

Geohazards

Our community has responded to and studied a variety of geohazard events over the years. Some of the most common geohazards studied include:

- Large earthquakes
- Volcanic unrest
- Induced seismicity
- Landslides

PI-led responses to geohazard events have unique needs and can significantly benefit from a pool of specialized instrumentation designed to best meet those needs.



Photo: University of Canterbury

Instrument Testing and Evaluation at the PASSCAL Instrument Center

During the summer and fall of 2021, PASSCAL technicians have been busy evaluating a variety of equipment for potential inclusion in the new rapid response pool.

Compact Broadband Seismometers

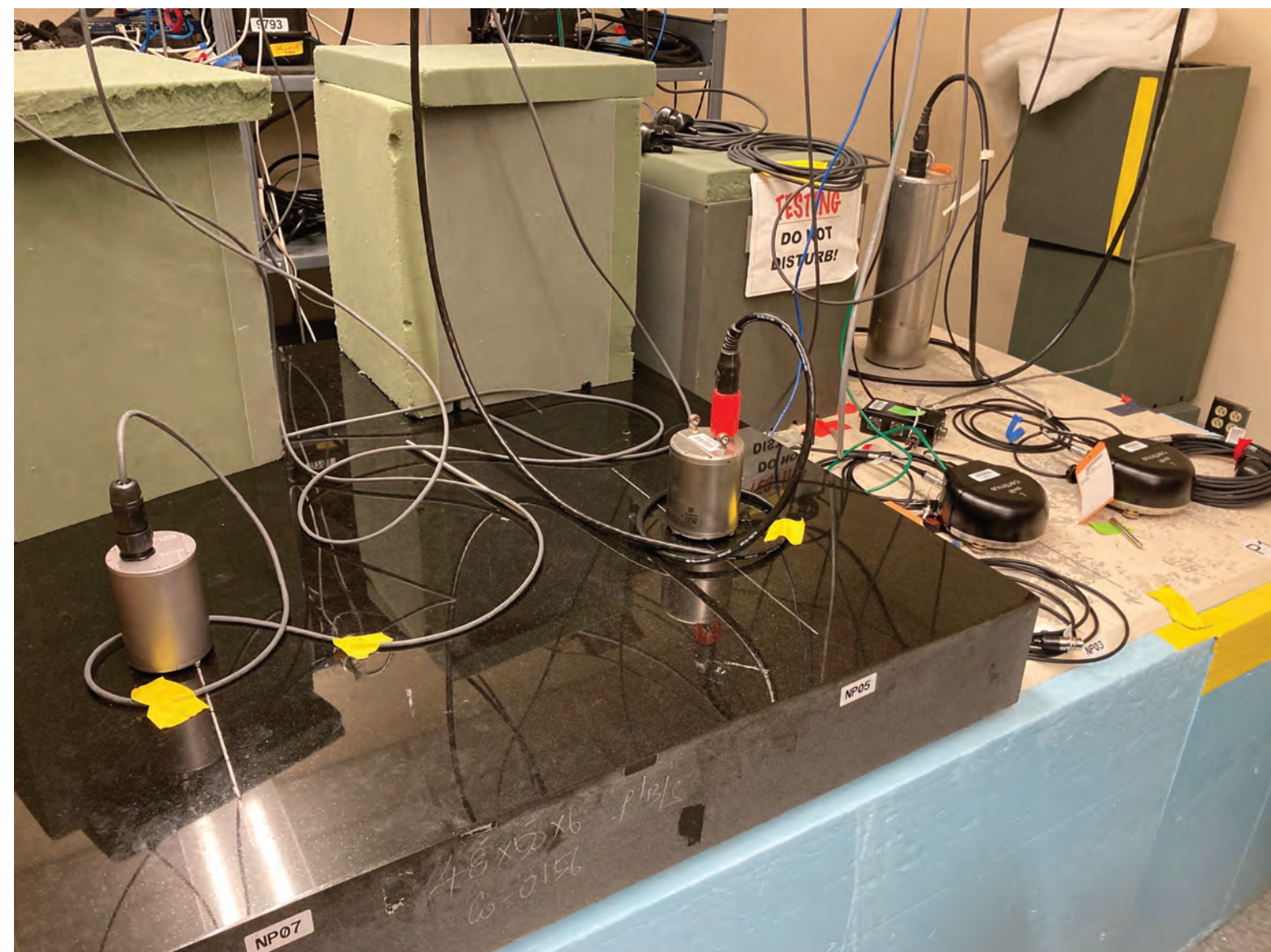
Three vendor offerings were selected for evaluation based on their ability to meet community needs for a small/compact, light-weight, waterproof, rugged seismic sensor with a response >20s. Technical staff evaluated these sensors on PASSCAL testing piers (see photos at right) to assess instrument response as well as general sensor form factor and design including cable connectors and leveling feet.

Small, Low-Power Digitizers

Two new light-weight, low-power (<500mW) seismic digitizers were also purchased for testing and evaluation. During testing, PASSCAL staff looked at power consumption, data offload, storage capacity, build quality, and form factor.



Several small, direct-bury sensors seen prior to testing at the PASSCAL Instrument Center in August 2021.
Photo by Justin Sweet.



Two compact, direct-bury sensors undergoing pier testing at the PASSCAL Instrument Center. Photo by Justin Sweet.

Finalizing Equipment Pool and Usage Policies

IRIS staff have been refining cost models for the final rapid response equipment pool based on recent vendor quotations and available funding. Using these constraints, and the recent results of equipment testing and evaluation at PASSCAL, we anticipate a final rapid response pool to contain the following components:

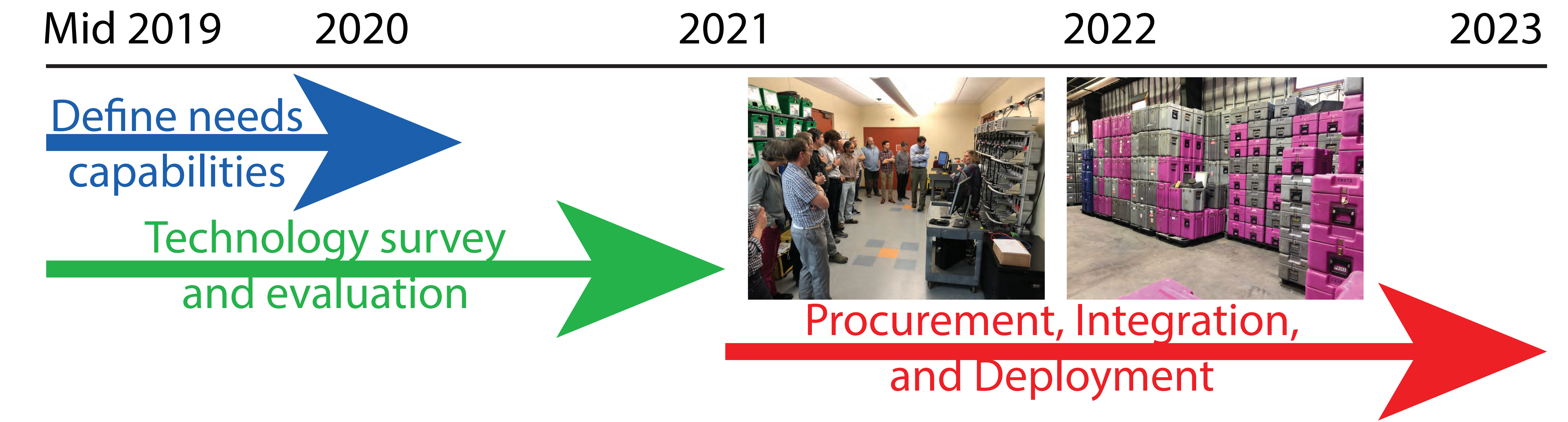
- ~34 compact broadband sensors
- ~10 strong motion sensors
- ~44 seismic digitizers
- ~10 infrasound sensors
- ~100 nodal seismometers (see photos)
- ~44 quick-deploy cases



Two varieties of seismic nodal sensors under consideration for the rapid response pool. Mag-Seis Fairfield ZLand nodes (left) and SmartSolo IGU-16 nodes (right). Photos from PASSCAL.

In addition to finalizing the makeup of the new rapid response pool, IRIS staff have also been working on a set of usage policies that will govern how this new community resource will be used. These policies are being developed in close coordination with community governance, and are essential to ensuring that this equipment will be available and effective when needed for community-led rapid response deployments. Beyond usage, these policies are also expected to outline data sharing requirements and IRIS coordination between PIs and other agencies who may be responding to the same event.

Project Timeline



A final procurement plan is expected to be reviewed and endorsed by the PASSCAL standing committee this month. Instrument procurements will occur in 2022 and 2023 with plans to deploy these items as soon as possible following delivery and integration. We expect the new pool of rapid response instrumentation will be ready and available for community use beginning in 2023.

Acknowledgements

This material is based upon work supported by SAGE which is a major facility fully funded by the National Science Foundation.

Instrument testing, evaluation, and operation is supported by the PASSCAL Instrument Center. We wish to also thank the many community members who have provided helpful input.