

Heather M. Clifford

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EDUCATION

University of Maine, Orono, ME	June 2016 – Present
MSc. Quaternary and Climate Studies	(GPA: 3.95)
Clemson University, Clemson, SC	August 2011 – December 2015
B.S. Environmental Engineering	(GPA: Overall 3.2, Major 3.4)

RESEARCH/ FIELD EXPERIENCE

Graduate Research Assistant , University of Maine	June 2016-Present
Assisted in sampling and analyzing ice cores using a Laser Ablation Inductively Coupled Plasma Mass Spectrometer as well as collecting and processing data for Colle Gnifetti (Swiss Alps) and Allan Hills (Antarctica) ice cores.	
Field Assistant , Kangerlussuaq, Greenland Expedition	June 2017
Assisted in drilling, collecting and transporting of several meters long ice core drilled from the Greenland ice sheet.	
Laboratory Technician Intern , Clemson University	May-December 2015
Worked with professors and graduate students at Clemson Environmental Technology Lab on large scale research project, ' <i>Radionuclide Waste Disposal: Development of Multi-scale Experimental and Modeling Capabilities</i> ', funded by the Department of Energy's Office of Science.	
The GREEN Study Abroad Program , Iceland	March 2014
Participated in graduate level renewable energy and sustainability courses & a Sustainability Capstone Project at Iceland School of Energy at Reykjavik University.	

TEACHING EXPERIENCE

Substitute Teacher , Sandwich, MA	January-May 2016
Responsible for providing instruction, managing the classroom environment, and promoting student learning in the absence of an elementary school teacher	

PUBLICATIONS

- Pales, A. R., Li, B., Clifford, H. M., Kupis, S., Edayilam, N., Montgomery, D., Liang, W.-Z., Dogan, M., Tharayil, N., Martinez, N., Moysey, S., Powell, B., & Darnault, C. J. (2018).

Preferential flow systems amended with biogeochemical components: imaging of a two-dimensional study., *Hydrol. Earth Syst. Sci.*, **22**, 2487-2509.

- Pales, A. R., Kinsey, E. N., Li, C., Mu, L., Bai, L., Clifford, H. M., & Darnault, C. J. (2017). *Rheological properties of silica nanoparticles in brine and brine-surfactant systems.* *Journal of Nanofluids*, **6**(5), 795-803.
- Li, B., Pales, A. R., Clifford, H. M., Kupis, S., Hennessy, S., Liang, W. Z., ... & Darnault, C. J. (2017). *Preferential Flow in the Vadose Zone and Interface Dynamics: Impact of Microbial Exudates.* *Journal of Hydrology*.

CONFERENCE ABSTRACTS

- Clifford, H., Spaulding, N., Royer, M., Sneed, S. B., Korotkikh, E., Handley, M., Kurbatov, A., ... & Mayewski, P. A. (2018, April). *A New Approach for Ultra-High-Resolution Ice Core Data Processing.* In EGU General Assembly Conference Abstracts.
- Clifford, H., Mayewski, P. A., Higgins, J. A., Introne, D., Kurbatov, A., Sneed, S. B., ... & Yan, Y. (2016, February). *An Ultra-High-Resolution Investigation of 1 Ma Old Ice from Allan Hills Blue Ice Area, Antarctica.* In *AGU Fall Meeting Abstracts*.
- Pales, A., Darnault, C., Li, B., Clifford, H., Montgomery, D., Moysey, S., ... & Tharayil, N. (2017, April). *Flow and Transport of Radionuclides in the Rhizosphere: Imaging and Measurements in a 2D System.* In EGU General Assembly Conference Abstracts (Vol. 19, p. 10432).
- Kinsey, E., Pales, A., Li, C., Mu, L., Bai, L., Clifford, H., & Darnault, C. (2016, April). *Rheological Properties of Nanoparticle Silica-Surfactant Stabilized Crude Oil Emulsions: Influence of Temperature, Nanoparticle Concentration and Water Volume Fraction.* In EGU General Assembly Conference Abstracts (Vol. 18, p. 10720).
- Pales, A. R., Li, B., Clifford, H., Edayilam, N., Montgomery, D., Dogan, M., ... & Darnault, C. J. G. (2016, February). *Imaging and Measurements of Flow Phenomena and Impact of Soil Associated Constituents Through Unsaturated Porous Media in a 2D System.* In *AGU Fall Meeting Abstracts*.

RESEARCH TECHNIQUE EXPERIENCE

Graduate Research Assistant, University of Maine

June 2016-Present

Responsible for:

- Performing experiments with Laser Ablation Inductively Coupled Plasma Mass Spectrometer (LA-ICP-MS) on ice cores
- Ice core sample preparations in -26C freezer
- Creating software for ice core data processing

Lab Technician Intern, Clemson University

August – December 2015

Responsible for:

- Organizing and performing a variety of bench scale experiments with soil samples,
- Using Light and X-ray Transmission imaging techniques to determine water content and soil structure within a 2D Tank
- Operated IPLab Imaging software and MATLAB to analyze experimental data
- Handling radioactive materials

Senior Capstone Design Project, Clemson University

Jan – May 2015

- Conducted laboratory research to remove recalcitrant dye from wastewater effluent using Electrocoagulation with Gerber Pumps Inc.

PRESENTATIONS & AWARDS

UMaine Graduate School Government Grant Award	Spring 2018
European Geosciences Union Presentation	Spring 2018
Harold W. Borns, Jr. Symposium Presentation	Spring 2018
Harold W. Borns, Jr. Symposium Presentation	Spring 2017
American Geophysical Union Presentation	Fall 2016

RELEVANT SKILLS

Computer Programming: Python3, MATLAB, NCL, Linux

Software: Microsoft Office, Igor, AutoCAD, Adobe Illustrator, IPLab, IceCoreDater

RELEVANT COURSEWORK

University of Maine:

The Changing Arctic, Data Analysis in MATLAB & Python, Climate Culture & Biosphere, Risk Communication, Advances in Ice Core Research, Atmosphere Ocean Ice & Climate Change, Volcanos & Climate, Climate Analysis in NCL

University of Reykjavik:

Energy Economics, Renewable Energies, Geothermal & Hydropower Technology

Clemson University:

Organic Chemistry, Soils, Toxicology, Engineering Skills, Statistics, Calculus (I II III IV), Physics (I II), Computer Programming, Statics, Dynamics, AutoCAD, Environmental History, Fluid Mechanics, Environmental & Engineering Economics, Water & Wastewater Treatment Systems, Air Pollution Engineering, Physics of Climate, Solid & Hazardous Waste Management, Thermodynamics, Quantum Mechanics, Environmental Risk Assessment, Environmental Sustainability

SCHOOL INVOLVEMENT

University of Maine

Member of Earth & Climate Sciences Graduate Student Club

Clemson University

Member of Students for Environmental Action

Member of Environmental Engineering Club

Member of Engineers without Borders

REFERENCES

Dr. Paul Mayewski, Climate Change Institute, University of Maine, Orono ME

P: 207-581-3019

Email: paul.mayewski@maine.edu

Dr. Andrei Kurbatov, Climate Change Institute, University of Maine, Orono ME

P: 207-581-2840

Email: akurbatov@maine.edu

Dr. Christophe Darnault, Env. Engineering & Earth Sciences, Clemson University, Clemson SC

P: 864-656-1398

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