

The**Cornell**Lab  of Ornithology

***A Framework for evaluating
learning outcomes of Public
Participation in Scientific
Research Projects***

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

Citizen Science

Intentional collaborations in which members of the public engage in authentic research to generate science-based knowledge



Also Known As . . .

Public Participation in Scientific Research (PPSR)

community science

participatory biodiversity

assessment Pro-Am partnerships

community based

citizen

monitoring

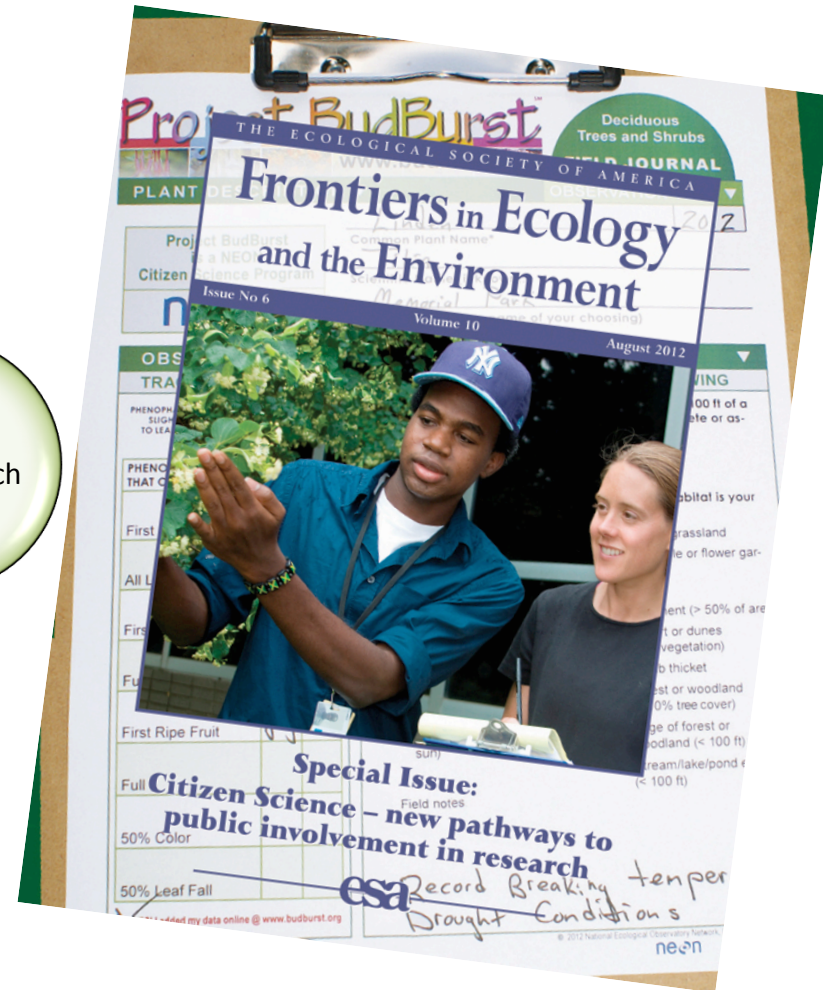
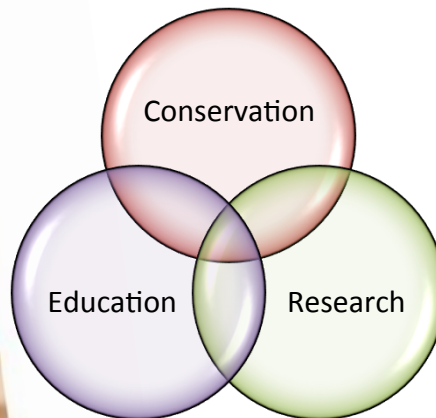
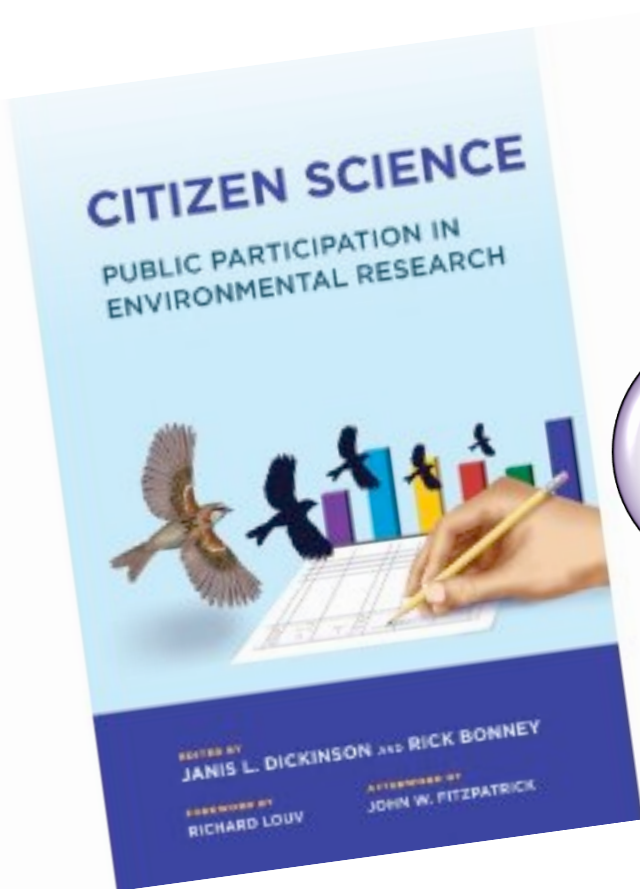
volunteer

science

biological monitoring

Program Development & Evaluation

Goals of Citizen Science



Models of PPSR

Contributory

Collaborative

Co-Created

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



Bonney et al. 2009. CAISE Inquiry Group Report

Findings from CAISE Report

- Each model has strengths & weaknesses
- Higher engagement suggested deeper learning
- Scarcity of quality evaluations
- Need for more sensitive measures
- No opportunity for cross-programmatic analyses
- Cry for help!



"It was a cry for help, really – I tried to slash my wrists with rollerblades."

DEVISE

Developing, Validating, and Implementing Situated
Evaluation Instruments to Assess the Impacts of PPSR



GOAL:

**Improve evaluation quality and capacity across
the field of Citizen Science**

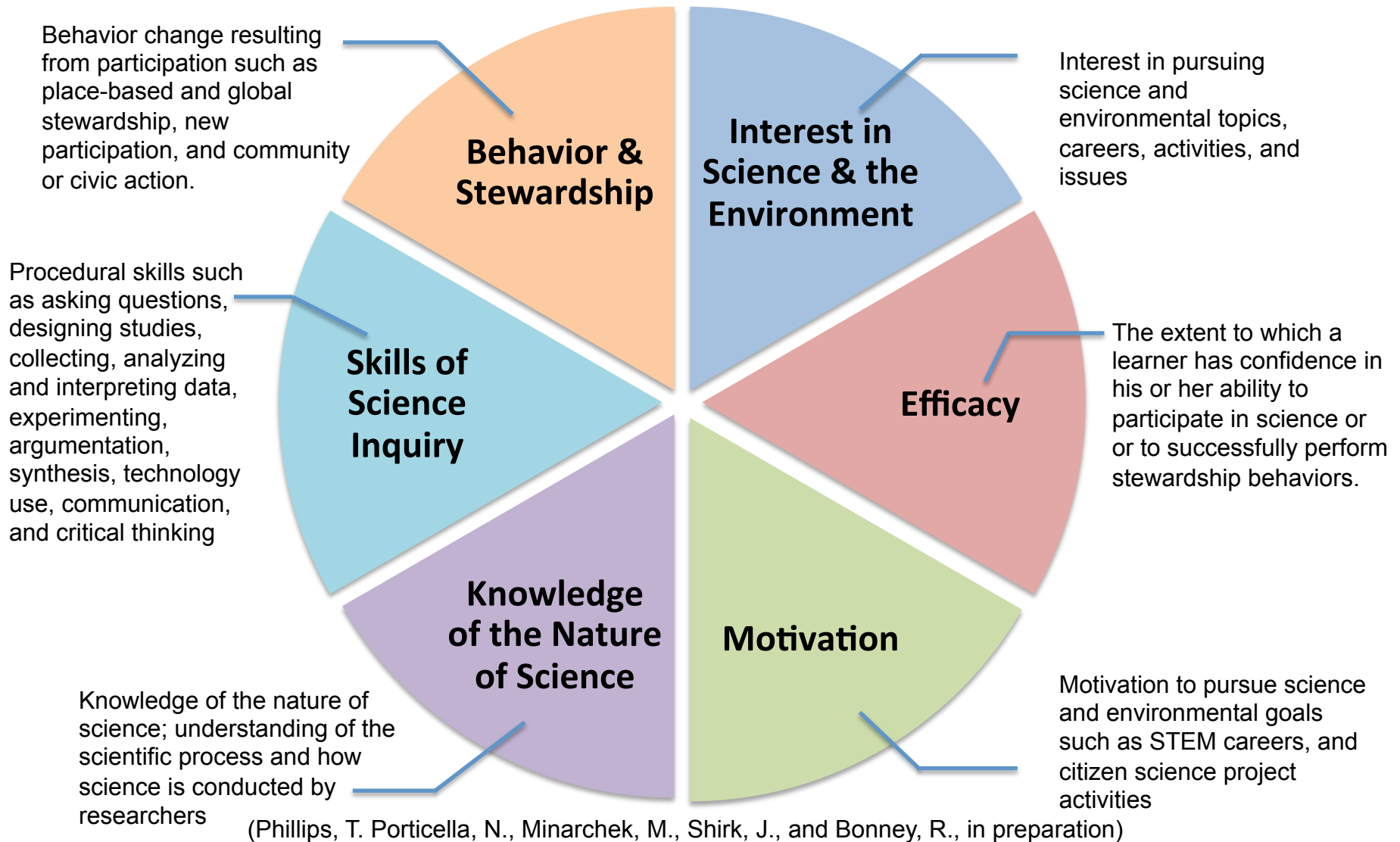
OBJECTIVES:

- Inventory extant tools/instruments
- Develop and test customizable instruments
- Implement evaluation strategies with case studies
- Provide professional development opportunities
- Build community of practice for evaluations of citizen science projects

Framework Development

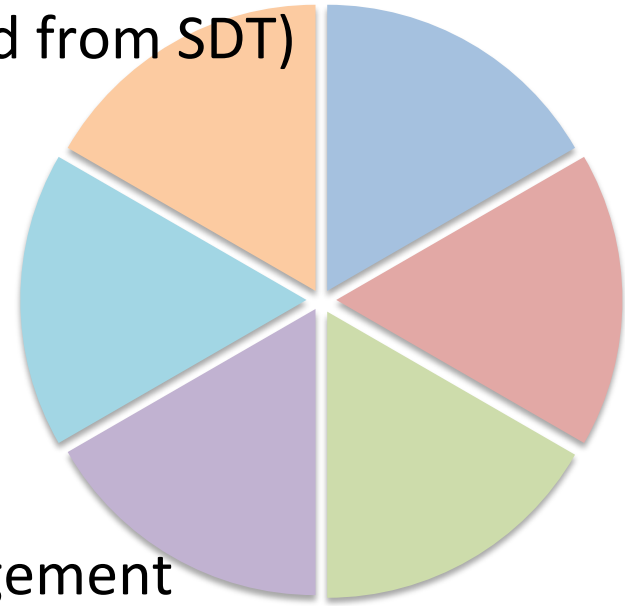
- Focus on Individual Learning Outcomes (ILOs)
- Literature review, interviews and past experiences by research team
- Online Survey of PPSR practitioners; N= 200 respondents
- In-person survey at recent PPSR conference; N= 104 respondents
- Online Survey of Practitioners reaching underserved audience; N=400
- Exhaustive review of goals & outcomes from 300+ PPSR web sites

Framework for Evaluating PPSR Learning Outcomes



Scales currently being tested or under development

- Interest in science for kids
- Interest in science for adults
- Interest in environment (Nature relatedness Scale)
- Efficacy toward conservation (modified from SDT)
- Efficacy toward science learning (modified from SDT)
- Motivation toward science learning
- Motivation toward conservation
- Perceptions of Science
- Self efficacy toward science inquiry skills
- Data interpretation skills databank
- Environmental stewardship retrospective
- General measures of satisfaction & engagement



DEVISE Validation Efforts

Test and validate scales on a variety of projects

- GBBC
- Water Quality groups
- CUBS, BirdSleuth
- Astronomy clubs
- SciStarter web site



Validating for...

- Content validity (expert review)
- Construct validity (interviews, focus groups, online feedback)
- Internal structure (factor analysis)
- Reliability (test-retest)
- Relationships with other variables (convergent, divergent, predictive)

Data Collection Plan

SCALE NAME	Methods	Status -	Audience	Number reached	Date Range	Action Items	Notes
Interest in Science Scale - Kids (Noam et al)	In-person focus groups	done	CUBs Youth Devel Program (Latino high school kids)	7	May 4, May 7		Using a slightly different item than ATIS
	Pilot online and paper survey (pre-post)	done	Birdsleuth Classroom	750	Fall 2011-Spring2012	Data to be analyzed	Using a slightly different item than ATIS with Science Efficacy and Motivation
	Pilot paper survey (pre-post)	in testing	BirdSleuth Afterschool (middle school)	180	May-August		with Science Efficacy
			BirdSleuth Afterschool (underrepresented middle school kids in Brooklyn or Chaumont, NY)	10	July	Norman waiting for programs to begin so that groups can be scheduled	Using a slightly different item than ATIS
	In-person focus groups	planning					
Interest in Science Scale - Adults (Noam et al)	In-person focus groups	Done	WQM - Elmira	20	14-Jun-12		Based on interest in science for kids...
	Online feedback forms	not started	GBBC adults			Need to decide if we want to pursue an adult interest in science scale	
	Telephone interviews	not started	GBBC, WQM, and Astronomy				
	Pilot online surveys	not started	GBBC, WQM, and Astronomy				
Conservation Efficacy	Paper-based feedback	done	Arts/Nature Workshop Kids at CLO	15	1-Feb-12	Brief write up of results from Norman	nature vs. environment - data is messy probably wont use it
	In-person focus groups	done	ALLARM workshop	10	24-Mar-12	Data entered, we need to look it over	
	Expert review	done	Motivation group	6	6-May-12		Major Revision using feedback from expert review of science efficacy scale
	In-person focus groups	done	CUBs Youth Devel Program (Latino high school kids)	7	May 4 & 7, 2012		
	In-person focus groups	done	ALLARM workshop	15	15-Jun-12	Data needs to be entered	
	Pilot paper survey (pre-post)	in testing	BirdSleuth Afterschool (middle school)	180	May-August 2012		with Nature Relatedness
	Online feedback forms	in testing	GBBC participants		June		with Nature Relatedness
			BirdSleuth Afterschool (underrepresented middle school kids in Brooklyn or Chaumont, NY)	10	1-Jul-12	Norman waiting for programs to begin so that groups can be scheduled	
	In-person focus groups	planning					
	Pilot online surveys	not started	GBBC, WQM, and Astronomy				
Science Efficacy	In-person focus groups	done	ALLARM workshop	10	24-Mar-12	Revise items if necessary	
	Pilot paper and online surveys (pre-post)	done	Birdsleuth Classroom	750	Fall 2011-Spring2012	Data to be analyzed	
	Expert Review	done	Motivation group	6	6-May-12		Major Revision
	Pilot online surveys (post only)	done	Birdsleuth Classroom	500	16-Apr-12	Data to be analyzed	
	In-person focus groups	done	ALLARM workshop	15	15-Jun-12	Data needs to be entered	
	Pilot paper survey (pre-post)	in testing	BirdSleuth Afterschool (middle school)	180	May - August 2012		with Interest in Science
	Online feedback forms	in testing	SciStarter		June		with Self-Reported Experience
			BirdSleuth Afterschool (underrepresented kids in Brooklyn or Chaumont, NY)		1-Jul-12	Norman waiting for programs to begin so that groups can be scheduled	
	In-person focus groups	planning					
	Pilot online surveys	not started	GBBC, WQM, and Astronomy				

Next Steps – Year 3

- Conduct evaluations on varying projects
 - eBird (Adult)
 - Water Quality Monitoring (A)
 - CUBS (Youth)
 - CA-Master Naturalists (A)
 - Hudson River Estuary Projects (Y)
 - Great Sunflower Project (A)
- Build professional development tools
- Provide technical assistance and support
- Build evaluation capacity across PPSR



Coming soon: DEVISE Online Toolkit

**. . . for evaluators and non-evaluators to
conduct quality evaluations of individual
learning outcomes**



- Goals, outcomes, & indicators
- User's Guide to evaluation
- Database of tested instruments
- PPSR Case studies
- Tutorials & resources
- Support & consultation
- Framework for measuring ILO's



A monarch butterfly with orange and black wings is perched on a purple thistle flower. The background is a soft, out-of-focus light blue and white.

**Questions about these resources or interested in
helping to test instruments for DEVISE?**

**Please contact
tina.phillips@cornell.edu**

Thank you!

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