Citizen Science - For All Ages: Thriving in Hennepin County, Minnesota  
Mary Karius - Hennepin County Environment and Energy  
We have three projects that involve citizens of all ages in data collection. The first, River Watch, is a stream monitoring program for youth concentrating on collection and identification of macroinvertebrates; a wetland monitoring program for all ages called the Wetland Health Evaluation Program where we collect macroinvertebrates and conduct vegetative inventories; and a new citizen pruner program concentrating on tree care in our cities, beginning in Spring 2017.

GotScience: Creating Space for Open-Access Science Communication and Education  
Kate Stone - Science Connected  
GotScience.org is a volunteer-powered project of Science Connected, a nonprofit organization dedicated to increasing public understanding of science. GotScience.org translates complex research findings into accessible insights on science, nature, and technology. In our work to increase public understanding of science, we uphold the highest possible standards of scientific and journalistic integrity. We do not sensationalize, cherry-pick, or misrepresent the research reports. We do not report pseudoscience or mistake correlation for causation. We source peer-reviewed academic journals and follow the Code of Ethics of the Society of Professional Journalists.

CrowdWater  
Barbara Strobl - University of Zurich  
The project CrowdWater aims to collect hydrological data worldwide using a smartphone application. People can estimate water levels, runoff, soil moisture (and potentially more variables), and upload this data to a database. The potential of this data for calibrating hydrological models for e.g. flood forecasting will be evaluated.

NatureLynx  
Joelle Chille Cale - Alberta Biodiversity Monitoring Institute  
NatureLynx is a brand-new citizen science tool currently in production by the Alberta Biodiversity Monitoring Institute (ABMI). Available on mobile and desktop, NatureLynx acts as a central database for publicly-generated biodiversity data from Alberta and supports sharing of that data through its mapping platform and other functions. Users upload biodiversity sightings, have their sightings verified by experts, and participate in "Groups" and "Missions" to learn about the natural world and participate in biodiversity-related research. NatureLynx is also an outreach platform for existing citizen science initiatives, schools, naturalist groups, and other not-for-profits, fostering increased engagement and supporting collaboration around everything biodiversity.

Mobile Environmental Citizen Science at Michigan Tech  
Robert Pastel - Michigan Technological University  
Mobile Environmental Citizen Science at Michigan Tech develops small and unique citizen science web applications for scientists and project leads from universities, government agencies and non-profit organizations. Scientists from Canada to Mexico have worked directly with students from computer science, psychology and humanities developing applications. The development process is iterative prototyping so the scientist and project leads can see results early and evaluate their application ideas. The designs are focused on the citizen using the applications and potential citizen users provide feedback on the design to ensure enticing and effective applications.
HerpMapper.org

Christopher Smith - HerpMapper.org; Don Becker - HerpMapper.org; Mike Pingleton - HerpMapper.org

Reptiles and amphibians have intrigued humanity since the beginning of written history. Wild tales of dragons, serpents, and mystical beasts such as the Japanese kappa are rooted in the real and sometimes bizarre and fascinating forms of herpetofauna. In today's world, reptiles and amphibians (also simply known as "herps") continue to interest scientists and the general public alike. Herpetological clubs and societies exist all over the world, encouraging members of all skill levels to search for reptiles and amphibians in the wild. These "herpers" are in a position to record their field observations and often informally do so, in addition to many non-herpers who may incidentally observe amphibians and reptiles in the course of other outdoor activities. These potential citizen scientists can provide valuable records of species occurrence, rarity, and distribution - even for species that are difficult to detect. These records thus provide one of the most basic needs of conservation and research organizations: access to high-quality data for where species occur.

OpenSystems or Towards a Multidisciplinary Practice Where Art and Participation Are a Fundamental Part of the Way How Science Is Carried Out

Isabelle Bonhoure - Universitat de Barcelona

OpenSystems is a multidisciplinary group of the University of Barcelona that focuses on arts and public participation as core elements of the way of doing science. We work together with many actors and build tailored-made research collectives to address concerns and issues mostly grounded in urban contexts. We co-design collective and pop-up experiments to raise evidences to respond societal challenges and to publicly discuss the results in a way which is valid for a wide range of actors. Our experimental setup is placed in the wild with situated, public and participatory experiments involving citizens at different levels.

Red-headed Woodpecker Recovery Project

Caitlin Potter - University of Minnesota Cedar Creek Ecosystem Science Reserve

The Red-headed Woodpecker Recovery Project is a program of the Audubon Chapter of Minneapolis conducted in partnership with UMN's Cedar Creek Ecosystem Science Reserve (CCESR). Since 2008, citizen scientists have conducted research in CCESR's oak savannas to learn more about woodpecker nesting and habitat preferences, breeding behavior, site fidelity and brood rearing. This project is particularly notable since red-headed woodpeckers are declining throughout their range, but are stable at Cedar Creek. Trained volunteers monitor specific areas of the oak savanna and collect rigorous data for the project and scientists at UMN and partner universities.
Road-Stream Crossings: Characterization and Remediation
Thomas Tisue - Muskegon Community College; Lisa Dutcher - RSX Limited; Barbara Grob - White River Watershed Partnership; Matthew Paquin - Muskegon Community College; Margitta Rose - Muskegon Community College
Road-Stream Crossings: Characterization and Remediation. L. Dutcher (1,2,) B. Grob (1), M. Paquin (3), M. Rose (3), and T. Tisue (1,3,4) The White River Watershed Partnership (WRWP) is leading an effort to characterize road-stream crossings (RSXs) in the Upper White River (western Michigan) both before and after remediation. The major goals of this work are threefold: 1) to identify and prioritize RSXs most in need of remediation due to their impact on stream connectivity, hydrology and erosion; 2) to facilitate remediation by enhancing public awareness and assisting in fund raising; and 3) to conduct pre- and post-remediation surveys and modeling that document the benefits of RSX improvements for the benthic macroinvertebrate community, hydrological characteristics, and reduction of erosion/sedimentation. The methods employed in this effort include: 1) RSX assessments using protocols standard to the Great Lakes basin; 2) physical surveys of stream profiles, flow characteristics, and substrate texture; 3) Stream Quality Indices based on indicator organisms; and 4) both modeling and measurements of erosion and in-stream sediment transport. We gratefully acknowledge financial support and technical back-stopping by the Michigan Clean Water Corps, expert advice and training from the U. S. Army Corps of Engineers and the Michigan Department of Natural Resources, in-kind contributions from Muskegon Community College and the Muskegon Conservation District, the diligence of WRWP volunteers too numerous to name individually, and the generosity of the many funding sources who made costly remediation projects possible. 1 White River Watershed Partnership 2 RSX Limited 3 Muskegon Community College 4 Corresponding author

FracTracker Mobile App: A Tool for Documenting Oil & Gas Industry Activity
Kirk Jalbert - FracTracker Alliance
The FracTracker Mobile App is a tool for documenting oil & gas industry activity including drilled wells, pipelines, waste facilities, and processing plants. Users can submit geolocated photos and reports, view maps of oil and gas wells and pipelines, and share reports with others using the app's continually updated newsfeed.

CitSci.org
Russell Scarpino - CitSci.org, Natural Resource Ecology Laboratory, Colorado State University
Citizen science and community-based monitoring programs are increasing in number and breadth, generating volumes of scientific data. We built a cyber-infrastructure support system for citizen science programs (www.citsci.org) to support the full spectrum of program and data management needs. The system affords program coordinators the opportunity to create their own projects, manage project members, build their own data entry sheets, streamline data entry, visualize data on maps, automate custom analyses, and get feedback. Thus far, CitSci.org has engaged over 330 programs resulting in some 600,000+ natural resource observations.
Snapshot Wisconsin
Christina Locke - Wisconsin Department of Natural Resources
Snapshot Wisconsin is a partnership to monitor wildlife year-round, using a statewide network of trail cameras. We engage citizen scientists at two levels: 1) all of the trail cameras are hosted by volunteers, and 2) the photos captured by the trail cameras end up on Zooniverse, a crowdsourcing web platform where anyone in the world can help identify animals in the photos. The project will provide data that directly feed into decision-making for local and statewide wildlife management. It provides a unique opportunity for individuals, families, and students to get involved in monitoring the state's valuable natural resources.

The Citizen Science Program at the Smithsonian Environmental Research Center
Alison Cawood - Smithsonian Environmental Research Center (SERC)
At the Smithsonian Environmental Research Center (SERC), citizen scientists participate in laboratory and field activities as part of more than fifteen ongoing projects. Volunteers excavate archaeological sites to understand how humans have changed ecosystems, weigh caterpillars to compare the impacts of insect herbivory on different plants, sort through oyster shells in search of mud crabs that have been infected with invasive parasitic barnacles, and isolate fungi that native orchids need to grow. Our projects are integrated into a broader program, which allows participants to easily move among projects and explore a wide variety of environmental issues.

Mutual Benefits of the Results for Participants and Researchers
Rémi Knaff - INRA; Alexis Joly - Inria; Hervé Goëau - Cirad; Pierre Bonnet - Cirad; Antoine Affouard - Inria; Jean-Christophe Lombardo - Inria; Samuel Dufour-Kowalski - INRA; Jean-François Molino - IRD; Daniel Barthélémy - Cirad; Nozha Boujemaa - Inria
What: a strategy to benefit participants as much as researchers and other citizen science subjects in botany, ecology and environment. Why: citizen science participants are often considered as "just" data collectors, which is not very encouraging. The risk of losing contributors is high because they don't have an attractive - or any - counterpart. How: participants use a mobile app to recognize plants thanks to the camera of their smartphone. This allowed them to know which plants they meet (and this can also help the development of other citizen science projects). By submitting a picture, they also submit the date and GPS data of when the picture was taken. These data are then used in research studies (species repartition in the world, early detection of invasive species) Results: 3 years later, we have accumulated over 2.5 million downloads, with around 20 000 users per day and more than 330 000 pictures and data of plants. And the number of users keeps increasing. Conclusion: when a participant benefits directly from his work of citizen science, he is more likely to contribute again. We don't have to think only from the research point of view, let's think also from the participants point of views.

Cochrane Crowd: A Year In
Anna Noel-Storr - Cochrane Dementia and Cognitive Improvement Group
At a time when research output is expanding exponentially, citizen science has an important role to play in helping to manage the information overload. Within Cochrane, we have historically struggled to provide contributors with small but meaningful ways to get involved that suits both the organization and the contributor; the role of Cochrane review author is a huge commitment. As part of Cochrane's Project Transform, we have developed Cochrane Crowd offering contributors the opportunity to complete micro-tasks aimed at identifying and describing trials.
Monarch Larva Monitoring Project
Karen Oberhauser - University of Minnesota
Monarch Larva Monitoring Project volunteers collect data on monarch distribution and abundance, and North American milkweed habitat. We will focus on how we share MLMP findings with many audiences. Our website, two newsletters (one on the MLMP and one on Monarch Citizen Science in general), and social media reach public audiences and volunteers. MLMP data have been used in 19 scientific publications on topics ranging from monarch natural enemies, to potential impacts of climate change on monarchs, to impacts of participation in ecology-based citizen science on conservation actions. Finally, MLMP findings are informing federal conservation targets for habitat restoration.

Plants of Concern
Jason Miller - Plants of Concern at the Chicago Botanic Garden
POC is a rare plant monitoring program designed to gather standardized, regional monitoring data over time to detect population trends. With the data collected we aim to assess long-term trends in rare plant populations in response to management activities and/or threats to populations. We provide the data collected back to landowners, land managers and agencies to help them in determining future management practices.

Habitat Network
Megan Whatton - The Nature Conservancy
The Nature Conservancy joins the Cornell Lab of Ornithology to create the Habitat Network, which builds upon a pre-existing citizen science platform, YardMap, by expanding the focus into the urban arena to address environmental issues facing cities. Habitat Network aims to grow our Minnesota participation to bridge the online and on-the-ground worlds where environmental issues arise and are dealt with through the actions and choices of community members, like monarch and pollinator habitat creation, cleaner waterways, or clean energy, to benefit both humans and wildlife.

Dragonfly Swarm Project
Christine Goforth - North Carolina Museum of Natural Sciences
The Dragonfly Swarm Project examines dragonfly swarming behaviors of two types, feeding and migratory. This behavior is highly ephemeral and swarms form sporadically when the right conditions present themselves. The behavior is rarely observed, making it an ideal candidate for study by citizen scientists. Over the last 6 seasons, the Dragonfly Swarm Project has gathered simple descriptive data from over 5000 citizen scientists, data that are leading to a greater understanding of how and why this behavior exists and the important role it plays in our environment.

Driven to Discover: How YOUR Cit Sci Project Can Help Youth Become *Driven to Discover*
Andrea Lorek Strauss - University of Minnesota Extension
Driven to Discover (D2D) has a great track record of engaging youth in citizen science and capitalizing on that motivation to springboard youth into leading their own science investigations. Now, after six years of pilot testing, the robust materials are ready for YOU to use with your program participants. Suitable for use with any citizen science project, these tools and trainings help your staff or volunteers coach youth through building science skills, contributing to citizen science and then completing the full cycle of their own research project. The D2D team will coach your staff on implementing the program.
Make Your Mark in Biomedical Research with Mark2Cure

Ginger Tsueng - The Scripps Research Institute

At 26 million articles and growing, knowledge extraction from biomedical literature is an important big data problem. Mark2Cure trains citizen scientists to help tackle this problem in order to facilitate research on a rare disease known as NGLY1-deficiency. Learn about biomedical terms, biological processes, fascinating diseases, genes, and drugs from the same sources that scientists use—all while helping organize information relevant to a rare disease that makes children unable to shed tears when they cry. Training is provided via an online tutorial, and there is NO cost to participate. If you can READ, you can HELP.

Go Orchids

Maria Sharova - Smithsonian Environmental Research Center (SERC)

NAOCC is a collaboration of 14 partners that facilitate Go Orchids to promote orchid conservation through education, public engagement, and citizen science. This project focuses on tracking the growth of orchid species and collecting seeds and fungi of native orchids. This information is used to develop protocols to protect, propagate, and restore orchids which are endangered or threatened in their native habitat. Go Orchids citizen scientists are involved in a variety of research to help promote orchid conservation, such as orchid field surveys and processing samples in the lab. Collected facts about orchids are publicly available on the project website.

Cartoscope

Sofia Eleni Spatharioti - Northeastern University

Cartoscope is a new opensource online platform for crowdsourcing analysis of aerial images from environmental disasters. In the context of climate change, the distinctions between natural and human made disasters is less relevant. Cartoscope is building a sustainable online community that thinks across time and physical scales of environment damage. Non-profits can use Cartoscope to evaluate changes to watersheds over long periods of time, or to look at relatively local events and their remediation, such as damage to towns from tornadoes. Projects on the site can also be scaled up to organize crowd analysis of widespread disasters, like Hurricane Sandy.

NOAA Marine Debris Monitoring and Assessment Project

Sherry Lippiatt - NOAA Marine Debris Program

The NOAA Marine Debris Monitoring and Assessment Project (MDMAP) engages volunteers across the nation and internationally to survey and record the amount and types of marine debris stranded on shorelines. To date nearly 5,000 surveys have occurred at 248 different shoreline sites. Results from the MDMAP can drive marine debris policy development, guide education and outreach messaging, and inform important research questions. In 2016, NOAA launched a "Get Started Toolbox" for participants and conducted a national analysis of trends and drivers of marine debris. Understanding the debris in our environment is the first step to prevention!

The Encyclopedia of Life: An Open Biodiversity Resource for Citizen Science and Learning

Marie Studer - Encyclopedia of Life

The Encyclopedia of Life (EOL) is a free, online resource presenting information about the planet's microorganisms, plants and animals. It's a library of information gathered from over 350 international partners who provide text, images, videos, data and more. EOL also has several tools and services to repackage the information in helpful ways for outreach and learning. Tools include species cards (think...
of baseball cards for species!) and games and the ability to make your own Collections for your projects. All content on EOL is served under Public Domain, Creative Commons or other open licenses and can be freely reused.

The Center for Community and Citizen Science at University of California - Davis: How Can Universities Most Effectively Serve the Field of Citizen Science?

*Ryan Meyer* - UC Davis Center for Community and Citizen Science

U.C. Davis is building a home for programs and partnerships that revolutionize how -- and with whom -- science gets done. We want to hear from CSA 2017 participants and museum visitors about how universities can best collaborate with the broader community of people who are changing the face of scientific inquiry through citizen science, community science, and other forms of public participation in scientific research. We hope to engage the general public, avid citizen scientists, community science organizations, citizen science projects and programs, and other universities in this discussion.

Fresh Data; The Timely Exchange of Questions and Answers

*Jennifer Hammock* - Encyclopedia of Life, Smithsonian

Modern data sharing practices (and the internet) now enable global questions to be answered by a worldwide community of monitoring projects. The challenge today is finding the data, and conversely for a data source, ensuring your data are findable. Fresh Data is a search service indexing biodiversity data providers in a common search, allowing searchers (eg: 1300 scientists from the Encyclopedia of Life) to save queries and be notified when new data appears matching their interests. In return, queries are logged and Fresh Data provides services to notify data providers when their data are used, and what queries they answered.

Pharmalinked

*Leah Morris* - The University of King's College

Pharmalinked is in its most initial phase, resulting from an undergrad thesis exploring the hypothesis that a citizen science method applied to data collection in the pharmaceutical industry would re-distribute power by engaging citizens to create publicly owned, as well as credible data that can inform the pharmaceutical industry. Data is not only being hidden from the public, but from the prescribers who use this information to effectively treat patients. Pharmalinked will seek to use an online patient network to collect and interpret data that will be open and accessible to the international public.

The Drones Are Coming

*Robert Stevenson* - UMass Boston

For more than five years the Conservation Drone Project has spearheaded the use of drones for environmental monitoring. The advent of the next generation of drones, as exemplified by such products as DJI's Phantom series quad copters and Parrot's Disco fixed wing aircraft, show that products built for the recreational market can be used to collect scientific data. I describe a software application that will allow organizations to create missions and coordinate data collection from multiple drones owners to collect high quality imagery for population surveys and habitat monitor.
Foldit
*Seth Cooper - Northeastern University*
Foldit is an online multiplayer game that allows players to compete and collaborate to computationally fold and design proteins. Since its launch in 2008, it has had over 400,000 players, and demonstrated that by leveraging human problem solving and creativity, humans and computers can work together to solve previously unsolvable problems in biochemistry. Foldit players have contributed to solutions for two of the "holy grail" problems in computational structural biology: the protein folding problem and the protein design problem (also known as the inverse folding problem).

Anecdata.org: A Free Platform for Citizen Science
*Duncan Bailey - MDI Biological Laboratory*
Anecdata.org is a free online platform where anyone can host a citizen science project and start collecting, sharing, and analyzing a wide scope of geo-referenced environmental data. Anecdata supports data ranging from simple field notes and backyard photos to complete biodiversity checklists, water quality samples, and data from HOBO loggers. Organizations like the South Carolina Aquarium are using Anecdata and discovering the potential for engaging people in ways that lead to environmental change.

Biscayne Bay Drift Card Project (BayDrift)
*Chelle King - Patricia and Phillip Frost Museum of Science*
BayDrift was designed to discover the origin of trash that washes up on Miami’s coastline. Participants paint drift cards (small plywood cards) with designs, artwork, or poetry that serve as "messages in bottles." The cards are subsequently launched into Biscayne Bay and move with the currents of the Bay until they are found by volunteers at large cleanup events scheduled a few days to a week after the launch. The start and end points of the recovered cards are analyzed by scientist at CARTHE, in conjunction with GPS-equipped drifters that are launched concurrently with the cards from select sites.

Digital Earth Watch Picture Post Network - How Outdoor Digital Photographers Can Become Citizen Scientists
*Annette Schloss - Earth Systems Research Center, EOS, University of New Hampshire*
Improvements in technology and access to WiFi, plus the excitement that surrounds using mobile devices for environmental monitoring, have opened up unprecedented possibilities for supporting environmental science and stewardship. With cameras and smart phones, people are collecting meaningful information about the well-being of their communities as part of an effort to understand local effects of global climate change. Participants take repeat digital photographs of the landscape from a fixed platform, the Picture Post, and share pictures over the web to create a visual record in time and space. Simple image analysis tools are the next step in this learning process.

GLOBE Observer
*Kristen Weaver - SSAI, Inc./NASA Earth Science Education Collaborative*
GLOBE Observer is an app-based citizen science project designed to connect non-school-affiliated observers to the data collection opportunities of the GLOBE Program, without requiring extensive training. The first protocol available was cloud cover and type (including air temperature and other atmospheric variables), to be followed by mosquito larvae and land cover. Other data collection types will be added in the future. The program also connects participants to related NASA data and scientists using both satellite and citizen-generated datasets.
Federal Tools for Citizen Science and Environmental Justice
Laura Stewart - U.S. Environmental Protection Agency
The U.S. Environmental Protection Agency (EPA) has recently launched two national-scale screening tools, EJ SCREEN and the Community Focused Exposure and Risk Screening Tool (C-FERST). These tools advance the capacity of communities to conduct independent environmental assessments supported by peer reviewed science and strengthened by local voice through groundtruthing and community-led data collection. This table provides an opportunity for conference participants to engage in a live demonstration of the tools, access information and materials on national-scale citizen science and environmental justice projects that have used these tools and request a training for their community.

It's Thrush Time. Tracking Birds Activities and Use It as Indicator of Noise Pollution in Big Cities: A Brazilian Citisci Project to Be Extended around the World
Sandro Von Matter - Federal Rural University of Rio
Anthropogenic noise pose new challenges to songbird communication. In Brazil, Rufous-Bellied Thrush populations, one of the most abundant birds in big cities, shifted day by night, during singing. It’s Thrush Time, aim to track and analyse, yearly, the interference of anthropogenic factors, in the biology of the specie. With more than 18.000 participants per year, results pointed a highly significant correlation (P < 0.001) between birds singing activity time and traffic noise. The project focus on the engagement of general audience in a national event, to empower the society, specially people under high risk of vulnerability in a unique cause.

Establishing Native Plants in Restoration: Seeds or Seedlings?
Jennifer Long - Center for Environmental Biology
In "Establishing Native Plants in Restoration: Seeds or Seedlings?", undergraduate interns from UCI's Center for Environmental Biology work closely with volunteers from the California Coastal Commission's Community-based Restoration and Education Program to conduct both ecological and educational research. The goals of this citizen science project include 1) studying methods for establishing native plants in restoration and 2) studying the effectiveness of engaging adult volunteers in habitat restoration research. Community-based restoration can be an effective method for restoring native communities and for building awareness of local environmental issues; however, more research is needed to understand impacts of involvement on participant outcomes.

Aurorasaurus
Elizabeth MacDonald - NASA Goddard Space Flight Center
Aurorasaurus is a citizen science project that gathers real-time data about aurora sightings and sends out notifications to users when the Northern and Southern Lights are likely visible in their area. Aurorasaurus significantly improves forecasting of the aurora using citizen science reports and crowd-sourced (Twitter) ground truth observations of aurora. Registered users get location-based notifications, a real-time monitor of space weather activity, the capability to help verify tweets and search for real sightings, answers to science and aurora questions, and more.
Sierra to Sea: Discovering Greenhouse Gas Flux Within the Soil of Sierra Nevadan Meadows Through Citizen Science

*Gitte Venicx - Earthwatch Institute*

Sierra to Sea is Earthwatch's newest citizen science initiative and seeks to assess the vulnerability of Sierra Nevada montane meadows, which are critical for California's water supply and biodiversity. Working in partnership with University of Nevada Reno, over three community organizations and eighty eight citizen scientists across two years, we measured greenhouse gas fluxes at a ~9x greater spatial resolution and the 12-fold increase in temporal resolution above what is typically possible. In addition to valuable data collection, approximately 90% of our participants classified their experience as 'Excellent,' suggesting that the program was worth-while to their personal growth as well.

**Land Listeners Project with the Soil Carbon Coalition**

*Didi Pershouse - Soil Carbon Coalition and Center for Sustainable Medicine*

Students, farmers and scientists are working together using low-cost monitoring of landscape function to understand soil biology's central role in our lives. How do changes in soil health and land management influence flooding, drought, ambient temperatures, runoff, public health, carbon cycling, and local food and water security? Can we harness the power of soil ecosystems to create more resilient communities? These repeatable observations by citizen-scientists, researchers, and conservation professionals are uploaded to a public interactive map along with satellite data--enabling all involved to understand changes in landscape function, find successful innovators, and track results of changing agricultural and environmental policies.

**The Soil Carbon Coalition's Atlasbiowork.com and Land Listeners Projects**

*Didi Pershouse - Soil Carbon Coalition and Center for Sustainable Medicine*

How do changes in soil health influence flooding, drought, ambient temperatures, runoff, public health, carbon cycling, and local food and water security? Can we harness the power of soil-biology to create resilient communities? In our Land Listeners Project, students, farmers, and scientists work together using low-cost monitoring of landscape function, shared listening time, and systems thinking to understand soil biology's central role in our lives. Repeatable observations by citizen-scientists, researchers, and conservation professionals are uploaded to a public interactive map--atlasbiowork.com--enabling all involved to understand changes in landscape function, find successful innovators, and track results of changing agricultural and environmental policies.

**Water Action Volunteers Citizen Stream Monitoring Program**

*Peggy Compton - University of Wisconsin-Extension*

The Water Action Volunteers (WAV) Program involves citizen monitors in the collection of stream water quality data. Objectives of the program are to educate and empower citizens, to obtain high quality data useful for decision-making, and to encourage data and knowledge sharing. WAV has three levels--with the monitoring responsibilities and quality assurance measures becoming more intensive, and data uses shifting from educational to addressing management and research needs at higher levels. Program administration comes from the University of Wisconsin-Extension and the Wisconsin Department of Natural Resources. In 2015, WAV volunteers monitored 751 unique sites, making 4500+ site visits.
Partnership for Grassroots, Non-commercial Seed Systems for Community and Climate

Daniela Soleri - UC Santa Barbara

Semi-formal seed systems like seed libraries are non-commercial, the product of grassroots action, have few resources, can be very geographically focused, and are typically led through the hands-on expertise of dedicated volunteers. These seed systems work to broaden access to seeds for food crops, and to provide seed adapted to the needs of California’s culturally and environmentally diverse communities, and the social and climatic changes underway. This project is a partnership between 10 CA seed libraries and social and natural scientists from public universities, to develop and test strategies to meet the food system and community-building goals of seed libraries.

Societal Contributions to Globe at Night Observations in the Last 10 Years

Constance Walker - National Optical Astronomy Observatory

Globe at Night is an international citizen-science campaign to raise public awareness of the impact of light pollution by inviting citizen-scientists to measure and submit their night sky brightness observations. 180 countries over the last ten years have contributed more than 156,000 measurements of night sky brightness to Globe at Night. Data is open access and uses have included comparisons of global variations (Kyba et al.) as well as local work on lesser long-nosed bats.

Cedar Creek Wildlife Survey

Jonathan Poppele - Minnesota Wildlife Tracking Project

The Cedar Creek Wildlife Survey is a joint venture between the Minnesota Wildlife Tracking Project and the University of Minnesota’s Cedar Creek Ecosystem Science Reserve, a 5,400 acre research station 35 miles north of Minneapolis. The property, most of which is only open to researchers, is a mosaic of upland forest, savanna and prairie, and lowland bogs and marshes. This project offers participants a unique opportunity to experience this special landscape while learning wildlife tracking, connecting with nature, and helping Cedar Creek scientists inventory resident wildlife. Volunteers participate in quarterly surveys, supplemented by informal tracking excursions.

Sci starter

Catherine Hoffman

Market Science

Ryan Briscoe Runquist
Mutual Benefits of the Results for Participants and Researchers
Rémi Knaff – INRA; Alexis Joly – Inria; Hervé Goëau – Cirad; Pierre Bonnet – Cirad; Antoine Affouard - Inria; Jean-Christophe Lombardo – Inria; Samuel Dufour-Kowalski – INRA; Jean-François Molino – IRD; Daniel Barthélémy – Cirad; Nozha Boujemaa – Inria

What: a strategy to benefit participants as much as researchers and other citizen science subjects in botany, ecology and environment.

Why: citizen science participants are often considered as “just” data collectors, which is not very encouraging. The risk of losing contributors is high because they don’t have an attractful - or any - counterpart.

How: participants use a mobile app to recognize plants thanks to the camera of their smartphone. This allowed them to know which plants they meet (and this can also help the development of other citizen science projects). By submitting a picture, they also submit the date and GPS data of when the picture was taken. These datas are then used in research studies (species repartition in the world, early detection of invasive species...)

Results: 3 years later, we have accumulated over 2.5 million downloads, with around 20 000 users per day and more than 330 000 pictures and datas of plants. And the number of users keeps increasing.

Conclusion: when a participant benefits directly from his work of citizen science, he is more likely to contribute again. We don’t have to think only from the research point of view, let’s think also from the participants point of views.

Genetics of Taste Lab
Tiffany Nuessle - Denver Museum of Nature & Science

This project allows citizen scientists to participate as researchers in human taste and genetics projects. Citizen scientists complete NIH ethics training, are certified by both scientific staff and education staff to enroll museum guests in the study (to ensure data collected is scientifically sound and that the experience provided to crowdsourced guests is fun and educational as they contribute their health and taste data). Citizen scientists also learn to extract, prepare, and sequence DNA and moving forward will be given opportunities for analysis and dissemination as part of our NIH SEPA grant.

Zooniverse
Lucy Fortson - Zooniverse at Adler Planetarium

The Zooniverse is the world’s largest and most popular platform for people-powered research. This research is made possible by volunteers—hundreds of thousands of people around the world who come together to assist professional researchers. Our goal is to enable research that would not be possible, or practical, otherwise. Zooniverse research results in new discoveries, datasets useful to the wider research community, and many publications.