

# SciGirls

## Season 3 Outreach Evaluation

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### *Report on Interviews with Trainers*

Compiled by Holly Faulkner  
Cornell Lab of Ornithology

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## Executive Summary

Citizen SciGirls is an NSF funded, six-episode season of SciGirls that focused on increasing the awareness of and engagement in citizen science projects. The episodes and educator materials were created in partnership with the Cornell Lab of Ornithology and feature six unique citizen science projects; Monarch Larva Monitoring Project (MLMP), Celebrate Urban Birds, Nature's Notebook, S'COOL, FrogWatch USA, and Seafloor Explorer (no longer active). An outreach initiative was incorporated as part of the project in partnership with the National Girls Collaborative Project (NGCP) and evaluation on that outreach was conducted to understand the impact of the Train the Trainer (TTT) model on educator's use of citizen science projects in their program.

A three day TTT session was held in May 2015 at Twin Cities PBS in St. Paul, MN to train nine representatives from NGCP State Collaboratives in the SciGirls Seven and Citizen SciGirls project materials (episodes, activities). NGCP chose the nine leaders (from nine states) through an application process specifically targeting regions who had not previously received training on SciGirls research-based strategies. These trainers were then expected to hold two training sessions with up to 30 educators at each session between the fall of 2015 and fall of 2016. In all, fourteen sessions that were held reached approximately 226 educators and each concluded with an evaluation of the training.

To get a better understanding of the impact of the training, each trained educator was invited to complete a follow up survey in December 2016. Forty-five educators completed the survey and several educators agreed to participate in a follow-up phone interview. The twelve educators who agreed to participate in a follow-up phone interview were each assigned a number for anonymity and six were chosen for an interview- two educators who had implemented citizen science as a result of the training, two educators who have had prior experience conducting citizen science but have not implemented the Citizen SciGirls training, and two educators that had no prior experience with citizen science and have not implemented Citizen SciGirls. The goal of these interviews was to answer the question: Did the SciGirls Season 3 training prepare educators to do citizen science with their students? If so, how? If not, why not?

Each interviewee was contacted by email to set up a meeting time. The sixth chosen interviewee did not reply, and so a stand-in was chosen from the remaining educators. Each interview contained 6-7 questions that were informed by their survey response. As such, some of the questions were tailored specifically to the interviewee and lasted about ten to fifteen minutes. Four educators were interviewed by phone and were recorded with permission from the interviewee. Two educators preferred to be interviewed via email. The recordings were then transcribed and, with the emailed interview results, summarized in the report below.

## Results Summary- Educator 1

Educator 1 attended a training in Portland, Maine in February of 2016 and was contacted on March 16th, 2017. She had already implemented citizen science as a result of the training and was asked the following questions:

- What citizen science projects did you do and how did they go?
- In your survey response, you mentioned there was an impact on academic behaviors during the school year for these youth. Can you further explain this impact?
- Do you have plans to do more citizen science? If so, is there anything you might change?
- What is your appetite/capacity for continued training/involvement with SciGirls and citizen science? What would you like to know more about?
- Have you ever done a citizen science project online?

### Summary:

Educator 1 is a school-based math coach who was tasked with developing a program to integrate into her summer school curriculum that was based on characteristics of good citizenship. The training really inspired her and she immediately looked into using citizen science to fit her needs for the summer school program. Educator 1 worked with 1st-6th graders and assigned each grade a different citizen science project. All projects went over well with the grade levels - except for the (unnamed) ladybug project she used with third-graders (Table 1). This, she says, was attributed to the time of year. Early August was not a good time for the project as they found only one beetle. She intends to do this again with the program next year, but will switch the project for third-graders to be more seasonally appropriate.

Table 1: Projects used in the summer school program of Educator 1.

Age Group	Project	Notes
First Grade	S'COOL	Partnered with a STEM activity taken from the Boston Museum of Science STEM kits; used the SciGirls video which was very effective with this age group.
Second Grade	Big Butterfly Count	Modeled after the MLMP SciGirls episode; built a butterfly garden
Third Grade	"a ladybug project"	Was not seasonally appropriate for ladybugs - will be replacing with a new project this summer
Fourth Grade	water quality testing with Univ. of Maine Orno	Studied Maine lakes water quality; partnered with Auburn Water District; were able to talk to a researcher from the university who was then able to use the data they collected.
Fifth Grade	School of Ants	Kids built solar ovens, enjoyed being able to see ants eating, etc.
Sixth Grade	Celebrate Urban Birds	Used bird sanctuary nearby to school; used guidebooks to identify birds; kids will be able to use this knowledge as they visit the sanctuary during the school year.

Educator 1 also mentioned that there were notable changes in the academic performance in children who participated in the summer school program versus those who did not. She and others at her school do research on this and have found that in the past, “students didn’t really want to be here” and that they weren’t seeing any positive gains in the students. However, this summer when the citizen science projects were implemented, they found that students were able to maintain their science and math skills through to the following school year. This is best described in the following quote:

*“...So, when we decided to implement these projects around that citizenship piece, it turns out the math and science parts we were really looking for kids to maintain- we found that of those kids who did participate there was a 2-point gain on our benchmarking from spring to fall and for kids who did not participate there was actually a negative one point drop. And then also we tracked through surveys in terms of the citizenship piece, and looking at what skills students were able to transition from the beginning to the end of summer school and had almost a 10% increase in those citizenship qualities over time... And now, we’re tracking that through the school year to see how that’s gone and ...we’ve had about 40% drop in office referrals.”*

As mentioned previously, Educator 1 will be implementing citizen science projects again this summer. She noted that they have just secured the funding they need to employ summer school and that this year they will be doing a similar program. She is working citizen science into the curriculum again, with the only difference being the choice of project for third graders. If structured similarly in other places, this curriculum could likely be adopted by other summer school programs.

When asked what more SciGirls could offer in terms of training, Educator 1 noted that she’d like to know more ways to make some of the activities purposeful/personalized for her group. She spoke about the diversity of her students and how 40% were “English language learners,” and would be interested in finding ways to make the program more accessible to those students, if possible. She described how it wouldn’t necessarily mean translating the script, but broadening the context and helping it be more understandable in English to those students. She explains further below:

*“...we only instruct in English, but we have to modify all of our content for students- I mean we have students who have been in the country a week to several years and thinking about how that we can adapt the instructions so that they’re able to understand it. So, you know, ways to build a better context in the beginning so that they understand some of the terminology... I really think that using the videos has been really helpful because then they can see kids their own age doing the activities and they’re starting to link some of that language piece with what the expectation is for the project- that kind of stuff- which is really helpful when they do have those things to break that language barrier.”*

Educator 1 also talked about how she had looked into purely online citizen science projects, but didn’t find them as interesting, so she did not bring them into her curriculum. She said that having hands-on projects were much more helpful, especially because most students are of low socio-economic status and may not always have access to the internet.

## Results Summary- Educator 2

Educator 2 attended a training in Portland, Maine in February of 2016 and was contacted on March 16th, 2017. She had already implemented citizen science as a result of the training and was asked the following questions:

- What citizen science projects did you do and how did they go?
- Do you have plans to do more citizen science? If so, is there anything you might change?
- What is your appetite/capacity for continued training/involvement with SciGirls and citizenscience? What would you like to know more about?
- Have you ever done a citizen science project online?

### Summary:

Educator 2 implements citizen science with her sixth graders. She introduced them to the Gulf of Maine Research Institute's Vital Signs project. She notes that the students were engaged and that she thought they "saw the value in it as being authentic science." She indicated that she thought this was an online project- though also described how the class went out to search for invasive insects.

When asked about using citizen science in the future, Educator 2 indicated that she planned on doing more this spring, in collaboration with other teachers inside and outside of her district. They hope to use projects to look for invasive insects and also for ladybugs, but they are still in the planning stages.

Educator 2 was also asked about her capacity for continued training and involvement with SciGirls and citizen science. She would like to have resources available that help teachers to know their options for how to make connections to the "digital sciences." She noted that a training on how to go through some of the different programs - such as what is required of her, her class and her students - would be helpful as well. These resources and connections she's looking for seem to be more generally themed rather than specifically about SciGirls and citizen science, as she seemed to have a good grasp on implementing the Vital Signs project. Educator 2 added that she felt the students were very engaged with the project and after the hands-on part of the training, she felt much more comfortable with the whole process:

*"...it seems a little intimidating for teachers but it's kind of one of those things that you just have to jump in and do it and then you realize it's doable."*

Also during the interview, it was confirmed that she had facilitated this project with her entire class, and not just with "1 student" as her survey response showed.

## Results Summary- Educator 4

Educator 4 attended a training in Boston, Massachusetts in January of 2016 and was contacted on March 9th, 2017. In her survey response, she indicated that she had prior experience with citizen science, but had not implemented the Citizen SciGirls training. She was asked the following questions:

- What were the barriers to implementing citizen science projects?
- You mentioned you have had prior experiences with CS- can you describe those experiences briefly?
- What barriers prevent you from implementing citizen science projects?
- How could SciGirls help you overcome those barriers?
- What other things do you think you could do to include citizen science in your programs?

### Summary:

Educator 4 works in a library in a small city in Massachusetts. She said her biggest barriers to implementing citizen science is that she needs to be familiar with the content and to have the time to research what will work in her location. She currently hosts a monthly science program for elementary and sometimes middle school age children after school and has a limited time to work with. Seasonal or time-sensitive projects are not as useful to her, but she did say that activities like the one she did at the training (making an object neither sink nor float) were much more appropriate. She was able to bring that activity in particular to her program and said the kids really loved it.

When asked if there was anything SciGirls could do to make it easier to implement citizen science projects, she said the best thing was to keep sending information through her email. She likes to use them as a reminder and appreciates when they're easy to understand. She is used to using make-shift equipment and notes:

*"...I'm a librarian, I'm not a school teacher nor am I a professional scientist, so I don't have- you know, peanut butter jars are our beakers (laughs)- we have very simplistic types of things, in some ways it's nice for the urban audience that I have here because- the urban kids that I work with- they don't have fancy labs either."*

Educator 4 stated that she feels that she just needs to make a more concerted effort to help include citizen science into her programs. She knows she can become familiar with the material easily, but having time and proper staffing remain difficult for her. She has no control of when the library opens and closes nor with hiring, so finding the time to fit in projects that are more involved is something she doesn't have much control over. In this case, online activities or quick "grab and go" activities may be more suited for her space.

Educator 4 finished by saying how much she loved the training and how the hands-on portion is especially helpful to her. She thinks SciGirls is great and described a few bright students who are really encouraged by attending her programs and mentioned that it's great for her low-income community to encourage girls to pursue science-related careers.

## Results Summary- Educator 11

Educator 11 attended a training in Detroit, Michigan in March of 2016 and was contacted on March 24th, 2017. She had prior experience with citizen science, but had not implemented the Citizen SciGirls training. She was asked the following questions:

- What were the barriers to implementing citizen science projects?
- You mentioned that you are interested in further training. What part of implementing a citizen science project would you like more information about?
- Are there any other barriers that have prevented you from implementing a citizen science project? If yes, how can SciGirls help you overcome this?
- What other things do you think you could do to include citizen science in your programs?
- Can we send your contact information to SciGirls to continue to participate/receive information about citizen science professional development opportunities?

### Summary:

It was obvious in the interview that Educator 11 supports the SciGirls program. She described that after the training, she approached her local library several times with the program and got pushback. She then presented the idea to the local youth association with positive results. She says that the only issue for her is obtaining resources for the program, as she would need to buy the supplies for whichever project they decide to do, but has plans to implement the program this summer.

When asked if she could think of any way that SciGirls could help, she asked if SciGirls had any materials to provide, or an opportunity to apply for a grant to obtain those materials. She explains that the youth association provides students, but they don't provide a facility, food and snacks nor any basic materials. She states: "You have to come fully prepared with everything..." Educator 11 further explained that even online projects are not easy to do, not only because of her lack of resources, but because the students don't have regular access to computers either.

When asked about further training, Educator 11 stated that she'd like to go over the technological parts again. She also said that implementing the program within the first month after the training would be easiest, but that's not always feasible:

*"...I could tell, in going through it, that I needed to have more training so that I would feel more comfortable and self-confident in presenting it and facilitating it and if you could give any suggestions for even building that confidence with resources you already have I'm very open because it is definitely on our go sheet to implement that this summer."*

Educator 11 was especially interested in connecting with SciGirls again. She stated that she wants as much training and professional development as she can get and says she is willing to work around her barriers because:

*"...because to me, all kids need to be engaged and aware of what the SciGirls does- and to me it's just a brain- it's like lightning, if I can be exposed to something and I see it again, I have a reference. And I like that for younger kids and girls and that was one of the things that got me excited about it..."*

## Results Summary- Educator 9

Educator 9 attended a training in Piscataway, New Jersey in June of 2016 and was contacted on March 8th, 2017. She had no prior experience with citizen science, and had not implemented the Citizen SciGirls training. She answered the following questions via email:

- Do you have any barriers to implementing citizen science projects?
- You stated that you were planning a citizen science program in November. Which project did you implement, and how did it go? What was the reaction from the participants?
- What kind of outcomes (positive or negative) resulted from implementing the project?
- Did you have any challenges?
- Was the SciGirls training helpful to you in planning and executing this program?
- Is there anything that you think the SciGirls trainers could do to support other educators in future trainings? In other words, what would you include, or not include, in the trainings?
- Can we send your contact information to SciGirls to continue to participate/receive information about citizen science professional development opportunities?

### Summary:

During the initial survey, Educator 9 had stated she had not implemented SciGirls yet, but she was planning a program in November. During the interview she described that she had implemented the Parachute Parade program and that it went very well. She says the only barrier was that another employee had thought it was only for girls, and so Educator 9 explained the flexibility of the program. Shortly after, the employee then registered her grandson for the November program.

*"The children had a blast designing their parachutes and launching their parachutes off of the stairs of the library. was surprised that they responded so creatively to the project"*

Educator 9 further describes a positive outcome: After the program, the children who had participated were checking out books on making parachutes and paper airplanes. Her only challenge here was finding a good place to launch their parachutes.

The SciGirls training was very helpful in helping Educator 9 plan and execute this program and she says that the only thing she would like to do in other workshops is to go over the instructions for some projects and talk about "what works best" for their individual situations.

## Results Summary- Educator 10

Educator 10 attended a training in Portland, Maine in February of 2016 and was contacted on March 23th, 2017 after unsuccessful contact to Educator 12. She had no prior experience with citizen science, and had not implemented the Citizen SciGirls training. She answered the following questions via email:

- You stated that you got excited after going to the training- could you please explain what part(s) of the training made you so excited?
- What kept you from acting upon that excitement? (What barriers prevent you from implementing citizen science?)
- Ignoring any funding/timing/staffing issues, do you still feel prepared to implement a citizen science project, or do you feel you need to attend further training (or to be re-trained)?
- Is there anything that you think the SciGirls trainers could do to support other educators in future trainings? In other words, what would you include, or not include, in the trainings? What would make them more helpful to you?

### Summary:

Educator 10 mentioned in her survey that the training got her excited about the program. When probed further, she stated that she was excited because:

*"...citizen science seemed so easy and fun to do, and that it would be easy to come up with ways to incorporate them into my already existing Try-It Tuesday program. We also got information from Maine-based groups, which made me feel like there were local resources that I would be able to tap into as well. "*

She says the only thing preventing her from acting upon that excitement was that she had already planned out her Try-It Tuesday for that month, and it didn't seem as easy to do the next month. She notes that doing online citizen science wouldn't be enough for her children, who really need something hands-on after school, and that she wasn't close enough to any outdoor spaces that would work for implementing the projects.

When Educator 10 was asked about training, she said that she feels that it would be useful to be re-trained on SciGirls. She says that the information on the SciGirls website is useful but it is difficult to find what she needs:

*"...sometimes I get tired of going to link after link to discover it won't work for me. If I don't remember to click open in a new tab, I also have to re-enter all the information I was looking for."*

Finally, Educator 10 noted that it was very useful to have a connection to the local community integrated into the training. She adds that sending a newsletter as well as having information available on a USB would be helpful additions, as her laptop does not have a CD drive.

# Conclusion

Did the SciGirls Season 3 training prepare educators to do citizen science with their students? If so, how? If not, why not?

It seems that, of these six project leaders, all are interested in the SciGirls program and support its use in their educational spaces. They all had positive comments and were intending to implement the program, if they hadn't already.

The biggest barriers to implementing the program were lack of time and resources. Many trainers work in poorer cities and towns of the United States and do not have the funds to make projects happen or to even guide their students on the Internet for online projects. A few of the trainers also mentioned that they had a low retention rate for the content they learned at the training, noting that they want to attend further training. Suggestions for the trainings were centered on providing more resources and a deeper look into how to incorporate and flex the program into their specific communities.

Overall, it seems that SciGirls Season 3 training did prepare the educators to do citizen science with their students. The training definitely grabbed the educators' interest and they want as much extra information as they can get about the program.

All interviewees were asked and all agreed to share their contact information with SciGirls to continue to participate/receive information about citizen science professional development opportunities