Weston Buckley Anderson

Earth System Science Interdisciplinary Center
University of Maryland, College Park, 20742
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WestonAnderson.github.io/

ACADEMIC APPOINTMENTS

Earth System Science Interdisciplinary Center
University of Maryland, College Park, MD
Assistant Research Scientist — Jun 2021 - present

Earth Institute, Columbia University, New York, NY
Postdoctoral Research Fellow — *Sep 2018 – Jun 2021*

EDUCATION

Columbia University, New York, NY
PhD, Earth and Environmental Science — *Jul 2014 - Jul 2018*
- NSF Graduate Research Fellowship Program
- Columbia University Dean's Fellow

Johns Hopkins University, Baltimore, MD
B.S./M.S.E. Environmental Engineering, Systems Analysis — *May 2012*
- General Honors, Departmental Honors, Wolman Award for Interdisciplinary Study
- Dean's Master's Fellowship

PROFESSIONAL EXPERIENCE

Sr. Research Assistant — *2013 - 2014*
International Food Policy Research Institute
Research: Water resource management and food security analyses
Advisors: Dr Liangzhi You and Dr. Ephraim Nkonya

Risk Analyst — *2012 - 2013*
Risk Management Solutions
Description: Model-based natural catastrophe risk assessment

Research Assistant — *2011 - 2012*
The Hydroclimate Research Group, Johns Hopkins University
Research: Characterized the 2010-11 East Africa drought using remote sensing products
Advisor: Dr Ben Zaitchik

PUBLICATIONS

* denotes joint first co-authorship

Journal publications submitted

Anderson, W., Shukla, S., Verdin, J., Hoell, A., Justice, C., Barker, B., Slinski, K., Lenssen, N., Lou, J., Cook, B., McNally, A. Preseason maize and wheat yield forecasts for early warning. Nature Communications (Revised).

Shukla, S., Zaheer, F., Hoell, A., Anderson, W., Jayanthi, H., Husak, G. Drought Early Warning, ENSO based drought outlook, Afghanistan food security, Agricultural drought, Snow Drought. Weather and Climate Extremes (Revised).

Peer reviewed journal publications:

Funk, C., Harrison, L., Segele, Z., Rosenstock, T., Steward, P., […] Anderson, W., […] (2023). Tailored forecasts can predict extreme climate informing proactive interventions in East Africa. *Earth's Future*, 11(7), e2023EF003524

Heino, M., Kinnunen, P., Anderson, W., Ray, D. K., Puma, M. J., Varis, O., Siebert, S., Kummu, M. (2023). Increased probability of hot and dry weather extremes during the growing season threatens global crop yields. *Scientific Reports,* 13(1), 3583

Mauerman, M., Ross, C., Nébié, E.I., Anderson, W., Jensen, N. and Chelanga, P., (2023). The long-term impact of multi-season droughts on livestock holdings and Pastoralist decision-making in Marsabit, Kenya. *Journal of Arid Environments*, *211*, p.104928.

Anderson, W., Baethgen, W., Capitanio, F., Ciais, P., Cook, B.I., da Cunha, C.G., Goddard, L., Schauberger, B., Sonder, K., Podestá, G. and van der Velde, M., (2023). Climate variability and simultaneous breadbasket yield shocks as observed in long-term yield records. *Agricultural and Forest Meteorology*, *331*, p.109321.

Anderson, W., Cook, B.I., Slinski, K., Schwarzwald, K., McNally, A. and Funk, C., (2023). Multiyear La Niña Events and Multiseason Drought in the Horn of Africa. *Journal of Hydrometeorology*, *24*(1), pp.119-131.

Lesk, C., Anderson, W., Rigden, A., Coast, O., Jägermeyr, J., McDermid, S., Davis, K.F. and Konar, M., (2022). Compound heat and moisture extreme impacts on global crop yields under climate change. *Nature Reviews Earth & Environment*, *3*(12), pp.872-889.

Reed, C., Anderson, W., Kruczkiewicz, A., Nakamura, J., Gallo, D., Seager, R. and McDermid, S.S., (2022). The impact of flooding on food security across Africa. *Proceedings of the National Academy of Sciences*, *119*(43), p.e2119399119.

Zhang, T., He, Y., DePauw, R., Jin, Z., Garvin, D., Yue, X., Anderson, W., Li, T., Dong, X., Zhang, T. and Yang, X., (2022). Climate change may outpace current wheat breeding yield improvements in North America. *Nature communications*, *13*(1), p.5591.

Zhang, T., van der Wiel, K., Wei, T., Screen, J., Yue, X., Zheng, B., Selten, F., Bintanja, R., Anderson, W., Blackport, R. and Glomsrød, S., (2022). Increased wheat price spikes and larger economic inequality with 2° C global warming. *One Earth*, *5*(8), pp.907-916.

Mehrabi, Z., Delzeit, R., Ignaciuk, A., Levers, C., Braich, G., Bajaj, K., Amo-Aidoo, A., Anderson, W., Balgah, R.A., Benton, T.G. and Chari, M.M. … & You, L. (2022). Research priorities for global food security under extreme events. *One Earth*, *5*(7), pp.756-766.

Ivanovich, C., Anderson, W., Horton, R., Raymond, C. and Sobel, A., (2022). The Influence of Intraseasonal Oscillations on Humid Heat in the Persian Gulf and South Asia. *Journal of Climate*, pp.1-48.

Singh, J., Ashfaq, M., Skinner, C.B., Anderson, W.B., Mishra, V. and Singh, D., (2022). Enhanced risk of concurrent regional droughts with increased ENSO variability and warming. *Nature Climate Change*, *12*(2), pp.163-170.

Anderson, W., Taylor, C., McDermid, S., Ilboudo-Nébié, E., Seager, R., Schlenker, W., Cottier, F., de Sherbinin, A., Mendeloff, D. and Markey, K., (2021). Violent conflict exacerbated drought-related food insecurity between 2009 and 2019 in sub-Saharan Africa. Nature Food, *2*(8), pp.603-615.

Anderson, W.B.*, and Lesk, C* (2021): Trends in concurrent heat and drought over global croplands. Environmental Research Letters, *16*(5), 055024.

Hernandez, J.N., Anderson, W., Bridges, A., Fernandez, M.P., Hansen, W., Nebie, E., and Stock., A. (2021): Supporting interdisciplinary careers for sustainability. Nature Sustainability. https://doi.org/10.1038/s41893-020-00679-y

Singh, J., Ashfaq, M., Skinner, C., Anderson, W.B., Singh, D. (2021): Amplified Risk of Concurrent Drought Events with Co-occurring Modes of Natural Variability npj Clim Atmos Sci 4, 7. https://doi.org/10.1038/s41612-021-00161-2

Anderson, W.B., Han, E., Baethgen, W., Goddard, L., Muñoz, Á.G., and Robertson, A. (2020): The Madden-Julian Oscillation affects maize yields throughout the tropics and subtropics, Geophysical Research Letters, e2020GL087004

Jong, B.T, Ting, M., Seager, R., and Anderson, W.B. (2020): ENSO teleconnections and impacts on US summertime temperature during multi-year La Niña life-cycle. Journal of Climate. 33 (14): 6009–6024

Bren d'Amour* and Anderson, W.B* (2020): International trade and the stability of food supplies in the Global South, Environmental Research Letters, 15 (7).

Anderson, W.B., Muñoz, Á.G., Goddard, L, Baethgen, W., and Chourio, X. (2020): Madden-Julian Oscillation (MJO) teleconnections to crop growing seasons. Climate Dynamics. 1-17, https://doi.org/10.1007/s00382-019-05109-0

Cai, W, …Anderson, W.B….et al. (2020): Impact of El Niño-Southern Oscillation on South America in a warming climate, Nature Reviews Earth & Environment, 1(4), 215-231.

Anderson, W.B., Seager, R., Baethgen, W., Cane, M, and You, L. (2019): Synchronous crop failures and climate-forced yield variability. Science Advances, 5 (7), eaaw1976.

Anderson, W.B., Seager, R., Baethgen, W., and Cane, M (2018) : Trans-Pacific ENSO teleconnections pose a correlated risk to agriculture. Agricultural and Forest Meteorology, 262: 298-309, doi:10.1016/j.agrformet.2018.07.023

Xie, H, Perez, N, Anderson W.B., Ringler, C. and You, L. (2018): Impact of irrigation development strategies in Sub-Saharan African dryland on food security and import dependency in the region. Water International

Anderson, W.B., Seager, R., Baethgen, W., and Cane, M, (2017): Crop production variability in North and South America forced by life-cycles of the El Niño Southern Oscillation. Agricultural and Forest Meteorology, 239, 151-165

Anderson, W.B., Seager, R., Baethgen, W., and Cane, M, (2016): Life-cycles of agriculturally relevant ENSO teleconnections in North and South America. *Int. J. Climatol*, doi:10.1002/joc.4916

Anderson, W.B., You, L., Wood, S., Wood-Sichra, U., Wu, W (2015): An analysis of methodological and spatial differences in global cropping systems models and maps. *Glob. Ecol. and Biogeog*. doi: 10.1111/geb.12243

Li, Z., Liu, X., Anderson, W.B., Yang, P., Wu, W., Tang, H. and You, L. (2015): Chinese Rice Production Area Adaptations to Climate Changes, 1949–2010. *Environmental Science & Technology*, doi: 10.1021/es505624x

Anderson, W.B., Guikema S., Zaitchik, B. and Pan, W. (2014): Methods for estimating population

density in data-limited areas: evaluating regression and tree-based models in Peru. *PLoS ONE* 9(7): e100037. doi:10.1371/journal.pone.0100037

Nkonya, E. and Anderson, W.B. (2014): Exploiting provisions of land economic productivity without degrading its natural capital, *J. Arid Environ*., doi:10.1016/j.jaridenv.2014.05.012.

Anderson, W.B., Zaitchik, B.F., Hain, C.R., Anderson, M.C., Yilmaz, M.T., Mecikalski, J., and Schultz, L. (2012) Towards an integrated soil moisture drought monitor for East Africa, *Hydrol. Earth Syst. Sci*., 16, 2893-2913, doi:10.5194/hess-16-2893-2012.

Book Chapters:

Walker, T., Ward, C., Torquebiau, R., Xie, H., Anderson, W.B, Perez, N., Ringler, C., You, L., Cenacchi, N., Hash, T. and Rattunde, F., (2016) Agriculture: More Water and Better Farming for Improved Food Security. In "Confronting Drought in Africa's Drylands: Opportunities for Enhancing Resilience", pp.115-136. doi:10.1596/978-1-4648-0817-3_ch7

Nkonya, E., Anderson, W.B., Kato, E., Koo, J., Mirzabaev, A., von Braun, J., & Meyer, S. (2016). Global cost of land degradation. In *Economics of Land Degradation and Improvement–A Global Assessment for Sustainable Development* (pp. 117-165). Springer International Publishing.

Nkonya, E., Srinivasan, R., Anderson, W.B, and Kato, E. (2016). Economics of land degradation and improvement in Bhutan. In *Economics of Land Degradation and Improvement–A Global Assessment for Sustainable Development* (pp. 327-383). Springer International Publishing.

Anderson, W.B., and Johnson, T. (2016) Evaluating Global Land Degradation Using Ground-Based Measurements and Remote Sensing. In *Economics of Land Degradation and Improvement–A Global Assessment for Sustainable Development* (pp. 327-383). Springer International Publishing.

Other Publications:

Anderson, W. Chiduwa, M., De Weerdt, J., Diao, X., Duchoslav, J., Guo, Z., Kankwamba, H., Jamali, A., Nagoli, J., Thurlow, J., You, L. (2023): Mitigating the impact of El Niño on hunger in Malawi. https://doi.org/10.2499/p15738coll2.136971

Nielsen, T., Schünemann, F., McNulty, E., Zeller, M., Nkonya, E., Kato, E., Meyer, S., Anderson, W.B., Zhu, T., Queface, A., and Mapemba, L., (2015): The Food-Energy-Water Security Nexus: Definitions, Policies, and Methods in an Application to Malawi and Mozambique. IFPRI Discussion Paper 1480. doi: 10.2139/ssrn.2740663

Nkonya, E., Srinivasan, R., Anderson, W.B, and Kato, E. (2014). Assessing the economic benefits of sustainable land management practices in Bhutan. IFPRI Discussion Paper 01361. doi:10.2139/ssrn.2483995

Xie, H., You, L., Anderson, W.B., Ringler, C., Cenacchi, N., Perez, N. (2013) Agricultural water management for drylands in Africa south of the Sahara. International Food Policy Research Institute. Methodology report for the World Bank

Conference sessions convened:

Capotondi, A., Newman, M., Anderson, W., & Joh, Y. (2024, February). Multiyear to Decadal Climate Variability: Mechanisms, Predictability and Prediction II. In *104th AMS Annual Meeting*. AMS.

Anderson, W.B., McDermid, S.S., Lesk, C.S. and Swann, A.L., 2022, December. The Effects of Climate on Land, Water, and Vegetation in the Food System: Next Season to Next Century I Oral. In *Fall Meeting 2022*. AGU.

Invited Presentations:

Anderson, W.: IFPRI Policy seminar: Implications of El Niño 2023/24 for Africa South of the Sahara, November 29th

Anderson W. El Niño effects on Rural Population and Agriculture. USAID Briefing, October 13th, 2023

Anderson, W., Hoell, A., Harrison, L, and Davies, B: Briefing on the 2023 El Niño. USAID Bureau for Humanitarian Assistance, July 27th, 2023

Anderson, W and Lee, D.: FEWS NET Data Warehouse (FDW) crop production dataset. Oral presentation at the FEWS NET Science Meeting in Boulder, CO, June 15, 2023.

Anderson, W and Shukla, S.: ENSO-based Extended Crop Yield Outlooks. Oral presentation at the FEWS NET Science Meeting in Boulder, CO, June 15, 2023.

Anderson, W: ENSO-based Extended Crop Yield Outlooks. Oral presentation to the FEWS NET Science Team at the All-FEWS meeting in Mombasa, Kenya. May 5, 2023.

Anderson, W: Violent conflict exacerbated drought-related food insecurity between 2009 and 2019 in sub-Saharan Africa. Princeton University, High Meadows Environmental Institute Seminar, February 21, 2023

Anderson, W: Climate and food security, Washington State University, guest lecture in SOE 280: How the Earth's Climate System Works, March 21, 2022

Anderson, W: The past, present, and future of multiple breadbasket yield shocks, International Food Policy Research Institute Seminar. November 9th, 2021

Anderson, W.: The El Niño Southern Oscillation and simultaneous crop failures. The Johns Hopkins University Bromery Seminar Series, October 21, 2021

Anderson, W.: Climate Change and Food Security, Food For Thought seminar series, Columbia University, March 21st, 2021

Anderson, W.: Climate change and population health, Guest lecture for Intro to Global and Population Health, Columbia University, October 20th, 2020

Anderson, W: Multiple breadbasket failures and the El Niño Southern Oscillation, WHOI Paleoclimate Seminar, July 9th 2020

Anderson, W.: Climate change and population health, Guest lecture for Intro to Global and Population Health, Columbia University, November 4th, 2019

Presentations:

Anderson, W.: Multiyear crop yield forecasts for early warning. AMS Annual Meeting. Baltimore, Jan 29 2023 (oral pres.)

Anderson, W.: Multiyear ENSO-based crop yield forecasts for early warning. AGU Fall Meeting. San Francisco, Dec 15 2023 (oral pres.)

Anderson, W., The El Niño Southern Oscillation and crop yield forecasts, oral presentation at the NASA Goddard Space Flight Center Code 617, Lightning Talk - HSL seminar, Greenbelt, MD, April 20, 2023.

Anderson, W., Extended crop yield outlooks, oral presentation at the NASA Goddard Space Flight Center, Code 617, Terrestrial Water Cycle Seminar, Greenbelt, MD, May 17, 2023.

Anderson, W., Extended crop yield outlooks: Crop yield outlooks based on long-range forecasts of the El Niño Southern Oscillation, booth presentation at the All-FEWS meeting in Mombasa, Kenya, May 1-5, 2023.

Anderson, W., Han, E., Baethgen, W., Muñoz, Á., Goddard, L. and Robertson, A.W.: Does the Madden–Julian Oscillation Affect Crop Yields?. American Meteorological Society Annual Meeting, Boston MA, January 2020 (oral pres.)

Anderson, W., Han, E., Baethgen, W., Muñoz, Á., Goddard, L. and Robertson, A.W The MJO affects modeled and observed crop yields. LDEO Postdoc Symposium, September 10th, 2019 (oral pres.)

Anderson, W.B., Seager, R., Baethgen, W., Cane, M, and You, L.: What causes simultaneous crop failures? Correlated Climate Extremes Workshop, Columbia University, May 30, 2019 (oral pres.)

Anderson, W.: ENSO and global crop production. ENSO workshop, Santiago, Chile, March 4-6, 2019 (oral pres.)

Anderson, W.B., Seager, R., Baethgen, W., Cane, M, and You, L.: Climate-forced crop yield variability and synchronous crop failures. AGU Fall Meeting. Washington DC, Dec 10-18, 2018 (oral pres.)

Anderson, W.B., Seager, R., Baethgen, W., and Cane, M,: How relevant is ENSO to global crop production? IV International Conference on El Niño Southern Oscillation: ENSO in a warmer Climate. October 18, Guayaquil, Ecuador (oral pres.)

Anderson, W.B., Seager, R., Baethgen, W., and Cane, M,: Trans-Pacific ENSO teleconnections pose a correlated risk to global agriculture. The American Meteorological Society annual meeting. Jan 7-11, 2018. Austin, TX (oral pres.)

Anderson, W.B., Seager, R., Baethgen, W., and Cane, M,: The El Niño Southern Oscillation and sustainable intensification. *The Global Land Program Open Science Meeting.* Oct. 24-27, 2016. Beijing, CHN (oral pres.) **[Awarded outstanding presentation]*

Anderson, W.B., Seager, R., Baethgen, W., and Cane, M,: Life cycles of agriculturally-relevant ENSO teleconnections in North and South America. *American Geophysical Union Fall Meeting.* Dec. 14-18, 2015. San Francisco, CA (oral pres.)

Anderson, W.B "An analysis of methodological and spatial differences in global cropping systems models and maps". Chinese Academy of Agricultural Sciences, May 23rd, 2014. Beijing, China. (oral pres.)

Anderson, W.B "Assessing the benefits of sustainable land management practices in Bhutan: Land cover changes and hydrological analyses". IFPRI / World Bank hosted Workshop, March 18, 2014. Thimphu, Bhutan. (oral pres.)

Anderson, W.B, You, L., Wood, S., Wood-Sichra, U., Wu, W. "A Comparative Analysis of Global Cropping Systems Models and Maps," *American Geophysical Union Fall Meeting.* Dec. 9-13, 2013. San Francisco, CA (poster pres.)

Anderson, W.B., C. Hain, B. Zaitchik, M. Anderson, C. Alo and M. Yilmaz. "Towards an Integrated Soil Moisture Drought Monitor for East Africa," *American Geophysical Union Fall*

Meeting. Dec. 5-9, 2011. San Francisco, CA (poster pres.)

COMPETITIVE GRANTS

Co-I: Using terrestrial water storage to improve S2S hydrologic forecast skill — 2023 - 2025
NASA ROSES ($155,000)

PI: Climate Services for livestock management, — 2020 - 2022
The Earth Institute, Columbia University ($100,000)

Co-I: The climate science concierge, — 2020 - 2021
The Brown Institute ($50,000)

Co-I: Flash floods and food security (unsuccessful at NSF DISES, 2021) -

PI: Climate services for complex crises (unsuccessful at NSF HBDE, 2021) -

PI: Extended crop yield forecasts for early warning (unsuccessful at NASA ECR, 2024) -

OTHER GRANTS

PI: Correlated climate risks to the global food system. — 2022 - 2025
International Food Policy Research Institute (IFPRI; $236,000)

FELLOWSHIPS AND AWARDS

Earth Institute Postdoctoral Research Fellowship ($140,000) 2018 - 2020

NSF Graduate Research Fellowship ($98,000) *2014 - 2018*

Columbia Graduate School of Arts and Sciences Dean's Fellow ($168,000) *2014*

JHU Whiting School of Engineering Dean's Master's Fellowship ($23,000) *2012*

JHU Wolman Award for Interdisciplinary Study *2011*

Outstanding Student Presentation, GLP Open Science Meeting *2016*

TEACHING EXPERIENCE

Lecturer – Climate and Society Master's program, Columbia University *2020 -*
Dynamics of Climate Variability and Change, Fall 2020

Teaching Assistant - Columbia University
Regional Climate Dynamics: Dr. Andrew Robertson and Dr. Pietro Ceccato *2016, 2018*
Dynamics of Climate: Dr. Ron Miller *2017*
Dynamics of Climate Variability and Change: Dr. Alessandra Giannini and Dr. Lisa Goddard *2017*

Guest Lecturer – Washington State University
How does the climate system work? 2021

Guest Lecturer – Columbia University Irving Medical Center
Intro to Global and Population Health 2019, 2020

Teaching Assistant - The Johns Hopkins University 2011
Introduction to Environmental Engineering, Dr. Hedy Alavi.

PROFESSIONAL SERVICE

Reviewer: Science, Nature Communications, Nature Food, Nature Sustainability, Journal of Climate, Environmental Research Letters, Geophysical Research Letters, Agricultural and Forest Meteorology, Hydrology and Earth System Sciences, Earth System Dynamics, PLOS Climate, Journal of Applied Meteorology and Climatology, International Journal of Climatology, AGU Advances, Earth's Future, Earth System Dynamics, PNAS Nexus

US CLIVAR Panel Member *2023 - 2026*
Predictability, Predictions, and Applications Interface Panel

Associate Editor *2022 -*
Earth Interactions

Committee for Promotions and Appointments *2023 - 2026*
ESSIC, University of Maryland

Diversity, Equity, & Inclusion Action Committee *2020 - 2021*
IRI, Columbia University

Seminar organizer *2018 - 2021*
IRI, Columbia University

Graduate Student Committee *2016 -2018*
Department of Earth and Environmental Sciences

Graduate Student Advisory Council Representative, *2015 - 2016*
Columbia Graduate School of Arts and Sciences

Workshop Organizer, Thimphu, Bhutan *2014*
"Assessing the economic benefits of sustainable land management practices in Bhutan"
50+ participants, including the Honorable Minister of Agriculture and Forests

PROGRAMMING AND MODELING LANGUAGES

• Python • MATLAB • R • ArcGIS • SQL

OUTREACH

NASA Global Temperature Update - Live Shots 2023

Volunteer, 826 DC nonprofit writing workshop 2020
"Rewrite the stars" space writing camp

Co-organizer - Field trip to Lamont for Cayuga Center children 2019

Mentor - Secondary School Field Research Program, LDEO 2015, 2017
Internship program focused on diversity, equity, and inclusion

Citizen Teacher – Harlem Renaissance Leadership Academy
Semester-long Earth science course: A Tour of Earth's Natural Disasters 2015

Volunteer - BioBus. 2014-15
After school science programming for populations underrepresented in the sciences

Volunteer scientist - Big Green Theater Project, 2014
An annual eco-play writing program for elementary school children

Trip Leader - Engineers Without Borders, KZN South Africa 2010, 2011
Organized students and professional partners to work with rural community

gardeners, local NGOs and the Department of Agriculture in KwaZulu-Natal

Project Coordinator and Classroom Lead - Art Brigade! *2009-2012*
Tench Tilghman Elementary School and Carmelo Anthony Youth Development Center