## MOTIVATION AND BARRIERS IN ENVIRONMENTALLY BASED CITIZEN SCIENCE: A MIXED METHODS COMPARATIVE CASE STUDY

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Approximately two million people participate in biodiversity citizen science projects annually around the world (Theobald et al. 2015).

# What <u>motivates</u> and <u>prevents</u> participation in different projects?





# Interest in science Helping Be outdoors Social connections Love of nature Career aspirations

# Desire to learn contributing





Reason/motivation	Source			
Interest in topic/ learning	Curtis 2015, Hobbs & White 2012, Domroese & Johnson 2017, Jackson et al. 2015, Johnson et al. 2014, Land-Zandstra et al. 2016, Martin et al. 2016, Raddick et al. 2010, Schrock et al. 2000.			
Contributing/helping to science, conservation	Baruch et al. 2016, Curtis 2015, Domroese & Johnson 2017, Hobbs & White 2012, Land-Zandstra et al. 2016, Martin et al. 2016, McCaffred 2005, Raddick et al. 2010, Raddick et al. 2013, Reed et al. 2013.			
Connecting to nature	Bell et al. 2008, Domroese & Johnson 2017, Kelemen-Finan et al. 2013, Wright et al. 2015.			
Social engagement with others	Baruch et al. 2016 Bell et al. 2008, Bowser et al. 2013, Domroese and Johnson 2017, Wright et al. 2015, Reed et al. 2013, Eveleigh et al. 2014, Curtis 2015, Jackson et al. 2015.			
Attachment to place	t to place Lawrence 2006, Haywood et al. 2016.			
Collective value	Eveleigh et al. 2014, Nov et al. 2011, Nov et al. 2014.			
Helping community	Alender 2016.			
Career aspirations	Hiller and Kitsantas 2014.			
Gamification	Reed et al. 2013, Bowser et al. 2013.			





### Self Determination Theory

 Explains basic psychological needs (i.e., competency, relatedness, and autonomy) for behaviors (Ryan and Deci 2000).







# Projects in the Study







# Mixed-Methods Case Study Design

"An *empirical* inquiry that investigates a contemporary **phenomenon** within its **real-life context**" (Yin, 2013)

Phase	Data collection	Data analysis			
Qualitative	<ul> <li>72 Semi-structured phone interviews by four interviewers across six projects</li> </ul>	<ul> <li>Coded using <i>a priori</i> constructs from the literature and emergent themes</li> <li>NVivo software</li> </ul>			
Quantitative	<ul> <li>Online survey to six projects, August 2016</li> <li>14 item scale measuring intrinsic and extrinsic motivation; (Cronbach's Alpha = .800; N = 1,501)</li> </ul>	<ul> <li>Descriptive and Inferential statistics (normality, correlations, ANOVA)</li> <li>Excel and SPSS V22</li> </ul>			



# **Results:** Qualitative

**Motivations, Referenced by Project (N = 72)** 



Number of references





# Online Survey Quota Sampling

Project Name	Subject	Sample	Submitted Responses	Response rate	Cleaned Sample	% Female	Mean Age
NestWatch	Þ	1,981	482	24%	412	66%	55
MLMP		418	195	47%	181	80%	56
CoCoRaHS		1,979	622	31%	587	34%	62
EELS	Ś	153	67	44%	64	63%	49
ALLARM	æ	283	88	31%	88	55%	61
GCM*	ျိ	n/a	15	n/a	12	50%	48
TOTAL		4,814	1,469	31%	1,344	51%	58.4





## Results: Quantitative

#### Motivation by Project (N = 1,301)



The Cornell Lab of Ornithology



## Results: Quantitative







Were there any barriers you faced that caused you to stop participating or prevented you from ever participating? Please rate your agreement.

# Results: Barriers



\*Half of these barriers can be decreased through the project!





# Conclusions

- 1. Motivation for citizen science is multidimensional and complex.
- 2. Participants in **co-created projects are more likely to have extrinsic motivation** than participants in collaborative and contributory projects.
- 3. Intrinsic motivation may play a significant and important role in engagement and learning.
- 4. Many common barriers can be minimized through project communication/supports.





## **Merci**





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