

John M. Fegyveresi

Northern Arizona University
School of Earth and Sustainability
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APPOINTMENTS

Northern Arizona University, Flagstaff, AZ (Aug 2019 – present)

- Assistant Professor of Practice, School of Earth and Sustainability.
- Climate Science and Solutions (CSS) Graduate Program Director.

Cold Regions Research and Engineering Lab (CRREL), Hanover, NH (Aug 2015 – 2019)

- Research Physical Scientist (GS-12), Terrestrial and Cryospheric Sciences Branch.

Boston University, Boston, Massachusetts (Oct 2016 – present)

- Adjunct Assistant Professor, Department of Earth and Environment.
- Adjunct Lecturer, Department of Earth and Environment.

Pennsylvania State University (May 2015 – July 2017)

- Post-Doctoral Res. Associate, Dept. of Geosciences, and Earth & Env. Systems Institute.

EDUCATION

Ph.D. Geosciences, Pennsylvania State University. May 2015

- Dissertation Title: The Physical Properties of the West Antarctic Ice Sheet (WAIS) Divide deep ice core: development, evolution, and interpretation.
- Advisor: Richard B. Alley

M.S. Geosciences, Pennsylvania State University. May 2010

- Thesis Title: Reconstructing paleoclimates on the West Antarctic Ice Sheet using ice core bubble number-density.
- Advisor: Richard B. Alley

B.S. Engineering, Case Western Reserve University. May 1998

- Electrical and Computer Engineering – Focus: Digital Design and Systems Engineering.
- Minor: Philosophy

PROFESSIONAL EXPERIENCE

International Ocean Discovery Program Exp. 379: Amundsen Sea West Antarctic Ice Sheet History

- Shipboard scientist and post expedition research. Petrophysics and downhole scientist; post-cruise micro-CT analyses of porosity and bulk density (Jan 2019 – present).

University of New Hampshire Science Coordination Office (SCO)

- Field/Chief scientist for WAIS Divide/South Pole Ice Core projects. Processing/analysis of recovered ice cores; management of field science teams (Winters 2010 – 2015, WAIS Divide and South Pole field deployments).

Cleveland Clinic Foundation, Cleveland OH

- Enterprise Systems Engineer. Design and implementation of critical enterprise-wide network and laboratory infrastructure (Aug 1999 – Apr 2007).

NASA Lewis Research Center, Cleveland OH

- Intern, Systems Programming and Risk Assessment Group (Summer 1997, 1998).

TEACHING

Assistant Professor of Practice: Northern Arizona University

- ENV675a Topics in Environmental Discourse: Adaptation, 3 credits.
- EES 687 Professional Development: 1 credit.
- ENV675b Topics in Environmental Discourse: Energy, 3 credits (Spring 2020).
- EES 608 CSS Fieldwork Experience, 3 credits (Summer 2020).
- ENV675c Topics in Environmental Discourse: Mitigation, 3 credits (Fall 2020).
- GLG 596 Quaternary Climate Change, 3 credits (Spring 2021).

Adjunct Faculty: Boston University

- ES351 Paleoclimatology and Oceanography, 4 credits.
- ES107 Introduction to Climate and Earth Systems Science, 4 credits, assistant instructor.

Research Associate: Pennsylvania State University

- GEOSC 320: Ice and Climate, 4 credits, course developer and assistant instructor.

Graduate Teaching Assistant: Pennsylvania State University

- GEOSC 320: Ice and Climate
- GEOSC 10: Geology of the National Parks
- GEOSC 472: Field Geology (Summer field camp).

ADVISING and MENTORING

Graduate Student Advising:

- Currently advising 16 Professional Science Masters CSS Students, NAU

Graduate Student Committees:

- Masters Thesis Committee member: Donovan Dennis (2018), Boston University. Thesis title: Preliminary investigations of the effect of sublimation on the stable water isotope signal of exposed surface, sub-surface, and buried ice.
- Masters Thesis Committee: Shivani Ehernefeucht (2018), Boston University. Thesis title: Modeling post-depositional changes of δD in ice due to sublimation.

Graduate Research Mentor:

- Directed Research Mentor: Allison Pelletier (UMASS Lowell - 2018)
- Directed Research Mentor: Lauren Farnsworth (CRREL/Dartmouth College - 2018)

Undergraduate Research Mentor:

- Thesis Committee: Nathan Stevens, The Schreyer Honors College (2015).
- Directed Research and Field Mentoring, Emma Koehle (U. Washington), Melinda Nicewonger (U.C. Irvine), Dom Winski (Dartmouth College).

PUBLICATIONS

- ZR Courville, RM Lieblappen, AK Thurston, RA Barbato, **JM Fegyveresi**, LB Farnsworth, J Derry, SL Doherty, SA Rosten, 2019. "Microorganisms associated with dust on snow." *Frontiers in Earth Science* (*in review*).
- Lieblappen RM, JM Fegyveresi, D Albert, ZR Courville, 2019, "Using Ultrasonic Waves to Determine the Microstructure of Snow." *Frontiers in Earth Science* (*Accepted – in revision*).
- Hartman LH, AV Kurbatov, DA Winski, AM Cruz-Uribe, SM Davis, NW Dunbar, NA Iverson, M Aydin, **JM Fegyveresi**, DG Ferris, TJ Fudge, EC Osterberg, and MG Yates, 2019, "Volcanic glass properties from 1459 C.E. volcanic event in South Pole ice core dismiss Kuwae caldera as a potential source." *Scientific Reports*, 9, 14437, doi:10.1038/s41598-019-50939-x.
- Winski DA, TJ Fudge, DG Ferris, EC Osterberg, **JM Fegyveresi**, J Cole-Dai, Z Thundercloud, TS Cox, KJ Kreutz, N Ortman, C Buizert, J Epifanio, EJ Brook, R Beaudette, J Severinghaus, T Sowers, EJ Steig, EC Kahle, TR Jones, V Morris, M Aydin, MR Nicewonger, KA Casey, RB Alley, ED Waddington, NA Iverson, RC Bay, JM Souney, 2019. "The SP19 Chronology for the South Pole Ice Core – Part 1: Volcanic matching and annual-layer counting." *Clim. Past*, 15, 1793-1808, doi: 10.5194/cp-15-1793-2019.
- Rowley NS, AM Carleton, **JM Fegyveresi**, 2019. "Relationships of West Greenland supraglacial melt-lakes with local climate and regional atmospheric circulation." *International Journal of Climatology*, 1–14, doi:10.1002/joc.6262.
- Fegyveresi, JM**, TJ Fudge, DA Winski, DG Ferris, RB Alley, 2019 : "Visual Observations and Stratigraphy of the South Pole Ice Core (SPICEcore): A Preliminary Holocene (~10.2 ka) Accumulation Record and Depth-Age Chronology." *ERDC/CRREL Report No. TR-19-10*. ERDC-CRREL, Hanover, NH, doi: 10.21079/11681/33378.
- Gohl, K., Wellner, J.S., Klaus, A., and the Expedition 379 Scientists, 2019. "Expedition 379 Preliminary Report: Amundsen Sea West Antarctic Ice Sheet History." International Ocean Discovery Program, doi:10.14379/iodp.pr.379.2019.
- Rowley NS and **JM Fegyveresi**, 2019. "Generating a supraglacial melt-lake inventory near Jakobshavn, West Greenland, using a new semi-automated lake-mapping technique." *Polar Geography*, 1-20, doi:/10.1080/1088937X.2019.1578289.
- Fegyveresi JM**, Alley, RB Voigt, DE, Fitzpatrick, JJ, Wilen, L, 2019. "Instruments and methods: A case study of ice core bubbles as strain indicators." *Ann. of Glaciology*, 60(78), 8-19, doi:10.1017/aog.2018.23.
- Fegyveresi JM**, RB Alley, A Muto, AJ Orsi, MK Spencer, 2018a. "Surface formation, preservation, and history of low-porosity crusts at the WAIS Divide site, West Antarctica." *The Cryosphere*, 12, 325-341, doi:10.5194/tc-12-325-2018.
- Fegyveresi JM**, 2017. "Quantifying the potential risks and future impact of a large Leverett Glacier crevasse on the South Pole Traverse (SPoT)". *ERDC/CRREL Report No. TR-17-16*. ERDC-CRREL Hanover, NH, United States, doi:10.21079/11681/24835.
- Fegyveresi JM**, RB Alley, JJ Fitzpatrick, KM Cuffey, JR McConnell, DE Voigt, MK Spencer, and NT Stevens, 2016. "Five millennia of surface temperatures and ice core bubble characteristics from the WAIS Divide deep core, West Antarctica." *Paleoceanography*, 31, 416-433, doi:10.1002/2015PA002851.

- Orsi AJ, K Kawamura, **JM Fegyveresi**, M Headly, RB Alley, J Severinghaus, 2015. "Differentiating bubble-free layers from melt layers in ice cores using noble gases." *J. of Glaciology*, 61(227): 585-594, doi:10.3189/2015JG14J237.
- WAIS Divide Project Members**, 2015. "Precise interhemispheric phasing of abrupt climate change during the last ice age." *Nature*, 520(7549), 661-665, doi:10.1038/nature14401.
- Fitzpatrick JJ, DE Voigt, **JM Fegyveresi**, NT Stevens, MK Spencer, J Cole-Dai, RB Alley, G Jardine, E Cravens, L Wilen, TJ Fudge, JR McConnell, 2014. "Physical Properties of the WAIS Divide Ice Core." *J. of Glaciology*, 60(224), 1181-1198, doi:10.3189/2014JG14J100.
- Mitchell LE, C. Buizert, EJ Brook, DJ Breton, **JM Fegyveresi**, D. Baggenstos, AJ Orsi, J Severinghaus, RB Alley, M. Albert, RH Rhodes, JR McConnell, M Sigl, O Maselli, S Gregory, and J Ahn, 2015. "Observing and modeling the influence of layering on bubble trapping in polar firn". *J. of Geophysical Research: Atmospheres*, 120, 2558–2574, doi:10.1002/2014JD022766.
- WAIS Divide Project Members**, 2013. "Onset of deglacial warming in West Antarctica driven by local orbital forcing." *Nature*, 500(7463), 440-444, doi:10.1038/nature12376.
- Fegyveresi JM**, RB Alley, MK Spencer, JJ Fitzpatrick, EJ Steig, JWC White, JR McConnell, and KC Taylor, 2011. "Late-Holocene climate evolution at the WAIS Divide site, West Antarctica: bubble number-density estimates." *J. of Glaciology*, 57(204), 629-638, doi:10.3189/002214311797409677.

Manuscripts in Preparation for Submission:

- Fegyveresi JM**, RB Alley, JJ Fitzpatrick, DE Voigt, ZR Courville, RM Lieblappen, 2020, "Measurement and interpretation of bubble number-density evolution from the SPC14 South Pole Ice Core through the Holocene." *J. of Glaciology* (in preparation)

SELECTED CONFERENCE ABSTRACTS

- S Passchier, CD Hillenbrand, T Frederichs, O Libman-Roshal, K Gohl, J Wellner, JM Fegyveresi, and **Expedition 379 Scientists**. 2020 Sedimentary processes offshore the Amundsen Sea, West Antarctica under different Pliocene climate states: first results from IODP Exp. 379. SEPM International Sedimentary Geosciences Congress, Flagstaff
- Fegyveresi JM**, Alley, RB, Fitzpatrick, JJ, Voigt, DE, Courville, ZR, Lieblappen, R 2018. Measurement and interpretation of bubble number-density evolution through the upper 1200 meters of the SPC14 South Pole Ice Core [Abstract: C41C-0351]. 2018 Fall Meeting, AGU, Washington, D.C.
- Fegyveresi JM**, Alley, RB, Fitzpatrick, JJ, Voigt, DE, Wilen, L., 2018. Can ice-core bubbles be used as strain indicators? A case study using a new hybrid-sample imaging technique [Abstract: 78A2754]. 2018 IGS Meeting, Buffalo, N.Y., 3-8 Jun.
- Buffen AM, JA Menking, EJ Brook, C Buizert, **JM Fegyveresi**, TJ Fudge, 2017. "A new Holocene $\delta^{13}\text{C}$ -CO₂ record from the South Pole ice core". South Pole Ice Core Meeting. U. of Wash., Seattle, Wa.
- Voigt DE, **JM Fegyveresi**, RB Alley, JM Fitzpatrick, and E. Cravens, 2017. "C-axis fabric of the South Pole Ice core; SPC14." South Pole Ice Core Meeting. U. of Wash., Seattle, Wa.
- Winski DA, EC Osterberg, DG Ferris, TJ Fudge, **JM Fegyveresi**, J Cole-Dai, KJ Kreutz, and BG Koffman, 2016. "A 5,000 year snow accumulation record from the South Pole Ice Core." [Abstract: PP51A-2284]. 2016 Fall Meeting, AGU, San Francisco, CA.

- Fudge, TJ, KC Taylor, ED Waddington, H Conway, JJ Fitzpatrick, RC Bay, **JM Fegyveresi**, 2016. "Irregular layering at mid-depths in two Antarctic Ice Cores." [Abstract: C52A-05]. 2016 Fall Meeting, AGU, San Francisco, CA.
- Lieb-Lappen R, ZR Courville, DD Albert, S Taylor, J Lever, R Barbato, A Song, RW Obbard and **JM Fegyveresi**, 2016. "Broad Applications for X-Ray Micro-Computed Tomography." [Abstract: H13N-07]. 2016 Fall Meeting, AGU, San Francisco, CA.
- Fegyveresi JM**, TJ Fudge, DG Ferris, March 2016. "Visual Stratigraphy, EMC Volcanic Matching, and a New Depth-Age Scale for the South Pole Ice Core (SPC14) to ~7ka." International Partnership in Ice Core Sciences (IPICS) Meeting, Hobart Tasmania, Aus.
- Souney JM, MS Twickler, M Aydin, KA Casey, **JM Fegyveresi**, TJ Fudge, EC Koehle, TA Neumann, MR Nicewonger, ES Saltzman, EJ Steig, March 2016. "The 1500 m South Pole Ice Core: Recovering a 40,000 year environmental record." International Partnership in Ice Core Sciences (IPICS) Meeting, Hobart Tasmania, Aus.
- Fegyveresi JM**, RB Alley, MK Spencer, A Muto, AJ Orsi, 2014. "Surface Formation and Preservation of Very-Low-Porosity Thin Crusts ("Glazes") at the WAIS Divide Site, West Antarctica." [Abstract: C31C-0328]. 2014 Fall Meeting, AGU, San Francisco, CA.
- Spencer MK, A Dennison, RB Alley, JJ Fitzpatrick, **JM Fegyveresi**, 2014. "Holocene climate at Siple Dome, W. Antarctica, using bubble number-density." [Abstract: C31C-0337]. 2014 Fall Meeting, AGU, San Francisco, CA.
- Fegyveresi JM**, RB Alley, JJ Fitzpatrick, MK Spencer, NT Stevens, 2014. "Bubble size, shape, and number-density evolution through the WDC06A brittle-ice zone." The Physics and Chemistry of Ice Conference (PCI), Dartmouth College.
- Edwards J, E Brook, JE Lee, L Mitchell, **JM Fegyveresi**, T Sowers, RB Alley, J McConnell, J Severinghaus, D Baggenstos, 2014. "Millennial and Sub-millennial Variability of Total Air Content from the WAIS Divide Ice Core." [Abstract: 15368]. 2014 EGU General Assembly, Vienna Austria.
- Fegyveresi JM**, RB Alley, A Muto, 2013. "Investigating surface crusting at the WAIS Divide Site." Midwest Glaciological Meeting (MGM), University Park, PA.
- Fegyveresi JM**, T. Sowers, RB Alley, J Edwards, L Mitchell, J Lee, E Brook, 2012. "The total gas content record at the WAIS Divide site and the effects of seasonality on the pore close-off volume." International Partnership in Ice Core Sciences (IPICS) Meeting, Presqu'île de Giens, France.
- Fegyveresi JM**, RB Alley, MK Spencer, T Sowers, 2011. "Seasonal influences on firn layering and bubble trapping, WAIS Divide, West Antarctica." [Abstract: C33C-0653]. 2011 Fall Meeting, AGU, San Francisco, CA.
- Fegyveresi JM**, RB Alley, MK Spencer, KM Walsh, and JJ Fitzpatrick, 2009. "Using the bubble number-density of WAIS glacier ice as a paleoclimatic and accumulation rate reconstruction tool: methods and findings." The PAGES Conference, Corvallis, OR.

GRANTS AND FUNDING

- Amundsen Sea West Antarctic Ice Sheet History IODP Exp. 379 (NSF Award: 1738942): 2019 funding \$65,000 (total TBD); role: shipboard and post-cruise scientist. (Ongoing).
- Climate history and flow processes from physical analyses of the SPICECORE South Pole Ice Core (NSF Award: 1542778): \$200,000; role: Co-PI. (2016-2019).

- Collaborative Research: A 1500m ice core from South Pole (NSF Award: 1142517): \$436,000; role: research associate and co-chief field scientist. (2012-2019).
- Quantifying the Potential Risks and Future Impact of a Large Leverett Glacier Crevasse on the SPoT (NSF AIL Award: EP-ANT-16-26): \$40,000; role: lead PI. (2016-2017).
- Reconnaissance of a New Potential Road Site to Replace the Transition Zone Road (NSF AIL Award: EP-ANT-16-32): \$85,357; role: Co-PI and field researcher. (2016-2017).
- Remote Sensing for Crevasse Detection for Science Traverses (NSF AIL Award: EP-ANT-16-63): \$50,000; role: Co-PI and research associate. (2016-2017).
- High frequency acoustic response of Earth materials (Army 6.1): \$745,000; role: Co-PI. (2014-2017).
- Support of M88A2 Improved Recovery Vehicle Performance in Snow and Ice Environments Testing (USMC): \$266,000; role: research scientist. (2016-2018).
- Microorganisms associated with dust on snow – (Army 6.1): \$100,000; role: research and field scientist. (2016-2018).
- Collaborative research: Continued study of the physical properties of the WAIS Divide deep core (NSF Award: 1043528): \$428,000; role: research associate and research assistant. (2011-2016).
- Origin and Climatic Significance of Rock Glaciers in the McMurdo Dry Valleys: Assessing Spatial and Temporal Variability (NSF Award: 1341284): \$331,000; role: research collaborator. (2014-2017).
- Collaborative Research: Spatial and temporal variability of surface albedo and light absorbing chemical species in Greenland (NSF Award: 1203876): \$368,000; role; researcher associate. (2012-2016).
- Collaborative research: Physical properties of the WAIS Divide deep core (NSF Award: 0539578): \$564,000; role: research assistant. (2008-2011).

Pending Proposals:

- Ground Penetrating Radar Investigation and Survey of Buried WAIS Divide Drilling Arch Using Autonomous Data Collection (NSF AIL Proposal: EP-ANT-16-32): \$80,000; role: Lead PI.
- Temperature-gradient metamorphism and bubble trapping in polar snow (Army 6.1 basic research): \$240,000; role: Lead PI.
- Climate history and flow processes from physical analyses of the Hercules Dome Ice Core (In preparation for Submission to NSF Antarctic Glaciology).

INVITED TALKS AND SEMINARS

- Nov-2016: South Pole Station, Antarctica, NSF Special Presentation for Secretary of State, John Kerry. "The US-led ice coring campaign to obtain a 50,000 year climate record from the South Pole."
- Apr-2016: Case Western Reserve University, OH: EEPS Dept. Colloquium Series. "Insights on climate dynamics and physical ice properties from the WAIS Divide Ice coring project."

- Jun-2014: DRI, University of Nevada, Reno, NV: Cryosphere and Climate Seminar. "Physical properties of the WAIS Divide ice core: what the bubbles are telling us."
- Mar-2012: Pennsylvania State University, PA: Geodynamics Colloquium Series. "Reconstructing paleoclimate in West Antarctic using ice-core bubble number-density."

OUTREACH

- Mar-2018: Thetford Historical Society, Thetford, VT. "Living and working at a remote field camp in Antarctica."
- Jan-2017: Francis C. Richmond Middle School, Hanover, NH. "Life and science on the West Antarctic Ice Sheet."
- Mar-2016: Montshire Museum and School, Norwich, VT. "How we drill ice cores, and what we can learn from them."
- Mar-2014: Cayuga Nature Center, Ithaca, NY. "Two miles of climate history: How we drilled the deepest ice core in Antarctica, and why."
- Feb-2013: Neil Armstrong Elementary School, Gates, NY. "Life at the bottom of the world."

SERVICE

- 2018 - present: Executive Committee for Ice Core Young Scientists (ICYS).
- 10-2018: NSF Proposal Reviewer (Antarctic Glaciology)
- 11-2017: NSF Proposal Reviewer (Antarctic Glaciology)
- 2015 – present: Peer reviewer for several journals including J. of Glaciology, A. of Glaciology, JGR, and The Cryosphere.
- 2010 – Graduate Program Committee, Pennsylvania State University.
- 2009-2010: Graduate Colloquium Committee, Pennsylvania State University.

AWARDS

- Paul D. Krynine Scholarship, Pennsylvania State University, Department of Geosciences, 2010-2014.
- Scholten-Williams-Wright Graduate Fellowship, Pennsylvania State University, Department of Geosciences, 2010.
- Provost Scholarship, Case Western Reserve University, Engineering Dept. 1994-1998
- Alumni Scholarship. Case Western Reserve University, Engineering Dept. 1998.