

## Seung Hun Baek

Atmospheric, Earth and Energy Division  
Lawrence Livermore National Laboratory

Nationality: USA  
Email: baek1@llnl.gov

### APPOINTMENTS

---

Postdoctoral Researcher, Lawrence Livermore National Laboratory	2023-present
Climate Scientist – Physical Hazard Analysis, S&P Global Sustainable1	2022-2023
Postdoctoral Associate, Yale University (50% appointment 9/22-6/23)	2020-2023
Graduate Research Assistant, Columbia University	2015-2020

### EDUCATION

---

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

### FELLOWSHIPS AND AWARDS

---

- Richard Foster Flint Postdoctoral Fellowship (\$130K), Yale University (2020-2022)
- 1<sup>st</sup> 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- Department of Energy Carbon Negative Shot, *Carbon Dioxide Removal and High-Performance Computing: Planetary Boundaries of Earth Shots* (\$5 million to Yale, contributing Postdoctoral Associate).

### PUBLICATIONS PENDING

---

16. **S.H. Baek**, J.M. Lora, C.B. Skinner, M. Fu, J. Zhu. Hydrologic cycle-AMOC destabilization feedbacks accelerate AMOC collapse by a factor of two, *in preparation*.
15. T. Hall, J.P. Kossin, T. Thompson, **S.H. Baek**, K. Drouin, D. Montagne. Probabilistic methods for projecting average recurrence intervals of coastal flooding with sea level rise, *EGUsphere [preprint]*, <https://doi.org/10.5194/egusphere-2023-425>, 2023.

### PEER REVIEWED PUBLICATIONS

---

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. Planavsky, 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>.

## PEER REVIEWED PUBLICATIONS (CONTINUED)

---

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 19<sup>th</sup> to 20<sup>th</sup> 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>
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>

## INVITED TALKS

---

- 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, Division of Environmental Science and Technology, Pohang University of Science and Technology.
- 2020 Informal Seminar, Geophysical Fluid Dynamics Laboratory.

## CONFERENCE PRESENTATIONS

---

- 2022 **Baek, S.H.**, J.M. Battalio, J.M. Lora. Atmospheric river variability over the last millennium driven by annular modes (Oral Presentation). *American Geophysical Union Fall Meeting 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). *4<sup>th</sup> 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). *European Geosciences Union 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*.
- 2022 **Baek, S.H.** and J.M. Lora. Counterbalancing Influences of Aerosols and GHGs on Atmospheric Rivers. (Oral Presentation). *American Meteorological Society: 35<sup>th</sup> Conference on Climate Variability and Change*.
- 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). *American Geophysical Union Fall Meeting 2019: Dynamics of Interbasin Interactions from Seasonal to Centennial Timescales I*.
- 2019 **Baek, S.H.**, J.E. Smerdon, M. Ting, Y. Kushnir, R. Seager. Untangling Observed Atlantic Multidecadal Variability (Poster Presentation). *US Climate Variability and Predictability Program: The Large Ensembles Workshop*.
- 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). *American Geophysical Union 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). *American Geophysical Union Fall Meeting 2017: Hydroclimatic Extremes: Droughts*.
- 2017 **Baek, S.H.**, J.E. Smerdon, S. Coats, A.P. Williams, B.I. Cook, E.R. Cook, R. Seager. Precipitation, temperature, and teleconnection signals across the combined North American, Monsoon Asia, and Old World Drought Atlases (Poster Presentation). *PAGES OSM Open Science Meeting: Large-scale hydroclimate variability and change of the Common Era: Patterns, Impacts, and Processes*.

## TEACHING EXPERIENCE

---

- 2019 Fall      *Teaching Assistant, UN2200 Earth Environmental System: Earth System*
- 2017 Spring    *Teaching Assistant, UN2310 Earth Environmental System: Life System*
- 2016 Fall      *Teaching Assistant, W4008 Introduction to Atmospheric Science*

## JOURNAL REFEREEING

---

*Proceedings of the National Academy of Sciences, Journal of Climate, Geophysical Research Letters, Journal of Geophysical Research – Atmospheres, Journal of Hydrology: Regional Studies*