

Supporting Statement A

iCoast—Did the Coast Change

OMB Control Number 1028-NEW

Terms of Clearance: None

Justification

- 1. Explain the circumstances that make the collection of information necessary. Identify any legal or administrative requirements that necessitate the collection.**

The U.S. Geological Survey (USGS) conducts sustained investigations of coastal hazards associated with major hurricanes that make landfall in the US. USGS hurricane research and response activities include collection of storm-surge water levels, aerial photography, and laser altimetry (lidar) surveys of pre- and post- storm beach conditions. These efforts document the nature, magnitude, and variability of coastal changes such as beach erosion, overwash deposition, island breaching, and destruction of infrastructure. Predictive models and assessments of severe storm impacts are developed and evaluated, and probabilistic assessments are distributed to the public, local, State, and Federal agencies. The assessments and observations provide information needed to understand, prepare for, and respond to coastal disasters. These ongoing analyses are authorized by 42 U.S.C 5201 et seq. The Disaster Relief Act of 1974, Section 202(a).¹

In support of this research, the USGS has been acquiring oblique aerial photographs of the coast before and after each major storm since 1995 and has amassed a database of over 140,000 photographs of the Gulf and Atlantic Coasts. Computers cannot yet automatically analyze these photographs because classifying this imagery requires understanding the diversity of forms that even this small set of primary features (shore, beach, dune, marsh, built environment) can represent. Human intelligence is needed, and USGS does not have the personnel or the capacity for this. These oblique aerial images are currently used for broad overviews of damage, and selected photo pairs have been shared on the Internet with the public after storms. The intense public interest in accessing the limited number of pre-and post-storm photographic pairs the USGS is currently able to share, and the increasing development of citizen science and crowdsourcing projects by Federal Government agencies suggests that a significant segment of the public might volunteer to serve as our “eyes on the coast.” The iCoast—Did the Coast Change? website (hereafter referred to as iCoast) will

¹ The Disaster Relief Act states that "The President shall insure that all appropriate Federal agencies are prepared to issue warnings of disasters to State and local officials." In addition, Section 202(b) states that "The President shall direct appropriate Federal agencies to provide technical assistance to State and local governments to insure that timely and effective disaster warning is provided."

mount the entire suite of pre- and –post-storm photographs from each major storm, and observers will compare photographs and classify the changes they see with predefined tags, or by appending free-text descriptions. Citizen scientists will identify coastal landforms, determine the storm impacts to the built infrastructure and to coastal landforms, and indicate other changes, including response and recovery efforts. USGS scientists will use the crowdsourced data from iCoast to ground truth and fine-tune their models of coastal erosion. These mathematical models predict the likely interaction between coastal features such as beaches and dunes, and storm surge. The models are based on pre-storm dune height, measured by lidar, and predicted wave behavior based on data from the National Oceanic and Atmospheric Administration (NOAA). The models are not currently based on ground truth observations, but a body of citizen observations will be combined with the models for more accurate predictions of vulnerability which can be shared with the public and with other government agencies. The iCoast project will also result in greater citizen awareness of the probabilities for coastal change, and will be a resource for teachers and students pursuing science, technology, engineering and math (STEM).

Other laws that support the use of citizen science observations for coastal change are:

- 15 U.S.C. 2901, 2908 The National Climate Program Act of 1978 which established a national climate program to assist the Nation and the world to understand and respond to natural and man induced climate processes and their implications.
- P.L. 101606 The Global Change Research Act of 1990 established the United States Global Change Research Program aimed at understanding and responding to global change, including the cumulative effects of human activities and natural processes on the environment, to promote discussions toward international protocols in global change research, and for other purposes.
- 43 U.S.C. 1701 et seq.; 43 U.S.C. 1737 The Federal Land Policy and Management Act of 1976 (FLPMA), authorizing the Secretary of the Interior to conduct investigations, studies, and experiments involving the management, protection, development, acquisition, and conveying of public lands; and to prepare and maintain inventories of all public land and resources.
- 46 U.S.C. 31(a) and (b) The Coastal Zone Management Act of 1976 providing that each department, agency, and instrumentality of the Executive Branch of the Federal Government may assist the Secretary (of Commerce), on a reimbursable basis or otherwise, in carrying out research and technical assistance for coastal zone management.
- 16 U.S.C. 3501 et seq. Coastal Barrier Resources Act of 1982 designating various underdeveloped coastal barrier islands, depicted by specific maps, for inclusion in the Coastal Barrier Resources System.
- 16 U.S.C. 661 et seq. Fish and Wildlife Coordination Act of March 10, 1934, (P. L. 79732) authorizing the Secretary of the Interior to prepare plans to protect wildlife resources, to conduct surveys on public lands, and providing recommendations to minimize impacts on fish and wildlife resources
- 16 U.S.C. 742(a)742d,742e742j)2 Fish and Wildlife Act of 1956 authorizing the Secretary of the Interior to conduct investigations, prepare and disseminate information, and make periodic reports to the public regarding the availability and abundance and the biological requirements of fish and wildlife resources; existing facilities, and other

means

- 2. Indicate how, by whom, and for what purpose the information is to be used. Except for a new collection, indicate the actual use the agency has made of the information received from the current collection. Be specific. If this collection is a form or a questionnaire, every question needs to be justified.**

iCoast represents an existing information collection without OMB approval. We tested iCoast with a small sample of internal USGS users—both coastal experts and non-experts—and fewer than 10 persons outside the USGS who represented our target group. The test was based on aerial photographs taken before and after Hurricane Sandy (2012). The data generated by these testers were compared to the vulnerability predictions of the mathematical model in several geographic areas. The testers' observations of changes in beach morphology and damage to infrastructure confirmed model predictions and provided rich human feedback to the model that will help refine predictions for future storms.

The USGS has designed iCoast to appeal to the following categories of users:

- Coastal scientists and marine science teachers and students (at all levels)—Coastal scientists and marine science students at the undergraduate and graduate levels, being familiar with processes of coastal erosion, will provide USGS with expert confirmation of model predictions; teachers and students at elementary and high schools will be introduced to beach landforms and processes.
- Coastal planners and managers—Coastal planners and managers enhance coastal access, promote stewardship, protect significant coastal places such as national, state, and local shoreline parks, revitalize working waterfronts, and oversee land use planning in coastal areas. This group is interested in short-term coastal vulnerabilities to extreme storms as well as long-term predictions of coastal change due to sea-level rise.
- Coastal residents—Since 1996, the USGS has been putting online aerial photographs of certain geographic areas before and after extreme storms. Coastal residents have shown great interest in these photographs. Frequently these residents have evacuated, and iCoast will provide an expanded resource for these residents to see the status of their property. We expect that this group of users will also gain a better understanding of their vulnerability to future storms.
- Watersport enthusiasts—this group of users can be considered coastal stewards interested in preserving the coast for recreational opportunities.
- Emergency responders—iCoast will be valuable before storms to potentially stage equipment and personnel in areas that are particularly vulnerable, and after storms to assess damages.
- Digital crisis volunteers—extreme storms and other disasters have attracted various communities of volunteers who use digital tools including social media and online maps to aid affected communities and emergency responders. Deployment of iCoast for future storms will provide a platform for these volunteer opportunities.
- Other Interested Public—judging by the success of the citizen science projects such as Galaxy Zoo (<http://www.galaxyzoo.org>) which has attracted many participants in a project to classify galaxies from the Sloan sky survey, the general public is quite

interested in participating in a citizen science project to classify images of phenomena even if they are not immediately present at the scene. We anticipate similar interest from the general public, particularly after large storms.

The tasks that the users of iCoast may perform are listed below and screen shots are shown in Appendix A:

- **Logging into iCoast** (Figure 1, p. 2) Users register for the application using externally issued credentials via the Federally approved “Open Identity Exchange” (www.openid.net) method. In this case, user credentials will be managed and authenticated by Google, an OpenID provider to the Federal Government. If they have previously registered, users will log in from this screen.
- **Registering for iCoast** (Figure 2, p. 3) First time users will complete their registration here. The iCoast software will compare the email address that is returned to the iCoast system by Google against the iCoast database of encrypted user email addresses. If the email is not found, the user is identified as a new user and the system will request the user’s time zone and crowd type.
- **Crowd Type** (Figure 3, p. 4) Users will choose from the crowd types shown in a drop down menu, or they can elect to enter another crowd type in a free-text box.
- **Welcome Page.** Seen by first-time users (Figure 4, page 5). Users begin tagging photos by pressing the button.
- **Welcome Back Page.** Seen by users who have registered but not yet tagged photos (Figure 5, page 6). Users who have previously registered but have not yet tagged photos can begin tagging photos.
- **Welcome Back Page.** Seen by registered users who have previously tagged photos. (Figure 6, p. 7). This page presents the user with a record of his or her previous tagging history in comparison to other users, based on the number of photos tagged. This data is drawn from the iCoast database which anonymously keeps track of each user’s activity. The purpose of showing the user this page is to inject an element of gamification into the application. The user can potentially derive satisfaction from having a place on a leaderboard with all other users, as though he or she were playing an online game. Users who wish to proceed directly to tagging photos can do so from this screen.
- **Profile and Tagging History** (Figure 7, p.8) A user curious about his or her tagging history can access it from the *Profile* button at the top of the screen. The profile can be changed, or the user can access his or her tagging history by pressing the button. The tagging history is shown in Figure 8, p. 9).
- **Help** (Figures 9-12, pp. 10-13). The user can access Frequently Asked Questions (FAQ) about the operations of the iCoast System or Coastal Aerial Photographs.
- **About** (Figure 13, p. 14). Using the *About* button at the top of the page, The user can access information about the purpose of iCoast, USGS aerial photographs, USGS predictive models of storm induced coastal change, benefits of iCoast, and the iCoast team at the USGS.
- **Choosing a project and post-storm photo to tag** (Figures 14-16, pp. 15-17) The user is shown a random photograph to tag. The location of this photograph is listed in the caption above the photograph. The user can tag that photograph OR select another random photograph OR pick a photograph from a map. Hovering a mouse over any of the choices will produce the help text shown. Currently the only iCoast project available for

tagging is based on photographs taken before and after Hurricane Sandy, but in the future, the photographs from each new storm will constitute a separate project. If the user elects to tag a photo from the map, he or she will be taken to the Map Navigator (figure 16, p. 17) where he or she may choose another photo.

- **Task 1: Match coastal aerial photos.** (Figure 17, p. 18). The user, having picked a photograph to tag, is shown a pre-storm photo generated by the computer. The matches are generated by an algorithm that uses geographic coordinates to determine the nearest pre-storm photograph to the photo the user has selected. These photos, however, may have been taken years apart and the flight altitude and distance of the plane from the shore may have differed between flights. Thus the pre-storm photo presented to the user by the computer may not be the best match for detecting change. The user can traverse the coast in either direction to find a better match, or he or she may accept the computer-generated match.
- **Task 2: Identify coastal landscape** (Figure 18, p. 19). This task has two parts. First the user identifies the type of coastline (barrier island, mainland, etc.) and then the level of human development. The user can hover his or her mouse over each term or tag to reveal a sample photograph of the landscape type (figure 19, p.20), and a textual description of the tag in the pop-up help box (pages 21 and 22 in the appendix).
- **Task 3: Determine impacts to coastal infrastructure** (Figure 20, p. 23). In this task, the user first identifies the type of infrastructure visible in the photographs, and then indicates which ones are damaged. Each tag selection has help images and texts associated with it (pages 24 and 25 in appendix).
- **Task 4: Specify changes to coastal landforms** (Figure 21, p. 26). In this task, the user classifies the photo with tags that relate to beach erosion, dune erosion, overwash of dunes by the storm, and inundation of barrier islands. Coastal scientists at the USGS have established a storm-impact scale that classifies storm damage into four regimes (see <http://coastal.er.usgs.gov/hurricanes/impact-scale/>):
 - Beach erosion (swash)—in which the water causes no net change to the dune system but may erode the beach,
 - Dune erosion (collision)—in which there is erosion of the dune face
 - Overwash—in which water flows over the dune, leaving sand deposits behind the dune, and
 - Inundation—which typically floods the entire barrier island.

The vulnerability model currently in use predicts which regime will dominate in a particular geographic area for a particular storm. Within each category shown in iCoast, Task 4, visual clues are given to aid the user in applying tags. For example, dark sand on the beach may be indicative of beach erosion while sand on the roads might indicate overwash. These visual clues have been developed through the long-term research of coastal scientists at the USGS. Users are also asked to identify the dominant coastal process from those regimes in the post-storm photo. Again, users are given photographs (figure 22) and text to help them make a decision (pages 28-30).

- **Task 5: Identify Other Changes** (Figure 23, p. 31). Users are asked to identify other post-storm changes and are given a free-text box for additional observations. Help text

for task 5 is shown on page 32 of the appendix.

- **Annotation Complete** (Figure 23, p. 33). On completion of tagging of a photograph, the user is presented with the number of photos tagged, his or her position on the leaderboard, the number of photos the user needs to tag to gain the top position on the leaderboard, the number of tags, the time spent tagging, and the location of the photograph. The user can log out or begin tagging another photograph.

The information sought in iCoast will be non-proprietary and contain no personally identifiable information as defined under the Privacy Act of 1974.

3. Describe whether, and to what extent, the collection of information involves the use of automated, electronic, mechanical, or other technological collection techniques or other forms of information technology, e.g., permitting electronic submission of responses, and the basis for the decision for adopting this means of collection. Also describe any consideration of using information technology to reduce burden and specifically how this collection meets GPEA requirements.

This information collection is conducted entirely on the Internet on a website hosted by USGS. It involves automated interactive mapping and visualizations that would be impossible to duplicate with paper technology. This collection is entirely voluntary and meets GPEA requirements.

4. Describe efforts to identify duplication. Show specifically why any similar information already available cannot be used or modified for use for the purposes described in Item 2 above.

USGS identified and evaluated several online citizen science projects in which volunteers were asked to analyze imagery after disasters. These projects were deployed by a Federal agency, a commercial firm, and a non-profit organization.

- The Civil Air Patrol (CAP), a volunteer arm of the Air Force, photographs areas affected by disasters. These photos are shared with the Federal Emergency Management Agency (FEMA). After Hurricane Sandy (2012) 35,000 of these photographs were put online using the MapMill system (<http://www.mapmill.org>) and evaluated by more than 6,000 citizen volunteers. These photographs were used for damage assessment and to target areas where resources were needed².
- The commercial satellite firm, Digital Globe, runs the Tomnod application (<http://www.tomnod.com>), an online system where volunteers are invited to tag satellite images. Tomnod was used after the Moore, Oklahoma tornado (2013), the Super Typhoon Haiyan (2013) and during recent flooding on the Gulf Coast.
- The Grassroots Mapping project (<http://grassrootsmapping.org>) was conceived by Jeffrey Warren. The website shares information about how to construct low-cost aerial imaging systems from cameras tethered to balloons and has a platform that can be used to

² (http://capvolunteernow.com/highprofile_missions/hurricanes/2012__hurricane_sandy/sandynews/?information_paper_on_cap_response_to_hurricane_sandy&show=news&newsID=16214)

stitch these photographs together. Various community groups have used these technologies to photograph disasters such as the Deepwater Horizon oil spill (2010).

Each of these projects was deemed insufficient for use by the USGS in constructing a system for volunteers to classify coastal damage from storms. The CAP images, while also taken from an oblique angle, covered a much larger area than the USGS photographs, and had an extremely simplified set of possible tags for the user to pick (little-to-no damage/medium damage/heavy damage.) Also since the CAP flights went quite far inland, their photos did not contain enough detail on specific damage to the immediate coastal dune and beach systems to be of use to the USGS. The Tomnod application is proprietary, and primarily uses satellite imagery. The imagery is not as detailed as aerial photographs taken by the USGS, and the vantage point of the Digital Globe images is from directly overhead, making them less useful for detecting the type of elevation changes that can be seen in the USGS oblique aerial photographs. The volunteer methods described by the Grassroots Mapping project would not scale to cover the geographic extent of a large storm, and would likely not be timely.

The information to be derived from iCoast is unobtainable elsewhere. USGS has a scientifically valuable archive of photographs stretching back almost 20 years. Analysis of these photographs by interested volunteers will increase the value of the data. Many of the storms recorded in this archive have occurred over the same terrains making comparative historical studies possible. This will lead to a long-term record of coastal response of the Gulf and Atlantic Coasts to extreme storms. The three applications mentioned above are aimed at situational awareness for first responders and other emergency personnel after storms and not at informing scientific predictions of coastal response in future storms. In addition, iCoast is designed to be reusable for future storms, which is not necessarily the case with any of the above systems.

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

There is no impact to small business or other small entities.

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.

Failure to collect this information will result in:

- Reduced ability to understand the impacts of severe storms and changing climate on coastal resources of concern;
- Reduced ability to share predictions and vulnerabilities with other Federal agencies and with the public;
- Reduced ability for coastal planners and managers from all levels of government to strategically allocate resources to areas of highest need. This would leave the Secretary of the Interior with reduced ability to fulfill his or her legal obligations under the acts mentioned in section 2.

7. **Explain any special circumstances that would cause an information collection to be conducted in a manner:**
- * **requiring respondents to report information to the agency more often than quarterly;**
 - * **requiring respondents to prepare a written response to a collection of information in fewer than 30 days after receipt of it;**
 - * **requiring respondents to submit more than an original and two copies of any document;**
 - * **requiring respondents to retain records, other than health, medical, government contract, grant-in-aid, or tax records, for more than three years;**
 - * **in connection with a statistical survey that is not designed to produce valid and reliable results that can be generalized to the universe of study;**
 - * **requiring the use of a statistical data classification that has not been reviewed and approved by OMB;**
 - * **that includes a pledge of confidentiality that is not supported by authority established in statute or regulation, that is not supported by disclosure and data security policies that are consistent with the pledge, or which unnecessarily impedes sharing of data with other agencies for compatible confidential use; or**
 - * **requiring respondents to submit proprietary trade secrets, or other confidential information, unless the agency can demonstrate that it has instituted procedures to protect the information's confidentiality to the extent permitted by law.**

There are no special circumstances associated with the proposed collection activity that would require it to be conducted in any of the manners described.

8. **If applicable, provide a copy and identify the date and page number of publication in the Federal Register of the agency's notice, required by 5 CFR 1320.8(d), soliciting comments on the information collection prior to submission to OMB. Summarize public comments received in response to that notice and in response to the PRA statement associated with the collection over the past three years, and describe actions taken by the agency in response to these comments. Specifically address comments received on cost and hour burden.**

On February 28, 2014, a 60-day Federal Register notice (79 FR 11461) was published announcing that USGS would submit this information collection to OMB for approval. Public comments were solicited for 60 days ending April 22, 2014. No comments were received from this Federal Register notice.

Describe efforts to consult with persons outside the agency to obtain their views on the availability of data, frequency of collection, the clarity of instructions and recordkeeping, disclosure, or reporting format (if any), and on the data elements to be recorded, disclosed, or reported.

We consulted with the individuals listed in the table to obtain their views on the information above. Several changes to the format and design of the application were suggested during the testing period and these have been incorporated.

Name	Occupation	Email
Dr. Nicholas R. Magliocca	The National Socio-Environmental Synthesis Center	nmagliocca@sesync.org
John Jones	Coastal resident, photographer	John@JonesInPhoto.com
Aubrey Goodman	Web technology developer	aubrey.goodman@gmail.com

Table 1. Individuals (non-USGS) consulted in the construction of the iCoast website.

Consultation with representatives of those from whom information is to be obtained or those who must compile records should occur at least once every three years — even if the collection of information activity is the same as in prior periods. There may be circumstances that may preclude consultation in a specific situation. These circumstances should be explained.

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

There will be no payment offered to respondents.

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

No assurance of confidentiality is given to respondents as no information of a confidential nature is solicited.

- 11. Provide additional justification for any questions of a sensitive nature, such as sexual behavior and attitudes, religious beliefs, and other matters that are commonly considered private. This justification should include the reasons why the agency considers the questions necessary, the specific uses to be made of the information, the explanation to be given to persons from whom the information is requested, and any steps to be taken to obtain their consent.**

The collection does not include sensitive or private questions.

- 12. Provide estimates of the hour burden of the collection of information. The statement should:**

- * Indicate the number of respondents, frequency of response, annual hour burden, and an explanation of how the burden was estimated. Unless directed to do so, agencies should not conduct special surveys to obtain information on which to base hour burden estimates. Consultation with a sample (fewer than 10) of potential respondents is desirable. If the hour burden on respondents is expected to vary widely because of differences in activity, size, or complexity, show the range of estimated hour burden, and explain the reasons for the variance. Generally,**

estimates should not include burden hours for customary and usual business practices.

- * If this request for approval covers more than one form, provide separate hour burden estimates for each form and aggregate the hour burdens.**
- * Provide estimates of annualized cost to respondents for the hour burdens for collections of information, identifying and using appropriate wage rate categories. The cost of contracting out or paying outside parties for information collection activities should not be included here.**

We estimate that the total dollar value of annual burden hours to the public is \$39,913. The source for the hourly rate for all civilian employees is drawn from the Bureau of Labor Statistics Employer Costs for Employee Compensation as referenced in footnote 3.

We examined the records of Internet visits to the USGS hurricane web pages after past storms. Judging by these records, we estimate that approximately 2500 visitors would classify photographs each year. We also tested the application with fewer than 10 volunteers from the general public and we estimate that each visitor will spend 30 minutes on the site and complete the classification of three sets of before and after photos. This time includes registration and reading the introductory and explanatory material. From the results of our user testing, we estimate that each volunteer will spend approximately 30 minutes on the site, and complete the classification of three sets of before and after photos. This time includes registration and reading the introductory and explanatory material (see Table 2). These figures may increase greatly in years when severe storms (category 4 or 5) covering wide geographic areas make landfall. The potential increase in visitors is impossible to predict at this point.

Annual number of respondents (public)	Number of pairs classified per session	Total number of pairs classified	Average time per session (in minutes)	Total annual burden hours	Dollar value of burden hours (includes benefits)	Total dollar value of annual burden hours
2500	3	7500	30	1250	\$31.93 ³	\$39,913

Table 2. Estimated non-Federal dollar value of annual burden hours

13. Provide an estimate of the total annual non-hour cost burden to respondents or recordkeepers resulting from the collection of information. (Do not include the cost of any hour burden already reflected in item 12.)

- * **The cost estimate should be split into two components: (a) a total capital and start-up cost component (annualized over its expected useful life) and (b) a total operation and maintenance and purchase of services component. The estimates should take into account costs associated with generating, maintaining, and disclosing or providing the information (including filing fees paid for form processing). Include descriptions of methods used to estimate major cost factors including system and technology acquisition, expected useful life of capital equipment, the discount rate(s), and the time period over which costs will be incurred. Capital and start-up costs include, among other items, preparations for collecting information such as purchasing computers and software; monitoring, sampling, drilling and testing equipment; and record storage facilities.**
- * **If cost estimates are expected to vary widely, agencies should present ranges of cost burdens and explain the reasons for the variance. The cost of purchasing or contracting out information collection services should be a part of this cost burden estimate. In developing cost burden estimates, agencies may consult with a sample of respondents (fewer than 10), utilize the 60-day pre-OMB submission public comment process and use existing economic or regulatory impact analysis associated with the rulemaking containing the information collection, as appropriate.**
- * **Generally, estimates should not include purchases of equipment or services, or portions thereof, made: (1) prior to October 1, 1995, (2) to achieve regulatory compliance with requirements not associated with the information collection, (3) for reasons other than to provide information or keep records for the government, or (4) as part of customary and usual business or private practices.**

There is no non-hour cost burden to respondents resulting from this collection. There are no fees associated with the application process, or with collection requirements or methods.

³ Derived from total average cost to employer of civilian workers for March 2014 as reported by the Bureau of Labor Statistics, June 11, 2014 (USDL-14-1075)

14. Provide estimates of annualized cost to the Federal government. Also, provide a description of the method used to estimate cost, which should include quantification of hours, operational expenses (such as equipment, overhead, printing, and support staff), and any other expense that would not have been incurred without this collection of information.

The estimates of annualized costs to the Federal government are shown in Tables 3 and 4. These costs have been separated into actual start-up costs, incurred in FY 2013 and FY 2014, and predicted annual costs thereafter. The start-up costs for Federal salaries and operational costs are \$75,360. The estimated annual costs for the following years are \$27,744. The sources for our figures are given in footnote 4. Due to the episodic nature of severe storms, and the unknown extent of citizen interest in the iCoast application, it is impossible to estimate with precision the estimated costs for subsequent years. The USGS intend intends to operate the iCoast site indefinitely.

Employee	Grade/ Step	Hours Worked	Hourly Rate +50% Overhead⁴	Personnel Costs	Operational Costs	Personnel + Operational
Computer Programmer	Student services contract	821	\$14.42	\$11,838		
Research Geographer	GS 12/3	1044	\$31.11	\$48,719		
Geologist	GS 11/5	40	\$27.58	\$1,655		
Research Geographer	GS 14/5	160	\$46.45	\$11,148		
Total				\$73,360	\$2,000	\$75,360

Table 3: Year 1 Start-up Costs—Inception to Launch

⁴ Hourly rates in Tables 3 and 4 drawn from Salary Table 2014-GS; Operational costs drawn from rates at individual USGS science centers supporting this application.

Employee	Grade/ Step	Hours Worked	Hourly Rate	Hourly Rate + 50% Overhead	Operational Costs	Personnel + Operational
Computer Programmer	Student services contract	288	\$14.42	\$4,153		
Geologist	GS 11/5	192	\$27.58	\$7,943		
Research Geographer	GS 14/5	160	\$46.45	\$11,148		
Total				\$23,244	\$4,500	\$27,744

Table 4: Annual Costs—Years 2-?

15. Explain the reasons for any program changes or adjustments in hour or cost burden.

This is a new application and a new collection.

16. For collections of information whose results will be published, outline plans for tabulation and publication. Address any complex analytical techniques that will be used. Provide the time schedule for the entire project, including beginning and ending dates of the collection of information, completion of report, publication dates, and other actions.

All raw, and limited summative, data are available upon demand and are presented in an electronic format on the project web site. Summary reports are published in scientific journals or other USGS outlets (e.g., open-file reports); published reports are compliant with USGS Fundamental Science Practice; reports are produced at periodic intervals, dependent on storm activity. Presentations are made at scientific conferences as appropriate.

Time schedule: The iCoast system has been constructed and tested. It is open for use by the public as of June 1, 2014, the beginning of the 2014 hurricane season. The iCoast application will continue indefinitely so long as it is supported by the USGS Coastal and Marine Geology Program.

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 for this request.

18. Explain each exception to the topics of the certification statement identified in "Certification for Paperwork Reduction Act Submissions."

There are no exceptions to the certification statement.