UNAVCO is transforming understanding of Earth systems and hazards using geodesy. This vision is realized through global leadership and facility best practices that integrate innovative geodetic technologies and open observations for geoscience research and education and for the improvement of the human condition.
2021 was a year of great change at UNAVCO. The global pandemic accelerated our operational transformation from a mostly face-to-face to a mostly hybrid and remote organization. Our shift to flexible work hours and flexible work locations allows UNAVCO employees to weather personal and professional challenges, and enables us to recruit and retain tremendously talented staff. We’re also deeply engaged in inclusion, diversity, and equity issues in new ways that support UNAVCO people and our extended community of scholars and scientists. We’ve become leaders in delivering scientific support, internships, short courses, and workshops in rapidly-changing contexts, in ways that make the practice of science and scientific findings ever more accessible.

In mid-2021, the NSF announced the extension of the GAGE (and SAGE) facility awards for two extra years, which allows us even more room to pursue transformations. The most obvious of these is our planned merger with IRIS, which will create the EarthScope Consortium in late 2022. The new organization will support all the activities of UNAVCO and IRIS, as well as exciting new capabilities in cross-disciplinary earth systems science. We’re engaging with a wide range of stakeholders who can bring new perspectives to our current mission and vision.

We’re also putting a lot of effort and creativity into changing how we handle data, with a new emphasis on cloud and high-performance computing and on low-latency streams. This data innovation is a great counterpart to the continued success of our sensor networks, especially the NOTA network, which performed well throughout the pandemic.

Throughout the challenges of the last years, our community remained strong and deeply involved in guiding us toward our vision of transforming the understanding of earth systems and hazards using geodesy. Community governance of our facility is a tremendous privilege that allows us to nimbly react to change and continue to drive innovation. Thanks to all of you for volunteering your time, ideas and expertise in service to our growing community. It remains an inspiration to see so many of you deeply invested in the well-being and continuous modernization of our facility.

Last but not least, thanks to all of you who continue to make exciting scientific discoveries using UNAVCO data, instrumentation, software, and human resources. We are inspired by your work, and we are ever committed to a growing understanding of our amazing planet.
By the Numbers

- **1,981** Permanent Stations Supported
- **231** Member Institutions
- **1000+** Volunteer Hours Contributed
- **77** Staff
- **529** Participants in GAGE/SAGE Science Workshop Activities
- **142** Terabytes of Data Delivered Oct. 2020-Sept. 2021
- **1,5M** Impressions on Social Media
- **11** New Hires
- **4,977** Accounts Payable Transactions
- **231** Permanent Stations Supported
- **100%** Vaccinated or Waived
UNAVCO secured a new interagency agreement with the NSF and the USGS in 2021 to build and operate the new geodetic data architecture of the ShakeAlert® Earthquake Early Warning System. Adding geodetic GNSS stations that measure ground movement is critical because it enables faster identification of the largest earthquakes. We also completed a previous two-year USGS Cooperative Agreement to build new stations in Oregon and upgrade others in Washington, Oregon, and California in service of ShakeAlert.

In Alaska, station reconnaissance and campaign survey work in June supported the Shumagin Postseismic PI project; that work proved especially valuable in light of the July 28 MB.2 earthquake in the same area. Coordination between UNAVCO and IRIS in support of PI-directed earthquake response included recovering data from stations that lost communications prior to the earthquake, repairing existing stations that were offline, revisiting survey sites, and placing new instruments. Together with IRIS/PASSCAL, a field team secured over 50 instruments spanning several projects at Thwaites Glacier despite severe limitations on Antarctic operations.

UNAVCO began the process of refactoring primary data flow, data processing and data access systems for a cloud environment. The real-time system, which lifts data directly from sites to the cloud, is already partially implemented and operational. New software development projects are also underway to build new data access, learning, and outreach tools using the Observable notebooks platform.

Our new website launched in January, with work ongoing to migrate and update existing content while reimagining some resources and approaches. The new site is designed to better enable public outreach, and to streamline access to services for the scientific and education communities.

We delivered short courses remotely this year, including a series of nine education “mini” short courses and the first extended virtual field short course in the GETSI project, plus five technical short courses. InSAR short course materials are now available online including new video tutorials for InSAR data access tools. Over 1,400 community members participated in short courses in 2021.

Nineteen interns participated in our summer RESESS, Geo-Launchpad, and USIP programs. The hybrid programs (5 weeks in Boulder, 6 weeks remote) were successful, with many interns presenting their summer work at the fall meetings of GSA or AGU.

Our IDEA committee (Inclusion, Diversity, Equity, and Accessibility) created an action plan for UNAVCO, Collaborative staff activities with IRIS ramped up throughout the year, including a joint cultural assessment survey.
UNAVCO currently has 21 active awards with funding totaling $57,701,912.

### 2020-2021 Financials

<table>
<thead>
<tr>
<th></th>
<th>2017 Actual</th>
<th>2018 Actual</th>
<th>2019 Actual</th>
<th>2020 Actual</th>
<th>2021 Forecast</th>
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<tbody>
<tr>
<td><strong>Total Direct Costs</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Actual / Forecast</td>
<td>$12,522,280</td>
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<td>$12,790,510</td>
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<td>Indirect Rate</td>
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<td>18.12%</td>
<td>16.74%</td>
<td>19.46%</td>
<td>17.94%</td>
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<tr>
<td><strong>Total Indirect</strong></td>
<td></td>
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<tr>
<td>Budget</td>
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<td>$2,327,240</td>
<td>$2,318,527</td>
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<tr>
<td>Actual</td>
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<td>$2,141,476</td>
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<td><strong>Labor Fringe</strong></td>
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<tr>
<td>Regular</td>
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<td>55.16%</td>
<td>51.90%</td>
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<td>56.02%</td>
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<tr>
<td>Temp</td>
<td>12.61%</td>
<td>11.42%</td>
<td>10.83%</td>
<td>10.64%</td>
<td>10.55%</td>
</tr>
</tbody>
</table>
The work of UNAVCO to support the community can only be done when the community has a voice and provides input and direction. We are grateful to the over 50 individuals who have committed their time to serving on governance. Thank you for your contributions and for your dedication to community-driven science support!

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