

Zachary McGraw

A climate modeler focusing on how aerosols and clouds drive large-scale temperature & precipitation changes

Main Research Interests

- Aerosol-cloud interactions
- Volcanic aerosol impacts
- Cloud feedbacks
- Precipitation change

Education

University of Oslo Sep. 2018 – Dec. 2020, full-time

PhD in Geosciences | Supervisor: Trude Storelvmo

Thesis title: *Global radiative impacts of aerosol variations through mixed-phase and cirrus clouds*

Yale University Aug. 2014 – Aug. 2018, full-time

MPhil in Atmospheres, Oceans & Climate Dynamics | Supervisor: Trude Storelvmo

Johns Hopkins University Aug. 2008 – May 2012, full-time

BSc double-majoring in Physics, Applied Math & Statistics

Work Experience

Columbia University & NASA GISS Jan. 2021 – present, full-time

Postdoctoral research scientist | Supervisors: Lorenzo Polvani & Kostas Tsigaridis

- Research projects on how volcanic aerosol influence temperature & precipitation
- Development tasks to improve volcanic aerosol representation in NASA GISS ModelE Earth system model
- Continued research on aerosol-cloud interactions

Columbia University & NASA GISS Oct. 2012 – July 2014, full-time

Research assistant | Supervisors: Susanne Bauer & Kostas Tsigaridis

- Programming project to automate reading of aerosol measurements for model input and visualization
- Climate model validation tasks using flight campaign measurements

Selected Publications

McGraw, Z. and Polvani, L.M. (pre-print out Dec. 2023). How Volcanic Aerosols Globally Inhibit Precipitation. ESS Open Archives. <https://doi.org/10.22541/essoar.170365256.68772036/v1>

McGraw, Z., DallaSanta, K., Polvani, L. M., Tsigaridis, K., Orbe, C., Bauer, S. E. (accepted at *Journal of Climate*, Dec. 2023). Severe global cooling after volcanic super-eruptions? The answer hinges on aerosol size.

McGraw, Z., Storelvmo, T., Polvani, L. M., Hofer, S., Shaw, J. K., & Gettelman, A. (2023). On the links between ice nucleation, cloud phase, and climate sensitivity in CESM2. *Geophysical Research Letters*, 50(17), e2023GL105053.

McGraw, Z., Storelvmo, T., Samset, B. H., & Stjern, C. W. (2020). Global radiative impacts of black carbon acting as ice nucleating particles. *Geophysical Research Letters*, 47(20), e2020GL089056.

McGraw, Z., Storelvmo, T., David, R. O., & Sagoo, N. (2020). Global radiative impacts of mineral dust perturbations through stratiform clouds. *Journal of Geophysical Research: Atmospheres*, 125(23), e2019JD031807.

Selected Presentations

McGraw, Z. and Polvani, L.: Reassessing post-eruption precipitation anomalies in the context of natural variability, EGU General Assembly 2023, Vienna, Austria, 24–28 Apr 2023, EGU23-4691, <https://doi.org/10.5194/egusphere-egu23-4691>, 2023.