**Exploring a Continuum of Involvement in a Citizen Science Program**

*Maria Sharova - Smithsonian Environmental Research Center (SERC); Alison Cawood - Smithsonian Environmental Research Center (SERC)*

Developing a participant engagement model that accommodates different motivations of citizen scientists is important to creating an active volunteer base. Despite the premise that citizen science can engage anyone in the scientific process, no single project can meet all volunteer needs, and meeting a variety of motivations within a project requires deliberate planning and design. Citizen scientists with different motivations may want to be involved in different parts of the research process. To the extent possible, provide a continuum of involvement, with multiple ways for volunteers to engage in a project is vital to achieve active engagement. Several projects that employ such a continuum can be found in the citizen science program at the Smithsonian Environmental Research Center (SERC), where within a given project a volunteer can help with data collection, data analysis, and even develop and implement their own research questions. These categories are not discrete, and individuals can move along this continuum at will. As a result, citizen scientists may be involved in the project in ways that are most appropriate for them. By analyzing project structure and surveying volunteers to assess their motivation, we will evaluate how effectively SERC’s citizen science program engages volunteers on different spaces of the continuum. We will thus provide an example of a continuum being implemented, and through the evaluation of volunteer satisfaction and motivations, determine how this structure meets the needs of volunteers and can serve as a model for other projects.


*Megan Mueller - Rocky Mountain Wild; Erica Garrouxte - Denver Zoological Foundation; Heather Batts - Denver Zoological Foundation*

Ongoing evaluation and refinement of citizen science projects can help ensure that projects meet research and volunteer engagement goals. However, evaluating and refining projects can be challenging, particularly for citizen science projects with limited resources. The Front Range Pika Project is a citizen science program that engages volunteers in research on the effects of climate change on the distribution of American pika (Ochotona princeps) across Colorado. Volunteers collect data on pika occupancy and habitat and microclimate variables that may influence pika. In addition to collecting long-term data to aid in the conservation of this alpine species, the Front Range Pika Project aims to educate and inspire volunteers to take action to address the impacts of climate change on Colorado’s high elevation ecosystems. Over seven years, we have used both qualitative and quantitative methods to evaluate and refine the Front Range Pika Project, within constraints imposed by our relatively small budget. This process has provided valuable insight on best practices to (1) recruit, retain, and engage volunteers for multiple seasons, (2) evaluate and improve field methodology, (3) evaluate and refine volunteer education to inspire conservation action, (4) manage open data and ensure data quality, and (5) evaluate the effectiveness of data in addressing research questions. This talk will share ideas useful for other projects as they evaluate and refine research and volunteer management approaches to run engaging, scientifically-rigorous citizen science projects. We emphasize practices that can be implemented by projects with limited resources.
Understanding Participants: Research on Participant Motivation and How to Use It in Practice
Anne Land-Zandstra - Leiden University; Marjolein de Vries
In order to develop citizen science projects that attract many people and keep them involved in the project, we need to know what motivates citizen scientists. Although many articles about the motivation of citizen scientists mention that not much has been studied about participant motivation, the body of knowledge has grown over the past few years. Some overarching results can be identified, such as that one of the most important motivators is the opportunity to contribute to a greater good — science in general or a certain topic in particular or the importance to give regular feedback to participants about the results of the project. Studies have also looked into the change of motivation during participation in the project. If we know all this, how can citizen science developers take these findings and put them into practice? And what else do we need to find out about participant motivation? For example, how does motivation differ between different types of citizen science projects or how does motivation change over time? Are there any cultural differences? In this presentation, first, an overview will be given of research on participant motivation, including some specific studies. Next, ways to translate these findings into practice of citizen science projects will be discussed. Finally, future directions for research on motivation of citizen scientists will be laid out and discussed with the audience.

Collaborative Modeling of Long-term Community-based Research Data in Rural Zimbabwe
M Eitzel - University of California, Santa Cruz; Emmanuel Mhike Hove - The Muonde Trust; Abraham Changarara - The Muonde Trust; Daniel Ndlovu - The Muonde Trust; Jon Solera - Seven Points Consulting; Alice Ndlovu - The Muonde Trust; Kleber Neves - Univers
The Muonde Trust is a registered Zimbabwean non-governmental organization whose mission is to support indigenous innovation by rural farmers. Muonde’s community-based research team has collected data on a variety of community-prioritized topics for the last 35 years and recently has been collaborating with visitors from outside Zimbabwe. One area of particular concern to the community is how to balance agricultural production with livestock husbandry and woodland stewardship. At the Santa Fe Institute in summer 2015, based on the community's input, we collectively created an Agent-Based Model of this system, its feedbacks, and outputs. We presented the model to the community in Zimbabwe in March 2016, receiving initial feedback on its accuracy and updating it accordingly. We also held workshops later in 2016 to inquire whether the data and modeling processes had helped them. Here we reflect on the process of creating and using the model, integrating self-reflection from non-Zimbabwean, model-building collaborators and participant observation of community modeling workshops (which included the local chief, who makes official land-use decisions). We found, unsurprisingly, that the model reflected some key aspects of the system while missing others. However, the model did generate significant conversation about the system. Elders had the opportunity to share their memories and understandings with younger community members, including discussions around climate change. Community members also observed a need for protecting key resources, which were often also sacred sites. We reflect on the reasons for the success of the Muonde Trust and their visitor-collaborators as a community-based research team.