

Information Collection Request

EXECUTIVE SUMMARY

Title: Generic Clearance for Participatory Science and Crowdsourcing Projects (Renewal)

EPA ICR Number: 2521.41

OMB Control Number: 2080-0083

Abstract

EPA relies on scientific information. Participatory science and crowdsourcing techniques allow the Agency to collect qualitative and quantitative data that might help inform scientific research, assessments, or environmental screening; validate environmental models or tools; or enhance the quantity and quality of data collected across the country's diverse communities and ecosystems to support the Agency's mission. Information gathered under this generic clearance will be used by the Agency to support the activities listed above and might provide unprecedented avenues for conducting breakthrough research. Collections under this generic ICR will be from participants who actively seek to participate on their own initiative through an open and transparent process (the Agency does not select participants or require participation); the collections will be low-burden for participants; collections will be low-cost for both the participants and the Federal Government; and data will be available to support the scientific research (including assessments, environmental screening, tools, models, etc.) of the Agency, states, Tribal or local entities where data collection occurs. EPA may, by virtue of collaborating with nonfederal entities, sponsor the collection of this type of information in connection with participatory science projects. When applicable, all such collections will comply with Agency policies and regulations related to human subjects research and will follow the established approval paths through EPA's Human Subjects Research Review Official. Finally, personally identifiable information (PII) will only be collected when necessary and in accordance with applicable federal procedures and policies. If a new collection is not within the parameters of this generic ICR, the Agency will submit a separate information collection request to OMB for approval.

SUPPORTING STATEMENT

1. Need and Authority for the Collection

Participatory science and crowdsourcing: Innovative research methods that engage the public

Participatory science and crowdsourcing are tools that engage, educate, and empower the public to apply their curiosity and contribute their talents to a wide range of scientific and societal issues. Participatory science is a form of open collaboration where the public can participate actively in the scientific process through methods that include asking research questions, collecting and analyzing data, interpreting results, or engaging in problem solving. Crowdsourcing is a process where individuals or organizations submit an open call for contributions of information from a large group of individuals ("the crowd"). Participatory science is EPA's all-embracing term that is inclusive of diverse community engagement models, academic disciplines, project scope, and/or methodology in which members of the public participate. Note that the term citizen science is used in statutes and regulations referred to throughout this document.

EPA's mission to protect human health and the environment

The mission of EPA is to protect human health and the environment. Participatory science and crowdsourcing can support EPA's mission and purpose, ensuring that national efforts to reduce environmental and public health risks are based on the best available scientific information and that all parts of society – communities, individuals, businesses, and state, local and Tribal governments – have access to accurate information sufficient to effectively participate in managing human health and environmental risks. To meet these goals, EPA fosters the use of science and technology, conducts leading-edge research, and funds community-driven projects. Likewise, the Agency conducts educational activities to increase the public's knowledge and understanding of environmental issues so that they can make appropriate decisions.

Benefits of using participatory science and crowdsourcing approaches at EPA

Participatory science and crowdsourcing can create engaging opportunities for the public to experience their environment, contribute environmental data at a more local level, and provide opportunities to analyze large environmental datasets. These methods give people the ability to easily share data they encounter in their communities and environments. Whether it is an individual photographing an endangered species they come across on their walk, someone at home adding descriptions to online aerial photographs taken at a disaster site, or owners of personal monitors documenting their daily activities, crowdsourcing and participatory science provide people a fun and accessible way to contribute to science or foster a greater appreciation of their natural environment and community. In addition, participatory science and crowdsourcing projects promote greater openness in the scientific process by actively encouraging participation in various aspects of research. Researchers using participatory science and crowdsourcing are committed to the dissemination of data and results back to the public.

Many federal and non-federal organizations are already using innovative participatory science and crowdsourcing tools to advance their missions. These tools are especially valuable where data are distributed across space and time or when projects rely on large datasets. Successful participatory science and crowdsourcing projects usually result from iterations of the design based on feedback from the participants.

The growth and success of participatory science and crowdsourcing is tied closely with advances in technology. Enhanced tools and methods are constantly making participatory science and crowdsourcing more feasible and effective.

Federal support for participatory science and crowdsourcing

In the 2017 American Innovation and Competitiveness Act¹, Congress authorized agencies to harness the ingenuity of the public by using open innovation methods such as participatory science and crowdsourcing. Participatory science and crowdsourcing are in line with the Paperwork Reduction Act's intent to "ensure the greatest possible public benefit from and maximize the utility of information created, collected, maintained, used, shared, and disseminated by or for the Federal Government."²

Design principles for participatory science and crowdsourcing projects

¹ American Innovation and Competitiveness Act, S.3084, 114th Cong. (2015-2016)

² OMB Memo M-11-07. Facilitating Scientific Research by Streamlining the Paperwork Reduction Act Process. December 9, 2010.

Participatory science and crowdsourcing projects under this generic ICR will include the following design principles:

1. Participants have a meaningful role in the research project and can act as contributors or collaborators.
2. Projects have a genuine scientific question or goal.
3. Projects are low-burden for participants.
4. Projects include active management of data and data quality, including a data quality assurance plan and ongoing evaluation of data quality and data management.
5. Projects are opt-in and participants have full control over the extent that they participate.
6. The data gathered and/or analyzed are shared with participants and generally made publicly available, unless there are security or privacy concerns that prevent this.
7. Participants receive feedback on how their contribution adds to the project.
8. Project leads evaluate scientific output, data quality, and the impact on participants.
9. Projects are designed to contribute to research and science, not to inform Agency regulations or policies.

EPA participatory science research will have clear linkages to community problems and concerns, and this participatory, “translational science approach” differentiates participatory science research from EPA’s traditional research activities. The objective of a participatory science project under this ICR is to use a rigorous research approach – and then apply findings to real-world problems.

2. Practical Utility/Users of the Data

EPA relies on scientific information. Participatory science and crowdsourcing techniques allow the Agency to collect qualitative and quantitative data that might help inform scientific research, assessments, or environmental screening; validate environmental models or tools; or enhance the quantity and quality of data collected across the country’s diverse communities and ecosystems to support the Agency’s mission. Information gathered under this generic clearance will be used by the Agency to support the activities listed above and might provide unprecedented avenues for conducting breakthrough research. See [Appendix](#) for selected examples of how the Agency has used information received from the current collection.

Collections will be from participants who actively seek to participate on their own initiative through an open and transparent process (the Agency does not select participants or require participation); the collections will be low-burden for participants; collections will be low-cost for both the participants and the Federal Government; and data will be available to support the scientific research (including assessments, environmental screening, tools, models, etc.) of the Agency, states, Tribal or local entities where data collection occurs. EPA may, by virtue of collaborating with non-federal entities, sponsor the collection of this type of information in connection with participatory science projects.

Collection of health symptoms, illnesses, and human biological samples (e.g., blood, urine, hair) is outside the scope of this generic clearance.

All such collections will accord with Agency policies and regulations related to human subjects research as described in EPA Order 1000.17A (*Policy and Procedures on Protection of Human Subjects in EPA Conducted or Supported Research*). Each project under this generic ICR will be classified as either not human subjects research (NHSR) or human subjects research (HSR). All HSR must be reviewed and approved by the EPA Human Subjects Research Review Official (HSRRO). To obtain approval by the

HSRRO, researchers must submit the Institutional Review Board (IRB)-approved research package including documentation of the approval or determination of exemption by the IRB or the institution's Human Research Protection Program (HRPP), evidence of a Federal wide Assurance (FWA) on file with the U.S. Department of Health and Human Services, or other assurance in accordance with 40 CFR 26.103(a). Human Subjects Officers (HSOs) will review NHR projects, and ensure the project is submitted to the EPA HSRRO for approval. Finally, personally identifiable information (PII) will only be collected when necessary and in accordance with applicable federal procedures and policies. If a new collection is not within the parameters of this generic ICR, the Agency will submit a separate information collection request to OMB for approval.

The methods used for collecting information can vary greatly across projects, including the use of apps, questionnaires or monitoring devices. All participatory science and crowdsourcing activities under this ICR will be consistent with the citizen science definition in Section 3 of the Citizen Science and Crowdsourcing Act of 2017. All projects conducted by EPA will be reviewed and approved by the EPA participatory science coordinator to ensure compliance with the parameters in this ICR as well as compliance with all other legal and administrative requirements. In addition, all projects submitted under this ICR will manage PII according to the Federal regulations. As with any scientific endeavor at EPA, participatory science and crowdsourcing projects will have approved data quality and data management plans as part of their project design before implementation. EPA provides employees resources for developing data quality and data management plans³.

The popularity and application of participatory science and crowdsourcing methods continues to grow with new and low-cost portable technologies. Therefore, the modes of data collection under this generic clearance may include: paper or digital questionnaires, data forms, surveys, focus groups or interviews; new and existing online collaboration tools; fields in a cell or smart phone applications (apps); online web-based forms or interactive computer interfaces that elicit information; social media platforms; text or SMS messages; readings from sensors (personal, mobile, stationary or portable) or other mobile, portable or stationary instruments- readings either sent back to the Agency in real-time, through an online data collection site, or through another acceptable mode listed here; analog or digital audio or video recordings; digital or analog photographs; and information collected automatically through an app, computer, the metadata accompanying a digital photograph, or a mobile sensor. Information may be actively collected and actively submitted information (such as descriptions, measurements, photographs, etc.) as well as passively submitted information, such as the metadata accompanying actively submitted information (date, time, and location stamps automatically included with apps and digital photographs).

Participatory science and crowdsourcing collections submitted under this generic clearance can be stand-alone projects or the methods may be incorporated into an existing or new project, including, but not limited to, projects in the following typology⁴:

- **Data gathering projects.** These projects may include 1) observation, characterization and documentation of natural phenomena or general environmental observations, opinions, or preferences, or 2) surveying participants or screening environmental conditions, including using specialized equipment provided by project leaders to record and submit data, or submitting samples plus descriptors for testing. Data may be collected using technologies mentioned above, through structured data forms, surveys, focus groups or interviews, submitting photographs or other media, surveys or questionnaires, or providing written observations.

³ <http://www.epa.gov/quality/>

⁴ Typology adapted from: Teresa Scassa and Haewon Chung. 2015. Typology of citizen science projects from an intellectual property perspective: Invention and Authorship Between Researchers and Participants. Wilson Center, Commons Lab, Case Study Series, Vol. 5.

- **Classification/problem solving projects.** Participants' tasks may include: 1) observation of recorded materials provided by project organizers (images, video, etc.) through structured data submission forms, surveys or questionnaires in an online or computer program, clicking boxes, highlighting parts of text or image, and providing comments and/or annotations; 2) classification of images or sounds using structured data submission forms or clicking boxes in an online or computer program; 3) transcribing information, by typing handwritten logs or notes; 4) performing a function meant to generate human behavior data; or 5) problem-solving or manipulation of data. Tasks 1-5 may be conducted via structured actions or instructions or through the use of a "human-based computational game" or a "game with a purpose", a human-based computational technique in which a computational process performs its function by presenting certain steps to humans in an entertaining way.

Data gathering and classification/problem solving projects may include participants providing information, opinions or observations about a research subject's environmental surroundings. Participatory science and crowdsourcing collections under this generic clearance may include the following types of questions or requests of participants:

- **Profile/Preference information.** Projects may request a username and/or password as well as user preference information to facilitate or customize the user experience. Participants may be asked to submit an email address, name, and zip code, as well as acknowledge a privacy policy or terms agreement. Participants may also be presented with an opportunity to be placed on a mailing list for the project. This includes projects administered through a web form or mobile application.
- **Personal and Contact Information.** Participatory science and crowdsourcing projects may solicit contact information. This information may be necessary to organize and analyze data (i.e., it may be necessary to know which data points are from the same observer). Projects may request contact information to provide participants with project updates and share data. Participants would be made aware that the publicly available data on contact information will be anonymized and aggregated, for example, by census tract, zip code, or city.
- **Experience and Expertise.** For data quality purposes, participatory science and crowdsourcing projects may request information to evaluate the skill level of the participant by asking about their experience with the project topic. Questions may be about a person's age range, level or topic of education, participation in organizations, or professional experience.
- **Information about Observations.** Projects may request accompanying information, such as the date and time of the activity, the location (e.g., GPS coordinates, address, zip code, etc.), the weather (e.g., temperature, precipitation, wind, humidity, visibility, etc.), and a description or characterization of the location (e.g., vegetation type, type of water body, environmental condition, etc.) or personal senses (e.g. smell, visual cues, sound, etc.).
- **Project Evaluation.** Participatory science and crowdsourcing projects may collect information on the participant's experience for project evaluation and development. This may include questions on how the participant found out about the project, the amount of time spent, distance traveled, how difficult the task was for the participant, whether the participant enjoyed the experience, and if they will participate again. Projects may also request information to evaluate participant outcomes, such as changes in the participant's understanding of the scientific process or project topic, through survey questions before and after participation.
- **Training.** Participatory science and crowdsourcing projects may need to train participants for the purpose of soliciting quality data and increasing participant benefits including education and engagement. Participants may be asked to read materials, watch training videos, or attend training sessions in-person or virtually via a webinar. To ensure that participants understand the training, they may be assessed through testing instruments like a questionnaire or survey, which may be administered online or through a computer program, on paper, in cell a phone app, or in-person.

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3. Use of Technology

Participatory science and crowdsourcing efforts often utilize information technology that is already available to potential participants (cell phones, personal computers, tablets, etc.). Projects submitted under this generic clearance may collect information electronically through new and existing online collaboration tools, cell phone applications (apps) or SMS, web-based forms, online computer programs or forms, social media platforms, or sensors (personal, mobile, stationary or portable).

4. Efforts to Identify Duplication

No similar data are gathered or maintained by the Agency or are available from other sources known to the Agency. No existing information can be adapted for the purposes of this collection because participatory science projects will collect new information that is not already available (e.g. local water and air quality).

5. Minimizing Burden on Small Entities

Participants in the crowdsourcing and participatory science projects under this generic clearance will be individuals, not small businesses or other small entities.

6. Effects of Less Frequent Collection

If unable to collect information through participatory science or crowdsourcing methods under a generic ICR, the Agency would be unable to adapt and utilize these innovative tools in a timely manner to engage the public in EPA science. With these methods, EPA benefits from the public's knowledge, expertise, and willingness to contribute to scientific endeavors that rely on large and geographically comprehensive datasets. The public and other organizations are beginning to capture and organize data with smartphones and portable sensors; the Agency's involvement will allow for publicly-generated data to effectively support EPA research, including initiating data collection, developing innovative methods for data processing, and managing data quality. The ability of EPA researchers to have access to the newest technologies affords EPA the opportunity to contribute meaningfully to low-cost sensor testing and use. Moreover, members of the public enjoy participating in participatory science and crowdsourcing projects, which are fun, educational, engaging, and will allow for more open communication between EPA and the public. Participatory science projects at other agencies have gathered millions of data points contributed by hundreds of thousands of interested individuals. These projects are always voluntary, low-burden, and rely on the interest and self-motivation of the participants. Finally, projects under this generic clearance will allow Agency researchers to test ideas more quickly, respond to the project's needs as they evolve, and incorporate feedback from participants for flexible, innovative research methods that involves the public in a variety of aspects of scientific research. Less frequent collection would limit the number of participatory science projects that EPA could conduct, which would directly decrease the benefits of the Agency's participatory science program.

7. General Guidelines

There are no special circumstances that would cause this information collection to be conducted in a manner inconsistent with OMB guidelines.

8. Public Comment and Consultations

a. Public Comment

In accordance with 5 CFR 1320.8(d), a 60-day and 30-day notice for public comment will be published in the Federal Register. The 60-day notice for public comment was posted on August 21, 2023, and closed on October 20, 2023. No comments were received before October 20, 2023.

b. Consultations

The Agency consulted with representatives from USGS, HHS and USDA on participatory science and crowdsourcing efforts. These federal representatives are associated with the Federal Community of Practice on Crowdsourcing and Citizen Science (FCPCCS). Representatives reviewed a draft of this generic clearance. This document reflects the feedback and comments from this community.

9. Payments or Gifts to Respondents

The Agency will not provide payment or other forms of remuneration to participants.

10. Provisions for Protection of Information

If a confidentiality pledge is deemed useful and feasible, the Agency will only include a pledge of confidentiality that is supported by authority established in statute or regulation, that is supported by disclosure and data security policies that are consistent with the pledge, and that does not unnecessarily impede sharing of data with other agencies for compatible confidential use. If the agency includes a pledge of confidentiality, it will include a citation for the statute or regulation supporting the pledge.

11. Justification for Sensitive Questions

No questions will be asked that are of a personal or sensitive nature as defined by OMB.

12. Estimates of Respondent Burden Hours & Labor Costs

A variety of platforms and media will be used to collect information from respondents. We expect that there will be a range of burden hours depending on the details of the participatory science and crowdsourcing method employed. The total range of annual burden hours requested is 350,000 to 400,000 hours based on the number of collections we expect to conduct over the requested period for this clearance.

The total dollar value of the annual burden hours is based on the National Compensation Survey: Occupational Wages in the United States published by the Bureau of Labor Standards Occupation and Wages, May 2022 (http://www.bls.gov/oes/current/oes_nat.htm#00-0000). We use the value for All Occupations, average hourly wage of \$29.76 multiplied by 1.6 to account for benefits, equal to \$47.62.

- A. Data gathering projects:** We estimate approximately 1,425 participants per year per data gathering collection project under this generic clearance. Under this generic clearance, we estimate 7 data gathering projects per year (10,000 registrants). We estimate the number of participants completing training will be 80% of registrants (8,000 participants). Training modules will vary by data collection; we estimate an average of four hours. For this estimate we assume that each trained participant will collect the same number of observations in the same amount of time. The estimated annual burden for 7 data gathering projects is 75,833 hours.
- B. Classification/problem-solving project:** We estimate 3 clarification/problem-solving projects annually under this generic clearance. We estimate the number of participants completing training will be 80% of registrants. Training modules will vary by data collection; we estimate four hours. The estimated number of participants that will spend time on the website, app, or computer program engaged in the activities will vary, and it is difficult to predict. Participants will continue to engage with the site based on their interest and submit data until the task is complete. For this estimate, we assume data collection

tasks (classification/problem solving) will be completed with 50% of the trained participants engaged by the sites for 8 hours per month or 96 hours per year. The estimated annual burden for 3 classification/problem solving projects is 313,250 hours.

Burden of information collection request table

Estimated Annual Reporting Burden			
Type of Collection	Number of Participants	Estimated Time per Participant (hours unless otherwise noted)	Total Annual Burden Hours
A. Data gathering projects			
Participant registration, initial login & reading guidelines	10,000	13 minutes	2,167 hours
Participant training (estimate 80% of those who register will undergo training)	8,000	4 hours	32,000 hours
Participants contributing observations (estimate all "trained")	8,000	5.2 hours (500,000 observations at 5 minutes each)	41,667
Total burden hours for data gathering projects			75,833 hours
Total annual labor costs for data gathering projects		hourly rate including benefits = \$47.62	\$3,611,167
B. Classification/problem-solving projects			
Type of Collection	Number of Participants	Estimated Time per Participant	Total Annual Burden Hours
Participant registration, initial login & reading guidelines	7,500	10 minutes	1,250 hours
Participant training	6,000	4 hours	24,000 hours
Participants completing data collection tasks	3,000	96 hours (8 hours/month)	288,000 hours
Total burden hours for classification/problem-solving projects			313,250 hours
Total annual labor costs		hourly rate including	\$14,916,965

for classification/problem-solving projects		benefits, \$47.62	
Total COMBINED ANNUAL burden hours			389,083 hours
Total COMBINED ANNUAL labor costs			\$18,528,132
Total COMBINED 3 YEAR burden hours			1,167,249
Total COMBINED 3 YEAR labor costs			\$55,584,396

13. Estimated Respondent Annual Non-Labor Cost (Capital and O&M)

There will not be fees associated with participation in the data collections under this generic clearance. Participants will not be required to purchase any equipment to collect data, but some low-cost sensors or other technical or low-tech supplies may be necessary to complete the data collection tasks. The costs to participants for materials will vary based on the data collection type (data gathering, classification/problem solving, or research subject participation) and medium (i.e., sensors, apps, or paper forms). The Agency does not expect participants to make purchases specifically for participatory science and crowdsourcing projects under this generic clearance. However, the table below reflects an annual 3-year estimate for Operations and Maintenance Costs (O&M) that participants might incur should they decide to purchase equipment to fully participate in a participatory science or crowdsourcing collection under this generic clearance. The estimate is based on the following assumptions: one eighth of the expected participants in the “data gathering projects” purchases low-tech equipment with a maximum cost of \$25 per person (i.e., use of already owned internet or data plans; or purchase of low-technology equipment like water monitoring kits) and one eighth of the expected participants in the “data gathering projects” purchases high-tech equipment (i.e. personal monitors, portable/personal air sensors, or other higher-technology equipment) with a maximum cost of \$500 per person.

Operations & Maintenance (O&M) Costs			
	Estimated maximum cost per participant	Estimated number of participants expected to use	O&M costs
Low-tech equipment	\$25.00	1000	\$25,000
Low-cost personal or portable technology	\$500.00	1000	\$500,000
Total annual non-hour burden cost			\$525,000
O&M costs over 3 years			\$1,575,000

14. Agency Burden Estimates

The anticipated cost to the Federal Government is approximately \$192,378 annually. These costs are comprised of project administration and estimated contractor payments. EPA person-costs are estimated using an hourly rate for a GS-14 (step 1) including an additional 60% for benefits based in Washington, DC. Time spent on each step may vary, as well as the GS-level of the employees involved. The estimate for project administration is based on 10 projects per year at 5% time given 2,087-hour divisor⁵ for an employee's annual rate of pay.

Task	Costs (and Person-hours) Per Project		Total Hours and Cost
	EPA (\$63.43/Hour)	Estimated contractor costs	Total Cost/Year (estimated for 10 projects per year)
Project Administration	\$132,378		\$132,378
Contractor costs		\$60,000	\$60,000
Total			\$192,378

15. Change in Burden

This three year renewal will allow EPA to continue its participatory science activities consistent with Congressional legislation (American Innovation and Competitiveness Act), a 2016 GAO report (“Practices to Engage Citizens and Effectively Implement Federal Initiatives”), a 2017 GAO Report (“Executive Branch Developed Resources to Support Implementation, but Guidance Could Better Reflect Leading Practices”), and a September 2018 EPA OIG report on improving management controls for EPA participatory science (“EPA Needs a Comprehensive Vision and Strategy for Citizen Science that Aligns with its Strategic Objectives on Public Participation”). The dollar figures have been updated to reflect current wages.

16. Publication of Data

The tabulation, timeline, analysis, and publication of information collected under this generic clearance will vary by submission.

In accordance with the Presidential Memorandum on Transparency and Open Government⁶, information collected under this generic clearance will disclose information rapidly in forms that the public can readily find and use and in compliance with the data policies outlined on Data.Gov⁷.

Each project submitted under this generic clearance will specify the tabulation, timeline, and analysis of the information collection. The information collected is for Agency scientific purposes, thus a number of projects are likely to publish the results of analyzed data, in peer-reviewed scientific journals, white-papers, Agency reports, or Agency strategic research plans, which will be available for public consumption.

17. Display of OMB Control Number Expiration Date on Instruments

The agency plans to display the expiration date for OMB approval of the information collection on all instruments.

18. Certification Statement

⁵ <http://www.opm.gov/policy-data-oversight/pay-leave/pay-administration/fact-sheets/computing-hourly-rates-of-pay-using-the-2087-hour-divisor/>

⁶ FR Doc. E9-1777, Presidential Memorandum for the Heads of Executive Departments and Agencies 01/26/2009.

⁷ <https://www.data.gov/data-policy>

This information collection complies with all provisions of the Certification for Paperwork Reduction Act Submissions.