

Reaching Rural Teachers with EarthScope Data Through Online Seismology Training

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EarthScope Outreach

Education and Outreach integrated into EarthScope from the beginning

Independent EarthScope National Office with extensive collaboration and close cooperation with the facilities, many other local and national partners

Primary goals

1. Create high profile EarthScope identity
2. Promote science literacy through informal education
3. Advance formal education in the classroom
4. Foster use of data, discovery, and technology
5. Establish sense of community ownership

earth
scope



EarthScope Outreach

A solid teacher training foundation already exists

1. Joint ESNO/IRIS/UNAVCO teacher workshops
 - usually just 1-1.5 days
 - either stand alone or in conjunction with an EarthScope National Meeting
2. Workshops focusing on reaching teachers of Native American students
 - run by Steve Semken, as part of the EarthScope National Office
 - included IRIS and UNAVCO staff
3. IRIS's Seismographs in Schools Program
 - NSF funded
 - two day workshops for teachers
 - co-located workshops with deployment region
 - participants received AS-1 educational seismometers

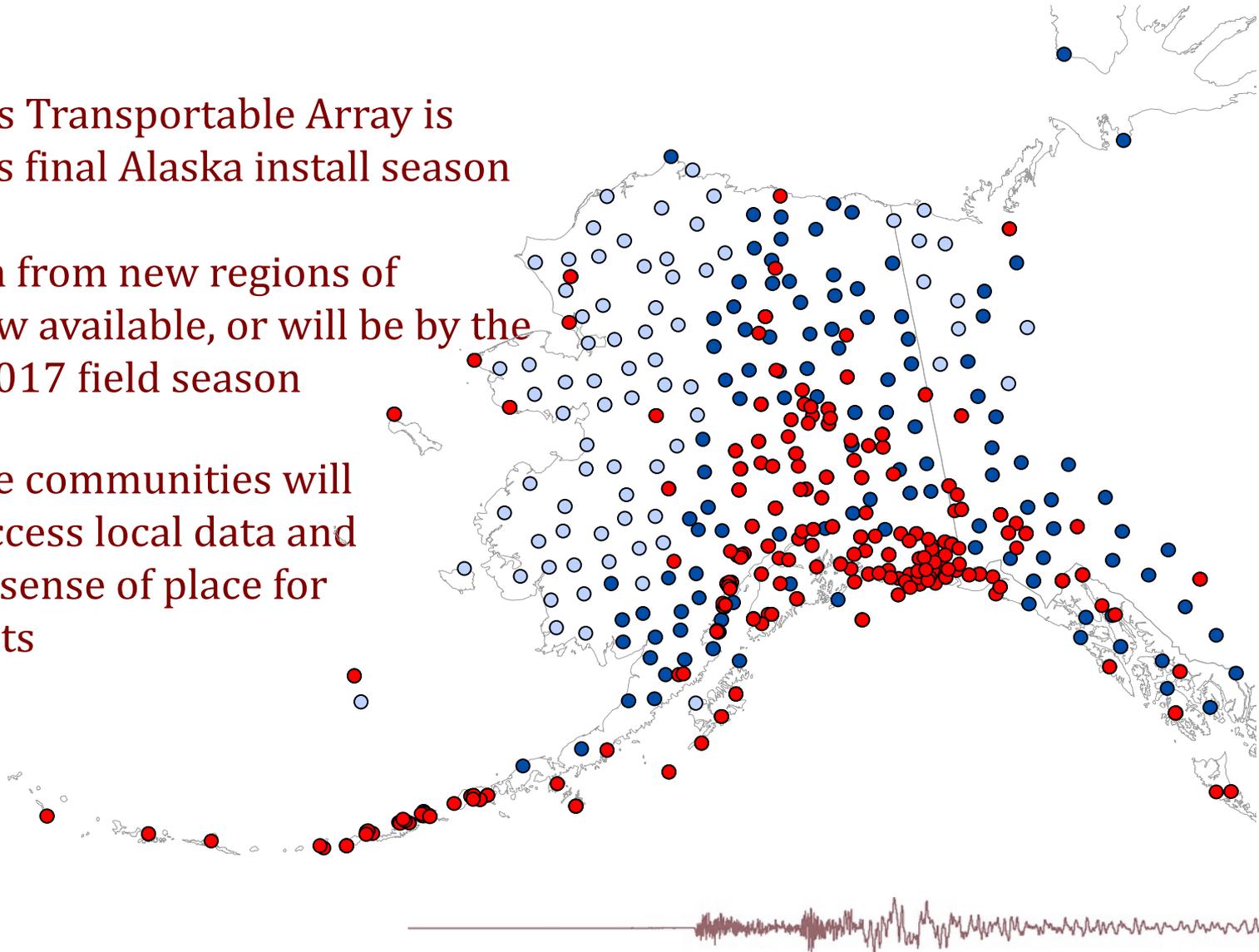


EarthScope's Transportable Array

EarthScope's Transportable Array is beginning its final Alaska install season

Seismic data from new regions of Alaska is now available, or will be by the end of the 2017 field season

More remote communities will be able to access local data and help tie in a sense of place for their students



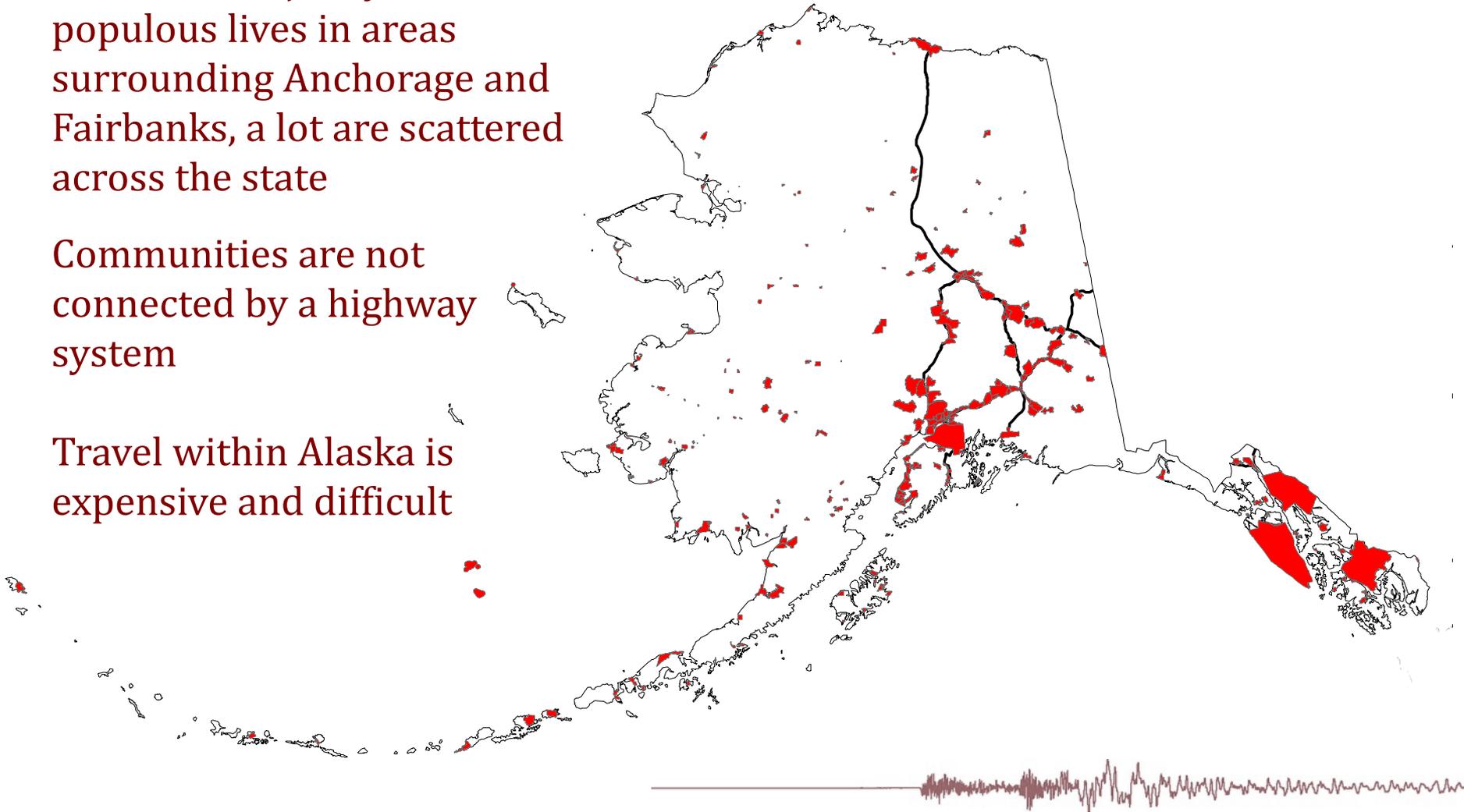
Alaska's Challenges

Alaska is big!

While the majority of the populous lives in areas surrounding Anchorage and Fairbanks, a lot are scattered across the state

Communities are not connected by a highway system

Travel within Alaska is expensive and difficult



Alaska's Challenges

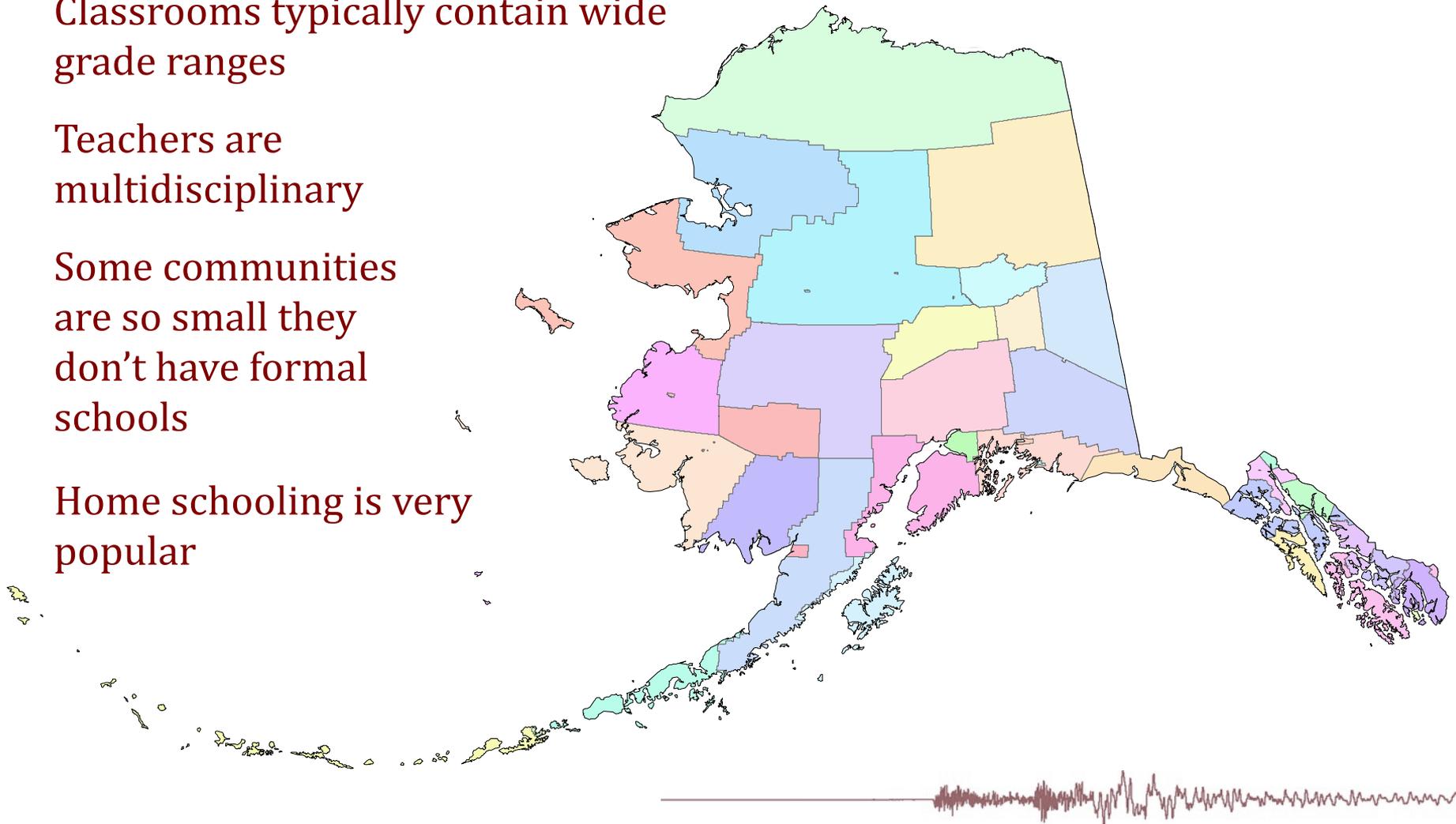
There are 53 school districts

Classrooms typically contain wide grade ranges

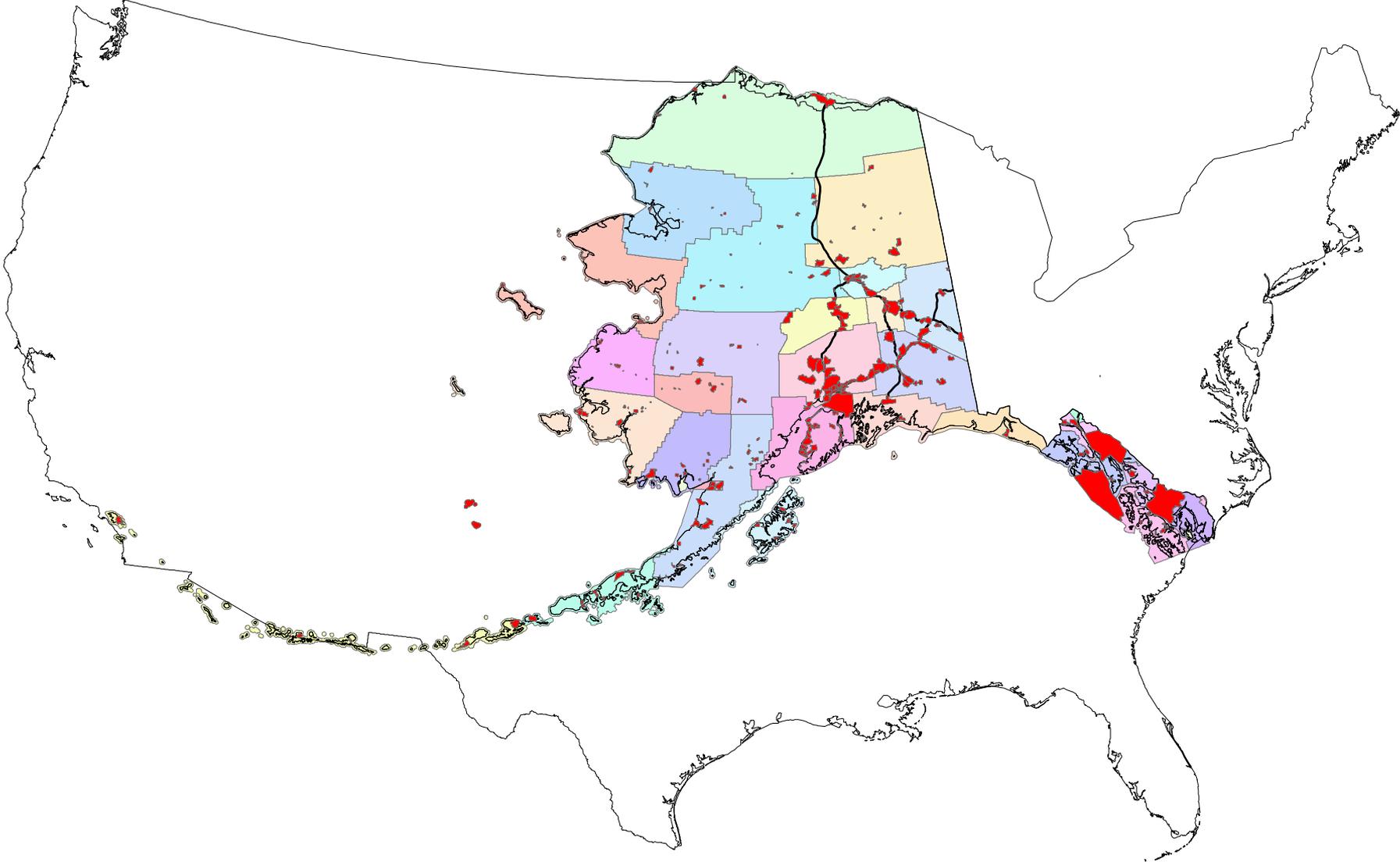
Teachers are multidisciplinary

Some communities are so small they don't have formal schools

Home schooling is very popular



Alaska's Challenges



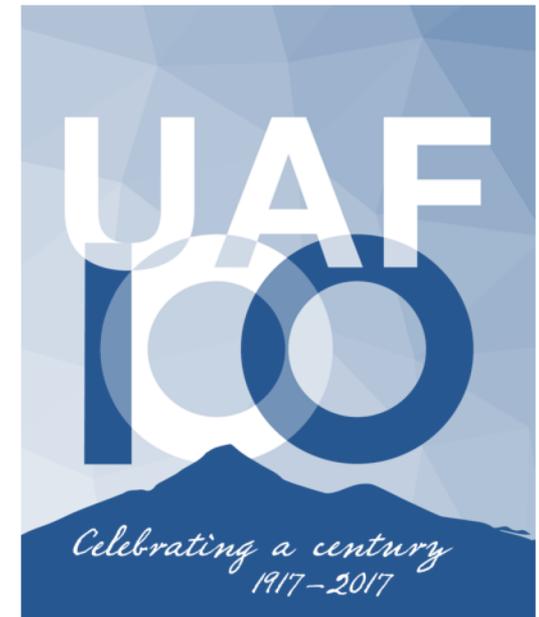
A New Approach

Move the workshop online

- allows teachers to participate from home or during class breaks
- creates a more flexible time table
- eliminates the need to schedule around hunting seasons, travel, etc.

Incentivize the participants

- offer professional development credit
- provide scalable resources to cover multiple age ranges with advice on how to use them
- create a cohort of teachers teaching the same material, upon whom to draw inspiration
- offer tuition reimbursement with successful completion



Building the Course

The framework

- Alaska focused
- Pass/Fail
- 15-week time frame
- 1-2 hour target per lesson – required for professional development credit
- offered through Blackboard – online classroom program used by many schools and universities
- video lectures followed by associated hands-on activities
- required group discussion with each lesson
- reflection assignment wherein teachers comment on how the lesson would affect their lesson plan
- both synchronous and asynchronous options
- Provide teachers with box of materials to get started



Building the Course

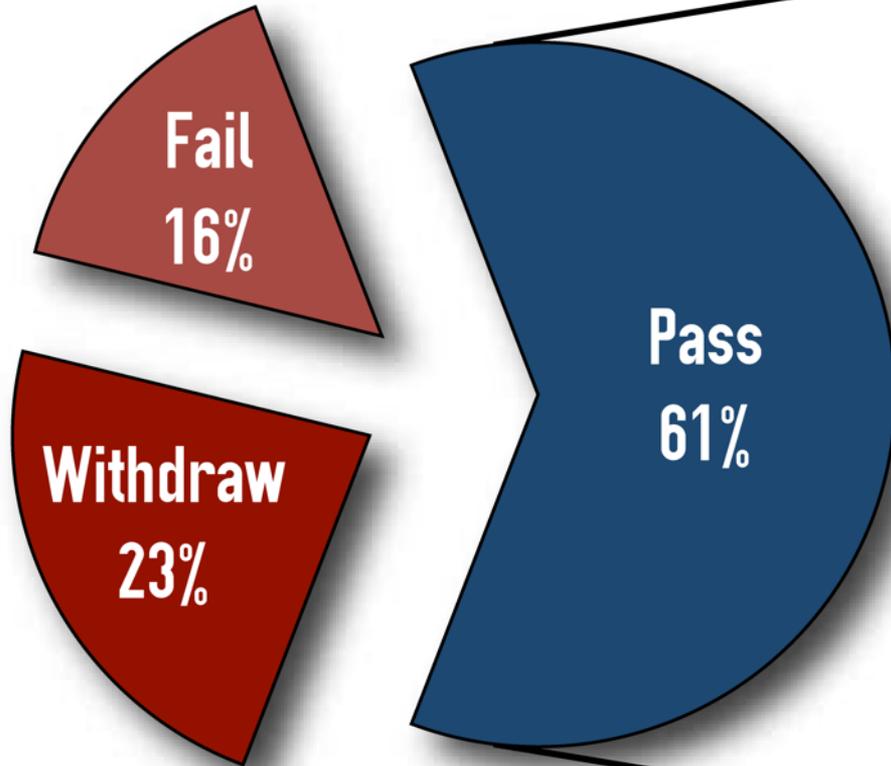
The syllabus

Three major blocks

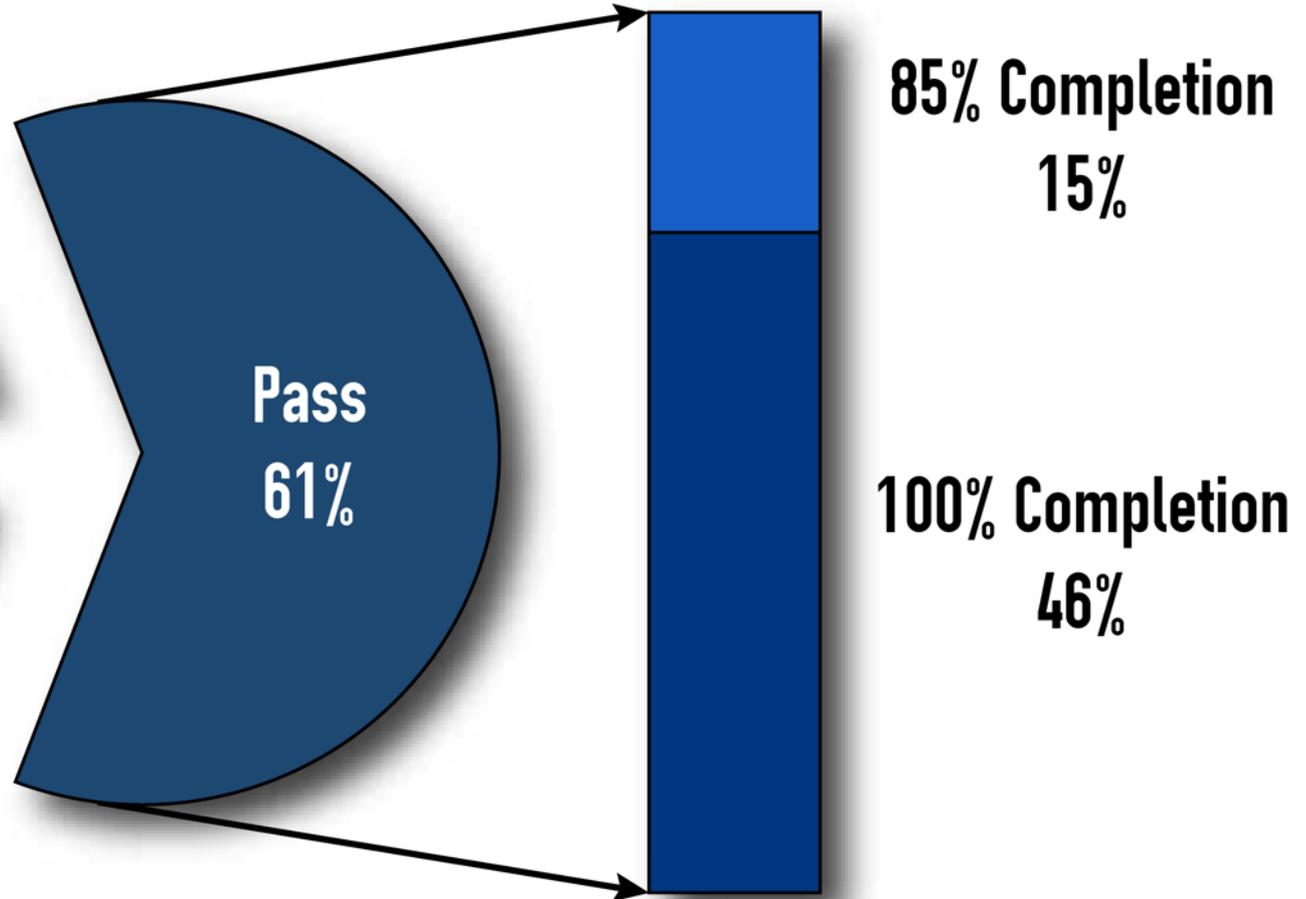
1. seismology basics
 - tectonics
 - earthquake basics
 - build your own seismograph
 - seismic wave basics
2. using IRIS's jAmaSeis software
 - importing data – emphasis on local stations
 - recognizing patterns in seismograms
 - calculating distance/location
 - calculating magnitudes
3. resources
 - Alaska Earthquake Center
 - IRIS's Online Resources
 - UNAVCO



Struggles

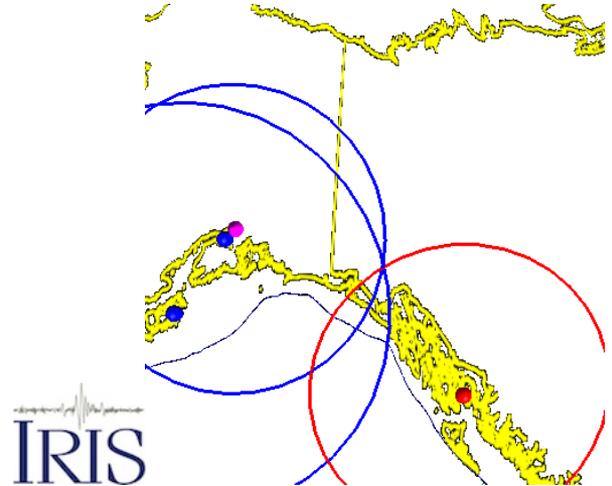
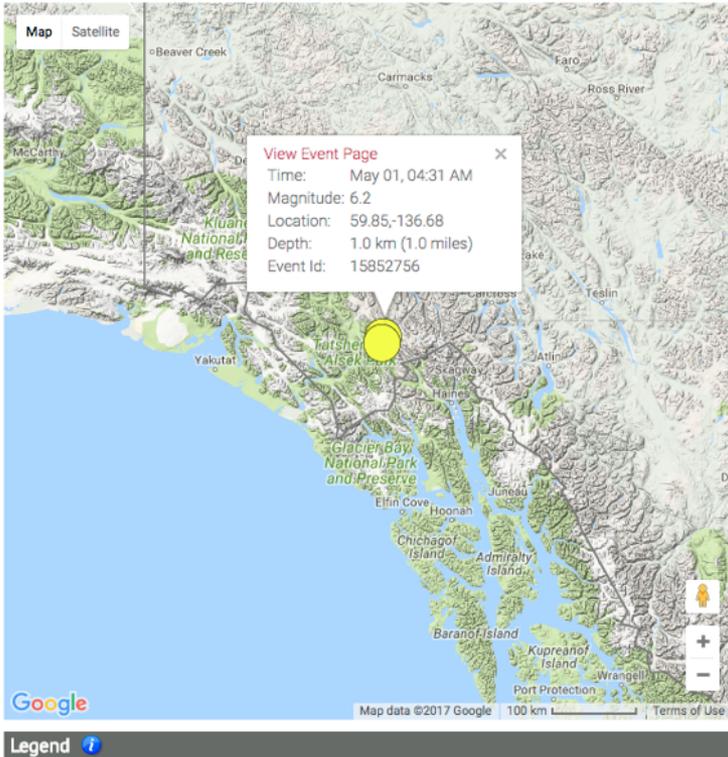


Successes



Successes

Number of earthquakes since April 28, 2017: 3029 | Largest: 6.2



Event View Data Summary

Station ID	Location	Lat/Lon	Distance	Magnitude	Filter	Start Time	Device Type
KDAK	Kodiak Island, Alaska, USA	(57.783, -152.583)	8.48° 941.99 km	Not Computed	None	05/01/2017 12:32	Geotech KS-54000 Borehole Seismometer
JKAK	Anchorage, Alaska, USA	(61.122, -149.721)	6.19° 688.06 km	Not Computed	None	05/01/2017 12:30	TC-1
V35K	Ketchikan, AK, USA	(55.328, -131.615)	5.98° 663.91 km	Not Computed	None	05/01/2017 12:30	Streckeisen STS-5A/Quanterra 330 Linear Phase Comp

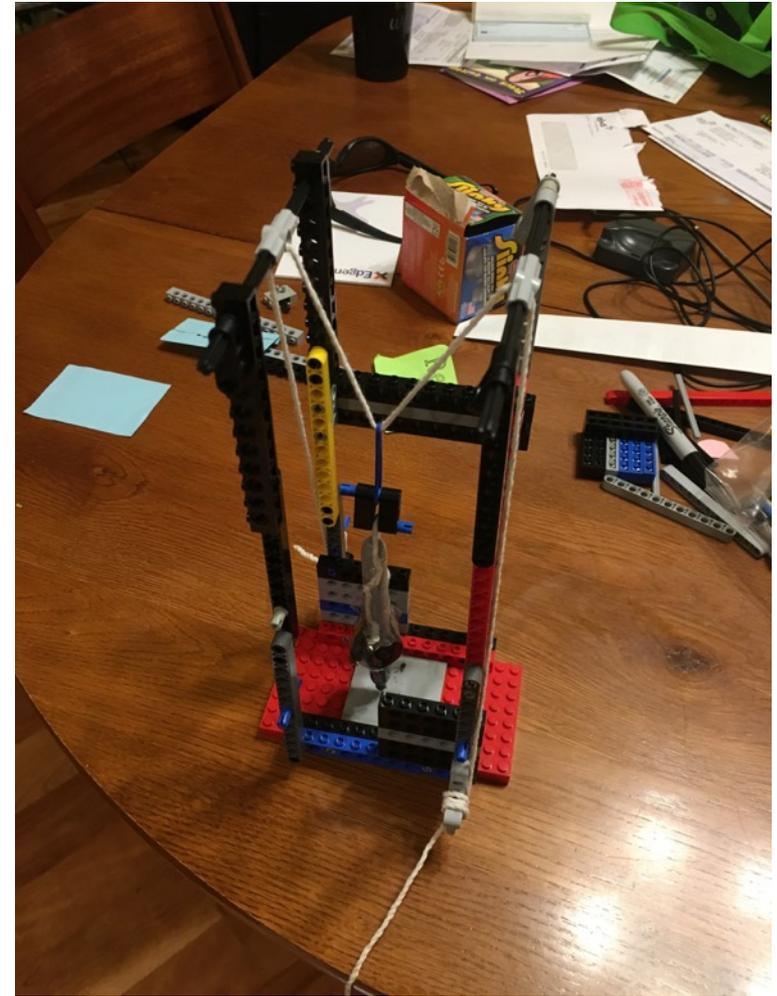


Participant Feedback

“I didn't have ***this in-depth of a lesson*** in Earthquakes in my college geology classes.”

“The Earthquake Machine activity has been awesome! It really ***engaged my students and fit the curriculum*** perfectly.”

“I love the earthquake class. I really ***need this kind of content support***. The lessons are fabulous too. I like going through them and actually do them as a student. I will be able to ***teach these lessons with more depth and meaning***. I just started teaching an Alaska Geology class and will be introducing these lessons with my students soon.”



Upcoming Plans

Second offering Fall 2017!

- Joint UAF, UAA offering
- Pursue 2-credit offering – consistent with work load
- Asynchronous, but with benchmark due dates to keep participant progress together
- Provide clearer direction with assignments – e.g. watch lesson videos before attempting the assignment
- Minor tweaks to lesson assignments



Thank You!

Additional Alaska TA Outreach on Poster 97

