

Hee Choi

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RESEARCH INTEREST

My research focuses on the dynamics of Earth's mantle convection and its implications for the initiation of plate tectonics and subduction processes on early Earth. I am also interested in ML/AI applications in analyzing and interpreting geologic features, with a focus on both early Earth and modern Earth processes. This includes detecting and characterizing geodynamic patterns, such as subduction zones, from complex numerical simulation outputs.

EDUCATION

Penn State University

Ph.D. in Geoscience

State College, PA

Aug 2019 – Now

University of Memphis

M.S. in Geophysics

Memphis, TN

Aug 2017 – Aug 2019

Kangwon National University

B.S. in Geophysics

Chuncheon, South Korea

Mar 2013 – Feb 2017

PEER-REVIEWED PUBLICATIONS

3. Choi, H. & Foley, B. J. (In Prep) Deep learning-based tracking of subduction zones in mantle convection models.
2. Choi, H. & Foley, B. J. (In Prep) Establishment of sustained subduction zone at the continent margin in early Earth.
1. Choi, H., & Foley, B. J. (2024). A limited effect of continents on subduction initiation for convection with grain-damage. *Journal of Geophysical Research: Solid Earth*, 129, e2024JB029136.

PRESENTATIONS

- *Deep learning-based tracking of subduction zones in mantle convection models* by H. Choi. and B. Foley., AGU24, Dec. 9-13, 2024, Washington, D.C.
- *The role of continents in determining subduction zone locations on the early Earth: Insights from numerical models* by H. Choi. and B. Foley., AGU Fall Meeting 2023, Dec. 11-15, 2023, San Francisco
- *Dynamics of Subduction Initiation: Where Subduction Initiates with Respect to Continents* by H. Choi. and B. Foley., AGU Fall Meeting 2022, Dec. 12-16, 2022, Chicago
- *Dynamics of subduction initiation with respect to continents* by H. Choi. and B. Foley., 2022 Ada Lovelace Workshop, Aug. 28 - Sep. 2, 2022, Hévíz, Hungary
- *A limited effect of continents on subduction initiation and lithospheric stress* by H. Choi. and B. Foley., AGU Fall Meeting 2020, Dec. 13-17, 2021, New Orleans
- *The role of continental lithosphere in subduction initiation* by H. Choi. and B. Foley., AGU Fall Meeting 2020 DI020-0010, Dec. 1-17, 2020, San Francisco
- *New numerical mid-ocean ridge models for interactions between plate-driving and resistant forces* by H. Choi. and E. Choi., AGU Fall Meeting 2019 T131-0281, Dec. 9-13, 2019, San Francisco
- *Modeling interactions between plate-boundary forces and evolving resistance at mid-ocean ridges as the origin of non-uniform seafloor growth* by H. Choi., E. Choi., and R. Reece., AGU Fall Meeting 2018 T33G-3847, Dec. 10-14, 2018, Washington, D.C.

PROFESSIONAL SERVICE

Session Chair

- *Outer Space Rocks! Enhancing the Understanding of our Planetary Neighbors*, GSA 2025 Joint Northeastern/North-Central Section Meeting, Mar. 27–30, 2025

TEACHING EXPERIENCE

Physical Process of Geology

Penn State University
FA2022, SP2023, FA2024

The Earth System and Global Change

Penn State University
SP2024

Summer course: Numerical Modeling and Data Visualization

Penn State University
SU2023, SU2024

Natural Disaster and Our Future

Kangwon National University
SP2016, FA2016

TECHNICAL SKILLS

Programming Languages: Python, C, C++, Fortran, MATLAB

Deep Learning Frameworks: TensorFlow, PyTorch

Libraries & Tools: NumPy, Pandas, Scikit-learn, OpenCV, Git, Docker

High-Performance Computing Skills: MPI, OpenMP, Slurm, Linux, Parallel Computing, Job Scheduling

SCHOLARSHIPS AND AWARDS

Paul D. Krynine Awards

Penn State University
SP2022, SP2023

Integrated Geoscience & Technology Education Program(CK1) Scholarship

Kangwon National University
FA2014, SP2015

Semester Honor Scholarship

Kangwon National University
FA2013, SP2014, FA2014, FA2015

Merit Scholarship

Kangwon National University
FA2013