

## SUPPORTING STATEMENT

**TITLE OF INFORMATION COLLECTION:** Generic Clearance for NASA Citizen Science and Crowdsourcing Projects – Landslide Reporter

**The OMB control number for this information collection is 2700-0168**

**TYPE OF INFORMATION COLLECTION:** New

### **A. JUSTIFICATION**

**1. Explain the circumstances that make the collection of information necessary.**

*Citizen science and crowdsourcing: Innovative research methods that engage the public*

There is an extensive need for openly available, comprehensive landslide inventories to improve our understanding of where and when landslides are occurring and model these processes at regional to global scales. Despite the need for landslide catalogs, routine mapping of landslides is time-consuming and resource-intensive. Unlike hurricanes or earthquakes that have global monitoring systems (e.g. Joint Typhoon Warning Center, <http://www.metoc.navy.mil/jtwc/jtwc.html>; World Meteorological Organization Tropical Cyclone Program, <https://severe.worldweather.wmo.int/>; Global Seismographic Network, <https://www.iris.edu/hq/programs/gsn>), or wildfires and floods that often can be globally mapped from space due to their size and characteristics, landslide activity is not monitored at the global scale. Landslides are frequently triggered by other natural hazards like earthquakes, floods, or hurricanes, making the reporting of individual landslides difficult and their effects often indistinguishable from the triggering hazard. Furthermore, landslides are usually small, widespread, and frequent, making it impossible with current technologies and funding to monitor and map landslides globally every day. A single storm can generate tens of thousands of landslides. Citizen science tools have the potential to engage the public to contribute landslides they encounter or that get reported in the media to improve our scientific understanding of this hazard and its impacts.

*NASA's mission to reach for new heights and reveal the unknown so that what we do and learn will benefit all humankind*

NASA uses the vantage point of space to understand our home planet and how it is changing. Models combining satellite precipitation, topography, land cover, and other factors have been developed to characterize landslide hazard dynamically; however, it is critical to evaluate the performance of these models. Further, open

landslide catalogs can inform awareness of landslide hazard hotspots around the world. Citizen science can support NASA's mission and purpose by providing new opportunities to explore our own home planet like never before, producing critical data that expands our knowledge of the universe, and advancing our ability to provide societal benefit through the synergy of satellite and ground based observations.

### *Benefits of research using citizen science and crowdsourcing approaches in NASA research*

The landslide citizen science initiatives can augment existing landslide research at NASA to build a more robust, publicly available global inventory. This data can be used to estimate the space and time patterns in landslide activity in ways not currently possible with existing data. It can also help to inform and validate landslide models seeking to consistently estimate potential landslide hazards. In addition to the science benefits, the citizen science project promotes greater openness in the scientific process by actively encouraging participation in various aspects of research and making the data fully available to the public.

### *Federal support for citizen science and crowdsourcing*

In the 2013 Second Open Government National Action Plan<sup>1</sup>, President Obama called on agencies to harness the ingenuity of the public by accelerating and scaling the use of open innovation methods such as citizen science and crowdsourcing. 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."<sup>2</sup>

### *Design principles for landslide citizen science project*

Citizen science project under this ICR include the following design principles:

1. Participants have a meaningful role in collecting landslide information, and can act as contributors, validators or collaborators on the work.
2. The project has a genuine scientific goal of advancing and improving global landslide catalogs for the benefit of all, including emergency responders, disaster specialists, researchers, and the general public.
3. Projects are low-burden for participants.
4. The project includes active management of data and data quality, including a data quality assurance and ongoing evaluation of data quality and data management.

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<sup>1</sup> [https://www.whitehouse.gov/sites/default/files/docs/us\\_national\\_action\\_plan\\_6p.pdf](https://www.whitehouse.gov/sites/default/files/docs/us_national_action_plan_6p.pdf)

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

5. The project is 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, e.g. how their data will be used and what the research findings are.
8. The project leads will evaluate scientific output, data quality, and the impact on participants.
9. The projects is designed to contribute to research and science, not to inform Agency regulations or policies.

**2. Indicate how, by whom, and for what purpose the information is to be used.**

The landslide citizen science project will allow the Agency to collect qualitative and quantitative data that might help inform scientific research on landslide sources, causes, distribution and impacts. It will inform new modeling methods regionally and globally and be used together with satellite data and products to expand and model understanding of landslide hazards and forecast potential impacts.

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. NASA may, by virtue of collaborating with non-federal entities, sponsor the collection of this type of information in connection with citizen science projects or challenges to increase involvement. Finally, personally identifiable information (PII) will only be collected when necessary and in accordance with applicable federal procedures and policies.

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, e.g. date, time, and location stamps automatically included with apps and digital photographs, etc.).

This citizen science project is classified as a data gathering project as defined under the generic clearance and is a stand-alone projects:

- **Data gathering projects.** The project includes 1) observation, characterization and documentation of landslides and impacts. Data will

be collected using structured data forms, surveys, submitting photographs or other media, surveys or questionnaires, or providing written observations. This data gathering project may include participants providing observations about a research subject's environmental surroundings, or classifications of imagery/data.

The citizen science project includes 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.** 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). Participants would be made aware that the publicly available data on contact information will be anonymized and aggregated.
- **Experience and Expertise.** For data quality purposes, this citizen science project may request information to evaluate the skill level of the participant by asking about their experience with the project topic.
- **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.)
- **Project Evaluation.** The citizen science project 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.
- **Training.** The citizen science project may need to train participants for the purpose of soliciting quality data and increasing participant benefits including education and engagement. This may include asking participants to read materials, watch training videos, or attend training sessions in-person or virtually via a webinar. Training materials are available at: <https://pmm.nasa.gov/landslides/report.html#howtoguides> .

3. **Describe whether, and to what extent, the collection of information involves**

**the use of information technology.**

In order to encourage participation and reduce burden on participants, this citizen science project will utilize information technology that is available to a number of potential participants (cell phones, personal computers, tablets, etc.). The project may collect information electronically through new and existing online collaboration tools, cell phone applications (apps) or SMS, web-based forms, web applications, online computer programs or forms, social media platforms, or sensors (personal, mobile, stationary or portable).

**4. Describe efforts to identify duplication.**

No similar data are gathered or maintained by the Agency or are available from other sources known to the Agency.

**5. If the collection of information impacts small businesses or other small entities, describe the methods used to minimize burden.**

The collection tools for citizen science activities will be presented in a way that is quick and simple for users to enter in data. All activities will be voluntary and thus respondents will not face any burden if the activity does not interest them.

**6. Describe the consequence to federal program or policy activities if the collection is not conducted or is conducted less frequently, as well as any technical or legal obstacles to reducing burden.**

If unable to collect information through this citizen science project, it would limit the ability to collect and provide open data on landslides. This project will also help to classify landslide occurrences and impacts after disasters, something fundamental to supporting disaster response and currently which does not exist in the current form. As a result, this project has the potential to significantly improve knowledge on landslides and engage more citizen scientists in the collection of data for scientific analysis and discovery in a way not possible with existing methods and data.

**7. Explain any special circumstances.**

NASA does not have any special circumstances that would cause an information collection to be conducted in any manners noted above. With regards to user privacy information, NASA protects the information's confidentiality to the extent required by law. Also, see the NASA SORNs at:  
<https://www.nasa.gov/content/nasa-privacy-act-system-of-records-notices-sorns>

- 8. Provide the date and page number of publication in the Federal Register for the 60-day and 30-day federal register notices required by 5 CFR 1320.8(d), soliciting comments on the information collection prior to submission to OMB.**

Not applicable. 60- and 30-day notices are not required for information collections submitted under the overall generic information collection request, 2700-0168.

- 9. Explain any decision to provide any payment or gift to respondents, other than remuneration of contractors or grantees.**

NASA currently does not provide any payment or gift to respondents for information collected, but there may be opportunities to provide unique compensation for participants through NASA's challenge activities.

- 10. Describe any assurance of confidentiality provided to respondents and the basis for the assurance in statute, regulation, or agency policy.**

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.

NASA's NVMS meets the privacy requirements listed in Federal Information Processing Standards. This includes the assignment of a senior agency official for privacy in accordance with NASA NPD 1382.17H, the completion of a comprehensive Privacy Impact Assessment, and a published document containing a listing of all information types collected. The Privacy Impact Assessment is reviewed periodically as a part of the risk management framework process for NVMS.

- 11. Provide additional justification for any questions of a sensitive nature.**

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

- 12. Provide estimates of the hour burden of the collection of information.**

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 success and evolution of the project to range from an annual burden of 61.50 to 105.50 hours based on the number of participants.

The total dollar value of the annual burden hours is based on the National Compensation Survey: Occupational Wages in the United States May 2017 published by the Bureau of Labor Standards Occupation and Wages, May 2017 ([http://www.bls.gov/oes/current/oes\\_nat.htm](http://www.bls.gov/oes/current/oes_nat.htm)). We use the value for All Occupations, average hourly wage of \$17.85 multiplied by 1.4 to account for benefits, \$25.00.

**Data gathering project:** We estimate 60 unique participants per year. The time it takes them to complete the one-time registration is 20 minutes, the one-time training approximately 33 minutes, and each observation 15 minutes. At a rate of 2.5 observations per participant per year, we estimate the range of annual burden for the collection of data gathering projects to be approximately 90.5 hours per year.

**Burden of information collection request table**

<b>Estimated Annual Reporting Burden</b>			
<b>Type of Collection</b>	<b>Number of Participants</b>	<b>Estimated Time per Participant</b>	<b>Total Annual Burden Hours</b>
<b>A. Data gathering projects</b>			
Participant registration, initial login & reading guidelines	60	20 minutes	20 hours
Participant training (estimate 80% of those who register will undergo training)	60	33 minutes	33 hours
Participants contributing observations (estimate all "trained")	60	Average of 2.5 observations per participant at 15 min per observation	37.5 hours
<b>Total burden hours</b>			<b>90.5 hours</b>
<b>Total maximum annual labor costs</b>		hourly rate including benefits: \$25.00	<b>\$2,262.50</b>

**13. Provide an estimate of the total annual cost burden to respondents or record**

**keepers resulting from the collection of information.**

There will not be fees associated with participation in the data collection. Participants will not be required to purchase any equipment to collect data. Therefore there should not be any cost burden associated with the citizen science project based on purchasing of low tech equipment, etc. Other than labor, there are no other estimated costs.

**14. Provide estimates of annualized cost to the federal government.**

The project leverages funding mechanisms already in place, therefore there would not be additional costs to the federal government based exclusively on these projects. Rather they would be funded through research, applications, and education funding sources. The anticipated cost to the Federal Government is approximately \$54,298 annually. These costs are comprised of: project administration and estimated contractor payments. NASA person-costs are estimated using an hourly rate for a GS-14 (Step 1) \$68.51 per hour 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 10% time given 2,087-hour divisor<sup>3</sup> for an employee’s annual rate of pay (\$142,984.54) and approximately \$40,000 in contractor costs per project. The estimated contractor costs is assumed to be approximately 30% of time for one mid-level contractor to conduct site

administration, user engagement, maintenance, etc. The estimate is for a mid-level support scientist contractor with a fully loaded rate of \$133,333 per year, which is commensurate with many of the NASA support contracts.<sup>4</sup>

Task	Rate of pay/hour	Percent of time	Total hours	Total
<b>NASA Civil Servant</b>	\$ 68.51	10%	208.70	\$ 14,298
<b>Support scientist contractor</b>	\$63.89	30%	626.1	\$ 40,000
<b>Total for 1 project/year</b>				\$ 54,298

**15. Explain the reason for any program changes or adjustments.**

<sup>3</sup> <http://www.opm.gov/policy-data-oversight/pay-leave/pay-administration/fact-sheets/computing-hourly-rates-of-pay-using-the-2087-hour-divisor/>

<sup>4</sup> Support contract rates are proprietary and competition sensitive for each contract; therefore, this represents an average estimate across several primary contracts that support NASA for a mid-support scientist rate.



This is a new information collection.

**16. For collections of information whose results will be published, outline plans for tabulation, and publication.**

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 Government<sup>5</sup>, 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.Gov<sup>6</sup>.

The information collected is for Agency scientific purposes, thus it is likely that the data from this project will be summarized and analyzed in peer-reviewed scientific journals, white-papers, Agency reports, or Agency strategic research plans, which will be available for public consumption.

**17. If seeking approval to not display the expiration date for OMB approval of the information collection, explain the reasons that display would be inappropriate.**

Not applicable. NASA will display the expiration date within the required PRA Statement.

**18. Explain each exception to the "Certification For Paperwork Reduction Act Submissions," per OMB Form 83-I as listed below.**

*The NASA office conducting or sponsoring this information collection certifies compliance with all provisions listed above.*

Name: \_Dalia Kirschbaum

Title: \_\_Research Scientist

Email address or Phone number: dalia.kirschbaum@nasa.gov

Date: \_8/3/2018\_\_\_\_\_

*(Certifying individual must be a civil service employee)*

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<sup>5</sup> FR Doc. E9-1777, Presidential Memorandum for the Heads of Executive Departments and Agencies 01/26/2009.

<sup>6</sup> <https://www.data.gov/data-policy>

## APPENDIX

### Policy support

- 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](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.
- H.R.1806 - America COMPETES Reauthorization Act of 2015 — 114th Congress (2015-2016) <https://www.congress.gov/bill/114th-congress/house-bill/1806>
- 15 U.S. Code § 3724 - Crowdsourcing and citizen science: It is the sense of Congress that—
  - (1) the authority granted to Federal agencies under the America COMPETES Reauthorization Act of 2010 ([Public Law 111–358](#); [124 Stat. 3982](#)) to pursue the use of incentive prizes and challenges has yielded numerous benefits;
  - (2) [crowdsourcing](#) and [citizen science](#) projects have a number of additional unique benefits, including accelerating scientific research, increasing cost effectiveness to maximize the return on taxpayer dollars, addressing societal needs, providing hands-on learning in STEM, and connecting members of the public directly to Federal science agency missions and to each other; and
  - (3) granting Federal science agencies the direct, explicit authority to use [crowdsourcing](#) and [citizen science](#) will encourage its appropriate use to advance Federal science agency missions and stimulate and facilitate broader public participation in the innovation process, yielding numerous benefits to the Federal Government and citizens who participate in such projects.