Noemi **Vergopolan**

Computational Hydrology · Environmental Engineering

59 Olden St., Princeton, NJ, 08544, United States

noemi@princeton.edu | vergopolan | @NVergopolan | Publications

Summary

Computational hydrologist, working on the development of scalable tools for high-resolution hydrological and natural hazards impact predictions by leveraging satellite remote sensing, land surface modeling, machine learning, data fusion, big data, and high-performance computing.

Education

Ph.D. in Civil and Environmental Engineering — Princeton, USA

Princeton University — 2021

- Graduate certificate in Statistics and Machine Learning (2020)
- Graduate certificate in Computational Science and Engineering (2019)

M.A. in Civil and Environmental Engineering — Princeton, USA

Princeton University — 2017

Oxford's Smith School of Enterprise and the Environment (Summer Program) — Oxford, UK

Oxford University — 2016

B.S. in Environmental Engineering — Curitiba, Brazil

Federal University of Paraná — 2013

B.S. in Civil and Environmental Engineering (Exchange Student) — Raleigh, USA

North Carolina State University — 2012

Honors & Awards

2018	Princeton Environmental Institute, Mary and Randall Hack '69 Graduate Award ($4k)	USA
2016	Princeton Environmental Institute, School of Public and International Affairs Award ($7k)	USA
2013	Federal University of Paraná Graduation Award Medal	Brazil
2012	Brazil Science Without Borders Scholarship ($70k)	Brazil
2011	North Carolina State University, International Culture Leadership Project, 1st Place Award	USA
2010	Brazil National Council for Scientific and Technological Development Fellowship ($5k)	Brazil

Professional Experience

Envex Engineering and Consulting — Curitiba, Brazil

Environmental Engineer — Oct. 2013 – Aug. 2015

Development of Environmental Impact Assessments; various projects for sanitation, urban drainage, and stormwater management; optimization networks for water quality monitoring; and hydropower plants' energy generation inventories.

SIMEPAR Meteorological Institute of Technology — Curitiba, Brazil

R&D Engineering Intern — Nov. 2010 – May. 2012

Development of statistical risk analysis frameworks to aiding the local civil defense warning system and stakeholder in monitoring extreme rainfall, landslides, and thunder activity.

Research Experience

Princeton University — Princeton, USA

Research Assistant — Jun. 2015 – May. 2021

Development of innovative tools for predicting field-scale soil moisture and its impacts on droughts, floods, water scarcity, and water-energy-food nexus. Expertise on high-resolution hydrological modeling, satellite remote sensing, machine learning, big data, and HPC.

NASA's Jet Propulsion Laboratory – California Institute of Technology Pasadena, USA

Visiting Student Researcher May 2013 – August 2013

Evaluation of NASA's evapotranspiration and precipitation satellite products (MODIS and TRMM) for understanding the impact of deforestation on the hydrological cycle in the Amazon rainforest.

Selected Peer-Reviewed Publications

2021

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.

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

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.

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.

Chaney, N. W., Torres-Rojas, L., **Vergopolan, N.**, & Fisher, C. K. **Two-way coupling between the sub-grid land surface and river networks in Earth system models**. *Geoscientific Model Development*. https://doi.org/10.5194/gmd-2020-291.

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.

2019

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

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**. Scientific Data. https://doi.org/10.1038/sdata.2018.214.

2017

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.

2016

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.

Volunteer & Leadership

Highwire Earth: Insights on Sustainable Development, Princeton University Princeton, USA

Director of Public Relations and Associate Editor 2018 - Current

Mathey College, Princeton University Princeton, USA

Host of the Princeton Energy and Environment Discussion Table 2017 - 2021

Princeton Latino Graduate Student Association, Princeton University Princeton, USA

Treasurer 2015 - 2017

Skills

Languages English, Portuguese

Programming Python, HPC, MPI-OpenMPI, TensorFlow, R, Fortran, C, Unix

Software GDAL, AutoCAD, ArcGIS, GRASS, HEC-MS, HEC-RAS, SWIMM, EPANET, Microsoft Suite.