

NATIONAL CITIZEN SCIENCE BUSHFIRE WORKING GROUP

CITIZEN SCIENCE PRINCIPLES

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Introduction

The National Citizen Science Bushfire Working Group* was established to increase awareness, understanding and participation in bushfire citizen science, with an aim to foster closer links with communities who are interested in collaborating on scientific research projects related to bushfires. The group is led by CSIRO and the Atlas of Living Australia (ALA) in close partnership with multiple organisations that have a keen interest in improving and supporting the delivery of citizen science programs. Its aim is to promote the capability and energy that exists in the citizen science community to increase the scale and impact of bushfire response and recovery as noted in the [Bushfire Science Roundtable's January 2020 statement](#). Members of this group were also involved in helping to assist in the delivery of the [Citizen Science Bushfire Project Finder](#) and developing the [Recommendations document](#). The National Working Group recognises that science can be significantly enhanced by increasing the diversity of people involved in science and that citizen science has tremendous capacity to upscale efforts spatially and temporally. This document produced by the Working Group, is designed to provide a common set of principles guiding participation in citizen science.



Principles for involvement in citizen science

While citizen science is a diverse practice which can be adapted and applied in many situations and disciplines, some key principles which underlie good practice in citizen science have been developed to form a consistent, transparent, and shared approach.

RELATIONSHIPS – the nature of the relationship between participants in a citizen science context

- > **Purpose** – provide clarity of roles and expectations for all parties involved including clarity of nature of contributions by all
- > **Equitable and inclusive** - Agree to be proactive in providing opportunities to participate from a diverse range of people, stakeholders, organisations, skills and disciplines
- > **Partnership** – develop a partnership with equity and transparency and mutual benefit to build trust
- > **Multi Directional Learning** – recognise that learning comes from all directions and importance of co-learning and sharing together.

OBJECTIVES – the goals or objectives to be achieved from a citizen science project

- > **Shared goals** - have clear objectives that are jointly developed by scientists and participants and clearly communicated, including the overall outcomes trying to be achieved (see below)
- > **Research output** - ensure there is a research output and that the science is robust with measureable outcomes
- > **Platform for collaboration** – aim for a platform for collaboration whether that be technological (e.g. databases, websites, mobile apps), social (e.g. networks, groups, crowd sourcing, community of practice) or via communication (e.g. social media, publicity, engagement/liaison officers).

DESIGN – considerations to take into account in the design & implementation of citizen science projects

- > **Resourcing** – ensure the project has adequate resources (expertise, technological and financial)
- > **Scale** – prototype or test first and ensure that the scale and pace of the project are realistic
- > **Team** – establish a small cohesive team with select expertise, specific skills and experience to manage the project
- > **Participants** – identify target participants early as the choice will affect protocols, training, language used, data capture etc.
- > **Motivation** – consider participant motivation and continued participation, and ensuring that the project is fun and rewarding for participants
- > **Mentoring** – ensure you provide scientific advice, mentoring and teach scientific methods to participants (as/if required)
- > **Joint benefits** – work for joint benefits and be aware of the needs of your participants
- > **Ongoing Evaluation** – build evaluations into the project and modify the project if needed.

PRACTICES – some of the practices to use on citizen science projects

- > **Policies** – accord with and support strategy, policies and approaches (e.g. code of conduct, Indigenous engagement, animal and human ethics, IP, strategic directions and privacy)
- > **Consensus** – ensure there is open consultation, consent and engagement in all decision making processes
- > **Language** – clarify and agree on shared meaning of commonly used terms
- > **Learning** – find what other comparable citizen projects have been undertaken and learn from their experiences
- > **Accessibility** – share data and results through open access practices
- > **Feedback** – provide ongoing feedback to participants, and obtain their feedback
- > **Acknowledgement and attribution** – make sure contributions are acknowledged openly
- > **Accountability** – ensure your practices are transparent to participants and stakeholders
- > **Evaluate** – monitor and evaluate the practices, processes and outcomes

Outputs and outcomes

Citizen science projects may vary in the outputs and outcomes they are trying to achieve. There should be a transparent expression of the balance between outcomes and the activities being undertaken to reach various outcomes. It is also important to monitor and evaluate outcomes with relevant indicators or measures and then to feed this back into approaches, processes and projects.

- > **Scientific/research outcomes** – new opportunities for discovery, knowledge, data capture and analysis, peer reviewed publications
- > **Learning/education outcomes** – improved or new skills, knowledge, understanding, ways of thinking or inquiry
- > **Engagement outcomes** – such as changing attitudes towards engagement with science and/or the natural world and outcomes related to self, such as enjoyment, satisfaction, stimulation, making a contribution, health and wellbeing or relationships with others
- > **Institutional or Community outcomes** – improved social capital, trust and capacity within an institution/community and with its stakeholders or customers that enables it to adapt, be resilient, solve problems, engage etc.
- > **Impact (Environmental, Social, Economic) outcomes** – captured by some of the outcomes above, but should also include science that is impactful.

A number of broad criteria have been identified as being ideal attributes for the data from the projects to make a valuable scientific contribution. These include the [FAIR](#), and [CARE](#) principles for data sharing in a way that enables maximum, responsible and ethical data use.



Citizen science methods and models

Citizen science activities should be informed by the fact there are many different types of citizen science models:

- > **Contributory model** – projects are designed by scientists, with citizens involved primarily in one or more of collecting, recording, classifying or analysing of data
- > **Collaborative model** – projects in which the public is also involved in analysing data, as well as refining project design, and disseminating any findings, and have some ownership
- > **Co-created model** – projects designed by both scientists and members of the public, working together, and at least some of the public participants are involved in all aspects of the work, a more shared ownership or participatory action research model
- > **Advisory model** – projects developed by citizens who seek some scientific advice or input
- > **Independent projects** – developed and undertaken by citizens, sometimes with no input from scientists
- > **Programs** – overarching programs (rather than individual projects) that build a community of citizen scientists.

Different models may require a different emphasis of certain principles.



Contributing organisations

*The National Citizen Science Bushfire Working Group is composed of representatives from:

- Atlas of Living Australia
- Australian Museum
- Conservation Volunteers Australia
- CSIRO
- Department of Agriculture, Water and Environment
- Department of Environment, Land, Water and Planning
- Department of Industry, Science, Energy and Resources
- Geoscience Australia
- Kingfisher Environment Consultancy
- South Australia Department for Environment and Water



References

A number of references were drawn on to produce these principles, they are:

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**Further
information**

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