitude decimal(9,4)
    longitude decimal(9,4)
    depth decimal(9,4)
    jdate int(7)
    magnitude decimal(7,2)
    magnitude_type char(10)
    magnitude_author char(30)
    reviewed tinyint(1)
    felt tinyint(1)
    event_type char(20)
    number_phases int(6)
    lddate decimal(17,5)
  
```



We spend a lot of time at the Earthquake Center anticipating what will happen during large earthquakes. For earthquakes occurring off the coast,

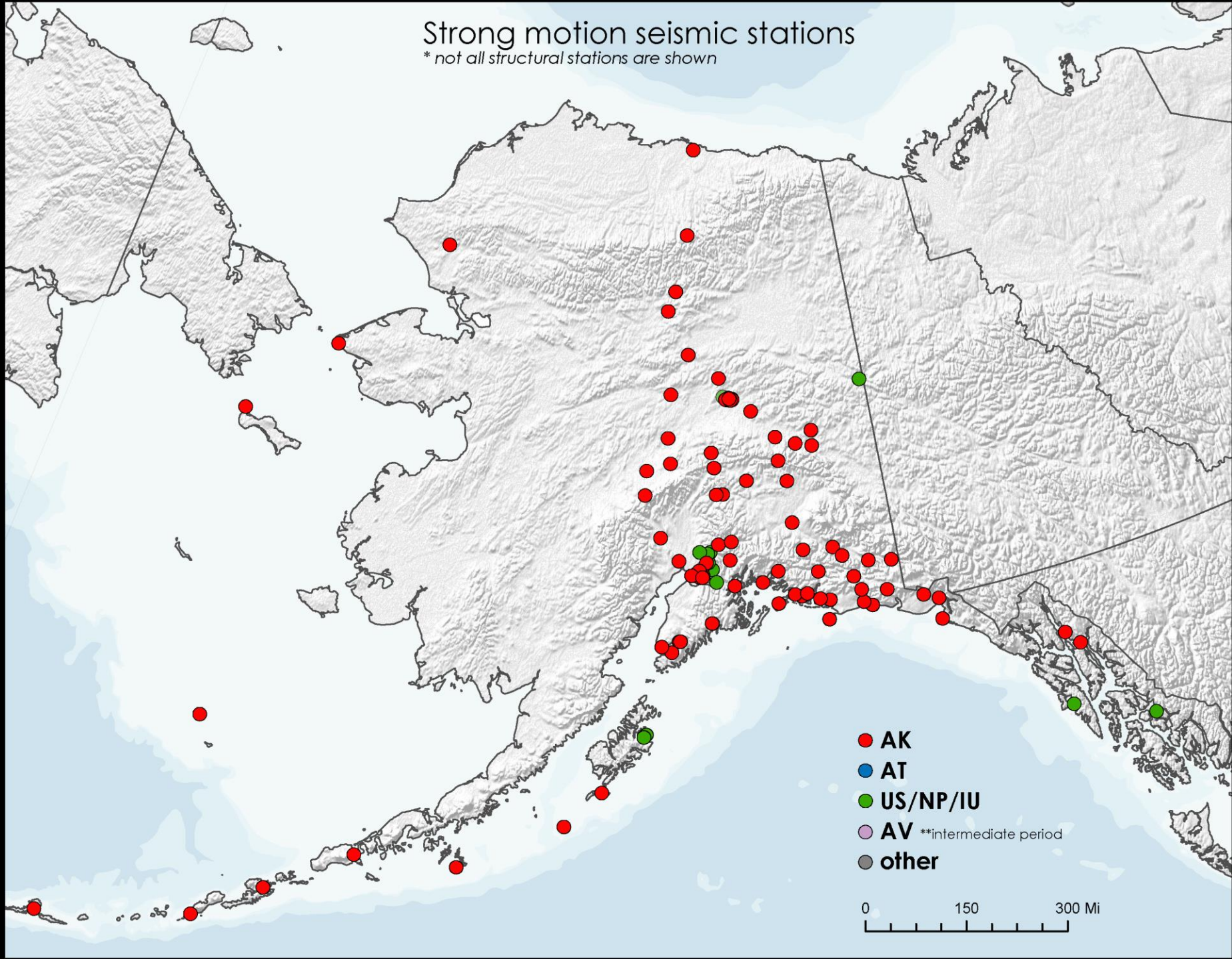


When a large earthquake occurs, geophysicists have many tools at their disposal to determine the properties of the fault (or faults) that ruptured during the earthquake.

strong motion

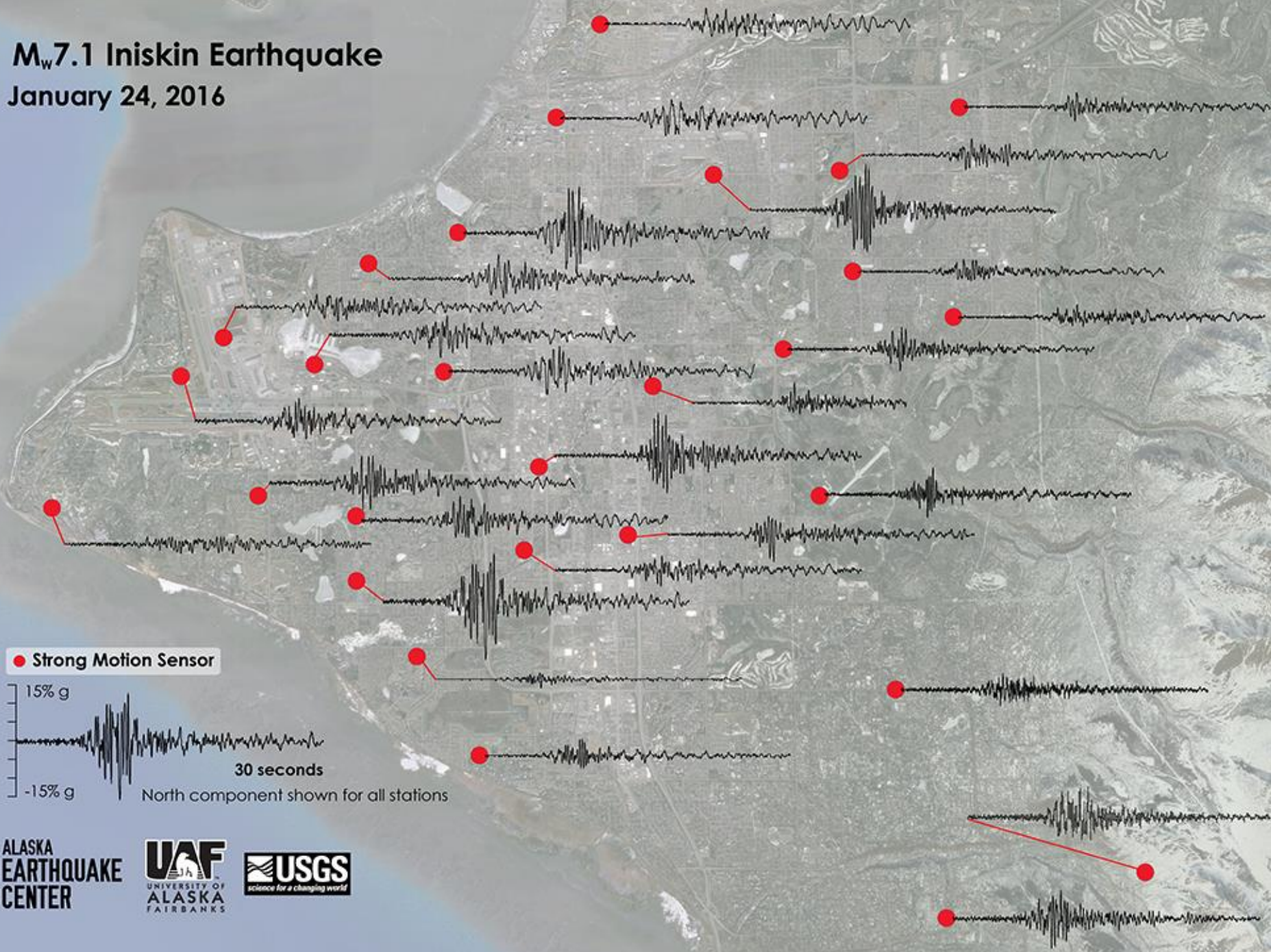
Strong motion seismic stations

** not all structural stations are shown*



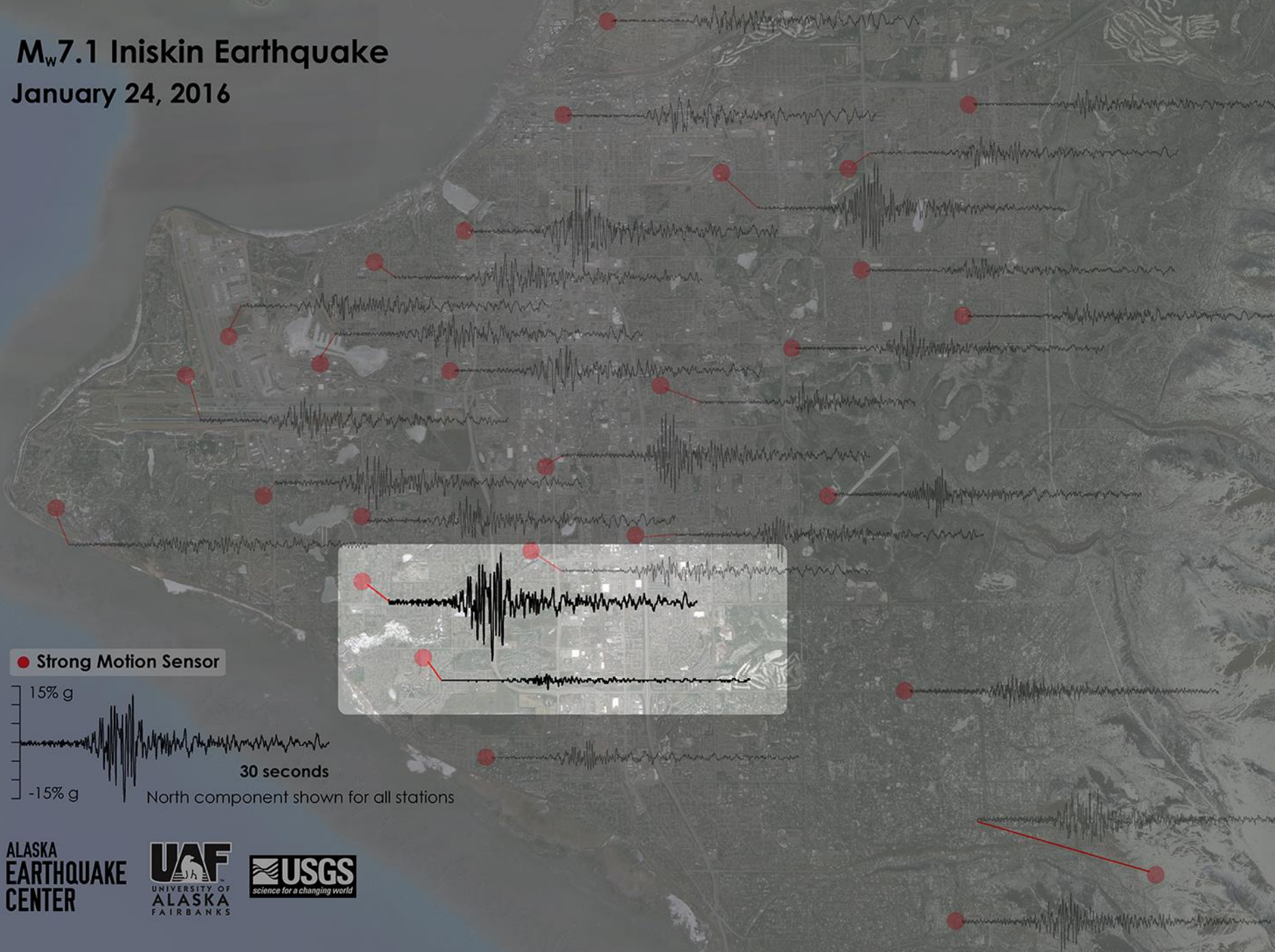
M_w7.1 Iniskin Earthquake

January 24, 2016

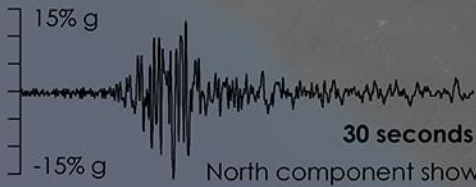


M_w7.1 Iniskin Earthquake

January 24, 2016



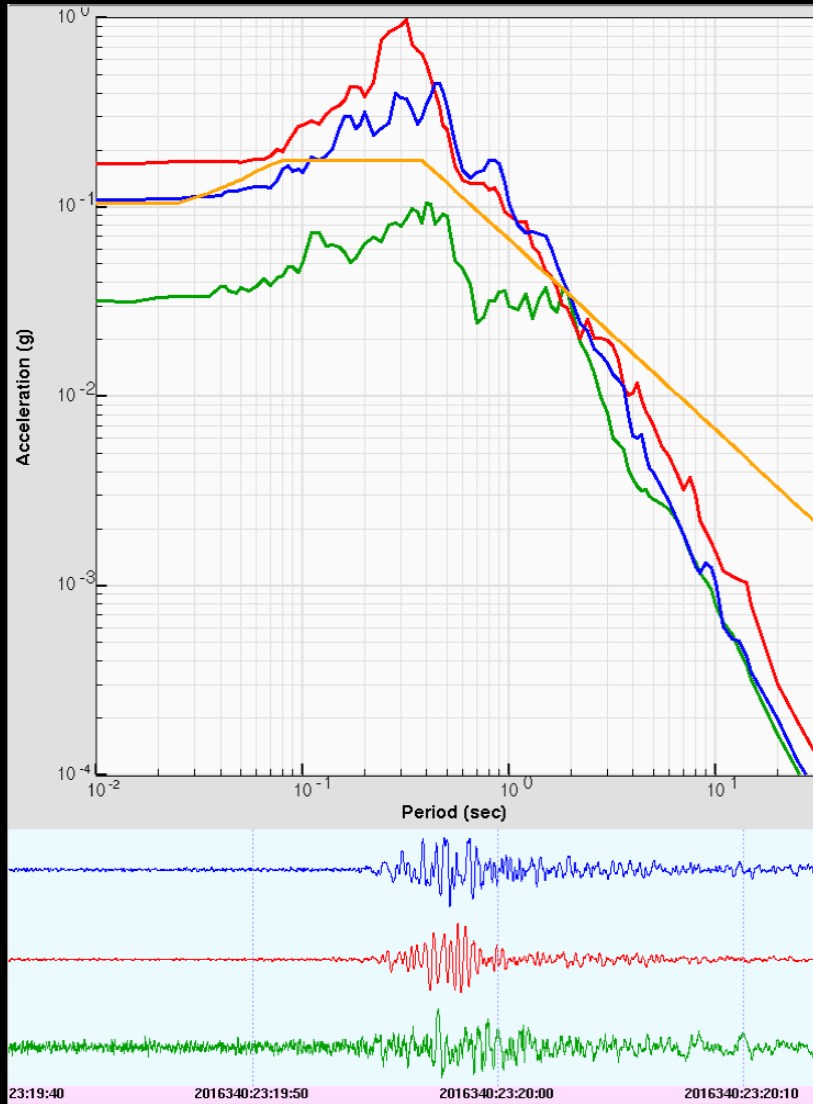
● Strong Motion Sensor



North component shown for all stations

no operational Big Horn yet

excited to see continued Big Horn growth

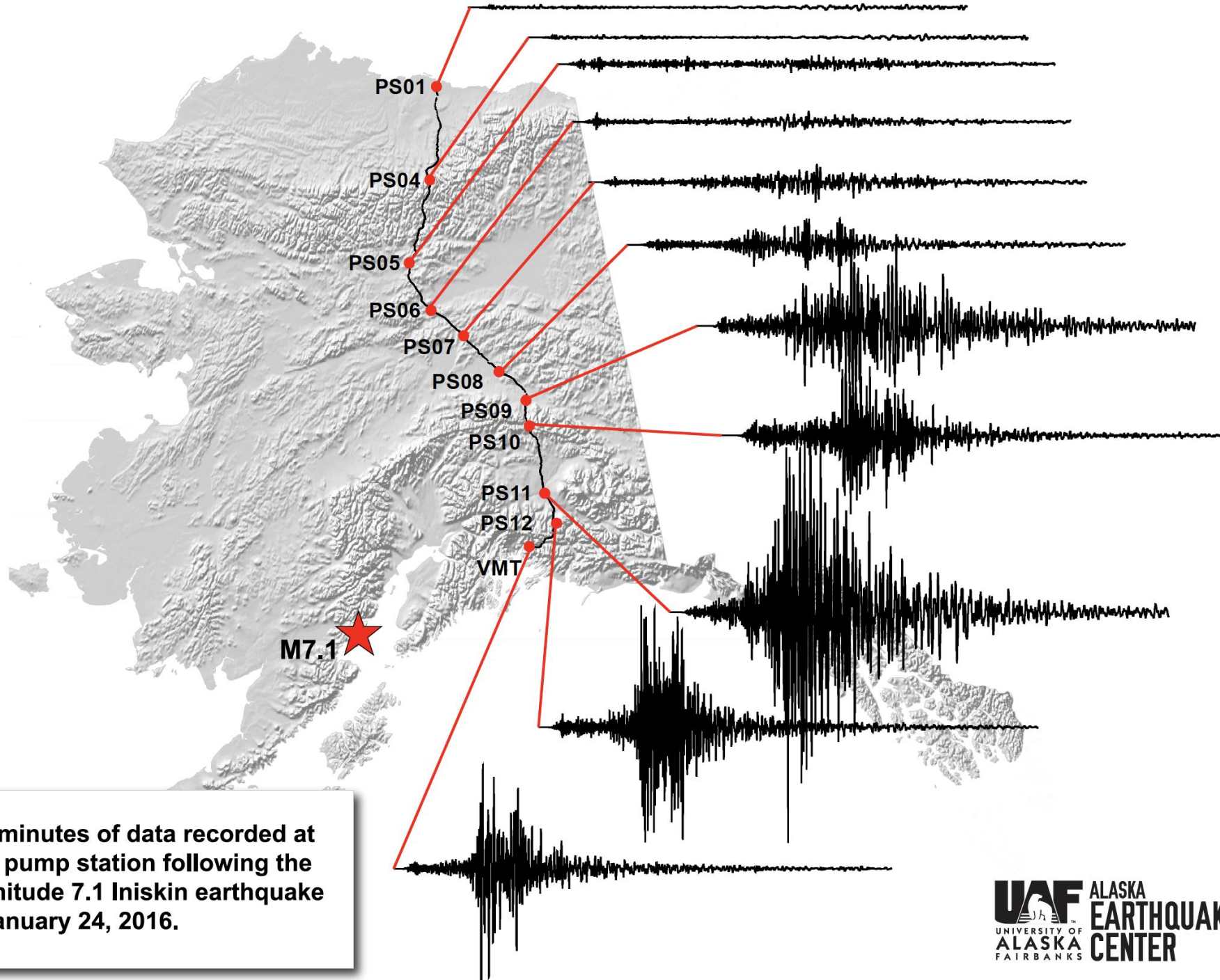


Response Spectrum ALARM

Staproc:	Time:	
NP_8026_D5	2016340:23:19:50.000	
Facility:	Station:	
Anchorage	NP_8026	
State:	Duration:	
final	50.0	
Channels:	HNN	HNE
Peak Acceleration:	0.170 g	0.109 g
Peak Velocity:	2.785 cm/s	10.945 cm/s

Exceedances:

limit	type			
STRUC1_DRS	DRS			
chan	nfreqs	fmax	pmax	percent
HNZ	1	0.53	1.90	3.97
HNN	63	3.12	0.32	452.41
HNE	48	2.17	0.46	209.11



Five minutes of data recorded at each pump station following the magnitude 7.1 Iniskin earthquake on January 24, 2016.

Before

After

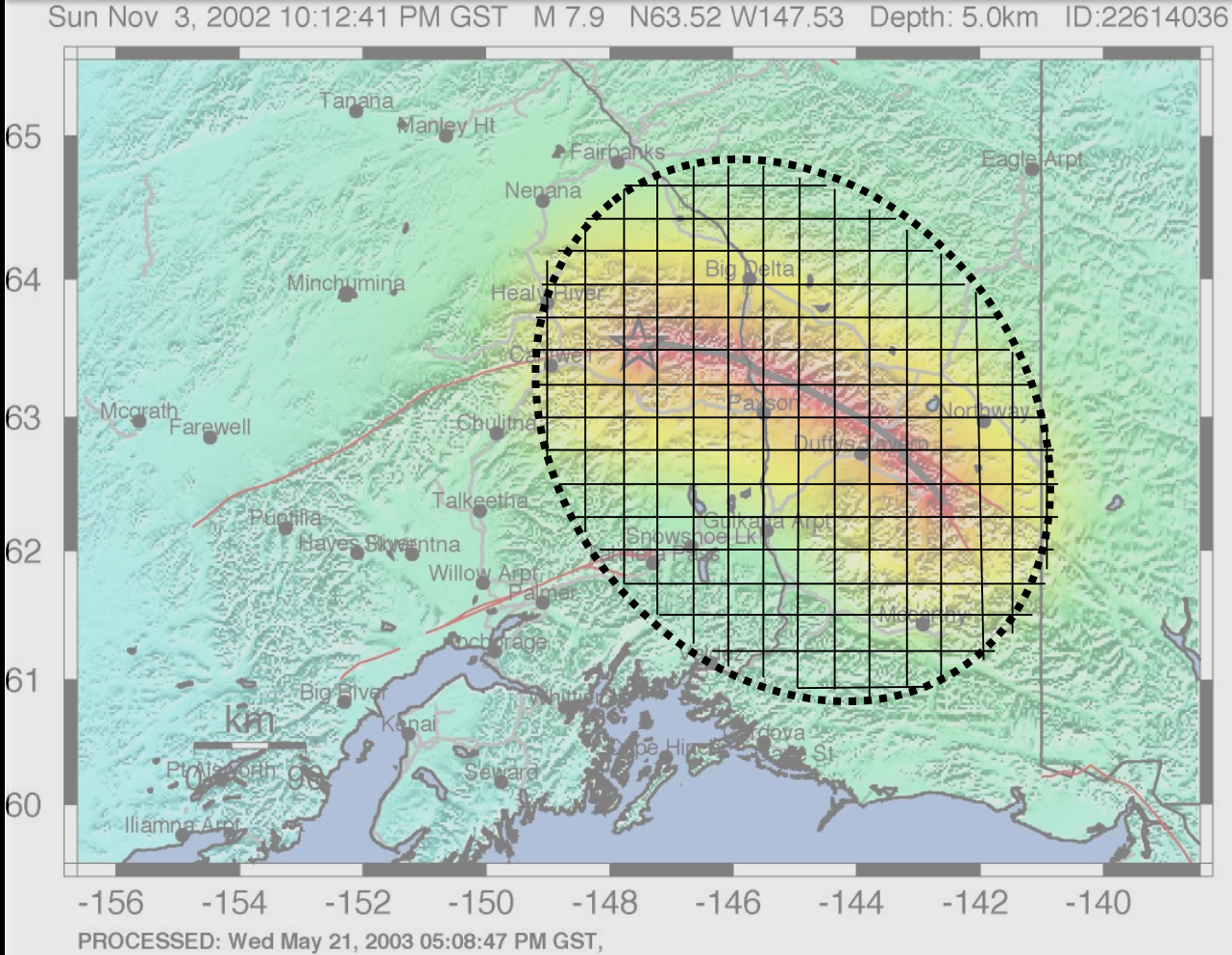


2002 Denali Fault. 6m of offset

in-house threshold monitoring

- moderate alarm
- high alarm
- automatic shutdown
- simple PGA-based metric

ShakeMap-based
 'interpolation'
 for post-event inspection



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	.17-14	1.4-39	3.9-92	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+

