

Environmental Science Series: Using citizen science to understand the environment (Q&A)



Environment
Protection
Authority Victoria



Publication 1930 December 2020

Community information

Overview

Our Environmental Science Series explores topics that affect everyday Victorians.

Guest speakers give insight into different environmental issues. The free talks focus on science and how it is, or can be, used to reduce the impact of these issues.

Our guest speaker for 'Using citizen science to understand the environment' was Dr Erin Roger. Erin is the Chair of the Australian Citizen Science Association (ACSA). She presented on citizen science and its applications across Australia.

Erin shared her experience of citizen science projects. This included examples of how community members have:

- contributed local knowledge
- monitored the environment
- shared information.

Below are EPA and Erin's responses to the questions raised in the session.

Q&A

What do you think are the key decisions to design and run a successful project that is engaging and achievable and collects valuable new data?

EPA:

It is important for citizen science projects to have:

- a clearly defined scientific question that needs answering. EPA's citizen science projects aim to develop this scientific question in collaboration with citizen scientists
- clear aims
- limitations
- length of project
- outcomes.

It is also useful to find groups in a community that can 'champion' the project through their interest in the topic.

It is best practice to:

- involve citizen scientists in how we interpret data
- report regularly on progress
- communicate how EPA may use the information the project collects.

More information

Contact EPA on **1300 372 842**
(1300 EPA VIC) or epa.vic.gov.au

EPA's Environmental Science Series:
epa.vic.gov.au/environmental-science-series

EPA's citizen science program:
epa.vic.gov.au/citizen-science



Using citizen science to understand the environment

EPA has a collaborative citizen science model. It aims to actively involve community members throughout the scientific process. The model develops shared understanding between EPA and the community by:

- co-designing environmental monitoring networks
- collecting important field data that provides new intelligence (co-monitoring)
- co-interpreting environmental data to identify new insights.

EPA citizen science programs use one or more elements from its citizen science model.

Erin Roger:

“First and foremost, I think the project needs to have clear aims and clear outcomes. This should include a clearly articulated scientific question the citizen science project or citizen scientists are helping to contribute to.

“Projects should also have very clear timeframes, recognising the challenge and costs associated with citizen science. Projects should not be designed to run indefinitely. A lot of people forget the ongoing costs and investment required to sustain a project, such as updating an app or continuing to communicate.

“Most importantly, I think it is important to report back to participants about:

- their contribution
- where the data is, who will use it and how
- progress of the project/initiative
- how their contribution matters.

“Increasingly, scientific papers are including citizen scientist. I think is a great step towards proper attribution of contribution.

“The design of the project really should hinge on the project and an understanding of the target or likely participants. Projects can target specific members of the community, such as flora and fauna groups, and can be more complex. I think projects targeting a broad community should clearly think about what is being asked, making sure instructions are easy to understand and tasks are relatively simple in nature. If data collection is involved, make sure you use methods and protocols for data validation, testing and adjusting protocols, and considering a mixed approach where citizen scientists can collect certain data, complemented with other data sources.

“Having media support is also important. Check out [this video](#) from ABC Science’s Kylie Andrews about keeping the message simple: “Help us do X so we can do Y”.”

Do you find there are certain demographics that participate most in citizen science? What can we do to get a wide range of participation?

EPA:

The demographics of participants in citizen science projects often depends on the location and the purpose of the project. For example, EPA’s dust study in the Latrobe Valley involved local community members. They were concerned about dust in their environment and had the time to use equipment and help analyse data. School groups have also been involved with some of EPA’s citizen science projects. Schools have been interested in increasing student scientific literacy. EPA also has some urban-based projects with citizen scientists from a variety of demographic areas. To encourage participation, EPA citizen science projects consider accessibility and feasibility. Projects have targeted participation from groups to increase accessibility. EPA assesses all projects in collaboration with community. This is to identify feasible outcomes for the study.

To encourage a wide range of participation, consider contacting community groups directly. When advertising a new project, it’s a good idea to use communication tools that will target a broad demographic. For example, social media, local newspapers, community radio, and online forums.

Erin Roger:

“I think the demographics of participants really does depend on the project. This speaks to tapping into people’s passions and interests. In Australia, I think there is a ‘typical’ cohort of people that participate in biodiversity-related projects. As diversity in science is so important, it is worth making a renewed effort to attract a wider range of participants in citizen science.

Using citizen science to understand the environment

“Recently I’ve been doing some work looking into citizen science and cities. Urban-focused citizen science projects are really underrepresented and considering the number and diversity of people in cities in Australia, I think this is an underdeveloped area (with fascinating research questions that can be addressed). I think careful consideration of how we promote participation in projects is crucial, recognising that science can be a significant barrier. We need to invite people in first.”

How do you keep people and groups engaged in longer citizen science projects?

EPA:

Regular communication is key, along with outlining the different stages of the project plan. Outlining budgets for the project also lets people know why a project may not be extended. If a project involves a community group, it’s important to work with the group to facilitate regular opportunities for the group to catch up. Many citizen scientists have a keen interest in science. However, our surveys and feedback from citizen scientists show that meeting and working with like-minded people from their community is also a key motivator for many.

EPA has implemented ACSA’s [‘ten principles of citizen science’](#) to encourage ongoing engagement in citizen science projects.

Erin Roger:

“Again, I think that regular communication and proper attribution will go a long way here. Citizen science project leaders invest a lot of effort to understand people’s motivations for participating in citizen science (there has been a lot written about this, but motivations vary). If participants value a social element, try and facilitate this in the citizen science project. Typically, I don’t think we’ve done a great job in communicating citizen science outcomes to participants. We also need really clear timeframes, so people understand there is an end date. See ACSA’s [‘Ten principles of citizen science’](#).”

“To see how some citizen scientists are paid as collaborators and ambassadors within their community for their work (an alternative model), see this blog by [Civic Laboratory’s Dr Max Liboiron](#).”

Have there been projects involving Traditional Owners in the design and implementation of citizen science projects – either here or overseas?

EPA:

EPA’s Citizen Science Program Plan 2020 – 2023 highlights working with Traditional Owners as an integral part of the citizen science program. EPA is committed to collaborating with Victoria’s first citizen scientists and integrating their knowledge into our programs.

Erin Roger:

“Yes, the involvement of Traditional Owners in citizen science is a really interesting space. Dr Emilie Ens (from Macquarie University) gave an interesting presentation recently where she indicated that Indigenous people don’t see themselves as citizen scientists but rather Australia’s first scientists. [Her talk](#) is on ACSA’s YouTube channel. Dr Ens works on the ‘We study the country’ project, which won the Eureka Citizen Science Prize and leads work on cross-cultural biodiversity surveys. Dr Cathy Robinson at CSIRO also engages in some [really engaging cross-cultural work](#).”

“There are also some strong cohorts internationally and I encourage anyone who is interested to [follow this link](#) to an upcoming Geo Indigenous Summit.”

What are the most effective ways to increase participation and engagement for large-scale citizen science projects?

EPA:

Large-scale citizen science projects can be challenging. Effective ways to engage people include creating smaller citizen science working groups. These can be based on location. An example of this is the [Australian Marine Debris Initiative](#), where a large-scale citizen science project has smaller working groups.

Regular updates are essential, along with clearly defined timelines. Celebrating the end of the project and acknowledging work done by citizen scientists is really important, together with acknowledging [any publications](#) related to the project.

Erin Roger:

“Large-scale citizen science projects are challenging, given the diverse nature of participants. People will continue to give their time if they:

- understand the value of their contribution
- understand who will use information and how
- receive regular project updates
- receive acknowledgement.

“Acknowledgement is also really important. Some projects have used incentives, such as prizes, but I think this has had mixed results. Gamification/leader boards are other tools that have been used. I really think it comes back to regular updates, acknowledgement and proper attribution. I’d also recommend this article which summarises how to build trust in citizen science:

Mat Gilfedder, [Cathy J. Robinson](#), [James E. M. Watson](#), [Thomas G. Campbell](#), [Brian L. Sullivan](#) & [Hugh P. Possingham](#) (2018) Brokering Trust in Citizen. *Society & Natural Resources*. Science <https://doi.org/10.1080/08941920.2018.1518507>

“Consider also asking for the budget to increase your impact. This could include:

- a science communicator
- social media campaign
- media and social scientist.

“Consider also asking for experts and well-known identities to be ambassadors for the project, which will help you spruik it to multiple demographics.

“At our recent #CitSciOzOnline Early and Mid-Career Researchers Symposium, our final keynote speaker Dr Vicki Martin spoke about [the four mistaken assumptions of citizen science](#) and provided evidence of social scientists’ impacts on citizen science projects from around the world.

“At #CitSciOz18 Frog Id’s, Danny Adams spoke about some of the social media practices and how they found the ambassadors [for this National Project.](#)”