KARL J. KREUTZ

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University of Maine
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APPOINTMENTS

University of Maine

2021- *Director*, School of Earth and Climate Sciences
2011- *Professor*
2006-2010 *Associate Professor*
2000-2005 *Assistant Professor,* Climate Change Institute & School of Earth and Climate Sciences
2000-2021 *Director*, Stable Isotope Laboratory

University of the Arctic

2022-2027 *UArctic Chair*, Ice, Climate, and Environmental History

EDUCATION

Woods Hole Oceanographic Institution

1998-2000 *Postdoctoral Scholar*, Department of Marine Chemistry and Geochemistry, and Department of Geology and Geophysics
Advisors: Drs. E.R. Sholkovitz and L.D. Keigwin

University of New Hampshire

1998 Ph.D. Earth Science (Geochemical Systems)
Ice Core Glaciochemical Records of Late Holocene Climatic Variability in West Antarctica
Advisor: Dr. P.A. Mayewski

University of Maine

1994 M.S. Geological Sciences
Paleoceanographic Conditions of the Late Wisconsin Marine Submergence in Eastern Coastal Maine: Stable Isotopic Evidence
Advisor: Dr. H.W. Borns, Jr.

State University of New York at Buffalo

1992 B.A. Geological Sciences

PUBLICATIONS (PEER REVIEWED)

*Kreutz ^undergraduate,*graduate, +postdoctoral advisee*
h-index = 40; i10 index = 80 (Google Scholar, March 2023)

Fang, L., T. M. Jenk, D. Winski, K. Kreutz, H. L. Brooks, E. Erwin, E. Osterberg, S. Campbell, C. Wake, M. Schwikowski, 2023, Early Holocene ice on the Begguya plateau (Mt. Hunter, Alaska) revealed by ice core 14C age constraints. *The Cryopshere*, 17 (9), 4007-4020, DOI: 10.5194/tc-17-4007-2023.

Chesler*, A., D. Winski*, K. Kreutz, B. Koffman*, E. Osterberg, D. Ferris, Z. Thundercloud, J. Mohan, J. Cole-Dai, M. Wells, M. Handley, A. Putnam, K. Anderson, N. Harmon^, 2023, Non-spherical microparticle shape in Antarctica during the last glacial period affects dust volume-related metrics. *Climate of the Past*, *19*(2), 477-492, https://doi.org/10.5194/cp-19-477-2023.

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Whitney*, N.M., A. D. Wanamaker*, C. C. Ummenhofer, B. J. Johnson, N. Cresswell-Clay and K. J. Kreutz, 2022, Rapid 20th century warming reverses 900-year cooling in the Gulf of Maine, *Nature Communications Earth & Environment,* 3 (1), DOI: 10.1038/s43247-022-00504-8.

Kindstedt*, I., K. M. Schild, D. Winski*, K. Kreutz, L. Copland, S. Campbell*, and E. McConnell*, 2022, Offset of MODIS land surface temperatures from in situ air temperatures in the upper Kaskawulsh Glacier region (St. Elias Mountains) indicates near-surface temperature inversions, *The Cryosphere*, 16 (8), 3051-3070, DOI: 10.5194/tc-16-3051-2022.

Koffman*, B.G., S. L. Goldstein, G. Winckler, M. R. Kaplan, K. J. Kreutz, L. Bolge, and P. Biscaye, 2021, Late Holocene dust provenance at Siple Dome, Antarctica, *Quaternary Science Reviews*, 274, DOI: 10.1016/j.quascirev.2021.107271

Gerbi, C., S. Mills, R. Clavette, S. Campbell*, S. Bernsen, D. Clemens-Sewall, I. Lee, R. Hawley, K. J. Kreutz, K. Hruby, 2021, Microstructures in a temperate glacier shear margin: Jarvis Glacier, Alaska, *Journal of Glaciology*, 67, 1163–1176, doi: 10.1017/jog.2021.62.

Nolan^, A., W. Kochtitzky*, E. Enderlin, R. McNabb, and K.J. Kreutz, 2021, Kinematics of the exceptionally-short surge cycles of Sít' Kusá (Turner Glacier), Alaska, from 1983 to 2013, *Journal of Glaciology*, 1–15, https://doi.org/10.1017/jog.2021.29.
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Winski*, D., E. Osterberg, K. Kreutz, D. Ferris, J. Cole-Dai, Z. Thundercloud, J. Huang, B. Alexander, L. Jaeglé, J. Kennedy, C. Larrick, E. Kahle, E. Steig, T. Jones, 2021, Seasonally-resolved Holocene sea ice variability inferred from South Pole ice core chemistry, *Geophysical Research Letters*, doi:10.1029/2020GL091602.

Epifanio, J. A., E. J. Brook, C. Buizert, J. S. Edwards, T. A. Sowers, E. C. Kahle, J. P. Severinghaus, E. J. Steig, D. A. Winski*, E. C. Osterberg, T. J. Fudge, M. Aydin, E. Hood, M. Kalk, K. J. Kreutz, D. G. Ferris, and J. A. Kennedy, 2020, The SP19 chronology for the South Pole Ice Core – Part 2: gas chronology, Δage, and smoothing of atmospheric records, *Climate of the Past*, *16*(6), 2431-2444, doi:10.5194/cp-16-2431-2020.

Lower-Spies, E. E., N. M. Whitney*, A. D. Wanamaker*, S. M. Griffin^, D. S. Introne, and K. J. Kreutz, 2020, A 250-year, decadally-resolved, radiocarbon time history in the Gulf of Maine reveals a hydrographic regime shift at the end of the Little Ice Age, *Journal of Geophysical Research: Oceans*, e2020JC016579, doi:10.1029/2020jc016579.

Kochtitzky*, W., D. Winski*, E. McConnell*, K.J. Kreutz, S. Campbell*, E.M. Enderlin, L. Copland, S. Williamson, B. Main, and H. Jiskoot, 2020, Climate and surging of Donjek Glacier, Yukon, Canada, Arctic, *Antarctic, and Alpine Research*, 52 (1), 264-280, doi: 10.1080/15230430.2020.1744397.

Winski*, D. A., T. J. Fudge, D. G. Ferris, E. C. Osterberg, J. M. Fegyveresi, J. Cole-Dai, Z. Thundercloud, T. S. Cox, K. J. Kreutz, N. Ortman, C. Buizert, J. Epifanio, E. J. Brook, R. Beaudette, J. Severinghaus, T. Sowers, E. J. Steig, E. C. Kahle, T. R. Jones, V. Morris, M. Aydin, M. R. Nicewonger, K. A. Casey, R. B. Alley, E. D. Waddington, N. A. Iverson, N. W. Dunbar, R. C. Bay, J. M. Souney, M. Sigl, and J. R. McConnell, 2019, The SP19 chronology for the South Pole Ice Core – Part 1: volcanic matching and annual layer counting, *Climate of the Past*, *15*(5), 1793-1808, 10.5194/cp-15-1793-2019.

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Walker's Companion: A Guide to the Orono Bog Boardwalk, Bird, J., J. Longcore, and R. Klose, eds., University of Maine Press, pp. 7-14.

Gilbert, L.A., D.S. Gross, and K.J. Kreutz, 2019, Developing undergraduate students' system thinking skills with an InTeGrate module, *Journal of Geoscience Education*, doi:10.1080/10899995.2018.1529469.

Miner*, K. R., K. J. Kreutz, S. Jain, S. Campbell*, and A. Liljedahl, 2018, A screening-level approach to quantifying risk from glacial release of organochlorine pollutants in the Alaskan Arctic, *Journal of Exposure Science & Environmental Epidemiology*, doi:10.1038/s41370-018-0100-7.

Wanamaker*, A.D., S. Griffin^, C, Ummenhofer, N. Whitney*, B. Black, R. Parfitt, E. Lower-Spies, D. Introne, and K.J. Kreutz, 2018, Pacific climate influences on ocean conditions and extreme shell growth events in the Northwestern Atlantic (Gulf of Maine), *Climate Dynamics*, https://doi.org/10.1007/s00382-018-4513-8.

Miner*, K.R., C. Bogdal, P. Pavlova, C. Steinlin, and K.J. Kreutz, 2018, Quantitative screening level assessment of human risk from PCBs released in glacial meltwater: Silvretta Glacier, Swiss Alps, *Ecotoxicology and Environmental Safety*, 166, 251-258.

Miner*, K.R., S. Campbell*, C. Gerbi, A. Liljedahl, T. Anderson, L. Perkins, S. Bernsen, T. Gatesman, and K. J. Kreutz, 2018, Organochloride pollutants within a polythermal glacier in the interior Eastern Alaska Range, *Water*, 10(9), 1157, doi:10.3390/w10091157.

Polashenski, D. J., E. C. Osterberg, B. G. Koffman*, D. Winski*, K. Stamieszkin, K. J. Kreutz, C. P. Wake, D. G. Ferris, D. Introne, S. Campbell* and G. M. Lewis, 2018, Denali ice core Methanesulfonic Acid records North Pacific marine primary production, *Journal of Geophysical Research: Atmospheres*, doi: 10.1029/2017jd028123.

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Miner*, K.R., J. Blais, C. Bogdal, S. Villa, M. Schwikowski, P. Pavlova, C. Steilin, C. Gerbi, and K.J. Kreutz, 2017, Legacy organochloride pollutants in glacial watersheds: a review, *Environmental Science Processes and Impacts*, doi:10.1039/c7em00393e.

Koffman*, B., K. J. Kreutz, and K. Trenbath+, 2017, Integrating scientific argumentation to improve undergraduate writing and learning in a global environmental change course, *Journal of Geoscience Education*, *65*, 231-239.

Osterberg, E. C., D. A. Winski*, K. J. Kreutz, C. P. Wake, D. G. Ferris, S. Campbell*, D. Introne, M. Handley, and S. Birkel, 2017, The 1200-year composite ice core record of Aleutian Low intensification, *Geophysical Research Letters*, 44(14), 7447-7454, doi:10.1002/2017gl073697.

Casey, K. A., S. D. Kaspari, S. M. Skiles, K. Kreutz, and M. J. Handley, 2017, The spectral and chemical measurement of pollutants on snow near South Pole, Antarctica, *Journal of Geophysical Research: Atmospheres*, *122*(12), 6592-6610, doi:10.1002/2016jd026418.

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Whitney*, N., A. D. Wanamaker*, K. J. Kreutz and D. Introne, 2017, Spatial and temporal variability in the $\delta^{18}O_w$ and salinity compositions of Gulf of Maine coastal surface waters, *Continental Shelf Research*, 137, 163-171.

Grigholm, B., P.A. Mayewski, V. Aizen, K.J. Kreutz, E. Aizen, S. Kang, K.A. Maasch, S.B. Sneed, 2017, A twentieth century major soluble ion record of dust and anthropogenic pollutants from Inilchek Glacier, Tien Shan, *Journal of Geophysical Research-Atmospheres*, 122, 1884-1900, soi:10,1002/2016JD025407.

Gilbert, L., D. Gross, and K.J. Kreutz, 2016, *Earth Systems Thinking*, Science Education Resource Center (SERC) NSF InTeGrate STEP Center online teaching module (equivalent to a peer-reviewed textbook chapter), https://serc.carleton.edu/integrate/teaching_materials/syst_thinking/index.html

Grigholm, B., P.A. Mayewski, V. Aizen, K.J. Kreutz, C.P. Wake, E. Aizen, S. Kang, K.A. Maasch, M.J. Handley, and S.B. Sneed, 2016, Mid-twentieth century increases in anthropogenic Pb, Cd, and Cu in central Asia set in hemispheric perspective using Tien Shan ice core, *Atmospheric Environment*, 131, 17-28, 0.1016/j.atmosenv.2016.01.030.

WAIS Divide project members (C. Buizert, B. Adrian, J. Ahn, M. Albert, R.B. Alley, D. Baggenstos, T. K. Bauska, R.C. Bay, B.B. Bencivengo, C.R. Bentley, E.J. Brook, N.J. Chellman, G.D. Clow, J. Cole-Dai, H. Conway, E. Cravens, K.M. Cuffey, N.W. Dunbar, J.S. Edwards, J.M. Fegyveresi, D.G. Ferris, J.J. Fitzpatrick, T. J. Fudge, C.J. Gibson, V.Gkinis, J.J. Goetz, S. Gregory, G.M. Hargreaves, N. Iverson, J. Johnson, T.R. Jones, M.L. Kalk, M.J. Kippenhan, B.G. Koffman*, K.J. Kreutz, T.W. Kuhl, D.A. Lebar, J.E. Lee, S.A. Marcott, B.R. Markle, O.J. Maselli, J.R. McConnell, K.C. McGwire, L.E. Mitchell, N.B. Mortensen, P.D. Neff, K.Nishiizumi, R.M. Nunn, A.J. Orsi, D.R. Pasteris, J.B. Pedro, E.C. Pettit, P.B. Price, J.C. Priscu, R.H. Rhodes, J.L. Rosen, A.J. Schauer, S.W. Schoenemann, P.J. Sendelbach, J.P. Severinghaus, A.J. Shturmakov, M. Sigl, K.R. Slawny, J.M. Souney, T.A. Sowers, M.K. Spencer, E.J. Steig, K.C. Taylor, M.S. Twickler, B.H. Vaughn, D.E. Voigt, E.D. Waddington, K.C. Welten, A.W. Wendricks, J.W.C. White, M. Winstrup, G.J. Wong, and T.E. Woodruff), 2015, Precise interpolar phasing of abrupt climate change during the last ice age, *Nature*, 520 (7549), 661-665.

Zdanowicz, C., D. Fisher, J. Bourgeois, M. Demuth, J. Zheng, P. Mayewski, K. Kreutz, E. Osterberg, K. Yalcin, C. Wake, E. J. Steig, D. Froese and K. Goto-Azuma, 2014, Ice Cores from the St. Elias Mountains, Yukon, Canada: Their Significance for Climate, Atmospheric Composition and Volcanism in the North Pacific Region, *Arctic,* 67(5), 35-57.

Osterberg, E.O., P.A. Mayewski, D.A. Fisher, K.J. Kreutz, K.A. Maasch, S. Sneed, and E. Kelsey, 2014, Mount Logan ice core record of tropical and solar influences on Aleutian Low variability: 500–1998 A.D., *Journal of Geophysical Research*, 119(19), 11,189–11,204, DOI: 10.1002/2014JD021847.

Koffman*, B.G., K. J. Kreutz, D. J. Breton, E. J. Kane^, D. A. Winski*, S. D. Birkel, A. V. Kurbatov, and M. J. Handley, 2014, Centennial-scale variability of the Southern Hemisphere westerly wind belt in the eastern Pacific over the past two millennia, *Climate of the Past*, *10*(3), 1125-1144, doi:10.5194/cp-10-1125-2014.

Koffman*, B.G., M. Handley, E. Osterberg, M. Wells, and K.J. Kreutz, 2014, Dependence of ice-core relative trace-element concentration on acidification, *Journal of Glaciology, 60(219),* 1-10, doi:10.3189/2014JoG13J137.

Koffman*, B.G., K.J. Kreutz, D.J. Breton, E.J. Kane^, D.A. Winski*, S.D. Birkel, A.V. Kurbatov, and M.J. Handley, 2013, Centennial-scale shifts in the position of the Southern Hemisphere westerly wind belt over the past millennium, *Climate of the Past Discussion*, *9*, 2135-3174.

Koffman*, B.G., Kreutz, K.J., Kurbatov, A.V., and Dunbar, N.W., 2013, Impact of known local and tropical volcanic eruptions of the past millennium on the WAIS Divide microparticle record, *Geophysical Research Letters*, 40, 1-5, doi:10.1002/grl.50822.

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Bertler, N.A.N., Barrett, P., Mayewski, P.A., Fogt, R., Kreutz, K.J., and Shulmeister, J., 2004, El Nino suppresses Antarctic warming, *Geophysical Research Letters*, 31, L15207, doi:10.1029/2004GL020749.

Pruett*, L.E., Kreutz, K.J., and Wadleigh, M., and Aizen, V.B., 2004, Assessment of sulfate sources in high-elevation Asian precipitation using stable sulfur isotopes, *Environmental Science and Technology*, 38, 4728-4733.

Aizen, V.B., Aizen, E.M., Melack, J.M., Kreutz, K.J., and Cecil, L.D., 2004, Association between atmospheric circulation patterns and firn-ice core records from the Inilchek glacierized area, central Tien Shan, *Journal of Geophysical Research*, 109, doi:10.1029/2003JD003894.

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Kreutz, K.J., C.P. Wake, V.B. Aizen, L.D. Cecil, J.R. Green, and Synal, H.A., 2004, Event to decadal scale glaciochemical variability on the Inilchek Glacier, Central Tien Shan, in Cecil, L.D., Thompson, L.G., and Steig, E.J., eds., *Earth Paleoenvironments: Records Preserved in Mid- and Low-Latitude Glaciers*, Kluwer Publishers, 61-79.

Bertler, N.A.N., Mayewski, P.A., Barrett, P.J., Sneed, S.B., Handley, M.J., and Kreutz, K.J., 2004, Monsoonal circulation of the McMurdo Dry Valleys, Ross Sea region, Antarctica: signal from the snow chemistry, *Annals of Glaciology*, 39, 135-145.

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Pruett*, L.E., Kreutz, K.J., Wadleigh, M., Mayewski, P.A., and Kurbatov, A., 2004, Sulfur isotopic measurements from a West Antarctic ice core: implications for sulfate source and transport, *Annals of Glaciology*, 39, 545-556.

Kreutz, K.J., Wake, C.P., Aizen, V.B., Cecil, L.D., and Synal, H.A., 2003, Seasonal deuterium excess in a Tien Shan ice core: influence of moisture transport and recycling in Central Asia, *Geophysical Research Letters*, 30(18), 1922, doi:10.1029/2003GL017896.

Kang, S., Kreutz, K.J., Mayewski, P.A., Qin, D., and Tandong, Y. 2002, Stable isotopic composition of precipitation over the northern slope of the central Himalaya. *Journal of Glaciology*, 48(163), 519-526.

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Kang, S., Mayewski, P.A., Qin, D., Yan, Y., Hou, S., Zhang, D., and Kreutz, K.J. 2002, Glaciochemical records from a Mt. Everest ice core: relationship to atmospheric circulation over Asia. *Atmospheric Environment*, 36(21), 3351-3361.

Dorion, C.C., Balco, G.A., Kaplan, M., Kreutz, K.J., Wright, J., and Borns, H.W. Jr. 2001, Stratigraphy, paleoceanography, chronology, and environment during deglaciation of eastern Maine. In Weddle, T.K., and Retelle, M.J., eds., *Deglacial History and Relative Sea-Level Changes, Northern New England and Adjacent Canada*, Geological Society of America Special Paper 351, p. 215-242.

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Kreutz, K.J., and Sholkovitz, E.R. 2000, Major element, rare earth element, and sulfur isotopic composition of a high-elevation firn core: Sources and transport of mineral dust in Central Asia. *Geochemistry, Geophysics, Geosystems (G^3),* **1**, paper 2000GC000082.

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Kreutz, K.J., Mayewski, P.A., Pittalwala, I.I., Meeker, L.D., Twickler, M.S., and Whitlow, S.I. 2000. Sea-level pressure variability in the Amundsen Sea region inferred from a West Antarctic glaciochemical record. *Journal of Geophysical Research,* **105** (D3), 4047-4059.

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Kreutz, K.J., Mayewski, P.A., Twickler, M.S., Whitlow, S.I., White, J.W.C., Shuman, C.A., Raymond, C.R., Conway, H., and McConnell, J.R. 1999. Seasonal variations of glaciochemical, isotopic, and stratigraphic properties in Siple Dome, Antarctica surface snow. *Annals of Glaciology*, **29**, 38-44.

Kreutz, K.J., and Mayewski, P.A. 1999. Spatial variability of Antarctic surface snow glaciochemistry: Implications for paleoatmospheric circulation reconstructions. *Antarctic Science*, **11**(1), 105-118.

Kreutz, K.J., Mayewski, P.A., Whitlow, S.I., and Twickler, M.S. 1998. Limited migration of soluble ionic species in a Siple Dome, Antarctic ice core. *Annals of Glaciology*, **27**, 371-377.

Kreutz, K.J., Mayewski, P.A., Meeker, L.D., Twickler, M.S., Whitlow, S.I., and Pittalwala, I.I. 1997. Bipolar changes in atmospheric circulation during the Little Ice Age. *Science*, **277**, 1294-1296.

Mayewski, P.A., Twickler, M.S., Whitlow, S.I., Meeker, L.D., Yang, Q., Thomas, J., Kreutz, K.J., Grootes, P.M., Morse, D.L., Steig, E.J., Waddington, E.D., Saltzman, E.S., Whung, P.-Y., Taylor, K.C. 1996. Climate change during the Last Deglaciation in Antarctica. *Science*, **272**, 1636-1638.

OTHER PUBLICATIONS

Kreutz, K.J., C.P. Wake, E.C. Osterberg, and A. Criscitiello, 2020, Stories from the ice: A history of climate and environmental change told in ice cores, *UArctic Shared Voices Magazine 2020,* pp. 22-23.

Koffman*, B.G., and Kreutz, K.J., 2014, Evidence that local dust sources supply low-elevation Antarctic regions, *PAGES Magazine*, 22(2), 76-77.

Crowley, T.J., Zielinski, G., Vinther, B., Udisti, R., Kreutz, K.J., Cole-Dai, J., and Castellano, E., 2008, Volcanism and the Little Ice Age, *PAGES News*, 16(2), 22-23.

Bertler, N.A.N., Barrett, P., Mayewski, P.A., Fogt, R., Kreutz, K.J., and Shulmeister, J., 2005, Reply to comment by Doran et al. on "El Nino suppresses Antarctic warming", *Geophysical Research Letters*, 32, L07707, doi:10.1029/2005GL022595.

Green, J., Cecil, L.D., Synal, H.A., Santos, J., Kreutz, K.J., and Wake, C.P., 2004, A high resolution record of chlorine 36 nuclear weapons tests fallout from Central Asia, *Nuclear Instruments and Methods in Physics Research Section B – Beam Interactions with Materials and Atoms*, 223, 854-857.

Green, J., Cecil, L.D., Synal, H.A., Kreutz, K.J., Wake, C.P., Naftz, D.L., and Frape, S.K., 2000, Chlorine 36 and cesium 137 in ice core samples from mid-latitude glacial sites in the Northern Hemisphere, *Nuclear Instruments and Methods in Physics Research Section B – Beam Interactions with Materials and Atoms*, 172, 812-816.

Kreutz, K.J., Mayewski, P.A., Meeker, L.D., Twickler, M.S., and Whitlow, S.I. 1998. Continuous glaciochemical measurements on the Siple Dome deep ice core. *Antarctic Journal of the U.S*, **33**(5).

Kreutz, K.J., Mayewski, P.A., Twickler, M.S., Whitlow, S.I., and Meeker, L.D. 1997. Glaciochemical studies at Siple Dome, West Antarctica, during the 1996-97 season. *Antarctic Journal of the U.S.*, **32**(5), 46-48.

Kreutz, K.J., Mayewski, P.A., Twickler, M.S., and Whitlow, S.I. 1996. Ice core glaciochemical reconnaissance in Inland West Antarctica. *Antarctic Journal of the U.S.*, **31**(5), 51-52.

FUNDING – NATIONAL SCIENCE FOUNDATION

MRI: Acquisition of LA-HR-ICPMS instrumentation for climate, environmental, ecosystem, and engineering research at the University of Maine, NSF OPP-2215771, $661,462, PI, 2022-2025.

Evaluating North Pacific hydroclimate during the Holocene using the Denali ice core archive, NSF AGS-Paleoclimate- AGS-2002483, $391,160, PI, 2020-2023.

EAGER: Ice core site selection attempt on the Mt. Logan summit plateau, NSF AGS-Paleoclimate-1916967, $62,105, UMaine co-PI, 2019-2021.

EAGER: Exploration of the Denali basal ice core archive, NSF AGS-1806422, $95,794, UMaine PI, 2018-2020.

Acquisition of LA-ICP-QQQ-MS equipment for in situ trace element and isotopic research and training at the

University of Maine, NSF-EAR 1626194 Instruments and Facilities, $298,269, UMaine co-PI, 2017-2020.

Collaborative Research: Influence of natural ice microstructure on rheology in general shear: in-situ studies in the Alaska Range, NSF-PLR-1503924 Arctic Natural Sciences, $420,937, UMaine co-PI, 2016-2019.

Collaborative Research: SPICE core chronology and climate records using chemical and microparticle measurements, NSF-PLR-1443397 Antarctic Glaciology, $428,481, UMaine PI, 2015-2020.

InTeGrate (Interdisciplinary Teaching about Earth for a Sustainable Future), National Science Foundation STEP-center award to SERC/Carleton College (C. Manduca, PI); $25,000 sub-award to Kreutz to co-develop Systems Thinking module, 2014-2016.

Geophysical reconnaissance to expand ice core hydroclimate reconstructions in the Northeast Pacific, NSF-AGS-1502783 Paleoperspectives on Climate Change, $214,890, UMaine PI, 2015-2018.

Collaborative Research: Reconstructing central Alaskan precipitation variability and atmospheric circulation during the past millennium, NSF-AGS-1203838 Paleoperspectives on Climate Change, $364,771, UMaine PI, 2012-2016.

Roosevelt Island Climate Evolution Project (RICE): US Deep Ice Core Glaciochemistry Contribution (2011- 2014), NSF-PLR-1042883 Antarctic Glaciology, $815,937, UMaine co-PI, 2011-2014.

Collaborative Research: Construction of a continuous, high resolution and absolutely-dated marine chronology from the Gulf of Maine during the last millennium, NSF-OCE-1003423 Paleoperspectives on Climate Change, $200,051, UMaine PI, 2010-2015.

Collaborative Research: Microparticle/tephra analysis of the WAIS Divide ice core, NSF-PLR-0636740 Antarctic Glaciology, $591,434, UMaine PI, 2007-2011.

Collaborative Research: Asian Ice Core Array (AICA): Reconstruction of Past Physical and Chemical Climate Over Asia, NSF-AGS-0754644 Paleoclimate, $415,336, UMaine co-PI, 2008-2011.

Collaborative Research: Drillsite Reconnaissance and Snow Chemistry Survey in Denali National Park, NSF-PLR-0714004 Arctic Natural Sciences, $95,200, UMaine PI, 2007-2010.

Collaborative Research: 2000+ Year Detailed, Calibrated Climate Reconstruction from a South Pole Ice Core Set in an Antarctic – Global Scale Context, NSF-PLR-0636506 Antarctic Glaciology, $203,858, UMaine co-PI, 2007-2010.

Dry Valleys Late Holocene Climate Variability, NSF-PLR-0228052 Antarctic Glaciology, $440,342, UMaine PI, 2003-2008.

A new Mt. Logan ice core record – change in climate and chemistry of the atmosphere for the North Pacific, NSF-PLR-0240878 Arctic Natural Sciences, $375,000, UMaine co-PI, 2002-2005.

Aquaculture-Based Calibration of the *M. edulis* Isotope Paleothermometer, NSF-AGS-0222351 Paleoclimate, $233,570, UMaine PI, 2002-2005.

Acquisition of a high resolution ICP-MS for Environmental Research and Training in Maine, NSF-EAR-0215724 Major Research Instrumentation, $350,308, UMaine PI, 2002-2005.

Paleoclimate from Mt. Everest Ice Cores, NSF-AGS-0139491 Earth Systems History, $397,005, UMaine co-PI, 2001-2004.

Collaborative Research: A Glaciochemical Record of Natural and Anthropogenic Environmental Change in the

Northwestern North American Arctic, NSF-PLR-0136005 Arctic Natural Sciences, $129,763, UMaine PI, 2002-2006.

Paleoclimate and Glaciological Reconstructions in Central Asia Through the Collection and Analysis of Ice Cores and Instrumental Data from the Tien Shan, NSF-AGS-0096323 Earth Systems History, $252,226; DOE, $181,674, UMaine PI, 1999-2002.

FUNDING – OTHER SOURCES

Sea-to-Sky Experience, Golden Family Fund, UMaine PI, $500,000, 2020-2030.

Isotope hydrology in the Penobscot River watershed: towards integrated water cycle monitoring, analysis, and research/education, University of Maine Faculty Research Fund Award, $8,900, UMaine PI, $8,900, 2020-2021.

Ice core site selection on the Mt. Logan plateau, 2020 field season, University of Alberta, UMaine PI, $30,143, 2020.

Cordillera Darwin glacier and paleoclimate assessment, National Geographic Society, UMaine PI, $11,952, 2014-2015.

Equipment upgrades for stable isotope analysis at UMaine, University of Maine Multiuser Equipment Initiative, UMaine PI, $41,030, 2012-2015.

Improving inquiry-based scientific writing in ERS201 (Global Environmental Change), Maine Physical Sciences Partnership, UMaine PI, $25,000, 2012-2015.

Major advances in the field of climate change reconstruction using ice cores, W.M. Keck Foundation, UMaine co-PI, $1,600,000, 2008-2011.

Determining the Sources of Salt Pollution in Maine Ground Water Using Isotopic and Elemental Characterization, MAFES/USDA, $27,400, UMaine co-PI, 2002-2005.

Isotope Hydrology in High-Elevation Ecuador Watersheds. University of Maine Faculty Research Fund Award, $8,700, UMaine PI, 2001-2002.

Long-term Dynamics of the Southern Monsoons, Glaciers, and Water Resources in South-Eastern Tibet, National Geographic Society, $25,000, UMaine Co-PI, 2001-2002.

Isotopic, Ionic, and Elemental Measurements on 1999 Snowpit Samples Collected from the Inilchek Glacier, Central Tien Shan, U.S. Geological Survey, $15,000, WHOI PI, 1999.

Trace Element Analysis of Upper Fremont Glacier (Wyoming) Ice Core Samples: A Pilot Study, U.S. Geological Survey, $3,000, WHOI PI, 1999.

Ice Core Reconnaissance in the Central Tien Shan, Kyrgyzstan, Department of Energy, $25,000, WHOI PI, 1998.

AWARDS, HONORS, AND FELLOWSHIPS

2022	UMaine Presidential Outstanding Teaching Award
2022	American Federation of Mineralogical Societies Honorary Award
2019	Phi Kappa Phi membership
2013	UMaine Center for Undergraduate Research Faculty Fellow
2011	UMaine Graduate Mentor Award
2008	Grand Island Distinguished Alumni Award
2003	UMaine Research Honor Roll

1998	Woods Hole Oceanographic Institution Postdoctoral Fellowship
1998	U.S. Geological Survey Postdoctoral Fellowship (declined)
1998	Sigma Xi Award for Excellence in Dissertation Research
1997	University of New Hampshire Dissertation Fellowship
1996	NASA Graduate Fellowship
1993	NSF Experimental Program to Stimulate Competitive Research (EPSCoR) Fellowship

SELECTED INVITED LECTURES/SYMPOSIA

2023	RiSE Center Conference
2021	Maine Conservation Voters
2021	Maine Climate Summit, Maine Mathematics and Science Alliance
2021	Phi Beta Kappa Visiting Speaker Roundtable
2020	Maine Conservation Voters
2020	U.S. Arctic Research Commission
2020	Paul Scherrer Institute and ETH Zurich, Switzerland
2020	Department of Geological and Atmospheric Sciences, Iowa State University
2019	Arctic data workshop, University of Maine
2019	Department of Geological Sciences, University of Buffalo
2019	Jones Seminar, Thayer School of Engineering, Dartmouth College
2019	UMaine Arctic symposium
2018	Paul Scherrer Institute and ETH Zurich, Switzerland
2014	Cold and Arid Regions Environmental and Engineering Research Institute, and Chinese Academy of Sciences, Lanzhou/Beijing, China
2014	UNAVCO Field Education workshop, Boulder, CO
2014	Maine Audubon Board of Trustees
2013	Colby College, Maine
2011	Laboratorie de Glaciologie et de Geophysique de l'Environement (LGGE), Grenoble, France
2010	Lamont-Doherty Earth Observatory, Dust Records in a Changing World Workshop
2010	Colby College, Maine
2010	University of Milano Biocca, Italy
2009	AGU Fall Meeting, San Francisco
2009	NSF Conversations from Antarctica
2008	AGU Fall Meeting, San Francisco
2004	AGU Spring Meeting, Montreal
2002	UMaine Dept. of Chemistry
	CORONA Conference, Isle of Shoals
	U.S. Geological Survey
2000	Cambridge University (U.K.)
	University of Maine
1999	University of California San Diego
	Massachusetts Institute of Technology
	NSF/PAGES Swiss Climate Summer School, *The Dynamics of the Earth System: Processes and Records of Past Climate Change*, Hasliberg, Switzerland
1998	NSF/NATO Summer School, *Greenland Ice Cores and North Atlantic Climate*, Thule, Greenland
	NATO Advanced Study Institute, *Numerical Modeling of the Global Atmosphere,* Brunig, Italy
	Woods Hole Oceanographic Institution
1997	Dartmouth College
	AIRNET Conference, Keene State College
	Northern New England Junior Science and Humanities Conference
1996	AIRNET Conference, Notre Dame College
1995	NASA Summer School for Earth Sciences, *Processes of Global Change*, Pasadena, California
	NATO Advanced Study Institute, *The Stratosphere and its Role in the Climate System*, Montreal, Quebec

TEACHING EXPERIENCE

University of Maine

2023	ERS321/602: Field Research Skills
2023	ERS116: Earth and Climate Science Research Learning Experience
2022-	ERS107: Energy, Environment, and Climate
2022-	ERS410: Sea-to-Sky Experience
2022	RLE150: Earth Garage: Innovation in Climate Change
2021	RLE150: Maine Coast-to-Katahdin Geoscience Experience
2017-2018	ERS425/525: How to Build a Habitable Planet
2012-2021	ERS191: Energy in the Earth System
2009-2014	ERS369: Energy Resources and Climate Change
2009-	ERS201: Global Environmental Change
2003-2009	ERS 200: Earth Systems
2002-2015	ERS527: Isotope Geology
2001-	ERS321/602: Field Research Skills, Stable Isotope Geochemistry, Isotope Hydrology, Paleoclimate, Glaciology, Climate Dynamics, Habitable Planet seminars
2000-2008	ERS315: Principles of Stratigraphy and Sedimentology

University of New Hampshire

1996-1998	Teaching Assistant; Natural Climate Variability

University of Maine

1993	Teaching Assistant; Introductory Geology

University of Buffalo

1992	Teaching Assistant; Summer Geology Field Course, Western U.S.

STUDENT ADVISING

In progress:
Ingalise Kindstedt (co-advisor, PhD expected 2025)
Hannah Brooks (advisor, PhD expected 2025)
Emma Erwin (co-advisor, PhD expected 2025)
Madelyn Woods (committee member, PhD expected 2024)
Steven Bernsen (committee member, PhD expected 2024)
Maraina Miles (committee member, PhD expected 2025)

Completed:
Aaron Chesler (co-advisor, PhD 2022)
Frankie St. Amand (committee member, PhD 2022)
Ingalise Kindstedt (advisor, MS 2021)
Laura Mattes (committee member, MS 2021)
Natalie Harmon (committee member, Honors thesis 2020)
Erin McConnell (advisor, MS 2019)
William Kochtitzky (advisor, MS 2019)
Andrew Nolan (advisor, Honors thesis 2019)
Kimberley Miner (advisor, PhD 2018)
Allie Balter (committee member, MS 2018)
Mariah Radue (committee member, MS 2018)
Courtney King (committee member, PhD 2017)
Benjamin Partan (advisor, MS 2016)
Justin Leavitt (advisor, Capstone 2016)
Bjorn Grighom (committee member, PhD 2016)
Peter Neff (external examiner, Victoria University, New Zealand, PhD 2015)
Nina Whitney (advisor, MS 2015)
Abigail Bradford (advisor, capstone 2015)

Seth Campbell (advisor, PhD 2014)
Tobias Koffman (committee member, PhD 2014)
Scott Braddock (committee member, MS 2014)
Jennifer Lennon (committee member, MS 2014)
Joshua Plourde (advisor, capstone 2013)
Bess Koffman (advisor, PhD 2013)
Krista Slemmons (committee member, PhD 2013)
Matthew Kohler (advisor, Honors thesis 2013)
Margaret Jackson (committee member, MS 2013)
Elizabeth Dengler (committee member, MS 2013)
Tobias Koffman (committee member, MS 2013)
Eric Kelsey (committee member, University of New Hampshire, PhD 2013)
Emile Boudon (external examiner, University of Oulu, Finland, PhD 2012)
Dominic Winski (advisor, MS 2011)
Isabel Moreno (external examiner, University of Grenoble, France, PhD 2011)
Kathryn Ladig (committee member, MS 2011)
Seth Campbell (advisor, MS 2010)
Daniel Dixon (committee member, PhD 2011)
Shelly Griffin (advisor, Capstone 2009)
Stuart Ryan (external advisor, Bates College, BS 2009)
Elena Korotkikh (committee member, MS 2009)
Erich Osterberg (postdoctoral advisor, 2008)
Benjamin Gross (advisor, MS 2008)
Alan Wanamaker (advisor, PhD 2007)
Bjorn Grighom (committee member, MS 2007)
Erich Osterberg (committee member, PhD 2007)
Bruce Williamson (advisor, MS 2006)
Daniel Dixon (committee member, MS 2004)
Susan Kaspari (committee member, MS 2003, PhD 2007)
Kaplan Yalcin (committee member, University of New Hampshire, PhD 2005)
Lee Pruett (advisor, MS 2003)
Thomas Whittaker (committee member, MS 2004)
V. Blue Spikes (committee member, PhD 2003)
Dylan Andrews (Capstone advisor, 2001)

SELECTED PROFESSIONAL SERVICE (UMAINE AND EXTERNAL)

2023	University of Maine System Trustee Professorship Committee
2023	University of Maine Presidential Outstanding Teaching Award Committee
2021-	Orono Land Trust Board of Directors
2020-	New England Arctic Network Executive Committee
2020-	Phi Kappa Phi executive committee
2019	Chair, ECS peer review committee
2019-	Steering committee, UMaine Arctic Network
2018-	Advisory panel, Boston Museum of Science, *Arctic Adventure: Exploring with Technology* exhibit
2018-	Member, School of Marine Science Chemical Oceanography search committee
2018-	ECS peer review committee
2017-2018	Chair, ECS/CCI Glaciology faculty search committee
2017-	UMaine representative to the University of the Arctic
2017-	undergraduate class advisor, ECS
2015	co-convener/session chair, Northeast GSA meeting, "Holocene paleoclimate perspectives on present-day Arctic change"
2014	co-convener/session chair, AGU Fall meeting, "Holocene climate archives from across the Arctic: Detailed paleoclimate perspectives on present-day polar change"
2014-	Center for Undergraduate Research Advisory Committee

2013-	Graduate Coordinator, Graduate Board representative, and Graduate committee chair, Climate Change Institute
2011	co-convener/session chair, AGU Fall meeting, "Pleistocene-Holocene climate variability in the North Pacific realm"
2010-2021	Editorial Board Member, *Scientific Reports* (Nature Publishing Group)
2009-2015	Chair, U.S. Ice Core Working Group (advisory to NSF)
2009-2015	Member, Science Advisory Board, Ice Drilling Program Office (advisory to NSF)
2009-2018	Member, Maine Audubon Board of Trustees
2009-	Member, PAGES Arctic 2kyr Working Group
2005-2009	Member, U.S. Ice Core Working Group (stable isotope representative)
2008-	University Research Council Hi-Tech Equipment Committee
2007-2010	Elected member, UMaine Faculty Senate; Research and Scholarship, and Library Committees
2008	co-convener/session chair, AGU Fall meeting, "Tropical Pacific Paleoceanography during the Late Quaternary"
2007	co-convener/session chair, AGU Fall meeting, "Low to High Latitude North Pacific Climate During the Holocene"
2004	co-convener/session chair, EGU 1st General Assembly session, "Climatic and environmental records from mid and low latitude ice cores"
2004-	Member, Churchill Exploration Fund committee
2002-	Chair, UMaine ICP-MS Facility advisory board
2005-	Member, UMaine Sawyer Environmental Chemistry Research Laboratory advisory board
2000-	Served on several ERS and CCI search committees, CCI graduate committee, ERS and CCI planning committees
1996-	GSA Partners for Education Program (PEP)
1996	NSF Electronic Emissary Program
1994-	Several (>100) presentations to K-12 classes and civic organizations

Panel reviewer for National Science Foundation (NSF) and German Research Foundation (DFG); proposal reviews for NSF, European Science Foundation, DFG, Natural Environment Research Council (U.K.), National Geographic, Agence Nationale De La Recherche (France), Canadian Science Foundation, Netherlands Organization for Scientific Research, Australian Antarctic Program, US-Israel Binational Science Foundation, Swiss National Science Foundation, Austrian Science Fund, Czech Science Foundation, Netherlands Organization for Scientific Research, UK Royal Society

Manuscript reviewer for *Science, Nature, Journal of Geophysical Research, Tellus, Geophysical Research Letters, Journal of Glaciology, Quaternary Science Reviews, Annals of Glaciology*, *Climate of the Past*, *Climate Dynamics*, *Environmental Science and Technology*, *Journal of Climate, Geology, Applied Geochemistry, Geochimica et Cosmochimica Acta*, *Hydrological Processes*, *Polar Research*, Kluwer Publishers, *Scientific Reports, Journal of Geoscience Education*

FIELD RESEARCH EXPERIENCE

2024	Eclipse Icefield, St. Elias Mountains, Canada
2024	Sea-to-Sky Experience, Alaska and Yukon Territories
2023	Sea-to-Sky Experience, Alaska and Yukon Territories
2022	Sea-to-Sky Experience, Alaska and Yukon Territories
2018	Icefield Divide, St. Elias Mountains, Canada
2017	Mt. Logan, St. Elias Mountains, Canada
2016	Eclipse Icefield, St. Elias Mountains, Canada
2015	Cordillera Darwin, Argentina
2014	Denali National Park, Alaska
2013	Denali National Park, Alaska
2012	Denali National Park, Alaska
2010	Denali National Park, Alaska
2008	Denali National Park, Alaska
2005	Dry Valleys, Antarctica

2004	Dry Valleys, Antarctica
2004	Coastal Greenland
2003	Dry Valleys, Antarctica
2003	Eclipse Icefield, St. Elias Mountains, Canada
2002	Eclipse Icefield, St. Elias Mountains, Canada
2001	Altai Mountains, Central Asia
2001	Andes Mountains, Ecuador
2000	Tien Shan Mountains, Central Asia
1998	Himalayan Mountains, Nepal
1998	Tien Shan Mountains, Central Asia
1998	Eyjafjallajökull Ice Cap, Iceland
1996	West Antarctica (Siple Dome)
1995	West Antarctica (Marie Byrd Land)
1994	West Antarctica (Siple Dome)
1992-1994	Eastern coastal Maine