

**Evaluation of
United States Regional GLOBE Student Research Symposia**

January 2018

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This report presents our evaluation of the United States Regional GLOBE Student Research Symposia (SRS) project directed by Jennifer Bourgeault, University of New Hampshire, for the time period between August 2016 – July 2017¹. Funding from the National Science Foundation for this project began in August, 2015. This document reports the extent to which each of the goals stated in the original proposal were met. The document is organized in the following sections:

- (1) Overall Summary of United States Regional SRS
- (2) Recruitment and Regional Participation
- (3) Regional Collaboration and Sponsorships
- (4) Student SRS Participation and Experience
- (5) Teacher Professional Development Support
- (6) GLOBE data and project submissions
- (7) Final comments

Data sources for the information presented in this document include: teacher surveys following their participation in the project, student pre- and post-symposia surveys, the GLOBE website, regional GLOBE partner registration lists and reports by the project coordinator, Jennifer Bourgeault. Survey instruments are found in the Appendix.

Each section will include the goals stated by the project team in the initial proposal in ***bold-face italics*** followed by our evaluation of the attainment of the goal after reviewing the evidence that was collected. Specific data will be referred to in the report in order to substantiate the evaluations that are being made.

¹ The 2016 GLOBE SRS evaluation results reported in this document were submitted by Dr. Diane Silva Pimentel and Erik Froburg in August 2016.

I. Overall Summary of United States Regional Student Research Symposia (SRS)

The U.S. Regional GLOBE SRS Project began in August 2015 with funding from the National Science Foundation. The overall purpose of this project was to coordinate six regional Student Research Symposia (SRS), formerly science fairs, across the United States that would serve as spaces for students to present their results of investigations using GLOBE data and protocols to peers and scientists. There were many goals associated with this project including providing resources and supports for teachers engaging in GLOBE-related research with their students, to increase the participation of teachers and students on the GLOBE website, and increasing teacher and student confidence in conducting GLOBE research investigations, to name a few.

Each year six regional student research symposia were held in the U. S. during the months of March, April, and May. During these two-day symposia, students participated in science-related activities which varied by venue; presented their GLOBE research to reviewers and community members; and interacted with scientists and peers. During this second year, thirty-six (36) U.S. GLOBE partners, 62 teachers, and 201 students participated in the regional SRS events.

II. Recruitment and Regional Participation

The project will engage ½ of the partners in each region who will mentor, attend, and send a team.

Data to evaluate this question were obtained from the GLOBE partner registration forms belonging to each region.

Table 1 shows the actual partnership numbers and percentage of goal met by region each year and cumulatively. The project team set out to have half of the partners participating from each region. This goal was met for only one of the regions. The Pacific region met the goal of 5 partners both years. Other regional participation ranged from 16%-85% of the goal. The Southwest region showed the lowest percent participation with only reaching 16% of the goal over a two-year period.

Table 1: Partnership Participation Goal Attainment Assessment

Geographic Area	Partnerships	Goal	Actual 2016	Actual 2017	Cumulative	% Goal Met (over 2 years)
Northwest	14	7	4	5	5	71%
Pacific	10	5	5	5	6	120%
Southwest	36	18	2	3	3	16%
Midwest	19	10	4	3	4	40%
Southeast	25	13	4	7	8	62%
Northeast & Mid-Atlantic	24	12	8	5	11	85%
Total	128	65	27	28	37	57%

Table 2 shows the actual participant numbers and percentage of goal met for teachers and students by region for each year. In the case of the 2017 SRS, the Pacific and Northeast/Mid-Atlantic regions met and exceeded the teacher and student participation goal. Overall, 95% of the total projected number of teachers participated in the regional events and the project met and slightly exceeded the number of projected student participants (103%) during the 2017 SRS.

Table 2: Teacher and Student Participation Goal Attainment Assessment

Geographic Area	Goal -Participants (not including mentors & leadership team)	Actual 2016	Actual 2017	% Goal Met (2017)
Northwest	7 teachers, 21 students	4 Tchrs, 20 Sts	3 Tchrs, 14 Sts	43%, 67%
Pacific	5 teachers, 15 students	5 Tchrs, 17 Sts	10 Tchrs, 18 Sts	200%, 120%
Southwest	18 teachers, 54 students	7 Tchrs, 33 Sts	9 Tchrs, 31 Sts	50%, 57%
Midwest	10 teachers, 30 students	8 Tchrs, 40 Sts	7 Tchrs, 33 Sts	70%, 110%
Southeast	13 teachers, 39 students	4 Tchrs, 22 Sts	9 Tchrs, 31 Sts	69%, 79%
Northeast & Mid-Atlantic	12 teachers, 36 students	9 Tchrs, 32 Sts	24 Tchrs, 74 Sts	200%, 205%
Total	65 teachers, 195 students	37 Tchrs, 164 Sts	62 Tchrs, 201 Sts	95%, 103%

Summary of Findings:

1. In general, each region engaged several of its GLOBE partnerships. Participation on average ranged from 16% to 100% of the goal to engage half the regional partners (Table 1).
2. In 2017 the SRS engaged 95% of the total projected number of teachers and the project met and slightly exceeded the number of projected student participants overall (Table 2; total students = 201; 103% of the goal).

III. Regional Collaboration and Sponsorships

The project will increase interaction between partners in each GLOBE region resulting in at least one collaboration project.

According to the project director, each region has committed to a third year of SRS. Given the collaborative nature of and the engagement of several regional partners throughout the symposia, a commitment to a third year of SRS is a testament to increasing the interaction between partners in each GLOBE region. In addition, partners in the Northeast/Mid-Atlantic are discussing new collaborative grants and the Partners in Colorado have created a state-based group.

The project will result in at least two regional leadership teams finding outside sponsorship.

According to the project director, Earth Networks sponsored lunch at the Northeast/Mid-Atlantic SRS. Also, NASA JPL provided the venue for the Pacific SRS. Finally, Purdue donated backpacks and goodies for each student.

IV. Student SRS Participation and Experience

The project will bring together students from different states to learn from each other, have a positive educational experience, and report “a positive attitude about science and the environment and see themselves as scientists” after the event. The project will increase student confidence in conducting GLOBE research investigations.

The data used to report students’ perspectives about their educational experiences and attitudes towards science were obtained from a survey administered before the SRS, and again at the end of the SRS. Of the 201 students who participated in the regional SRS, there were 135 students (67%) who completed the pre and post questionnaires. Some students did not answer all of the questions thereby causing variation in the number of respondents reported in each question.

Student Perception of SRS

When students were asked what “part of SRS did you enjoy the most?” the top six aspects were *meeting other students* (16%); *meeting scientists* (14%); *evening activities* (12%); *presenting research to peers* (11%); *presenting research to scientists* (11%); and *peer review from scientists* (11%)(Table 3). The reasoning for these selections were because these activities were considered fun (26%); were educational (25%); provided an opportunity to meet people with common interests to discuss science (21%); and were interesting (10%).

Table 3: The top six most enjoyable parts of the SRS identified by participating students across all regions. Percentages indicate the relative number of selections for a particular SRS activity (e.g., meeting students, peer review).

Meeting other Students	Meeting Scientists	Evening Activities	Presenting Research to Peers	Presenting Research to Scientists	Peer Review from Scientists
16%	14%	12%	11%	11%	11%

Selected student quotes:

- *It was very interesting to see what other groups chose as their research projects, as well as what other scientists had to say about our project.*
- *I thought the peer reviews were fun, and it was nice getting to know what other groups did.*
- *I enjoy meeting new people and getting feedback on my research so I can improve.*
- *I learned about science. It really helped me get a step closer to finding/choosing my career choice.*
- *I thought it was great to not only teach others about our findings but learn from them as well.*

There were more “enjoyable” attributes of the SRS identified (81%) by participating students, than “non-enjoyable” parts (19%). Nonetheless, among the 19% of “non-

enjoyable” aspects flagged the following parts were identified: opening remarks because it was “boring”; keynote speaker because there was “too much talking”; and peer review because “it was intimidating presenting to my peers.”

Selected student quotes:

- *I got nervous when presenting to other students.*
- *The keynote speaker went on for a while.*
- *It was difficult to think what could make someone else's project better or what they didn't do a good job at.*
- *I felt critical when asking about others' research.*

Student Value for Science

Students were asked to respond to several items that were designed to assess their value for science, including “*Being good at science is important*,” “*I want to have a career in science someday*” (both asked to all but the Alabama site), and “*I like science*” (only asked to students at the Alabama site). All items were measured using a 6-point Likert type rating scale, where 1 = Strongly Disagree and 6 = Strongly Agree. Overall, students in Alabama reported liking science more after the SRS. For the remainder of the sites, students reported initial (pre-SRS) high levels of value for science, ranging from a mean of 4.98 (South Dakota) to 5.44 (Indiana). Student value for science was still high at the post-SRS time point, ranging from 4.84 (South Dakota) to 5.31 (California) (Table 4).

Table 4: Participating students' perception of the value for science pre- and post SRS regionally and overall.

Value for Science	Pre			Post		
	M	SD	N	M	SD	N
Alabama	5.57	.79	28	5.74	.71	27
Denver	5.08	.85	30	5.09	.70	30
South Dakota	4.98	.77	13	4.84	.77	13
California	5.22	.9	18	5.31	.74	18
New Jersey	5.27	.74	40	5.26	.77	41
Indiana	5.44	.52	31	5.56	.53	31
Total	5.21	.79	133	5.24	.76	134

Though the overall scores on value for science increased from pre-SRS ($M = 5.21$, $SD = .79$) to post-SRS ($M = 5.24$, $SD = .76$) the increase was not statistically significantly different from zero; $t(131) = -.632$; $p = .528$, 95% CI [-.107, .055]. These results suggest SRS participant learners held an overall high level of value for science prior to the SRS event and their level remained high after the event, and in many cases increased (though not significantly) (Table 4).

Student Self-Efficacy for Science Practices

In order to assess participant learners' self-efficacy for doing science related tasks, we generated several items that asked participant learners to report how much they felt competent completing specific science practices. Sample items included “*I am able to analyze data to do science research*” and “*I am able to construct scientific arguments.*” The mean for science self-efficacy increased significantly for the aggregate; $t(133) = -3.674$; $p < .001$, 95% CI [-.206, -.620] as well as at each individual site (see Table 5 for means and standard deviations for all).

Table 5: Participating students' self-efficacy for science practices pre- and post SRS regionally and overall.

Science Self-Efficacy	Pre			Post		
	M	SD	N	M	SD	N
Denver	5.20	.65	31	5.25	.56	31
South Dakota	5.38	.33	13	5.32	.44	13
California	5.21	.59	18	5.38	.56	18
New Jersey	4.91	.55	41	5.08	.63	41
Indiana	5.06	.58	31	5.35	.46	31
Total	5.06	.73	135	5.20	.71	135

Additionally, student value for science was predicted by their self-efficacy after the SRS, while their self-efficacy as measured prior to the SRS was not a significant predictor of their overall value for science. These findings align with the literature regarding achievement motivation in academic contexts, which posits that self-efficacy beliefs are strong, stable belief sets that contribute to value, self-worth, and relevant affective experience like enjoyment and frustration (see Bandura, 1997 for overview).

Hierarchical multiple regression was conducted to examine this question. Self-efficacy for science practices prior to the SRS was entered into the model at Step 1, accounting for 12.8% of the variance in student value for science ($R^2 = .128$, $df = 1,128$, $p < .000$). For these students, every unit increase in self-efficacy for science practices before the SRS was associated with a .367 unit increase in value for science ($B = .367$, $p < .000$). When their self-efficacy for science practices after the SRS was entered into the model (Step 2), their self-efficacy prior to the SRS became insignificant ($R^2 = .282$, $F = 28.43$, $p < .000$). The results show that for these students, every unit increase in self-efficacy after the SRS was associated with a .7 unit increase in value for science. The total variance in value for science accounted for by this model was 28.2%. Therefore, student self-efficacy beliefs were high before the SRS, and those beliefs were related to their value for science, but that their self-efficacy beliefs increased (significantly) after the SRS, and THOSE beliefs were related much more strongly to their value for science.

Student Perception of How SRS Impacted Their Investigation Process

When students were asked “did participating in the SRS impact your understanding of the scientific process?” the overwhelming majority (94%) stated in the affirmative.

Selected student quotes:

- *I now have a better understanding of the scientific process and doing research is hard, but rewarding.*
- *It did, because I didn't realize how in depth you truly had to get to properly represent data.*
- *Yes because it doesn't seem scary or impossible anymore.*
- *Definitely. I have a heightened understanding of many scientific processes.*
- *Yes, just seeing scientists and talking to them helps me grasp the whole situation.*
- *I feel it had a big positive impact. It made us really utilize the scientific process. It was fun doing scientific research.*
- *Yes it really helped me realize what a real science conference is like.*

The experience of communicating their projects as well as participating in the peer review and review by a scientist at the SRS enhanced students' understanding of the investigation process. As a result of SRS, students recognized not only aspects of the nature of science (e.g., collaborative, repetitive) but also an improved understanding of applying the science practices.

Summary of Findings:

1. Students report high levels of value for science.
2. Males report higher overall levels of value and self-efficacy for science, but the differences were not statistically significant.
3. Student value for science (science is important, I want to have a science career, I like science) was predicted by student self-efficacy for science practices but only after the SRS (Time 2). This suggests that the SRS provided students with an efficacy-building mastery experience that does significantly predict their overall value for science.
4. After participating in SRS, students expressed enjoying “meeting other students interested in science” and “the opportunity to interact with and learn from professional scientists as part of the symposium review process.”
5. The majority of surveyed students (94%) who participated in the SRS reported that the experience had a positive impact on their understanding of the scientific process.

V. Teacher Professional Development Support

The project will increase teacher confidence in conducting GLOBE research investigations.

The data used to report teachers' perspectives about their experiences and the instructional impact of the SRS were obtained from a survey administered after the symposia. Of the 62 teachers who participated in the regional research symposia, there were 34 teachers (55%) who completed the post questionnaire. Some teachers did not answer all of the questions thereby causing variation in the number of respondents reported in each question.

Overall, 94% (n=34) teachers largely reported they were satisfied or very satisfied with the SRS project for themselves and their students. Teachers were overwhelmingly satisfied with the various components of the SRS events (Table 6). In particular, teachers were satisfied with

the keynote speech (97%; n=32), evening activities (100%; n= 28), review from scientists (88%; n=32), and the research presentations to reviewers and to other students (94%; n=32) (Table 6).

Table 6: Number of teacher respondents satisfied with a variety of components of the SRS.

How satisfied were you with each of the following components of the SRS experience?						
	Very Dissatisfied	Slightly Dissatisfied	Slightly Satisfied	Satisfied	Very Satisfied	Total
Opening Remarks	0	1 teacher (Alabama)	2	11	18	32
Meeting Other Teachers	0	1 teacher (Alabama)	3 teachers	7	21	32
Meeting Scientists	0	0	3 teachers	9	19	31
Keynote	0	0	1	9	22	32
Evening Activities	0	0	0	11	17	28
Research Presentations to Reviewers	0	1 (Alabama)	1	10	20	32
Research Presentations to Other Students	0	1 (Alabama)	1	9	21	32
Peer Review from Students	0	2 (Alabama)	3	8	18	31
Review from Scientists	0	2 (Alabama)	2	10	18	32
Closing Ceremony	0	2 (Alabama)	1	10	19	32
Total	0	10	17	94	193	

Selected teacher quotes:

- *It was a great opportunity to engage in authentic science projects and present them to the scientific community.*
- *Students were engaged and interested and had the opportunity to engage in real scientific communication.*
- *My students enjoyed the experience, and are eager to return next year. I thought it was a great opportunity for students like mine to get out of their neighborhoods and become scientists!*
- *My students and I loved the experience, it got them thinking about science. They came back from the conference and fixed their poster based on the comments they received. I*

did not ask them to do that but they realized science is about constantly improving their research.

Suggestions for Improvement of SRS

Teachers provided some ideas for improving the SRS project in the future. Suggestions focused on earlier and more thorough communication from the regional SRS host with respect to event logistics, more detailed expectations for students’ posters, and adjustments to specific site logistics. For instance, teachers would have appreciated more advanced notice with respect to the date of the regional SRS and detailed directions to the lodging. In addition, teachers requested more explicit expectations with respect to the student posters and some guidance about what aspects of the students’ research to emphasize in these presentations.

Selected teacher quotes:

- *I was very pleased with the experience, and hope to participate in the future. Our one disappointment was the feedback from the scientists reviewing the project: it took some time to get the feedback, and the students were confused by some of the comments. We had assumed that the poster was an extension of their research project, but it seems the scientists expected it to be a completely stand-alone poster.*
- *We enjoyed the experience, but we felt that the other schools seemed to be much more prepared as if they received help from a GLOBE representative or partner. We only had the website to guide us. I feel that as a teacher, I would have been better able to prepare my students if I had someone to help guide me and let me know what to expect at the SRS.*
- *Receive more advanced notice about event *receive more information about event *would like information that could be sent to parents on what to expect.*
- *I would appreciate more specific information on the posters - what information should be included and what is not essential. Timing for the conferences can be difficult because the NW conference is at the very end of the school year and overlaps with other school activities. Finally, getting information on dates like the regional symposia further in advance would help considerably with planning.*
- *Different activities for younger and older students.*

SRS Teacher Professional Development

Teachers reported that the SRS professional development activities, materials and what they learned were helpful, useful, and relevant (Table 7). Eighty-seven percent of teachers claimed “GLOBE materials presented were relevant” and 82% “will be able to implement” most of the time or always (Table 7).

Table 7: Teacher post-survey responses to the SRS professional development activity.

During this SRS professional development activity, how often did you feel...						
	Never	Seldom/Rarely; Once or Twice	Sometimes	Most of the Time	Always	Total
Task was too difficult	19	1	1	0	1 (Denver)	22

Task was interesting	0	1 (Alabama)	1	5	15	22
Eager to learn more about topic	0	1 (Alabama)	1	4	15	22
GLOBE materials are useful	0	1 (Alabama)	3	4	13	22
GLOBE materials are relevant	0	1 (Alabama)	1	5	14	22
You will be able to implement what you learned	0	1 (Alabama)	3	4	14	22
Will make you better educator	0	1 (Alabama)	3	3	15	22
Total	18	7	13	19	86	

The project will provide teachers with partner assistance, GLOBE resources and webinars to support the implementation of research investigations in the classroom

According to the teacher respondents, the SRS project provided GLOBE partner assistance, GLOBE resources, and webinars to support the implementation of student research projects in and outside the classroom. Consultation and support from the local GLOBE partnership (n=24) and the use of the Science Practices Resource Pages on the GLOBE internal web pages (n=21) were used most frequently by teacher respondents (Table 8). Teachers rated the local GLOBE consultation as very helpful (5.6/6) and the Science Practices web pages as helpful (5.25/6; Table 8). Webinars with topics ranging from a “SRS Question and Answer” session with Jen Bourgeault to “Putting it All Together- science poster” with Tracy Ostrom, were used by an average of seven teachers and were mostly considered helpful (Table 8).

Table 8: GLOBE resources teachers reported using and to what extent these resources were considered helpful.

Which of the following resources did YOU utilize PRIOR to attending the SRS?								
	AL	CO	NJ	IN	SD	CA	Total	How helpful?
Consultation/Support from your local GLOBE partnership	1	2	8	6	2	5	24	5.65/6
Weekly listserv updates	0	1	2	3	0	2	8	4.71/6
Teacher blog posts	0	1	2	2	1	1	7	4.43/6
Science Practices resource pages (on internal GLOBE web pages)	2	3	5	5	3	3	21	5.25/6
Webinar: <i>Symposia Q&A</i> , Hosted by Jen Bourgeault	0	0	2	3	0	0	5	5.4/6

Webinar: <i>Conducting Field Investigations</i> , Hosted by Rich Wagner	0	0	0	3	3	1	7	4.57/6
Webinar: <i>Writing Research Questions</i> , Hosted by Kevin Czajkowski	0	0	2	3	2	0	7	5.14/6
Webinar: <i>Analyzing GLOBE Data</i> , Hosted by Anne Lewis	0	1	1	2	1	0	5	4.4/6
Webinar: <i>CER Framework</i> , Hosted by Sherry Herron	0	0	1	3	1	3	8	5.88/6
Webinar: <i>The Science Poster</i> , Hosted by Tracy Ostrom	0	0	1	2	1	1	5	5.2/6

Teachers reported that their students also used the GLOBE resources, including the local GLOBE partnership support and webinars. The frequency by which the students used the variety of resources mirrored that of the teachers with the GLOBE consultation and Science Practices web pages being used the most and considered helpful (Table 9).

Table 9: GLOBE resources teachers reported their students using and to what extent these resources were considered helpful.

Which of the following resources did YOUR STUDENTS utilize PRIOR to attending the SRS?								
	AL	CO	NJ	IN	SD	CA	Total	How helpful?
Consultation/Support from your local GLOBE partnership	1	0	6	4	2	3	16	5.35/6
Weekly listserve updates	0	0	1	1	0	2	4	4.75/6
Teacher blog posts	1	0	0	0	0	1	2	5.0/6
Science Practices resource pages (on internal GLOBE web pages)	3	3	3	2	3	2	16	5.35/6
Webinar: <i>Symposia Q&A</i> , Hosted by Jen Bourgeault	0	0	0	1	0	0	1	5.5/6
Webinar: <i>Conducting Field Investigations</i> , Hosted by Rich Wagner	0	0	0	1	0	0	1	5.0/6
Webinar: <i>Writing Research Questions</i> , Hosted by Kevin Czajkowski	0	0	0	1	0	0	1	6/6
Webinar: <i>Analyzing GLOBE Data</i> , Hosted by Anne Lewis	0	0	0	1	0	0	1	5.5/6
Webinar: <i>CER Framework</i> , Hosted by Sherry Herron	0	0	0	1	0	0	1	5.5/6

Webinar: <i>The Science Poster</i> , Hosted by Tracy Ostrom	0	0	0	1	0	1	2	5.33/6
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Teachers suggested that the drop-in open office hours offered by GLOBE partners would be improved if made available on weekends (n=12) and more frequently (n=10). However, some teachers (n=11) stated they were not interested in this type of support.

The project will demonstrate how GLOBE can be used to meet national, state, and local standards and STEM goals and the Next Generation Science Standards.

In order to assess participant teachers’ self-efficacy for facilitating science related tasks, we generated several items that asked participant teachers to report how much they felt competent facilitating specific NGSS science practices. Sample items included “*I am able to facilitate asking questions with my learners*” and “*I am able to facilitate constructing scientific arguments with my learners.*” All items were measured using a 6-point Likert type rating scale, where 1 = Cannot Do This and 6 = Can Do This. Overall teachers (82%; n=33) perceived their participation in the SRS project as a means to improve their ability to integrate science research into their classroom or out-of-school-time program. In general, teachers reported being successful facilitating the eight Next Generation Science Standards science practices of scientific inquiry. Greater than 80% of the teachers reported being able to facilitate asking questions [NGSS science practice 1], planning & carrying out investigations [NGSS science practice 3], engaging in arguments based on evidence [NGSS science practice 7], and obtaining, evaluating, & communicating information [NGSS science practice 8] (Table 10). The NGSS science practices teachers reported with less confidence were developing & using models [NGSS science practice 2], analyzing & interpreting data [NGSS science practice 4], using mathematics & computational thinking [NGSS science practice 5], and constructing explanations for science [NGSS science practice 6] (Table 10).

Table 10: The NGSS Science Practices Teachers Report Being Able to Facilitate with Their Learners.

	Cannot do this	Can do a little	Can do some	Can do an average amount	Can do a great deal	Can do this	Total
Asking questions	0	0	1	3	11	19	34
Developing models	1	2	3	6	6	16	34
Using models	0	2	1	5	8	18	34
Planning investigations	0	0	2	3	10	20	35
Carrying out investigations	0	0	1	4	11	18	34
Analyzing data	0	2	1	6	6	20	35
Interpreting data	0	1	2	5	8	17	34

Using mathematics	0	0	4	5	9	15	34
Using computational thinking	0	2	1	10	3	18	34
Constructing explanations	0	1	6	1	8	18	34
Engaging in argument	0	0	3	3	10	18	34
Obtaining information	0	1	0	2	10	22	35
Evaluating information	0	0	1	2	11	20	34
Communicating information	0	0	0	3	6	25	34

Summary of Findings:

1. Teachers were overwhelmingly satisfied with the various components of the SRS events (Table 6).
2. Teachers reported participating in one or more professional development activities during the SRS. Teachers largely reported that the GLOBE teacher professional development tasks, materials, and what they learned were helpful, useful, and relevant to them (Table 7).
3. The SRS project provided GLOBE partner assistance, GLOBE resources, and webinars to support the implementation of student research projects in and outside the classroom. Consultation and support from the local GLOBE partnership and the use of the Science Practices Resource Pages on the GLOBE internal web pages were used most frequently by teachers (Table 8).
4. Overall teachers (82%; n=33) perceived their participation in the GLOBE SRS project as a means to improve their ability to integrate NGSS-aligned science research into their classroom or out-of-school-time program (Table 10).

VI. GLOBE Data and Project Submission

The project will increase data collection on the GLOBE website (of participating schools).

Data for this question were obtained from the GLOBE website. Each school was searched for the date range Jan 2009 – July 2017.

In 2016, of the 40 schools that participated in the US Regional GLOBE SRS, 8 entered data on the GLOBE website for the first time during the school year. In 2017, of the 50 schools that attended the GLOBE SRS 34 submitted data. Only 6 of those 34 had submitted the previous year. Therefore, the goal of increasing data collection on the GLOBE website was met in 2017.

The project will result in 30 schools (teams) submitting research projects through the GLOBE website.

Data for this question were obtained from the GLOBE Website. The search was limited to projects submitted to the site before July 2017 from the United States. The submission number from the United States was also compared to previous years.

In 2017, 28 teams submitted research projects through the GLOBE website. All of these were Student Research Symposia projects that were also submitted to the GLOBE International Virtual Science Symposium. In 2016, 14 student research projects were submitted to the GLOBE website. This shows a steady increase in the number of submissions each year (2015 (n = 1 submission) and 2014 (n = 4 submissions)).

From the data, it is unclear how the word team is meant to be operationalized. Some projects were associated with individual students while others included more than one student. If one considers each project as being produced by one team, there were 28 teams who uploaded their projects to the website.

While the target of 30 teams was not met, there was a significant increase in research project submissions to the GLOBE website associated with the SRS.

The project will result in 20 entries to the 2016 GLOBE International Virtual Science fair replacing a culminating National GLOBE Science Fair.

In 2016 there were 13 entries in the 2016 GLOBE International Virtual Science Symposium (IVSS) of the 67 total project entries in the Regional SRS. These 13 entries accounted for 21% of the USA entries in the IVSS. In 2017 the project exceeded its goal with 28 entries submitted to the 2017 GLOBE IVSS of the 95 total project entries in the Regional SRS.

The project will result in 6 entries to an international science fair or competition.

There were no data sources available for this goal to be evaluated. It is unclear if any of the 95 projects submitted to the regional SRS were also submitted to other science fairs or competitions.

The project will serve as a pilot for reoccurring annual regional GLOBE Science Fairs

All indications are that the GLOBE regional SRS will continue a third year. As previously indicated, partners are moving forward in expanding their partnerships and support mechanisms. Partners are currently organizing for next year's symposia according to the project coordinator.

The project will showcase high quality GLOBE student research within and across the regions.

Students exhibited their research at each of the regional research symposia and as stated previously, there were 28 teams that uploaded their work to the GLOBE website which would allow for students to view research across regions. The quality of GLOBE research projects was not assessed in this program evaluation. According to the project coordinator, all participants in the GLOBE regional SRS were encouraged to upload their projects to the GLOBE website.

Final Comments

The United States Regional GLOBE SRS project set out to organize six regional research symposia and develop supports for teachers and students to participate in these events. These main goals were achieved in that six regional symposia did take place successfully and professional development resources were created that specifically focused on the field investigations and the steps to use GLOBE data for authentic student research. Ambitious goals were set relative to partner, teacher, and student participation across all regions. While these goals were not met in all instances, participation was sufficient in the first two years to support the multiple events that took place at each two-day regional SRS. From discussions with the project director and from personal observation, it is evident that there are many partners who are committed to organizing the third year of GLOBE regional research symposia. Work is already underway to obtain outside sponsorship for the future events. Teachers appreciated the professional development and felt overall that it had positively impacted their instruction. Suggestions for improvements are included in this report and should be considered. Most students expressed positive feelings about their experiences in the SRS. The impact that the GLOBE regional SRS had on data and project upload onto the GLOBE website was strong and met expected goals in 2017. As the team prepares for the next SRS, some questions to consider are: What NGSS Science Practices do teachers become more comfortable with as a result of participating in the SRS project? What groups of students are participating in the SRS? Are the regional SRS accessible to students from diverse backgrounds? These types of questions would require additional teacher surveys and the collection of additional student demographic information that was not collected from students this time, but may provide insights as the team expands its impact and audience.