Public Participation in Scientific Research: 2012 Conference Evaluation

Prepared for:
The Organizing Committee

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Contents

PPSR Conference Evaluation 2012

Background

The overall goal of the project was to convene a large-scale, open conference on public participation in scientific research, bringing together science researchers, project leaders, educators, technology specialists, evaluators, and others from across many disciplines to discuss advancing the field of PPSR. The conference included three sessions for posters and conversations, and five plenary sessions of presentations. The meeting culminated in an open meeting to explore strategies for large-scale collaborations to support and advance work across this field of practice, through the development of an association. The driving purposes are the furthering of PPSR as a field (professionalization), formalizing PPSR as a field of practice, and increasing collaborations across disciplines.

The overarching evaluation question, therefore, is a progress question: did the conference lead to any large-scale collaborative efforts to support the field, large-scale collaborations to advance work across this field, and the development of an association or other professionalizing activities? To these ends, the following questions guided the evaluation efforts:

1. Why did people choose to attend? What are their motivations?

2. What are differences in perceptions of PPSR and data use?

3. What are entry expectations for the field? For the conference?

4. Do conference participants support the purposes/intents of the conference? Does this change as the conference progresses?

5. In what ways are participants willing to engage beyond the conference (with others; with the field) and does this change during the conference?

6. In what ways does interest in collaborations increase or decay in the participants after the conference experience?

Methods

Entry measure. To generate a baseline and serve as a means of better understanding the outcomes of the conference, it was important to obtain information to answer evaluation questions 1, 2, and 3 in a direct way. This was done as a web-based pre-conference

questionnaire, using the list provided by ESA for registrants. These data were quickly processed to inform the conference organizers as they moved into the conference.

Process measure. As the conference itself is the focus of the evaluation, understanding the changes in participants during the conference toward the goals of the conference around the key products is a way of formatively understanding the potential for success. The evaluator took advantage of breaks, meals, and movement time to ask a series of questions relating to evaluation questions 4 and 5. The same questions were asked across the conference, but analyzed over the time of the event to attempt to determine if there were changes toward the desired outcomes and if any resistance emerged, when that occurred. Sense-making methodologies informed the question structure to ensure that process and product attitudes are captured.

Post-conference measure. At the conclusion of the conference, participants engaged with a post-program response questionnaire. The instrument included satisfaction measures, intention measures, and willingness to engage further. Both the pre- and the post-conference feedback asked for minimal demographics to describe the participants in the conference.

Delayed-post measure. Participants were asked to complete a follow-up questionnaire three months after the conference. A link to the questionnaire was sent to participants via email; the questionnaire was hosted on surveymonkey.com and was left open for two weeks following the sending of the link. Demographic information was again collected to gain a deeper description of participants.

All scales used were 7-point ranking scales. No summated scales were used. Statistics employed were descriptive, non-parametric.

Findings

For the purposes of this report, the pre-measure and the post-conference feedback are presented together. Findings from the delayed post are presented alongside the pre-and post-conference findings or separately as relevant.

Who participated?

Pre- and post-conference

Of the 296 registered conference attendees, 133 participants (44.9%) completed the pre-conference questionnaire and 124 (41.9%) completed the post-conference feedback form. There were 103 (34.8%) who responded to the delayed-post measure, though not all attendees provided e-mails. As the pre-measure only included those who had registerd in advance, the post does not include those individuals who left early, and the delayed is dependent on access

to accurate e-mails, response rate overall for a conference evaluation is strong and the decay is not unusual and the overall delayed-post response rate is very good.

Of those responding to the question on the feedback measure, 80 (64.8%) were female and 29 (23.2%) were male. Eighty-eight of the respondents who identified race/ethnicity, labeled themselves as Caucasian, White, Euro, Northern European, Swedish, or white/English. Two identified as Asian or Chinese-American, a third identified as Asian, and fourth as Japanese. Six self-identified as Hispanic, Latino/a, Mexican-American, and Chicana-German. Three called themselves mixed race (white/black, multiracial, and Latina & white). Thirty of the attendees additionally participated in the process evaluations.

The conference organizers wanted broad engagement of those involved in different aspects of PPSR, so participants were asked to identify all the roles in which they engage in PPSR (Table 1), and then to identify the primary role in which they engage in PPSR (Table 2).

Table 1: Role identification of participants in PPSR

	Pre		Post		Total*	
	N	%	N	%	N	%
Coordinate, direct, or manage a PPSR project	73	54.8	32	56.1	105	55.3
Scientist who uses PPSR to gather data	55	41.4	22	38.6	77	40.5
Individual who participates in gathering or analyzing PPSR data	50	37.6	22	38.6	72	37.9
Represent a group that conducts PPSR	51	38.3	16	28.7	66	34.7
Educator who uses PPSR in teaching	42	31.6	20	35.1	62	32.6
Researcher who studies PPSR	45	33.8	17	29.8	62	32.6
Represent an organization that wants to begin to use PPSR	33	24.8	16	28.1	49	25.8
Building infrastructure to support the field of PPSR	45	33.8	-	-	45	23.7
Pre n= 133; post n=57; N=190						

Columns do not equal 100% as respondents were allowed to select as many as they felt appropriate.
*Post numbers were for those who did not provide information for the pre-measure. Thus the total reflects all respondents who provided this information.

A few participants identified only one role, several had dual and some had many roles. The dominant roles held include coordinating or directing a PPSR program, and being a scientist who uses PPSR to gather data. Respondents were then asked to identify the one role with which they most identified. Findings are listed in Table 2 (below).

Table 2: Primary Role in PPSR in descending order of frequency of response

	Pre		Post		Total*	
	N	%	N	%	N	%
Coordinate, direct, or manage a PPSR project	45	33.8	24	48.0	69	38.3
Researcher who studies PPSR	19	14.3	6	12.0	25	13.9
Represent an organization that wants to begin to use PPSR	18	13.5	4	8.0	22	12.2
Scientist who uses PPSR to gather data	14	10.5	7	14.0	21	11.7
Represent a group that conducts PPSR	11	8.3	5	10.0	16	8.9
Building infrastructure to support the field of PPSR	12	9.0	-	-	12	6.7
Educator who uses PPSR in teaching	7	5.3	4	8.0	11	6.1
Individual who participates in gathering/analyzing PPSR data	4	3.0	-	-	4	2.2
N=180						

*Post numbers were for those who did not provide information for the pre-measure. Thus the total reflects all respondents who provided this information.

In removing the multiple roles, several roles of those responding shift in proportion and importance (Table 3). For example, the researcher studying PPSR moves from a rank of 5th to a rank of 2nd; representing an organization that wants to begin to use PPSR shifts from 7th to 3rd. Representing a group that conducts PPSR drops from 4th to 5th in ranking and individual who participates drops from 3rd to 8th. These numbers suggest that those involved in PPSR engage in multiple ways in their work, but that there are particular roles by which participants can be identified.

Table 3: Comparison of ranks of roles

	%	Rank	%	Rank
	Many		Primary	
Coordinate, direct, or manage a PPSR project	55.3%	1	38.3%	1
Scientist who uses PPSR to gather data	40.5%	2	11.7%	4
Researcher who studies PPSR	32.6%	5	13.9%	2
Represent a group that conducts PPSR	34.7%	4	8.9%	5
Represent an organization that wants to begin to use PPSR	25.8%	7	12.2%	3
Building infrastructure to support the field of PPSR	23.7%	8	6.7%	6
Educator who uses PPSR in teaching	32.6%	5	6.1%	7
Individual who participates in gathering or analyzing PPSR data	37.9%	3	2.2%	8

The most striking comparison is the shift from being an Individual who participates in gathering or analyzing PPSR data from ranking third to eighth when the primary role is presented. This is not surprising as the majority of people likely to attend this type of

conference are in a professional leadership capacity, not necessarily those who consider themselves participants. However, given some of the comments that follow, this may be an area for consideration for future conferences/gatherings.

Over half the participants responding have been involved with PPSR for 1-10 years. Nine percent have not yet been involved with PPSR and 18 percent have been involved for more than 10 years (Table 4).

Table 4: Tenure with PPSR

	N	%
Have not yet	17	9.3
Less than 1 year	21	11.5
1 - 3 years	53	29.1
4 - 10 years	58	31.9
More than 10 years	33	18.1
N=182		

Use of PPSR in Practice

In the pre-measure, respondents were asked to discuss how they use PPSR in practice. Not surprisingly, the responses closely mirrored the demographic of role in PPSR. The responses were narratives around the roles of teaching, research, management and coordination, monitoring, and scientific use of data. The full list of uses is in Appendix D.

In the post-conference feedback form, respondents were asked to select their primary professional identity. Ten individuals named Citizen Science coordinator or program coordinator; five self-identified as ecologists; five as conservation biologists or scientists; and another five as professors. Five used the term "research" as the leading descriptor while six used the informal/nonformal or nontraditional educator label. Three called themselves biologists and one a botanist. There were three social scientists, two wildlife biologists, three designers, three non-profits, and three museum professionals. Other miscellaneous labels included agroecologist, academic outreach, communications, community organizer, volunteer coordinator, and web bioinformatics professional. There was a broad distribution of professional identities offered by participants in the conference.

These data can be compared to the pre-measure question related to professional association membership. As with the labels for professional identity, the associations named represent a wide array of interests and affiliations, although there is clustering around ecology, environment, and science teaching, and then additional professional societies very much tied to

the academic preparation of the individual. These findings are potentially skewed due to the alignment of this conference with the ESA conference.

Table 5: Professional Association Membership

Ecological Society of America	43
North American Association for Environmental Education	12
American Geophysical Union	9
National Science Teachers Association	8
Society for Conservation Biology	6
American Academy for the Advancement of Science	5
George Wright Society	4
National Association for Interpretation	4
National Marine Educators Association	4
American Ornithologist's Union	3
Association of Science and Technology Centers	3
Society for the Social Study of Science	3
Society of Ecological Restoration	3
National Association for Research in Science Teaching	3
North American Lakes Management Society	3
American Meteorological Society	2
Animal Behavior Society	2
The Wildlife Society	2

Note: individuals were asked to name up to three; only those with more than one incident are reported here.

There were a total of 121 associations named by participants. The long list of other associations in which one respondent participated can be found in Appendix E.

In the pre-measure, respondents were asked with whom they worked. Most participants (62%) work with adults with children also participating, or just adult groups. Only about one in ten works with children or teens specifically. No participants reported working with seniors, though this may be an issue of definition with many programs including all ages of adults.

Table 6: Ages involved most in PPSR programs

	N	Percent
Children	3	2
Teens	11	9
Young adults	10	8
Adults	33	26
Seniors	0	0
Primarily adults/also youth	58	46
Primarily youth/also adults	11	9
N=126		

Who participated? Delayed Post

Of the conference participants emailed the link to the follow-up questionnaire three months after the conference, 103 initiated the questionnaire by answering the first item. Of those responding to the demographic measures, 63 (75%) were female and 21 (25%) were male. Eight (10%) of those responding to a question on identity stated they identify as LGBTQQI. Thirty-nine (46%) of the participants stated they have obtained a Master's degree, 31 (37%) have a Ph.D., and 14 (17%) named their highest level of education is a Bachelor's degree. Seventy-seven participants (91%) describe themselves as white/Caucasian, six (7%) as other, two (2%) as Hispanic/Latino, one (1%) as Asian-American, one (1%) as Black/African American, one (1%) as multiracial, and 1 (1%) as Asian.

Participants were asked additional items to describe their roles engaging in PPSR. Ecology was the most frequently cited discipline which again, may be biased due to the alignment of this conference with the ESA conference, followed by Conservation biology, Education, and Other. Those choosing "Other" were asked to provide a description. Descriptions included Marine science, Geography, Evolution, Urban ecology, Information science, Earth science, and Natural resource management (see Table 7).

Table 7: Primary discipline in which participants engage with PPSR in descending order of frequency

Discipline	N	% of respondents (N=86)
Ecology	65	76
Conservation biology	36	42
Education	32	37
Other	18	21
Social sciences	15	17
Climatology	13	15
Public health	5	6
Biochemistry	4	5
Astronomy	2	2

Engineering	2	2
History	2	2
Library Science	1	1

Columns do not equal 100% as respondents were allowed to select as many disciplines as they felt appropriate.

Participants noted they engage in PPSR across a variety of sectors. The most common sectors noted were higher education, informal science institutions, and grade 7 through 12 education. Private industry and philanthropy were the least frequently noted sectors of engagement.

Table 8: Sector in which participants engage with PPSR in descending order of frequency of response

Sector	N	% of respondents (N=87)
Higher education	37	43
Informal science institutions	26	30
7-12 education	21	24
Site based environmental organization/NGO (nature center, botanical garden, etc)	17	20
Non-site based environmental organization/NGO	17	20
Federal government	13	15
State government	9	10
Local government	9	10
Other	9	10
Private industry	3	3
Philanthropy	3	3

Columns do not equal 100% as respondents were allowed to select as many as they felt appropriate.

Most comments on challenges facing PPSR in the pre-measure and the process measure related to aspects of data. Quality control and assurance were the most commented on aspects, but management of data, large data sets, and collection of data were also mentioned. The second most common challenge was identified as evaluation followed closely by funding. Implementation challenges included staffing, time demands, sustainability of programs, communications, and partnerships with scientists, teachers, and the community. Also within the implementation challenges was the mention of finding collaborators. Volunteer issues including recruitment, training, and retention were named by several respondents. A pattern emerged in terms of where a program is in its life-cycle as those starting programs or planning PPSR efforts mentioned planning as the biggest challenge.

Value of PPSR

Values of PPSR were asked in the pre-measure, the process measure, and the feedback measure. Responses were consistent and so are presented cohesively. One clear set of values for those attending is around the benefits to the researcher or the scientist. These include the resource of people (large numbers) for gathering data, the data itself, and "cheap monitoring" referring to volunteers. A second set of values is the benefits to the participants in PPSR.

Connecting to a broader idea or issue, gaining a sense of participating and caring about the world, understanding scientific processes, and having a sense of meaningful contribution were subthemes of participant benefit. A third value set is based on benefits to the community. Engaged citizens, public ownership of science, demystifying or making science accessible and an increased awareness of the importance of science emerged. Additional benefits to the larger community mentioned include increased stewardship and enhanced scientific or STEM literacy. The final cluster of values was that of a learning exchange leading to cultural shift. "Culture of respect and trust in science and scientists," mutual learning, broader perspectives on a particular issue, the democratization of science, and a transformation of how knowledge is produced clustered around the concept that there is a larger impact of engagement in PPSR beyond the data or the activity itself.

Importance of PPSR – delayed post

The delayed post asked participants to comment on why PPSR is important to various groups (scientists, educators, participants) as well as themselves. Responses reflected participants' beliefs that PPSR is a way of democratizing scientific research and making the research accessible and understandable to the general public. Participants noted PPSR is a unique way to engage scientists with the public, that educators can utilize it to actively engage their students in science, and that PPSR is a way to bridge the gap between science and the general public. Additionally it was noted that the data collected en masse is critical to the work of numerous scientists and could not be easily accomplished without public participation.

Expectations for and satisfaction with the conference

In the pre-measure, there were five clusters that emerged related to what respondents hoped to get from the conference.

1. Networking, meeting others, learning from others
2. Learning, getting new ideas in general, getting new ideas (specific, multiple mentions of data management, methods, funding sources, integration, curriculum, use of data)
3. State of the field, scope and breadth, and a chance to contribute to the field
4. Volunteer management, recruitment, retention, motivation
5. Share with others; gain exposure/visibility

Participants in the conference were also asked retrospectively (in the post-conference measure) about their expectations for the conference[1]. The strongest response, as identified as the most dominant cluster from above, was that of having opportunities for networking ($\bar{x}$=5.40, SD=1.50 on a 1-7 satisfaction scale), followed by getting to know new people ($\bar{x}$=5.10, SD-=.29), which shared the same cluster identified in the pre-data. Learning new ideas was also slightly

[1] Due to a transfer error from the electronic to the paper copy, the instrument did not contain a separate scale for expectations; ten individuals did include their rankings of expectations and six participants completed the instrument online. Therefore, the data are presented to support the pre-measure findings, but are not included in a statistical comparison with satisfaction.

positive with a mean of 4.70 (SD=1.06). Sharing with others (the fifth cluster), was also negligibly positive in expectation with mean of 4.10 (SD=.994). The third cluster also aligns with a slightly positive mean for the expectations on "furthering the work of PPSR as a field" ($\bar{x}$ =4.89, SD=1.12) and "revitalized/re-energized about PPSR" ($\bar{x}$=4.60, SC=1.51). Even though there was a cluster of expectations around volunteer management, recruitment, retention and motivation, the items on audience building and on making programs more diverse had negative expectations ($\bar{x}$=3.11, SD=1.36 and $\bar{x}$=3.22, SD=1.48 respectively).

There was a clear interest in and expectation toward networking and learning about the field. The idea of sharing with others was also a very consistent theme.

In terms of satisfaction (Table 9), conference participants were very strongly satisfied with the experience. Overall, they were revitalized/re-energized about PPSR ($\bar{x}$=.615) which was one of the common expectation themes. They were also strongly satisfied with their learning of new ideas ($\bar{x}$=5.41). Participants were also strongly satisfied with their opportunities for networking ($\bar{x}$=5.56) and getting to know new people ($\bar{x}$=5.41). Although there was positive agreement on the last few items, the agreement was only moderate on the items of time to share experiences with others ($\bar{x}$=4.89), insights into making a program more diverse ($\bar{x}$=4.59) and insights into audience building ($\bar{x}$=4.59). As these last few were clustered into expectations, it is valuable to note that satisfaction was positive, but not strongly so, suggesting there may be ways of better achieving these outcomes.

Table 9: Means and standard deviations of satisfaction

	Mean	Std Dev
Opportunities for networking	5.56	1.22
Getting to know new people	5.41	1.18
Learning new ideas	5.91	1.16
Time to share my experiences with others	4.89	1.43
Revitalized/re-energized about PPSR	6.15	1.03
Insights into audience building	4.59	1.42
Insights into making my program more diverse	4.63	1.55
Furthering the work of PPSR as a field	5.91	1.15

Satisfaction – delayed post

The delayed post questionnaire asked participants to respond to the same scaled items measuring satisfaction with elements of their conference experience. The items with the highest mean scores, suggesting the highest level of overall participant satisfaction, were very strong opportunities for networking ($\bar{x}$=6.03, SD=1.07) and a strong mean score for revitalized/re-energized about PPSR ($\bar{x}$=5.86, SD=1.53). While all items had means suggesting positive levels of overall satisfaction ($\bar{x}$ >4.0), insights into making my program more diverse ($\bar{x}$=4.34, SD=1.61) and insights into audience building ($\bar{x}$ =4.51, SD=1.53) were just above this threshold. Table 10 compares the two post-scores.

Table 10: Participant satisfaction with conference – delayed post

	Post Conference		Delayed Post	
	Mean	Std Dev	Mean	Std Dev
Opportunities for networking	5.56	1.22	6.03	1.07
Getting to know new people	5.41	1.18	5.75	1.06
Learning new ideas	5.91	1.16	5.84	1.10
Time to share my experiences	4.89	1.43	4.98	1.53
Revitalized/re-energized about PPSR	6.15	1.03	5.86	1.53
Insights into audience building	4.59	1.42	4.51	1.53
Insights into making my program more diverse	4.63	1.55	4.34	1.61
Furthering the work of PPSR as a field	5.91	1.15	5.73	1.39

There were gain scores in reflection about the conference related to opportunities for networking (with a mean gain of .47) getting to know new people (mean gain of .34) and time to share experiences (mean gain of .09). There was a decay in mean scores between the conference and the delayed post around the other items, such as revitalizing/re-energizing participants about PPSR (mean decay of .31). This is not surprising as affect decay is expected. There was also a slight decay in satisfaction with furthering the work of the field (decay of .18), which could certainly be related to the high energy around the final discussion about creating an association, and the reality of the time it takes to move this type of vision forward. The affect decay across several of the items appears to be normal decay from the peak of the emotional experience of being there. In general, these findings suggest that meaningful connections were made, and that follow-ups did occur, and there is an overall positive reflective view of the conference experience.

Value of attending – delayed post

Participants were asked to reflect on the most valuable aspect of the conference (see Appendix G). A strong majority of responses contained an element of networking with others, which echoes the satisfaction scores. It was noted that many different disciplines were brought together, providing the ability for networking beyond the boundaries of one's field. Additionally it was noted that the opportunities to network extended to those who hold different positions within the varied disciplines that utilize PPSR, such as educators, academics, and environmentalists.

Similar to networking, the other frequently cited most valuable aspect of the conference related to learning what others are doing/how PPSR is being utilized across fields. It is clear that the conference allowed many attendees to expand their awareness of how PPSR is used both within their own disciplines and across other disciplines. Many noted gaining an awareness of the reach and diversity of PPSR, the research and findings on PPSR, and the breadth of projects

utilizing PPSR. This expanded awareness was facilitated both through attending official conference sessions, as well as informal conversations that took place throughout the conference.

Process findings

Throughout the conference, participants were approached (using convenience sampling—approach those sitting alone, moving toward the evaluator, standing and not engaging with another person before the start of the day, during breaks between sessions and at mealtimes) and at the end of the day. The same three questions were asked: what do you need from the conference to make it successful for you?, how do you think you would/how are you/how did you get that?, and what are the most important needs/greatest opportunities for PPSR?

As the conference began, and through the middle of the afternoon of the first day, comments tended to use "I" statements in response to all three questions asked. Needs were very focused on meeting people, learning from others, and finding out what's new in the field.

Mid-afternoon of the first day through mid-morning of the second day, the language shifted to a "sharing" modality. Individuals stated they had achieved the needs (consistent with the above focusing on meeting people and learning from others/what's new in the field). The most consistent ways in which people fulfilled these needs was through the poster sessions. Several noted the panels and the speakers, often using words such as "surprising," and referred to the diversity of speakers and the range of topics. An interesting emergence in language was around the concept and language of sharing. In some cases, "we" was used in conjunction with "I;" in many others, the desire to share with others (give and take implied in most comments) emerged as a dominant theme.

The morning of the second day, and clearly by noon of that day, the language shifted to a more consistent "we." There was little entry need that had not been satisfied, and the focus of energy in the interviews was on the future for the field. Comments were sometimes extensive, often shared with passion and concern. Ideas came more quickly and were more expansive than in the first two phases. There seemed to be, in this nonrepresentative sample, a consensus on the need to move the field forward and extend the work of PPSR.

Throughout, the needs for PPSR generally were externalized—the need for PPSR to be seen as obtaining good data for legitimate science, usually to be seen by scientists as legitimate means of collecting valid data; the need for PPSR to be seen as an appropriate tool for teaching. The language around perception of others of PPSR was important. There was also a subtheme of the language of PPSR itself—the perceived confusion caused by the proliferation of names used to describe the various activities which constitute PPSR.

Opportunities for the field focused strongly on the need for organization and promoting PPSR across scientific and educational disciplines. This transition in language and focus supports the

conference organization designed by the organizing committee. The final session with a focus on discussions for the future retained a majority of participants in the conference, which anecdotally supports the observation that the design facilitated the movement from having entry needs met, to forums for engaging (though, as noted below, never enough), to moving the field. As an observer of the conference, the decision to keep the participants in a large group, even when doing the poster sessions, likely contributed strongly to the support for an association. Because smaller interest bodies did not have time to coalesce, and even though extremely crowded, having the poster sessions in the same larger space as the meeting, appeared to facilitate psychological and sociological bonding of the full body into a relationship.

Intentions

Following the conference, participants were asked about their intentions related to the desired outcomes expressed by the organizers. Overall, intentions were positive. Sharing things learned at the conference with others had a very strong level of agreement with a small deviation ($\bar{x}$=6.27, SD=.98). A second very strong level of agreement was the reflective practice of critically examining one's own work or program ($\bar{x}$=6.02, SD=1.02). These two intentions seem to support the entry needs of information about PPSR, what is happening in the field, and what are considered better practices. The application of these efforts, changing one's own program or practice, had clearly strong agreement with a mean of 5.93 (SD= 1.13) (see Table 11).

Strong agreement was obtained on intentions related to the entry need of networking. The strongest response in this group of intentions was for requesting information from specific individuals ($\bar{x}$=5.98, SD=1.09). Networking with other participants had a clearly strong mean of 5.82 (SD = 1.17) as did sending information to specific individuals ($\bar{x}$=5.73, SD=1.37).

Table 11: Intentions of participants following the conference

	Mean	Std Dev
Network with other participants	5.82	1.17
Send information to specific individuals	5.73	1.37
Request information from specific individuals	5.98	1.09
Share things I learned here with other colleagues	6.27	.98
Critically examine my work/program	6.02	1.02
Try something new I learned here	5.93	1.13
Build a collaboration with someone I met here	5.48	1.32
Conduct more evaluations of my project	5.21	1.46

The lowest means, though still clearly positive, were toward building a collaboration with some they met during the conference ($\bar{x}$=5.48, SD=1.32) and conducting more evaluations of their projects ($\bar{x}$=5.21, SD=1.46). That conducting evaluations was the lowest mean is not surprising given the complexity of this action compared to some of the other actions named, and also in the specific skills seen as necessary for doing this work.

Behaviors since conference - delayed post

Participants rated their level of engagement in eight activities identified as potentially viable stemming from having attended the conference. Six of these activities had a mean score below the midpoint (4.0) of the scale. The two items rated positively, suggesting a higher level of overall engagement in these activities were: Share things I learned at the conference with other colleagues ($\bar{x}$=5.53, SD=1.63) and Critically examine my work/program ($\bar{x}$=4.80, SD=1.86). The two lowest rated items were build a collaboration with someone I met at the conference ($\bar{x}$=3.03, SD=2.05) and request information from specific individuals ($\bar{x}$=3.26, SD=1.86) (Table 12).

Table 12: Behaviors engaged in by participants since attending conference – delayed post

	Mean	Std Dev
Network with other participants	3.64	1.82
Send information to specific individuals	3.90	2.02
Request information from specific individuals	3.26	1.86
Share things I learned at the conference with other colleagues	5.53	1.63
Critically examine my work/program	4.80	1.86
Try something new I learned at the conference	3.61	1.96
Build a collaboration with someone I met at the conference	3.03	2.05
Conduct more evaluations of my project	3.46	2.09

Those who engaged in the activities rated above were asked to share what they did and what the value was (see Appendix H for full list of responses). Many participants noted they had shared ideas and lessons they had picked up from the conference with their colleagues that had not attended. This sharing of information led to discussions between colleagues and re-thinking how these lessons can be applied to their own projects. It was noted by a few participants that one outcome of these conversations with colleagues was to examine how data might be better shared with the general public. Others noted that these conversations generated new ideas or renewed excitement within project collaborators.

A number of participants responded that they had reviewed or evaluated their programs/projects since attending the conference. Some noted these evaluations had not been done in the past, while others noted that program evaluation had been a long standing tradition prior to attending the conference. It was noted that evaluating one's program provided for a perspective on what the project might be accomplishing and if there may be other ways to go about accomplishing desired outcomes. A number of participants noted the benefit of critical reflection that program evaluation provided.

Another key behavior noted by conference participants was following up with other attendees or beginning to develop new partnerships with those they had met through the conference. A

number of participants noted they partnered on grant applications with colleagues they had met through attending the conference. It was noted that follow-up conversations included requests for data to be shared as well as sharing relevant findings and information from conference presentations. Some participants noted they will be collaborating with those they met at the conference on future presentations regarding PPSR at upcoming conferences.

Future intentions – delayed post

Participants gave an overall positive rating for each of eight items asking their future intentions to engage in behaviors stemming from attending the conference. Three items had a mean above 5.0: Critically examine my work/program ($\bar{x}$=5.69, SD= 1.71), Share things I learned at the conference with other colleagues ($\bar{x}$=5.41, SD=1.86), and Network with other participants ($\bar{x}$=5.30, SD=1.82). Only one item received an overall rating below 4.5: Send information to specific individuals ($\bar{x}$=4.26, SD=2.22). The higher standard deviation on this item suggests a split between a sizeable group of participants that are very likely to engage in this behavior, and another group that rated their intentions as much less likely (Table 13).

Table 13: Continued intentions of participants – delayed post

	Mean	Std Dev
Network with other participants	5.30	1.82
Send information to specific individuals	4.26	2.22
Request information from specific individuals	4.67	2.14
Share things I learned at the conference with other colleagues	5.41	1.86
Critically examine my work/program	5.69	1.71
Try something new I learned at the conference	4.69	2.14
Build a collaboration with someone I met at the conference	4.95	2.04
Conduct more evaluations of my project	4.95	2.16

In comparing intentions, actions, and continued intentions, the above data are reinforced. There were small decays in intention around conducting more evaluations, and critically examining individual's work and programs. As revealed in the narrative, these things appear to have been happening. There were also fairly low decays in building collaborations with someone met and networking with other participants. Although there is decay, all items still have a clearly positive strength and suggest there is ongoing perceived value in the conference providing the framework for these things to happen.

The largest decays in intention were around those actions which can be viewed as "one-off" behaviors: sending information to specific individuals, requesting information from specific individuals, and trying something new learned at the conference. Table 14 shows the intention scores and contrasts that with the reported behavior score.

Table 14: Mean comparisons of behavioral intentions

	Post	Delayed-report	Delayed-Intention	Intention Decay
Network with other participants	5.82	3.64	5.30	.52
Send information to specific individuals	5.73	3.90	4.26	1.47
Request information from specific individuals	5.98	3.26	4.67	1.31
Share things I learned at the conference with other colleagues	6.27	5.53	5.41	.86
Critically examine my work/program	6.02	4.80	5.69	.33
Try something new I learned at the conference	5.93	3.61	4.69	1.24
Build a collaboration with someone I met at the conference	5.48	3.03	4.95	.53
Conduct more evaluations of my project	5.21	3.46	4.95	.26

Future of the field

Building on the challenges and values, in the pre-measure, respondents were asked to identify their "hopes and dreams" for PPSR. A number of respondents offered "growth" as their dream—growth of the importance and significance of PPSR, the numbers of programs and people engaged in PPSR, and the community of science doing this work. Others dreamed of PPSR as a respected field with an impact on the practice of science, a field that guides science directives, and through widely used processes, gathers data that are valuable and widely used.

Professionalism of the field was perhaps the dominant overarching frame. Some of the comments reflected organization of the field through a professional society or a committee or group of another organization, a clearinghouse for data, a clearing house for programs and methods, coordinated national efforts such as an "event weekend," and guiding principles for PPSR or the standardization of methods. Others in this cluster mentioned a field that would not have a single definition or approach, but would support alternative models, increased collaborative models, but be driven more by best practices. All of these would support greater inclusion of PPSR in formal education curriculum. Several individuals referred to a Community of Practice and the hope for a stronger CoP.

Another focus of hopes and dreams was on greater support for PPSR. This would include much more support from funding sources that are private, government, and foundations. Others focused on increased support from the science community and that PPSR would be demonstrating its contributions to science, increased scientific literacy, and enhanced attitudes toward science and the environment.

Finally, there were respondents who envisioned changes in society as a result of PPSR work. Some saw a more informed and engaged society, while others saw the changes as increased scientific or environmental literacy. There were some who dreamed of respectful and understanding dialogues among scientists and communities. As one respondent wrote, the hope was to: "do what social systems have failed to do—create an environmentally literate, engaged public."

During the process evaluation, individuals were asked about what they saw as needs for the field. These included the predominant need of trust from the scientific community and the also common need of trust from the educational community. Some saw the need as finding the "common ground between the rigor of scientific research and the importance of comprehensive approach to involvement." There were comments related to "making science we do relevant to scientists" and making science we do relevant "to communities." A large subset felt data management, data sharing, and data visualization were also tremendous needs. There were a few comments related to the need for focus on diversity of those facilitating PPSR projects and those engaged in PPSR projects, and various comments that focused on costs of programming, benefits of engaging, communication, extending engagement, and similar themes.

In the conference feedback, respondents were asked to rank their interest in participating in several activities that could support a professional organization (see Table 15). Not surprisingly, the overall means decrease as the level of commitment and individual activity increases; there is an almost complete inverse relationship with the standard deviations. With the exception of the two strongest means, the deviations quickly rise to levels that suggest multi-modality (greater than 1.5), which supports the entry assumption of the more time required to add to one's workload, the fewer willing to take on that work. Even so, all mean agreements were clearly positive with the exception of serving on a national board which had a slightly positive mean, suggesting there is agreement to commit at all levels to engage in creation of an association. It should also be noted that the numbers of people necessary to accomplish any of the tasks reduces along with the means, suggesting there is body enough to engage at all levels.

Table 15: Willingness to engage in association activities

	Mean	Std Dev
Communicate/use a list serve for others doing PPSR	5.82	1.34
Provide reports and studies from your work via a collective website	5.72	1.28
Work with others for the improvement of PPSR nationally	5.50	1.43
Engage in national efforts to create an organization	5.18	1.62
Create a system of mentoring of PPSR	5.14	1.68
Serve on a committee for a national association	5.05	1.75
Serve on a board for a national association	4.50	1.85

The strongest agreement is over communicate with others using a list-serve ($\bar{x}$=5.82, SD=1.34) with a fairly close mean ($\bar{x}$=5.72, SD 1.28) for providing reports and studies to a collective website. There is a slight skree drop then to those willing to work with others for the creation of an association ($\bar{x}$=5.50, SD=1.43). There is a clear drop from these three to the next cluster of three, which have engaging in national efforts and creating a mentoring system closely placed with means of 5.18 and 5.14, respectively. A slight drop from these is to serving on a committee for a national association, which is conceptually not tremendously different from the other two ($\bar{x}$=5.05, SD=1.75). The last item is an outlier and that is for serving on a board for a national association with a still positive mean of 4.50 (SD=1.85).

The single most consistent criticism of the conference was around the logistics of the poster session. A tremendous majority of responses criticized the crowdedness, noisiness, and impassibility of the spaces. Recommendations included moving into additional rooms and putting posters in the hall. Caution is urged in interpreting these criticisms for two reasons: 1) suggestions were offered from the most sincere, valued sense, but not from a conference management and cost perspective; and 2) as mentioned above, psychologically for *this* particular conference with its unique goals and purposes, maintaining participants in one space served an important purpose. However, for future conferences, organizers should critically consider the issues mentioned by participants regarding difficulty of moving, difficulty in reading, and difficulty in talking. Additionally, there were many concerns with the inability to determine to which posters to attend in the restricted time of each poster session. Receiving advance abstracts or having some means of previewing the various posters was often cited, but practical means beyond having abstracts online or published were limited by time and physical limitations.

There were many comments surrounding the need for topical, issue, or geographical breakouts. As before, for the purposes of this conference, having the full group together throughout the conference was vital to moving toward the desired outcomes. Yet, for future conferences, the ideas of creating quasi-open-space sessions around topics or issues, having partially facilitated or enabled lunch and dinner groupings of topical or geographical interest groups, including one or more meals in the conference for the purpose of networking, and having topical breakout sessions could be important for the conference.

Participant notes to conference organizers – delayed post

Participants were asked if they had any additional information to share with conference organizers (see Appendix J). Participants were overwhelmingly positive about the conference, as "Thank you," was the most frequent response given. A few participants offered up suggestions for the field such as consideration of changing the term from PPSR to something else and developing mentorship programs for those entering the field. Other comments reflected requests for logistical considerations in the future such as of the amount of space especially in the poster session room and requests for a longer conference. These comments

echo the post-conference feedback and suggest the responses to the conference, positive and critical, are stable.

Conclusions

1. Why did people choose to attend? What are their motivations?

There is tremendous energy around PPSR by those who engage in the professional work of public participation in scientific research. People attended the conference for the dominant reasons of networking with others doing this type of work, to learn about the work being conducted by others in the field, to share their own experiences and work in PPSR, and to support the furtherance of PPSR as a field.

2. What are differences in perception of PPSR and data use?

For those engaged in PPSR, the issue is not perceptions of PPSR and data use nearly as much as perceptions of those external to the field of PPSR, data use, and educational value. The single most consistent comment offered relates to ongoing concern about the more negative perceptions potential partners, the larger scientific community, and educators have about the rigor, validity, and value of PPSR. Those doing this work appear to be champions for the field, and potentially wield an impressive collective knowledge around the value of the work of the field, the value of the data, and the value of the experience for those engaged.

3. What are entry expectations for the field? For the conference?

Entry expectations were fairly low—to learn more, to learn about what is happening in the field, to network, and to share their own work. These entry expectations seemed to be primarily for the conference, but also tied to the field. The biggest issues there were, and remain, how to communicate about the value of the data, the value of the experience, and the importance of this work to communities and the environment and science as a field. Further, the potential of PPSR to facilitate the work of research scientists is extensive if the mechanisms can be managed.

4. Do conference participants support the purposes/intents of the conference? Does this change as the conference progresses?

Conference participants entered with needs that closely paralleled the expectations of the conference organizers. The organization, flow, and management of the conference facilitated the movement of conference attendees along the intentions of the organizers while still allowing conference participants to retain individual voice and individual perspectives. This

provided for a stable post-conference perception of the satisfaction with and value of the conference.

5. In what ways are participants willing to engage beyond the conference (with others; with the field) and does this change during the conference?

There is a positive intention of participants to engage beyond the conference, not only with each other, but also the field. Clearly, the intention to engage with others/network is strongly supported in the findings. The willingness to engage in work for promotion of the field, however, is surprisingly strong, although the decay of willingness to engage as the commitment becomes more intense is not surprising. Even so, the willingness to engage, even at the most time and energy commitment level were positive across all participants. In general, over time there was decay in intention to engage in the delayed measure.

6. In what ways does interest in collaborations increase or decay in the participants post the conference experience?

Many small collaborations appear to have grown from interactions facilitated through the conference. It will be extremely difficult to ascertain the degree to which the conference led to additional collaborative efforts, but the intentions suggest such collaborations will occur.

Although delayed-post response was only 36% of those attending, such a response rate is very good. Although no generalizations can be made to the non-respondents, it is often the case that those most engaged and those most bothered by something will respond to a questionnaire. If that is the case, then these findings suggest that the conference did shift the field. The positive orientation going into the conference, the needs being met as recognized through the process evaluation, the very high level of energy upon departure, and the delayed-post indicators of engagement and application work together to reveal a timely, valuable, and useful conference experience for those involved.

Recommendations

The responses to the evaluations at all points strongly support the need for future gatherings or convenings around PPSR. Continued focus on building opportunities for sharing and networking are important. Also, beginning to consider ways to engage the broad perspectives in ways that challenge all participants would be valuable.

It would appear the timing, structure, and facilitation of the conference were appropriate at the time for the meeting, and did lead to a meaningful experience for participants. Continuing the

concept of a “single conference” may be appropriate, assuming the immediate needs of those in the field continue to be networking and establishing shared experiences to build community.

In terms of planning, the organizers did an excellent job, and the dominant concern during the conference and in recall, was the crowded conditions of the poster exhibit. The team might examine creative ways of reworking space and engaging participants in the recreation of space if such conditions present themselves in the future.

The power of the conference was in mobilizing energy among the participants. The shifts in orientation during the conference related to entry needs being met, which allowed the participants to then fully engage. Ensuring that future conferences are built on specific needs of the attendees will facilitate continued positive energy through the conference.

For future conferences, it might be valuable to facilitate discussions within the larger community regarding the value of collaborations. Additionally, it might be beneficial to track or to seek feedback on collaborations that emerged from prior meetings facilitated by the conveners. Such information could inform facilitation of other potential collaborations or at least serve as examples for those attending conferences of how they might network with others.

Clearly, future meetings are desired by those who responded, and indicators are that if these future convenings are constructed and implemented as well as this conference, then they will be valuable to both participants and the emerging field of PPSR in general.

Appendix A

Pre-Conference Measure

Greetings! On behalf of the planning committee, we appreciate your completion of this short questionnaire. We look forward to seeing you in Portland!

What is your role with PPSR? Check the boxes that best describe how you are engaged with PPSR or Citizen Science. Check all that apply.

- Coordinate, direct, or manage a PPSR project
- Represent a group that conducts PPSR
- Scientist who uses PPSR to gather data
- Individual who participates in gathering or analyzing PPSR data
- Educator who uses PPSR in teaching
- Researcher who studies PPSR
- Represent an organization that wants to begin to use PPSR
- Building infrastructure to support the field of PPSR

Of these, which ONE most closely aligns with how you would describe your role in PPSR? Check only one.

- Coordinate, direct, or manage a PPSR project
- Represent a group that conducts PPSR
- Scientist who uses PPSR to gather data
- Individual who participates in gathering or analyzing PPSR data
- Educator who uses PPSR in teaching
- Researcher who studies PPSR
- Represent an organization that wants to begin to use PPSR
- Building infrastructure to support the field of PPSR

How long have you been engaged in PPSR?

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

Briefly, explain how you use PPSR in your practice.

Which national or international professional associations are you a member of? List up to three that you think are the most relevant to you or your work.

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

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

What are you most hoping to "get"from this conference?

In your work, what are the challenges for PPSR? Planning? Implementation? Evaluaton? Choose one particular challenge you face and tell us about it.

What do you believe is the greatest value of PPSR?

What are your hopes and dreams for the future of PPSR as a field of practice?

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 Portland!

Appendix B

Process Interview Schedule

Conference rolling interview schedule

NAME:
DATE:
Time:

Put sticker on nametag to remember 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 how the conference is going for you? Thanks!

What do you need to get from this conference for you to say it was a success?

Are you getting it? How?

What do you think are the biggest issues facing PPSR?

What do you think are the greatest opportunities for PPSR?

Thanks!

Appendix C

Post–conference measure

If you wish to complete this feedback form online after the conference, do so at the following link:

https://cosicolumbus.qualtrics.com/SE/?SID=SV_0BM8SZf240k2k29

OR, complete it and turn it in before you leave Sunday afternoon.

THANKS

Prior to the conference you were asked to create a code for yourself. If you DID make a code, please enter it here:

CODE:

If you did not complete the pre-conference questionnaire, you can create a code now such as the last four digits of your phone number or an important date etc).

CODE:

What was the most valuable aspect of the conference for you?

For the following, please think about your expectations coming to the conference AND how satisfied you are 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. A 1 would reflect a very low score and a 7 a very high score.

	Not at all satisfied						Very satisfied
Opportunities for networking	1	2	3	4	5	6	7
Getting to know new people	1	2	3	4	5	6	7
Learning new ideas	1	2	3	4	5	6	7
Time to share my experiences	1	2	3	4	5	6	7
Revitalized/re-energized about PPSR	1	2	3	4	5	6	7

Insights into audience building	1	2	3	4	5	6	7
Insights into making my program more diverse	1	2	3	4	5	6	7
Furthering the work of PPSR as a field	1	2	3	4	5	6	7

To what degree do you believe you will engage in any of the following activities related to the conference when you return home?

	Not at all						Completely
Network with other participants	1	2	3	4	5	6	7
Send information to specific individuals	1	2	3	4	5	6	7
Request information from specific individuals	1	2	3	4	5	6	7
Share things I learned here with other colleagues	1	2	3	4	5	6	7
Critically examine my work/program	1	2	3	4	5	6	7
Try something new I learned here	1	2	3	4	5	6	7
Build a collaboration with someone I met here	1	2	3	4	5	6	7
Conduct more evaluations of my project	1	2	3	4	5	6	7

Is there a new partnership or collaboration you'd like to develop that emerged during the conference? What is the idea for collaboration/why this collaboration?

We are all busy people, but it is often the busy people who do more! Without committing yourself to anything (this is anonymous, so you are fine!), how willing are you to doing any of the following activities for the field of PPSR?

	No way!						I'm ready!
Engage in national efforts to create an association	1	2	3	4	5	6	7
Work with others for the improvement of PPSR nationally	1	2	3	4	5	6	7
Provide reports and studies from your work via a collective website	1	2	3	4	5	6	7
Create a system of mentoring for PPSR	1	2	3	4	5	6	7
Communicate/use a list-serve for others doing PPSR	1	2	3	4	5	6	7
Serve on a board for a national association	1	2	3	4	5	6	7
Serve on a committee for a national association	1	2	3	4	5	6	7

(If you want to volunteer to do something, contact one of the conference coordinators)

Is there anything you hoped to get from the conference that you did not get or did not get enough of?

Would you have any suggestions for the conference committee?

Because the coordinators are interesting in understanding the field, they would like a baseline on a couple of demographics to gauge the field now and in the future. To that end, we ask a couple of demographics if you are willing to share. Are you:

____ Male ____ Female

What is your ethnic or racial identity----

What would you say is your primary professional identity? (e.g. elementary school teacher; field scientist studying butterfly conservation; etc.)----

If you completed the pre-conference questionnaire, you're done!
If you didn't, would you answer the following couple of questions so we have a bit more information about who responded?
What is your role with PPSR? Check the items that best describe how you are engaged with PPSR or Citizen Science. Check all that apply.

____ Coordinate, direct, or manage a PPSR project
____ Represent a group that conducts PPSR
____ Scientist who uses PPSR to gather data
____ Individual who participates in gathering or analyzing PPSR data
____ Educator who uses PPSR in teaching
____ Researcher who studies PPSR
____ Represent an organization that wants to begin to use PPSR

Of these, which **one** most closely aligns with how you would describe your role in PPSR?

____ Coordinate, direct, or manage a PPSR project
____ Represent a group that conducts PPSR
____ Scientist who uses PPSR to gather data
____ Individual who participates in gathering or analyzing PPSR data
____ Educator who uses PPSR in teaching
____ Researcher who studies PPSR
____ Represent an organization that wants to begin to use PPSR

How long have you been engaged in PPSR?

____ Have not yet
____ Less than 1 year
____ 1-3 years
____4-10 years
____ More than 10 years

Appendix D

Delayed-post measure

Greetings! It's hard to believe it's been three months since we were in Portland. 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 Portland discussing PPSR and its future. 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 heimlich.1@osu.edu.

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

- Yes
- No

Enter your code here

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

For the following, please think about your expectations in coming to the conference and, from your 3 month removed perspective, how satisfied you are with the opportunities afforded you by the conference experience. For each item, rate your level of satisfaction. A 1 would reflect a very low score and a 7 a very high score.

	Satisfaction						
	Not at all					**Completely**	
Opportunities for networking							
Getting to know new people							
Learning new ideas							
Time to share my experiences							
Revitalized/re-energized about PPSR							
Insights into audience building							

Satisfaction

	Not at all					Completely
Insights into making my program more diverse						
Furthering the work of PPSR as a field						

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 early August? On the right, to what degree are you intending to do any of these?

Have done this								Intend to do this						
Not at all						Very Much		\Not planning to at all				Fully Intend		
							Network with other participants							
							Send information to specific individuals							
							Request information from specific individuals							
							Share things I learned at the conference with other colleagues							
							Critically examine my work/program							
							Try something new I learned at the conference							
							Build a collaboration with someone I met at the conference							
							Conduct more evaluations of my project							

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 PPSR 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 PPSR? Check those that apply.

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

In what sector is your work in which you engage with PPSR? 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 PPSR?

- ○ 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 LGBTQQI?

- ○ Yes
- ○ No

Do you have any other things you'd like to share with the conference organizers?

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

Appendix Eerbatim comments on “uses of PPSR”

Teacher workshops on the Great Lakes, including zooplankton, larval fish, and algae data collection that will be used by university-based researchers and as a teaching tool for 4th-10th grade science teachers. Volunteer coordinator for a non-profit that uses adult citizen volunteers to conduct land assessments and analyzes information for the land owners and local land conservation organizations.

I manage elements of the UK-based OPAL (Open Air Laboratories) project, including designing and running a public participation survey.

We gather a wide variety of inputs from citizens, scientists, and others about the impacts of climate change on the US. This includes technical information (e.g., reports on observations, syntheses across recent science, etc.) and inputs on topics for future study.

Data collected by students at Lane Community College is in alignment with 4 data networks: National Phenology Network, Project BudBurst, Portland Budwatch & Monarch Larva Monitoring Project. 2. As a member of the Friends of Buford Park & Mt Pisgah I am a member of the Science & Technology Advisory Committee which oversees volunteer monitoring and data collection, specifically an ongoing herpetology monitoring project.

I facilitate expeditions for teachers to participate in polar research. I also use PPSR in my teaching in environmental education and science education

We solicit citizen observations of imperiled species to track current ranges. manage a national data collection program that relies on PPSR.

My master's project analyzed the quality of volunteer-collected data. After graduation, I continued working on this project for another year. I have since begun a phd, and my dissertation research depends on gathering data from unique sources, including historical journals and contemporary amateur naturalists. I continue to be interested in how to best utilize volunteer collected data and how to design successful PPSR projects.

I was helping coordinate a pilot PPSR project, but now I am just analyzing the data about the experience of citizen scientists so I am not involved with an active project. I hope to be involved in other PPSR projects in the future, but I do not know yet in what capacity.

I am currently studying the use of PPSR in an educational context at an environmental education center

I publish ecological papers using PPSR data, I study PPSR participants and social outcomes, and develop new PPSR projects

In both research and education; provide workshops and public presentations, personally collect data and encourage others to do so.

My program monitors rare and endangered plant species. We train and engage about 250 Citizen Scientists each year in monitoring protocols. Results are shared with landowners for their management planning.

The organization with which I work offers field science programs to high school students in conjunction with researchers conducting on-going wildlife monitoring projects. We organize our curricula and field experiences around PPSR whereby our participants collect data used by

our research partners, in addition to completing a variety of other experiential education activities and initiatives.

First of all, I would like to respectfully mention that I *strongly* dislike the term PPSR--to me, a totally alienating term, as cold and distant as the term "citizen science" is community-oriented and inviting. I represent a group that is implementing a citizen science project on pollination services to crops in community gardens in Seattle. We are a diverse group of pollination biologists, staff, and students at the University of Washington who are volunteering our joint efforts on the project.

I direct a network of volunteers along the Pacific Coast that report observations of spawning runs of California Grunion, a beach spawning marine fish. Their data are used for scientific studies, management issues, and planning purposes by over 150 local, state, and national organizations.

We are particularly interested in approaches to PPSR that can support monitoring marine protected areas in California.

Currently, I coordinate a PPSR project. The project involves volunteers in the data collection, while the training, analyses, and reporting are done by professionals (including me) working for my organization. The volunteers have also been providing invaluable feedback on the protocols, etc. Last summer we got good data related to our project objectives. This summer I would also like to begin surveying their volunteers about their experiences. Overall, I have been involved in PPSR for the last approx. as a volunteer; a representative of a group doing PPSR, an environmental educator, including teaching units with PPSR activities; a researcher of environmental volunteers, including those doing PPSR; a coordinator and designer of a PPSR project; etc. I continue to do so in all roles (varying by degrees over time).

I develop a cyberinfrastructure support system to support PPSR efforts

I used PPSR for a while several years ago while coordinating an alliance of adult natural resource outreach & service programs. In my current job, I am project coordinator for a partnership of scientists, non-profit organizations, and agencies using citizen science to investigate dragonfly migration.

I am developing one, possibly two, PPSR projects right now in collaboration with scientists from my institutions. I'm interested in the use of PPSR as an approach to engage the public in science.

I work with tribal member students to collect ecological data to evaluate changes and design restoration treatments. The students receive basic training on data collection including vegetation sampling and geomorphic surveying. They enter the data and we are working towards basic analysis and interpretation of the findings, along with outreach materials and publications.

Connecting people to nature while collecting information to be used for climate change and other environmental factors analysis

I work for the National Park Service at Olympic National Park and for a network of parks in the Pacific Northwest through the North Coast and Cascades Science Learning Network. We have used PPSR to conduct presence/absence monitoring of the endemic Olympic Marmot for the past two summers. We want to utilize the public to conduct bee monitoring and bio blitz type

activities. We hope to use PPSR to increase public awareness of issues facing national parks and how managers use scientific research to inform decision making and policy decisions.

We've used PPSR at Port Townsend Marine Science Center for more than 25 years to engage the public in collecting water quality and species data. In the last several years, we've conducted Puget Sound wide studies of beach plastics using volunteers in 12 counties. We are in the process of having our first peer-reed journal article published, on the ingestion of plastics by gulls. Over the course of the year, our volunteers participate in up to a dozen monitoring/research projects, mostly in conjunction with agencies such as NOAA, Dept of Health or other agencies. We just received an EPA grant to engage volunteers in collecting roof runoff samples for toxics analysis.

I studied PPSR for a year, then began to build a pilot program for a local conservation alliance. The pilot is a plant inventory of a mountain park preserve in the Phoenix, AZ metro area. Our larger, longer term goal is to have multiple PPSR programs sustained throughout our preserve system as a way to collect badly needed data, to connect the community to nature and to science as a process, and to build capacity for science-informed management.

For the past nine years Ocean Discovery Institute has implemented an intensive citizen science program for underrepresented high school students. Students participate in authentic research alongside scientists. This program has resulted in participants building their scientific knowledge and pursing STEM degrees, leading Ocean Discovery to explore expansion of this model to the broader underrepresented community.

Undergraduate thesis looked at citizen-science data vs professional data, I work at the Denver Zoo doing citizen-science projects, I am starting graduate school with Gregory Newman and citsci.org

I have 20 years experience as a GIScience researcher and practitioner using participatory mapping/public participation GIS (PPGIS), with a focus on its use for natural resource management and land use planning. Currently, however, I study the policy and social science issues surrounding crowdsourcing & crowdmapping for disaster management.

My project(s) collect information on wildlife health events/mortalities from organized volunteer networks or casual observers. While many federal, state and academic programs are tasked with investigating wildlife health events, no centralized system maintains reports of all occurrences or provides a simple of what is going on. All the projects we engage in are creating infrastructure and methods to aggregate and standardize wildlife health event observations/information which can help improve decision-makers situational awareness of wildlife health issues, where they are happening right now, and deliver this information to managers who can use it to make well-informed decisions. Because agencies are hampered by red tape, privacy, records delays and other issues that may delay release of official information - we are looking to harness signals of events from open source news, organized and individual citizen scientists and social media channels to improve the overall understanding of where wildlife health events are occurring.

We are using high-school aged youth to collect data on urban trees planted by a large urban forestry nonprofit.

I am retired individual who participates in several Citizen Science projects. I contribute funding to several Citizen Science projects.

We have a wide array of surveys that inform our land management practices and inform us about natural fluxations in species densities. Birds, butterflies, reptiles, amphibians, ants, prairie and riparian vegetation, stream morphology, heronry monitoring, and more take place at my nature center. We use it to encourage nature awareness and appreciation in our community, to involve community in our research and to expose people of all ages to applied science.

I am the outreach director for a nationwide citizen science project. we gather data on pollinator service from individuals across the country

Co-direct Wyoming Stream Team, a state-wide water quality monitoring project. NestWatch chapter coordinator. Facilitate the following projects for Teton Science Schools participants: pika behavior observations, Nature Mapping Jackson Hole, CoCoRaHS and Wyoming Stream Team. Trying to create a long-term a fire succession monitoring program on our campus.

I test water quality in creeks and used to direct the program of volunteers to collect the data and upload it to a web-interactive database.

Use Flickr for finding "Birds with Field Readable Markers: Bands, Collars, Rings & Tags" http://www.flickr.com/groups/505232@N24/ especially Caspian Terns

I manage a PPSR project and support educators in using it effectively in their science curriculum, formal and informal.

I co-direct a service-learning program in which university students collect, analyze, and present environmental data for community partners. Examples of current and recent projects include habitat assessment, restoration planning, ecological research, and environmental monitoring. Specific topics include oak, riparian and wetland restoration; water quality; conservation of imperiled species; and pollinator conservation. Through our program, we have created protocols which are then used by volunteers to continue the projects after the students complete their work.

We are in the early stages of a project intended to get local (central Illinois) community members involved in the collection of water quality data (i.e. pH, dissolved oxygen, turbidity, flow rate, overall site description, etc.) for the Illinois River and its tributaries. We are also trying to obtain feedback/evaluations from the participants in order to assess citizen learning gains from the program.

Over the past year I have used nation-wide ecology citizen science projects such as ebird to teach ecology research skills to high school students; however, the main focus of my energy has been on researching best practices in engaging students in field ecology research for an environmental education organization that is interested in developing a new program for this.

I provide technical, financial, and organizational support for all of the citizen-based monitoring project coordinators in my state. I try to stay abreast of the latest developments in PPSR so that I can promote those that improve the efficiency and effectiveness of citizen-based monitoring in the state.

I conduct PPSR projects on a 26 acre school campus (K - 6). These projects are conducted in a significant way by the students and will be used for long-term monitoring and land management plan.

Using volunteer groups to help collect data on forest restoration projects.

Utilize volunteers to conduct coral reef monitoring surveys. Assess their ability to collect scientifically valid data.

To present our program

I help design and implement PPSR projects at a research learning center and national park. We use the projects to gather data for science and resource management projects and to achieve educational objectives.

PPSR is used as programming on the museum floor to engage guests in activities based on climate change. I am directing a project which is building an on-line platform for mapping and analyzing PPSR data. In addition, I am directing the research efforts to help us understand what people learn from the combination of fieldwork and work on this on-line platform.

I have helped train citizens for the Monarch Larva Monitoring Project (www.mlmp.org) in MN, PA and CO. I am now working for NEON and am getting involved with Project Budburst, and will be helping to explore how we can best use citizen science to engage folks in NEON.

I am an intern at Craters of the Moon National Monument. We, so far, don't use visitor data much. We keep logs of what plants and animals they see if it's something that stands out but we don't keep all records. We want to start doing so and to create interactive projects or exercises aimed at adults so those who want a more involved experience at the park don't have only Jr Rangers to fall back on.

I work with several butterfly monitoring groups in North America. I started by asking to use their data for analysis, but more recently I've been working to help develop systems to support data management, visualization, and sharing.

I study projects.

To bridge our education and research depts.

I work with communities and universities to build collaborative research partnerships.

Started by developing an invasive species citizen science program. Conducted research related to data quality and participant impacts (knowledge, skills, attitudes, behavior, science literacy). Also helped develop a cyberinfrastructure to provide data management services to local organizations conducting citizen science projects (citsci.org). Continue to be involved with PPSR related activities through continuation of above programs, networking with colleagues, and writing related grants.

We are starting up a residential environmental education program that has a component called GreenWatch which will encourage people to participate in existing Citizen Science programs. They can also go on to become a Neighborhood Naturalist.

I've introduced the opportunity for using PPSR as a learning tool to a regional network of 45 organizations. I utilize citizens to collect data about species occurrences via an online project, and their data are quality-checked before being added to a database. Data from our project are

provided to climate change scientists, government resource managers, and others who request them.

Coordinate water monitoring program; graduate student studying volunteer monitoring.

I was part of the Communicating Climate Change Project, which used citizen science to teach about climate change. I had a group of teens count frog calls and do butterfly field counts. Currently, I am having a group of teens test water and soil in a variety of local places.

I gather data to look at ecological patterns on a continent-wide scale. That requires use of PPSR data. I supervise an NPS Research Learning Center, and we utilize PPSR both as a tool to promote science literacy and resource stewardship while gathering useful data to support science-informed decision making.

As a science graduate student I headed up a PPSR project and have been analyzing the data for both education and scientific purposes. I am not a educational researcher who is incorporating PPSR aspects into teacher science professional development projects.

I don't at present, but have directed programs that involved middle and high school students (and teachers) in field science in parks. Data was shared with park managers.

developing methods for ecosystem monitoring by experts and non-experts

I have been one of the directors or director of the Smith Moutain Lake and Claytor lake and Ferrum College Volunteer Water Quality Monitoring Programs for 25 years. I have used these programs and the data collected to study the trophic status of Mid-Atlantic reservoirs and their aging towards eutrophication. I have also studied the bacterial and algal populations in addition to the source of the bacteria in these lakes/reservoirs. These programs have also become an environmental education for the communities and the local and state agencies.

Our climate monitoring role and responsibility is greatly helped by citizens collecting and sharing local climate data from their own backyards

My research involves understanding what motivates people to participate in PPSR, particularly projects that take place completely online. I specifically research user behaviors and reactions to the Zooniverse, a collection of online citizen science projects.

I began using PPSR when I worked in extension with invasive species - citizens and volunteers were often our first detectors of new invasions. Now I lead a citizen science and outreach program aimed at improving the understanding of biodiversity in our daily lives - to that end, we engage the public in participating in science daily.

I organized and manage Portland Budwatch, a Citizen and Student Scientist Partnership using USA National Phenology Network protocol to collect phenology data along an urban to rural gradient trail system in Portland Oregon.

I develop applications to support conservation and biodiversity

I am involved in volunteer projects that rely on ppsr. I am also wanting to implement such projects with a non-profit watershed protection group that I currently volunteer with.

I work with a group of fishermen and scientists to investigate water quality questions. My main interest in the project is to investigate power dynamics and scientific creativity as a result of the process.

As a scientist, I use PPSR to gather data on rarely observed animal behaviors so that I can begin to answer questions about the function and causes of these behaviors. I have also recently been hired to oversee the development and implementation of a citizen science program at a large science museum.

In my current job I represent NPS groups that do, or want to do, PPSR projects. In my previous job I managed an annual bioblitz with a strong citizen science focus

We are the host of a national PPSR program, which we ask chapters to host locally. We use this as an educational/outreach tool, a way to engage the public in learning about and doing science, and as a mechanism for collecting scientific data.

I develop, coordinate, and oversee PPSR projects at Mammoth Cave National Park. I am also actively involved in leading PPSR participants in the field to collect data and helping them analyze the data. I have a pending NSF proposal that if funded will create a new citizen science project that will advance both the PPSR field and the scientific fields related to the project. In addition, on my own time I have been writing a column for the KY Assoc. for Env. Ed.'s quarterly newsletter describing different national citizen science projects and how educators can use them in formal and nonformal settings.

I train others to collect meteorological data for contribution to NOAA and also work with the GLOBE program to train teachers on how to train students to take data that scientists can use.

To engage K-12 students in practicing scientific methods and deepen their understanding of scientific principles and the role of science in environmental stewardship.

Currently, I coordinate a nationwide PPSR program and I also volunteer for a different statewide effort at a coordinator level. Both projects train volunteers on how to collect biological/environmental data to contribute to a larger scale dataset and encourage participants to contribute to newsletters and online communities. Previously, I have engaged in several smaller scale programs at both the coordinator and participant levels. The majority of PPSR projects I have volunteered for or coordinated have been contributory and I am very interested in discovering avenues to make existing PPSR projects more collaborative in nature as a means to enhance data quality and participant experience, as well as promote learning goals and eventual attitude/behavioral changes.

I have, in the past, collaborated to train volunteers for a PPSR project ("Grunion Greeters"--Birch Aquarium at Scripps and Pepperdine University)

we send citizen scientists out to specific locations in Glacier National Park to monitor common loons, mountain goats, pikas and invasive plants

Scientists at my university (Willamette University) are developing PPSR projects as part of their scholarly research with student research assistants or to address the broader impacts and outreach of their research. I'm eager to know how to create university infrastructures to help scientists accomplish PPSR projects.

Past: As a scientist, in order to gather data Current: As a tool for engaging volunteers in projects that benefit natural resources and as an educational tool.

Use PPSR to assist with research and as a tool to teach applied science and the scientific method.

Write about new projects and current trends in PPSR.

Community science, usually linked to local environmental issues. PPSR is used to support community understanding of the situation and dealing with it

I manage a long-term (15 year) Citizen Science nearshore monitoring project, and it is a signature program for our organization.

I began the rocky intertidal protion of the LiMPETS program over ten years ago and then helped the National Marine Sanctuary in California combine it with the sandy beach program. More recently, I helped bring in the Pacific Grove Museum of Natural History come in to manage the program in the Monterey Bay area.

We run the Zooniverse suite of online PPSR projects. PPSR is core to our scientific method.

I coordinate a program helping middle school students to create authentic animal research projects comparing zoo animals with animals in their backyard. The program is in its 4th year, however the only dissemination thus far has been a culiminating event where the students are able to share their work. This year we created an iPad app that will enable the students to share their data throughout the research process as well as at the culminating event.

I would say I have been more "aware" of PPSR rather than "engaged" in it, although we have promoted it as a way to educate, engage and employ youth in natural resources work.

I work with a network of butterfly monitoring groups. I both analyze the data, develop models for data analysis and am currently developing infrastructure to support the volunteers and foster data sharing and visualization

n/a - interested in local/regional health use potential

As a natural history museum, we use citizens to turn in photographic vouchers of amphibians and reptiles. We intend to amplify the project to include a web-based interface and an educational component.

Education of high school students and undergraduates in marine ecology. Gathering coastal habitat monitoring data

I'm director of an herbarium that involves public volunteers in curation.

I manage the TogetherGreen fellowship program. We do community based conservation and many of our fellows use PPSR actively.

We are using participatory research to gather data on social science issues related to natural resource management.

I manage an urban network of field stations that uses PPSR at its core. All researchers must open up all research processes to citizen volunteers to the extent they are able.

Appendix F

Membership organizations named once

- Agronomy Society of America
- Alliance of Natural Resource Outreach and Service Programs
- American Anthropological Association
- American Association of Geographers
- American Association of State Climatologists
- American Association Variable Star Observers
- American Fern Association
- American Public Health Association
- American Shore and Beach Preservation Association
- American Society for Information Science & Technology
- American Society of Ichthyologists and Herpetologists
- American Society of Mammalogists
- American Society of Naturalists
- American Sociological Association
- Americorps
- ASCD
- Association for Computing Machinery
- Association for Environmental Studies and Sciences
- Association for Psychological Science
- Association for Science Teacher Education
- Association for the Rhetoric of Science and Technology
- Association for Tropical Biology and Conservation
- Association for Women in Science
- Association of American Biology Teachers
- Association of American Geographers
- Association of Computing Machinery
- Association of Field Ornithologists
- Association of Mid-Atlantic Aquatic Biologists
- Association of Natural Resource Extension Professionals
- Association of Nature Center Administrators
- Association of Polar Early Career Scientists
- Astronomical Society of the Pacific
- Atlantic Society of Fish and Wildlife Biologists
- Biodiversity Information Standards
- California Science Teachers Association
- Canadian Society for the Study of Evolution
- Children and Nature Network
- Council on Undergraduate Research

- CSSE
- Dragonfly Society of the Americas
- EDDMaPs
- Entomological Society of America
- ESIP Federation
- Freshwater Mollusk Conservation Society
- International Association for Great Lakes Research
- International Association for Society and Natural Resources
- International Primatological Society
- International Science Teachers Association
- International Society for Design and Development in Education
- International Society for the Learning Sciences
- Italian Engineers Professional Association
- Midwestern Psychological Association
- Montana Environmental Education Association
- NABS
- National Association of Biology Teachers
- National Association of Science Writers
- National Audubon Society
- National Earth Science Teachers Association
- National Organization of Research Development Professionals
- National Park Service
- National Volunteer Organizations Network
- Natural Areas Association
- NCGE
- New World Agriculture and Ecology Group
- North Carolina Environmental Educators Association
- Northeast Partners in Amphibian and Reptile Conservation
- Pacific Seabird Group
- Polar Educators International
- Project WET Canada
- Royal Geographic Society
- SABER
- SCGIS
- SER
- Sierra Club
- Smithsonian Institution

- Society for Conservation GIS
- Society for Freshwater Science
- Society for Integrative and Comparative Biology
- Society for Range Management
- Society for the Psychological Study of Social Issues
- Society of Freshwater Biology
- Society of Freshwater Sciences
- Society of Integrative and Comparative Biology
- Society of Systematic Biologists
- The Natural History Network
- Trout Unlimited
- Udall Scholars
- University Leipzig
- USA NPN
- Vital Signs of Maine
- Western Society of Naturalists
- Whitebark Pine Ecosystem Foundation
- Wildlife Society

Appendix G

Verbatim comments on “most valuable aspect of the conference“

Neworking and bringing together ideas from disparate disciplines

The interaction with individuals from different disciplines, but with interest in citizen science

Networking with others, and advancing the ideas of citizen science.

Learning about the range of programs and how they include non-scientists.

Being able to network with other educators, leaders and environmentally conscious people.

The networking and lessons learned from other similar programs

Connecting with a professional network of colleagues working on similar issues, surfacing issues I hadn't thought about before and who can provide resources for challenges across the fields.

Some of the presentations, and also the networking opportunities.

learning the priorities and reach and diversity of the operators in this field... I was struck by the fact that a group self-organized on the last afternoon to talk about education, and by the fact that that group was the largest discussion group.

Networking; getting a sense of the many initiatives that are ongoing, and learning about new possibilities.

Talking to other people about their projects and lessons learned

Seeing the range of PPSR out there, and hearing what the current issues of concern and excitement are.

Learning about the diversity of PPSR projects, initiatives, research, and outcomes. Connecting with peers operating in the space.

Knowledge of the breadth of PPSR projects and the perspective Arfon brought to my work.

Connecting with others doing PPSR research at other institutions.

Poster sessions, networking, and break out group discussions.

Networking - meeting other PPSR practitioners and discussing past projects (what has worked and what hasn't) and seeding new project ideas

informal networking opportunities

Partly it was just being part of such a large group of people, all of whom saw some value in democratizing the process of scientific inquiry. I've been working on a vision for "translational ecology" that would encompass multiple means of increasing both the usefulness and the public understanding of our science, and I have argued the PPSR must be part of that. I organized a symposium on that topic for ESA 2012, and having the PPSR workshop immediately beforehand helped me see better how to do that.

The opportunity to network with people working on citizen science on "the other side of the pond" - we felt like we were a bit behind here in the UK in terms of publishing about citizen science (both theorising around the topic, and case studies), so it was great to meet people who were publishing etc, but also encouraging to meet so many people who were at a similar stage to us. The poster sessions were particularly valuable as they gave opportunity to hear and see some amazing projects.

the networking--meeting so many people who are all involved in citizen science

1) Seeing the numerous ways across all science disciplines in which the public are successfully engaged in cooperative and collaborative research efforts. 2) Finding others who are serious about data management and archival issues

As a public librarian, I spend most of my time trying to figure out how to distill all of the amazing opportunities for our patrons to engage with information. I do not have a science background, so creating opportunities for meaningful interaction with science is a weakness in our program. This conference gave me a general view of how Citizen Science programs are organized, and what I need to do to offer them. Then it provided specific opportunities. It was awesome.

Exposure to a variety of citizen science project and an update on the big picture of PPSR.

Having the time to consider how citizen science connects to our work - often it's hard to start something new without specific time set aside.

I love the fact that we are getting it together to form a bona fide organization! The comraderie and networking was really valuable, and the presentations were fantastic!!! I love the breadth of research that is going on -- loved the Zooniverse presentation, and focus on diversity. YAY!

The people I met.

Meeting people and talking about the posters.

Getting to informally talk with others engaged in citizen science - and those talks emerged into our sheets of next steps at the end.

Meeting face to face people from so many projects who are working on citizen science projects, creating new connection and building further on existing connections

Networking

Talking and reflecting with peers in the field and seeing what great citizen science is going on all over.

Seeing how little of the citizen science was basic ecological research.

Networking

The highly energetic enthusiasm of the PPSR crowd and the opportunity to network with them!

Networking. Meeting other people who have had similar experiences in their programs and learning from how they addressed challenges or shared positives.

just one? a toss up between learning how much is going on in this field and networking with everyone who is doing it.

Networking and learning about various projects.

hearing about projects using citizens in other disciplines. networking with others.

The networking with other professionals.

Meeting others doing similar projects (and also different ones, but got more from those with overlap)

Having a meeting with so many like-minded individuals got me energized to move the field forward.

Broader exposure to practices in the field.

Talking with other people doing this kind of work and expanding my knowledge of different public participation approaches.

Seeing projects that people were successfully carrying out, and seeing the wide variety of projects.

-Learning about the breadth and scope of cit sci projects happening all over the country. - Meeting other folks interested in a leadership role in this burgeoning field - Talking about methods with other grad students

Learning about the size and enthusiasm of the community. I didn't think there were particularly new ideas there, but the opportunity to form a community and work together was very compelling.

Seeing the range of citizen science projects and programs out there, seeing how other groups implement their own citizen science activities, and the opportunity to interact with nearly 300 other people who are just as excited about the field as I am.

The plenary talks were great. It was a wonderful overview of the field.

Learning about the vast variety of citizen science opportunities available to the public and some of the challenges that people running those projects are facing.

Networking

Networking with like minded folks

Opportunity to see that there actually has been progress in the field of citizen science. Getting ideas about projects and making contacts with colleagues on evaluation and collaboration.

Inspiring me. Learning about areas of research. Networking.

Discussions during poster presentations and meeting fellow practitioners

Networking with colleagues with similar research interests

Networking

for me and my organization Citizen science seemed like something that was going to be very difficult. The conference definitely made it more accessible and easier for our program

The opportunity to see posters about projects that have addressed similar challenges and to meet with the authors.

networking/meeting others--particularly individuals in positions similar to mine, as I am in a new job

The diversity of projects and approaches presented and discussed as a group

Just being with people with a passion for involving citizens in the sciences that they know and care about

Seeing the many forms of citizen science taking place.

recognizing that many of the participants faced similar challenges and as our team, and building the initial framework for a peer group around citizen science

Meeting others who are thinking about how to professionalize the field, beyond getting good scientific data

Connecting with people and getting inspired

networking and inspiration

learning about how ecological/other sciences are building community research engagement/capacity

networking, finding others thinking about similar approaches to the work

The opportunity to discuss ideas and projects with other participants during the poster sessions.

Networking opportunities, getting ideas

Hearing all of the diverse and various perspectives and applications of PPSR in research and practice.

seeing friends and colleagues in the PPSR community, getting inspired and generating new ideas

Networking with people who realize the value of public participation in science.

Interacting with the other scientists.

Meeting other people who are working on similar research, learning about what the research gaps

are.
Many people
Networking at the poster sessions
Learning about other PPSR projects, meeting the PPSR community, and learning about trending topics (challenges, funding sources, etc.)
1) Collaboration with peers. 2) Introduction to programs of which I was unaware.
guest speakers, poster sessions
Networking, problem solving within the community of practice.
Learning about the history of citizen science and breadth of projects across the nation.
Networking with other similar organizations and with people and organizations that can provide or receive support.
The variety and also foundational similarities (1) between citizen science (2) different endeavors. (1) all the different data sets; (2) organizing and training volunteers. Most interesting was the debate about the validity of the data produced by CS projects and how that was being determined. What was frustrating was the inaccessibility of the large data sets for educational use.
Discovering that there are currently numerous ways for the public to become involved in scientific research.
Sharing expertise with such a broad and open group
seeing the history that is already established and the emergence of shared vocabulary

Appendix H

Verbatim comments on "what did you do and was it of value?"

I have shared what I learned as well as some of the content from the conference with colleagues. We plan to implement more evaluations in our program primarily by partnering with an education person. The information from the conference also provided many resources as we submit a new grant proposal using PPSR.

Sharing ideas with others; critically looked at my future research and wrote a grant, in part, based on PPSR 2012

I reviewed my program and am in the process of implementing some new features based on the review. I also made some contact with another participant, but it is not clear that this will lead to an active collaboration.

I have been working on evaluating my project and the impact that it has had or could have in the future. Keeping adolescents involved in citizen science activities is important to me, my students, their parents and the world we all live in

yes - we created a new partnership and assisted with a grant where an east coast program wrote a grant to model our program on the east coast.

Sharing lessons with local colleagues has led to a change in how we share data with the public and has generated valuable conversation about how to continue to improve data sharing and data management practices. While the conference didn't solve all of our data needs, it was very valuable in generating more productive conversations and empowering our organization to tackle these issues more quickly than if I hadn't attended the conference. Additionally, I am reaching out to contacts I made at the conference as I write new grant proposals.

I've reached out to several people I met regarding diversity in PPSR issues. Also, I reached out to someone who had some data relevant to me and they shared it with me. All of value in terms of moving the diversity issue forward.

We already do evaluations of our programs, so I haven't done more. We will certainly continue to do them in the future (my answers didn't really fit the options). We practice continuous improvement, constantly evaluating and examining our program with a critical lens and making adjustments - this didn't fit nicely into your options, either. I did all my planned follow up from this meeting with people I met and my colleagues. We are planning a proposal that may have us reach out to additional contacts made at the PPSR meeting. I've also had more conversations about PPSR as a name vs. citizen science... people don't all get the shift. I don't like the acronym, but PPSR is more true to the spirit and intent. what's in a name, anyway??

Networking. Of general value in building towards possible future collaboration.

Contacted individual who presented about an analysis of their project, how effective they were at engaging and retaining volunteers and a survey they did to determine this; they were very willing to share their survey format and are interested to compare our results

with theirs

Thinking about how to incorporate PPSR into my various projects has been very valuable. That is, the conference helped to demonsrate that PPSR can take many forms -- the sky's the limit (literally in the case of GalaxyZoo -- ha!) and we need to be creative!

Brainstorm and discuss with colleagues improvements to our evaluation tools and practices, and how we plan to improve on future reporting of PPSR results.

Started discussing potential collaboration with one project and plans to do so with others.

I brought the information I gained at the conference back to collaborators at my home institution and we used that to further our project and motivate us. It was nice to find that there will be an audience for our work.

I've been in discussions with people I met at the conference about new collaborations and projects; I've shared ideas from the conference with my team and with other local PPSR practitioners.

We are developing a graduate certificate in Translational Science that will be offered here at Utah State University. Since attending the PPSR conference I have taken several opportunities to describe to colleagues how we might broaden and deepen our vision for how to incorporate PPSR skills into that new certificate. For example, my group is meeting tomorrow with folks in our doctoral program in Theory and Practice of Professional Communication about how they might work with us, and since August I have become convinced that we not only need help with scientific communication in a traditional sense, but also with folks who specialize in human-computer interactions (an emerging field) and can help environmental scientists think creatively about ways to use computers, new media, gaming, and other approaches to bringing citizens into their science.

I have been in touch with one person I met at the conference, and although nothing has come of it yet, we hope to work together more in the future. I have presented ideas I gained from the conference to my department, which went down very well, and I am hoping that some futher research funding will come of it though doing joint projects with staff not currently engaged in PPSR.

The main thing I did was to work with a partner at my own institution to implement more citizen science into our teen projects. We have also been looking at how we can improve our citizen science projects in the future.

I came to a new institution after the PPSR meeting, and the information I gained at the meeting has provided an exceptional gateway or opening for me to my science colleagues here. I've also helped to open the eyes at my institution into how PPSR can be involved in the development of new outdoor learning laboratories for our programs, by considering how local stakeholders (adjacent property owners, for example) could potentially be informed and involved about what we are planning or hoping to do.

We are in the process of working with other libraries in our consortium to offer a variety of CS programs in the Boise area. It is slow going, because this is new and doing it well requires planning and coordination. However, there is definitely buy in! I count this as a victory.

I've begun to look at our citizen science project with a new perspective and will start implementing changes over the next few months, including: adding a pre-evaluation,

reguarly communicating results to participants, and updating training materials.

I have followed up with some connections made, and it was very valuable. I have also tried to approach evaluation of my program differently, based on what I learned at the conference.

I continue to evaluate my work and seeing it in light of the work of others at the conference is very valuable.

I have had lasting conversations, bringing in others around my program, on the ethics involved in citizen science - both from evaluation standpoint and from data management/access standpoint. I'd love to more formally work on these sorts of issues, so this might turn into a more formal collaboration.

I have shared what I learned at the conference with colleagues. This has been valuable because it has gotten my colleagues to think more about PPSR.

I've started a collaborative project with another participant.

Shared ideas with my staff and planned/implemented several appreciation ideas for our citizen scientists.

We have been looking at some of our workplans to ensure that in a year and in two years we are where we want to be. That was extremely useful in balancing workloads. We have also begun discussions about evaluating our training programs (in person and online). This will prove very useful as we think about the most effective and most efficient training options for the future.

Requested and got information about informed consent issues in troubled regions - this relates to local work with undocumented and vulnerable populations. Snowballed off someone at the conference to a locally based colleague of theirs - initiated an invitation to participate in a community/academic research center. Collected examples of PPSR and web locations - referenced these and passed on to locally interested groups.

Follow-up with participants to share ideas

critically evaluate the reliability of data collected by my volunteers. Yes was valuable as support has been increased for my program, and other organizations are interested in looking at the data.

I e-mailed one of the presenters. It was of moderate value. I did share the information with some of my colleagues.

It's an interesting assumption that my program wasn't diverse in the first place...

I shared discussions with my project partner and got him up to speed on the importance of collecting not only data for our project but also data ABOUT our project. We are successful in collecting data but not as successful in collecting and sharing project metrics. It was certainly valuable because collecting and sharing project metrics will help our project contribute to the success of the field. We will be able to provide those metrics to researchers evaluating the effectiveness and reach of these kinds of projects.

I really can't remember.

We've shared ideas with colleagues, and the data has been instrumental in my own research and paper writing.

-shared some methods with a participant, valuable to me because I felt like I helped someone with a cool project. -was able to share excitement with scientists in my new community - feel like it gave my research more clout -gave a seminar and talked about conference, gave me a chance to gush and be enthusiastic which made my presentation better - decided to recalculate some data on a recent manuscript because of feedback from other scientists after giving my poster presentation. - possible grant opportunity with someone I met at conference

I've been sending information and requesting information from several participants and the networking opportunities afforded by the meeting have been quite good. I have also tried implementing a new citizen science program for high school students at my museum where the students come to the museum's field station, go on a tour, and then work with me to develop their own citizen science projects. The goal is to eventually open these projects up to everyone (so the students can collect data from a wide geographic range) and allow groups of students at participating high schools to continue developing their projects for several years. I never would have considered this co-created approach to citizen science if I hadn't attended the meeting.

I definitely shared the knowledge I gained about the field with others at my institution. Thus far we have still not made the leap into the world of PPSR, but I feel we are much closer now than we have ever been. The talk I gave renewed interest in PPSR at our institution.

Our program connects citizens with PPSR projects. I had a different perspective than most participants during the conference but learned a lot and are officially launching our new program in January.

networked with a couple of folks.

Have planned a several month evaluation of our Citizen Science Program Have met with potential collaborators that we connected with at the conference

The PPSR conference inspired me to think about increasing diversity among my volunteer base. This has been rewarding to think about.

My program is currently not funded, so I am not able to apply improvements or evaluation as the questionnaire asked. I've mostly been establishing networks and working with folks on joint funding opportunities.

Shared information about the meeting with others. Yes, it was good to let those not there know what happened.

I discussed with my collaborator plans to evaluate the program; that led to an effort to survey past participants; I am still awaiting results from that.

I'm in a new position now that is somewhat less related to PPSR, but I'm hoping to increase the PPSR activity in my organization. Reflecting on new ideas I learned at the conference and following up with some individuals has been helpful in thinking about that.

I have received from and provided information to participants. I have shared some of the information I learned at the conference and a lot of the enthusiasm that it generated with colleagues at work. The conference and the sharing of information highlighted the importance for my organization to engage further in doing Citizen Science. There is work to do to engage higher management on this issue.

Amazingly, in 3 months I have already forgotten some of my intentions and some of my accomplishments. One thing that I recall having a strong intention was to get more acquainted with the Association of Science and Technology Centers and try to determine how to utilize the association to seek opportunities for partnering with a variety of science centers. We'll report back on this later.

Connecting with colleagues regarding specific points related to PPSR has been of great value.

We have partnered with some of the conference organizers to create a session for the George Wright Society biennial meeting on parks and protected area management, to bring the emerging dialogue to an audience of protected area managers.

We have proposed an East coast-based LiMPETs program under NOAA's BWET grant program, with colleagues I met at the conference as advisors. We approached a fellow attendee about serving as an external evaluator on a program for us. I have proposed setting citizen science/ppsr as a "niche" for a local agency seeking strategic direction. I have spent time examining our programs that incorporate ppsr to determine the relative importance of education and data-gathering.

Discussions with colleagues have been valuable as we assess plans for program adjustments in the coming year.

More critical evaluation of program and how to improve it. I think its been of value just from a reflective standpoint- I haven't got data at this point on programmatic impacts.

Network with other people doing projects and incorporate some of what I learned into my projects.

We partnered with a post-doc student interested in documenting the process of establishing our citizen science program. We also evaluated and were better equipped to plan for the production of our program.

Examined my own programs, conducted evaluations and shared the things I learned with colleagues

Thought about better ways to measure our efforts/progress.

I'm sorry but this is too complex a question and I would like to give a meaningful answer but don't have the time.

Keeping in touch with participants primarily through social media. The value is less that it is helping me with PPSR specifically, and more in that it is a community-building exercise.

Used the information and resources to share with colleagues in my region, convened a meeting of different groups interested in citizen science.

These conferences and workshops always inspire reflection on the direction of our programming. We spent three months creating a visioning document for our programs.

I have made my colleagues aware of PPRS and the value and importance of citizen science endeavors but need to do more actions for effective outreach.

I have looked into how I can incorporate programs/projects into my high school science classes.

Appendix I

Verbatim comments on "why/if you think PPSR is important…"

PPSR is radically restructuring the potentials of both scientific epistemology and ontology. While there has been a tendency within the literature to hail participatory science as "democratic," I think this might be the wrong word. It instead appears to shift the ground that science stands on to a flattened ontology that creates meaning laterally, rather than hierarchically. Done correctly, PPSR has the potential to distribute meaning and value of scientific research in ways that the rigor of the academy often precludes.

PPSR is important to scientists because, in some cases, the volume of data necessary or the amount of brain power needed to answer some scientific questions is beyond the capabilities (time and money) for most professionals. It is important to educators because participation in science means a lot more than simply learning what other people do. To participants, we create an informed citizenry which values science, the scientific process, and/or demistifies what scientists do. It offers a sence of empowerment and wonder regarding our world.

PPSR is important to me as an educator because it provides authentic science experiences for my students.

I believe it is a wonderful transdisciplinary initiative, benefiting society.

It is important to give the public the capabiltiy and support to do their own inquiry. I think the range of opportunities, from providing data to an important program all the way to doing their own study and using their data to make decisions in their communities, is a key benefit to participants and society at large.

PPSR made me feel energized about citizen science and it helped me to see that our efforts ARE important and recognized by people throughout the world. I was at a point in my career that I was feeling discouraged because the adminstration at the school does not recognize field work or citizen science as an important action. Shortly before the conference my principal had actually approached me and suggested that we limit water monitoring because it was not college preparatory

It's important to scientists because we need help collecting data of all forms. It's important to educators - to use science as a tool for learning and engaging folks in the environment around us. It is important to participants to give them a sense of stewardship and ownership. It is important to me because I am a scientist and an educator and it provides the best of both worlds!

PPSR is an important entry point for many different sectors of the public to become involved in the scientific enterprise. It's important for scientists because it can enhance the rigor and creativity of the work they do and inspire new questions and approaches. It's important to educators to be able to incorporate authentic practices of scientists in their classroom and generate excitement with relevant work. PPSR is also an exciting way for K-12 educators to think through some of the framework of the Next Generation Science Standards. It's especially important to participants who are historically underrepresented in the sciences as an entry point to careers and educational tracks. It's important for diverse audiences to have engaging pathways to scientific careers so we can have representative voices in how we conduct research and who sets research agendas. As STEM increases its importance in economic growth, PPSR is a critical gateway to economic equity and social justice.

PPSR is important as it puts scientific practices in the hands of informal learners, and gives people more reason to be outside, observing their world. These are the main primary values from my perspective. I think the usefulness to scientists is developing, and is only a secondary concern for me at this point.

PPSR is essential! Both for scientists who may have fewer resources to use to collect data and to engaging the next generation in the actual practice of science to engage their imaginations and aspirations! Not to mention their awareness of their role and natural ability, of every human's role and natural ability, in questioning and answering and researching what's going on in the natural world. That's why it's essential to scientists and students. It's essential to educators in that educators are charged with preparing students/youth for success in an increasingly science- and data-driven world, and PPSR programs can give educators unparalleled help in creating authentic science experiences for learning. It's important to me because it's real, it's democratic, it's inclusive, it's about setting people up for success in something that they might not have thought was within their capacity. I would LOVE for more people to get that science is within their grasp, that they have something to offer and much to learn (joyfully!).

PPSR seems like an important mechanism for involving the general public in meaningful scientific research; also of scientific value in providing fine-grained data on biotic responses to climate change.

Some research qiestions can only be addressed with large numbers of trained people dispersed over a wide area, so it's a bonus for research. It also educates the public (in my case about aquatic habitats and conservation), engages them in their local environment, and gives them a better undestanding of issues they often vote on and/or lobby for. The project is accessible to children so it's a good way to get kids out of the class and into the mud. The public distrusts or disbelives scientists because they don't understand what we do--PPSR is a perfect bridge.

PPSR has the potential to be a paradigm-shifter for science -- and, I suppose, if you want me to get REALLY philosophical, for society. One could argue that our sustainability challenges would be greatly aided by a public that is increasingly literate and engaged scientifically. PPSR has the potential to aid in that literacy and engagement -- to essentialy change our society's relationship to science. It also has the potential to drastically increase the information available to scientists ...and data is the bread and butter of scientists! Especially in today's science, where scale is critical and large scales (regional, national, global) are necessary for understanding, PPSR has tremendous potential as a data-generator. This is a great question, BTW. :)

Science is a process that helps us make meaning and construct knowledge about the world around us on which we depend for our survival. Better engaging the general public in understanding and valuing the natural world through science is in my opinion the best way for us to make positive decisions with respect to the environment. For scientists -- to share their knowledge more widely. For educators - to provide learners with motivating, primary experiences. For participants -- experiential education. For me, all of the above!

It is a good opportunity (not always utilized) for scientists, educators, and participants to collaborate. Large data sets and improved public education are great goals to keep striving for.

By doing science through PPSR projects, people of all ages can build their appreciation and understanding of the natural world and scientific inquiry.

For scientists - to conduct research, to augment research and to spread the word of science! A great way to communicate with the wider community. For educators - a fantastic platform for formal and informal education, incorporating real science into teaching. For participants - an exciting way to participate in science and to communicate with scientists (an sometimes policy makers, too).

Earlier I used the term "democratization of science." I believe one reason Americans are increasingly skeptical of environmental science - including climate, ecosystems, sustainability, etc. - is that we as scientists have (mostly inadvertently) distanced ourselves from the larger society we serve. A lot of scientists think all they need to do to remedy this is make science more "sexy" and somehow build a more ecologically literate public. I think that's a rather narrow and elitist vision. To me, the challenge also is making our science relevant - requiring work on our part as well as on the part of non-scientists. Not only do we need to help citizens understand why our questions might be important to them, but we also need to focus more on questions that citizens know are important to them. That's where PPSR comes in: By directly engaging citizens at all levels in the scientific process, we not only can help people understand science but we can help scientists understand people. And frankly, scientists aren't the only people who can make astute observations about the world around them - PPSR is a way we as scientists can become better at it.

PPSR is important to scientists because working with people enriches our practice; when engaging with people they ask all sorts of questions, some of which you've never thought of before, so it helps you to think more deeply about the values and assumptions that you bring to your work. Often we're funded by tax-payers, so we owe it to them to discuss our projects with them, be steered by them, feed-back our results, and I think we need to be more open about data too, and let people "play" with, or analyse the data that they collect for "our" projects. For educators I think PPSR can be important if resources and projects are being created that educators can use when working with their students - this has been a good way of engaging large numbers of people with our CS project. It also helps the less scientific educators incorporate more science in their teaching. Our research has shown that participation in projects can improve behaviours towards the environment (e.g. joining environmental organisations), and attitudes towards the environment, in some cases, helping with careers in environmental or scientific sectors. It's important to me because I love sharing my knowledge of the natural world with people, showing them that their participation in projects really matters, I like the interaction with people and being able to inspire some of them to learn more about science. It's also a really interesting research area for me, particularly around how to evaluate projects, and the benefits that participants may gain from participation.

Clearly, it is helpful to the scientists to gather data. It is helpful to institutions by being a creative way for institutions to engage with the public in a meaningful way. To the participants, they learn content and process skills while also learning about issues and having a role in real scientific research. To educators, it is a tool for teaching content, process skills, and civic or environmental action while having motivated learners. To me, it has been useful due to the variety of options, which gives me flexibility.

For scientists - I am always looking for more data to help me understand my environment.

If I know that the data were collected following established protocols from someone who was provided some modicum of training, such data can be invaluable. As an educator, I enjoy training and teaching everyone not just my students. Every time I can convince someone of the value of scientific knowledge-seeking, I become more personally satisfied. Spawning intellectual curiosity in people who never thought of themselves as scientists, or being interested in science, motivates me. This helps to motivate the participants - they derive value from their efforts on a very personal level. People participate because they care - just as in any, well, hobby. They develop personal interests and passions that can be stoked by PPSR projects that openly seek this type of collaboration.

For me, CS is about the transition in the way that individuals interact with information. As a librarian, my job is not to simply provide materials- it is to link people to a greater world that might not be evident in their everyday lives. CS is an important avenue for that "two way" informational experience that I want to define my library.

I believe PPSR is very important. For scientists, it allows greater data collection, but also interaction with the public. This is imperative in order for scientists to be aware of public misconceptions around science and general levels of science literacy. With this knowledge, scientists will hopefully be able to correct misconceptions and communicate more effectively with the public. For educators, PPSR projects are excellent teaching tools. They provide integrated learning opportunities, a connection to 'real' science and scientists and most importantly, the opportunity to change the paradigm that only the best and the brightest students can be scientists. For participants, PPSR is an opportunity to be a steward, to meet new people, to expand science knowledge and skills and to be a part of something bigger than oneself. For me, PPSR is important for all of the above reasons, as I have played the role of scientist, educator and participant. I believe strongly in this field and am excited to help it grow.

It democratizes science, makes it less of an 'other', which makes it more accessible.

PPSR is important because it is an accessible entry point for non-scientists to become involved in science research. As a PPSR participant, it allows me to engage in a field of science that is not part of my job--I learn so much in an area that is not my field of expertise! As a PPSR provider, I love seeing people excited about participating in real science.

I teach research design and finding ways to encourage citizens to engage in research by understanding good design is very important to me.

Scientists are often viewed as stuffy ivory-tower personalities, or crazy and disconnected from the needs of the community. PPSR bridges the divide between the lab and the places we live and work to produce more of a symbiosis and understandings on both ends.

To scientists - because they are getting funding from the public and should be 'citizen scientists' as Stilgoe and Irwin defined To educators - to share the fun of science and develop new areas of learning To participants - learning about their area and new science To me - because it makes my work more meaningful and enjoyable

PPSR provides scientists with the data that they need to solve enviornmental problems that have a large geogrpahic or temporal scale. For educators it provides an opportunity for students to gain skills in inquiry through authentic scientific research. For participants it provides an opportunity to engage with their natural environment and to contribute to

something real. For me it provides exciting career opportunities that combine my interests in science and public outreach.

I think it is important to share and hear what is going on in the field. I think we all strive to be innovative and think we are doing something cutting edge. But, it is nice to know that you have colleagues who have maybe already been down this path and can offer advise or future collaborations can come out of conferences like this.

I find it important because it powerfully extends my ability to collect high quality information and engage the general public in conservation education and science.

As a scientist PPSR is extremely important because it leverages the amounts of reliable data that can be collected enormously, provided the training is good and clear. On a personal/political note, I believe that we are building a critical and expanded constituency that will understand and advocate for the natural world/conservation.

PPSR is a great way to gain large amount of information about somethings at a scale that no single research department could. It's also a great way for people to interact with specific elements of their surroundings; it sharpens people's attention to targeted areas, whether it's a search image for a bird, a frog call, plastic bags on the street, it gets people thinking and taking note.

I came to the conference from a health research perspective and although I knew of individual projects had not seen the field as a whole. Much of our work is around CBPR and PPSR overlaps our work strongly - or, I should say, the goals overlap. Medical and community health research because of academic silos, a very narrow and often pharmaceutical solution outlook, and, to be frank, general arrogance, tends to find CBPR in any of its forms to be 'unscientific,' overly time consuming, and without a clear track towards either grants or academic advancement. We feel that science done that engages people at almost any level and, at the highest level listens to, engages, and responds to people, is better science. A body of evidence is slowly accumulating that supports this and it was very affirming to see the more advanced state of work in PPSR and feel like we were both moving in the right direction.

It helps more people understand the importance and relevance of science to many aspects of their lives.

With respect to coral reef ecosystems specifically (my area of interest), gathering data to document and monitor conditions on a large temporal and spatial scale can be an overwhelming task with logistical constraints and limited funding. Traditional scientific studies are often limited to species specific interactions and do not contain sufficient information to allow for a comprehensive assessment of the condition of a coral reef ecosystem. Community-based monitoring groups are useful for collecting great amounts of data for health monitoring at low cost, and many of these groups have been rigorously evaluated for scientific validity. International partnerships, non-governmental organizations (NGOs) as well as government agencies with limited means are using volunteer monitoring schemes to help manage natural resources, and many programs have expanded to include students, local and non-local resident volunteers to monitor terrestrial and aquatic habitats including coral reef ecosystems. Of course, peer to peer networking can enhance impacts through social learning, and there is a community desire to learn and be involved. I am fulfilled by the fact that I help to spread the importance of conservation

throughout the community with hopes of contributing to added protection of these ecosystems.

As an educator and a citizen, I feel it is critical for the scientific community to connect in meaningful ways with the public. With the looming impacts of climate change our very survival as a species depends on how well PPSR does this.

I think - OK know - that there are many ivory tower scientists out there who could benefit from knowing that people have brains in their heads and can do science even without a PhD in the sciences (or at all). For educators, PPSR gives opportunities for hands on learning that make lessons meaningful to their students. For participants there are many opportunities for learning, about the project directly + 'spin off' topics related to the project. I also provide opportunities for everyone to meet one another and feel part of a team (educators, scientists, volunteers, and other stakeholders)

To scientists - they can use the public to collect data for them at a scale that would not be possible for an individual scientist or would require so much money to be impossible. To educators - they can get involved in real ongoing science and contribute to large questions outside of their classrooms. To participants - PPSR fosters an appreciation for the scientific process and promotes scientific literacy. To me - I care about the poor scientific literacy in our country; I like engaging kids and adults to get excited about biodiversity on our planet; I like that PPSR can make a meaningful difference in people's lives while also supporting scientific discovery.

I think it's a novel way to get new kinds of science done that haven't been possible before. Participants can get something out of their contribution as well, so there are a lot of potentially beneficial individual outcomes, and educators can use it as a way of creating authentic science experiences. It's important to me because it's interesting and expands our collective ability to tackle important scientific challenges.

It is critical that stakeholders and researchers work together. It not only improves science by bringing together different forms of knowledge, but it also improves the potential for science to be useful and relevant. Further, it strengthens stakeholders' understanding of science and its usefulness; it strengthens capacity by merging resources; it enhances student education through application and networking experiences, and enhanced learning opportunities, and it strengthens community.

Important for getting important conservation issues heard. Important for stewardship of the environment over the long term. Important for scientific acquisition of data over large areas and long durations.

PPSR gives science back to the people - empowers, inspires and engages folks with the process of science and builds community. It is good for scientists to build community outside of their sphere and learn to communicate their science better. It is good for educators to learn their science better and practice teaching in a new way. It is good for participants to know that they can contribute to science and community and it is important to me because it is necessary to involve people in understanding how to live in a more healthy and sustainable way. Education that increases scientific literacy leads to critical thinking and better decision making. Building community holds people accountable to each other and leads to better decision making. It is also important to me because it inspires me and I want to help expand and build this exciting field.

I personally think that PPSR is important because it allows me to research rarely observed insect behaviors that I am unable to research alone. I think PPSR is particularly good for this sort of research because the participants are widely distributed and have a variety of schedules that are conducive to making these kinds of observations. Educators can use PPSR to get people excited about science, to make them see that you really don't have to have a degree in science to make a valuable contribution to our understanding of the world. The hands-on nature of PPSR is also great for doing inquiry-based science, even if the teachers don't feel strongly versed in science. Participants get to learn about new things and be a part of science, which I think is an ample reward for participation. Scientists especially benefit from PPSR though, I believe. By allowing people to participate in your research, you allow them to learn something about what you do, how you do it, and WHY you do it. This is important for creating a scentifically literate society that supports scientific research and progress.

PPSR is an important method of collecting scientific data because the more people participate in science the more invested, engaged, and knowledgable citizens will be in what happens in the world around them.

I think that PPSR will help build community, develop a stronger relationship between people and the earth and create community members who are more likely to volunteer and be engaged in our other programs.

It is a way to get people to understand the problems we are facing with climate change. Using nature to do this is a great way to not have to hit them over the head with a 2x4.

It's important to bridge the gap between scientists and the public, and to provide opportunities for the public to think scientifically, especially in this age of specialization, misinformation, and reliance on facts as an 'option'. Also, with limited resources, volunteers can make a real contribution to collecting distributed data that would otherwise be too costly or unfeasible to collect.

As a researcher and manager: I like science. I like a well organized research project, that fulfills its desire. But I love people. I love positive human interactions. And PPSR seems like an excellent bridge between science and people.

Lets any regular person to reach far beyond themselves and have an impact on world-class science.

I think there is a disconnect among scientists and the public. PPSR offers an opportunity to connect them while facilitating improvement in science literacy and environmental behavior.

The topic is important. I'm not sold on the PPSR title whatsoever though. Sorry. It's too many letters and too easy to forget what it stands for. "Citizen science" is easier as it's actually words that have meaning in my mind (or any of the other host of phrases, but an acronym just doesn't work). Back to your question then...it's importnat because there are numerous questions to answer (across fields of science) and citizens are able to help answer them - whether they be citizen-generated or scientist-generated questions. It's important to me because it's invigorating to see the questions generated either by the citizens or by the scientists and see answers be formulated through data collection.

I think it is important to broaden engagement with historically underserved communities--PPSR is a powerful tool for helping to do that.

It is important to scientists because it can expand our capabilities, not just in terms of data collection, but also in terms of generating new questions and ways of thinking about study systems and data. It is important to educators because it is one very clear way to build connections between students (of all ages) and scientists. It's important to me because it is a fascinating and exciting field and offers an opportunity to bridge gaps between science and the non-scientist public.

PPSR is important to engage non-scientists in understanding and caring for the world around them. It is especially important, even essential, where government considers the environment as a secondary matter. Projects that link scientists, educators and/or the public increase understanding between groups, and improves the public's understanding of environmental issues and of what is scientifically reliable information. Greater understanding can lead to greater support for scientific research and monitoring, for environmental protection and for caring for the common good.

I believe that citizen science may be the most important tool at our disposal for bridging the gap between scientific research of all kinds and the local and global communities it effects.

PPSR is a great way to connect the public with science, natural resources, and specific places. It can help an agency/organization collect needed data during a time of shrinking budgets, increase relevancy of the organization for the broader public, and teach scientific skills. Plus, people tend to have a lot of fun!

It is so important to get people vested in nature. How better than to get them vested than to have them feel like they are contributing information that might be useful. People have gotten so far removed from nature that the health of our planet is in jeopardy.

chance for our society to become ecologically suatainable

PPSR gives scientists educators and participants a way to engage in meaningful dialogue with eachother and with the communities they serve.

From my point of view (coming from the education side), I see PPSR as a valuable way to engage multiple audiences in learning about their local environment and ecosystem context, what field science entails, how data are applied to decision making, and on and on. The scientists we have worked with have said that they've learned a lot about how to communicate with those same audiences about their work. For me, ppsr is a step closer to democratization of science and scientific information.

Scientists: If planned well and with appropriate QA/QC the data can and should be valuable to scientists. In addition, there is a benefit to the research world as the public gains understanding of science, they become more supportive of it. Educators: It's a great way to provide hands-on learning opportunities that students often internalize and remember longer than classroom setting experiences. Participants: Our participants often mention opportunities for both intellectual and emotional connections with the natural world as being highly valuable. They feel good about providing valuable data for the time they spend on the project. Me: It is truly rewarding to see the enthusiasm and dedication of some of our participants, and they share this enthusiasm with their friends which spreads support of science in the community. I am also getting useful data at a relatively low cost. For the cost of one coordinator and a couple of student interns, I got the equivalent of 10 full time technicians in the field for 3 months.

It empowers everyone to do and understand science, so they are not afraid of it.

We must educate the nonnscientists to understand how to keep the Earth moving in a positive diretion.

It is important for citizens to feel like they are contributing to science research, taking ownership of something is really one of the best ways of learning about something. It also can inspire citizens to take a closer look, potentially leading them to a career within the same field or related field as the citizen science program.

PPSR is important for all of us because it is an effective way to have us all working together for the same cause with clear objectives and goals and outcomes.

PPSR is just so damn functional. It works, and it will help us move through some of the most chronic challenges for science and at the intersection of science and society. PPSR allows us to capture data at large scale, it helps advance science literacy, it helps build capacity for conservation, it gets scientists and community members talking, it may even get community members talking with their elected leaders... It empowers participants to better-understand the world they live in, and in doing so, empowers them to make informed decisions. There is so much potential in this tool-- more so than any other tool I can think of. That is why it is so important to me.

Improve Science Literacy in general and in relation to the biodiversity of my region (San Diego), allow teachers and students to participate in authentic science work and collaboration, help scientists see the value in engaging groups of non-scientists in collaborative work.

The disconnect between science and the "public" is unfortunately very evident - in the media, in policymaking, and in the way people speak and react. It is incumbent upon scientists to make their work not only accessible, but understandable. So many scientific terms are misused (what does it mean if something is significant). "I can look at that data and come up with any conclusion so what good is it?" (No, there are rules and structures) Many of us have personal filters that influence the decisions of how we live our lives (budgetary, health, etc.). To what degree are those filters based on real-world scientific information and to what degree are they based on media information. Science has a critical place in dealing with climate change, global population issues, public health, etc. We can't solve these problems as a community if we can't all speak the same language. I believe PPSR can have a huge impact in applying the work of all areas of science.

Important to create an organized effort (have a professional organizations) to bring together disparate information that could provide broader and interesting biological insights and understanding. Recognition of organizations large and small that have been observing, recording and monitoring data and provide them with support and excitement of contributing to larger understanding. Encouraging everyone to be a “scientist” and work with data! Understand what data is as a tool for answering scientific questions.

Appendix J

Verbatim comments on "other things you'd like to share with the conference organizers"

A statement of ethics is key to moving forward.

I know the conference was large, but it would be helpful to have a shared meal such as an evening banquet. I find this provides opportunity to discuss what people learned during the day's events. Great job!

Wonderful experience; let's do it again soon!

I think the term "PPSR" is awful and does not invoke anything to anyone. If you want a term and dislike "citizen science", try to find something that has some kind of meaning beyond the academics that came up with the term. Citizen science requires an emotional investment from participants and PPSR sounds like a disease. (sorry!)

Thank you for giving me the opportunity to attend, network and learn more

I really hope the conference continues to happen and possibly extend the meeting time we have. It was a great experience - there are so many things going on in PPSR currently, I would like to see the momentum continue. 2 days was not enough.

Thanks for organizing us - I'm looking forward to the work that comes out of the conference and future meetings!

I struggle with poster sessions... I optimistically keep giving them a try, keep generating an open mind with which to approach them, I put a lot of time and thought into my posters, and then I'm disappointed yet again... The poster sessions at the PPSR conference were overwhelming, too crowded for conversation or comfort, and left me wondering why I'd bothered. I don't know what the answer is. Giving every poster presenter a speaking slot would have been overwhelming, maybe... but what if we'd each been given 1 slide and 2 minutes? and 5 of these happened between every 15 minute presenter? Or what if they were more powerfully curated and grouped?

Great work; please do it again!

We need a bigger room next time!!!!! The posters were great but it was hard to move and hard to talk to people without shouting.

Thank you SOOOOO much for all of your work -- PPSR is very inspiring, and I'm so grateful for all that you did to bring us together!

Thanks for a great first-time effort. When's the next conference?

I want to thank everyone who put this on. It was a truly great experience and I hope it will continue as an annual gathering.

Thanks!

Thank you!

No, I've probably said more than my share.

Just a thank you for organizing it. I think it really re-energized people.

Let's do it again! The poster sessions were informative but much too crowded. It was very hard to see all of them and engage in the authors. Session logistics (timing) were ok, I think, but we just needed a bigger space for it. I don't want to see the number of posters cut down; the ones I saw and the people I met at the posters sessions were some of the

most valuable things I learned personally at the conference. Thank you! Oh, and did I thank you, yet? Thank you!!!

This was an awesome opportunity. The only thing that would be even MORE helpful at this point is help in designing projects that are "doable" for librarians. Realistically, few librarians in Idaho have the training to design and implement a CS project. in rural areas, many do not have education beyond HS. They need a step by step, almost "canned" program. We are making progress, but it is a big project!

Thanks! Looking forward to being involved with working groups and another conference!

Please plan another conference soon!

When thinking about diversity, please also include socioeconomic groups - the fishers I work with are not the standard demographic, but they are largely white males. However, they're part of the country, along with the Appalachians, that are working to be recognized as minorities in need - they speak with their own accent and can trace family history in the region literally to the Roanoke colony.

It was a fantastic event and very memorable, thank you for all the effort of putting the meeting

While I felt the conference was wonderful, I did feel that the space a bit tight to see all the posters. I also felt there needed to be a little more balance between speakers and break-out sessions. I think with the field being so broad it may be nice to have break out sessions that are of interest to certain members. While the presentations were all great, they did get a big long and repetitive it seemed.

Open ended brainstorming at the end of the conference had high potential, but was too unorganized for that many people to participate. Needed more organization and forethought. I'd also like to have more opportunities for general idea sharing, and less specifics about individual projects in the talks. Seems individual project information is best shared in a presentation and more synthesis ideas should be presented in talks.

Thank you for keeping up the momentum! I can learn more from the inclusive, grass-roots, democratic style of organization you are building. It's powerful.

Thanks for a great meeting. I hope you are able to communicate movement toward an Association/Society to the community as things progress. I look forward to being part of those discussions.

I thought the conference was extremely well organized. The presentations were sequentially arranged in such a way that I (pretty new to PPSR) didn't get lost and learned a great deal. There was ample time for discussions around the posters and to talk with participants (although the width of the poster aisles was a challenge!). I came away completely fired up. If this site were chosen again (from the East Coast and I love Portland, OR), there could be a brief presentation of the convention center's attempts to deal with water run off and the city of Portland's increasingly thoughtful relationship to the river whose name I can now pronounce like a native.

I appreciated all the work that went into organizing the conference. It was a good balance between posters and presentations. I would have liked more effort placed on helping someone new to ESA to connect with other educators (I was one of the very few K - 12 educators there). Also, I really question the need for a separate organization for PPSR. It

is a discipline but I think the field should work within the umbrella of a larger organization like ESA.

I really enjoyed the 'all posters' format - fantastic idea. Allowed for rich discussions with people coming to my poster, and with those whose posters I visited. Also allowed many opportunities for informal networking. I did at times feel that there were some assumptions made by the speakers that somehow we were an audience of elitist white people who had no (or at 'best' insufficient') consideration for diverse audiences. My community and project has a population that is reflective of the cultural diversity of the larger population. Women tend to be overly-represented, but research shows this is often the case. Their sexuality and incomes are none of my business (though at a guess there is a range of incomes represented). I was also uncomfortable that there often was the inherent assumption that if the participants were not involved from step 1 in designing the project all the way through to data analyses that it was somehow 'less worthy' of projects that have this level of participation. Certainly, there are many projects where the participants ought to be more involved in the project - I am a strong believer in the grassroots approach and generally shy away from 'top down' directives. However, many projects, including mine, are of a very different nature. The volunteers I work with would not have known that the question under study was even a question if they had not become part of the project. I stay in communications with them during the monitoring season and throughout the year - they *are satisfied and happy* with their level of participation. Many have given input on the protocols, and all suggestions have been taken into account for adjustments in the next monitoring season. Most (if not all) *would quit* if more were asked of them.

Thank you for your hard work.

It was a GREAT conference and I hope you'll do it again next year! I can't wait to learn more and interact with more people.

I wish the poster sessions hadn't been so crowded. It was really difficult to navigate such tight corridors. It would have been interesting to have a time or place for different stakeholders to meet. For example if you are in informal ed meet in the left front corner of the room, if you are in formal ed go to the front right corner, etc. I think there are common pitfalls that we face based on the type of institution we are a part of. I really liked having the plenary presentations on the citizenscience.org website. That was a great resource.

It would be great if future conferences had a strand about the participation side of things.

Great survey! This helped a lot thinking about designing my own.

Amazing conference and I hope we have more of them

If there were only one event a year that I could attend, it would be this conference.

The conference was great. I have learned a lot and it still helps me sustain my passion for PPSR in the current context of major public service cuts. Thanks for bridging the gap between disciplines and between organizations with this diverse conference.

I am looking forward to the development of a formal organization focused on PPSR and hope to participate.

Thanks for all your efforts to build a community of practice! It was great to have everyone together.

I am hoping to be more involved and hope we can build on the workshop.

I hope it happens again next year!

I'm waiting to hear about work with small groups to advance some of the ideas that came out of the final breakout discussions! please keep us in the loop!!

Keep up the great work! It's motivating to know that other people are organizing and working to advance PPSR as its own cause and possible field of study/practice.

It was a great conference! I wish I had been able to attend ESA afterward. Also, it might be useful to set up a mentorship program for new people, pairing them with people who are established in the field.

Keep on the good work! When is the next conference?

Let's keep this thing moving!!!!

I would encourage the citizen Science on-line data bases to work on making the large data sets easily available to high school and university science courses so students can work with data sets.