



PROCEEDINGS

SAFMC Citizen Science Program Design Workshop

January 19-21, 2016

Prepared by SAFMC Staff

Table of Contents

I. Background.....	4
II. Workshop Overview.....	5
III. Final SAFMC Citizen Science Program Blueprint.....	8
Program Identity.....	8
Goals & Objectives.....	9
Administration.....	9
A. Parent/administrative support organization: SAFMC	9
B. Transition Strategy (development to implementation):	9
C. General overview and hierarchy	9
D. Roles & Operations – Program Administration Hierarchy	11
Partnerships	15
Paid Staff	16
Funding Requirements.....	17
Legal and Liability concerns	17
Initial “Kickstarter” project	17
Miscellaneous topics and recommendations	18
IV. Appendices	19
Appendix A – Participant List - January 2016 SAFMC Citizen Science Program Design Workshop	19
Appendix B – Pre-Workshop Survey Results	19
Appendix C – Workshop Introduction Presentations.....	19
Keynote: Fish are Just Like Birds! - <i>Rick Bonney, Public Engagement in Science, Cornell Lab of Ornithology.....</i>	19
Making Dives That Count – Ocean Citizen Science Monitoring - REEF Volunteer Fish Survey Project - <i>Christy Pattengill-Semmens, Reef Environmental Education Foundation (REEF)</i>	19
Lessons Learned: Use of text message reporting to quantify catch and effort at NC king mackerel tournaments - <i>Scott Baker, North Carolina Sea Grant.....</i>	19
Building Partnerships for Success: A collaboration to design a solution to safely release fishes that experience barotrauma – <i>Sara Mirabilio, North Carolina Sea Grant.....</i>	19
Citizen Science Project Design - <i>Jennifer Shirk, Cornell Lab of Ornithology/Citizen Science Association...</i>	19
Appendix D – Expert Group Plenary and Notes – Communication.....	19
Appendix E – Expert Group Plenary and Notes – Data Management.....	19

Appendix F – Expert Group Plenary and Notes – Governance	19
Appendix G – Expert Group Plenary and Notes – Participants	19
Appendix H - Expert Group Plenary and Notes – Researchers	19
Appendix I - Expert Group Plenary and Notes – Science Standards	19
Appendix J – Post-Workshop Survey Results	19
Appendix K – List of Suggested Citizen Science Projects.....	19
Appendix L – Agenda - SAFMC Citizen Science Program Design Workshop.....	19

I. Background

The South Atlantic Fishery Management Council (SAFMC) manages federal fisheries over a broad geographic range along the eastern U.S. from the Florida Keys to North Carolina. Management encompasses a wide range of habitats and species managed through seven fishery management plans, along with plans addressing habitat, sargassum, and corals. For many years the South Atlantic Fishery Management Council has grappled with the challenge of ensuring adequate and timely science to support management despite limited resources, a multitude of species to manage, and a complex and highly diverse ecosystem. Discussions of data challenges and the resulting scientific uncertainties often lead to offers from fishermen to provide their vessels as research platforms, collect samples and record their own observations to help increase scientific knowledge and 'fill data gaps'. Additionally, common themes heard from stakeholders through the SAFMC's 2014-2015 Visioning Process included the need for more and better data to manage fisheries and a willingness to work with scientists to help collect data throughout the region.

Citizen science is a growing field in which trained members of the public collaborate and engage with scientists in the inquiry and discovery of new knowledge. Public participation in scientific research advances science, research, and policy and fosters an informed and engaged citizenship.

The Council recognized the desire of constituents to get involved and the need to have a well-designed program and accompanying sampling protocols to ensure that information collected through such efforts can be used to inform stock assessments and management decisions. To meet this growing need, the Council decided to explore developing a comprehensive Fishery Citizen Science Program.

In March 2015, the Council created a Citizen Science organizing committee to consider ways the SAFMC could use citizen science to address research and data needs. The organizing committee consisted of SAFMC staff (Amber Von Harten, John Carmichael, and Julia Byrd), Council members (Mark Brown, Michelle Duval, and Ben Hartig), SEFSC Director (Dr. Bonnie Ponwith), and a representative from The Pew Charitable Trust (Leda Dunmire). As a first step, the committee recommended convening a workshop where interested citizens, fisheries managers and scientists, and citizen science practitioners gathered to develop recommendations for designing such a program. The Council supported the proposed workshop and committed to providing travel and logistics support. The Organizing Committee developed an agenda and identified interested participants for the Citizen Science Workshop. Working closely with Rick Bonney and Jennifer Shirk, citizen science experts affiliated with the Department of Program Development and Evaluation at the Cornell Lab of Ornithology, the Organizing Committee learned more about the field of citizen science and refined the workshop approach and topics based on this information. The Committee also worked with the state Sea Grant Programs from NC, SC, GA and FL to tap into their experience working with constituents on research and monitoring projects. To support wider participation in the workshop, each state Sea Grant Program in the South Atlantic also provided additional travel support for a number of fishermen participants.

II. Workshop Overview

The SAFMC Citizen Science Program Design Workshop was held January 19-21, 2016 in Charleston, SC. The primary goal of this workshop was to develop programmatic recommendations (Blueprint) for a comprehensive Citizen Science program for the South Atlantic Council. Over 65 people from throughout the region participated in the workshop including commercial, for-hire, and private recreational fishermen, partners from each of the four state Sea Grant programs, data managers and scientists from state and federal agencies, academic institutions, and non-governmental organizations. Workshop observers included Council members and NOAA Fisheries headquarters staff, including Richard Merrick, Chief Science Advisor for NOAA Fisheries. See Appendix A for a complete list of workshop participants.

Prior to the workshop, an online survey was sent to workshop participants to get a better idea of their background, their knowledge and experience on citizen science, and what they were hoping to get out of the workshop. Results from this survey helped the Organizing Committee develop the workshop agenda. See Appendix B for survey results and Appendix L for the workshop agenda.

During the workshop, presentations were given by Rick Bonney and Jennifer Shirk, from the Cornell Lab of Ornithology. Their presentations provided an overview of the definition of Citizen Science, the necessary components for a Citizen Science project or program, and examples of successful Citizen Science projects. Additional presentations were given by Christy Semmens from Reef Environmental Education Foundation (REEF) and Scott Baker and Sara Mirabilio from North Carolina Sea Grant to showcase examples of fishery-related Citizen Science programs and projects on both a national and local level. All of the citizen science speaker presentations are in Appendix C.

The remainder of the workshop was divided into three sessions. Each session had a breakout group exercise followed by a plenary session. These sessions focused on,

- Session I – Project Ideas: brainstorming potential Citizen Science project ideas to address fishery issues in the region,
- Session II – Project Design: learning about the key elements for designing a successful Citizen Science project, and
- Session III – Expert Group Recommendations: developing draft recommendations for components critical to a Citizen Science program for the South Atlantic.

During Session I, participants were divided into small breakout groups to brainstorm topics and approaches for potential citizen science projects for the South Atlantic. Topics could address all fisheries managed by the Council and consider all components of the fishery – fishery resource, ecosystem, habitats, social and economic issues, environmental issues, etc. Workshop facilitators helped participants summarize the list of project ideas and approaches from each breakout group and then categorized them to develop common themes for the types of projects that could be supported by citizen science. See Appendix K for a summarized list of project ideas and approaches.

In Session II, the top three project ideas from Session I were selected as the focus for the Project Design exercise. The top three project ideas were

- Better Private Recreational Data
- Fishery Discards
- Environmental Data Collection

Participants were divided into small breakout groups and were asked to design a citizen science project using one of the project ideas developed in Session I (listed above). Groups were asked to use the five project components for a citizen science framework described during Jennifer Shirk's presentation when designing their citizen science project. The five components include,

1. Identify goals (Science/participants/policy-action);
2. Establish Capacity (Staff/volunteers/partners);
3. Design/Refine (Question/protocol, Training, Infrastructure);
4. Manage (Participation, Data, Expectations);
5. Apply/Adapt (Research/action, Determine effectiveness, Transparency)

The groups shared their project design elements during a plenary session to set the stage for Session III that would have participants develop draft recommendations for components needed for a Citizen Science Program for the South Atlantic.

During Session III, participants were divided into expert groups based on their current role and expertise in South Atlantic fisheries. The expert groups focused around six areas:

- | | |
|----------------------|---|
| • Governance, | • Researchers, |
| • Science Standards, | • Communication, and |
| • Data Management, | • Fisherman/Citizen Science Participants. |

Each Expert Group developed core program recommendations and presented these to all workshop participants during a plenary session. These draft recommendations provided input to the development of the final SAFMC Citizen Science Blueprint document.

Expert Group breakout notes and Expert Group plenary presentations are found in Appendices D – I.

A post-workshop online survey was sent to workshop participants to gauge what information they learned; identify the components of a Citizen Science Program that were most important to them personally and to the SAFMC's efforts to develop a program; identify the components they thought would be the most challenging in designing a citizen science program; and evaluate the workshop speakers and hands on exercises. Post-workshop survey results are found in Appendix J.

The Council's Citizen Science organizing committee met the day after the workshop, January 22, 2016 and used the expert groups' recommendations to help develop the Citizen Science Program Blueprint. The Blueprint is a document to help develop the Council's Citizen Science Program. In addition to establishing a governance structure for operations and program oversight, the Blueprint calls for developing five essential program action teams to focus on volunteers; data management; projects and topics management; communication, outreach, and education; and finance. The document also outlines the need to establish multiple partnerships with existing programs and agencies to mutually identify research and data needs; improve constituent knowledge, involvement, and buy-in; collect better data to

address management issues; increase data gathering capacity; and help to resolve long-standing data needs. Results from the post-workshop survey were used to further refine the Blueprint document. The SAFMC Citizen Science Blueprint is found in Section II of the Proceedings.

At their March 2016 meeting, the SAFMC reviewed and adopted the SAFMC Citizen Science Program Blueprint and in September 2016, a Council level Citizen Science Committee was established to provide guidance for the development of the program. In December 2016, the Council established a Citizen Science Program Manager staff position to begin implementation of the Program Blueprint.

III. Final SAFMC Citizen Science Program Blueprint



SAFMC Citizen Science Program Blueprint

Prepared by the SAFMC Citizen Science Planning Workgroup, based on recommendations of the SAFMC Citizen Science Workshop

Program Identity

- A. Program Official name:** South Atlantic Fishery Management Council Citizen Science Program
- B. Brief name:** The program will be branded using a shorter name that could possibly form a catch acronym or other brief name to refer to the program. This will be developed by the Operations Committee.
- C. Mission Statement:**
“Improve fisheries management through collaborative science”
- D. Vision Statement:**
“more collaboration + more data + more trust = better management”
- E. Values:**
- | | |
|-----------|------------|
| • empower | • reliable |
| • include | • trust |
| • engage | • mutual |
| • respect | |
- F. Definition of “Citizen Science” for the Program:** The definition of citizen science for this specific program is yet to be defined. Establishing a definition for the program will be one of the first tasks charged to the Operations Committee and Oversight Board.

Goals & Objectives

The planning workgroup drafted preliminary potential goals for a citizen science program that will be modified once the program launches and development begins. Specific objectives will be developed in coordination with the program A-Teams and reviewed by the Operations Committee.

GOAL 1: Adopt and sustain a new approach to increase the data available to address research and management needs.

- *Objectives should consider all aspects of fisheries including fish, fishery, ecosystem, fishermen.*

GOAL 2: Ensure data collected are appropriate, relevant, reliable, accessible, timely and useful.

GOAL 3: Build partnerships for mutual learning and collaboration.

GOAL 4: Enhance stewardship for the resources of the South Atlantic.

GOAL 5: Foster active engagement and communication about processes, results and impacts.

- *Objectives should consider strategies for providing feedback on usage, collection*

Administration

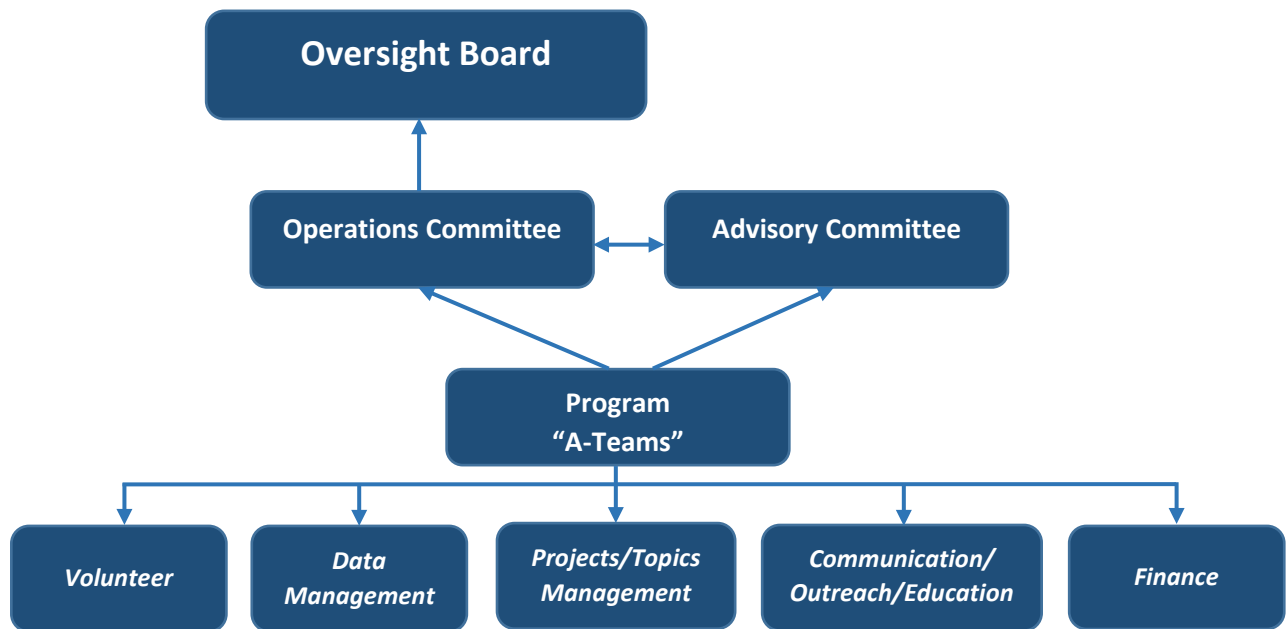
A. Parent/administrative support organization: SAFMC

B. Transition Strategy (*development to implementation*):

- Existing organizing committee will handle oversight tasks until planned infrastructure is in place and ready to take the reins.
- Anticipate 12-18 months before fully transferred, with the clock starting once funding is secured and initial staff is hired.
- Tasks will be delegated to other infrastructure components as they are developed and brought on line.
- Organizing Committee members are expected to continue to serve key roles in various bodies of the permanent infrastructure.

C. General overview and hierarchy

Citizen Science Program Organizational Chart



D. Roles & Operations – *Program Administration Hierarchy*

1. Oversight Board

Design/ Purpose	<ul style="list-style-type: none">• Similar to SEDAR Steering Committee or ACCSP Coordinating Council• Approve policies, provide program direction/multi-partner support, and advice
Membership	<ul style="list-style-type: none">• Representatives from SERO; SEFSC; NOAA Headquarters, Sea Grant (rotating), SAFMC (Chair, Executive Director, and SSC Chair); Stakeholders (private, for-hire, commercial); ACCSP/ASMFC; State agency; Advisory Committee Chair
Appointments	<ul style="list-style-type: none">• Council appointed: <i>Stakeholders(3); NGO; Sea Grant; At-large; SSC Chair; State agency; AP Chair</i>• Designated by agency: <i>SERO, SEFSC, S&T, ACCSP/ASMFC</i>• Named individuals may designate temporary or permanent proxies
Tasks	<ul style="list-style-type: none">• Approve program policy (SOPPS), goals, and objectives (<i>Developed by staff & Operations Committee</i>)• Approve program budget (<i>Developed by staff; recommendations from A-Teams</i>)• Provide infrastructure & governance direction (<i>through SOPPS & program evaluation</i>)• Meets annually (face-to-face); Additional meetings in first 2-3 years of program
Staff Support	<ul style="list-style-type: none">• Citizen Science Program Manager (<i>supervised by SAFMC Deputy Director for Science & Statistics</i>)

RECOMMENDATION: Establish a Citizen Science Program Oversight Board.

2. Operations Committee

Design/ Purpose	<ul style="list-style-type: none">•Smaller group of advisors that develop program recommendations for the Oversight Board to consider•Approve policies, provide program direction/multi-partner support, and advice
Membership	<ul style="list-style-type: none">•Representatives from Citizen Science Organizing Committee (2 Council members, SEFSC Director/Designee; Council Staff (Deputy Dir for S&S); NGO); A-Team Leaders; SSC (Chair or Designee)
Appointments	<ul style="list-style-type: none">•Appointed by the Oversight Board•Term policies would be developed by the Oversight Board to govern membership
Tasks	<ul style="list-style-type: none">•Establish A-Teams immediately (topic specific task forces)•Coordinate with A-Team Leaders•Report A-Team recommendations to the Oversight Board•Draft SOPPS and policies for Oversight Board approval
Staff Support	<ul style="list-style-type: none">•Citizen Science Program Manager (<i>supervised by SAFMC Deputy Director for Science & Statistics</i>)

RECOMMENDATION: Establish a Citizen Science Program Operations Committee.

3. Advisory Committee

Additional standing committees may be added over time to assist with specific programmatic needs related to projects supported through the citizen science program. Committees to coordinate proposal review and other technical/data needs are examples of possible standing committees that may be convened in the future.

Design/ Purpose	<ul style="list-style-type: none">• Serve in the role of advisors similar to the Council's Advisory Panels• Works in conjunction with the Operations Committee to develop recommendations for the Oversight Board
Membership	<ul style="list-style-type: none">• Fishermen (private, for-hire, commercial) and scientists• 3 stakeholders per state
Appointments	<ul style="list-style-type: none">• Appointed by the Operations Committee• Nominated by partners• Term policies would be recommended by the Operations Committee and approved by the Oversight Board to govern membership
Tasks	<ul style="list-style-type: none">• Serve as outreach ambassadors• Assist with developing strategies for recruiting and training volunteers• Identify research and data needs• Serve in some capacity during the proposal review process
Staff Support	<ul style="list-style-type: none">• Citizen Science Program Manager (<i>supervised by SAFMC Deputy Director for Science & Statistics</i>)

RECOMMENDATION: Establish a Citizen Science Program Advisory Committee

4. A-Teams

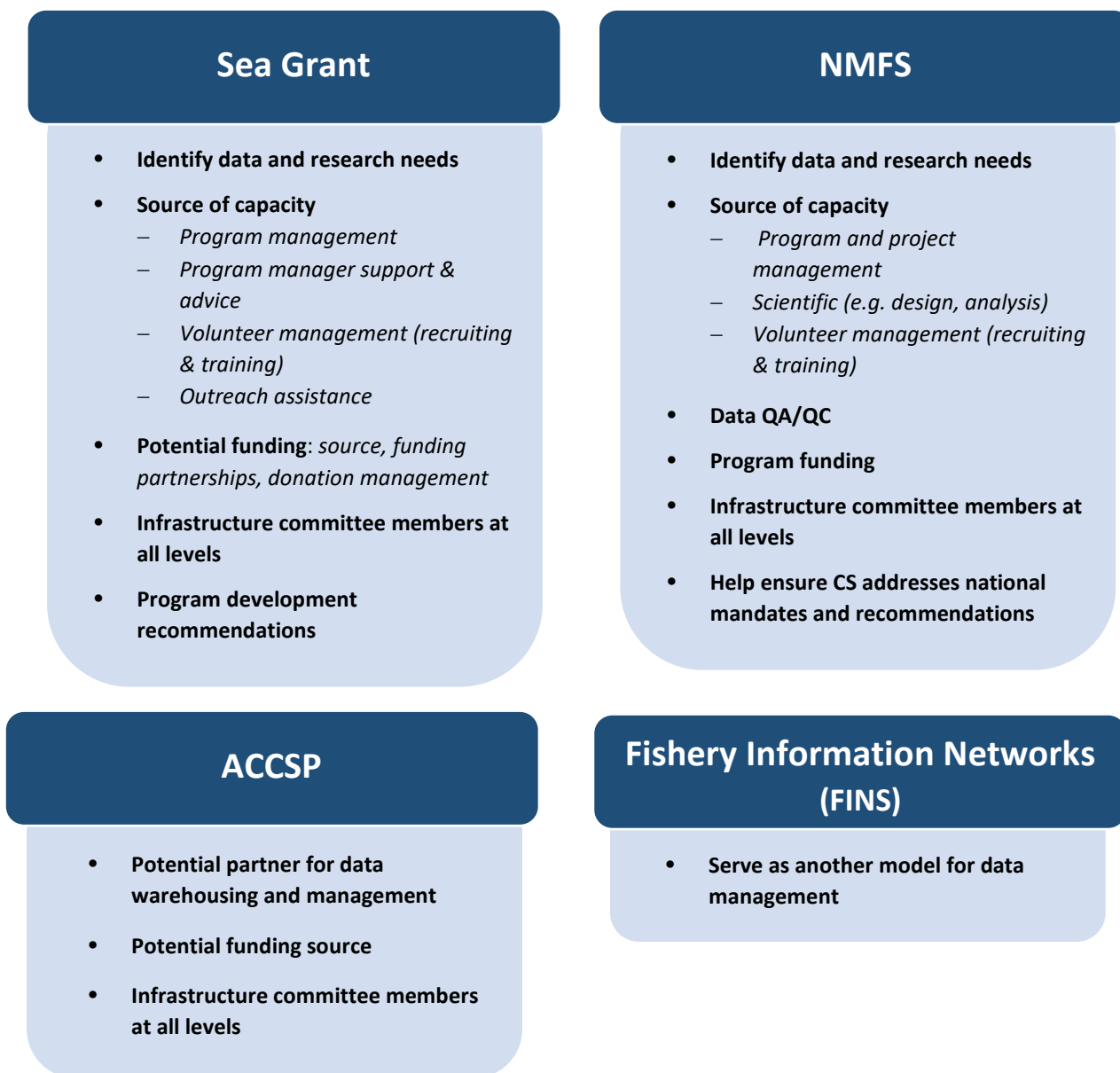
The A-Teams are task forces that will be developed during the initial launch of the citizen science program to help develop program components as outlined below.



RECOMMENDATION: Establish five (5) A-Teams to develop program components. Others maybe added based on the advice of the Operations Committee.

Partnerships

The aim of a Citizen Science program would be to complement existing programs with similar missions and leverage new resources and partnerships to expand upon the fishery data needs in the region. Possible partnership opportunities were identified with existing programs and agencies. Developing relationships would likely be mutually beneficial to the entities involved. Potential benefits from partnering with the Citizen Science Program could include: identifying research and data needs; improving constituent knowledge, involvement, and buy-in; having better data to address management issues; increasing data gathering capacity; and helping to resolve long-standing data needs. Potential partners are listed below along with support they could potentially provide to a Citizen Science Program.



(Continued)

(Partnerships continued)

State Agencies

- Identify data and research needs
- Source of capacity
 - Project management
 - Scientific
 - Volunteer management (recruiting & training)
- Potential funding partnerships
- Project managers and partners
- Infrastructure committee members at all levels

SAFMC

- Administrative parent
 - HR, staff management
 - Office space
 - Program support, funding
- Program guidance & direction
- Identify data and research needs
- Source of capacity
- Infrastructure committee members at all levels

Non-Governmental Organizations (NGOs)

- Source for capacity building
- Identify data and research needs

Cooperative Research Program (CRP- federal grant program)

- Potential benefits from CS
 - Promote awareness of CRP
 - Connect citizens and researchers interested in CRP projects
- Potential benefits to SAFMC
 - Increase benefit from CRP to SAFMC issues
 - Recommend CRP priorities

RECOMMENDATION: Expand existing partnerships with the identified agencies and programs and build collaborative relationships with newly identified agencies and programs.

Paid Staff

To ensure success, dedicated, full-time staff will be required for both initial program development and long-term support. Initially, a program manager is recommended to develop the infrastructure, initiate training and outreach, and support initial projects. The program manager will be a SAFMC employee within the science and statistics branch.

Dedicated managers for individual projects will be required as projects expand in number or complexity. Such positions could be filled by partner staff, well-trained and motivated volunteers, or dedicated program staff if resources and need allow.

Immediate tasks for the Citizen Science Program manager include,

- Inventorying current marine citizen science efforts;
- Organizing and populating program infrastructure;
- Serving as the point of contact for the program and interested volunteers; and
- Pursuing administrative and project funding.

Once the program is up and running, tasks will shift to supporting program committees, project management, volunteer support, and outreach and education.

RECOMMENDATION: Hire a full time program manager as soon as funds are available.

Funding Requirements

Funding is required to initiate the program, including salary and travel for the program manager, website development and hosting, outreach and training activities and travel for program committees and teams to develop program guidance. Additional funding for project support would further insure success of the critical first projects.

Since the governance recommendation is to house the program within the SAFMC, core administrative funding, such as that used to support staff salaries, must be obtained through NMFS channels. Funding for specific projects may come from various other sources, including competitive programs such as CRP, S-K, MarFin as well as partner organizations such as Sea Grant, state agencies, and ACCSP.

RECOMMENDATION: Pursue short-term funding options for program development and long-term alternatives to ensure its success and sustainability.

Legal and Liability concerns

Collecting, storing, and providing access to data raises potential legal and liability concerns that will need to be addressed during program development. For example, data used for decision making in the Council Management system fall under the requirements of federal laws including the Information Quality Act and the more recent PARR directive that addresses access.

Consideration must also be given to risk management and liability in the event of accidents that may occur during field activities associated with projects supported or endorsed by the Program.

RECOMMENDATION: Agency reviews program SOPPS to ensure compatibility with applicable laws and mandates.

Initial “Kickstarter” project

Workshop participants strongly supported initiating a “kickstarter” project early in the launch of a Citizen Science Program. Initiating a “kickstarter” project could help demonstrate how a project would be administered and implemented in the new Citizen Science program, develop

initial interest in a program and serve as an outreach platform, and help showcase the successes of citizen science driven projects.

Recommendations were made to develop criteria for project selection including,

- Identifying a simple, useful project with a high chance of success and broad constituent interest
- Consider a project in which the outcome will not have a direct negative impact on South Atlantic fisheries (i.e., fishery closure) but rather will add to information about the fishery to help support management decisions.
- Establish a process for project solicitation, review, and selection.

RECOMMENDATION: Develop a project selection process in order to initiate a “kickstarter” project.

Miscellaneous topics and recommendations

Advice

- Pilot projects are good.
- Fail early, Fail often: let the program evolve and don’t be afraid to try new things.
- Outreach is critical and should be a component at each infrastructure level.
- Training is critical for project participants and managers.
- Hierarchy is required; interests and needs will vary broadly.
- Consider how to foster “matchmaking” for project ideas with scientists needing data connected with citizens who can provide those data and citizens with ideas connected with scientists who can turn them into projects.
- Possibly use a web oriented match-making type platform to connect scientists and citizens.

IV. Appendices
(available as separate documents)

[Appendix A – Participant List - January 2016 SAFMC Citizen Science Program Design Workshop](#)

[Appendix B – Pre-Workshop Survey Results](#)

[Appendix C – Workshop Introduction Presentations](#)

Keynote: Fish are Just Like Birds! - Rick Bonney, *Public Engagement in Science, Cornell Lab of Ornithology*

Making Dives That Count – Ocean Citizen Science Monitoring - REEF Volunteer Fish Survey Project - *Christy Pattengill-Semmens, Reef Environmental Education Foundation (REEF)*

Lessons Learned: Use of text message reporting to quantify catch and effort at NC king mackerel tournaments - *Scott Baker, North Carolina Sea Grant*

Building Partnerships for Success: A collaboration to design a solution to safely release fishes that experience barotrauma – *Sara Mirabilio, North Carolina Sea Grant*

Citizen Science Project Design - *Jennifer Shirk, Cornell Lab of Ornithology/Citizen Science Association*

[Appendix D – Expert Group Plenary and Notes – Communication](#)

[Appendix E – Expert Group Plenary and Notes – Data Management](#)

[Appendix F – Expert Group Plenary and Notes – Governance](#)

[Appendix G – Expert Group Plenary and Notes – Participants](#)

[Appendix H - Expert Group Plenary and Notes – Researchers](#)

[Appendix I - Expert Group Plenary and Notes – Science Standards](#)

[Appendix J – Post-Workshop Survey Results](#)

[Appendix K – List of Suggested Citizen Science Projects](#)

[Appendix L – Agenda - SAFMC Citizen Science Program Design Workshop](#)

SAFMC Citizen Science Design Workshop: Participant List

January 19-21, 2016

FirstName	LastName	Affiliation	State	Email
North Carolina				
Scott	Baker	NC Sea Grant	NC	bakers@uncw.edu
Dick	Brame	Coastal Conservation Association	NC	dbrame55@gmail.com
Kenny	Fex	Commercial Fisherman	NC	kensurffex@gmail.com
Bob	Lorenz	Recreational Fisherman	NC	rjlorenz@ec.rr.com
Chris	McCaffity	Commercial Fisherman	NC	freefish7@hotmail.com
Sara	Mirabilio	NC Sea Grant	NC	saram@csi.northcarolina.edu
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Paul	Rudershausen	NC State University / CMAST	NC	pjruders@unity.ncsu.edu
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South Carolina				
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Robert	Olsen	Recreational Fisherman	SC	robert@knotatworkfishing.com
Marcel	Reichert	SCDNR - Marine Resources Division; SAFMC SSC	SC	reichertm@dnr.sc.gov

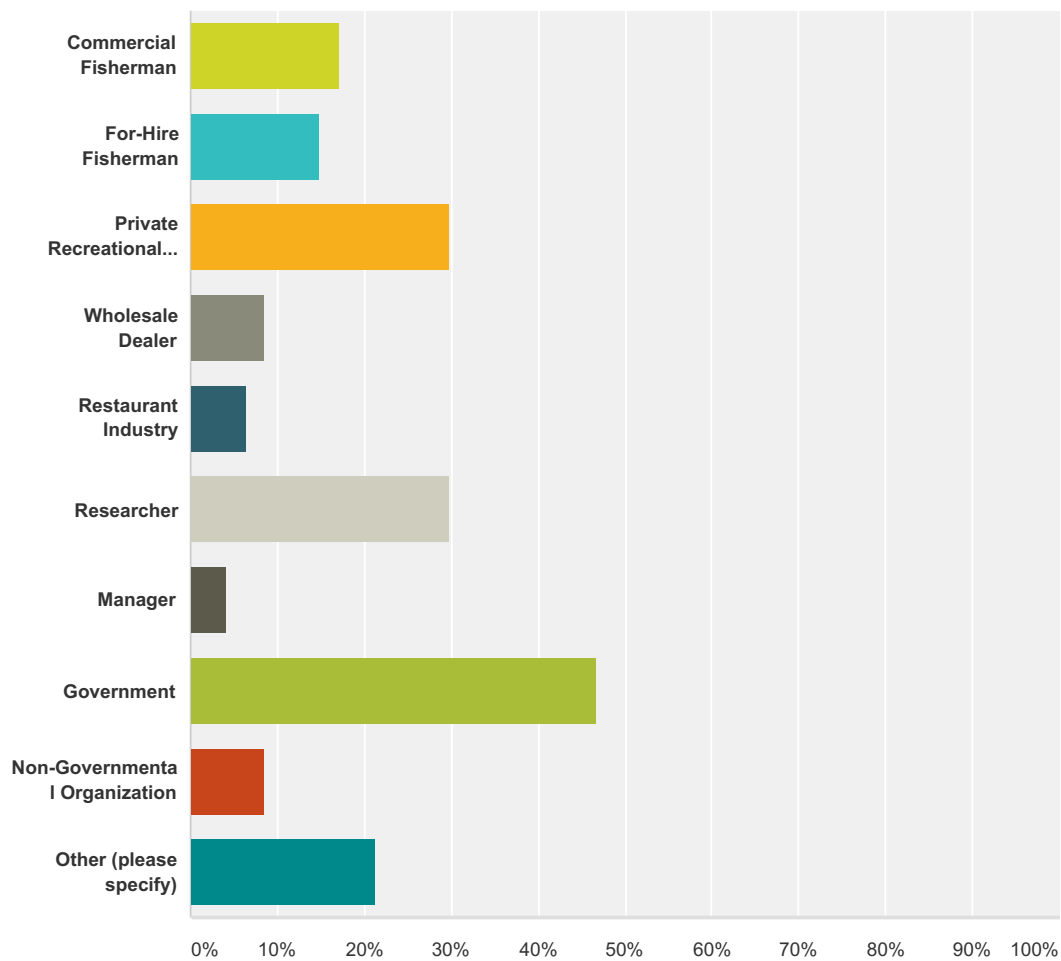
Georgia				
Bob	Barnette	GA for-hire	GA	captbobbarnette@gmail.com
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Florida				
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Jim	Freeman	Commercial Fisherman	FL	cfreeman23@bellsouth.net
Rusty	Hudson	Directed Sustainable Fisheries	FL	DSF2009@aol.com
Jimmy	Hull	Commercial Fisherman	FL	hullsseafood@aol.com
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Michael	Rowland	Fisherman	FL	michael.rowland@ubs.com
Beverly	Sauls	Florida Fish and Wildlife Conservation Commission - FWRI	FL	beverly.sauls@myfwc.com
Bouncer	Smith	For-hire Fisherman	FL	CaptBouncer@bellsouth.net
Mimi	Stafford	Fisherman	FL	Simi01@bellsouth.net
Dave	Webb	Fisherman	FL	pfishinpfun@prodigy.net

Additional Invited Participants				
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Julie	DeFilippi	Atlantic Coastal Cooperative Statistics Program	VA	julie.defilippi@accsp.org
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Presenters and Invited Experts				
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Christy	Semmens	REEF	CA	christy@reef.org
Jennifer	Shirk	Cornell University	NY	jls223@cornell.edu

Organizing Committee				
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Laura	Oremland	NOAA Fisheries	MD	laura.oremland@noaa.gov
Council Staff				
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Brian	Cheuvront	SAFMC Staff	SC	brian.cheuvront@safmc.net
Chip	Collier	SAFMC Staff	SC	chip.collier@safmc.net
Mike	Errigo	SAFMC Staff	SC	mike.errigo@safmc.net
Kim	Iverson	SAFMC Staff	SC	kim.iverson@safmc.net
Kari	MacLauchlin	SAFMC Staff	SC	kari.maclauchlin@safmc.net
Julie	Neer	SEDAR Staff	SC	julie.neer@safmc.net
Julie	O'Dell	SAFMC Staff	SC	julie.odell@safmc.net
Roger	Pugliese	SAFMC Staff	SC	roger.pugliese@safmc.net
Gregg	Waugh	SAFMC Staff	SC	gregg.waugh@safmc.net

Q1 How do you participate in fisheries in the South Atlantic? (Check all that apply.)

Answered: 47 Skipped: 0



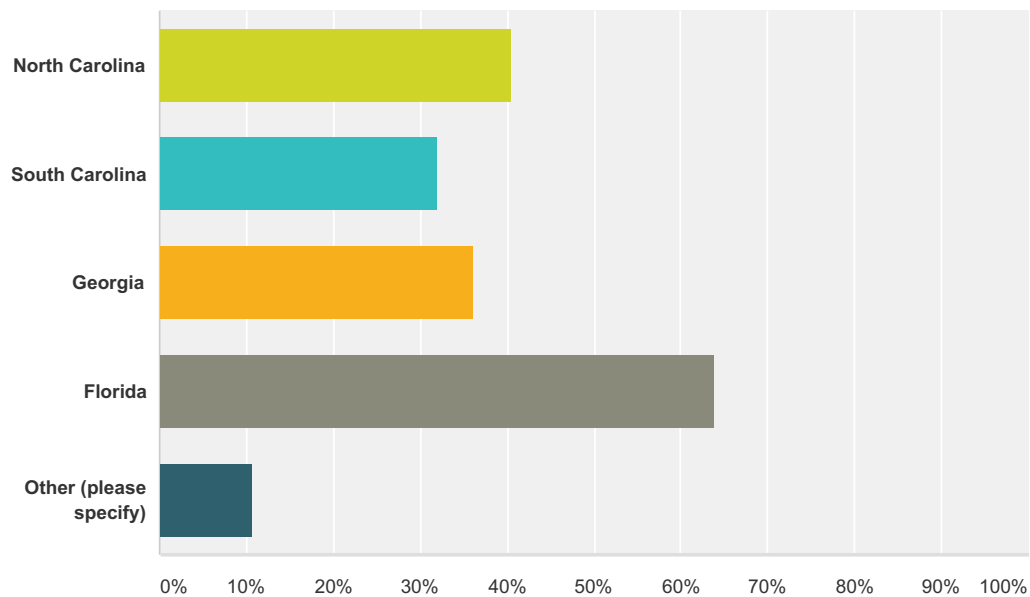
Answer Choices	Responses	
Commercial Fisherman	17.02%	8
For-Hire Fisherman	14.89%	7
Private Recreational Fisherman	29.79%	14
Wholesale Dealer	8.51%	4
Restaurant Industry	6.38%	3
Researcher	29.79%	14
Manager	4.26%	2
Government	46.81%	22
Non-Governmental Organization	8.51%	4
Other (please specify)	21.28%	10

Total Respondents: 47

#	Other (please specify)	Date
1	As extension agent and as researcher for UGA.	1/6/2016 1:48 PM
2	member of the SSC	1/6/2016 10:26 AM
3	extension	1/4/2016 4:17 PM
4	Sea Grant Extension	1/4/2016 12:27 PM
5	Sea Grant	1/4/2016 11:02 AM
6	Extension	12/28/2015 2:50 PM
7	Sea Grant/ Extension	12/17/2015 3:57 PM
8	Provide data for fishermen, dealers, research, management and government agencies.	12/16/2015 1:47 PM
9	Southeastern Fisheries Association	12/15/2015 12:18 PM
10	Salt water fisheries consultant	12/14/2015 1:27 PM

Q2 Which state(s) do you participate in fisheries? (Check all that apply.)

Answered: 47 Skipped: 0

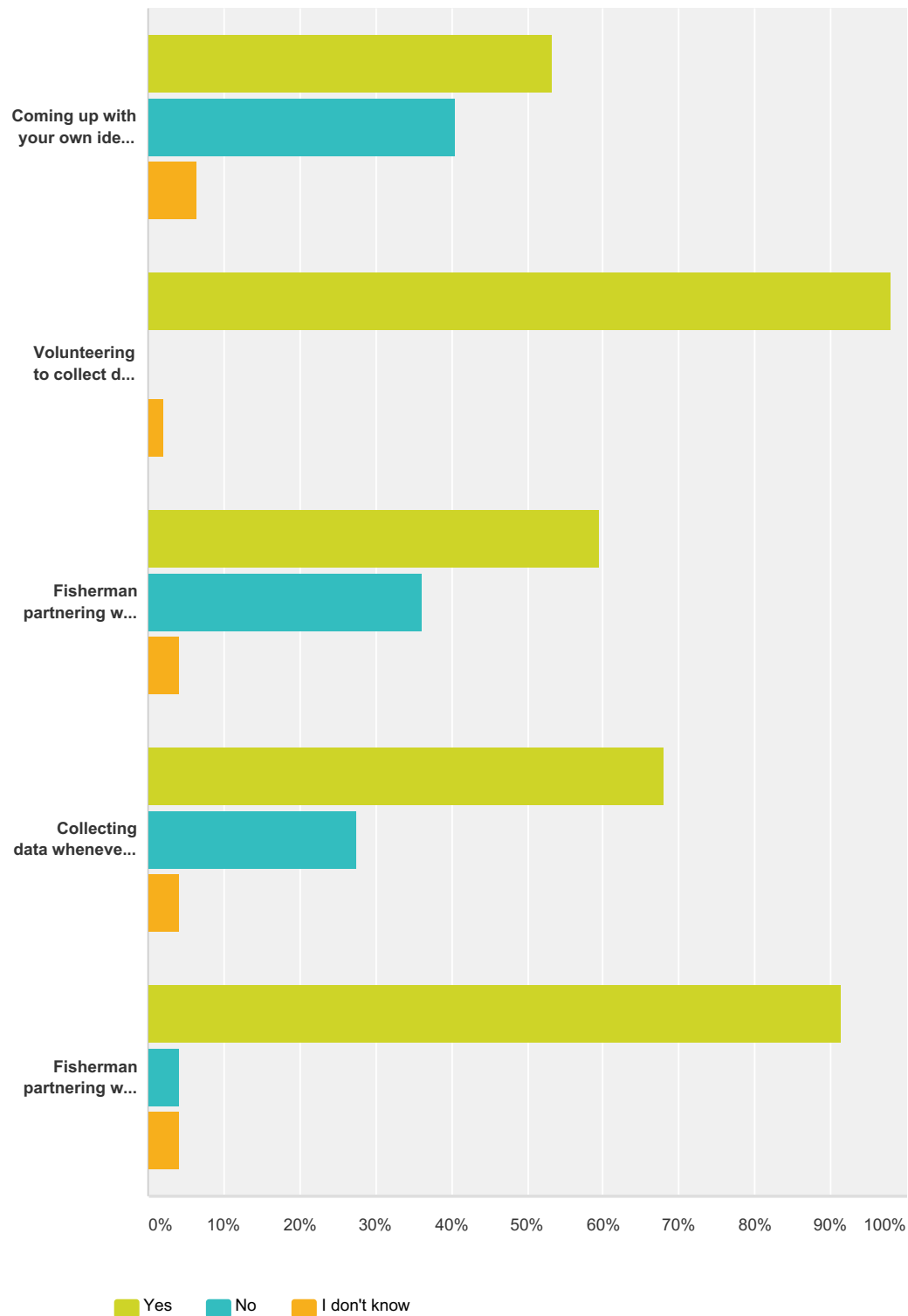


Answer Choices	Responses
North Carolina	40.43% 19
South Carolina	31.91% 15
Georgia	36.17% 17
Florida	63.83% 30
Other (please specify)	10.64% 5
Total Respondents: 47	

#	Other (please specify)	Date
1	National level	1/11/2016 9:56 AM
2	Gulf States	1/8/2016 9:44 AM
3	All	1/6/2016 10:27 AM
4	Do not directly participate -- research	1/6/2016 10:26 AM
5	Gulf of Mexico	12/14/2015 1:27 PM

Q3 Which of the examples below would you consider citizen science? (Select 'Yes' for the projects that represent citizen science and 'No' for the projects that do not.)

Answered: 47 Skipped: 0



	Yes	No	I don't know	Total
Coming up with your own idea and designing a project to collect data	53.19% 25	40.43% 19	6.38% 3	47
Volunteering to collect data for a project as part of your normal fishing activities (e.g. record lengths of discarded fish, recording ocean temperature on trips)	97.87% 46	0.00% 0	2.13% 1	47
Fisherman partnering with a researcher and getting paid to collect data	59.57% 28	36.17% 17	4.26% 2	47
Collecting data whenever it is convenient for your schedule (e.g. you catch a red snapper and take biological samples to a drop off station)	68.09% 32	27.66% 13	4.26% 2	47
Fisherman partnering with a researcher to design a collaborative project	91.49% 43	4.26% 2	4.26% 2	47

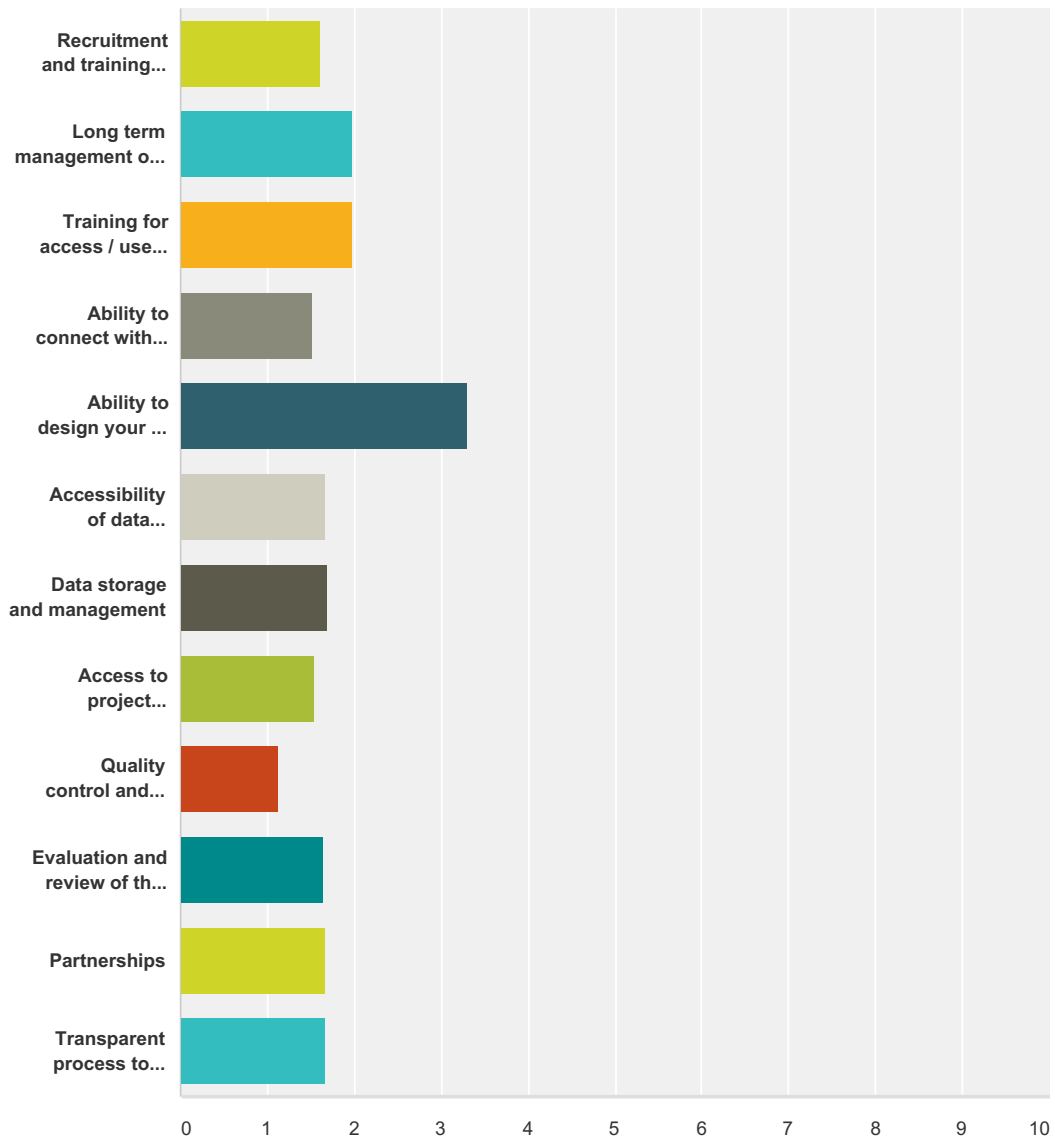
#	If you wish, please elaborate on what citizen science means to you.	Date
1	Ideally, this should encompass full integration of scientists and citizen-scientists (i.e., fishers, etc.) so the contributions are valid and can be legitimately used for fisheries management	1/8/2016 3:37 PM
2	Commercial fisherman that make their living in the ocean have more sea time hours and should be at the top of all data collecting . As we live it not just dream about in an office behind a computer!????	1/8/2016 7:54 AM
3	A possible program to increase fishery data collection capacity in a collaborative manner utilizing commercial and recreational vessels.	1/7/2016 8:13 PM
4	I do think that a fisherman partnering with a researcher can lead to either cooperative research (getting paid) or to a citizen science initiative (fishermen/public/anglers working to voluntarily collect data).	1/6/2016 4:48 PM
5	Data collection by individuals who are not trained as formally trained scientists	1/6/2016 12:17 PM
6	In citizen science, the public participates voluntarily in the scientific process, addressing real-world problems in ways that may include formulating research questions, conducting scientific experiments, collecting and analyzing data, interpreting results, making new discoveries, developing technologies and applications, and solving complex problems.	1/6/2016 10:31 AM
7	I'll defer to Wikipedia: "Citizen science (also known as crowd science, crowd-sourced science, civic science, volunteer monitoring or networked science) is scientific research conducted, in whole or in part, by amateur or nonprofessional scientists."	1/4/2016 5:20 PM
8	To me, citizen science would be synonymous with 'crowd-sourced science', 'civic science', 'volunteer monitoring' or 'networked science'. The general public can help make science happen by volunteering for a research project. In the past, collecting large samples of data for research was the most challenging task of any initiative. However, with today's interconnected world, thousands of people from around the globe can remotely contribute to a study and provide, analyze or report data that researchers can use.	1/4/2016 4:25 PM
9	Citizen Science can take place in many shapes and forms. To me, citizen science is defined as the use amateur or non-professional scientists, perhaps under the direction of scientists, to carry out science-based experiments, projects or data collection. Citizen scientists can take part in the design and development of a new project or simply join into an existing project established using scientific principles.	1/4/2016 12:39 PM
10	In general I think the definition of citizen science is pretty general however there are some requirements in that data/sample collection needs to be streamlined for all participants (ie. volunteers follow a specific protocol) and the data collected is analyzed and preferentially utilized by scientists, resource managers, etc.	1/4/2016 11:06 AM
11	I think this citizen science program should foster working relationships between interested fishermen and researchers. We should be more like liaisons than adversaries and work together toward a common goal of responsibly managed sustainable fisheries.	1/2/2016 12:32 PM
12	The selections fairly well covered my outlook on the subject.	12/31/2015 12:09 PM
13	Citizen science is something that fits under the same definition of science, but by someone without the formal training in science or profession in the sciences. Citizen science should still be unbiased and objective, whether intentional or unintentional, meaning there must be a well thought out strategy to obtaining the information that is being pursued.	12/29/2015 4:11 PM
14	Collaboration between user groups and researchers/managers to collect and apply data that will be beneficial to all groups involved.	12/17/2015 4:00 PM

Citizen Science: Pre-Workshop Survey

15	To me citizen science means to voluntarily participate in a program that is designed to enhance the data base of knowledge through observations by an educated group of citizens. I see it providing increased information for scientific analysis, but, also serving to educate the public and involve them in the process of understanding our environment.	12/16/2015 12:25 PM
16	Citizen Science is Fisherman Stakeholders personally involved in projects cooperatively with Federal and State Agencies and Scientist. The opportunity for both Agency (Fisheries independent) and Fisherman (fisheries Dependent) to work together combining their Knowledge, equipment, Skills and passion will produce the Best Possible Science.	12/15/2015 12:36 PM
17	Citizen science is most effective when it is in collaboration with state, federal, or academic researchers. Citizens wishing to contribute benefit from this partnership because it ensures that the data they provide is collected in a representative manner and has maximum utility for use in assessments and management decisions.	12/15/2015 10:55 AM
18	People with a common interest that participate in scientific work with the direction of scientists	12/14/2015 2:04 PM
19	Being able to bring the vocational saltwater fishing experience into the scientific forums.	12/14/2015 1:32 PM

Q4 What components are most IMPORTANT (e.g. most critical) to you in the design of a citizen science program? Rank each component on a scale of 1 to 5, with 1 being most important and 5 being least important.

Answered: 46 Skipped: 1



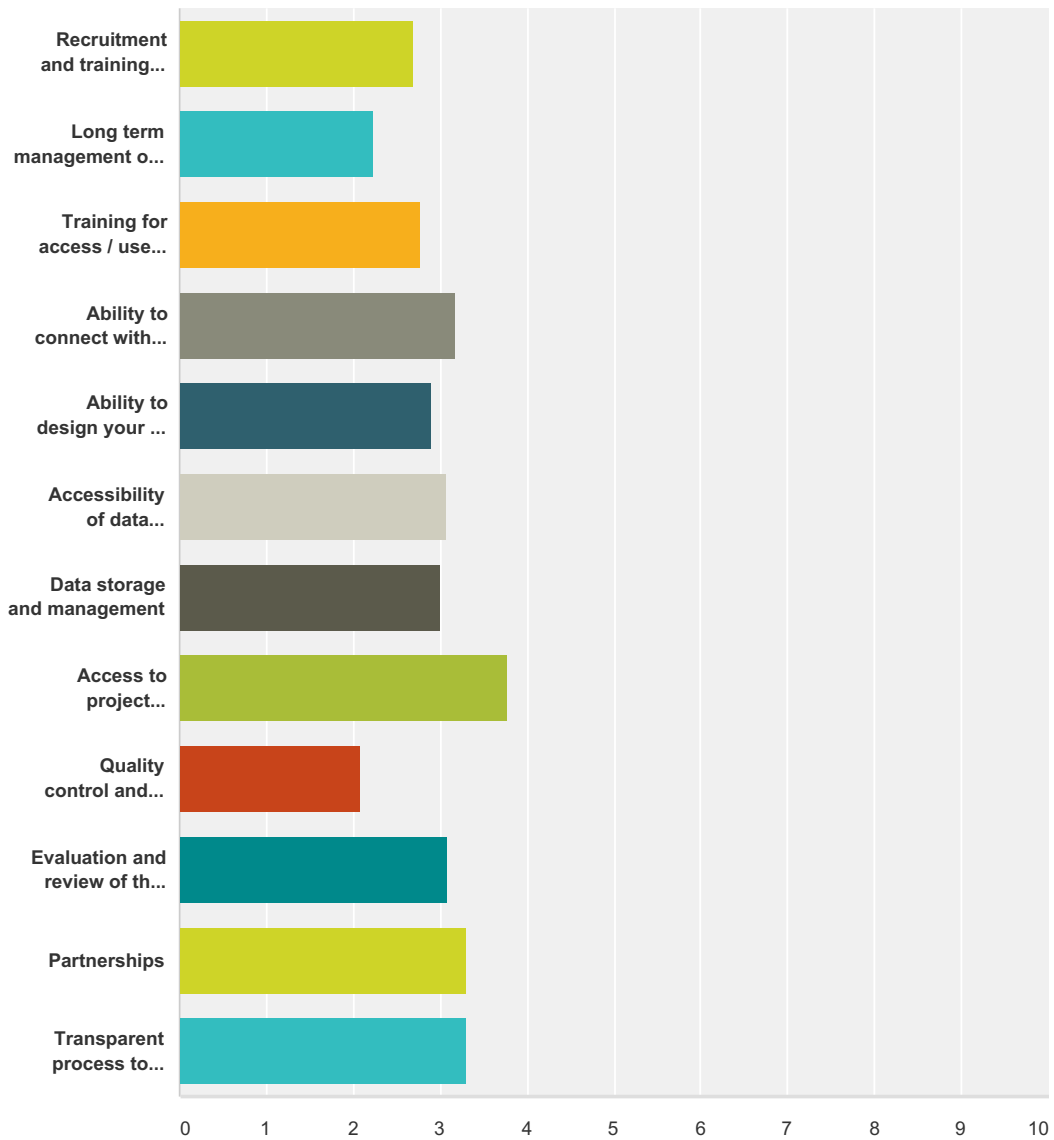
	1. Very Important to Me	2.	3.	4.	5. Not at all Important to Me	Total	Weighted Average
Recruitment and training of volunteers	58.70% 27	23.91% 11	15.22% 7	2.17% 1	0.00% 0	46	1.61
Long term management of volunteers	32.61% 15	39.13% 18	26.09% 12	2.17% 1	0.00% 0	46	1.98
Training for access / use of data	36.96% 17	30.43% 14	30.43% 14	2.17% 1	0.00% 0	46	1.98

Ability to connect with scientists who have a project and need participants to collect data	58.70% 27	30.43% 14	10.87% 5	0.00% 0	0.00% 0	46	1.52
Ability to design your own project	8.70% 4	13.04% 6	39.13% 18	17.39% 8	21.74% 10	46	3.30
Accessibility of data collected	50.00% 23	34.78% 16	13.04% 6	2.17% 1	0.00% 0	46	1.67
Data storage and management	56.52% 26	21.74% 10	17.39% 8	4.35% 2	0.00% 0	46	1.70
Access to project progress and final reports	60.87% 28	26.09% 12	10.87% 5	2.17% 1	0.00% 0	46	1.54
Quality control and assurance of the data collected	91.30% 42	4.35% 2	4.35% 2	0.00% 0	0.00% 0	46	1.13
Evaluation and review of the program	54.35% 25	28.26% 13	15.22% 7	2.17% 1	0.00% 0	46	1.65
Partnerships	56.52% 26	21.74% 10	19.57% 9	2.17% 1	0.00% 0	46	1.67
Transparent process to select projects for the program	54.35% 25	26.09% 12	17.39% 8	2.17% 1	0.00% 0	46	1.67

#	If there are other components not included above, please list below.	Date
1	The ability to design your own project is important but this must be developed with scientific review and scientific protocols	1/7/2016 8:17 PM
2	Adequate study design is very important	1/6/2016 10:33 AM
3	Establishing realistic and achievable objectives (1); Continuous and useful feedback geared towards participants at all phases of the project (1)	1/4/2016 12:43 PM
4	Recognition of volunteers	12/17/2015 4:03 PM
5	Controlling the cost . Getting the most for the Money thru efficiency and economical design managing people and equipment	12/15/2015 12:42 PM
6	Regional oversight to identify data needs and ensure that collection efforts fulfill those needs so that resources are utilized effectively.	12/15/2015 11:36 AM

Q5 What components do you think will be most CHALLENGING (e.g. the most difficult) in the design of a citizen science program? Rank each component on a scale of 1 to 5, with 1 being most challenging and 5 being least challenging.

Answered: 46 Skipped: 1



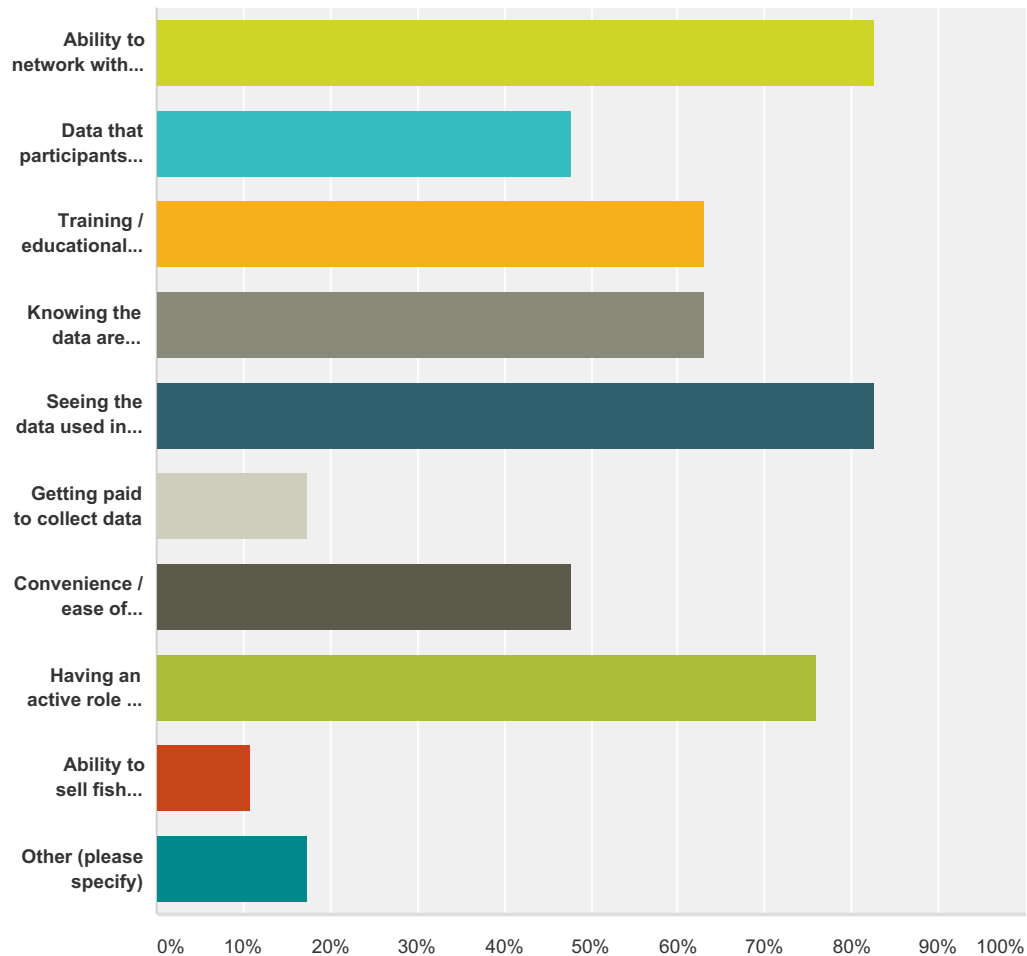
	1. Very Challenging to Me	2.	3.	4.	5. Not at all Challenging to Me	Total	Weighted Average
Recruitment and training of volunteers	15.22% 7	19.57% 9	47.83% 22	15.22% 7	2.17% 1	46	2.70
Long term management of volunteers	32.61% 15	23.91% 11	32.61% 15	8.70% 4	2.17% 1	46	2.24

Training for access / use of data	6.52% 3	34.78% 16	39.13% 18	13.04% 6	6.52% 3	46	2.78
Ability to connect with scientists who have a project and need participants to collect data	8.70% 4	19.57% 9	32.61% 15	23.91% 11	15.22% 7	46	3.17
Ability to design your own project	17.39% 8	15.22% 7	41.30% 19	10.87% 5	15.22% 7	46	2.91
Accessibility of data collected	10.87% 5	21.74% 10	23.91% 11	36.96% 17	6.52% 3	46	3.07
Data storage and management	13.04% 6	17.39% 8	34.78% 16	26.09% 12	8.70% 4	46	3.00
Access to project progress and final reports	6.52% 3	2.17% 1	23.91% 11	41.30% 19	26.09% 12	46	3.78
Quality control and assurance of the data collected	45.65% 21	17.39% 8	23.91% 11	8.70% 4	4.35% 2	46	2.09
Evaluation and review of the program	10.87% 5	19.57% 9	30.43% 14	28.26% 13	10.87% 5	46	3.09
Partnerships	4.35% 2	10.87% 5	45.65% 21	28.26% 13	10.87% 5	46	3.30
Transparent process to select projects for program	4.35% 2	17.39% 8	36.96% 17	26.09% 12	15.22% 7	46	3.30

#	If there are components not included above, please list below.	Date
1		1/2/2016 12:40 PM
2	Cost, management, control of supplies/equipment to participate. Out of pocket costs to volunteers.	12/31/2015 12:17 PM
3	Funding will be the most challenging for Citizen Science. The demand on current available funds is going to be hard to overcome with out New Money coming from Congress. We needs Congress to be on board with Citizen Science. They should be informed and involved from the Beginning.	12/15/2015 12:49 PM
4	access to project progress and access to final reports are two very different things. Final reports are often easily accessible but finding updates on the project's progress is not.	12/14/2015 1:11 PM

Q6 What would encourage you to participate in a citizen science project? (Check all that apply.)

Answered: 46 Skipped: 1



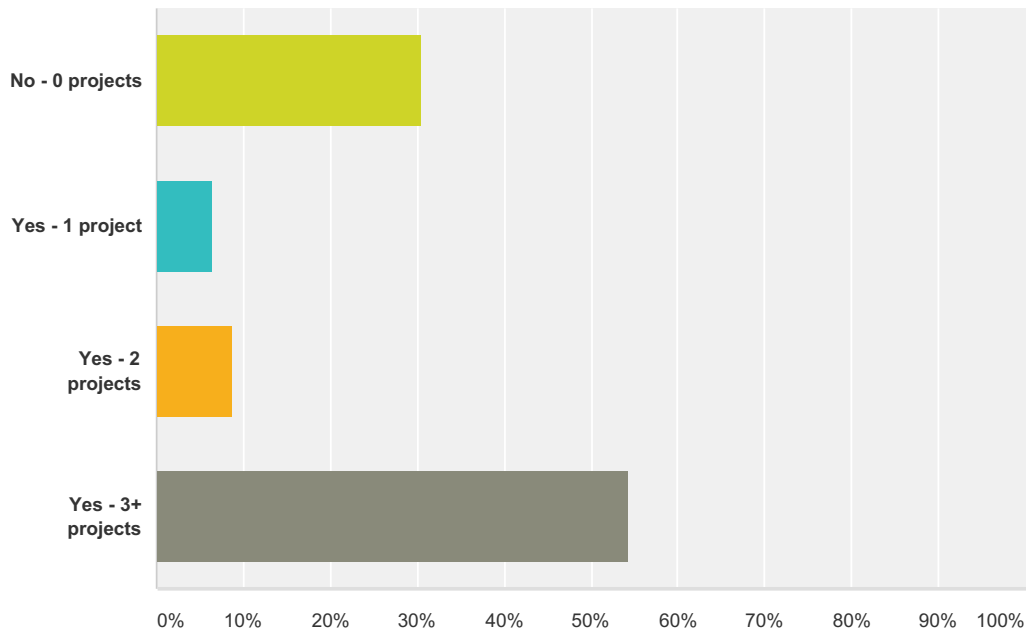
Answer Choices	Responses	
Ability to network with researchers, fishermen, and other stakeholders	82.61%	38
Data that participants can easily access	47.83%	22
Training / educational opportunities	63.04%	29
Knowing the data are credible because I helped collect them	63.04%	29
Seeing the data used in stock assessments and/or for management decisions	82.61%	38
Getting paid to collect data	17.39%	8
Convenience / ease of participation or data collection	47.83%	22
Having an active role in the science that is used to manage my fisheries	76.09%	35
Ability to sell fish during a closed season to offset the cost of research	10.87%	5
Other (please specify)	17.39%	8

Total Respondents: 46

#	Other (please specify)	Date
1	Getting paid to collect the data is not a necessity for a CS project. However, if there is money available for certain projects it would be an incentive to participate. The convenience factor will be important for some projects. As an example, if you were asked to put a temperature sensor on the boat or gear where the sensor stored the data that is a convenience of technology and all the fisherman would have to do is install the device and remove and send in at the appropriate time. The collection of data when it is convenient for you to do so is not what I envision as a CS project. However, there are projects such as fish rack collection at your convenience can yield valuable fisheries data.	1/7/2016 8:38 PM
2	a worthwhile project	1/6/2016 1:57 PM
3	As a user of the results, none of these questions are relevant	1/6/2016 10:35 AM
4	Taking part in shifting the fishery management focus away from restricting access and calculating waste to enhancing our fisheries, freedom, and food supply.	1/2/2016 12:44 PM
5	Collect quality data from people who it is difficult to track - example is private fisherman on their own boats, like me and my friends. Ability to get my peers more excited, interested, enrolled and compliant with fishery management rules and regulations. Educate my peers, with me having more validity with them due to my known participation in an open, honest and scientific program to determine the state of fisheries.	12/31/2015 12:22 PM
6	This question does not apply to me	12/16/2015 1:48 PM
7	The opportunity to help provide basic Life History and all other fisheries data and information critically needed for stock assessments and management of our South Atlantic stocks.	12/15/2015 1:00 PM
8	Clear goals and objectives and a robust design for ensuring data are representative of the fishery and useful for useful for stock assessment and management	12/15/2015 11:40 AM

Q7 Other than reporting landings through federal and state data collection programs (e.g. MRIP and state trip tickets), have you ever been involved in fisheries research or data collection projects?

Answered: 46 Skipped: 1



Answer Choices	Responses	
No - 0 projects	30.43%	14
Yes - 1 project	6.52%	3
Yes - 2 projects	8.70%	4
Yes - 3+ projects	54.35%	25
Total		46

#	If you wish, please include details on the projects you have been involved with.	Date
1	To many to list!	1/8/2016 7:59 AM
2	King mackerel otolith shape and microchemistry collection and analysis. 2 years. Collected biological samples from KM caught on my vessel and from area fish houses. Lengths, weights, reproductive tissue and otoliths. Mutton snapper biological sampling project. 3 years. Provided samples from catch to FWC researchers that collected biological data.	1/7/2016 8:49 PM
3	N/A -- researcher, not harvester	1/6/2016 10:31 AM
4	I am a research fishery biologist, so have been involved (and continue to be involved) in many fisheries research projects, including cooperative (with industry) projects focused on red snapper and blueline tilefish.	1/4/2016 5:27 PM
5	I've been involved in fisheries research, just not citizen science related projects	1/4/2016 11:15 AM
6	Testing descending devices.	1/2/2016 12:45 PM
7	Citizen SAV monitoring in the Chesapeake Bay. Record at sea Sea Turtle sightings, time, date, and location.	12/31/2015 12:25 PM
8	I work with the SCDNR MARMAP program.	12/29/2015 4:16 PM

9	I coordinated with my Sea Grant Colleagues and a researcher at FWC to develop the a Goliath Grouper citizen science project where trained volunteers did conduct diving surveys of goliath grouper abundance and size distribution on artificial reefs in SW Florida. 2015 marked the 6th year we collected data for the project: Contact Angela Collins with Florida Sea Grant (acollins@ufl.edu) or Bryan Fluech with Georgia Sea Grant (fluech@uga.edu) for more information. Florida Sea Grant initiated a project with charter captains and private anglers to assess the use of various fish descending gear devices when dealing with barotrauma; data collected were shared with state and federal fisheries managers, which helped contribute to changes on allowance of descending gear devices in the Gulf of Mexico I coordinated with a Ph.D student from the University of S Florida to collect fin clip samples from juvenile goliath grouper as part of his dissertation work. I helped recruit anglers and coordinated trainings between them and the student so that they could legally collect samples and submit them. I coordinated with FWC to promote their tarpon DNA collection study program, which involved anglers collecting DNA samples from the fish they catch. I organized training workshops where project managers could explain their projects, and what they could learn about the fishery from the data collected by the anglers. We also worked with our communications team to develop a video on the program (https://www.youtube.com/watch?v=qzDwh5HcpJA).	12/17/2015 4:19 PM
10	I am currently collecting data for water parameters do, ph, temp, turbidity), I have done intercept interview of recreational fishermen to identify and weigh their catch, towed plankton net for conch larvae and run post larvae lobster collectors and been involved in coral and sponge restoration projects.	12/16/2015 12:38 PM
11	Crustation and Fin-fish projects both State and Federal helping design and working with Agency scientist on My Vessels performing Juvenile studies, Taggin and, mapping spawning stock aggregations.	12/15/2015 1:09 PM
12	I have been involved in developing proposals, recruiting fishery participants, designing survey methods, providing oversight for collecting data cooperatively in the field, managing data, analyzing data, sharing data for use in assessments, and reporting results.	12/15/2015 11:46 AM
13	Provided fishing locations to the NMFS, FWC, MARMAP, SEFIS and the SAFMC. Worked with Protected Resources Division of the NMFS developing TEDs during the 1980's. Provided genetic shark fin samples for analysis. Helped the NMFS to develop a shark fleet reduction program.	12/14/2015 1:40 PM
14	Red snapper biological data collection, from point of view of GADNR staff	12/14/2015 1:05 PM
15	Tagging and collecting specimens of barracuda Collecting tuna specimens Fin clip and dna specimens of tarpon Tagging swordfish, sailfish, swordfish and mahi	12/14/2015 12:56 PM

Q8 What did you like about the project(s) you participated in (e.g. what would you like to see duplicated in future projects)?

Answered: 32 Skipped: 15

#	Responses	Date
1	N/A Administered Project	1/11/2016 11:04 AM
2	Synergistic interaction between scientists and fishers. Co-learning and jointly developing ideas for solving problems and achieving desired goals	1/8/2016 3:43 PM
3	I like the close interaction between fishermen, scientists and managers that starts prior to question identification and continues through project design and methods development, data collection, analysis, and eventual policy use of the data. The continuous interaction is highly valuable for everyone involved.	1/8/2016 9:50 AM
4	I felt that I was doing the right thing offering my knowledge . Doesn't always come out that way!	1/8/2016 8:03 AM
5	Working with scientists that designed a research project that would answer research needs from the last SEDAR assessment. Training on correct methodology for collecting and processing biological samples.	1/7/2016 9:01 PM
6	Working in the field, the data collection itself.	1/7/2016 3:07 PM
7	Standardized and simple. If anything is going to be useful for the general public it must be simple to understand and it must be easily replicated.	1/6/2016 8:39 PM
8	ability to actively participate in data collection and see the trends "real time" as we collected data	1/6/2016 5:00 PM
9	seeing the results and they were positive for the fishery	1/6/2016 1:59 PM
10	I like seeing presentations of the research projects I've participated in, and it is nice to be thanked in the acknowledgements	1/6/2016 12:24 PM
11	Data that is relevant to assessment and management collected within a robust experimental design.	1/6/2016 11:36 AM
12	Research was used to further understanding of biology/life history of various reef fishes.	1/6/2016 10:39 AM
13	NA	1/6/2016 10:36 AM
14	getting out in the field	1/6/2016 8:57 AM
15	Motivated volunteers tagging fish for 3+ years and providing reliable information.	1/5/2016 2:36 PM
16	Use of project results to fill information gaps relevant to monitoring, assessment and management.	1/4/2016 5:30 PM
17	collaborative learning and building trust between a varied project team	1/4/2016 4:34 PM
18	Building a history of project / program success by starting with achievable deliverables where participants can easily see the impact of their work.	1/4/2016 12:52 PM
19	I liked being part of a project that focused on a positive solution.	1/2/2016 12:54 PM
20	I enjoyed an ability to participate and a feeling that in a small way I could make a difference and be more qualified to have a point of view.	12/31/2015 12:33 PM
21	In terms of collaborative projects, the ability to obtain data outside of the realm of our sampling season and scale is a huge bonus. We are limited in terms of vessels, man power, and of course funds to be as thorough as we would like to.	12/29/2015 4:20 PM
22	Working collaboratively with fishermen. Fishermen felt like they were helping the fishery.	12/28/2015 2:58 PM
23	Recognition for the anglers/divers who participated. When available, promotional items were given to participants.	12/17/2015 4:22 PM
24	Contributing to the knowledge base and working with others to interest them in the process.	12/16/2015 12:40 PM
25	Cost efficiency of Cooperative projects which leads to more projects. sharing of Knowledge between Agency and Stakeholders. Scientific Ground truthing of what fisherman see on the water. Sampling where we conduct the fisheries. Having the ability to personally explain and defend the data and the results obtained from their use.	12/15/2015 1:20 PM

26	Developing cooperative partnerships with the fishermen and collecting data within the fishery that is representative and directly applicable to the fishery (i.e. does not rely on experimental or controlled designs, but measures conditions directly within the fishery that results are being applied to).	12/15/2015 11:51 AM
27	n/a	12/14/2015 2:15 PM
28	Making information available that was previously unknown to scientists and managers.	12/14/2015 1:42 PM
29	High quality data directly used for assessments and management	12/14/2015 1:41 PM
30	enthusiasm of the fishermen usefulness of the data to local management	12/14/2015 1:39 PM
31	Being able to access the biological data on harvested fish that, without the program participants, would have been unavailable. In a fishery that is closed most of the year, access to biological data from fisheries-dependent sampling is so limited.	12/14/2015 1:08 PM
32	Everything was great. Learning of the travels and growth of specimens was most rewarding	12/14/2015 12:58 PM

Q9 What did you dislike about the project(s) you participated in (e.g. what would you want to change for future projects)?

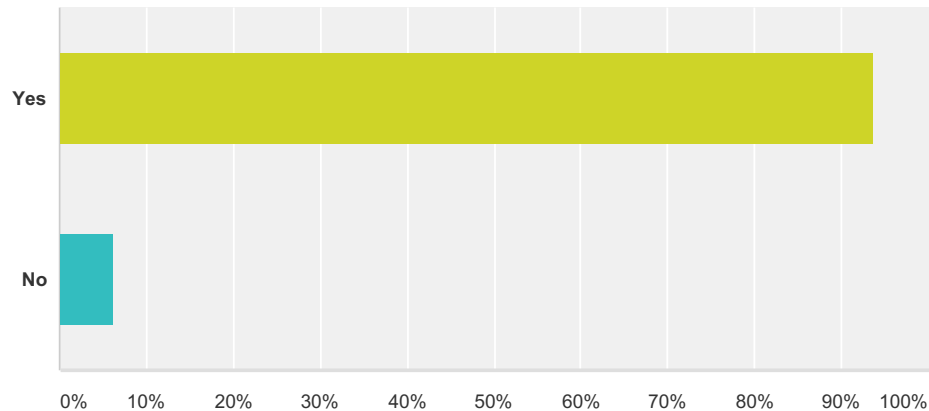
Answered: 32 Skipped: 15

#	Responses	Date
1	N/A Administered Project	1/11/2016 11:04 AM
2	Misunderstanding from fishers re. their role and why the project could not be conducted in the way that was most convenient for them	1/8/2016 3:43 PM
3	poor communication in some cases.	1/8/2016 9:50 AM
4	Making sure the final reports were give to me the review With plenty of time with the scientist or researcher to properly review for corrections .	1/8/2016 8:03 AM
5	One project did not follow up and send me the results of the study which is a critical need. Also I had developed a king mackerel project but could not find a partner to participate. It was the year of the Gulf oil spill which complicated the process but that can be a problem for fishermen. It would be interesting to know if there are any co-operative research projects that were initiated by fishermen.	1/7/2016 9:01 PM
6	Analyzing the data.	1/7/2016 3:07 PM
7	I disliked projects that were complex and poorly designed. If data are to be collected by members of the public they have to be simple and well designed so that there is some utility to the resulting data.	1/6/2016 8:39 PM
8	administering those projects I have been in charge of!!	1/6/2016 5:00 PM
9	not much	1/6/2016 1:59 PM
10	Participating in projects that are poorly designed	1/6/2016 12:24 PM
11	Poor experimental design.	1/6/2016 11:36 AM
12	More collaboration with industry	1/6/2016 10:39 AM
13	NA	1/6/2016 10:36 AM
14	the bureaucracy	1/6/2016 8:57 AM
15	Finding the right motivated volunteers was very difficult. Less than 1 in 20.	1/5/2016 2:36 PM
16	Federal regulations regarding award of contracts have benefits but make cooperative projects between NMFS and industry difficult to initiate.	1/4/2016 5:30 PM
17	difficulty in obtaining information following project completion	1/4/2016 4:34 PM
18	Projects that are too ambitious or too unrealistic in nature. Projects that did not devote enough time or resources to participant recruitment, engagement and retention during ALL phases of project / program.	1/4/2016 12:52 PM
19	Researchers should be more prepared for handling fish while tagging them and collecting data. (e.g. placing a wet towel over the fish's eyes and using something like a fishgrip to calm and control them) I also disliked watching fish float away because it was time to release one without assistance.	1/2/2016 12:54 PM
20	Things sort of went in to black box for me, with little ability to track what actually happened or what was the outcome from my participation. One way communication.	12/31/2015 12:33 PM
21	The part which I dislike most in the projects I have participated is the inconsistent nature of sample collections at times, whether it is frequency, spatial range, or consistency in terms of following protocol.	12/29/2015 4:20 PM
22	Having more fishermen involved in the project.	12/28/2015 2:58 PM
23	Its important to communicate with the participants about how the data are being used. This makes them feel like there is a valid reason for them to participate in the projects. Otherwise, the feel like it was a waste of time.	12/17/2015 4:22 PM
24	Cold interviewing is challenging. Many people don't trust you. Thought I was law enforcement connected.	12/16/2015 12:40 PM
25	Duration of project because of lack of funding. Convince congress and Managers to provide more funding.	12/15/2015 1:20 PM

26	No stable funding source to support long-term fishery-dependent monitoring after they are initiated. Limited to seeking short-term grants to develop and test new methods and expend a lot of effort recruiting fishermen and getting buy-in only to exhaust funds after 1 to 3 years of data collection. Very frustrating for the researchers and the fishermen in the South Atlantic region	12/15/2015 11:51 AM
27	n/a	12/14/2015 2:15 PM
28	How long it takes to get cooperative work started, and the years it takes before being able to utilize the material.	12/14/2015 1:42 PM
29	Data quality control and access to data.	12/14/2015 1:41 PM
30	make the data more publicly available	12/14/2015 1:39 PM
31	Despite outreach and monetary incentive (Bass Pro Shops gift certificate), the number of participants was still very small.	12/14/2015 1:08 PM
32	Not much. Most projects were very well run	12/14/2015 12:58 PM

Q10 Were you satisfied with the instructions and training you received for the project(s) you participated in?

Answered: 32 Skipped: 15

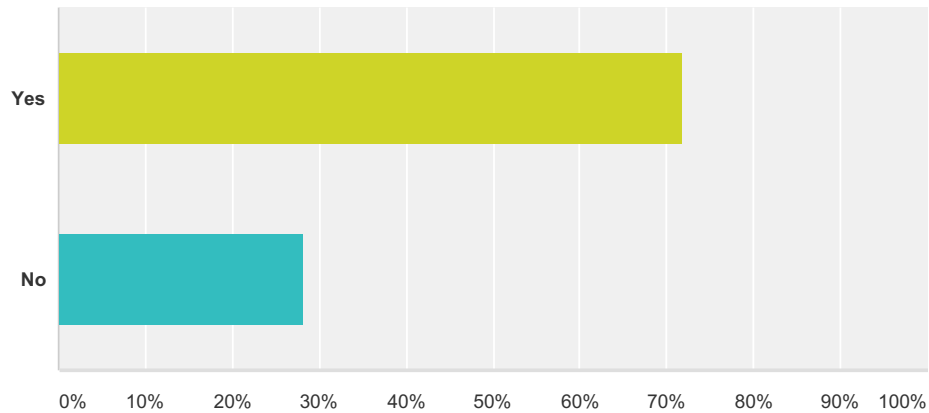


Answer Choices	Responses
Yes	93.75% 30
No	6.25% 2
Total	32

#	If you wish, please share any details of what aspects of the training worked well and/or what didn't work well.	Date
1	With my knowledge we were able to open the eyes of many of the researchers to adjust their criteria for the project. Also I was able to learn more about there objectives on the project . Any many other things.	1/8/2016 8:07 AM
2	what worked well: there were four major roles, and each person had the opportunity to serve in each of those roles; there was little overlap, so it was easy to establish a division of labor and for each participant to quickly educate and "train" the next person serving in that role.	1/6/2016 5:15 PM
3	NA	1/6/2016 10:36 AM
4	Training was actually very minimal, as nothing really needed. Most came from reading published instructions.	12/31/2015 12:37 PM
5	I am typically involved with the training and instructions, so this is not applicable.	12/29/2015 4:22 PM
6	I was one of the researchers (I was a technician under the researcher doing the work). The fishermen had no problems with the fishing part which is what we needed for the research project. They were very accommodating to requests and they made suggestions themselves as we worked.	12/28/2015 3:01 PM
7	Face to face time (workshop/trainings) is important so there are plenty of opportunities to answer questions and provide context of why the project is being conducted	12/17/2015 4:23 PM
8	The willingness to answer all questions. and open conversation between Agency and Fisherman. Also the commitment of both to explain how and why decisions are made, have been vital to the success we have had. Both must have a desire to reach the goals of project at some cost of Personal Time and Money.	12/15/2015 1:29 PM
9	this question is not applicable to me, projects I have been involved in I have been the one responsible for providing instructions/training	12/15/2015 11:53 AM
10	n/a	12/14/2015 2:16 PM
11	Sometimes with some cooperative research the samples were not readily available.	12/14/2015 1:44 PM
12	Question is N/A for me	12/14/2015 1:42 PM

Q11 Were you satisfied with the availability of results / reports for the projects you participated in?

Answered: 32 Skipped: 15



Answer Choices	Responses
Yes	71.88% 23
No	28.13% 9
Total	32

#	If you wish, please share any details of why you were or were not satisfied with the availability of results.	Date
1	I elaborated on this in the earlier question.	1/8/2016 8:07 AM
2	One project sent me the results the other did not. Again, I believe that it is critical that fishermen receive the results of CS projects.	1/7/2016 9:05 PM
3	the person heading up the project (chief scientist) shared simple summary data (total # of fish tagged, highest # tagged each day, length distribution, etc) within a week of the project conclusion. this is an annual project, so these results are added to a database for the entire time series.	1/6/2016 5:15 PM
4	Volunteers like to see a summary of the results in an annual report	1/6/2016 12:26 PM
5	Tough to get reports from volunteers	1/6/2016 10:36 AM
6	In one project, I was unsuccessful in communicating project results to participants in what I thought would have been a timely manner. Such failures, if they happen on a regular basis, can affect the credibility of the program. While resources may be needed to assist with data collection, enough resources should be set aside to attend to participant feedback and communication, especially if developing a program with multiple projects. This may actually take more time and resources than the data collection.	1/4/2016 1:01 PM
7	Never got to see the final report.	1/2/2016 12:55 PM
8	I was very neutral on this. No extreme satisfaction, but not dissatisfied. Pretty low stakes things for me and of general interest only for the subject projects.	12/31/2015 12:37 PM
9	I am typically involved with the report preparation, so this is not applicable.	12/29/2015 4:22 PM
10	Yes the fishermen were professional and helpful in helping to acquire data.	12/28/2015 3:01 PM
11	The results have been made available to Me, and are being used in stock assessments now and in the future.	12/15/2015 1:29 PM
12	this question is not applicable to me, projects I have been involved in I have been the one responsible for reporting results	12/15/2015 11:53 AM
13	n/a	12/14/2015 2:16 PM

14	Once the projects were completed the material generally was available for use.	12/14/2015 1:44 PM
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Q12 In a few sentences, what benefits would you hope to get out of a citizen science program in the South Atlantic?

Answered: 46 Skipped: 1

#	Responses	Date
1	High quality data that could feed into stock assessments and other fisheries science efforts.	1/11/2016 2:58 PM
2	More data collected over a larger geographic area at a cost less than that required for the same program done exclusively by biologists. Better "buy in" from participants with regards to management decisions.	1/11/2016 11:07 AM
3	Better integration of the fishing industry in the research and management process. Buy-in from fishers re. the challenges of collecting valid fisheries data.	1/8/2016 3:45 PM
4	I hope that the program can serve as a way to gather a great amount of high quality data that can be used to support stock assessments and the transition to a more holistic, ecosystem-based management program.	1/8/2016 9:51 AM
5	Not sure...	1/8/2016 9:22 AM
6	To outreach to the public so their knowledge on a public resource could be better understood. And why the importance of participation in the process of managing a public resource for their access to it . And just how important the commercial industry is to the consumer.	1/8/2016 8:12 AM
7	Increasing fishery data collection capacity. Documenting physical changes in the SA ocean environment. Cost effective research utilizing rec and comm vessels. Collaboration between scientists and fishermen in a process where both learn from each other. Fishermen are more likely to "own" the results of projects in which they are involved. Broadening the scope of stakeholders involved in CS projects. Lifelong learning is a positive aspect of CS projects. Developing better stewardship of our fishery resources.	1/7/2016 9:15 PM
8	A mechanism to truly bolster state/federal data collection to aid in management decisions. Building more relationships with constituents and scientists. Learning more about the scientific method and what really goes into the data collection and analysis, which eventually leads to management decisions.	1/7/2016 3:09 PM
9	I hope that I can contribute to the design of a program, which can provide simple and useful long term standardized data that can be collected by anyone with very limited training.	1/6/2016 8:41 PM
10	I would hope to fill in gaps in existing information (and collect needed new information) in a cost-effective manner that builds trust between scientists, managers and constituents and gives the latter some "skin in the game".	1/6/2016 5:17 PM
11	It would be a great start of bringing together all aspects of the fishery together and being able to trust the data, fisherman and scientists to make decisions on any certain project.	1/6/2016 3:08 PM
12	Better data collection and "buy in" by the public.	1/6/2016 2:50 PM
13	Good worthwhile projects for fishermen.	1/6/2016 2:03 PM
14	Citizens are very capable of collecting data. I think transparency in the process and ability to participate will lead to more educated fishermen/women about the science of stock assessments and add more data points for fisheries management.	1/6/2016 12:29 PM
15	More robust data collection resulting in more reliable stock assessments.	1/6/2016 12:12 PM
16	Relevant data that fills data gaps.	1/6/2016 11:37 AM
17	Citizen science program could help provide supplemental data to aid management/research/assessments.	1/6/2016 10:40 AM
18	Examples of how we move out on this nationally	1/6/2016 10:37 AM
19	1) I would like to see expanded participation and trust in fisheries management by harvesters. Having role data collection and analysis should help grow confidence in management. 2) Better/more comprehensive data that SSC can use in decision-making, particularly for species that we have relatively little data on.	1/6/2016 10:35 AM
20	More and better data, leading to better management decisions. Citizen involvement in data collection and science, leading to better understanding and buy-in in science supported management decisions.	1/6/2016 9:18 AM
21	Collection of currently unavailable information (discards, biological samples, etc) on a continuing basis.	1/5/2016 2:38 PM

22	I would hope to see the establishment of projects filling prioritized data gaps relevant to fisheries and environmental monitoring, assessment and management.	1/4/2016 5:32 PM
23	More creative solutions to fisheries management problems arising from the ability to bring more experience to bare. More expansive sampling that would translate into a more accurate picture of a situation.	1/4/2016 4:38 PM
24	A successful South Atlantic citizen science program would provide participants with an opportunity to be engaged in data collection that supplements and /or improves existing data streams used to manage fisheries resources.	1/4/2016 1:13 PM
25	Ideally, having the management process become more transparent for the fishermen and letting them feel as if they are a part of the process	1/4/2016 11:16 AM
26	I hope to see solutions that collect better data through collaborative research, underwater video, and tagging programs. I also hope to see a project that experiments with trapping lionfish. Finally, I hope to see a shift in the fishery management mindset that focuses more on enhancing our fisheries and food supply than restricting our freedom to access them.	1/2/2016 1:07 PM
27	An ability to do more than simple advocacy to effect fisheries. Stronger involvement and increased intellectual challenge. I have a love of science and the ocean that has been lifelong.	12/31/2015 12:39 PM
28	An increase in knowledge while developing a trust with the fishing community. By participating in research, it gives the fishing community a stake in the project and helps them to better understand of the rationale behind research decisions, which in turn will lead to less confusion and animosity going forward. It also benefits the science community by providing data collected from extremely knowledgeable people who spend large amounts of time on the water, data which may not have been available any other way.	12/29/2015 4:27 PM
29	Fishermen feeling like they are involved in stock assessments for fisheries and that they have a say in how fisheries are managed.	12/28/2015 3:01 PM
30	Increase the number of samples, especially for fisheries that are not covered adequately under the current data collection mechanisms. To capture changes in the environment and fisheries, including those from frequent regulation changes.	12/21/2015 3:57 PM
31	Has the potential to provide fisheries user groups with a better understanding of the complexities of the management task. Has the potential to engage user groups directly in the research essential to effective management.	12/20/2015 9:25 AM
32	I would hope that LOCAL knowledge from sport fishermen and divers would have a greater impact on regulations Thank you	12/17/2015 7:46 PM
33	more real time data that are useful for managers and researchers. Also, greater collaboration and trust between different stakeholders for a common good.	12/17/2015 4:24 PM
34	I would like to see projects aimed at closing existing data gaps and providing data that can be used in stock assessments and management decisions. Projects that increase the involvement of the industry have the potential to increase the confidence in the data and the decisions based on those data. However, caution should be used if attempting to create non-collaborative and vetted projects as these may consume resources but produce data which are biased, contain too few data points are in some other way unsuitable for use.	12/16/2015 1:54 PM
35	I have found that most people like to participate in understanding our environment to some degree and can be a wonderful resource to enable collection of data in a way that enables scientists to be efficient with their funding sources. It also serves to educate the public and invites them to be part of a better understanding.	12/16/2015 12:44 PM
36	Having the satisfaction that as a fisherman, I did everything possible to produce data that genuinely reflects the accurate current status of the stocks. Knowing that our stocks will be managed sustainable for Maxium Yield for the American People who Own the Resources.	12/15/2015 1:35 PM
37	A mechanism for long-term funding with sufficient regional oversight to ensure that data collections are coordinated, that data collected across areas/states are compatible and can be used in combination in stock assessments, that data are representative of the fishery or can be properly weighted to correct for non-representative sampling, and that funded programs have clear goals and make real progress towards filling a particular data gap that improves stock assessment and management in the region.	12/15/2015 11:58 AM
38	Relationship building Thinking out side of the box Collaborative design and implementation of beneficial projects for use in management decisions	12/15/2015 11:07 AM
39	The ability To transfer my experience and observations into a scientific method. I would like gain more knowledge of the information that researchers are looking for.	12/14/2015 8:29 PM
40	The benefit of having stakeholders see their data used.	12/14/2015 4:51 PM
41	The ability to better understand the role of science in fishery management. And to educate other fisherman and consumers	12/14/2015 2:27 PM

42	To help analysts and managers to be able to conduct their work in a way that fishermen can buy into the results.	12/14/2015 1:45 PM
43	High quality data collection using scientifically solid methods. Stakeholder participation.	12/14/2015 1:43 PM
44	Active, enthusiastic engagement of fishermen in scientific projects that leads to measurable impacts to the state's resources	12/14/2015 1:40 PM
45	Being able to match the need/desire by our constituents to participate and provide data with the statistical limitations of self-selected datasets (i.e., anglers selecting themselves to voluntarily participate in data collection). Also, having clear ideas of projects we can target as a region, with increased efficiency and planning, would be very helpful.	12/14/2015 1:11 PM
46	Most important is gathering and sharing knowledge with the public that may help insure the continued survival of these resources	12/14/2015 1:00 PM

Q13 If you are willing to have workshop organizers contact you for more details about your responses, please enter your email address below.

Answered: 36 Skipped: 11

#	Responses	Date
1	laura.oremland@noaa.gov	1/11/2016 2:58 PM
2	wiggersr@dnr.sc.gov	1/11/2016 11:07 AM
3	You already have it, this is Luiz! :D	1/8/2016 3:45 PM
4	heymanwill@yahoo.com	1/8/2016 9:51 AM
5	carolyn.belcher@dnr.ga.gov	1/8/2016 9:23 AM
6	abundantseafood@gmail.com	1/8/2016 8:13 AM
7	mackattackben@att.net	1/7/2016 9:16 PM
8	michelle.duval@ncdenr.gov	1/6/2016 5:17 PM
9	rjolsen2@yahoo.com	1/6/2016 3:08 PM
10	dave@halyardsrestaurant.com	1/6/2016 2:51 PM
11	lparker@uga.edu	1/6/2016 2:03 PM
12	cfreeman23@bellsouth.net	1/6/2016 12:12 PM
13	tyandle@emory.edu	1/6/2016 10:35 AM
14	dbrame55@gmail.com	1/5/2016 2:39 PM
15	todd.kellison@noaa.gov	1/4/2016 5:32 PM
16	bakers@uncw.edu	1/4/2016 1:13 PM
17	lkrimsky@ufl.edu	1/4/2016 11:16 AM
18	freefish7@hotmail.com	1/2/2016 1:07 PM
19	rjlorenz@ec.rr.com	12/31/2015 12:39 PM
20	bublew@dnr.sc.gov	12/29/2015 4:27 PM
21	habeels@ufl.edu	12/28/2015 3:01 PM
22	pfishingfun@prodigy.net	12/20/2015 9:26 AM
23	Mrowfish@aol.com	12/17/2015 7:48 PM
24	fluech@uga.edu	12/17/2015 4:24 PM
25	julie.defilippi@accsp.org	12/16/2015 1:55 PM
26	simi01@bellsouth.net	12/16/2015 12:45 PM
27	hullsseafood@aol.com	12/15/2015 1:35 PM
28	Beverly.Sauls@MyFWC.com	12/15/2015 11:59 AM
29	Dukesa@dnr.sc.gov	12/15/2015 11:08 AM
30	Captainira@att.net	12/14/2015 8:29 PM
31	scott.smith@ncdenr.gov	12/14/2015 4:51 PM
32	Dcjeffcoat@comcast.net	12/14/2015 2:28 PM

33	DSF2009@aol.com	12/14/2015 1:45 PM
34	Reichertm@dnr.sc.gov	12/14/2015 1:44 PM
35	kathy.knowlton@gadnr.org	12/14/2015 1:11 PM
36	Captbouncer@bellsouth.net	12/14/2015 1:01 PM

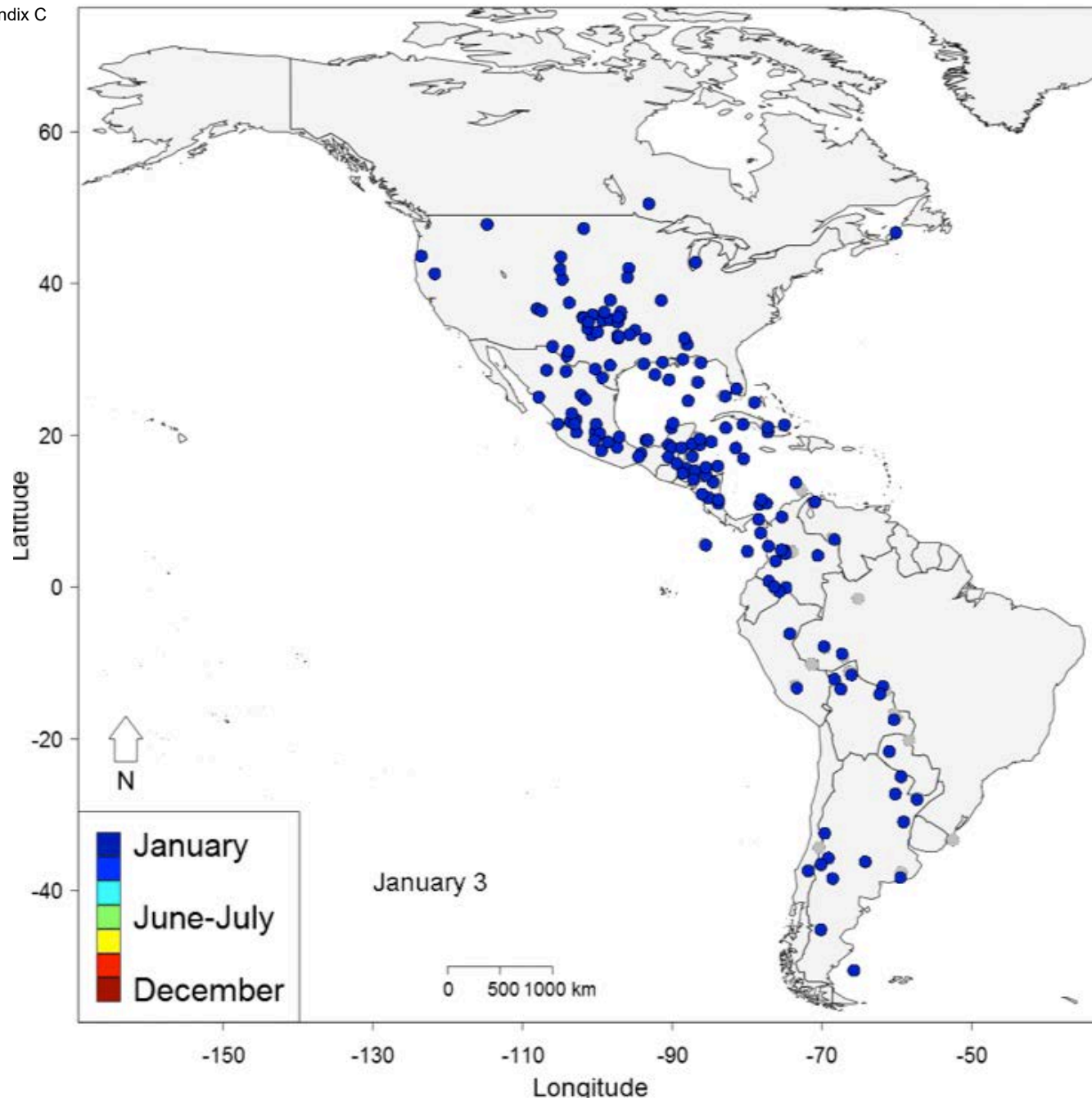
Fish are Just Like Birds!

Rick Bonney

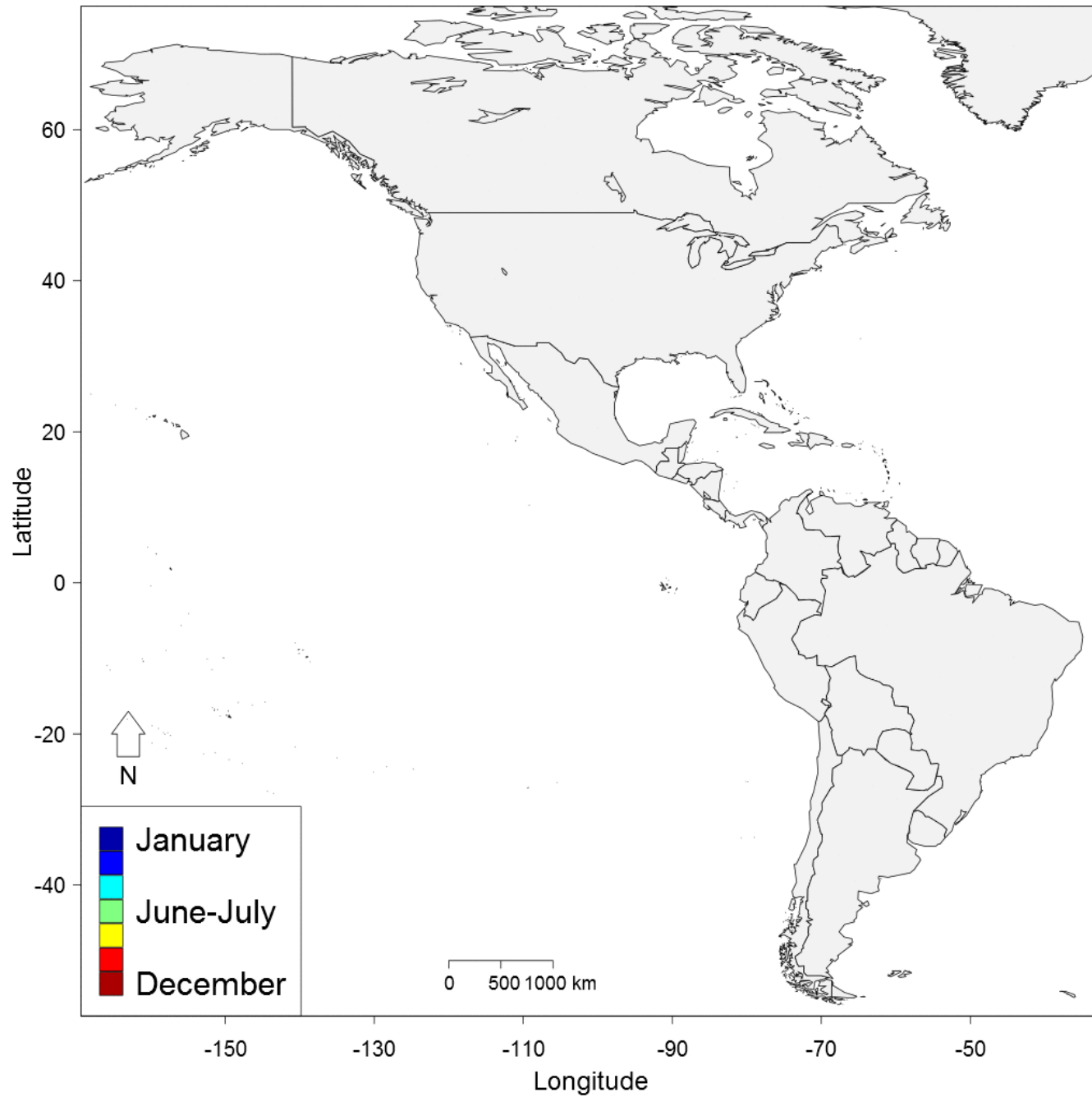
Director, Public Engagement in Science

The**Cornell**Lab  of Ornithology

Appendix C



Appendix C



Citizen Science



Appendix C

Scientific work undertaken by
members of the public, typically in
collaboration with scientists



Citizen Science ...

Is big, interdisciplinary, and productive

Has the potential to transform science and policy

Must be built through intentional design

Can be a major tool for fisheries councils!

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Types of Citizen Science

Data Collection

Data Processing

Community Science

Curriculum Projects

Types of Citizen Science

Data Collection

Data Processing

Community Science

Curriculum Projects

Appendix C

Monarch Larvae Monitoring Program

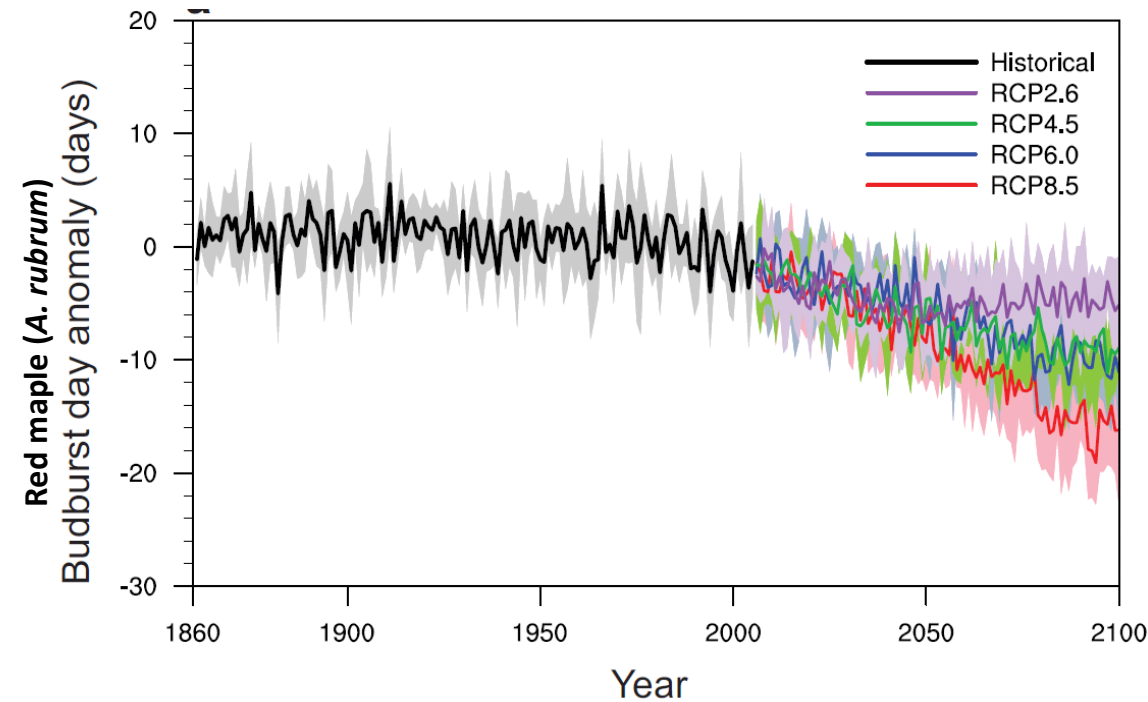


Photo, MLMP photo gallery

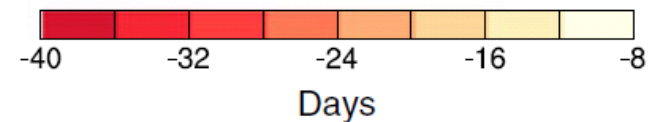
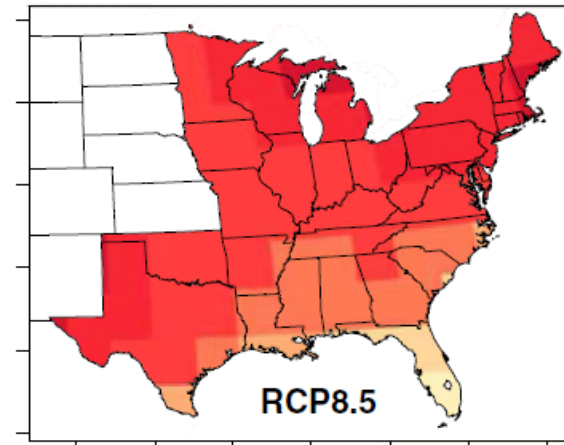
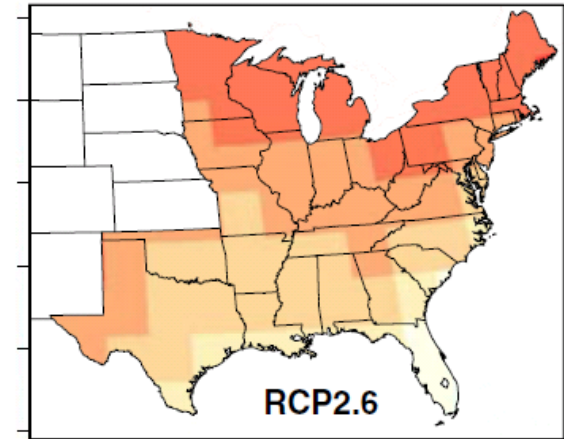


Photo, Christine Ruffo

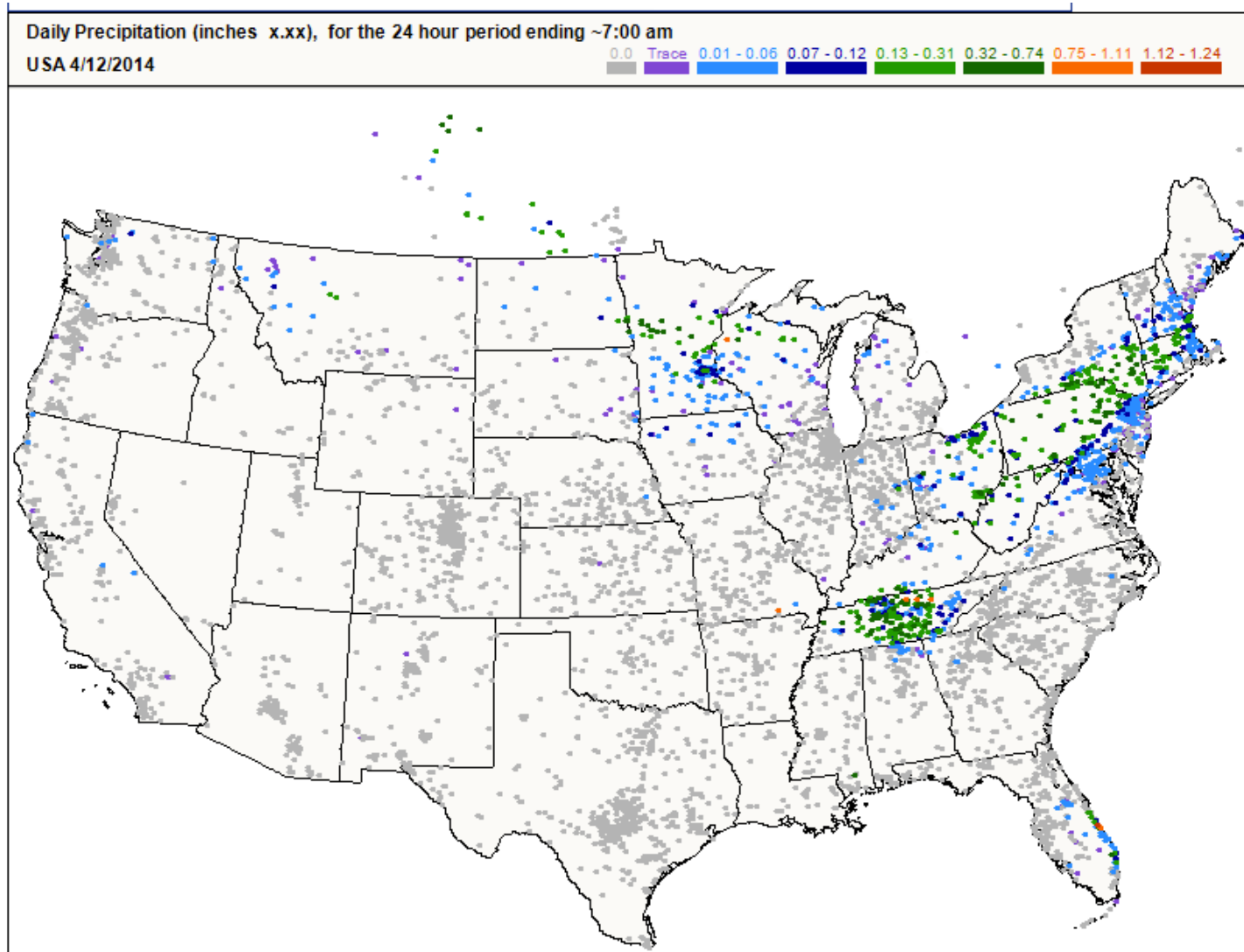
Nature's Notebook



A. rubrum, 2080-2099



Community Collaborative Rain, Hail, and Snow Network





Early Citizen Science

1880: Lighthouse Surveys



1890: National
Weather Service
Cooperative
Observer Program



1900: National Audubon Society
Christmas Bird Count



Types of Citizen Science

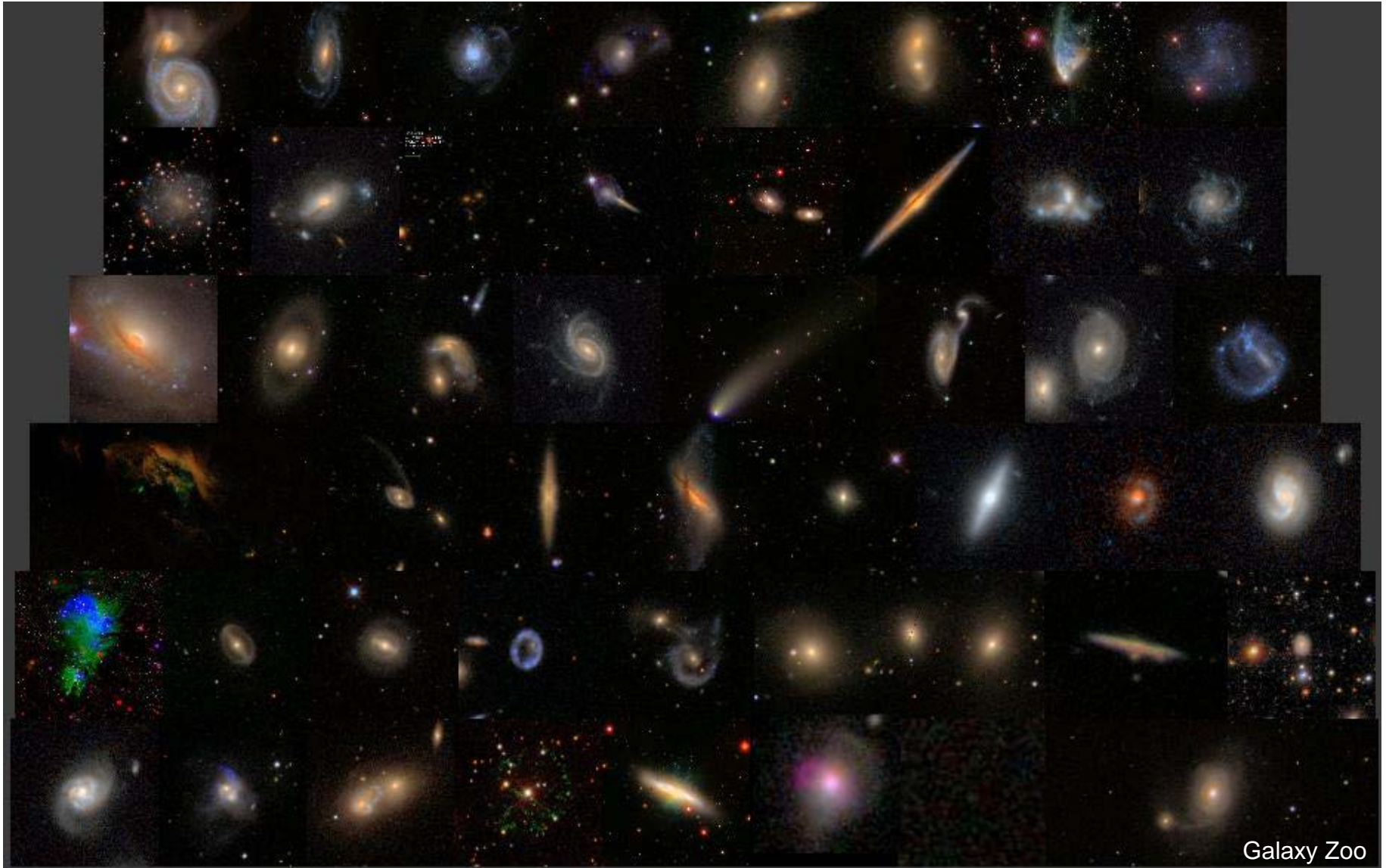
Data Collection

Data Processing

Community Science

Curriculum Projects

Galaxy Zoo



Climate



Model Earth's climate using historic ship logs

Help scientists recover Arctic and worldwide weather observations made by US Navy and Coast Guard ships.

oldWeather



Classify over 30 years of tropical cyclone data.

Scientists at NOAA's National Climatic Data Center need your help.

CycloneCenter

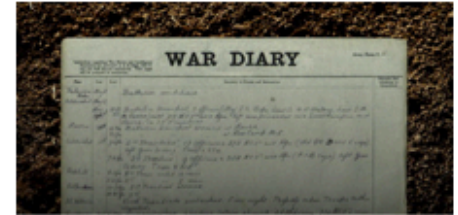
Humanities



Study the lives of ancient Greeks

The data gathered by Ancient Lives helps scholars study the Oxyrhynchus collection.

ANCIENT LIVES



Explore soldiers' diaries from the First World War

Annotate and tag diaries from the First World War.

OPERATION WAR DIARY

Nature



Hear Whales communicate

You can help marine researchers understand what whales are saying



Help explore the ocean floor

The HabCam team and the Woods Hole Oceanographic Institution need your help!



You're hot on the trail of bats!

Help scientists characterise bat calls recorded by citizen scientists.



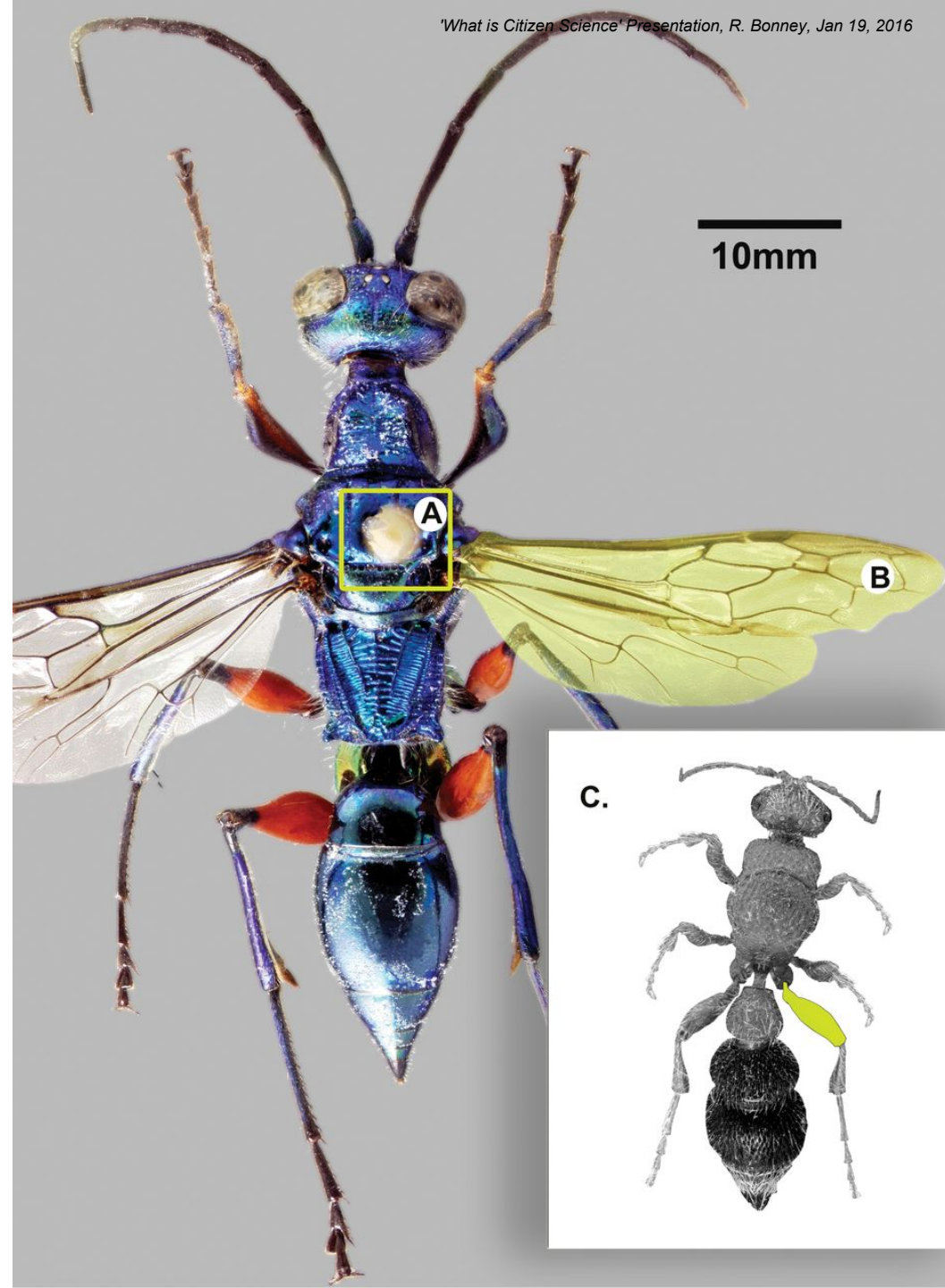
Go wild in the Serengeti!

We need your help to classify all the different animals caught in millions of camera trap images.

Volunteers can:

- Transcribe
- Georeference
- Annotate

Will greatly increase
scientific utility of
specimens



Types of Citizen Science

Data Collection

Data Processing

Community Science

Curriculum Projects

Water quality monitoring



The History of the San Juan Headwaters Forest Health Partnership

A 2009 meeting in Pagosa Springs, CO highlighted the need to include all stakeholders in forest management activities, leading to the formation of the San Juan Headwaters Forest Health Partnership, which describes its mission as "pro-active, collaborative approaches to improving the health and long-term resilience of communities by addressing forest and watershed health." By bringing land managers, businesses, community members, and environmental groups together to discuss project needs, locations, goals, and impacts before the projects are initiated, San Juan Headwaters has been able to address concerns and build support for projects that are determined to be relevant and important. The group is locally built, is driven by the local communities, and looks to advance the local economy and health.



[Read the case study >](#)

Types of Citizen Science

Data Collection

Data Processing

Community Science

Curriculum Projects

INVESTIGATOR'S FIELD JOURNAL | MONARCHS

Driven to Discover



BirdSleuth

Curriculum

Professional Development



Fee-based kits & free
downloads



Online & in person

Citizen Science

Is big, interdisciplinary, and productive

Has potential to transform science and policy

Must be built through intentional design

Can be a major tool for fisheries councils!

Impacts of Citizen Science

Increasing Scientific Knowledge

Informing Science Policy

Impacts of Citizen Science

Increasing Scientific Knowledge

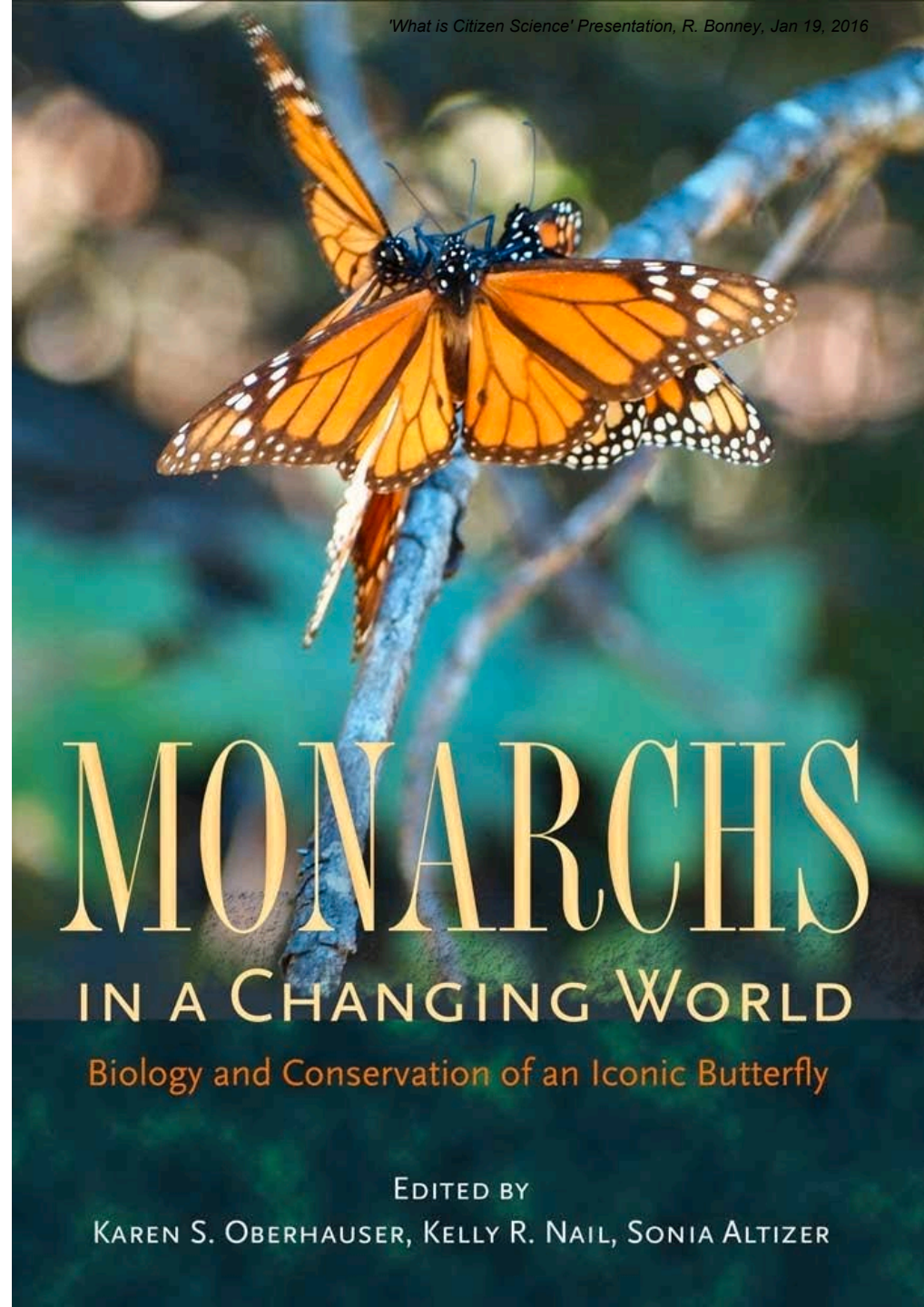
Informing Science Policy



Discovery of wintering grounds

Population and migration dynamics

Interactions with crops



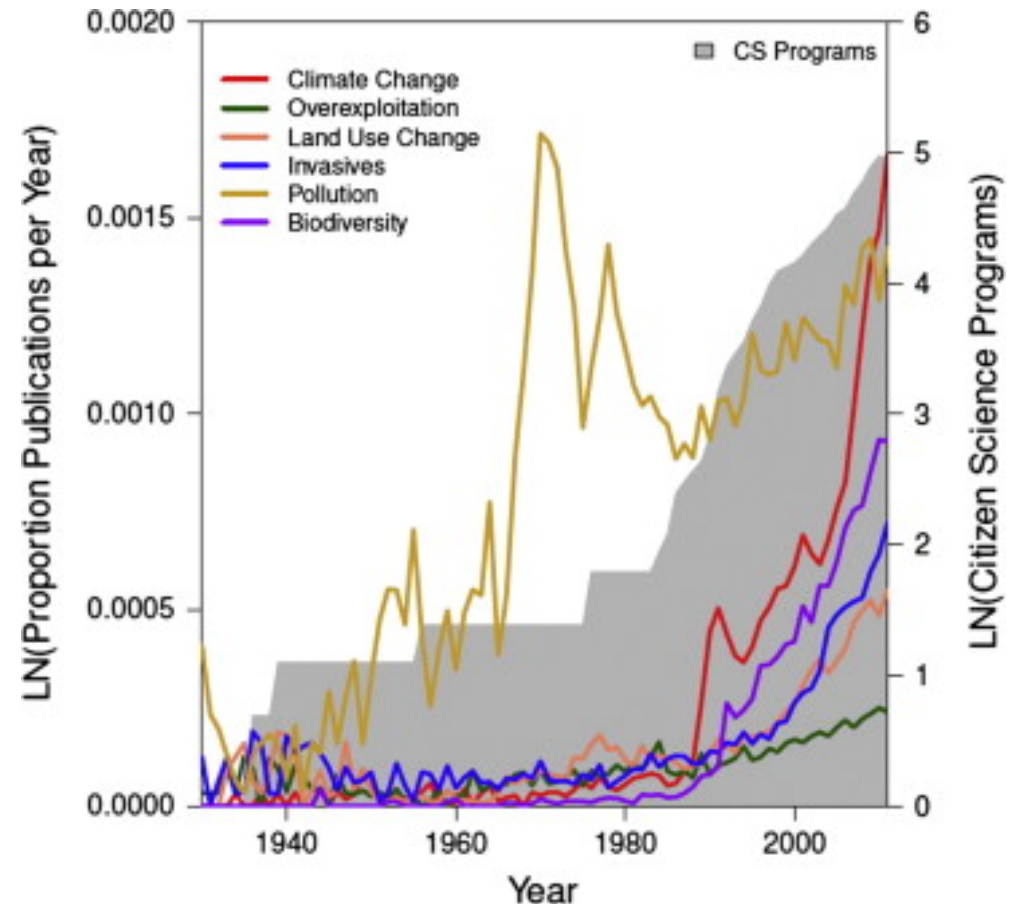
Theobald et al. 2015: *Biological Conservation*

One sample of 388 projects:

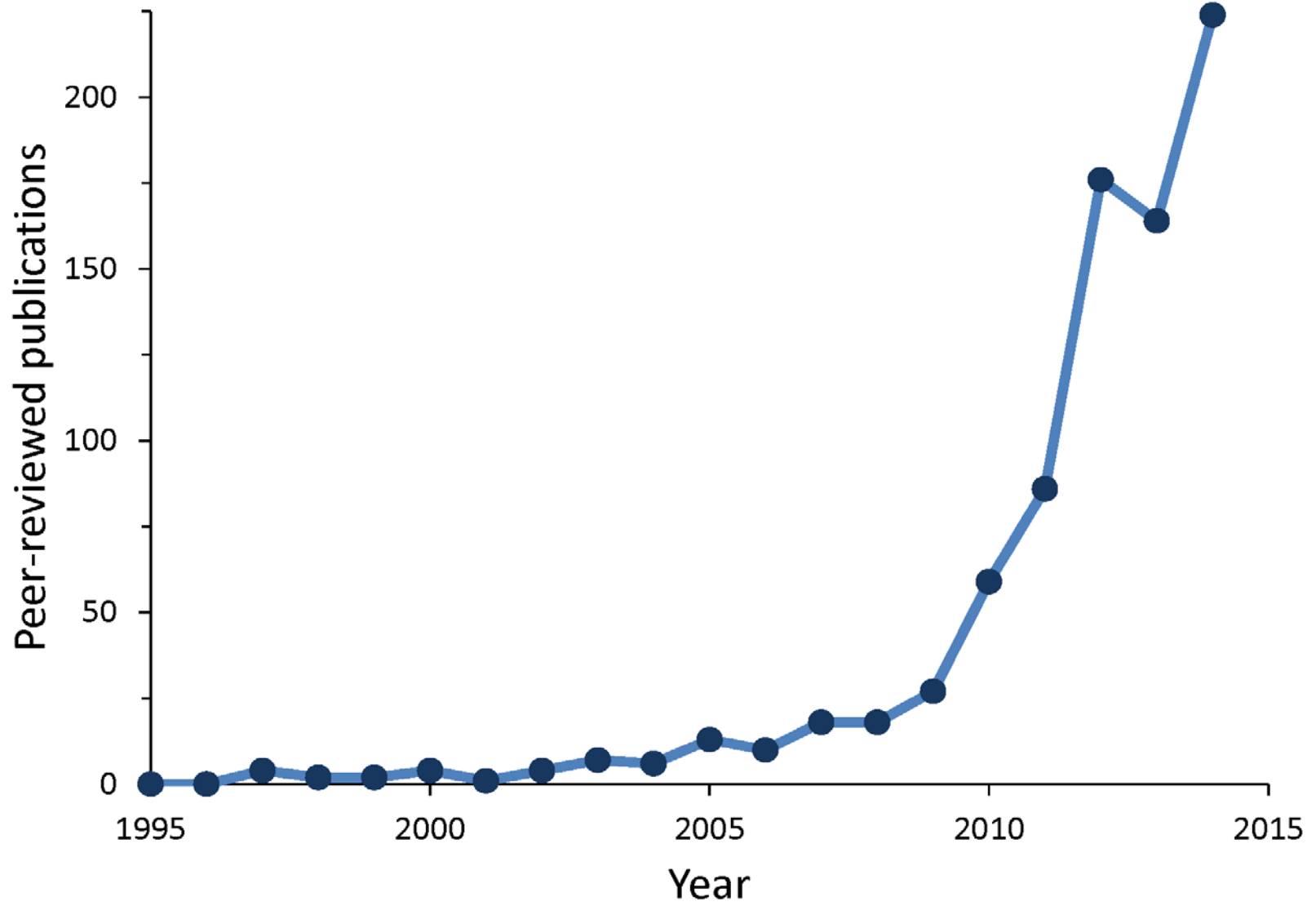
~1.3 million volunteers

Contribute ~\$2.5 billion in-kind annually

12% contribute to peer-reviewed publications



Appendix C



Appendix C



- *Ecology*
- *Science*
- *BioScience*
- *Biological Conservation*
- *PNAS*
- *PLoS ONE*
- *Conservation Biology*
- *More ...*

Impacts of Citizen Science

Increasing Scientific Knowledge

Informing Science Policy

Appendix C Clean Air Coalition of Western NY: Tonawanda Air Quality Study



Community Health Effects: Industrial Hog Operations

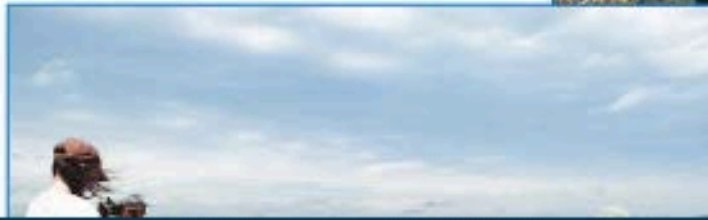


ISSUES IN ECOLOGY

Published by the Ecological Society of America

Investing in Citizen Science Can Improve Natural Resource Management and Environmental Protection

Duncan C. McKinley, Abraham J. Miller-Rushing, Heidi L. Ballard, Rick Bonney, Hutch Brown,
Daniel M. Evans, Rebecca A. French, Julia K. Parrish, Tina B. Phillips, Sean F. Ryan, Lea A. Shanley,
Jennifer L. Shirk, Kristine F. Stepenuck, Jake F. Weltzin, Andrea Wiggins, Owen D. Boyle,
Russell D. Briggs, Stuart F. Chapin III, David A. Hewitt, Peter W. Preuss, and Michael A. Soukup



Citizen Science

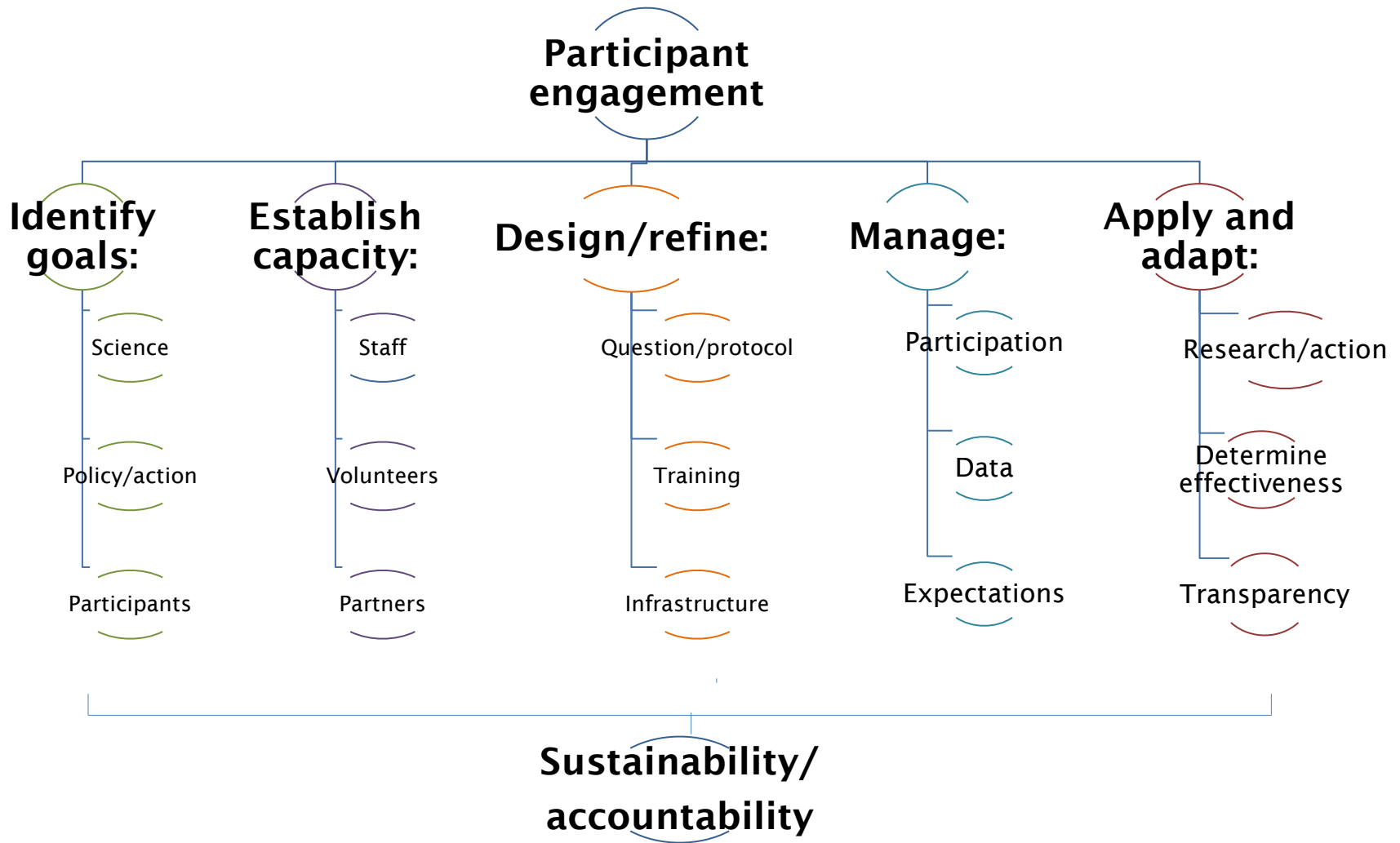
Is big, interdisciplinary, and productive

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Can be a major tool for fisheries councils!

Components of project design



www.birds.cornell.edu



*A membership institution interpreting and conserving the earth's biological diversity through research, education, and **citizen science** focused on birds*

Appendix C

NORTH AMERICAN NEST-RECORD CARD PROGRAM

Species: Tree Swallow E W B R O O K S

Observer (two initials, last name)
In squares in space opposite

Shaded Boxes not to be completed by observer

YEAR

1 2 3 4 5 6 7 8 9 10 11 12

6 1 4 7 5 8 5 1 4

Fill in if known

Latitude

29 4 2 31 1 5 33

Longitude

41 7 7 44 8

Elevation
(in feet above sea level)

34 6 36 1 9 6 0 41 7 7 44 8

Locality (in relation to nearest town) 3 1/4 m W. Alfred

State or Province NV

HABITAT (circle where appropriate)

1. Woods 2. Swamp 3. Marsh 4. Field 5. Grassland 6. Desert 7. Tundra 8. Suburban 9. Urban

01. Coniferous 02. Deciduous 03. Mixed 04. Orchard 05. Cultivated 06. Fallow 07. No Veget. 08. Hedgerow

09. Shrub 10. Salt 11. Brackish 12. Fresh 13. Sandy Beach 14. Gravel Beach 15. Other (specify)

DOMINANT PLANT(S) IN HABITAT (list one or two)

NEST SITE (circle where appropriate)

01 Bare ground 02 On ground in vegetation 03 Floating 04 Low vegetation 05 Shrub 06 Palm 07 Deciduous tree branch

08 Deciduous tree cavity 09 Conifer branch 10 Conifer cavity 11 Nest box 12 Other structure 13 Cliff or bank

PRINCIPAL PLANT OR STRUCTURE Melaleuc

SUPPORTING NEST

Height of Eggs Above Ground or Water in Feet (feet and tenths if under five feet)

If parasitized by Cowbird check here ☐ If same pair had other nestings this year, indicate which this is (1, 2, 3)
(use separate card for each nesting)

PLEASE COMPLETE BOTH SIDES OF THE CARD

rev. 5-4-71

If used for colonial nesting check here ☐ and see instructions

COMMENTS

Stage of building, if eggs warm, age of young, if banded, etc.

Eggs	Young	Edut	Build- ing	Adult On
5		8 1		✓
5		8 1		✓
6 19	1 4	8 1		✓
6 26	1 3			
7 3	1 3	6 1		

4(3) banded on seckle pear
(dead) tick. (04)

01 Unknown because not revisited
02 Young seen leaving nest
03 Parent(s) excited near nest
04 Parent(s) with young near nest
05 Nest empty, intact
06 Nest empty, damaged

OUTCOME INCLUDING CASES WHERE OUTCOME UNKNOWN (circle where appropriate)

07 Nest deserted
08 Failure due to weather
09 Failure due to predation
10 Failure due to invertebrate parasites
11 Failure due to cowbirds
12 Failure due to competition with other species
13 Failure due to human activities
14 Failure due to pesticides (give details separately)
15 Other (describe above)

Please complete both sides and return at end of season to your Regional Center or to Laboratory of Ornithology,
Cornell University, Ithaca, New York 14850. We thank you for contributing your time and efforts to this program.

Appendix C



CLO Citizen Science Program



- Project FeederWatch (1986)
- Project PigeonWatch (1993)
- Project Tanager (1993)
- House Finch Disease Survey (1995)
- The Birdhouse Network (1996)
- Birds In Forested Landscapes (1997)
- Cerulean Warbler Atlas (1997)
- Golden-Winged Warbler Atlas (1999)
- Great Backyard Bird Count (1999)
- Urban Bird Studies (2001)



[illegible]

'What is Citizen Science' Presentation, R. Bonney, Jan 19, 2016

[illegible][illegible][illegible]

(fenchone) just to Sew (200 - 1200)
 200-1 200-6
 200-5 200-1
 200-1 200-2
 200-20 200-3
 200-15 200-20
 200-1 200-1
 200-12 200-15
 200-10
 200-4

[illegible][illegible]

Life May - 1. American crow
2. common grackle
3. red dove
4. European starling
5. mourning dove
6. capoe's hawk
7. American hawk
8. rule swan
9. blue-crowned night
10. northern flicker
11. sandpiper
12. chickadee
13. warbler
14. robin
15. blue jay
16. cardinal
17. house sparrow
18. goldfinch
19. chipping sparrow
20. vesper sparrow
21. junco
22. cowbird
23. meadow lark
24. red-winged blackbird
25. blue bird
26. yellow throat
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470. yellow throat
471. blue jay
47



[Home](#)
[About](#)
[Submit Observations](#)
[Explore Data](#)
[My eBird](#)
[Help](#)

1 2 3 What did you see or hear?

GROUPS BASED ON 1018 COMPLETE CHECKLISTS FOR CHEMUNG COUNTY

FREQUENT (10% OR MORE)

<input type="checkbox"/>	Canada Goose
<input type="checkbox"/>	Mallard
<input type="checkbox"/>	Killdeer
<input type="checkbox"/>	Ring-billed Gull
<input type="checkbox"/>	Mourning Dove
<input type="checkbox"/>	Ruby-throated Hummingbird
<input type="checkbox"/>	Red-bellied Woodpecker
<input type="checkbox"/>	Downy Woodpecker
<input type="checkbox"/>	Northern Flicker
<input type="checkbox"/>	Eastern Phoebe
<input type="checkbox"/>	Red-eyed Vireo
<input type="checkbox"/>	Blue Jay
<input type="checkbox"/>	American Crow

- *300 thousand users*
- *10 million hours*
- *250 million observations*
- *98.5% world's species*
- *> 100 peer-reviewed publications*

eBird



Willow Flycatcher annual occurrence

THE STATE OF THE BIRDS 2014

United States of America



Home

Foreword

The State of the Birds

Habitats

Preventing Extinctions

Preserving Abundance

Lessons

Our Approach

Maps & Species Lists

Acknowledgments

News Room

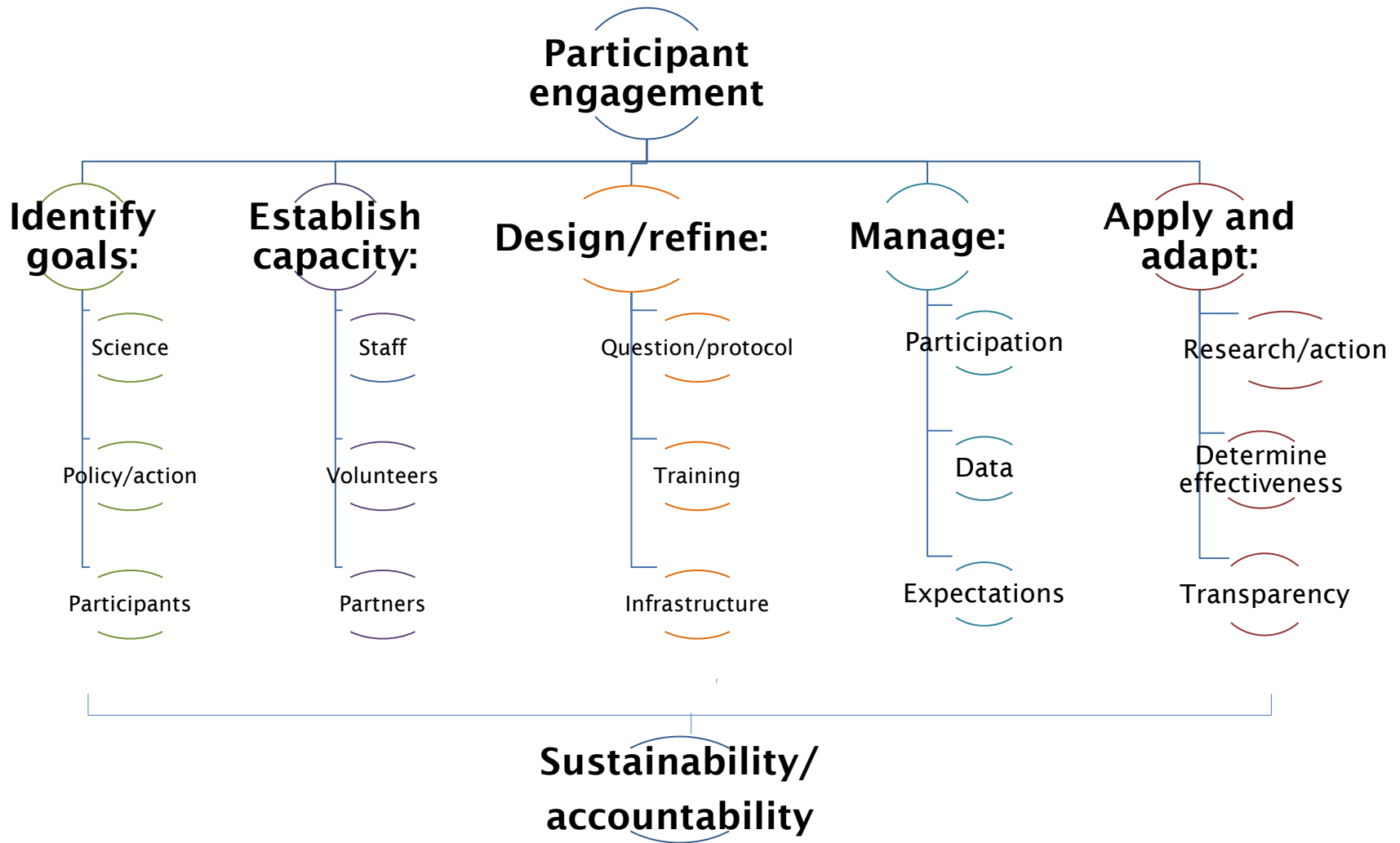
The State of the Birds Report 2014



Watch the video for an overview of the State of the Birds Report



Components of project design



Design/refine; Manage

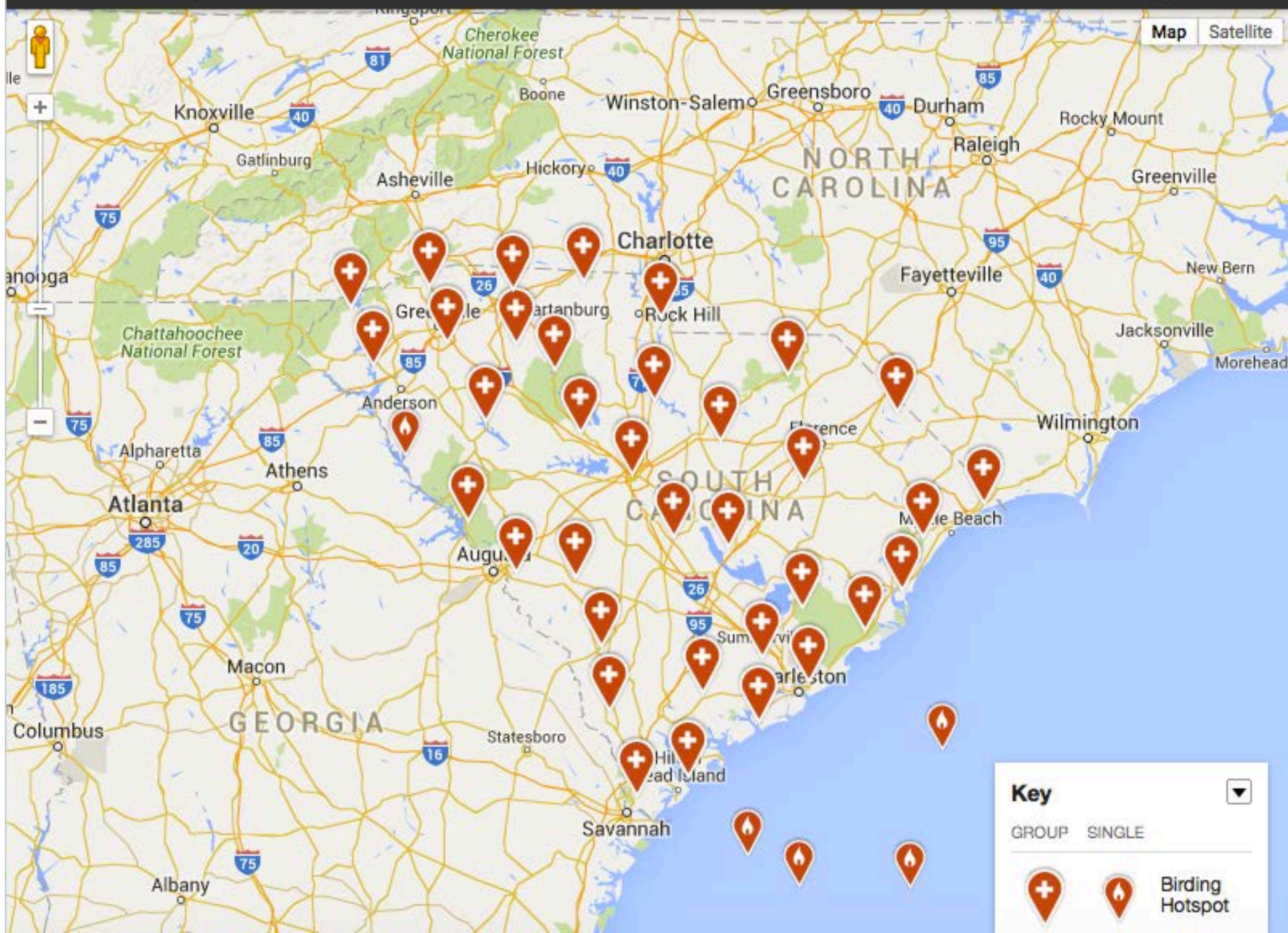
- *Data quality (“smart” forms; flagged records; regional editors)*
- *Portals*
- *Participant tools*

Zoom to:



Enter place name, address, or lat/long coordinates...

Appendix C

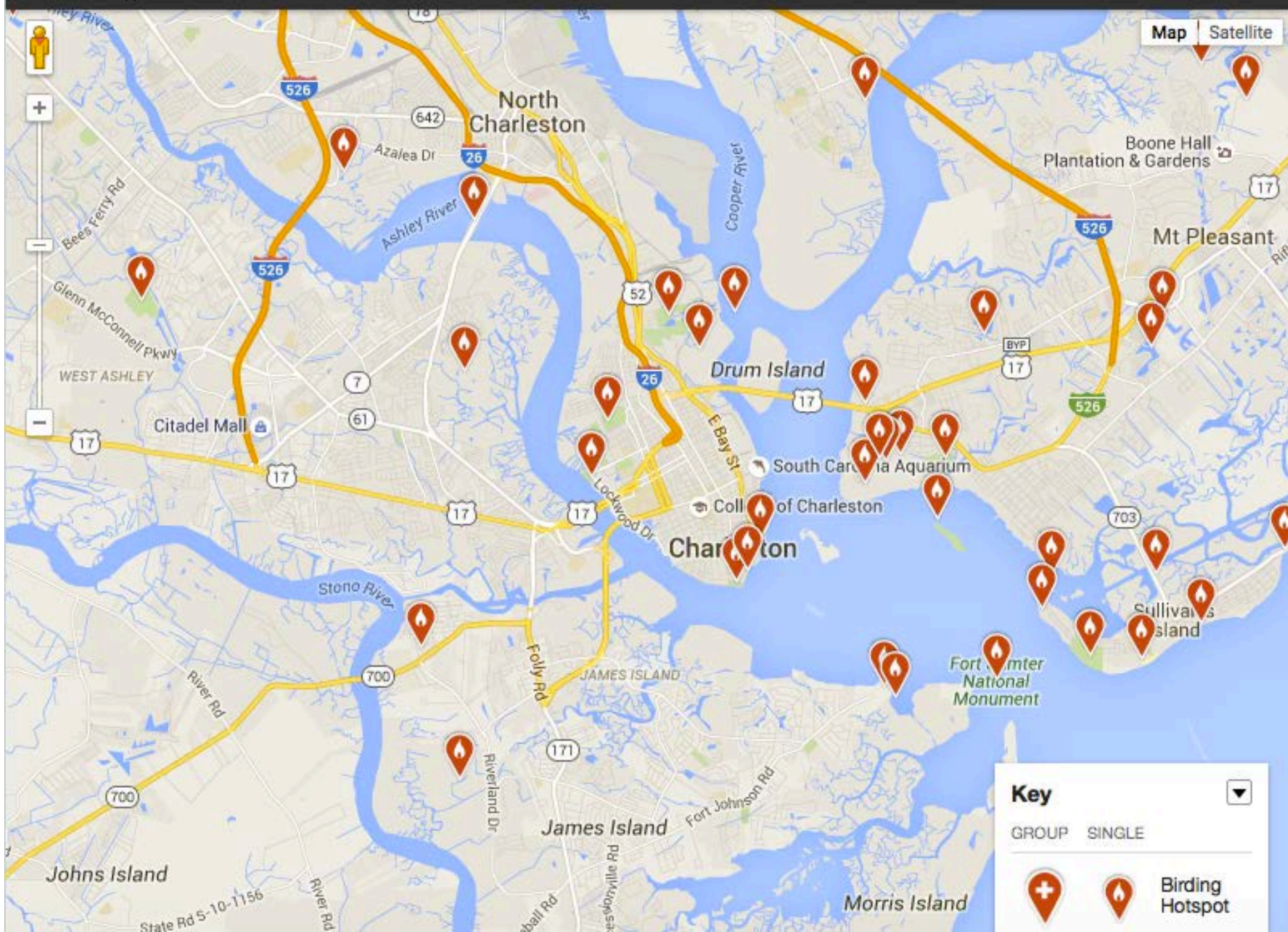


Zoom to:

Enter place name, address, or lat/long coordinates...

'What is Citizen Science' Presentation, R. Bonney, Jan 19, 2016

Appendix C



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[My eBird](#)
[Help](#)

Rick Bonney (rickbonney)
[Sign Out](#)


1
2
3

Date and Effort

Charleston Battery, Charleston County, South Carolina... [Change](#)

*
Observation Date:

Jan

2016


* = Required

*
Observation Type:

☐
Traveling
You traveled a specific distance — walking a trail, driving a refuge loop, field birding.
[▶ More Info...](#)

☐
Stationary
You stayed at a fixed location — watching from a window, hawkwatching, seawatching.
[▶ More Info...](#)

☐
Historical
Birding was your **primary purpose**, but you cannot estimate start time, duration, and distance; use Traveling or Stationary if you can estimate these.
[▶ More Info...](#)

☐
Incidental
Birding was not your **primary purpose** — noting a bird while driving or gardening.
[▶ More Info...](#)

☐
Other

▶

Continue
▶

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Appendix C

* **Observation Date:**

Jan --- 2016 

* = Required

* **Observation Type:**

- ☐ **Traveling** You traveled a specific distance — walking a trail, driving a refuge loop, field birding.
- ☐ **Stationary** You stayed at a fixed location — watching from a window, hawkwatching, seawatching.
- ☐ **Historical** Birding was your **primary purpose**, but you cannot estimate start time, duration, and distance; use Traveling or Stationary if you can estimate these.
- ☒ **Incidental** Birding was not your **primary purpose** — noting a bird while driving or gardening.
- ☐ **Other**


► More Info...

► More Info...

► More Info...

► More Info...

Start Time (AM/PM):

8 : 00 AM  Use 24-hour Clock

Party Size:

1 Enter the total number of people in your birding party

Comments:

This is a test, this is only a test



Continue ►

Appendix C

1

2

3


What did you see or hear?

Charleston Battery, Charleston County, South Carolina...

Change

Mon Jan 18, 2016 8:00 AM

Change



GROUPS BASED ON 1 COMPLETE CHECKLISTS FOR CHARLESTON BATTERY

FREQUENT (10% OR MORE)

<input type="checkbox"/>	Greater/Lesser Scaup
<input type="checkbox"/>	Bufflehead
<input type="checkbox"/>	Hooded Merganser
<input type="checkbox"/>	Red-breasted Merganser
<input type="checkbox"/>	Horned Grebe
<input type="checkbox"/>	Northern Gannet
<input type="checkbox"/>	Double-crested Cormorant
<input type="checkbox"/>	Brown Pelican
<input type="checkbox"/>	Great Egret
<input type="checkbox"/>	American Coot
<input type="checkbox"/>	Ring-billed Gull
<input type="checkbox"/>	Herring Gull
<input type="checkbox"/>	American Crow

NOT REPORTED

<input type="checkbox"/>	Black-bellied Whistling-Duck
<input type="checkbox"/>	Snow Goose
<input type="checkbox"/>	Canada Goose
<input type="checkbox"/>	Mute Swan
<input type="checkbox"/>	Tundra Swan

Q | Jump to Species...

+ Add Species

↓ Alphabetic

☐ Show Rarities
 ☐ Show Subspecies

Are you submitting a **complete checklist** of the birds you were able to identify?

☐ Yes
 ☒ No
 ☐ ?

You are using the 'Incidental' protocol and therefore birding was not your [primary purpose](#). Complete checklists of birds should only be reported using another protocol option.

◀

Submit ▶

Appendix C

GROUPS BASED ON 1 COMPLETE CHECKLISTS FOR CHARLESTON BATTERY

FREQUENT (10% OR MORE)

☐ Greater/Lesser Scaup
☐ Bufflehead
☐ Hooded Merganser
☐ Red-breasted Merganser
☐ Horned Grebe
☐ Northern Gannet
☐ Double-crested Cormorant
☒ **1 Brown Pelican** Hide Details

Details:

Add text, photos, audio, or video describing the bird, its habitat, and behavior...

X

Media:

Upload up to 10 files (JPG, PNG, GIF, MP3, WAV, or M4A). Max size: 10mb for images, 250mb for audio.

X

Drop Files Here...
or
Select

Add data...

Age & Sex

Breeding Code

Oiled Birds

Media

Details

☐ Great Egret
☐ American Coot

Q Jump to Species...

+ Add Species

↓ Alphabetic

☐ Show Rarities
☐ Show Subspecies
☒ Group by Most Likely ?

Shortcuts

Preferences

Are you submitting a **complete checklist** of the birds you were able to identify?

☐ Yes
☒ No
☐ ?

You are using the 'Incidental' protocol and therefore birding was not your **primary purpose**. Complete checklists of birds should only be reported using another protocol option.

◀

Submit ▶

Appendix C

1
2
3

What did you see or hear?

Capital Hill, Australian Capital Territory, AU [Change](#)

Thu Jul 23, 2015 8:00 AM [Change](#)

GROUPS BASED ON 558 COMPLETE CHECKLISTS FOR AUSTRALIAN CAPITAL TERRITORY

FREQUENT (10% OR MORE)

☐ Black Swan
☐ Maned Duck
☐ Pacific Black Duck
☐ Australian Shoveler
☒ **1 Gray Teal** [Hide Details](#)

☐ White-eyed Duck
☐ Australasian Grebe
☐ Hoary-headed Grebe
☐ Little Pied Cormorant
☐ White-faced Heron
☐ Purple Swamphen
☐ Dusky Moorhen
☐ Eurasian Coot
☐ Masked Lapwing
☐ Crested Pigeon

Details:
X

Add data...
Age & Sex
Breeding Code
Oiled Birds
Details

+ Add Species
↓ Alphabetic

☐ Show Rarities
☐ Show Subspecies
☒ Group by Most Likely ?

Shortcuts
Preferences

Are you reporting all of the birds you saw/heard to the best of your ability? Please indicate below.

☐ Yes
☐ No
☐ ?

◀

Submit ▶

Appendix C



Home

Submit Observations

Explore Data

My eBird

Help

[Sign In or Register as a New User](#)

Welcome to Louisiana Bird Atlas eBird

Birding in the 21st Century.

News and Features

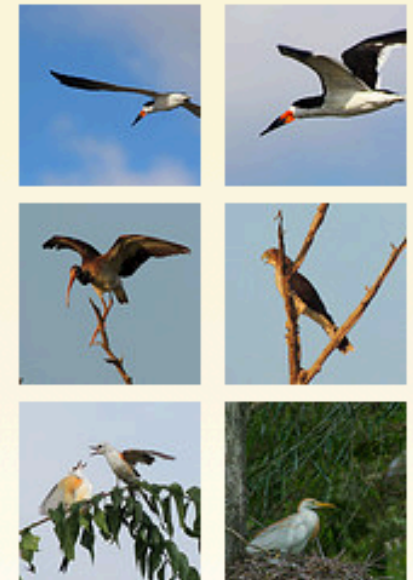
Final Summer Atlas Season Begins June 1

30 April 2013

It's hard to believe the final Louisiana Summer Bird Atlas is here. It is time to get out and close out those quads. The priorities are to complete quads where large unsampled areas occur e.g. north of I-10 near Welsh, southern Atchafalaya basin, and on the LA-TX border. If this is your first time to participate, welcome! More information can be found at the Louisiana Bird Resource Office website: <http://birdoffice.lsu.edu>.



Louisiana Birds Pool



[More at Flickr](#)

Most Checklists Submitted for Current Month

► [St. Tammany -- 78](#)

[Inicio](#) [Acerca de](#) [Envía tus observaciones](#) [Ver y explorar](#) [Mi eBird](#) [Ayuda](#)

[Regístrate](#)

Traducir a: [English](#) | [Español](#)

Bienvenido a aVerAves

Observación de aves en el siglo 21

Noticias sobre observación de aves

[Letreros Informativos para rutas de Observación de Aves en San Pancho, Nayarit](#)

23 julio 2013

El Observatorio de Aves de San Pancho (OASP) se dió a la tarea de invitar a negocios y organizaciones civiles locales y regionales a participar en un proyecto de letreros informativos que tienen tanto la finalidad de promover la observación de aves ante locales, turistas nacionales e internacionales así como de fomentar el conocimiento de [...]

[Temporada 2013 del Conteo de Aves en Reproducción \(BBS\) en el norte de México](#)

18 julio 2013

Este año, muchos nuevos voluntarios se sumaron al programa de Conteo de Aves en Reproducción (Breeding Bird Survey) y otros tantos repitieron las rutas que han venido muestreando por varios años. El BBS tiene mas de 40 años de llevarse a cabo




CONABIO

Mayoría de listas enviadas para el mes actual

- [Jalisco -- 111](#)
- [Oaxaca -- 75](#)
- [Baja California Sur -- 52](#)
- [Veracruz -- 44](#)
- [Nayarit -- 42](#)
- [Distrito Federal -- 39](#)
- [Guerrero -- 36](#)
- [Baja California -- 29](#)
- [Quintana Roo -- 24](#)
- [Colima -- 22](#)

Personal Records

'What is Citizen Science' Presentation, R. Bonney, Jan 19, 2016



[Home](#) | [About](#) | [Submit Observations](#) | [Explore Data](#) | [My eBird](#)

Hello Marshall Iliff (miliff) | [Preferences](#) | [Sign Out](#) Translate to: [English](#) | [Español](#) | [Français](#) | [Português](#)

My eBird

Manage your personal lists, observations, locations, and account settings.

Your Life List: **2610 Species**

Last updated 7 sec ago.

Your Stats

	Life	Year	Month
Total Species	2610	773	116
Total Checklists	14429	1505	22
ABA Area Total Ticks	8115	1398	133

Your Lists

Major Region
Country
State/Province
County

	Life	Year	Month
Barnstable, Massachusetts	307	198	0
Essex, Massachusetts	296	128	0
Worcester, Maryland	284	101	0
Suffolk, Massachusetts	276	187	69
Orange, California	266	0	0
Plymouth, Massachusetts	255	124	0
Anne Arundel, Maryland	239	109	0
Cumberland, Maine	232	75	0
York, Maine	225	19	0

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Donate Now

My Observations

[Summarize My Observations](#)
Create frequency, abundance, and other tables of my observations.

[Manage My Observations](#)
View, edit, print, share or download my observations.

[My Shared Observations](#)
Checklists that other eBird users have shared with me

[Manage My Locations](#)
Edit existing locations

[Import Data](#)
Import data from a spreadsheet, database, or birding program.

[Manage Imported Data](#)
View, fix, and submit your imported data

[Download my Data](#)
Download and save your data on your computer.

Appendix C



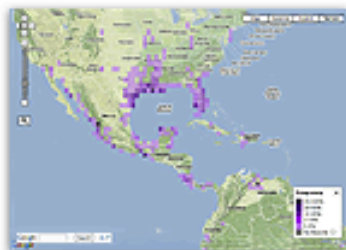
Explore a Region

Recent sightings, checklists, birding activity, best hotspots, and top birders for a county, state, province, or country.



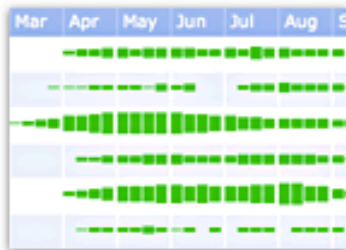
Explore Hotspots

Discover the best places for birding nearby or around the world.



Species Maps

Explore interactive range maps by species or subspecies — zoom in for details



Bar Charts

Find out what birds to expect throughout the year in a region or location

Your Totals

Track your totals and compare with other eBirders.

Yard Totals

How many species and checklists have you submitted for your yard?

Patch Totals

How many have you submitted for your favorite birding patches?

Top 100

Compare with the top eBirders in your region.

Species You Need

Tools to find species you haven't seen yet.

Target Species **NEW**

Prioritized list of county, state, or life birds that you can expect to find in a region

[Home](#)

[About](#)

[Submit Observations](#)

[Explore Data](#)

[My eBird](#)

[Help](#)

[Sign In or Register as a New User](#)

Welcome to eBird in Australia

Birding in the 21st Century.

News and Features

[Our eBird Big Day, 9th May 2015 at Bush Heritage Australia's Ethabuka Reserve](#)

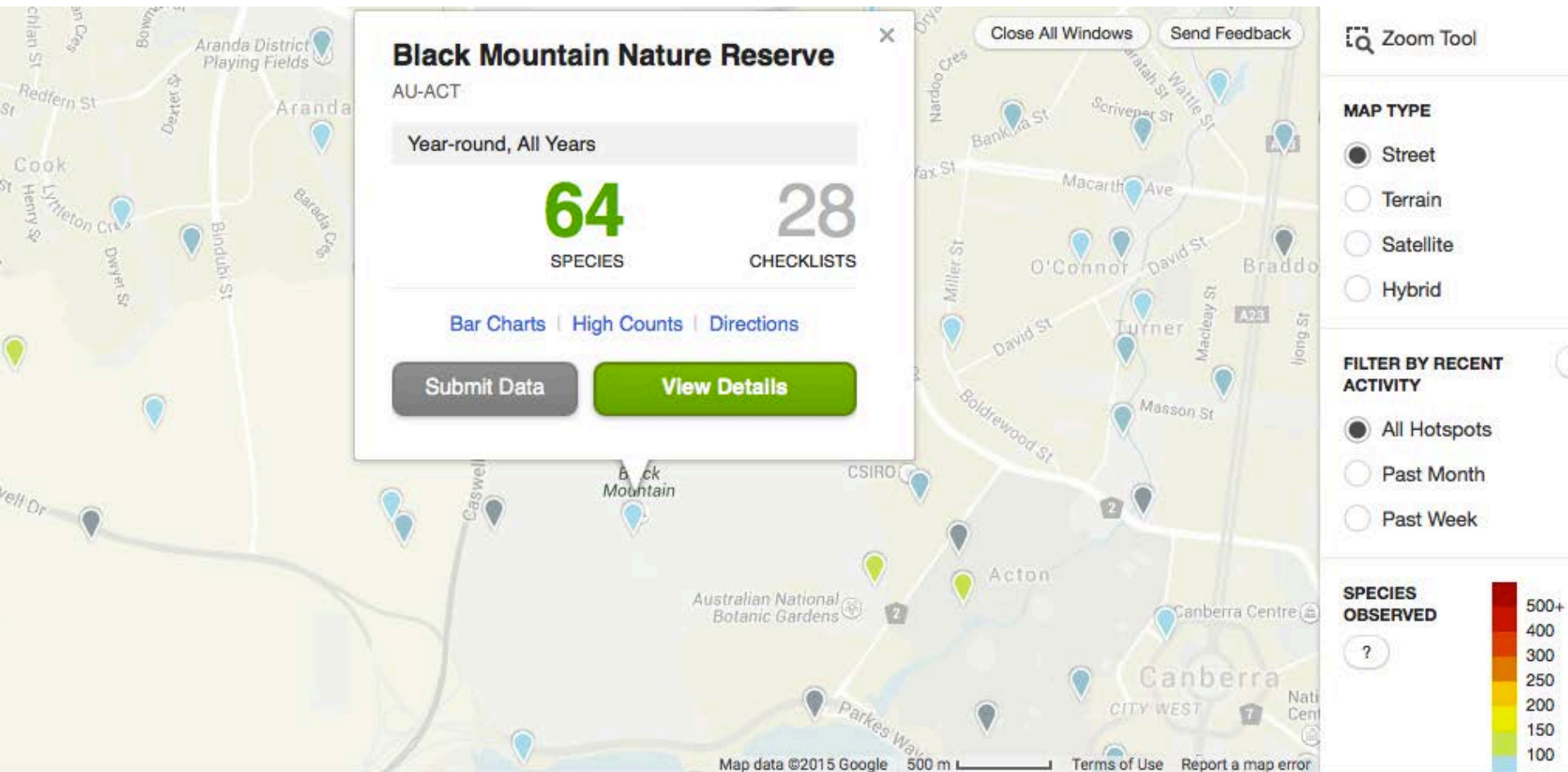
12 June, 2015

Many eBirders across Australia enjoyed the challenge of finding local endemics for the first ever Global eBird Big Day on May 9 this year, and the joint effort of 214 participants recorded 494 species. This is a great achievement for the first ever Global eBird Big Day. Margaret and Richard Alcorn, Eremaea pioneers and Steering Committee members for Eremaea eBird, recount their experiences in the first ever Global Big Day this year.



**Contact the Eremaea
eBird Team**

Appendix C



< [Hotspot Map](#) Appendix C

Black Mountain Nature Reserve

[Australian Capital Territory, AU](#) — [Get Directions](#)

All Months ▾

All Years ▾

Set

Submit Data

Overview

Recent Visits

64 Species | 28 Checklists

Last Seen

First Seen

High Counts

Bar Charts ➔

Show All Details

	SPECIES NAME ▾	COUNT ▾	DATE ▾	BY
1	Common Bronzewing	1	1 Jul 2015	Martin Butterfield
2	Sulphur-crested Cockatoo	X	1 Jul 2015	Martin Butterfield
3	Crimson Rosella	2	1 Jul 2015	Martin Butterfield
4	White-throated Treecreeper	X	1 Jul 2015	Martin Butterfield
5	Superb Fairywren	X	1 Jul 2015	Martin Butterfield
		2	1 Jul 2015	Martin Butterfield

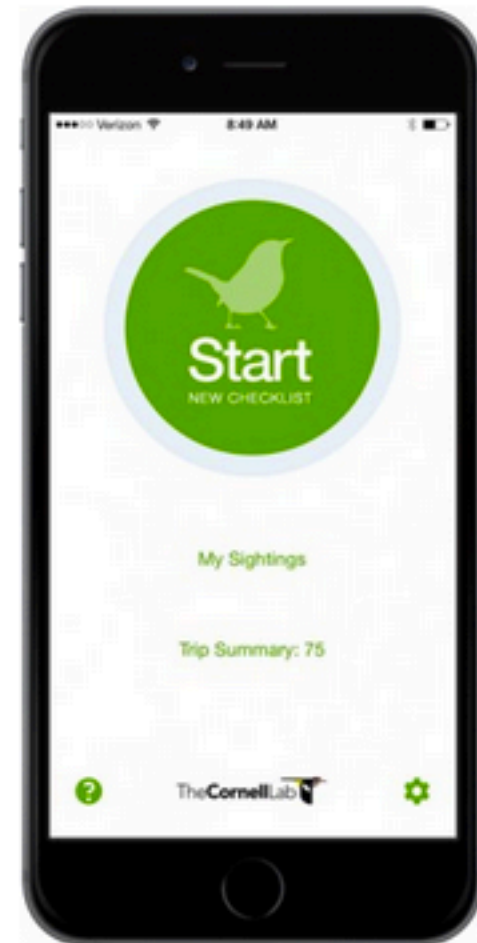
eBird mobile app for iOS now available!

18 June 2015

We would like to invite you to download our new eBird free iOS app for data entry. You can find the app at this link in iTunes:



In 2012, David Bell's company [BirdsInTheHand, LLC](#), released a mobile app called 'BirdLog', on Android and iOS devices. This app revolutionized the way birders recorded information in the field, and was the first and only app to tie directly into your eBird account for data entry. The app became so critical to eBird, that in 2014 the Cornell Lab of Ornithology and David Bell reached an agreement to transfer development and management the app to the eBird team at Cornell. All current iterations of BirdLog will be sunsetted in the near future, so it is important to make the switch to eBird mobile as soon as possible. The Android version will follow in a few months. Read on to learn more about the transition.



Apply/adapt

- *Data availability*
- *Management*

YOUR DOWNLOAD PRIVILEGES WILL EXPIRE IN 365 DAYS

CURRENT VERSION EBD_relAug-2012 – Includes eBird data through Aug-2012

Updated quarterly (15th of Mar, Jun, Sep, and Dec)

Prepackaged Options

World

All species, locations, and dates

3.2 GB
.tar

Sampling Event Data

Effort data only

498 MB
.tar

Please note these files are large and might take a long time to download. Files are delivered in .tar format.

Custom Download

Build a custom dataset using these options. Your request will be added to our download queue in the order it was received. We will send you an email when your download is ready. Files are delivered in .zip or .tar format, depending on size.

Species: ☐ All species☒ Choose species...**Region:** ☒ All regions☐ Choose region...**Date Range:** ☒ All dates☐ Choose date range...**Options:** ☐ Include unvetted data **Submit Request**

Spatiotemporal Variation in Avian Migration Phenology: Citizen Science Reveals Effects of Climate Change

Appendix C

'What is Citizen Science' Presentation, R. Bormay, Jan 19, 2016

Allen H. Hurlbert , Zhongfei Liang

Published: February 22, 2012 • DOI: 10.1371/journal.pone.0031662

Article

Authors

Metrics

Comments

Related Content

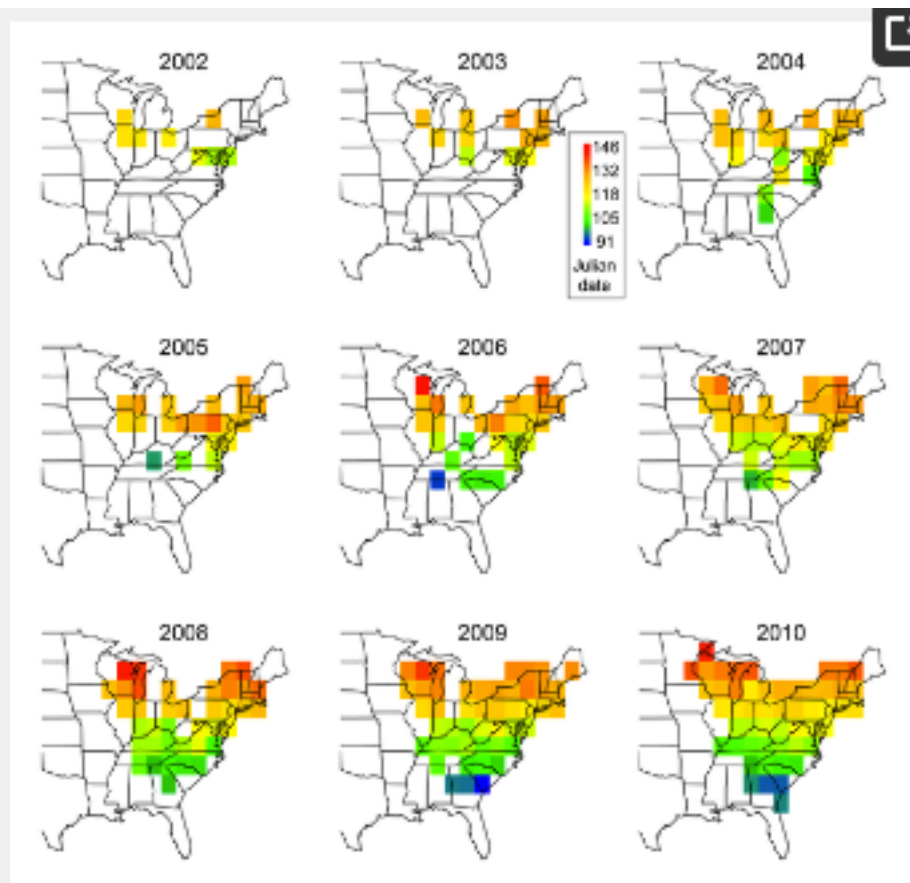
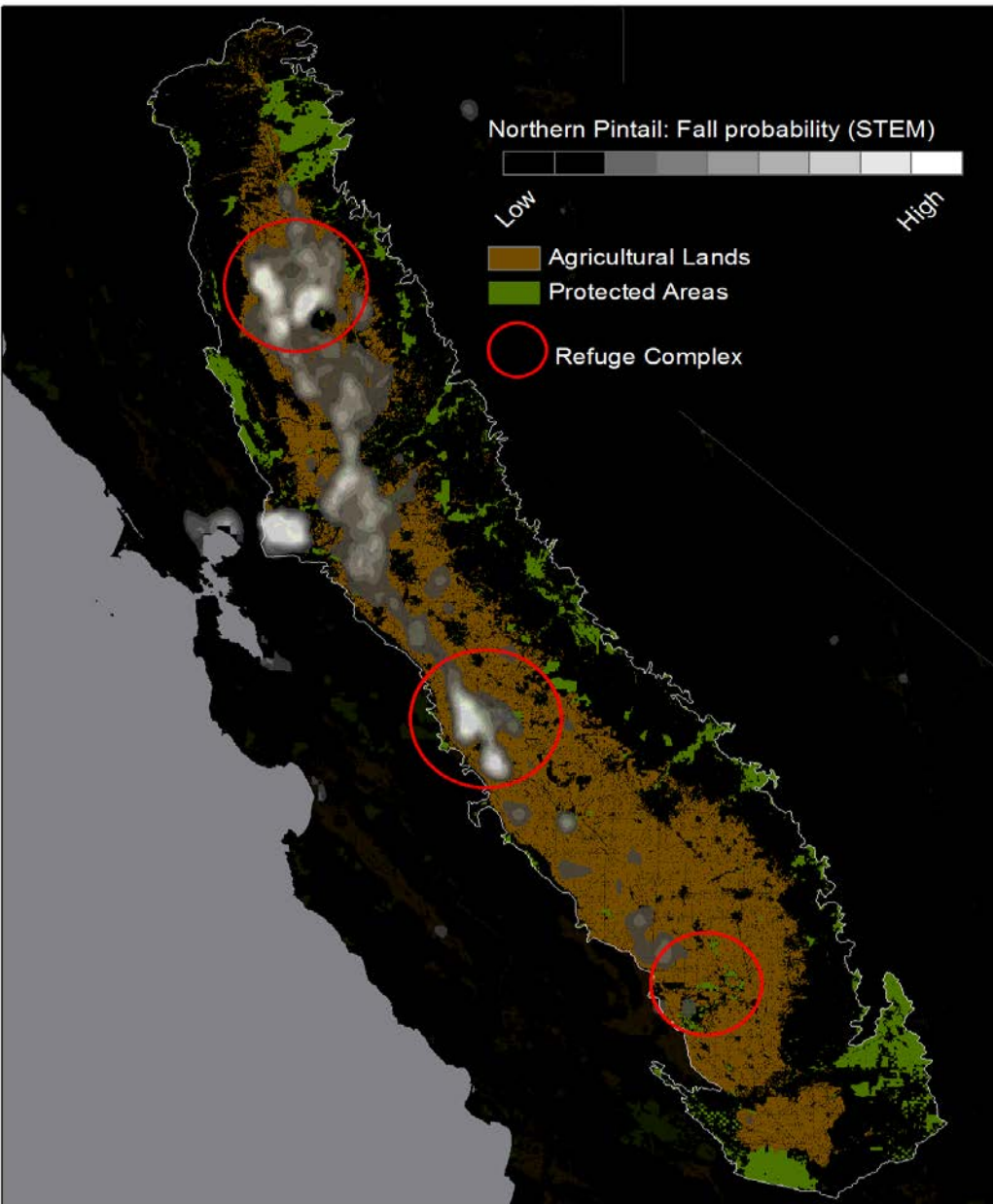


Figure 2. Spring arrival dates for the red-eyed vireo.

Appendix C



SCIENCE

Paying Farmers to Welcome Birds

By JIM ROBBINS APRIL 14, 2014



Snow geese seen from above massing in the Sacramento Valley, a stop in their migratory journey.

Drew Kelly/The Nature Conservancy

WHEATLAND, Calif. — The Central Valley was once one of North America's most productive wildlife habitats, a 450-mile-long expanse marbled with meandering streams and lush wetlands that provided an ideal stop for migratory shorebirds on their annual journeys from South America and Mexico to the Arctic and back.

Farmers and engineers have long since tamed the valley. Of the wetlands that existed before the valley was settled, about 95 percent are gone, and the number of migratory birds has declined drastically. But now an unusual alliance of conservationists, bird watchers and farmers have joined in an innovative plan to restore essential habitat for the migrating birds.

The program, [called BirdReturns](#), starts with data from [eBird](#), the pioneering citizen science project that asks birders to record sightings on a [smartphone app](#) and send the information to the [Cornell Lab of Ornithology](#) in upstate New York.

Citizen Science

Is big, interdisciplinary, and productive

Has the potential to transform science and policy

Must be built through intentional design

Can be a major tool for fisheries councils?



An active organization of divers and marine enthusiasts committed to ocean conservation

Online Data Entry

Welcome REEF Fish Survey

This online form can be used to enter survey data collected from any REEF region, including Hawaii, the Pacific Northwest, California, the South Pacific, the Tropical Eastern Pacific, Northwest US & Canada, and the Tropical Western Atlantic. **Please note that data entered online will not be loaded into the REEF database immediately.**

First time submitting a REEF survey online? Click [here](#) to view information and instructions.

You must have a REEF member number to use this form. If you are not a member yet or you have lost your member number, please use the links below to receive a new number or retrieve your existing number. You can also contact REEF at reefhq@reef.org or 305-852-0030 to receive your member number.

[New Member](#) [Lost ID Number](#)

Please enter Your Member ID and Last Name below.

Member ID

Last Name



Appendix C

CITIZEN SCIENCE ASSOCIATION

Mission: To advance citizen science through communication, coordination, and education

Vision: A world where people understand, value, and participate in science

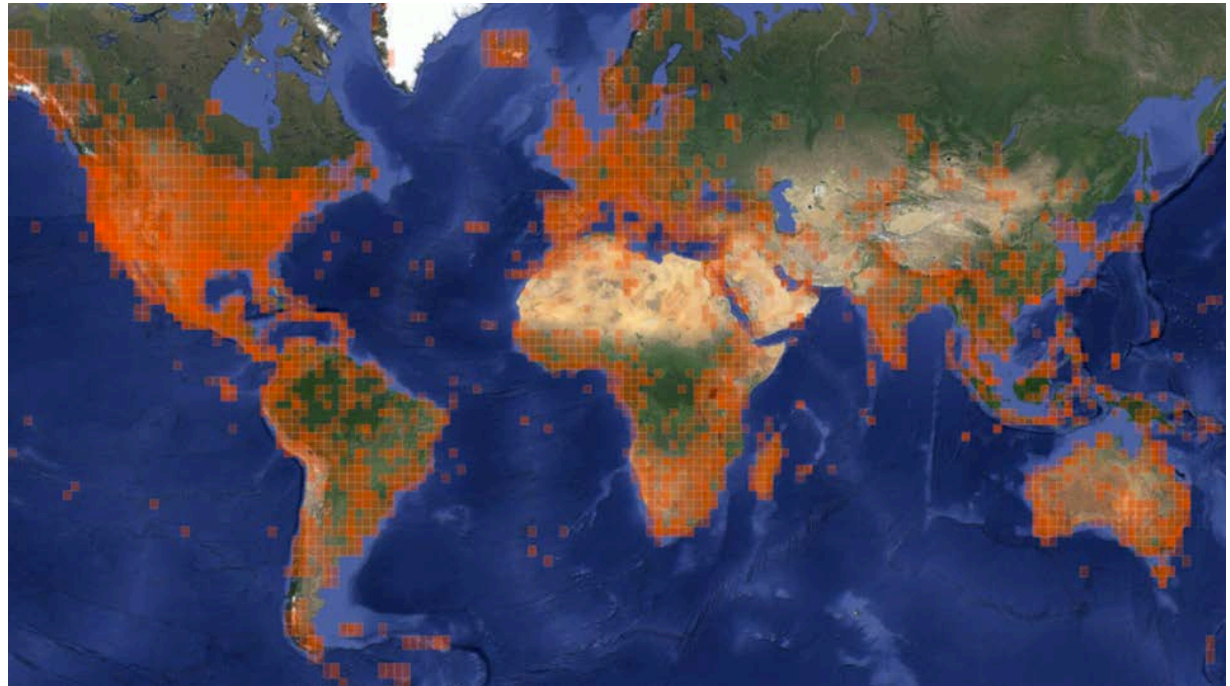




Appendix C

CITIZEN SCIENCE ASSOCIATION

Over 4,000
members from
more than 30
countries



WELCOME TO CITIZENSCIENCE.ORG, HOME OF THE CITIZEN SCIENCE ASSOCIATION

Flickr image: Mount Rainier National Park



The power of citizen science.

Citizen science is the involvement of the public in scientific research – everything from community-driven research to global investigations. The Citizen Science Association, through CitizenScience.org, unites expertise from educators, scientists, data managers, technology specialists, evaluators, and others to power citizen science. Join us, and help speed innovation by sharing insights across disciplines.

over 1K
Projects

over 1M
Volunteers

over 3.5K
Members

Citizen Science News

[Site News](#)

[Social Feed](#)

[Opportunities](#)

2015: The year citizen science was validated

What a monumental year for citizen science! After decades, if not generations, of collective uphill battles to validate the field—to prove to the establishment that citizen science is serious science—we finally [...]



Recent Case Study

[Be flexible and adaptive – New York](#)

Appendix C



Biennial conferences

CitSci2017

February 23-25
Raleigh, NC, USA



The power of citizen science.

Citizen science is the involvement of the public in scientific research – everything from community-driven research to global investigations. The Citizen Science Association, through **CitizenScience.org**, unites expertise from educators, scientists, data managers, technology specialists, evaluators, and others to power citizen science. Join us, and help speed innovation by

over 1K

Projects


over 1M


Volunteers

over 3.5K


Members

[Home](#) [About](#) [Contact](#) [Content](#) [Research Integrity](#)

Search... 

 **CITIZEN SCIENCE:**
THEORY AND PRACTICE


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CONVERSATIONS


[< previous](#)

 **CitSciAssoc**
@CitSciAssoc

Feedback requested by 15 JAN:
Improving Access to Earth Observation
whitehouse.gov/blog/2015/12/0...
[#citsci](#)

10:11 PM - 5 Jan 2016

  2 

 **Mark2Cure**
@Mark2Cure

Appendix C



Professional development

Federal Crowdsourcing and Citizen Science Toolkit

[HOME](#) [HOW TO](#) [CASE STUDIES](#) [RESOURCE LIBRARY](#) [LAW AND POLICY](#)

Welcome!

Crowdsourcing and citizen science help federal agencies to innovate, collaborate and discover. In this toolkit, you will learn how to design and maintain projects. You can also read through case studies and access additional resources related to communities that practice crowdsourcing and citizen science.

What Is Crowdsourcing?

In crowdsourcing, organizations submit an open call for voluntary assistance from a large group of individuals for online, distributed problem solving.

What Is Citizen Science?

In citizen science, the public participates voluntarily in the scientific process, addressing real-world problems in ways that include formulating research questions, conducting scientific experiments, collecting and analyzing data, interpreting results, making new discoveries, developing technologies and applications, and solving complex problems.

Featured Case Studies

Center(s) for Citizen Science

- *Projects organized around themes and issues*
- *Determine data/social needs for themes and issues*
- *Meta-analysis of available data and projects—strengths and gap analysis*
- *Bring together different projects/models/types of citizen science to address themes and issues*
- *Inform policy and management*

Appendix C



Making Dives That Count – Ocean Citizen Science Monitoring

REEF Volunteer Fish Survey Project



Appendix C

REEF Volunteer Fish Survey Project

www.REEF.org



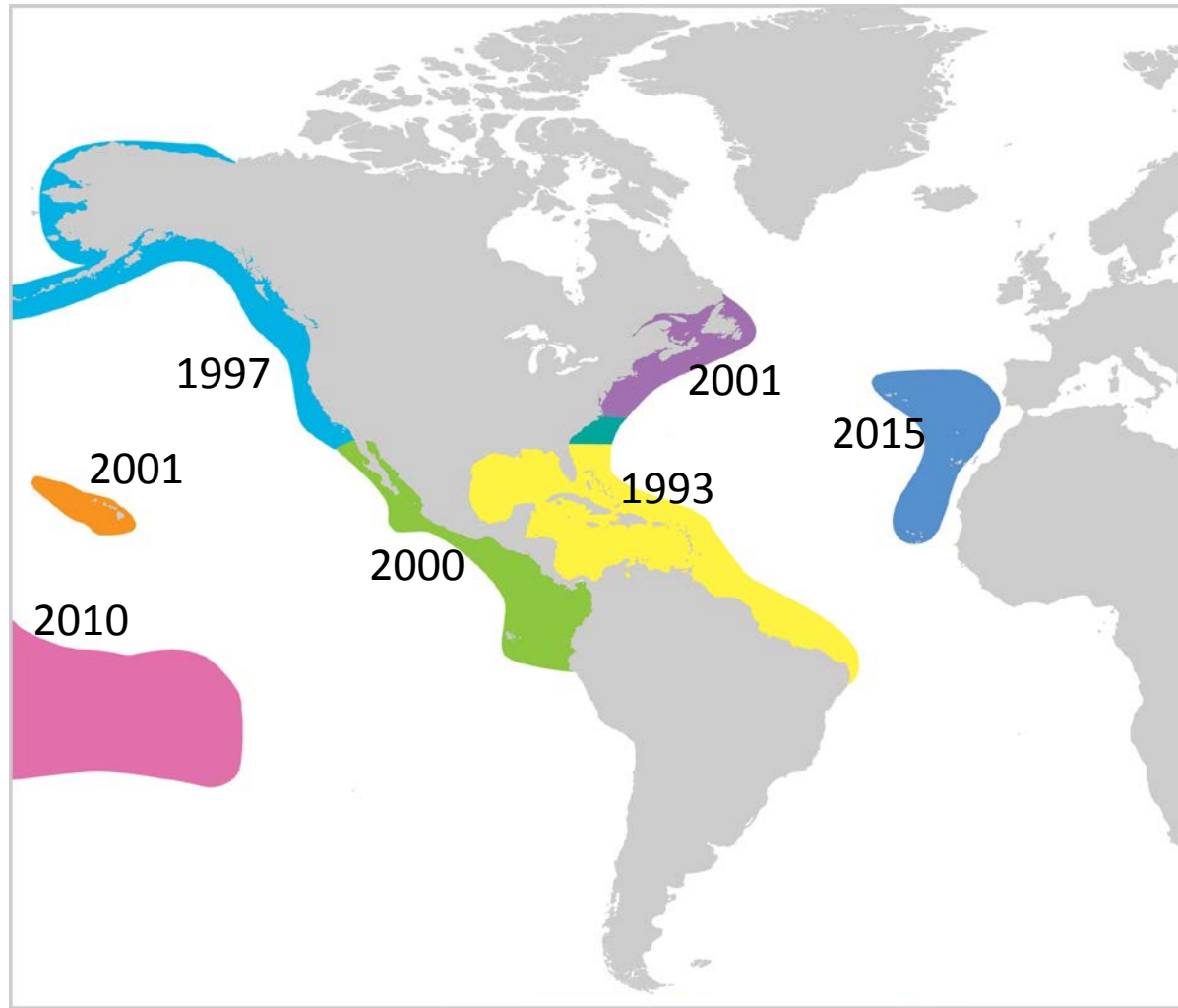
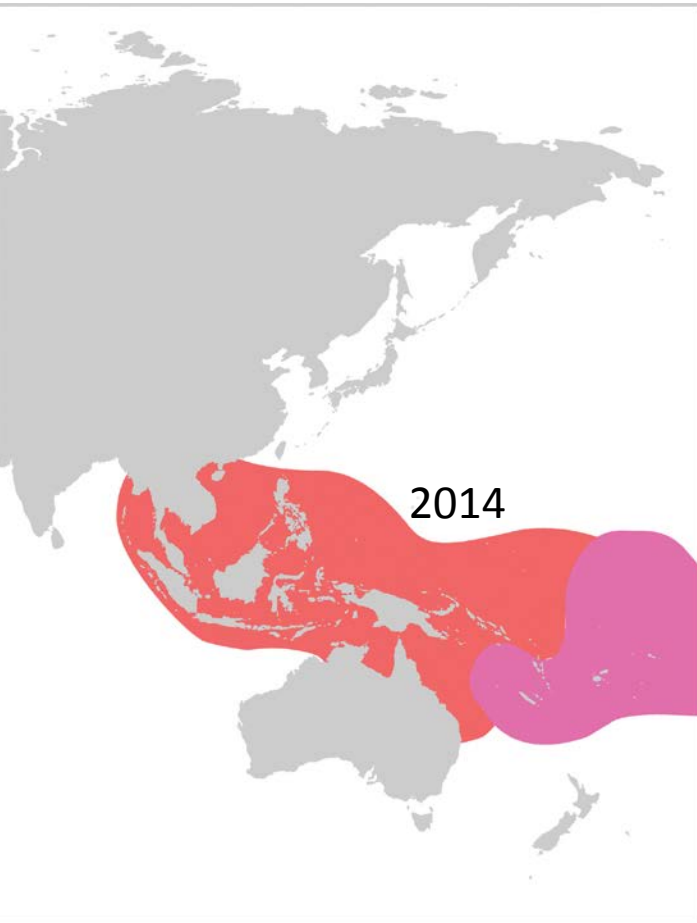
Roving Diver Technique

- Free swimming range around dive site
- Record all fish species; indicator invertebrates and algae in temperate regions
- Estimate relative abundance for each species
 - Single (S) - 1
 - Few (F) - 2-10
 - Many (M) - 11-100
 - Abundant (A) - >100
- Submit sightings data and survey details via online entry interface
- Automated and manual quality control/error checking



Appendix C

REEF Volunteer Survey Program



Appendix C

REEF Volunteer Fish Survey Project

200,839 Surveys

12,038 Sites

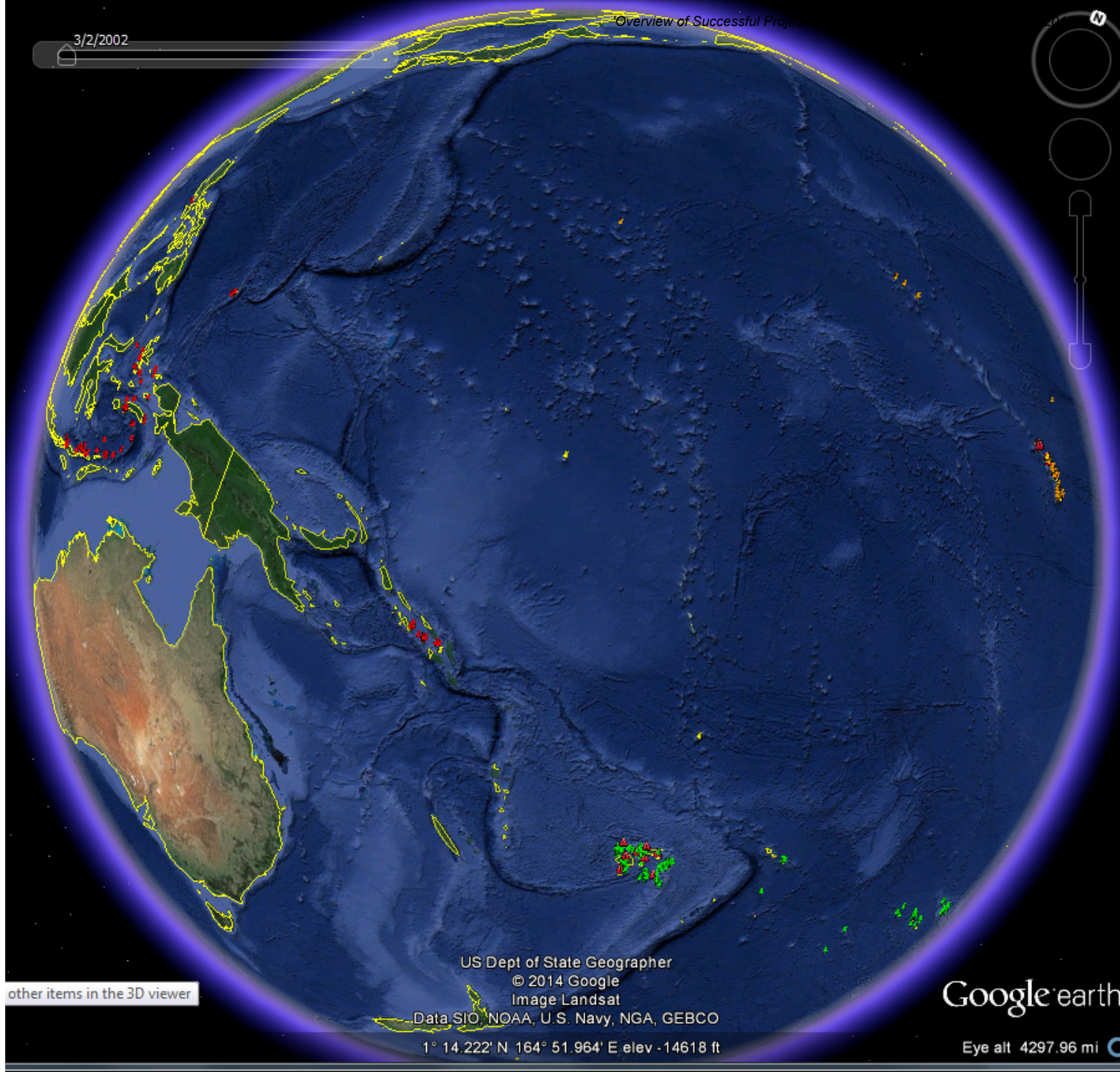


As of January 2016

12,038
Survey
Sites
World
Wide



12,038
Survey
Sites
World
Wide



Appendix C

REEF Volunteer Fish Survey Project

200,839 Surveys

12,038 Sites

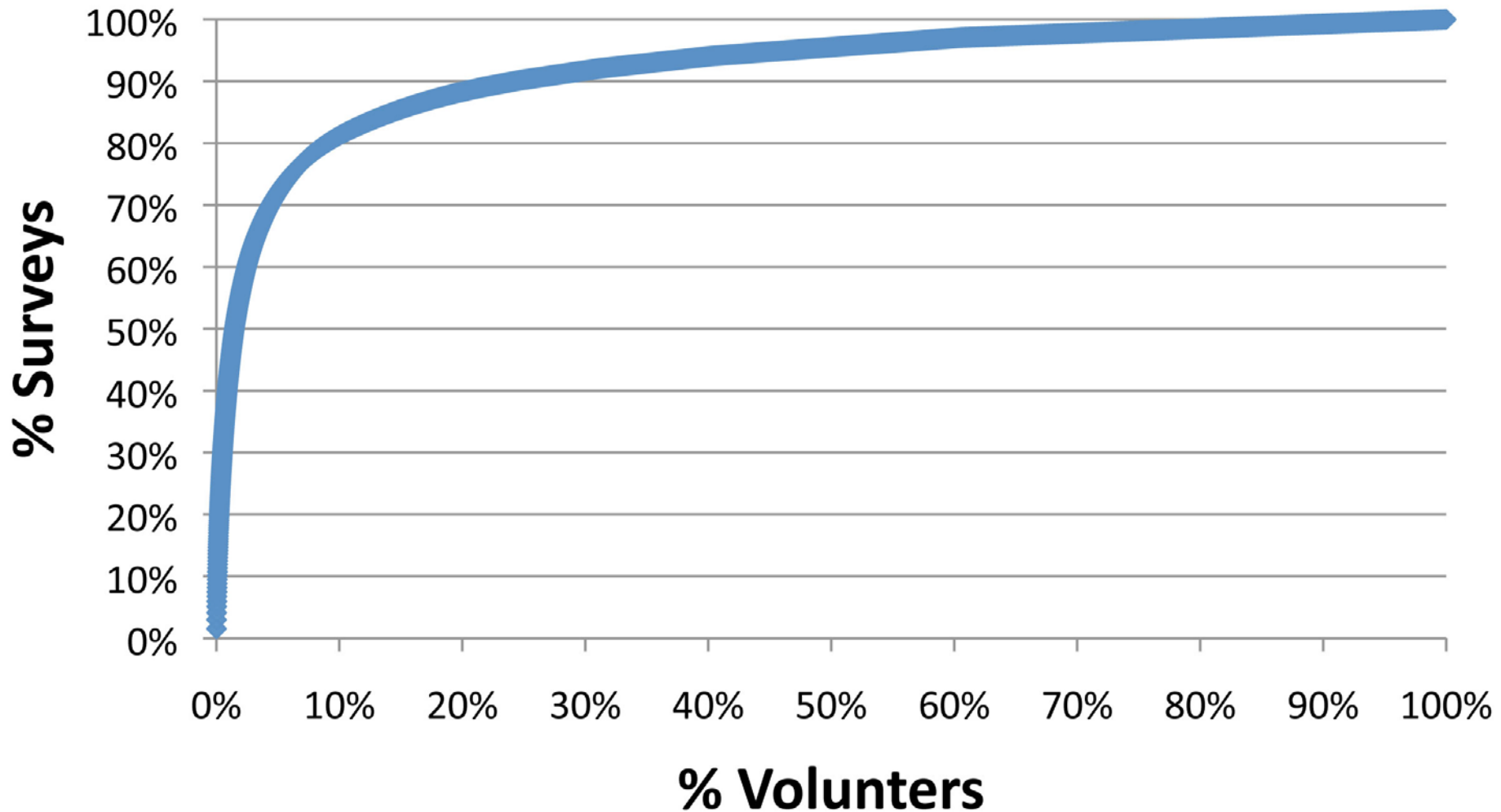
16,000+ Volunteers



As of January 2016

Appendix C

Volunteer Contribution Curve



345 volunteers (2.5%) have done 100+ surveys,
accounting for 112,345 surveys (60%)

Appendix C

REEF Volunteer Fish Survey Project



200,839 Surveys

12,038 Sites

16,000+ Volunteers

8.5 million records

3,600+ species



As of January 2016

Online Data Reports

Geographic Zone Report

Region: South Pacific ▾ **Geographic Zone:** Bligh Water (5102)

Start Date: Jan ▾ 1 ▾ 1993 ▾ **End Date:** May ▾ 28 ▾ 2013 ▾

Species Display: Chart (New) ▾ **Show:** Common names ▾

Change

Reset report options

Survey Type: SA = Species & Abundance; SO = Species

Click on a geographic place name to expand its sub-zones, or on a numeric zone ID that ID

		Surveys				Bottom Time
		Expert		Novice		
Code	Site	SA	SO	SA	SO	(H:M)
SOP						
5	Fiji	44	0	111	0	160:40
51		44	0	111	0	160:40
5102	Bligh Water	44	0	111	0	160:40
51020101	Cat's Meow	2	0	1	0	3:53
51020102	Humann Nature (Bligh Water)	1	0	0	0	1:28
51020104	E-6 (Makogai Island)	4	0	4	0	7:28
51020105	Mt. Mutiny / Hi-8 (Makogai Island)	4	0	4	0	9:40
51020113	Coral Corner (Vatu-i-ra)	6	0	22	0	29:40
51020114	Gomo (Vatu-i-ra)	3	0	5	0	7:16
51020115	Mellow Yellow (Vatu-i-ra)	4	0	16	0	20:14
51020116	Maytag (Vatu-i-ra)	2	0	3	0	3:37
51020117	Howard's Diner	3	0	11	0	14:47
51020118	White Wall (aka Channel, Wakaya Island)	3	0	21	0	23:50

51020138	Dominoes	1	0	1	0	2:23
51020139	Half Pipe	1	0	1	0	2:21
51020140	Christine	1	0	0	0	1:00
51020141	Joji's Reef	1	0	1	0	1:59
51020144	Alacrity	2	0	1	0	2:58
51020147	China Shop	1	0	0	0	1:00
TOTALS		44	0	111	0	160:40

Species

%SF = Sighting Frequency; DEN = Density Score?

Bar length corresponds to sighting frequency
Color saturation corresponds to density score



Two-spined Angelfish ▼

SF: 83.2% | DEN: 2.1

Species ID #: 0006

	Expert	Novice	Total
SF	88.6%	81.1%	83.2%
Den	2.3	2.1	2.1

Regal Angelfish ▶

SF: 81.9% | DEN: 1.9

[Moorish Idol](#) ►

SF: 80% | DEN: 2

Scalefin Anthias ▶

SF: 78.1% | DEN: 3.9

Bicolor Angelfish ▶

SF: 76.8% | DEN: 2.2

Golden Damsel ▶

SF: 75.5% | DEN: 2.9

Eastern Triangular

SF: 71.6% | DEN: 2.2

Raw Data Files Upon Request

Metadata includes:

- Surveyor Information
- Date, Start Time, Bottom Time
- Location
- Water Temperature, Visibility, Current
- General Habitat Description

Users include:

- Academic Scientists
- Resource Agencies
- Graduate Students

Data Uses

- Population Assessments
- Fisheries-Independent Stock Assessments
- Protected Area Monitoring
- Identification and Tracking of Non-native Species
- Biodiversity Hotspots for Ecoregional Planning
- Investigating Ecological Patterns
- Assessments for Endangered Species Act Listings
- Non-extractive User Group Patterns of Use

51 science and resource management publications

www.REEF.org/db/publications

Recent Publications

- Thorson, JT, MD Scheuerell, BX Semmens, and CV Pattengill-Semmens. 2014. **Demographic Modeling of Citizen Science Data Informs Habitat Preferences and Population Dynamics of Recovering Fishes.** *Ecology*
- Holt, BG, R Rioja-Nieto, MA MacNeil, J Lupton, and C Rahbek. 2013. **Comparing Diversity Data Collected Using a Protocol Designed for Volunteers with Results from a Professional Alternative.** *Methods in Ecology and Evolution*
- Francisco-Ramos V, Arias-González JE . 2013. **Additive Partitioning of Coral Reef Fish Diversity Across Hierarchical Spatial Scales Throughout the Caribbean.** *PLoS ONE*
- Stallings, CD. 2009. **Fishery-Independent Data Reveal Negative Effect of Human Population Density on Caribbean Predatory Fish Communities.** *PLoS ONE*

Programs

Volunteer Fish Survey Project



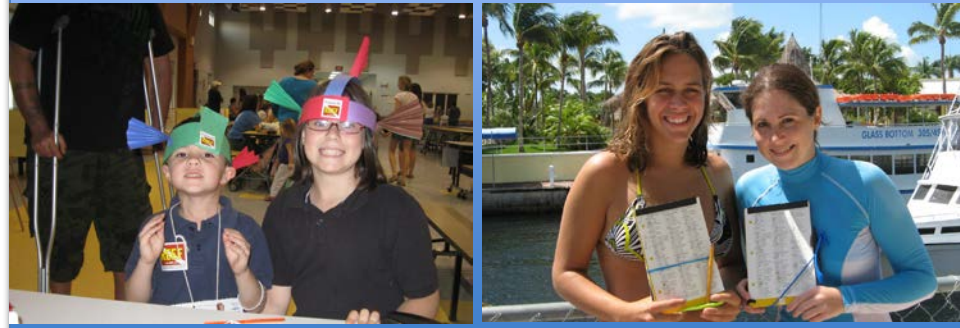
Invasive Lionfish Research Program



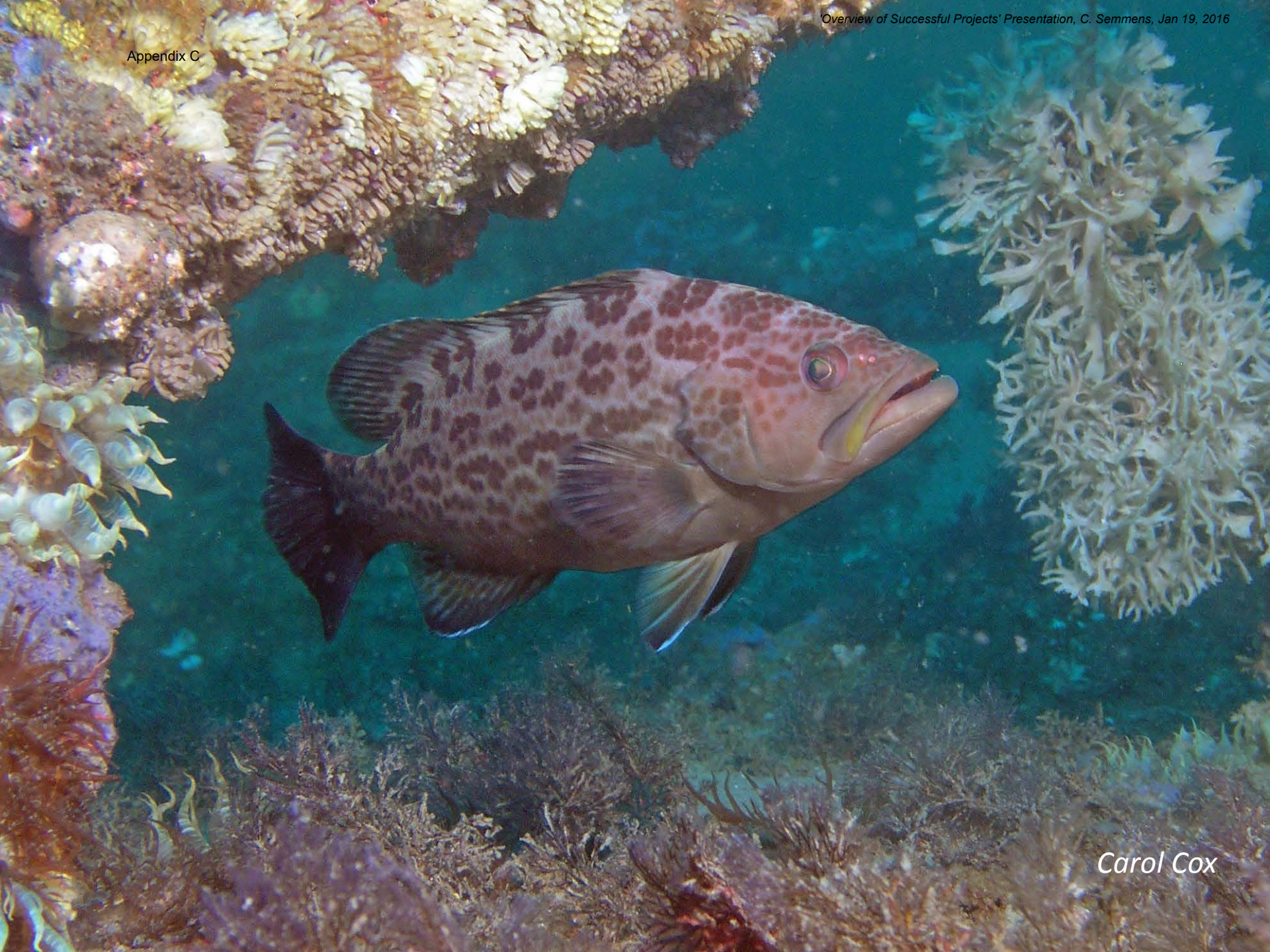
Grouper Moon Project



Explorers Education and Internships



Appendix C



Carol Cox

Identify Goals

- The inception of REEF and the VFSP
- Goals for Science, Policy/Action, and Participants (Shirk and Bonney 2015)
 - Science
 - “Engaging volunteers at previously unthinkable scales”
 - Providing “additional insights and expertise”
 - The role of technology in making CS possible
 - “CS data can stand alone or can complement other data”
 - Data quality – realistic goals and careful design
 - Connect with data users from start
 - Participants
 - Must understand motivation of participants, realistic expectations of what they are willing to do

Establish Capacity

- Early efforts of capacity building focused on:
 - Expertise (developing protocol, computer/db management)
 - Finding volunteers to participate
 - Securing funding from individuals and a few key private foundations who provided early (and continued) seed money
 - Establishing program sustainability, regional expansion began in year 4
 - Leveraging partnerships for administrative and overhead expenses
- Volunteers
 - “those who opt to participate more than likely bring some level of skill, interest, insight, or commitment” → primary reason why REEF has never required training
 - Early studies that evaluated volunteer skill
- Staff
 - Unpaid staff for first several years, 1-2 staff until about year 4, today (23 years later) we have 6 FT and 4 PT
 - All but one are not scientists

Design/Refine

Protocol

- “Pilot where possible”, data sheets, training materials, and document potential biases in method and novice vs. expert if possible
- Finalize and stick with protocol

Training

- Diversity of training opportunities
- Pre-formatted survey materials
- Experience levels → document metadata about observers

Infrastructure

- “it is most efficient if designed for sustainability”
- Data sharing policy

Manage

Participation

- “important to value participation consistency and reliability”, “acknowledge and celebrate contributions of volunteers” -> most CS programs are dominated by a core group of dedicated volunteers, need to ensure that they will keep coming back as well as recruiting enough new people to counter natural attrition
 - Flexibility in when and where, protocol meshes with existing recreational activity
 - Top 25 lists, Advanced Assessment Team levels, ability to view data, share data uses

Data

- Keep it simple, and robust to growth (open source)
- Document changes in record
- QA/QC at several steps

Apply and Adapt

- Big, messy datasets -> innovative analytic techniques, finding next generation scientists who aren't afraid of big, messy, and non-stratified
- Evaluation and determining effectiveness, doesn't have to be elaborate. And must be patient, it takes time -> snowball effect

Thank You

©Carlos & Allison Estapé



Appendix C

SAFMC
Citizen Science
Program Design
Workshop

Jan. 19-21, 2016

North Carolina Sea Grant:

Your link to research & resources for a healthier coast.

Lessons Learned:

Use of text message reporting to quantify catch and effort at NC king mackerel tournaments

Scott Baker
Fisheries Extension Specialist



Novel Data Collection Via SMS

Overview

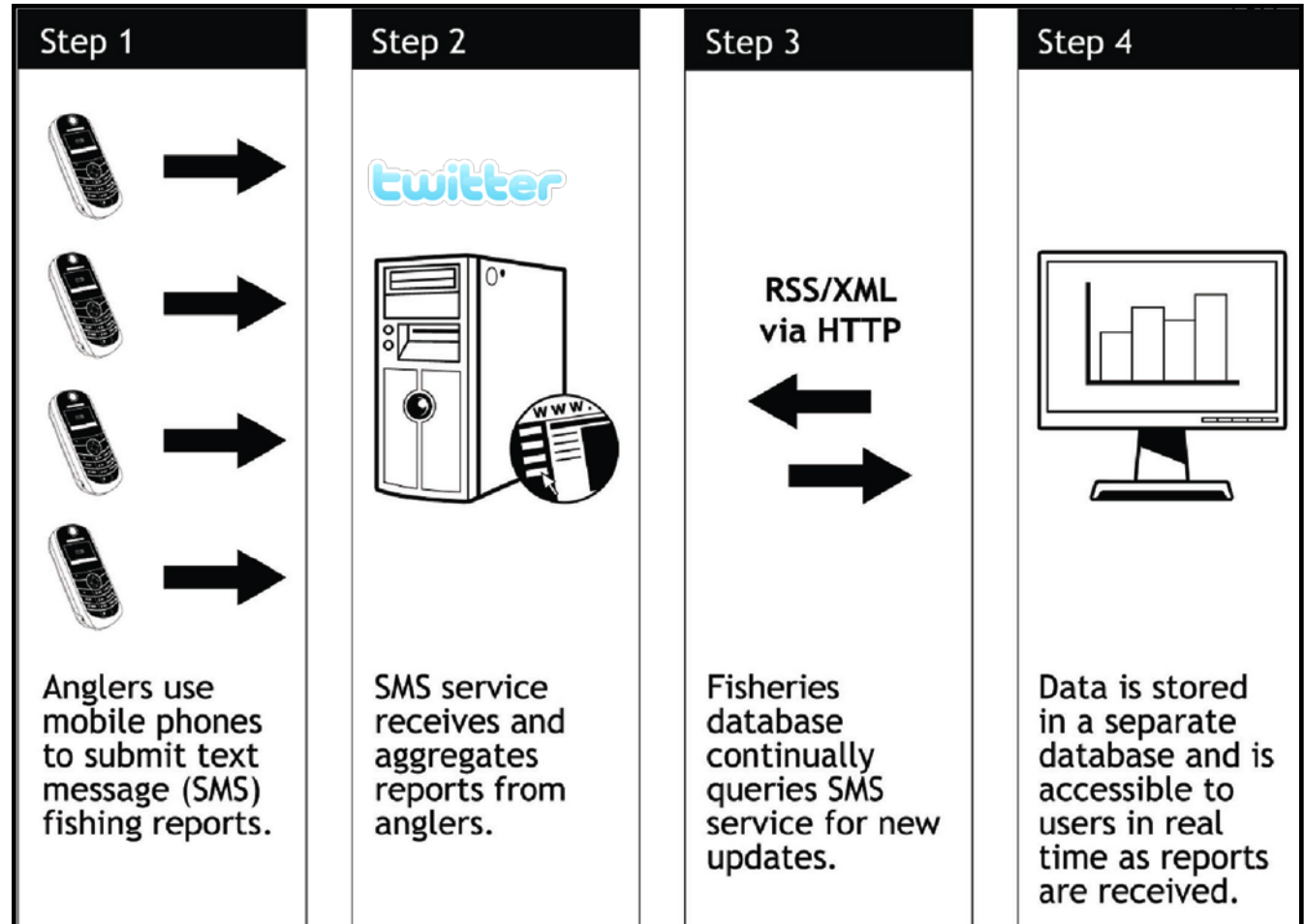
Goals

Capacity

Design

Manage

Adapt





Self Reporting at Tournaments

Overview

Goals

Capacity

Design

Manage

Adapt





Overview

Goals

Capacity

Design

Manage

Adapt

Self Reporting at Tournaments

- Science

- Estimate CPUE and harvest at 6 king mackerel tournaments

- Participants

- Submit reports whether successful or not in tournament

- Policy / Action

- Showcase importance of tournaments
-



Overview

Goals

Capacity

Design

Manage

Adapt

Self Reporting at Tournaments

- Staff
 - 2 NCSG + 2 students
 - Volunteers
 - Approached 2,500 anglers (~1,000 boats)
 - ~15% submitted reports
 - Partners
 - NCDMF and Tournament organizers
-



Overview

Goals

Capacity

Design

Manage

Adapt

Self Reporting at Tournaments

- Question/protocol
 - Describe that boat's trip using project syntax / code words
 - Training
 - Some hands-on, mostly refer to wallet card provided
 - Infrastructure
 - SMS > aggregator > XML via RSS > MySQL database
-



Overview

Goals

Capacity

Design

Manage

Adapt

Self Reporting at Tournaments

- Participation
 - ~15% of total trips; increased when reminders incorporated
 - Data
 - All usable, but some data entry errors and misunderstanding
 - Expectations
 - Difficult to identify and manage
-



Overview

Goals

Capacity

Design

Manage

Adapt

Self Reporting at Tournaments

- Research/Action
 - Results similar to previous study that used paper surveys
 - Determine effectiveness
 - Method works but project hampered by lack of complete buy-in by partners/participants
 - Transparency
 - Complete (data accessible online as received)
-



Lessons Learned...

Overview

Goals

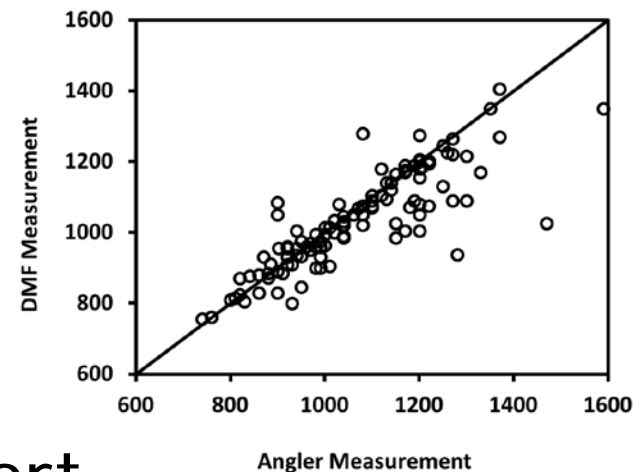
Capacity

Design

Manage

Adapt

- Better convey purpose and need
- Utilize tournament resources
- Minimize reliance on new technology
- Devote more time and money to participant feedback and follow-up
- Anticipate and control for biases and mistakes
- Avoid metric system!
- Agency role in effort





Appendix C

SAFMC
Citizen Science
Program Design
Workshop

Jan. 19-21, 2016

North Carolina Sea Grant:
Your link to research & resources for a healthier coast.

Building Partnerships for Success: *A collaboration to design a solution to safely release fishes that experience barotrauma*

Sara Mirabilio
Fisheries Extension Specialist



Regional Barotrauma Study

Overview

Goals

Capacity

Design

Manage

Adapt



Overview

Goals

Capacity

Design

Manage

Adapt

Release Gear on For-Hire Boats



■ Science

- Demonstrate 'barotraumatized' fish survive if released with descending gear

■ Participants

- 'real-world' fishing setting aboard for-hire boats with paid captains, mates and 30+ passengers

■ Policy / Action

- Improve survivorship of discarded fishes



Building Partnerships for Success

Overview

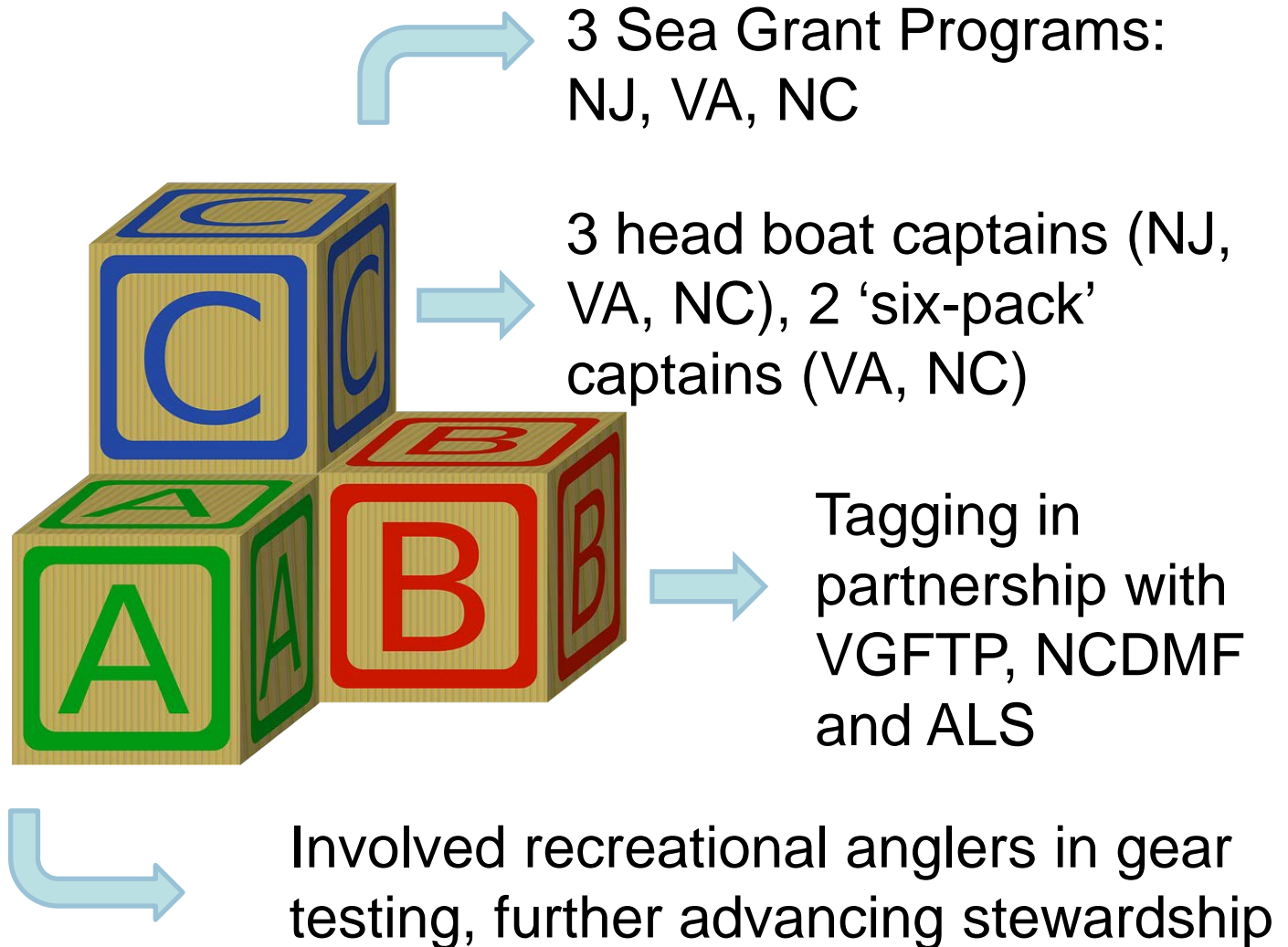
Goals

Capacity

Design

Manage

Adapt



Overview

Goals

Capacity

Design

Manage

Adapt

Traditional Ecological Knowledge



■ Knowledge from 'here'

- location specific, detailed, not easily generalized to other places

■ Knowledge from 'away'

- professional understandings based on assumptions and evidence, transferable across time and space



Descended Fish Live to Tell the Tail

Overview

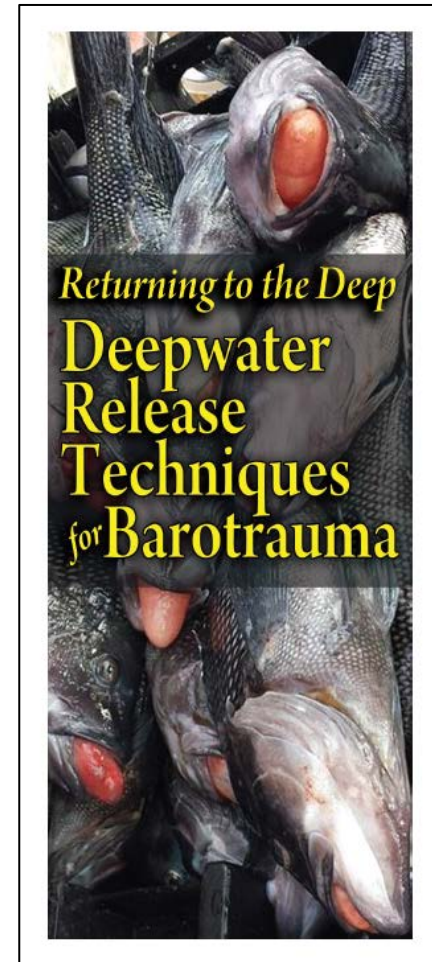
Goals

Capacity

Design

Manage

Adapt





Overview

Goals

Capacity

Design

Manage

Adapt

Lessons Learned...

- No one set tool or device for everybody.
- Post-project outreach should include discussion with respective local enforcement officers.
- Full support within the recreational industry likely garnered only by offering incentives.

“Getting fishermen — recreational anglers and commercial fishermen, too — to use stuff like that is challenging. But, I think the way Sea Grant goes about it, where they work cooperatively with boats rather than order them around, it has potential.” – Capt. Ernie Foster





Citizen Science Project Design

Jennifer Shirk

Cornell Lab of Ornithology/Citizen Science Association

*South Atlantic Fisheries Management Council
January 2015*

Appendix C





ABOUT

ASSOCIATION



Jennifer Shirk

[Log Out](#)

WELCOME TO CITIZENSCIENCE.ORG, HOME OF THE CITIZEN SCIENCE ASSOCIATION

Flickr image: Mount Rainier National Park



The power of citizen science.

Citizen science is the involvement of the public in scientific research – whether community-driven research or global investigations. The Citizen Science Association unites expertise from educators, scientists, data managers, and others to power citizen science. Join us, and help speed innovation by sharing insights across disciplines.

over 1K

Projects

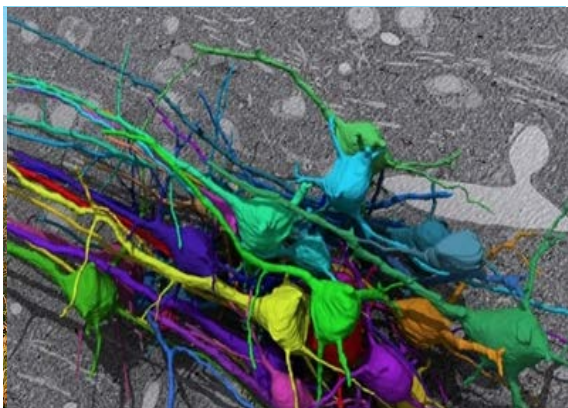
over 1M

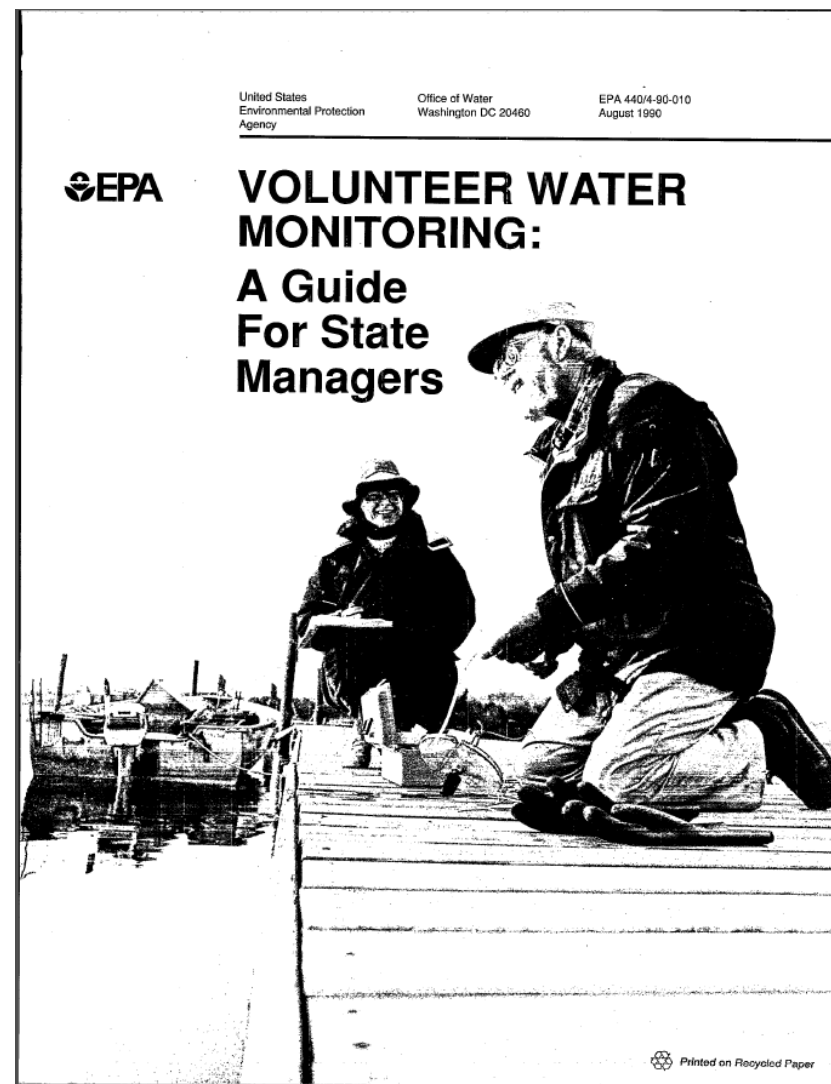
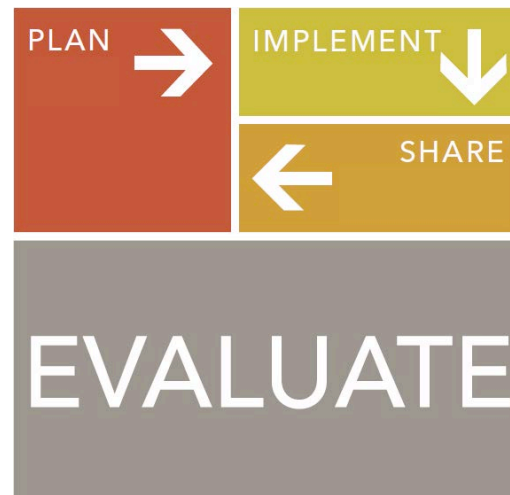
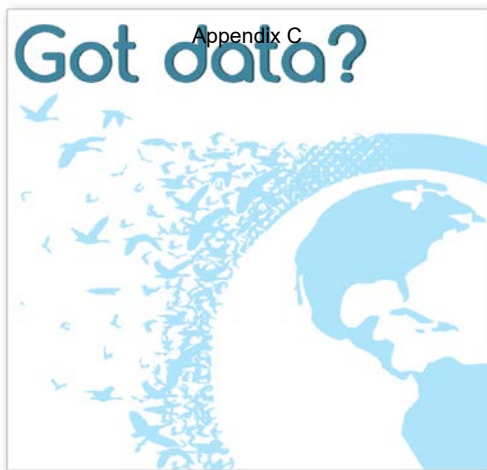
Volunteers

over 3.5K

Members

Citizen Science News

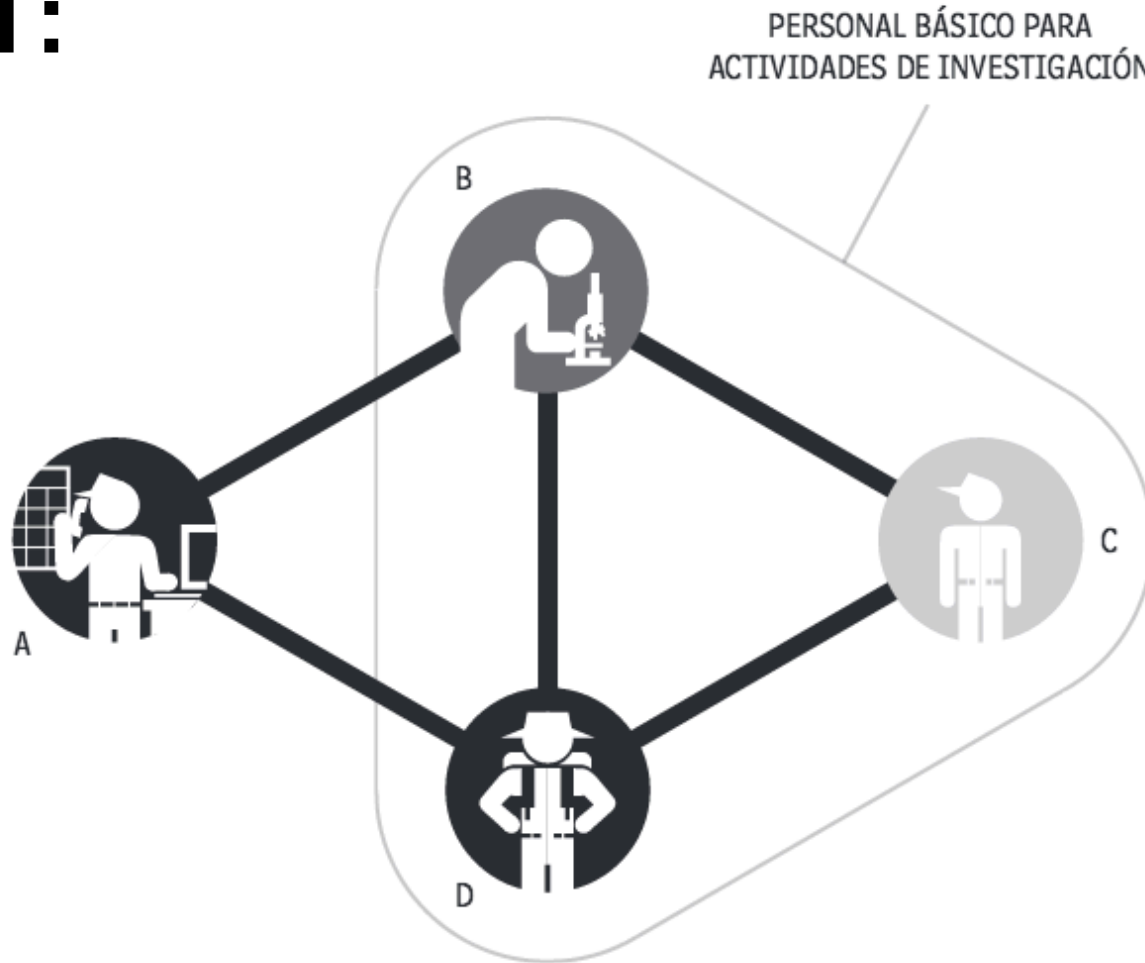




Appendix C

PROJECT, PROGRAM, FRAMEWORK?

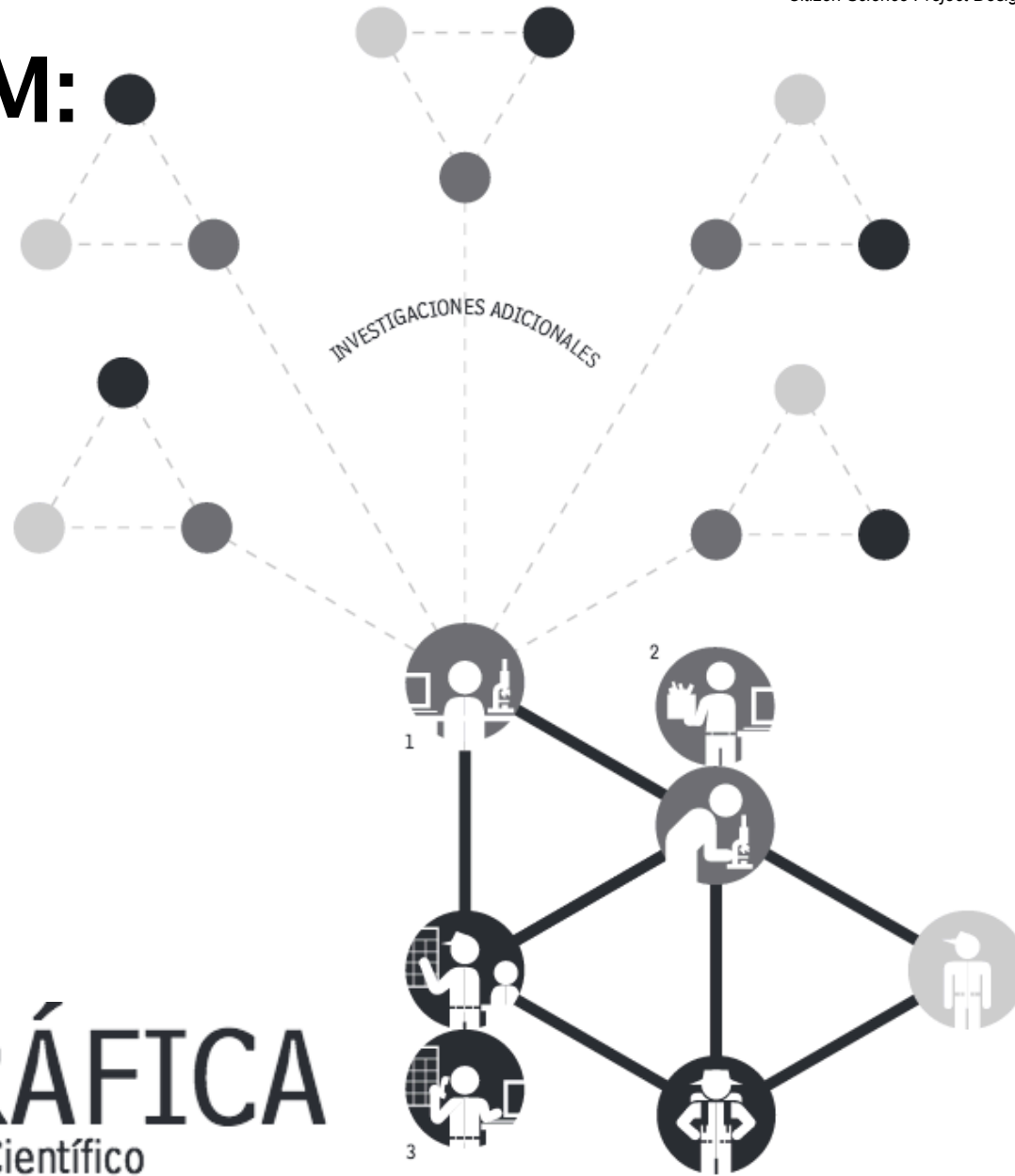
PROJECT:



INFOGRÁFICA

Programa Ciudadano Científico
Fideicomiso de Conservación de Puerto Rico

PROGRAM:



INFOGRÁFICA

Programa Ciudadano Científico
Fideicomiso de Conservación de Puerto Rico

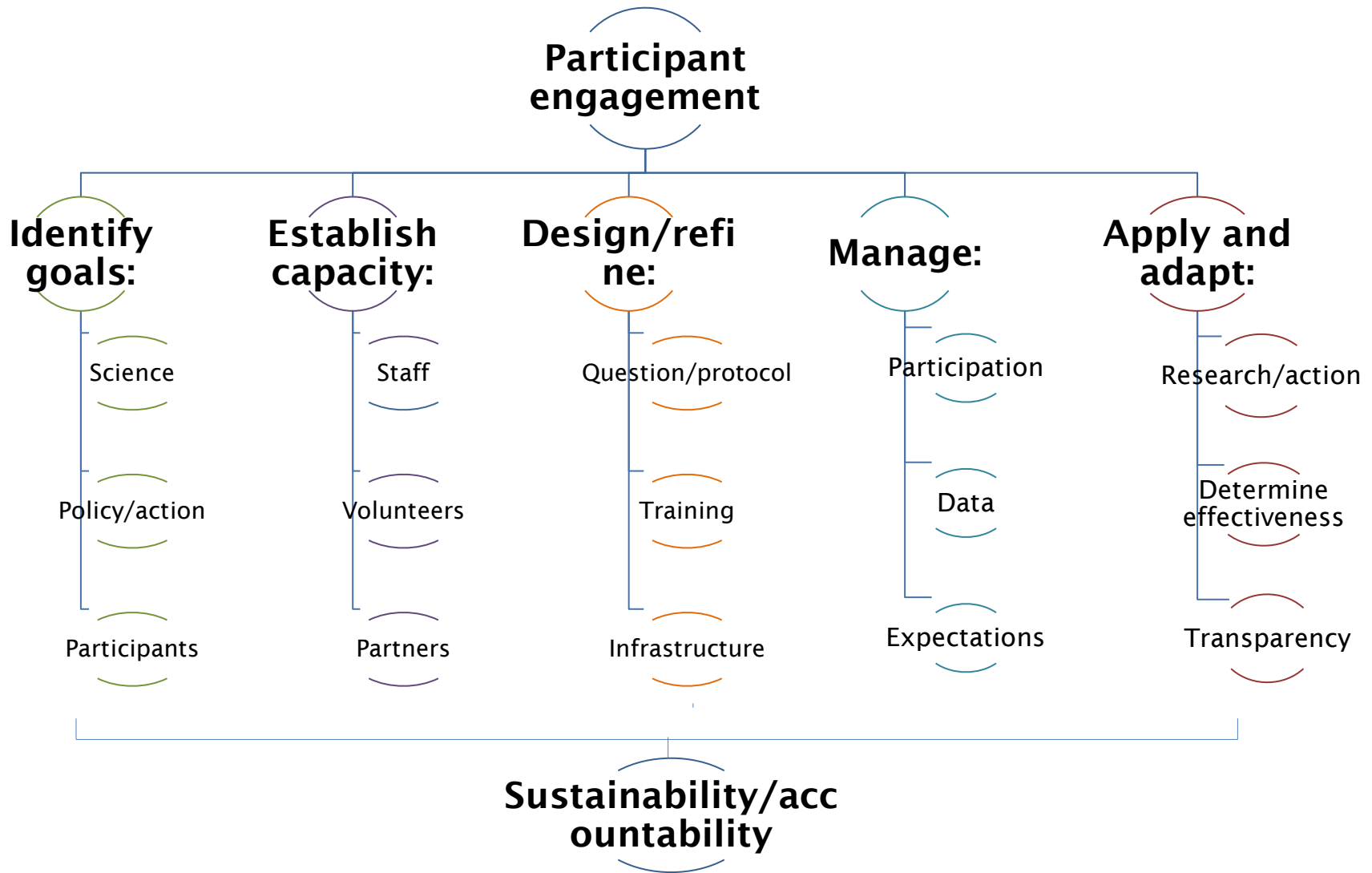
Canadian Community Monitoring Network

The Four Key Phases of the CCMN Model for Community Based Monitoring



(Pollock and Whitelaw 2005; Vaughan et al 2003)

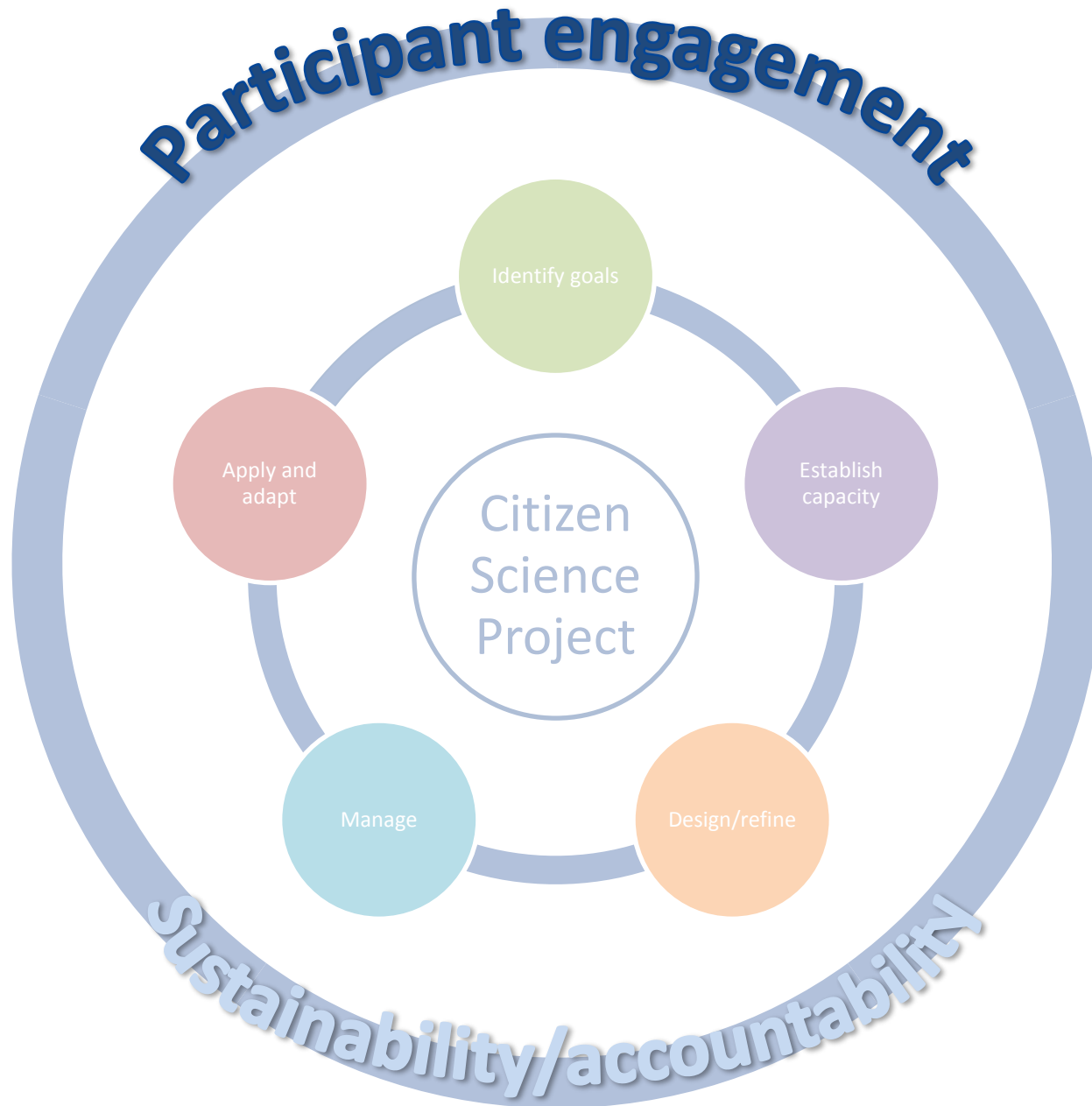
Components of project design



Appendix C



Appendix C



Participant engagement

Define a question/issue

Gather information

Develop explanations

Design data collection methods

Collect samples

Analyze samples

Analyze data

Interpret data/conclude

Disseminate conclusions

Discuss results/inquire further

Contributory

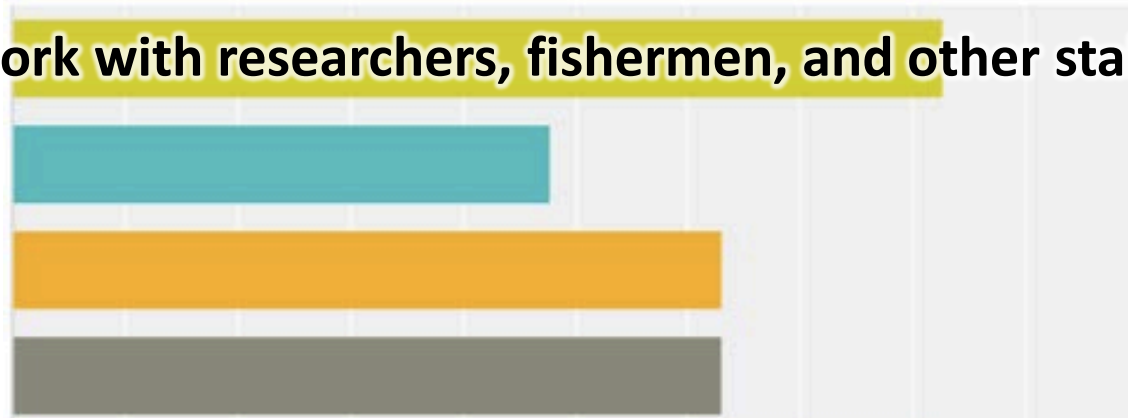
Collaborative

Co-Created

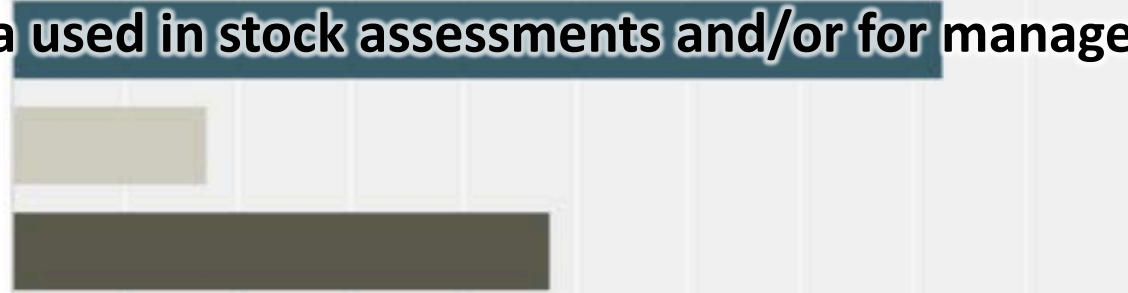
Bonney et al. 2009; Shirk et al. 2012; Stepenuck in press

What would encourage you to participate in a citizen science project?

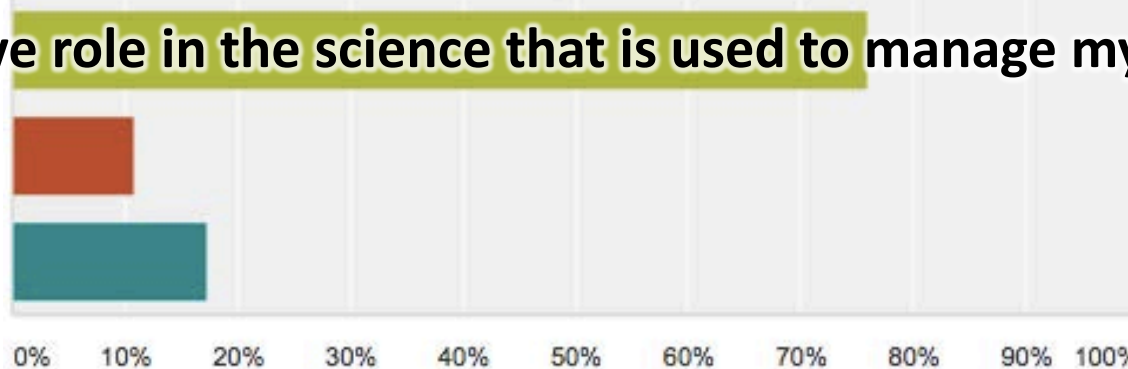
Ability to network with researchers, fishermen, and other stakeholders



Seeing the data used in stock assessments and/or for management decisions



Having an active role in the science that is used to manage my fisheries



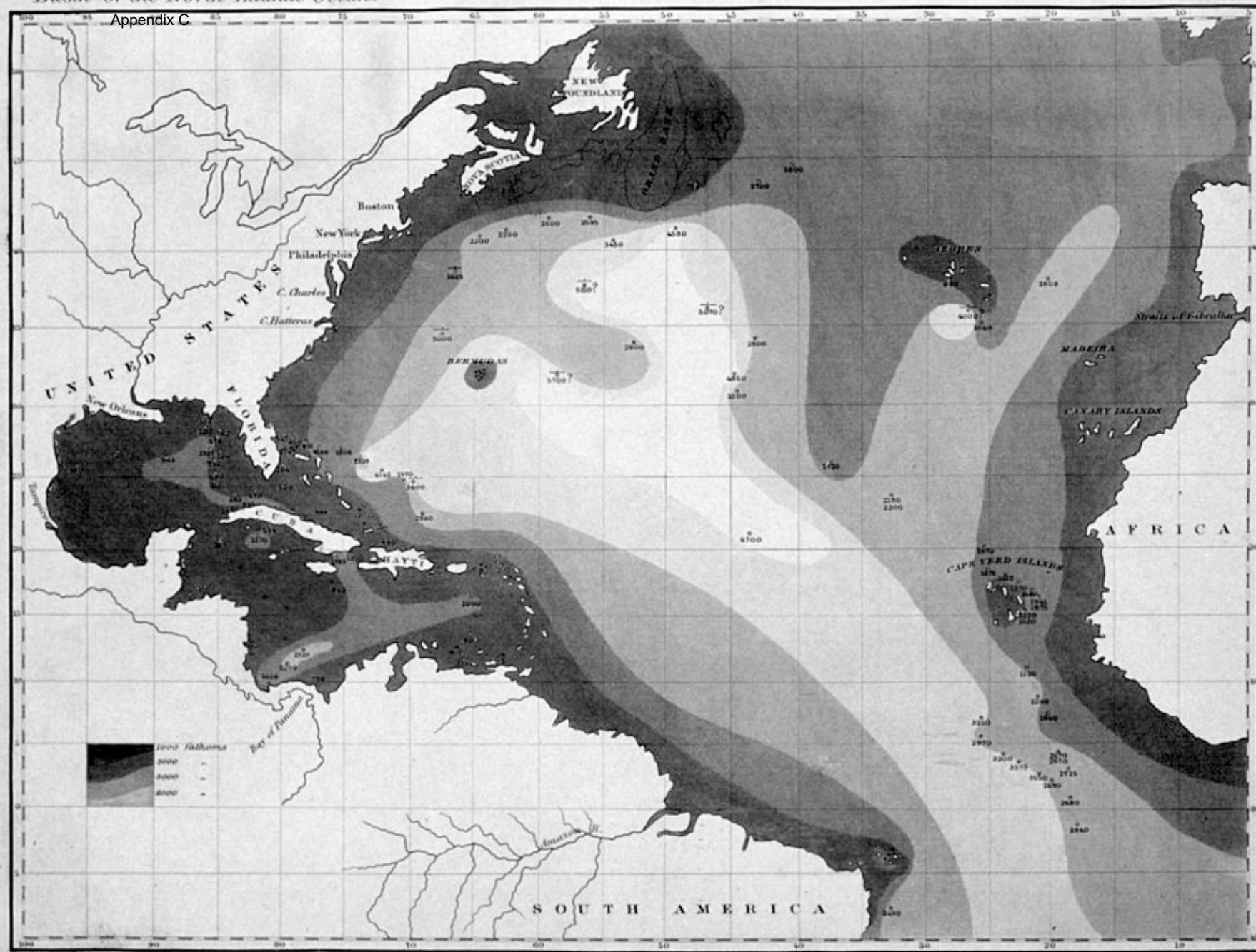
Appendix C



Basin of the North Atlantic Ocean.

Plate XIV.

Appendix C

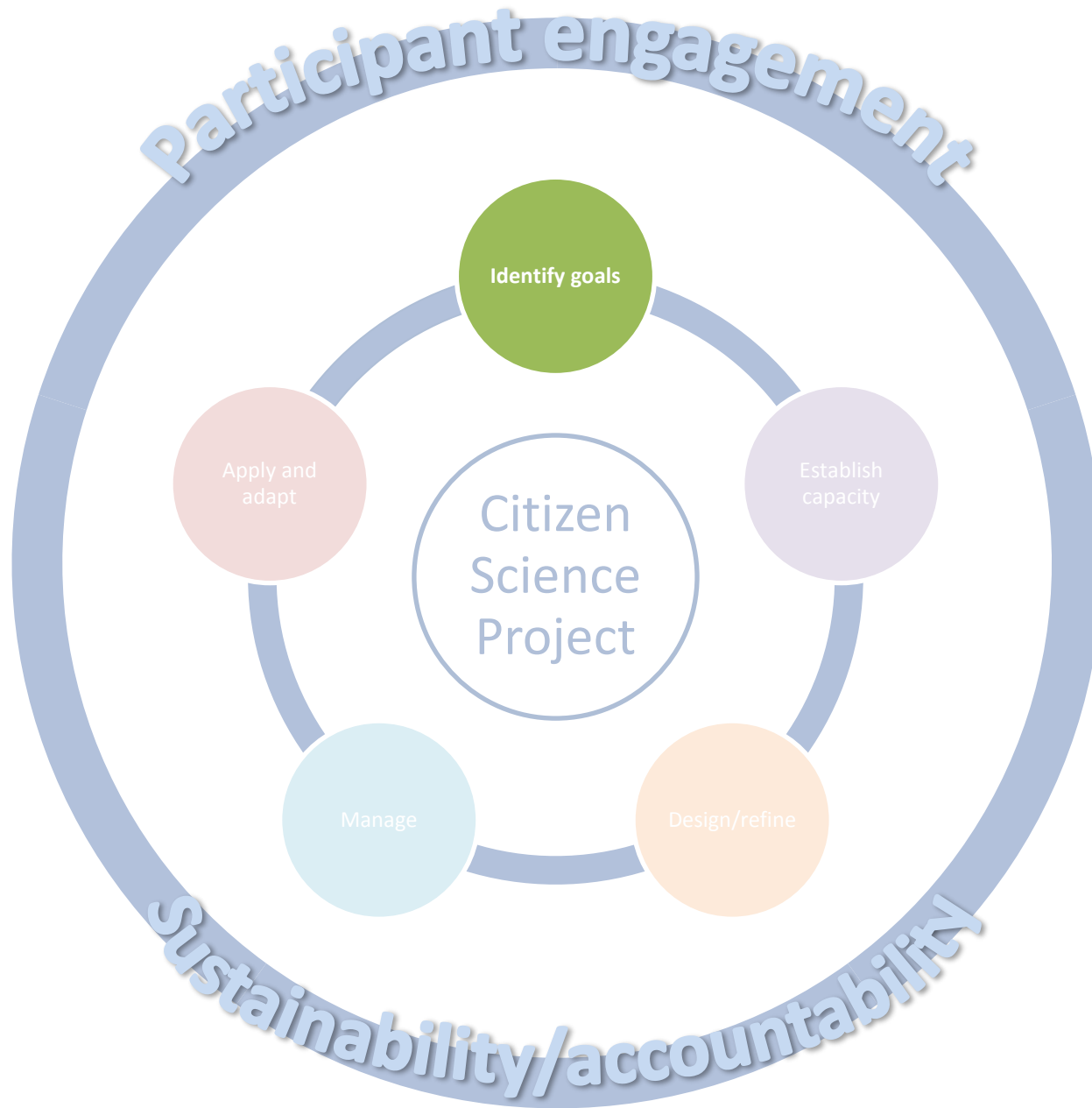


“Synergistic interaction between scientists and fishers. Co-learning and jointly developing ideas for solving problems and achieving desired goals.”

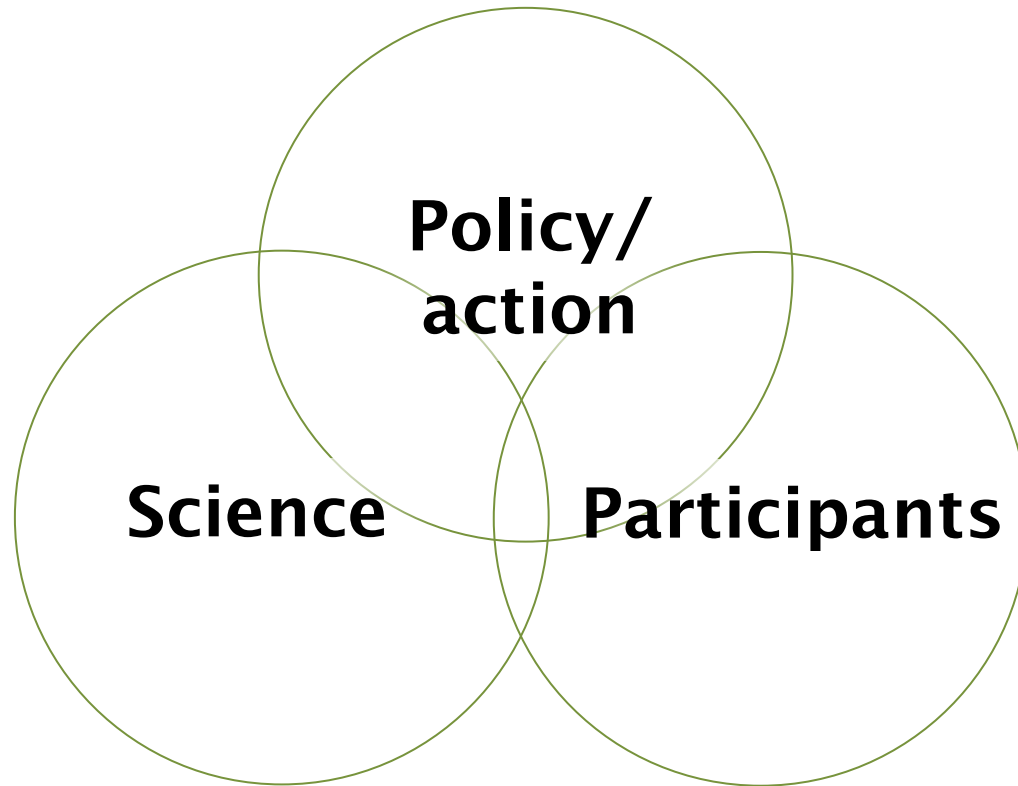
Participant engagement

- ✧ Open communication
- ✧ Issues of trust, reciprocity, accountability
- ✧ Transparency about goals and outcomes

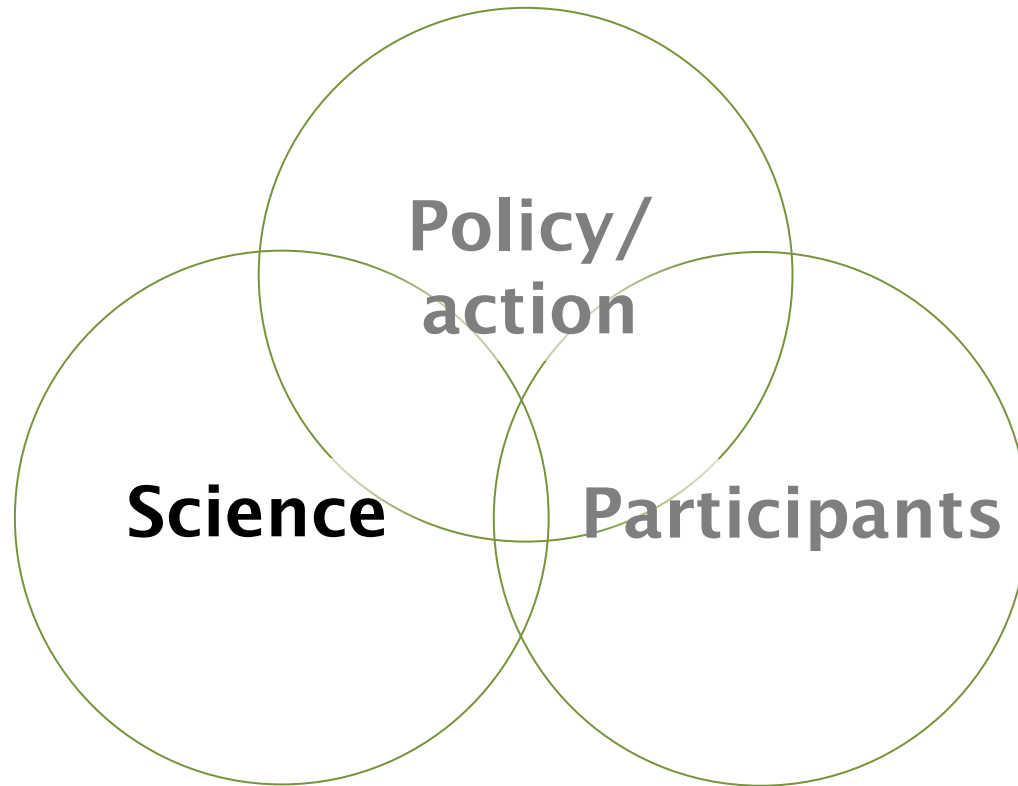
Appendix C



Identify/align goals



Identify/align goals



Identify/align goals

Data “quality” ---> Data *integrity*

Accessibility

Appropriate amount

Believability

Completeness

Concise representation

Consistent representation

Ease of manipulation

Free of error

Interpretability

Objectivity

Relevancy

Reputation

Security

Timeliness

Understandability

Value-added

...

(from Hunter et al. 2012)

Canadian Community Monitoring Network



Flickr photo by KIDD99 <https://www.flickr.com/photos/kidd99/5999302661>

timely ♦ accessible ♦ relevant ♦ useful

Identify/align goals

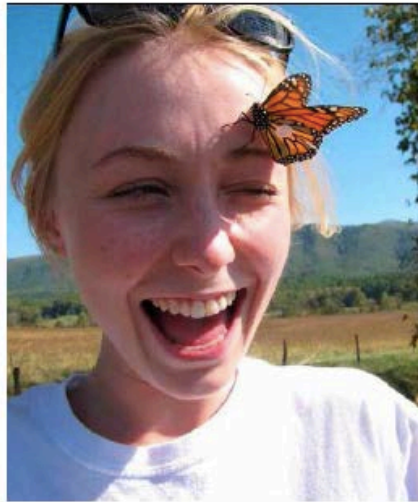
Data

*****Identify information needs and data users at the outset***

- Set quality objectives
 - Relevant to goals and concerns
(US EPA 1990)
-

Appendix C

The **Cornell** Lab of Ornithology



Program Development
and Evaluation

USER'S GUIDE FOR
**EVALUATING LEARNING OUTCOMES
FROM CITIZEN SCIENCE**

Tina Phillips
Marion Ferguson
Matthew Minarchek
Norman Porticella
Rick Bonney

Using Results Chains to Improve Strategy Effectiveness

An FOS How-To Guide

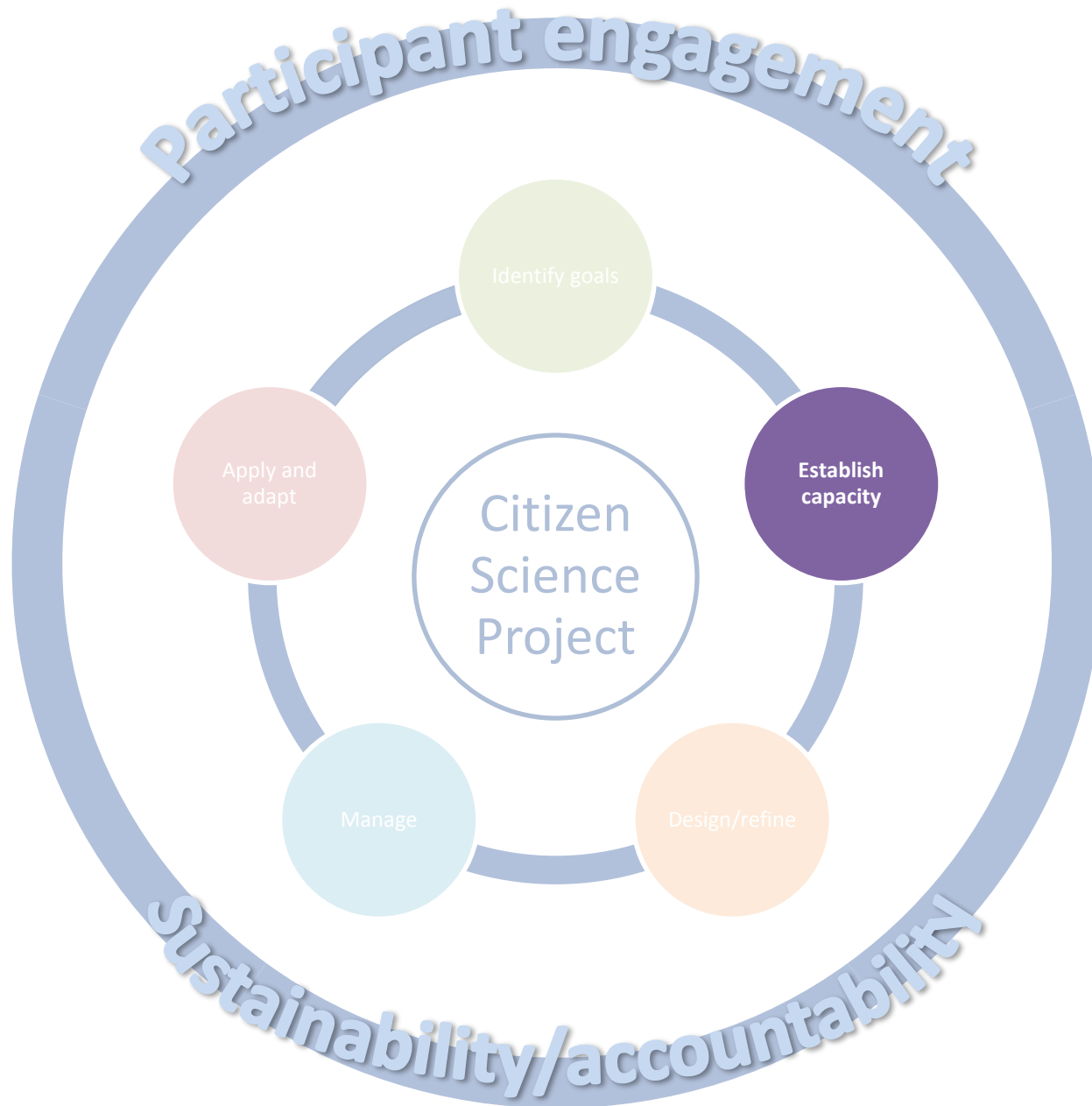
May 2007



Foundations of Success
Improving the Practice of Conservation

www.FOSonline.org
info@FOSonline.org

Appendix C



Establish capacity

Where can you efficiently access the skills and resources needed to be effective?

Where does the capacity already exist that you can leverage?



Partners

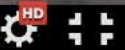
Staff

Volunteers

GoPro underwater fishing (167ft deep), shetland.



▶ ⏮ 🔊 0:41 / 3:01





Appendix C

Projects

About

Talk

Notifications

Collect

BUILD A PROJECT

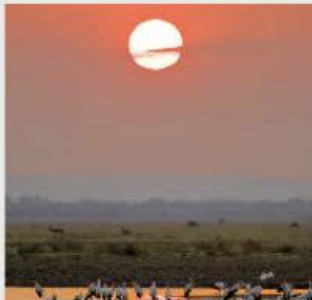


Sign in

Register

All Projects

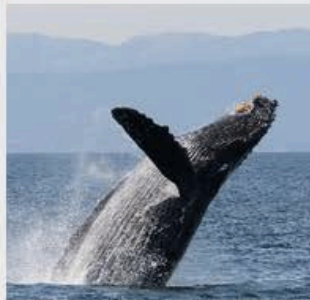
Showing 1-20 of 43 found



WILDCAM GORONGOSA



FOSSIL FINDER



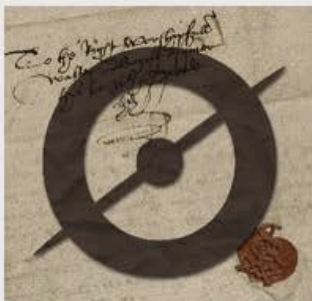
WHALES AS INDIVIDUALS



SEASON SPOTTER IMAGE
MARKING



SEASON SPOTTER
QUESTIONS



SHAKESPEARE'S WORLD



JUNGLE RHYTHMS



CHIMP & SEE

Discover the secret life of chimpanzees. We need your help to study, explore, and learn from thousands of videos.

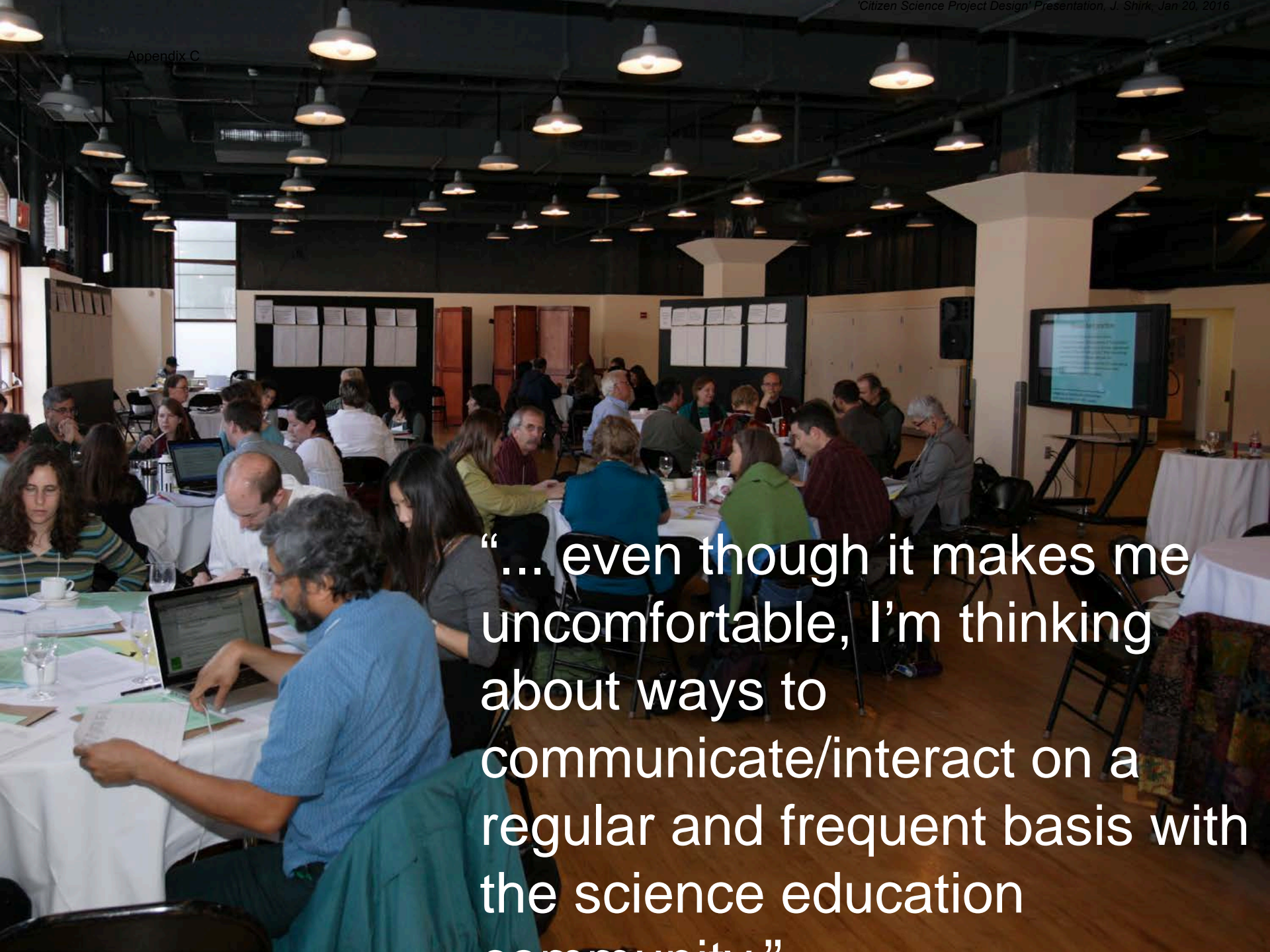


ANNOTATE



SCIENCE GOSSIP

chimpanzee.org



“... even though it makes me uncomfortable, I’m thinking about ways to communicate/interact on a regular and frequent basis with the science education community.”

[« All Events](#)

Citizen Science Free Online Training Course

February 17 @ 3:00 pm - 4:00 pm | Recurring Event ([See all](#))

Thinking about adding citizen science to your work, but don't know where to get started? Schoodic Institute is offering a free online, pilot training class for you!

Simply click on our flier to register.

Citizen scientists

Monitor rare plant communities,
Collect phenology data,
Count nesting birds,
Measure water quality,
Contribute to biodiversity discovery,
and more

In September 2015 White House Office of Science and Technology Policy issued a memorandum encouraging the use, where appropriate, of citizen science by Federal agencies.

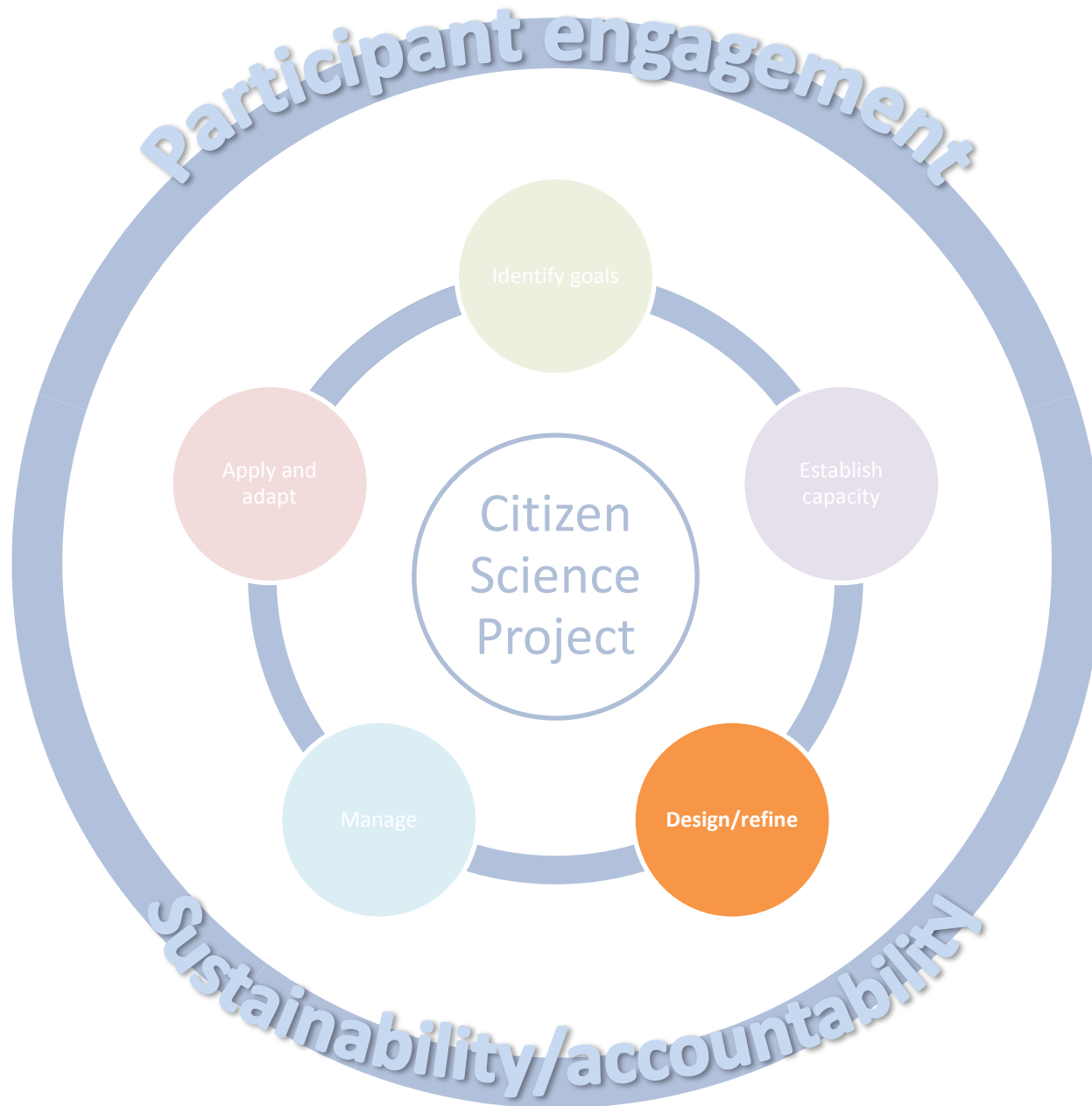


Thinking about adding citizen science to your work...
but don't know how to get started?

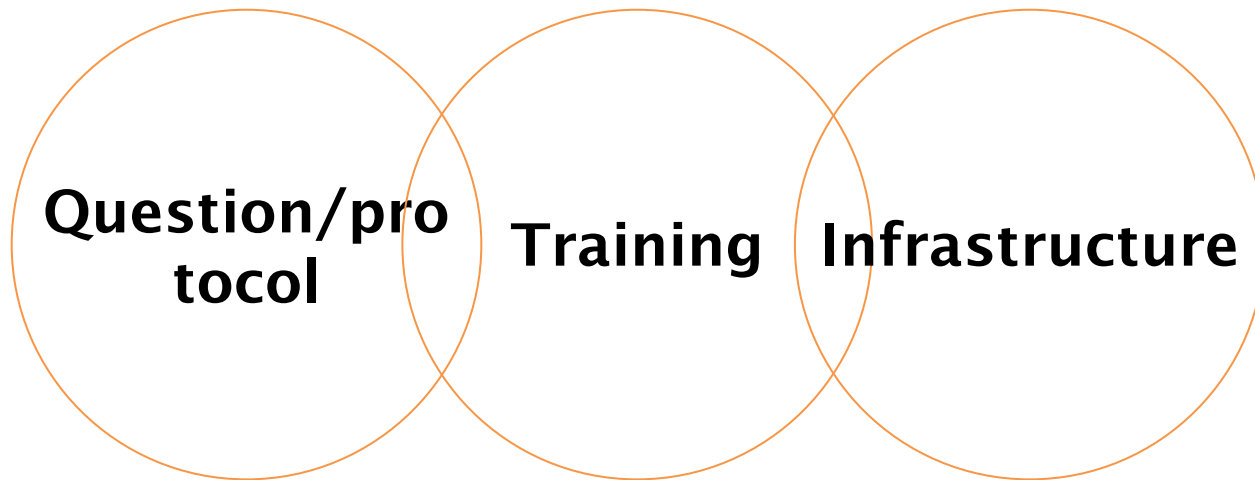
Schoodic Institute is offering a free, online pilot training course for you!

We are looking for five teams of citizen science practitioners to join us for the pilot of this exciting course starting February 17, 2016

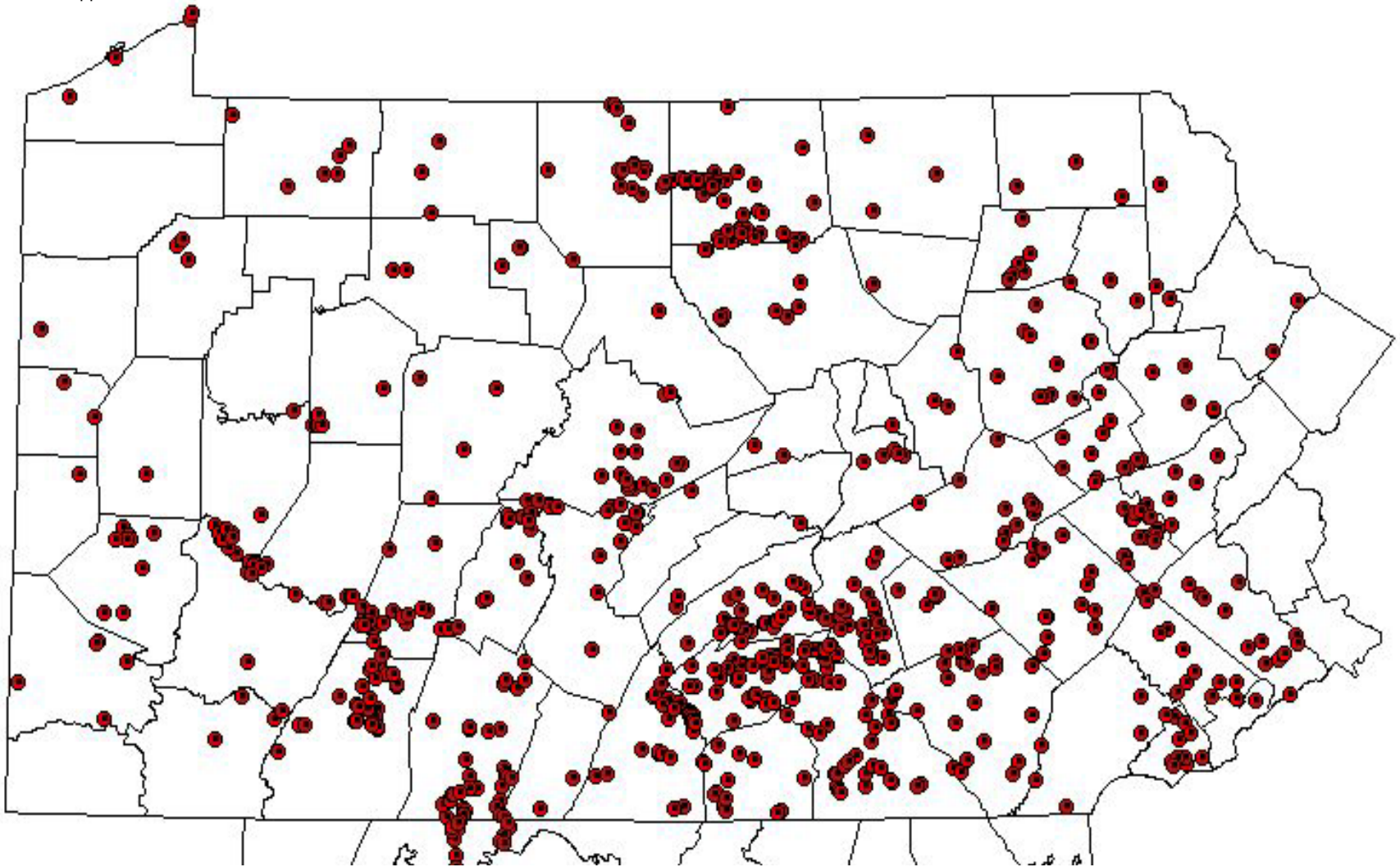
Appendix C



Design/refine



Appendix C

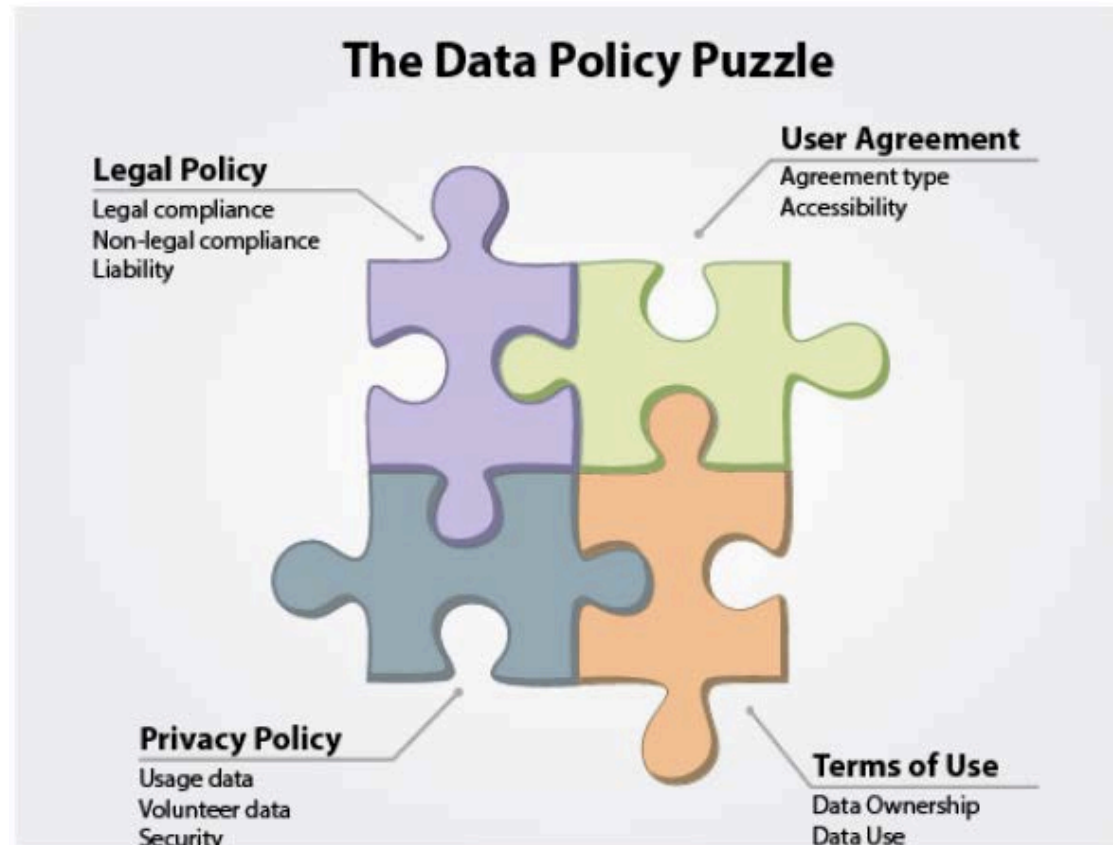


ALLARM: Alliance for Aquatic Resource Monitoring

Appendix C

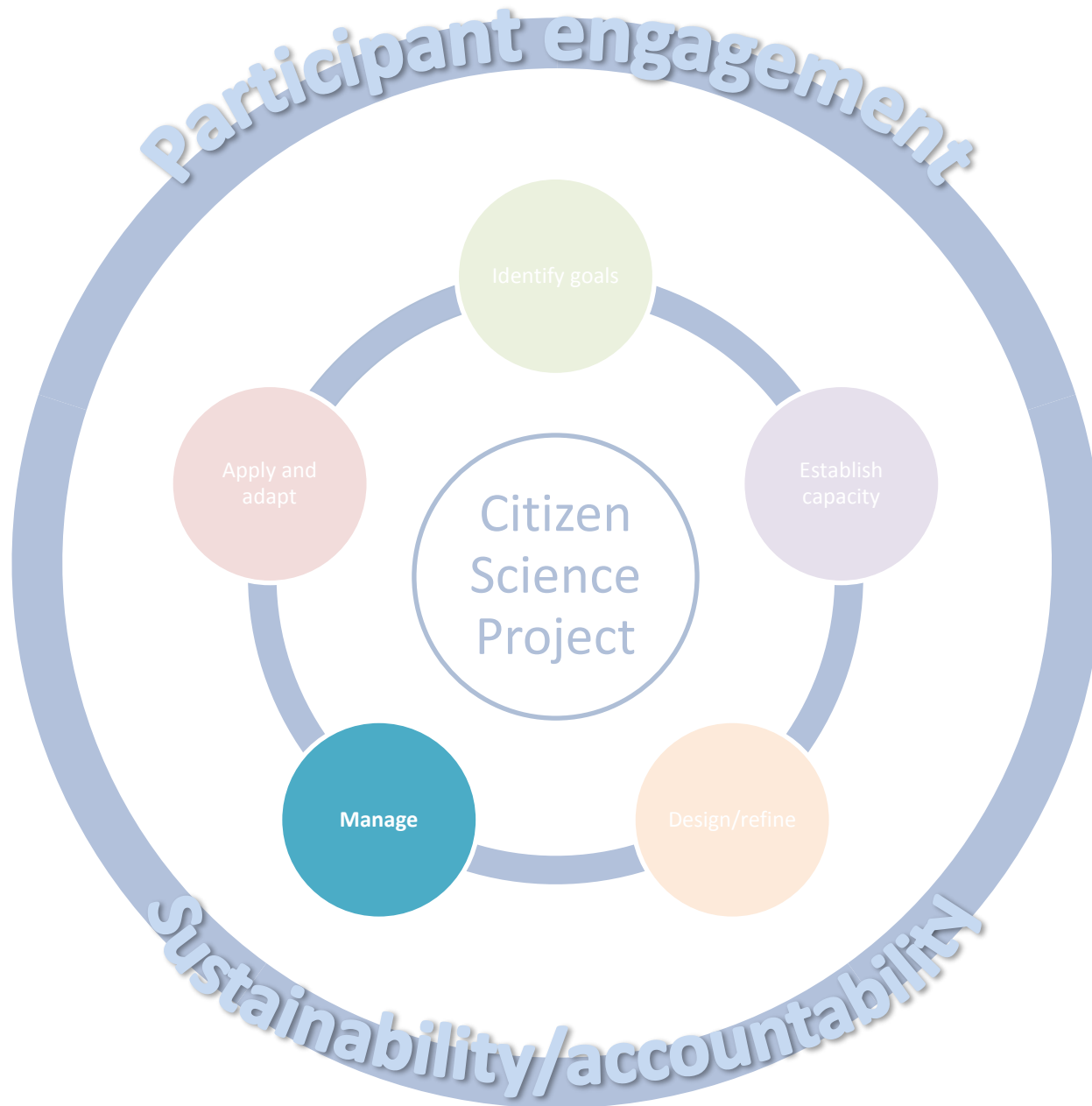


Appendix C

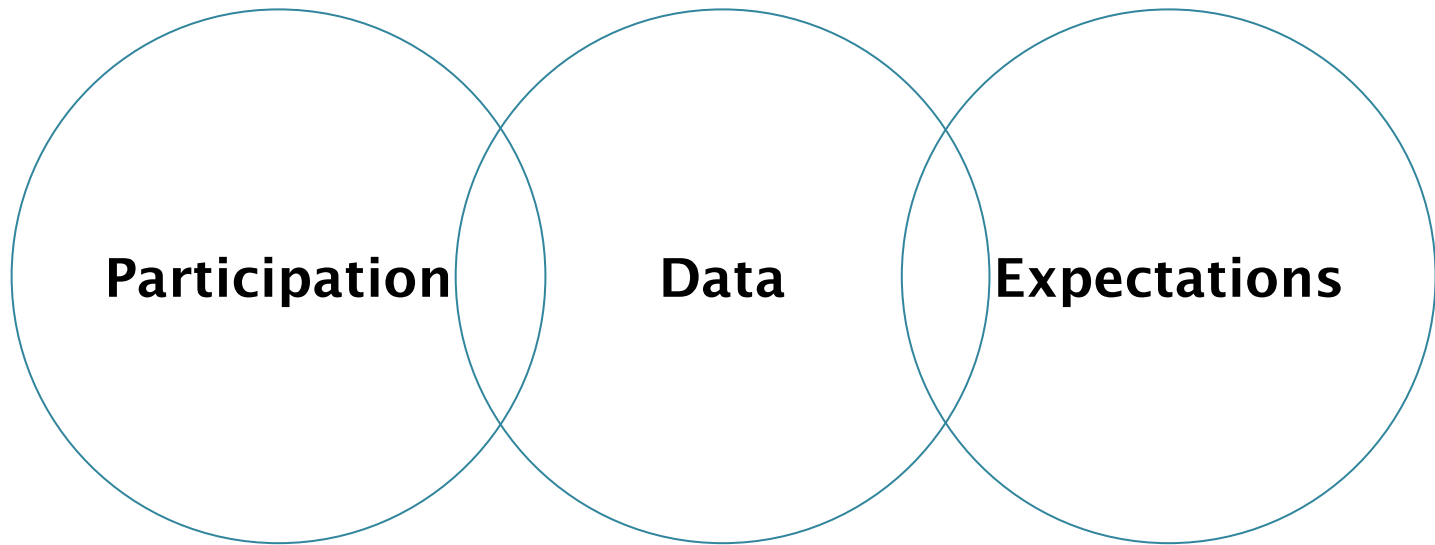


(Bowser et al Data policy primer, DataONE)

Appendix C



Appendix C Manage

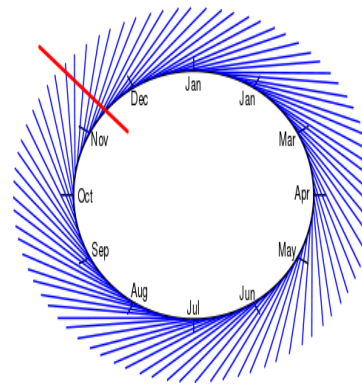


Appendix C



$$F(X, s, t) = \frac{1}{n(s, t)} \sum_{i=1}^m f_i(X, s, t) I(s, t \in \theta_i)$$

STEM Temporal Design





Loudoun Wildlife Conservancy

People and Wildlife Living in Harmony

Loudoun Bluebird Nestbox Trails

Home

About Loudoun Wildlife

Programs and Field Trips

Citizen Science
(Monitoring, Counts, Surveys)

Habitat Restoration
- Public Projects
- Audubon at Home
- Bringing Back the Monarchs

Conservation Advocacy

Educational Resources

Habitat Herald Archives

Loudoun Wildlife Store

Join, Renew, Donate

Volunteer!

Contact Us

Our Community

Loudoun's Great Places

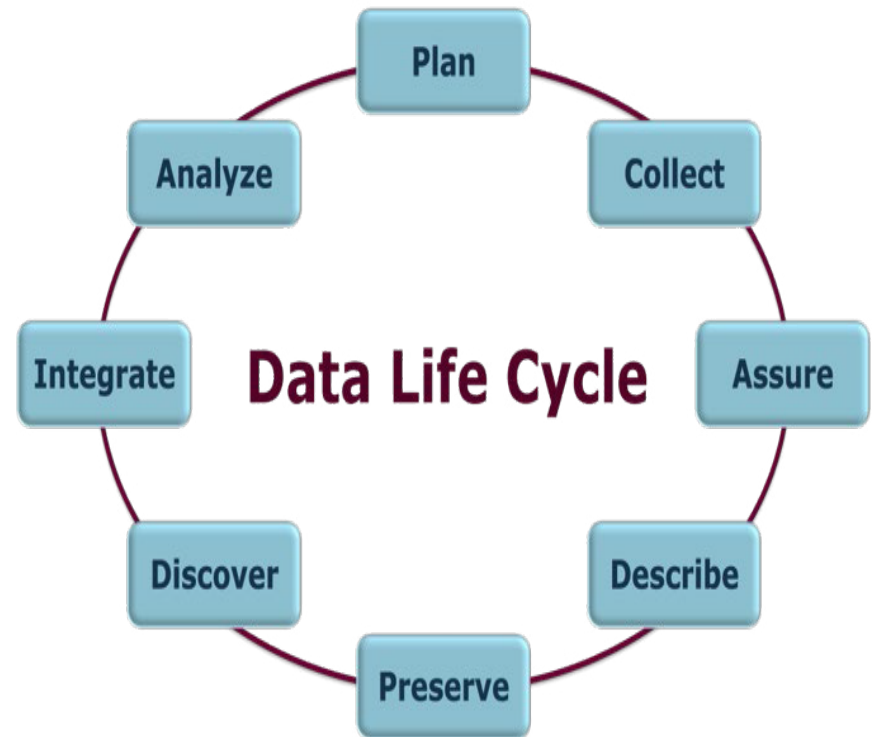
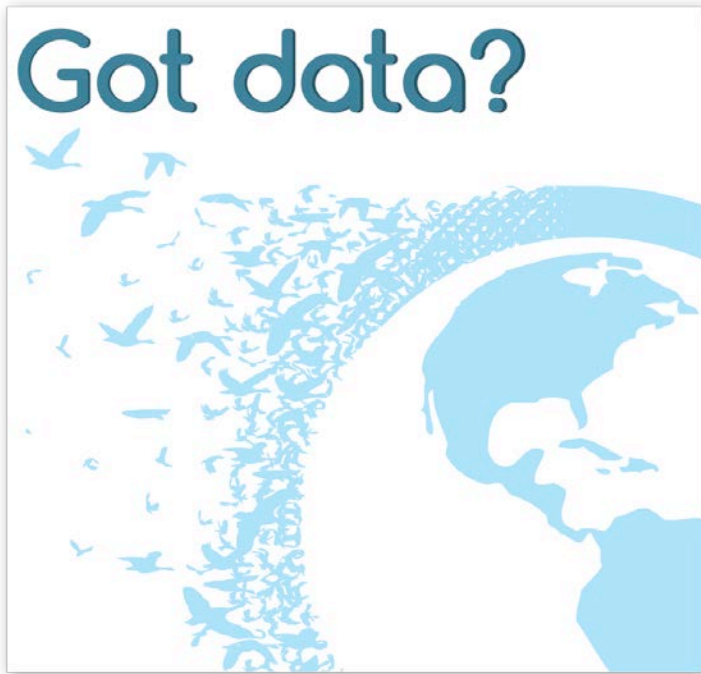
Search Our Site



[View Larger Map](#)

[Tweet](#)

Appendix C



(Wiggins et al Data management guide, DataONE)

Appendix C

QAPP Worksheet #11

(UFP-QAPP Manual Section 2.6.1)

Use this worksheet to develop project quality objectives (PQOs) in terms of type, quantity, and quality of data determined using a systematic planning process. Provide a detailed discussion of PQOs in the QAPP. List the PQOs in the form of qualitative and quantitative statements.

These statements should answer questions such as those listed below. These questions are examples only, however; they are neither inclusive nor appropriate for all projects.

Title:

Revision Number:

Revision Date:

Page ____ of ____

Project Quality Objectives/Systematic Planning Process Statements

Who will use the data?

What will the data be used for?

What type of data are needed? (target analytes, analytical groups, field screening, on-site analytical or off-site laboratory techniques, sampling techniques)

How “good” do the data need to be in order to support the environmental decision?

How much data are needed? (number of samples for each analytical group, matrix, and concentration)

Where, when, and how should the data be collected/generated?

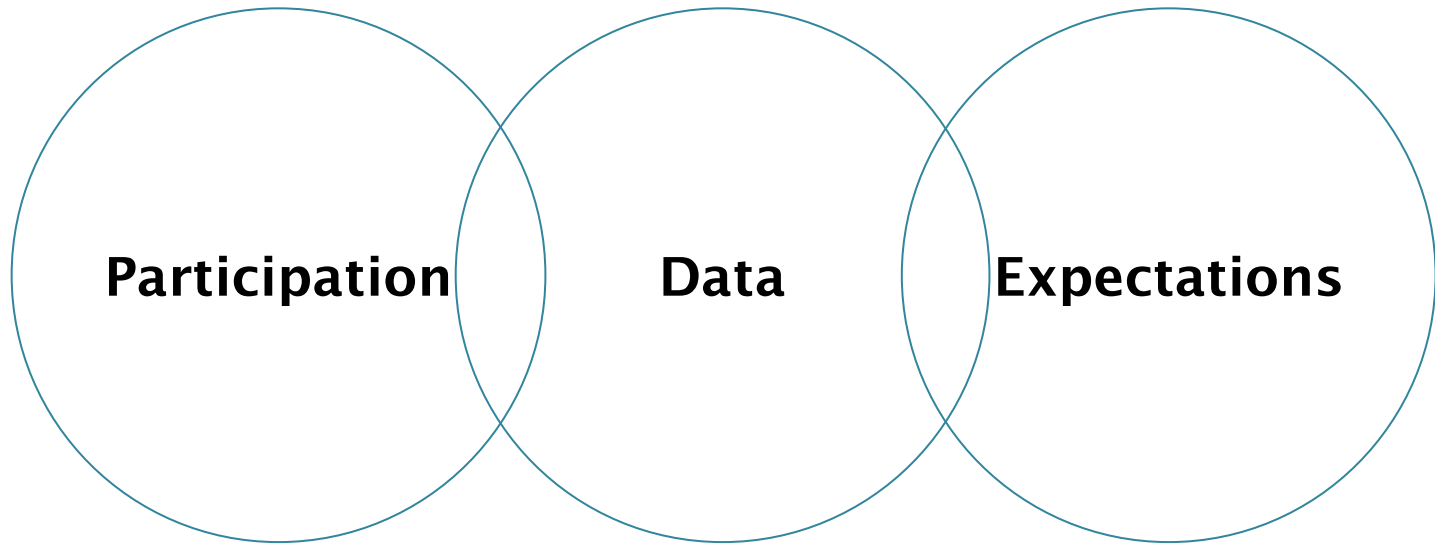
Who will collect and generate the data?

How will the data be reported?

How will the data be archived?

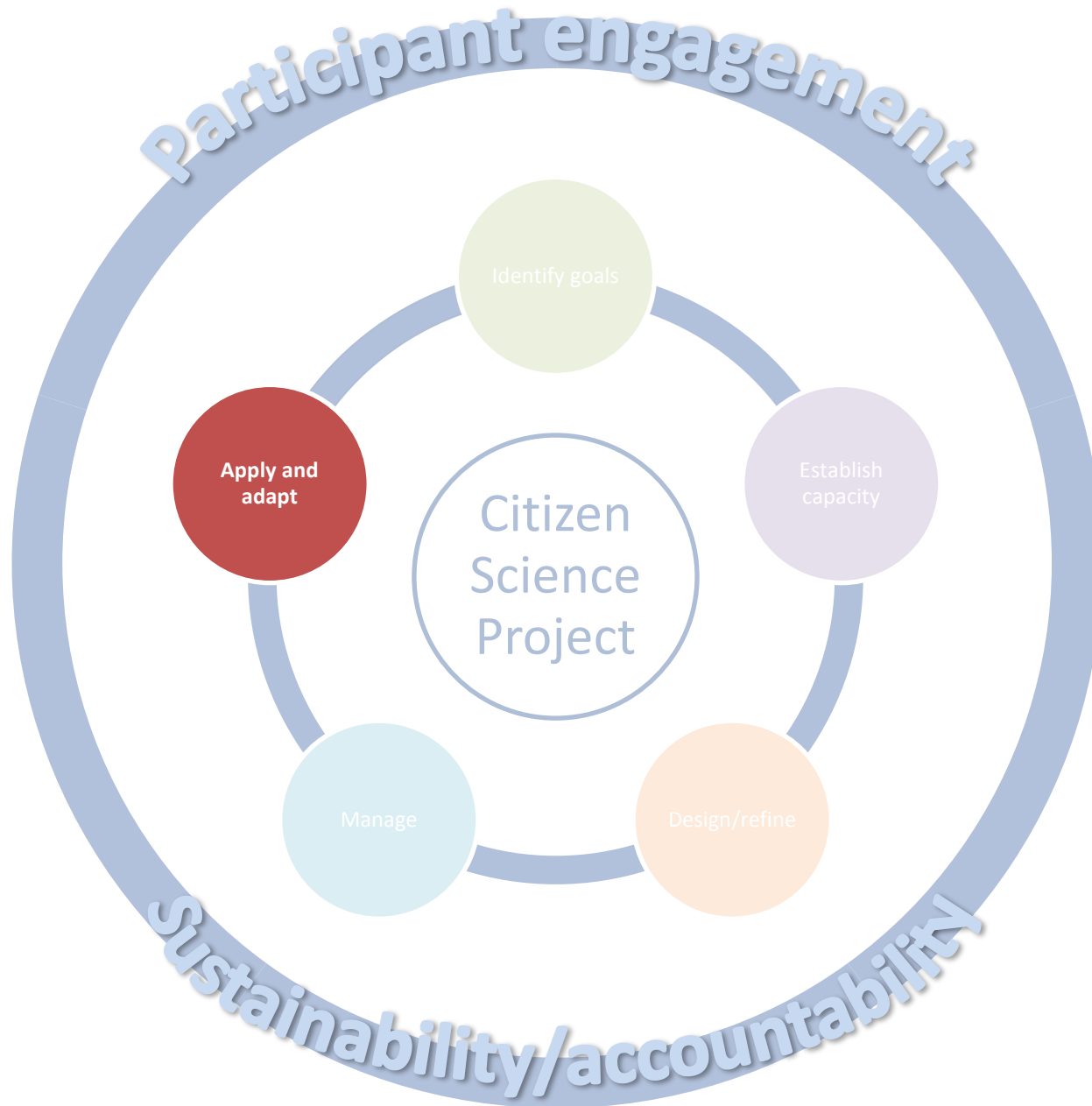
(EPA Workbook, Quality assurance project plans)

Manage

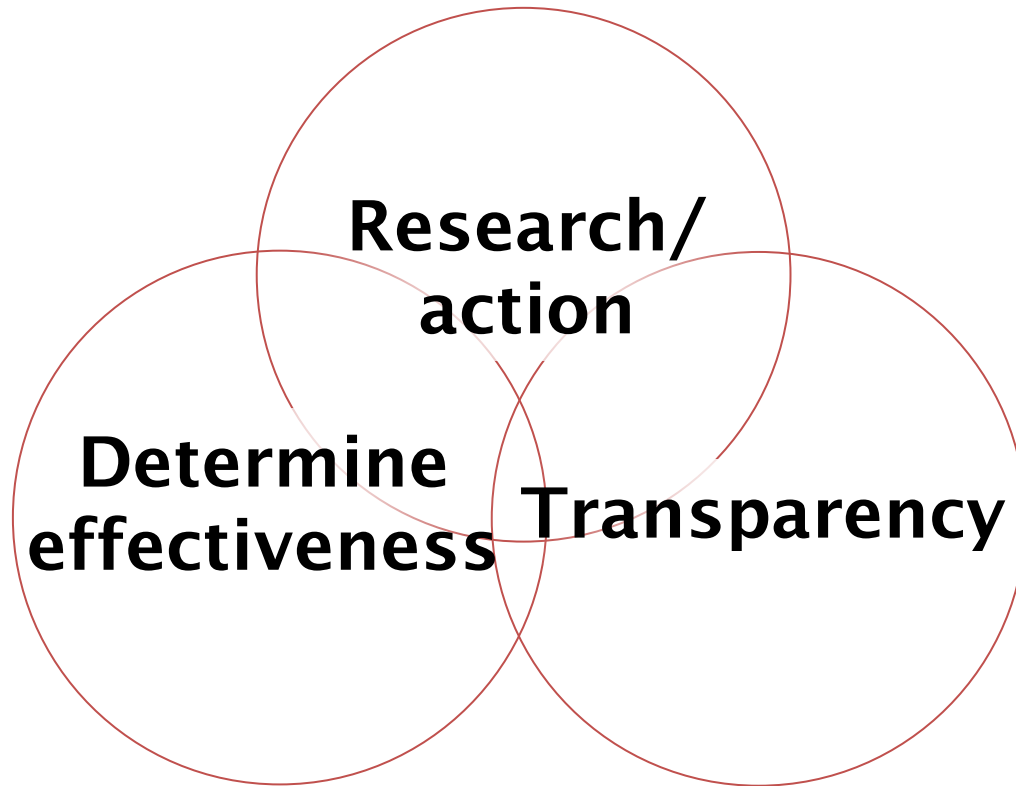


Data access, visualization

Appendix C

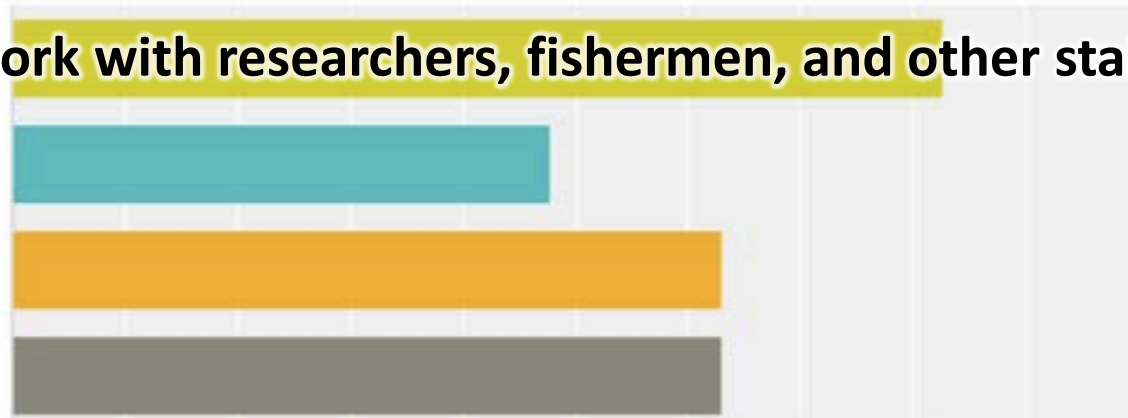


Appendix C **Apply/adapt**

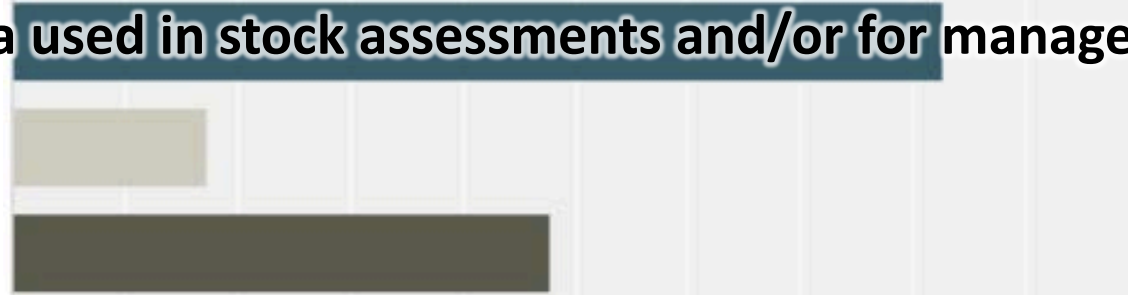


What would encourage you to participate in a citizen science project?

Ability to network with researchers, fishermen, and other stakeholders



Seeing the data used in stock assessments and/or for management decisions



Having an active role in the science that is used to manage my fisheries



0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Appendix C



Sustainability/accountability

A program can provide *continuity*

- ✧ Institutional knowledge/memory
- ✧ Track impacts (ROI)
- ✧ Point of contact/trust
- ✧ Celebration/recognition

Appendix C

Atlantic Coastal Action Program

Sustained funding --> high efficiency, high quality

Low capacity --> no core staff, no consistent work



www.flickr.com/photos/novaseeker/15023838371/

PROJECT, PROGRAM, FRAMEWORK?

- ✧ Build on relationships
- ✧ Find shared value
- ✧ Establish partnerships
- ✧ Leverage existing resources
- ✧ ...

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Insights from...

Owen Boyle
WI Dept. of Natural Resources

Maria Fernandez-Gimenez
Colorado State University

Muki Haklay
University College London

Greg Newman
Colorado State University

Rajul Pandya
American Geological Society

Michael Pocock
Centre for Ecology and Hydrology

Kris Stepenuck
University of Wisconsin, Madison

Julie Vastine
Dickinson College

Jake Weltzin
USGS

Sarah Weston
Saint Mary's University

Graham Whitelaw
Queen's University

... and key documents.

CROWDSOURCING, CITIZEN SCIENCE, AND THE LAW: LEGAL ISSUES AFFECTING FEDERAL AGENCIES

By Robert Gellman

policy
series
vol 3





“... even though it makes me uncomfortable, I’m thinking about ways to communicate/interact on a regular and frequent basis with the science education community.”

Synthesis of insights from experts:

Owen Boyle

WI Dept. of Natural Resources

Maria Fernandez-Gimenez

Colorado State University

Muki Haklay

University College London

Greg Newman

Colorado State University

Rajul Pandya

American Geological Society

Michael Pocock

Centre for Ecology and Hydrology

Kris Stepenuck

University of Wisconsin, Madison

Julie Vastine

Dickinson College

Jake Weltzin

USGS

Sarah Weston

Saint Mary's University

Graham Whitelaw

Queen's University

... and key documents.



Expert Group: COMMUNICATION

Expert Group Participants:

Sara Mirabilio

Lisa Krimsky

Shelly Kreuger

Bryan Fleuch

Kim Amendola

Rick DeVictor

Julie Davis

Kim Iverson - staff

Citizen Science Program Design Workshop

January 19-21, 2016





Citizen Science Program Component: *COMMUNICATION*

Recommendations: Outreach at Program Level

- Generalized PR for Roll Out: Include talking points
- Targeted Materials for Likely Participants
- Mechanism for Match Making
- Advisory Board or AP Structure
- Clear Policy Statement on Data Use
- Fisheries Forum
- Testimonials from Participants
- Develop a Program Brand
- Beta Test Everything



Citizen Science Program Component: *Communication*

Recommendations: Outreach at Project Level

- **Tutorials/Training (Continual with multiple formats)**
- **Regular Updates to Participants**
- **Develop Talking Points**
- **Beta Test – e.g., training videos**



Citizen Science Program Component: *Communication*

Recommendations: Elements Benefiting from Outreach

- **Participant Engagement Cross-cuts ALL Elements**
- **Early Stages (Goals and Capacity):** *Tell the story of how the program came to be*
- **Managing Participation and Expectations Hinges on Communication and Outreach**



Citizen Science Program Component: *Communication*

Recommendations: Methods of Communication by Users

- **Overarching Web Portal**
- **Training Plan**
 - Train the Trainers (highliners)
- **Media Plan**
 - Press Releases and Social Media (Media Outlets)
 - Media Days, Field Trips (Media Outlets), Policy Makers
- **Feedback and Recognition Plan**
 - Quarterly Updates (participants)
 - Annual Symposium (all)
- **Facilitating Project Development** (participants, scientists and resource managers)



Citizen Science Program Component: *Communication*

Recommendations: Outreach Resources Currently Available

- **Partnerships:** NOAA Fisheries/Sanctuary; MREP; SG Programs; State Communication Programs; Groups “Doin’ It”; Industry Assoc./Clubs; Aquariums
- **Venues:** Trade Shows; Science Education Conferences
- **Technology Platforms:** YouTube/Vimeo; Social Media; Webinars (GoToMeeting); Open Source (e.g., REEF)
- **Funding:** NGO; Foundations; Federal Grants; Crowd Sourcing (project level)



Citizen Science Program Component: *Communication*

Recommendations: **MARINA**

- **Ensure All Participants Get Recognition**
- **Is a Communication Plan and Separate Outreach Plan Necessary?**
- **First Step: Inventory of Current Marine CitSci Efforts**
- **Who is the “Face” of the Program: Affects Buy-In**
- **Need to Define “Citizen Science”**
- **Outreach Materials Should be Sensitive to Minority Groups (e.g., multiple languages)**
- **Simplified Application Process (compared to current RFPs)**

Expert Group - Communication
SAFMC Citizen Science Program Design Workshop
January 19-21, 2016

Expert Group: Communication

Group Participants:

Dick Brame
Julie Davis
Bryan Fleuch
Shelly Kreuger

Lisa Krinsky
Kim Amendola
Rick DeVactor

Discussion Questions:

These questions are provided to help start discussion on some of the components you could consider when developing a citizen science program. However, there may be other ideas the group may determine are important to consider.

During discussion, consider that the scope of a citizen science program could range from a small program that operates with few resources to a large program with many resources available. Develop recommendations that will include a range of options to support a program that may be small, medium, or large in scope.

- 1) What types of outreach will be needed for a citizen science program?
- 2) What types of outreach/training/recruitment strategies will be needed for a project?
- 3) Considering the different elements of a citizen science program, which elements of a program would benefit from outreach programs and training?
- 4) What methods of communication are appropriate for different users and different aspects of a citizen science program?
- 5) What communication resources are currently available to support a citizen science program? (Partnerships, technology platforms, funding, etc.)

Breakout Discussion Notes:

Goal Discussion:

- Foster participation between stakeholder, resource managers
- Foster fishermen-generated research – fishermen have innovative ideas
- What does “foster” reference?
- Provide a platform for citizen-driven science.
- Creating a network

- Goal should address long-term sustainability of the program “Building a sustained citizen science program.”
- Creating partnerships to engage fishers...
- Key words: consistency, transparent, “inclusive of all by self choice”, applied, sustainable, stakeholders
- Scale and inclusivity make a CitSci program different from a CRP
 - There is more of a spirit of inclusiveness
- There is definitely an opportunity for education for participants

Components Needed –

Question 1: What types of outreach will be needed for a citizen science *program*?

- This is dependent upon the project
- Theoretically, all tools could be used
- Brainstorming meetings for the
- Steering Committee
- Advisory Panel
- Front end:
 - Promotional materials about why this is being done.
 - Why is this important? What’s involved?
 - Examples of successful CitSci program
 - Manage expectations – what it will and will NOT do
 - Develop a strategy for outreach
 - Note that outreach and recruitment continues (never ending)
 - Consider targeted audiences:
 - Languages
 - Best way to reach specific sectors, e.g., utilizing tournaments
 - Utilize partners
 - Level 1: Awareness and PR
 - Level 2: Targeting likely participants
 - Level 3: Delivery, training,
 - Level 4: Feedback, communicating results
- Level 1 is always occurring as well as other steps for the levels as long as the program continues. Evaluation occurs at all levels. Need for periodic milestone evaluation. (Note – these levels were identified after discussing individual projects for a PROGRAM).
 - Before developing PR materials, frame out with entities that will help communicate program (e.g., SAFMC meets with Sea Grant programs). Involve outreach partners early to make sure relevant and appropriate format.

Question 2: What types of outreach/training/recruitment strategies will be needed for a *project*?

- Video - Suggested conducting a beta test to make sure the tutorial delivery is appropriate

- Printed materials
- Web-based information
- Tradeshow
- If training is *necessary*: on-the-water training. This would be project specific and may not always be necessary
- Need annual recruitment:
 - Fishing clubs
 - Updates (quarterly newsletters)
- Develop talking points
- Utilize Fishery Forums – may be in conjunction with fishing shows or stand alone. Fishermen share the data with other fishermen and how they have been involved!
- Testimonials from fishermen involved in the program

Question 3: Considering the different elements of a citizen science program, which elements of a program would benefit from outreach programs and training?

- Outreach applies to all of the elements – the “header” is Participant Engagement!
 - Identify Goals
 - Establish Capacity
 - Design/Refine
 - Manage
 - Participant engagement and need for recruitment
 - Apply and Adapt
- Discussion about the need to be adaptive within the framework as it is presented.
- **What methods of communication are appropriate for different users and different aspects of a citizen science program?**

Program Level Outreach

Lumping communication and outreach for this exercise

Need for generalized PR

- Need recruitment of people – not linear
- PR continuous
- Grouped items by “Front End” and “Back End”

Front End

- Identify participants
- Utilize I&E AP
- Identify partners and use “match making”
- Have a year of beta testing materials – use focus groups, advisory panels

- Noted other projects, e.g., Sea Grant programs
- Identify other successful CitSci programs within fisheries as examples to use
- Recognize the need to have information and results to participants and others – Fisheries Forum, etc.

Project Level Outreach

- Information needed relative to training and tutorials
- Beta test any tutorials and training materials
- Recognize the knowledge of volunteers – note that training is not always necessary
- Train the trainer – e.g., Master Gardner Program
- Develop talking points
 - Address expectations of participants and program expectations
 - All persons on the same page
- Training is never over
- Outreach is necessary for EVERY program element but focus on Manage element (participants, data in/out, expectations) – continuous loop

Discussion:

- Program needs “branding” – e.g., eBird, iSnapper, etc.
- Options for branding
 - Have an outside marketing firm
 - Have advisory panels involved in branding
 - Involve the workshop participants
 - “Get you Geek On” ☺
 - Program needs to be associated with the Council but have its own identity
 - Need to specify connection to the Council – co-branding

Question 4: *What methods of communication are appropriate for different users and different aspects of a CitSci Program?*

- Identify different users
 - General program users
 - Data users
 - Fishermen
 - Students
- Training
 - Train the Trainer
 - Sector specific training
- Media
 - Develop talking points
 - Press releases
 - Social media
 - Media Days – to highlight projects as they occur

- Website that is Program specific – look at other sites for examples
 - Website will provide platform for accessing
 - Data
 - Potential projects
 - Why participate – how to get involved
 - Highlight current projects – similar to Zooniverse
 - Recognize the contributions of participants and individuals involved in the program
- Newsletters/Reports for Specific Participants – use FWC Tarpon DNA Tagging Program as an example
 - Have specific updates to participants
 - Need to show how the data is being used
- Need for Recognition of Participants
 - Look at other programs and recognition
 - May be project specific

Question 5: *What communication resources are currently available to support a CitSci Program?*

- Partnerships
 - State Communication Programs – e.g., FWC outreach specialists (Rich Abrams, etc.)
 - MREP
 - Sea Grant Programs
 - Fishermen’s Associations/Clubs
 - Trade Shows - ICAST
 - Educational Conferences – e.g., NMEA
 - Aquariums
- Technology Platforms
 - Social Media – YouTube, Apps, Facebook, etc.
 - Webinars – training, etc. – Go To Meeting
 - Open Source – e.g., REEF
 - Groups “doin’ it” – e.g., iSnapper, iAngler
- Funding:
 - NGOs
 - Foundations
 - Crowd Sourcing? – e.g., Kickstarter, etc. for individual projects with program providing the framework
- Focus on methods for users:
- Need to keep
 - Commercial fishermen – training at the fish house
- Use existing communication channels to promote programs
- Initial outreach should include background

- Why is there a program? Share story about the need. (Element: Establish capacity)
- Need to have a media campaign to promote the program
 - Talking points are key

Marina –

- There is an opportunity for education for participants
- Clearly define what qualifies as Citizen Science (e.g., is cooperative management CitSci?)
- Who is the “face” of the program? The Council? Fishermen?
- Multiple languages
- Targeted audience
- Communication and Outreach – consider a plan for each and utilize partners
 - Acknowledge the partners and recognize the parts and rolls each plays within the program
- Utilize MREP to reach potential “highliners”
- Crowd sourcing for assessing video from GoPros – consider non-traditional audiences, e.g. Zooniverse.
- What differentiates a CitSci program from other programs? E.g., oyster gardening, NC Sea Grant and oyster spat project, Coastal Rain, Hail and Snow (rain gauges)
- Are their fishery examples that can be used –
- National Volunteer Monitoring Conference in Tampa – May 2-6 in TPA
- Are lionfish derbys considered Citizen Science?
- Council should be clear on what defines Citizen Science under their program.
- Difference between Cooperative Research and Citizen Science??
This needs to be discussed and clarified. We discussed projects and how they may fit under a CitSci Program.

Plenary Discussion:

Communication

- Continuing education could be warranted for certain things, depending on data collected
 - Also for legal changes/policy changes
- Also important to evaluate program as we go for feedback and evolution
- Not sure how CitSci communication model will fit into Council structure
 - AP type structure is envisioned



Expert Group: Data Management

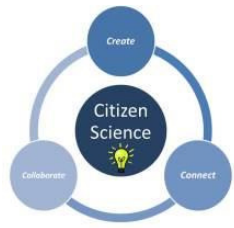
Expert Group Participants:

Amy Dukes, Julie DeFilippi, Scott Smith,
Steve Turner, Laura Oremland, Christy
Semmens

Citizen Science Program Design Workshop

January 19-21, 2016

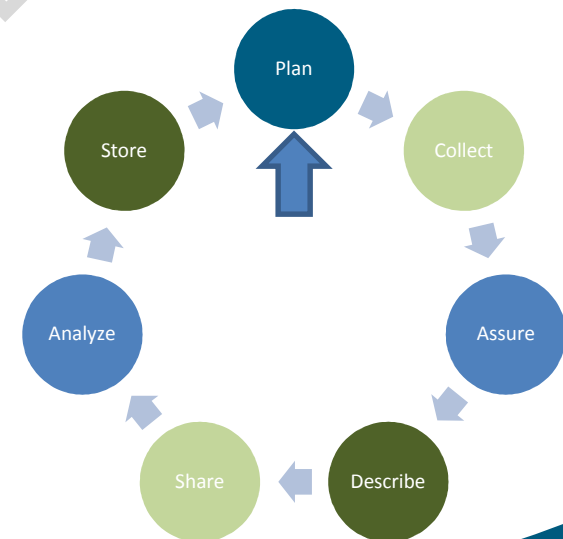




Citizen Science Program Component: *Data Management*

Recommendations: Broader Program

- **Education and outreach critical component**
 - Realize value of data being collected / Examples of impact
- **Data collected through citizen science (CS) are reliable**
 - CS certification program with on-going training opportunities
- **The Data Life Cycle**
 - Follow the project/program cycle
 - Includes data management plan, data policies, collection, storage, analysis, etc.





Citizen Science Program Component: *Data Management*

Recommendations: Broader Program

- **Work with existing infrastructure – FINs (e.g. ACCSP, GulfFIN)**
 - Centralized access to data
 - Programming capability
 - Project development will take time
- **CS Advisory Board (Oversight Committee)**
 - Review CS projects
 - Ensure projects meet data life cycle and standards
 - Provide feedback



Citizen Science Program Component: *Data Management*

Recommendations: Broader Program

- **Consider applicable mandates**
 - National Standard 2 / Information Quality Act
 - Public Access to Research Results (PARR)
- **Resources**
 - DataOne – documentation, data policy
 - CitSci.org – data entry/mgmt tools
 - Fishackathon – application development
 - FIN documentation - standards



Citizen Science Program Component: *Data Management*

Recommendations:

- **Data Access**
 - Make the data open and available to the furthest extent possible
 - Confidentiality considerations/legal obligations must be met
 - Important to identify core driver for collection (data must be available at a level necessary to meet project objectives)
 - Accessibility includes data availability and ease of understanding; should tie back to education/outreach



Citizen Science Program Component: *Data Management*

Recommendations:

- **Data Management Plan**
 - Consider collect, assure, store, and share
- **Data Policy**
 - Define degree of openness and accessibility for each project, one size doesn't fit all
 - Created in collaboration with participants
 - Research existing policies



Citizen Science Program Component: *Data Management*

Recommendations: Data Policy Framework

- **Ownership**
 - Data Collector
 - Funder / Funding Agency
 - Collecting Agency
 - Data Storage / Infrastructure Entity
 - End User Groups
- **Accessibility**
 - Sharing
 - Confidentiality
 - Presentation
- **End User Citation**
- **Data use guidelines/agreements**



Citizen Science Program Component: *Data Management*

Recommendations:

- **Infrastructure**
 - **Electronic data collection**
 - Paper can be used as tool
 - Paper forms would be entered electronically by the data collector
 - **Considerations**
 - Who is doing the data collection?
 - What data you are collecting?
 - Resources – available staff or trained volunteers



Citizen Science Program Component: *Data Management*

Recommendations:

- **QA/QC**
 - 1st level – Automated validation during data entry
 - 2nd level – Auditing (computer)
 - 3rd level – staff or trained volunteer (people)
- **Data Standards**
 - Citizen Science Level – adoption of FIN standards
 - Fit standards into existing projects if possible/necessary
 - New projects should have defined standards
- **Storage**
 - Long term storage (even for shorter projects)

Expert Group – Data Management
SAFMC Citizen Science Program Design Workshop
January 19-21, 2016

Expert Group: Data Management

Participants:

Scott Smith (NC)
Julie DeFilippi (ACCSP)
Laura Oremland (NOAA Fisheries)
Steve Turner (NMFS FSC)

Christy Semmens (REEF)
Amy Dukes (SCDNR)
Julia Byrd (SAFMC)

Discussion Questions:

These questions are provided to help start discussion on some of the components you could consider when developing a citizen science program. However, there may be other ideas the group may determine are important to consider.

During discussion, consider that the scope of a citizen science program could range from a small program that operates with few resources to a large program with many resources available. Develop recommendations that will include a range of options to support a program that may be small, medium, or large in scope.

- 1) What types of data storage and infrastructure will be needed for a citizen science program?
- 2) Are there any data storage and infrastructure resources currently available that could help support a citizen science program?
- 3) What types of QA/QC procedures and/or data standards should be in place to ensure the quality of data collected through a citizen science program? Who should be responsible for developing and implementing these procedures and standards?
- 4) Who should have access to data collected through a citizen science program and how should they be able to access the data? What data sharing guidelines are necessary?

Breakout Discussion Notes:

Julia Byrd outlined the above questions which this group and requested that we also consider what the CS program should look like, while embracing a range of funding capabilities (unlimited resources to very limited funding). Also asked for other questions to address:

Julie suggested that the SCW was like the “life Cycle”...like a Data Life Cycle.

Laura – Another question to consider is data ownership. (Question 5)

Laura - Whatever data you collect, each data set should be thought of as a comprehensive data set, constantly thinking about how the data being collected would support other projects, both existing

and future ones. This allows for the data to be reliable, yet good and usable data. (Think about the complexity of the project to ensure that extensive training “skilled” effort is not necessary) Proper design equals good CS projects.

Julie - We have to, at some point, trust and rely on folks to collect positive data.

Scott - This is accomplished through education and outreach. The concept of a CS Certification Program.

Julie – are their current programs (independent programs perhaps) that could be used as a validation tool.

Scott – Could establish a validation tool to again validate the data...once a month send in a picture of the primary species that you are capturing to confirm ID.

Steve – Outreach and buy in...how do we achieve these, what do we offer to the public as an incentive?

Steve - Make all the CSP's be an education tool. Have the participants realize the impact of the data they are providing, the utility of the data, showcase the education opportunities it has, SEDAR is an education outlet but it is limited, while a CSP may not be as limited.

Julie – Remind people that more data does not equal more fish availability.

Laura – CSP as they are executed and produce valuable outcomes can help reduce uncertainty.

Questions: In no particular order!

4) Who should have access to data collected through a citizen science program and how should they be able to access the data? What data sharing guidelines are necessary?

5) Who owns the data?

Did these in combination....

Data ownership - who owns the data has its pros and cons...who decides the data ownership?

What kind of questions would one ask to find out data ownership...intellectual entity who designs the database they own it.

Steve – If one participates they give up the right to ownership. Get rid of the privacy issues. This would not create confidential for an issue...might reduce buy in though said Amy.

Create an “Accept” policy like you see when you down load an application. The personal identity would be kept confidential but the data point will be a public record.

Does this need to be lawyer question?

Provide data back to fisherman: Sunni NY – Summer Flounder Project, catches, as a bycatch, are so low but the catches are much localized. Fisherman are providing catch data and fishing location to

produce a map indicating where the fish are located to plan to avoid the high catch areas to keep fishing for other species open longer.

Publishing data should be all data points, summarized data.

What is the data collected for and who paid for it might play into ownership issues. If agreed to upon execution it could exempt confidentiality.

Julie - Data policy would need to be created to serve as a template to address ownership issues since there is not a one fit system for all CSP, along with creating disclaimers to inform the public up front.

Priority and resources will allow for accessibility of data...make the data flashy, easy to understand and find, and disseminate.

Link the data back to an education/outreach side...if not it's a disconnect.

NGO's might be a great holder of the data and feed it out to the data users and needers.

Recommendation – Make the data open and available to the furthest extent.

Recommendation – Create a Data Policy...this would allow an overseeing “Board” to determine the degree of openness and accessibility of the CSP. Identify the Core Driver, why is there a need for this data collections. This would be project specific, assist in framework, address needs/desires of participant's, data transfers outlined ahead of time, funding agencies perspective. (Example: Aug 2013 E-Bird Workshop, outlines the CSP Data Policy)

Data Policy Framework - Template Outline fort what to consider...step by step...each step might be dependent on a previous step. These are things to consider:

- **Ownership --- data collector, Funding Agency, collecting agency, data storage/data infrastructure entity, and end user groups.**
- **Accessibility --- sharing, confidentiality, presentation of data**
- **Citation --- Tracking of data usage, identifier**

Day 2 – Since questions 1, 2 and 3 are interrelated, they are all done collectively.

- 1) What types of data storage and infrastructure will be needed for a citizen science program?
- 2) Are there any data storage and infrastructure resources currently available that could help support a citizen science program?
- 3) What types of QA/QC procedures and/or data standards should be in place to ensure the quality of data collected through a citizen science program? Who should be responsible for developing and implementing these procedures and standards?

Julia reminded the group to think about what programs/projects that might be on going that CSP could partner with.

The first discussion point was more about how the data would be collected prior to the actual data storage efforts and infrastructure. Steve commented that electronic (web based, phone call in) is preferred but Julie added that there would still need to be a paper version for certain individuals.

Christy – made the comment the even if you have an electronic tablet for a data entry tool...it can often be too slow to capture the data that you are collecting....data sheets (paper) are fast and can be entered electronically as a secondary effort. The paper is just a stepping stool for the data collector to use but not to submit.

This would often be project specific. – What data are you collecting, who is collecting it, Additional resources may need to be developed, ie. a call in center.

Recommendation – Data collected Electronical is preferred. If a paper form is used, it would still be up to the data collected to input the data electronically.

Real-time validation by the data provider, and QA/QC secondary effort (auditing of the data) would be completed by the project staff or by properly trained volunteer. The more sophisticated the project, the more complex the validation tools will need to be.

Real-time validation by the data provider, and QA/QC secondary effort (auditing of the data) would be completed by the project staff or by properly trained volunteer. The more sophisticated the project, the more complex the validation tools will need to be.

Recommendation – An Advisory Board should be created to serve as an overview committee to review CSP. Provide recommendations and feedback to project, ensure that the project meets the Data Life Cycle.

Creating data standards would be beneficial (must have) to CSP, if the project is new, standards would be developed and include validation, or if the project fits into an existing project framework, the existing standards would need to be followed. Again, some of these decisions might need to be reviewed at a “Board” level. Still some question as to who would sit on that Board, by NOAA Fisheries could be one. The pool would need to be representative of a large group...expertise group.

Julie made the point that if and when this centralized CSP Data Warehouse is created, a standard code system (species, gears, data elements) needs to be created. ie. Darwin Core. ACCSP and Gulfin use a standard system of codes which could be adopted by CSP's.

Recommendation – Data Storage/infrastructure needs to be in a centralized CSP Data Warehouse (current groups would include Gulfin/ACCSP that might be able to partner with a CSP Umbrella), this ensures that the data is accessible by all -project leaders, data collectors, data users, and the public. This allows for a long term storage location while easing accessibility.

Christy mentioned a CitSci.org, it's a resource tool for data entry and management tools and it's FREE!

Julie – ACCSP would be willing to consider, but knowing that additional funds/staff would have to be in place.

Steve commented that regardless of the project, a CSP setup and design will take time, especially if the projects need to be reviewed and approved by a Board.

The concept of the Matchmaking Site is strongly recommended, this group feels that even a Cooperative Research Projects are a form of Citizen Science Project. This open forum should be designed to allow everyone (scientists, data collectors, data users, and data seekers) to collaborate to meet goals.

Plenary Discussion:

Data Management

- The concept of data ownership will be a serious issue that needs to be considered
- Also need to realize what happens if you own your data, but it is published and/or available for others to use
- Issues of confidentiality in relation to data sharing and ownership will also become quite important as this process evolves



Expert Group: Governance

Expert Group Participants:

John Carmichael

Jim Berkson

Ben Hartig

Bonnie Ponwith

Leda Dunmire

Rick Bonney

Michelle Duval

Gregg Waugh

Richard Merrick

Citizen Science Program Design Workshop

January 19-21, 2016





Citizen Science Program Component: *Governance*

Recommendation 1:

Identify the South Atlantic Fishery Citizen Science Program as a cooperative program between NMFS, Sea Grant, and the South Atlantic Fishery Council (SAFMC).



Citizen Science Program Component: *Governance*

Recommendation 2:

Immediately seek interim funding to support core program infrastructure and administration.



Citizen Science Program Component: *Governance*

Recommendation 3:

Hire one full-time Council staff member ASAP to get the program started.



Citizen Science Program Component: *Governance*

Recommendation 4:

The program should be long-standing, which will require seeking base-level, perennial funding.



Citizen Science Program Component: *Governance*

Recommendation 5: Establish a citizen science steering committee for program management and oversight



Citizen Science Program Component: *Governance*

- **Potential initial steering Committee membership**

1. SERO (RA or designee)
2. SEFSC
3. NOAA HQ (S&T designee)
4. SeaGrant (state, rotating)
5. SAFMC Chair
6. SAFMC ED
7. SSC chair or designee
8. For-hire fishing stakeholder (appointed by Council)
9. Private fishing stakeholder (appointed by Council)
10. Commercial fishing stakeholder (appointed by Council)
11. ACCSP
12. NGO (appointed by Council)



Citizen Science Program Component: *Governance*

Recommendation 5: Steering Committee Charge

Charge

- Approve program policy (SOPPS), goals and objectives
- Approve program budget
- Provide infrastructure and governance direction
- Design program evaluation



Citizen Science Program Component: *Governance*

Recommendation 5: Steering Committee Charge, cont'd

- Establish 4 task forces to address immediate program policy and infrastructure needs
 - Finance
 - Data standards and management
 - Volunteer and project management
 - Project review and selection



Citizen Science Program Component: *Governance*

What does success look like... aka Goals

- Information collected is used to address important, contemporary science or management questions
- Broad participation in projects and support from participants: constituencies, scientific community and partners.
- Improved relations, communication, and information exchange and accessibility among constituents, scientists and managers.
- Program is viewed as a model approach to improve fisheries management around the nation.



Expert Group: Participants 1

Expert Group Participants:

Ira Laks, Andy Piland, Bouncer Smith, Deidra Jeffcoat, Jim Freeman, Mike Freeman, Rusty Hudson, Robert Olsen, Englis Glover, Dave Snyder

Citizen Science Program Design Workshop

January 19-21, 2016





Citizen Science Program Component: *Program Goals*

Recommendations:

- Program should fill in data gaps and be based on data needs
- Increase communication and matchmaking between scientists and fishermen
- Develop projects that produce usable, timely, and transparent data
- Program where citizens have a vested interest
- Improved data collection from private recreational fishermen
- Education in combination with data collection



Citizen Science Program Component:

Current Skills

Recommendations:

- Knowledge and experience of species, fish identification, regions, timing, location, etc.
- Can collect biological, physical, and environmental data
- Have physical assets and infrastructure (e.g. boat, different types of gear)
- Networking and communication with other fishermen
- Fishermen being vehicle for outreach



Citizen Science Program Component: *What Willing to Do?*

Recommendations:

- Volunteer time
- Willing to take scientists on board
- Harvest of specific species
- Collect biological samples from fish
- Fishing logs
- Photograph fish and upload data/picture
- Willing to collect all types of data as long as know what kind of data is needed
- Record bycatch or catch composition



Citizen Science Program Component: *Training Needs*

Recommendations:

- **How to gather data correctly so it can be used**
- **Some type of certification for certain projects**
- **How training is delivered is project specific**
 - **Complex project – in-person training**
 - **Simple project – online training or instructions, reference card, YouTube videos**
- **Training of recreational fishermen to collect relevant data and keep good records**



Citizen Science Program Component: *Incentives*

Recommendations:

- Ensuring fish for future generations
- Seeing how data is being used in management decisions
- Log-on to website to see data contributed
- Sharing data is enough!
- Being allowed to keep fish but send in carcass
- Avoid incentives that provide compensation/\$
- Commercial sector providing motivation for recreational sector to be involved - Outreach
- Education to youth



Citizen Science Program Component:

Data sharing/accessibility

Recommendations:

- Platform or mechanism to show people the data and how it's being used
- Built in QA/QC for instantaneous data submissions (e.g. OCEARCH shark)
- Social Media for broad overview of projects or available reports
- Alerts when new data is available for a project (opt-in email alerts)



Citizen Science Program Component:

Expectations for Sharing Results

Recommendations:

- **In-person meeting of project participants to discuss project summary**
- **Webinars or Video report**
- **Email report and/or website where report is located**
- **Consider regional meetings/reporting/emails with regional approaches to any communication**
- **Status report of where citizen science project has helped in management process**



Citizen Science Program Component:

How Projects Should be Prioritized

Recommendations:

- **Top down approach – management needs from scientists and SAFMC**
- **Fishermen providing ideas to scientists or SAFMC (some type of Request for Proposals/Ideas)**
- **SEDAR steering committee helping to flush out priorities**
- **Projects need to be appropriate for citizen scientists**
- **List of SAFMC research needs**



Expert Group: PARTICIPANTS II

Expert Group Participants:

Bob Lorenz
Dave Harter
Mark Marhefka
Bob Barnette
Lindsey Parker
Jimmy Hull
Michael Rowland
Mimi Stafford
Dave Webb
Mark Brown

Citizen Science Program Design Workshop

January 19-21, 2016





Citizen Science Program Component: *PARTICIPANTS II*

GOALS OF CITIZEN SCIENCE PROGRAM

- **Provide better and more data**
 - Fill data gaps
 - more information
 - Long-term and consistent
 - Reasonable cost
 - On-the-water data
- **Show effectiveness/ impact of regulations**
- **Connect scientists who need data with people who can collect the data**



Citizen Science Program Component:

PARTICIPANTS II

GOALS OF CITIZEN SCIENCE PROGRAM

- **Improve communication and engagement**
- **Build credibility of science and data**
- **Give participants a voice and be part of the science and management process**
- **Responsibility and conservation ethic - “do the right thing”**
- **Get people involved and informed about fisheries management and science**



Citizen Science Program Component: *PARTICIPANTS II*

Data collection:

- **Reporting what you caught**
 - **COMMERCIAL-**
 - Additional information for logbooks
 - Economic info
 - Discards
 - **RECREATIONAL**
 - Catch
 - Discards
 - Economic info



Citizen Science Program Component:

PARTICIPANTS II

Data collection:

- **Biological Data- on demand and species-specific**
 - Otoliths, gonads, fish parts
 - Length/weight of discards
 - Carcass drop-off or pick-up
- **Tagging**
 - Track movement/location
 - Detailed information about sample of fish
 - Discard mortality data
- **Taking observers on trips**



Citizen Science Program Component:

PARTICIPANTS II

Incentives to Participate:

- Show scientists on-the-water information
- Improve science used in management decisions
- Contribute to better and more data
- Potential to change regulations (improved mgmt.)
- Evaluate effectiveness of existing regulations
- Be part of the process
- Responsibility to participate
- Improve trust of data and buy-in from others
- Show how the fishery has changed and how it could be



Citizen Science Program Component:

PARTICIPANTS II

Expectations of Participants:

- Access to the data
- See how data is being used
- Progress reports and engagement with scientists
- Clear goals of the project, and how the outcome meets the goals
- Learn about science and management



Citizen Science Program Component: *PARTICIPANTS II*

Recruiting and Retaining Volunteers:

- Through organizations and clubs
- Corporate sponsors/partners-
 - Distribute information and recruit
- AP Members and Local Captains
- Provide frequent progress reports at the beginning to establish buy-in



Citizen Science Program Component:

PARTICIPANTS II

Obstacles to participation:

- **I WOULD NOT PARTICIPATE IF:**
 - costs too much
 - too much time (Although some time burden will just be necessary)
 - could negatively affect me (shut down fishery)
 - it's not simple to collect/report (private rec)
 - there is financial compensation (private rec)
 - unexpected legal liability
 - I don't see how data are used/ being used



Citizen Science Program Component: *PARTICIPANTS II*

Selecting and Prioritizing Projects:

- **Selection committee**
 - Made up of NMFS, Council, Fishermen, etc
- **Prioritize most important data gaps**
- **Pilot project should be simple to start with and build buy-in**
- **Solicit ideas from the public**
- **Public input on set of potential project ideas**

Expert Group – Participants 1 and 2
SAFMC Citizen Science Program Design Workshop
January 19-21, 2016

Due to the large number of fishermen represented at the workshop, the Participant Expert Group was divided into two groups – Participants 1 and Participants 2. Below is a summary of the discussion for each of the Participants groups.

Expert Group: Participants 1

Group Participants:

Chris McCaffity
Andy Piland
Englis Glover
Robert Olsen
Deidra Jeffcoat
Dave Snyder

Jim Freeman
Rusty Hudson
Ira Laks
Bouncer Smith
Holly Abeels

Discussion Questions:

These questions are provided to help start discussion on some of the components you could consider when developing a citizen science program. However, there may be other ideas the group may determine are important to consider.

During discussion, consider that the scope of a citizen science program could range from a small program that operates with few resources to a large program with many resources available. Develop recommendations that will include a range of options to support a program that may be small, medium, or large in scope.

- 1) What types of data collection skills do you already have?
- 2) What types of data collection would you be willing to do while out fishing?
- 3) What type of data would you want to collect?
- 4) What skills would you need to learn to carry out different types of citizen science data collection?
- 5) How should training for a citizen science project be delivered?
- 6) Should project participants (citizen scientists) have to go through a certification program to participate in projects? Would a certificate be valuable to you?
- 7) What incentives would fishermen need to participate in citizen science?
- 8) What are your expectations for how project results should be shared?
- 9) How should projects be prioritized and selected?

Breakout Discussion Notes:

Program Goals –

- Brings scientists and user groups together in the marine world for a sustainable resource
- Getting data & filling data gaps/holes
- Direction from scientists and council on what fishermen can provide to them based on their list of needs (e.g. priority list)
- Dialog between scientists and fishermen (e.g. two-way communication and collaboration)
- Help prioritize and identify projects that need to be done and match up with data needs
- Streamline process for filling data gaps; get data real-time through citizen-science projects
- Data that's produced can be used and doesn't contradict something else that's already collected; small sample size that would need to be extrapolated
- Even if data comes in as contradictory, that allows the program to grow and develop and potentially change
- Augment data that's already being collected (i.e. MRFS, MRIP, APPIS, SEDAR, etc.)
- Develop projects that produce usable, timely, and transparent data
- Universal data collection and methods that includes recreational and commercial both reporting the same thing at the same frequency; Make it mandatory for recreational as it is for commercial
- Program that people value and "believe" in (e.g. buy-in to the program) to address data needs
- Improved data collection from recreational fishermen (i.e. quality and percentage of anglers) and scientists need to be able to rely on that data; citizens need to have vested interest
- Start with little, precise, specific projects that can be built easily and are the beginning of the framework to build and grow larger projects (snowball analogy)
- Scientists communicate with fishermen letting them know there's a data gap that needs to be filled (matchmaking component); Fishermen can create a "profile" (i.e. skills/areas of expertise) so scientists know who they can go to help them get data that is needed
- Engaging fishermen with known skill sets
- Broad base but fun especially for younger kids and families; think outside the box; engage youth in projects
- Focus on combining educational events with data collection effort

Components Needed –

- Skills – Have & willing to do
 - Knowledge and experience of species, regions, timing, location
 - Fish tagging, whole fish, gonads, stomach contents, aging parts, otolith removal, fin clips
 - Networking and communication with other fishermen
 - Written or electronic log books
 - Report tagging on internet

- Social media
- Commercial – dealers do reporting weekly that is used for monitoring
- Physical assets and infrastructure (e.g. boat, different types of gear)
- Fishermen being vehicle for outreach
- Collecting physical & environmental data (ex. Chlorophyll, temperature, etc.)
- Fish identification is important!
- Training Needs
 - How to gather data correctly so it can be used; Need courses on how to conduct certain data collection skills.
 - Some type of certification for certain projects (e.g. project specific training)
 - How training delivered is project specific (e.g. YouTube, in person, one-on-one); project training delivery should be driven by specific projects
 - Complex – in-person training
 - Simple – online training or instructions, reference/wallet card, video, placard
 - Training for collecting environmental data, like chlorophyll, that fishermen don't currently collect
 - Training a recreational fishermen to collect relevant data (in certain way) and keep good records so that data can be used in management process into the future
- Incentives
 - Retention of fisheries for future generations; ensuring fish for future generations
 - Management driven can be an incentive for citizen science
 - How's my data being used? Transparency and seeing how everyone's data is being used and applied to management decisions. Looking online to see people's data; accessibility of data for everyone.
 - Bragging rights
 - Avoid incentives that provide compensation or money.
 - Sharing data should be enough! Commercial fishermen feel strongly about this.
 - Get to catch more or certain species if you provide data. Being allowed to keep fish (with the requirement to send in carcass).
 - Example: Red snapper collection in SC, fishermen put in raffle for Yeti cooler who brought in a carcass.
 - If recreational fishermen saw commercial & charter/for-hire fishermen were involved in citizen science and could see the data, that might be an incentive to get involved in collecting data; important outreach component (also linked to outreach about programs)
 - Shirts, hats for certain anglers (e.g. swag)
 - Sponsorships from companies for specific projects and to help advertise projects; companies sponsor projects and awards/rewards
 - Show kids/youth how to take fish samples as part of outreach/education
 - Educational events that also serve as data collection effort
 - If provide incentives, have names put into a lottery, no matter what kind of information you provide (e.g. no data, lots of data) so not biased

- Data sharing/accessibility
 - Seeing specifically the data being used in the stock assessment
 - Make assessments/process more accessible to fishermen and seeing the methodology specifically (e.g. how arriving at fishing effort numbers)
 - Seeing data might incentivize people to want to get involved
 - Platform or mechanism to show people the data and how it's being used
 - Maps are great visualizations (e.g. eBird)
 - Consider data QA/QC for instantaneous data submissions (e.g. OCEARCH shark)
 - Social Media – Outreach about results
 - Alerts when new data is available for a project (e.g. opt-in alerts, email, etc.) (ex. ROFFs email)
 - Breakdown barriers between scientists and fishermen, so make sure scientists are involved (e.g. matchmaking component, tools to connect fishermen & scientists)
- Willing to record/produce in citizen science program
 - Willing to volunteer time when not doing main job during busy seasons
 - Willing to take scientists out on board; take a scientist to observe normal work-day
 - Harvest of specific species or interaction with specific species
 - Keep species alive in live well
 - Bouncer & Rusty - Tag fish, record fish released, collect whole & partial samples, surface water temps, Sargassum presence, measure fish, etc.
 - Fishing logs
 - Recreational - Photograph that can be texted or uploaded in mobile app with basic data (i.e. length)
 - Willing to collect all kinds of data as long as know what kind of data is needed and have the time/opportunity to collect
 - Long-lines and other types of commercial fishermen can collect all kinds of data with data loggers (i.e. water column data, GoPro on BSB pot, bottom temp, etc.)
 - Recreational – tagging (i.e. billfish foundation), fork lengths, water temp, sargassum/seaweed presence/absence, take pictures
 - Record bycatch or catch composition information no matter what type of project or data being collected (i.e. if requesting data on pigfish, still collect data on other species caught)
- Participant Expectations for Sharing
 - In-person meeting of project participants to discuss project
 - Money towards data probes versus in-person meeting
 - Webinars
 - Email report and/or website where report is located
 - Video report
 - Consider regional meetings/reporting/emails; regional approaches to any communication that comes out (but should still be an opt-in system)
- How projects should be prioritized?

- Top down approach, management needs from scientists and scientists reaching out to fishermen but also fishermen being able to reach out scientists if they see something in particular
- SEDAR data workshop steering committee process helps to flush out priorities
- Projects need to be appropriate for citizen scientists
- Council deciding projects for citizen scientists to do that might not seem important now but might be relevant in future

Marina – *Items to address later*

- Consider private recreational harvest permitting (accountability?) not just license, fishermen would have to report fish caught under permit; this would help a program and projects produced from a program; gives more vested interest
- Limit your catch, not catch your limit; more conservative fishermen these days with more catch and release fishermen; need to consider different values with different generations and people
- Mechanism to notify participants about changing conditions (e.g. temperature, currents, etc.) to prompt you to collect data; also serves as an incentive to have “insider information”

Additional Information –

- Why wait to collect data that is already currently available from dealers and commercial fishermen?
- Need to collect data from private recreational fishermen!
- License for all private recreational fishermen that fish offshore

Expert Group – Participants 2
SAFMC Citizen Science Program Design Workshop
January 19-21, 2016

Expert Group: Participants 2

Group Participants:

Kenny Fex
Bob Lorenz
David Harter
Mark Marhefka
Bob Barnette
Lindsey Parker

Jimmy Hull
Michael Rowland
Mimi Stafford
Dave Webb
Mark Brown

Discussion Questions:

These questions are provided to help start discussion on some of the components you could consider when developing a citizen science program. However, there may be other ideas the group may determine are important to consider.

During discussion, consider that the scope of a citizen science program could range from a small program that operates with few resources to a large program with many resources available. Develop recommendations that will include a range of options to support a program that may be small, medium, or large in scope.

- 1) What types of data collection skills do you already have?
- 2) What types of data collection would you be willing to do while out fishing?
- 3) What type of data would you want to collect?
- 4) What skills would you need to learn to carry out different types of citizen science data collection?
- 5) How should training for a citizen science project be delivered?
- 6) Should project participants (citizen scientists) have to go through a certification program to participate in projects? Would a certificate be valuable to you?
- 7) What incentives would fishermen need to participate in citizen science?
- 8) What are your expectations for how project results should be shared?
- 9) How should projects be prioritized and selected?

Breakout Discussion Notes:

GOALS AND OBJECTIVES

- Bigger is better
- From best available data to better available data
- Aligning the data needs with the citizens who can obtain the data. If info in discards of reef fish is needed, ask [the right people].
- Need to get the word out that you're not "the man." "I'm from the government, I'm here to help" ... may need a PR campaign to get started. People are afraid of you don't trust you. If people realize you are here to help, they'll give more information than you'll know what to do with.
- The idea of regulatory agencies asking users for help raises credibility.
- The idea of citizen science came from the fishermen – saying we can help inform the science.
- More successful if you can stay away from hot button issues. Worried about info that could limit or exclude access to fisheries.
- Goal to provide long-term data sources, an abundance of data long term, something that's affordable. Agencies have a lack of money to obtain data. A way to obtain a lot of data at a reasonable cost. Data poor. Build upon existing systems – you already have infrastructure in place for port samplers. People to possibly train, manage... volunteers can be additional arms and legs to get the job done.
- Communications... eg., gray triggerfish just went from 14 to 12 inches – need to say *why*. Otherwise confusing, frustrating.
- Need communication among scientists, managers, citizens.
- Having a voice
- Being a part of the system, providing some of the information
- Ideally, be able to have data year round, to not have the gaps that we have now. A consistent snapshot of what's going on with the fishery. We have closures on fish during spawning season.
- Avoiding the key question: What data do we need?
- Agencies say they don't have enough personnel to evaluate data from fishermen. If we're going to promote certain types of project they need to be simple, low-cost, something people will be willing to do, to get the most bang for the buck. Doing this type of project, it can't be too overwhelming for any one of the folks involved.
- If we could only collect one piece of data, what would it be? Where would you start?

WHAT KINDS OF QUESTIONS/DATA COLLECTION SKILLS/REPORTING?

- Skills: can catch, identify, measure, weigh fish.
- Skills: simple act of reporting (discards/harvest), CPU
- Logbooks
- Would be easy to expand volunteer efforts of commercial fishermen to collect additional data. What more data are needed? Need to know that from the scientists. Would it help if we

put x in the commercial log books? Hook size? Selectivity? Is there something else? Already have the infrastructure, the reporting requirement. Do we have plenty of length measurements, for example?

- Some will have to fill out an economic report as well.
- Gaping hole is from recreational anglers. That would be a huge addition
- Need a census of recreational anglers: who we are, where we go. States have fought stamps and licenses.
- Commercial: would be willing to put a temp device or go pro on pots. Environmental, habitat information. Any gear fisherman could easily adapt to use recording devices.
- Otoliths, gonads... commercial fishermen have done a lot. Taken dry ice. Measured every single fish on a 4K lb trip. Fleet on your feet. Commercial, can't do that on every trip.
- Need something quick to keep fish alive. Start weighing them, they will start to stress.
- How would you decide what trips, if you have a lot of extra work?
- For a while, Mark brought in black sea bass carcasses from every trip. Would leave them on the dock. Agencies would pick up and sample stomach contents, etc. Everybody tried to participate in that.
- Right now (commercial) only 10% are required to report discards, but there's a big need for discard information. Ask additional people to collect discard data: just give them an additional logbook for discard data. Incentives? Doesn't have to be a large number, just start by asking for volunteers. Isn't that much more work.
- Which is most important for the studies. KISS (keep it simple, stupid)
- For high-effort, ask on-demand, species-specific, that could inform upcoming stock assessments
- Tagging fish can be done on all sectors. Code tag for location caught. Samplers pay for legal fish.
- Mark asks Bonnie: since you're in charge of data, the type of data that you take care of an d evaluation, what type of data takes the least amount of manpower to process? Huge gradient. Most time consuming (but unbelievably valuable): reading video, and aging a fish (lots of time to get the bone out, read and confirm, etc.). Easy: in addition to fishery independent data, asking water chemistry data... to link the physical habitat information with the ecological data (e.g., catch numbers with average temperature). Lengths of 100 fish easier to process than 100 hours of video. Mark asks, if you had a group of CS fishermen selected out to sample their catch, is that something that could be held in comparison to MRIP numbers? Bonnie: are these data valuable and can they be used, that's an important question. But the first thing you need to do is identify the question. If your question is, is there a way to ground-truth MRIP data using citizen science, then yes. You can ask people questions about their fishing experience to use that as a second line of evidence. MRIP has talked about doing this. Follow-up: what is the most important question this area has to answer right now? Right now, seeing landings of blue tile fish coming from further north in higher numbers than they're used to seeing. Have those fish been there all along and haven't been fished before? Or are those fish from here and are moving further north? How would you conduct data collection to answer those questions? NOAA worked with the industry to do some test fishing, do some samples to do genetic testing to see if it was a separate

population. These are questions you can help us answer. Climate change is a reasonable hypothesis, now we have to test that. One person remembers as a kid hearing of huge tile fish die offs... is it cyclical?

- **Anyone can be trained to do anything.** Way back, we were collecting otoliths ourselves. There was no data, they needed info. There were vats and vats of snapper coming in. Wasn't random sampling, which caused a problem, but I can get those otoliths out of there, that's no problem.
- Bonnie agrees, skill is not going to be a limiting factor.
- One skill requirement is the ability to go offshore, fish, and get back. Not everybody can do that.
- Different question: what are people willing to do. [see below, day 2]
- Have something in layers. Start with something simple, if you want to go deeper and in more detail you can.
- Bonnie asks, with a lot of different species, people who make their living fishing know them all, at all stages. Recreational fishermen may not know what they're catching. Could do a study to determine how capable a person who fishes for fun knows what they catch. That determines whether you're in compliance with the law. That kind of info could be really useful, as the agency works under assumptions that the regulations are being followed and therefore have a response. Is the regulation right, or are the ids wrong? Could use fishermen to help assess that. Mark thinks that there's now less of that [mis-ids] than there was in the past.
- It's soft skills you need: commitment to participate, in detail, to get on the computer and report.
- PR campaign, to make this a do-able habit like wearing a life vest.
- KIS. Make it interesting and fun. Little wins.

CHALLENGES/OPPS FOR PRIVATE RECREATIONAL REPORTING

- Would it be valuable if even only half of the recreational fishermen reported? Big question for the scientists.
- Challenging that you don't know the assumptions associated with their data. Nobody knows that world. Until you get a snapshot of what's coming out of there, you have no idea. A snapshot could get you started, from self-reporting.
- Volunteers went to restaurants, docks, etc. a while back to ask survey questions (FWC promoted that). Voluntary reporting from the recreational sector. Start somewhere.
- General public, some people may reject all of this (will take away my access to the resource). You hear, all the time, "you're just killing yourself."
- With the red snapper problem in the Gulf, electronic log book. Shrimp fishery had been accused of killing the baby red snapper, logbook proved beyond the shadow of a doubt that the shrimp fishery wasn't a concern. A lot of the guys who took it on were worried about it, but it was a saving grace. "The truth set them free."
- If we showed that we didn't have a huge discard issue, it could come back and help us rather than hurt us.

- last year, the discard [assumption used to calculate] was so high it was higher than when the fishery was open! If you want to correct this, you could provide REAL discard data, so they don't have to make assumptions
- Carcass program, need some place to put them. When fillet on the dock, put them in a bag, tag them, put them in a dedicated freezer/cooler. All that is time consuming for the agency.
- For the private recreational angler, possibly getting length and tagging a discard, if you can do it efficiently. Do-able for somebody willing to do it.
- Tagging: state agencies provided tags. Every fish would get measured, tagged, released, done efficiently by trained personnel. Boat was being run by someone who knew how to put them on the fish.
- Easy to pick up surface temperature, depth, window of the time of day.
- Two kinds of tagging: catch and release, or bringing something in to the dock to look at stomach contents, spawning stage, etc.
- The recreational ability to release red snapper alive is quite low. Could have a program to encourage retaining that fish to learn something from it, so it's not a total waste. Also an opportunity for an educational program on how to release them so they have the best chance to survive.
- You have to get the ones that want to participate. A lot will buck everything out there. The ones that want to be part of the project are the ones that will probably give the best data.
- Approach advocacy groups. Sailfish tagging. You have to get buy-in from credible advocates, peer influence. Commercial guys have built-in economic incentives, but recreational, you have to figure out some incentive that will make it worth their while, beneficial.
- Help people know where fish migrate to at different times of year.
- Mortality
- Good for the public, you can know what the fish are doing.
- But you try to involve a recreational angler who suspects there will be a negative impact, you can look at instances like.... To show benefit. Don't try to get too grandiose too quick. If then you have success, they can start to see benefits: makes the recreational fishing experience better (however you define that). The critical thing is that the first time has to be a positive experience for the participants. If they have a bad experience, it will be a long time to get over that. Have to make it easy. Design something that's almost a guaranteed success.
- Have to pay extra in FL for a lobster stamp, snook stamp, idea is that money will go in to research that sustains the species. Maybe for every four you turn in you get to keep one. Reward. Maybe stamp money goes into rewards.
- E.g., ten lion fish, you get to keep an extra lobster. (BUT, lots of people got stung!)
- Look at things that are successful, and build on that.
- Private... fed fisheries program has to have a long-term goal to get a license structure implemented. Could take ten years or more. After you have that implemented, you can start with requirements even if they're spot requirements. [Don't say that in front of some people of you'll get shot] – some commercials didn't want recreationals to have licenses. The sooner you start the initiative, the sooner you'll get through the fight and it will die down. [Bonnie clarifies some things that are on the books, fed considers needs satisfied if states

have sufficient licensing/registration] That requirement gives you leverage to ask for additional information.

- Q for Bonnie, where do you get your estimate for private recreational effort? Comes from MRIP. Used to be a telephone survey, now a mail survey. Effort and catch are measured completely separately. Then, go to the docks to get CPU.
- What are the core questions? Maybe oversimplified, but: How many fish are there? And are those numbers getting bigger or smaller? At the core of the management problem. Bonnie says that's crucial, whether the pop is growing or shrinking. But more refined as well: is the black sea bass north of this line related to one south of this line? Buut one person says that for the average citizen scientist, those questions may be too complex. When you're looking at engaging recreational anglers, the toughest crowd to get involved, and you ask them, they're going to say, how many fish are there? Trying to drive it back to core questions. Am I restricted from catching dolphin because the number is shrinking. Why is the number shrinking? What is going to drive the catch limit? The people who you want to get involved, ask them what's important to them. Basically, access to catch more fish more often. To get to that objective, here's where we're going to have to start. Walk them over to it.
- Bonnie agrees that knowing that is important, but it may have to be separated from citizen science, because it's not really a transaction. If that's a perception, you could end up biasing the data. COUNTER: but the reverse is also true. Somewhere in there is **an opportunity to get a better understanding of how management happens**. If they don't believe that the stock is in distress, then it doesn't matter. Not sure where the chicken and the egg is in the issue. Not going to get people to participate unless there's a credible **process**.
- Birders, their reporting has led to what they can derive from a now massive data set. In fisheries, in its simplest form, on the recreation side, they report what they caught, what they discarded. But there's not a linear translation to birds. In no way is someone reporting an observation of a bird going to limit their ability to observe the bird.
- Manatees example: how many are there? Changed from endangered to threatened. Similar story for glass groupers.
- If their involvement doesn't result in anything (even if it's a negative action), you're not going to have long-term involvement

INCENTIVES

- Going to NOAA site to check next four days of weather... what if at the bottom of the page it had a link to ask you about your last trip? That site is something that people use (there are other sites as well). Some people look at it all the time, sometimes several times a day.
- Why? To show scientists what you are seeing on the water, what you are seeing coming over the side of the boat. It may be different than what scientists are seeing.
- In the environment in which you are fishing in. Data from the actual habitat, where the fishery is conducted.
- To improve the science that there is for them to manage these things with. Most feel that there's a lack of it.

- There's no way you can duplicate the hours that we put in. It's a huge resource, the number of man hours. Just to contribute.
- Some might say: If I can correct what I believe is wrong, I can have access to the resource. What some people believe.
- The ability to track your own information, like a log. You'd have to know more about the program. You could actually get into the science, see the data, understand why the managers are... "screwing it like they are."
- More power.
- Remove some of the management on the species we're harvesting, bag limits, seasons, size limits. Access, being able to retain. To compensate. Being able to go into MPAs [he may have used the word "truthifying?"]
- Why would you want to do it? What is the reward? Like to keep a release tool. Or a fish (lion fish example).
- To be a personal contributor to management decisions. Not just complain, do something.
- Amber differentiates values from rewards.
- Help be policy and management initiators, not just receivers.
- Sure all you guys get is complaints.
- If you have incentives, keep something you wouldn't be able to keep.
- Recall Bonnie's comment about being really careful about what you promise. Dave Webb: says he has changed his position based on what she said. [regarding promising that the fisheries will benefit]
- Dave W: Feels an obligation to give something back. Challenge people to give something back, feels fortunate to have been able to make his living
- "This came from your peers" may have more credibility. Maybe incognito, doesn't want them blowing up his boat.
- When you have a direct part in a decision, you get more buy-in. Actually be exposed to the data that's discovered, be part of the decision that's made, you're not going to go say it's BS because you were there, you were part of it.
- Feel empowered to have done what is right.
- Comment from VHS radio, everyone throwing back red snapper. "It doesn't matter what we prove to them, they're never going to give us our fish back."
- But when that guy comes up and says, "you know, I was wrong" – then you've got it.
- Moment of truth.
- Sustainability as an incentive. So our fishery will continue to be sustainable.
- Financial burden minimized to participants. Any tools needed, needs to be provided. Understanding what they're asking us to go and do is in parallel with our fishing practices (transects not really fishing). Crew member still needs to be compensated.
- Mark: grew up in Daytona on the water, watched many years people finding bonanzas, red snappers, people would go out and decimate, his dad would say, "this is going to bit us in the butt one day" (spawning stock). Set something in his head, we do need regulations, we do need something in place. Took a turn that nobody expected. Maybe now we can get a handle on it with citizen science.

- Timing of closures, so you don't all get concentrated in a certain area.
- If you can leave them alone a little while, you're a lot better off in the future.
- Geomorphological data showing areas in the keys that aggregate spawning areas due to upwelling. The minute people starting putting lines on maps, people started showing up. This one particular spot – even if you do a temporal closure, other species spawn at other times. → Almost like a baited field.
- Have they ever put out a scientific report saying that closing this area (Bob B), how do they tell if that's actually helping at all. They never tell you where it's improving.
- Keri: you don't necessarily have the resources to evaluate that.
- Michael R: Is there a missing link of a social scientist? Keri is a social scientist!
- Bob B: Joe Fisherman sees you close the fishery, for six or seven years, but there's never been any kind of paperwork showing that it's helping. He (Joe Fisherman) doesn't care about anything other than that. Where am I getting some kind of return on my investment of not being able to fish there? If you go to the fair and you knock all the dolls over, and the guy says thank you have a nice day.
- Bob L: When asked why he shows up to these things, he thinks in terms of offsets. Where in this process is something to show, educate, and develop for the future? Some changes may happen into the future, like spawning closures. Is there something else that can be devised? Can you suggest what else they could do? Could some fishermen with the right education could also service the dive industry, for example. They're losing a source of income, and that's what they see... That's all they know...how do you show them other options.
- Economic analysis Guy made his living there, now he can't go there any more. How do you move opinion. A lot of this is branding. Just acknowledging. Just acknowledging some of the realities, and engaging people in conversation... but here's the plan, here's what actually can make a difference. 90% of this is communication. Understanding why you should be doing that, why tax dollars are invested, why you can't go out there with your grandson. We know the reality of the limitations of regulation. But when you're talking with a group of fishermen, you let them know you know the difference between discard and putting in a trauma device. If you use a word that indicates you don't know what they're dealing with, there's no incentive.
- Ask the audience who has a college education. They have no idea what you're talking about most of the time – all they know is what they see. When you say discard, what they see is a trash can. They see it as a release. You gotta get out of the scientific mindset, and to the guy who works on the car M-F. You need to address this problem not towards the people you're meeting with, but towards the scientists. All they can see is what you're taking away from them. Give it to them in a language they can understand. The delivery, that is the key (Bob B).
- Be honest about the losses if there are some.
- Commercial boat has places to keep things dry, recreational boats may not. Phone is \$700 that you have to keep dry. When you get back, fill in data: what I "released" Can throw out the highs and lows. You need this recreational data.
- Like what the coastal communities see with the DOT. First they throw out the alternative route, but look what you'll get down the line, call us if you have some issues.

- All around the table at about the same point in their lives, have seen what the reality has been. She's concerned that her children and grandchildren may not have the opportunity to witness the beauty and abundance of our oceans. Help enthuse other people to be a participant. There is data coming out to demonstrate that this can work. Feels compelled to inspire other people to participate. The cost of it is too great. **Going to have to be spread across all of our backs, the people who have benefitted from this abundance.**
- Macro view: the interdependence of species. People on the water don't even know they're embarking on that. The recreational guy doesn't see the multi-dimensional, multi-layer things that the management sees. Not going to reach everybody, but get more people off the brink. At least try to move people from actively trying to stop you, to debating. (DAVE W)

RECRUITING

- Go through clubs, Bill Fish, IGFA... where 100s 1000s of people are going to get guidance, ideas, leadership. Can have a different conversation with people running those organizations and get them to help you. Leverage that resource. Going to need other people to help you.
- Fishermen are kind of independent.
- Michael R: will give a presentation at his rewards meeting.
- Mark: several guys on outboards all fished together in one are on a regular basis. He doesn't see that in Charleston, but in Florida.
- Bob L also sees informal fishing clubs
- Some more formal fishing clubs, help educate people.
- Dave: industry, too. Tougher sell. Selling fishing reels, outboards – depends on how their customers see it.
- Towboat US, Seatoad... might be great PR. Depends on how they perceive it. How do their customers feel about this.
- Advisory panel in areas should be doing the brokering for this.
- West Marine, would be to their benefit.
- Individual captains, like Bouncer – sponsored by companies. He's very outspoken, very leading edge conservationist, willing to risk that. Reach out to people like that. If they buy in to the plan, see the legitimacy, they're willing to take personal risk, feel like they have an obligation,. Sometimes it's hard to identify them, but listen for the loud voice. Going to be a bunch of these things put together.
- Guy Harvey.
- Mark: Roffers.
- [in certain areas] Everyone is aware of how fragile the resource is. They're aggressive about conservation. (Dave) Reach out to them, it's hard, but if they buy in you'll get assistance. Get people speaking for you.1) recruitment, 2) getting people off the brink.
- Corporate concept: a tougher sell, but you can find people. Becomes a financial leverage for them. Influenced by their customers
- iAngler...

- Anyone who spends a lot of time on the water knows there's a lack of data to inform management. If you spend any amount on equipment, you know we're data poor, all of our stocks. If you can convince people that you can help fix this problem, "the truth will set you free."
- The shrimpers who put the data on to prove they weren't the problem. Won't always work that way, sometimes the truth is that there is a problem. One of the key points to convincing people is that **we're not trying to prove that they're the problem**. Then talk about obligations. You're just one piece. We want to make sure we're not overburdening you, we're not charging you with the impacts if you're not part of the problem. But the facts will be what they are.
- A lot of assumptions that take place when lacking data (MRIP famous for that). A project that can quantify some of that, whether it's worse or better than the assumption.
- A specific need: to quantify MRIP. They don't believe it's correct, this is an opportunity to fix it.
- Err on side of being conservative, we don't know what the number is. It has to be better with more data. Maybe we won't manage it so aggressively, will still have to manage.
- Bob asks about leaders, ambassadors in commercial industry. Others: they're more involved already.
- Demographics in commercial: getting older, no new blood stepping up. But, new recreational fisherman... the first time they go fishing, that's what they understand it to be. Old guys know how it WAS.
- This is their ground zero, we know what it has been, what it has the capacity to be. It could recover to a much better level if we could get the assessments right.
- Be able to show what it was... show a snapshot of where it was, where we are now... get a grasp of it, understand it.
- No question there's less fish. But economics, by demand... isn't the money still the same? No, not the same... example of lobster, five years ago commercial fishermen needed to be bought out, but then the Chinese market opened up.
- The consumer isn't represented here.
- There's as many fish as there ever was (in his place, in his lifetime), because of the management. Incentive: help manage the resource for sustainability, show the managers more data for better management, better sustainability.
- If you're involved, on the commercial side, you have the incentive to do this. You have honed in on your craft, are committed, dedicated, not just for the gravy. You're permitted, so regulated, you can't imagine. Two different incentives (vs recreation). It's business. You can't do it part time any more, you're completely committed. So bound to recording. (Jimmy)
- If you made bankers take the same tests, you'd have a lot less bankers!
- Just depends on Eric, John, saying this is what we need from you guys. If the council does this right, will be swimming in data.

DATA

- Alignment between cost of data collection and data analysis (video expensive all around).
- The data have to be important. Lacking now but needed. Important for solving the problem and easy to collect., not too much time burden, cost burden.
- Mark: already collecting data for MRIP, Feds. If we go in that direction, an area where data aren't collected.
- An expectation of feedback. Understanding what the contribution is, where the data are going.
- Expectation of access to the data.
- Understanding what the objectives are, what are the goals. People don't like blind studies, big surprise of what's actually being looked at.
- If we do this, that's going to have xxx savings in the long run.
- Yearly statement: something for my effort.
- Conversation, chance to interact and discuss with the scientists
- Conclusion isn't as important as updates along the way. No surprises.
- As you go, not just annual. Jimmy: he likes to learn from what's going on. Mark agrees.
- As you're initiating this, more frequent updates. As people gain confidence and you gain credibility, may not need to be as frequent. When you're trying to engage, have to put a lot of effort into it.

OBSTACLES

RECREATIONAL	FOR HIRE	COMMERCIAL
<ul style="list-style-type: none"> • When you're trying to break the ice with recreational anglers, you're trying to get them to do something they're not doing now. • Get WestMarine to design survey, pay for it, put it on their website. That's where recreational guys go. Their benefit would be to get feedback from anglers, their email and phone number, • Dave W says he would volunteer to be an observer 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • Interested in taking observers. Provides credibility. Requires safety inspection, may not be as easy for recreational.

Discourages participation		
<ul style="list-style-type: none"> • Cost money • Too much time • Shuts fishery down • Pure “play” fisherman: no compensation, doesn’t want anything that would generate a 10-99 form. • Unexpected or unintended legal liability. 	<ul style="list-style-type: none"> • Cost money • Too much time • Shuts fishery down 	<ul style="list-style-type: none"> • Cost money • Too much time • Shuts fishery down
Could make it easy		
<ul style="list-style-type: none"> • Sometimes a phone call 		

PRIORITIZE BY:

- Data gaps. Who decides? Council or NMFS, SEDAR
- Engage collectors about what’s important, and make them mesh up. Engage citizen scientists in what they think.
- Inspire people with a recognized need. Skin in the game.
- Form a committee, with SEDAR, Council, others, potential leaders of this program, negotiate what’s do-able. Especially in a pilot, simple and easy. Something that’s useful, that’s easy to obtain.
- Success-oriented.
- Pick something that’s reasonable, may not be the priority of the Council but still important. Let them get buy in, build yourself some credibility. Let them have a win. Get them engaged and get them committed.
- “We picked your project, your priority.” – then yours can be the next 10 projects, you will have built credibility.
- Go to fishing clubs, board of directors can take positions that are controversial with their own members (Dave). Can’t ask every individual. Get input from governing boards, they know what their membership will tolerate. Get ideas on something that people will buy in to.
- Online survey of people with recreational licenses. (may not be workable for the pilot, though)
- Maybe select group come up with short list of ideas and then do a priority vote.
- Engaging the general public is really difficult. A lot of people won’t respond. Like the Council- the people who show up are the leaders.

Birds are NOT like fish.

No rocks were thrown!

Marina –

- Is something easy also going to be something that will make a difference?



Expert Group: RESEARCHERS

Expert Group Participants:

Scott Baker, Doug Mumford,
Paul Rudershausen, Wally Bublely,
Kathy Knowlton, Russ Brodie, Bev Sauls,
Will Heyman, Mike Jepson, Ken Brennan,
Todd Kellison, and Rob Wiggers

Citizen Science Program Design Workshop
January 19-21, 2016





Citizen Science Program Component: *RESEARCHERS*

Key Elements to working with stakeholders:

- **Time and Money**
- **Recognized need from the stakeholder's perspective**
 - Data must be seen as important and useful
- **Good relationships with stakeholders**
 - If they don't already exist work through those who do have the relationships
- **LOTS of communication and outreach**
- **Make sure stakeholders feel ownership with the project**



Citizen Science Program Component: *RESEARCHERS*

Key Elements continued:

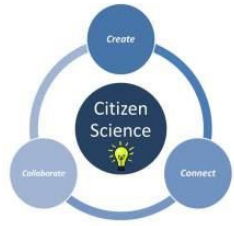
- Be sensitive to stakeholder's concerns about what you're collecting and how it will be used
- Set appropriate expectations
- Have a designated point of contact for stakeholders



Citizen Science Program Component: *RESEARCHERS*

Methods to recruit and retain stakeholders:

- **Promote your project**
 - Websites, News outlets, networking
- **Personal invitation to participate - “I need your help”**
- **Define how long you are asking them to participate**
- **Use peer to peer recruitment**
- **Provide incentives and revise them over time**
- **Provide lots of feedback**
- **Use “gamification” – earn badges for participation levels**



Citizen Science Program Component: *RESEARCHERS*

Training stakeholders to participate:

- Provide training when it is convenient for them
- Use appropriate training methods – video, peer-to-peer
- Do not underestimate the amount of follow up needed after training is provided
- Be careful how you qualify people to participate – don't insult them
- Field training is more engaging than workshop training



Citizen Science Program Component: *RESEARCHERS*

Skills needed to work with fishermen:

- **Great communication skills**
 - Listening
 - Be humble, let them talk
 - Respect what they know
 - Be ready to learn from them
 - Be tactful
 - Be persistent
- **Know the fishery they are participating in**



Citizen Science Program Component: *RESEARCHERS*

Biggest successes and challenges:

- Don't assume that the larger group of stakeholders wants the same thing the smaller group you are talking to wants.
- Be sure what you collect is useful
- Pilot projects are critical
- Be prepared to fail
- Consider non-fishing participants (ex: divers can also collect temperature data.)
- Be aware that they might think that participation could lead to “undesirable” regulations



Citizen Science Program Component: *RESEARCHERS*

Project Management Recommendations:

- Following up takes the majority of time once the project is underway
- Contact person is critical and should be available outside of normal office hours
- Data processing time must be fast, preferably automated. Stakeholders want fast feedback.
- QA/QC takes time and maybe longer than many other projects because frequently these data aren't the cleanest.
- Include sufficient staff time to evaluate data



Citizen Science Program Component: *RESEARCHERS*

Outreach Recommendations (from researcher experience):

- Outreach can be good or bad
- Social media can help get the word out, but it is hard to stop misinformation
- Be transparent about the project
- Use limited resources wisely – target the appropriate groups.



Citizen Science Program Component: *RESEARCHERS*

General Recommendations:

- The SAFMC Citizen Science program must be distinctive
- Recognize that it will take time before data will be ready for management or assessment use.
- Potential projects should be reviewed in advance by the SSC and other science groups (e.g. SEFSC) to make sure the data obtained will be useful for management and assessments.



Citizen Science Program Component: *RESEARCHERS*

General Recommendations:

- **Think of this in terms of a Program with multiple projects**
 - Individual projects may cater to different users
 - Every project may not succeed, but with some successes the program will succeed

Expert Group Breakout Session
SAFMC Citizen Science Program Design Workshop
January 19-21, 2016

Expert Group: Researchers

Group Participants:

Scott Baker
Doug Mumford
Pau Rudershausen
Wally Bubley
Kathy Knowlton
Russ Brodie

Beverly Sauls
Will Heyman
Mike Jepson
Ken Brennan
Todd Kellison

Discussion Questions:

These questions are provided to help start discussion on some of the components you could consider when developing a citizen science program. However, there may be other ideas the group may determine are important to consider.

During discussion, consider that the scope of a citizen science program could range from a small program that operates with few resources to a large program with many resources available.

Develop recommendations that will include a range of options to support a program that may be small, medium, or large in scope.

- 1) What key elements are needed to work successfully with stakeholders on a collaborative project?
- 2) What methods did you use to recruit (and retain?) stakeholders to participate in your project(s)? What methods were most successful / least successful and why?
- 3) What methods have you used to train stakeholders to participate in a collaborative project? Which methods were most successful / least successful and why?
- 4) What skills would you need to learn to work effectively with fishermen?
- 5) What have been your biggest successes and challenges when working collaboratively with stakeholders? What guidance can you provide to help ensure future citizen science projects are successful?
- 6) From a project management perspective, what is the level of time commitment and/or workload for collaborative projects?

Breakout Discussion Notes:

- 1) ***What key elements are needed to work successfully with stakeholders on a collaborative project?***
 - Time (personnel)
 - Money (personnel, gear, etc.)

- Makes it difficult to plan when you don't know what you have with regards to time and money
- Large scale plan vs small-scale plan based on resources available
- Need to prioritize goals, so you can work with what you have/get
- There needs to be a recognized need, from the stakeholders' view, that the data are important and useful
- Good relationships with stakeholders
 - If already exist, you are in a good place to start
 - If the credibility/trust doesn't already exist, you need to find someone who has it to help get the ball rolling
- Lots of communication, outreach
- People have to feel like their contributions are worthwhile to them
- Stakeholders need to feel they have ownership of the project
- Need to be sensitive about stakeholder concerns regarding what you are collecting and how you will use it
- Need to go back to find out what the stakeholder issues are first, then here are some ways to address them, then build a project based on feedback from stakeholders about what is feasible
- Set appropriate expectations
- Point of contact that they can reach to ask questions, and who will follow up/share info
- Leadership support from the agency
- Councils are going to need to work with the states, but also work with other agencies/groups (SeaGrant, environmental groups, reserve staff, etc) that may have a better relationship with the targeted group

2) *What methods did you use to recruit (and retain?) stakeholders to participate in your project(s)? What methods were most successful / least successful and why?*

- Having minimum control over the people you work with is not optimal
- Promote your project
 - Websites
 - Newspaper
 - Networking (known fisherman, state reps, agency folks, previous CRP collaborators, local biologists)
- Personnel invitation to participate
- Stakeholders liked to see agency/state folks out collecting data
- Let them know you are signing up for a specific period of time (Also helps with retention)
- Peer to Peer recruitment
- Changing the incentives
- Recognition of their participation
- Constant feedback
 - Updates of program
 - Specific time frame then you get a report

- Gamification of participation
 - Badges, stars, etc
- “I need your help”
- Persistence – don’t give up easily
- SWAG helps and is relatively cheap

3) *What methods have you used to train stakeholders to participate in a collaborative project? Which methods were most successful / least successful and why?*

- Training
 - Find a time that works for them
 - In-person, YouTube videos, pamphlets
 - Peer-to-peer
- Face-to-face training: if you cap the participation, people will participate because no one wants to be left out
- Don’t underestimate how much time the follow-up will take after training, so be sure to figure that in
- “Qualifying” people prior to participation
 - Shark project – wanted to make sure they could ID sharks but many didn’t even want to take the exam
 - Need to handle qualifications tactfully
- “Field” training rather than workshop setting

4) *What skills would you need to learn to work effectively with fisherman?*

- Good listener – understand their concerns, issues
- Good communication skills
- Be able to be humble, let them talk
- Need to have a good working understanding of the field you are working in
- Don’t be judgmental/ be open-minded about what skills people might bring to the table
- Make sure you staff have these traits
- Be respectful of what they know
- Be ready to learn something
- Be tactful with follow-ups, reminders
- Persistence – don’t give up easily

5) *What have been your biggest successes and challenges when working collaboratively with stakeholders? What guidance can you provide to help ensure future citizen science projects are successful?*

- Be sure you understand what the larger group of people will actually do based on what a small group insists “everyone wants”
- Must make sure that whatever you collect is useful
- A pilot project will be critical in the initial stages of the program

- First projects should have an extremely high probability of success, even if not the most pressing need.
 - Multiple small projects may be a good way to start
 - Individual projects may fail, but the program will succeed
- Should consider stakeholders other than just fishermen when designing program (birders, dive boats, etc.)
- Need to consider how participation may be effected when data collected may produce “undesirable” regulations
- One negative experience with *any* scientific/data endeavor affects how they cooperate with *all* other agencies/partners/programs
- Stakeholders in general remember the negative more than the positive

6) *From a project management perspective, what is the level of time commitment and/or workload for collaborative projects?*

- Never underestimate the amount of time follow up with participants will take
- Follow up takes up the majority of time once the project is underway
- Critical to have a contact person for stakeholders to reach out to
 - May not be Monday-Friday, 9-5
 - Best if individual has passion for the project
- Need to build in time to process results – anglers want it quickly
- QA/QC takes may take a bit of time for some of this type of data is not always the “cleanest”

General Recommendations:

- Distinctiveness of the Council program needs to be clear; not just doing something that someone else is already working on
- The Council needs to recognize that it will most likely be some time before the data collected through these projects will be able to be incorporated into assessment or management advice
- Potential projects should be reviewed by the SSC in the development stages

Outreach Recommendations

- Outreach can be both good and bad
- Social media can be helpful or cause things to spiral out of control
- Transparency is the way to go
- You need to use your resources wisely, targeting your outreach to the appropriate audience

Plenary Discussion:

- Have a body (like the SSC) approve people to collect data in order to prevent issues with data not being used because of problems with data collection
- Not automatically a failure if not useful for assessments
 - Many uses for fisheries data that are important besides assessments

- True CRP projects tend to have good retention
 - Voluntary data collection programs tend to have fall off in participation, especially if follow up is not done



Expert Group: Science

Expert Group Participants:

Marcel Reichert, Carolyn Belcher, Erik Williams, Luiz Barbieri, Jack McGovern, Tracey Yandle

Citizen Science Program Design Workshop
January 19-21, 2016





Citizen Science Program

Science vs. Data Collection

- All data are good!
- However, Data \neq Science
- Data are scientifically valuable when it follows the rigors of the scientific process.



Citizen Science Program Component: *Proposal Development*

Recommendations:

- Council and Fishery AP's help to develop a list of issues/needs/data gaps
 - However, all ideas are welcome to be submitted as a proposal
- List goes out to fishing community via AP's/Council/etc. to gather ideas for projects to address these issues
- Proposals come back to a new Citizen Science AP to be reviewed



Citizen Science Program Component: *Project Criteria/Proposal Review*

Recommendations:

- Define goal of project
 - Does it address a data gap?
 - Is the goal achievable/measurable?
- Full and clear description of methods
 - Including a table of milestones/timeline
 - Include QA/QC and validation procedures
- Identify issues/biases with data (Data Integrity)
- How might data be used? (Stock Assessment, Management, Other?)



Citizen Science Program Component: *Project Review*

Recommendations:

- Different levels/types of review depending on type of project
 - Match projects with appropriate funding program
- Scientist involvement from beginning and in all aspects
 - Design, Testing, Evaluation
- Citizen Science AP should include scientists, managers, and fishermen



Citizen Science Program Component: *Evaluation*

Recommendations:

- All projects should be evaluated for success
- Long-term projects need regular evaluation
 - All projects should have an evaluation mid-stream
 - Will help determine if methodology adjustment/data validation is necessary
- Short-term projects need evaluation for how well they achieved their goals



Citizen Science Program Component:

Data Validation

Recommendations:

- Will strengthen scientific rigor and utility of data
- Will be project specific
- Different types of projects will require different methods to validate the data



Citizen Science Program Component: *Overall Citizen Science Database*

Recommendations:

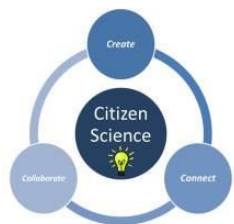
- All participants given unique id and an overall database is kept across all projects
 - Can help with socioeconomic analyses across projects
- Clearly described documentation
 - Secure and transparent
- Rigorous QA/QC procedure at multiple stages
- People can access all their data, for all projects they are involved in
 - Secure access to personal data, public access to all data in aggregated fashion



Citizen Science Program Component: *Communication*

Recommendations:

- All data are valuable, but must take care not to oversell a project or dataset
 - Zeros are important
- Need to be realistic about the potential use of certain data
 - Negative reviews will occur



Questions?

Expert Group - Science Standards
SAFMC Citizen Science Program Design Workshop
January 19-21, 2016

Expert Group: Science Standards

Group Participants:

Marcel Reichert
Carolyn Belcher
Tracey Yandle
Luiz Barbieri

Jack McGovern
Andy Strelcheck
Erik Williams

Discussion Questions:

Objective: Provide guidance on how to ensure the data collected through a citizen science program are robust and appropriate for use in stock assessments and management.

These questions are provided to help start discussion on some of the components you could consider when developing a citizen science program. However, there may be other ideas the group may determine are important to consider.

During discussion, consider that the scope of a citizen science program could range from a small program that operates with few resources to a large program with many resources available. Develop recommendations that will include a range of options to support a program that may be small, medium, or large in scope.

- 1) How should project proposals, ideas or suggestions be reviewed and evaluated? Modified? Approved for inclusion in the program?
- 2) Should overarching science standards or project criteria be developed *a priori*? If so, how can this be accomplished?
- 3) How and when should projects be evaluated to ensure reliable and robust data?
- 4) What type of validation and QA/QC practices should be applied to citizen science data?
- 5) What types of data or research needs are poorly suited to citizen science methods, and why?
- 6) What types of data or research needs are well suited to citizen science methods, and why?
- 7) What program practices and requirements would you recommend the council adopt to ensure citizen science data can be used with confidence?

Breakout Discussion Notes:

Components Needed –

- Assumption is that data from this program is going to feed into stock assessments and management in some way

- Process of including fishermen and having them help collect data can increase buy-in, which is its own benefit of this program
- Can depend on data that is collected
 - Catch data is a beast that may not be applicable to Citizen Science
 - Depends on how heavily you rely on sampling design
 - Data such as landings require reports of zeros as well as when a rare event happens
- Communication is key
 - Need input on design and testing
- Volume and type of data collected is key to how the data can be used
 - With enough voluntary data, may even be able to do a validation study to look at potential biases and correction factors
- Very hard to know a priori what useful data will come out of certain projects
 - Early input by scientists is key, but not so rigorous as to kill all projects
- How useful the data are depends on what kind of data is being collected and how much of it is being collected
- Need some checks and balances
- What types of problems/questions can Citizen Science be able to address?
 - Certain questions do not lend themselves well to Citizen Science projects (indices of abundance, landings, etc.)
 - Can be really helpful in collecting economic data
 - Qualitative data and data that is easy to report is likely to make a good Citizen Science project
 - Changes in abundance may also be good CS projects (long-term)
- Some data is better than no data
- Need to worry about validation of data if it is to be used in assessments or management
- Review of projects
 - Should depend on who is applying and who is funding the project
 - Can have different categories for the type of proposal
 - CRP proposals can be given endorsements to the CRP program at the SEFSC
 - Since the goal of all projects is to produce information to be used in assessments or management, would be nice to have federal review of some sort from the beginning
- Who can/should administer the program?
 - Sea Grant-like hub with Council/AP review
 - Involving the AP's in developing calls for proposals that go out to fishermen asking for projects/solutions to these data gaps/issues (topics for Citizen Science)
 - Hub is the administration house of the program
- Encourage the collection of data, with some guidance and nudging
 - Don't inhibit the evolution of the data collection
 - Never give an outright rejection, but give guidance and help match scientists and fishermen to facilitate the creation of programs
- Need to make sure we don't oversell the results of any project
 - Don't make promises we can't keep

- All data is valuable, but only that data that goes through a rigorous statistical design is likely to have direct implications for stock assessments.
 - There are different levels of data integrity that will affect how the data can be used
 - Volume of data can upgrade data in its level of integrity
- Can build confidence by communicating use of data
- Communicating use is important and should be done for all Citizen Science projects
- Use state based Sea Grant to help administer this regional Citizen Science program, with regional and state buy-in
 - Still need central housing for the program
- Validation and QA/QC is going to be very project dependent
- Regular reviews can help identify where and when to do validation studies to validate certain parts of the data
- Need to consider public vs. confidential data

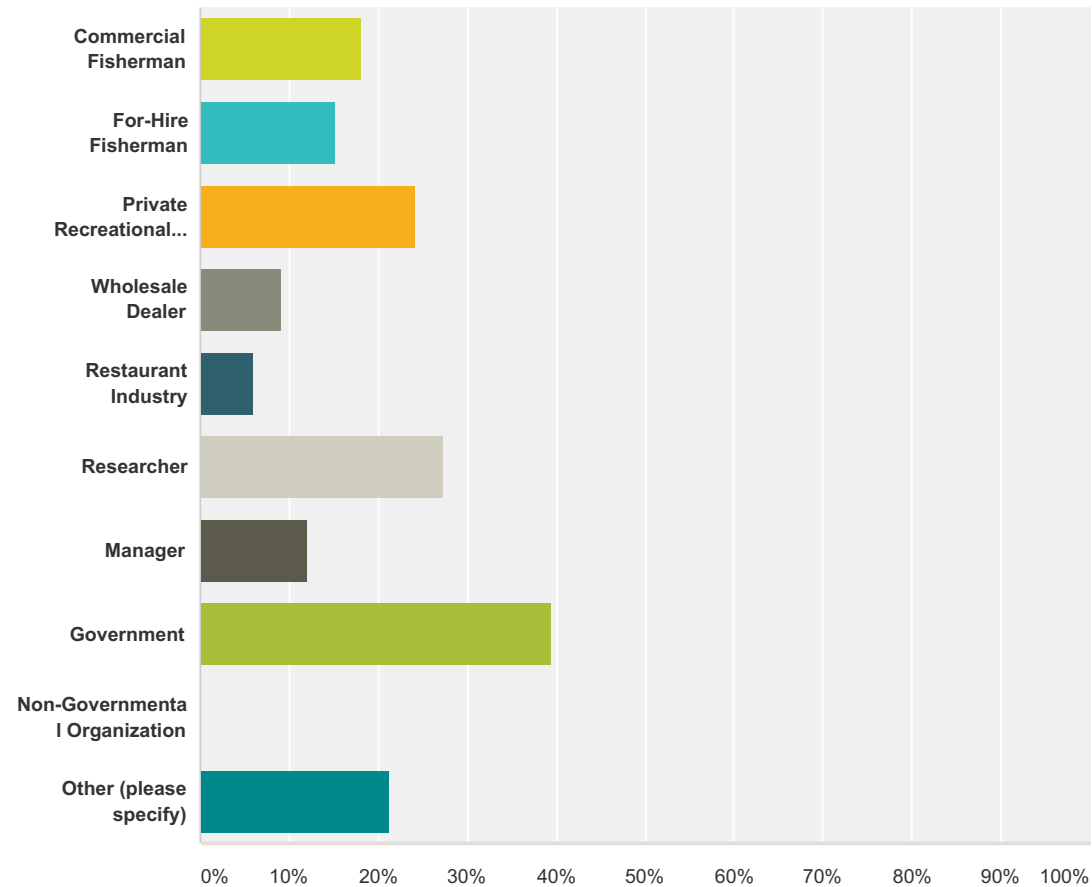
Plenary Discussion:

Science

- In terms of including zero data and rating people on their ability to collect data, it may be possible to incorporate the skill/amount of effort of individuals into how their data is used

Q1 How do you participate in fisheries in the South Atlantic? (Check all that apply.)

Answered: 33 Skipped: 0



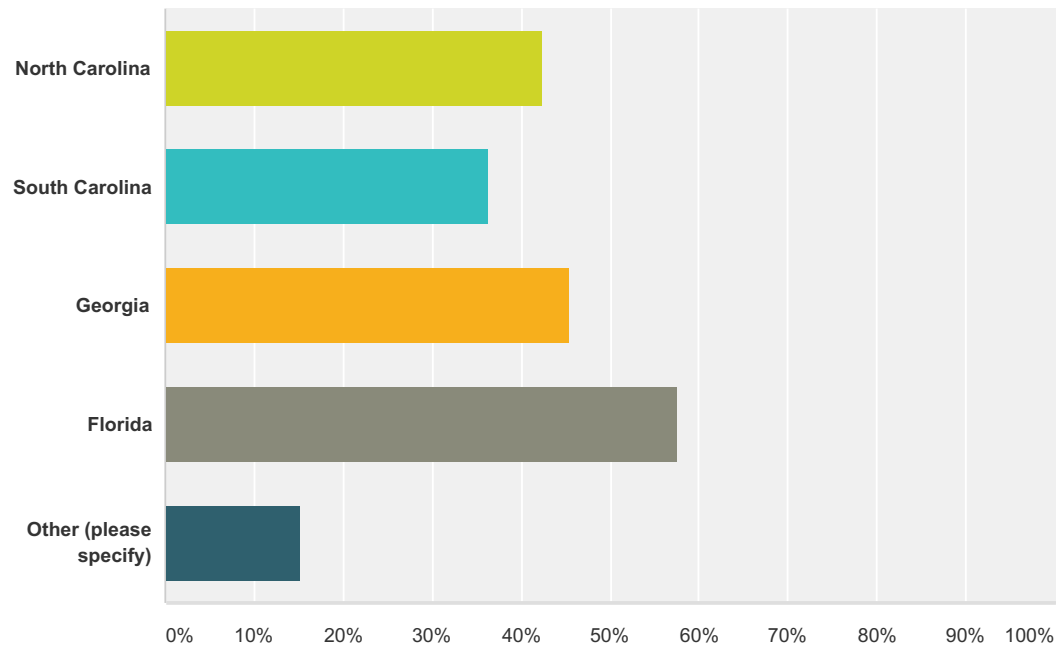
Answer Choices	Responses	
Commercial Fisherman	18.18%	6
For-Hire Fisherman	15.15%	5
Private Recreational Fisherman	24.24%	8

Wholesale Dealer	9.09%	3
Restaurant Industry	6.06%	2
Researcher	27.27%	9
Manager	12.12%	4
Government	39.39%	13
Non-Governmental Organization	0.00%	0
Other (please specify)	21.21%	7
Total Respondents: 33		

#	Other (please specify)	Date
1	ACCSP	2/10/2016 3:10 PM
2	Saltwater Consultant	2/9/2016 9:31 AM
3	Concerned citizen public servant	2/8/2016 5:41 PM
4	Sea Grant	2/6/2016 8:06 AM
5	Sea Grant/Extension	2/4/2016 10:43 AM
6	SSC member	2/2/2016 6:20 PM
7	Sea Grant	2/2/2016 10:26 AM

Q2 Which state(s) do you participate in fisheries? (Check all that apply.)

Answered: 33 Skipped: 0



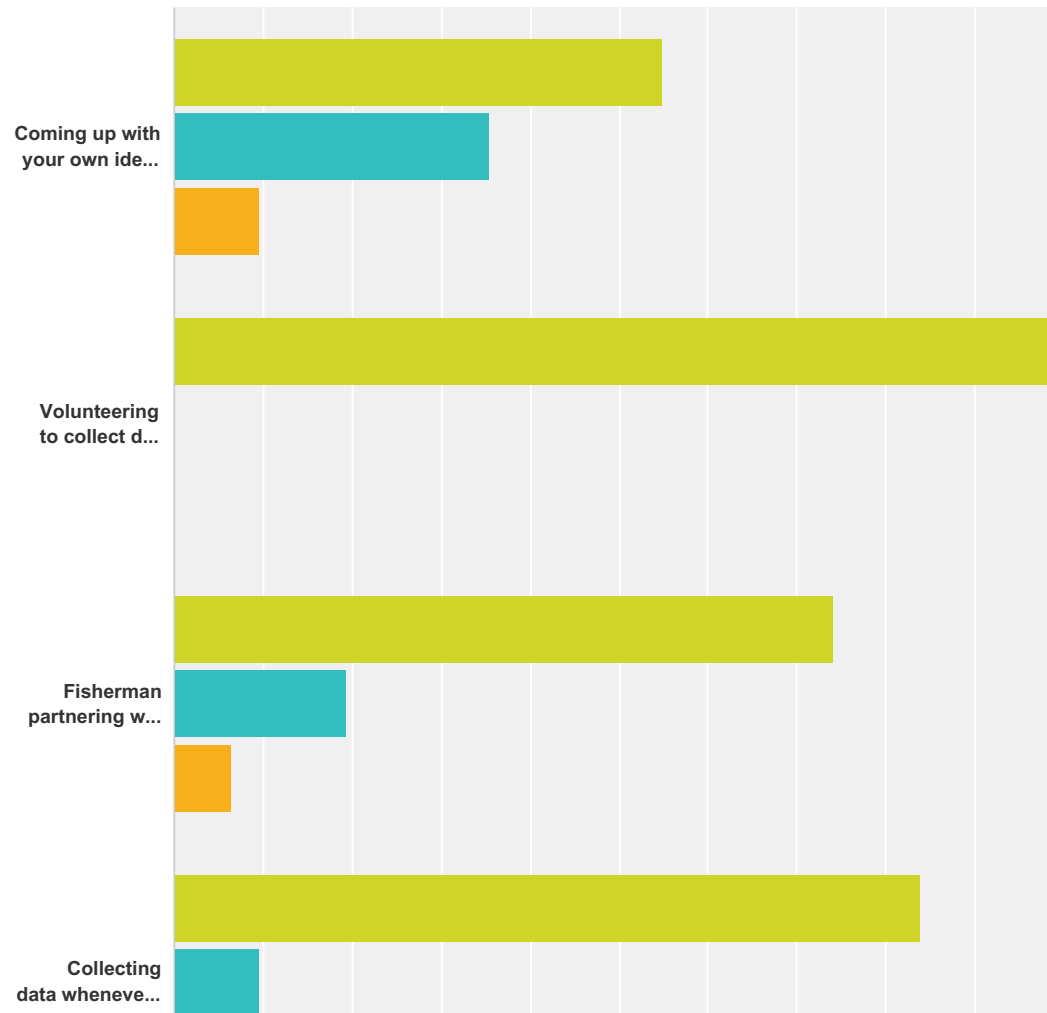
Answer Choices	Responses	
North Carolina	42.42%	14
South Carolina	36.36%	12
Georgia	45.45%	15
Florida	57.58%	19
Other (please specify)	15.15%	5
Total Respondents: 33		

#	Other (please specify)	Date
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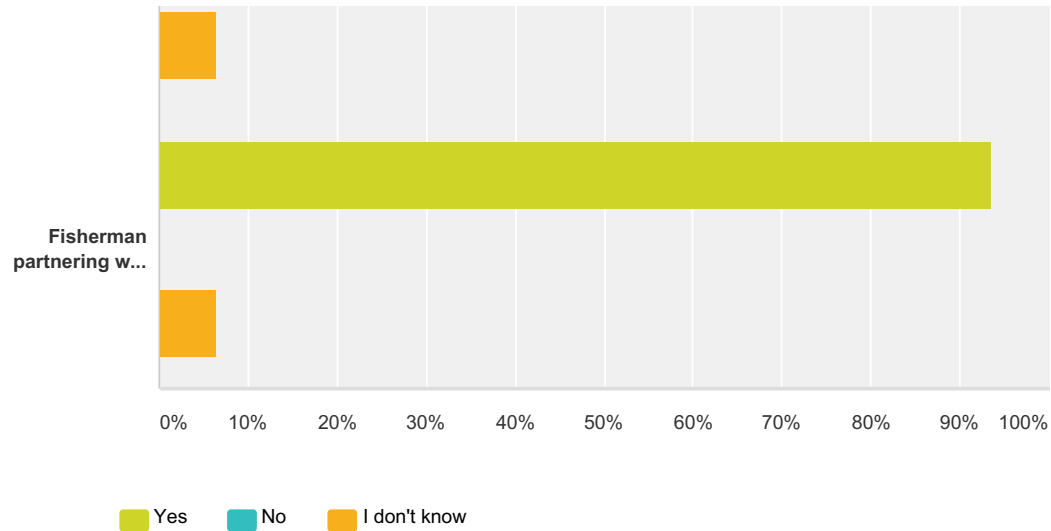
1	Federal	2/10/2016 3:10 PM
2	HMS shark fisheries from Maine to Texas	2/9/2016 9:31 AM
3	research scientist participates in all states	2/8/2016 5:15 PM
4	Regional science	2/3/2016 6:26 AM
5	none	2/2/2016 6:20 PM

Q3 Based on what you learned at the workshop, which of the examples below would you consider citizen science? (Select 'Yes' for the projects that represent citizen science and 'No' for the projects that do not.)

Answered: 31 Skipped: 2



Citizen Science: Post-Workshop Survey



	Yes	No	I don't know	Total
Coming up with your own idea and designing a project to collect data	54.84% 17	35.48% 11	9.68% 3	31
Volunteering to collect data for a project as part of your normal fishing activities (e.g. record lengths of discarded fish, recording ocean temperature on trips)	100.00% 31	0.00% 0	0.00% 0	31
Fisherman partnering with a researcher and one or both getting paid to collect data	74.19% 23	19.35% 6	6.45% 2	31
Collecting data whenever it is convenient for your schedule (e.g. you catch a red snapper and take biological samples to a drop off station)	83.87% 26	9.68% 3	6.45% 2	31
Fisherman partnering with a researcher to design a collaborative project	93.55% 29	0.00% 0	6.45% 2	31

#	If you wish, please tell us more about your thoughts on the examples listed above.	Date
1	Questions 1,2, and 4 are assuming I was a fishermen. While they all have some aspect of citizen science in the broad definition, it all depends on the application of the findings. In situations such as 4, those data will be extremely limited in the information they provide.	2/9/2016 8:51 AM
2	I do not think having an individual design their own project and collecting data is Citizen Science that would be valuable to regulator and management organizations such as NMFS, NOAA, SAFMC or a state marine fisheries management department. The reason would be that the projects would be too variable in design and the data difficult to manage and utilize. I do think that a suggestion conduit, if available, would be valuable to get ideas for studies to scientific centers and enhance the pool of ideas. However, there must be some central review and approval mechanism or scientific committee to assure executing the studies would be of value and the data useful.	2/8/2016 7:27 PM

Citizen Science: Post-Workshop Survey

3	The next to the last project sounds less than valid, however, a carcass collecting program would not require much structure if enough info were provided to augment valid science, eg, age at length.	2/8/2016 7:00 PM
4	Citizen science should be looked at like a jigsaw puzzle . If there are pieces missing the puzzle is not complete ! Fisherman live it .	2/8/2016 5:44 PM
5	Just what I was hoping you would ask	2/7/2016 1:20 PM
6	Hard to make a determination based on the information alone above.	2/6/2016 8:11 AM
7	i think the last example could be considered citizen science if that project is designed so that multiple stakeholders are able to participate.	2/4/2016 9:45 AM

Q4 In your own words and based on what you learned at the workshop, tell us your definition of citizen science.

Answered: 31 Skipped: 2

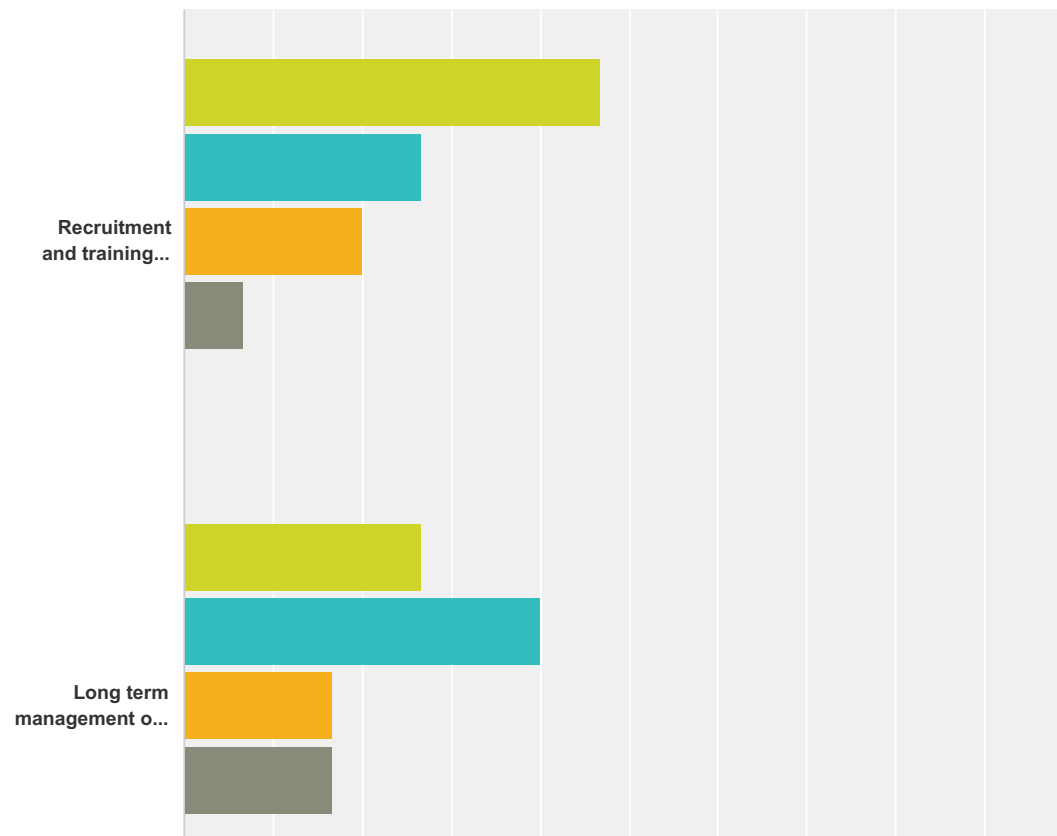
#	Responses	Date
1	The ability of the public to aid in data collection and share their observations with the scientific community.	2/12/2016 6:27 AM
2	Science (data collection, analysis, etc.) conducted or otherwise intricately involving non-trained scientists and members of the general public.	2/10/2016 3:11 PM
3	Should be a way to help gather a better understanding of our fisheries through collaborative science projects between the fishermen and the researchers.	2/10/2016 8:34 AM
4	Collaboration at many levels between user groups and researchers/regulators to collect, analyze, publish and incorporate scientific data for the purpose of managing, conserving, protecting and harvesting natural resources.	2/9/2016 12:05 PM
5	Citizen science allows participants of the different fishing sectors to bring their experience to the table for comment to see if others are interested in collaborating with gathering useful data for scientific assessments to achieve the best management results for future generations.	2/9/2016 9:38 AM
6	People donating their time and energy to collect useable data.	2/9/2016 9:32 AM
7	Citizen science is the participation of non-professionals in the sciences to provide ideas, collect, or analyze data for purposes of advancing or enhancing the science or management.	2/9/2016 8:53 AM
8	Collection of data needed to answer research questions taken by non-scientists	2/9/2016 8:17 AM
9	Citizen science is a broad term that includes many different types of programs ranging from simple data collection efforts by citizens, following clear guidelines to complex collaborative projects that involve citizens (e.g. fishers) in the design of the questions and data collection systems, implementation, interpretation of the data, and use of the data for decision making	2/8/2016 9:37 PM
10	The utilization of properly trained and oriented citizens for obtaining scientific data actively in the field and under field conditions. Citizen Science is a mechanism to obtain significant and low cost expansion of appropriate execution of scientific studies and data collection under the most diverse conditions obtainable. The studies would be very real time and valid due to the participants having a minimum of preset "scientific bias", since they are not specialists in the field of the science. They will tell and record it like it is with little predication to "research and report" to a desired and pre-desired target end, as often is prevalent with "professional researchers" who are often biased by the hope to obtain results that please the grantors of funds - very common in research done by university researchers.	2/8/2016 7:39 PM
11	Citizen science is a concept of finding ways for constituents and scientists to work together to identify, plan, and design the collection and analysis of data relating to the natural world by members of the general public as part of a collaborative project in concert with scientists.	2/8/2016 7:10 PM
12	My definition doesn't matter much, but I hope it includes anything that allows the general public to input useful data into the system, and that the data is viewed as fair and unbiased by critics and therefore considered useable, rather than anecdotal.	2/8/2016 7:06 PM
13	Citizen science to me means in my world that the Fisher would collect every possible bit of exact information that he can possibly do within his capability during his normal fishing practices .	2/8/2016 5:47 PM

Citizen Science: Post-Workshop Survey

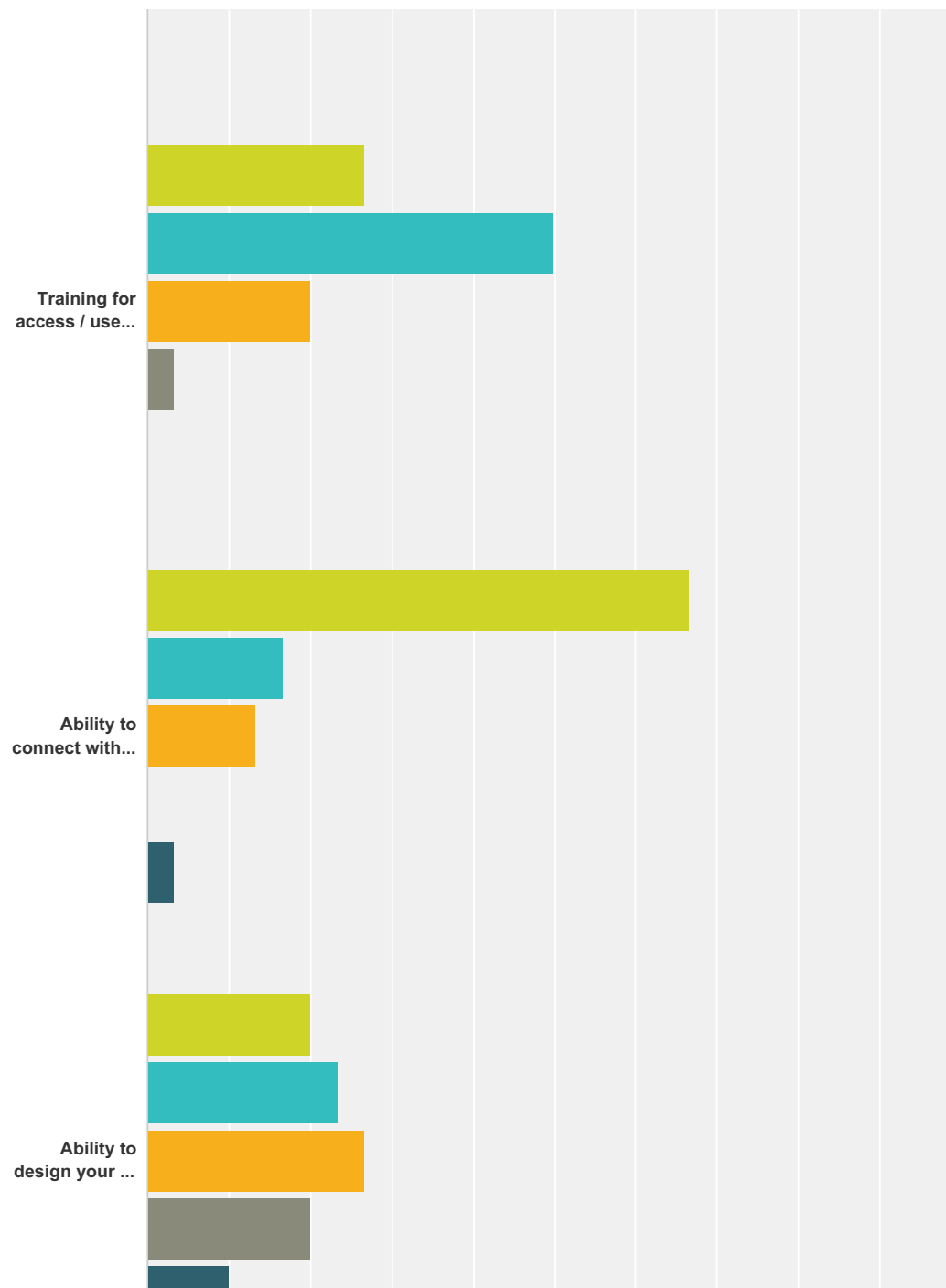
14	My definition of citizen science from what I learned at the workshop is a joint, symbiotic effort by fishermen and scientists with the intent of insuring the health of and accessibility to marine resources in the future.	2/7/2016 1:32 PM
15	Citizen science is the process by which non-traditional scientists or members of the public acting under the protocols established by scientific principles, work collaboratively with trained scientists to develop, participate in and/or analyze results from research projects.	2/6/2016 8:19 AM
16	Citizens providing scientific data to complement or supplement other forms of data collection	2/5/2016 3:02 PM
17	A partnership between scientists, fishermen and managers with the mutual goal of developing innovative ways to collect and provide information that will help to better manage fisheries.	2/4/2016 1:36 PM
18	Increasing the capacity to collect data relative to stock assessments and management in a collaborative and cost effective manner utilizing volunteer commercial and recreational fishermen under a scientifically designed protocol that fosters interaction between scientists and fishermen.	2/4/2016 12:27 PM
19	stakeholders (com/rec fishermen, citizens, divers etc) collecting data in collaboration with researchers to solve/address an issue.	2/4/2016 10:49 AM
20	Citizen science is the voluntary engagement of citizens in the collection of data and information, generally over long periods of time or large geographic areas. Citizen science can range from contributory (submitting info) to participatory (providing input on the project design).	2/4/2016 9:55 AM
21	Public participation with individuals in the science community to collect, analyze or research data	2/3/2016 5:30 PM
22	Participating in an organized project with clearly defined goals and methods to voluntarily collect information for scientists.	2/3/2016 12:21 PM
23	The collection of data by non-scientists, and provision of those data for use in the resource management process.	2/2/2016 12:57 PM
24	The participation of nonscientists in the process of gathering data under scientific guidance	2/2/2016 12:31 PM
25	Non-profit work initiated or conducted by citizens while following all steps of a rigorous scientific process.	2/2/2016 11:19 AM
26	Citizen Science is the practice of engaging the public in the collection of scientific data.	2/2/2016 10:27 AM
27	The opportunity for non-scientists to participate in the scientific process	2/2/2016 10:27 AM
28	Working with fishermen and other stakeholders on the water to design methods and to collect data that is useful to management and researchers.	2/2/2016 10:12 AM
29	An endeavor in which members of the public participate in the collection of data they collect themselves, or analyze data collected by others.	2/2/2016 10:09 AM
30	Crowd-sourcing data collection and analysis activities to nonprofessional scientists.	2/2/2016 10:02 AM
31	Citizen science is when a member of the public voluntarily participates in an activity which furthers the base of publicly available knowledge on any given subject.	2/2/2016 9:58 AM

Q5 Based on your current role in South Atlantic fisheries (fisherman, scientist, manager, extension agent, etc.), tell us how important each of the components are to you personally and your participation in a citizen science program. Use the columns to rank components that are important to you personally on a scale of 1 to 5, with 1 being most important and 5 being least important.

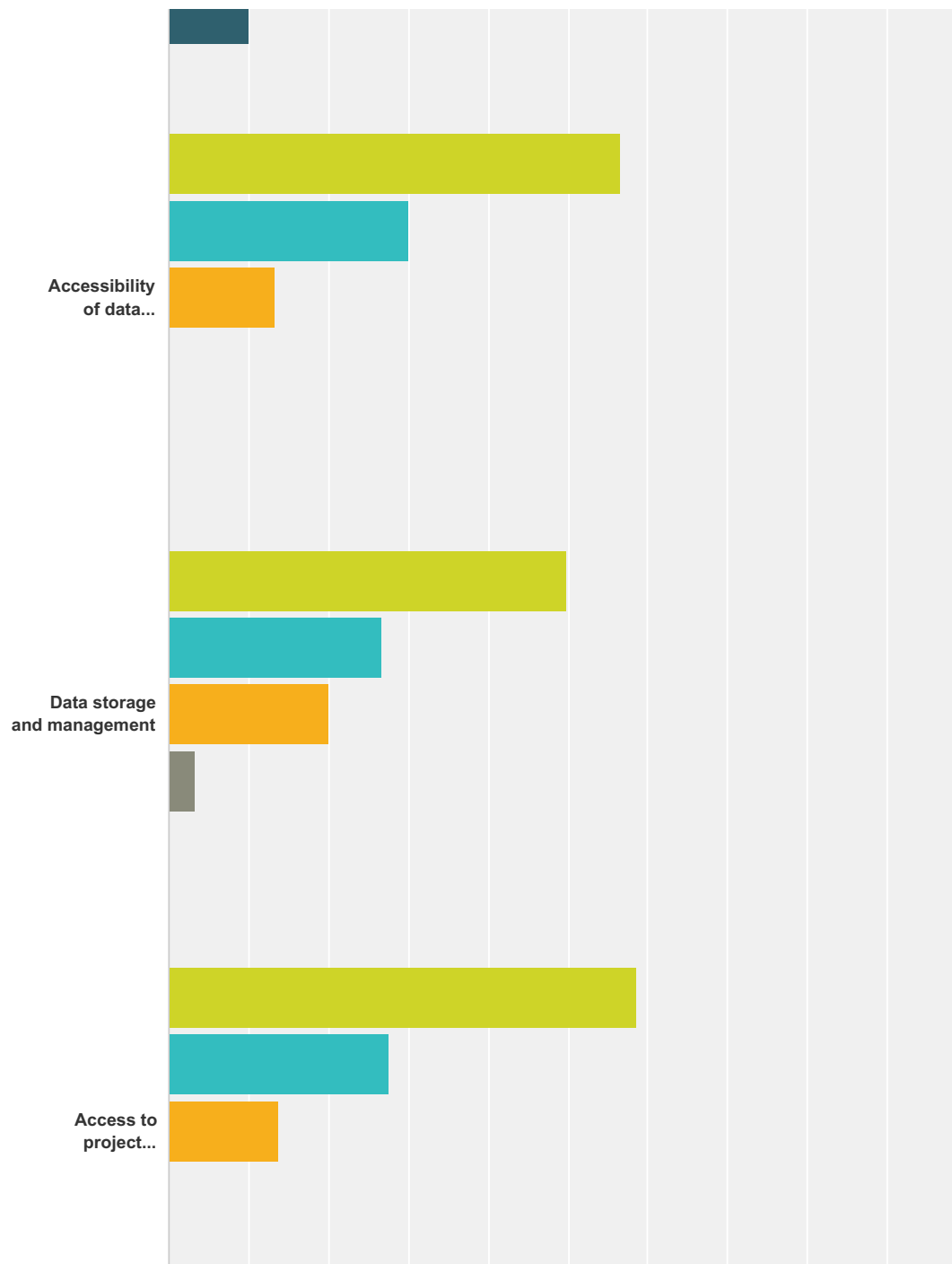
Answered: 30 Skipped: 3



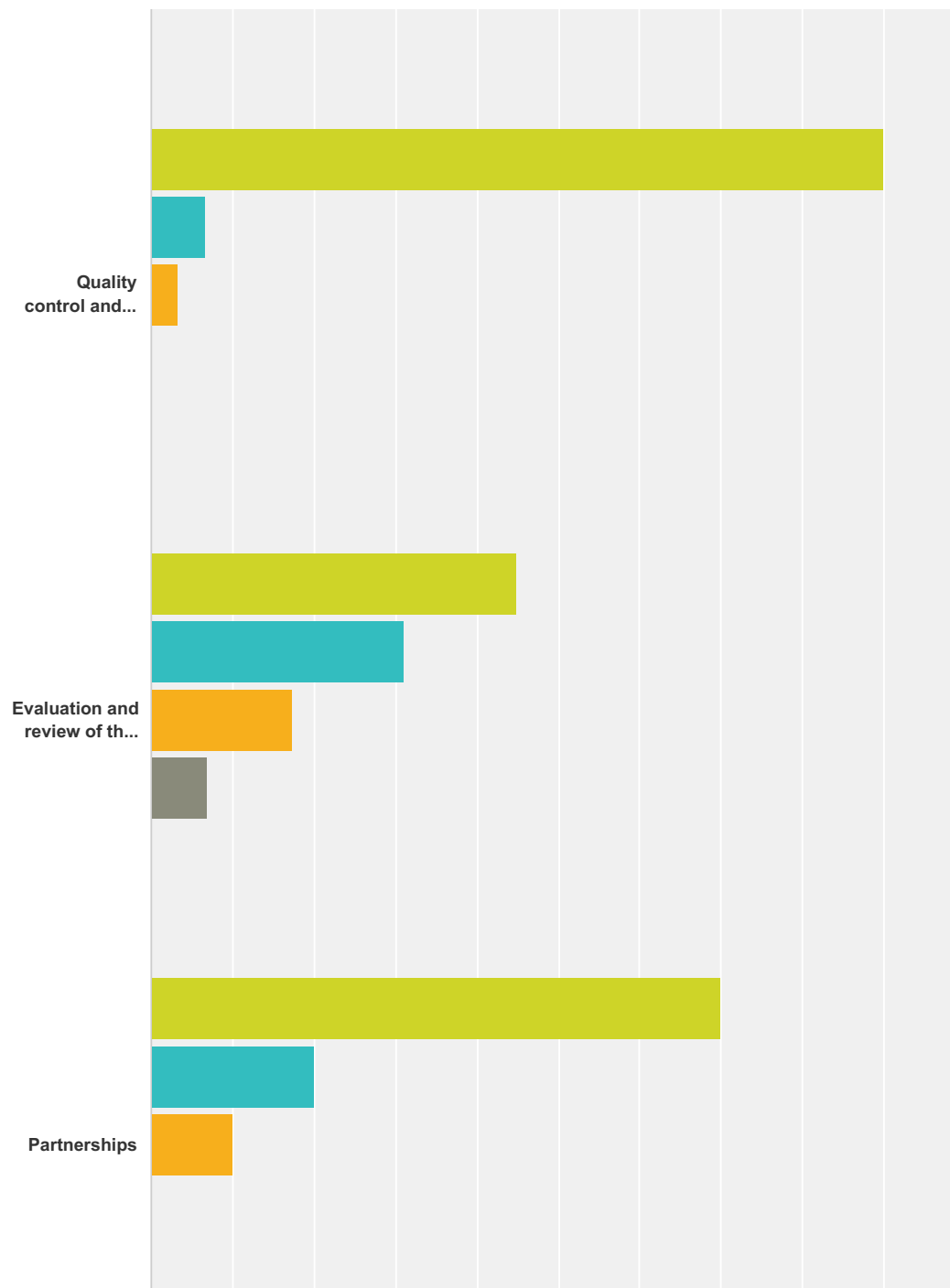
Citizen Science: Post-Workshop Survey



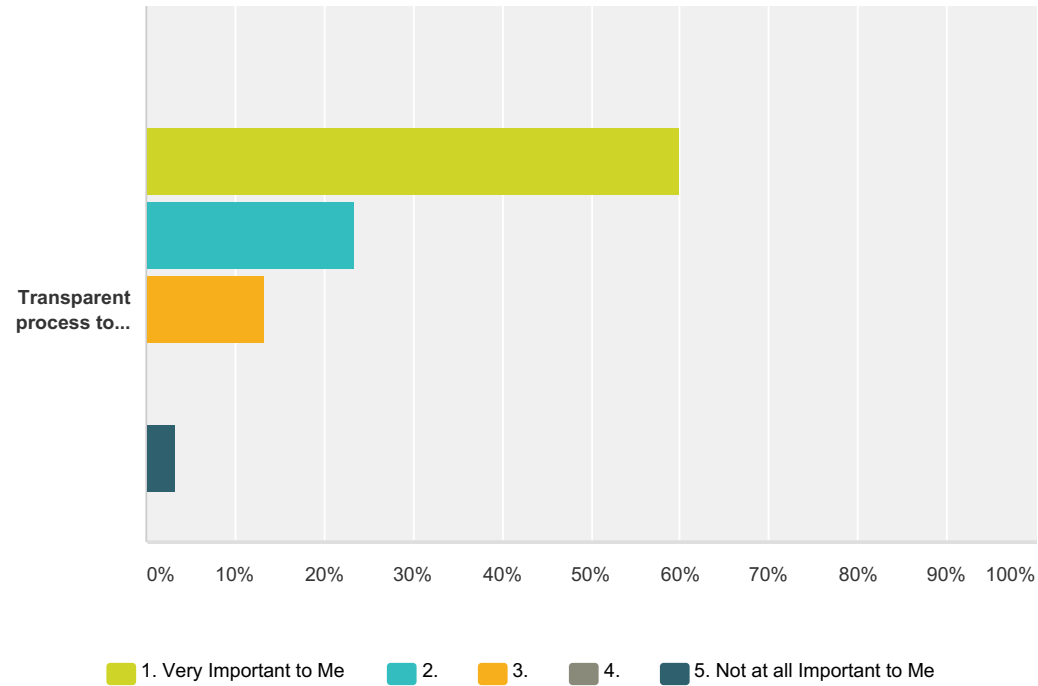
Citizen Science: Post-Workshop Survey



Citizen Science: Post-Workshop Survey



Citizen Science: Post-Workshop Survey



	1. Very Important to Me	2.	3.	4.	5. Not at all Important to Me	Total Respondents
Recruitment and training of volunteers	46.67% 14	26.67% 8	20.00% 6	6.67% 2	0.00% 0	30
Long term management of volunteers	26.67% 8	40.00% 12	16.67% 5	16.67% 5	0.00% 0	30
Training for access / use of data	26.67% 8	50.00% 15	20.00% 6	3.33% 1	0.00% 0	30
Ability to connect with scientists who have a project and need participants to collect data	66.67% 20	16.67% 5	13.33% 4	0.00% 0	3.33% 1	30
Ability to design your own project	20.00% 6	23.33% 7	26.67% 8	20.00% 6	10.00% 3	30
Accessibility of data collected	56.67% 17	30.00% 9	13.33% 4	0.00% 0	0.00% 0	30
Data storage and management	50.00% 15	26.67% 8	20.00% 6	3.33% 1	0.00% 0	30

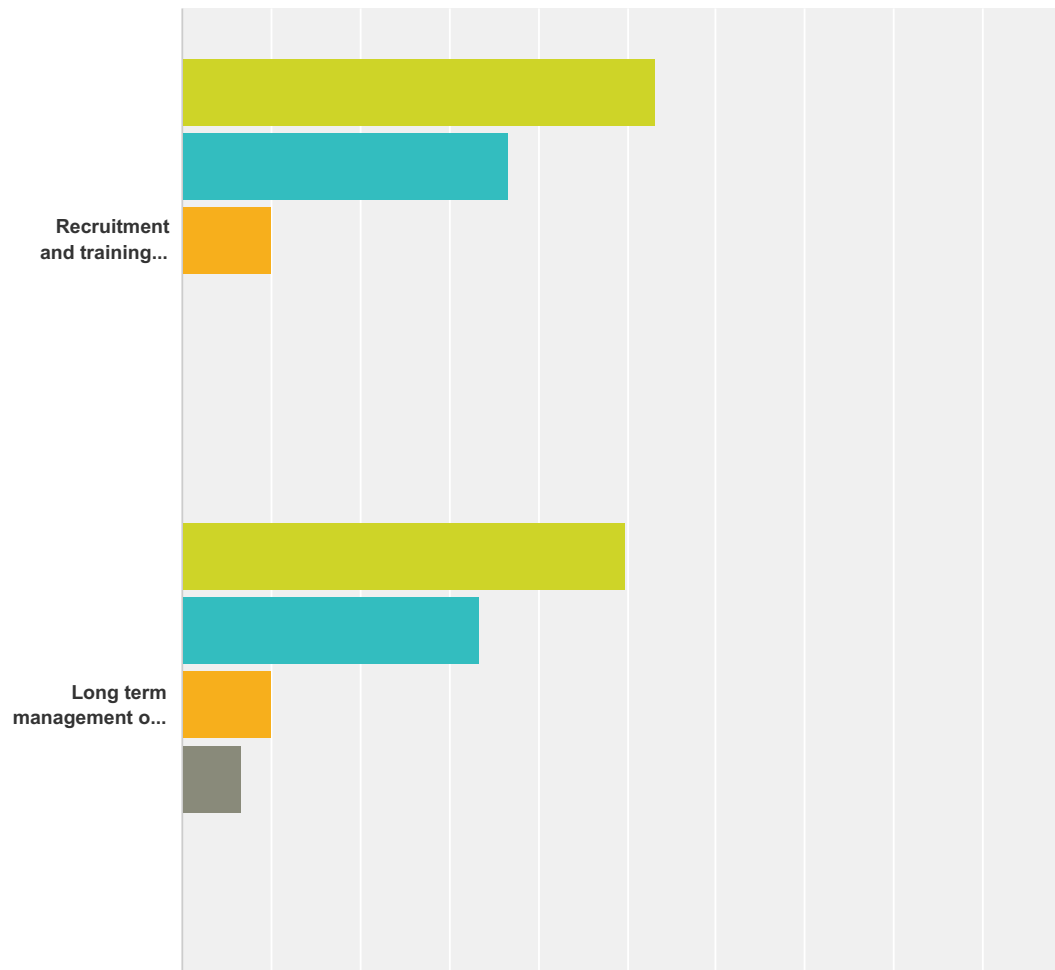
Citizen Science: Post-Workshop Survey

Access to project progress and final reports	58.62% 17	27.59% 8	13.79% 4	0.00% 0	0.00% 0	29
Quality control and assurance of the data collected	90.00% 27	6.67% 2	3.33% 1	0.00% 0	0.00% 0	30
Evaluation and review of the program	44.83% 13	31.03% 9	17.24% 5	6.90% 2	0.00% 0	29
Partnerships	70.00% 21	20.00% 6	10.00% 3	0.00% 0	0.00% 0	30
Transparent process to select projects for the program	60.00% 18	23.33% 7	13.33% 4	0.00% 0	3.33% 1	30

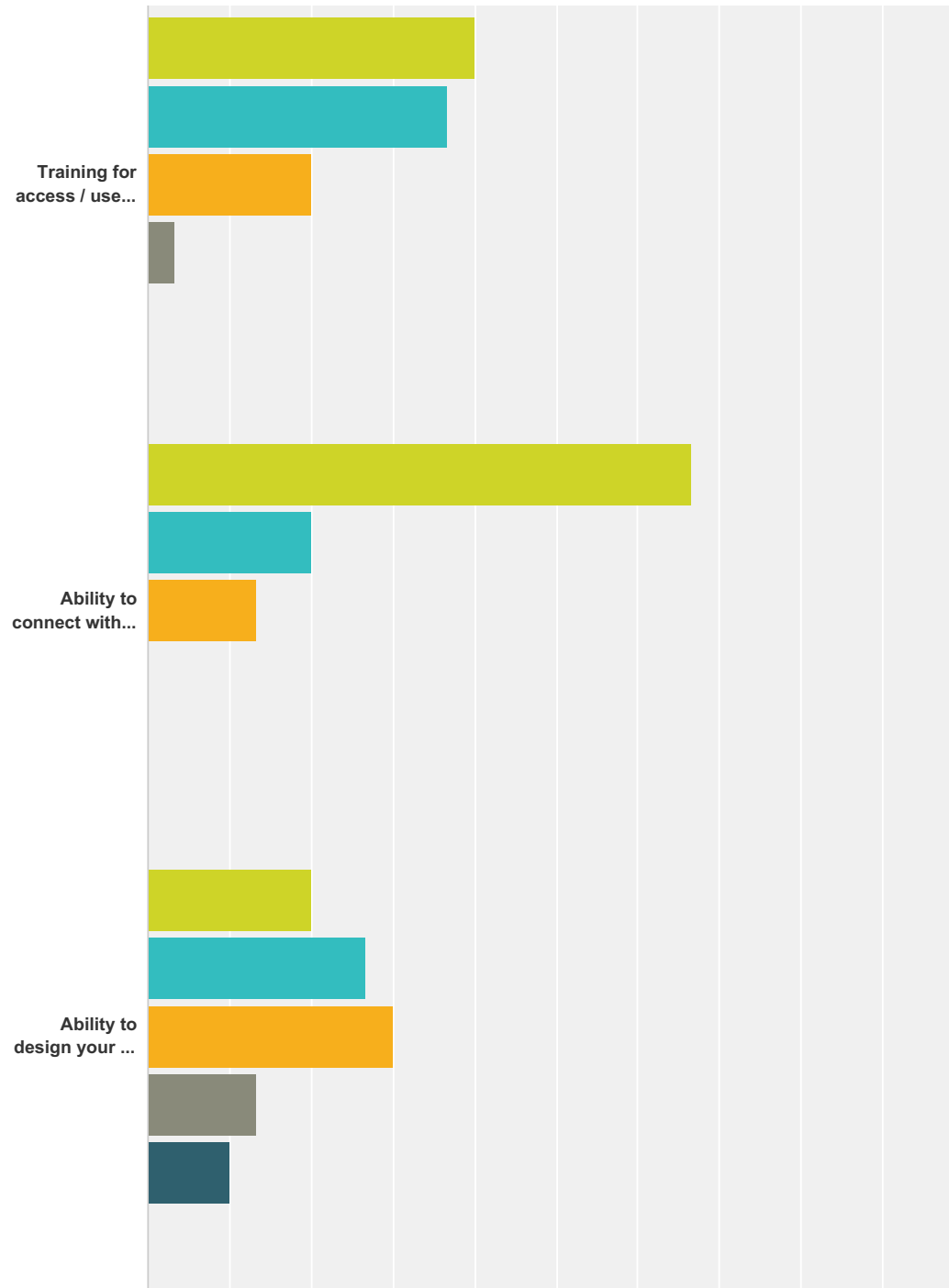
#	Please add any other additional thoughts on the components above and their importance to you and your participation in a citizen science program.	Date
1	All are important.	2/9/2016 9:32 AM
2	In general, the most important factors of citizen science to me are developing and maintaining relationships with "citizens" while producing sound science. Whatever needs to go into that is important to me.	2/9/2016 8:56 AM
3	A live and in person wrap up and review of the project and the results after the study is considered completed.	2/8/2016 7:42 PM
4	1) Ownership, 2) Need or valid applicability to on-going or new research,	2/8/2016 7:16 PM
5	Collaborative process, Fosters dialogue and two way learning opportunities between scientists and fishermen, Creates educational opportunities on the science used in management, fosters stewardship of our waters, habitat and natural resources	2/4/2016 12:32 PM

Q6 Based on what you learned at the workshop, tell us how important each of the components are to a citizen science program. Use the columns to rank components that are important to a PROGRAM on a scale of 1 to 5, with 1 being most important and 5 being least important.

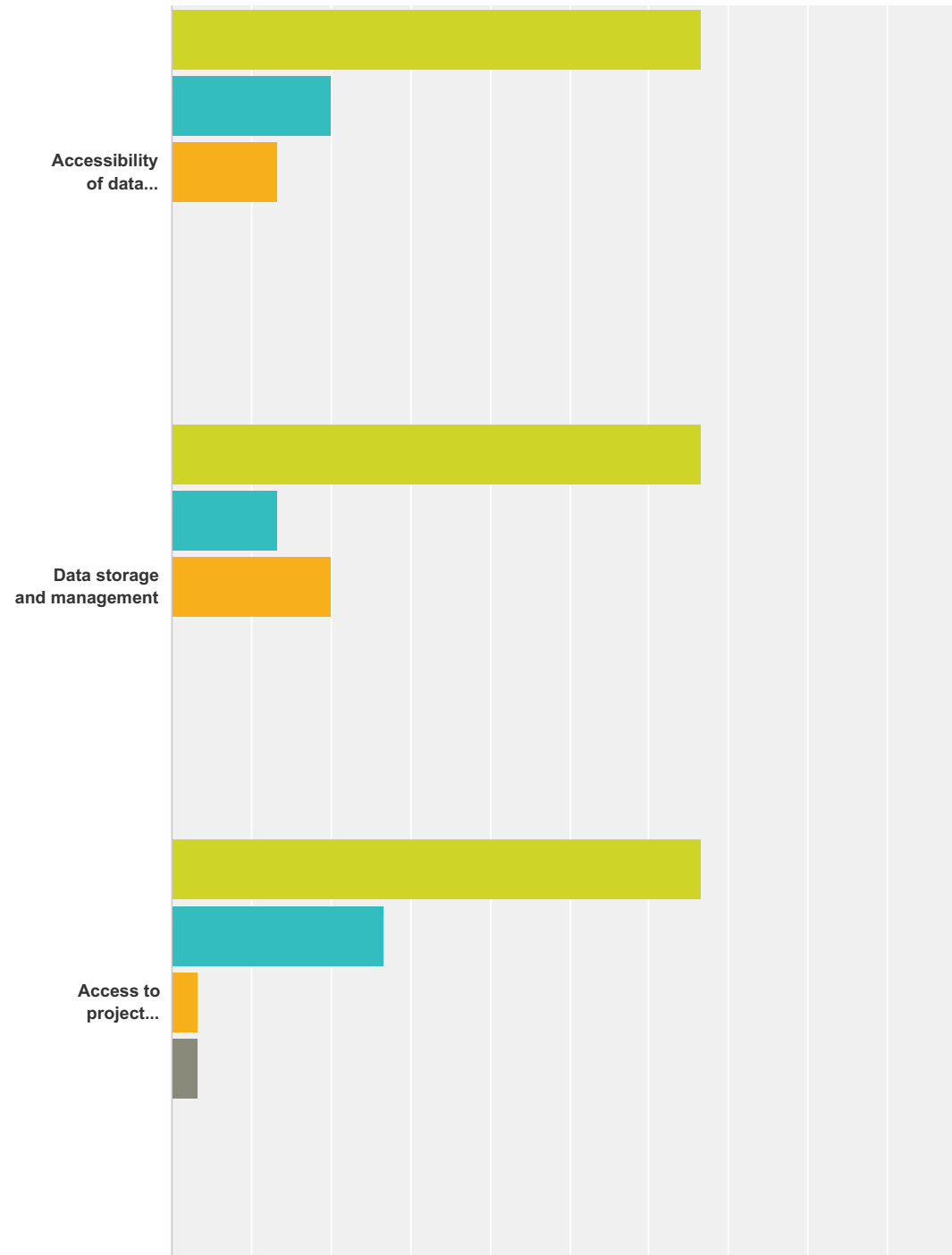
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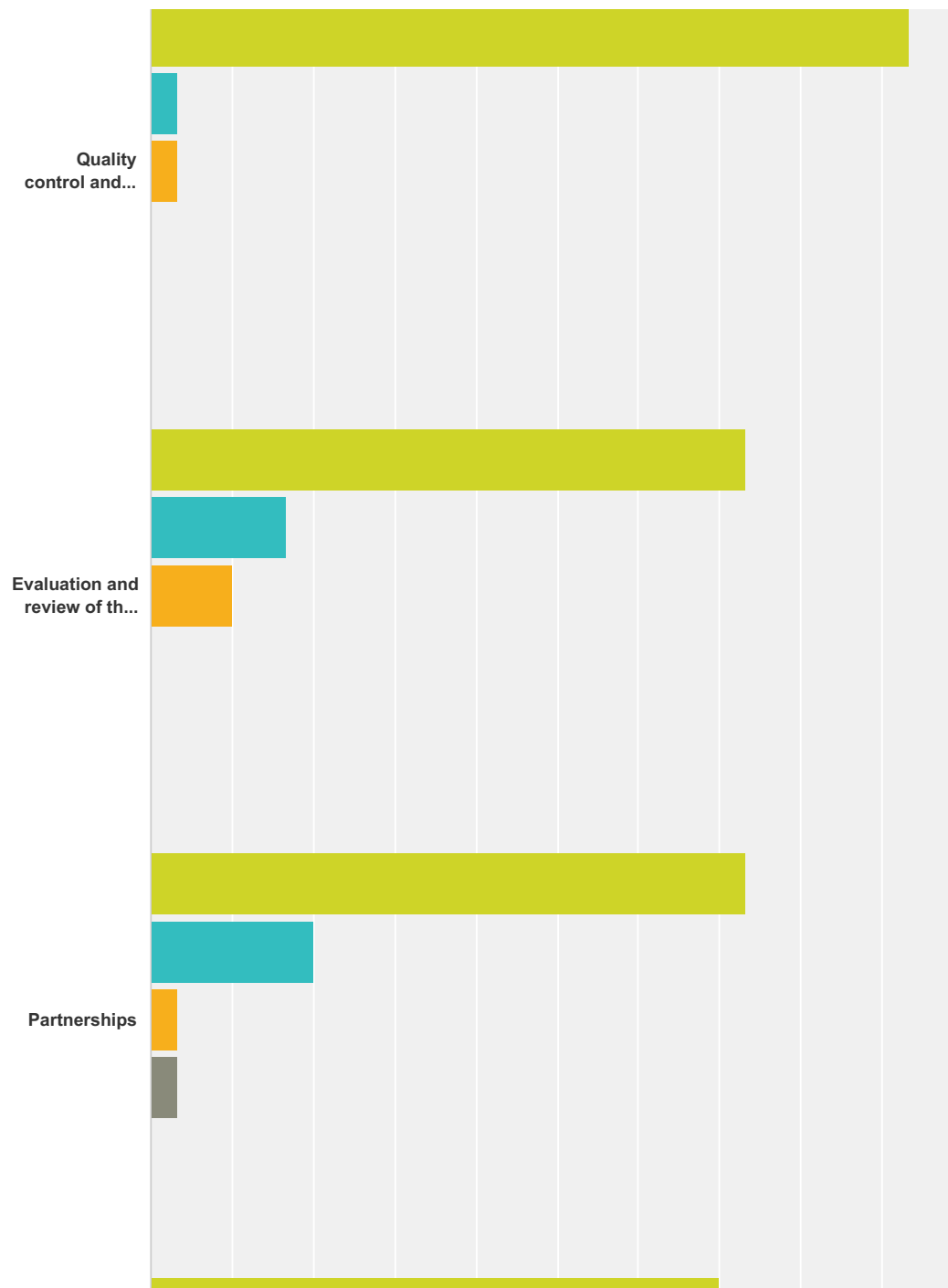
Citizen Science: Post-Workshop Survey



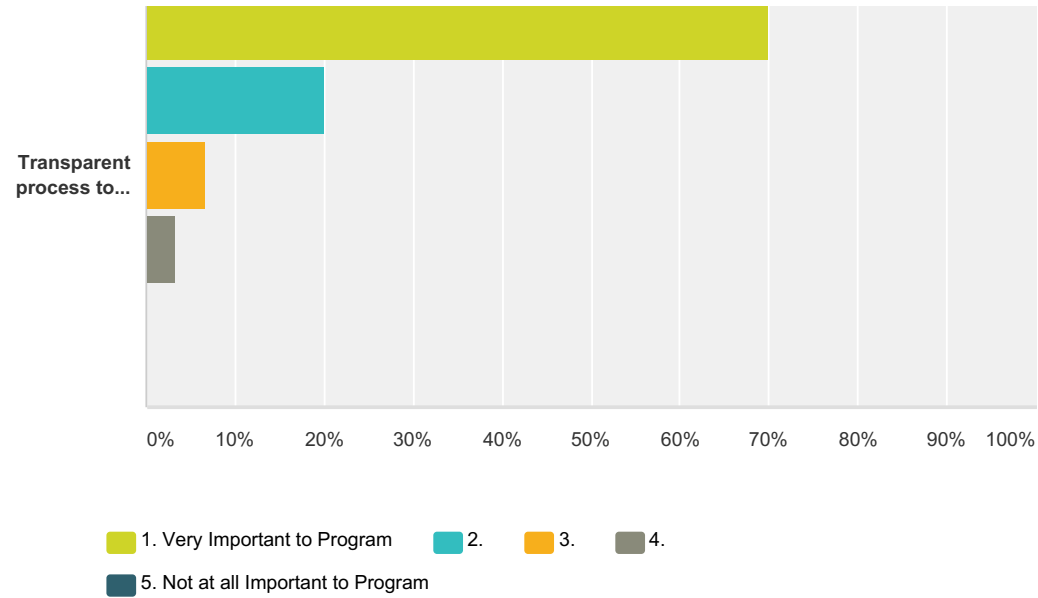
Citizen Science: Post-Workshop Survey



Citizen Science: Post-Workshop Survey



Citizen Science: Post-Workshop Survey



	1. Very Important to Program	2.	3.	4.	5. Not at all Important to Program	Total Respondents
Recruitment and training of volunteers	53.33% 16	36.67% 11	10.00% 3	0.00% 0	0.00% 0	30
Long term management of volunteers	50.00% 15	33.33% 10	10.00% 3	6.67% 2	0.00% 0	30
Training for access / use of data	40.00% 12	36.67% 11	20.00% 6	3.33% 1	0.00% 0	30
Ability to connect with scientists who have a project and need participants to collect data	66.67% 20	20.00% 6	13.33% 4	0.00% 0	0.00% 0	30
Ability to design your own project	20.00% 6	26.67% 8	30.00% 9	13.33% 4	10.00% 3	30
Accessibility of data collected	66.67% 20	20.00% 6	13.33% 4	0.00% 0	0.00% 0	30
Data storage and management	66.67% 20	13.33% 4	20.00% 6	0.00% 0	0.00% 0	30
Access to project progress and final reports	66.67% 20	26.67% 8	3.33% 1	3.33% 1	0.00% 0	30

Citizen Science: Post-Workshop Survey

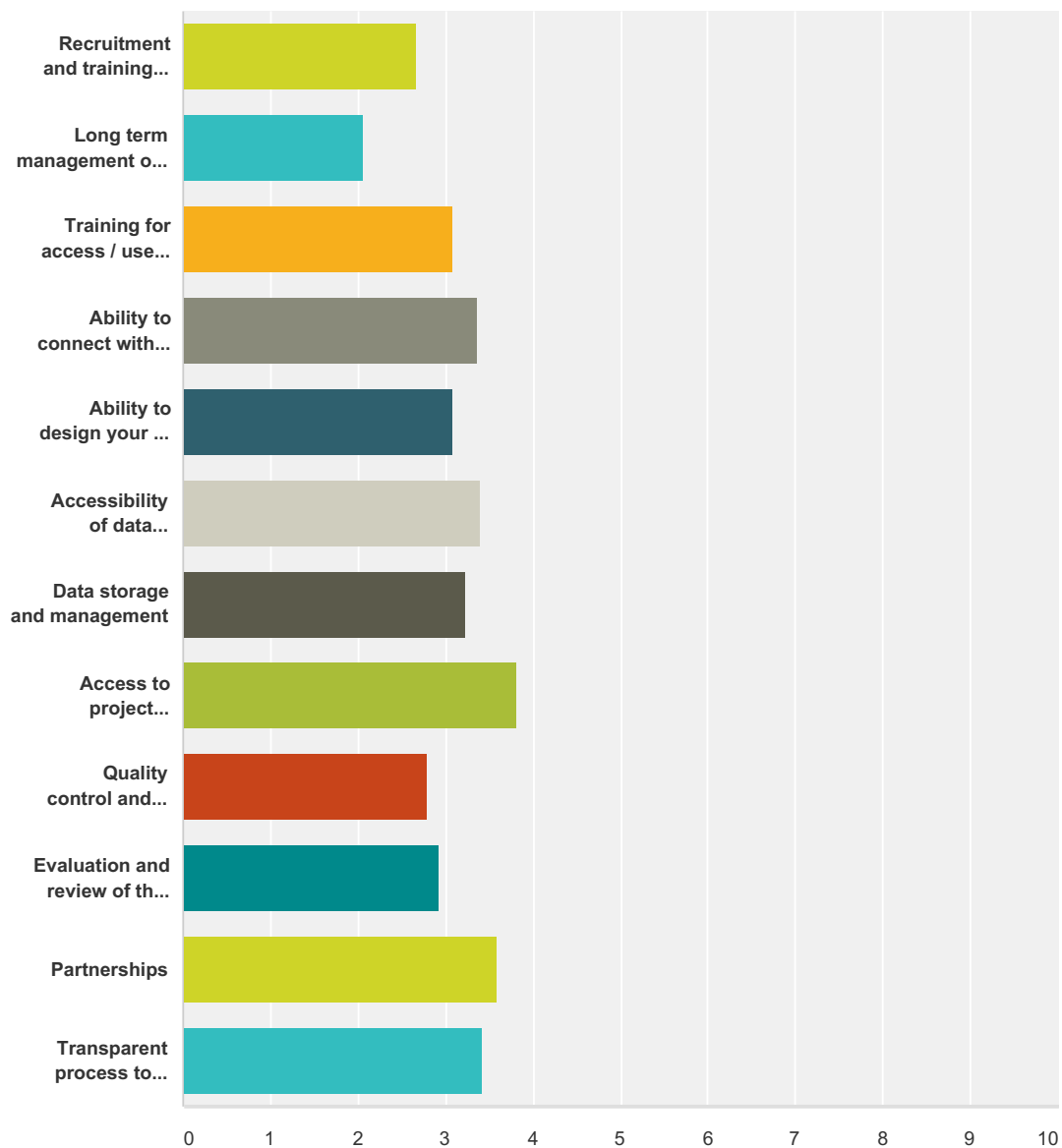
Quality control and assurance of the data collected	93.33% 28	3.33% 1	3.33% 1	0.00% 0	0.00% 0	30
Evaluation and review of the program	73.33% 22	16.67% 5	10.00% 3	0.00% 0	0.00% 0	30
Partnerships	73.33% 22	20.00% 6	3.33% 1	3.33% 1	0.00% 0	30
Transparent process to select projects for the program	70.00% 21	20.00% 6	6.67% 2	3.33% 1	0.00% 0	30

#	Please add any other additional thoughts on the components above and their importance to a citizen science program.	Date
1	All are imprtant, how important varies by opinion.	2/9/2016 9:34 AM
2	Collaboratory process	2/4/2016 12:34 PM
3	Citizen science projects can.are done on any scale with very little forethought- but these components are necessary for a successful program	2/2/2016 10:29 AM

Q7 Based on what you learned at the workshop, what components do you think will be most CHALLENGING (e.g. the most difficult) in the design of a citizen science program? Rank each component on a scale of 1 to 5, with 1 being most challenging and 5 being least challenging.

Answered: 30 Skipped: 3

Citizen Science: Post-Workshop Survey



	1. Very Challenging to Me	2.	3.	4.	5. Not at all Challenging to Me	Total	Weighted Average
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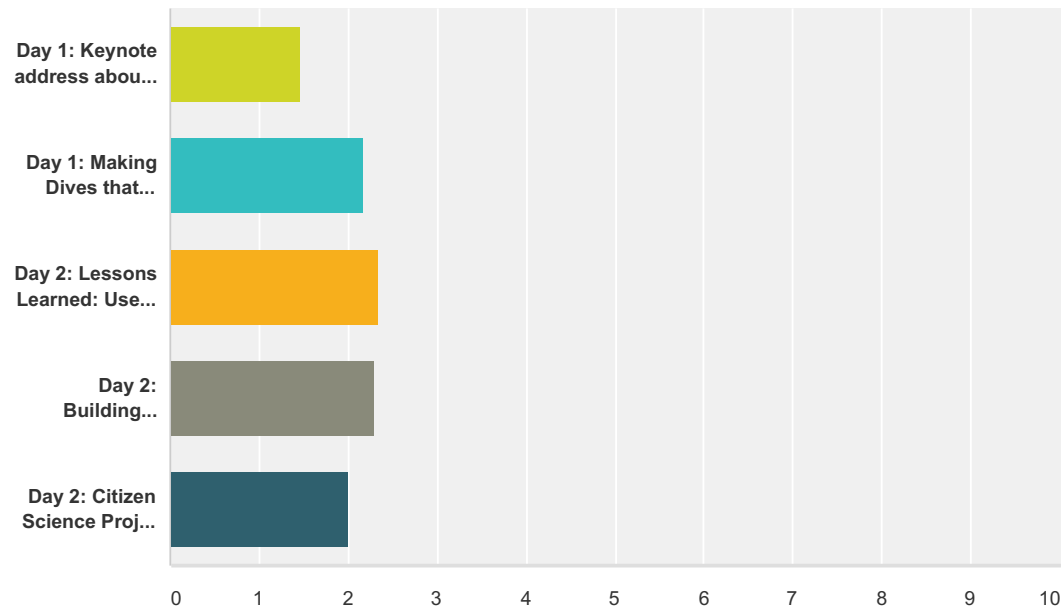
Citizen Science: Post-Workshop Survey

Recruitment and training of volunteers	16.67% 5	33.33% 10	23.33% 7	20.00% 6	6.67% 2	30	2.67
Long term management of volunteers	43.33% 13	23.33% 7	20.00% 6	10.00% 3	3.33% 1	30	2.07
Training for access / use of data	3.33% 1	20.00% 6	46.67% 14	23.33% 7	6.67% 2	30	3.10
Ability to connect with scientists who have a project and need participants to collect data	10.00% 3	16.67% 5	20.00% 6	33.33% 10	20.00% 6	30	3.37
Ability to design your own project	13.33% 4	16.67% 5	33.33% 10	20.00% 6	16.67% 5	30	3.10
Accessibility of data collected	6.67% 2	10.00% 3	33.33% 10	36.67% 11	13.33% 4	30	3.40
Data storage and management	6.67% 2	23.33% 7	23.33% 7	33.33% 10	13.33% 4	30	3.23
Access to project progress and final reports	0.00% 0	3.33% 1	33.33% 10	40.00% 12	23.33% 7	30	3.83
Quality control and assurance of the data collected	23.33% 7	20.00% 6	26.67% 8	13.33% 4	16.67% 5	30	2.80
Evaluation and review of the program	0.00% 0	36.67% 11	40.00% 12	16.67% 5	6.67% 2	30	2.93
Partnerships	3.33% 1	6.67% 2	36.67% 11	33.33% 10	20.00% 6	30	3.60
Transparent process to select projects for program	0.00% 0	20.00% 6	36.67% 11	23.33% 7	20.00% 6	30	3.43

#	If there are components not included above, please list below.	Date
1	Developing ownerships (very difficult)	2/8/2016 7:19 PM
2	This may be inherently incorporated in "long term management of volunteers" but communication with volunteers, project managers and scientists is essential	2/2/2016 10:31 AM

Q8 The workshop consisted of invited speakers presentations, breakout group exercises, and plenary sessions. Please let us know how valuable the INVITED SPEAKERS AND PRESENTATIONS were to you and your understanding of citizen science.

Answered: 30 Skipped: 3



	1. Was tremendously valuable to me	2.	3.	4.	5. Did not provide value to me	Did not participate in this session.	Total	Weighted Average
Day 1: Keynote address about What is Citizen Science - Rick Bonney, Cornell Lab of Ornithology	70.00% 21	23.33% 7	3.33% 1	0.00% 0	0.00% 0	3.33% 1	30	1.47
Day 1: Making Dives that Count - Ocean Citizen Science Monitoring: REEF Volunteer Fish Survey Project - Christy Semmens, REEF	30.00% 9	40.00% 12	16.67% 5	10.00% 3	3.33% 1	0.00% 0	30	2.17

Citizen Science: Post-Workshop Survey

Day 2: Lessons Learned: Use of text message reporting to quantify catch and effort at NC king mackerel tournaments - Scott Baker, North Carolina Sea Grant	33.33% 10	26.67% 8	26.67% 8	6.67% 2	0.00% 0	6.67% 2	30	2.33
Day 2: Building Partnerships for Success: A collaboration to design a solution to safely release fishes that experience barotrauma - Sara Mirabilio, North Carolina Sea Grant	43.33% 13	13.33% 4	26.67% 8	10.00% 3	0.00% 0	6.67% 2	30	2.30
Day 2: Citizen Science Project Design - Jennifer Shirk, Cornell Lab of Ornithology/Citizen Science Association	50.00% 15	26.67% 8	10.00% 3	6.67% 2	0.00% 0	6.67% 2	30	2.00

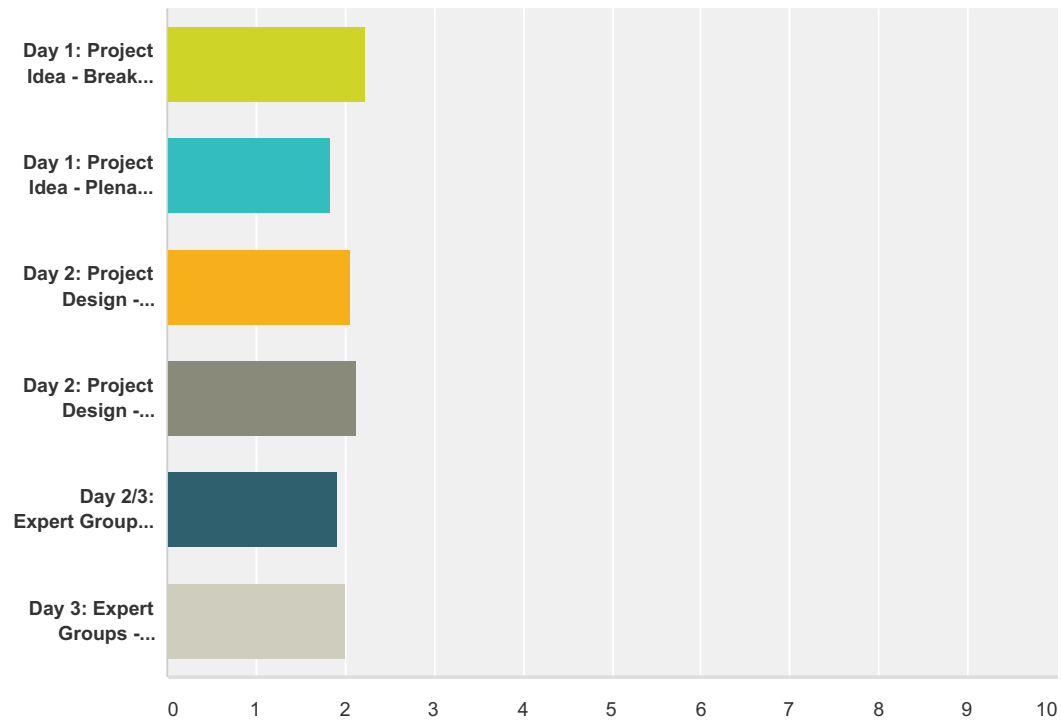
#	Please provide any additional feedback on any of the invited speakers and presentations and their value to your understanding of citizen science.	Date
1	These presentations provided valuable information on the scope of projects that were successful using citizen science and enlightened me as to the caution that needs to be taken in development of a project so that the data can be useful.	2/9/2016 9:00 AM
2	They all did a fairly nice job and I found the topics and ensuing discussions of intellectual interest and value.	2/8/2016 7:48 PM
3	Rick was outstanding and entertaining. Jennifer was probably the best presenter I have ever had the pleasure to hear. She was remarkable	2/8/2016 7:21 PM
4	Unfortunately I don't remember these exact presentations To make a comment .	2/8/2016 5:58 PM
5	The Cornell speakers did a great job. I wish that we had more (any?) examples of SciCit where competitive, conflicting, or consumptive use of natural resources is involved (ex., hunting).	2/6/2016 8:28 AM
6	Each presenter was very helpful from their perspective in presenting a better understanding of what CS is about, how it can be used, that there are resources and supporting infrastructure required for a successful project and some of the problems that can arise in different projects	2/4/2016 12:47 PM
7	Each of the speakers addressed different and important challenges and design elements of citizen science, which was great.	2/4/2016 10:01 AM

Q9 The workshop consisted of invited speakers presentations, breakout group exercises, and plenary sessions. Please let us know how valuable each of the BREAKOUT GROUP SESSIONS AND PLENARY SESSIONS were to you and your understanding of citizen science. Reminder

- There were three sessions during the workshop that used breakout groups and plenary discussions:- PROJECT IDEA session was the part of the workshop where participants brainstormed in small groups and discussed with the group at large about citizen science topics and approaches for the South Atlantic.- PROJECT DESIGN session was the part of the workshop where participants took a sample project and designed the project using the 5 components of citizen science project design.- EXPERT GROUPS session was the part of the workshop where participants were assigned to a specific expert group area to develop recommendations for a South Atlantic citizen science program. Expert groups consisted of Participants, Researchers, Communication, Science Standards, Data Management, and Governance.**

Answered: 30 Skipped: 3

Citizen Science: Post-Workshop Survey



	1. Was tremendously valuable to me	2.	3.	4.	5. Did not provide value to me	Did not participate in this session.	Total	Weighted Average
Day 1: Project Idea - Breakout Session	33.33% 10	33.33% 10	23.33% 7	3.33% 1	0.00% 0	6.67% 2	30	2.23
Day 1: Project Idea - Plenary Session	46.67% 14	40.00% 12	3.33% 1	6.67% 2	0.00% 0	3.33% 1	30	1.83
Day 2: Project Design - Breakout Group Session	40.00% 12	26.67% 8	26.67% 8	3.33% 1	0.00% 0	3.33% 1	30	2.07
Day 2: Project Design - Plenary Session	40.00% 12	23.33% 7	26.67% 8	6.67% 2	0.00% 0	3.33% 1	30	2.13
Day 2/3: Expert Groups - Breakout Session	46.67% 14	33.33% 10	6.67% 2	10.00% 3	0.00% 0	3.33% 1	30	1.93
Day 3: Expert Groups - Plenary Session	50.00% 15	26.67% 8	10.00% 3	6.67% 2	0.00% 0	6.67% 2	30	2.00

Citizen Science: Post-Workshop Survey

#	Please provide comments on why or why not the breakout group and plenary sessions were of value to your understanding of citizen science.	Date
1	The breakout session in terms of project design was the most eye-opening, because it highlighted the need for good communication. There were nuances within the topic in our group, which led to talking around in circles quite a bit as members with different backgrounds viewed the problem differently and so were trying to come up with solutions to slightly different goals, thus muddying up the process. It is very important to understand where your collaborators are coming from and to explicitly state the goals and how those results will be used.	2/9/2016 9:04 AM
2	I've been immersed in this stuff for years. These sessions were not designed to be valuable for me.	2/8/2016 9:42 PM
3	The project idea session was not as good as it could be due to some over dominance in speaking by a very few individuals, upon which I felt some things were not pertinent. I found myself a little impatient to just "move on with it". A little also happened at the Expert Group session, though not nearly as bad. That group stayed more on point.	2/8/2016 7:56 PM
4	Had some odd individuals in my project design group	2/8/2016 7:22 PM
5	Project Idea Breakout: It was clear that in my group members were having a hard time focusing on CS projects and their understanding of CS in a general sense. That changed dramatically as the workshop progressed.	2/4/2016 12:53 PM
6	It was incredibly valuable to see how similarly many of the breakout groups were thinking, whether that was in regards to project ideas, project design, or even the expert groups, despite the fact that they were focused on different topics. The project design breakout was very enlightening, in that the project ideas we were tackling were quite broad, and (at least in my group), if folks had tried to focus the question a bit more (e.g., we want to know how many fish XX you are throwing back and why?) instead of trying to tackle the entire topic at once, they may have found it more productive.	2/4/2016 10:09 AM
7	I think the order of the sessions got in the way of their success as the project design session got too wrapped up in the specific "project idea" and less on what it takes to develop a citizen science project.	2/2/2016 10:36 AM
8	I feel that many participants were still unsure of what citizen science was during the initial project idea breakout. By the next breakout, I felt everyone was on board.	2/2/2016 10:09 AM

Q10 What did you like about the sessions you participated in at the workshop?

Answered: 30 Skipped: 3

#	Responses	Date
1	The exchange of ideas from stakeholders, scientists and managers.	2/12/2016 6:38 AM
2	I liked learning about the true expanse of citizen science options and everyone realizing the importance of making sure we are speaking each other's language.	2/10/2016 3:55 PM
3	I really liked the enthusiasm and willingness between fishermen and scientist to want to work together to resolve past conflicts and issues	2/10/2016 8:44 AM
4	The fact that the SAFMC is so willing to engage with user groups to benefit resource management	2/9/2016 12:11 PM
5	The variety of discussions that identified key data that needs to be gathered and used.	2/9/2016 9:43 AM
6	They were interesting with the different disciplines.	2/9/2016 9:39 AM
7	Interacting with non-science people to better understand where they are coming from and to try to convey the science end as well.	2/9/2016 9:07 AM
8	Collaboration within the group and discussion	2/9/2016 8:20 AM
9	excellent and broad participation	2/8/2016 9:43 PM
10	Interacting with many people. I learned a lot.	2/8/2016 7:58 PM
11	The excitement and sense of shared contribution	2/8/2016 7:24 PM
12	What I liked about this session was that for so many years as a commercial fisherman I have been screaming to have more fishery dependent data available and finally managers and scientist are starting to see just how important fisherman can really be .	2/8/2016 6:18 PM
13	I Felt my input was valued in a meaningful way in the small groups	2/7/2016 1:55 PM
14	John and Amber did a great job MCing and moderating the plenary discussions. CitSci is a very big and complicated topic and I think the sessions reinforced that.	2/6/2016 8:35 AM
15	Integrated people from different groups (stakeholders, scientists, managers). Great discussion and prioritization of topics and methods. Excellent group of experts and very well facilitated sessions.	2/5/2016 3:09 PM
16	Good communications and the flow of ideas. There seemed to be a mutual goal to explore the possibilities of citizen science in a positive way.	2/4/2016 1:36 PM
17	Meeting new people with similar goals for CS. Seeing the progress and understanding as the workshop progressed. Observing the broad based support from a variety of disciplines.	2/4/2016 12:57 PM
18	Networking and sensing this topic is something people are interested in making happen	2/4/2016 10:54 AM
19	Everyone spoke up and participated!	2/4/2016 10:10 AM

Citizen Science: Post-Workshop Survey

20	The collaboration with my peers.	2/3/2016 5:39 PM
21	seeing collaborative efforts from different parties.	2/3/2016 12:27 PM
22	Knowledgeable and broad-ranging (in terms of areas of expertise) participants.	2/2/2016 1:03 PM
23	Interesting to see how the discussions continue to evolve after the breakouts and the systematic progression of the workshop	2/2/2016 12:36 PM
24	Diverse points of view being brought together.	2/2/2016 11:25 AM
25	Having the Ornithology lab there was a fantastic idea. Their experience, expertise and input into this process helps to validate a fisheries program. The planners also did a great job with the breakout sessions making sure that groups were always mixed. This encouraged participation and helped to capture every stakeholder sectors' POV.	2/2/2016 10:41 AM
26	There were some good ideas and solutions brought about.	2/2/2016 10:37 AM
27	Everyone participated and most were looking forward to collaboration with researchers to find better answers to fishery questions.	2/2/2016 10:20 AM
28	I thought it was incredibly well planned and exceedingly enjoyable that the membership of the groups changed throughout the workshop. Excellent idea!	2/2/2016 10:19 AM
29	The expert group sessions provided an opportunity to learn from others in your field. The other sessions allowed me the opportunity to see how other people in different fields reacted to proposals.	2/2/2016 10:14 AM
30	Good cross-section of folks from different sectors.	2/2/2016 10:07 AM

Q11 What did you dislike about the sessions you participated in at the workshop and what would you want to change for future workshops?

Answered: 30 Skipped: 3

#	Responses	Date
1	I liked everything. Maybe more of top down wants and needs from managers and scientists.	2/12/2016 6:38 AM
2	None, job well done!	2/10/2016 3:55 PM
3	Nothing i thought it was well executed!	2/10/2016 8:44 AM
4	Groups were a little too large for good interaction	2/9/2016 12:11 PM
5	The small coffee cups to carry to remote places.	2/9/2016 9:43 AM
6	I didn't dislike any of them.	2/9/2016 9:39 AM
7	Some of the presentations were longer than they needed to be and did not convey as much relevant content.	2/9/2016 9:07 AM
8	None	2/9/2016 8:20 AM
9	nothing. It was great.	2/8/2016 9:43 PM
10	The only suggestion to make things a little better would be for staff to be more comfortable and quicker to "police" participants who stray off point or talk to much out of turn.	2/8/2016 7:58 PM
11	I would screen for odd people	2/8/2016 7:24 PM
12	Well thought out	2/8/2016 6:18 PM
13	On some points I felt a disconnect in communication do to scientific thought processes verses those of a laymen	2/7/2016 1:55 PM
14	Would have liked to have a seen a summary of research needs taken from the assessments, etc. This could have been a good ending to the workshop - something to let people think on when they leave.	2/6/2016 8:35 AM
15	2 1/2 days was a bit too long	2/5/2016 3:09 PM
16	Certain people had a tendency to dominate the session when more opinions should have been heard	2/4/2016 1:36 PM
17	Nothing! It exceeded all of my expectations!	2/4/2016 12:57 PM
18	Seemed to drag out a bit after the 2nd day	2/4/2016 10:54 AM
19	i didn't dislike anything...	2/4/2016 10:10 AM
20	Unbalanced represenitives in first break out session	2/3/2016 5:39 PM

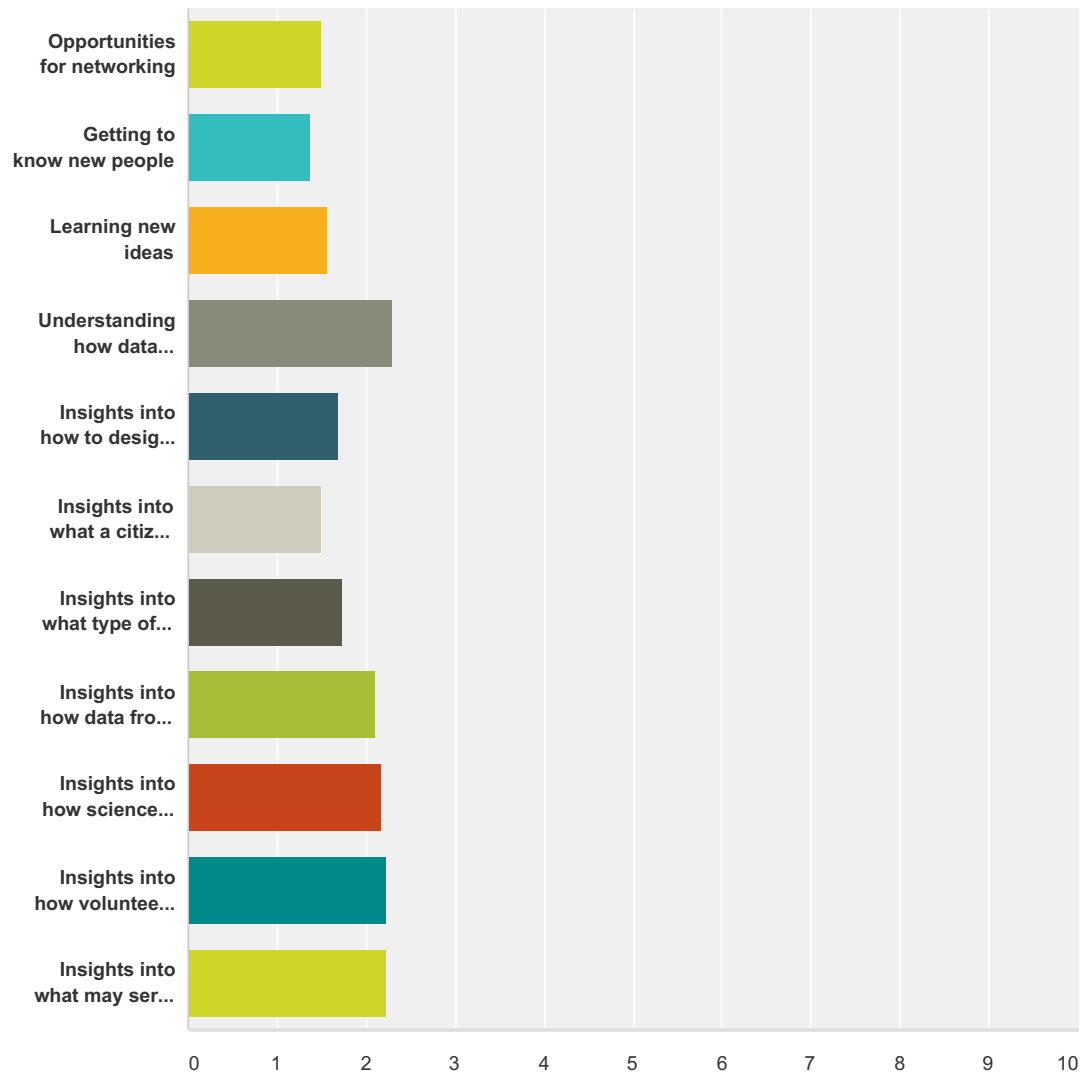
Citizen Science: Post-Workshop Survey

21	seeing how slowly the process will take, certainly this is expected and can't be changed- completely understandable.	2/3/2016 12:27 PM
22	N/A	2/2/2016 1:03 PM
23	Without strong direction/guidance from group leaders, it would be very easy to get lost in the weeds.	2/2/2016 12:36 PM
24	Goals of workshop were not very well defined.	2/2/2016 11:25 AM
25	There was very little that I would change. Mostly it was basic meeting management things- some of the breaks were too long, keeping on schedule, etc. The expert panel plenary should have been kept to 10 minutes/group. This would have forced the novel ideas to be reported out and eliminated the redundancy that we heard.	2/2/2016 10:41 AM
26	I have never liked break out groups and flip charts. I would prefer that they are not done at any meetings.	2/2/2016 10:37 AM
27	I did hear one or two comments that at times group participants dominated the discussion with their thoughts	2/2/2016 10:20 AM
28	I would not recommend a single change. There was nothing about the sessions that I did not like.	2/2/2016 10:19 AM
29	There was a bit of confusion during the second session about what our actual goals were. I think the mediator explained it well, some people were just slow on the uptake. Maybe more time explaining what we were to accomplish in our breakout groups was needed?	2/2/2016 10:14 AM
30	Unclear definition of citizen science from the Council's perspective (but that was sort of the point of the workshop), some needed better facilitation	2/2/2016 10:07 AM

Q12 Please think about your expectations prior to the workshop and rate how satisfied you are with the opportunities afforded by the workshop experience. A rating of 1 is completely satisfied and a rating of 5 is not satisfied at all.

Answered: 30 Skipped: 3

Citizen Science: Post-Workshop Survey



	1. Completely Satisfied	2.	3.	4.	5. Not Satisfied at all	Does not apply	Total	Weighted Average
Opportunities for networking	63.33% 19	23.33% 7	13.33% 4	0.00% 0	0.00% 0	0.00% 0	30	1.50
Getting to know new people	70.00% 21	23.33% 7	6.67% 2	0.00% 0	0.00% 0	0.00% 0	30	1.37

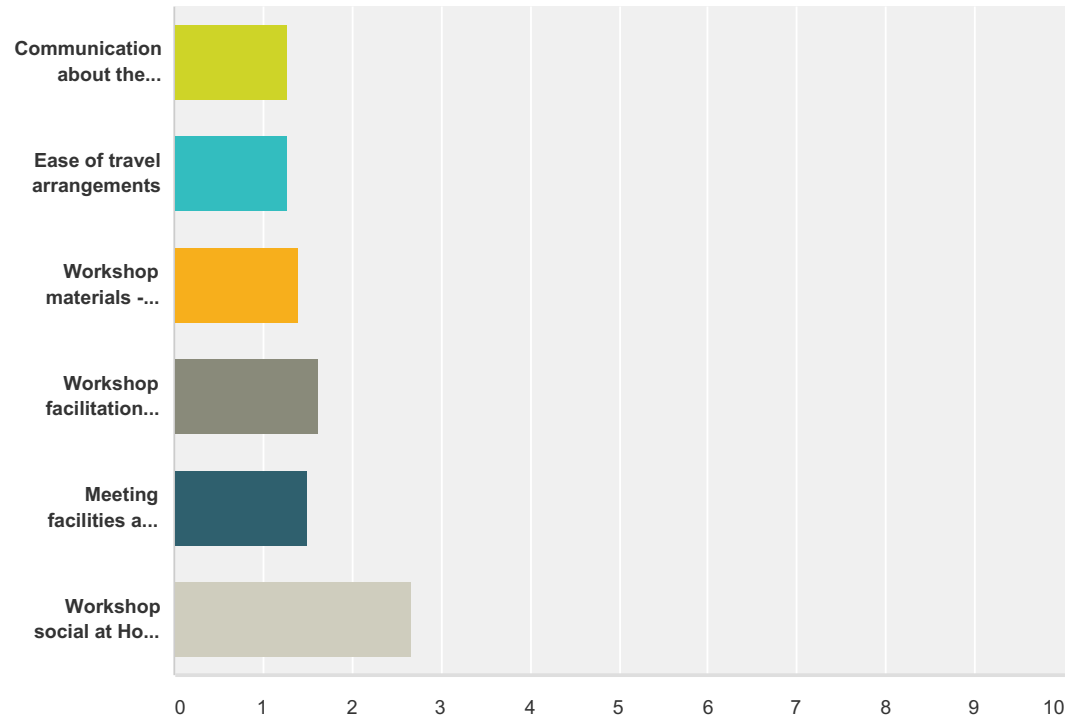
Citizen Science: Post-Workshop Survey

Learning new ideas	56.67% 17	33.33% 10	6.67% 2	3.33% 1	0.00% 0	0.00% 0	30	1.57
Understanding how data collection translates into management	30.00% 9	30.00% 9	30.00% 9	3.33% 1	3.33% 1	3.33% 1	30	2.30
Insights into how to design a citizen science project	43.33% 13	43.33% 13	13.33% 4	0.00% 0	0.00% 0	0.00% 0	30	1.70
Insights into what a citizen science program might need to be successful	63.33% 19	26.67% 8	6.67% 2	3.33% 1	0.00% 0	0.00% 0	30	1.50
Insights into what type of communication is needed to work collaboratively	46.67% 14	36.67% 11	13.33% 4	3.33% 1	0.00% 0	0.00% 0	30	1.73
Insights into how data from a citizen science program will need to be managed	26.67% 8	40.00% 12	30.00% 9	3.33% 1	0.00% 0	0.00% 0	30	2.10
Insights into how science protocols are needed in order for data to be accepted for use in management	26.67% 8	46.67% 14	16.67% 5	6.67% 2	0.00% 0	3.33% 1	30	2.17
Insights into how volunteers need to be managed, trained, and recruited	26.67% 8	40.00% 12	23.33% 7	6.67% 2	0.00% 0	3.33% 1	30	2.23
Insights into what may serve as an incentive to participate in citizen science	30.00% 9	33.33% 10	26.67% 8	3.33% 1	6.67% 2	0.00% 0	30	2.23

#	Please provide any additional feedback on how your workshop expectations were or were not met.	Date
1	This provided the opportunity to truly think about and "get into the weeds" regarding the details that need to be taken into account to successfully use citizen science.	2/9/2016 9:09 AM
2	I wish there was more available on long term maintenance of citizens science projects. How to maintain initial energy.	2/8/2016 7:26 PM
3	Many of the CitSci concepts or best management practices were identified and discussed broadly - although we rarely got into the details/specifics. Probably not needed for an initial workshop.	2/6/2016 8:38 AM
4	Really cool well designed program to introduce CS to a variety of professionals and fishermen.	2/4/2016 1:00 PM

Q13 Please rate your overall workshop experience. A rating of 1 is completely satisfied and a rating of 5 in not satisfied at all.

Answered: 30 Skipped: 3



	1. Completely Satisfied	2.	3.	4.	5. Not Satisfied at all	Does not apply	Total	Weighted Average
Communication about the workshop from organizers	73.33% 22	26.67% 8	0.00% 0	0.00% 0	0.00% 0	0.00% 0	30	1.27
Ease of travel arrangements	76.67% 23	20.00% 6	3.33% 1	0.00% 0	0.00% 0	0.00% 0	30	1.27

Citizen Science: Post-Workshop Survey

Workshop materials - agenda and other literature provided to prepare you for the workshop	66.67% 20	26.67% 8	6.67% 2	0.00% 0	0.00% 0	0.00% 0	30	1.40
Workshop facilitation - style of breakout groups and plenary sessions	56.67% 17	30.00% 9	6.67% 2	6.67% 2	0.00% 0	0.00% 0	30	1.63
Meeting facilities and hotel	66.67% 20	23.33% 7	3.33% 1	6.67% 2	0.00% 0	0.00% 0	30	1.50
Workshop social at Holy City Brewing	33.33% 10	23.33% 7	20.00% 6	6.67% 2	0.00% 0	16.67% 5	30	2.67

#	Please provide any additional feedback on your satisfaction of the overall workshop experience.	Date
1	Only reason I rated the social a medium was that the food selection was minimal and I did not want the greasier fare that night. I was not able to stay long in order to go to a more acceptable dining venue and complete dinner at a reasonable hour. The beer, however, was excellent!	2/8/2016 8:02 PM
2	The SAFMC did a remarkable job. Best workshop of this type i ever attended. SAFMC has it "going on", i can honestly say it was fun. Wait please add the "fun" requirement to what a citizens science project should provide or how designed	2/8/2016 7:29 PM
3	It was well worth my time, I look forward to viewing the results Thank You	2/7/2016 2:00 PM
4	The SAFMC staff did a great job pulling this together!	2/6/2016 8:39 AM
5	I would have liked to seen the results of your pre-survey to get a better idea of how the group defined citizen science and what examples of citizen science projects they had worked on before.	2/4/2016 10:56 AM
6	The project team did a great job, you should be proud of a successful workshop	2/2/2016 10:42 AM

Q14 If the Council moves forward with developing a citizen science program, what are your expectations for the first year of the program' ?

Answered: 30 Skipped: 3

#	Responses	Date
1	Small and specific projects that will help the program expand in the near future.	2/12/2016 6:43 AM
2	I would like to see the dedication of funds to provide for staff support (hiring) and the formation of the advisory/oversight board to include experts from the categories at the workshop.	2/10/2016 3:58 PM
3	organization in providing an outlet through the council for regular CS communications on ideas for future projects	2/10/2016 8:48 AM
4	A steep learning curve but well worth the effort	2/9/2016 12:13 PM
5	The new direction to augment data resources for the SAFMC and fishing interests.	2/9/2016 9:44 AM
6	I don't have any expectations just hope it works out well	2/9/2016 9:41 AM
7	I expect development of the personnel and framework of the program to be established. This is a large, complex, and for the most part, unknown process, so I want plenty of time and consideration to go into this before it gets ramped up into a functional program. By taking the time at the beginning and not moving too quickly, the program stands a better chance of actually producing usable research and continuing into the future.	2/9/2016 9:13 AM
8	Development of projects and recruiting volunteers to collect data for those projects.	2/9/2016 8:22 AM
9	Vision of the future outlined, including long term sources of funding.	2/8/2016 9:45 PM
10	BIG	2/8/2016 9:14 PM
11	Do not bite off more than you can chew. Try some simple pilot(s) on rather uncomplicated studies and simple data needs to work out the bugs that will inevitably develop. Do not underestimate the difficulty of managing "volunteers". Many will stray worse than cats, "work" only when completely convenient to them, and many will be very poor on time management and meeting endpoint commitments. Volunteers, by nature, overwhelmingly start hot, but many fade within time - say a year. Continuity with participants could be a challenge, along with "payback" for effort put in training.	2/8/2016 8:12 PM
12	Brain-storming to identify projects	2/8/2016 7:29 PM
13	Hopefully we can find the money to get the program started and initiate a simple project for proof of concept. Hire a full time staff person to run the program	2/8/2016 12:55 AM
14	Hopefully they would find some way to get the word out to all interested parties about the importance of this program. Maybe Public service announcements. Advertising?	2/7/2016 2:06 PM
15	Establishment of protocols; formation of an advisory body; initial discussion of potential topics	2/6/2016 8:40 AM
16	Start with a couple of smaller, simpler projects that can become more complex with time. Identify clearly defined goals and secure sufficient funding to achieve them.	2/5/2016 3:13 PM

Citizen Science: Post-Workshop Survey

17	Develop a plan that is comprehensive, realistic and long term	2/4/2016 1:37 PM
18	Developing program objectives and identifying the role of partners	2/4/2016 10:57 AM
19	Getting the infrastructure set up properly to allow for the first data collection project to operate smoothly!	2/4/2016 10:12 AM
20	Creating a pool of participants and scientist with solid objectives	2/3/2016 5:43 PM
21	hopefully show evidence of progression, yes, very difficult to show during early stages.	2/3/2016 12:29 PM
22	I would anticipate that s considerable amount of time and effort would need to be expended building the framework for the program - e.g., how projects will be identified / chosen, criteria for selecting participants, determining whether to provide incentives, and determining metrics to evaluate success.	2/2/2016 1:11 PM
23	Proof of concept and easily implemented/successful programs to be funded.	2/2/2016 12:39 PM
24	Confusion	2/2/2016 11:28 AM
25	What is clear from the workshop and reading materials presented that a citizen science program must be simple, and it is best if it is partnered by scientists.	2/2/2016 10:46 AM
26	1) Hiring a program manager 2) Development of task forces 3) Process for identifying projects 4) Initial communications campaign	2/2/2016 10:43 AM
27	I expect it mostly will be lining up projects, volunteers and support.	2/2/2016 10:34 AM
28	In order to increase the chance of success and ability to have folks believe and engage in the Program, the Council needs to select a straight forward, simple project with a high probability of measurable success.	2/2/2016 10:22 AM
29	I believe the first year will be a rocky one until there is enough data collected to display some close to real time information in a way that fishermen can appreciate. I believe that displaying the data in a meaningful and accessible way will be integral to buy-in, and if that is done correctly, the first year of the program will be a success. I expect the first year to establish a project, establish a pool of potential citizen scientists, and begin collecting!	2/2/2016 10:18 AM
30	A clearly outlined process for submitting project ideas and selecting projects	2/2/2016 10:11 AM

Q15 If you are willing to have workshop organizers contact you for more details about your responses, please enter your email address below.

Answered: 24 Skipped: 9

#	Responses	Date
1	Captainira@att.net	2/12/2016 6:43 AM
2	julie.defilippi@accsp.org	2/10/2016 3:58 PM
3	pfishinpfun@prodigy.net	2/9/2016 12:13 PM
4	DSF2009@aol.com	2/9/2016 9:45 AM
5	lparker@uga.edu	2/9/2016 9:42 AM
6	bubleyw@dnr.sc.gov	2/9/2016 9:14 AM
7	habeels@ufl.edu	2/9/2016 8:22 AM
8	heymanwill@yahoo.com	2/8/2016 9:46 PM
9	abundantseafood@gmail.com	2/8/2016 9:15 PM
10	rjlorenz@ec.rr.com	2/8/2016 8:12 PM
11	doug.mumford@ncdenr.gov	2/8/2016 7:29 PM
12	mackattackben@att.net	2/8/2016 12:56 AM
13	Mrowfish@aol.com. 321-258-5270	2/7/2016 2:08 PM
14	bakers@uncw.edu	2/6/2016 8:40 AM
15	Luiz.Barbieri@myfwc.com	2/5/2016 3:14 PM
16	Kenneth.Brennan@noaa.gov	2/4/2016 1:37 PM
17	fluech@uga.edu	2/4/2016 10:57 AM
18	michelle.duval@ncdenr.gov	2/4/2016 10:12 AM
19	Dcjeffcoat@concast.net	2/3/2016 5:43 PM
20	dave@halyardsrestaurant.com	2/3/2016 12:29 PM
21	carolyn.belcher@dnr.ga.gov	2/2/2016 12:39 PM

22	lkrimsky@ufl.edu	2/2/2016 10:43 AM
23	ga_capt@yahoo.com	2/2/2016 10:35 AM
24	kathy.knowlton@dnr.ga.gov	2/2/2016 10:22 AM

Potential Citizen Science Project Ideas
SAFMC Citizen Science Program Design Workshop
January 19-21, 2016

Plenary Discussion Notes:

Project Theme 1– Invasive/Protected/Rare Species

Project Ideas

- Collect presence/absence data

Approaches

- Logs: Web portal, logbooks, app, etc.

Additional Discussion

- Can look at ranges of species
- How prolific are invasives?
- What is spatial and temporal overlap of fishery and protected species?

Project Theme 2– Socio-economic Data

Project Ideas

- Need better, more consistent socio-economic data
- Try to get at why we see trends in other data (landings, etc.)

Approaches

- Where's my fish? Type of tracking of fish from being caught through the entire process.
- Incentives/compensation for participation
- Logbook to collect socio-econ data
- Online reporting/mapping tool to look at how far people drive, where tackle shops are in relation to fishing docks, etc.

Additional Discussion

- Evaluation of economic value

Project Theme 3– Better Private Rec Data

Project Ideas

- Both catch and effort data
- Need better CPUE estimates
- Try to address gaps for rare species or areas of rec sector not well sampled

Approaches

- Logs (Catch and Effort)
- Harvest tags
- Tournament reporting

Project Theme 4– Biological Sampling/Life History (Biostatistics)

Approaches

- Citizen Dockside sampling of catch.
- Carcass collection programs.
- Video collection of bio data
- Logbook add-on
- Tag program for restricted/data limited species

Additional Discussion

- Try to approach real-time collection of data

Project Theme 5– Discards

Project Ideas

- Need better data on amount of discards, disposition, size, etc.

Approaches

- Tagging studies
- Logbook/web portal/etc.
- Use of cameras/photos

Additional Discussion

- Look at predation
- Use of descending devices
- Size comps, disposition, etc. collected by logbooks

Project Theme 6– Species Distribution

Project Ideas

- Where are species of interest and when
- How prolific are they in different areas of the South Atl?

Approaches

- Tagging studies

- Acoustics

Project Theme 7– Environmental Data

Project Ideas

- Oceanographic data collection (Temp, currents, etc.)

Approaches

- Sensors/probes on boats or anchors to collect data

Additional Discussion

- We have very little environmental data at local scales, which are important to fish and fishermen.
- Need this data to eventually incorporate into assessments.

Project Theme 8– Characterize fisher behavior

Project Ideas

- In response to different management changes

Approaches

- Online survey form
- Compliance Reports

Additional Discussion

- Can help with analyses in Council Amendments

Project Theme 9– Historical Catch Reconstruction

Project Ideas

- Allow people to report all their old logs and data
- Reconstruct historical data

Approaches

- Online service to enter catch logs
- Data from logs, photos, newspapers

Additional Discussion

- Can be very important for assessments

Project Theme 10– Outreach/Education

Project Ideas

- Issues with Buy-in
- Need to change public perceptions

Approaches

- Training of stewards from community/industry

Additional Discussion

- Important for training of volunteers
- Affects all projects

Project Theme 11– Habitat Distribution

Approaches

- Sonar mapping
- Video data

Project Theme 12– Spawning Information

Project Ideas

- Spawning areas
- Info on spawning fish
- Photos of gonads and whole fish

Approaches

- Carcass program
- Acoustics

Project Theme 13– Fishing infrastructure

Project Ideas

- Look at how far people drive, where tackle shops are in relation to fishing docks, etc.

Approaches

- Online reporting/mapping tool

Additional Discussion

- Evaluation of economic value to people within geographic areas

Project Theme 14– Test/develop tools and technologies

Project Ideas

- For example, descending devices and volunteer training programs

Additional Discussion

- A program that can be applied to many situations

Project Theme 15– Measure Recruitment

Project Ideas

- Both a topic and an approach

Overarching Ideas

- Training of volunteers
- Matching service - match scientists with interested community volunteers
- Incentives

Priority Projects

1. Discards - logbooks/catch cards/web reports (could include size, disposition, predation, descending device use, etc)
2. More Private Recreational Data - catch logs (could include catch, effort, and misc by variables)
3. Environmental data – fishermen collect environmental and catch data using probes



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Dr. Michelle Duval, Chairman
Charlie Phillips, Vice-Chairman

Gregg T. Waugh, Executive Director

AGENDA

SAFMC Citizen Science Program Design Workshop

January 19-21, 2016

Town and Country Inn,
Charleston, SC

Day 1 – Tuesday, January 19, 2016

- 1:00 PM** **Welcome – Gregg Waugh, SAFMC Executive Director**
- Introduction & Workshop Overview – John Carmichael, SAFMC Staff**
- 1:15 PM** **Presentation: *What is Citizen Science?* – Rick Bonney, Cornell University**
Participants will learn about the field and applications of citizen science.
- 2:15 PM** **Project Ideas Session: Overview – John Carmichael, SAFMC Staff**
- 2:30 PM** **Project Ideas Session: Breakout Groups**
Participants will be divided into breakout groups and guided through a facilitated brainstorming session to develop ideas about topics and approaches for potential citizen science projects in the South Atlantic.
- 3:00 PM** **Break**
- 3:15 PM** **Project Ideas Session: Plenary**
Each breakout group will share results from the brainstorming session in a facilitated discussion to identify common project ideas and approaches. Participants will also prioritize project ideas at the end of the session.
- 4:15 PM** **Presentations: Examples of Successful Citizen Science Projects -**
Learn about two successful projects involving citizen scientists and cooperative research collaborations.
Presenters:
Dr. Christy Semmens, Reef Environmental Education Foundation (REEF)
Scott Baker and Sara Mirabilio, North Carolina Sea Grant
- 5:15 PM** **Adjourn**
- 6:30 PM** **Social at Holy City Brewing Company (*Directions provided in briefing materials*)**

Day 2 – Wednesday, January 20, 2016

- 8:30 AM** **Introduction to Day 2 – John Carmichael, SAFMC Staff**
- 8:45 AM** **Presentation: Citizen Science Project Design – Dr. Jennifer Shirk, Cornell University**
Learn about five components that can help develop a citizen science project. Components include, 1) Identify goals; 2) Establish Capacity; 3) Design/Refine; 4) Manage; 5) Apply/Adapt
- 9:45 AM** **Break**
- 10:00 AM** **Project Design Session: Breakout Groups**
Participants will be divided into breakout groups and guided through a facilitated brainstorming session to design one citizen science projects using the five project design components and the priority project ideas identified on Day 1.
- 12:00 PM** **Lunch (on your own)**
- 1:30 PM** **Project Design Session: Plenary**
Each breakout group will share results from the brainstorming session in a facilitated discussion to identify common ideas and approaches for each component of the project design and discuss the lessons learned from the project design session.
- 3:30 PM** **Break**
- 3:45 PM** **Expert Groups Session: Overview – John Carmichael, SAFMC staff**
- 4:00 PM** **Expert Groups Session: Breakout Groups**
Participants will be divided into assigned expert groups and guided through a facilitated brainstorming session to develop recommendations on program design elements for each expert group theme. Expert group themes include, Science Standards, Governance/Infrastructure, Communication, Data Management, Citizen Science Participants/Users, and Researchers
- 6:00 PM** **Adjourn**

Day 3 – Thursday, January 21, 2016

- 8:30 AM** **Expert Groups Session: Breakout Groups (Continued)**
- 12:00 PM** **Lunch (on your own)**
- 1:30 PM** **Expert Groups Session: Plenary**
Each breakout group will present program design recommendations from the brainstorming session through a facilitated discussion.
- 4:00 PM** **Public Comment**
- 4:30 PM** **Next Steps and Closing Remarks**
- 5:00 PM** **Adjourn**