



# Mobilizing public participation in science, technology, and policy: Understanding the motivations of citizen science volunteers

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# Motivation in citizen science



**Motivation** designates the **recruitment** and **retention** of volunteers.

Understanding motivation is an important research, practical, and ethical question.



# My perspective



**Technologies may** allow data collection by communities who traditionally remained uninvolved in scientific projects...

*How can Floracaching **be designed** to motivate a new group of citizen science volunteers?*



# This talk

## **Framing the Problem**

Understanding the question  
Research review

## **Two Case Studies**

Adventure Scientists  
CoCoRaHS

## **Designing for Motivation**

Lessons learned  
How to understand your volunteers



# Common questions

1. Why do volunteers **start** participating in a citizen science project?
2. Why do volunteers **keep** participating over time?
3. What, if anything, can be done to discourage volunteers from “dropping out?”
4. How can researchers understand motivation?



# Why is this complicated?



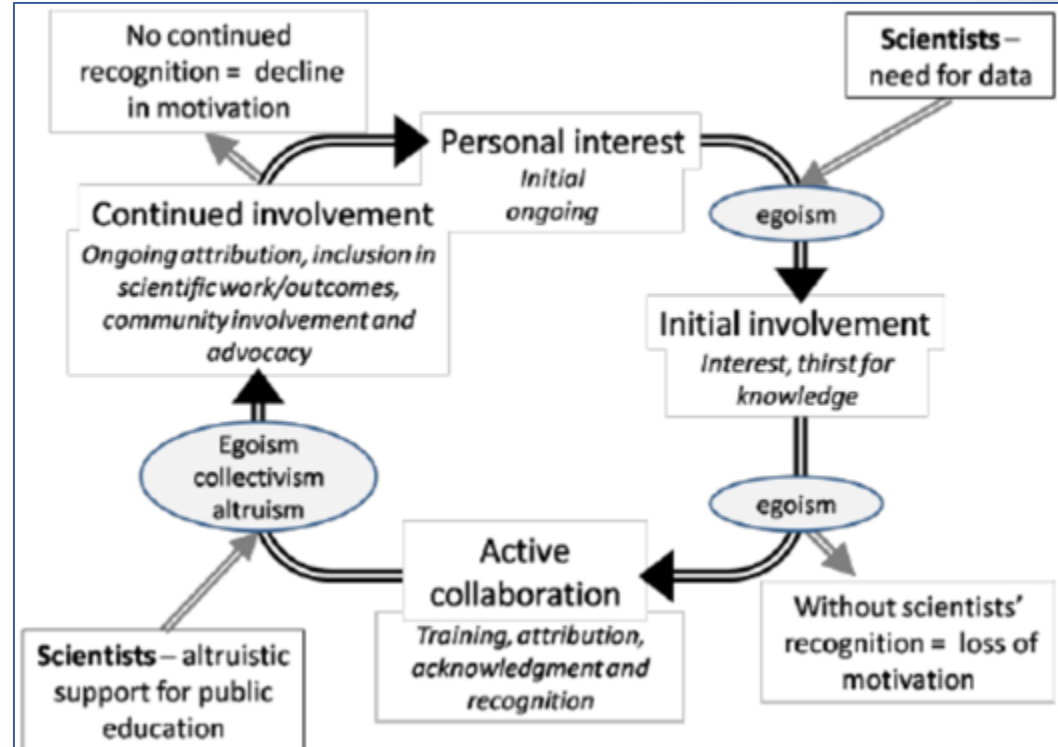
Motivation changes in regard to **individual differences**.

# Why is this complicated?



Motivation changes in regard to **cultural differences**.

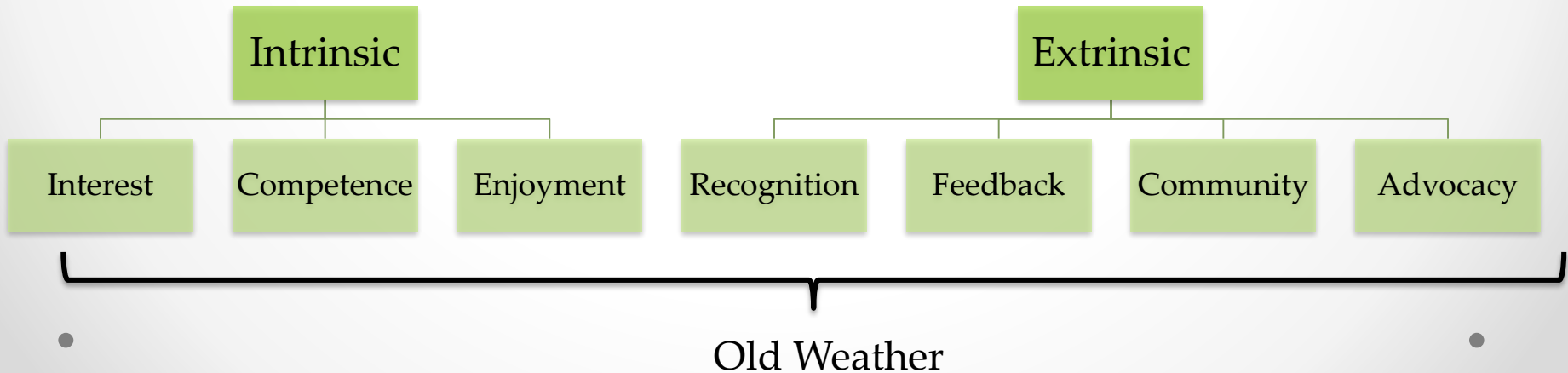
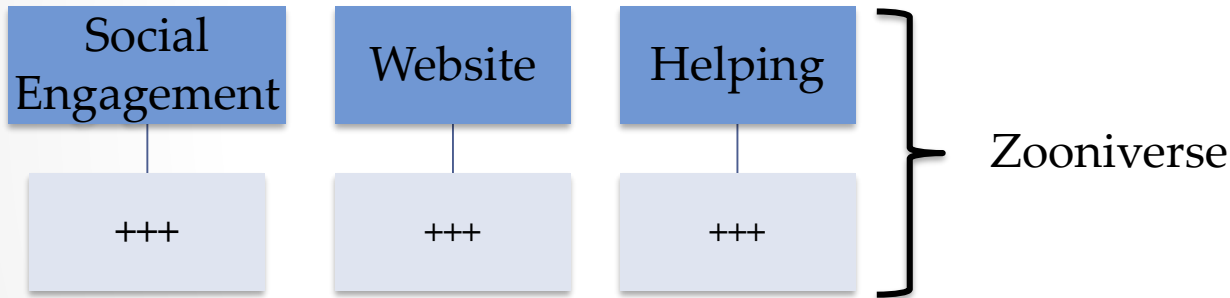
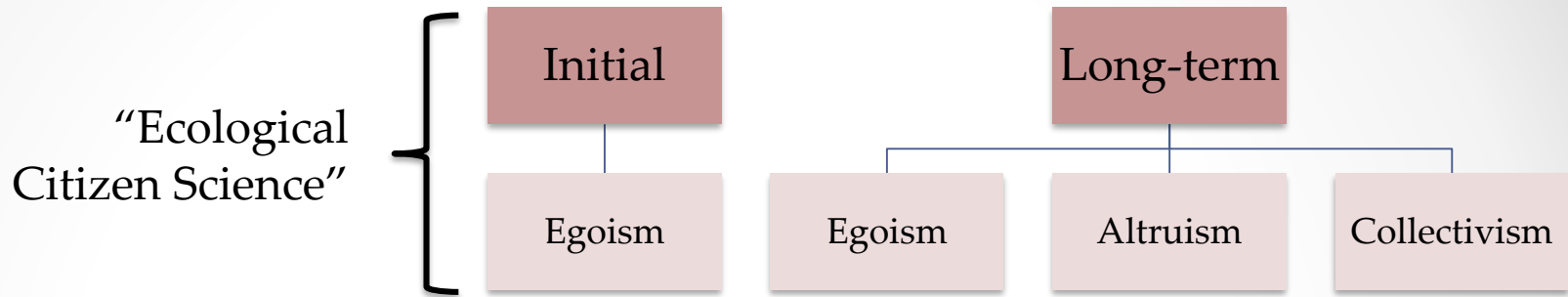
# Why is this complicated?



Motivation changes **over time**.



# In addition...



# Common ground

1. **Fun**, including enjoyment of the research task or environment.
2. Interest in or desire to learn about research **topic**.
3. **Recognition**, through feedback or more formal rewards.
4. Individual **relationships** and community membership or building.
5. **Shared Goals**, including advancing science, conservation, or generally helping.



Foldit Happy Moths Zoo-niverse Eyewire Online Eco-logical Flora-caching Bio-diversity

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**Fun**

Task

Environment

**Topic**

Interest

Learning

**Recognition**

Feedback

Reward

**Relationships**

Individual

Community

**Shared Goals**

Science

Conservation

Helping



Foldit Happy Moths Zoo-niverse Eyewire Online Eco-logical Flora-caching Bio-diversity

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**Fun**

Task

Environment

**Topic**

Interest

Learning

**Recognition**

Feedback

Reward

**Relationships**

Individual

Community

**Shared Goals**

Science

Conservation

Helping

**Intrinsic**

**Extrinsic**



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**Fun**

Task

Environment

**Topic**

Interest

Learning

**Recognition**

Feedback

Reward

**Relationships**

Individual

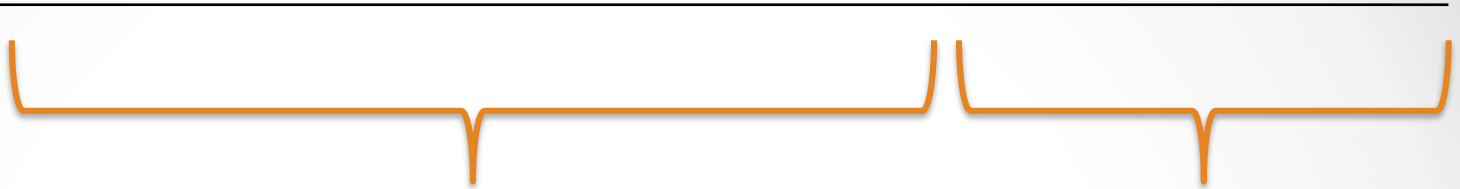
Community

**Shared Goals**

Science

Conservation

Helping



**Online**

**Place-Based**



Foldit Happy Moths Zoo-niverse Eyewire Online Eco-logical Flora-caching Bio-diversity

**Fun**

Task



Environment



**Topic**

Interest



Learning



**Recognition**

Feedback



Reward



**Relationships**

Individual



Community



**Shared Goals**

Science



Conservation



Helping



# Retention...



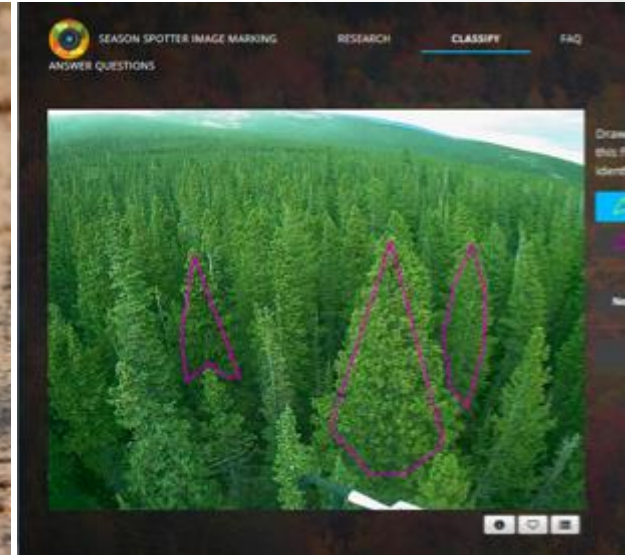
## Invaders of Texas

43% Retention



## The Texas Quail Index

39% Retention



## Season Spotter

19% Retention



# CoCoRaHS\*

## **Mission:**

To provide the highest quality [precipitation] data for natural resource, education and research applications

## **Number Volunteers:**

~20,000

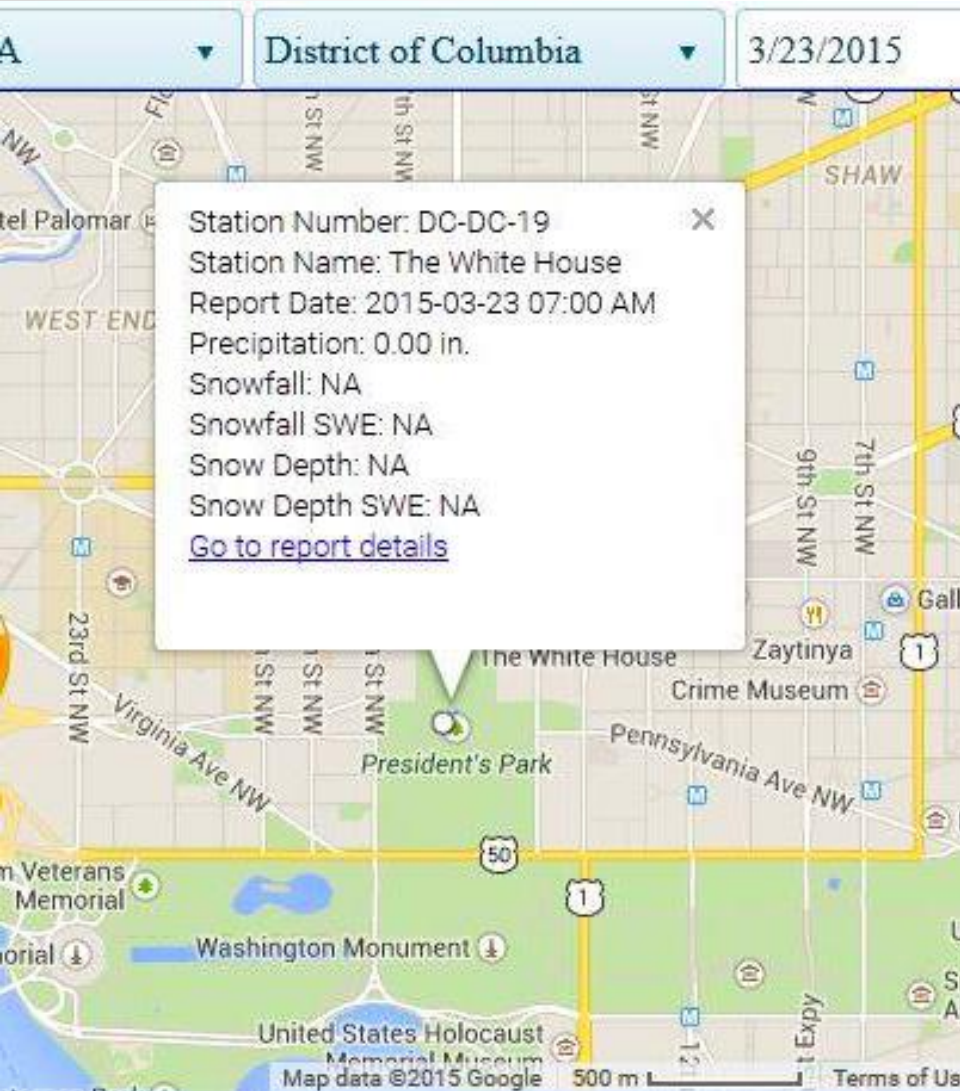
## **Annual retention:**

~50% (up to ~80%)

\*Community Cooperative Rain Hail & Snow Network



# CoCoRaHS



<b>Fun</b>	
Task	<input checked="" type="radio"/>
Environment	
<b>Topic</b>	
Interest	<input checked="" type="radio"/>
Learning	<input checked="" type="radio"/>
<b>Recognition</b>	
Feedback	<input type="radio"/>
Reward	
<b>Relationships</b>	
Individual	
Community	<input checked="" type="radio"/>
<b>Shared Goals</b>	
Science	<input type="radio"/>
Conservation	
Helping	



## Task

- *“At 6.59 it’s nothing. At 7:00 1,000 people submit.”*

## Learning

- Framing *“climate,” “variability”*

## Feedback

- Nolan’s intervention
- Certificates for perfect reporting

## Community

- Balancing privacy and connection

## Bonus: Project Leader

- *“People don’t know him, but they think they know him...”*

# Adventure Scientists



**Mission:** to equip partners with data...that are crucial to unlocking solutions to the world's environmental challenges

**Number Volunteers:** 10s to 100s

**Annual retention:** ~80-90%



# Adventure Scientists

## Fun

Task

Environment



## Topic

Interest

Learning



## Recognition

Feedback



Reward

## Relationships

Individual



Community



## Shared Goals

Science



Conservation



Helping



## Environment

- *“We brand ourselves to people who call themselves adventurers”*

## Learning

- Awareness of environmental issues

## Relationships

- *“I would interview people at coffee shops, breweries, etc.”*
- *“Comradery”* and community

## Conservation

## Bonus: Investment

- Events cost time, not money

# Summary

## Motivation in CoCoRaHS and Adventure Scientists

- Initial interest
- “Fulfillment”
  - Personal
  - Shared goals
- Relationships and community
  - Leadership & team building

## Broader implications

- Feedback not *inherently* valuable
- Cross-project research can be good...
- Designing for differences (individual; cultural; temporal) is better

# Designing for motivation



Credit: Kirra Paulus



Lessons from Software Development: Know the user, test, iterate



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