Geoscience COVID-19 Impacts Study Update

Examining impacts and resilience within academia

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08 April 2022

Funding for this project is provided by the National Science Foundation (Award #2029570). The results and interpretation of the survey are the views of the American Geosciences Institute and not those of the National Science Foundation.
Project Goals

- Assess short-term and long-term impacts of pandemic
- Establish a baseline of pre- and post-COVID-19 workplace and instructional environments
- Assess the magnitude and permanency of changes to workplace and instructional environments
- Inform response and recovery planning for future disasters and disruptions to work and instructional environments
Survey Design

Participant Consent
- Employer
- Academic Dept
- Academic faculty
- K-12 faculty
- Student
- Post-doctoral fellow
- Non-academic geoscientist
- Unemployed
- Retired

Benchmark (Feb 2020)
- Employer
- Academic Dept
- Individual

Next Update
- Employer
- Academic Dept
- Individual
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Survey Design

Multi-cohort longitudinal survey

Continuous onboarding
May 2020 – Dec 2021

Participants are not required to answer every survey

Survey sent every 2 weeks
Survey participation by major cohort

Participants by major cohort

- Academic departments: 100 (Total), 86 (Active)
- Geoscience employers: 122 (Total), 98 (Active)
- Individuals: 1,626 (Total), 1,387 (Active)

Total participants
Active participants
What we’ve learned...

- Impacts to departments and instructional formats
- Impacts to skills/knowledge acquisition
- Impacts to workplace environments
- What changes persist?
Departmental Budgets

Budget cuts less severe than expected.

Outlook is improving with less than 1/3 of departments expecting budget cuts for the coming academic year.

60% expecting no change in budget for the coming academic year.
Staffing Impacts

Most impacts occurred during Summer 2020 with focus on reduction in hours and furloughs of staff and non-tenured faculty.

Active hiring picked up in May 2021 and has remained at a relatively steady rate.

Hiring freezes / positions left unfilled persists for about 10% of departments.
Staffing Impacts

With vaccine availability, regulatory prohibitions on travel and field activities substantially diminished.

With Delta and Omicron surges, we see an uptick in limitations as well as faculty deciding to forgo travel and field activities.
Changes in promotion and tenure guidelines focused primarily on promotion clock extension, with most departments requiring faculty to opt-in to take advantage of the accommodation.

Over 80% of faculty reported not opting to take advantage of accommodations.
Institutional Plans

Hopes for a return to normal diminished by Delta and Omicron surges.
Current expectations are in-person instruction with masking, testing, and vaccines, with some institutions planning to continue hybrid course options.
Continuing Students – Enrollment Intention

Continuing students persisting in academic studies.

Small cohorts of students delaying graduation and returning part-time to finish studies in Fall 2020 and Fall 2021.

Enrollment intention for next term

- Returning full-time
- Returning part-time
- Graduating, enrolling in new program
- Graduating, not returning
- Defer return
- Discontinuing enrollment at current school
- Undecided
Most departments offering only in-person instruction (primarily with COVID-related restrictions).

Nearly 1/4 of departments offering dual mode with a combination of in-person with either online or hybrid formats.
Instructional Formats

Half of departments now offering *only* in-person labs.

~ 20% of departments offering dual-mode instruction.
Instructional Formats

Over 90% of departments now offering in-person field instruction, primarily at local sites.

75% of departments offering only in-person field instruction.

Limitations on vehicle usage and travel persist.
Virtual instructional activities will likely be integrated as back-up sections or as supplemental activities to in-person activities.
Interest in Virtual Instruction

Students more interested in virtual learning than faculty in virtual teaching.

Most interest in virtual instruction for lecture courses.
Interest in Virtual Instruction

Workloads for virtual instruction, especially course prep activities, are still more than for in-person instruction, but this has lessened since 2020.
Satisfaction with Virtual Instruction

Increased satisfaction with quality of online content and with ability for students to work in groups.
Satisfaction with Virtual Instruction

More variability with student satisfaction.

Increased satisfaction with group work, engagement with instructors and quality of online course content.
Benefits of Virtual Instruction

Largest benefit of virtual instruction is flexibility it provides especially to students for reviewing content and taking courses at their own time / pace.
Challenges with Virtual Instruction

Issues with student engagement and diminished course quality are top issues with virtual instructional activities.
Cancelled Instructional Activities

Cancellation of field components to courses and field courses primarily due to pandemic impacts.

Cancellation of lecture and labs in 2021-2022, primarily due to low enrollments.

Geoscience instructional activities cancelled during the pandemic, by academic year

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<th>Academic departments</th>
<th>2020-2021</th>
<th>2021-2022</th>
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<tr>
<td>Lecture courses</td>
<td>3%</td>
<td>9%</td>
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<tr>
<td>Lab sections / courses</td>
<td>7%</td>
<td>9%</td>
</tr>
<tr>
<td>Field components</td>
<td>17%</td>
<td>5%</td>
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<tr>
<td>Field courses</td>
<td>17%</td>
<td>7%</td>
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Student Impacts

Delays in thesis, dissertation and capstone projects is the top reported issue.

Impacts to field instruction especially during 2021 field season.

Increase in students reporting changes to project design.

Students also delaying defense / graduation due to project delays and availability of field instruction.
Course topics were primarily field methods, but also included minerology, sedimentology, and structural geology.
Departmental Actions

- Continuing students
  - Acceptance of substitutions for courses
  - Waivers for pre-requisites, make-up courses / directed studies
  - Spaces in 2021-2022 field courses offered first to students who were unable to take prior year’s course
  - Postponed degree progress

- Graduating students
  - Waived field course requirements
  - Delay of graduation until students could take in-person field course
  - Make-up courses / independent studies to fulfill field course requirement
Most graduates acquiring skills via self-taught instruction or via on-the-job training.
Workplace policies

Just over half of departments offer remote-first policies for faculty and staff.
Changes in work policies

In-office work policies available to faculty and staff

Remote work policies available to faculty and staff

Change in remote work policies to more of a focus on limited remote-work
Most faculty now working in the office at least half time. Work location appears to be responsive to pandemic situation.
Work-at-home assistance

Most departments provided equipment and training for faculty and staff.
Remote teaching / learning adaptations

Students more likely to have a shared workspace for remote learning, but this has decreased since 2020.
Remote teaching productivity

General increase in productivity across all categories except for teaching.
Remote learning productivity

General decrease in productivity across most categories, possibly due to graduating cohort of 2020-2021.
Student recruitment and retention is an increasing concern, as are budgets and staffing.
Workplace safety and academic rigor of programs continue as a pandemic-related concern. Job security is top non-pandemic concern for faculty.
Workplace safety and employment opportunities continue as top pandemic-related concerns. Employment opportunities are also top non-pandemic related concern.
Pandemic-related restrictions

Restrictions for facilities and field activities have substantially lessened.

Limitations on staffing and access still persist for some students and faculty.
Pandemic-related restrictions

Restrictions related to health and safety are still in place for most faculty and students.

Most common restrictions are related to masking, vaccines, and social distancing.
Pandemic-related restrictions

Restrictions for travel and meetings have lessened.

Restrictions on in-person meetings and travel limitations are most common restrictions.
Ongoing questions

- Which instructional modes will be integrated long-term?
  - Will departments provide direction or will it up to faculty?
  - How widespread will be the adoption of virtual lab and field components? What factors will lead to their adoption?
  - Will virtual instruction be used as recruiting tools?
- Will pandemic-related accommodations to promotion and tenure influence career trajectories for faculty?
- Will degree requirements change for majors?
  - New skill requirements based on employer needs?
  - More flexibility in completion requirements (substitutions, duration of program)
Recent Graduates

Over half of recent geoscience graduates are employed.

Highest unemployment is among those who graduated during the pandemic.
Recent Graduates

Recent Graduates

Lower percentage of more recent graduates working in non-geoscience positions. Possibly reflects taking jobs until they find a geoscience job.
Recent Graduates

~1/3 of unemployed recent graduates are seeking work both in the geosciences and in other professions.
Recent Graduates

Top reasons for seeking work outside of the geosciences includes lack of geoscience job options, and not having adequate skills or education.
Employment Trends

Steady decline from Aug 2019 - Feb 2021
Pandemic shocks and oil & gas sector contraction

Credit: AGI; data derived from the U.S. Census Bureau, Current Population Survey

AGI | American Geosciences Institute | Connecting Earth, Science, and People
Operational impacts

While impacts are lessening overall, supply chain disruptions continue for ~ 1/3 of employers.

Supply shortages also impacting employers. 2020 – PPE; 2021 – IT supplies.
Most employers continue to report full or excess workloads relative to staffing.
Staffing expectations

Impacts from Delta variant in staffing expectations in late 2021, but expectations improve again before Omicron wave begins.
Hiring and Job Openings

Hiring picked up in mid-2021 and then again in late 2021.

Job openings remained relatively steady, with an increase in late 2021.
Challenges finding and hiring talent

Increases in the percentage of employers reporting no challenges with finding and hiring talent.

Recruitment continues to be an issue for employers.

Onboarding new staff, especially into remote working environments, remains a challenge.
While in-office work increased thru 2020, remote work options declined only slightly. The small percentage of employers offering lab access is reflective of the limited number of companies with lab facilities.
Employer support for remote work

Most employers provided equipment for employees as well as software and office supplies.

Over half of employers have reduced their active office space usage due to remote work.
Proficiency with virtual skills

Increased proficiency across all categories.

Most improvement in project collaboration.
Benefits to remote work

Top benefits include the improved use of virtual technologies, and flexibility for employees.
Challenges to remote work

Biggest challenge remains the lack of in-person interactions which fosters relationships, community, and new idea generation.
Employer hiring

Employers mostly hire at the Bachelor’s and Master’s levels.

With what degree levels do you hire full-time geoscience new hires?

- Bachelor’s: 90%
- Master’s: 80%
- Doctorates: 50%
New hire required / preferred skillsets

Top required skills:
- field skills
- proficiency with virtual platforms

Proficiency with virtual platforms is becoming increasingly important.

~20% of employers have changed what they are looking for in new hires, with most looking for candidates that can work with minimal to no supervision.
Ongoing questions

- Will remote work and remote-first policies become permanent?
  - Will remote work enable a more geographically distributed workforce?
  - Will employers continue financial and logistical support for remote work?
- Will employers reduce their operational footprint?
  - What will be the impacts to labs and advanced computing capabilities?
- Will preferred / required skills for new hires be different than pre-pandemic?
- How will employers address skills / knowledge gaps for new hires that were students during the pandemic?
Thank you!

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