

**Opening Remarks**  
**At the White House Citizen Science Forum,**  
**“Open Science and Innovation: Of the People, By the People, For the People”**

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- Thank you Jenn, for that introduction. And on behalf of President Obama let me thank all of you for being with us for this White House Citizen Science Forum. Special thanks goes to Jenn Gustetic for her incredibly hard work to build momentum for the use of open-innovation tools, including citizen science and crowdsourcing in and among a very broad range of sectors and actors. Thanks, too, to everyone who worked so hard to organize today’s event, especially Lea Shanley, Kristen Honey, and Meredith Stewart.
- At today’s meeting, we’ll highlight how citizen science and crowdsourcing can support the missions of Federal agencies, and we’ll celebrate some of the outstanding contributions that Americans are making to science, engineering, and innovation through these open and participatory approaches.
- While some citizen science projects go back more than a hundred years—the Christmas Bird Count, for instance, is in its 116<sup>th</sup> year this holiday season—citizen science and crowdsourcing have grown substantially over the last three decades.
- The benefits of citizen science and crowdsourcing are many. Citizen science and crowdsourcing enable research at large geographic scales and over long periods of time in ways that professional scientists working alone could not easily duplicate. Public participation extends research into places that would otherwise be difficult to reach, from the top of high-altitude glaciers to our own microbiomes.
- Let me give a few examples of the impressive variety of high-impact citizen science and crowdsourcing efforts going on today:
  - One example is in the natural world. In 2009, the USA National Phenology Network founded Nature’s Notebook, a national, online program that allows both amateur and professional naturalists to record their observations of plants and animals. Over the past six years, more than 5,500 volunteers have submitted more than 5.7 million observations to the Notebook, which includes data on 31,000 unique species. These

crowdsourced data have contributed to 17 peer-reviewed scientific publications on topics as diverse as timing of ragweed pollen maxima and effects of climate variation on production of native seeds in California.

- A second example demonstrates how crowdsourcing can harness the power of the human eye and brain to solve puzzles and detect patterns in imagery. NASA's Goddard Institute is leveraging crowdsourcing to identify targets for future planet-hunting missions. Through Goddard's "DiskDetective" project, more than 28,000 volunteers have together made more than 1.4 million classifications of possible planetary systems. I want to emphasize that because computer algorithms currently aren't sophisticated enough to be able to distinguish potential planetary systems from other bright objects in space, these classifications could not have been made on such a large scale without the assistance of human volunteers. Volunteers are also helping to grow the project by translating the Disk Detective site into eight foreign languages, including Romanian, Mandarin, and Bahasa.
- And a third example shows how a single effort powered by citizen science can have a whole host of applications. OpenStreetMap is an openly licensed map of the world populated by data from volunteer contributors. Through crowdsourcing, OpenStreetMap is able to provide information on a broader array of topics, and to update this information more frequently, than conventional maps. The Department of State, the U.S. Agency for International Development (USAID), and the Peace Corps have all used OpenStreetMap to support their humanitarian and development missions, in ways such as evaluating the effectiveness of indoor spraying for mosquitoes to prevent malaria in Botswana; disaster mitigation/planning, disaster response, and disaster recovery efforts in Nepal and the Philippines; hazard mapping and risk reduction in settlements surrounding volcanoes in Indonesia; and epidemiological monitoring and vaccination drives in refugee sites in South Sudan and Ethiopia.
- But citizen science and crowdsourcing projects don't just help the institutions running those projects. They also help the individuals participating in them by creating opportunities for learning outside the classroom, providing people with hands-on, engaging experiences in science, technology, engineering, and mathematics.
  - For instance, there's a project called the Community Collaborative Rain, Hail, and Snow Network, which since 1998 has been getting volunteers of all ages working together to measure and map precipitation. A recent report found that students who participated in this project improved their science skills and were more likely to aspire to a career in STEM. As one teacher put it, "That's all my kids talked about ... They were so excited to think that ... what we record every day matters."
- So citizen science and crowdsourcing can deliver multiple benefits. These innovative approaches can simultaneously enhance scientific research, address societal needs, provide hands-on STEM learning and increase STEM literacy. And by allowing individuals to participate in efforts that transcend geographic and sectoral boundaries, citizen science and

crowdsourcing can help create a sense of connectivity, community, and ownership that you rarely get with traditional scientific methods.

- I'm delighted by the diversity of participants we have here today: to see that researchers, students, community leaders, NGOs, entrepreneurs, academics, government employees, and many others are embracing the value of citizen science and crowdsourcing. Indeed, the future of citizen science will involve networks and partnerships across many kinds of organizations, and I hope that this White House Citizen Science Forum will stimulate some new projects and collaborations.
- But since I'm a Federal employee, I want to shine a special spotlight on the many Federal agencies that have already put citizen science and crowdsourcing to work. Today, almost two dozen different agencies run more than 85 crowdsourcing and citizen science projects. These projects include everything from gathering real-time natural hazard information to measuring mobile broadband performance across America. Depending on your organization's needs and goals, these approaches can efficiently generate high-quality data or help solve other problems you might face.
- There's still a lot of room to build on this work. There's a lot of untapped potential for citizen science and crowdsourcing to help advance the missions of Federal agencies, and generate broader scientific and societal outcomes.
- So I am happy to announce that the White House Office of Science and Technology Policy is releasing two new products to encourage and support the use of citizen science and crowdsourcing at Federal agencies, and to provide guidance on the principles and practices that maximize the value and effectiveness of these approaches in helping the government better serve Americans.
- First, today I released a **memorandum to Executive Departments and Agencies entitled *Addressing Societal and Scientific Challenges through Citizen Science and Crowdsourcing***. This memo articulates three important principles that Federal agencies should embrace to get the greatest value and impact from these citizen science and crowdsourcing:
  - **First**, citizen science must be held to the same standards as traditional science. When crowdsourcing is applied to scientific research, projects should follow standard scientific practices in design, implementation, data-quality assurance, data management, and evaluation.
  - **Second**, data worth collecting and using are also worth preserving and sharing. Consistent with this Administration's Open Data policy, project data, applications, and technologies should strive to be transparent, open, and available to the public.

- **Third**, consistent with the principles outlined in the President’s memorandum on Open Government, projects should engage the public in ways that maximize both the value volunteers provide to the project and the value volunteers derive from participating. Citizen science and crowdsourcing projects should be designed to make our Government “of the people, by the people, and for the people.”
- My memo also directs agencies to take two specific actions to advance the appropriate use of citizen science and crowdsourcing.
  - Each agency will designate a specific coordinator for citizen science and crowdsourcing projects.
  - And each agency will catalogue the citizen science and crowdsourcing activities that it directly supports and that are open for public participation. These activities will be collected by the General Services Administration on a new, centralized database and website that will make it easy for the public to find out about and participate in Federally-managed citizen science and crowdsourcing projects—much as Challenge.gov has done for prizes and challenges.
- The second announcement I want to make is that today, the U.S. government is fulfilling a commitment made in the 2013 Open Government National Action Plan, and releasing the first-ever **Federal Crowdsourcing and Citizen Science Toolkit** to help Federal agencies design, carry out, and manage citizen science and crowdsourcing projects.
  - The development of this online toolkit was a lesson in collaboration in and of itself—OSTP, in partnership with the Federal Community of Practice for Crowdsourcing and Citizen Science and GSA’s Open Opportunities Program, engaged more than 125 federal employees from over 25 agencies to develop the content for the Toolkit, build the website to host it, and conduct the user testing needed to make sure it works and is easy to use.
  - The toolkit draws on the expertise of dozens of experienced project designers across and outside government and is thus a valuable resource for ideas, case studies, best practices, and lessons learned from citizen science and crowdsourcing projects. The Toolkit will help agencies plan and carry out projects in accordance with the principles of data quality, openness, and public participation articulated in my memo.
- As Director of the Office of Science and Technology Policy, I think citizen science is a perfect example of a field that truly lies at the nexus of those three things: science, technology, and policy. New technologies – from low-cost sensors and other types of monitoring instruments, to increasingly ubiquitous and powerful smartphones, to the rapid expansion of high-speed Internet connectivity – are facilitating citizen science on a scale that simply wasn’t possible even just a few years ago.
  - We can harness this new technological infrastructure to advance both scientific discovery, and the realization of policy objectives that will lead to positive outcomes

for all Americans. So I encourage Federal employees – and everyone – to innovate and experiment, to be creative in using citizen science and crowdsourcing to achieve your goals.

- In closing, I want to acknowledge that the momentum around, and enthusiasm for, citizen science and crowdsourcing that we're here to celebrate today is a product of many people's hard work over the last several years.
  - In particular, I want to acknowledge the Federal Community of Practice on Citizen Science and Crowdsourcing, or CCS. The CCS was formed organically in June of 2013, by a group of Federal employees who were interested in raising the profile of and developing best practices for citizen science and crowdsourcing in government.
  - In the past year, this community of practice has doubled in size, and now includes representatives of 42 Federal departments, agencies and bureaus. The CCS, led by co-chairs Lea Shanley and Jay Benforado, has provided seemingly limitless vision, energy, and excellence in advocating for citizen science and crowdsourcing across government. This action-oriented group is an excellent example of what federal employees across agencies can accomplish when they collaborate with shared vision and purpose. Many of the products you see today—this forum, all of the examples I reference in my memo, and the thought leadership behind the toolkit—would not have been possible without this group. If you are a member of the CCS or toolkit team, can you stand now? Let's give them a round of applause for their excellent work [applause].
- Thank you all for being here this morning. I'm looking forward to some great discussions, and I'm excited to see what amazing new collaboration, projects and impacts come out of today's events.