

Ash L. Gilbert

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Dept. of Atmospheric & Oceanic Sciences, University of Colorado-Boulder, Boulder, CO 80309

EDUCATION

University of Colorado, Boulder

Ph.D., Atmospheric and Oceanic Sciences

Candidacy Exam

M.S., Atmospheric and Oceanic Sciences

Boulder, CO

Expected April 2027

2024

2025

University of Michigan

B.S.E. with Honors, *summa cum laude*

Major: Climate & Meteorology, concentration in Meteorology

Minors: Computer Science & Latin

Ann Arbor, MI

2022

AWARDS & HONORS

ATOC Student Service Award

2025

CIRES Graduate Student Research Award

2025 – 2026

ESSS Conference – Best Poster in Aerosols, Clouds, and Precipitation Session

2023

NSF Graduate Research Fellowship

2022 – 2025

RESEARCH INTERESTS

- polar cloud processes
- Community Earth System Model (CESM)
- Arctic climate
- wind nudging
- climate model development
- internal climate variability
- climate change attribution
- atmosphere-sea ice interactions

RESEARCH EXPERIENCE

University of Colorado, Boulder

Graduate Research Assistant, Advisor: Jennifer E. Kay

Boulder, CO

2022 – Present

Project 1 (2023 – 25):

- Collaborators: Penny Rowe
- Evaluated the impact of supercooled liquid water optical properties on the Arctic climate via a hierarchy of climate models (CESM), ordered by level of dynamical constraint
- Identified a substantial effect from the optics in constrained dynamical models, but not in dynamically unconstrained models
- Proposed this model hierarchy as a method to assess the effect of model physics changes on a model climate
- First-author manuscript of this project has been published

Project 2 (2024 – 2025):

- Collaborators: Edward Blanchard-Wrigglesworth, Marika M. Holland, David A. Bailey, Alexandra Jahn, and David P. Schneider
- Assessed the contribution of winds to recent Arctic warming and sea ice loss using wind nudging in CESM and comparing to observations and the pre-industrial CESM control
- Evaluated the change in wind contribution for an increase and decrease in mean state sea ice thickness

- Developed a tuned version of CESM2 that has a pre-industrial climate and modern-day mean state sea ice
- First-author manuscript of this project has been published

- Collaborators: Edward Blanchard-Wrigglesworth
- Assessed the contribution of winds, greenhouse gases, and aerosols to recent Arctic warming and sea ice loss using wind nudging in CESM and single-forcing attribution framework
- Evaluated the performance of new wind nudging runs against observations and large ensemble runs
- First-author manuscript of this project was submitted in summer 2026

- Collaborators: H  l  ne Chopfer
- Analyzing precipitation from EarthCARE Cloud Profiling Radar to understand additional information gained from EarthCARE's increased vertical resolution
- Project is still being scoped, but will likely focus on the Great Lakes region or the Arctic

- Collaborators: William Chapman and Ian Eisenman
- Theoretical modeling project designed to probe how wind nudging affects a coupled climate model

Research Assistant, Advisor: Jeremy N. Bassis

- Determined the controls on supraglacial lake formation through observational analysis and modeling to further knowledge of ice sheet ablation
- Identified the observed spatio-temporal patterns in supraglacial lake formation and air temperature with ArcGIS
- Modeled how supraglacial lakes drain to replicate observed patterns using Python software and ArcGIS
- Presented poster on work in 2020 and 2021 at national conference for American Geophysical Union
- Participated in weekly lab meetings discussing relevant research papers and professional development topics
- Wrote and submitted a research paper for publication from this project (rejected)

Research Assistant, Advisor: Christiane Jablonowski

- Analyzed a case study of lake effect snow forecasting for the UFS-SRW model coupled to the FV3COM, a lake dynamics model
- Ran various configurations of the coupled UFS-FV3COM model on the NCAR Cheyenne supercomputer
- Compared model results to reanalysis data and snow accumulation observations to evaluate model skill
- Contributed to manuscript that included this case study, which is in review

- Worked under a mentor to find the influence of temperature dependence of cloud optical properties on simulated IR flux
- Received anti-discrimination, anti-harassment, DEI, and research ethics training through a series of professional development seminars provided by NSF

- Gave research talk as final part of the REU
- Presented poster on work in 2021 at national conference for American Meteorological Society

University of Michigan

Kangerlussuaq, Greenland

Field Expedition Member, Lead: Perry Samson

2019

- Gained significant field research experience by working with team of students and professors to conduct multiple experiments involving stream flow, net solar radiation, PIBAL and rawinsonde launches, air quality, and 3D-scanning with drones
- Led and trained sub-team responsible for radiosonde launches

University of Michigan

Ann Arbor, MI

Research Assistant, Advisor: Perry Samson

2018 – 2019

- Wrote Python program that accessed a data bank of HY-SPLIT trajectories and retrieved trajectories corresponding to high or low ^{18}O values, then ran trajectory coordinates through a probability distribution function to produce a map that described where air with a high or low ^{18}O likely originated in order to find moisture sources for the UMBS using Python
- Concluded project by writing a summary paper and giving a poster presentation

University of Michigan

Ann Arbor, MI

Research Assistant, Advisor: Phoebe Aron

2018 – 2019

- Interpolated meteorological, hydrological, and isotopic data with ArcGIS tools
- Developed and evaluated multiple procedures for calculating statistics of watersheds with ArcGIS tools
- Maintained and updated database of meteorological and isotopic information with SQL for Southern Peru
- Performed linear regression analysis on reanalysis datasets and isotope data using MATLAB
- Assisted PhD student relating to their study of hydrology in the Peruvian Andes by completing a variety of small research projects

TEACHING EXPERIENCE

University of Colorado, Boulder

Graduate Teaching Assistant, Climate Modeling Lab

Fall 2026

University of Michigan

Instructional Aide, Earth and Space System Evolution

Fall 2021

Collaborator, Melting Ice Rising Seas Teach-Out

Fall 2019 – Spring 2020

SERVICE

Journal Reviewer

Geophysical Research Letters

University of Colorado, Boulder

ATOC REU

Summer 2024

- Mentored an undergraduate student for a summer research project
- Gave technical and career advice

RECCS Program

Summer 2023

- Co-mentored an undergraduate student for summer research project with another graduate student
- Gave technical help

Prospective Student Committee

2023 – Present

- Helped organized prospective student visits in the spring
- Mentorship Committee 2023 – Present
- Participated as a mentor in the Graduate Application Mentorship program in Fall 2022-26
 - Mentored several students each year applying to the department by giving advice and reviewing personal statements
 - Co-led Graduate Application Mentorship program in Fall 2023-26
 - Matched mentor graduate students to mentee applying students
- Technology Committee 2022 – 2024
- Made improvements to department website including removal of old links and addition of photos and personal website links to graduate student pages
 - Advocated for committee to have department website access to make regular updates

University of Michigan

- Engineering Honors Graduate School Panel 2023 – 2025
- Served on five graduate school informational panels for seniors in the Engineering Honors program
 - Answered questions about the graduate school application process and graduate school life

COMPUTER SKILLS

- | | |
|---------------------------------------|-----------------------------------|
| • Python | • Unified Forecast System (UFS) |
| • Jupyter | • Autodesk Inventor |
| • C++ | • Adobe Illustrator |
| • SQL | • Microsoft PowerPoint |
| • MATLAB | • LaTeX |
| • Fortran90 | • GitHub |
| • Community Earth System Model (CESM) | • Message-Passing Interface (MPI) |
| • ArcGIS | • OpenMP |
| | • OpenACC |

LANGUAGES

Latin (reading knowledge)

PROFESSIONAL ASSOCIATIONS

American Geophysical Union
 American Meteorological Society
 Out in STEM

PUBLICATIONS

Submitted

Gilbert, A.L., Kay, J.E., and Blanchard-Wrigglesworth, E. Internal and anthropogenic contributions to recent (1950-2024) Arctic temperature and sea ice change. *Environmental Research: Climate*.

In review

Wright, D.M., Jablonowski, C., Fujisaki-Manome, A., Mroczka, B., **Gilbert, A.**, Titze, D., Mann, G.E., Anderson, E.J. The Sensitivity of Lake-Effect Snowfall to Changes in Lake Surface Conditions Across the Forecast Horizon in the Unified Forecast System's Short-Range Weather Application (UFS-SRW). *Monthly Weather Review*.

Gale, S., Fu, Q., Wang, H., Blanchard-Wrigglesworth, E., Wang, M., **Gilbert, A.**, Sweeney, A.J., and Po-Chedley, S. Why April Stands Out: Monthly Impacts of Internal Variability on Arctic Amplification. *Journal of Geophysical Research: Atmospheres*. Preprint (<https://doi.org/10.22541/essoar.15002817/v1>).

Published

Gilbert, A.L., Kay, J.E., Blanchard-Wrigglesworth, E., Bailey, D.A., Holland, M.M., Jahn, A., and Schneider, D.P. (2025). Observed winds alone cannot explain recent Arctic warming and sea ice loss. *Environmental Research: Climate* 4(4), 045009. <https://doi.org/10.1088/2752-5295/ae11cb>.

Gilbert, A., Kay, J.E., and Rowe, P. (2025). A novel model hierarchy isolates the limited effect of supercooled liquid cloud optics on infrared radiation. *Geoscientific Model Development* 18(19), 7185-7197. <https://doi.org/10.5194/gmd-18-7185-2025>.

Jonko, A., Oliveto, J., Beaty, T., Atchley, A., Battaglia, M.A., Dickinson, M.R., **Gilbert, A.**, Godwin, D., Kupfer, J.A., Hiers, J.K., Hoffman, C., North, M., Restaino, J., Sieg, C., and Skowronski, N. (2024). How will future climate change impact prescribed fire across the contiguous United States? *npj Climate and Atmospheric Science* 7(1), 1-10. <https://doi.org/10.1038/s41612-024-00649-7>.

Snide, C.E., **Gilbert, L.**, Meyer, A., Samson, P., Flanner, M., and Bassis, J. (2020). Seeing the Greenland Ice Sheet through students' eyes. *Eos*, 101. <https://doi.org/10.1029/2020EO139739>.

PRESENTATIONS

Seminars

Gilbert, A. Influence of winds and sea ice thickness on recent Arctic warming and sea ice loss. UCLouvain Earth and Life Institute: Climate. Louvain-la-Neuve, BE. June 2026.

Gilbert, A., Kay, J., Blanchard-Wrigglesworth, E., Bailey, D.A., Holland, M.M., Jahn, A., and Schneider, D. Observed Winds Alone Cannot Explain Recent Arctic Warming and Sea Ice Loss. Atmospheric and Oceanic Sciences Colloquium. Boulder, CO. September 2025.

Talks

Gilbert, A., Kay, J., and Blanchard-Wrigglesworth, E. Attribution of Recent Arctic Warming and Sea Ice Loss in the Context of the Observed Winds. UCAR, Boulder, CO. June 2026.

Gilbert, A., Kay, J., Blanchard-Wrigglesworth, E., Bailey, D.A., Holland, M.M., Jahn, A., and Schneider, D. Observed Winds Alone Cannot Explain Recent Arctic Warming and Sea Ice Loss. Climate and Cryosphere (CliC) Conference. Wellington, NZ. February 2026.

Gilbert, A., Kay, J., Blanchard-Wrigglesworth, E., Bailey, D.A., Holland, M.M., Jahn, A., and Schneider, D. Isolating the Contribution of Observed Winds to Recent Arctic Warming and Sea Ice Loss. Community Earth System Model (CESM) Workshop. UCAR, Boulder, CO. June 2025.

Gilbert, A., Kay, J., Blanchard-Wrigglesworth, E., Schneider, D. Isolating the Contribution of Observed Winds to Recent Arctic Warming and Sea Ice Loss. AMS Denver Summit 2025. AMS Denver Summit, Denver, CO. May 2025.

Gilbert, A., Kay, J., Blanchard-Wrigglesworth, E., Schneider, D. What controls the rapid Arctic warming since 1980? International Conference on Arctic Research Planning (ICARP IV) at Arctic Science Summit Week 2025. Boulder, CO. March 2025.

Gilbert, A., Kay, J., Blanchard-Wrigglesworth, E., Schneider, D. Isolating the Contribution of Observed Winds to Recent Arctic Warming and Sea Ice Loss. Land Ice and Polar Climate Working Group Meeting 2025. NCAR, Boulder, CO. March 2025.

Gilbert, A., Kay, J., and Rowe, P. Isolating the Influence of Temperature-dependent Cloud Optics on Infrared Radiation within a Model Hierarchy. Polar Radiant Energy in the Far InfraRed Experiment (PREFIRE) Science Team Meeting. Boulder, CO. August 2024.

Gilbert, A., Kay, J., and Rowe, P. Isolating the Influence of Temperature-dependent Cloud Optics on Infrared Radiation within a Model Hierarchy. Community Earth System Model (CESM) Workshop. UCAR, Boulder, CO. June 2024.

Gilbert, A. and Kay, J., A Breakdown of Arctic Warming. Land Ice and Polar Climate Working Group Meeting 2024. NCAR, Boulder, CO. February 2024.

Posters

Gilbert, A., Kay, J., and Chepfer, H. An Observational Constraint on Future Greenland Precipitation Based on New Data from EarthCARE. AMS Madison Summit. Madison, WI. August 2026.

Gilbert, A., Kay, J., Blanchard-Wrigglesworth, E., Bailey, D.A., Holland, M.M., Jahn, A., and Schneider, D. Observed Winds Alone Cannot Explain Recent Arctic Warming and Sea Ice Loss. Earth System and Space Science (ESSS) Conference. Boulder, CO. December 2025.

Gilbert, A., Kay, J., Blanchard-Wrigglesworth, E., Schneider, D. What controls the rapid Arctic warming since 1980? American Geophysical Union (AGU) Abstracts. A33B-1975. Washington, DC. December 2024.

Gilbert, A., Kay, J., Blanchard-Wrigglesworth, E., Schneider, D. Isolating the Contribution of Observed Winds to Recent Arctic Warming and Sea Ice Loss. Earth System and Space Science (ESSS) Conference. Boulder, CO. December 2024.

Gilbert, A., Kay, J., Blanchard-Wrigglesworth, E., Schneider, D. Isolating the Contribution of Observed Winds to Recent Arctic Warming and Sea Ice Loss. Graduate Climate Conference (GCC). Pack Forest, Eatonville, WA. November 2024.

Gilbert, A., Kay, J., and Rowe, P. Isolating the Influence of Temperature-dependent Cloud Optics on Infrared Radiation within a Model Hierarchy. Cloud Feedback Modeling Intercomparison Project (CFMIP) Meeting. Boston College, Boston, MA. June 2024.

Gilbert, A., Kay, J., and Rowe, P. Isolating the Influence of Temperature-dependent Cloud Optics on Infrared Radiation within a Model Hierarchy. Polar Amplification of Climate Change Across Hemispheres and Seasons: Causes and Constraints Workshop. UCAR, Boulder, CO. January 2024.

Gilbert, A., Kay, J., and Rowe, P. Isolating the Influence of Temperature-dependent Cloud Optics on Infrared Radiation within a Model Hierarchy. Earth System and Space Science (ESSS) Conference. Boulder, CO. December 2023.

Gilbert, A. and Kay, J. Impact of Temperature Dependent Cloud Optical Properties on Modeled Infrared Radiation. Gordon Research Conferences (GRC) 2023 Radiation and Climate. Bates College, Lewiston, ME. July 2023.

Gilbert, L. and Bassis, J. Observing and Modeling Drainage Networks from Supraglacial Lakes on Russell Glacier, West Greenland. American Geophysical Union (AGU) Abstracts. C151C-0809. Virtual. December 2021.

Gilbert, L., Rowe, P., Fergoda, M., Neshyba, S. Influence of Temperature Dependence of Cloud Optical Properties on Simulated IR Flux at South Pole, Antarctica. American Meteorological Society (AMS) Abstracts. 136. Virtual. January 2021.

Gilbert, L. and Bassis, J. Observing and Modeling Drainage Networks from Supraglacial Lakes on Russell Glacier, West Greenland. American Geophysical Union (AGU) Abstracts. C061-0011. Virtual. December 2020.

Gilbert, L., Aron, P., Samson, P., Poulsen, C. Ensemble Probability Program for Backward Trajectories from the University of Michigan Biological Station (UMBS) based on the Relative Abundance of $\delta^{18}\text{O}$. Michigan Geophysical Union (MGU) Symposium. Ann Arbor, MI. April 2019.

REFERENCES

Jennifer E. Kay, PhD
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Edward Blanchard-Wrigglesworth, PhD
Research Associate Professor
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