Citizen Science: Many hands building a web of powerful data

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Author(s)

Alice Kelly Pennaz

It’s early on a Saturday as Ann Kelly carefully picks her way down a steep stream bank in her dusty-green rubber boots. On one side of the stream is a residential street, on the other a popular park where children and dogs are already bounding across the grass. Down in the streambed, however, parts of wild Virginia still exist—the stream gurgles across smooth stones as vines, tree roots, and branches break the surface. Ann wades out into the water and scoops up water for analysis. She will take this water back to her home where she will prepare her samples, placing them in the small incubator in her bedroom—carefully positioned out of her cat’s reach.

With these monthly rituals, Ann provides information on E. coli bacteria that her county government conveys to the Virginia Department of Environmental Quality to help ensure the health and well-being
of those who might come in contact with this water. The county also uses these data to locate breaks in sanitary sewer lines or other pollution point sources. Ann’s samples, along with those collected by many other volunteers across the stream network also contribute to monitoring the overall health of the Chesapeake Bay. Ann does not hold a degree in aquatic ecology, geochemistry, toxicology, or hydrology. In fact, she holds a PhD in 18th Century English literature. Yet her monthly data collection adds a vital thread in a web of citizen scientists who monitor streams across her county and the state. This contribution has allowed Ann to give back to the community while being outdoors and continuing to learn, a goal she had when she retired from being an English Professor. Becoming an Arlington Regional Master Naturalist (https://armn.org/) has opened new doors for her, by allowing her to get involved in Stormwater Management as well as insect identification at the National Park Service Headquarters of the George Washington Memorial Parkway (https://mail.google.com/mail/u/1/#search/bug+lab/1635eb0625011ef1?projector=1).

Ann’s stream monitoring falls into a long tradition of citizen science in the United States. Thomas Jefferson collected an unbroken line of weather observations (https://www.loc.gov/resource/mtj7.059_0055_0102/) from 1776 to 1818. In the 1850s Henry David Thoreau (https://www.elsevier.com/connect/tracking-climate-change-with-the-help-of-henry-david-thoreau) collected first-flowering dates, first leaf-out dates, and the arrival of migratory birds to his home in Massachusetts. In 1900 the Christmas Bird Count was established by the Audubon Society (https://www.audubon.org/conservation/science/christmas-bird-count), wherein citizens from across the country record the birds they see in the weeks surrounding Christmas, a count that continues to this day.

Citizen science that seeks to collect information on pollutants and contaminants in water, soils, and air also has a long history in the United States as a part of the environmental justice movement. Beginning in the 1980s, this movement has sought to ensure the fair distribution of environmental benefits and burdens. Supporting the core principles (https://www.ejnet.org/ej/principles.pdf) of the environmental justice movement, citizen science can empower a wide range of people to be “equal partners at every level of decision-making, including needs assessment, planning, implementation, enforcement, and evaluation.” Citizen science, participatory action research, and citizen monitoring have played important roles in pointing out the disproportionate environmental burdens that communities of color and of lower socioeconomic status bear. Groups like the Louisiana Bucket Brigade (http://www.labucketbrigade.org/) use EPA-approved “buckets” to monitor air quality in their communities. This type of work has been used to hold industry accountable for unsafe practices, and to explain cancer clusters, disease outbreaks, and other public health crises such as the Flint water crisis in 2014 (https://www.rawstory.com/2016/01/efforts-of-citizen-scientists-to-expose-flint-water-crisis-highlights-increasing-influence/).

The democratization of science and technology has empowered communities to impact policy-making, regulation, zoning, and city planning. With citizen science tools, networks, and data, historically disadvantaged communities are empowered to engage in these critical conversations to incite change.

You are invited to RSVP (https://www.aaaspolicyfellowships.org/events/symposium-community-driven-citizen-science-health-and-environment) to learn more about the policies, projects, issues, and strategies related to community driven-research and citizen science at the STPF Community-driven Citizen Science for Health and the Environment Symposium on June 14, 2018. Learn how to get involved in citizen science projects at the symposium’s expo which will highlight ongoing local and regional citizen science projects. The symposium is sponsored by the AAAS Science & Technology Policy Fellowship program and the South Big Data Regional Innovation Hub. Join us and weave
yourself into the amazing web of citizen scientists across the United States and the World.


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