

Clare B. Gaffey

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Education

Ph.D. Geography Clark University, August 2024.

Committee members: Drs. Karen Frey (chair), Lyndon Estes, John Rogan, Lee Cooper.

M.A. Geography Clark University, 2022.

M.A. Geography, Concentration in Geographical Information Science University at Albany, SUNY, 2018.

Committee members: Drs. Andrei Lapenis (chair), Alexander Buyantuev, George Robinson.

B.S. Environmental Science, Concentration in Biology University at Albany, SUNY, 2012. *Magna Cum Laude*.

Professional Experience

PA2F-International Arctic Science Committee (IASC) Marine Working Group Fellow

Polar Initiative funded by the Prince Albert II of Monaco Foundation. 2025-present.

College of Earth, Ocean and Atmospheric Sciences, Oregon State University, Postdoctoral Scholar

SCOPE-Gradients funded by the Simons Foundation (Life Sciences). 2025-present. PI: Dr. Laurie Juranek.

Department of Environmental Studies, College of the Holy Cross, Visiting Assistant Professor

ENVS125-03 *Introduction to Climate Change*, ENVS117-03 & 04 *Environmental Science*, Fall 2024.

Department of Biology, College of the Holy Cross, Visiting Lecturer

BIOL117-03 & 04 *Environmental Science*, Fall 2023 & Spring 2024.

Graduate School of Geography, Clark University, Research Assistant

The Distributed Biological Observatory Project funded by NSF. 2019-2022. PI: Dr. Karen Frey.

RAPID: Impacts of Increased Light Transmittance on Ocean Heating, Primary Productivity, and Carbon Cycling

Across a Pacific Arctic Continental Shelf Gradient funded by NSF. 2022-2023. PI: Dr. Karen Frey.

College of Fisheries and Ocean Sciences, University of Alaska Fairbanks, Temporary Research Technician

Arctic Marine Biodiversity Observing Network. Fall 2020. PI: Dr. Katrin Iken.

Graduate School of Geography, Clark University, Teaching Assistant

GEOG119 *Arctic in the Anthropocene*, Fall 2018, GEOG104 *Earth System Science*, Spring 2019.

The Research Foundation of the University of Albany, SUNY, Research Assistant

Funded by NSF (MRI Award #1531511; IDBR Type A Award #1455544). 2016-2018. PI: Dr. Andrei Lapenis.

Publications

Gaffey CB, Bax N, Krauzig, N, Tougeron K. (2024) A call to strengthen international collaboration to assess climate change effects in polar regions. *PLOS Climate*, 3(10): e0000495.

<https://doi.org/10.1371/journal.pclm.0000495>

Gaffey CB, Frey KE, Cooper LW, Grebmeier JM. (2022) Phytoplankton bloom stages estimated from chlorophyll pigment proportions suggest delayed summer production in low sea ice years in the northern Bering Sea.

PLOS ONE, 17(7): e0267586. <https://doi.org/10.1371/journal.pone.0267586>

Gaffey CB, Bhardwaj A, Frey KE, Estes L. (2022). Polar and Cryospheric Remote Sensing Using sUAS. In: Konsoer, K., Leitner, M., Lewis, Q. (eds) sUAS Applications in Geography. Geotechnologies and the Environment, vol 24. Springer, Cham. https://doi.org/10.1007/978-3-031-01976-0_9

Gaffey C, Bhardwaj A. (2020) Applications of Unmanned Aerial Vehicles in Cryosphere: Latest advances and prospects. *Remote Sensing*, 12(6), 948; <https://doi.org/10.3390/rs12060948>

Gaffey C. (2018) Comparison of Remote Sensing Methods for Depicting Phenology of White Spruce (*Picea glauca*) and Other Coniferous Species. *ProQuest*, 978-0-438-33962-0.

Datasets

Gaffey CB. (2025). Phytoplankton pigments from discrete water samples collected from the Research Vessel Sikuliaq, Gulf of Alaska to Bering Sea, 2023. Arctic Data Center. doi:10.18739/A2RJ48X0F.

Frey KE & **Gaffey CB.** (2025). Optical measurements of light transmittance of the upper water column, United States Coast Guard Cutter (USCGC) Healy, Chukchi Sea to Central Arctic Ocean (2022). Arctic Data Center. doi:10.18739/A2XD0R056.

Gaffey CB & Frey KE. (2024). Phytoplankton pigments from discrete water samples collected from the rosette at specific depths, United States Coast Guard Cutter (USCGC) Healy, Chukchi Sea to Central Arctic Ocean, 2022. Arctic Data Center. doi:10.18739/A2TB0XX3S.

Grants and Awards

NSF Office of Polar Programs 2025-2026. Proposal titled *Collaborative Research: EAGER: Impact of freshwater input and stratification on ecological and biogeochemical regimes from shelf to basin in the Siberian Arctic* with C. Gaffey (Lead PI, Oregon State University), L. Jensen (PI, University of Washington), A. D'Angelo (PI, University of Rhode Island), and E. Chamberlain (PI, Woods Hole Oceanographic Institute). \$300,000 total; Gaffey portion \$75,000.

Polar Science Early Career Community Office Conference Travel Grant 2025-2026. \$440.

IASC Cross-Cutting and Working Group Call 2025. Proposal titled *Early Career Researcher Workshop for the Synoptic Arctic Survey 2* with C. Gaffey (Lead PI, Oregon State University), L. von Friessen (Linnaeus University), C. Goethel (University of Maryland), S. Sandy (University of Alaska Fairbanks), et al. €14,500.

NSF Navigating the New Arctic 2025. Arctic Observing Systems and Technology Working Group. \$750.

NSF Office of Polar Programs 2022-2024. Arctic Doctoral Dissertation Research Improvement Grant proposal titled *Doctoral Dissertation Research: Resolving Novel Arctic Late Season Phytoplankton Blooms*. \$60,120.

Travel Support to attend Arctic Science Summit Week 2024. IASC Marine Working Group. €1,500.

Coast Guard Arctic Service Medal 2023

Society of Woman Geographers Conference Travel Award 2023. \$500.

Graduate Student Council Skills Award 2022, 2023. Clark University. \$900.

US Geospatial Intelligence Foundation (USGIF) Doctoral Scholarship 2020, 2021. \$8,000.

Adrian Dahood-Fritz Memorial Fund 2021. Association of Polar Early Career Scientists (APECS). €1,000.

Early Career Funding to attend Arctic Science Summit Week 2021. IASC.

Edna Bailey Sussman Fund 2020. Proposal titled *The Effects of Novel Arctic Algae Double Blooms on Benthic Food Supply*. \$8,825.

Pruser Dissertation Enhancement Award 2020. Clark University. \$1,000.

Early Career Funding to present at the 2020 Polar Technology Conference. Arctic Research Consortium of the United States (ARCUS).

Travel Awards to present at the 2019 AAG Conference, 2023 AGU Fall Meeting. Clark University. \$700.

Libbey Enhancement Award 2018. Clark University. \$3,500.

Huyck Research Grant 2018. Edmund Niles Huyck Preserve, Inc. Proposal titled *Remote sensing of Picea glauca phenology*. \$2,000.

Conference Sessions Convened

Reigstad, M., Ashjian, C., Goethel, C., **Gaffey, C.**, Grebmeier, J. Responses of the Pan-Arctic Coupled Physical-Chemical-Biological System to ongoing Environmental Changes. *Ocean Sciences Meeting*. Glasgow, Scotland. March 2026.

Conference Presentations

Gaffey, C., Frey, K., Light, B., Cooper, L., Grebmeier, J. Evidence of Fresh Phytoplankton Growth and Heating Feedbacks During Fall in the Pacific Arctic. *Consortium for the Advancement of Marine Arctic Sciences Workshop*. Seattle, Washington. April 16, 2025.

Gaffey, C., Bax, N., Krauzig, N., Tougeron, K. Reaffirming International Commitment for Sustained Polar Research. *Arctic Science Summit Week*. Boulder, Colorado. March 26, 2025.

Goethel, C., **Gaffey, C.**, Grebmeier, J., Cooper, L., Frey, K., Moore, S.. Keeping curiosity alive: Maintaining early career participation in long-term Arctic ecosystem monitoring. *Arctic Science Summit Week*. Boulder, Colorado. March 26, 2025.

Gaffey, C., Goethel, C. Development of the Synoptic Arctic Survey Early Career Researchers Group. *Arctic Science Summit Week*. Boulder, Colorado. March 20, 2025.

Gaffey, C., Frey, K., Cooper, L., Grebmeier, J., Light, B. Characteristics of Light, Heat, and Chlorophyll-a in the Pacific Arctic During the Fall 2022 Synoptic Arctic Survey Cruise. *Ocean Sciences Meeting*. New Orleans, Louisiana. February 19, 2024.

Gaffey, C., Frey, K., Light, B., Cooper, L., Grebmeier, J. The Role of Fall Algal Blooms in Ocean Heating: Observations from the US Synoptic Arctic Survey. Poster presented at the *Alaska Marine Science Symposium*. Anchorage, Alaska. January 30, 2024.

Gaffey, C., Frey, K. Fall Light and Phytoplankton Bloom Observations during the U.S. Synoptic Arctic Survey. Poster presented at the *American Geophysical Union Fall Meeting*. San Francisco, California. December 14, 2023.

Grebmeier, J., Cooper, L., Goethel, C., Marx, B., **Gaffey, C.,** Silberberg, J., Tepper-Rasmussen, M. Benthic Studies during the 2022 US Synoptic Arctic Survey. *ISAR-7 Seventh International Symposium on Arctic Research*. Tachikawa, Japan. March 8, 2023.

Gaffey, C., Frey, K., Cooper, L., Grebmeier, J. Emerging capabilities of satellite ocean color and in-situ chlorophyll pigments to address algal phenology studies in the Bering Sea. Poster presented at the *Polar Marine Science Gordon Research Conference*. Ventura, California. March 7, 2023.

Gaffey, C., Frey, K., Cooper, L., Grebmeier, J. Synoptic Arctic Survey: Initial results of late season phytoplankton bloom progression in the Pacific Arctic. *Arctic Science Summit Week*. Vienna, Austria. February 28, 2023.

Grebmeier, J., Cooper, L., Goethel, C., Marx, B., **Gaffey, C.,** Silberberg, J., Tepper-Rasmussen, M. Benthic Studies During the 2022 US Synoptic Arctic Survey. *Alaska Marine Science Symposium*. Anchorage, Alaska. January 24, 2023.

Gaffey, C. (Invited), Frey, K., Cooper, L., Grebmeier, J. Emerging capabilities of satellite ocean color and in-situ chlorophyll pigments to address algal phenology studies in the Bering Sea.* Poster presented at the *United States Geospatial Intelligence Foundation GEOINT Symposium*. Denver, Colorado, April 24-27, 2022.

***Awarded second place for best poster.**

Gaffey, C., Frey, K., Cooper, L., Grebmeier, J. Phytoplankton Bloom Stage Estimated from Chlorophyll Pigments Suggest Delayed Summer Production in Low Sea Ice Years in the Northern Bering Sea. *Ocean Sciences Meeting 2022*. Virtual, Hawaii, February 27 - March 4, 2022.

Cooper, L.W., Grebmeier, J., Cooper, R., **Gaffey, C.,** Goethel, C., Maisch, J., Sandy, S., Shipton, P., Danielson, S., Iken, K. Late Season Observations of Productivity in the Northern Bering and Chukchi Seas: Initial Results from an October 2020 Research Cruise. *Arctic Science Summit Week 2021*. Virtual, Portugal, March 19-26, 2021.

Cooper, L.W., Grebmeier, J., Cooper, R., **Gaffey, C.,** Goethel, C., Maisch, J., Sandy, S., Shipton, P., Danielson, S., Iken, K. Late Season Observations in the Northern Bering and Chukchi Seas: Initial Results from an October 2020 Research Cruise. *Alaska Marine Science Symposium*. Virtual, Alaska, January 26-28, 2021.

Gaffey, C. (Invited). Bridging the gap: unmanned aerial vehicles for polar applications. *United States Geospatial Intelligence Foundation GEOINTegration Summit*. Virtual, Florida, September 28-29, 2020.

Gaffey, C., Bhardwaj, A. Recent emergence of unmanned aerial vehicles for cryosphere research. Poster presented at the *ARCUS 2020 Polar Technology Conference*. Boulder, Colorado, March 10-12, 2020.

Lapenis, A., Robinson, G., **Gaffey, C.,** Mencuccini, M., Buyantuev, A., Jiang, S. Linking Radial Growth Phenology to Reflection Indexes in Coniferous Species. *American Geophysical Union Fall Meeting*. San Francisco, California, December 11, 2019.

Gaffey, C., Lapenis, A., Buyantuev, A. Comparison of remote sensing methods for depicting phenology of *Picea glauca*; a case study for unmanned aerial vehicles. Poster presented at the *17th Annual Graduate Multidisciplinary Conference*. Worcester, Massachusetts, April 17, 2019.

Gaffey, C., Buyantuev, A., Lapenis, A. A comparison of white spruce phenology detected from ground, satellite, and drone's eye view. Poster presented at the *American Association of Geographers 2019 Annual Meeting*. Washington D.C., April 3-7, 2019.

Gaffey, C. Remote Sensing Methods of White Spruce Phenology. *New Trends in Information Science Research Conference*. Albany, New York, March 23, 2018.

Lapenas, A., Robinson, G., **Gaffey, C.** Wind speed affects measurements of vertical growth of mature *Picea glauca* and confounds seasonal correlations with radial growth. *American Association of Geographers 2017 Annual Meeting*. Boston, Massachusetts, April 5-9, 2017.

Orton, M., Robinson, G., Lapenas, A., **Gaffey, C.** Climate and links between spruce (*Picea*) stand phenology above and below ground. *American Association of Geographers 2017 Annual Meeting*. Boston, Massachusetts, April 5-9, 2017.

Buyantuev, A., Lapenas, A., Shiguo, J., Robinson, G., **Gaffey, C.**, Orton, M. Reconciliation of plant phenology across scales: understanding the relations between tree physiology dynamics, tree canopy phenology and satellite-observed landscape phenology. *The Ecological Society of America 2017 Annual Meeting*. Portland, Oregon, August 6-11, 2017.

Certifications

Diversity & Inclusion Certificate

The Clark University Diversity and Inclusion Program included 27 hours of training and a project. 2019-2021.

Remote Pilot Certificate (Part 107)

Licensing necessary for USA drone pilots awarded by the Federal Aviation Administration (FAA). 2019.

Technical Skills

Python	Terrset	SNAP
Google Earth Engine JavaScript	ENVI	SeaDAS
ArcGIS	ODV	R
Agisoft		

Field Experience

2025: *The East Siberian and Laptev seas*
Scientist (Lead PI on NSF Award #2532048): Collected water column samples for phytoplankton identification using HPLC and IFCB onboard the US Coast Guard Cutter *Healy* icebreaker during the Nansen and Amundsen Basins Observational System research cruise in the Siberian Arctic Ocean.

2022: *The North Pole and Pacific Arctic*

Scientist (co-PI on NSF Award #2210615) and Research Assistant: Collected water column chlorophyll pigments, optical measurements using a hand-deployed Compact Optical Profiling System, and atmospheric aerosols onboard the US Coast Guard Cutter *Healy* icebreaker for the Synoptic Arctic Survey research cruise in the High Arctic and Chukchi Seas.

2021-2023: *Pacific Arctic Region*

Research Assistant: Collected and processed water samples for chromophoric dissolved organic matter onboard the Canadian Coast Guard *Sir Wilfrid Laurier* icebreaker for the Distributed Biological Observatory research cruise in the Bering and Chukchi Seas.

2020: *Pacific Arctic Region*

Research Technician: Collected and filtered water samples for eDNA onboard the R/V *Norseman II* for the Distributed Biological Observatory research cruise with associated funding from Arctic Marine Biodiversity Observing Network in the Bering and Chukchi Seas.

2019: *Pacific Arctic Region*

Research Assistant: Collected and filtered water samples for chlorophyll and nutrients, and assisted in the collection of benthic fauna and sediment samples onboard the Canadian Coast Guard *Sir Wilfrid Laurier* icebreaker for the Distributed Biological Observatory research cruise in the Bering and Chukchi Seas.

2016-2018: *The Edmund Niles Huyck Preserve, New York*

Research Assistant: Flew unmanned aerial vehicles (UAVs) to survey tree canopies weekly March - November. Assisted maintaining data collection of dendrometers, rhizotrons and soil moisture sensors.

Service

Review Service

Remote Sensing, ISPRS International Journal of Geo-Information, Journal of Mountain Science, Diversity, Polar Record

Selected Professional Service

- Chair of the Synoptic Arctic Survey Early Career Researchers (SAS ECR), 2025-present.
- Member of the Synoptic Arctic Survey Science Steering Committee, 2025-present.
- Coordinator of the New York State Club Field Hockey League (NYSCFHL), 2018-present.
- IARPC Collaborations Mentorship Program Participant, 2022, 2024.
- Executive Secretary for *NASA Transform to Open Science* review panel, 2023.
- Founded the *500 Women Scientists* Pod for Worcester, MA and served as coordinator 2020-2022.
- Mentor to three mentees for the *Ocean Sciences Meeting Mentor/Mentee Program* 2022.
- Lab and field volunteer for the US Geological Survey, summer 2016.
- Map Captain for the Capital Region Sustainability Plan, summer 2012.
- Interned at OurEarth.org, summer 2010.

University Service

- Graduate School of Geography Admissions Committee 2021-2022.
- Clark University Earth System Science Faculty Search Committee 2020.
- Clark University Geographical Society (CUGS) Representative, 2019-2020.
- Graduate School of Geography Committee on Tenure, Promotion, or Reappointment, 2019.

- Geography Department Representative for Clark's Graduate Student Association (GSA), 2018-2019.
- Clark University Library Committee, 2018-2019.
- Clark University Graduate Student Commencement Speaker Committee, 2019-2020.

Selected Lectures and Outreach

- Public research presentation through the Synoptic Arctic Survey webinar series. April 22, 2024
- Invited Guest Lecture for GEOG4049 Geospatial Applications of Small Unoccupied Aircraft Systems at Louisiana State University. February 28, 2024.
- Guest Lecture for Oceanography at West Anchorage High School. February 2, 2024.
- Invited Guest Lecture for BIOL281 Conservation Biology at the College of the Holy Cross. November 10, 2023.
- Invited Guest Lecture for BIOL235 Marine Biology at the College of the Holy Cross. October 17, 2023.
- Science Lecture onboard the Canadian Coast Guard Ship *Sir Wilfrid Laurier*. July 2023.
- Science Lecture onboard the Research Vessel *Sikuliaq*. June 2023.
- Science Lecture for the US Coast Guard crew onboard the USCGC *Healy*. October 2022.
- Panelist on GEOG119 The Arctic in the Anthropocene research panel at Clark University. October 10, 2019.
- Student Speaker for Geography & Planning Department at the 2018 UAlbany Undergraduate Recognition Ceremony. May 19, 2018.
- Invited Guest Lecture GOG125 The American City at SUNY Albany. February 5, 2018.
- Presenter at the Huyck Preserve and Biological Research Station Thursday Night Lecture Series. *Remote Sensing of White Spruce Phenology*. July 12, 2018.
- UAV Demonstration for the Huyck Preserve Science Symposium and Environmental Monitoring Workshop. August 4, 2018.
- Guest Lecturer for the Huyck Preserve Wildlife Ecology Day Program. August 6, 2018.
- Hosted various renewable energy workshops in K-12 schools organized by SmartKids NY and STEM events in conjunction with Century Solar Supply, Questar III BOCES, NYSEDA and TEC-SMART 2013-2015.

Media

McAlister, J., DuBois, B., Hall, P., and Koorbusch, E. "Faculty Interviews: Clare Gaffey" *ENVS Newsletter*, College of the Holy Cross (October 6, 2023).

Landry, M. "Clare Gaffey, 2021 USGIF Scholarship Winner." *Trajectory*, USGIF (January 7, 2022).
<https://trajectorymagazine.com/clare-gaffey-2021-usgif-scholarship-winner/>

"Clare Gaffey - Arctic scientist" interviewed by Melissa Hale-Spencer on *Other Voices* podcast, The Altamont Enterprise (January 18, 2021). <https://altamontenterprise.com/podcasts>

Luttrell, A. "Clark geography researcher experiences a 'changing Arctic' on recent expedition" *ClarkNow*, Clark University (November 20, 2020).
<https://clarknow.clarku.edu/2020/11/20/clark-geography-researcher-experiences-a-changing-arctic-on-recent-expedition>

"Research Grounded Yet Lofty" *News Center*, University at Albany (August 31, 2016).
<https://www.albany.edu/news/72940.php>

Workshops

Arctic Chief Scientist Training, UNOLS Arctic Icebreaker Coordinating Committee and NSF Office of Polar Programs, June 3-13, 2023, Seward-R/V *Sikuliaq*-Nome, AK.

Scalable and Computationally Reproducible Approaches to Arctic Research, NSF Arctic Data Center, March 27-31, 2023, National Center for Ecological Analysis, Santa Barbara, CA.

What's behind the curtain of the NASA Plankton, Aerosol, Cloud, ocean Ecosystem (PACE) mission? Ocean Carbon & Biogeochemistry and NASA Goddard, August 1-5, 2022, Baltimore, MD.

Other Experience

- Founded University at Albany's Club Field Hockey Team, 2009.
- Coached Guilderland High School JV Field Hockey and Nordic Ski teams 2013-2018.

Professional Affiliations

International Arctic Science Committee (IASC)
Interagency Arctic Research Policy Committee (IARPC)
Association of Polar Early Career Scientists (APECS)
Arctic Research Consortium of the United States (ARCUS)
The Oceanography Society (TOS)