Generic Clearance for Participatory Science and Crowdsourcing Projects (Renewal)
OMB Control Number: 2080-0083

Supporting Statement – Part B: STATISTICAL METHODS
Data collection methods and procedures will vary; however, the primary purpose of these collections will be for qualitative and quantitative data collections 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.

1. **Universe and Respondent Selection**
Statistical methods will not be used in the selection of respondents. Participants in participatory science and crowdsourcing projects are self-selected. The method for soliciting participation will be described fully in each collection request, but participation may be advertised through targeted outreach and engagement methods like standard and social media outlets, collaborations with on-the-ground partners, public talks, and word-of-mouth.

The number of participants will vary by project submitted under this generic clearance. The variation in participation is likely due to multiple factors like personal interests, accessibility, perceived burden, outreach by the Agency, and success over time.
Results will not be used to directly inform Agency regulations or policies. Data also will not be generalized beyond the scope of the sample.

2. **Procedures for Collecting Information**
Data collection methods and procedures will vary and the specifics of these will be provided with each collection request. Each request under this generic collection will include details on the statistical methodology for stratification and sample selection (if applicable to the collection – this is not applicable to the selection of participants), estimation procedure, degree of accuracy needed for the research purpose described in the justification, unusual problems requiring specialized sampling procedures, and any use of periodic data collection cycles (less frequent than annual) to reduce burden.

3. **Methods to Maximize Response**
Participants will have complete control over their participation in participatory science or crowdsourcing projects. Participants will need to proactively seek out opportunities, respond to an email, or actively sign up for a project to participate. Outreach and advertising materials will provide information on how to participate but will not assume participation from anyone. Several existing participatory science and crowdsourcing projects employ engagement tactics to support continued participation, and reduce non-response including newsletters with appreciation, motivation and results delivered to participants, and optional bi-weekly reminders to observe. The collection requests under this generic clearance may utilize some of these techniques while acknowledging that participants have full control over whether to participate or not.

Each collection request under this generic clearance will specify methods to track and increase response rates. Some collection requests will provide opportunities for participants to submit negative data, for example, information on the time and effort to attempt to obtain an observation in the event of no observation.

4. **Testing of Procedures**

Pretesting may be done with internal staff or a limited number of external colleagues (less than 10). If the number of pretest respondents exceeds nine members of the public, the Agency will submit the pretest instruments for review under this generic clearance.

5. Contacts for Statistical Aspects and Data Collection

Projects submitted under this generic clearance can consult with statisticians in the development, design, conduct, and analysis of the data collection. Statistical expertise is available from agency statisticians or contractors and the Agency will include the names and contact information of persons consulted in the specific information collection requests submitted under this generic clearance as needed.

C. APPENDIX

EPA Statutory Authorities

- Crowdsourcing and Citizen Science Act, 15 U.S.C. § 3724 ("Citizen Science Act") authorizes federal science agencies to use crowdsourcing and citizen science to conduct projects designed to advance the mission of the respective federal science agencies.
- American Innovation and Competitiveness Act § 402 42 USC § 1861 authorizes Federal science agencies to "conduct projects designed to advance the mission of" the agency. It also authorizes an agency to work with outside organizations in these projects.
- Clean Air Act § 103, 42 U.S.C. § 7403, authorizes research into techniques for monitoring and controlling air pollution.
- Clean Water Act § 104, 33 U.S.C. § 1254, authorizes EPA to encourage, cooperate with and render technical services to individuals, including the general public, to promote the coordination and acceleration of demonstrations, studies and training relating to the causes, effects, prevention and elimination of water pollution.
- Solid Waste Disposal Act § 8001, 42 U.S.C. § 6981, authorizes EPA to encourage, cooperate with and render technical services to individuals as well as public and private sector entities to promote the coordination and acceleration of demonstrations, studies, training and public education programs relating to, among other things: adverse and welfare effects of the release of solid waste into the environment; operation and financing of solid waste management programs; planning and operation of resource recovery and conservation systems and hazardous waste management systems; production and marketing of recovered resources; reductions in the amount of solid and hazardous waste and unsalvageable waste materials; and, the development and application of improved methods of collecting and disposing of solid wastes to recover and market materials and energy from these wastes.
- Marine Protection, Research and Sanctuaries Act § 203, 33 U.S.C. § 1443, authorizes EPA to encourage, cooperate with, and render technical assistance to public and private sector entities, including individuals, to promote the coordination of demonstrations, studies and training to minimize dumping of materials into the ocean that may unreasonably degrade or endanger human health, welfare, or the marine environment and economic potential.
- Safe Drinking Water Act § 1442, 42 U.S.C. § 300j-1, authorizes the Administrator to conduct research, studies, and demonstrations relating to the causes, diagnosis, treatment, control, and prevention of risks to human health related to drinking water supply, and to share information and make recommendations based on this research and investigation.
- The National Environmental Education Act, § 4, 20 U.S.C. § 5503authorizes EPA to develop and support programs to increase environmental literacy.
- 107-118 Comprehensive Environmental Response, Compensation and Liability Act § 311, 42 U.S.C. § 9660, authorizes EPA to conduct research, and provide training and technical assistance to individuals

and organizations, to facilitate the inventory, assessment, preparation and remediation of brownfields sites, including associated community involvement.

Policy support

- EPA Vision and Principles for Participatory Science: https://www.epa.gov/participatory-science/epa-vision-participatory-science
- GAO Report GAO-17-507. Open Innovation: Executive Branch Developed Resources to Support Implementation, but Guidance Could Better Reflect Leading Practices. June 2017. This report identified key actions agencies and executive offices could do to encourage and expand the use of open innovation in government.
- EPA Office of Inspector General Report No. 18-P-0240. EPA Needs a Comprehensive Vision and Strategy for Citizen Science that Aligns with Its Strategic Objectives on Public Participation. September 5, 2018. This report evaluated whether EPA has developed controls to manage the use of citizen science results to meet the agency's mission.
- 2013 Second Open Government National Action Plan - encourages Federal Agencies to harness the ingenuity of the public by accelerating and scaling the use of open innovation methods such as citizen science and crowdsourcing: https://www.whitehouse.gov/sites/default/files/docs/us_national_action_plan_6p.pdf
- OMB Memo M-11-07. Facilitating Scientific Research by Streamlining the Paperwork Reduction Act Process. December 9, 2010. Citizen 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."
- OMB Memo M-10-06. Open Government Directive. December 8, 2009. Promotes open government and the use of new technologies.
- OMB Memo M-15-16. Multi-Agency Science and Technology Priorities for the FY 2017 Budget. July 9th, 2015. "Agencies are encouraged to use approaches to foster innovation such as Grand Challenges, incentive prizes, citizen science, and collaboration with members of the Maker Movement."

Lessons Learned from EPA's First and Second Generic ICR for citizen science (2016-present) Generic ICR #2080-0083

EPA used the generic ICR for participatory science to conduct twenty-four new projects. Some "lessons learned" are that well designed participatory science projects can 1) fill data gaps and provide another means of identifying potential environmental problems, 2) improve public understanding of environmental issues and actions that address them, 3) create a stronger, more inclusive and collaborative network of individuals and organizations dedicated to environmental problem solving, and 4) yield cost savings and efficiency in environmental monitoring and protection programs.

EPA benefitted from an Office of the Inspector General (OIG) self-initiated audit of EPA's participatory science conducted in 2017 and 2018. The final report was issued on September 5, 2018, titled "EPA Needs a Comprehensive Vision and Strategy for Citizen Science that Aligns with Its Strategic Objectives on Public Participation" (https://www.epa.gov/sites/production/files/2018-09/documents/_epaoig_20180905-18-p-0240.pdf). The report highlights as a noteworthy achievement the generic ICR to expedite the approval process for new citizen science projects.

Selected Projects Included Under the Generic ICR #2080-0083 (from 2016-present)

1. **Bloomwatch and CyanoScope**

a) **Date**: 2016 to present

b) **Location:** Primary geographic target was northeastern U.S. (EPA Regions 1 & 2), but there has been broad participation from across the country.

c) **Number of Participants:** Over 300 organizations have participated so far.

d) **Project Summary:** Bloomwatch and CyanoScope are two tiers of a three-tiered program to identify, monitor, and manage harmful cyanobacteria blooms. BloomWatch is the first tier of the program that utilizes a phone app, allowing the public to photo document the occurrence of a suspected bloom. These images are immediately uploaded to a crowdsourced public facing data dashboard while notifications of the event are sent simultaneously to preselected email lists as established by the user. This allows for individuals/organizations in charge of managing blooms to be notified immediately and appropriate action to be taken. Cyanoscope is the second program tier and follows on Bloomwatch by enabling the participant to collect bloom samples after taking images and using consistent methods for microscopically confirming cyanobacteria populations within the waterbody and identifying potentially toxic genera within the sample. This step helps verify that the bloomWatch images are indeed cyanobacteria in origin and provides notice that potentially toxin producing cyanobacteria are present.

e) **Types of Data Collected:** Image based documentation of harmful algal blooms, microscopic images of individual organisms, and fluorometric data

f) **How Results Were Disseminated or Used:** This program has trained hundreds of individuals over the past few years and has been the catalyst for many local startup monitoring and education programs. It continues to be well received and participation continues to expand. There is also a great need for aggregating data across state lines in order to gain regional perspectives. EPA is developing data visualization and exploration tools.

g) **Types of Future Information Collection:** Types of information that may be collected in the future include water quality data, biological information on the types of cyanobacteria present in specific waterbodies, cyanobacteria toxin data, and toxin accumulation in biota.

2. **Smoke Sense**

a) **Date:** 2017 - present

b) **Location:** Nationwide

c) **Number of Participants:** 90,000 (estimated)

d) **Project Summary:** The overarching objective of the Smoke Sense project is to develop and maintain an interactive platform for building knowledge in communities about wildfire smoke, health impacts and protective actions to reduce exposure that can improve health outcomes. Central to the Smoke Sense project is the smart phone application through which participants can explore current and forecasted daily air quality, maps of fire locations, satellite images of smoke plumes, and learn about ways to protect our health from smoke and poor air quality.

e) **Types of Data Collected:** Individual reports of smoke observations, behavioral actions taken to reduce exposure, and evaluation of risk communication messages.

f) **How Results Were Disseminated or Used:** Results from this project will be used to promote public science literacy, provide education or training to the public, produce novel data, augment existing data, advance ongoing scientific research, provide data or tools to the public, inform agency planning, support community efforts and encourage community engagement. To date, the project has resulted in five manuscripts which provide an unprecedented advance in knowledge of individual level engagement with the issue of air quality as a health risk. Data is also available in the smart phone application and on the data visualization site on https://www.epa.gov/air-research/smoke-sense-study-citizen-science-project-using-mobile-app

g) **Types of Future Information Collection:** Future collections will likely be the same as current.

3. **Smoke Ready Communities**

a. **Date:** 2021 - present

b. Location: Combination of virtual and physical locations: Butte-Silver Bow, Montana & Garfield County, Colorado

c. Number of Participants: approximately 60

d. **Project Summary:** This project is one way that EPA is working to protect public health during wildfire smoke events by improving smoke forecasting abilities, identifying and communicating when and where smoke events are occurring, building local capacity, and providing tools and resources for communities for health protection during smoke events. The purpose of this participatory research is to support local communities in developing a tailored strategy for how their community will respond to future wildfire smoke episodes and advance the state of the science on effective approaches to local collaborative planning processes that support community-defined outcomes related to local response and resilience to wildfire smoke episodes.

e. Types of Data Collected: Experience and perspectives on the impacts of extreme wildland fire smoke events on communities and how communities respond; perceptions on health risks associated with smoke exposure; and input on ideas for community-level responses.

f. **How Results Were Disseminated or Used:** Results will inform the broader conversation in the peer-reviewed literature on effective strategies for addressing complex social-environmental issues. Results will also inform EPA on how to approach community-led collaborative projects, and leverage insights for program and tool development and revision processes. Also, the county wildland fire smoke response plans will be used by local communities during future smoke events that require a public health response at the community level.

g. Types of Future Information Collection: Future collection will likely be similar.

4. **EPA Sanitary Survey App for Marine and Fresh Waters**

a) Date: 2021 - present

b) Location: Virtual

c) Number of Participants: 105

d) **Project Summary:** The EPA Sanitary Survey App for Marine and Fresh Waters allows users to gather sanitary survey data to identify sources of fecal contamination and potential harmful algal bloom (HAB) events affecting water quality. The App consists of surveys for both marine and fresh waters. The Sanitary Survey App can be used on any device in the field without the need for WiFi or Internet access. It includes photo storage, real time geolocation, links to websites such as the National Weather Service to access data, and free data storage.

e) Types of Data Collected: Sanitary survey data to identify sources of fecal contamination and potential HAB events affecting water quality.

f) **How Results Were Disseminated or Used:** Data collected could be used by states, territories, and tribes to understand sources of fecal contamination that are impacting a beach or waterbody. Data collected can also be used to develop predictive models for making same-day decisions on swimming advisories.

g) Types of Future Information Collection: Future collection will likely be similar.