

The Encyclopedia of Life is an unprecedented effort to gather scientific knowledge about all life on earth—multimedia, information, facts, and more. [Learn more at eol.org](http://eol.org).

Contributing to Research



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What is citizen science and who can be involved?

No matter your passion—butterflies, mushrooms, birds, seashells, or all life on Earth—there is a citizen science project that needs your help to thrive. Citizen science, also called Public Participation in Scientific Research (PPSR), has always been around, but during the last 5 to 10 years it has taken off with a new generation of participants, tools, Internet resources, and mobile devices. This is especially true of species inventories, or BioBlitzes, which focus on counting the number of organisms found in a particular geographic region over a defined amount of time: for example, 12 or 24 hours.

Over the last few hundred years, people who were not professional scientists, but were interested in natural history, collected and shared observations and descriptions of nature that formed a baseline or starting point of information that helped to better define and understand the living world. As time went on, new information was added to this body of knowledge, and comparisons and hypotheses or predictions about what might happen under certain conditions were made. Natural historians had excellent observational and recording skills. Through this “patient interrogation of a landscape” (Lopez 1986) they gathered all kinds of information about individual species; the growth, behavior and interactions of plants and animals; the phenology or life cycle and timing of animal migrations; plants flowering; and much more. As the scientific method developed, more experiments and analyses were performed, generating new knowledge about how the natural world works as well as the number and role

of the organisms or species that inhabit it. If it weren't for the help of nonprofessional scientists, data collection, analysis, and the contribution of knowledge about the living world would have been extremely slow. The same is true today.

Currently, citizen science (or PPSR) continues to involve people of all ages, skills and interests directly in a variety of scientific projects and activities. Anyone can be involved and make meaningful contributions. It simply takes a desire to learn and a willingness to get involved in a project. Many projects are also taking advantage of technologies such as the Internet and mobile devices. These tools create flexibility around when and how someone participates in a project and they allow people to work collaboratively on projects without being constrained by having to meet with an individual or group at a defined time and place.

The benefits of PPSR projects range from creating public awareness and understanding of scientific concepts to fostering scientific skills including observation, recording, measuring, and analysis. Another very important outcome is that PPSR projects can provide real contributions to scientific research, benefiting both the scientific community and society. "The natural world is full of questions whose answers require a PPSR approach. The number of published scientific papers based on citizen-collected data is increasing each year. Many more projects could be created that will appeal to the increasing numbers of amateur naturalists and stargazers who are interested in lending their brains to science." (Bonney et al. 2009)

Matching your interests and skills with projects

Do you like to take photographs of nature and share them over the Internet or via your smart phone? Or would you prefer to help a scientist collect data for a global plant monitoring effort? Perhaps you want to join a team of people at an upcoming BioBlitz taking place somewhere in the world? There are a very large number of international citizen science projects from which to choose. Several helpful websites and resources are listed at the end of this article. But before investigating those specific options, take a minute to review the different types or levels of projects that are available.

- Bonney, et al. (2009) did an analysis of existing PPSR projects and programs, which vary in the extent to which the public is involved in different aspects of a scientific investigation—from data collection to defining a question for study. The report identifies three project types:
- Contributory projects designed by scientists, with participants involved primarily in collecting samples and recording data
- Collaborative projects in which the public is also involved in analyzing data, refining project design, and disseminating findings
- Co-created projects are designed by scientists and members of the public working together, and at least some of the public participants are involved in all aspects of the work (Bonney et al. 2009)

Tools and resources on Encyclopedia of Life (EOL)

The Encyclopedia of Life is all about plants, animals, and micro-organisms. It's also about getting people to share their enthusiasm, information, and observations about the natural world.

To that end, EOL has developed several tools and partnerships to help people make and share observations, share their BioBlitz event information, and upload their species images or event images to EOL. Species identification help can be obtained online through the EOL-iNaturalist project or you can check out a listing of Identification Resources.

Alternately, if you want to start a project for yourself, your school or neighborhood, you can begin by making a Collection and maybe a Field Guide. The tools and resources on EOL are free and can be used to suit your needs.

Examples of citizen science websites

There are hundreds, perhaps thousands, of citizen science websites around the world. This is a sample list to get you started on some explorations. If you have a site we should know about, please Contact Us.

EOL Citizen Science Projects Collection <http://eol.org/collections/29226>

Citizen Science Alliance www.citizensciencealliance.org/

Citizen Science Central www.birds.cornell.edu/citscitoolkit

CitSci.org <http://citsci.org>

Citizen Science Quarterly <http://citizensciencequarterly.com/>

iNaturalist <http://www.inaturalist.org/>

iSpot <http://www.ispot.org.uk/>

Journey North <http://www.learner.org/jnorth/tulip/index.html>

Mushroom Observer <http://mushroomobserver.org/>

National Geographic Society <http://www.nationalgeographic.com/explorers/projects/bioblitz/>

Observado <http://observado.org/index.php>

Project Budburst <http://neoninc.org/budburst/>

Project Noah <http://www.projectnoah.org/>

SciStarter.org <http://www.scistarter.com/>

References

Bonney, R., Ballard, H., Jordan, R., et al. 2009. Public Participation in Scientific Research: Defining the Field and Assessing Its Potential for Informal Science Education. A CAISE Inquiry Group Report. Washington, D.C.: Center for Advancement of Informal Science Education (CAISE).

Ecological Society of America. 2012. Citizen Science: New Pathways to Public Involvement in Research. *Frontiers in Ecology and the Environment* 10(6).

Lopez, B. 1986. *Arctic Dreams: Imagination and Desire in a Northern Landscape*. New York: Scribner. 496 pp.