



Citizen Science Conference

Full Evaluation Report

August, 2015

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National Science Foundation
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This project was completed with support from the NSF (Project #1501158)

LifelongLearningGroup.org

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Executive Summary

Citizen Science 2015 was the inaugural conference of the Citizen Science Association (CSA). The conference planned for two days of building connections and exchanging ideas across a wide spectrum of disciplines and experiences and was held February 11th and 12th in San Jose, California, as a pre-conference of the American Association for the Advancement of Science's Annual Meeting.

In addition to the other strands, a specific strand dedicated to education was held to identify opportunities and strategies to support the integration of citizen science into the Science, Technology, Engineering, and Math (STEM) learning ecosystem. The field of citizen science, broadly defined as public participation in scientific research, is growing rapidly. It is producing significant science and societal outcomes; however, its potential to transform STEM education has yet to be realized at scale. Innovations in diverse disciplines are improving the effectiveness and utility of citizen science in achieving STEM learning goals. Rarely, however, do these innovators have opportunities to share ideas and develop activities that will help spread and scale up their implementation. The goal was to facilitate growth and innovation in the use of citizen science in STEM education for diverse audiences.

The organizers of the Citizen Science Conference are committed to evaluation and have conducted evaluations of prior conferences and workshops. For this conference, the goal was to evaluate the overall conference and specifically focus on the education strand.

The evaluation was driven by eight guiding questions and included a pre-measure; process observation and interviews; post measure; and a delayed-post measure.

Overall, the conference appears to have met its goals. Participants felt very positive about the conference and about the field of Citizen Science, there was a sense of reinvigoration and commitment moving forward, and there is evidence of follow-up activity by individuals after the conference. Specifically addressing the questions guiding the evaluation of the conference:

1. Who are the participants and do they represent the breadth of the field of citizen science?

The participants are somewhat diverse in that they cover range of positions, purposes, and “homes” of citizen science programs. Geographic and type of program focus are diverse.

2. How relevant were the strands for the participants?

The strands for the conference were used in the solicitation for papers and posters to ensure topics the Conference Committee thought were important were addressed. The intention was the strands would be used to help individuals navigate the many concurrent sessions. In the findings, the strands were seen as relevant, by the respondents, but were not, for many of them, meaningful. This is in part due to the complex, competing interests of the participants and the multiple roles and needs many of the participants bring to the conference and hope to get from the experience.

3. How important were the goals for the conference for the participants? For the field?

The goals were seen as important for the conference participants, but more important and uniformly more important for the field. This finding speaks to the breadth of motivation for participation in citizen science, the breadth of utility to science and people of the work of citizen science, and the breadth of topics addressed through citizen science projects.

4. How important is presenting for conference participation?

Conferences vary on the need to present to support attendance. As this is the first measure for this conference and Association, it is important to note that over half (59%) of respondents noted that presenting was important for them to be able to attend. This information will be important in planning future conferences to ensure there are ample and different opportunities for individuals to make contributions to the conference.

5. What are expectations of participants and are those expectations satisfied?

Consistent with prior findings, the dominant expectations coming into the conference, immediately after the conference, and remaining as important several months after the conference include networking, skill building, and obtaining new insights. These expectations were met through the conference.

6. Do perceptions of participants change during the course of participation?

Generally, in this conference, perceptions did not change much during the course of the conference. Some individuals enter with broad goals or interests and get clarity in what they need/want from the conference as it progresses. Those coming with clear intentions/expectations seem to seek out those experiences offered by the conference to get these expectations met.

7. What is the process of engagement in a single strand of the conference?

The strand, specifically the Education strand, makes sense as an organizing tool for the conference. Approximately half the interviewees from this strand intentionally engaged in the education strand as the overall topic of education relates to their professional work. About a quarter attended based on individual curiosity about the strand, and the other quarter choose to attend based on the conference program description of a particular session.

8. Does coupling the conference with another benefit the participants?

There is a slightly positive benefit to participants, but overall not very important to the participants for the conference to be aligned with another conference.

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Citizen Science Conference 2015 Conference Evaluation

Introduction

Citizen Science 2015 was the inaugural conference of the Citizen Science Association (CSA). The conference planned for two days of building connections and exchanging ideas across a wide spectrum of disciplines and experiences and was held February 11th and 12th in San Jose, California, as a pre-conference of the American Association for the Advancement of Science's Annual Meeting.

In addition to the other strands, a specific strand dedicated to education was held to identify opportunities and strategies to support the integration of citizen science into the Science, Technology, Engineering, and Math (STEM) learning ecosystem. The field of citizen science, broadly defined as public participation in scientific research, is growing rapidly. It is producing significant science and societal outcomes; however, its potential to transform STEM education has yet to be realized at scale. Innovations in diverse disciplines are improving the effectiveness and utility of citizen science in achieving STEM learning goals. Rarely, however, do these innovators have opportunities to share ideas and develop activities that will help spread and scale up their implementation. The goal was to facilitate growth and innovation in the use of citizen science in STEM education for diverse audiences.

The organizers of the Citizen Science Conference are committed to evaluation and have conducted evaluations of prior conferences and workshops. For this conference, the goal was to evaluate the overall conference and specifically focus on the education strand.

Methods

A conference evaluation is often grounded in satisfaction, even though such information rarely gives the coordinators insights into what can be changed to lead toward desired outcomes. For this conference, the coordinators were most interested in understanding entry and exit attributes of the conference participants related to the Citizen Science Association goals and the specific goals of the conference.

The evaluation was guided by eight evaluation questions:

1. Who are the participants and do they represent the breadth of the field of citizen science?
2. How relevant were the strands for the participants?
3. How important were the goals for the conference for the participants? For the field?
4. How important is presenting for conference participation?
5. What are expectations of participants and are those expectations satisfied?
6. Do perceptions of participants change during the course of participation?
7. What is the process of engagement in the education strand of the conference?
8. Does coupling the conference with another benefit the participants?

Pre-Measure

A few days prior to the conference, a questionnaire was sent electronically to all registered conference participants. This instrument included a series of questions related to the nature of individuals' involvement in citizen science, their role(s), sector representation, and length of tenure in citizen science work. They were asked (partially open-ended) what they desired to get from the conference.

A scale of interest in strands was provided using a 7-point interest scale. They were given parallel scales asking about importance to self and importance to the field related to the goals of the conference also on parallel, 7-point scales. The final pre-item asked participants about the importance of presenting to their attendance.

Conference Process

The Education Working Group of the Citizen Science Association has initiated a process to move the field toward outcomes they have identified for education within citizen science. One of the steps was to focus on specific questions for the field at the conference in the Education strand. The evaluation included a focus on this strand and a process evaluation to understand better if the objectives were being met.

A convenience sample of persons who attended Education strand sessions for both days of the conference were asked face-to-face five questions that included:

1. Are you aware there is an Education strand for the Citizen Science conference?
2. What do you think is important for the Education strand sessions to address?
3. Do you see (or anticipate) these discussions happening?
4. What do you hope to get from attending an Education session?
5. What do you think is the value of the Education strand for Citizen Science as a field?

A total of 35 conference attendees provided responses to all five questions. Responses were first organized by question and then frequency of similar types of responses.

Post-Measure

Following the conference, a post measure was distributed. This instrument included demographics to match the pre-conference, although those who had completed the pre-measure skipped this section by using a code they had created prior.¹

Delayed-post Measure

Approximately three months after the conference, a delayed-post measure was distributed through a link sent by e-mail. The questions for this measure provided an opportunity to both reflect back

¹ A glitch in the skip logic created a freeze for those who tried to create a new code (those who had not responded to the pre-measure). This caused some responses to end without full completion of demographics.

on the conference, and also to inquire as to any activity undertaken as a result of participation in the conference. Parallel demographics were asked to match the pre and post measures.

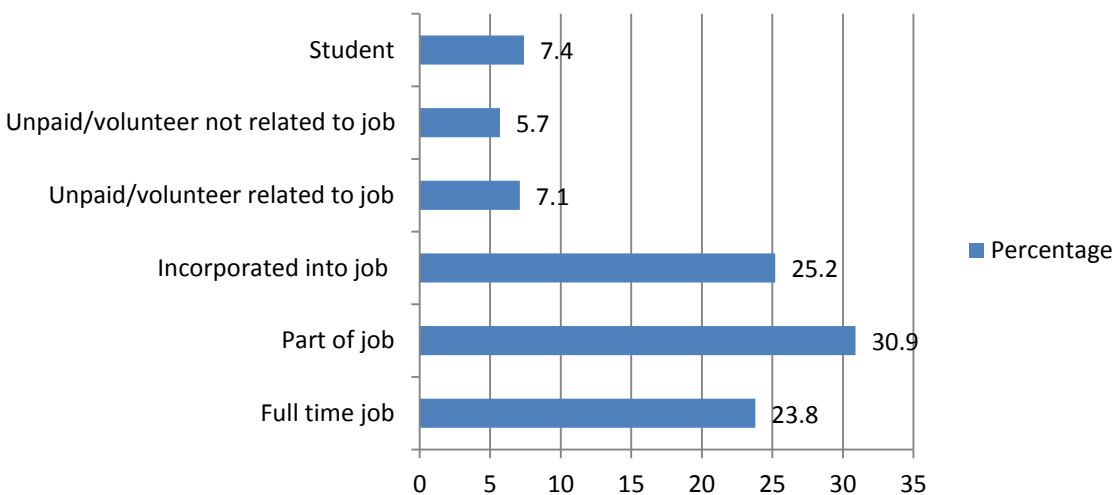
Findings

Who participated

Combining the data from the pre-measure and the data from the post-measure for those who did not provide the data in the pre, there were a total of 227 respondents providing demographic data. The delayed post is not included as only 7 individuals had not provided demographic data previously and most skipped several of the demographic questions, and 80% (88 out of 109) of the respondents did not remember their code, so there was no ability to match demographics with earlier responses.

Not quite 1/3 of the respondents reported they were paid to work in the citizen science field as part of their job or as a part-time job (n=87, 30.9%). A quarter of the respondents (n=71, 25.2%) incorporate citizen science occasionally within their job activities. This brings to more than 50% participants who working in citizen science as a part of their paid employment as compared to the 67 respondents (23.8%) who are paid to work in citizen science as a full time job. There were 21 (7.4%) who are students involved in citizen science, 20 (7.1%) who are unpaid/volunteers where the citizen science work is directly related to their job/profession, and 16 (5.7%) whose work in citizen science is unpaid/volunteer work unrelated to job/profession. The chart below shows the full distribution.

Table 1. Percentage of respondents by nature of involvement in citizen science



Role in citizen science

The most common role in citizen science was that of coordinating, directing, or managing a citizen science initiative (154 of 902 total responses or 17.1%).² The next highest response was for

² Due to individuals interpreting the question differently on the pre-measure, the question was simplified. In the pre, respondents were asked primary, secondary, and additional roles. In the post measure, they were asked to select up to three roles.

conducting scientific research that relies on citizen science volunteers (n=111, 12.3%). The table below (Table 2) shows the total responses across roles by response for role and % against total responses.

Table 2. Roles in Citizen Science by n and percent in rank order

	n	Percent Total Responses
Coordinate, direct, or manage a citizen science initiative	154	17.1
Conduct scientific research that relies on citizen science volunteers	111	12.3
Conduct educational or social science research about citizen science	87	9.6
Conduct evaluations of citizen science projects	62	6.9
Volunteer participant	61	6.8
Provide educational support to one or more citizen science initiatives	78	8.6
Provide scientific support for one or more citizen science initiatives	75	8.3
Educator who uses citizen science in teaching	64	7.1
Provide communication support to one or more citizen science initiatives	60	6.7
Provide technological support for one or more citizen science initiatives	50	5.5
Provide networking and/or support services for leaders of initiatives	45	5.0
Conduct independent or DIY research	28	3.1
Participate in a way other than those listed here	27	3.0

To explore the proportion of respondents engaging in each of these roles, a proportional comparison of all respondents who named any role against the total number of participants in the study is presented in Table 3 (on the following page). Although the proportions remain comparable, the complexity of the multiple-roles becomes more obvious in this visual presentation.

Twenty-seven of the respondents to the questionnaire responded to the last item: participate in a way other than those listed here. Thirteen of these respondents offered a unique reason, suggesting there is no reason to give special attention to any one for these responses as it is not a role routinely serving the citizen science field. These reasons are presented in the Table 4, found on the next page. The other 14 responses were variations on the above roles, but the individual felt their context was unique.

Table 3. Distribution of roles across respondents

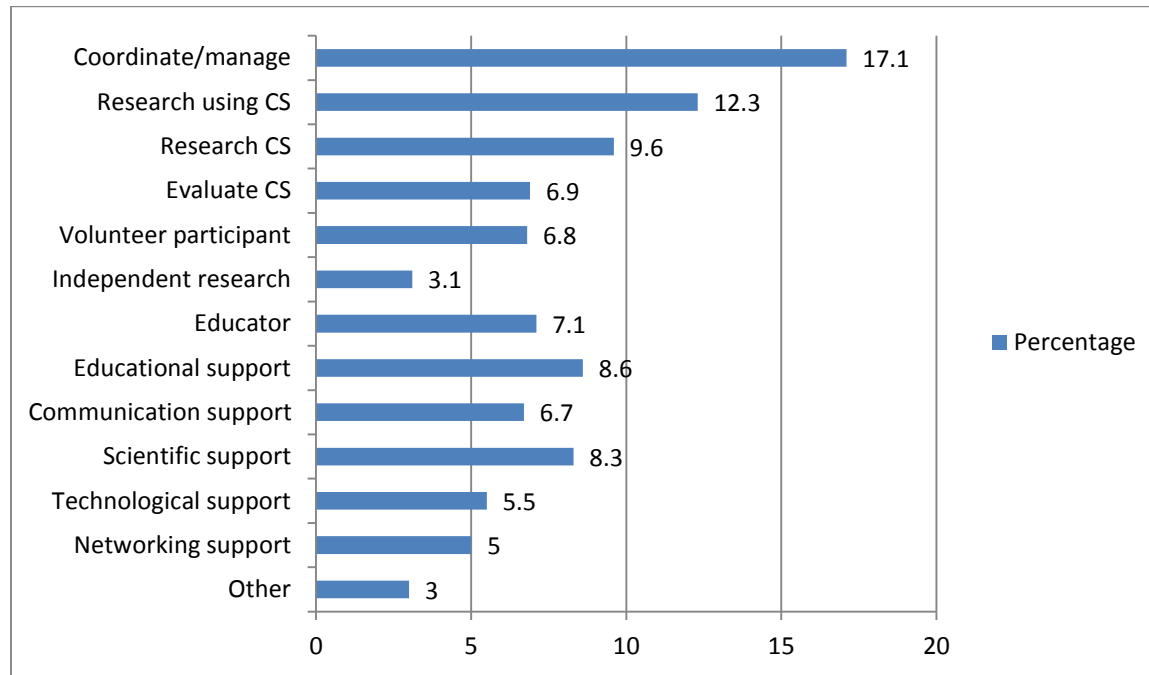


Table 4. Participation: other reasons

Participation	n
Journalist who writes about citizen science	1
Project director for an NSF-supported multimedia initiative on citizen science	1
Public policy developer who supports citizen science	1
Employee of a resource center that supports STEM learning professionals	1
CSA Board member, advised individual citizen science projects	1
College Prep Coordinator	1
Manager of a multi-function natural resources volunteer group	1
Educator who supports other educators using citizen science in their teaching	1
Chair of a community-based organization's Data Review & Dissemination sub-committee	1
Mediator and facilitator of citizen science initiatives	1
Nonprofit employee	1
Teacher professional development provider	1
Citizen science initiative developer in Africa	1

Sector representation

Respondents were asked about what they felt best described the “home” for their involvement with citizen science. Respondents were allowed up to three sectors. The total n was 586 or 2.7 responses per respondent.

The dominant sector for “home” for citizen science was Academia which had 86 primary sector responses and a total of 111 total responses (20.6% of 538 responses). This was followed by informal science education with a primary sector of 28 and a total response of 68 (12.6%). The second highest primary sector, however, was site-based NGO which had 39 primary responses, but only 62 total responses (11.5%). These were followed by Non site-based NGO (9.7%), Federal government (8.7%), K-12 education (8.6%), and State/Provincial government (5.7%). All other options were below 4.5% of responses.

Table 5. Sector involvement by n and percent

	Primary Sector		Secondary Sector		Additional Sector		TOTAL	
	n	%	n	%	n	%	n	%
Academia	86	30.2	14	10.8	11	8.9	111	20.6
Informal science education	28	9.8	27	20.8	13	10.6	68	12.6
Site-based NGO	39	13.7	12	9.2	11	8.9	62	11.5
Non site-based NGO	27	9.5	16	12.3	9	7.3	52	9.7
Federal government	30	10.5	9	6.39	8	6.5	47	8.7
K-12 Education	15	5.3	21	16.2	10	8.1	46	8.6
State/Provincial government	16	5.6	5	3.8	10	8.1	31	5.7
Varied institutions	12	4.2	5	3.8	10	8.1	27	5.0
Other	11	3.9	5	3.8	9	7.2	25	4.6
Local government	7	2.5	7	5.4	11	8.9	25	4.6
Private industry	8	2.8	4	3.1	11	8.9	23	4.3
Philanthropy	6	2.1	5	3.8	10	8.1	21	3.9

Twenty five individuals noted that they worked with other sectors. Several of the comments were tied to the above categories (e.g. one respondent said “not profit” and another said “several institutions.” Others explained their choices in the above by either naming the organizations/institutions specifically. The other sectors as named by the respondent included those listed by name and frequency of name in Table 6, found on the next page.

Table 6. Other sectors

	n
Public television	2
Non-profit	2
CSNA (Citizen Science Network Australia)	1
Cooperative Extension Department of Land-Grant University	1
After-school program	1
Smithsonian Environmental Research Center (federal/nonprofit/academic)	1
Agricultural Development in Africa and Asia	1
Youth development, college and career prep for underserved youth	1
Boundary organization	1

Tenure of engagement

A strong plurality of respondents (41.6%) reported having been engaged with citizen science for 4-10 years. An additional 43 (19.0%) have been involved for more than 10 years. Almost a third (74 or 32.7%) of respondents have been involved for 1-3 years. Of the remaining, 11 (4.9%) have been involved less than 1 year, and 4 (1.8%) have not yet been engaged in citizen science.

Audience of programming

Most of the programs represented at the conference were targeted toward adults (n=62, 29.1%) or primarily adults but youth are also involved (n=92 or 43.2%) making the adult target audience the primary for 72.3% of the respondents. Six respondents identified seniors as the target (2.8%) making adults nearly ¾ of all audiences. There were 121 respondents or 9.9% who identified teens as the primary audience, and another 7 (3.3%) who identified children. Primarily youth but adults also are involved was identified by 15 respondents (7.0%) and family groups accounted for 7 or 3.3% of responses.

Attendee diversity

There were three comments offered in the post measure both appreciating the inclusion of youth as attendees and presenters, and desiring additional opportunities for youth participation. One comment noted the focus on diversity and inclusion but the lack of diversity in attendees and another specifically noted the sessions on Indigenous Peoples, and the lack of native peoples at the conference.

Nationality

In response to observations at the conference that attendees had come from many countries, a question was added to the post-survey asking for Nationality (asked about permanent home). Of the 107 respondents, 80 were from the U.S., 7 were from the UK/England, 3 were from Germany, 2 from Canada and individual respondents from France, New Zealand, Puerto Rico, South Africa, Sweden, and Tanzania.

Conference strands

Respondents were asked to rate the conference strands in terms of interest using a rank-item scale. In the pre-measure, all of the strands had clearly positive responses, but the clear dominant was the “best practices” strand which had a mean of 6.60 on a 7-point scale. This item, as did all the others, however, had an inflated standard deviation suggesting there are a clear number of individuals for whom the strand does *not* hold interest. This spread of deviation across the items suggests that the themes resonate overall, but no one theme resonates across all respondents.

In the post measure, respondents were asked how valuable each strand was for them. The pre and post measures cannot be evenly compared, as interest and value pre and post are very different constructs. Even so, there was a fairly clear distinction between interest across strands, and value of the strand in actuality, likely due to interest being high in the pre across many of the strands which would suggest individuals could not have all their interests met in the conference. This was also heard in comments offered to the organizers by several respondents (10 of 78) who were frustrated by too many concurrent sessions and wished to attend more than was possible. Others (7 of 78) suggested adding a third day to the conference so that people could attend more sessions.

One of the purposes for collecting perceptions of persons who attended Education strand sessions during the conference was to assess their level of awareness that the conference did have strands and specifically an Education strand. Of the 35 conference attendees who were asked, 42% indicated they were aware of the Education strand, 29% said they were not aware there was a strand, and 29% indicated initially they were not aware of the strand but figured out there probably was based on the session titles and topic areas.

Post-conference, all strands did have a positive mean, although the mean scores were between 5.0 and 5.5 across the strands with relatively low standard deviations, suggesting there was positive, consistent value for those who reported participating in any of the strands. Of the valid 198 respondents for this item, there were 98 who reported attending the Digital Opportunities strand, 121 who attended the Best Practices strand, 99 each for Broadening Engagement and Making Education Connections, 113 in the Research and Evaluation strand, and 127 in the Tackling Grand Challenges strand.

Table 7. Interest in (pre) and value of (post) each conference strand

	Interest (pre)		Value (post)	
	Mean	Standard Dev	Mean	Standard Dev
Digital opportunities and challenges in citizen science	5.75	2.26	5.06	1.41
Best practices for designing, implementing, and managing CS projects & programs	6.60	2.20	5.39	1.32
Broadening engagement to foster diversity & inclusion	5.76	2.14	5.06	1.47
Making education and lifelong learning connections	5.55	2.21	5.49	1.41
Research on and evaluation of the citizen science experience	6.08	2.22	5.44	1.15
Tackling grand challenges and everyday problems with citizen science	5.90	2.14	5.43	1.28

These findings would suggest the strands do provide a framework for meaning making across sessions, and do help capture and frame interests.

Importance and value of citizen science

In the delayed post measure, respondents were invited to comment on the importance and value of citizen science. Two-fifths (n=85; 80% of all survey respondents) of the 106 conference attendees who completed the post conference follow-up survey did so. Individual comments were analyzed and summarized by the six categories of perceived importance, five of which related to users, and one which was about general importance of citizen science.

Overall Findings:

Of those who completed the survey and provided comments:

- Almost 1 in 6 (n=15) survey respondents commented on why Citizen Science is **important to them**. While some survey respondents described the value of Citizen Science in terms of its impact on them and their ways of thinking, others described Citizen Science being important to them because of its impact on the general public.
- A little more than 1 in 4 (n=30) survey respondents commented on the importance of Citizen Science **to the general public**. Mostly these included that it helps to broaden the public’s understanding and appreciation of the nature of science, it engages the public and increases their sense of ownership regarding their environment, and it contributes to the democratization of science.
- A little more than 1 in 10 (n=13) survey respondents commented on why Citizen Science is important **to those who engage in Citizen Science projects**. These comments included that it increases knowledge and understanding of science, contributes to personal investment and ownership of the scientific process, and results in persons feeling they are part of the scientific community. Most comments seemed to be by non-participants about participants, rather than by participants themselves.
- 1 in 6 (n=17) survey respondents commented on why Citizen Science **is important to scientists**. Primarily it increases their capacity to collect data, as well as the amount of data scientists can analyze. It helps provide scientists with different perspectives about the phenomenon they are studying and how it can be studied.

- Almost 1 in 10 (n=9) survey respondents commented on why Citizen Science is **important to educators**. Primarily it provides hands-on learning opportunities and makes science “real” and relevant to those they teach.
- 1 in 10 (n=11) provided more **general comments** about the importance of Citizen Science. It helps to break down barriers and build connections people to the world around them by bringing together science, knowledge, experience, passion, and new ways of thinking.

Importance to Survey Respondents

Fifteen respondents (14% of all survey respondents) commented on why Citizen Science is important to them personally. The following are selected examples of comments:

It has helped me to understand a lot more about how the world of people works and what the challenges and problems we're dealing with are all about, and how we might begin to solve them. Being involved with citizen science has definitely helped me learn more about my local environment than I would have without it.

I didn't become fascinated in the realm of science because of text books in school; it was through hands on learning and the wonderful science teachers I had that wanted us to get creative and try experiments on our own.

CS is important to me because it unlocks a lot of doors. It enable scientists to dream big when thinking about projects, it invites the public to be part of the process, it helps people understand their environment, and it helps people increase their understanding of science.

It's important to me to share the joy and fun and wonder of science, the excitement of discovery, the satisfaction of contributing to a larger project—arguably the biggest collaborative project in human history. It's important to me that non-professional scientists understand how science works. I want going out and doing a little science on the weekend to become as normal as soccer practice.

Importance to Citizens/the General Public

Thirty (30) respondents (28% of all survey respondents) commented on the importance of Citizen Science related to the general public. These comments did not specifically state ‘citizens who participated in citizen science’—the following did not specifically limit citizens or the general public to those who participated in their comments in their response wording. Mostly, these included the ideas that citizen science helps to broaden the public’s understanding and appreciation of the nature of science, engages the public and increases their sense of ownership regarding their environment, and contributes to the democratization of science. The following are selected examples of comments:

Citizen science is important for the democratization of science--making what is often invisible, visible, and what is often exclusive, inclusive. Science belongs to everyone.

It [Citizen Science] builds public understanding and appreciation of science, and helps connect communities to a better understanding of their place and the environment. It allows rigorous life-long learning for all ages in the sciences.

Importance to Citizen Science Participants

Thirteen (13) respondents (12% of all survey respondents) commented on why Citizen Science is important specifically to those who engage in Citizen Science projects. These comments included that it increases knowledge and understanding of science, contributes to personal investment and ownership of the scientific process, and results in persons feeling they are part of the scientific community. Most comments seemed to be by non-participants about participants, rather than by participants themselves. The following are selected examples of comments:

I have been developing citizen science programs for 27 years. It is a way to engage participants in active learning and contributing data to scientist and resource managers that they would not otherwise be able to collect.

CS is important to participants because it helps them have a better understanding of science. They learn how scientific research is performed, how data is collected, how information is shared, and that they can contribute to this process.

It [Citizen Science] is important to participants because they gain ownership of a project by being part of something so much bigger than themselves. They gain satisfaction knowing that they are an integral part of an important study. They also connect on a deep level to the resource, the place, and the objective.

Citizen Science is important because it involves the public. It engages the public through involvement, volunteerism, learning and discovery. Through these processes individuals develop a personal connection to what they are involved in and become stakeholders. These stakeholders then have a vested interest in contributing and making a difference.

For the students that our program serves, CS brings value, meaning and depth to the concepts and practices they learn about in the classroom. It makes them feel like a valued part of the scientific community. They are inspired by the work and for those that don't love science as a school subject, some are transformed by the experience and opportunity and have a new found love for science and the natural world.

Importance to Scientists

Seventeen (17) respondents (16% of all survey respondents) commented on why they believe Citizen Science is important to scientists. The following are comments represent the value of citizen science that respondents perceive for scientists:

Citizen Science is important to scientists because they can cover so much more ground, impact so many more people, gather so much more valuable data.

Citizen Science is important to scientists because it enables us to collect far more data than we would be able to on our own, and it helps us to get the message out to the public about science.

CS empowers the next generation of scientists to explore their curiosity and connect with network of other interested people

Citizen Science helps scientists get out of their ivory tower and interact and communicate with people

...in their study areas--thereby subtly changing their thinking about (and hopefully execution too) their research and what comes out of it.

Importance to Educators

Nine (9) respondents (9% of all survey respondents) commented on why Citizen Science is important to educators. The following comments represent the value of citizen science that respondents perceive for educators:

For educators, Citizen Science provides a rich, hands-on way of keeping things interesting in the classroom, acquiring and maintaining students' attention and interest in science, and of course, answering that question all kids ask, "when are we ever going to need this in REAL life?"

It is a very powerful way of showing that everyone can be involved in science and that science is not elitist.

Citizen Science gives students a reason to care about what they are studying, since it's grounded in a real scientific question (and perhaps the question was developed by the students themselves!).

General Importance

Eleven (11) respondents (10% of all survey respondents) provided more general comments about the importance of Citizen Science and the individuals' perceived value of the citizen science endeavor. The following are selected examples of comments:

Citizen science has great potential to advance science, to engage and to educate.

Too many of our problems are insurmountable without public understanding and support. Yet, we are more disconnect from nature and these issues than any time in human history. I see citizen science as a great connector; re-connecting is the only way that we can survive as a species.

Cit sci provides a means towards a better relationship between humans and the environment.

Because the planet is screwed unless we learn how to collaborate and work together. citizen science enables that possibility

Citizen science increases ownership of a scientifically based approach to enhance global sustainability.

Goals for the conference

The goals of the conference, in alignment with the goals of the Association, were presented to respondents to rank in order of importance to them individually and perceived importance to the field (the Citizen Science community). For all goals, the importance to the field exceeded the importance to the individual.

The highest ranking goal both for individuals and the field was the sharing of best practices. There was no statistically significant difference between individual and field for this item.. The second highest ranked item for individual was sharing different perspectives, again, no statistically significant difference between individual and field. , The second highest ranked item for importance to the field, however, was sharing innovations which had a statistically significant difference from the importance to the individual. Table 8 below shows the means, deviations (most of which were in an expected range), and significance (non-parametric paired t-test).

Table 8. Pre measure: Importance to me/field comparisons

	Important to Me		Important to the Field		Sig
	Mean	Std Dev	Mean	Std Dev	
Opportunity for interdisciplinary dialogue	5.85	1.46	6.18	1.17	.022
Sharing different perspectives	6.03	1.24	6.23	1.04	.095
Sharing best practices	6.35	1.12	6.55	.94	.078
Sharing innovations	5.99	1.30	6.28	1.06	.016
Building a framework for bridging citizen science and STEM education communities	5.33	1.73	5.88	1.34	.001
Building a framework for having citizen science effectively implemented in a variety of learning environments	5.24	1.64	5.89	1.34	.000
A research, development, and action agenda to support the framework	5.34	1.62	5.82	1.42	.000

A nonparametric mean comparison was conducted between importance for individual and importance for the field using Wilcoxon Signed Ranks test, based on negative ranks. Each importance item has a statistically significant difference between the lower means for the individual and the higher means for the field at $p < .01$. These findings could suggest that as a whole, people see the value for all these goals for the field. This value is especially obvious in the framework goals where there were inflated standard deviations with positive but not strong mean scores for the individuals which could indicate a broader spread of importance and multi-modality for individuals with clearly positive means with more narrow deviation for the field suggesting more uniform agreement.

In other words, all the goals are perceived as important across respondents with generally very strong agreement. There is a wider range of responses and statistically significantly lower mean

scores for importance to individuals which might suggest people do see value for themselves, but not across all the goals.

This finding was more evident in the post measure of importance to me/importance to the field measure where a statistically significant difference was found for all items using the Z score comparing the lower means across all items and higher deviations for most items for individual importance versus field importance (Table 9).

Table 9. Post measure: Importance to me/field comparisons

	Important to Me		Important to the Field		Z score	Sig
	Mean	Std Dev	Mean	Std Dev		
Opportunity for interdisciplinary dialogue	6.06	1.279	6.42	.977	-3.417	.001
Sharing different perspectives	6.01	1.191	6.22	1.121	-2.654	.008
Sharing best practices	6.20	1.112	6.54	.920	-3.586	.000
Sharing innovations	6.01	1.175	6.23	1.228	-2.567	.010
Building a framework for bridging citizen science and STEM education communities	4.76	1.936	5.63	1.302	-5.509	.000
Building a framework for having citizen science effectively implemented in a variety of learning environments	4.89	1.828	5.70	1.298	-5.302	.000
A research, development, and action agenda to support the framework	5.07	1.737	5.81	1.362	-5.564	.000

n=143

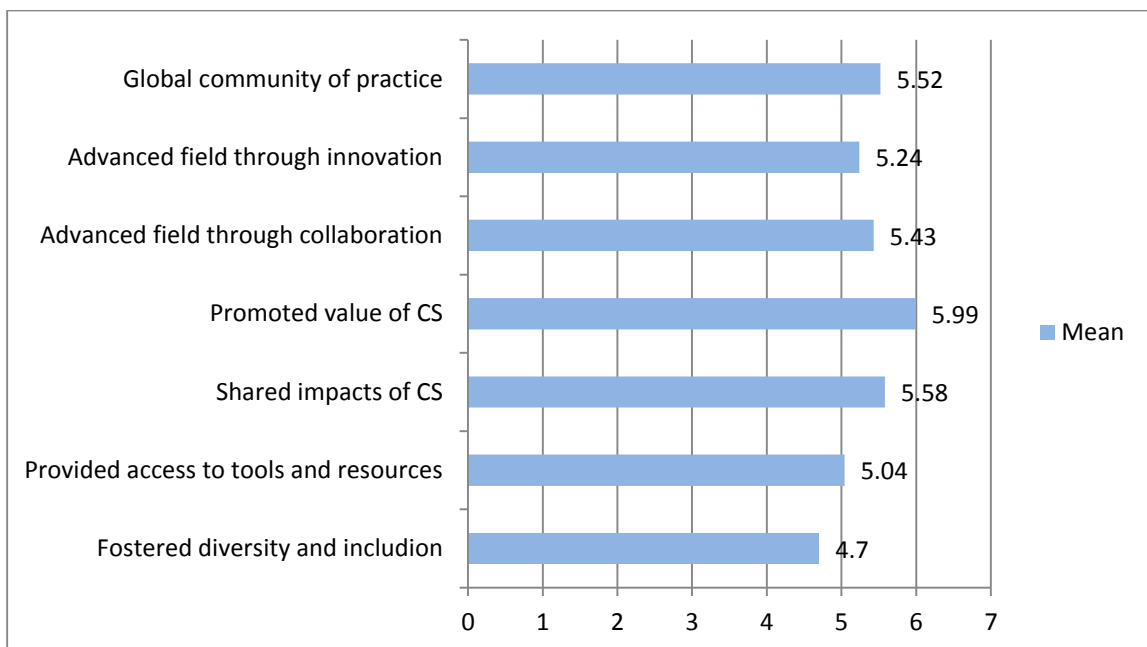
Using a Mann-Whitney U test, pre and post comparisons were made for both areas of importance to the individual and to the field (Table 9). There were statistically significant differences for the three frameworks questions in the decrease in mean scores from pre to post for individual importance. There was a statistically significant increase in importance to the field for interdisciplinary dialogue.

Table 10. Comparison pre/post: Importance to me/field comparisons

	Important to Me		Sig	Important to the Field		Sig
	Pre	Post		Pre	Post	
Opportunity for interdisciplinary dialogue	5.85	6.06	1.96	6.18	6.42	.002
Sharing different perspectives	6.03	6.01	.881	6.23	6.22	.517
Sharing best practices	6.35	6.20	.236	6.55	6.54	.340
Sharing innovations	5.99	6.01	.743	6.28	6.23	.995
Building a framework for bridging citizen science and STEM education communities	5.33	4.76	.000	5.88	5.63	.263
Building a framework for having citizen science effectively implemented in a variety of learning environments	5.24	4.89	.000	5.89	5.70	.179
A research, development, and action agenda to support the framework	5.34	5.07	.000	5.82	5.81	.589

The goals of the *Association* were also presented to respondents where they were asked to express the degree to which they believed the conference contributed to the goal (7 point scale). All means were positive, with the lowest being furthering the goals of fostering diversity and inclusion (4.70) and the strongest agreement being a very strong “promoted the value of citizen science” (5.99). All standard deviations were below expected, indicating slight kurtosis and general alignment of respondents’ scores. Table 11 below shows a comparison of the mean scores of the degree to which participants perceived goals being met.

Table 11. Chart: Degree to which the conference addressed goals of the Association



Means on a 7-point scale

The same question was asked on the delayed-post measure. For four of the goals, there was a slight decay (from .07 to .20). Three goals had slight gains, with providing access to tools and resources having the lowest gain of .07, following advancing the field through innovation with a .12 gain and sharing impacts of citizen science with a .21 gain.

In the pre-measure, the outcomes for the conference were seen as more important for the field than for the individual. Sharing Innovations, Sharing Best Practices, and Opportunity for Interdisciplinary Dialogue had extremely positive mean scores (\bar{x} =6.28, 6.23, and 6.18 respectively) and were all in the importance to the field scale. The three lowest mean scores were related to building frameworks, part of the goals for the Education strand, and research/development/action agenda as important to the individual (\bar{x} =5.24, 5.33, 5.34). All but two of the items (Sharing Different Perspectives and Sharing Best Practices) were statistically significantly different. Table 12 shows the pre-measure means, standard deviations, and measures of significance (z scores) using the Wilcoxon Signed Ranks Test based on negative ranks.

Table 12. Pre measure: Importance to me/field comparisons

	Important to Me		Important to the Field		Sig
	Mean	Std Dev	Mean	Std Dev	
Opportunity for interdisciplinary dialogue	5.85	1.46	6.18	1.17	.022
Sharing different perspectives	6.03	1.24	6.23	1.04	.095
Sharing best practices	6.35	1.12	6.55	.94	.078
Sharing innovations	5.99	1.30	6.28	1.06	.016
Building a framework for bridging citizen science and STEM education communities	5.33	1.73	5.88	1.34	.001
Building a framework for having citizen science effectively implemented in a variety of learning environments	5.24	1.64	5.89	1.34	.000
A research, development, and action agenda to support the framework	5.34	1.62	5.82	1.42	.000

The same items were presented to respondents of the post measure. As with the pre measure, mean scores were higher for importance to the field. For the post, all mean scores were statistically significantly different between importance to self and importance to the field. The highest mean scores were for importance to the field in Sharing Best Practices, (\bar{x} =6.54) Opportunity for Interdisciplinary Dialogue (\bar{x} =6.42), and Sharing Innovations (\bar{x} =6.23). The lowest mean scores were in importance to self and were slightly positive: Building a Framework for Bridging Citizen Science and STEM education (\bar{x} =4.76) and Building a Framework for Having Citizen Science Successfully Implemented in a Variety of Learning Environments (\bar{x} =4.89).

Table 13. Post measure: Importance to me/field comparisons

	Important to Me		Important to the Field		z score	Sig
	Mean	Std Dev	Mean	Std Dev		
Opportunity for interdisciplinary dialogue	6.06	1.279	6.42	.977	-3.417	.001
Sharing different perspectives	6.01	1.191	6.22	1.121	-2.654	.008
Sharing best practices	6.20	1.112	6.54	.920	-3.586	.000
Sharing innovations	6.01	1.175	6.23	1.228	-2.567	.010
Building a framework for bridging citizen science and STEM education communities	4.76	1.936	5.63	1.302	-5.509	.000
Building a framework for having citizen science effectively implemented in a variety of learning environments	4.89	1.828	5.70	1.298	-5.302	.000
A research, development, and action agenda to support the framework	5.07	1.737	5.81	1.362	-5.564	.000

n=143

In comparing the importance pre to post measures overall, there were no statistically significant differences between pre and post on any of the items. Table 14 (below) shows all mean scores and the variance of the significance measures from pre/post on importance to self and importance to the field.

Table 14. Pre/post comparison importance to self and to field

	Important to Me			Important to the Field		
	Pre	Post	Sig	Pre	Post	Sig
Opportunity for interdisciplinary dialogue	5.85	6.06	.242	6.18	6.42	.409
Sharing different perspectives	6.03	6.01	.052	6.23	6.22	.743
Sharing best practices	6.35	6.20	.490	6.55	6.54	.691
Sharing innovations	5.99	6.01	.667	6.28	6.23	.913
Building a framework for bridging citizen science and STEM education communities	5.33	4.76	.152	5.88	5.63	.411
Building a framework for having citizen science effectively implemented in a variety of learning environments	5.24	4.89	.202	5.89	5.70	.260
A research, development, and action agenda to support the framework	5.34	5.07	.531	5.82	5.81	.394

Importance in presenting at the conference

The plurality of respondents to this question (n=37 revealing tremendous decay from the prior question which had n=120) indicated they did not need to present in order to attend (15, or 41%). Ten (27%) needed to present in order for their organization to pay while an additional 22% needed to present so that the project would cover the cost. An additional 45 (11%) needed to present for academic reasons. This then shifts the majority to being 59% needing to present in some form in order to attend the conference.

Expectations and satisfaction

In the premeasure, respondents were asked what they were most hoping to “get” from the conference. One hundred ten (110) of the 133 (82%) respondents provided comments. Responses were clustered into the following themes. Some respondents provided multiple responses that are included under multiple themes.

Table 15. Open ended responses—what participants hoped to get from the conference

Responses	n
Networking	36
Insight into best practices in research and science education	19
Sharing work/exchanging ideas with other attendees	15
Opportunities to collaborate/partner with other science-oriented groups/organizations	9
Ideas for data management and dissemination	8
Strategies for motivating/engaging volunteers	7
Learning about various citizen science evaluation research	7
Learning more what CS is doing in the US and Europe	6
Becoming more familiar with current issues in science and research	6
Ideas for incorporating citizen science into K-8 classrooms	5
Ideas and strategies for engaging “regular” citizens in science	5
Ideas of sustaining CS programs	2
Learning about ways that people are using citizen science	2
Increased insight into how participants view their roles in research programs	1
Seeing CS developed as part of “community development” and matters of equity (voice)	1
Funding citizen projects and opportunities	1
Learning about initiatives that combine social and natural sciences	1
Improving and building partnerships between citizen science and researchers	1
Learning about evidence-based measures of program success	1
Ideas for projects that can be implemented outside the formal school setting	1
Standardized evaluation measures for meta-analysis	1

In the delayed post, participants were asked to reflect on what they felt was the most valuable aspect of the conference. In line with the above, the dominant response was networking, meeting others, or connecting with just under half the 113 comments including one of these terms. Some of these comments referred to discussing issues, research or infrastructure while others shared the

Becoming aware of the depth and breadth of citizen science across the many disciplines of science, from neurons to great-blue herons, from microbes to whales. Until you literally “meet” the people doing this work, it is easy to take it for granted or underestimate it.

Delayed post respondent

value of getting feedback on their work. A couple specifically mentioned the social lunches as “a great way to meet other people and find out more about their projects in a less formal setting.” Others found value in talking with others who have similar thoughts, questions, or types of efforts while another group saw value in meeting those from different backgrounds and different projects. There were also comments about working groups and updates as valuable to the respondents.

The second largest cluster of comments as dominant value from the conference surround the ideas of diversity of projects/programs, presenters, and topics. Many of these comments referred to the scale, purpose, scope, or breadth of citizen science as in the comment about the “mixture of scientific endeavors including citizen science in their efforts” and observation that “the field is broader than what I had previously understood.”

A third cluster coalesced around learning, exposure, or hearing from others. These folks talked about new tools, information, and the “chance to see what else is happening and hear the discussions that are occurring ABOUT citizen science.” One appreciated “all the knowledge acquired about other Citizen Science initiatives.”

A smaller group felt validated or affirmed. As one noted feeling “that what I do is important and valued.” Another expressed the sentiment that the conference was an “affirmation that what I do is important and valued, on a bigger picture. I took this validation back with me as motivation and a beacon to remind me why I continue on my career track, even though I don’t always receive the validation within my organization.”

The Education working group was/is awesome! And the forty-plus educators who joined us and shared their ideas and passions were wonderful and strongly committed to making sure we were proposing transformational and effective learning for all participants and partners...particularly within an equity lens.

Delayed post respondent

There were also respondents who felt the dominant value was about being ‘energized.’ For a few, it was being personally energized or inspired by programs and others. For a couple of others, it was about being energized as a field and the energy of the conference itself.

The final cluster that emerged was that of citizen versus scientist. For most of the individuals who included comments that fell into this theme, there was acknowledgement of ‘the other’ perspective:

Understand how scientists view the non-scientific citizen involvement in data gathering and the importance of established processes to validate the data/

Seeing the different views of citizen science and understanding the depth of pride non-scientists had in conducting scientific work.

There were a few comments that reflected how projects “demonstrated beautifully the contributions citizens can make to significant scientific projects.”

Perceptions of participants during the course of participation in the Education strand

A convenience sample of 35 persons who attended Education strand sessions for both days of the conference was asked several questions specific to the sessions of this strand.

Respondents indicated it would be important for the Education strand sessions to address practical ways and approaches to educating others about science (20%), how to ensure the quality of community generated data (20%), how to connect formal approaches of teaching science with informal approaches is important (17%), and how to address Next Generation Science Standards through informal science education (17%). Other comments that represented less than 10% of responses included how to engage culturally and racially diverse audiences in citizen science and how to work with classroom teachers in doing citizen science projects. Across both days of the conference, over half (51%) of respondents felt that the Education strand sessions were addressing these issues or anticipated they would, slightly less than half (49%) were “not sure.” Of those who were not sure, 20% of these were respondents from the first day of the conference who said they had not yet looked at the conference session descriptions to know or anticipate that sessions would address these issues.

Regarding what the respondents hoped to gain from attending the Education strand sessions, responses from the 35 Education strand attendees were similar to those collected by the survey, with the exception of networking opportunities. This might be a result of the question that asked what attendees thought was important specifically for the Education strand conference “sessions” to address, rather than the conference as a whole. Of the respondents, 29% indicated learning how to engage youth in citizen science projects, 23% said gaining insight into what citizen projects others are doing and available resources to implement such projects, 14% commented on wanting to hear specific strategies and tools for teachers and nonprofits to implement citizen science projects, and 14% on how university professors can effectively communicate and educate people outside higher education institutions about science concepts. Other responses included ideas of how to measure impact of citizen science projects (10%) and tools for youth to use to collect data (6%).

The respondents perceived that the value of the Education strand sessions of the conference to the field of Citizen Science included: 1) recognizing and promoting education as a tool for increasing awareness about citizen science (31%), 2) identifying and exploring strategies of educating and engaging youth to sustain science in the future (29%), 3) highlighting youth engagement in citizen science through their conference attendance and participation in session presentations (23%), and 4) more effectively communicating scientific data and convincing skeptics that community generated data are valid and reliable (17%). It was also not always clear if respondents were interpreting “citizen science” as referring to the Association or to the broader endeavors of the field. Some conference attendees commented that the Education strand sessions seemed to focus almost exclusively on kindergarten through 12th grade student education and excluded adult learning.

Aspects of the conference

Over eighty-one percent (81.8%) of the respondents (n=137) attended only the Citizen Science Conference and not the American Association for the Advancement of Science (AAAS) conference that immediately followed. Connecting to another conference is only slightly important for most of the respondents with means for most responses being just above the neutral of 3 (on the 5 point scale). The median was neutral on all five items and all the items excepting preference for being with a different conference exhibited kurtosis, again supporting the position that generally, there is no strong preference around the Citizen Science Conference associating with any other conference. Interestingly, the most near normal distribution was for a preference with a different conference, suggesting those who went to both Citizen Science and AAAS conferences probably like having these conferences joined while others identified conferences more aligned with their usual attendance.

Table 16 below shows the means, standard deviations (all within expected range) and kurtosis for the five items.

Table 16. Mean and distribution of preferences for conference connections

	Mean	Std Dev	Kurtosis
I like having Citizen Science conference connected to another conference	3.53	.866	.775
It is good to hold the CS conference in conjunction with the AAAS meeting	3.36	.813	-.355
I think the Citizen Science meeting should be on its own	3.01	.956	.317
It does save me money to have two conferences together	3.10	.999	.317
It makes no difference to me if the CS conference is connected to another conference or not	3.35	1.043	.297
I would prefer CS conference to be with a different other conference	2.93	.726	-.781

n=141

The post-measure conference survey provided an opportunity for conference attendees to communicate anything they want the Association leadership and the conference planners to know about their conference experience. Responses were so varied that relatively few clear themes emerged across responses except that approximately 40% of survey respondents specifically indicated they thought the conference was great, with approximately 13% commenting there were too many sessions offered at the same time that did not allow for attending all sessions of interest.

Table 17. Open ended responses—Post Conference feedback

Responses	n
Overall Conference Experience	
Conference was great	31
Appreciated hard work of conference committee and planners	15
Conference Tone	
“Anti-scientist” sentiment existed as a result of the non-scientist empowerment dialogue	3
Appreciated citizen science taking a social justice role	1
Conference Organization/Structure/Sessions	
Too many concurrent sessions offered at the same time	10
Desire to have longer conference, last 3 days	7
Liked the speed-talks, especially for late in the day when energy is low	4
Liked the opportunities and amount of time for networking	4
Would have liked more opportunities and time to network	4
Too many sessions were merely “story-telling” without data and evidence of academic rigor	3
Would like to have had more practical, hands-on, tools about teaching and learning best practices	3
Would have liked more sessions about working with data, quality strategies, management, analysis, dissemination, and application	2
Have conference sessions specifically for volunteers	2
Felt that the conference content seemed too heavily focused on education and diversity	2
Conference Facilities	
Did not like that some conference sessions were held on opposite sides of the conference center	4
Conference facility was difficult to navigate and find session rooms	4
Conference facility was too cold	2
Conference Logistics/Process	
Technical difficulties (computer, sound, PowerPoint) during some sessions were distracting	4
Cost of conference registration was too much	4
Experienced lack of communication with conference coordinator (un-returned emails)	2
Too many room changes	2
Would like to have had more informal social gatherings	1

n=78

Activity following the conference

Of the 106 conference attendees who completed the post conference follow-up survey, almost two-thirds (**n=65**; 61% of all survey respondents) provided comments about what they did after

attending the conference. Individual comments were analyzed and summarized by the following categories: they built collaborations; critically examined their own work/improved practice; networked; shared things they learned at the conference; and conducted evaluations.

Overall Findings:

Of those who completed the survey and provided comments:

- Almost 1 in 5 commented that after attending the conference they collaborated with other conference attendees on citizen science related projects. (1 In 3 indicated on the survey they fully intend to do so)
- Almost 1 in 6 commented about taking time after the conference to reflect on their own practices for improvement. (1 in 4 indicated on the survey they fully intend to do so)
- Approximately 1 in 7 provided comments about networking with other conference attendees during and after the conference. (1 in 3 indicated on the survey they fully intend to do so)
- Approximately 1 in 10 indicated sharing information they learned at conference with colleagues and other persons who did not attend the conference. (1 in 3 indicated on the survey they fully intend to do so).

Built Collaborations

Eighteen (18) respondents (17% of all survey respondents) provided comments about building collaborations. Most of these were examples of connections conference attendees made during the conference that later resulted in collaborative projects. The following are sample responses.

I met people (from my own state!) who ended up developing a grant project for their own audience using my citizen science/education program. It's a perfect fit for collaborating and we probably wouldn't have met or connected if not for the conference.

Building collaborations has been incredibly useful. I'm planning three upcoming trips and will meet with CSA participants on all (two are actually for pleasure, but I still want to use the time to foster relationships).

I am trying to promote ethics training and have collaborated with other academic professionals in doing this. Our team reached out to the CSA for more networking and outreach.

Critically Examined Own Work/ Improved Practice

Seventeen (17) respondents (16% of all survey respondents) provided comments about critically examining the work they do to improve their practice. Most comments described rethinking the nature of citizen science and using new insights to guide their practices. The following are sample responses.

I had conversations with people I met at the conference about developing new ways of thinking about citizen science.

I have been sharing with many colleagues the idea of putting scientists in the passenger seat, rather than the driver's seat, for citizen science projects, and I believe that has been a very valuable sentiment to share. I have also reached out to one of the other presenters in my session for details about their instrumentation and some advice in troubleshooting my own, which was very helpful!

I have reflected on my own citizen science project to keep improving it through the years.

I reflected on how my work can be more "scientific"

Networked

Fifteen (15) respondents (14% of all survey respondents) provided comments about networking opportunities they engaged in during and after the conference, with approximately half of the comments described how networking resulted in collaborative projects with conference attendees. The following are sample responses.

Began networking. Yes. Made it a point to try to meet people, and have kept in touch with some of them.

I've been networking with new people thanks to the meeting, which has resulted in my being included as a collaborator on some new grants and has improved my access to resources that others have developed. I've also shared a lot of my own resources with others since the meeting. The networking opportunities afforded by the meeting were truly excellent.

I've done a lot of networking/consulting with other people in museums that I met at the conference about how to engage people in urban biodiversity citizen science.

Shared Learning

Eleven (11) respondents (10% of all survey respondents) provided comments about sharing information they learned from the conference with colleagues and other persons who did not attend the conference. The types of sharing included formal and informal conversations, brown bag lunch discussions, implementing on-going approaches and venues to discuss implications of citizen science, and using social media. The following are sample responses.

Four other museum staff and I attended the conference. After the conference we presented a brown bag lunch about our experiences. Some of us also met with our executive staff to debrief about the conference. We have created a citizen science working group, to help move our program forward.

I discussed citizen science with my students after I got back and it enriched my class. It has also enriched my ongoing research and interactions with colleagues to be able to say "This xyz is happening, and I know so because of the CitSci 2015 conference."

I have published a blog post about my experience at the CSA conference, and have shared personal information one-on-one with other people. I continue to write (as a journalist) about different science in which citizens play a major role.

Evaluation

Eight (8) respondents (8% of all survey respondents) provided comments about their evaluation efforts. Most comments described new efforts, jumpstarting previously planned efforts, or improving current evaluation practices after attending the conference. The following are sample responses.

We are in the process of evaluating our project which hasn't been done in depth since 2003. The CitSci conference highlighted the importance in evaluating and the value of evaluation!

We have moved into a professionally developed evaluation tool for our citizen science project. Funds have been secured and a project manager has been hired to capture the essence, pros and cons of the students/parents/community members we serve.

I have gone through some of the evaluation resources I learned about at the conference. I am getting started on evaluation, so it was useful to see examples.

Reflections on the conference

For any conference, what the participants recall of the meeting after some time has passed that best indicates what worked and what might be enhanced for future conferences.

Of the 106 conference attendees who completed the post conference follow-up survey, slightly more than one-third (n=41; 39% of all survey respondents) provided comments and/or recommendations for the next conference in 2017. Often these comments were provided as feedback on the 2015 conference (i.e., what they liked and did not like) and suggestions for continuing or changing these identified aspects. Individual comments were analyzed and summarized in four categories: positive feedback on the 2015 conference; conference presentations/content; conference structure/organization; conference participants.

Overall Findings:

Of those who completed the survey and provided comments:

- Approximately 1 in 10 specifically provided positive feedback and comments about their 2015 conference experience.
- About 1 in 10 suggested having more time and opportunities at the 2017 to network
- About 1 in 10 made suggestions about conference presentations that included ensuring they end on time as scheduled, are more interactive and hands-on, and information provided and discussed is transferable beyond the specific project presented.
- About 1 in 10 made suggestions about the conference structure/organization that included offering half-day and full-day preconference workshops that provide more skill development and in-depth information on a specific topic, expanding the time of the poster session, continuing the Education and Diversity tracks, and more time for conference attendees to “digest” and process information shared.
- About 1 in 10 commented they want to see more diversity of conference participants, not only racially and ethnically, but also geographic representations, age, areas of practice, experience, and perspectives.

Positive Feedback on the 2015 Conference

Ten (10) respondents (9% of all survey respondents) provided positive feedback comments about the conference. The following are sample responses.

I thought the conference was both useful and enjoyable.

Thank you for all the amazing sessions, posters, people, etc that took an incredible amount of hard work by many!!!!!!!!!!!!!!

I thought the 2015 conference was exceptional and hope it will be recreated with the same thoughtfulness, energy and commitment, in a great setting that will also be inspiring

Keep building on the tremendous energy and excitement!

Networking

Eleven (11) respondents (10% of all survey respondents) provided comments that indicated a desire to have more time and opportunities to network at the 2017 conference. Following are a sample of responses that included such opportunities.

More networking, with structured goals

More time to network, more networking sessions or meals for people in similar fields, networking for students.

Longer talks, or sessions that are for an entire morning where topical C.S groups can network, discuss successes and work in collaboration

Help to arrange meet-ups in the evening so folks have people to go for dinner with.

Conference Presentations/Content

Ten (10) respondents (9% of all survey respondents) provided comments regarding the conference presentations. The following provide a sense of the range of comments.

The sessions were jam packed. If a session ran over (even just 3-5 min) it affected the next sessions since the schedule was so crammed. Speakers kept going despite moderators telling them they were out of time or they were cut off/stopped, but you were left without hearing the full presentation.

I found the presentations diverse and helpful, but would like to see them more balanced with small interactive groups revolved around specific topics.

I think too many of the sessions were about individual project accomplishments, but very little was applicable to the broader community. In the future the conference coordinators should be stricter about not accepting projects that don't have any results

More time for presentations and less for symposiums; More emphasis on projects and less emphasis on evaluating projects.

More breakout groups for specific areas of CS. Not as many "sit and listen to presenters".

Conference Structure/Organization

Ten (10) respondents (9% of all survey respondents) provided comments regarding the conference presentations. The following are sample responses.

Continue to have Diversity and Education strands.

Many of my fellow attendees commented that we did not have "time" to mull over what we learned and dialogue and compare with each other. Fewer panels - but more time between them for the exchange of ideas with others in audience.

I think it would be so valuable to have workshops in addition to presentations at the conference. Universal topics like how to design a data entry system for volunteers, how to recruit volunteers, how to use social media effectively, maybe science communication/interpretation, data visualization for non-scientists, designing curricula, etc. There are a million possibilities. But having a time where experts on those topics present what they know, along with resources and references, and then participants get time to ask questions, interact with others, etc. I think this would be really valuable. Even more so than hearing presentations!

The poster session is so important in my opinion. It's the best opportunity for networking and for learning about the broad diversity of projects out there. Please break the poster session up into at least two sessions so that everyone can see all the posters and so that people presenting posters can circulate, too. It will be more effective and less overwhelming that way. It seemed to work well that way at the 2012 conference.

Conference Participants

Ten (10) respondents (9% of all survey respondents) survey provided comments regarding conference participants. Most of these comments focused on a desire to see more diversity of the conference participants, not only racially and ethnically, but also geographic representations, age, areas of practice, experience, and thought. Some of the comments included:

I expect a more inclusive conference in terms of geography and disciplines. Better emphasis on getting more diverse representation

Diversity was lacking at this conference. I think diversity can be increased if we have more of the citizen science participants attending and presenting at the conference in 2017.

I really do hope you include the citizen scientists --- there were so few at the conference. Being one myself, I felt we were mostly invisible. Right now, it is my opinion that it is a one way conversation amongst the researchers. I am not convinced the data gatherers are respected and valued as much as they should be.

I think it would interesting if you could come up with a scholarship fund for kids of all ages to be able to come to the conference and see what kind of projects there are in Citizen Science and be able to meet scientists.

Implications

Citizen Science is a broad and diverse endeavor with many facets and foci. Given this context, it is not surprising there was not convergence around a single priority and also reflected in the disparity between what the individual feels they need, and what they see as important for the field. The strength of agreement on the goals for the field is important for the Association and moving forward, Citizen Science Association should strive to keep the focus of the Association and the conference on the broader work of the field versus the work done by the individual.

- As with most conferences, there is an ongoing challenge between many options and too many competing sessions of interest. There is support for Citizen Science Association to continue to experiment with approaches and to take advantage of the nature of the field itself to experiment with doing a conference differently. There is also the possibility to continue to experiment with the structure of the conference both in affiliation and in the way the conference is conducted and to broaden the field through example (e.g. having youth present and presenting).
- As is often noted in other conferences, conference attendees were not clear about the conference strands. Those who did value them suggesting it might be worthwhile to make the conference strands sessions more clearly identifiable, either by color-code, block scheduling, or some other identification.
- The Education Strand of sessions were perceived by some conference attendees to focus almost exclusively on kindergarten through 12th grade student education and exclude adult education. Going beyond the data, but building on suggestions from respondents, shifting the language from “education” which many interpret as schooling to something more lifespan and learning focused (e.g. Adult and Youth Learning strand). There was some interest expressed in including more workshop sessions on adult learning, incentives for engaging adults in learning, and possibly teaching adults how to teach youth about Citizen Science concepts.
- We found there was tension between academic and non-academic engagement in and use of citizen science. This is not a new finding, but it does suggest this issue is not being addressed in such a way as to turn the tension to a strength of the field.
- There continues to be tension between scientific use and educational use of citizen science and it is important to continue to stress the continuum of use and to highlight exemplary programs at different discreet points along the continuum.
- A major value of the conference is attendees ability to network . To that end, it is valuable to continue to provide ample time and opportunities outside conference sessions for attendees to network and to continue to creatively determine ways to offer formal and informal social events during the conference.
- The conference facility can have a significant impact on attendees’ experience and decision to return for future conferences and events. Comments suggest that attendees want to have

conference session locations that are easy to find and that travel time between sessions is minimal, especially given the rapidity of the sessions.

Conclusions

Overall, the conference appears to have met its goals. Participants felt very positive about the conference and about the field of Citizen Science, there was a sense of reinvigoration and commitment moving forward, and there is evidence of follow-up activity by individuals after the conference. Specifically addressing the questions guiding the evaluation of the conference:

1. Who are the participants and do they represent the breadth of the field of citizen science?

The participants are somewhat diverse in that they cover range of positions, purposes, and “homes” of citizen science programs. Geographic and type of program focus are diverse.

2. How relevant were the strands for the participants?

The strands for the conference were used in the solicitation for papers and posters to ensure topics the Board thought were important were addressed. The intention was the strands would be used to help individuals navigate the many concurrent sessions. In the findings, the strands were seen as relevant, by the respondents, but were not, for many of them, meaningful. This is in part due to the complex, competing interests of the participants and the multiple roles and needs many of the participants bring to the conference and hope to get from the experience.

3. How important were the goals for the conference for the participants? For the field?

The goals were seen as important for the conference participants, but more important and uniformly more important for the field. This finding speaks to the breadth of motivation for participation in citizen science, the breadth of utility to science and people of the work of citizen science, and the breadth of topics addressed through citizen science projects.

4. How important is presenting for conference participation?

Conferences vary on the need to present to support attendance. As this is the first measure for this conference and Association, it is important to note that over half (59%) of respondents noted that presenting was important for them to be able to attend. This information will be important in planning future conferences to ensure there are ample and different opportunities for individuals to make contributions to the conference.

5. What are expectations of participants and are those expectations satisfied?

Consistent with prior findings, the dominant expectations coming into the conference, immediately after the conference, and remaining as important several months after the conference include networking, skill building, and obtaining new insights. These expectations were met through the conference.

6. Do perceptions of participants change during the course of participation?

Generally, in this conference, perceptions did not change much during the course of the conference. Some individuals enter with broad goals or interests and get clarity in what they need/want from the conference as it progresses. Those coming with clear intentions/expectations seem to seek out those experiences offered by the conference to get these expectations met.

7. What is the process of engagement in a single strand of the conference?

The strand, specifically the Education strand, makes sense as an organizing tool for the conference. Approximately half the interviewees from this strand intentionally engaged in the education strand as the overall topic of education relates to their professional work. About a quarter attended based on individual curiosity about the strand, and the other quarter choose to attend based on the conference program description of a particular session.

8. Does coupling the conference with another benefit the participants?

There is a slightly positive, benefit to participants, but overall, not very important to the participants for the conference to be aligned with another conference.

Appendix A: Pre-measure

Note: This is a downloaded version of an online questionnaire and does not reflect the formatting nor does it include the embedded skip logic.

Citizen Science Association conference pre-measure

Greetings! On behalf of the planning committee, we appreciate your completion of this short questionnaire which will help us be better aware of the needs of the participants. We look forward to seeing you very soon in San Jose!

Recognizing that you may be involved in citizen science in multiple ways, which choice BEST describes the nature of your involvement with citizen science?

- I am paid to work in the citizen science field as my full time job
- I am paid to work in the citizen science field as part of my job or as a part-time job
- I incorporate citizen science occasionally within my job activities
- My work in citizen science is unpaid/volunteer work that is directly related to my job/profession
- My work in citizen science is unpaid/volunteer work that is unrelated to my job/profession
- I am a student involved in citizen science

Please choose up to three of the following statements to describe your role or roles in citizen science

	Primary Role	Secondary role (optional)	Additional roles (optional)
I coordinate, direct, or manage a citizen science initiative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I conduct scientific research that relies on citizen science volunteers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I conduct educational or social science research about citizen science	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I conduct evaluations of citizen science projects	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am a volunteer participant enrolled in one or more citizen science initiative/s	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I conduct independent or Do-It-Yourself research	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am an educator who uses citizen science in teaching	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I provide educational support to one or more citizen science initiatives (e.g. curricula, trainings)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I provide communication support to one or more citizen science initiatives (e.g. online, social media)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I provide scientific support for one or more citizen science initiatives (e.g. protocol development, data analysis)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I provide technological support for one or more citizen science initiatives (e.g. database management, tool development, web/app design)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I provide networking and/or support services for leaders of citizen science initiatives	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I participate in a way other than those listed here (please specify below)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If you participate in a way not listed above, please share details here!

What sector(s) best describe the "home" for your involvement with citizen science ,if any? If more than one, please indicate up to three sectors.

	Primary sector	Secondary sector (optional)	Additional sector (optional)
Federal government	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
State/Provincial government	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Local government	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Academia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
K-12 Education	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Informal science education	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Site-based NGO (science center, botanical garden, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Non site-based NGO	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Private industry	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Philanthropy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Varied institutions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (describe below)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If you indicated your involvement is with a different sector, please describe briefly.

How long have you been engaged in Citizen Science?

- Have not yet
- Less than 1 year
- 1-3 years
- 4-10 years
- More than 10 years

What age group do you work with/plan to work with MOST in your citizen science program?

- Children
- Teens
- Young adults
- Adults
- Seniors
- Primarily adults but youth are also involved
- Primarily youth but adults are also involved
- Family groups

What are you most hoping to “get” from this workshop?

There are six conference strands for this year's conference. We would like to see how interested you are in each of the strands. If you are not at all interested, you'd choose a 1. If the strand is something in which you have the most interest, you'd choose a 7.

	Not at all interested	2	3	4	5	6	Most interested
Best Practices for Designing, Implementing & Managing CS Projects & Programs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Broadening Engagement to Foster Diversity & Inclusion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Digital Opportunities and Challenges in Citizen Science	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
\Making Education and Lifelong Learning Connections	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Research on and Evaluation of the Citizen Science Experience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tackling Grand Challenges and Everyday Problems with Citizen Science	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The coordinating committee desires several outcomes for the workshop. We would like to see how important each of these is to you, and how important you believe it is to the Citizen Science community. On the left, let us know how important it is to you, personally, by ranking each item a 1 (if it is not at all important) to a 7 (if it is very important). On the right side, using the same scale, tell us how important you believe it is for the Citizen Science Community.

	Important to me							Important for the Citizen Science Community						
	Not at all important	2	3	4	5	6	Very important	Not at all important	2	3	4	5	6	Very important
Opportunity for interdisciplinary dialogue	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sharing different perspectives	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sharing best practices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sharing innovations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Building a framework for bridging citizen science and STEM education communities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Building a framework for having citizen science effectively implemented in a variety of learning environments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A research, development, and action agenda to support the framework	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Are you presenting at this year's conference?

	Yes	No
I am presenting a paper	<input type="radio"/>	<input type="radio"/>
I am on a panel	<input type="radio"/>	<input type="radio"/>
I am presenting a poster	<input type="radio"/>	<input type="radio"/>

How important was your presenting at the conference in allowing you to participate? Check any/all of the statements that you agree with that might apply.

- I need to present in order for my organization to pay for my attendance
- I need to present so that my project will cover the cost of attending
- I need to present for academic reasons
- I do not need to present in order to attend

So we can avoid repeating some of these questions on the post-conference feed-back form, please provide a "code" for yourself to use on that form. (some people use the last 4 digits of their phone, their birthdate, or something like that)

- ____ Code number/letter 1
- ____ Number/letter 2
- ____ Number/letter 3
- ____ Number/letter 4

Thank you for your time and we'll see you in San Jose!

Appendix B: Process and Immediate Post Measures

Education Strand rolling interview schedule

NAME:

DATE:

Time:

Put sticker on nametag so remember who not to interview again.

Hi! I wondered if I could take just a minute of your time to get you to answer a few questions about the Education strand? Thanks!

What do you think is important for the discussions in the strand to address?

Do you see those discussions happening (or anticipate them happening)?

What do you hope to get out participation in the education strand?

What do you think is important for Citizen Science as a field to get out of the education strand?

Thanks!

Note: this is a download of the on-line questionnaire and does not accurately reflect the formatting nor does it include the embedded skip logic.

Citizen Science Association 2015 conference post measure

Greetings! We hope you had a productive and rewarding time at Citizen Science 2015 and a good trip home! To help the Association move forward, we would love to get some feedback from you about the conference and your experience.

You may have noticed there were six conference strands for this year's conference. Knowing that you may have focused on one or more strands, or that you might have used the strands for planning which talks or sessions you attended, please let us know how valuable the strands in which you participated (went t sessions) were to you. If the strand did not provide value to you, you'd choose a 1. If the strand provided great value to you, you'd choose a 7. If you did not participate in a strand, you'd check the last column.

	Did not provide value to me	2	3	4	5	6	Was tremendously valuable to me	Did Not Participate in this strand
Best Practices for Designing, Implementing & Managing CS Projects & Programs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Broadening Engagement to Foster Diversity & Inclusion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Digital Opportunities and Challenges in Citizen Science	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Making Education and Lifelong Learning Connections	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Research on and Evaluation of the Citizen Science Experience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tackling Grand Challenges and Everyday Problems with Citizen Science	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

What was a highlight of the conference for you?

The coordinating committee desired several outcomes for the conference overall and for some strands in particular. We would like to see how important each of these is to you now that the conference is concluded, and how important you believe it is to the Citizen Science community. On the left, let us know how important it is to you, personally, by ranking each item a 1 (if it is not at all important) to a 7 (if it is very important). On the right side, using the same scale, tell us how important you believe it is for the Citizen Science Community.

	Important to me, personally							Important for the Citizen Science Community						
	Not at all important	2	3	4	5	6	Very important	Not at all important	2	3	4	5	6	Very important
Opportunity for interdisciplinary dialogue	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sharing different perspectives	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sharing best practices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sharing innovations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Building a framework for bridging citizen science and STEM education communities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Building a framework for having citizen science effectively implemented in a variety of learning environments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A research, development, and action agenda to support the framework	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

From the prior conferences, several outcomes seemed important for participants. Please think about your expectations coming to the conference AND how satisfied you were with the opportunities afforded you by the conference experience. For each item, rate your level of expectation on the left and satisfaction on the right using the same scales as above.

	Expectations coming in							Satisfaction						
	None	2	3	Neutral/No expectation	5	6	Very high	Not at all	2	3	Neutral/No expectation	5	6	Completely
Opportunities for networking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Getting to know new people	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learning new ideas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sharing my experiences	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Revitalized/re-energized about Citizen Science	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insights into making my program more diverse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Furthering the work of the field of Citizen Science	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The following are the goals of the Association. How well do you think the conference moved them forward?

	Did not do this well at all	2	3	4	5	6	Did this very well
Helped establish a global community of practice around citizen science	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Advanced the field through sharing innovation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Advanced the field through fostering collaboration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Promoted value of citizen science	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Shared impacts of citizen science	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Helped provide access to tools and resources that foster best practices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Helped foster diversity and inclusion in the field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The Citizen Science conference was scheduled beside AAAS as a way to reduce costs for some participants. Which of the following best describes your participation?

- I attended only the Citizen Science Conference
- I attended both conferences

The Citizen Science conference was scheduled as a pre-conference workshop to the AAAS annual meeting. We are interested in discovering if you think this or some other option is a good idea. For each of the following, please let us know how strongly you agree or disagree with each statement.

	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
I like having Citizen Science conference connected to another conference	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is good to hold the CS conference in conjunction with the AAAS conference	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think Citizen Science meeting should be on its own	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It does save me money to have two conferences together	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It makes no difference to me if the CS conference is connected to another conference or not	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would prefer CS conference be with a different other conference	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

What conference would you recommend?

Prior to the conference, you were asked to create a code for yourself. Do you have a code?

- Yes
- No

Enter the code you created for yourself here:

- ____ Code number 1
- ____ Number 2
- ____ Number 3
- ____ Number 4

So we can avoid repeating some of these questions on the follow-up form, please provide a "code" for yourself to use on that form. (some people use the last 4 digits of their phone, their birthdate, or something like that)

- ____ Code number 1
- ____ Number 2
- ____ Number 3
- ____ Number 4

Recognizing that you may be involved in citizen science in multiple ways, which choice BEST describes the nature of your involvement with citizen science?

- I am paid to work in the citizen science field as my full time job
- I am paid to work in the citizen science field as part of my job or as a part-time job
- I incorporate citizen science occasionally within my job activities
- My work in citizen science is unpaid/volunteer work that is directly related to my job/profession
- My work in citizen science is unpaid/volunteer work that is unrelated to my job/profession
- I am a student involved in citizen science

Following is a list of roles in citizen science. Some people have one role, others play many roles. Thinking about your work in citizen science, select up to three roles you play. Please select ONLY the roles with which you most are engaged up to three (3).

- I coordinate, direct, or manage a citizen science initiative
- I conduct scientific research that relies on citizen science volunteers
- I conduct educational or social science research about citizen science
- I conduct evaluations of citizen science projects
- I am a volunteer participant enrolled in one or more citizen science initiative/s
- I conduct independent or Do-It-Yourself research
- I am an educator who uses citizen science in teaching
- I provide educational support to one or more citizen science initiatives (e.g. curricula, trainings)
- I provide communication support to one or more citizen science initiatives (e.g. online, social media)
- I provide scientific support for one or more citizen science initiatives (e.g. protocol development, data analysis)
- I provide technological support for one or more citizen science initiatives (e.g. database management, tool development, web/app design)
- I provide networking and/or support services for leaders of citizen science initiatives
- I participate in a way other than those listed here

If you participate in a way not listed above, please share details here!

What sector(s) best describe the "home" for your involvement with citizen science, if any? Check only one from the first column. If more than one, please indicate up to two more, with one check in each column.

	Primary sector	Secondary sector (optional)	Additional sector (optional)
Federal government	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
State/Provincial government	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Local government	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Academia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
K-12 Education	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Informal science education	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Site-based NGO (science center, botanical garden, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Non site-based NGO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Private industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Philanthropy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Varied institutions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (describe below)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If you indicated your involvement is with a different sector, please describe briefly.

How long have you been engaged in Citizen Science?

- Have not yet
- Less than 1 year
- 1-3 years
- 4-10 years
- More than 10 years

What age group do you work with/plan to work with MOST in your citizen science program?

- Children
- Teens
- Young adults
- Adults
- Seniors
- Primarily adults but youth are also involved
- Primarily youth but adults are also involved
- Family groups

And finally, is there anything you want the Association leadership and/or the conference planners to know?

Thank you very much! Your responses will be very helpful as we move forward.

Appendix C: Delayed Post Measure

Citizen Science Association post conference follow up

Greetings! It's hard to believe it's been three months since we were in San Jose for the first conference of the Citizen Science Association. If your world is like ours, much has happened and days have blurred in the time since we met. We'd greatly appreciate your taking just a few minutes and reflecting back on those important, busy days in San Jose. Please note, you will be able to go back to a previous page and if you stop partway through, you can return to finish later. Your responses are anonymous and the evaluator has no way of tracking responses to any individual. If you have a problem while completing the questionnaire, contact Joe Heimlich at jheimlich@cosi.org.

Reflecting back, what was the most valuable aspect of the conference for you?

For the following, please think about your expectations prior to the conference and how satisfied you are with the opportunities afforded by the conference experience. For each item, rate your level of satisfaction. A 1 would be not at all and a 7 would be completely.

	Satisfaction						
	Not at all	2	3	4	5	6	Completely
Opportunities for networking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Getting to know new people	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learning new ideas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Time to share my experiences	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Revitalized/re-energized about Citizen Science	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insights into audience building	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insights into diversifying my program audience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Furthering the work of Citizen Science as a field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The following are the goals of the Association. Thinking back, how well were each of these addressed in the conference program and events?

	Not well at all	2	3	4	5	6	Very well
Establish a global community of practice around citizen science	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Advance the field through sharing innovation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Advance the field through fostering collaboration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Promote value of citizen science	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Share impacts of citizen science	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Help provide access to tools and resources that foster best practices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Help foster diversity and inclusion in the field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

It is often the case that we leave with good intentions, but time gets away from us. Following are several statements related to different things individuals intended to do once they left the conference. On the left, to what degree have you done any of these things since the conference? On the right, to what degree are you intending to do any of these?

	Have done this							Intend to do this						
	Not at all	2	3	4	5	6	Very Much	Not planning to at all	2	3	4	5	6	Fully Intend to
Network with other participants	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Send information to specific individuals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Request information from specific individuals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Share things I learned at the conference with other colleagues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Critically examine my work/program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Try something new I learned at the conference	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Build a collaboration with someone I met at the conference	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Conduct more evaluations of my project	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If you've done some of these, what did you do and was it of value? How so?

We'd love for you to get philosophical for a moment, and share with us why/if you think Citizen Science is important. Why is it important to scientists? to educators? to participants? Why is it important to you?

Since the conference, there have been requests to the organizers to better describe those who were part of the conference as well as a desire to track how the field changes into the future, To that end what follows are several questions to try to get a sense of the diversity of those who participated. If you are uncomfortable with any question, you can skip it and go to the next. Again, these data are being used only to describe the richness or lack of richness of diversity of those who participated in the conference.

What is the primary discipline (or disciplines) in which you engage with Citizen Science? Check those that apply.

- Astronomy
- Biochemistry
- Climatology
- Conservation biology
- Ecology
- Economics
- Engineering
- History
- Library science
- Public health
- Social sciences
- Other _____

In what country do you reside (your permanent home)?

On the conference pre-questionnaire and on the post-conference feedback form, you were asked to create a code for yourself. Do you remember your code?

- Yes
- Did not create one
- Don't remember

Enter your code here

In what sector do you engage with Citizen Science? Check those that most apply.

- Federal government
- State government
- Local government
- Higher education
- K-6 education
- 7-12 education
- Informal science institutions
- Site based environmental organization/NGO (nature center, botanical garden, etc)
- Non-site based environmental organization/NGO
- Private industry
- Philanthropy
- Other _____

How many years have you been in the field of Citizen Science?

- Have not yet
- Less than 1 year
- 1-3 years
- 4-10 years
- More than 10 years

What is your highest level of education?

- Some high school
- High school diploma
- Some college
- Associates or technical degree
- Bachelor's degree
- Master's degree
- Professional degree
- Ph.D. or Ed.D

Which of the following are terms you would use to describe yourself? Please check all that apply.

- Hispanic/Latino/a
- American Indian
- Alaskan Native
- First Nations
- Native Hawaiian/Pacific Islander
- Other Indigenous Group
- White/caucasian
- Asian-American
- Black/African American
- Multiracial
- Asian
- African
- Other _____

Are you:

- Male
- Female
- Trans

Do you identify as LGBT+?

- Yes
- No

Do you have any other comments to make or recommendations for the 2017 conference?

That's all! Thank you very much for your time and your commitment to Citizen Science!