Bonanza Creek LTER Education & Training

Year in review and ways to collaborate

Elena Sparrow & Katie Spellman
BNZ Education seeks to:

- Inspire wonder and appreciation of the boreal forest and how it is studied.
- Increase access to and use of BNZ assets (e.g. personnel, sites, data) by students, teachers, and the public
- Improve inclusion and diversity of people who are receiving the benefits of BNZ assets (training opportunities, use of BNZ products, etc.)
- Prepare students for ecological and related careers
Bonanza Creek Education Programs

K12 & Schoolyard LTER
- Fostering Science
- Arctic and Earth SIGNs
- Community & Citizen Science Programs
- Day trips
- Public Events

Undergraduate & Graduate
- Graduate research and training
- Research Experience for Undergraduates
- Summer Climate Research Intensive
- NEW - BNZ data in Undergraduate classrooms (Wagner et al. RCN-UBE Incubator)
- NEW _Grad Student training to work with communities in conducting Arctic research

Adults
- Arctic and Earth SIGNs
- Community & Citizen Science Programs
- PD Workshops for Educators
- In a Time of Change
- Public Events

BNZ Symposium ● March 24, 2023
GLOBE / Arctic and Earth SIGNs

Approach: Use various ways of knowing and learning about the environment to help your community address climate change issues.

- Learning from elders and community
- Co-produced youth-centered projects
- Resource matchmaking (GLOBE, BNZ, NASA, etc.)
- Indigenous curricula supports
- Meet-the scientist sessions
- Community action and sharing.
Opportunities

Support a team mid-project with a virtual visit and discussion with a group who has chosen a project related to your research.

Align theme with priorities emergent from the SES Working group results and ANAC.

Leverage GLOBE in proposals (it connects to almost everything!)
GLOBE Student Research Symposium

- K-12 Youth present their year-long research
- Poster review by 2 STEM professionals and student peer-review
- over 100 attendees last year from 14 communities across Alaska.
- This year, bigger and from whole NW US region.

Opportunities for BNZ:
- Be a reviewer
- Help lead an activity in your lab or building on the UAF campus
Summer Research Intensive

- 2022 was 6th year of the program
- 16 First generation college students from Santa Ana College MESA program and UAF Climate Scholars Program students
- 2 credits, 200-level

Opportunities:
- Serve as a group mentor for the week,
- hire an alum as an REU
- Create your own research intensive!
## Public Participation in Scientific Research Spectrum

<table>
<thead>
<tr>
<th>Contractual</th>
<th>Contributory</th>
<th>Collaborative</th>
<th>Co-Created</th>
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<tbody>
<tr>
<td>Community members identify a question and ask a scientist to design, conduct and report the research. The community assists in the interpretation of the results and leads the use of the data.</td>
<td>Scientists identify a question and design the methods. Community members collect the data, and sometimes interpret and use the results. Scientists are responsible for the data analysis, use and publication.</td>
<td>Generally designed by scientists. Members of the public contribute data but also help to refine project design, analyze data, and/or disseminate findings.</td>
<td>Community members and scientists work together to design the project. At least some of the public participants are actively involved in most or all aspects of the research process.</td>
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Decreasing LEVELS OF PUBLIC PARTICIPATION Increasing

Adapted from Shirk et al. (2012)
We tested two community & citizen science program design in two projects to determine how each design supports youth learning.
How do youth think the project is relevant to their communities?

- **Community**
  - Contributory: 8
  - Cocreated: 19

- **Life/planning**
  - Contributory: 11
  - Cocreated: 37

- **Understanding**
  - Contributory: 6
  - Cocreated: 21

- **Basic berry/ice**
  - Contributory: 5
  - Cocreated: 12

- **Science**
  - Contributory: 3
  - Cocreated: 14

- **Understanding**
  - Contributory: 5
  - Cocreated: 20

- **Climate impacts on berries/ice**
  - Contributory: 5
  - Cocreated: 20

**Number of times code was applied**

*n = 49 youth*
Do youth believe they can make a difference in their communities through these projects?

“I can use science to help my community”

Graph: S. Clement
Do youth believe they can make a difference in their communities through these projects?

$n = 196$ youth

Graph: S. Clement
Co-created and contributory approaches have different outcomes.

The more agency in co-determining the questions we address with BNZ work (particularly the applied science questions) the more valuable it will be to the people who participate in or use our work.