Bonanza Creek LTER Education & Outreach

Year in review and next steps

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Elena Sparrow, Pat Doak, Diane Wagner

Photo Credit: Jasmine Shaw
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.
Long-term goals (5 year) that will shape our next grant cycle

- *Long-term goal 1.* Formalize some of our opportunistic program offerings to increase efficiency and access to these programs.
- *Long-term goal 2.* Develop a program to assist BNZ faculty in incorporating BNZ datasets into their existing undergraduate course teaching.
- *Long-term goal 3.* Develop relationship with the UAF climate change minor program and the UAF Honors College Climate Scholars Program
- *Long-term goal 4.* Develop a BNZ graduate student orientation program.
- *Long-term goal 5.* Develop a BNZ Science communicator position and communication plan and deliver regular BNZ science communications to the public, stakeholders and partners.
- *Long-term goal 6.* Continue strengthening connection and tightening feedback loops between BNZ research and education through PPSR and leveraging of GLOBE and Fostering Science programs.

BNZ Strategic plan section link: https://docs.google.com/document/d/1ouSfwpAGovr08UbgqPim_A82mlAhv3TH/edit?usp=sharing&ouid=115272221693528683102&rtpof=true&sd=true
Bonanza Creek Education Programs

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

**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)

**Adults**
- Arctic and Earth SIGNs
- Community & Citizen Science Programs
- In a Time of Change

BNZ Symposium ● October 22, 2021
Fostering Science
Fostering Science

<table>
<thead>
<tr>
<th>Year</th>
<th>New BNZ</th>
<th>Returning BNZ</th>
<th>Denali</th>
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<td>2017</td>
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<td>2021</td>
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* Virtual BNZ camp only
News and Plans

**Funding:**

1. We now have a Fostering Science General Support Fund for tax-free donations (thank you, Willy Gordon).

2. We have funding for 2 years from the Doug Schamel Fund. This will cover the costs of the Denali camp.

**Camp Expansion:**

- Expand day camp to 2 camps (16 kids maximum / camp)
- Add a Denali backcountry backpacking trip for experienced youth

**Training expansion:**

- Background on impacts of ACEs on youth and impacts on learning
- Building and diversifying our pool of instructors, including youth “aging out”
News and Plans

New Program: ScienceWeb:

• Internship program for older youth:
  • Field or lab work with LTER members
  • Job training / college preparation
  • Junior counselor positions
  • Near-peer mentoring

• Goals:
  • Provide pathway to STEM participation
  • Strengthen connections to youth and to adults
  • Contribute toward JEDI goals
    • Foster youth are hugely underrepresented in STEM
    • >50% of our campers are Alaska Native
    • 50% reported wanting to be a scientist or considering it after participating in camp
Community & Citizen Science

Pre-COVID Girl Scout
“Think like a Citizen Scientist Day”
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.
Focus for 2020-21
- Birch forest change and cultural values
- Renewable energy potential - biomass

Major events:
- Virtual Educator workshop
- Learning from Kk’eeyh youth camp
- Meet the scientist sessions
- GLOBE Grandma birch phenology
- IBFRA citizen science workshop

BNZ Assets:
- Boreal Allometric equations (Yarie, Kane et al.)
- USFS Citizen Science program access (FIA)
- Sparrow, Spellman, Mulder, Genet, Young-Robertson

BNZ Symposium ● October 22, 2021
Arctic and Earth SIGNs

Educator workshop on boreal forest renewable energy resources and Indigenous relationships with birch.

Meet the Scientist event with USFS and BNZ scientists with McGrath School. Tree biomass measurements using GLOBE Observer Trees

BNZ Symposium ● October 22, 2021
Arctic and Earth SIGNs

GLOBE Grandma Autumn Green Down

5 videos • 64 views • Last updated on Apr 24, 2021

Join Grandma GLOBE in learning activities for the autumn season designed to facilitate an early primary grade level adaptation of GLOBE green down. This resource series is designed for eLearning, at-home learning or families and educators seeking authentic science opportunities to enrich early childhood STEM.

Over 100 families tracked leaf green down of birch, aspen and poplar last fall and 5 classrooms this year using GLOBE Grandma. 456 views!
2020-21 Highlights

- Demand for continuation of the program by educators and Tribal organizations
- Museum of the North Berry Month
- Total of 32 communities involved, 1500 volunteers and 17,000 observations
- Mulder et al. *In Press*. Natural History of Berry Loss
- Spellman et al. 2021 Linking data to planning for action through scenarios

BNZ Assets:

- BNZ pilot funding and graduate student support,
- ITOC wearable art examples
- Katie Spellman, Christa Mulder, Elena Sparrow, Lindsay Parkinson, Kristin Schroder, Laura Weingartner
- Data Archiving- Jason Downing
New directions: Alaska’s Berry Future

New directions in Berry science

- Gather information needs and concerns of communities
- Identify datasets available on berries across the state
- Identify gaps in science and future science
- Tightly align our science to the climate adaptation needs of our communities
- MicroBerry!

BNZ Assets:

- a decade+ of prior BNZ research on berry species
- Mulder, Spellman, Muscarella, Sparrow, Heeringa, Chase
Fresh Eyes on Ice

Ice thickness, snow pack & snow water equivalent, ice phenology

2020-21 Highlights
- Continued ice and snow monitoring and learning with 14 community teams
- NASA Community Eyes on River Ice needs assessment
- Photo observation expansion
- New partnerships with TCC, NWS, GLOBE and NASA

BNZ Assets:
- Tanana River Ice Camera at BNZ
- Dana Brown, Katie Spellman, Elena Sparrow
Summer Research Intensive

5th year of the program
First generation college students from Santa Ana College MESA program 2021
Addition of UAF Climate Scholars Program students
Aug 2021 - Hybrid Engagement in SoCal and AK, 2 credits
HONR F395
2021 Numbers:
- 15 students (66% from groups underrepresented in STEM)
- 7 research projects completed
- 3 locations (Porto, Portugal; Bear Paw Reserve, CA; CPCRW)
BNZ data in the undergraduate classroom

- New RCN-UBE grant to better use publicly-available data on Alaska’s changing environment in undergraduate teaching
- Teaching module development, encouragement to use data in student research
Emergent themes and needs

Themes:
- Alignment of community priorities, learner needs, BNZ assets
- BNZ rising to serve when a call arises
- Adaptability
- Pathways for youth engagement as they mature, pathway for inclusion
- Leveraging partnerships

Programmatic Needs:
- People power to sustain and strengthen efforts (Student engagement and outreach coordinator?)
- Dedicated science communicator
- Ways to support student and public BNZ identity (gathering space, orientation, etc)
- Easy pathway for BNZ researchers to “plug in”

“This research experience has meant to me more than just a research project. This wonderful experience has helped me determine what I want for my future career.”

-1st generation college student at the Undergraduate Research Intensive