

Elizabeth Hillary Case

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Pronoun: she/her

Research Experience

Graduate Student at Columbia University (Polar Geophysics)

2017 – present

- I deploy and analyze phase-sensitive radar to measure firn compaction to help constrain mass change estimates across ice sheets and glaciers
- Co-leading phase-sensitive radar deployment on the GHOST team of the International Thwaites Glacier Consortium (ITGC)

The Erickson Lab at Cornell University (UAVs and Neural Networks)

2015 – 2017

- **Lead researcher** on project using UAVs and convolutional neural networks to monitor mosquito habitat

Papers

1. **Case, E.**, Kingslake J. *Phase-sensitive radar as a tool for measuring firn densification. (Paper in prep)*
2. Das, I., MacGregor, J., Schelgel, N., Larour, E., Poinar, K., Noel, B., Alexander, P., **Case, E.** *Evolving Centennial-Scale Snow Accumulation Rates Across Greenland from Operation IceBridge Accumulation Radar. (Paper in prep)*
3. **Case, E.**, Shragai, T., Harrington, L., Ren, Y., Morreale, S., Erickson, D., *Evaluation of Unmanned Aerial Vehicles and Neural Networks for Integrated Mosquito Management of Aedes albopictus (Diptera: Culicidae)*. Journal of Medical Entomology. May 2020. <https://doi.org/10.1093/jme/tjaa078>

Presentations

1. Boucher, A., Rand, C.F., Bellamy, K., Che, Y., Høien, J., Johansen, N., Reahl, J.N. **Case, E.** and Dennis, D. "Outcrop-scale Estimates of Fracture Density Using Structure from Motion on the Juneau Icefield" (AGU 2019)
2. **Case, E.**, Kingslake J. "Firn Compaction: Models and Measurements" (IGS Radioglaciology, 2019)
3. **Case, E.**, Kingslake J. "Phase-sensitive radar for measuring firn compaction." (AGU, 2018)
4. **Case, E.**, Kingslake, J. "Phase-sensitive radar: a new tool for measuring firn compaction." (IGS, 2018)
5. **Case, E.**, Shragai, T., Ren, Y., Harrington, L., Morreale, S., Erickson, D. "MosquitoNet: Investigating the use of UAVs and Neural Networks in Integrated Mosquito Management" (AGU, 2017)
6. Woods-Robinson, R., **Case, E.** "Cycle for Science: Adventure-based science education" (Poster at AGU, 2017)

Invited Talks

1. "Firn compaction and meltwater percolation: ApRES, Antarctica, and JIRP." Dartmouth Ice and Climate Seminar Series. July 2020.
2. "Observing firn compaction to inform altimetry corrections." NASA GISS Sea Level Rise Seminar. August 2020.

Professional Experience

Cycle for Science co-founder

2014 – present

3. Co-founded an award-winning program that ties science outreach with outdoor adventures
4. Reached 2000+ students in creative, hands-on lessons during 3-month and 1-week trips bicycling across the United States (2015) and upstate New York (2019)
5. Ran two crowdfunding campaigns that raise > \$13000

Science, Environment and Agriculture Journalist

2014 – 2015

6. Data-driven reporter at the cross-section of environment and agriculture in drought-torn Yolo County

Education

Columbia University

2017 – 2021

Earth and Environmental Science, PhD student

Adviser: Jonathan Kingslake

Cornell University

Mechanical Engineering, Masters (GPA: 3.8)

2015 – 2017

University of California, Los Angeles

Physics, B.S. (GPA: 3.6)

2009 – 2014

Awards, Fellowships, and Professional Licenses

NSF Graduate Research Fellowship (2016-2021)**AGU Centennial Grant (2019)** \$4900 grant for Cycle for Science**Chevron Student Initiative Fund (2019)** \$1500 for research on the Juneau Icefield**Creative Climate Awards (2019)****AGU Outstanding Student Presentation Award (2019)****Columbia Graduate School of Arts and Sciences Conference Award (2018)****IGS Travel Fellowship (2018)****AGU Student Travel Fellowship (2017)****Dean's Fellowship, Columbia University (2017)****SHIFT Emerging Leaders Program (2016)** inaugural selection of under-35 conservation leaders**First place in Enterprise News Series (2016)** for 4-part series "Putah Creek Legacy"**First place in Agricultural Reporting (2015)** for story on olive industry in Yolo County**AAAS Mass Media Science and Engineering Fellow (2013)** at The Oregonian**National Science Foundation Research Experience for Undergraduates (2012)** at SRI International in Menlo Park**Teaching Experience**

Teaching Assistantship

7. Earth: Origins, Evolution, Processes, Futures (UN 1011). Columbia University.
8. Earth's Environmental Systems: the Climate System (UN 2100). Columbia University.
9. Mechanics of Engineering Materials (MAE 3270). Cornell University.

Spring 2020

Spring 2019

Fall 2016

2017

Teaching as Research Fellow

- Investigated stress triggers and reductions for new graduate teaching assistants

Graduate Teaching Specialist

- Design and teach curriculum to train 150+ new engineering teaching assistants

2016-2017

Select Outreach and DEI Work

Science Education Invited Talks:

- "Adventures in Crowdfunded Science Outreach." Materials Research Society Conf. (Phoenix, AZ)
- "Sol-Cycle 2.0: teaching science with recyclables" Science Teachers Association of New York State Conf. (Rochester, NY)

2016

2016

Outreach 2017-2020

- Cycle for Science: Glaciers: a one-week, 120-mile bicycle ride up the Hudson Valley, New York to teach 200+ students about glaciation and how it shapes the land.
- Case, E. and Mirsky, S. "Warming on Thin Ice" *Scientific American*.
- Glaciers and glaciation in the Hudson Valley for the Lyceé Français de New York
- Lamont Doherty Open House

2019

2019

2019, 2020

2017, 2018, 2019

Community at Lamont-Doherty Earth Observatory

- Professional Conduct Committee
- Graduate Student Committee
- Chevron Student Initiative Fund Committee
- Organized and led IPCC Reading Seminar

2019-present

2018-present

2019-2020

2019

Professional Societies & Memberships

Association of Polar Early Career Scientists
American Geophysical Union
American Alpine Club
International Glaciological Society

Workshops

Karthaus (September 2018)
IDDO Shallow Core Training (June 2018)

Field Experience

Juneau Icefield, Alaska July-August 2019
10. Geophysics faculty member teaching ground-penetrating radar and ice dynamics at the Juneau Icefield Research Program

Juneau Icefield, Alaska July-August 2018
11. Used phase-sensitive radar to measure firn compaction on 91-point, 9 km² grid, flow and bed topography at the icefield divide
12. Took shallow firn cores (total of 80m) and photos / videos with UAV for photogrammetry

Denali National Park, Alaska August 2016
13. Measured GPS at stakes embedded in the ice, part of a larger ice monitoring project

Skills and Hobbies

Languages

Spanish (conversational)
German (beginner)

Programming

Matlab (proficient)
Python (proficient)
R (intermediate)

Music

Banjo (intermediate)
Fiddle (beginner)

Outdoors

Climbing (led > 10 trips in 2019)
Cycle touring