RSC/Presidential Grant Report

Due September 30th of the ending year of the grant

Examples of previous grant reports can be found here: https://gustavus.edu/kendallcenter/grant-opportunities/grant-examples.php

First Name *

Betsy

Last Name *

Byers

E-mail *

bbyers

Date *

MM DD YYYY

09 / 13 / 1979

Please select the grant for which you are submitting a report: *

- (●) Research, Scholarship and Creativity
- ( ) Presidential Faculty-Student Collaboration

Presidential Faculty-Student Collaboration Grant Report Details

Please compose your answers offline and copy/paste into the appropriate text boxes. While answers inputted into this form should be available if you close the form and return in the same browser, we cannot guarantee that this function will work.

Please summarize the activities and outcomes of your grant. *

Please explain how you accomplished the goals you set for yourself in your grant proposal. *

Please summarize any outcomes (publications, revised syllabi, conference presentations, new research directions, etc.), and discuss your plans for continuing or expanding on your work in this project. *

Please discuss your collaboration with your student grantee. What was successful? What aspects of the relationship proved challenging? *

Please share any observations about anything else that was important to you and/or any problems you encountered during this grant project about which the Provost's Office should be aware. *

Research, Scholarship and Creativity Grant Report Details

Please compose your answers to the following questions offline and copy/paste into the appropriate text boxes. While answers inputted into this form should be available if you close the form and return in the same browser, we cannot guarantee that this function will work.

Please summarize the activities and outcomes of your grant. *

The activity of this grant was to support travel to work alongside our colleague Jeff LaFrenniere, as well as his NSF collaborators in the field. The goals were two fold:

1. Exposure to working with scientists collecting data in the field.
2. Development of work inspired by time in the field for exhibition during Nobel 55: Climate Changed.

The outcome was successful achievement of the two goals: I was able to travel with scientists into the field. I also exhibited work at Nobel 55 as well as in an additional exhibition at Rosalux Gallery in Minneapolis, MN.

Please explain how you accomplished the goals you set for yourself in your grant proposal. *

Goal 1: Exposure to working with scientists collecting data in the field.

My co-collaborator Emily Dzieweczynski (‘19) and I traveled to Cayambe, Ecuador to be on site for a week in the field with Dr. LaFrenierre, Dr. Stanton and their post-doc and undergraduate research fellows Leah Nelson and Bri Jol. We worked alongside the scientists helping to haul their equipment and aid in data collection. (Examples include digging a hole for ablation stakes with an auger, carrying equipment at 16000 feet over a mile in glacial till and learning safety protocol being tied up on the ice and how to stall a fall with an ice axe!)

We gained tremendous respect for our colleagues and the difficulties they face collecting data. There is no replacement for the direct experience we had. During our time of observation we collected sound and visual information that we utilized for our artwork presented in the Education forum of the Nobel Conference.

Goal 2: Development of work inspired by time in the field for exhibition during Nobel 55: Climate Changed.

After returning from Cayambe, my collaborator and I worked for three months in the studio to create a VR piece (3 min 30 sec) from our collected 3D film and audio clips. The film takes the perspective of a water molecule as it travels through the complex system of the Hermoso Galcier on Volcán Cayambe. The aim of this video is to educate the public on the unique water system our colleagues are studying on the Hermoso Glacier as well as its impact on the surrounding agricultural area. We presented this work in the educational forum at Nobel 55: Climate Change. Our work was also featured in the Nobel brochure with a brief bio and statement. It read:

As a collaborative team, Betsy Ruth Byers and Emily Dzieweczynski (‘19) pair glaciological and psychological research to create interactive and immersive art spaces that promote empathy between humans and the environment. Their current work employs virtual reality and sensory stimuli to place viewers in distressed environments of receding glaciers. At the Nobel conference, attendees will be able to experience their recent projects focused on the Rhone Glacier in Switzerland as well as a new VR animation exploring the impact of climate change on the hydrological system at Volcán Cayambe in Ecuador. This animation uses real 360° footage of the glacier, paired with overlaid virtual animations of watercolor paintings. It is a full immersion experience for the viewer and brings to life the perspective of water droplets traversing the entire hydrologic system of Volcán Cayambe’s tropical glacial watershed. The animation is inspired by the collaborative and interdisciplinary research of Gustavus colleague Dr. Jeff LaFrenierre along with his Co-Primary Investigators Dr. Crystal Ng, Dr. Daniel Stanton Dr. Andrew Wickert, Dr. Li Li and was created with the support of an NSF grant.

The collaboration with Dr. LaFrenierre gave us, as artists, a significant opportunity to observe first-hand the collection of scientific data and to partner directly with colleagues working in the field this past June in Ecuador. Our project purposefully overlaps the boundaries between art and science aiming to delineate the ways in which the fields of science and art intersect and in which they can mutually benefit one another. Art can offer a subjective place to explore concerning viewpoints that are often an immediate consequence to learning about scientific data regarding climate change. Our collaboration is an example of how art and science are two vital ways of understanding the complex and the entangled questions about climate change we collectively face.

Please summarize any outcomes (publications, revised syllabi, conference presentations, new research directions, etc.), and discuss your plans for continuing or expanding on your work in this project. *

In addition to the Nobel Conference, we had a collaborative exhibition at Rosalux Gallery in Minneapolis in March 2020 (this exhibition was closed after a week due to COVID, but we were able to have a public reception and opening prior to closing). The exhibition featured artwork developed from our time in the field including an animation that paired glacial melt with water measurements, olfactory pieces that recalled the smells near the glacier and watershed, and auditory work that captured live sounds from the research site. (Please see the pdf pg 7-12 for more descriptive material of the exhibition). The artist statement for Reservoir read:

As a collaborative team, Betsy Ruth Byers and Emily Dzieweczynski pair glaciological and psychological research to create interactive and immersive art spaces that promote empathy between humans and the environment. Their current work employs virtual reality and sensory stimuli to place viewers in distressed environments of receding glaciers. Reservoir explores the impact of climate change on the hydrological system at Volcán Cayambe in Ecuador. Byers and Dzieweczynski use auditory, olfactory, and visual characteristics observed at the Hermoso glacier on Cayambe during a National Science Foundation research trip in June of 2019 to offer viewers a bodily experience of the tropical glacier.

Collaborating with scientists gave the artists a significant opportunity to observe first-hand the collection of scientific data and to partner directly with colleagues working in the field. This project purposefully overlaps the boundaries between art and science, aiming to delineate the ways in which the fields of science and art intersect to mutually benefit one another. Art can offer a subjective place to explore concerning viewpoints that are often an immediate consequence to learning about scientific data regarding climate change. Viewers will be encouraged to explore with all of their senses throughout the gallery and ultimately, to reflect on what it means to be a glacier in today's world of rising global temperatures and increasing melt.

We will be continuing work on this project in the next few years including another interactive, educational component.

Additionally, the work on this NSF grant has opened further research opportunities. I am now in the process of another NSF grant proposal as a PI along with Dr. Laura M. Wehrmann and Dr. Kirk Cochran of Stony Brook University, Dr. Thomas S. Bianchi, University of Florida and Alexander B. Michaud, Bigelow Laboratory for Ocean Sciences. The grant is titled: The influence of Glacial Retreat on Arctic Marine Sediment Carbon Burial and will be submitted to the NSF office of Polar Programs, Arctic Natural Sciences this fall.

Please share any observations about anything else that was important to you and/or any problems you encountered during this grant project about which the Provost's Office should be aware. *

Thank you for your continued support of my research through the RSC grant. I am grateful to have the opportunity to apply for funding.

FYI, after receiving this grant, we received additional funding through a supplemental budget request to CO-PI Dr. LaFrenierre's NSF Grant no. 1758854.

E-Signature

E-Signature *

Betsy R. Byers

Work Samples

Betsy Ruth Byers
612.382.8190
bbyers@gustavus.edu
betsyruthbyers.com

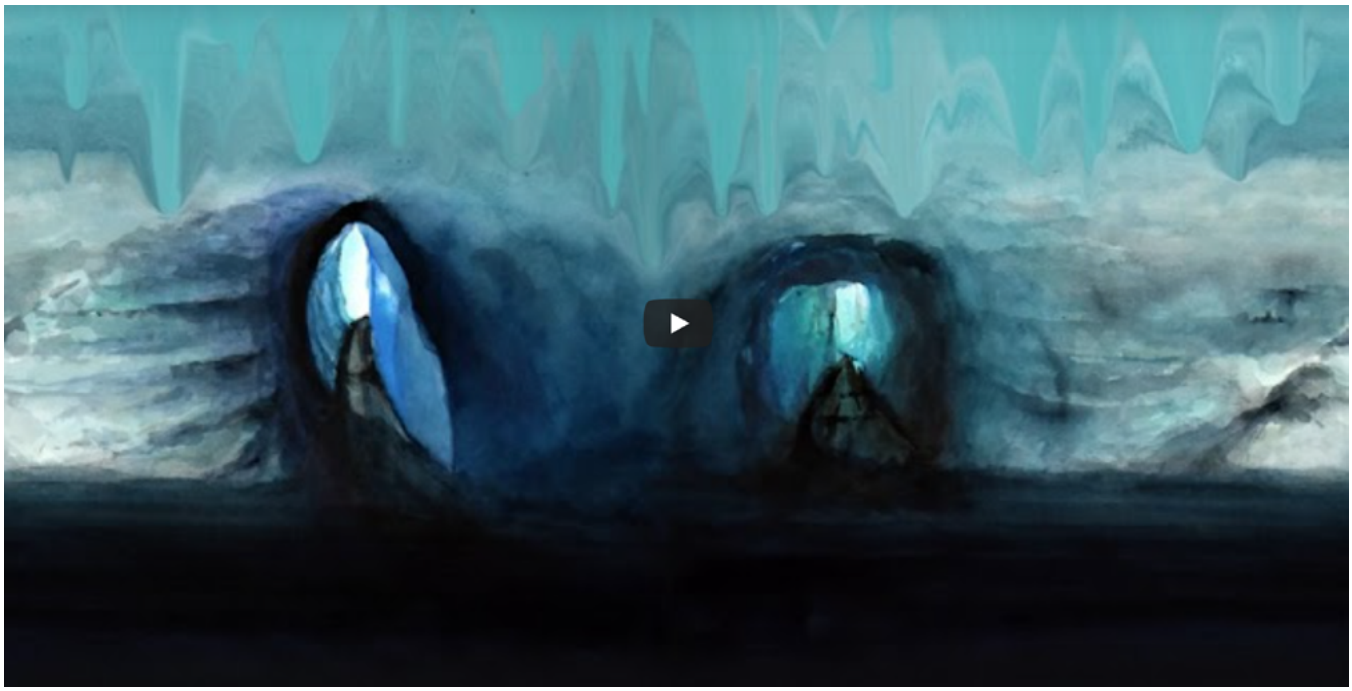
Emily Dzieweczynski
651.261.0366
edzieweczynski@gmail.com
emilydz.com

Rhöne Glacier

Presidental Collaborative Research grant from
Gustavus Adolphus College
2018-2019

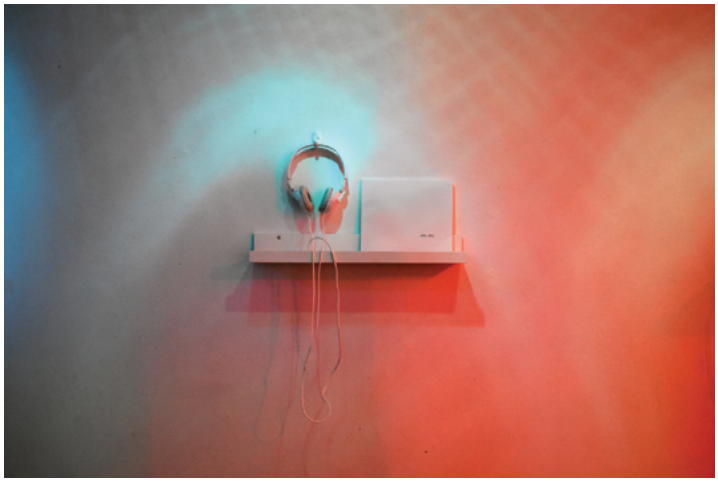
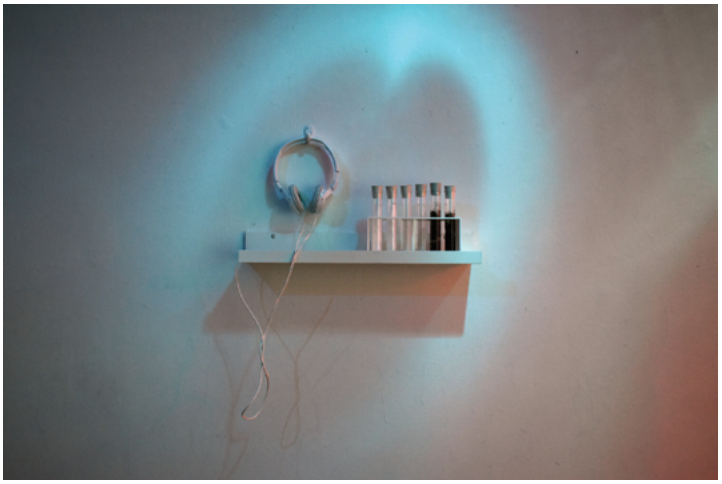
Still from 0 °C, -3 °C, multisensory gallery installation at the 410 Project, 2019

The collaborative research of Associate Professor Betsy Byers and Emily Dzieweczynski works to promote empathy between living beings and the natural environment by creating artistic immersive and sensory spaces. Funded by a Presidential Collaborative Research grant from Gustavus Adolphus College, the team used both sensory and glaciological data from the receding Rhöne Glacier in Oberwald, Switzerland as a starting point. With this glaciological data paired with neurobiological research on empathy, the team hypothesized that creating 1.) an immersive environment and 2.) a sensory experience of the glacier could produce the strongest empathetic response. An immersive environment was created using virtual reality, a medium selected because of its studied success in provoking empathy. The team studied both the sensory qualia of the glacier and our neurobiological processing of the stimuli to create sensory spaces. Through these immersive environments, education, and community outreach, the work aims to bring attention to climate change and to create an altruistic attitude through empathy with the natural environment.

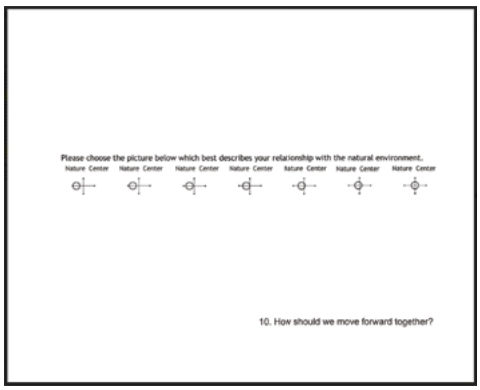


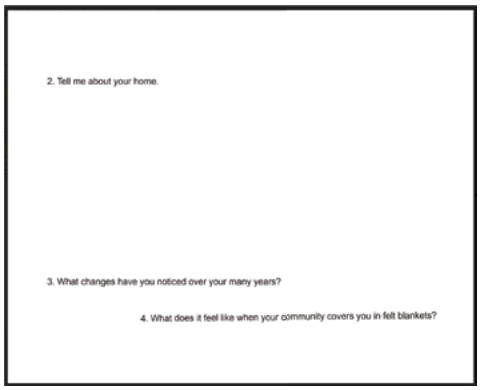
Still from Melt, 360° Video, 1 min, 2019
Link to full video here.

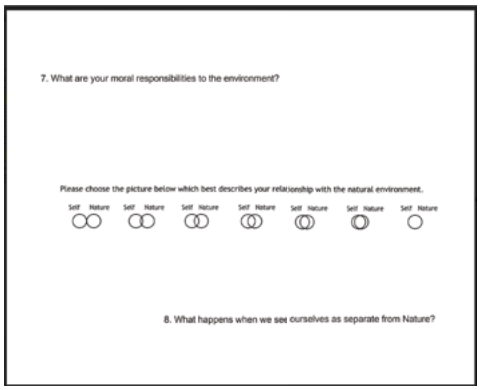
Still from Rhöne:1980-2011, 360° Video, 2 min, 2018
Link to full video here.

Stills from 0 °C, -3 °C, multisensory gallery installation at the 410 Project, Mankato, MN, 2019
Pictured: Audio is paired with an artist book (left), audio is paired with scents (right)
Link to paired audio here.







Pages from 0 °C, -3 °C, book, 2019
Link to full book here.

Research was presented as a culminating exhibition, 0 °C, -3 °C, at the 410 Gallery in Mankato, MN

Stills from 0 °C, -3 °C, multisensory gallery installation at the 410 Gallery, Mankato, MN, 2019

Presentation of research at the American Swedish Institute at the event “Climate Changed: Facing Our Future,” Minneapolis, MN, 2019

Presentation of research at the Minnesota State Capitol at the event “Scholars at the Capitol,” St. Paul, MN, 2019

Cayambe, Ecuador

Collaborative National Science Foundation grant no. 1758854, “Determining the eco-hydrogeologic response of tropical glacial watersheds to climate change: an integrated data approach”
2019-2021

Stills from Reservoir, multimedia installation, Rosalux Gallery, Minneapolis, MN, 2020

As a collaborative team, Betsy Ruth Byers and Emily Dzieweczynski pair glaciological and psychological research to create interactive and immersive art spaces that promote empathy between humans and the environment. Their current work employs virtual reality and sensory stimuli to place viewers in distressed environments of receding glaciers. This research explores the impact of climate change on the hydrological system at Volcán Cayambe in Ecuador. Byers and Dzieweczynski use auditory, olfactory, and visual characteristics observed at the Hermoso glacier on Cayambe during a National Science Foundation research trip in June of 2019 to offer viewers a bodily experience of the tropical glacier.

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Co-PI's:
G. -H. Crystal Ng, Ph. D., Assistant Professor, Department of Earth Sciences, University of Minnesota, Twin Cities, MN (Gene-Hua)

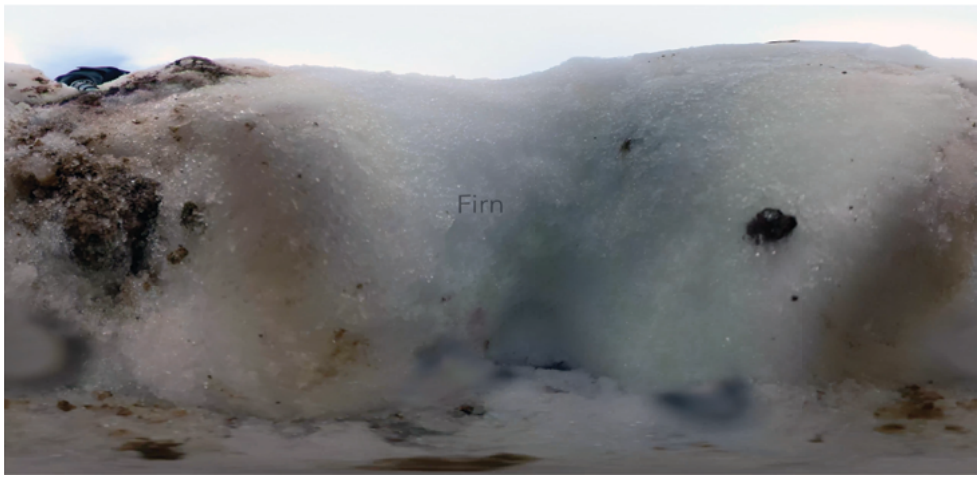
Dr. Daniel E. Stanton, Research Assistant Professor, Ecology, Evolution, and Behavior, University of Minnesota, Twin Cities, MN

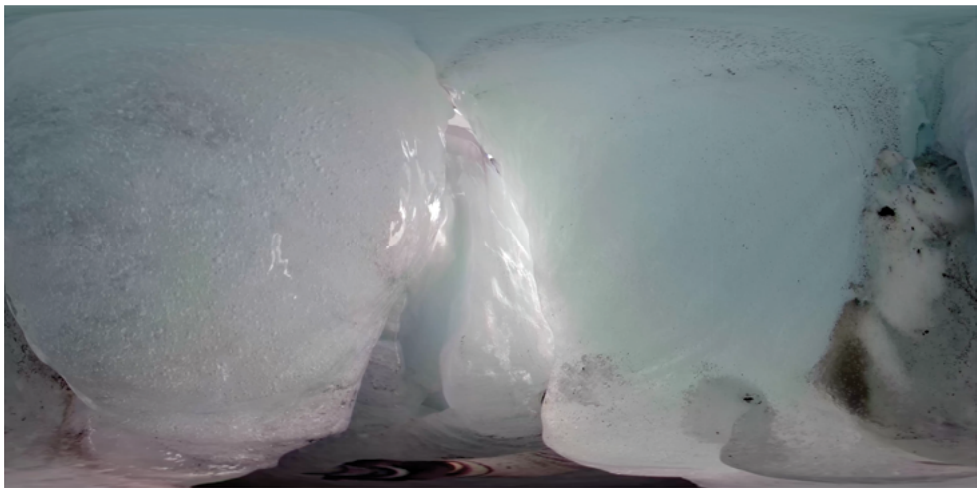
Andrew D. Wickert, Ph. D., Assistant Professor, Department of Earth Science, University of Minnesota, Twin Cities, MN

Jeff La Frenierre, Ph. D., Assistant Professor, Department of Geography and Environmental Studies, Gustavus Adolphus College, St. Peter, MN

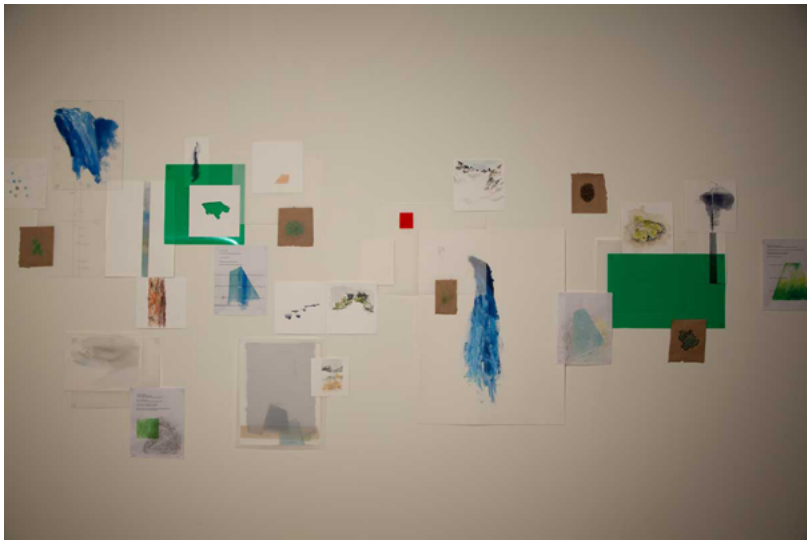
Li Li, Ph. D., Associate Professor, Department of Civil and Environmental Engineering, Penn State University, PA

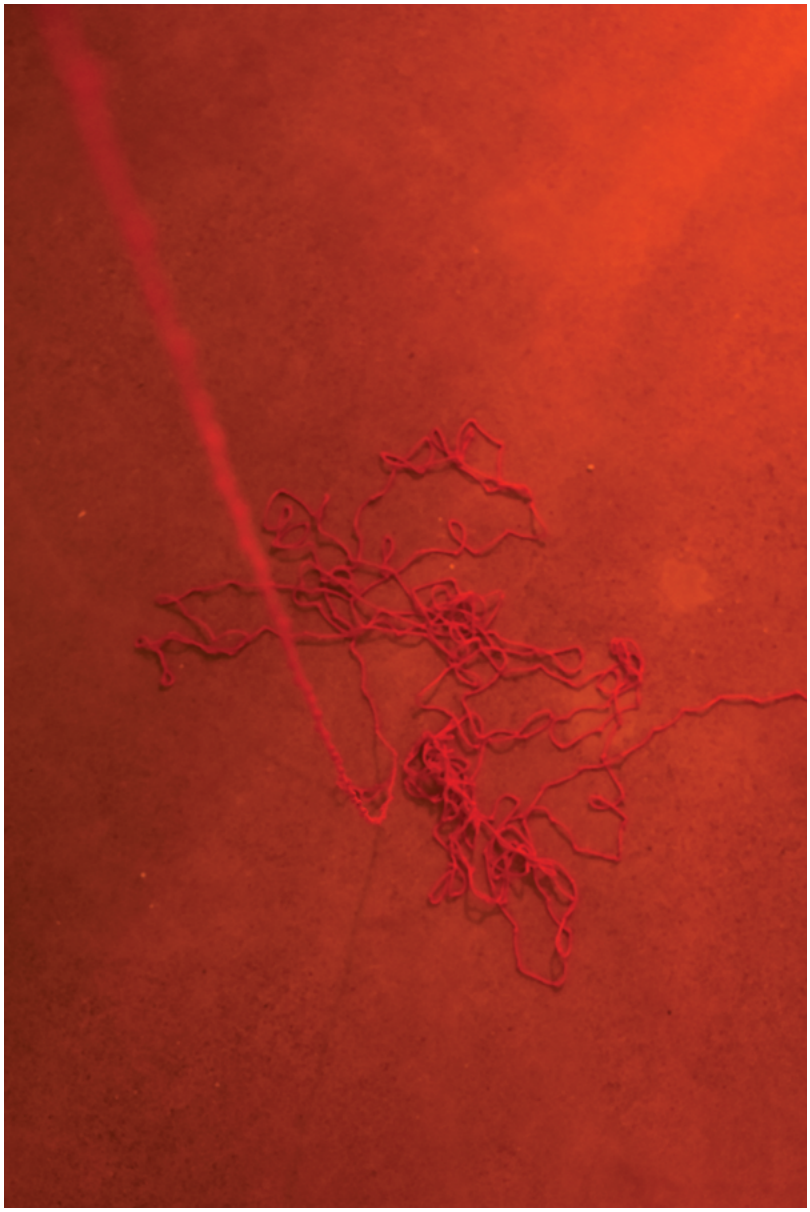
Images from field research in Cayambe, Ecuador, June 2019



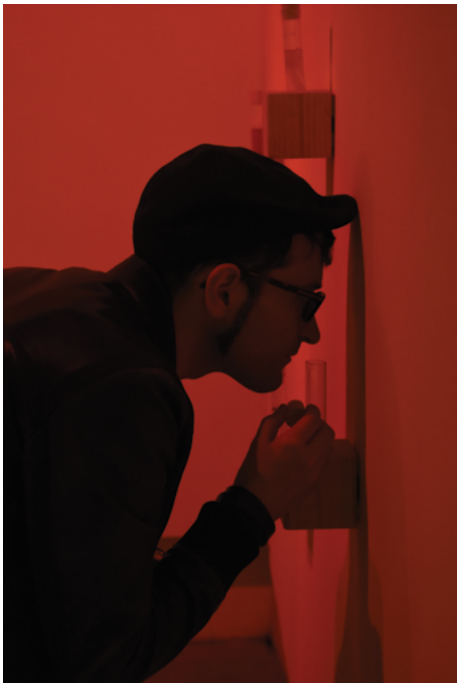


Stills from *Cayambe, Ecuador*, 360° Video, 3:30 min, 2019
Link to full video here.

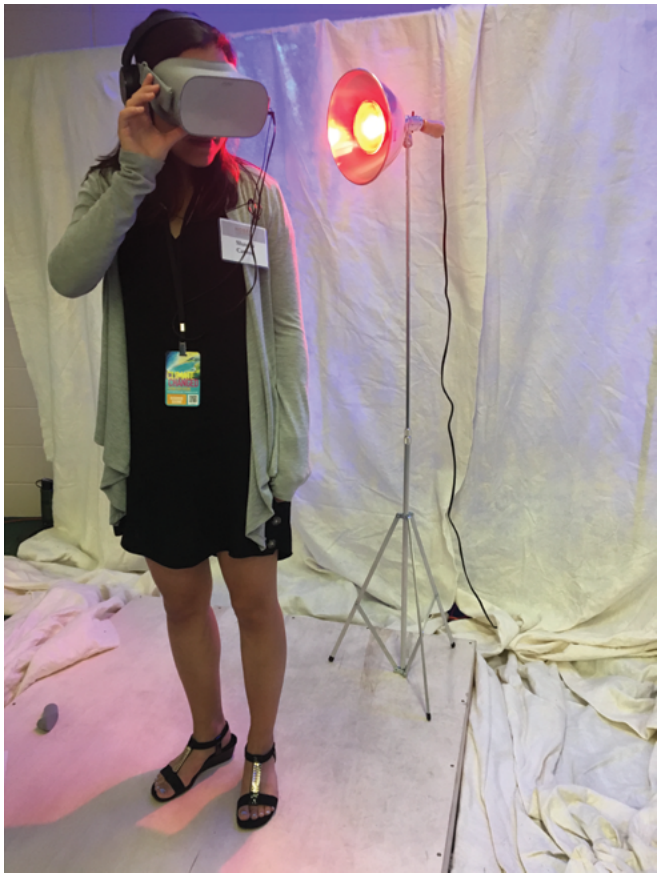


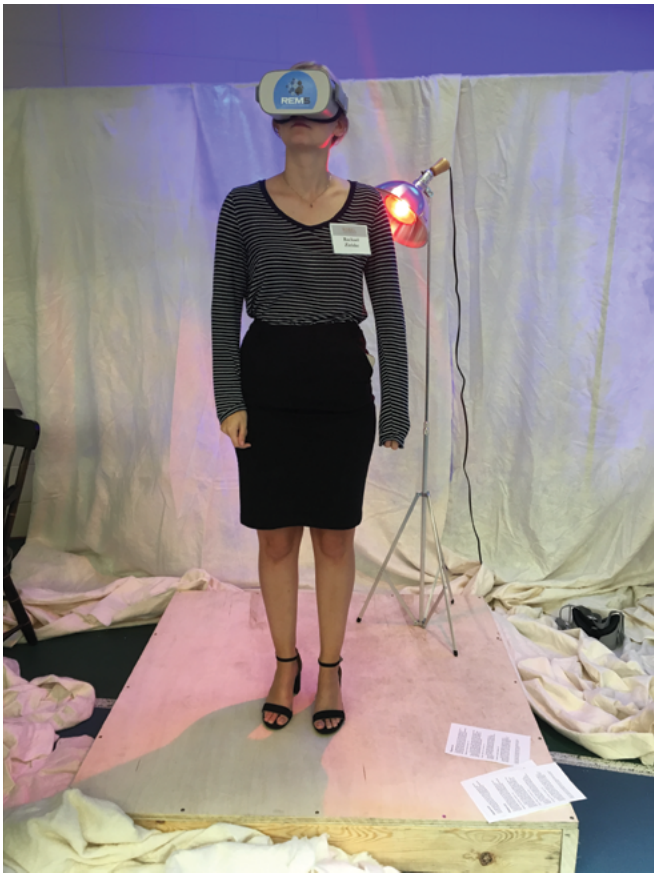


Stills from Reservoir, multimedia installation, Rosalux Gallery, Minneapolis, MN, 2020



Stills from Reservoir, multimedia installation, Rosalux Gallery, Minneapolis, MN, 2020
Link to paired audio here.





Presentation of research at Nobel Conference 55: Change changed, Gustavus Adolphus College, St. Peter, MN, 2019