

Seung Hun Baek

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APPOINTMENTS

<i>Postdoctoral Researcher</i> , Lawrence Livermore National Laboratory	2023-2025
<i>Climate Scientist – Physical Hazard Analysis</i> , S&P Global Sustainable1	2022-2023
<i>Postdoctoral Associate</i> , Yale University (50% appointment 9/22-6/23)	2020-2023

EDUCATION

<i>Ph.D., Earth & Environmental Sciences</i> , Columbia University	2015-2020
<i>B.A., Environmental Science</i> , Columbia University	2010-2014

FELLOWSHIPS AND AWARDS

- Richard Foster Flint Postdoctoral Fellowship, Yale University (2020-2022)
- 1st Place (\$500), Expert Scored Poster Presentation, Yale Climate Day (2021)
- Nominee, Schmidt Science Fellows (2019)
- Honorable Mention, National Science Foundation Research Fellowship (2016)
- Dean's Fellow (5-yr full funding), Columbia University (2015-2020)

FUNDED GRANTS

2023-2026	US Department of Energy Carbon Negative Shot, <i>Carbon Dioxide Removal and High-Performance Computing: Planetary Boundaries of Earth Shots</i> (institutional PI; \$58K to LLNL; \$5.7 million total)
2020-2022	Richard Foster Flint Postdoctoral Fellowship of Yale University (\$130K awarded on original proposal 2020-2022; \$65K extension in 2023)

INVITED TALKS

2024 *Environmental Studies and Sciences Seminar*, Santa Clara University
2023 *Seminar*, Lawrence Livermore National Laboratory
2023 *Current Research in Earth, Environmental and Planetary Sciences*, Rice University
2023 *Seminar*, Schiller Institute for Integrated Science and Society, Boston College
2023 *Seminar*, Department of Earth and Environmental Sciences, University of Texas-Arlington
2022 *Seminar*, Department of Earth and Environmental Sciences, University of Illinois Chicago
2021 *Atmosphere Ocean Climate Dynamics Seminar*, Yale University
2021 *Departmental Seminar*, Pohang University of Science and Technology
2020 *Informal Seminar*, Geophysical Fluid Dynamics Laboratory

TEACHING EXPERIENCE

2024 Spring	<i>Guest Lecturer</i> , ECS0003 Introduction to Climate Science
2019 Fall	<i>Teaching Assistant</i> , UN2200 Earth Environmental System: Earth System
2017 Spring	<i>Teaching Assistant</i> , UN2310 Earth Environmental System: Life System
2016 Fall	<i>Teaching Assistant</i> , W4008 Introduction to Atmospheric Science

JOURNAL REFEREEING

PNAS, Journal of Climate, Geophysical Research Letters, Journal of Geophysical Research – Atmospheres, Nature Communications, Journal of Hydrology: Regional Studies

PUBLICATIONS PENDING

18. **S.H. Baek**, E.E. McClenny, P.A. Ullrich. Response of atmospheric river width and intensity to aquaplanet warming: A detection algorithm- and background moisture-independent approach, *in preparation*.
17. **S.H. Baek**, J.M. Lora, C.B. Skinner, M. Fu, J. Zhu. Atmospheric and oceanic energetics during North Atlantic freshening events, *submitted*.
16. J. Stuienvolt-Allen, Y. Chikamoto, S.S.Y. Wang, **S.H. Baek**, J. Yoon. Dynamics and climate change impacts driving the leading mode of western U.S. hydroclimate variability, *in preparation*.

PEER REVIEWED PUBLICATIONS

15. **S.H. Baek**, P.A. Ullrich, B. Dong, J. Lee (202x). Evaluating downscaling with expected hydroclimatic co-variances, *Geoscientific Model Development*, *in press*.
14. J.M. Lora, C.B. Skinner, W.D. Rush, **S.H. Baek** (2023). The hydrologic cycle and atmospheric rivers in CESM2 simulations of the Last Glacial Maximum, *Geophysical Research Letters*, <https://doi.org/10.1029/2023GL104805>
13. **S.H. Baek***, Y. Kanzaki*, J.M. Lora, N. Planavksy, C. Reinhard, S. Zhang (2023). Impact of climate on the global capacity for enhanced rock weathering on croplands, *Earth's Future*, <https://doi.org/10.1029/2023EF003698> (*denotes equal contribution).
12. **S.H. Baek**, J.M. Battalio, J.M. Lora (2023). Atmospheric river variability over the last millennium driven by annular modes, *AGU Advances*, <https://doi.org/10.1029/2022AV000834>.
11. **S.H. Baek**, Y. Kushnir, M. Ting, J.E. Smerdon, J.M. Lora (2022). Regional Signatures of Forced North Atlantic SST Variability: A Limited Role for Aerosols and Greenhouse Gases, *Geophysical Research Letters*, <https://doi.org/10.1029/2022GL097794>.
10. Scholz, S.R., R. Seager, M. Ting, Y. Kushnir, J.E. Smerdon, B.I. Cook, E.R. Cook, **S.H. Baek** (2022). Changing hydroclimate dynamics and the 19th to 20th century wetting trend in the English Channel region of northwest Europe, *Climate Dynamics*, <https://doi.org/10.1007/s00382-021-05977-5>.
9. **S.H. Baek**, Y. Kushnir, W.A. Robinson, J.M. Lora, D.E. Lee, M. Ting (2021). An Atmospheric Bridge Between the Subpolar and Tropical Atlantic Regions: A Perplexing Asymmetric Teleconnection, *Geophysical Research Letters*, <https://doi.org/10.1029/2021GL096602>
8. **S.H. Baek** and J.M. Lora (2021). Counterbalancing influences of aerosols and greenhouse gases on atmospheric rivers, *Nature Climate Change*, <https://doi.org/10.1038/s41558-021-01166-8>.
7. **Baek, S.H.**, J.E. Smerdon, B.I. Cook, A.P. Williams (2021). US Pacific Coastal Droughts are Predominantly Driven by Internal Atmospheric Variability, *Journal of Climate*, <https://doi.org/10.1175/JCLI-D-20-0365.1>
6. **Baek, S.H.**, J.E. Smerdon, G. Dobrin, J.G. Naimark, E.R. Cook, B.I. Cook, R. Seager, M.A. Cane (2020). A quantitative hydroclimatic context for the European Great Famine of 1315-1317, *Communications Earth & Environment*, <https://doi.org/10.1038/s43247-020-00016-3>
5. Williams, A.P., E.R. Cook, J.E. Smerdon, B.I. Cook, J.T. Abatzoglou, K. Bolles, **S.H. Baek**, A. Badger, B. Livneh (2020). Large contribution from anthropogenic warming to a developing North American megadrought, *Science*, <https://doi.org/10.1126/science.aaz9600>

PEER REVIEWED PUBLICATIONS CONTINUED

4. **Baek, S.H.**, N.J. Steiger, J.E. Smerdon, R. Seager (2019). Oceanic drivers of spatially widespread droughts in the contiguous US over the Common Era, *Geophysical Research Letters*, <https://doi.org/10.1029/2019GL082838>
3. **Baek, S.H.**, J.E. Smerdon, R. Seager, A. P. Williams, B. I. Cook (2019). Pacific Ocean forcing and atmospheric variability are the dominant causes of spatially widespread droughts in the contiguous United States, *Journal of Geophysical Research – Atmospheres*, <https://doi.org/10.1029/2018JD029219>.
2. PAGES Hydro2k Consortium (including **S.H. Baek**; 2017), Comparing proxy and model estimates of hydroclimate variability and change over the Common Era, *Climate of the Past*, <https://doi.org/10.5194/cp-13-1851-2017>.
1. **Baek, S.H.**, J.E. Smerdon, S. Coats, A. P. Williams, B.I. Cook, E.R. Cook, and R. Seager (2017), Precipitation, temperature, and teleconnection signals across the combined North American, Monsoon Asia, and Old World Drought Atlases, *Journal of Climate*, <https://doi.org/10.1175/JCLI-D-16-0766.1>

SELECT CONFERENCE PRESENTATIONS

- 2024 **Baek, S.H.**, P.A. Ullrich, B. Dong, J. Lee. Evaluating downscaling with expected hydroclimatic co-variances. (Oral Presentation, upcoming). *AGU Climate Downscaling and Weather Postprocessing: Development, Evaluation, and Applications II*.
- 2023 **Baek, S.H.**, Y. Kanzaki, J.M. Lora, N. Planavksy, C. Reinhard, S. Zhang. Impact of climate on the global capacity for enhanced rock weathering on croplands (Poster Presentation). *AGU 2023: Science-Based Gigaton-Scale Carbon Dioxide Removal (CDR): Strategies for Monitoring, Measurements, Reporting, and Verification (MMRV) II*
- 2022 **Baek, S.H.**, J.M. Battalio, J.M. Lora. Atmospheric river variability over the last millennium driven by annular modes (Oral Presentation). *AGU 2022: Atmospheric Rivers: Processes, Impacts, and Uncertainties*
- 2022 **Baek, S.H.**, J.M. Battalio, J.M. Lora. Atmospheric river variability over the last millennium driven by annular modes (Oral Presentation). *4th International Atmospheric River Conference 2022*
- 2022 **Baek, S.H.**, Y. Kushnir, W.A. Robinson, J.M. Lora, D.E. Lee, M. Ting. An Atmospheric Bridge Between the Subpolar and Tropical Atlantic Regions: A Perplexing Asymmetric Teleconnection. (Oral Presentation). *EGU General Assembly 2022: The North Atlantic: Natural Variability and Global Change*.
- 2022 **Baek, S.H.**, Y. Kushnir, W.A. Robinson, J.M. Lora, D.E. Lee, M. Ting. An Atmospheric Bridge Between the Subpolar and Tropical Atlantic Regions: A Perplexing Asymmetric Teleconnection. (Oral Presentation). *US Atlantic Meridional Overturning Circulation Science Team Meeting*.
- 2021 **Baek, S.H.** and J.M. Lora. Counterbalancing Influences of Aerosols and GHGs on Atmospheric Rivers. (Poster Presentation). *Yale Climate Day*.
- 2019 **Baek, S.H.**, J.E. Smerdon, M. Ting, Y. Kushnir, R. Seager. Untangling Observed Atlantic Multidecadal Variability (Oral Presentation). *AGU 2019: Dynamics of Interbasin Interactions from Seasonal to Centennial Timescales I*.
- 2018 **Baek, S.H.**, N.J. Steiger, J.E. Smerdon. Parsing the dominant ocean influences on spatially widespread droughts in the contiguous US over the Common Era (Oral Presentation). *AGU Fall Meeting 2018: Climate of the Common Era*.
- 2017 **Baek, S.H.**, J.E. Smerdon, R. Seager, A.P. Williams, B. I. Cook. Parsing the contributions of ocean forcings and atmospheric variability to spatially widespread droughts in the contiguous United States (Oral Presentation). *AGU 2017: Hydroclimatic Extremes: Droughts*.