
Survey response

Candidate statements and CV/resume

Please enter your name and email address below. [First Name]

Gretchen

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Le Buhn

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What do you feel are the major concerns facing the citizen science community?

The citizen science community has made enormous strides over the past ten years. There have been dramatic increases in the number of projects, number of participants and breadth and quality of the science. Yet, the promise of citizen science, the idea that through citizen participation, the community can gather critically needed data while improving science literacy and increasing community engagement has yet to be realized. I see three areas that will help increase the value of citizen science: expanding the diversity of the community; increasing the rigor of the science; and connecting science to understanding, action, management and policy.

The benefits of engaging a diverse community are well recognized. From the improvements in decision making to the embrace of democratic ideals, it is clear that broad community engagement is necessary. The difficult question is how to make citizen science pertinent and accessible to all communities and community members. If we believe in the promise of citizen science described above, we must find ways to increase participation by underserved communities.

Who doesn't want a project with high scientific rigor and high community engagement, learning and participation? Science provides a framework for answering questions. It has a well-defined set of standards and processes, but science is not easy. For our data to be used, it must meet the standards of science. This means developing simple, repeatable, protocols and developing data analysis techniques that can address the complex issues of the patchy and highly variable data sets that we collect. While there are many examples of citizen science data being useful and meeting the standards of science, there are still many projects where this is a struggle. As a community, finding ways to develop and share best practices including providing professional development, engaging participants and community members with analytical expertise, and building resources within the community are critical to enhancing the employment and usefulness of citizen science data.

Finally, what excites me about citizen science is the idea that as a community, we can complete the circle from asking questions through data collection and interpretation and, finally, to action. The power of community engagement whether developing new understanding of objects in space, tracking changes in water quality or documenting the effects of climate change is not simply the ability to collect and process data at previously unimaginable scales, it is to have communal sense of engagement and in a sense, ownership of the science that leads to the desire to learn more, to take a stand, or to change minds. As a community, if we can discover the best practices for closing the final loophole between scientific results and action, citizen science will play a role like no other field of science.

What skills and what types of experience would you bring to the CSA board?

As a scientist, educator, and manager of a large citizen science project, I would bring a mix of skills to the CSA board. For the past nine years, I have run the Great Sunflower Project, the largest citizen science program focused on pollinators. As a project run on a shoestring budget, this means I have worn all the hats from science educator to membership coordinator to web designer. In that capacity, I have worked with experts to design participant surveys, do A/B testing of the website, and to do research designed to understand the motivations of participants. I have developed curricula for implementation at university and elementary school levels. I know the joys and frustrations of many of the different parts of putting together a citizen science project.

As a community member, I have participated in many of the projects designed to improve the science in the field. In particular, I worked with the DataOne working group to develop a set of best practices for data management. I have contributed to research through Carnegie Mellon on the role of identity in user retention, through DEVISE on user motivation and through Syracuse on the role of technology.

As a faculty member in a biology department at an academic institution, I have a strong background in ecology and evolutionary biology with particular expertise in developing monitoring programs. This gives me a good perspective on what the characteristics are for high data quality and the analytical techniques for dealing with data complexity. In addition, I work at university with a strong commitment to diversity and where we have done considerable training on best practices for working with diverse communities. I work with a diverse student body every day.

I also have considerable expertise running science programs at camps for middle school students. In this capacity, I am a user of many other citizen science programs from CoCoRAHS to Nature's Notebook. I have experienced the difficulty and fun of developing a curriculum using a variety of citizen science projects.

Most importantly, I am a believer that citizen science has the potential to change the relationship between citizens and science and lead to a better future.

Gretchen LeBuhn

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Professional Preparation.

San Francisco State University. Full professor. August 2012-present.

Instructor. CONICET. Mendoza Argentina. Ciencia Ciudadana. June 2016.

Director. Great Sunflower Project (www.greatsunflower.org). 2007-present.

Board member. NatureBridge - Golden Gate campus. 2014-present.

Lead Author. Intergovernmental Panel on Biodiversity and Ecosystem Services. 2014-2016.

Panelist. PPSR for Northern California. Davis California March 2013.

Advisory committee, National Ecological Observatory Network Citizen Science Group. 2013-2015.

Instructor. Tabor Academy Summer Program. Summer 2012-2016.

Commissioner. Marin County Parks and Open Space. 2011-2014

Technical Advisor. GEF/UNEP/FAO:Conservation and Management of *Pollinators* for Sustainable Agriculture, through an Ecosystem Approach 2008-2015.

Director. Presidential Scholar's Program.2011-2015.

Working group member. Public Participation in Science. Data Observation Network for Earth (DataONE). 2011-2014.

University of California, Santa Barbara, Ph.D. March 1998. Biology.

University of Connecticut, Storrs, M.S. June 1991. Botany.

Vanderbilt University, B. A. December 1984. European Studies.

Recent Pertinent Publications. (* student author, 46 publications in total)

Journal articles:

1. Ryan, W.H., Gornish, E.S., Christenson, L., Halpern, S., Henderson, S., LeBuhn, G. and Miller, T.E., 2017. Initiating & Managing Long-Term Data with Amateur Scientists. *The American Biology Teacher*, 79(1), pp.28-34.
2. Hudson, L.N., Newbold, T., Contu, S., Hill, S.L., Lysenko, I., De Palma, A., Phillips, H.R., Alhusseini, T.I., Bedford, F.E., Bennett, D.J. and Booth, H., and many others (including **LeBuhn**). 2017. The database of the PREDICTS (Projecting Responses of Ecological Diversity In Changing Terrestrial Systems) project. *Ecology and Evolution*, 7(1), pp.145-188.
3. **LeBuhn, G.**, E. Connor, M. Brand, J. Coville, K. Devkota, R. Thapa, M. Kasina, R. Joshi, K. Aidoo, P. Kwapong, C. Anoh, P. Bosu, M. Rafique. 2016. Monitoring Pollinators Around the World. In "Pollination Services to Agriculture" ed. Barbara Gemmill-Herren. Routledge.
4. *Colloran, B. and **G. LeBuhn**. 2015. The Benefits of Meadow Restoration for Pollinators. In: T. Root and K. Hall. *Biodiversity in a Changing Climate: Linking Science and Management in Conservation*. Univ. of California Press. Berkeley.
5. Hudson, L. and many others including **LeBuhn**. 2014. The PREDICTS database: a global database of how local terrestrial biodiversity responds to human impacts." *Ecology and evolution* 4.24:47014735.
6. Wiggins, A., Bonney, R., Graham, E., Henderson, S., Kelling, S., Littauer, R., **LeBuhn, G.**, Lotts, K.,

Michener, W., Newman, G., Russell, E., Stevenson, R. & Weltzin, J. 2013. Data Management Guide for Public Participation in Scientific Research. DataONE: Albuquerque, NM.

7. **LeBuhn, G.**, S. Droege, E. Connor and many others. 2013. Detecting insect pollinator declines on regional and global scales. *Conservation Biology* 1:113-120.
8. *Goodman, R. **G. LeBuhn**, N. Seavy, T. Gardali and J. Bluso-Demers. 2012. Avian body size changes and climate change: warming or increasing variability? *Global Change Biology* 1:63-73.
9. Oberhauser, K. and **G. LeBuhn**. 2012. Insects and Plants: Engaging Undergraduates in Authentic Research via Citizen Science. *Frontiers in Ecology and the Environment*. 2012;10:318-320.
10. *Zhang, H. M. *Korayern, D.J. Crandall, and **G. LeBuhn**. 2012. Mining photo-sharing websites to study ecological phenomena. Abstract submitted to 2012 ACM WSDM Conference Seattle, Washington, USA.
11. Droege, S. V. Tepedino, **G. LeBuhn**, W. Link, R. L. Minckley, Q. Chen, C. Conrad. 2010. North American Bowl Trap Evaluation 1. Spatial Patterns of Captures of Bees. *Journal of Insect Conservation and Diversity*. 3:15-23.

Books:

1. Frey, K. and **G. LeBuhn**. 2016. *The Bee Friendly Garden*. Ten Speed Press. Berkeley.
2. **LeBuhn, G.** and N. Pugh. 2013. *A field guide to the Common Bees of California*. UC Press. Berkeley.
3. E. Mader, M. Vaughan, M. Shepherd, S. Black and **G. LeBuhn**. 2011. *Attracting Native Pollinators: The Xerces Society Guide to Conserving North American Bees and Butterflies and Their Habitat*. Storey Press.

Field Manual:

LeBuhn, G., S. Droege, E. Connor, B. Gemmill-Herren, N. Azzu and the contributors to the Handy Bee Manual. 2015. *Protocol to Detect and Monitor Pollinator Communities: Guidance for Practitioners*. UN: Food and Agriculture Organization. Rome, Italy.