In a Time of Change:

Integrating Science with Arts and Humanities in Alaska

Mary Beth Leigh
Associate Professor of Microbiology
Director, In a Time of Change program

BONANZA CREEK LTER
Boreal Forest Ecology

UAF UNIVERSITY OF ALASKA FAIRBANKS

Arts and Humanities update

- In a Time of Change Program
  - Trophic Cascades tour to Anchorage
  - New project: Microbial Worlds
- Ecological Reflections LTER-wide network
  - Coordination
  - Funding efforts
  - Publications
  - Mission
- Discussion
  - How could the arts and humanities advance science?

In a Time of Change:

Trophic Cascades

Predator-prey-ecosystem interactions

August 2-31, 2013

Artists:

Charlotte Bird, Jack Dalton, Pedar Dalthorp, Daryl Farmer, Karin Franzen, Margo Klass Ree Nancarrow, Peter Porco, Todd Sherman, Colleen Toledano

Pictured: Detail from 'Hare and Gone Again' Ree Nancarrow & Charlotte Bird

In a Time of Change: Trophic Cascades

Bonanza Creek LTER

Red Fox with Prey
Todd Sherman

In a Time of Change: Trophic Cascades
Bonanza Creek LTER

Now and When

Charlotte Bird

and

Ree Nancarrow

In a Time of Change:
Trophic Cascades

Bonanza Creek LTER

The Dance Floor
Karin Franzen

In a Time of Change: Trophic Cascades
Bonanza Creek LTER

FAIRBANKS ARTS ASSOCIATION

In a Time of Change: Trophic Cascades
Special Literary Reading

Jack Dalton has grown up between two worlds, his Yup'ik Inuit and European heritages. He is a story-teller, actor, writer, teacher, director and visual artist/sculptor. Jack is a Rasmuson Foundation Fellow. He has created and produced five plays, written a book, and taught creative writing to tens-of-thousands of students around the world. He is currently working on his first opera, *Ada*, based on the life of Ada Blackjack.

Daryl Farmer is the author of *Bicycling Beyond the Divide*, a Barnes and Noble Discover Great New Writer's Award and was a Colorado Book Award finalist. Farmer's work has appeared in such journals as *Paddlefish, Hayden's Ferry Review, South Dakota Review, Quarter After Eight* and *Isotope*. He received his M.A. and Ph.D. in creative writing from the University of Nebraska-Lincoln. Currently, he is an assistant professor at the University of Alaska-Fairbanks.

Saturday
Aug 17th @ 4 pm

Bear Gallery
Alaska Centennial Center for the Arts
Pioneer Park, 2300 Airport Way

Questions: contact Jill Shipman at jill@fairbanksarts.org or 456-6485 ext. 222

BONANZA CREEK LTER Boreal Forest Ecology

NATIONAL PARK SERVICE

Institute of Arctic Biology University of Alaska Fairbanks

UAF UNIVERSITY OF ALASKA FAIRBANKS

This reading is sponsored by the Fairbanks Arts Association, an organization funded by Private, Corporate and Foundation memberships and donations, City of Fairbanks, Fairbanks North Star Borough, Alaska State Council on the Arts, and the National Endowment for the Arts.

Tour to Alaska Pacific University (Anchorage, Sept. 2014)

Tour to Alaska Pacific University (Anchorage, Sept. 2014)

Tour to Alaska Pacific University (Anchorage, Sept. 2014)

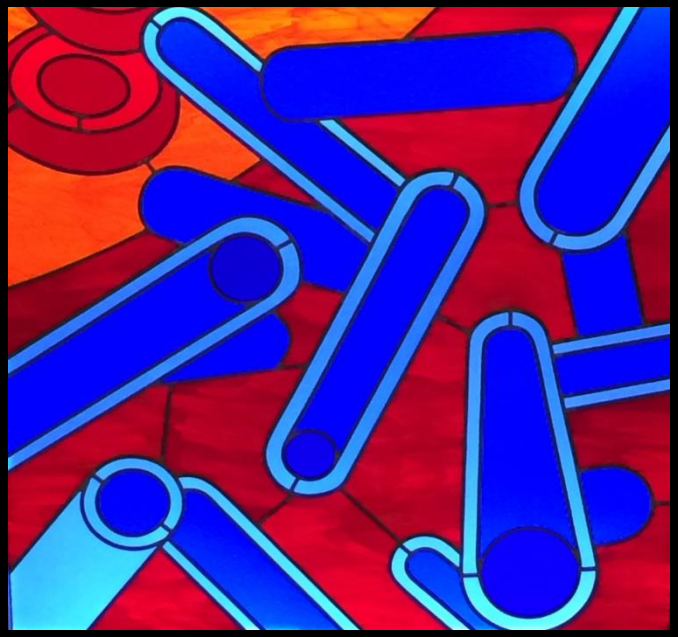
Tour to Alaska Pacific University (Anchorage, Sept. 2014)

Jannah Atkins, APU curator Ariel Thomasson, ITOC Curator

In A Time of Change – TROPHIC CASCADES

NAME	EMAIL	COMMENTS
Alina Hollosson		Best of the Best ever!!
Ward Thibert		Best show ever at APU!
Monica O'Keefe		wow! great show
Susan Schagoura		great mix of media and development of thought. Beautiful
Kathy + Garry Faulkner		thoughtful, great show
Suzanne Dvorak		outstanding work!
Susan Mare		great show!
Tracy Anna Bader		I love the topic - very timely! Wonderful work. ☺
Shaletownsend		GREAT SHOW
Judy Lehman		Wonderful!
Carrie Harris		Amazing! ♡
Eli Fleischer		thought-provoking and awe-inspiring!
Pam Butcher		interesting and beautiful ♡xo
Mimi Beck		wonderful overlap of art & science
Karen Olsson		- Ambitious projects! Go Fairbanks Artists.
KN Goodwin		

Next project
ITOC: Microbial Worlds



Organisms and Environments (detail)
Stained Glass
Jessie Hedden and David Mollet

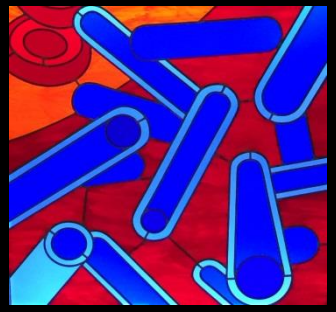
- Funding
  - Broader Impacts of NSF Ecosystems grant (PI Leigh)
  - BNZ?
  - Seeking more
- Soliciting artists spring 2015, show in 2016/17

Wolf: Reliquary
Margo Klass

In a Time of Change: Trophic Cascades
Bonanza Creek LTER

Next project – ITOC: Microbial Worlds

- New elements
  - Deeper and more frequent art/science interaction
    - Artist in residence
    - Alaska group
      - » Salon style model
      - » Encouraging art/sci partnerships
  - Expanded group of scientists - microbiologists and ecologists – WANT TO BE INVOLVED?
  - Artist honoraria
  - New venue: Well Street Gallery
  - Annie Duffy, curator/coordinator
  - Additional elements for broader audience



Artist in Residence – Kevo Subarctic Research Institute, Finland

Stephanie Dixon (NYC), with MB Leigh and postdoc Mary-Cathrine Leewis

Artist in Residence – Stephanie Dixon (NYC)

Dancer/Choreographer, Costume designer, Photographer

Student, Fashion Institute of Technology, NYC

Artist in Residence – Kevo Subarctic Research Institute, Finland

Stephanie Dixon (NYC), with MB Leigh and postdoc Mary-Cathrine Leewis

Artist in Residence – Kevo Subarctic Research Institute, Finland

Stephanie Dixon (NYC), with MB Leigh and postdoc Mary-Cathrine Leewis

Artist in Residence – Kevo Subarctic Research Institute, Finland

Stephanie Dixon (NYC), with MB Leigh and postdoc Mary-Cathrine Leewis

www.acclaimclipart.com

Painting with Microbes: This Art's ALIVE

www.acclaimclipart.com (edited)

Microbes are everywhere. They're on your skin, on surfaces all around you, in the soil and water, and on food. But don't worry; the vast majority of microorganisms are harmless and many are even beneficial to human health and the environment. The ones you will be working with for this activity have no documented health hazards.

Information & Instructions

Your canvas will be a Petri dish.

These dishes will provide a nourishing environment for microbes to grow. They contain food for microbes like sugar, proteins, and mineral nutrients mixed into a gel called agar. Plain agar is essentially a seaweed Jell-O® (but don't eat it, yuck!). It holds together all the nutrients to make a good place for microbes to live. When the plates are new, they are sterile (nothing alive is there) and not hazardous.

3 different types of plates are available for you:

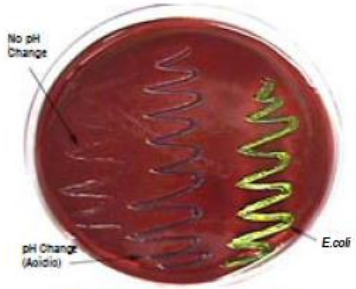
Sterile NA Plate by Wikipedia user Lity_M

1. Tryptic Soy Agar (TSA) –

Provides a broad-range of nutrients to allow most microbes to grow and show their normal color.

2. Eosin Methylene Blue Agar (EMB) –

Is selective, meaning only certain types of microbes will grow,. On EMB, some Enterobacteriales, like *E.coli* will appear metallic green. The agar also contains dyes which will respond to pH changes, turning the microbes purple when they release acids as they grow.

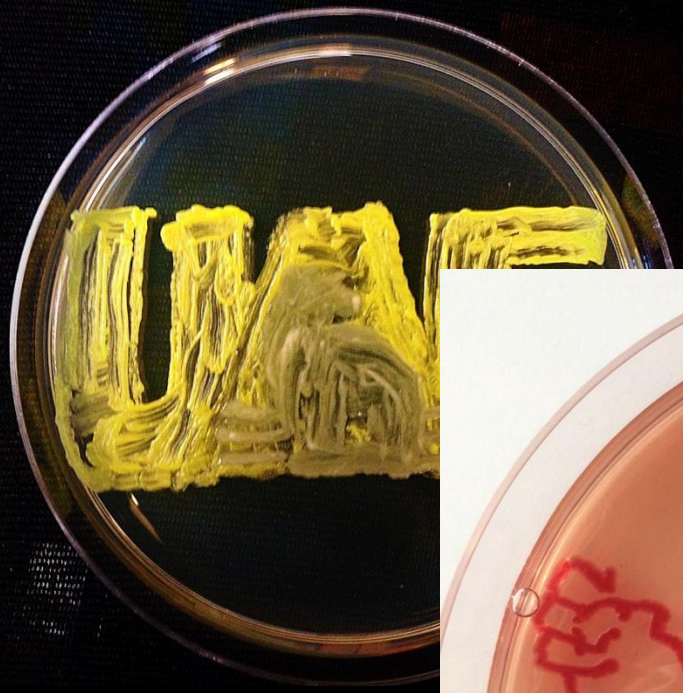


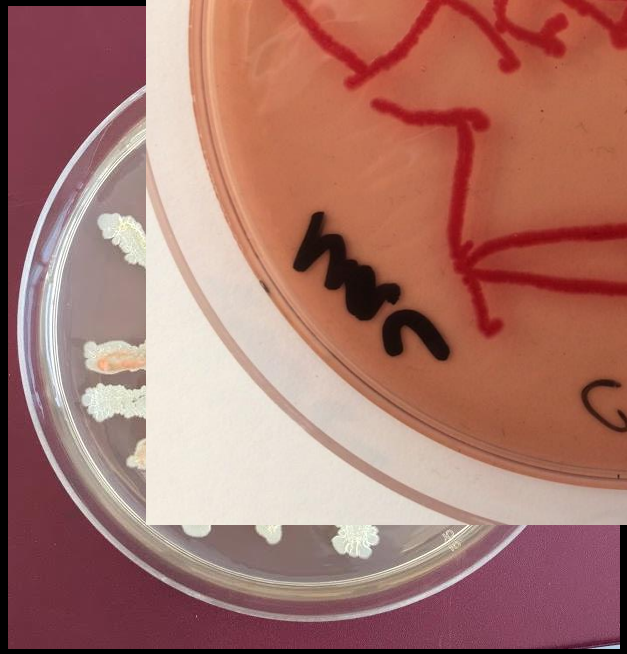
EMB Plate by Dr. Donald Hicks, Los Angeles City College

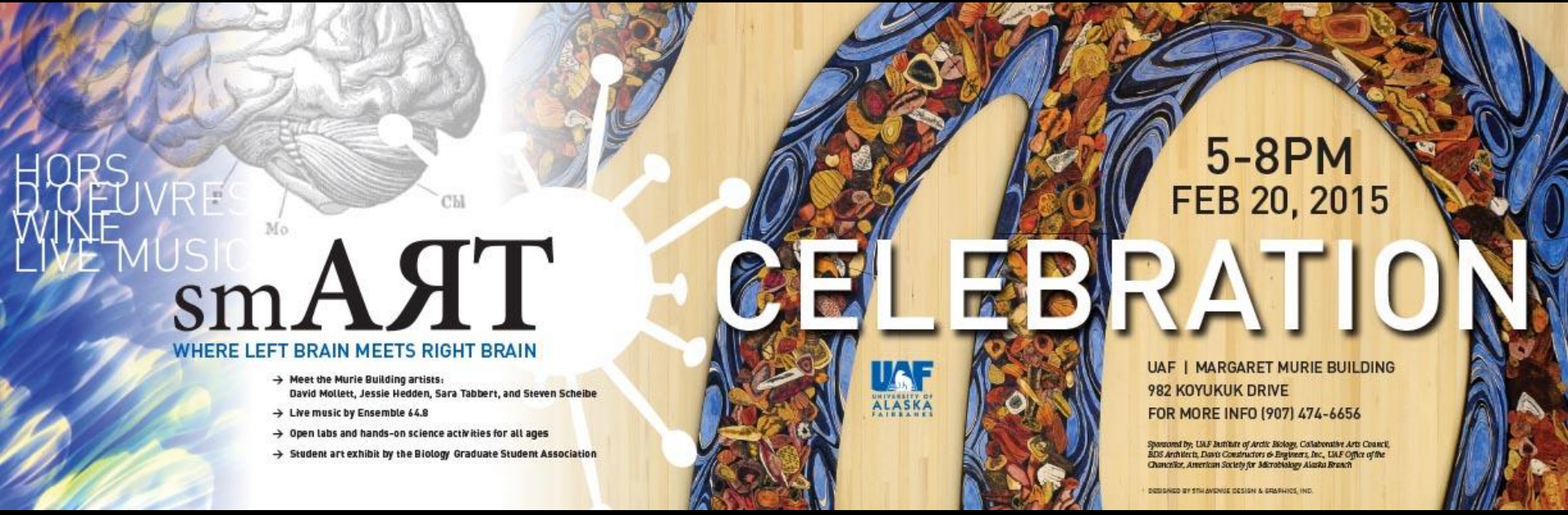
3. MacConkey Agar (MAC) –

Is also selective for certain microbes and contains a pH dye that will turn the microbes and the plate itself from a peach color to bright pink when the microbes release acids while growing.

Microbial Art







OPEN LABS AND HANDS-ON ACTIVITIES

→ **Paint with Microbes**
(Rm. 206, Mary Beth Leigh)
Paint bacteria onto Petri plates, then take home and watch them grow.

→ **Magnify!**
(Rm. 211, Denise Kind)
Get a close-up view using microscopes and dissecting scopes

→ **Skins and Bones**
(Rm. 309, Link Olson)
View specimens from the mammalogy teaching collection

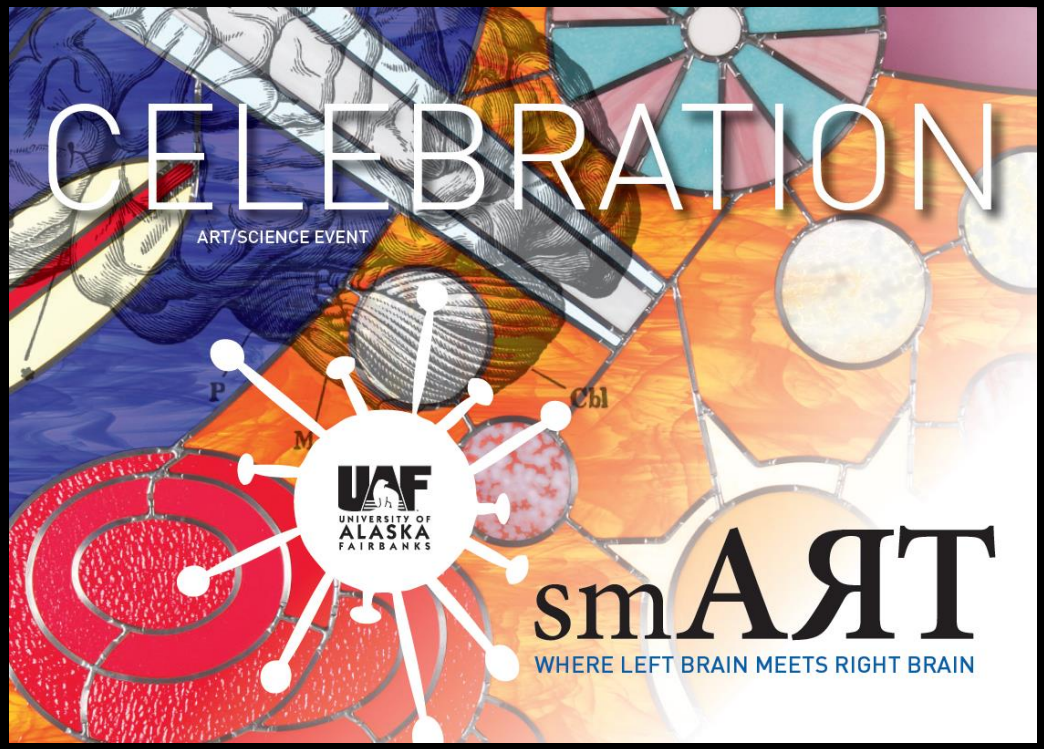
→ **Biomedical Lab Tour**
(Rm. 218, Kelly Drew, Jack Chen, Andrea Ferrante)
See a human brain, a hibernating arctic ground squirrel, and tour the neuroscience, virology and immunology lab.

→ **Shuminagashi Printmaking**
(Rm. 306, Laura Conner)
Explore art and science through the ancient art of Japanese marbling.

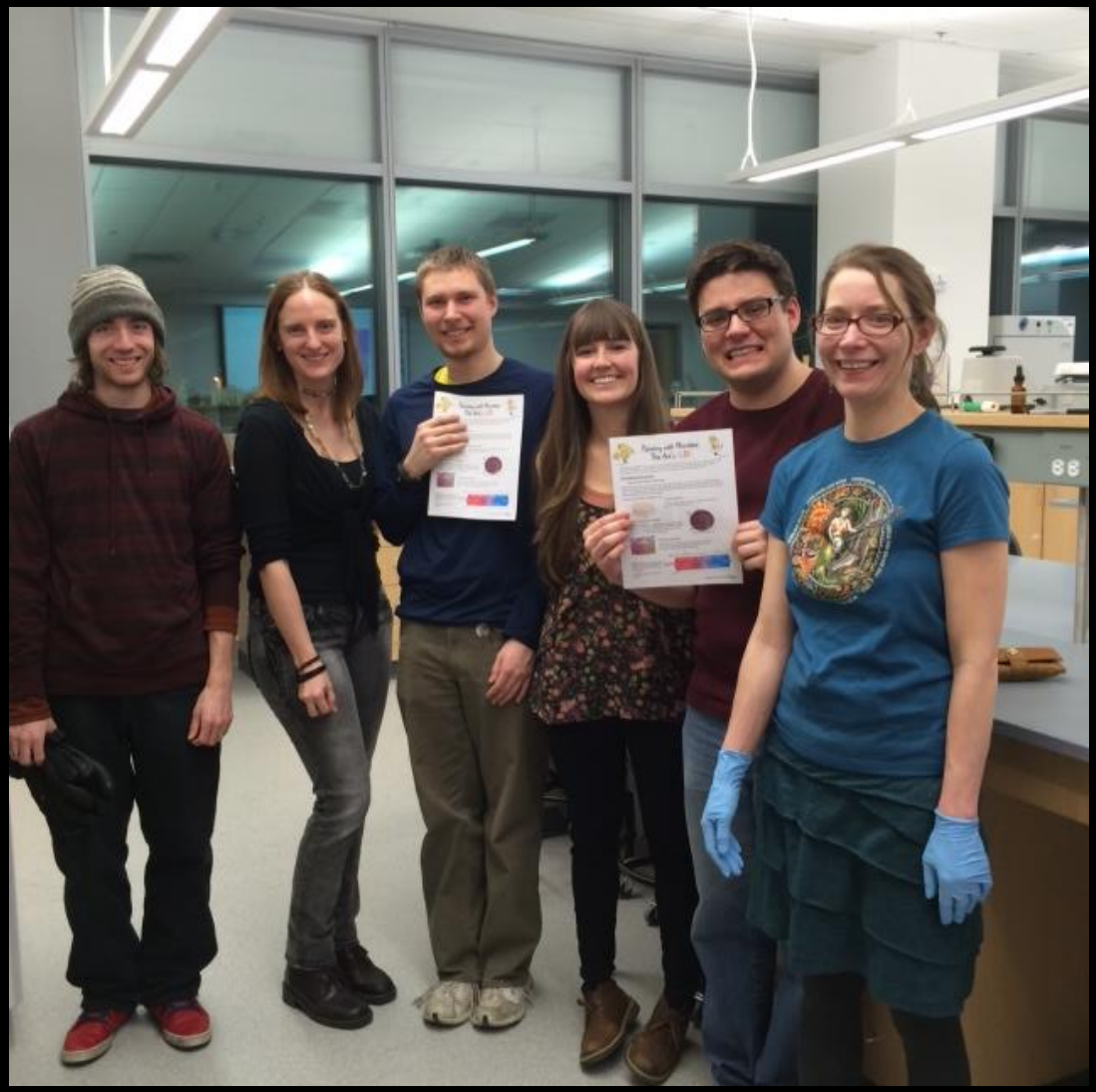
→ **Murie Building Art in the Making**
(Auditorium)
See a slideshow of the art works being created.

BIOLOGY GRADUATE STUDENT ASSOCIATION (BGSA) STUDENT ART EXHIBIT AND SALE

→ View art by grad students in the Biological Sciences program at their self-curated exhibit in Room 103-105. Art sales will benefit BGSA.



Microbial Art – Developers and Mentors



Painting with Microbes

Painting with Microbes

“The Science of Sci Fi” film series

October, 2015

Special guest: Prof. Michael Lee, Music and Film Historian, University of Oklahoma

With MB Leigh and other special guests TBD

Ecological Reflections
LTER Network-wide efforts

- Coordination of arts and humanities (AH) activities
  - Fred Swanson (AND, USFS) & MB Leigh – primary leads
- Ecological Reflections
  - www.ecologicalreflections.com

Publications

- *Permafrost* – UAF English department literary journal
  - Color plates of Trophic Cascades pieces
  - Peter Porco's story
- Manuscripts from LTER-wide Ecological Reflections synthesis project (LNO funding)
  - Michael Nelson (AND), Fred Swanson (AND), Lissy Goralnik (AND) and Mary Beth Leigh (BNZ)
    - Goralnik et al., *Earth Stewardship*, in press
    - Swanson, *Ecosphere*, in prep.
    - Goralnik, Nelson, Leigh, in prep.

Chapter 16
Arts and Humanities Efforts in the US Long-Term Ecological Research (LTER) Network: Understanding Perceived Values and Challenges

Lissy Goralnik, Michael Paul Nelson, Leslie Ryan, and Hannah Gosnell

Abstract Calls for interdisciplinary approaches to environmental problem-solving are common across the biophysical and social sciences. Recently, some of these collaborations have incorporated the creative arts and humanities, including projects across the 24 sites of the US Long-term Ecological Research (LTER) network. A substantial body of artistic and written work has been produced by LTER-affiliated sites. However, there has been no systematic analysis of this work. We used a cross-site, social scientific analysis to understand the extent and nature of arts and humanities inquiry in the LTER network and to assess perceptions about the values and challenges associated with it. We found that 19 of the 24 LTER sites agree or strongly agree that arts and humanities inquiry is important and relevant for the sites. Perceived values of this work include its goodness in and of itself, as well as its ability to foster outreach and public involvement and to inspire creative thinking. Contrarily, participants identified funding, available labor, and available expertise as limiting factors in the growth of arts and humanities inquiry in the LTER network. Respondents highlighted themes relevant to the relationship between ecological science and ethics, including participants' willingness to accept fostering empathy, an identified value of arts and humanities inquiry, as pertinent to LTER network goals and research on some level. This ethical potential of arts and humanities inquiry in the LTER network provides an opportunity to bridge ecological research with arts and humanities inquiry in ways that are meaningful for Earth stewardship.

Keywords Empathy • Ethics • Ecology • Interdisciplinary • Intrinsic value • Place-based

L. Goralnik (✉) • M.P. Nelson • L. Ryan
Department of Forest Ecosystems and Society, Oregon State University, Corvallis, OR, USA
e-mail: Lissy.goralnik@oregonstate.edu; mpnelson@oregonstate.edu; leslie.ryan@oregonstate.edu

H. Gosnell
Geography, Environmental Sciences, and Marine Resource Management, College of Earth, Ocean and Atmospheric Sciences, Oregon State University, Corvallis, OR, USA
e-mail: gosnellh@geo.oregonstate.edu

© Springer International Publishing Switzerland 2015
R. Rozzi et al. (eds.), *Earth Stewardship*, Ecology and Ethics 2,
DOI 10.1007/978-3-319-12133-8_16

Uncorrected Proof

Taking it to the next level
Funding efforts

NSF conversations:

- NSF-NEA-NEH joint funding initiative (Al DeSena and others)
  - Specific foci, pre-determined - 1) Brain research, 2) Data visualization and 3) Entrepreneurship and innovation
- Informal Education – outreach elements only
- Saran – Promote AH work from Broader Impacts to Intellectual Merit
  - EAGER – as a step forward
  - Workshop – for coordination
  - RCN!
    - Partners: Michael Nelson (AND), Lindsey Rustad (Hubbard Brook), Roger Ruess, others being sought

From Saran Twombly:

How can you integrate science and art to address the complex questions posed by ecological dynamics? Not sense of place, but how different philosophies envision complex interactions.

This moves the endeavor beyond art exhibits or educational materials to the solving of complex problems, and brings arts, humanities, and science to bear on the intellectual merit of an activity. One could argue that it is no longer enough to use arts and humanities to reach the public. Let's use them to advance our abilities to solve complex problems.

This would require a research agenda – it's arts research combined with scientific research: posing ideas, designing ways to address questions, working together to understand how different aspects of an ecosystem (natural or social) are integrated and how to understand the complex dynamics that result. This moves the art beyond a broader impact, would engage artists in research together with scientists, and merge different ways of approaching hard questions to advance fundamental understanding of the natural world.

Our missions and challenges

- Broader Impacts
  - Outreach elements
- Intellectual Merit
  - Beyond outreach – true collaboration
    - What does science gain?
    - How can AH help science solve complex problems?
    - Is problem-based approach appropriate?

- How might the arts and humanities help solve a problem, advance fundamental understanding?

Questions and Discussion