Chloe D Gustafson, PhD

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Academic Appointments

Postdoctoral Research Scientist — Nov. 2020 - present
Department of Geography
Swansea University
Supervisor: Bernd Kulessa

Postdoctoral Research Scientist — Oct. 2020 - Nov. 2020
Lamont-Doherty Earth Observatory, Columbia University
Supervisor: Kerry Key

Education

PhD, Earth and Environmental Sciences — October 2020
Lamont-Doherty Earth Observatory, Columbia University
Dissertation: *Electromagnetic investigations of submarine and subglacial groundwater systems.*
Advisor: Dr. Kerry Key

MS, Earth Sciences — December 2016
Scripps Institution of Oceanography, University of California San Diego
Advisor: Dr. Kerry Key

BS, Geophysical Engineering, *Magna Cum Laude* — May 2015
Colorado School of Mines
Outstanding Graduating Senior in Geophysics

Publications

Gustafson, C., K. Key, R. L. Evans (2019), Aquifer systems extending far offshore on the U.S. Atlantic margin, *Scientific Reports, 9,* 1-10, doi:10.1038/s41598-019-44611-7.

Blatter D., K. Key, A. Ray, **C. Gustafson**, and R. L. Evans (2019), Bayesian joint inversion of controlled source electromagnetic and magnetotelluric data to image freshwater aquifer offshore New Jersey, *Geophysical Journal International, 218(3)*, 1822-1837, doi:10.1093/gji/ggz253.

Tinto K., L. Padman, C. Siddoway, S. Springer, H. Fricker, I. Das, F. C. Tontini, D. Porter, N. Frearson, S. Howard, M. R. Siegfried, C. Mosbeux, M. Becker, C. Bertinato, A. Boghosian, N. Brady, B. Burton, W. Chu, S. I. Cordero, T. Dhakal, L. Dong, **C. Gustafson** and et al. (2019), Ross Ice Shelf response to climate driven by the tectonic imprint on seafloor bathymetry, *Nature Geoscience, 12*, 441-449, doi.org/10.1038/s41561-019-0370-2

Funded Proposals

Investigation of the Lithosphere/Asthenosphere Boundary and Course in Geophysical Methods at Sea
Funding source: U.C. Ship Funds 2016
Funded amount : $6200
Ship time acquired: 16 days

Seminars

Wet hot rocks and cool geophysics: does groundwater lubricate Antarctic ice flow? *University College London, Institute for Risk and Disaster Monthly Seminar* *Jointly presented with B. Kulessa*	November 2020
Magnetotelluric imaging of subglacial groundwater beneath Whillans Ice Plain, West Antarctica *Electromagnetic Methods Research Consortium at Columbia University Summer Workshop*	July 2020
Wet hot rocks and cool geophysics: does groundwater lubricate Antarctic ice flow? *International Glaciological Society Global Seminar* *Jointly presented with B. Kulessa*	July 2020
Exploring Antarctic Subglacial Hydrology using MT. *IRIS Webinar: Magnetotelluric Science Vignettes*	April 2020
Characterizing extensive hydrogeologic systems beneath ice sheets and oceans using electromagnetic methods. *Australian Society of Exploration Geophysicists Global Webinar*	April 2020
Geophysical imaging of subglacial and submarine groundwater systems. *Department of Geology Colloquium, University of Kansas*	February 2020
Imaging groundwater systems beneath ice sheets and oceans. *Department of Geosciences Colloquium, Pennsylvania State University*	January 2020
Investigating subglacial hydrogeology of Whillans Ice Plain, West Antarctica, using magnetotelluric data. *Department of Geophysics Heiland Lecture, Colorado School of Mines*	October 2019
The first magnetotelluric survey of an active subglacial hydrologic system. *Geoscience Seminar, University of Colorado Boulder*	October 2019
Addressing the sea level challenge. *Lamont Advisory Board Meeting, Columbia University* [*co-presenter with R. Bell, M. Tedesco, and M. Cashman*]	March 2019
An extensive offshore aquifer on the U.S. Atlantic margin. *EM Methods Research Consortium Workshop, Columbia University*	Oct. 2018
An appraisal of offshore groundwater on the U.S. Atlantic Margin. *Marine Geology Seminar, Rutgers University*	Oct. 2018
A pilot electromagnetic survey of groundwater beneath the U.S. Atlantic continental shelf. *First year and transfer colloquium, Lamont-Doherty Earth Observatory*	April 2018
Resolution capabilities of marine CSEM imaging of subduction zones. *Seafloor EM Methods Consortium, Scripps Institution of Oceanography*	May 2016

Conference Abstracts

Invited Talk. **Gustafson, C.**, K. Key, M. Siegfried, and H. Fricker. 2020. Extensive saline groundwater beneath Whillans Ice Stream, West Antarctica. *AGU 2020 Fall Meeting.*

Invited Talk. **Gustafson, C.**, K. Key, and R. Evans. 2020. Electromagnetic geophysical mapping of offshore freshened groundwater on the U.S. Atlantic margin. *GSA 2020 Fall Meeting.*

Talk. **Gustafson, C.**, K. Key, M. Siegfried, and H. Fricker. 2020. Imaging salty groundwater in sedimentary basins beneath Whillans Ice Plain, West Antarctica. *West Antarctic Ice Sheet Workshop.*

Talk. **Gustafson, C.**, K. Key, M. Siegfried, and H. Fricker. 2020. Deep imaging of subglacial hydrology. *International Thwaites Glacier Collaboration Science Meeting June 2020.*

Invited Poster. **Gustafson, C.**, K. Key, and R. Evans. 2019. Characterizing offshore aquifer systems on the U.S. Atlantic margin with electromagnetic methods. *AGU 2019 Fall Meeting.*

Poster. **Gustafson, C.**, K. Key, M. Siegfried, and H. Fricker. 2019. Electromagnetic imaging of subglacial hydrogeology of Whillans Ice Plain, West Antarctica. *AGU 2019 Fall Meeting.*

Talk. Siegfried, M., H. A. Fricker, **C. Gustafson**, K. Key, A. Laventer, J. E. Dore, B. Huber, K. Mankoff, J. Priscu, B. Rosenheim, and the SALSA Science Team. 2019. Anatomy of a draining subglacial lake in West Antarctica. *AGU 2019 Fall Meeting.*

Talk. **Gustafson, C.**, K. Key, M. Siegfried, and H. Fricker. 2019. Basal to bedrock: magnetotelluric imaging of an active subglacial hydrologic system. *West Antarctic Ice Sheet Workshop.*

Poster. Siegfried, M., H. Fricker, **C. Gustafson**, K. Key, A. Leventer, J. Dore, B. Huber, K. Mankoff, J. Priscu, B. Rosenheim, and the SALSA Science Team. 2019. Physical properties of a draining subglacial lake, *West Antarctic Ice Sheet Workshop.*

Poster. **Gustafson, C.**, K. Key, R. L. Evans, and D. Blatter. 2018. An extensive offshore aquifer on the U.S. Atlantic margin, *24th Electromagnetic Induction Workshop, Helsingør, Denmark.*

Poster. Person, M., **C. Gustafson**, K. Key, R. L. Evans, M. Steckler, C. Paola, V. Voller, C. Grall, A. Micallef, D. Cohen, and J. W. Wilson. 2018. The Role of Sediment Transport and Sea-Level Fluctuations on the Sequestrations of Offshore Freshwater Along Passive Continental Margin Environments, *EGU General Assembly.*

Talk. **Gustafson, C.**, K. Key, and R. L. Evans. 2017. A pilot electromagnetic survey of groundwater beneath the U.S. Atlantic continental shelf, *AGU 2017 Fall Meeting.*

Poster. **Gustafson, C.** and K. Key. 2016. Resolution study of marine CSEM imaging of subduction zones, *AGU 2016 Fall Meeting.*

Poster. **Gustafson, C.** and K. Key. 2016. Resolution study of marine CSEM imaging of subduction zones, *23rd Electromagnetic Induction Workshop,Chang Mai,Thailand.*

Fieldwork

Hikurangi Trench, New Zealand, Marine EM Survey. Recovered 42 seafloor magnetotelluric instruments. *R.V. Roger Revelle.*	Feb. 2019 - March 2019
Whillans Ice Plain, West Antarctica, Surface Geophysics. Conducted EM, GPS, and radar experiments. Installed long-term subglacial observatory.	Nov. 2018 - Jan. 2019
Ross Ice Shelf, Antarctica, Airborne Geophysics. Processed aerogeophysical datasets.	Oct. 2017 - Dec. 2017
Pawnee, Oklahoma, U.S., Land MT Survey. Deployed and recovered land magnetotelluric instruments.	Nov. 2016
Okmok Volcano, Alaska, U.S., Marine EM Survey. Deployed and recovered seafloor magnetotelluric instruments. *R.V. Thompson and R.V. Sikuliaq.*	June 2015 - July 2015
Pagosa Springs, Colorado, U.S., Geophysics Field Camp. Conducted seismic, gravity, magnetic, electrical, electromagnetic, and differential GPS surveys.	May 2014 - June 2014

Service

Reviewed Journals: Geophysical Research Letters, Journal of Applied Geophysics, Frontiers in Marine Science	
IRIS Electromagnetic Advisory Committee member	Jan. 2021 - Jan. 2024
Primary convener and lead session chair, "Sub-ice-sheet and sub-ice-shelf environments: Bridging the gap between modern observations and geologic records ", AGU 2020 Fall Meeting	Fall 2020
Lead session chair, "Frontiers in Electromagnetic (EM) Geophysics ", AGU 2020 Fall Meeting	Fall 2020
Co-convener, "Sub-ice-sheet and sub-ice-shelf environments: Bridging the gap between modern observations and geologic records ", AGU 2019 Fall Meeting	Fall 2019
Divisional Seminar Co-organizer, Marine Geology and Geophysics & Seismology, Geology and Tectonophysics, Lamont-Doherty Earth Observatory	August 2019 - August 2020
Changing Ice Changing Coastlines Committee, Lamont-Doherty Earth Observatory	August 2018 - January 2020
White Paper Co-Author, "Assessment of East Antarctic Ice Sheet sensitivity to warning its potential for contributions to seal level rise," Subglacial Access Community Future Science Planning Workshop.	March 2019

White Paper Co-Author, "Access Drilling Priorities in Greenland," Subglacial Access Community Future Science Planning Workshop. — March 2019

Graduate Student Committee, *Social Chair*, *Chevron Student Initiative Fund Liaison*, Lamont-Doherty Earth Observatory — August 2018 - May 2020

Selected Media & Outreach

PBS News Hour SciTechNow [television] (air date: March 23, 2020).
`https://www.scitechnow.org/videos/scitech-now-episode-619-3o7ow5/`

Antarctic Week Talk with a Scientist Video Call. Farmington Middle School. Nov. 2019.

Antarctic Week Talk with a Scientist Video Call. Hoover Middle School. Nov. 2019.

BBC News World Service (2019). "Could there be drinking water under the seas?" [podcast] Science in Action.
`https://www.bbc.co.uk/programmes/w3csym1w`

Caperton Morton (2019). "Huge Aquifer Imaged off the Atlantic Coast." *EOS*
`https://eos.org/articles/huge-aquifer-imaged-off-the-atlantic-coast`

Seeker (2019). "Scientists Just Discovered Fresh Water Under the Ocean, and It's HUGE." *Over 1.2 million views on YouTube.*
`https://www.youtube.com/watch?v=e_XZbsIo-aA`

Guest scientist. Public School 70, Bronx, New York City. October 2018.

Workshops

SMART Summer School. Understanding marine hydrogeology through the lens of geophysics: Bridging the gap across the coastal zone. — Summer 2019

Teaching

Computational Earth Science. Columbia University. Teaching Assistant. — Fall 2019

Earth Origin, Evolution, Processes, and Future. Columbia University. Teaching Assistant. — Spring 2018

Internships

Chevron (Petro-Technical Data Management Group) — June - August 2014
Evaluated seismic and well data transfer software.
Evaluated and updated seismic meta data.

U.S. Geological Survey National Earthquake Information Center — May 2013 - Jan 2014
Created ShakeMaps for historical and recent earthquakes.
Processed seismic time series.