Gwenn M. Miller Hennon, Ph.D.
Associate Professor
University of Alaska Fairbanks
gmhennon@alaska.edu

Research Goal:

Leverage physiology and genomics to improve predictions of marine microbial ecology in response to changing climate.

Education

Ph.D. 2015
Oceanography, University of Washington

Master of Science 2012
Oceanography, University of Washington

Bachelor of Science 2009
Chemistry, MIT

Positions

Assistant Professor 2019 - present
College of Fisheries and Ocean Sciences, University of Alaska Fairbanks

Postdoctoral Research Scientist 2016-2019
Biology and Paleo Environment, Lamont-Doherty Earth Observatory, Columbia University
Dyhrman Lab: The impact of climate change on marine microbial interactions

Graduate Research Assistant 2009-2015
Center for Environmental Genomics, University of Washington
Armbrust Lab: Mechanisms and drivers of phytoplankton acclimation to climate change

Honors

Dean's Recognition Awards: Outstanding Advisor 2024
College of Fisheries and Ocean Sciences, University of Alaska Fairbanks

Dean's Recognition Awards: Outstanding Researcher 2022
College of Fisheries and Ocean Sciences, University of Alaska Fairbanks

Teaching

*(*new course)*

Graduate Courses

Biological Oceanography OCN650 (Fall semester 2020-present, Spring semester 2022 asynchronous, co-taught)
Oceans and Global Change OCN 681 (Spring semester 2023)
Ocean Sciences Seminar OCN 692 (Spring semester 2020, 2024)
Phytoplankton and Marine Microbes* OCN 655 (Spring semester 2021, 2023)
Subarctic Oceanography Field Course* OCN 625 (summer 2023-present, co-taught)

Undergraduate courses

Biological Oceanography OCN449 (Fall 2020-present, Spring semester 2022 asynchronous, co-taught)
Data Analysis and Writing for Aquatic Sciences* OCN 303 (Fall semester 2021-present)

Oceans and Global Change OCN 481 (Spring semester 2023)
Ocean Sciences Seminar OCN 492 (Spring semester 2020, 2024)
Phytoplankton and Marine Microbes* OCN 455 (Spring semester 2021, 2023)
Subarctic Oceanography Field Course* OCN 425 (summer 2023-present, co-taught)

Advising

Graduate students

Anais Gentilhomme 2019-2020 (co-advised), MS Oceanography 2020
Kyle Dilliplaine 2020-2025, PhD Oceanography 2025
Jacob Cohen 2020-2022, MS Oceanography 2022
Stephanie O'Daly 2022-2024 (second advisor), PhD Oceanography 2024
Megan Brauner 2022-present (co-advised), PhD Oceanography expected 2026

Undergraduate and post-baccalaureate students:

Hannah Goldberg (co-mentored at Columbia University), Will Flager (co-mentored at University of Alaska Anchorage), Emily Williamson (UAF)

Committee member to current graduate students:

Dan Cushing (PhD Oceanography), Emily Ortega (PhD Oceanography), Jeanette Gann (PhD Marine Biology), Josianne Haag (PhD Oceanography), Kodi Haughn (PhD Biology), Sydney Wilkinson (PhD Marine Biology)

Funding

LTER: NGA Phase-II: Resilience and Connectivity Across Transitions in the Northern Gulf of Alaska Ecosystem, Funded by NSF (October 1, 2023 - September 30, 2028) ($6,373,175.00) PI Russell Hopcroft with Co-PI Ana Aguilar-Islas, Co-PI Seth Danielson, Co-PI Jerome Fiechter, Co-PI Gwenn Hennon

EPSCoR Seed- Investigating microbial productivity at the terrestrial-marine interface in Lynn Canal, Funded by NSF- EPSCoR Fire and Ice (January 1, 2020 - January 1, 2022) ($27,454.00) PI Gwenn Hennon with Co-PI Jason Fellman

GEOAllies Program, Funded by NSF (August 31, 2021)($2,000.00), PI Gwenn Hennon

Water is Life -- Water is Alive, Funded by North Pacific Research Board (September 1, 2019 - August 31, 2021) ($20,000.00), PI Gwenn Hennon

Hot Spots of Activity in the Cold Ocean, Funded by North Pacific Research Board (September 1, 2018 - August 31, 2021) ($180,659.00), PI Gwenn Hennon

Investigating the impacts of oil exposure and changing snow cover on sea ice microbial communities, Funded by Bureau of Energy Management- Coastal Marine Institute (September 1, 2020 - December 31, 2022) ($149,831.00), PI Gwenn Hennon

Deep Plankton Imager System, Funded by Murdock Charitable Trust (July 1, 2020) ($325,700.00), PI Russell Hopcroft with Co-PI Ana Aguilar-Islas, Co-PI William Burt, Co-PI Seth Danielson, Co-PI Gwenn Hennon, Co-PI Andrew Mcdonnell

Automatic sampling of microbial community composition in the Gulf of Alaska, Funded by Murdock Foundation- Gulf of Alaska Seed Funds (January 1, 2020 - September 30, 2020) ($21,070.00), PI Gwenn Hennon

Collaborative Research: Ecology and Evolution of Microbial Interactions in a Changing Ocean, Funded by National Science Foundation- Biological Oceanography (March 1, 2019 - February 28, 2025) ($683,575.00), PI Gwenn Hennon with Co-PI Sonya Dyhrman

Publications

(student mentees)*

Dilliplaine, K. B.*, Whitmore, L. M., Aguilar-Islas, A., Bolt, C., Dumack, K., Jin, M., Kaufman, M., Oggier, M., **Hennon, G. M. M.** (*in review*) Sea-ice microbial community succession and the potential role of parasitoids in the maintenance of diversity. *Environmental Microbiology*

Gentilhomme*, A., Sweet, C., **Hennon, G. M. M**., Collins, R. E. (2024). Genomic signatures of cold adaptation in the family *Colwelliaceae*. *Extremophiles,* 28(39). https://doi.org/10.1007/s00792-024-01356-0

O'Daly*,S., **Hennon, G.**, Kelly, T., Strom, S., McDonnell, A. (2024). Strong and efficient summertime carbon export driven by aggregation processes in a subarctic coastal ecosystem. *Limnology and Oceanography*. https://doi.org/10.1002/lno.12561

Dilliplaine*, K. D., & **Hennon, G.** (2023). Impacts of crude oil on Arctic sea-ice diatoms modified by irradiance. *Elem Sci Anth*, *11*(1). https://doi.org/10.1525/elementa.2023.00074

Hennon, G. M. M., Sefbom, J., Schaum, E., Dyhrman, S. T., & Godhe, A. (2021). *Guidelines for the study of climate change effects on HABs, Chapter 4: Studying the acclimation and adaptation of HAB species to changing environmental conditions* (M. L. Wells, M. Burford, A. Kremp, M. Montresor, & G. C. Pitcher, Eds.). UNESCO-IOC/SCOR. https://doi.org/10.25607/OBP-1692

Harke, M. J., Frischkorn, K. R., **Hennon, G. M. M**., Haley, S. T., Barone, B., Karl, D. M., Dyhrman, S. T. (2021). Microbial community transcriptional patterns vary in response to mesoscale forcing in the North Pacific Subtropical Gyre. *Environmental Microbiology*. https://doi.org/10.1111/1462-2920.15677

Phelps, S. R., **Hennon, G. M. M**., Dyhrman, S. T., Limón, M. D. H., Williamson, O. M., & Polissar, P. J. (2021). Carbon Isotope Fractionation in Noelaerhabdaceae Algae in Culture and a Critical Evaluation of the Alkenone Paleobarometer. *Geochemistry, Geophysics, Geosystems*, *22*(7), e2021GC009657. https://doi.org/10.1029/2021GC009657

Smith, A. N., **Hennon, G. M. M**., Zinser, E. R., Calfee, B. C., Chandler, J. W., & Barton, A. D. (2021). Comparing *Prochlorococcus* temperature niches in the lab and across ocean basins. *Limnology and Oceanography*, *66*, 2632–2647. https://doi.org/10.1002/lno.11777

Hernández Limón*, M. D.; **Hennon, G. M. M**.; Harke, M. J.; Frischkorn, K. R.; Haley, S.; Dyhrman, S. T., "Transcriptional patterns of *Emiliania huxelyi* in the North Pacific Subtropical Gyre reveal the daily rhythms of its metabolic potential" (2020) *Environmental Microbiology, 22(1), 381-396, doi: 10.1111/1462-2920.14855*

Hennon, G. M. M.; Dyhrman, S. T., "Progress and promise of omics for predicting the impacts of climate change on harmful algal blooms" (2020) *Harmful Algae, 91(101587), 1-14, doi: 10.1016/j.hal.2019.03.005*

Hennon, G. M. M; Williamson*, O. M.; Hernández Limón*, M.; Haley, S. T.; Dyhrman, S. T., "Non-linear physiology and gene expression responses of harmful alga *Heterosigma akashiwo* to rising CO_2" (2019) *Protist,* 170(1), 38-51, doi: 10.1016/j.protis.2018.10.002

Hennon, G. M. M.; Morris. J.J.; Haley, S.; Zinser, E. R.; Durrant, A., Entwistle, E.; Dokland, T.; Dyhrman, S. T.. "The impact of elevated CO_2 on *Prochlorococcus* and microbial interactions with 'helper' bacterium *Alteromonas*" (*2018) ISME Journal,* 12,

520-531, doi: 10.1038/ismej.2017.189

Hennon, G. M. M.; Hernández Limón*, M.; Haley, S. T.; Juhl, A.; Dyhrman, S. T., "Diverse CO_2-Induced Responses in Physiology and Gene Expression among Eukaryotic Phytoplankton" (*2017) Frontiers in Microbiology, Aquatic Microbiology*, 8 (2547), 1-14, doi: 10.3389/fmicb.2017.02547

Hamilton*, M.; **Hennon G. M. M**.; Needoba, J.; Maxey, K.; Morales, R.; Peterson, T. D.; Shatz, M.; Swalwell, J.; Zuber, P.; Armbrust, E.V.; Ribalet, F. "Dynamics of Teleaulax cryptophyte prey during red water blooms in the Columbia River Estuary" (2017*) Journal of Plankton Research*, 39(4), 589-599, doi: 10.1093/plankt/fbx029

Howard, E.; Durkin, C.; **Hennon, G. M. M**.; Ribalet, F.; Stanley, R., "Biological production, export, and phytoplankton communities across 8000 km of the South Atlantic: Basin scale similarity with mesoscale variability". (2017) *Global Biogeochemical Cycles*, 31(7), 1066-1088, doi: 10.1002/2016GB005488

Hennon, G. M. M.; Ashworth, J.; Groussman*, Ryan D.; Berthiaume, C., Morales, R.; Baliga, N.; Orellana, M.; Armbrust, E.V.. "Diatom acclimation to elevated CO_2 via cAMP signalling and coordinated gene expression". (*2015) Nature Climate Change,* 5, 761-765, doi: 10.1038/nclimate2683

Hennon, G. M. M. ; Quay, P.; Morales, R. L.; Swanson*, L. M.; Armbrust, E. V. . "Acclimation conditions modify physiological response of the diatom *Thalassiosira pseudonana* to elevated CO_2 concentrations in a nitrate-limited chemostat" (2014) *Journal of Phycology*, 50, 243-253, doi: 10.1111/jpy.12156

Antos, J.M.; **Miller, G.M**.; Grotenbreg, G.M.; Ploegh, H.L.. Lipid Modification of Proteins through Sortase-Catalyzed Transpeptidation. (2008) *Journal of the American Chemical Society*, 130(48), 16338-16343, doi: 10.1021/ja806779e

Select Presentations

Brauner, M.*, Aguilar-Islas, A., McParland, E. L., Briggs, B. R., Hennong, G. M. M., "Iron Fertilization Effects on Microbial Communities and Interactions in the Northern Gulf of Alaska" (2025) poster, Alaska Marine Sciences Symposium, Anchorage, AK

Dilliplaine, K.*, **Hennon, G. M. M.**, "Transcriptional responses of an Arctic Sea-Ice Diatom to crude oil and irradiance" (2024) poster, Ocean Sciences Meeting, New Orleans, LA

O'Daly, S.*, **Hennon, G**., Kelly, T. B., Kiko, R., Lekanoff, R. M., Pretty, J., Schröder, S. M., McDonnell, A. M. P., "Large-scale patterns of marine snow in the Southern Ocean and the impact of fronts" (2024) oral presentation, Ocean Sciences Meeting, New Orleans, LA

Dilliplaine, K.*, Whitmore, L., Aguilar-Islas, A., Bolt, C., Eicken, H., Kaufman, M., Oggier, M., Rember, R., **Hennon, G. M. M.**, "Microbial community structuring, dynamics, and interactions during the algal bloom in Alaskan landfast sea ice" (2024) oral presentation, Ocean Sciences Meeting, New Orleans, LA

Brauner, M.*, Cohen, J.*, Briggs, B. R., **Hennon, G. M. M.**, "Co-occurrence networks of marine microbes in the Northern Gulf of Alaska" (2024) poster, Ocean Sciences Meeting, New Orleans, LA

Dilliplaine, K.*, Whitmore, L., Aguilar-Islas, A., Bolt, C., Eicken, H., Kaufman, M., Oggier, M., Rember, R., **Hennon, G. M. M.**, "Microbial community structuring, dynamics, and interactions during the algal bloom in Alaskan landfast sea ice" (2024),

Alaska Marine Sciences Symposium, Anchorage, AK

Brauner, M.*, Cohen, J.*, Briggs, B. R., **Hennon, G. M. M.**, “Co-occurrence networks of marine microbes in the Northern Gulf of Alaska” (2023) poster, American Geophysical Union, San Francisco, CA

Hennon, G. M. M., “Find the helpers: prioritizing multiple-driver studies of key taxa” (2023) Invited Plenary Speaker, Ocean Carbon & Biogeochemistry workshop, Woods Hole, MA

O’Daly, S.*, **Hennon, G. M. M.**, Kelly, T. B., Kiko, R., Lekanoff, R., Pretty, J., Schroder, S. M., McDonnell, A. M. P.,”Impacts of fronts on Southern Ocean particle distribution in the mesopelagic” (2023) ASLO, poster, Palma Mallorca, Spain

Dilliplaine, K.*, **Hennon, G. M. M.** “Sensitivity of Sympagic Algae to Crude Oil in a Brighter Arctic”, (2023) Polar Marine Science Gordon Research Conference, poster, Ventura, CA

Hennon, G. M. M., Brauner, M.*, Cohen, J.*, Williamson, E.*, Whitney, E., Fellman, J. “The impact of glacial inputs on marine microbial communities in Alaska’s coastal margins” (2023) Alaska Marine Science Symposium, poster, Anchorage, AK

Brauner, M.*, Cohen, J.*, Briggs, B.R., **Hennon, G. M. M..** ”Co-occurrence networks of marine microbes in the Northern Gulf of Alaska” (2023) Alaska Marine Science Symposium, poster, Anchorage, AK

Cohen, J.*, Strom, S., Danielson, S., Collins, R.E., **Hennon, G. M. M..** “Shifts in microbial community composition during the 2019-2020 Pacific Marine Heat wave in the northern Gulf of Alaska” (2023) Alaska Marine Science Symposium, oral presentation, Anchorage, AK

Hennon, G. M. M., Williamson, E.*, Whitney, E., Fellman, J. “The impact of glacial inputs on the marine microbial communities in Alaska’s coastal margins” (2022) Ocean Sciences Meeting, virtual delivery, Honolulu Hawaii

Hennon, G. M. M. “Life on thin ice: Glacial retreat at Alaska's coastal margins” (2022) Science for Alaska Lecture Series, invited speaker, virtual delivery, University of Alaska Fairbanks Geophysical Institute, https://www.gi.alaska.edu/events/science-alaska-lecture-series/4720

Dilliplaine, K.*, **Hennon, G. M. M..** “Sea-ice diatom sensitivity to sublethal crude oil exposure in a brighter Arctic” (2022) Alaska Marine Science Symposium, Virtual, Anchorage, Alaska

Cohen, J.*, Collins, R.E., **Hennon, G. M. M..** “Investigating the Impact of Marine Heatwaves on Phytoplankton Community Composition in the Gulf of Alaska” (2022) Alaska Marine Science Symposium, Virtual, Anchorage, Alaska

Dilliplaine, K.*, **Hennon, G. M. M.**. "Diatoms on thin ice: sensitivity and resiliency to anthropogenic change in the Alaskan Arctic". (2021) Invited Speaker, Molecular Life of Diatoms Conference 6, virtual meeting, Scripps Institute of Oceanography, San Diego, California, USA

Hennon, G. M. M.. “Towards predicting climate change impacts on phytoplankton communities from the Subtropics to the Arctic” (2021) Invited Speaker, virtual delivery, NOAA Northwest Fisheries Science Center Seminar, Seattle, Washington, USA

Williamson, E.*, Hennon, G. M. M. “Phytoplankton diversity and abundance in Kachemak Bay across a glacial gradient” (2021) Alaska Marine Science Symposium, Virtual Poster Presentation

Dilliplaine, K.* and **Hennon, G. M. M**.. “Impact of sublethal oil exposure and irradiance on sea-ice algae” (2021) Alaska Marine Science Symposium, Virtual Poster Presentation

Hennon, G. M. M; Williamson*, O. M.; Hernández Limón*, M.; Haley, S. T.; Dyhrman, S. T., “Non-linear physiology and gene expression responses of harmful alga *Heterosigma akashiwo* to rising CO_2” (2020) Ocean Sciences Meeting, Poster Presentation, San Diego, California, USA

Hennon, G. M. M.; Morris, J. J.; Haley, S. T.; Zinser, E.; Durrant, A. R.; Entwistle, E.; Dokland, T. and Dyhrman, S. T.. “Elevated CO_2 alters the microbial interaction between *Prochlorococcus* and ‘helper’ bacterium *Alteromonas”* (2018) Ocean Sciences Meeting, Oral Presentation, Portland Oregon, USA

Hennon G. M. M. “CO_2 alters the interaction of a globally important phytoplanker and its helper bacterium” (2017) Invited Speaker, Ecology, Behavior and Evolution Seminar, University of California San Diego, USA

Hennon G. M. M. “Uncovering mechanisms of phytoplankton response to rising CO_2” (2017) Invited Speaker, Marine Sciences Seminar, University of Connecticut Avery Point, USA

Hennon G. M. M.; Haley, S.T.; Morris, J. J.; Zinser, E. R.; Dyhrman, S.T.. “Gene expression of a globally relevant marine bacteria model system in response to elevated CO_2” (2016) ISME, Montreal, Canada

Hennon G. M. M.; Howard, E.; Ribalet, F; Stanley, R.; Armbrust E.V.. Continuous flow cytometry and gas flux measurements across nutrient and temperature gradients in the Atlantic Ocean. (2015) ASLO Aquatic Sciences Meeting, Grenada, Spain

Hennon, G. M. M.; Ashworth J.; Morales, R.; Berthiaume, C.; Baliga, N.; Orellana, M.; Armbrust, E. V. “Gene expression reveals mechanisms of diatom acclimation to elevated CO_2”. (2014) Ocean Global Change Biology, Gordon Research Conference, Waterville Valley, New Hampshire, USA

Hennon, G. M.; Armbrust, E. V.; “Acclimated Physiology and Gene Expression of the Diatom *Thalassiosira pseudonana* under Elevated CO_2” (2013) ASLO Aquatic Sciences Meeting, New Orleans, LA, USA

Professional Service

Session co-chair: Understanding microbial marine life through the molecular lens
Ocean Sciences Meeting 2024, New Orleans, LA

NGA-LTER Fairness and Unity committee co-chair 2024-present

Northern Gulf of Alaska Long Term Ecological Research (NGA-LTER) executive committee 2022-present

Tamamta program affiliate faculty 2022-present
University of Alaska Fairbanks, College of Fisheries and Ocean Sciences

Oceanography faculty hiring committee 2022, 2024

University of Alaska Fairbanks, College of Fisheries and Ocean Sciences

Ocean Acidification Research Center Advisory Committee 2020- present
University of Alaska Fairbanks

Justice Equity Diversity Inclusion (JEDI) Committee member: 2021-present
University of Alaska Fairbanks, College of Fisheries and Ocean Sciences

Postdoctoral Scholar Selection Committee: 2021
Cooperative Institute for Climate Ocean and Ecosystem Studies

Undergraduate Curriculum Working Group: 2020
University of Alaska Fairbanks, College of Fisheries and Ocean Sciences

Ocean Acidification Research Center Advisory Committee: 2020- present
University of Alaska Fairbanks, College of Fisheries and Ocean Sciences

Masters in Marine Studies Committee: 2020
University of Alaska Fairbanks, College of Fisheries and Ocean Sciences

Peer Reviewer for:
Plant Physiology 2022-present
New Phytologist 2021-present
Limnology and Oceanography 2019-present
Harmful Algae 2019-present
Applied Microbiology and Biotechnology 2018- present
ISME Journal 2017- present
Marine Ecology Progress Series 2017-present
Philosophical Transactions B 2017-present
Genome Research 2016- present
PLoS ONE 2015-present
Molecular Ecology 2014-present

Society Member:
American Society for Microbiology (ASM) 2021- present
International Society for Microbial Ecology (ISME), 2015-present
Association for the Sciences of Limnology and Oceanography (ASLO) 2012-present
Phycological Society of America (PSA) 2010-present

Public service

Educational kit: "The Hidden World Within Sea Ice" available from the Museum of the North kit loan program https://www.uaf.edu/museum/education/educators/kits-hands-on-objects/natural-history/#SeaIceMicrobe

Outreach presentations:
Arctic Research Open House 2022, 2023, 2024
Joy Elementary Earth Week 2019, 2022
Coastal Communities Forum Youth Reception 2021

Lab website www.hennonlab.com