Collaborative Research: Implementing 21st century geodesy learning through faculty development and expanded applications of data to societal issues

Project Period: 08/01/2017-07/31/2020
Reporting Period: 08/01/2017-07/31/2018
Principal Investigators: Meghan Miller (PI), Donna Charlevoix (Co-PI), Beth Pratt-Sitaula (Co-PI)
Sponsor: NSF DUE-IUSE
Award ID: 1725347
Collaborators: Bruce Douglas (Indiana University), Rebecca Walker (Mt San Antonio College)

Participants in the GETSI Phase 2 Materials Development Meeting, February 2018. The group includes ten module authors, three GETSI PIs, and two SERC assessment and evaluation consultants.
Accomplishments

What are the major goals of the project?

GETSI (GEodetic Tools for Societal Issues) is a curriculum development and dissemination project to increase the use of geodetic data by both introductory and majors-level undergraduate students. This grant is for GETSI Phase 2, which continues the work started under a TUES Phase 1 “exploratory” grant.

Over the last two decades, technical advances in geodesy – the study of the size, shape, and mass of the Earth and their changes with time – have revolutionized our understanding of Earth processes and produced discoveries of major societal impact related to climate change, water resources, natural hazards, and environmental change. Overall, teaching resources and textbooks have simply not kept pace with advances in geodesy, both for introductory and upper division undergraduate courses.

Overarching Objectives

1. Improve geoscience (particularly geodetic) knowledge base of undergraduate students both for general science literacy (introductory) and future science workforce (majors-level).
2. Improve effectiveness of teaching resources and pedagogy employed by faculty members teaching geodesy, geoscience, and allied science and engineering fields.

GETSI Phase 2 Outputs

1. Development, testing, revision, and publication of six new curricular modules featuring geodesy data investigations applied to critical societal issues and supporting Earth science, climate, and quantitative literacy at both introductory and majors’ levels in diverse academic settings.
2. Extensive faculty professional development and module dissemination to ≥450 instructors through in-person and virtual short courses.
3. Educational research on the process of adaption and adoption of online undergraduate curricular materials to better serve students and instructors.
4. Educational research on the challenges and benefits of building curricular materials that serve both geoscience and allied engineering and science undergraduates.

GETSI Phase 2 Outcomes

1. Students:
   a. Are able to apply authentic geodetic data and quantitative reasoning to scientific questions
   b. Have improved understanding of nature, methods, and communication of science
   c. Gain Earth and climate science literacy and the ability to apply them to critical resource, hazard, and environmental issues

2. Faculty
   a. Adopt developed GETSI curricular modules
   b. Have improved knowledge of geodetic data and methods
   c. Include more connections between authentic data and addressing critical societal issues
   d. Increase use of promising pedagogical practices in STEM education (e.g.,
3. Educational research:
   a. Better knowledge of process by which instructors adapt and adopt online resources
   b. Improved understanding of the relationship between teaching practices and materials adoption
   c. Expand capabilities to develop teaching resources that bridge between geodesy learning and other STEM disciplines

What was accomplished under these goals?

Major Activities

GETSI partners with the SERC (Science Education Resources Center) InTeGrate project (Interdisciplinary Teaching about Earth for a Sustainable Future) for curriculum design. SERC provides assessment consulting, external evaluation, and webhosting.

Progress towards the major project outcomes is:

- Output #1 Module Development - significant progress; slightly behind schedule
- Output #2 Dissemination - underway and on schedule
- Output #3 Research on Use - feedback survey collection underway
- Output #4 Research on Transfer - not started; scheduled to be done later in the grant

The report from SERC, the external evaluator, also provides information on the accomplishment of project outcomes (see Appendix).

Output #1: The modules are authored by teams of two higher education faculty from different universities. All six curricular modules were started during the February 2018 GETSI 2 Materials Development Meeting (https://serc.carleton.edu/getsi/meetings/Feb2018_authors/agenda.html).

These are:
- Volcanic Hazards (Introductory level)
- Water Resources and Hazards (Introductory level)
- Measuring the Earth with GPS (Introductory level)
- Flood Hazards (Majors level)
- Landscape & Environmental Change (Majors level)
- Changing Ice and Sea Level (Majors level)

The SERC External Evaluation Report (see Appendix) shows that participant authors are strongly positive about the development meeting giving it an overall satisfaction rating of 9.6 out of 10.

The content of the modules goes through a rigorous review process including four checkpoints prior to classroom testing. Some adjustments to the schedule and accomplishments have been made since the SERC External Evaluation Report was written in May 2018. All six modules passed Checkpoint 1 by the end of the development meeting. Three modules are approaching being ready for Checkpoint 2, two have passed Checkpoint 2, and one has passed Checkpoint 3. Three of the modules are planning to do classroom
testing during fall semester and three during spring semester. Final publication of all six modules is still on schedule for late summer or early fall 2019.

Output #2: GETSI held two short courses and one webinar during Year 1 reaching a total of more than 100 participants. An additional workshop will be held July 19 as part of the Earth Educators Rendezvous (EER) (Lawrence, Kansas). Access of the GETSI website (part of the SERC website) has increased notably since the start of GETSI Phase 2. Details on short courses, webinar, and website use are included in the SERC External Evaluation Report. In addition, GETSI modules have been or will be disseminated through posters and presentations at 2018 Earth Educators Rendezvous, 2018 UNAVCO Science Workshop, and 2017 American Geophysical Union (AGU) Annual Meeting as well as through UNAVCO and partner listservs. GETSI has engaged in outreach from the UNAVCO and National Association of Geoscience Teachers (NAGT) booths at both GSA and AGU and the UNAVCO booth at the EER.

Outcome #3: The “Share You Experience” feedback surveys are available on the GETSI website (https://serc.carleton.edu/gets/share_experience.html). A total of ten post-use feedback surveys have been collected for the seven published GETSI modules. In addition, more than 50 participants in short courses have given information on intended use. This information will be folded into the final analysis. This outcome will be emphasized more in subsequent years.

Opportunities for training and professional development?
GETSI materials authors receive professional development related to pedagogical best practices for geoscience teaching. Participants in short courses and webinars receive professional development related to both pedagogy and geodesy content.

How have results been disseminated to communities of interest?
As described above in Major Activities Output #2, modules have been disseminated to the broader geoscience education community via a short courses, webinars, conference exhibit booths, conference presentations, listservs, and websites. GETSI is also featured on the UNAVCO website as a major project (http://www.unavco.org/projects/projects.html#Major) giving it prominence beyond just the Education section of the site, which tends to be used by a smaller subset of the UNAVCO community.

Plan for next reporting period?
We plan to continue the activities and schedule as outlined in the project proposal. Outcome #1 Module Development will be largely finished. Outcome #2 Dissemination will continue at a similar pace to Year 1. Additional emphasis will be placed on the research elements Outcomes #3 and 4.
Products

Conference Papers and Presentations

Title: Activities, Animations, and Online Tools to Enable Undergraduate Student Learning of Geohazards, Climate Change, and Water Resources
Conference: American Geophysical Union Annual Meeting, 2017
Authors: Beth Pratt-Sitaula, Becca Walker, Bruce Douglas, Vince Cronin, Gareth Funning, Leigh Stearns, Donna Charlevoix, Meghan Miller

Title: Data-rich societally-situated undergraduate teaching resources and instructor professional development for geoscience classrooms and field courses
Conference: UNAVCO Science Workshop, 2018
Authors: Beth Pratt-Sitaula, Bruce Douglas, Becca Walker, Benjamin Crosby, Donna Charlevoix, Meghan Miller

Title: Data-rich societally-situated undergraduate teaching resources and instructor professional development for geoscience classrooms and field courses
Conference: Earth Educators Rendezvous, 2018
Authors: Beth Pratt-Sitaula, Donna Charlevoix, Becca Walker, Bruce Douglas, Benjamin Crosby, Meghan Miller

Websites

GETSI Project Site: http://serc.carleton.edu getting/index.html
This is the GETSI project website. It gives background information on the project and is the primary publication site of the teaching modules when they are complete. Development workspaces allow for internal project notes and draft module text.

Participants

Individuals

Meghan Miller UNAVCO PI 0 Months
As the UNAVCO President Miller is responsible for coordination with the science community and the successful accomplishment of the work. She is paid entirely out of indirect as her work is for the proportional benefit of all awards; thus she does not draw salary on this grant.

Donna Charlevoix UNAVCO Co-PI 0 Months
As the Director of UNAVCO’s Education and Community Engagement, Charlevoix is also responsible for coordination with the science community and the successful accomplishment of the work. Her salary is covered through the NSF GAGE Facility Cooperative Agreement.

Beth Pratt-Sitaula UNAVCO Co-PI 2 Months
A UNAVCO Educational Specialist, Pratt-Sitaula serves as the GETSI facilitator in charge of project logistics and communication. She coordinates between UNAVCO, the authors, technical experts, beta-testers, SERC, NAGT, and related organizations. She leads
dissemination (meeting presentations, journal papers, articles, website content, webinars). Pratt-Sitaula’s funding to work on GETSI is from this NSF IUSE grant.

Kaatje Kraft  Whatcom Community College  Faculty  1 month
Kraft serves as a module co-author on the new introductory-level module *Volcanic Hazards*. Her full time job is as a faculty member at Whatcom Community College. GETSI will pay her a total of $7500 stipend over the period of work on module development and revision.

Rachel Teasdale  California State University-Chico  Faculty  1 month
Teasdale is serving as a module co-author on the new introductory-level module *Volcanic Hazards*. Her full time job is as a faculty member at California State University-Chico. GETSI will pay her a total of $7500 stipend over the period of work on module development and revision.

Karen Kortz  Community College of Rhode Island  Faculty  1 month
Kortz is serving as a module co-author on the adapted introductory-level module *Measuring the Earth with GPS*. Her full time job is as a faculty member at Community College of Rhode Island. GETSI will pay her a total of $4000 stipend over the period of work on module development and revision.

Jessica Smay  San Jose City College  Faculty  1 month
Smay is serving as a module co-author on the adapted introductory-level module *Measuring the Earth with GPS*. Her full time job is as a faculty member at San Jose City College. GETSI will pay her a total of $4000 stipend over the period of work on module development and revision.

Jonathan Harvey  Fort Lewis College  Faculty  1 month
Harvey is serving as a module co-author on the adapted introductory-level module *Water Resources and Hazards*. His full time job is as a faculty member at Fort Lewis College. GETSI will pay him a total of $4000 stipend over the period of work on module development and revision.

Stephen Hughes  University of Puerto Rico-Mayaguez  Faculty  1 month
Hughes is serving as a module co-author on the new majors-level module *Landscape & Environmental Change*. His full time job is as a faculty member at University of Puerto Rico-Mayaguez. GETSI will pay him a total of $7500 stipend over the period of work on module development and revision.

Bobak Karimi  Wilkes University  Faculty  1 month
Karimi is serving as a module co-author on the new majors-level module *Landscape & Environmental Change*. His full time job is as a faculty member at Wilkes University. GETSI will pay him a total of $7500 stipend over the period of work on module development and revision.

James McNamara  Boise State University  Faculty  1 month
McNamara is serving as a module co-author on the new majors-level module *Flood Hazards*. His full time job is as a faculty member at Boise State University. GETSI will pay him a total of $7500 stipend over the period of work on module development and revision.

Venkatesh Merwade  Purdue University  Faculty  1 month
Merwade is serving as a module co-author on the new majors-level module *Flood Hazards*. 
His full time job is as a faculty member at Purdue University. GETSI will pay him a total of $7500 stipend over the period of work on module development and revision.

Susan Kaspari Central Washington University Faculty 1 month
Kaspari is serving as a module co-author on the adapted majors-level module *Changing Ice and Sea Level*. Her full time job is as a faculty member at Central Washington University. GETSI will pay her a total of $4000 stipend over the period of work on module development and revision.

Phil Resor Wesleyan University Faculty 0 Month
Resor served as module co-author on the majors-level module "GPS, Strain and Earthquakes". This year he was involved in instructing a short course. His full time job is as a faculty member at Wesleyan University. GETSI paid him a total of $600 stipend for this project year.

Vince Cronin Baylor University Faculty 0 Month
Cronin served as module co-author on the majors-level module "GPS, Strain and Earthquakes". This year he was involved in instructing short courses. His full time job is as a faculty member at Baylor University. GETSI paid him a total of $600 stipend for this project year.

Ellen Iverson SERC Professional 0 month
Iverson is the lead assessment consultant and external evaluator for the GETSI project. She is paid by SERC (Science Education Resources Center) via a subaward from this NSF IUSE project.

Kristin O'Connell SERC Professional 0 months
O'Connell supports Iverson on assessment and evaluation for the GETSI project. She is paid by SERC (Science Education Resources Center) via a service agreement with this NSF IUSE project.

Stuart Birnbaum SERC Faculty 0 month
Birnbaum is the assessment consultant for the majors-level modules. He is paid by SERC (Science Education Resources Center) via a subaward from this NSF IUSE project.

Monica Bruckner SERC Professional 0 month
O'Connell is the webmaster for the GETSI project. She supports any needs related to the SERC-hosted GETSI website and all issues related to submission of student data for assessment review. She is paid by SERC (Science Education Resources Center) via a subaward from this NSF IUSE project.

**Organizations**

Type: Academic Institution
Name: SERC (Science Education Resource Center)
Location: Northfield, MN
Contribution: Assessment and evaluation; dissemination
Details: SERC is providing assessment design, external evaluation, and project dissemination through a designated subaward. GETSI module design and assessment are following the model of SERC's InTeGrate project. Modules are being reviewed by expert
assessment consultants and student data will be collected using the InTeGrate collection system. SERC is also hosting the GETSI website and providing content management assistance for the site and webinars. As needed, GETSI announcements go out through SERC channels to the wider geoscience community. Ellen Iverson, a SERC assessment specialist, is providing external evaluation of the GETSI project (see report in Significant Results section).

Type: Other Nonprofits
Name: National Association of Geoscience Teachers (NAGT)
Location: Northfield, MN
Contribution: Collaborative Research
Details: NAGT is collaborating with GETSI on dissemination. For example, as part of publicizing GETSI webinars, announcements went out on NAGT listservs.

Type: Other Nonprofit
Name: American Geophysical Union
Contribution: Collaborative Research
Details: AGU collaborated on the hosting and recruiting for the short course held immediately before AGU annual meeting 2017.

**Impacts**

**What is the impact on the principal discipline?**

Geodesy encompasses an increasingly important set of geoscience methods for better understanding earth processes. Its scope has greatly increased from early applications of surveying and tectonic plate motions to include critical insights into natural hazards (ex. earthquake, volcanoes, landslides), climate change (ex. ice mass and sea level change), and water resources (ex. groundwater storage and change). However, the field remains fairly technical and access to some data sets is limited due to expertise needed to process data. Therefore undergraduate students are seldom given the chance to analyze geodesy data. This is a critical omission for a toolbox of techniques needed for the next generation of science literate citizens and geoscience workforce members. GETSI is working to address part of this gap through the development and dissemination of high quality teaching modules for both introductory and majors-level courses that feature geodesy data analysis.

**What is the impact on society beyond science and technology?**

As our global population continues to increase, living in ever more marginal lands with ever-increasing temperatures and decreasing water resources, our ability to mitigate effectively for natural hazards, respond to climate changes, and manage our common resources becomes ever more critical. The GETSI project is rooting the study of earth science through the lens of societally important questions. The aim is to increase the ability of students (as citizens) to analyze and address these challenges.
Changes/Problems

*Actual or Anticipated problems or delays and actions or plans to resolve them*

We extended the development period of the modules by a couple months to accommodate authors’ teaching schedules. We do not anticipate this leading to any significant changes in the project final schedule or outcomes.

Appendix – SERC External Evaluation Report
EXECUTIVE SUMMARY

The first phase of the GEodesy Tools for Societal Issues (GETSI) project, from 2014-2017, focused on developing the processes and supports to enable teams of faculty to develop, test, revise, and disseminate geodesy modules to help meet the project objectives. Beginning in the fall of 2017, phase two of the project continues the collaborative development of geodetic teaching materials along with a new emphasis on adoption of the materials. As seen in the phase-2 outputs of the logic model (Figure 1), adoption is facilitated through professional development and dissemination, and through educational research on adaption/adoptions of online curricular materials as well the challenges and benefits of the materials.

PROGRESS ON PROJECT GOALS

Goal 1: develop, test, revise, and publish six additional curricular modules (each ~two weeks in length) that are centered on geodesy applied to issues of societal importance and to aid students in achieving Earth science, climate, and quantitative literacy

- Evidence of progress for Goal 1 includes participation records and survey responses from pre-meeting webinars, along with surveys and reporting pages from the face-to-face new author

---

Figure 1: GETSI Phase II Logic Model. The overarching GETSI goals remain the same from phase I, while the phase 2 outputs include a new emphasis on materials adoption.
meeting. Progress is still on track to be completed on time, though the module development and review is slightly longer than anticipated, moving into fall for some teams (details below).

Goal 2: conduct in-person and virtual short courses to disseminate GETSI teaching materials and provide faculty development to >450 instructors in geoscience and allied science/engineering fields

- Evidence of progress for Goal 2 includes registration and end-of-event survey data from short-courses offered in fall of 2017 and winter of 2018. Combined, the AGU short-course and InTeGrate webinar had 143 participants, with at least 40 of 108 Structural Geology and Tectonics (SGT) forum participants attending a GETSI breakout session. Website analytics record the increased use of GETSI materials since Phase II dissemination efforts began (see Table 2, Figures 2 & 3).

Goal 3: research the process of adaption and adoption of curricular materials through follow up with at least 75 instructors

- Evidence of progress for Goal 3 has begun with the AGU short-course presented three modules that were enthusiastically received (see End of Workshop report). Participants’ have high interest in adapting or adopting all three modules (see Table 1 for details). A list of instructors willing to be contacted about their adaption and adoption of GETSI materials is also being compiled through the dissemination events and online access request forms.

Goal 4: research the challenges and benefits of building curricular materials that serve students in geoscience and allied fields.

- Data analysis of student data will begin in year 2.

**MODULE DEVELOPMENT**

**PRE-MEETING WEBINARS**

Prior to the face-to-face materials development meeting, the primary project facilitator led three webinars for all team members: 1) Introduction to the GETSI-InTeGrate Development Model & Guiding Principles (January 8, 2018), 2) GETSI-InTeGrate Development Approach & Writing Learning Goals (January 22, 2018), 3) Assessment & Rubrics (February 5, 2018). The goals of these webinars were to give participants an introduction so that they would be better prepared to move forward on curriculum design at the face-to-face team meeting. The webinars provided an overview of the relationship between the GETSI project and the InTeGrate STEP Center, an overview of the GETSI guiding principles, an introduction to the GETSI development website, an introduction to the GETSI materials development rubric which included specifics on designing strong learning goals, and an introduction to the goals of the face-to-face meeting.

Brief webinar roadchecks gave participants an avenue to ask unanswered questions and also probed for most surprising content presented. Participants indicated satisfaction with the preparatory material and utility of the content. No unanswered questions were posed, and instead indicated they did not yet have questions or all of their questions had been answered. For example:

*No you answered all of my questions*
Everything is clear, I'm looking forward to the workshop to really focus on the project, but I appreciate having the webinars and "homework" to get things rolling.

FACE-TO-FACE TEAM MEETING

The six new module teams met February 9-11, 2018 at the UNAVCO office in Boulder to being work on the teaching materials. The meeting included the assessment consultants and was led by the primary project facilitator. Team topics and levels include: 1) Climate Change (Majors level adapted), 2) Landscape and Environmental Change (Majors level new), 3) Measuring the Earth with GPS (Intro level adapted), 4) Storm and Flood Hazards (Majors level new), 5) Volcanic Hazards (Intro level new), 6) Water Hazards and Resources (Intro level adapted).

The goals of the meeting were for participants to:

1) Get to know team members and establish working relationships with team members, the assessment consultants, and the project lead,
2) Explore the materials development process and become comfortable with Serckit content management system,
3) Review potential geodesy data types and sources related to their module,
4) Sketch out their module content, components, and document their plan on the CMS, and
5) Create a workplan, timeline, and communications plan.

The evaluation of the meeting was accomplished through end-of-day roadchecks and end-of-meeting survey. In addition, the module outlines, workplans, timeline, and communication plans from both teams on the CMS serve as documented artifacts for meeting the intended goals.

Two roadchecks were administered online during the meeting. Both roadchecks indicated that participants were satisfied with the meeting at that time with overall satisfaction ratings of 9.3 (out of 10) for roadcheck 1 and 9.4 (out of 10) for roadcheck 2. The roadchecks highlighted that the agenda allowed for the appropriate interspersion of content with work time and that this made for focused and productive days.

The overall satisfaction of participants for the meeting was 9.6 (out of 10) indicating that all were very satisfied with their meeting experience. Write-in comments reflected participants’ satisfaction with the way the meeting had been structured and the content provided. One participant added “Really feel like this time was so well spent and was able to really make some solid movement toward wrapping my head around this project.”

One area of concern going forward was regarding finding and using datasets appropriately. I am a little concerned with finding one particular data set and making sure that it shows what we envision it will show.

GETSI MATERIALS DEVELOPMENT RUBRIC- EMBEDDED EVALUATION

The GETSI rubric (based on the InTeGrate rubric) assists curriculum developers as they prepare materials by embedding criteria for the project guiding principles and evidence-based teaching practice (including learning goals, assessment, resources, instructional strategies, and alignment of these curricular aspects). The rubric guides a checkpoint process in which an assessment consultant and the primary project facilitator ensure that the materials being developed will pass the rubric before pilot testing. The elements
of the rubric also served as a guide for the agenda for the materials development meeting. Aligning the meeting development agenda and the process proved to be a powerful way to move new teams forward efficiently and ensuring an evaluative and evidence-based practice stance from the beginning.

All six teams have completed module outlines, workplans, timeline, and communication plans at the meeting or shortly following the meeting. **Measuring the Earth with GPS** module has also passed checkpoint 2, which includes a detailed outline of the structure of the materials, pedagogic design, and assessment plans. The other five teams plan to reach checkpoint two between May 15 to June 10. Four teams plan to complete checkpoint 4, where materials are ready to pilot, by early fall. The remaining two plan to be done by early winter in time for spring testing.

**FACULTY DEVELOPMENT AND DISSEMINATION**

**EVENT MEASURES**

A central focus of GETSI Phase II is engaging the broader community with adopting and adapting GETSI materials. To that end, year 1 has included professional development and dissemination events, including an AGU short course and a webinar (via the InTeGrate webinar series) (see Table 1).

<table>
<thead>
<tr>
<th>ENGAGEMENT PRODUCT</th>
<th>ENGAGEMENT MEASURES</th>
</tr>
</thead>
</table>
| AGU Short Course: *Using GPS data in undergraduate courses: from tectonic motions to water resources and climate change issues*, December 10, 2017 | • 26 registered participants  
• 23 completed end of event survey reporting high satisfaction (9.3 out of 10)  
• Respondents plan to adopt at least some of all three modules: *GPS, Strain, and Earthquakes* (21/23), *Ice Mass and Sea Level Change* (21/23), *Measuring Water Resources with GPS, Gravity, and Traditional Methods* (23/23) |
| Webinar: *Addressing Landslide Hazards in Introductory Undergraduate Courses*, April 18, 2018 | • 117 registered participants  
• 36 participated in scheduled discussion hour  
• 4 completed end of event survey reporting high satisfaction (8.75 out of 10)  
• 364 users (to date) viewed the webinar page |
| Workshop session at SGT forum: *Review and Demonstration of Available Geodetic Imaging Resources for Education*, January 7, 2018 | • 108 SGT participants had the option of attending this session  
• 10 completed end of event survey reporting high satisfaction (9.0 out of 10) |

*Table 1: Community engagement event measures*
WEBSITE MEASURES

The website usage has continued to grow (see Table 2) with overall 13,364 unique users. As discussed above, Phase II has an increased focus on dissemination and adoption of materials. Since this began in September of 2017, early indicators show a marked increase in website page views and users visiting the GETSI site (see Figure 2).

<table>
<thead>
<tr>
<th>Period</th>
<th>Pageviews</th>
<th>Unique Pageviews</th>
<th>Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>January – December 2015</td>
<td>5,114</td>
<td>3,823</td>
<td>1,301</td>
</tr>
<tr>
<td>January – December 2016</td>
<td>11,906</td>
<td>8,980</td>
<td>2,566</td>
</tr>
<tr>
<td>January – December 2017</td>
<td>23,833</td>
<td>17,993</td>
<td>5,852</td>
</tr>
<tr>
<td>January 2015 – April 2018</td>
<td>55,714</td>
<td>41,710</td>
<td>13,364</td>
</tr>
</tbody>
</table>

Table 2: GETSI website usage over time

Website visitors primarily enter the site through internet search engines (54%), followed by direct entry, which includes all serc.carleton.edu links and directly typing in the url (35%). The remaining visitors enter through referring sites (7%) and through social media (4%) (Figure 4). These last two categories can be most directly attributed to dissemination efforts and include visitors following links from unavco.org (277), Facebook (156), Twitter (96), google and yahoo email clients (91), and nagt.org (30).

Figure 3: Top types of entry to the GETSI site
In addition, since September 1, 2017, 76 faculty have requested access to the password protected instructor materials (55% of all requests since materials were available in 2016). Of those 75 responded to a question about how they might use the materials, where 50 of 75 intended to use or had already used the materials in a particular course. More information about how the materials were implemented in the classroom is being collected through the “Share your experience” forms. Five responses across the five available classroom modules have been collected to date.

**Figure 4: Survey response for those requesting access to the files**

- I am already using (or have used) these GETSI materials in a course: 3
- I have a particular course in which I intend to use these materials: 47
- I have a course or courses for which this material might be: 17
- I’m just exploring for now: 8