Noemi Vergopolan

Tenure-track Assistant Professor · Computational Hydrology & Remote Sensing
Earth, Environmental and Planetary Sciences, Rice University, 6100 Main St., Houston TX, 77005
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Research Interests

Hydrology, Earth system science, satellite remote sensing, water resources, hydroclimate extremes, human-water systems, soil science, agriculture, ecology, numerical modeling, data assimilation, high-performance computing, machine learning, and big data.

Professional Appointments

Rice University – Earth, Environmental and Planetary Sciences   Houston, TX, USA
Assistant Professor of Hydrology and Remote Sensing   Jul. 2024 – Current

Princeton University – Atmospheric and Ocean Sciences Program   Princeton, NJ, USA
Postdoctoral Researcher Associate   Jun. 2021 – Jun. 2024

NOAA – Geophysical Fluid Dynamics Laboratory   Princeton, NJ, USA
Visiting Researcher Scientist   Jun. 2021 – Jun. 2024

Envex Engineering and Consulting   Curitiba, PR, Brazil
Environmental Engineer   Oct. 2013 – Aug. 2015

Education

Princeton University   Princeton, USA
Ph.D. in Civil and Environmental Engineering   May 2021
- Certificate in Statistics and Machine Learning (2021)
- Certificate in Computational Science and Engineering (2019)

Princeton University   Princeton, USA
M.A. in Civil and Environmental Engineering   June 2017

Federal University of Paraná   Curitiba, Brazil
B.S. in Environmental Engineering   Apr. 2014

Honors & Awards

2022	**AGU Science for Solutions Award** - one of AGU's highest honors for *"outstanding contributions to water and food security through advances in hyper-resolution land surface modeling and satellite remote sensing"*	USA
2022	**Paul F. Boulos Excellence in Computational Hydrology Award** - American Academy of Environmental Eng. & Sci. ($1.5k)	USA
2022	**GEWEX Travel Award** - World Climate Research Programme of the World Meteorological Org. ($2k)	USA
2021	**Cooperative Institute for Modeling the Earth System Fellowship** - Princeton & NOAA-GFDL ($200k)	USA
2018	**Mary and Randall Hack '69 Graduate Award** - Princeton Environmental Institute ($4k)	USA
2016	**School of Public and International Affairs Award** - Princeton Environmental Institute ($7k)	USA
2015	**Science Without Borders PhD Scholarship** - CAPES/Brazil Government & LASPAU/Harvard (declined)	Brazil/USA
2013	**Academic Excellence Medal** - Merit award given to the top 1% students at Federal University of Paraná	Brazil
2012	**1st Place in the International Culture Leadership Award** - North Carolina State University	USA
2011	**Science Without Borders Undergraduate Scholarship** - CNPq/Brazilian Government ($70k)	Brazil/USA
2010	**Undergraduate Research Fellowship** - CNPq/Brazil Government ($5k)	Brazil

Peer-Reviewed Scientific Publications

Google Scholar: https://scholar.google.com/citations?user=ETyTAKcAAAAJ&hl.

§ indicates visiting or external graduate student mentee

In Review

[1] §**Saavedra, F.**, **Vergopolan, N.**, Musolff, A., Merz, R., Wang, Z., Winter, C., Tarasova, L. Mapping Hydrological Connectivity from Soil Moisture Patterns: An Explainable AI Perspective on Nitrate Modeling. *Water Resources Research*.

[2] Waldman, K., Blekking, J., Jain, M., Nkonde, C., **Vergopolan, N.** What discrepancies between farmer perceptions and observational data teach us about smallholder decision making. *Environmental Research Letters*.

[3] §**Laipelt, L.**, Fleischmann, A., Comini de Andrade, B., **Vergopolan, N.**, Biudes, M., Aragão, L., Collischonn, W., Ruhoff, A. Increased Amazon evapotranspiration since 1990 in a warming climate. *Environmental Research Letters*.

[4] §**Bacelar, L.**, §**Laura Torres-Rojas, L.**, **Vergopolan, N.**, Waterman, T., Chaney, N. Leveraging clustering to enable locally relevant and computationally efficient runoff predictions. *Journal of Hydrology*.

[5] §**Caballero, C.**, Biggs, T., **Vergopolan, N.**, Camelo, L., Comini de Andrade, B., Laipelt, L., Ruhoff, A. Decadal Hydroclimatic Changes in the Pantanal - the World's Largest Tropical Wetland. *Nature Scientific Reports*.

[6] Raoult et al. Parameter Estimation in Land Surface Models: Challenges and Opportunities with Data Assimilation and Machine Learning. *Journal of Advances in Modeling Earth Systems*.

[7] Krishnan, V. U., **Vergopolan, N.**, Singh, B. B., Indu, J., Karthikeyan, L. Hyper-Resolution Land Surface Modeling for Farm-Scale Soil Moisture in India: Enhancing Simulations with Soil Vertical Heterogeneity. *Hydrology and Earth System Sciences*. https://doi.org/10.5194/hess-2024-339.

[8] Mohamadzadeh, N., Sadeghi, M., **Vergopolan, N.**, Liang, L., Bandara, U., Altare, C., Caldas, M. Landcover-Specific Calibration of the Optical Trapezoid Model (OPTRAM) for Soil Moisture Monitoring in the Central Valley, California. *Frontiers in Remote Sensing Image Analysis and Classification*.

[9] J. A. Flores, C. J. Gleason, C. Brown, **N. Vergopolan**, M. M. Lummus, L. A. Stearns, D. Li, L. C. Andrews, D. Basnyat, C.B. Brinkerhoff, R. Ducusin, D. Feng, E. Friedmann, X. He, M. Girotto, S. V. Kumar, R. B. Lammers, G. Lamsal, F. Z. Maina, A. A. Proussevitch, A. Richey, E. Shevliakova, D. Subedi, J. Wang. Accelerating river discharge in High Mountain Asia. *AGU Advances*.

2024

[26] §**Almagro, A.**, Meira Neto, A., **Vergopolan, N.**, Roy, T., Troch, P. A., Oliveira, P. T. S. The drivers of hydrologic behavior in Brazil: insights from a catchment classification. *Water Resources Research*. https://doi.org/10.1029/2024WR037212

[25] Walker, D., **Vergopolan, N.**, Cavalcante, L., Smith, K.H., Agoungbome, A., §**Almagro, A.**, Apurv, T., Dahal, N., Hoffmann, D., Singh, V., Xiang, Z. Flash drought typologies and societal impacts: a worldwide review of occurrence, nomenclature, and experiences of local populations. *American Meteorological Society - Weather, Climate, and Society*. https://doi.org/10.1175/WCAS-D-23-0015.1.

2023

[24] Castano-Duque, L., Winzeler, E., Blackstock, J., Liu, C., **Vergopolan, N.**, Focker, M., Barnett, K., Owens, P., van der Fels-Klerx, H.J., Vaughan, M., Rajasekaran, K. Dynamic Geospatial Modeling of Mycotoxin Contamination of Corn in Illinois: Unveiling Critical Factors and Predictive Insights with Machine Learning. *Frontiers in Microbiology*. https://doi.org/10.3389/fmicb.2023.1283127.

[23] Beck, H. E., McVicar, T., **Vergopolan, N.**, Berg, A., Lutsko, N., Dufour, A., Zeng, Z., Jiang, X., van Dijk, A., Miralles, D. High-resolution (1 km) Köppen-Geiger maps for 1901–2099 based on constrained CMIP6 projections. *Nature Scientific Data*. https://doi.org/10.1038/s41597-023-02549-6.

[22] §**Caballero, C.**, Biggs, T., **Vergopolan, N.**, West, T., Ruhoff, A. Transformation of Brazil's biomes: The dynamics and fate of agriculture and pasture expansion into native vegetation. *Science of the Total Environment*. https://doi.org/10.1016/j.scitotenv.2023.166323.

[21] §**Chengcheng, X.**, §**Torres-Rojas, L.**, **Vergopolan, N.**, Chaney, N. W. The utility of state-of-the-art soil properties maps in soil moisture modeling. *Water Resources Research*. https://doi.org/10.1029/2022WR032336.

[20] Kivi, M., **Vergopolan, N.**, Dokoohaki, H. A comprehensive assessment of in situ and remote sensing soil moisture data assimilation in the APSIM model for improving agricultural forecasting across the U.S. Midwest. *Hydrology and Earth System Sciences*. https://doi.org/10.5194/hess-27-1173-2023.

[19] Cecil, M., Chilenga, A., Chisanga, C., Gatti, N., Krell, N., **Vergopolan, N.**, Baylis, K., Caylor, K., Evans, T., Konar, M., Sheffield, J., Estes, L. How Much Control do Smallholder Maize Farmers Have Over Yield? *Field Crops Research*. https://doi.org/10.1016/j.fcr.2023.109014.

[18] Gatti, N., Cecil, M., Baylis, K., Estes, L., Blekkin, J., Heckelei, T., **Vergopolan, N.**, Evans, T. Is closing the agricultural yield gap a "risky" endeavor? *Agricultural Systems*. https://doi.org/10.1016/j.agsy.2023.103657.

2022   [17] **§Torres-Rojas, L.**, **Vergopolan, N.**, Herman, J. D., Chaney, N. W. Towards an Optimal Representation of Sub-Grid Heterogeneity in Land Surface Models. *Water Resources Research*. https://doi.org/10.1029/2022WR032233

[16] **Vergopolan, N.**, Sheffield, J., Chaney, N. W., Pan, M., Beck, H. E., Ferguson, C. R., Torres-Rojas, L., Eigenbrod, F., Crow, W., Wood, E. F. High-resolution soil moisture data reveal complex multi-scale spatial variability across the United States. *Geophysical Research Letters*. https://doi.org/10.1029/2022GL098586.

[15] Walker, D. W., Cavalcante, L., Kchouk, S., Neto, G. R., Dewulf, A., Gondim, S. R., Martins, E. S. P. R., Melsen, L. A., Filho, F. A. S. F., **Vergopolan, N.**, van Oel, P. R. Drought diagnosis: what the medical sciences can teach us. *Earth's Future*. https://doi.org/10.1029/2021EF002456.

2021   [14] **Vergopolan, N.**, Chaney, N. W., Pan, M., Sheffield, S., Beck, H. E., Ferguson, C. R., Torres-Rojas, L., Sadri, S., & Wood, E. F. SMAP-HydroBlocks, a 30-m satellite-based soil moisture dataset for the conterminous US. *Nature Scientific Data*. https://doi.org/10.1038/s41597-021-01050-2.

[13] **Vergopolan, N.**, Xiong, S., Estes, L., Wanders, N., Chaney, N. W., Wood, E. F., Konar, M., Caylor, K., Beck, H. E., Gatti, N., Evans, T., & Sheffield, J. Field-scale soil moisture bridges the spatial-scale gap between drought monitoring and agricultural yields. *Hydrology and Earth System Sciences*. https://doi.org/10.5194/hess-25-1827-2021.

[12] Chaney, N. W., Torres-Rojas, L., **Vergopolan, N.**, & Fisher, C. K. HydroBlocks v0.2: enabling a field-scale two-way coupling between the land surface and river networks in Earth system models. *Geoscientific Model Development*. https://doi.org/10.5194/gmd-14-6813-2021.

[11] Beck, H. E., Pan, M., Miralles, D. G., Reichle, R. H., Dorigo, W. A., Hahn, S., Sheffield, J., Karthikeyan, L., Balsamo, G., Parinussa, R. M., van Dijk, A. I. J. M., Du, J., Kimball, J. S., **Vergopolan, N.**, & Wood, E. F. Evaluation of 18 satellite- and model-based soil moisture products using in situ measurements from 826 sensors. *Hydrology and Earth System Sciences*. https://doi.org/10.5194/hess-25-17-2021.

2020   [10] **Vergopolan, N.**, Chaney, N. W., Beck, H. E., Pan, M., Sheffield, J., Chan, S., & Wood, E. F. Combining hyper-resolution land surface modeling with SMAP brightness temperatures to obtain 30-m soil moisture estimates. *Remote Sensing of Environment*. https://doi.org/10.1016/j.rse.2020.111740.

[9] Beck, H. E., Westra, S., Tan, J., Pappenberger, F., Huffman, G. J., McVicar, T. R., Gründemann, G. J., **Vergopolan, N.**, Fowler, H. J., Lewis, E., Verbist, K., & Wood, E. F. PPDIST, global 0.1° daily and 3-hourly precipitation probability distribution climatologies for 1979–2018. *Scientific Data*. https://doi.org/10.1038/s41597-020-00631-x.

[8] Sadri, S., Pan, M., Wada, Y., **Vergopolan, N.**, Sheffield, J., Famiglietti, J. S., Kerr, Y., & Wood, E. (2020). A global near-real-time soil moisture index monitor for food security using integrated SMOS and SMAP. *Remote Sensing of Environment*. https://doi.org/10.1016/j.rse.2020.111864.

[7] Porcù, R., Miglio, E., Parolini, N., Penati, M., & **Vergopolan, N**. HPC simulations of brownout: A noninteracting particles dynamic model. *The International Journal of High Performance Computing Applications*. https://doi.org/10.1177/1094342020905971.

2019   [6] Waldman, K. B., **Vergopolan, N.**, Attari, S. Z., Sheffield, J., Estes, L. D., Caylor, K. K., & Evans, T. P. Cognitive Biases about Climate Variability in Smallholder Farming Systems in Zambia. *Weather, Climate, and Society*. https://doi.org/10.1175/wcas-d-18-0050.1.

2018   [5] Beck, H. E., Zimmermann, N. E., McVicar, T. R., **Vergopolan, N.**, Berg, A., & Wood, E. F. Present and future Köppen-Geiger climate classification maps at 1-km resolution. *Nature Scientific Data*. https://doi.org/10.1038/sdata.2018.214.

[4] Zhao, Y., **Vergopolan, N.**, Baylis, K., Blekking, J., Caylor, K., Evans, T., Giroux, S., Sheffield, J., & Estes, L. Comparing empirical and survey-based yield forecasts in a dryland agro-ecosystem. *Agricultural and Forest Meteorology*. https://doi.org/10.1016/j.agrformet.2018.06.024.

2017   [3] Beck, H. E., **Vergopolan, N.**, Pan, M., Levizzani, V., van Dijk, A. I. J. M., Weedon, G. P., Brocca, L., Pappenberger, F., Huffman, G. J., & Wood, E. F. Global-scale evaluation of 22 precipitation datasets using gauge observations and hydrological modeling. *Hydrology and Earth System Sciences*. https://doi.org/10.5194/hess-21-6201-2017.

[2] Wanders, N., Bachas, A., He, X. G., Huang, H., Koppa, A., Mekonnen, Z. T., Pagán, B. R., Peng, L. Q., **Vergopolan, N.**, Wang, K. J., Xiao, M., Zhan, S., Lettenmaier, D. P., & Wood, E. F. Forecasting the Hydroclimatic Signature of the 2015/16 El Niño Event on the Western United States. *Journal of Hydrometeorology*. https://doi.org/10.1175/jhm-d-16-0230.1.

| 2016 | [1] **Vergopolan, N.**, & Fisher, J. B. The impact of deforestation on the hydrological cycle in Amazonia as observed from remote sensing. *International Journal of Remote Sensing*. https://doi.org/10.1080/01431161.2016.1232874. |

Book Chapters

| 2020 | Beck, H. E., **Vergopolan, N.**, Pan, M., Levizzani, V., van Dijk, A. I. J. M., Weedon, G.P., Brocca, L., Pappenberger, F., Huffman, G. J., & Wood, E. F. Global-scale evaluation of 22 precipitation datasets using gauge observations and hydrological modeling. In: Satellite Precipitation Measurement. V. Levizzani, C. Kidd., D. B. Kirschbaum, C. D. Kummerow, K. Nakamura, F. J. Turk, Eds., Springer Nature, Cham, Advances in Global Change Research, 69, 625-653, https://doi.org/10.1007/978-3-030-35798-6_9. |

Datasets

| 2021 | **Vergopolan, N.**, Chaney, N. W., Pan, M., Sheffield, S., Beck, H. E., Ferguson, C. R., Torres-Rojas, L., & Wood, E. F. SMAP-HydroBlocks: Hyper-resolution satellite-based soil moisture over the continental United States. *Zenodo*. https://doi.org/10.5281/zenodo.5206725 |

Invited Seminars Presentations

2024	• Rice University – Civil and Environmental Engineering. • University of Texas Arlington – Earth and Environmental Sciences. • Texas A&M – Biological and Agricultural Engineering Department. • Earth System Sciences Interdisciplinary Center – University of Maryland and NASA's Goddard Space Flight Center. • King Abdullah University of Science and Technology (KAUST). Saudi Arabia. • Princeton University - Mathey Fellows Seminar.
2023	• Middlebury College - Earth and Climate Sciences Department. • New York University - Civil and Urban Engineering Department. • Rice University - Earth, Environmental and Planetary Sciences. • Columbia University - Earth and Environmental Engineering Department.
2022	• Research Institute for Geo-Hydrological Protection - Italian National Research Council. Italy • University of Illinois Urbana-Champaign - Crop Sciences. • American Academy of Environmental Engineers and Scientists. [Video]. • UFZ – Helmholtz Center for Environmental Research. Germany. • Princeton University - High Meadows Environmental Institute. • Rutgers University - Department of Earth and Environmental Sciences. • Rice University - Earth, Environmental and Planetary Sciences.
2021	• University of California Santa Barbara - Climate Hazards Center • Federal University of Paraná - Department of Civil Engineering
2020	• US Army Engineer Research and Development Center - Cold Regions Research & Engineering Laboratory. • NOAA Geophysical Fluid Dynamics Laboratory
2018	• Utrecht University - Physical Geography Department. The Netherlands

Invited Conference Presentations

| 2025 | **Vergopolan, N.** Innovation in Water Resource Management: Integrating Soil Moisture Monitoring for Drought Diagnosis. *São Paulo International Groundwater Week - University of São Paulo*. Brazil.

Vergopolan, N. Leveraging Land Surface Models & Satellite Remote Sensing for Advancing Nature-Based Solutions: Applications in Flood, Drought, and Carbon Monitoring. *Nature-Based Solutions for a Resilient Gulf Coast Workshop*. Houston, TX, USA. |
| 2024 | **Vergopolan, N.**, et al. Advancing Water and Food Security with AI and Hyper-Resolution Soil Moisture Data. *American Geophysical Union Fall Meeting*. Washington, DC, USA.

Vergopolan, N. Towards locally relevant soil moisture monitoring for scientific and water resources applications. *XVII SRHNE – Brazilian Northeast Water Resources Symposium 2024*. Brazil.

Vergopolan, N. The use of big data for extreme hydroclimate analysis. *XVII SRHNE – Brazilian Northeast Water Resources Symposium 2024*. Brazil. |

Vergopolan, N. Reconciling Observation and Model Scales: Locally Relevant Soil Moisture for Water and Agriculture Decision Making. *Open Science for Agriculture Using NASA Climate Data Workshop*. Virtual.

Vergopolan, N. SMAP-HydroBlocks: Challenges and Opportunities in Integrating Soil Moisture Data with Artificial Intelligence. *4th Annual Land Data Assimilation Community Workshop*. Virtual. [Video]

2023   **Vergopolan, N.** Local droughts: unveiling an emerging phenomenon previously underdetected, underestimated, and overlooked. Keynote Speaker. *American Geophysical Union Fall Meeting*. San Francisco, CA, USA.

Vergopolan, N. Hyper-resolution Land Surface Modeling and Satellite Data Assimilation: Bridging Data Gaps for Improved Plant-Soil-Water Representation in Earth System Models. Invited Speaker. *American Geophysical Union Fall Meeting*. San Francisco, CA, USA.

Vergopolan, N. Data Availability and Sensor Technologies: What data do (hyper-resolution) models need? *NOAA/NIDIS/USDA National Soil Moisture Workshop*. [Video]. Beltsville, MD, USA.

2022   **Vergopolan, N.** Advances in water and food security through hyper-resolution land surface modeling and satellite remote sensing. Keynote Speaker. *American Geophysical Union Fall Meeting*. Chicago, IL, USA.

Vergopolan, N. Advances in water and food security through hyper-resolution land surface modeling and satellite remote sensing. Keynote Speaker. *American Geophysical Union – Early Career Researcher Conference*. Chicago, IL, USA.

Vergopolan, N. Field-scale soil moisture for drought monitoring and agricultural yield prediction at the local scales. Keynote Speaker. *American Geophysical Union – Frontiers in Hydrology*. San Juan, PR, USA.

Vergopolan, N. Eric Wood's contributions and recent advances on hyper-resolution land surface modeling. Oral talk. *European Geophysical Union General Assembly*. Vienna, Austria.

2019   **Vergopolan, N.** Hyper-resolution Hydrological Modeling. Lecture series at the *BRECcIA workshop for 'Building Research Capacity for sustainable water and food security in sub-Saharan Africa'*. University of Southampton, UK.

Other Conference Presentation and Workshops Proceedings

2024   **Vergopolan, N.**, Chaney, N., Malyshev, S., Shevliakova, E. Improving Vegetation Realism in Earth System Models through Satellite Observations. *American Geophysical Union Fall Meeting*. Washington, DC, USA.

2023   **Vergopolan, N.**, Chaney, N., Malyshev, S., Shevliakova, E. Leveraging advances in hyper-resolution vegetation data assimilation for S2S hydroclimate applications. Oral talk. *8th EGU Galileo Conference - A European vision for hydrological observations and experimentation*. Naples, Italy.

Vergopolan, N., Chaney, N., Malyshev, S., Shevliakova, E. Leveraging advances in hyper-resolution vegetation data assimilation for S2S hydroclimate applications. Oral talk. *American Meteorological Society – Hydrology Conference*. Denver, CO, USA.

2022   **Vergopolan, N.**, Chaney, N., Malyshev, S., Shevliakova, E. Leveraging advances in hyper-resolution vegetation data assimilation for S2S hydroclimate applications. Oral talk. *American Geophysical Union Fall Meeting*. Chicago, IL, USA.

Vergopolan, N., J. Sheffield N., Chaney, M. Pan, HE. Beck, CR. Ferguson, L. Torres-Rojas, F. Eigenbrod, W. Crow, and EF. Wood. The spatial variability and scaling behavior of field-scale soil moisture across the United States using SMAP-HydroBlocks. Oral talk. *American Geophysical Union – Frontiers in Hydrology*. San Juan, PR, USA.

Vergopolan, N., J. Sheffield N., Chaney, M. Pan, HE. Beck, CR. Ferguson, L. Torres-Rojas, F. Eigenbrod, W. Crow, and EF. Wood. Mapping field-scale soil moisture and its spatial variability across the United States using SMAP-HydroBlocks. Oral talk. *European Geophysical Union General Assembly*. Vienna, Austria.

Vergopolan, N. Towards locally relevant global soil moisture monitoring for water resources and climate applications. Poster. *Land Surface Modeling Summit – University of Oxford*. Oxford, UK.

2021   **Vergopolan, N.**, Sheffield, J., Chaney, N. W., Pan, M., Beck, H. E., Torres-Rojas, L., Crow, W., & Wood, E. F. Mapping surface soil moisture at 30-m resolution and assessing its spatial variability across the United States using SMAP-HydroBlocks. Oral talk. *American Geophysical Union Fall Meeting*. New Orleans, LA, USA.

Vergopolan, N., Herrera-Estrada, J. E., Sheffield, J., Estes, L., & Wood, E. F. Improved detection of flash droughts using hyper-resolution hydrological modeling. Oral talk. *European Geophysical Union General Assembly*. Virtual.

2020	**Vergopolan, N.**, Chaney, N., Beck, H., Pan, M., Sadri, S., Sheffield, J., & Wood, E.F. Hyper-resolution land surface modeling enables hydrologically consistent 30-m SMAP-based soil moisture retrievals over continental scales. Oral talk. *American Geophysical Union Fall Meeting*. Virtual.
	Vergopolan, N., Chaney, N. W., Beck, H. E., Pan, M., Sheffield, J., & Wood, E. F. Hyper-resolution land surface modeling enables 30-m SMAP-based soil moisture at continental scales. Oral talk. *European Geophysical Union General Assembly*. Virtual.
2019	**Vergopolan, N.**, Xiong, S., E. Herrera-Estrada, J., Sheffield, J., Wood, E.F., & Estes, L. The spatiotemporal scales of drought and its impacts on field-scale agricultural yields. *Panta Rhei Drought in the Anthropocene Workshop*. Phoenix, AZ, USA.
	Vergopolan, N., Xiong, S., J., Sheffield, J., Wood, Evans, T., K. Caylor, K., E.F., & Estes, L. The spatiotemporal scales of drought and its impacts on field-scale agricultural yields. Poster. *American Geophysical Union Fall Meeting*. San Francisco, CA, USA
	Vergopolan, N., Chaney, N., Pan, M., Beck, H., Sheffield, J., & Wood, E.F. High-resolution hydrological modeling and remote sensing for soil moisture prediction at the decision-making scales. *Princeton Research Day*. Princeton, NJ, USA
	Vergopolan, N. Using Hyper-resolution Land Surface Modeling to Downscale SMAP Soil Moisture to 30 Meters. *Princeton Environmental Institute - Discovery Day*. Princeton, NJ, USA
2018	**Vergopolan, N.**, Chaney, N., Pan, M., Beck, H., Sheffield, J., & Wood, E.F. Using hyper-resolution land surface modeling for downscaling of remotely sensed soil moisture. Abstract 9327. Oral talk. *European Geophysical Union General Assembly*. Vienna, Austria.
	Vergopolan, N., Chaney, N., Pan, M., Beck, H., Sheffield, J., Chan, S., & Wood, E.F. Using hyper-resolution land surface modeling for downscaling of remotely sensed soil moisture. Poster. *American Geophysical Union Fall Meeting*. Washington, DC, USA.
2017	**Vergopolan, N**., Chaney, N., Wanders, N., Sheffield, J., & Wood, E.F. Incorporating human-water dynamics in a hyper-resolution land surface model. Abstract 296821. Oral talk. *American Geophysical Union Fall Meeting*, New Orleans, Louisiana, USA.
2016	**Vergopolan, N**., & Fisher, J. B. The impact of deforestation on the hydrological cycle in Amazonia as observed from remote sensing. Poster. *American Geophysical Union Fall Meeting*, San Francisco, CA, USA.
2012	**Vergopolan, N.**, Heilmann, A., Igarashi, A., & Leite, E. Empirical and standard frequency distributions of lightning peak current of cloud-to-ground flashes in Parana and Sao Paulo states. *International Conference on Grounding and Earthing & International Conference on Lightning Physics and Effects*. Bonito, MS, Brazil.
	Vergopolan, N., & Leite, E. Extreme Rainfall in Parana Coast: Distribution and Recurrence Time. *Brazilian Meteorology Congress*. Gramado, RS, Brazil.
2010	**Vergopolan, N.**, & Grimm, A. The impact of climate change on El Niño Southern Oscillation in South America. *18th EVINCE - Federal University of Parana Scientific Meeting*. Curitiba, PR, Brazil.

Mentoring & Advising

Rice Graduate Students
- 2024 - present: Adnan Dehghani (EEPS)

Rice Undergraduate Students
- 2024 - present: Caroline Hashimoto (CEVE)

Rice Graduate Students Thesis Committees
- 2024 - present: True Furrh (PhD, CEVE)
- 2024 - present: Charlie Marshall (PhD, EEPS)
- 2024 - present: Miriam Gammerman (MS, EEPS)
- 2024 - present: Kyle Ostlind (MS, CEVE)

External Graduate Student Mentoring & Advising

- 2023-current: Priscila Costa Muzzi de Vasconcelos (PhD, UNICAMP Universidade Estadual de Campinas, Brazil)
- 2023-current: Vishnu U. Krishnan (PhD, IIT Bombay, India)
- 2022-current: Felipe Saavedra (PhD, UFZ Center for Environmental Research, Germany)
- 2021-current: Leonardo Laipelt (PhD, Federal University of Rio Grande do Sul, Brazil)
- 2021-2025: Luiz Bacelar (PhD, Duke University)
- 2021-2024: Cassia Brocca Caballero (PhD, Federal University of Rio Grande do Sul, Brazil)
- 2018-2022: Laura-Torres (PhD, Duke University)
- 2018-2022: Xu Chengcheng (PhD, Duke University)

External PhD and Master Students Thesis Committees & Defenses

- 2025 - PhD. Luiz Bacelar. Bridging High-Resolution Runoff Simulations with Large-Scale Hydrological Models. Duke University. USA.
- 2024 - PhD. Cassia Brocca Caballero. Dynamics of Land Use and Land Cover in Brazil and Impacts on Surface-Atmosphere Interactions. Federal University of Rio Grande do Sul. Brazil.
- 2024 - PhD. André Ballarin. Future perspectives of extreme events and water availability in Brazilian catchments. University of São Paulo. Brazil.
- 2023 - MS. Leonardo Laipelt. The impacts of deforestation in the evapotranspiration processes in the Amazon. Federal University of Rio Grande do Sul. Brazil.
- 2021 - PhD. Andre Almagro. Towards a better understanding of catchment hydrology in Brazil. Federal University of Mato Grosso do Sul. Brazil.

Teaching

Rice University

- EEPS 440/640 Geospatial Data Science (Spring 2025)

Princeton University

- CEE 478 Senior Thesis Colloquium (Fall 2019, Spring 2020)

Professional Activities

University Service (Rice)

- **2024** - Rice Ken Kennedy Institute. Fellowship Proposal Reviewer.
- **2024** - Rice Sustainability Institute. Postdoctoral Fellowship Search Committee.

Departamental Service (Rice)

- **2024 - present**: Department Seminar Committee
- **2024 - present**: Pan Postdoctoral Fellowship Search Committee.
- **2024 - present**: Graduate Admissions Committee

Editorial Service

- **Guest editor (2023-present)**: EGU "Drought, society, and ecosystems" inter-journal special issue (Natural Hazards and Earth System Sciences; Hydrology and Earth System Science; Biogeosciences; Geoscience Communication).
- **Peer-Review Referee**: Nature Water, Journal of Hydrology, Remote Sensing of Environment, Water Resources Research, Hydrology and Earth System Science, Journal of Hydrometeorology, Hydrological Sciences Journal, Hydrological Processes, Journal of Advances in Modeling Earth Systems, Global Change Biology, Remote Sensing, Water, Journal of Applied Water Engineering and Research, Atmosphere.

Proposal Grant Reviewer and Panelist

- NSF - Hydrologic Sciences
- NASA - Early Career Investigator Program
- NASA - Terrestrial Hydrology
- DOE - Established Program to Stimulate Competitive Research
- Schmidt Sciences Foundation

External Review Board Committees
- NASA-ISRO SAR Mission (NISAR) – Review Board Chair for the soil moisture Algorithm Theoretical Basis Document (2022).

Seminars, Conferences, and Workshops Organization
- **2024** - Convener on the "Advancements in Monitoring and Modeling the Water Cycle in Agroforestry Systems" session at AGU Fall Meeting.
- **2024** - Convener on the "Remote Sensing of Soil Processes" session at AGU Fall Meeting.
- **2023** - Convener on the "Flash and rapidly emerging droughts: challenges and opportunities" session at EGU Meeting.
- **2017** - 2021 Organizer of the Princeton Energy and Environment Discussion Table, hosting 4-7 speakers per semester.
- **2019** - Co-Organizer of the Panta Rhei Drought in the Anthropocene Workshop. Phoenix, AZ, USA.
- **2017** - 2018 Co-Organizer of the Princeton University Civil and Environmental Engineering Brown Bag Seminars.
- **2016** - Co-Organized of the Observations and Modeling across Scales Symposium. Princeton University.

Professional Association
- American Geophysical Union (2016 –)
- European Geosciences Union (2018 –)
- American Meteorological Society (2022 –)

Short-term Visiting Researcher Positions

2019	**Duke University** – with Prof. Nathaniel Chaney, Civil and Environmental Engineering Dept.	USA
2018	**Utrecht University** – with Prof. Niko Wanders, Physical Geography Dept.	NL
2017	**University of Southampton** – with Prof. Justin Sheffield in the Geography & Environmental Sci. Dept.	UK
2013	**NASA's Jet Propulsion Lab / Caltech** – with Dr. Joshua Fisher, Water, Energy, and Carbon Cycles Dept.	USA

Work Experience & Professional Development

2016	**Oxford University, Smith School of Enterprise and the Environment,** Graduate Summer School	Oxford, UK
2012	**North Carolina State University, Civil and Environmental Engineering,** Exchange Student	USA
2011	**SIMEPAR Meteorological Institute of Technology,** Research Assistant	Brazil
2010	**Federal University of Paraná, Meteorology Laboratory,** Research Assistant	Brazil

Leadership & Outreach

Princeton University – Mathey College — Princeton, USA
Resident Graduate Student Advisor — 2017 – 2021
Organizing community engagement events, and mentoring of around 20 first-year students each year.

Princeton University – Mathey College — Princeton, USA
Host of the Princeton Energy & Environment Discussion Table — 2017 - 2021

Princeton University – Highwire Earth: Insights on Sustainable Development — Princeton, USA
Director of Public Relations and Associate Editor — 2018 - 2020
https://https://highwire.princeton.edu

Princeton University – Princeton Latino Graduate Student Association (LGSA) — Princeton, USA
Treasurer and Co-Organizer of Social and Cultural Events — 2015 - 2017
http://princetonlgsa.weebly.com

Instituto Bom Aluno — Curitiba, Brazil
Mentoring & Volunteering — 2008 - 2022
Individual advising to high school and college students from low-income and unprivileged backgrounds. https://www.bomaluno.org.br