

Daeun Lee

Ph.D. candidate
Department of Earth and Environmental Sciences
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Research interests

Paleoclimate reconstruction using coupled earth system modeling and proxy records, high-resolution climate modeling and regional analysis, inter-model variability analysis

Education

2020-present (exp. 2025 April)	<i>University of Michigan</i> , Ann Arbor, Michigan Ph.D. candidate , Dept. Earth and Environmental Sciences Advisor: Dr. Chris Poulsen / co-advisor: Dr. Julia Cole Certificate in Data Science Michigan Institute for Computational Discovery & Engineering
2018-2020	<i>Ewha Womans University</i> , Seoul, Republic of Korea Master of Science , Dept. Earth Science Education Advisor: Dr. Jeonghoon Lee Thesis: "Applications of continuous monitoring of water vapor isotopes: From the Southern Ocean to Antarctic coastal snowpack"
2014-2018	<i>Ewha Womans University</i> , Seoul, Republic of Korea Bachelor of Science , Dept. Science Education, Earth Science Education

Research Experience

2020 – Present	Earth and Environmental Sciences, University of Michigan
Graduate Student	Climate Change Research Group (Advisor: Dr. Chris Poulsen)
Research Assistant	· Collaborative Research: Parsing the influence of climate and tectonics on Miocene ecosystems and faunal evolution in the East African Rift, Kenya (co-PI: Dr. Chris Poulsen) · CZ170 project: Digging into Soil Carbonate Formation Processes with Triple Oxygen Isotopes (PI: Dr. Naomi E. Levin)
2018-2019	Korea Polar Research Institute (KOPRI) , Incheon, Republic of Korea
Research Assistant	<i>Glaciological Lab at Division of Paleoenvironment Research</i> (PI: Dr. Soon Do Hur) · Reconstruction of past climate and environmental changes using high resolution ice core records in Victoria Land, Antarctica
2017-2020	Ewha Womans University , Seoul, Republic of Korea
Research Assistant	<i>Environmental Geochemistry Laboratory</i> (Advisor: Dr. Jeonghoon Lee) · Analysis of stable water vapor isotopes and its applications to the hydrological cycle · Characterization of movement of sub-glacier meltwater based on seawater and meltwater isotopes around Thwaites, West Antarctica · Development of non-traditional isotopic transport model with isotopic proxies

Publications

Lee, D., Poulsen, C. J., and Acosta, R. P. (*in-prep*) Multiple ocean equilibria cause decoupling of the atmospheric pCO₂ and regional temperatures. *Paleoceanography and Paleoclimatology*.

Saslaw, M., Yang, D., Lee, D., Poulsen, C. J., and Henkes, G. (*submitted*) An isotope mass balance analysis of evaporative loss from Lake Turkana, Kenya using $\delta^{18}\text{O}$ and δD of natural waters. *Water Resources Research*.

Green, D. R., Ávila, J. N., Cote, S., Dirks, N., Lee, D., Poulsen, C. J., Williams, I. S., Smith, T. M. (2022) Fine-Scaled Climate Variation in Equatorial Africa Revealed by Modern and Fossil Primate Teeth. *PNAS*.

Lee, D., Han, Y., Kim, S., Hur, S. D., Lee, J. (2020) Development of a calibration system for stable water vapor isotope measurements using Cavity Ring-Down Spectroscopy. *Journal of the Geological Society of Korea*. 56(3), 395-403. DOI : 10.14770/jgsk.2020.56.3.395

Field Experience

Jan. 2023	Soil water sampling: Mojave National Preserve, CA
Jun. 2022	Meteoric water and surface water sampling: Kenya
Nov. 2021	Setting up stable water isotope analyzer (CRDS by Picarro inc.) and installing precipitation monitoring stations: Mpala Research Center, Kenya
Nov. 2018	Water vapor isotope measurements by CRDS in Marine Boundary Layer: Antarctic Ocean research cruise R/V ARAON from Christchurch, NZ to Jangbogo Station, Antarctica
Dec.2018- Feb. 2019	Shallow ice core drilling with surface water vapor isotope monitoring campaign: Tourmaline Plateau, Antarctica
2018-2019	Separation of lake “Osongjae” evapotranspiration by water vapor isotopes: Jeonju, Republic of Korea
2018-2019	Continuous monitoring of water vapor isotopes: KOPRI, Incheon, Republic of Korea
Aug. 2018	Tracing the water vapor transport and its origin using water vapor isotopes: Jeju island, Republic of Korea

Conferences and Presentations

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- Lee, D. and Poulsen, C. J. (2023, December) Response of Eastern African Hydroclimate to Tethys Seaway Closure and CO₂. *American Geophysical Union Fall Meeting, San Francisco, 2023*. (Poster presentation)
- Lee, D., Poulsen, C. J., and Acosta, R. P. (2022, December) Multiple ocean equilibria cause decoupling of the atmospheric pCO₂ and regional temperatures. *American Geophysical Union Fall Meeting, Chicago, 2022*. (Poster presentation)
- Lee, D., Acosta, R. P., and Poulsen, C. J. (2021, December) Modeling the effects of declining CO₂ and C4 vegetation expansion on late Miocene African environments. *American Geophysical Union Fall Meeting, 2021*.
- Lee, D., Han, Y., Moon, J., Kim, S., Hwang, H., Hur, S. D., and Lee, J. (2019, October) Continuous measurements of water vapor isotopes on the Antarctic Ross Sea coastline. *The 74th joint conference of the Geological Society of Korea* (Oral presentation).
- Lee, D., Han, Y., Hur, S. D., and Lee, J. (2019, April) The characteristics of atmospheric water vapor isotopic composition over middle and high latitudes marine boundary layer. *The European Geoscience Union General Assembly* (Poster presentation).
- Lee, D., Han, Y., Kim, S., Chang, C., Ahn, U. S., Hwang, H., Hur, S. D., and Lee, J. (2018, October) A study on moisture transportation process by altitudes in Jeju island using water vapor isotopes. *The 73rd joint conference of the Geological Society of Korea* (Poster presentation).
- Lee, D., Lee, J., Lee, W. S., Choi, H.-B., and Lee, S.-G. (2017, October) Comparison between total least squares and ordinary least squares for relationship of stable water isotopes. *The 72nd joint conference of the Geological Society of Korea* (Poster presentation).

Research Computing Awards

2021-2024	Simulation of Late Cenozoic climate change over the East Africa Rift Valley with the Community Earth System Model, NCAR CISL Computer Allocation for 13,000,000 core-hours on Cheyenne HPC. (UMIC0084)
2021-2023	The influence of C4 plants on the hydroclimate over East Africa during the Miocene, NCAR CISL Computer Allocation for 300,000 core-hours on Cheyenne HPC. (UMIC0080)

Honors and Fellowships

2022, 2023	Rackham Graduate Student Conference Travel Grants	University of Michigan, Ann Arbor
2022	Turner Research Grant	University of Michigan, Ann Arbor
Winter 2021	Rackham Graduate Student Research Grants	University of Michigan, Ann Arbor
Winter 2021	Departmental Fellowship	University of Michigan, Ann Arbor
2017	Scholarship for Leadership and Academic Excellence	Korea Scout Association

Technical Skills

Numerical modeling: fully coupled Earth system models (Community Earth System Model by NCAR)
Programing language: basic skills in Fortran, Python, NCAR Command Language, Matlab, Grapher™, JMP®
Laboratory instrument: Cavity Ring-Down Spectroscopy (Picarro inc. stable water isotopes analyzer)

Teaching Experience

Graduate Student Instructor

Fall 2020 Introduction to Environmental Sciences, University of Michigan, Ann Arbor
2018-2019 Geochemistry, Ewha Womans University

Pre-service teacher

2017 spring Earth Science, Sookmyoung Women's Middle school
2016 spring Science, Gwang-nam Middle school

Mentoring and Outreach

2024	co-chair, 2024 Michigan Geophysical Union (April 2024)	Univ. of Michigan
May 2023	co-instructor for Stable isotopes in ecohydrology workshop at Mpala Research Center, Kenya (lead instructor: Daniel R. Green)	Leaky Foundation (Green & Wessling)
2023	Abstracts & Programs committee chair, 2023 Michigan Geophysical Union (April, 2023)	Univ. of Michigan
2022-23	cataLIST (Ladies in Science and Technology) mentoring circles	Univ. of Michigan
2022-present	Unlearning Racism in Geoscience (URGE)	Univ. of Michigan
2022	Earth Camp, graduate instructor	Univ. of Michigan
2022	The Science Communication Fellows program	Univ. of Michigan
2020-present	Association for Women in Science	Seoul, S. Korea

Press Coverage

"First Korean female scientist attended a field campaign in Antarctica."
· [Chosun Ilbo \(Daily newspaper\)](#)
· Korea Broadcasting Studio ([Daily News](#), [Radio program](#))