Evaluating the Impact of the IRIS EPO Presence at the 2017 NSTA National Convention
Los Angeles, CA | March 31, 2017 - April 2, 2017

Michael Hubenthal – IRIS Education and Public Outreach
July 11, 2017

Table of contents

Executive Summary

Annually, the IRIS Education and Public Outreach (EPO) program participates in the national conference of the National Science Teachers Association (NSTA). Through participation in the conference IRIS seeks to increase the science education community's awareness of the IRIS Consortium and the products and programs that it offers, while also encouraging and enabling post-conference use of IRIS's educational resources. IRIS has three primary approaches to achieve these goals.

- Direct work with teachers in hour-long in-person professional development workshops
- Promotion of products and programs as part of share-a-thon sessions
- One-on-one interactions with teachers at the IRIS booth on the convention floor

In 2017, this consisted specifically of two, hour-long workshops, seven share-a-thon presentations, and a 10'x10' corner booth on the show floor. Prior to the conference, IRIS staff set the following three performance targets for attendance at the 2017 NSTA. 1) Reach at least 700 attendees at the booth and sessions combined, 2) Collect 200 new badge scans for the Teachable Moments/IRISEd listserv, 3) Optimize programing and costs to keep costs at or below $20/interaction.

Pre-show promotions implemented this year appear to be effective as IRIS reached nearly 6% of the 9511 conference attendees (NSTA, 2017), the highest percentage achieved to date (Figure 5). Active traffic on the show floor allowed IRIS staff to reach an estimated 565 attendees (Table 3), while one workshop alone attracted 140 teachers, a reach well above average for workshops (Figure 3). These productive efforts made up for poor attendance at this year's share-a-thons where attendance was well below average and in most cases represented a new minimum attendance (Figure 4). As a result, IRIS exceeded its first performance target by reaching a total of 906 attendees. IRIS did not meet its performance metric of 200 badge scans due, to some degree, to the very poor turnout at the share-a-thon, where Teachable Moments (TM) was being promoted and historically a large number of scans occurs. Finally, IRIS also beat its third performance metric with a cost per interaction rate of $17.70/interaction.

Since IRIS has demonstrated the capacity to effectively measure the reach of all three major activities at NSTA (e.g. workshops, share-a-thons, and booths), IRIS should begin to invest effort into strategies to measure the impact of their work, which in turn, will help them further optimize their efforts. The following recommendations reflect this increased focus on impact and should be undertaken in addition to continued efforts measuring reach.

Recommendations

- Future performance metrics should be adjusted to reflect the success of this year's effort
- Develop additional approaches to measure the effectiveness of eblasts
- Tailor social media content
- Develop an evaluation to explore how teachers select the hour-long sessions they attend at NSTA
- Develop an evaluation that can be quickly implemented at the end of each session to measure aspects of effects on participants' behavior, attitude, skill, interest, and knowledge (BASIK).
- Expand evaluation to estimate how many teachers reached during a share-a-thon followed up
- Develop a booth impact survey to measure changes in attendees' BASIK.
- If badge scans for TM are an important metric, having more tools to scan participants may be worth the effort depending on costs.
- Review the budget to see further costs savings that may exist to trim costs even further

Background

Annually, the IRIS Education and Public Outreach (EPO) program participates in the national conference of the National Science Teachers Association (NSTA). Through participation in the conference IRIS seeks to increase the science education community's awareness of the IRIS Consortium and the products and programs that it offers, while also encouraging and enabling post-conference use of IRIS's educational resources. IRIS has three primary approaches to achieve these goals.

- Direct work with teachers in hour-long in person professional development sessions
- Promotion of products and programs as part of share-a-thon sessions
- One-on-one interactions with teachers at the IRIS booth on the convention floor

Participation in the NSTA National Convention is also an opportunity for IRIS EPO to receive feedback, directly from teachers about the products and programs it offers and to gain an understanding of teachers' instructional needs and concerns. While much of this feedback is collected informally through conversations with teachers at the booth, IRIS also uses the meeting to conduct formal evaluations of EPO products and programs with this national teacher audience. This combination of formal and informal feedback informs the development and updating of IRIS products and services.

The 2017 NSTA conference was held in Los Angeles, CA. IRIS EPO sent three staff to the meeting to deliver two hour-long PD workshops, present five products as part of four share-a-thon sessions, and setup, staff, and dismantle a 10'x10' booth on the convention floor. Our impact targets for this meeting were to reach at least 700 attendees at the booth and sessions, collect 200 new badge scans for the Teachable Moments/IRISEd listserv, and optimize programing and costs to keep costs per interaction below $20/teacher. These impact targets contribute to the longer-term outcomes identified in the Logic Model (figure 1) for attending NSTA.

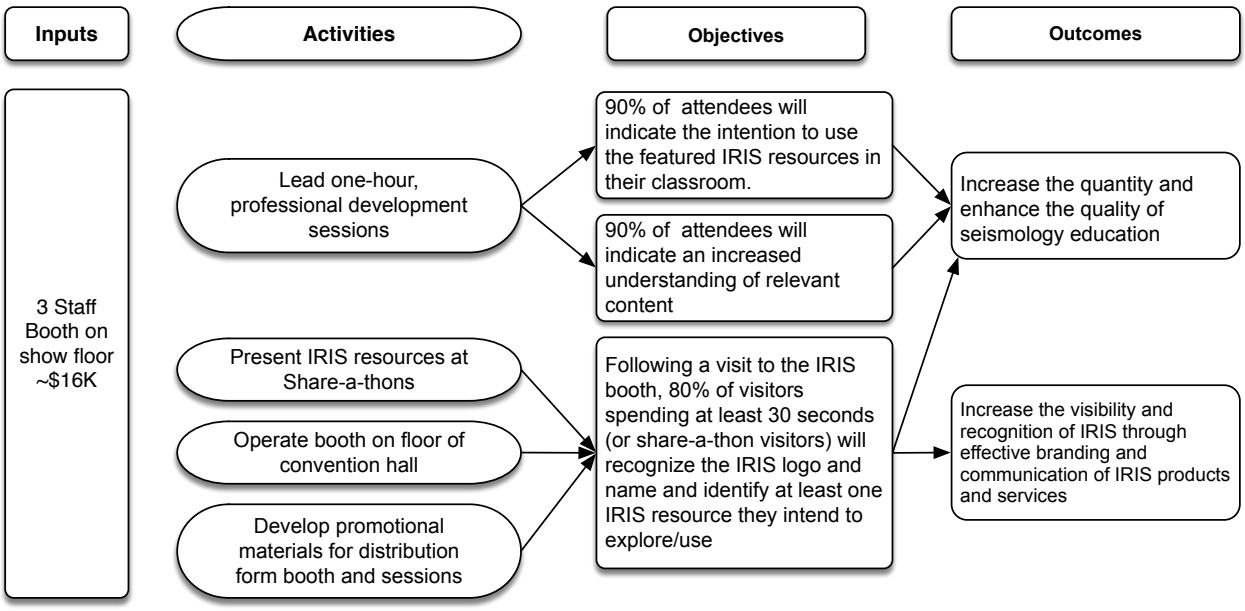

Figure 1: Logic model for attending the national NSTA conference.

In addition, IRIS staff also coordinated two evaluation efforts during the 2017 NSTA. These efforts were conducted by external evaluators. The first was a broad survey to develop a baseline measure of IRIS brand recognition among teachers (full report can be downloaded here: http://bit.ly/2w839qD). The second was a usability test of the InClass resource database (full report can be downloaded here: http://bit.ly/2xY0yz1).

Pre-Show Promotion

Prior to NSTA, IRIS promoted its sessions and booth with targeted messaging sent directly to attendees who who were Earth, Physical, and General Science teachers at the middle or high school levels. The eblast (Appendix B) was sent on Sunday, two days prior to the start of NSTA. This was a paid service provided by NSTA, but the content of the eblast was designed by IRIS EPO staff.

IRIS also used Twitter and Facebook to promote the IRIS presence at NSTA. Posts on both platforms appeared a few days prior to NSTA announcing that IRIS would be at NSTA. Then, daily posts were made during the show to promote the booth's location at NSTA, as well as as the daily schedule of IRIS sessions. Because social media accounts are free, the cost of such adversiting is only the effort required to create the content and push the information. In this case, all content was already created so the time investment was negligible.

Hour-Long Sessions

Hour-long sessions provide an opportunity for IRIS EPO to contribute to the content knowledge and pedagogical content knowledge of participants. Sessions are designed such that participants can learn new content while gaining direct experience using the featured IRIS resources. This allows, teachers to confidently implement the activity when they return to their classrooms. In the session, participants not only receive relevant handouts for the lesson, but they also receive the IRIS Earthquake Resource handout (Appendix A). This handout provides an overview of the spectrum of resources IRIS offers.

In 2017, IRIS submitted three proposals to run one-hour workshops within the agenda of the National NSTA meeting. The proposals included a new lesson to facilitate learning about the current issue of induced seismicity from hydraulic fracturing, promotion of the jAmasies software for streaming seismic data into the classroom, and a repeat session of the popular activity to find Earth's core using seismic data. In recent years, NSTA has been cutting back on the total number of sessions any group can run at the meeting. As a result, only two of IRIS's session proposals were ultimately accepted for presentation.

> **Yes, Humans Really Do Cause Earthquakes: Hydraulic Fracturing, Wastewater Injection, and Earthquakes -** Explore the "hot topic" of induced earthquakes with your students through an activity built on the Argument-Driven Inquiry framework that supports three-dimensional learning.
> http://www.iris.edu/hq/inclass/lesson/542
> *Presenter(s): John Taber (IRIS: Washington, DC), Michael Hubenthal (IRIS: Washington, DC), Mike Gallagher (Oakland Schools: Waterford, MI)*

Discovering and Measuring Earth's Layered Interior: A Three-Dimensional Learning Activity from IRIS - Using math, building models, analyzing earthquake data, and participating in scientific discourse can lead your students to discover and measure Earth's outer core!
http://www.iris.edu/hq/inclass/lesson/16
Presenter(s): Michael Hubenthal (IRIS: Washington, DC), John Taber (IRIS: Washington, DC)

Share-a-thons

Share-a-thons are opportunities to informally introduce a large number of teachers to a single resource in a short amount of time. To accomplish this, presenters distribute themselves at tables around the outside of a large meeting space. Attendees then circulate around the room and visit as many tables as possible in any order they wish. Once a small group of teachers has gathered, presenters introduce a single resource in 3 - 5 minutes. At the conclusion of each presentation, presenters distribute a handout that allows the audience to get more information on the resource at a later time. These mini-presentation are repeated continuously until the conclusion of the session or until all session attendees have visited all the presenter tables. The fast-paced format of share-a-thons does not allow for much impact beyond piquing the interest of participants and providing them with a handout to learn more.

In 2017 IRIS participated in four share-a-thons. Table 1 below illustrates the resources presented in each share-a-thon as well as the number of EPO staff that presented. To help attract the attendees' attention, IRIS EPO staff brought a single pop-up banner stand to place behind the presenter table. This year, IRIS staff also distributed an additional handout, the IRIS Earthquake Resource handout (Appendix A), which provides an overview of the spectrum of resources IRIS offers.

Table 1: IRIS participation in share-a-thons at the 2017 NSTA National Meeting

Share-a-thon	Staffing	Resources presented
NESTA Earth System Science	2	Earthquake Machine & Seismic Waves viewer
Meet in the Middle	2	Asperity vice/5-Slinky Model & Teachable Moments
NSTA High School	1	geophysics
NESTA Geology	2	Teachable Moments & jAmaSeis

Booth

A 10'x10' corner booth is the core component of the IRIS presence on the convention floor at NSTA. As illustrated in Figure 2, the booth consists of three pop-up banners, which span the back of the booth,

plus a large monitor that loops a slideshow of IRIS's educational resources (e.g. 10 to 12 slides). On a side counter, a touch screen computer highlights digital resources, while a physical model (e.g. the earthquake machine) is ready for demonstrations. A main demo screen and laptop, along with handouts, are positioned on the front counter. This year, the monitor on the side counter featured the IRIS Earthquake Browser (http://ds.iris.edu/ieb/) and various animations each day. Screens on the front counter featured the Seismic Waves Viewer (http://ds.iris.edu/seismon/swaves/) on one and jAmaSeis (http://www.iris.edu/hq/inclass/software-web-app/jamaseis) with a real-time data stream, on the second. IRIS staff also hand out several items to teachers who stop by. These giveaways include the "Earthquakes... Like Ripples on Water?" poster (https://www.iris.edu/hq/inclass/poster/earthquakes_like_ripples_on_water) , plastic slinkys, IRIS stickers, "Shaking Up Earth Science" name badge ribbon, and the IRIS Earthquake Resource handout (Appendix A).

Figure 2: IRIS staff set up the booth at the 2017 NSTA convention in Los Angeles, CA

Staff who work at the booth at NSTA have been trained to use the following dialogue when meeting teachers who approach the booth. The goal of the dialog is to identify a need the teacher has, introduce them to IRIS, and highlight one or two resources that are likely to meet their needs, and ensure the teacher understand how to access the resources.

Greet – "Hello"

Welcome – "Welcome to our Booth. My names is XXXXXX…"

Meet – "…and you are?"

Discover – "So what brings you here?" or "I saw you were looking at the screen, do you teach about earthquakes?" *It is not about what you tell… it is what you ask!*

Organization – Point out the logo. "IRIS is a facility for seismological research that is funded by the National Science Foundation. Through our education and public program we produce a variety of free educational resources for teachers and their students."

Products - All of the above should occur before you start talking about products…
Less is more as they are probably on information overload.

- IEB/3DV or Earthquake Channel
- jAmaSeis
- Hands on activity to lessons and demos

Use one of three products as an example of what we offer…

Closing –

1 Scanning their badge for IRIS Teachable Moments list
2 Get them a copy of the IRIS Earthquake Resource handout (Appendix A) and note or mark the resources that you discussed with them.

Methods

Pre-Show Promotion

The evaluation of the pre-show promotion was focused on gathering data on how much attention the various platforms used were able to garner for IRIS. For example, the audience of the eblasts were measured by the system at NSTA which sends the blasts. This system reports the number of recipients who received the email. the number who opened and viewed the eblast (open rate), and number of users who clicked on an embedded URL in the email to access the linked content. This number is reported as click-through rate.

Similarly, the potential audience of social media was measured through metrics reported by the platforms used. From Facebook, we report "Reach" and from Twitter we report "Impressions." While both provide a metric for the potential audience, they do differ and therefore cannot be directly compared. For example, Facebook reach is the number of *unique* people who saw your content, while Twitter impressions are not limited to unique people. Rather, Twitter impressions represent the number of times a Tweet is served in timeline or search results.

The impact of the social media promotion was also gauged by the impact it had on viewers. For Facebook, the interaction rate was determined by dividing the number of Interactions (e.g. times individuals interacted with the content by "liking" or "sharing" a Facebook post) by the Reach. For Twitter, the Engagement rate was determined by dividing the number of Engagements (e.g. time individuals retweeted, replied, followed, etc. a tweet) by the number of Impressions.

Hour-Long Sessions

The evaluation of hour-long sessions sought to answer two key questions; How large was the reach of the workshop (e.g. how many people attended)? How did the workshop impact participants (e.g. how did their Behaviors, Attitudes, Skills, Interest, and/or Knowledge change as a result of participating)?

To define the reach of the session, IRIS staff took a head count shortly after the session began. Since there is some ebb and flow in participation (some teachers arrive late while others leave early), a second head count was taken later in the workshop. Each headcount is accompanied by a photo. Attendance is also tracked by the difference in the number of handouts brought to the session compared and the number left at the end of the session. Since each approach has its own shortcomings (e.g. coming and goings of participants, and people potentially taking extra handouts or not taking any at all) the evidence is triangulated to arrive at a reasonable estimate that the program can have confidence in.

To answer the question of impact, a post-session evaluation has been previously employed. The results show very positive participant perceptions, self-reported increases in content knowledge and instructional self-efficacy, which ultimately result in teachers using the activities presented and increasing the amount of time they spend teaching related seismological topics (Hubenthal and Taber, 2004). This year, EPO staff decided to leverage the evaluation conducted by NSTA (Table 2) and invest time into adding evaluation to other aspects of NSTA attendance. The NSTA evaluation is available to conference attendees in an online format to complete for up to a week following the conference. NSTA then compiles the results and provides aggregate results to presenters several weeks following the conference.

Share-A-Thons

Unlike workshops, share-a-thons are designed to interest teachers in a resource and provide them with a way to follow up at a later time. Given this, we have determined that share-a-thons may be best measured by reach alone. In the past, the program has attempted to count the teachers who come up to the table, but doing so is difficult as teacher come and go continuously, especially once crowds begin to form. Thus, the program uses the number of handouts distributed at each share-a-thon as an estimate of reach. To achieve this count, EPO staff carefully count the number of handouts they bring with them. During the share-a-thon they attempt to only disseminate the handouts to teachers who watched the introduction. Following the share-a-thon, staff count the number of handouts they have left and report the difference.

Booth

To estimate the reach from the booth, staff uses pocket clickers to count conversations with attendees. Staff were instructed to record the time and date they started and ended counting on a clipboard in the booth. Then, they were to “click” once for each person that they engaged with during this time period. For the purpose of the evaluation, engagement at the booth was defined as conversation in which EPO staff provided an attendee with more information about IRIS, and/or resources attendees might use as part of their instruction. These engagement counts provide a snapshot of the traffic at the booth within a given time window. Using these snapshots from across the day, we calculated an average number of interactions/hour for the booth on each day. This daily interaction average can then be multiplied by the number of staff hours worked at the booth to generate an estimated daily reach. Daily reach can then be summed to generate a total estimated reach from the booth.

Results

Pre-show promotion

The eblast was sent to 3,516 registrants who were Earth, Physical, and/or General Science teachers at the middle or high school levels. According to NSTA, who reported the statistics via email correspondence, the eblast was opened by 1307 (37.2%) of the recipients. This is higher than average for email marketing campaigns, which according to mailchip, an industry leading email marketing service, generally only achieves open rates in the low 20%. For example, February 2017 averages from across all mailchimp clients averaged a 21.6% open rate (mailchimp, 2017). However, only 14 (0.4%) of recipients actually clicked through the email content to the website. This is slightly lower than what we find via google analytics. Here, we found 44 pageviews during a one week monitoring period following the dissemination of the eblast. This discrepancy could be explained by webcrawlers and other bots hitting the unlinked webpage. Another possibility is that despite being unlinked, some individuals were able to discover and view the page via search engines. Regardless of the reason, these low click-through rates suggest that IRIS should focus on including all relevant content in the actual e-blast itself.

The coordinated use of Facebook and Twitter to advertise and promote the IRIS booth and sessions within the 2017 NSTA Conference occurred between 3/22 and 4/1. This included 5 Facebook posts with a total potential audience of 8220, and 5 tweets with a total potential audience of 2421. The interaction rate for the Facebook posts was 1.0%, while the engagement rate for the tweets was 1.9%. On Facebook, the most effect post types were announcements listing the schedule of IRIS activities for the following day and linking to more information about the upcoming activities. On Twitter, most post types received similar amounts of traffic, with an average engagement rate of 1.86%. The general announcement received somewhat more interaction (4.4% engagement) then the more specific announcements about the booth or upcoming activities.

Overall the pre-show promotional efforts appear to be cost-effective effort. The eblast costs $0.41 per email address and social media costs are minimal as most content is already created and the staff time to make the posts is negligible.

Hour-Long Sessions

This year, the reach of IRIS led hour-long sessions was very strong. As illustrated in Figure 3, IRIS staff reached 165 teachers via two hour-long sessions. The first session on “Induced Seismicity,” had the largest attendance of any hour-long session that IRIS has facilitated since tracking began in 2013. Meanwhile, the “Earth Structure” session reached 25 teachers, which was slightly below average attendance, but was on par with the last time the session was facilitated at a NSTA, in 2013, when 28 teachers attended. Photographic evidence was taken for the Induced Seismicity session (Appendix c) but no photo was taken for the Earth structure session.

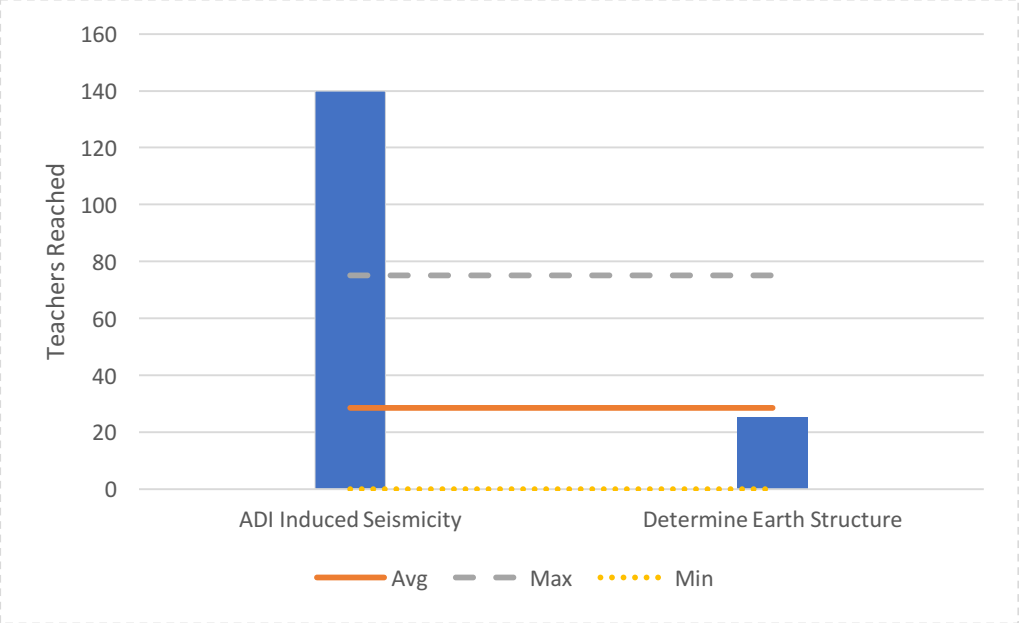

Figure 2: Reach achieved through IRIS's hour long sessions as part of the 2017 NSTA National Convention. Blue bars illustrate reach for each 2017 session, while lines represent the maximum (grey dashed), minimum (yellow dotted) and average (orange solid) reach from previous sessions held at NSTAs from 2013-2016.

In addition to reaching a significant number of teachers, IRIS sessions at the 2017 NSTA also appeared to meet participants' needs and were presented in a clear organized fashion as illustrated in Table 2 below. The response rate to the NSTA evaluations was extremely low. For example, the response rate for the Induced Seismicity workshop was 8%, while the Earth Structure session was 4%.

Table 2: Participant perceptions of IRIS's hour-long workshops at the 2017 NSTA national convention. Data was collected through the external NSTA session evaluation system.

	Yes, Humans Really Do Cause Earthquakes: Hydraulic Fracturing, Wastewater Injection, and Earthquakes		**Discovering and Measuring Earth's Layered Interior: A Three-Dimensional Learning Activity from IRIS**	
Please indicate the degree to which you agree with the followings statements.	Average score (scale = 1 to 5, where 1=strongly agree)	(n)	Average score (scale = 1 to 5, where 1=strongly agree)	(n)
I selected this session for immediate classroom use.	1.3	11	1	1
I selected this session based on the reputation of the speaker.	3.5	11	5	1
I selected this session to improve my personal pedagogical knowledge/skill.	1.4	10	1	1
I selected this session to improve my science content knowledge.	1.9	11	1	1
The session met my needs.	1.5	11	1	1
The information presented was clear and well-organized.	1.2	10	1	1
Safe practices were employed.	1.2	11	1	1
The session avoided commercial solicitation.	1.3	11	1	1
The session should be repeated at another NSTA conference.	1.2	11	1	1

Share-A-Thons

By attending four share-a-thon session and running multiple presentations in each, IRIS staff hours reached a total of 176 teachers (Figure 4). Since each resource was presented by a single staff member, 25 teachers were reached per staff hour invested in share-a-thons in 2017. As Figure 3 illustrates, this reach was at, or below the historic minimums for share-a-thon. For example, in 2016 the NESTA geology and earth science share-a-thons reached 45 and 60 teachers respectively, which was more than double what these sessions reached this year. This downswing in attendance in 2017 could be attributed to the location of the NESTA share-a-thons, in the farthest corner of the convention hall, which made them somewhat difficult to find and inconvenient to visit.

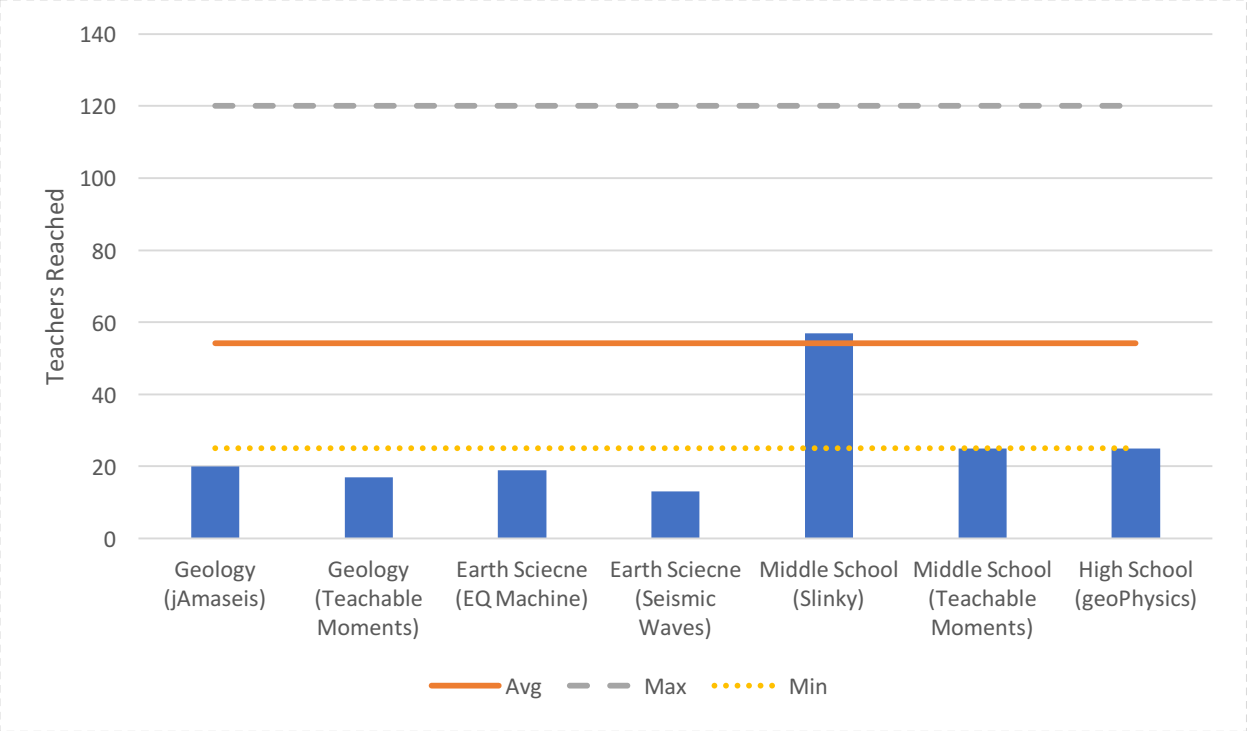

Figure 3: Reached through IRIS's participation in share-a-thons at the 2017 NSTA National Convention. Bars illustrate reach per activity presented with the share-a-thon session indicated in parenthesis. Lines represent the maximum (grey dashed), minimum (yellow dotted) and average (orange solid) reach from previous share-a-thons held at NSTAs from 2013-2016.

Booth

As illustrated in Table 3 below, staff counts suggest that approximately 565 attendees were engaged at the booth across the three days of the show. This was based on the number of staffing hours for each day and the interaction rates tallied by staff working in the booth. The second day of the show was the busiest of the three, but compared to past NSTAs, all three were quite busy.

Table 3: Estimates of the number of attendees who interacted with EPO staff at the booth on the convention floor based on staff counts

	Staff Hours	Avg. Interactions/Hour	Estimated Reach
March 30, 2017	13.0	13.3	173
March 31, 2017	14.5	18.9	273
April 1, 2017	9.5	12.5	119
Estimated show total	37	15.3	565

For example, NSTA reported that there were 9511 attendees at the 2017 conference (NSTA, 2017). This means that staff at the booth reached nearly 6% of the show attendees. While this is a small percentage of the total attendees, it is the largest percentage of show attendees we have achieved in the past five years (Figure 4).

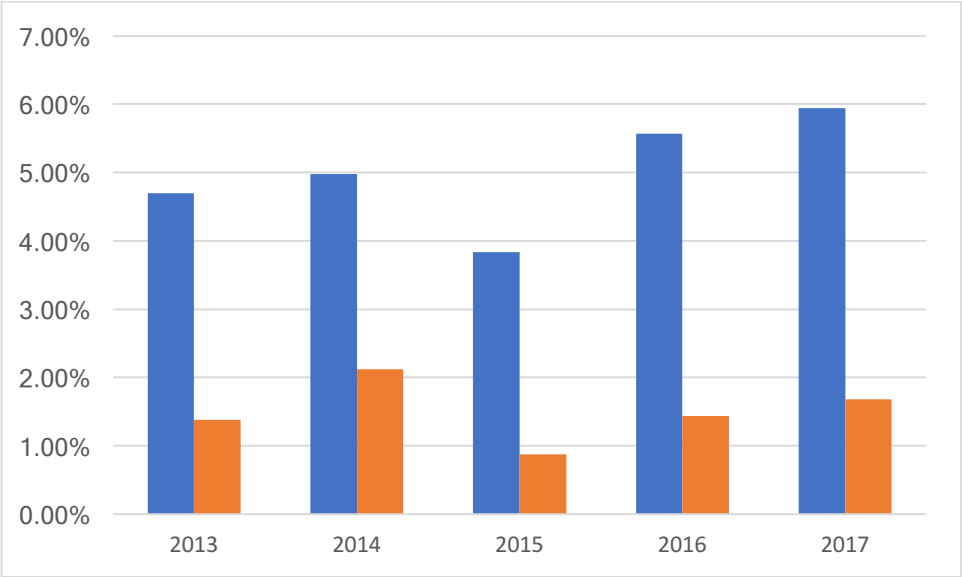

Figure 4: The annual percentage of NSTA conference attendees who interacted with EPO staff at the IRIS booth (blue), and the annual percentage of NSTA Conference attendees whose badges were scanned for IRIS Teachable Moments (orange) suggest a strong IRIS presence on the show floor.

In addition to counting engagements, IRIS staff also scan attendees' badges to sign them up for our Teachable Moments listserve. Badge scanning occurs primarily from the booth, but the scanner is also taken to the share-a-thon. Unfortunately, since there is only one system, it is not possible to know what number were scanned from the booth versus the share-a-thon. However, this year, IRIS scanned 160 badges combined (1.7% of attendees). While this is on par with previous years' totals (Figure 4), it should be noted that this occurred almost exclusively at the booth given the low turnout at the share-a-thons in 2017 (Figure 3) where historically large numbers of badge scans have occurred.

Costs

As illustrated below, the costs for IRIS EPO's participation at the 2017 National NSTA Convention totaled just under $16,100, excluding staff time. The largest expense category in attending NSTA was staff travel which made up roughly 36% of the total. The booth, including furnishings, electric, and internet, made up 25% of the total, as did the shipping of the booth, handouts, and workshop supplies and consumables. The remainder consisted of advertising (9%) and printing (5%). The cost per interaction for 2017 can be calculated using the following formula. Total cost / Total reach = Cost per Interaction or $16,096.03/(565 [booth] + 176 [share-a-thon] + 165 [workshop]) = $17.70/attendee reached.

Table 4: IRIS EPO's participation costs for the 2017 NSTA Convention.

Booth	$4,039.23
Shipping	$4,022.18
Printing	$764.74
Advertising	$1,450.50
Staff travel	$5,819.38
Total	$16,096.03

Summary

Prior to the 2017 NSTA National Convention, IRIS staff set performance targets for attendance at NSTA. IRIS sought to reach at least 700 attendees at the booth and sessions combined, collect 200 new badge scans for the Teachable Moments/IRISEd listserv, and optimize programing and costs to keep costs at or below $20/interaction.

Pre-show promotions appear to be an effective strategy as the percentage of attendees reached by IRIS at NSTA in 2017 was the highest ever achieved (Figure 4). Active booth traffic (Table 3) and an extremely well attended one-hour workshop (Figure 2) made up for the poor attendance at the share-a-thons (Figure 3). Despite this downswing in reach via share-a-thons the small amount of preparation required by IRIS staff to participate continues to make IRIS's involvement in share-a-thons a good value. Participation in NESTA's share-a-thons also allows IRIS to help support NESTA activities.

IRIS exceeded its first performance target by reaching a total of 906 attendees. IRIS did not meet its second performance metric of 200 badge scans. This was due, to some degree, to the very poor turnout at the share-a-thon where Teachable Moments was being promoted and historically a large number of scans occurs. There is only one badge scanner that comes free with the booth reservation. Normally the scanner is at the booth, however, it is taken to the share-a-thons when Teachable Moments are presented. Thus, if it is at the share-a-thon, which had low turnout this year, it cannot be used at the booth. As a result, IRIS fell 20% short of reaching its goal of 200 new badge scans for the Teachable Moments listserv. Finally, IRIS was able to exceed its costs/interaction performance metric. As illustrated above, the final cost per interaction was $17.70/interaction as a result of the significant number of teachers IRIS was able to reach throughout the conference.

Since IRIS has demonstrated that it can effectively measure the reach of its efforts in all of the three major efforts at NSTA, workshops, share-a-thons, and booths, IRIS should begin to invest effort into strategies to measure the impact of their work, which in turn, will help them further optimize their efforts. The following recommendations reflect this increased focus on impact and should be undertaken in addition to efforts to measure reach.

Future performance metrics should be adjusted to reflect the success of this year's effort

Since IRIS successfully exceeded two of the three performance metrics that it had set for itself, IRIS should adjust these metrics upwards slightly in 2018 to continue to encourage growth.

Develop additional approaches to measure the effectiveness of eblasts

Metrics provided by NSTA for eblasts do not provide any insight into "if" and "to what degree" the emails influence attendees interest and behaviors. Therefore, further efforts should include an approach to attempt to measure this. For example, future emails might include a coupon that can be redeemed at the booth or sessions for a "special" slinky and could then be counted.

Tailor social media content
In the future, social media posts promoting NSTA on Facebook should focus on scheduling giving additional information about upcoming activities and Twitter posts should provide general information.

Develop an evaluation to explore how teachers select the hour-long sessions they attend at NSTA
Unfortunately, we don't know a lot about how attendees select the sessions they attend, so we can only guess that the "hot-topic" nature of induced seismicity was a draw. Developing a better understanding of this would certainly help us optimize our efforts.

Develop an evaluation that can be quickly implemented at the end of each session to measure aspects of participants' BASIK.
While IRIS has a strong handle on the reach of workshops at NSTA, the NSTA evaluation had an extremely low response rate and the items did not really shed much light on the impact the workshops had on the participants. Therefore, it is suggested that a more robust evaluation be conducted in 2018 to explore the impact the workshop has on participants' BASIK. Specifically, the evaluation should do the following.

1. At the beginning of the session, email addresses should be collected from session participants.
    a. Use to contact about them about use and better measure session impacts on teachers' behaviors (e.g. Did participants use the activity with their students? If not, why not? If so, how successful was the implementation?)
    b. Sign teachers up for the teachable moments
2. At the end of the session a short evaluation should be distributed
    a. Collect participants' perceptions of the workshop directly, reasons for attending, how well it met expectations
    b. Gauge changes in participants' knowledge, interest, and confidence in teaching the content presented via retrospective pre/post items.
    c. Gauge teachers' predictions for their own use of the activity in the classroom – do they intend to use something they learned, if so, what? In what way?
    d. Collect participants' ideas and suggestions to improve the workshop or the activity itself

Expand evaluation to estimate how many teachers reached during a share-a-thon followed up
While IRIS's evaluation of share-a-thons provides a measure of reach at the venue, it does not currently measure an impact the session has on attendees' BASIK. The evaluation could be expanded to gain a sense of impact through the use of custom URLs on the flyers to track visitors.

Develop a booth impact survey to measure changes in attendees' BASIK.
A survey was developed for other booth efforts and could be leveraged at NSTA in the future. This could provide insight into attendees' perceptions and experiences at the booth post visit. In turn, such information could be used to refine the booth offerings and messaging.

If badge scans for TM are an important metric, having more tools to scan participants may be worth the effort depending on costs.

This would increase the scanning capacity both at the booth during much of the show. It would also provide an additional scanner that could be used at workshops and share-a-thons. The former may be a missed opportunity currently.

Review the budget to see further costs savings that may exist. trim costs even further
There may not be any, but other subtle items may exist to trim the budget. These may include reducing shipping costs by shipping further in advance, doing more printing in advance of the show to take advantage of lower priced, longer turn around options.

References

mailchip (2017) Average Email Campaign Stats of MailChimp Customers by Industry. Retrieved from https://mailchimp.com/resources/research/email-marketing-benchmarks/

Sheldrake, J. (2017) Post Event Report: NSTA National Conference on Science Education. (Sheldrake, J., personal communication, April 11, 2017).

Appendix A: Earthquake Resources Handout

Front

Back

Appendix B: Pre-show Eblast

ATTENDING NSTA?

Join us in Los Angeles!

Join us at the Los Angeles NSTA to expand your knowledge of earthquakes while learning to using our FREE classroom resources! **Find us at our BOOTH #1948 or attend one of our exciting learning sessions!**

Our FREE resources include animations, seismic data, classroom activities and demos, videos, earthquake recording software, posters, and much more!

Friday

Analyzing and Interpreting Data to Determine Earthquake Hazards
Friday, March 31 8:00 AM - 9:00 AM
Los Angeles Convention Center, 504

National Earth Science Teachers Association (NESTA) Shares:
Earth System Science Share-a-Thon
Friday, March 31 12:30 PM - 1:30 PM
Los Angeles Convention Center, Petree Hall D

Meet Me in the Middle Session: **Middle Level Share-a-Thon**
Friday, March 31 2:30 PM - 4:30 PM
JW Marriott Los Angeles at L.A. LIVE, Diamond Ballroom Salon 4/5

Saturday

Yes, Humans Really Do Cause Earthquakes: Hydraulic Fracturing, Wastewater Injection, and Earthquakes
Saturday, April 1 9:30 AM - 10:30 AM
Los Angeles Convention Center, 515A

High School Hands-On Hodge-Podge Share-a-Thon
Saturday, April 1 11:00 AM - 12:30 PM
Los Angeles Convention Center, 152

National Earth Science Teachers Association (NESTA) Shares:
Geology Share-a-Thon
Saturday, April 1 12:30 PM - 1:30 PM
Los Angeles Convention Center, Petree Hall D

Sunday

Discovering and Measuring Earth's Layered Interior: A Three-Dimensional Learning Activity fromÂ IRIS
Sunday, April 2 8:00 AM - 9:00 AM
Los Angeles Convention Center, 306 AB

More details at: www.iris.edu/hq/nsta

We hope to see you there!

IRIS

CONNECT

Facebook
Twitter #NSTA17
Pinterest

CONTACT

Have questions? Contact us at:
epo@iris.edu

Appendix C: Workshop Attendance Photos

Photo of attendance at IRIS's session on Induced Seismicity from the back of the room. The photo was taken on April 1, 2017 at 9:40am (local time).

Photo of attendance at IRIS's session on Induced Seismicity from the front of the room. The photo was taken on April 1, 2017 at 9:54am (local time).