How to increase citizen engagement in scientific research

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26 October 2017
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Citizen science

Definition:

“scientific work undertaken by members of the general public, often in collaboration with or under the direction of professional scientists and scientific institutions” (Oxford Dictionary, added in 2014)

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“There are a lot smart, educated, thinking people who are not in the tenure track who have a lot to contribute to the world.” (Jessica Richman, uBiome)
Citizen science: examples

Georgia Adopt-A-Stream

CosmoQuest

Welcome to Project BudBurst!

Every plant tells a story about changing climates.
We are a national network of citizen scientists monitoring plants as the seasons change. Join us!

1. Register Online
Create a My BudBurst account

2. Learn How to Observe
Find out what to look for when making observations.

3. Select a Plant
Next, choose a plant to observe.

4. Go Outside and Observe
Now the fun part! Print a report form, go outside, and observe your plant.

5. Report
Sign in to your My BudBurst account to submit your observation.

It's that easy!
Citizen science: examples

Aquila Project (New Zealand)

iNaturalist

Audubon Christmas Bird Count
Luminous ID

- Plant identification guide to filter through grasses, forbs, and woody/shrub species at CU’s Mountain Research Station on Niwot Ridge
- Upload species observations with GPS and photo
- Interactive website to view & verify observations
Citizen science: benefits

- Participation in the scientific process
  - Increase scientific understanding
  - Develop deeper connection with and interest for environment

- Accessibility to scientific research
  - Understand importance of research

- Direct contribution to research with data collection
  - Maximize data
Citizen science: benefits

Luminous ID

- Convenient and easy way to look up plants in the field
- Increase researcher & citizen engagement at Niwot Ridge
- Create geographical and photographic phenology dataset
• Georgia Adopt-A-Stream: stream quality
• CosmoQuest: identified images for topographic features
• BudBust: timing of flowering
• Aquila Project: identified areal images for presence of invasive species
• iNaturalist: location of species world-wide
• Audubon Christmas Bird Count: location and counts of bird species
Luminous ID

- Option to upload ~250 different species observations
- Recorded data: species photograph, species name, date, GPS, GPS accuracy, username
- Uploaded observations stored for one year at www.luminousid.org
- Geographical data remains on website, photographic data downloaded yearly to Niwot server
Development

• Join existing Citizen Science project as volunteer, project leader, or Principle Investigator

• Create new Citizen Science project
Luminous ID

- 2 year collaboration with teams of 6 CU Computer Science seniors in Software Engineering course
- We provided species data, general app design, and desired functionalities
- Students responsible for development, design details, and testing

CS Senior Projects:
https://www.colorado.edu/cs/senior-capstone/sponsor-senior-project
Implementation

• Find interested community partners
  o What aspect of community does your project speak to?

• Incentivize volunteers
  o What they will learn
  o How they will contribute to science
  o Follow-up upon project completion
Luminous ID

• Freely available for smartphone & tablet
• Advertised in collaboration with: INSTAAR, Mountain Research Station, Niwot Long-Term Ecological Research (LTER)
• Potential expansion to:
  o Science Discovery K-12 outreach program
  o REU (Research Experience for Undergrads) students
  o Undergraduate field courses
  o Outdoor education programs