Earth Challenge 2020

Leveraging citizen science
for social and environmental good

For the 50th anniversary of Earth Day, Earth Day Network, the U.S. Department of State, and The Wilson Center are launching *Earth Challenge 2020* as the world's biggest ever coordinated citizen science campaign.

By working together, we will help our partners mobilize millions of people to collect over one billion observations in areas including air quality, water quality, pollution, biodiversity, and human health to strengthen the nexus between science, the environment, and society.

Photo credit: https://bit.ly/2rr8mVn

WHY CITIZEN SCIENCE?

Education & Engagement

Local Roots

Accountability

Global Reach

Scope
1,000+
Projects on 7 continents

People Power
1,534,554
World Monitoring Day participants

Scale
$2.5 billion
In-kind valuation of biodiversity monitoring

Luckily for all of us, environmental enthusiasts around the world have been collecting observations of their environments for over 100 years to respond to exactly this climate crisis. This quiet, madly productive movement transcends politics and academia and is a powerful tool for fighting climate change.
Citizen science, sometimes called participatory science, refers to the collective action of millions of people who record data into open source databases to support scientists and policy-makers make better decisions for a healthier, safer world. The movement's historic data allows us to understand what our globe used to be like and how it has changed. Now, thanks to technological advances, data is collected at unprecedented rates from wildly diverse locations.

Local Roots: Citizen science unfolds in local communities where volunteers have unique contextual knowledge of environmental and social conditions.

Global Reach: High quality data collected by trained volunteers can be re-used in national and global research and assessments.

Education and Engagement: Hands-on participation in science and technology boosts STEM literacy.

Accountability: Citizens help drive governments and businesses to make positive impacts on communities and the environment.

Scope: 1,000+ existing citizen science projects spanning 7 continents

People Power: 1,534,554 World Monitoring Day participants

Scale: Up to $2.5 billion In-kind valuation of biodiversity monitoring alone (*Theobald et al. 2015*)

Stat 1: http://www.worldwatermonitoringday.org/

Earth Challenge 2020 has many goals regarding data and education, but its most powerful purpose is to serve as a tool to combat climate change. The challenge addresses climate change in primarily two ways:

1. Participatory science is empowering, accessible, and impactful. Everyone and anyone can participate regardless of age, education, ability, or geographic location. Given the thousands of projects in existence, there are millions of opportunities to act on behalf of your community and build the databases that will inform decision-makers. Will citizen science solve climate change? No, it won't, but engaging the public in the scientific process presents a powerful option for action. Citizen science provides a grassroots approach to fueling the environmental movement with meaningful data that can be yield exponentially grander results. Together, the movement is far more impactful than citizen scientists' individual actions. Given the political state of our world, we need citizen science now more than ever before.

2. The Earth Challenge 2020 team has selected research themes that speak directly to some of the thorniest issues associated with climate change: air quality, water quality, pollution, biodiversity, and human health. By linking the environment and human health, we are making climate science more

relevant than ever. We are building interdisciplinary tools that will attack climate change through these five themes. Earth Challenge 2020 will revolutionize the way we understand environmental research through 1) the aggregation of over one billion data points and 2) the educational resources that make this data meaningful to communities as well as policy-makers.

Resources include protocols for data collection, a code library and software development kit (SDK), educator guides, and "what-you-can-do" toolkit linking participation to action.

Data are collected to meet local, regional, national, and global needs, with data and metadata standards addressing a range of challenges to high-quality data collection and ethical data sharing.

Technology developments include a flexible mobile application, data submission forms, cloud-based data portal with suite of APIs, and data analysis and visualization tools.

Engagement - Global summits and workshops will elevate the impact and value of citizen science and help people and projects participate in Earth Challenge 2020.

Outcomes include a coordinated global citizen science community, engaged and educated volunteers, new open data portal, and scientific research outcomes.

Picture: https://bit.ly/2ngsKaU

EARTH CHALLENGE 2020

Timeline

Outreach, partner recruitment, and strategic planning. We will coordinate with the existing citizen science community, help mobilize new communities, and recruit strategic partners including governments, NGOs, and technology companies. In addition, we will design the scientific research questions and data standards that will support Earth Challenge 2020 research. This is the stage we're at now.

Earth Challenge 2020 Hackathons! We will work with our partners to host global hackathons recruiting public volunteers to develop apps, sensors, APIs, and data visualization tools to help people and projects participate.

1 billion data points. We will collect one billion observations between April 1st and April 22nd. Some of these will be uploaded directly via the official Earth Challenge 2020 app. Others will be shared by participating citizen science projects through APIs and similar tools.

Evaluation and impact. We will use Earth Challenge 2020 to understand the links between participation in citizen science and factors including knowledge gains, interest in STEM, and behavior change. Our database will be used in dozens of research publications, and can help shape the future of environmental reporting and assessment.

HELP MAKE IT HAPPEN!

An integrated platform will connect volunteers around the world with technology resources, participating projects, and each other, but we need your help to make it happen.

- Submit research questions by December 15 of this year to participate in our effort to crowdsource the world's most burning environmental questions. These questions will help to shape the direction of Earth Challenge 2020 at large.

- Become a citizen scientist. Find local citizen science projects to put your community on the map and help guide decision-makers.

- If your organization or institution has open data, please reach out to work with our team on developing APIs so that our databases can communicate. This type of data sharing magnifies the impact of your data and contributes to even greater global coverage.

- Financially support Earth Challenge 2020. We have a number of unique opportunities for sponsors to come on board and collaborate with us on particular issues that align well with organizational missions.

- Get involved with our 2019 hackathon planning by hosting or planning to participate. The hackathons will develop the technologies and resources needed for Earth Challenge 2020 to launch and the events will occur all over the world.

- Offer your expertise and skills to our scientific advisory teams to help ensure scientific rigor throughout Earth Challenge 2020 development. These teams will convene in January so reach out soon!

- Collaborate on our series of locally relevant toolkits on education and action. Earth Challenge is more than just a database. It is helping to spark a new movement of empowered, educated, innovative individuals. The toolkits will offer options for action in response to data collected so that change occurs at the individual to global scale.

Picture: https://bit.ly/2QJ8MES

Submit research questions on Twitter @Earth_Challenge; #EC2020 or at www.earthday.org/earthchallenge2020. We are thrilled to have submissions from all seven continents and we want more! What is most critical to YOU and your local environment? What burning questions do YOU want answered?

Share the Earth Challenge 2020 vision with your networks. Global outreach is critical to the success of the Earth Challenge 2020 movement and we are recruiting as wide and diverse participation as possible. Please share this opportunity with your networks!

Collaborate with us! Email EarthChallenge2020@earthday.org to start the conversation. We have an incredible team of partners and collaborators and would love to start a conversation with you to identify opportunities for teaming up on

PARTNERS & COLLABORATORS

Lead Partners

EARTH DAY NETWORK

Wilson Center

Core Collaborators

American Association for the Advancement of Science
Association of Science-Technology Centers
Connect4Climate – World Bank Group
Conservation X Labs
EarthEcho International
Hult Prize
National Council for Science and the Environment
Open Geospatial Consortium
RESET
SciStarter
The United Nations Environment Programme

We have a growing list of core collaborators and would love to be in touch if you and your organization would like to be involved. [Next slide has email.]

Thank You

Email: EarthChallenge2020@earthday.org
Website: earthday.org/earthchallenge2020