Donghoon Lee, Ph.D.

Canada Research Chair Tier-2 in Climate Resilient Water and Food Security
Assistant Professor, Department of Civil Engineering, University of Manitoba
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Education:

- PhD in Civil and Environmental Engineering, University of Wisconsin-Madison   2013 — 2018
  - Advisor: Dr. Paul Block
  - Dissertation: Global-Scale Seasonal Streamflow Characteristics and Predictions with Assessment of Flood-Health Vulnerability and Risk
- MS in Civil Engineering, Ajou University, South Korea   2010 — 2012
- BS in Civil System Engineering, Ajou University, South Korea   2004 — 2010

Research Employment:

- Canada Research Chair Tier-2 in Climate Resilient Water and Food Security   2024 – present
- Assistant Professor, Department of Civil Engineering, University of Manitoba   2024 – present
- Affiliated Researcher, Climate Hazards Center, Department of Geography, University of California, Santa Barbara   2023 – present
- Postdoctoral Researcher, Climate Hazards Center, Department of Geography, University of California, Santa Barbara   2020 – 2023
- Research Associate, Department of Civil and Environmental Engineering, University of Wisconsin-Madison   2018 – 2020
- Graduate Research Assistant, Department of Civil and Environmental Engineering, University of Wisconsin-Madison   2013 – 2018

Grants:

- PI. Canada Research Chair Tier-2 in Climate Resilient Water and Food Security. 2024-2028, $600,000 CAD.
- Co-I (PI: S. Shukla). Improving a process based understanding of how terrestrial water storage can improve S2S hydrologic forecasts skill in data sparse regions. *NASA ROSES: ESR – Subseasonal-to-Seasonal Hydrometeorological Prediction*. 2023-2024. $750,000 USD.
- Grant writer & Research Associate (PI: P. Block). Development of a Forecast-based Flood and Health Risk Management System to Support Advanced Disaster Preparedness. *Wisconsin Alumni Research Foundation – UW2020*. 2019-2020. $439,000 USD.
- Grant writer & Research Assistant (PI: P. Block). Flood Prediction to Support Advanced Disaster Preparedness and Public Health Risks: Understanding, Development, and Application. *Global Health Institute – Seed Grant*, University of Wisconsin-Madison. 2017-2018. $50,000 USD.

Unsuccessful Proposals:

- PI. HKH GeoProject: An earth observations and machine learning-powered decision support tool to advance early warning of agricultural droughts and facilitate food security vulnerability assessment in the Hindu Kush-Himalaya Region. *NASA SERVIR*.

Peer-Reviewed Publications (†Student/Mentee)

Submitted/In Review
- **D. Lee**, W. Anderson, X. Chen, F. Davenport, S. Shukla, R. Sahajpale, M. Budde, J. Rowland, J. Verdin, L. You, M. Ahouangbenoni, K. Davis, E. Kebede, S. Ehrmannk, C. Justice, and C. Meyer. (in review, SDATA-24-02480), HarvestStat Africa – Harmonized Subnational Crop Statistics for Sub-Saharan Africa. Preprint: https://doi.org/10.31223/X5M123.
- H. Kim, **D. Lee**, M. Seo, & K. Woosnam (in review, JCIT-D-24-02022) Climate Gentrification and Green Infrastructure in the U.S. Great Lakes Region: Engaging with Heat Exposure and Adaptation Policy.

Accepted/Published
[16] F. Davenport, **D. Lee**, S. Shukla, G. Husak, C. Funk, M. Budde, & J. Rowland. (2024). Testing Spatial Out-of-Sample Area of Influence for Grain Forecasting Models. *Environmental Research Letters*. doi: 10.1088/1748-9326/ad845e.

[15] **D. Lee**, F. Davenport, S. Shukla, G. Husak, C. Funk, M. Budde, J. Rowland, & J. Verdin. (2024). Contrasting Performance of Panel and Time-series Models for Subnational Crop Forecasting in Sub-Saharan Africa. *Agricultural and Forest Meteorology*. doi: 10.1016/j.agrformet.2024.110213.

[14] S. Shukla, F. Zaheer, A. Hoell, W. Anderson, H. Jayanthi, G. Husak, **D. Lee**, B. Barker, S. Pervez, K. Slinski, C. Justice, J. Rowland, A. Mcnally, M. Budde, & J. Verdin. (2024). ENSO-based outlook of droughts and agricultural outcomes in Afghanistan. *Weather and Climate Extremes*. doi: 10.1016/j.wace.2024.100697.

[13] [†]H. Roland, K. Curtis, K. Malecki, **D. Lee**, P. Block, & J. Bazo. (2023). Geographic Isolation and Vulnerability Across Peru's Ecological Regions: The Influence of Regional Contexts of Extraction. *Annals of the American Association of Geographers*. doi: 10.1080/24694452.2023.2216762.

[12] J. Lala, **D. Lee**, J. Bazo, & P. Block. (2022). Evaluating prospects for subseasonal-to-seasonal forecast-based anticipatory action from a global perspective. *Weather and Climate Extremes*. 38. 100510. doi: 10.1016/j.wace.2022.100510.

[11] **D. Lee**, F. Davenport, S. Shukla, G, Husak, C, Funk, L. Harrison, A. McNally, M. Budde, J. Rowland, & J. Verdin. (2022). Maize yield forecast using earth observation and machine learning for Sub-Saharan Africa. *Global Food Security*. doi:10.1016/j.gfs.2022.100643.

[10] **D. Lee**, J. Y. Ng, S. Galelli, & P. Block. (2022). Unfolding the relationship between seasonal forecast skill and value in hydropower production: A global analysis. *Hydrology and Earth System Sciences*. doi:10.5194/hess-26-2431-2022.

[9] F. Davenport, S. Shukla, W. Turner, C. Funk, N. Krell, L. Harrison, G. Husak, **D. Lee**, & S. Peterson. (2021). Sending out an SOS: using start of rainy season indicators for market price forecasting to support famine early warning. *Environmental Research Letters*. doi:10.1088/1748-9326/ac15cc.

[8] [†]C. Keating, **D. Lee**, J. Bazo, & P. Block. (2021). Leveraging multi-model season-ahead streamflow forecasts to trigger advanced flood preparedness. *Natural Hazards and Earth System Sciences*. doi:10.5194/nhess-21-2215-2021.

[7] **D. Lee**, H. Ahmadul, J. Patz, & P. Block. (2021). Predicting social and health vulnerability to floods in Bangladesh. *Natural Hazards and Earth System Sciences*. doi:10.5194/nhess-21-1807-2021.

[6] Y. Zhang, L. You, **D. Lee**, & P. Block. (2020). Integrating climate prediction and regionalization into an agro-economic model to guide agricultural planning. *Climatic Change*. doi:10.1007/s10584-019-02559-7.

[5] **D. Lee**, P. Ward, & P. Block. (2018). Identification of symmetric and asymmetric responses in seasonal streamflow globally to ENSO phase. *Environmental Research Letters*. doi:10.1088/1748-9326/aab4ca.

[4] **D. Lee**, P. Ward, & P. Block. (2018). Attribution of large-scale climate patterns to seasonal peak-flow and prospects for prediction globally. *Water Resources Research*. doi:10.1002/2017WR021205.

[3] **D. Lee**, P. Ward, & P. Block. (2015). Defining high-flow seasons using temporal streamflow patterns from a global model. *Hydrology and Earth System Sciences*. doi:10.5194/hess-19-4689-2015.

[2] **D. Lee**, J. Choi, S. Shin, & J. Yi. (2013). A study on proper number of subbasin division for runoff analysis using Clark and ModClark methods in midsize basins, *Journal of The Korean Society of Civil Engineers*. doi:10.12652/Ksce.2013.33.1.157.

[1] **D. Lee**, C. Choi, M. Yu, & J. Yi. (2012). Reevaluation of multi-purpose reservoir yield, *Journal of Korea Water Resources Association*, doi:10.3741/JKWRA.2012.45.4.361.

Technical Reports:

- Roland, H.B., **Lee, D.**, Wirz, C. D., Curtis, K.J., Malecki, K., Brossard, D., & Block, P. February 2021. Stakeholders' Perspectives on Flood Risk and Vulnerability in Peru. A report from the University of Wisconsin-Madison 2020 project: Development of a Forecast-based Flood and Health Risk Management System to Support Advanced Disaster Preparedness. http://digital.library.wisc.edu/1793/82505.

Invited Talks:

- **D. Lee**, "Forecasting for Disaster Resilience and Food Security," *CNU Conference of Advanced Technology 2024, Chungnam National University*, Nov 14, 2024

- **D. Lee**, "Forecasting for Disaster Resilience and Food Security," *United Nations Academic Impact (UNAI) – The Last Drop: Water Researchers Speakers Series, University of Manitoba*, Oct 21, 2024.

- **D. Lee**, "Forecasting for Disaster Resilience and Food Security," *Climate Seminar, Department of Geography, University of California Santa Barbara*, Jun 7, 2024.

- **D. Lee**, "Sustainable Management of Future Water Resources and Hazards," *Manitoba Hydro*, Feb 16, 2024.

- **D. Lee**, "Planning for Prosperity: Forecasting for Disaster Management and Food Security," *Departmental Seminar, Division of Environmental Science & Engineering, Pohang University of Science and Technology (POSTECH),* Mar 7, 2023.

- **D. Lee**, "Forecasting for pre-disaster management from flood hazard to food insecurity," *Geography Seminar Series, Department of Geography, University of Cincinnati*, Mar 26, 2021.

- **D. Lee**, "Developing a global flood prediction model to support health risk management," *Global Health Tuesday seminar, Global Health Institute, University of Wisconsin-Madison*, Nov 28, 2017.

Presentations:

- S. Shukla, F. Davenport, B. Das, **D. Lee**, W. B. Anderson, E. Yoon, A. Hazra, K. Slinski, A. McNally, K. M. Tabor, L. Harrison, & G. J. Husak. (2024). From Agricultural Drought Risks to Crop Production Shocks: Enhancing Food Insecurity Early Warning through the Application of Remotely Sensed and Modeled Soil Moisture. *AGU Fall Meeting*.

- **D. Lee**, W. Anderson, F. Davenport, S. Shukla, E. Yoon, B. Das, G. Husak, & C. Funk. (2024). HarvestStat Africa: Application to Crop Yield Forecasting for Improved Food Security in Sub-Saharan Africa. *AGU Fall Meeting*.

- W. Anderson, **D. Lee**, X. Chen, F. Davenport, S. Shukla, R. Sahajpal, M. Budde, J. Rowland, J. Verdin, L. You, M. Ahouangbenon, K. Davis, E. A. Kebede, S. Ehrmann, C. Justice, & C. Meyer. (2024). An open-access subnational crop statistics dataset for climate-smart analyses in Africa. *AGU Fall Meeting*.

- B. Das, S. Shukla, F. Davenport, **D. Lee**, L. Harrison, G. Husak, K. M. Tabor, J. Rowland, M. Budde, & J. Verdin. (2024). Evaluating Crop Yield Prediction Models in Sub-Saharan Africa: Biophysical vs. Agro-climatic predictors. *AGU Fall Meeting*.
- S. Shukla, F. Davenport, **D. Lee**, W. Anderson, E. Yoon, K. Slinski, A. Harza, & A. McNally. (2024). Enabling long-lead crop yield forecasting with remotely sensed and modeled soil moisture and seasonal scale forecasts to support food insecurity early warning. *AGU Chapman Conference*.
- F. Davenport, **D. Lee**, & S. Shukla. (2023). Testing Spatial Out-of-Sample Area of Influence for Grain Forecasting Models, *Western Regional Science Association (WRSA)*.
- **D. Lee**, F. Davenport, S. Shukla, G. Husak, C. Funk, M. Budde, J. Rowland, & J. Verdin. (2023). Utilizing Earth Observation for Enhanced Crop Production Forecasting in West Africa. *AGU Fall Meeting*.
- **D. Lee**, F. Davenport, S. Shukla, L. Harrison, G. Husak, C. Funk, M. Budde, J. Rowland, A. McNally, & J. Verdin. (2023). Leveraging Hydroclimate and Earth Observation to Predict Grain Production in Sub-Saharan Africa. *EGU General Assembly*.
- P. Block, K. Southard, **D. Lee**, & J. Bazo. (2023). Emerging Opportunities and Challenges of Anticipatory Actions for Disaster Preparedness. *EGU General Assembly*.
- F. Davenport, S. Shukla, **D. Lee**, P. Anderson, G. Husak, & C. Funk. (2023). Testing Spatial Out-of-Sample Area of Influence for Grain Forecasting Models: How does out of Spatial Out-of-Sample AoI Change through the Season?. *EGU General Assembly*.
- **D. Lee**. (2023). Vulnerability to Natural Hazards: Spatial Patterns and Disparities. *Spatial Lightning Talks. Center for Spatial Studies, University of California Santa Barbara*.
- **D. Lee**, F. Davenport, S. Shukla, L. Harrison, G. Husak, C. Funk, M. Budde, J. Rowland, A. McNally, & J. Verdin. (2022). In-season Operational Forecasts of Subnational Grain Production in Sub-Saharan Africa. *AGU Fall Meeting*.
- F. Davenport, S. Shukla, **D. Lee**, P. Anderson, G. Husak, & C. Funk. (2022). Testing the Spatial Out-of-Sample Area of Influence for Survey Based Forecasting Models. *AGU Fall Meeting*.
- P. Block, H. Roland, K. Malachi, **D. Lee**, D. Brossard, K. Curtis, C. Wirz. (2022). Perspectives on Flood Risk, Vulnerability, and Early Warnings in Peru. *AGU Fall Meeting*.
- **D. Lee**, F. Davenport, S. Shukla, G. Husak, and C. Funk. (2021). An operational crop yield forecasting system for Sub-Saharan Africa using earth observation and machine learning. *AGU Fall Meeting*.
- F. Davenport, S. Shukla, **D. Lee**, M. Landsfeld, D. Macharia, G. Husak, and C. Funk. (2021). Implementing and integrating earth observation based systems for grain forecasting in Eastern and Southern Africa. *AGU Fall Meeting*.
- C. Funk, E. Williams, P. Peterson, W. Turner, R. Green, S. Shukla, **D. Lee**, C. Tuholske, L. Harrison, and G. Husak. (2021). Exploring a new set of global vapor pressure deficit observations and projections, accompanied by regional NDVI impact assessments in the southwest U.S. and Sub-Saharan Africa. *AGU Fall Meeting*.
- **D. Lee**, F. Davenport, S. Shukla, G. Husak, and C. Funk. (2021). Maize yield forecast using Earth Observation data and machine learning for Sub-Saharan Africa. *EGU General Assembly*.
- H. Roland, **D. Lee**, K. Malecki, K. Curtis, & P. Block. (2020). Flood-related Vulnerability in Iquitos, Peru: An Applied Approach to Inform Disaster Aid Forecast-based Financing. *Population Association of America*.
- **D. Lee**, H. Ahmadul, & P. Block. (2020). Social-health vulnerability and predictability of flood impacts using flood forecast and satellite inundation in Bangladesh. *AGU Fall Meeting*.
- J. Y. Ng, **D. Lee**, S. Galelli, & P. Block. (2020). Benefits and limits of season-ahead forecasts for hydropower production: a global analysis. *EGU General Assembly*.
- P. Block & **D. Lee**. (2020). Predicting floods and flood-health vulnerability to support pre-disaster management in Peru. *EGU General Assembly*.
- **D. Lee**, J. Bazo & P. Block. (2019). Prediction of flood-health vulnerability and risk to support pre-disaster management in Peru. *AGU Fall Meeting*.

- **D. Lee** & P. Block. (2018). Assessment of a flood-induced health risk prediction system. *AGU Fall Meeting*.
- **D. Lee** & P. Block. (2018). Development of a flood-induced health risk prediction model: A case study for Africa. *Environmental and Water Resources Congress*.
- **D. Lee** & P. Block. (2017). Development of a flood-induced health risk prediction model for Africa. *AGU Fall Meeting*.
- J. Y. Ng, **D. Lee**, S. Galelli, & P. Block. (2017). Determining the effect of key climate drivers on global hydropower production. *AGU Fall Meeting*.
- **D. Lee**, P. Ward, & P. Block. (2017). Using season-ahead streamflow predictions to estimate flood-induced health risks for early warning. *Environmental and Water Resources Congress*.
- **D. Lee**, P. Ward, & P. Block. (2016). A Preliminary evaluation of season-ahead flood prediction conditioned on large-scale climate drivers. *EGU General Assembly*.
- **D. Lee**, P. Ward, & P. Block. (2016). A Preliminary season-ahead prediction of global flood risks. *Environmental and Water Resources Congress*.
- **D. Lee**, P. Ward, & P. Block. (2016). Conditioning season-ahead global flood forecasting on large-scale climate indices. *AGU Fall Meeting*.
- **D. Lee**, P. Ward, & P. Block. (2015). A preliminary evaluation of season-ahead flood risks globally. *AGU Fall Meeting*.
- **D. Lee**, P. Ward, & P. Block. (2015). Flood prediction: Can a global scale analysis be informative? *Environmental and Water Resources Congress*.
- P. Block & **D. Lee**. (2014). Prospects for seasonal global flood forecasting. *UCOWR/NIWR/CUAHSI Annual Conference*.
- P. Block, **D. Lee**, & P. Ward. (2014). Prospects for seasonal global flood forecasting. *Environmental and Water Resources Congress*.
- **D. Lee**, P. Ward, & P. Block. (2014). Prospects for season-ahead global flood forecasts. *AGU Fall Meeting*.
- J. Choi, **D. Lee**, & J. Yi. (2012). Analysis of flood runoff hydrograph by parameter estimation Technique. *Korea Water Resources Association Conference*.
- T. Kwon, **D. Lee**, & J. Yi. (2012). Flood discharge and stage analysis of GyeongIn ARA Waterway for the July 2011 Flood. *Korea Water Resources Association Conference*.
- **D. Lee**, J. Choi, & J. Yi. (2012). Analysis of Runoff Variation According to Subbasin Division. *Korea Water Resources Association Conference*.
- **D. Lee**, C. Choi, M. Yu, & J. Yi. (2011). Reevaluation of Andong and Imha reservoirs yield. *Korea Water Resources Association Conference*.
- C. Choi, H. Kim, J. Yi, M. Yu, & **D. Lee**. (2011). Optimal reservoir operation using goal programming for flood control. *EGU General Assembly*.
- M. Yu, **D. Lee**, C. Choi, & J. Yi. (2010). Construction of flood inundation map for flood damage analysis. *Korea Water Resources Association Conference*.

Teaching:
- Climate Change in Civil Engineering, University of Manitoba (Winter 2025).
- Hydroclimatology, University of Manitoba (Fall 2024).
- Fluid Mechanics, University of Wisconsin-Madison, Teaching Assistant (Fall 2017).
- Elementary Surveying & Practice, Ajou University, Teaching Assistant (Spring 2012).
- Fluid Mechanics, Ajou University, Teaching Assistant (Fall 2011).

Advising/Mentoring:
- Boluwatife Akintola , MSc student, University of Manitoba (2024-current)
- Hugh Roland, PhD student, University of Wisconsin-Madison (2019-2022)
- Colin Keating, MS student, University of Wisconsin-Madison (2019-2021)
- Li Xu, MS student, University of Wisconsin-Madison (from Beijing Normal University) (2019)

Honors and Awards:
- Canada Research Chair Tier-2 in Climate Resilient Water and Food Security. 2024, $600,000 CAD.
- James Villemonte Excellence in Research Graduate Student Achievement Award, 2018.
- Research Conference Travel Funds Award, The Graduate School, University of Wisconsin-Madison, 2018, $1,200.
- Becker Travel Supplement Funds Award, University of Wisconsin-Madison, 2015-2018, $1,000.
- Presentation Winner of Students Competition, Korea Water Resources Association Conference, 2012.

Professional Services:
- Guest Editor, "Special Issue on Digital Water", Blue-Green Systems (Impact Factor: 4.6), https://iwaponline.com/bgs/pages/si_digital_water.
- Session Co-convenor, "Advances in Quantifying Impacts and Extents of Land-Use/Land-Cover Change on Hydrology and Climate Change," American Geophysical Union Fall Meeting, 2022.
- Review editor for *Frontiers in Climate* (2021-present)
- Ad-hoc reviewer for
    - Agricultural Water Management
    - Applied Geography
    - Atmospheric Measurement Techniques
    - BMC Public Health
    - Climatic Change
    - Earth's Future
    - Environmental Modeling & Software
    - Environmental Research Letters
    - Frontiers in Climate
    - Frontiers in Environmental Science (2024)
    - Journal of Hydrology
    - Journal of Water Resources Planning and Management
    - Natural Hazards and Earth System Sciences
    - npj Climate and Atmospheric Science
    - Sustainability
    - Water Resources Research
    - Weather and Forecasting

Professional Associations:
American Geophysical Union
American Society of Civil Engineering
European Geosciences Union
Korean Water Resources Association
Korean Society of Civil Engineering.