The Field Experiences for Science Teachers (FEST) Program: Involving Connecticut High School Science Teachers in Field Seismology

by Maureen D. Long

ABSTRACT

The Field Experiences for Science Teachers (FEST) Program, based in the Department of Geology and Geophysics at Yale University, provides field seismology experiences to secondary school science teachers in Connecticut. Research experiences for K-12 science teachers have been shown in the past to improve students' test scores and encourage inquiry-based teaching in the science classroom. FEST provides one-week sessions for teachers that include one day of orientation and four days of field work experience on the 15-station broadband Seismic Experiment for Imaging Structure beneath Connecticut. Here, I describe the FEST program, including strategies for teacher recruitment, the structure of the program, and lessons learned from the first three program sessions. FEST has demonstrated that field seismology experiments can provide high school teachers with a fun, engaging, and highly immersive field experience that provides a benefit that is out of proportion to a relatively modest time commitment. Participation in FEST has exposed teacher participants to concepts in seismology, introduced them to resources for teaching about seismology in their classroom, and provided them with a meaningful summer research experience.

INTRODUCTION

Research experiences for secondary school teachers have been shown to improve their students' test scores (Silverstein *et al.*, 2009), and there is a substantial body of literature about the effectiveness of Research Experience for Teachers (RET) or Scientific Work Experience Programs for Teachers (SWEPT) programs (e.g., Melear *et al.*, 2000; Dresner and Worley, 2006; Brown and Melear, 2007; Dixon and Wilke, 2007; Grove *et al.*, 2009; Pop *et al.*, 2010). Programs that establish effective partnerships between working scientists and teachers have also been shown to be valuable (e.g., Dresner and Starvel, 2004; Dresner and Worley, 2006; Pegg *et al.*, 2010). At their best, RET programs contribute to teachers' ability to teach about science as a process for discovery through inquiry and a frontier for creating new knowledge, rather than as a static and rigid body of facts (e.g., Dresner and Worley, 2006; Blanchard *et al.*, 2009). RET programs enjoy substantial support from the U.S. National Science Foundation (NSF), and several opportunities for science teachers to engage in research exist. However, there are barriers to teacher participation in research projects; for example, laboratory or computationally based projects are often time consuming and require extensive training before a teacher participant can meaningfully engage in scientific inquiry.

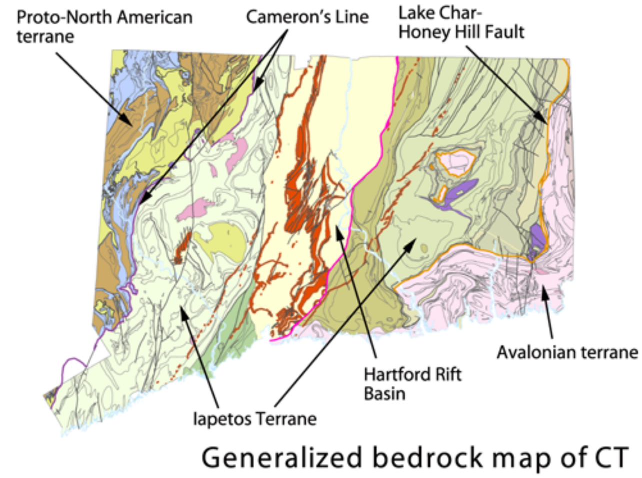
Field-based projects can be an excellent avenue for involving teachers in scientific research (e.g., Dresner, 2002; Dresner and Worley, 2006); field work is ideally a fun, highly immersive experience that meaningfully contributes to scientific research projects, and can provide a payoff that is out of proportion to a relatively small time commitment. Broadband seismology deployments represent a particularly good opportunity to provide teachers with field-based research experience. Broadband deployments are labor-intensive, with field tasks ranging from simple (digging holes, mixing, and pouring concrete) to complex (constructing and configuring electronics systems, leveling and orienting sensors), but even the more complicated tasks can easily be learned over a few days. The typical workflow of a broadband seismology deployment allows for novice field personnel to get up to speed on tasks quickly and to make a meaningful contribution to data collection from the very start.

The Field Experiences for Science Teachers (FEST) program is a pilot program, funded by a National Science Foundation (NSF) CAREER grant, that is designed to provide one week of broadband seismology field experience to secondary school science teachers in Connecticut. The program is slated to run for four 1-week sessions over a period of several summers, with each teacher participating for one session. Three of the four planned FEST sessions have been completed to date, with a fourth planned for summer 2017; the program has so far reached ten individual teachers from nine different schools. FEST is being run in conjunction with the Seismic Experiment for Imaging Structure beneath Connecticut (SEISConn), a deployment of 15 broadband seismometers in a linear array across northern Connecticut. The FEST program has thus given Connecticut-based teachers an opportunity to experience field work in their own backyard, and to connect seismology research with their (often substantial) prior knowledge of local geology. In this article, I provide an overview of the FEST program, the SEISConn experiment, teacher recruitment and evaluation strategies, and lessons learned from the first three FEST sessions, and provide recommendations to seismologists who may consider involving high school teachers in field experiments.

GEOLOGY OF CONNECTICUT AND THE SEISCONN EXPERIMENT

The state of Connecticut exhibits extraordinarily varied bedrock geology that reflects a complete Wilson cycle of supercontinent assembly and dispersal in a compact area (Fig. 1). Overviews of the geologic and tectonic history of Connecticut aimed at the general reader are given by Skehan (2008) and De Boer (2009). Briefly, the bedrock geology of Connecticut reflects a series of tectonic events associated with Appalachian orogenesis (e.g., Bird and Dewey, 1970), which itself consisted of three distinct phases (the Taconic, Acadian, and Alleghanian orogenies), and subsequent continental rifting associated with the opening of the Atlantic Ocean. Proto-North American units are found in the northwestern portion of the state, including Grenville basement rocks up to ~1.1 Ga old (Fig. 1). A protracted series of subduction–collision events associated with the closing of the Iapetos Ocean between roughly 485–250 Ma resulted in the accretion of a variety of terranes onto proto-North America (e.g., Karabinos *et al.*, 1998; Aleinikoff *et al.*, 2007), culminating in the accretion of Avalonia during the last phase of assembly of the supercontinent Pangea (e.g., Wintsch *et al.*, 1992). Avalonian rocks are exposed in southeastern Connecticut and are separated from units of Iapetos oceanic affinity to their west by the Lake Char-Honey Hill fault (Fig. 1). The opening of the Atlantic Ocean and the breakup of the Pangea supercontinent during the Mesozoic is expressed in structures of the Hartford Rift basin in central Connecticut (e.g., Hubert *et al.*, 1992; Schlische, 1993), including sedimentary sequences as well as basalt and diabase units of early Jurassic age (Fig. 1).

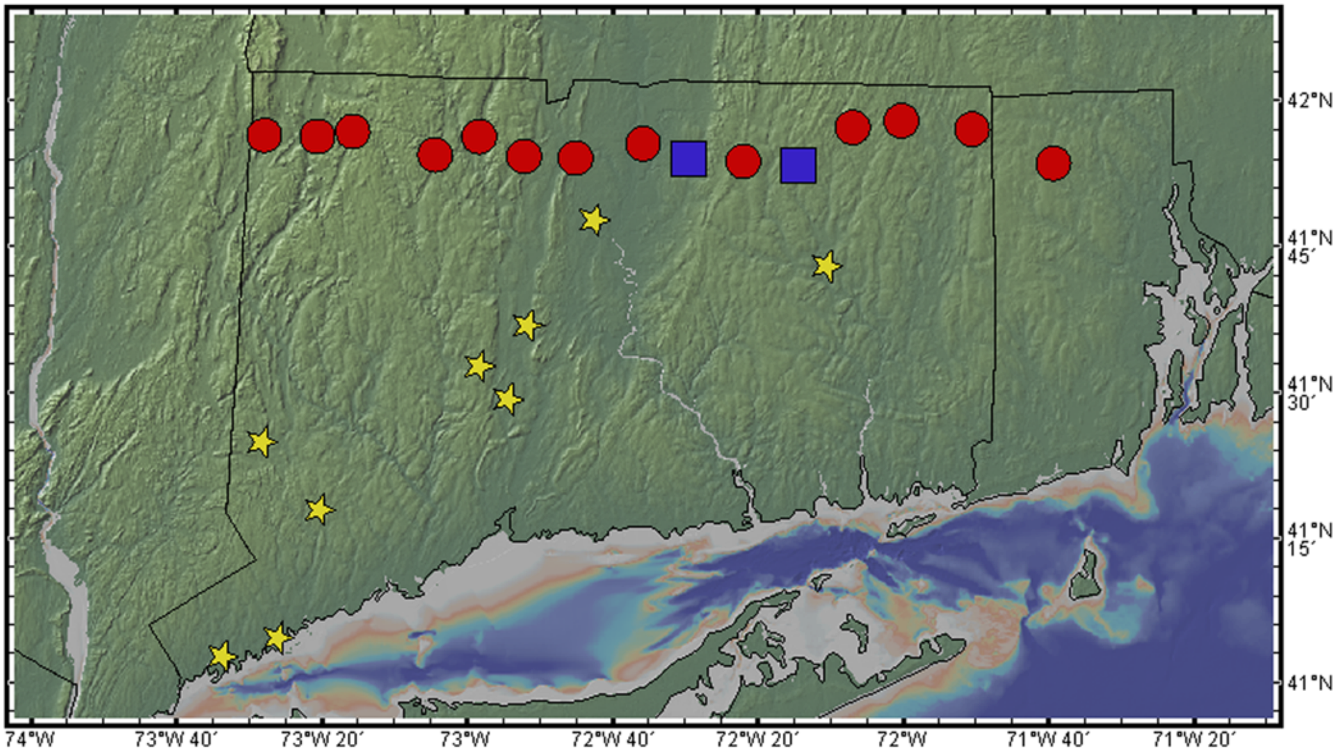
The scientific goal of the SEISConn experiment is to characterize the structure of the crust and mantle lithosphere along a transect across northern Connecticut, and to understand to what extent tectonic processes associated with the supercontinent cycle (such as subduction, terrane accretion, orogenesis, and rifting) have affected the structure of the lithosphere. The linear SEISConn array (Fig. 2) has an aperture of ~150 km, stretching from Salisbury, Connecticut, at its western end to Glocester, Rhode Island, in the east. The array traverses a variety of geologic units ranging from proto-North American



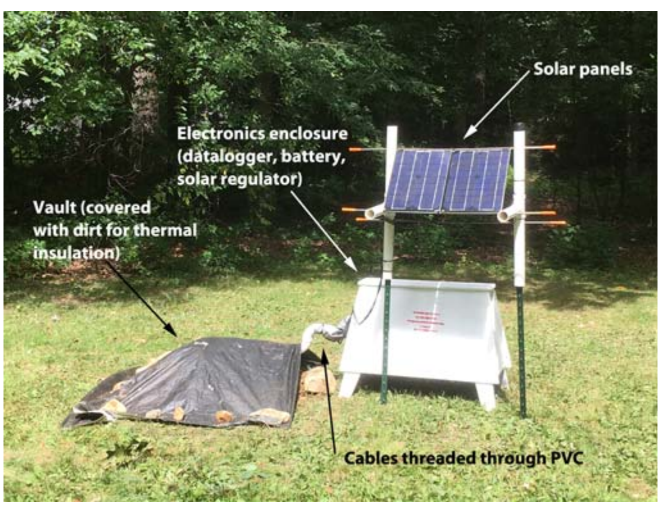
▲ **Figure 1.** Geology of Connecticut, lightly modified from the Generalized Bedrock Geologic Map of Connecticut (Connecticut Geological Survey, 2013), based in part on Rodgers (1985). In the northwestern part of the state, proto-North American units ranging from 450–1100 Ma in age are bounded to the east by Cameron's Line. The Avalon (or Avalonian) terrane (roughly 600–700 Ma old and of peri-Gondwanan affinity) is found in the southeastern part of the state and is bordered on its west by the Honey Hill-Lake Char fault. The Hartford Rift basin in central Connecticut is a Mesozoic age rift basin made up mostly of clastic sedimentary rocks, with Early Jurassic basalt and diabase units. To the west and east of the Hartford basin lie units of the Iapetos terrane, made up of metamorphosed sedimentary and igneous rocks of middle-to-early Paleozoic age. The color version of this figure is available only in the electronic edition.

rocks in the west, across Iapetos oceanic terranes and the Hartford basin in central Connecticut, to the Avalonian terrane in the east (Fig. 1). The array will eventually include 15 broadband stations, for a nominal station spacing of about 11 km. Of the 15 station locations, 14 are in Connecticut, with the remaining station located in Rhode Island to achieve coverage across the Lake Char-Honey Hill fault (Fig. 1). Six stations were installed during the summer and fall of 2015, with an additional seven installed (or repaired) during the summer of 2016; the remaining two stations are slated for installation in 2017. All stations are sited on private land, including two on land owned by Yale, several on farms, camps, or retreat centers, and a number sited in backyards in quiet residential neighborhoods.

The equipment deployed at each station includes a Trillium 120PA broadband sensor connected to a Taurus digitizer/datalogger, along with peripherals such as solar panels, a solar regulator, and a Global Positioning System (GPS) antenna. All equipment was manufactured by Nanometrics, Inc., and is owned by Yale University. The station design, shown in Figure 3, consists of a buried 35-gal plastic drum that serves as a vault, with the sensor sitting on a concrete pad at the bottom. A deep-cycle marine battery, the solar regulator, and the Taurus are housed in a wooden electronics enclosure (Fig. 3)



▲ **Figure 2.** Map of the Seismic Experiment for Imaging Structure beneath Connecticut (SEISConn) stations and locations of schools at which Field Experiences for Science Teachers (FEST) participants were based. Circles indicate SEISConn stations that were installed prior to the end of summer 2016; squares indicate nominal locations for stations that are slated for installation during the Spring of 2017. Stars indicate school locations. The color version of this figure is available only in the electronic edition.



▲ **Figure 3.** Annotated photo of a completed SEISConn station. The Trillium 120PA seismometer is placed at the bottom of the vault, which is covered by dirt and a tarp for thermal insulation. The electronics are housed in a wooden enclosure; cables from the sensor and solar panels are threaded through polyvinyl chloride (PVC) and are connected to the Taurus digitizer, housed inside the electronics box. Station design by Juan Aragon, Yale University. The color version of this figure is available only in the electronic edition.

that is prefabricated prior to station installation and has a hole in the side for the solar panel and sensor cables. Solar panels and the GPS antenna are mounted on polyvinyl chloride (PVC) frames connected with rebar and secured to fence posts. A section of PVC in a gooseneck configuration is mounted on top of the barrel, allowing the sensor cable to be connected to the electronics enclosure. Major tasks involved with the installation of a SEISConn station include digging the hole for the vault, mixing and pouring concrete for the sensor pad, assembling the solar panel mounts, building the PVC connections for the vault and electronics box, setting up and configuring the electronics system, orienting and leveling the sensor, running through the installation checklist and beginning data collection, and sealing the vault and electronics box before leaving the station.

TEACHER RECRUITMENT AND DEMOGRAPHICS

I experimented with a few different strategies for recruiting FEST participant teachers. For session 1, which took place during the summer of 2015, recruitment of the two teacher participants was through word of mouth, taking advantage of contacts made through my previous involvement as a guest speaker with the Peabody Museum of Natural History at Yale and the Institute for Science Instruction and Study (ISIS) at Central Connecticut State University. For sessions 2 and 3, which took place during the summer of 2016, a more formal application and selection process was used. An email describing the program and soliciting applications was sent to the Connecticut Science Teachers Association (CSTA, see Data and Resources) email list. The application process for teachers was simple, consisting of a short letter describing the applicants' backgrounds and interests. Applications were solicited from Connecticut-based teachers of earth science and related fields (including but not limited to physics, chemistry, and environmental science) at the high school level. I received approximately a dozen applications or other expressions of interest in the program, although some teachers that expressed interest were unable to participate during the program's timeframe or missed the application deadline. Based on the application letters, four teacher participants were chosen for each of sessions 2 and 3, bringing the total number of FEST participants to date to ten. Each FEST participant was compensated with a stipend of $1000 for participation in the full one-week program; in a few cases when teachers had other commitments during the week, the stipend was prorated for partial participation.

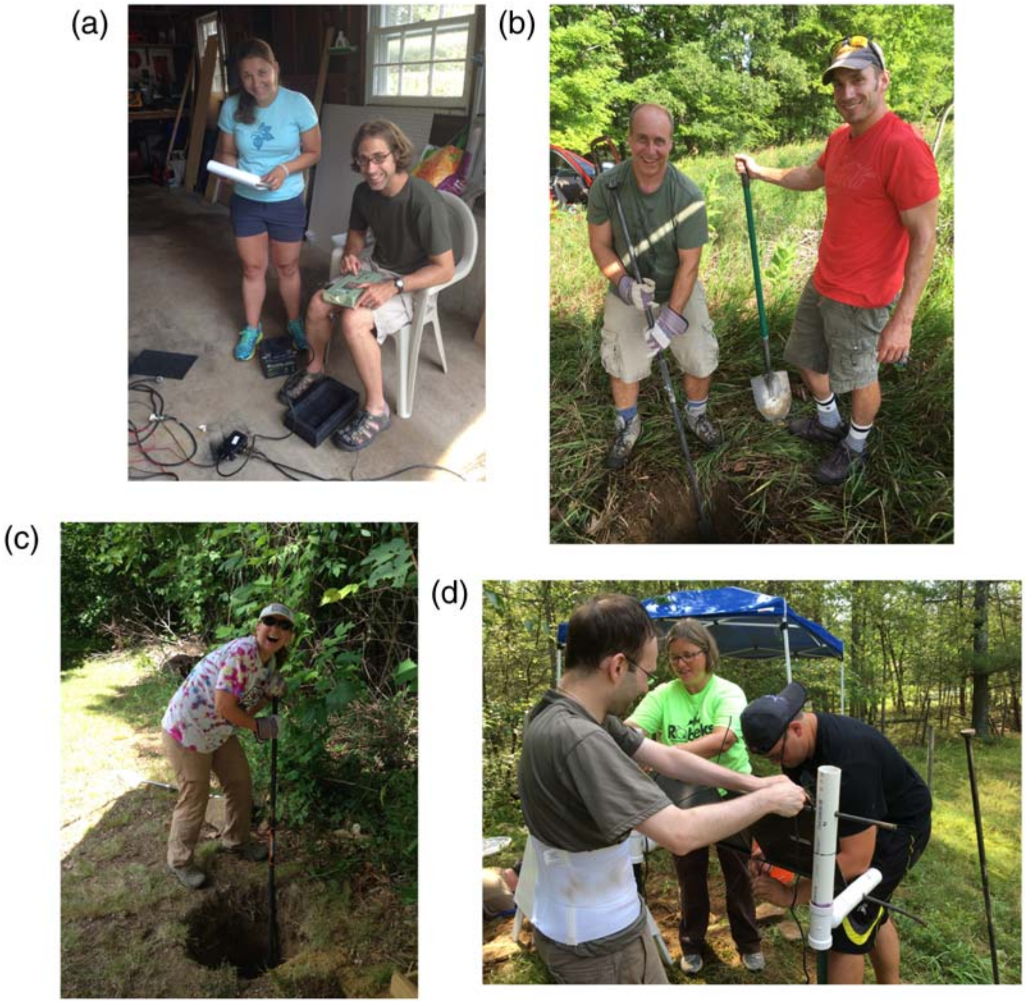
The teachers who have participated in FEST encompass a wide range of career stages, subjects taught, educational background, and type of school or district. FEST participants ranged from those with over 20 years of experience in the classroom to one teacher who was still a few weeks away from beginning a first full-time teaching position. A majority of FEST participants were certified to teach earth science, but most were also certified in general science or other subjects, and several program participants taught mainly biology or environmental science classes. Nearly all FEST participants had some Advanced Placement (AP) classes in their teaching portfolios, with AP Environmental Science a commonly taught subject. Most FEST participants taught at the high school level, although two were in middle schools. Half of the FEST teachers held an undergraduate degree in earth science from an institution in Connecticut and thus had fairly extensive prior knowledge of Connecticut geology. Of the ten teachers who participated in the program, four had advanced degrees in their content areas, with three of those holding a Ph. D. degree in science. A goal of the FEST program is to reach teachers at a range of different schools and districts, and, as a group, the FEST participants achieved geographic diversity (Fig. 2) as well as diversity in terms of the types of schools and districts in which they teach. One participant taught at a private special education program, whereas the remaining teachers worked in public schools ranging from large urban districts (e.g., Hartford, Waterbury, Danbury) to smaller suburban ones (e.g., Cheshire, Easton/Redding). Two of the FEST teachers worked at science, technology, engineering, and math (STEM)-oriented public magnet schools, whereas one participant was in the process of transitioning from high school teaching to teaching at the community college level at the time of participation.

PROGRAM STRUCTURE

The FEST program has three major goals: (1) to expose teachers to a meaningful field-based research experience that contributes substantially to a seismology research effort and facilitates inquiry-based teaching in their classrooms; (2) to expose teachers to the fields of seismology and solid earth geophysics, enabling them to bring related material to their classes; and (3) to expose teachers to existing resources that can be used in their classrooms to teach about earthquakes, seismology, and earth structure.

In order to meet these goals, each of the first three FEST sessions was structured with one day of orientation and preparatory activities on campus at Yale (mainly aimed at accomplishing the second and third goals), followed by four days of field-based experience (mainly aimed at accomplishing the first goal). The Monday orientation days began with an approximately two-hour session in the morning that covered the basic principles of observational seismology and Earth structure, with the goal of highlighting how modern structural seismology is accomplished and emphasizing unanswered questions that are the focus of ongoing scientific work. The EarthScope USArray program (see Data and Resources) was given significant emphasis in this discussion, with seismograms from nearby Transportable Array station M62A (Hamden, Connecticut) used as examples. The introductory discussion was followed by an overview of Connecticut geology and the scientific problems being addressed by the SEISConn project, including a discussion of the concept of the Wilson cycle. The morning session also included a discussion of what seismology field work entails (with accompanying field photos) and what participants could expect, along with a safety briefing. In the afternoon, a brief overview was given of resources for teaching about seismology and geophysics available through the Incorporated Research Institutions for Seismology (IRIS) Education and Public Outreach (EPO) initiative. This included a tour of the lesson plans, animations, visualizations, and software resources available through the EPO website (see Data and Resources), with an emphasis on software tools such as jAmaSeis (see Data and Resources) that enable teachers to download and manipulate seismic data for educational purposes. The final activity of orientation day was time spent going through equipment checklists, testing equipment, and loading vehicles for the upcoming field activities.

On each of the four field days, the participants worked as a group along with the principal investigator (PI) and one or more Yale students to service, construct, and install SEISConn stations. For the summer 2015 session, the team constructed and installed four stations, one per day. For the summer 2016 sessions, the field team spent the first field day servicing previously installed stations to collect data and check on station health, and then spent the remaining three field days installing new stations. A selection of field photos illustrating the FEST experience is shown in Figures 4 and 5. A typical station construction and installation generally took approximately 4–6 hrs from start to finish, depending on weather and ground conditions. Participants tended to naturally divide into subgroups to accomplish tasks, with individuals trading off over the course of the week so that all participants had a chance to try out a variety of field tasks. These included testing equipment before deploy-



▲ **Figure 4.** Field photos from the first three sessions of FEST. (a) Session 1 participants test equipment on orientation day, prior to its deployment. (b) Session 2 participants dig a hole at the Yale-Myers Forest in Eastford, Connecticut. (c) A session 3 teacher breaks ground on the first SEISConn station in Barkhamsted, Connecticut. (d) Session 3 participants construct the solar panel mount and attach the solar panels at a station in Chepachet, Rhode Island. The color version of this figure is available only in the electronic edition.

ment (Fig. 4a), digging the hole for the vault (Figs. 4b and 4c), building solar panel mounts (Fig. 4d), scribing a north–south line on the pad at the bottom of the vault (Fig. 5a), installing, orienting, and leveling the sensor (Fig. 5b), and running through the installation (or service) checklist (Fig. 5c). A photo of the FEST session 2 participants next to a completed station in East Windsor, Connecticut, is shown in Figure 5d.

PROGRAM EVALUATIONS

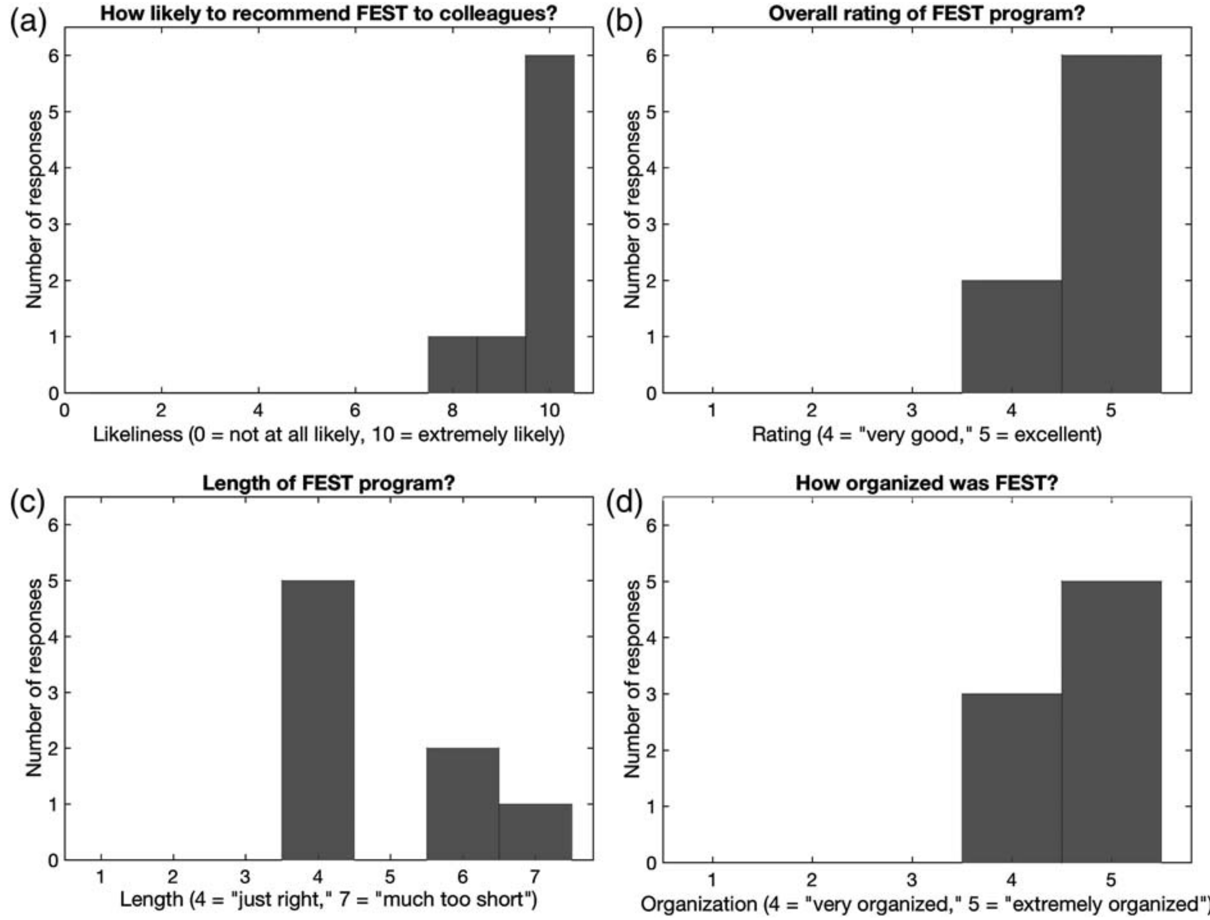
By design, the first session of FEST was fairly informal and reached a small number of teachers; no formal evaluation of session 1 was carried out, although informal comments and suggestions were solicited and received via email from the two participants. For sessions 2 and 3, a simple, anonymous evaluation survey was designed and administered using the online SurveyMonkey tool (see Data and Resources). The goal of the evaluations was to learn whether the program participants thought their FEST experience was worthwhile and whether they would recommend it to other teachers, and to solicit feedback and suggestions for how the program might be improved upon in the future. The evaluation survey was purposefully short, with four multiple-choice questions and four open-ended questions; to encourage participation, the survey was designed to be completed in no more than ten minutes. Multiple-choice questions included “How likely would you be to recommend FEST to a colleague?”, “Overall, how would you rate the FEST program?”, “Was the FEST program length too long, too short, or about right?”, and “How organized was the FEST program?”. Open-ended questions included “What aspects of the program did you like best/least?”, “What aspects of the FEST program would you change? What suggestions would you give for next year’s program?”, and “If additional resources were available to run a program like FEST on a larger scale, do you have any suggestions for what that program might look like? What types of additional research experiences might be useful to you as a teacher?”, along with a space for any additional comments about the program. A link to the survey was sent to participants shortly

▲ **Figure 5.** Field photos from the first three sessions of FEST. (a) A session 2 participant scribes a line oriented north–south on the bottom of the vault at a station in Tolland, Connecticut, in preparation for sensor installation. (b) A session 1 participant installs a sensor at a station in Falls Village, Connecticut. (c) A session 3 participant fills out a service sheet during a visit to a station in Barkhamsted, Connecticut. (d) Session 2 participants pose next to their first completed station in East Windsor, Connecticut. The color version of this figure is available only in the electronic edition.

after the end of the session 3 program; participants were asked to complete the survey within one week, with one email reminder sent out three days prior to the deadline.

Each of the eight participants completed the survey, for a participation rate of 100%. Overall, the program participants' impressions of FEST were quite positive, as indicated by their responses to the multiple-choice questions (Fig. 6). Regarding the likeliness that they would recommend the FEST program to a colleague (Fig. 6a), all responders rated their likeliness as at least an 8 on a scale of 1–10, with 6 out of 8 responders (75%) giving it the highest rating. The overall rating of the FEST program was high (Fig. 6b), with 6 out of 8 responders (75%) rating it "excellent" and the rest "very good." In terms of program length (Fig. 6c), a majority of responders (5 out of 8, or 62%) thought the length was "just right," whereas two thought it was "somewhat too short" and one thought it was "much too short." The organization of the program also rated highly (Fig. 6d), with 5 out of 8 (62%) responders characterizing the program as "extremely organized" and the rest calling it "very organized."

Answers to the open-ended questions gave additional insight into what aspects of the program the participants found most useful, as well as suggestions for future sessions. Several responders commented on how they might incorporate their experiences into classroom instruction; for example, one responder mentioned using field photos "to show my students that science doesn't necessarily mean a lab coat and chemicals" and another mentioned "bring[ing] my improved knowledge of seismic equipment to the classroom to use with my students." Another respondent commented that after program participation, "[t]eachers are better able to expose students to real world applications" of science, with the "possibility of



▲ **Figure 6.** Results from multiple-choice evaluation survey questions. (a) Histogram of responses to the question "How likely is it that you would recommend FEST to a colleague?", on a scale from 0 (not at all likely) to 10 (extremely likely). (b) Histogram of responses to the question "Overall, how would you rate the FEST program?", with potential responses including "excellent," "very good," "good," "fair," and "poor." (c) Histogram of responses to the question "Was the one-week FEST program length too long, too short, or about right?", with potential responses ranging from "much too long" to "much too short." (d) Histogram of responses to the question "How organized was the FEST program?", with potential responses including "extremely organized," "very organized," "somewhat organized," "not so organized," and "not at all organized."

opening future researchers to their passion" as a potential benefit of exposing students to their teachers' seismology research experiences. In general, survey respondents expressed strong enthusiasm for the experience of being in the field and engaging in scientific data collection, with several mentions of "get[ting] back into the field" and "get[ting] my hands dirty" as positive aspects, and for the opportunity to interact closely with fellow teachers and working scientists. One respondent wrote that "this program builds strong relationships between the academia world and laymen… collaborating and bridge building relationships were formed," whereas another praised "the opportunity to work with other teachers, and perform something akin to a public service." Finally, there were positive comments about the orientation day and the exposure to the IRIS EPO materials, with one teacher writing that "[t]he introduction day was excellent; it put the program, the project, and the week in perspective. As teachers, we also received an excellent internet based resource with real-time data for us to incorporate into our classroom."

Suggestions for the future from survey respondents centered around incorporating visits of the PI to the classroom (a suggestion that has already been implemented in the past with a PI visit to one of the session 1 teachers' classrooms), expanding and lengthening the program to include a component of actual data analysis, and the development of lessons or classroom exercises that center specifically around the SEISConn experiment. When asked what suggestions they would have for a program like FEST on a larger scale with additional resources, respondents mentioned the possible expansion into different scientific fields (one respondent mentioned volcanology, archeology, marine biology, meteorology, and astronomy as potential areas of interest), additional emphasis on the development of resources to help teachers bring SEISConn data into their classrooms, longer programs that involve a 4- to

6-week research experience, and the potential involvement of high school students in addition to teachers.

DISCUSSION AND RECOMMENDATIONS

Overall, the first three sessions of FEST have been successful, and have shown that one week of teacher participation in a broadband seismology field deployment can serve as a meaningful research experience. FEST participants rated the program highly on evaluative surveys, and were generally extremely likely to recommend the program to a colleague. In general, the one-week program duration has worked well, yielding a good balance between the amount of time the teachers had to commit to the program and the payoff in terms of gaining meaningful research experience; however, some participants expressed a desire for a longer experience on program evaluation surveys. FEST has provided opportunities for team building, collaboration, and exchanging experiences and strategies among the teacher participants, and has also helped to build (hopefully long-lasting) partnerships between teachers and the PI. From my own perspective as a university educator, the opportunity to spend time with teachers at the middle and high school levels and learn from their experiences has been invaluable. The integration of the FEST program with the SEISConn experiment has provided logistical and financial advantages, eliminating the need for costly and complicated travel plans to remote field sites, and has also yielded opportunities for many of the teacher participants to build on their prior knowledge of Connecticut geology. Furthermore, the fact that FEST teachers were able to carry out research in a local, "science in our backyard" setting should provide natural avenues for them to incorporate their FEST experiences into their classrooms, and also provided opportunities for the teachers to engage with local landowners and community members while in the field.

Although the FEST program has generally been successful, it has also illuminated some of the challenges inherent in small-scale, PI-driven RET programs. These challenges include the question of how to effectively maintain partnerships between researchers and teachers beyond the week-long field experience, particularly during the academic year when both teachers and PIs have many demands on their time. Activities such as follow-up PI visits to classrooms are valuable, but require time, effort, and advance planning on both sides. More generally, RET programs with multiple participants require substantial effort on the part of the PIs, and funding support is necessary for program success. A funding mechanism such as the CAREER program within NSF, which explicitly includes a substantial education and outreach component, represents one example of how PI-driven RET programs might be successfully supported and integrated into ongoing research efforts. Although the success of PI-driven, field-based RET programs such as FEST is encouraging, it is unclear how easily such programs could be scaled up to reach larger audiences of teachers, or whether scaling up such programs would be desirable. Another challenge inherent to small-scale RET programs is effective assessment. Although the inexpensive and relatively easy online surveys implemented for FEST were sufficient to give a general view of how teachers viewed the program, a more detailed program assessment that includes support for an outside evaluator would be desirable in the future, and would help to give a more detailed picture of how teachers' attitudes and classroom practices changed as a result of their research experience (e.g., Dixon and Wilke, 2007; Blanchard *et al.*, 2009; Pop *et al.*, 2010).

PI-driven RET programs such as FEST that reach a relatively large cohort of teacher participants generally require dedicated resources and effort on the part of the PI; however, the FEST program has demonstrated that broadband seismology field work can provide an excellent research opportunity for secondary school teachers, and this experience need not be limited to the context of a dedicated RET program. Building on my experience with FEST, I plan to include high school science teachers as participants in future field projects for which the timing and logistics make this a practical option. Field seismology experiments are often personnel-intensive, and including a "slot" on field teams for a high school teacher is an excellent way to provide opportunities for teacher participation in research, expose teachers to the field of seismology, foster partnerships between seismologists and teachers, and include an effective education and outreach component in field experiments. Particularly as large, collaborative, community-driven experiments become more common (e.g., the recent GeoPRISMS Eastern North American Margin Community Seismic Experiment, see Data and Resources), opportunities for seismologists to involve teachers in their field experiments are plentiful. The FEST program has demonstrated that teachers can derive a great deal of benefit from even a short-field seismology experience, gaining new knowledge of the field of seismology and bringing the excitement of cutting-edge research in solid Earth geophysics back to their classrooms.

CONCLUSIONS

The first three sessions of the FEST summer research program for teachers have been successful, and have demonstrated that seismic deployments are an effective setting for field-based RET programs. To date, ten Connecticut teachers have participated in one-week FEST sessions; a fourth session, planned for summer 2017, will involve additional participants and will place additional emphasis on strategies for using SEISConn data in the high school classroom. FEST teachers have reported high levels of satisfaction with their participation in the program, and are generally highly likely to recommend the program to their colleagues. As currently structured, the FEST program meets the goals of providing a meaningful research experience for high school science teachers, exposing teachers to the fields of seismology and solid earth geophysics, and promoting the use of educational materials such as those produced by the IRIS EPO program in high school science classrooms. Future improvements to FEST, based on teacher surveys, will include PI visits to high school classrooms and the development and dissemination of a lesson plan based on Connecticut geology and tectonics and incorporating SEISConn data. Based on the success of the FEST program to date, I encourage field seismologists to consider including high school teachers in their field experiments, as teacher participation in seismology deployments serves the dual purpose of exposing teachers to both a meaningful research experience and to the field of seismology.

DATA AND RESOURCES

Data collected during the Seismic Experiment for Imaging Structure beneath Connecticut (SEISConn) experiment (network code: XP) will be archived with the Data Management Center (DMC) of the Incorporated Research Institutions for Seismology (IRIS). Data from the experiment will be made public after a two-year embargo; public release of the data is scheduled for summer 2020. The Connecticut Science Teachers Association (CSTA) website can be accessed at http://www.csta-us.org (last accessed January 2017); the EarthScope USArray program website can be accessed at http://www.usarray.org (last accessed January 2017); the IRIS Education and Public Outreach (EPO) website can be accessed at https://www.iris.edu/hq/programs/education_and_outreach (last accessed January 2017); the jAmaSeis software is available at http://www.iris.edu/hq/jamaseis/ (last accessed January 2017); the SurveyMonkey tool is available at www.surveymonkey.com (last accessed January 2017); and the GeoPRISMS Eastern North American Margin Community Seismic Experiment website is available at http://www-udc.ig.utexas.edu/enam (last accessed January 2017).

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Maureen D. Long
Department of Geology and Geophysics
Yale University
PO Box 208109
New Haven, Connecticut 06520 U.S.A.
maureen.long@yale.edu

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