Memorandum

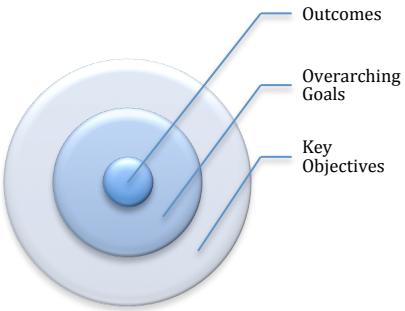
To: **Client:** Doug Helton, NOAA, Office of Response and Restoration
Faculty Mentor: Beth Bryant, UW School of Marine and Environmental Affairs
EM Program Coordinator: Anne DeMelle, UW Program on the Environment
From: **Citizen Science Management (CSM) Team**
(Sam Haapaniemi, Myong Hwan Kim, and Roberto Treviño)
Date: October 20, 2014
Re: **Project Management Plan: Citizen Science and Emergency Response Project**

I. Purpose

This memo provides the project management plan for the Citizen Science and Emergency Response Project which serves as a preliminary internal working and management tool. It first describes the strategic framework that will guide and inform Citizen Science Management (CSM) efforts to improve the emergency response of the National Oceanic and Atmospheric Administration (NOAA). It then provides the plan of action to operationalize the strategic framework by outlining the organization, management schemes, and roles and responsibilities. Major milestones and deadlines are also provided so that important aspects of the project are properly addressed. Finally, initial lists of key contacts and resources are included.

II. Project Strategic Framework: Outcomes, Goals and Objectives

NOAA's Office of Response and Restoration (OR&R) is interested in investigating and analyzing emerging technologies and practices that may have potential to help with future response efforts. Therefore, for the purposes of this project, **CSM Team will focus on how citizen science can be used to improve emergency response efforts and management**. Citizen science potentially may be useful to OR&R, but only so far as the responders are prepared to receive and meaningfully incorporate the data and information. By better understanding the strengths and weaknesses as well as best practices of citizen science, OR&R will be able to improve its activities and turn public support into a manageable asset.



CSM Team believes the integration of citizen science will lead to the following **outcomes**: (1) Improving NOAA's ability to fulfill its coordination, communication, and consultation roles, and (2) ensuring emergency response is better informed by scientific knowledge.

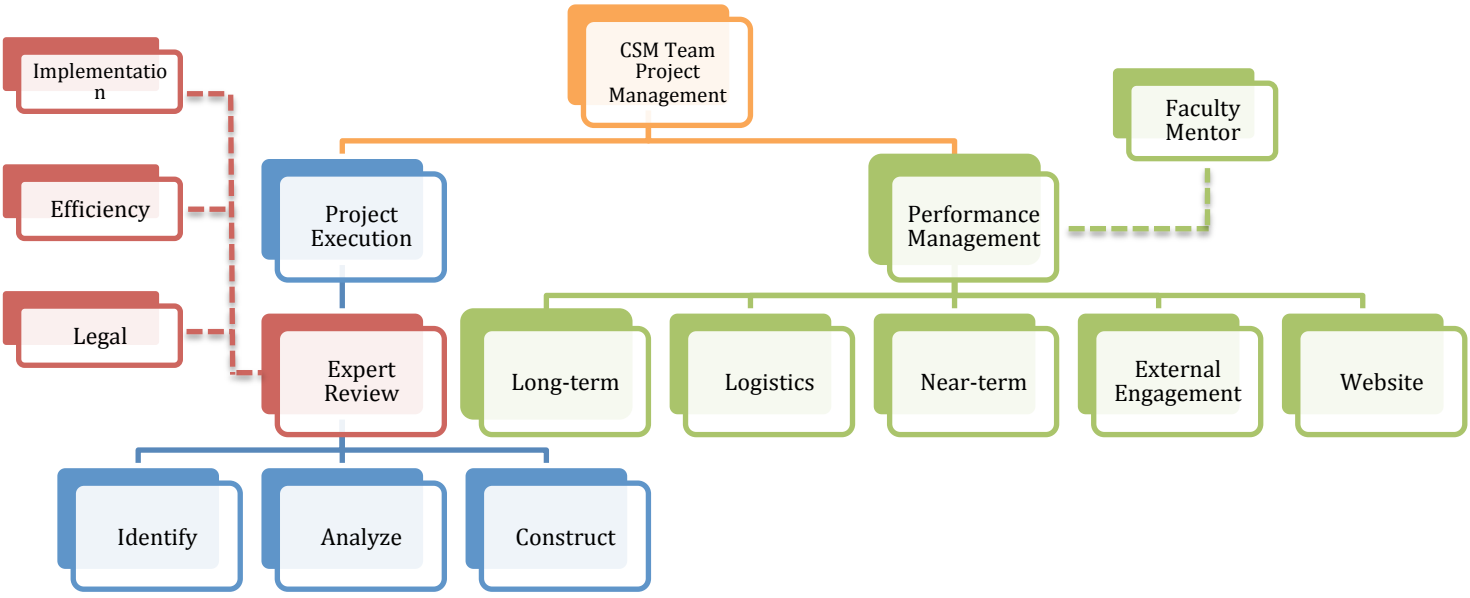
To achieve these outcomes, the following goals and objectives have been set to guide efforts.

- The **overarching goals** of this project are to: (1) identify and prioritize OR&R activities that could benefit from citizen science, bearing in mind recent developments in crowdsourcing, and (2) provide recommendations on effective citizen science management.
- These goals can be broken up into three **key objectives**: (1) to provide the most current and relevant information on citizen science from the perspective of all involved parties, (2) to compare and contrast different models of citizen science, including but not limited to observations, data collection, and interpretation, and (3) to identify gaps in NOAA's response capacity that could best be filled through the use of citizen science.

III. Plan of Action

The following plan of action outlines the organization, management schemes, and roles and responsibilities for the Citizen Science and Emergency Response Project.

1. Project Organization Overview

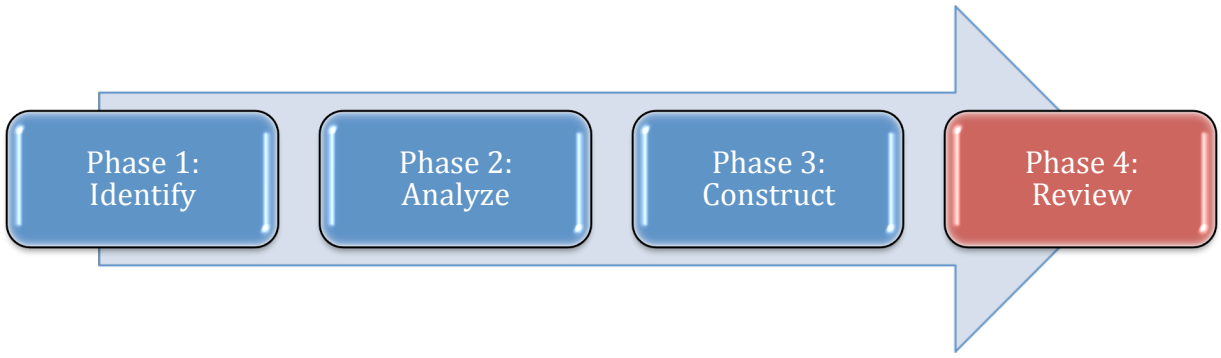


CSM Team has organized efforts, activities, roles and responsibilities under the two management schemes: **project execution** and **performance management.** Integrated use of these management schemes will ensure the right mix of technical input and organizational oversight in operationalizing the strategic framework.

Under the **project execution** scheme, the research and analysis underpinnings for the project are organized and balanced with the legal, efficiency, and implementation tradeoffs in determining the feasibility of the final recommendations. The **Performance management** scheme involves the planning, leading, staffing, and organizing of project tasks to facilitate progression through the project.

2. Project Execution Scheme

Project execution will proceed in **four phases**: identify, analyze, construct, and review. Progression through the four phases of project execution will allow for a coordinated and organized approach, ensuring the findings and recommendations are well researched, critically analyzed, and feasible from a variety of perspectives. The diagram and table below provide the overview of this scheme, followed by details of each phase.



Completed by: 11/24/14	Completed by: 1/26/15	Completed by: 2/23/15	Completed by: 3/12/15
Research focus: - Citizen science - Crowdsourcing - NOAA roles - Governing policies **Conduct gap assessment**	**Analyze options:** - Environmental & safety risk - Information reliability - Training requirements - Human capital & technology demands	**Recommend activity:** - Pre-incident - During incident - Post incident **Develop bridging strategy**	**Expert review:** - Legal - Efficiency - Implementation

Phase 1 – Identify

CSM Team will conduct research on identified focus areas to answer the following central questions:

a. What has been the role of citizen science in recent environmental disasters?

b. What does the growth of public interest in participation mean for response agencies in terms of opportunities and challenges?

c. How can we leverage the public interest to benefit emergency response efforts?

Identification efforts include investigating scholarly literature, popular press articles, and professional reports. Additionally, the Team will engage key stakeholders and experts. By the conclusion of Phase 1, we anticipate **Key Objective (1)** will be achieved, providing the basis for Phase 2 to achieve Key Objectives (2) and (3).[1]

Phase 2 – Analyze

[1] **Key objectives**: (1) To provide the most current and relevant information on citizen science from the perspective of all involved parties, (2) to compare and contrast different models of citizen science, including but not limited to observations, data collection, and interpretation, and (3) to identify gaps in NOAA's response capacity that could best be filled through the use of

Building on the research, CSM Team will engage in a methodical and critical examination of citizen science program components to answer the following questions:

a. What are ways in which OR&R can manage the high flow of information that is inherent in a citizen science program?
   i) Who owns the information once it is collected and submitted?
   ii) Who uses the information that citizen science provides and how is it used?
   iii) How can we ensure the reliability of the data?

b. What are the aspects of a successful citizen science program?
   i) What are the environmental, safety, and human health risks associated with volunteer activities in support of an emergency response?
   ii) What are the implementation costs (e.g. people, time, money, efforts)?
   iii) For various metrics, what are the ranges (e.g. high, medium, low) of potential options?

By the conclusion of Phase 2, we intend to have comprehensively addressed **Key Objectives (2) and (3)**.[2] This foundation will help shape potential citizen science solutions to address emergency response gaps to be further refined in Phase 3.

Phase 3 – Construct

Informed and supported by Phases 1 and 2, CSM Team will develop **a synthesis report** with a particular focus on (1) identifying and prioritizing OR&R activities that could benefit from citizen science, and (2) providing recommendations on effective citizen science management, thereby addressing **the overarching goals** of the project. A bridging strategy will also be included to guide the implementation of the recommended citizen science program.

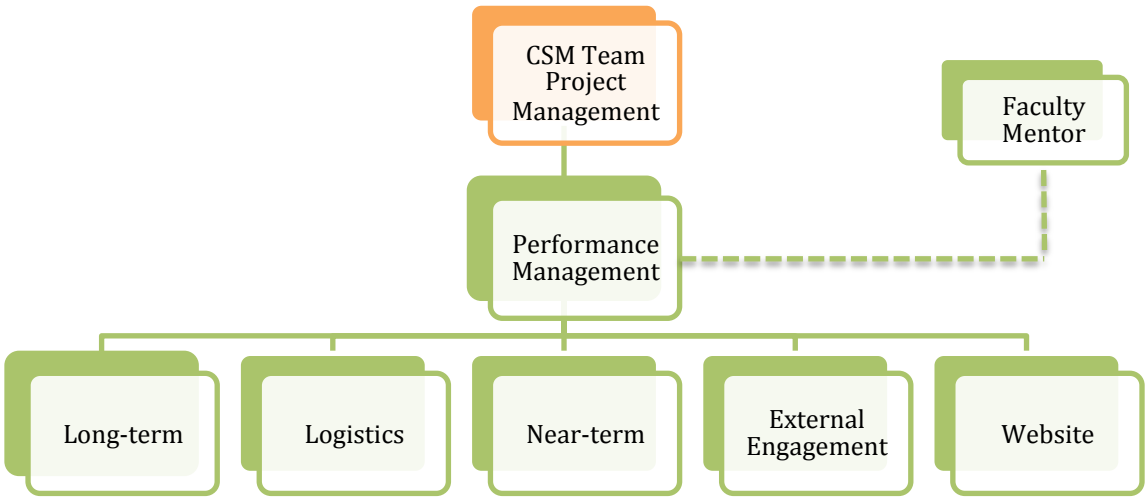
Phase 4 – Review

The above report will be **balanced with the legal, efficiency, and implementation tradeoffs** in order to determine the feasibility of potential OR&R activity and citizen science management options. To that end, CSM Team will seek support from NOAA and University of Washington faculty to fill professional and technical expertise.

[2] **Key objectives**: (2) to compare and contrast different models of citizen science, including but not limited to observations, data collection, and interpretation; and (3) to identify gaps in NOAA's response capacity that could best be filled through the use of citizen science.

3. Performance Management Scheme

Performance management has been further organized under five functional areas, with corresponding management roles and team members assigned. Under this scheme, project status and progress will be compared to the actual plan. If necessary, the management team may adjust schedules or do what is necessary to keep the project on track. The diagram and table below provide associated **performance management roles, assignments,** and **responsibilities.**



Role	Assigned	Responsibilities
Long-term	Myong	Monitor and evaluate team progress through Technical Execution phases; collaborate with near-term manager to adjust as needed
Near-term	Rob	Monitor and evaluate team performance to achieve deliverables; consult long-term manager on impact of schedule adjustments to overall plan
Logistics	Sam	Ensure all scheduling and technology support are provided for team and client meetings
External engagement	Myong	Communications point-person with faculty mentor and client; ensures all deliverables are submitted by deadline
Website	Sam	Create, manage, and update the CSM Team website incorporating new material in a timely manner
Faculty mentor	Professor Bryant	Provide overall project oversight, clarify Keystone Project and client expectations, and advise and support CSM team in project planning and execution

IV. Major Milestones and Deadlines

Major milestones and deadlines serve as a means to assess project progression, to ensure adequate communication with our client, and to signal completion of key phases throughout the project, so that key deliverables are adequately completed. The project execution phases and the corresponding deliverables are listed below.

Phase 1 – Identify

- Launch CSM Team website
- Interim presentations to the EMC class and NOAA
- Interim report summarizing the most current and relevant information on citizen science and preliminary options to address gaps in the existing emergency response system

Phase 2 – Analyze

- 1-page progress report summarizing different models of citizen science and finalized options to address gaps in the existing emergency response system

Phase 3 – Construct

- Draft final report on recommendations, building upon the above research and analysis

Phase 4 – Review

- Environmental Management (EM) Symposium
- Final Presentation to NOAA ERD
- Final Report including OR&R activity and citizen science management recommendations that are well researched, critically analyzed, and feasible from a variety of perspectives
- Update CSM Team website

A Gantt chart is included to provide a detailed illustration of the project schedule (Attachment 1).

V. Key Contacts

The following table contains a preliminary list of key contacts for the project. The list will be updated as research progresses.

Name	Organization	Title	Email
Beth Bryant	UW, School of Marine Affairs	Affiliate Assistant Professor	bcbryant@uw.edu
Anne DeMelle	UW, Program on the Environment	Graduate Program Coordinator	ademelle@uw.edu
Doug Helton	NOAA, OR&R	Incident Operations Coordinator	doug.helton@noaa.gov

VI. Research Sources

A variety of sources will be used to understand and analyze existing citizen science models as well as provide the basis for development of potential new models. These sources can be broken down into the following six categories: Scholarly articles, popular press articles, non-profit/university resources, government resources, internet sources and business sector sources. Below, a brief description of each category is provided.

Scholarly Articles

This will consist of journal-published, peer-reviewed material. CSM team will use this research to build a credible foundation for ongoing research.

Popular Press Articles

Popular press material will be drawn from news sources, blogs and online media outlets. While this is expected to provide less substantial information than the scholarly material, it will provide a more up to date resource, help the team initially understand how citizen science is being used, and possibly provide a channel for exploring new and emerging models in the field.

Non-Profit/University Resources

This is non-peer reviewed material published by non-profit organizations and institutions. Functionally, it will serve a similar purpose to the popular press articles while possibly providing other case studies for further research. It will also provide a resource to see how public institutions are using citizen science to meet a variety of goals.

Government Resources

Government resources will provide similar information to non-profit and university sources, but will be drawn from public agencies such as NOAA and the Department of Ecology. This will provide insight into how public agencies are currently using citizen science and provide the most relevant comparisons for OR&R's needs.

Internet Sources

For the purposes of this project, internet sources will exclude all sources that fall into any of the other listed categories. Remaining will be web sources like wikis that will allow non-vetted, but very up to date information to be accessed.

Business Sector Sources

Business sector resources will be useful insofar as they offer information on how the private sector is collecting and managing data from citizen science and crowdsourced projects. While this may not be directly applicable, the models used across sectors may prove to be translatable to one another.

Re: Project Management: Citizen Science and Emergency Response Project

Attachment 1: Citizen Science and Emergency Response Project Gantt Chart	**Date**	October		November				December						January				February				March				
		20	27	3	10	17	24	1	8	12	15	22	29	5	12	19	26	2	9	16	23	2	9	12	16	20
	Week	1	2	3	4	5	6	7	8	8.5	9	10	11	12	13	14	15	16	17	18	19	20	21	21.5	22	22.5
Phase 1 - Identify																										
1.1 Research Citizen Science		1	2	3	4	5																				
1.2 Research Crowdsourcing		1	2	3	4	5																				
1.3 Research NOAA Roles		1	2	3	4	5																				
1.4 Research Governing Policies		1	2	3	4	5																				
1.5 Gaps Assessement					1	2																				
Phase 2 - Analyze																										
2.1 Platform Options					1	2																				
2.2 Risk Analysis											1	2	3	4	5	6										
2.3 Training Requirements											1	2	3	4	5	6										
2.4 Resources Demands											1	2	3	4	5	6										
Phase 3 - Construct																										
3.1 Pre-incident																1	2	3	4	5						
3.2 During incident																1	2	3	4	5						
3.3 Post-incident																1	2	3	4	5						
3.4 Citizen science management																1	2	3	4	5						
3. 5 Bridging Strategy																			1	2						
Phase 4 - Review																										
4.1 Legal Review																						1	2			
4.2 Efficiency Review																						1	2			
4.3 Implementation Review																						1	2			
Key Deliverables	**Lead**																									
Memo 2	Rob																									
Website Launch/Class Presentation	Sam				1	2	3																			
Client Interim Presentation	Myong					1	2																			
Progress Report 1 &2	Sam						1	2	3							1										
Draft Final Report	Rob																1	2	3	4						
EM Symposium Presentation	Myong																			1	2	3	4			
Client Final Presentation	Myong																						1	2		
Website Update	Sam																							1	2	
Final Report	Rob																				1	2	3	4	5	

** Note: Numbers inside the cell denote the number of weeks CSM Team will be working on the deliverables or sub-phases of the project.*