Request for Approval under the "Generic Clearance for Citizen Science and Crowdsourcing Projects" (OMB Control Number: 2080-0083)

TITLE OF INFORMATION COLLECTION: Using Citizen Science to Analyze Underwater Video in the Great Lakes (Deep Lake Explorer)

PURPOSE:

This is a continuation of the Deep Lake Explorer effort that was started in 2017.

As part of the National Coastal Condition Assessment, over 1000 underwater videos were collected as ancillary information in understanding the benthic community in the Great Lakes. The distribution of invasive species (e.g. round goby, dreissenid mussels) and benthic habitat features in the Great Lakes nearshore zone are knowledge gaps. The goal of this project is to evaluate a web-based citizen science approach to analyzing underwater videos. A citizen science approach to underwater video analysis is cost-effective and allows for individual videos to be analyzed by multiple viewers. Multiple analysts increase the precision of the analysis and reduces bias. The underwater video footage interpretation is a growing field but is expensive if only done by trained professional analysts. Citizen scientists will be trained and tested for accuracy using a subset of high quality videos. The relative precision, accuracy and cost-effectiveness of the citizen science approach will be compared to expert video interpretations.

NEED AND AUTHORITY FOR COLLECTION:

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

USES OF RESULTING DATA:

This project aims to develop underwater video-based indicators that can be used to estimate ecological conditions of the Great Lakes nearshore.

The information will be used to increase our understanding of habitat characteristics and invasive species in the Great Lakes nearshore, as well as address the following questions:

- Can a citizen science approach to underwater video analysis meet the information needs of resource managers?
- How does the data produced by citizen scientists compare to the data produced by experts in terms of precision, accuracy, and relevancy to management needs? What effects if any does video quality and attribute selection have when comparing analysis of experts and citizen scientists?

These results will guide underwater video indicator development and will be integrated into the OW's National Coastal Condition Assessment (NCCA), which aims to fulfill the Clean Water Act assessment and anti-degradation provisions to provide estimates of ecological condition. Results will also support Great Lakes National Program Office (GLNPO) priorities identified under the Great Lakes Water Quality Agreement (GLWQA). The GLWQA Lakewide Management Annex and Great Lakes Nearshore Framework (https://binational.net/2016/09/27/nearshore-eaux-littorales-2/) include commitments for

assessing nearshore health and identifying and communicating cumulative impacts and stresses to the Great Lakes' nearshore environment. These activities are non-regulatory.

The primary audience of the data once interpreted are resource managers in the Great Lakes. It is also intended to inform the public of work that is being conducted in the Great Lakes and provide a view into what the world looks like under the water. Zooniverse is available to the public and has an international presence. It currently has over 1.5 million registered users, see https://www.zooniverse.org/projects/USEPA/deep-lake-explorer

DATA COLLECTION METHODS:

Multiple analysts increase the precision of the analysis and reduces bias.

PARTICIPANT UNIVERSE:

Category of Respondent	No. of Respondents	Number of responses per respondent	Participation Time per response	Burden Hours
	5500	200	0.07 hours	77,000 burden hours
Totals	5500	200	0.07 hours	77,000 burden hours

Estimated number of respondents and responses per respondent is based on similar existing projects on the Zooniverse platform which have had 3000 – 8000 respondents, and over 1,000,000 responses. Estimated time to respond per video is 4 minutes.

AGENCY COST: The estimated annual cost to the Federal government is The estimated annual cost to the Federal government is $50,588.

15 hours per week (ORISE fellow) x $31.25 hourly rate = $24,375 annual

10 hours per week (EPA Fed) x $50.41 hourly rate = $26,213 annual

STATISTICAL ANALYSIS:

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DATA QUALITY ASSESSMENT PROCEDURES:

Data quality assessment procedures are summarized in the quality assurance project plan for the project, titled "Quality Assurance Project Plan - Using Citizen Science to Analyze Underwater Video in the Great Lakes" (September, 2017).

ADMINISTRATION OF THE INSTRUMENT: (Check all that apply)

[X] Web-based or Social Media   [ ] Mail

[ ] Telephone   [ ] Other, Explain

[ ] In-person

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