

David F. Muñoz, Ph.D., M.ASCE

Assistant Professor

Charles E. Via, Jr. Department of Civil and Environmental

Virginia Tech

[Email](#) | [Google Scholar Profile](#) | [ORCID](#) | [CoRAL Lab Website](#) | [GitHub](#)

CAREER HIGHLIGHTS

- Assistant Professor, Virginia Tech (2022 to present)
- 28 peer-reviewed journal publications (5 from former and current graduate students)
- Recipient of the 2026 ASCE ExCEED Teaching Fellow distinction
- Development of a graduate course: CEE 5364 – Compound Flood Hazard Assessment
- Research work featured in CNN, FOX Weather, Yahoo News
- Outreach include Virginia Tech – Kid’s Tech University Program (2024 to present)

ACADEMIC APPOINTMENTS

August 2022 to present

Assistant Professor

Charles E. Via, Jr. Department of Civil & Environmental Engineering at Virginia Tech. Patton Hall Blacksburg, VA 24061.

September 2021 to August 2022

Postdoctoral Researcher

Center for Complex Hydrosystems Research (CCHR). The University of Alabama. 248 Kirkbride Ln, Tuscaloosa, AL 35401.

October 2017 – August 2018

Research Assistant

“Cost Effective Neural Technique to Alleviate Urban Flood Risk” - [CENTAUR project](#). Department of Civil Engineering. Faculty of Sciences and Technology of the University of Coimbra (FCTUC) – Pólo II. Rua Luis Reis Dos Santos, 3030-790. Coimbra, Portugal.

EDUCATION

August 2018 – September 2021

Ph.D. Civil and Environmental Engineering

The University of Alabama, United States

Dissertation: Integration of Physically-Based and Data-Driven Modeling Approaches for Compound Coastal Flood Hazard Assessment Under Uncertainties

Advisor: Hamed Moftakhari

September 2015 – September 2017

MSc. Earth and Environment

Wageningen University & Research, The Netherlands

Thesis: Tidal influence on the discharge distribution at two junctions of the Kapuas River (West Kalimantan, Indonesia)

Advisor: Ton Hoitink

October 2007 – February 2013

Bachelor in Civil Engineering

University of Cuenca, Ecuador

Thesis: Study to determine the variation of runoff coefficient and its impact on the Calle Larga and Miguel Velez streets of Cuenca

Advisor: Diego Idrovo

PEDAGOGICAL TRAINING

July 2026

ExCEED Teaching Workshop. American Society of Civil Engineers. Remote Workshop.

March 2026

Advance Teaching Certificate Program. Center for Excellence in Teaching & Learning. Virginia Tech. Blacksburg, VA.

March 2025

Principles of Effective Teaching Certificate Program. Center for Excellence in Teaching & Learning. Virginia Tech. Blacksburg, VA.

October 2024

Mentoring Workshop. Graduate School. Virginia Tech. Blacksburg, VA.

HONORS & AWARDS

July 2026

ExCEED Teaching Fellow by the American Society of Civil Engineers

March 2023

Faculty Mentoring Award. Virginia Tech.

April 2022

Outstanding Dissertation Award. Department of Civil, Construction and Environmental Engineering, The University of Alabama.

July 2022

NHERI RAPID Facility Intensive Hands-On Training. Travel award. Seattle WA.

June 2019

National Water Center Innovators Program – Summer Institute. Consortium of Universities for the Advancement of Hydrologic Science (*CUAHSI*) and National Oceanic and Atmospheric Administration (*NOAA*). Tuscaloosa, AL.

SPONSORED RESEARCH

Principal Investigator

September 2024 to August 2025

Virginia Sea Grant Fellowship. (Student: Samuel Daramola). Flood impacts to rural coastal communities in Virginia. Amount: \$5,000. Share: \$5,000.

March 2024

New Faculty Mentoring Grant Program. Amount: \$1,500. Share: \$1,500.

Co-Investigator

August 2022 to September 2025

CAS-Climate: Nonstationarity of Compound Coastal Floods in the Anthropocene, National Science Foundation, Award # 2223894. Amount: \$595,571. Share: \$79,794

GRADUATE STUDENT SUPERVISION

Ph.D. Students

Expected December 2026

Md. Shadman Sakib. Ph.D. Civil and Environmental Engineering. Virginia Tech
Dissertation: Characterizing Nonlinear Interactions in Extreme Water Level and Salinity Dynamics during Cyclonic Events

August 2022 - December 2025

Samuel Daramola. Ph.D. Civil and Environmental Engineering. Virginia Tech.
Dissertation: Enhancing Compound Flood Modeling through Efficient Data-Driven, Physics-based, and Transfer Learning Frameworks.
Current position: Postdoctoral Researcher at Stevens Institute of Technology, NJ.

M.S. Students

August 2022 - December 2025

Christopher Mansky. M.S. Civil and Environmental Engineering. Virginia Tech.
Thesis: A Machine-Learning Based Approach to Predicting Waterborne Disease Outbreaks Caused by Hurricanes.
Current position: Transportation Engineer at Dewberry, VA.

MENTORSHIP ACTIVITIES

Virginia Tech

Rachael Cronin, M.S. Civil and Environmental Engineering (2023)
Leonard Ohenhen, Ph.D. Geosciences (2024)
Jack Vaquez, M.S. Civil and Environmental Engineering (2025)
Sean O'Dowd, M.S. Civil and Environmental Engineering (2026)

The University of Alabama

Ebrahim Hamidi, Ph.D. Civil and Environmental Engineering (2025)
Sadaf Mahmoudi, Ph.D. Civil and Environmental Engineering (2025)
Meraj Sohrabi, Ph.D. Civil and Environmental Engineering (2025)
Michael Lewis, Ph.D. Civil and Environmental Engineering (2026)

TEACHING AND EDUCATION ACTIVITIES

Undergraduate Instructor

August 2022 to present

CEE 3814 – Analytics in Civil and Environmental Engineering.

Graduate Instructor

August 2023 to present

CEE 5364* – Compound Flood Hazard Assessment. Development of graduate level course.

Guest Lectures

November 2024

CEE-2804 – Introduction to Civil and Environmental Engineering, Virginia Tech. Topic: “Compound Flooding: Hurricane Helene”.

April 2023

CEE-4554 – Natural Disasters, Virginia Tech. Topic: “Compound Flooding – An emerging natural disaster”.

October 2022

CEE-2804 – Introduction to Civil and Environmental Engineering. Virginia Tech. Topic: “Compound Flood Modeling”.

October 2021

CEE-5944 – Environmental and Water Resources. Topic: “Perspective on uncertainty quantification and reduction in compound flood modeling and forecasting”.

RESEARCH PUBLICATIONS

**Muñoz Group Student*

28. Alipour A, Irish JL, Weiss R, **Muñoz D.F** (2026). Characterization of tropical cyclone surge evolution. Coastal Engineering, 211:105086. <https://doi.org/10.1016/j.coastaleng.2026.105086>
27. Daramola S.*, **Muñoz D.F.**, Shen C (2026). Toward transferable models for efficient spatiotemporal flood prediction across coastal-estuarine systems. Cambridge Prisms: Coastal Futures, 4:e13. <https://doi.org/10.1017/cft.2026.10037>
26. Radfar S, Moftakhari H, **Muñoz D.F.**, Gori A, Diermanse F, Lin N, AghaKouchak A (2026). Towards a typology for hybrid compound flood modeling. Hydrology and Earth System Sciences, 30(5):1397–1420. <https://doi.org/10.5194/hess-30-1397-2026>
25. Luna Abril P, Muñoz P, Samaniego E, **Muñoz D.F.**, Merizalde MJ, Lillo-Saavedra M, Célleri R (2026). Evaluating the three-cornered hat method for hourly satellite precipitation fusion in hydrological forecasting: A case study in a Tropical Andean Basin. Journal of Hydrology: Regional Studies, 64:103163. <https://doi.org/10.1016/j.ejrh.2026.103163>
24. Sakib M.S.*, **Muñoz D.F.**, Wahl T (2025) Breaking Down Annual and Tropical Cyclone-induced Nonlinear Interactions in Total Water Levels. Advances in Water Resources, :105108. <https://doi.org/10.1016/j.advwatres.2025.105108>
23. Daramola S.*, **Muñoz D.F.**, Sakib M.S.*, Thurman H, Allen G (2025). A transferable deep learning framework to propagate extreme water levels from sparse tide-gauges across spatial domains. Expert Systems with Applications, :130222. <https://doi.org/10.1016/j.eswa.2025.130222>
22. Mahmoudi S, Moftakhari H, **Muñoz D.F.**, Radfar S, Sweet W, Moradkhani H (2025). Escalating High Tide Flooding Along the Atlantic and Gulf Coast of the United States Due To Sea Level Rise. Earth’s Future, 13(9):e2024EF005328. <https://doi.org/10.1029/2024EF005328>

21. Muñoz, J., Muñoz, P., **Muñoz, D.F.**, Célleri R. (2025). Reducing latency in satellite-based precipitation estimates using GOES-16 and machine learning. *Journal of Hydrologic Engineering*. <https://doi.org/10.1061/JHYEFF.HEENG-6543>
20. Daramola S.*, **Muñoz, D.F.**, Moftakhari, H., and Moradkhani, H. (2025). A cluster-based temporal attention approach for predicting cyclone-induced compound flood dynamics. *Environmental Modelling & Software*. <https://doi.org/10.1016/j.envsoft.2025.106499>
19. Daramola S.*, **Muñoz, D.F.**, Muñoz, P., Saksena S., and Irish, J. (2025). Predicting the evolution of extreme water levels with long short-term memory station-based approximated models and transfer learning techniques. *Water Resources Research*. <https://doi.org/10.1029/2024WR039054>
18. Muñoz, P., **Muñoz, D.F.**, Orellana-Alvear, J., and Célleri R. (2024). Enhancing runoff forecasting through the integration of satellite precipitation data and hydrological knowledge into machine learning models. *Natural Hazards*. <https://doi.org/10.1007/s11069-024-06939-w>
17. **Muñoz, D.F.**, Moftakhari, H., and Moradkhani, H. (2024). Quantifying cascading uncertainty in compound flood modeling with linked process-based and machine learning models. *Hydrology and Earth System Sciences*. <https://doi.org/10.5194/hess-28-2531-2024>
16. Mahmoudi, S., Moftakhari, H., **Muñoz, D.F.**, Sweet, W., and Moradkhani, H (2024). Establishing flood thresholds for sea level rise impact communication. *Nature Communications*. <https://doi.org/10.1038/s41467-024-48545-1>
15. Moftakhari, H., **Muñoz, D.F.**, Asajan, A., AghaKouchak, H., Moradkhani, H., and Jay, D. (2024). Nonlinear Interactions of Sea-Level Rise and Storm Tide Alter Extreme Coastal Water Levels: How and Why? *AGU Advances*. <https://doi.org/10.1029/2023AV000996>
14. Merizalde M.J., Muñoz, P., **Muñoz, D.F.**, Corzo, G., Samaniego, E., and Célleri R. (2023). Integrating geographic data and the SCS-CN method with LSTM networks for enhanced runoff forecasting in a complex mountain basin. *Frontiers in Water*. <https://doi.org/10.3389/frwa.2023.1233899>
13. Moragoda, N., Cohen, S., Gardner, Jhon, **Muñoz, D.F.**, Narayanan, A., Moftakhari, H., Pavelsky, T. M. (2023). Modeling and Analysis of Sediment Trapping Efficiency of Large Dams using Remote Sensing. *Water Resources Research*. <https://doi.org/10.1029/2022WR033296>
12. Hamidi, E., Peter, B., **Muñoz, D.F.**, Moftakhari, H., and Moradkhani, H. (2023). Fast Flood Extent Monitoring With SAR Change Detection Using Google Earth Engine. *IEEE Transactions on Geoscience and Remote Sensing*. <https://doi.org/10.1109/TGRS.2023.3240097>
11. Abbaszadeh, P., **Muñoz, D. F.**, Jafarzadegan, K., Moftakhari, H., Moradkhani, H. (2022). Perspective on uncertainty quantification and reduction in compound flood modeling and forecasting. *iScience by Cell Press*. <https://doi.org/10.1016/j.isci.2022.105201>

10. **Muñoz, D.F.**, Moftakhari, H., Kumar, M., Moradkhani, H., (2022). Compound Effects of Flood Drivers, Sea Level Rise, and Dredging Protocols on Vessel Navigability and Wetland Inundation Dynamics. *Frontiers in Marine Science* 9. <https://doi.org/10.3389/fmars.2022.906376>
9. Jafarzadegan, K., **Muñoz, D. F.**, Moftakhari, H., Gutenson J., Savant G., Moradkhani H. (2022). Real-time coastal flood hazard assessment using DEM-based hydrogeomorphic classifiers. *Natural Hazards and Earth System Sciences*. <https://doi.org/10.5194/nhess-2021-359>
8. **Muñoz, D. F.**, Yin, D., Bakhtyar, R., Moftakhari, H., Xue Z. G., Mandli K., Ferreira C. (2021). Inter-model comparison of Delft3D-FM and 2D HEC-RAS for Total Water Level Prediction in Coastal to Inland Transition Zones. *Journal of the American Water Resources Association*. <https://doi.org/10.1111/1752-1688.12952>
7. Yin, D., **Muñoz, D. F.**, Bakhtyar, R., Moftakhari, H., Xue Z. G., Mandli K., Ferreira C. (2021). Extreme water level simulation and component analysis using a compound flooding model framework in Delaware Estuary during Hurricane Isabel. *Journal of the American Water Resources Association*. <https://doi.org/10.1111/1752-1688.12947>
6. **Muñoz, D. F.**, Abbaszadeh, P., Moftakhari, H., Moradkhani, H. (2021). Accounting for uncertainties in compound flood hazard assessment: The value of data assimilation. *Coastal Engineering*. <https://doi.org/10.1016/j.coastaleng.2021.104057>
5. **Muñoz, D. F.**, Muñoz P., Moftakhari H., Moradkhani H. (2021). From local to regional compound flood mapping with deep learning and data fusion techniques. *Science of the Total Environment*. <https://doi.org/10.1016/j.scitotenv.2021.146927>
4. **Muñoz, D. F.**, Muñoz P., Alipour A., Moftakhari H., Moradkhani H., Mortazavi B. (2021). Fusing multi-source data to estimate the effects of urbanization, sea level rise and hurricane impacts on long-term wetland dynamics. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*. <https://doi.org/10.1109/JSTARS.2020.3048724>
3. **Muñoz, D. F.**, Moftakhari, H., Moradkhani, H. (2020). Compound effects of flood drivers and wetland elevation correction on flood hazard assessment. *Water Resources Research*. <https://doi.org/10.1029/2020WR027544>
2. **Muñoz, D. F.**, Cissell, J., Moftakhari H. (2019). Adjusting emergent wetland elevation with OBIA, random forest and the 2016 NLCD. *Remote Sensing*. <https://doi.org/10.3390/rs11202346>
1. **Muñoz, D. F.**, Simões, N.E., Leitão, J.P., Marques, A.S., Maluf, L. (2019). Generalizing multi-reward functions aimed at identifying the best locations to install flow control devices in sewer systems. *Urban Water Journal*. <https://doi.org/10.1080/1573062X.2019.1700284>

EDITORIALS

Ganguli P., Han., S, **Muñoz, D.F.**, and Pal, S. (2025). Spatiotemporal modelling and assessment of water-related multi-hazards. *Frontiers in Water*. <https://doi.org/10.3389/frwa.2025.1579106>

CONFERENCE PROCEEDINGS

Moftakhari H, **Muñoz D.F.**, Song JY, Alipour A, Moradkhani H (2021) Challenges for Appropriate Characterization of Compound Coastal Hazards. :58–68. *Proceedings, Geoextreme 2021*. Savannah, Georgia. <https://doi.org/10.1061/9780784483695.007>

SOFTWARE AND DATA PRODUCTS

*Muñoz Group Student

Spatiotemporal-TL (2025): <https://github.com/CoRAL-Lab-VT/Spatiotemporal-TL>

Daramola S.*, **Muñoz D.F.**, Sakib M.S.*, Thurman H, Allen G (2025). A transferable deep learning framework to propagate extreme water levels from sparse tide-gauges across spatial domains. *Expert Systems with Applications*, :130222. <https://doi.org/10.1016/j.eswa.2025.130222>

FloodDepth-DL (2025): <https://github.com/CoRAL-Lab-VT/FloodDepthDL>

Daramola S.*, **Muñoz, D.F.**, Moftakhari, H., and Moradkhani, H. (2025). A cluster-based temporal attention approach for predicting cyclone-induced compound flood dynamics. *Environmental Modelling & Software*. <https://doi.org/10.1016/j.envsoft.2025.106499>

LSTM-SAM (2025): <https://github.com/CoRAL-Lab-VT/LSTM-SAM>

Daramola S.*, **Muñoz, D.F.**, Muñoz, P., Saksena S., and Irish, J. (2025). Predicting the evolution of extreme water levels with long short-term memory station-based approximated models and transfer learning techniques. *Water Resources Research*. <https://doi.org/10.1029/2024WR039054>

INVITED TALKS & SEMINARS

December 2024

American Geophysical Union (AGU). Washington DC. “Advancing Compound Flood Modeling with Hybrid Approaches: An Integrated Statistical, Process-based, and Machine Learning Modeling Perspective”.

October 2023

3rd International Workshop on Waves, Storm surges, and Coastal Hazards. Notre Dame, IN. “Cascading Uncertainty in Compound Flood Modeling”.

October 2022

Universidad de Cuenca, Ecuador. “Perspectiva sobre la cuantificación y reducción de incertidumbre en el modelamiento y predicción de inundaciones”. Virtual Online.

SCIENTIFIC MEETINGS – ORAL PRESENTATIONS & POSTERS

*Muñoz Group Student

33. Alipour A, Irish JL, Weiss R, **Muñoz D.F.** (2026). Classes of hurricane surge hydrographs. 39th International Conference on Coastal Engineering (ICCE). Galveston, TX.
32. Daramola S*, **Muñoz D.F.**, Sakib M.S., Thurman H, Allen G (2025). Modeling Water Level Propagation with Sparse Gauges using Enhanced Deep Learning and Spatiotemporal Transfer Learning Approaches. American Geophysical Union (AGU). New Orleans, LA.
31. Sakib M.S.*, **Muñoz D.F.**, Wahl T, Irish JL, (2025). Compound Effects of Synthetic, Low-frequency Tropical Cyclones and Sea Level Rise Scenarios on Nonlinear Tide–Surge Interactions. American Geophysical Union (AGU). New Orleans, LA.
30. Alipour A, Irish JL, Weiss R, **Muñoz D.F.** (2025). Unraveling Regional Differences in Storm Surge Hydrographs and Characteristics Along the US Coastlines. American Geophysical Union (AGU). New Orleans, LA.
29. Sakib M.S.*, Maghsoodifar F., Mowafy M., Wang H., Cohen S., Tsang Y., Moftakhari H., **Muñoz D.F.**, Ray P., Lei F. A Comparative Analysis of Operational Multi-Method Flood Inundation Mapping: Quantifying Fidelity–Accuracy Tradeoffs. American Geophysical Union (AGU). New Orleans, LA.
28. Maghsoodifar F., Sakib M.S.*, Mowafy M., Wang H., Cohen S., Tsang Y., Moftakhari H., **Muñoz D.F.**, Ray P., Lei F. (2025). Bridging Return Period Gaps in Flood Inundation Mapping Using a Hybrid Deep Learning Approach. American Geophysical Union (AGU). New Orleans, LA.
27. **Muñoz D.F.**, Daramola S*, Sakib M.S.*, (2025). Towards a Global Transferability of Models for Cyclone-induced Compound Flooding. Bi-annual Coastal and Estuarine Research Federation (CERF). Richmond, Virginia, USA.
26. Muñoz, J., Muñoz, P., **Muñoz, D.F.**, Céleri R. (2025). Leveraging machine learning and satellite precipitation data to overcome latency challenges in operational hydrology. European Geoscience Union (EGU). Vienna, Austria.
25. Luna-Abril, P., Muñoz, P., Samaniego E., **Muñoz, D.F.**, Merizalde, MJ., Celleri, R. (2025). Evaluating the Three-Cornered Hat Method for Satellite Precipitation Data Fusion and its Influence on Runoff Forecasting. European Geoscience Union (EGU). Vienna, Austria.
24. Sakib, M.S.*, **Muñoz, D.F.**, Wahl, T. (2024). Breaking down nonlinear interactions and underlying drivers of total water level variability and compound flood dynamics. American Geophysical Union (AGU). Washington, DC.
23. **Muñoz, D.F.**, Moftakhari, H., Moradkhani, H. (2024). Quantifying cascading uncertainty in compound flood modeling. American Geophysical Union (AGU). Washington, DC.
22. **Muñoz, D.F.**, Daramola S*, Sakib, M.S.*, Moftakhari, H., Moradkhani, H. (2024). Advancing Compound Flood Modeling with Hybrid Approaches: An Integrated Statistical,

- Process-based, and Machine Learning Modeling Perspective. American Geophysical Union (AGU). Washington, DC.
21. Daramola S.*, **Muñoz, D.F.**, Moftakhari, H., Moradkhani, H. (2024). A Physics-Aware Deep Learning Approach for Estimating Compound Flood Dynamics Under Uncertainty. American Geophysical Union (AGU). Washington, DC.
 20. Muñoz, P., **Muñoz, D.F.**, Orellana-Alvear, J., Celleri, R. (2024). Unlocking precision in flash flood forecasting: A synergistic approach using machine learning and satellite-ground integration European Geoscience Union (EGU). Vienna, Austria.
 19. Daramola S.*, **Muñoz, D.F.**, Irish, J. (2024). Characterizing the evolution of extreme water level over the United States with LSTM-Station-based Approximated Models and transfer learning techniques. Ocean Sciences Meeting. Louisiana, LA.
 18. Mahmoudi, S., Moftakhari, H., Moradkhani, H., and **Muñoz, D.F.** (2023). The Effects of Sea Level Rise on Future High Tide Flooding Regimes. American Geophysical Union (AGU). San Francisco, CA.
 17. **Muñoz, D F.**, Moftakhari, H., and Moradkhani H. (2023). Cascading Uncertainty in Compound Flood Modeling. 3rd International Workshop on Waves, Storm surges, and Coastal Hazards. Notre Dame, IN.
 16. **Muñoz, D F.**, Moftakhari, H., and Moradkhani H. (2023). Compound Flood Mapping Across Scales: The Power of Physics-Informed Machine Learning Frameworks. Georgia, GA.
 15. **Muñoz, D F.**, Moftakhari H., Kumar, M., Moradkhani H. (2022). Dynamic Response of Estuarine Systems to Dredging Protocols and Sea Level Rise. American Geophysical Union (AGU). Chicago, IL
 14. Mahmoudi, S., **Muñoz, D.F.**, Moftakhari, H., and Moradkhani, H. Physics-informed Machine Learning for Estimation of Spatially-distributed Sea Level Rise Rates and their Associated High Tide Flooding.
 13. Sohrabi, M., **Muñoz, D.F.**, Moftakhari H., Moradkhani H. A novel statistical approach for tropical cyclone-driven compound flood forecasting (2022). American Geophysical Union (AGU). Chicago, IL.
 12. Lewis, M., Moftakhari, H., **Muñoz, D.F.**, Mekonnen, M., Moradkhani, H., Boehm., M. Current and Future State of the Gulf of Mexico's Food, Energy, and Water Nexus (2022). American Geophysical Union (AGU). Chicago, IL.
 11. Hamidi, E., Peter, B., **Muñoz, D.F.**, Moftakhari, H., and Moradkhani, H. Fast Flood Mapping with Synthetic Aperture Radar Data Using Google Earth Engine (2022). American Geophysical Union (AGU). Chicago, IL.
 10. Moradkhani, H., Jafarzadegan, K., Abbaszadeh, P., Moftakhari, H., Alipour, A., **Muñoz, D.F.**, Yarveysi F., and Gavahi K., Toward A Universal Portrayal of Extreme Events: Hazard, Vulnerability and Risk (2022). American Geophysical Union (AGU). Chicago, IL.

9. Moragoda, N., Cohen, S., Gardner, Jhon, **Muñoz, D.F.**, Narayanan, A., Moftakhari, H., Pavelsky, T. M. Modeling and Analysis of Sediment Trapping Efficiency of Large Dams using Remote Sensing (2022). American Geophysical Union (AGU). Chicago, IL.
8. **Muñoz, D F.**, Abbaszadeh P., Moftakhari H., Moradkhani H. (2021). Accounting for Uncertainties in Compound Flood Hazard Assessment with Data Assimilation. American Geophysical Union (AGU). New Orleans, LA.
7. **Muñoz, D F.**, Vandermus A., Moftakhari H. (2021). Wetland Dynamics and Morphological Changes due to Hurricane-induced Sediment Deposition. American Geophysical Union (AGU). New Orleans, LA.
6. Hamidi, E., **Muñoz, D.F.**, Moftakhari, H., and Moradkhani, H. Rapid coastal flood mapping with SAR data using random forest technique (2021). American Geophysical Union (AGU). New Orleans, LA.
5. **Muñoz, D F.**, Muñoz P., Moftakhari H., Moradkhani H. (2021). Large-scale compound flood mapping with deep learning and data fusion techniques. European Geosciences Union (EGU).
4. Muñoz P., **Muñoz, D F.**, Orellana, J., Moftakhari H., Moradkhani H., and Célleri, R. (2021). Long short-term memory networks for real-time runoff forecasting using remotely sensed data. European Geosciences Union (EGU).
3. **Muñoz, D F.**, D Yin, J Tian, R. Bakhtyar, K. Mandli, C Ferreira (2020). Influence of Forcing Conditions on Total Water Level Prediction and Spatiotemporal Patterns in Delaware Bay, USA. Ocean Sciences Meeting (OSM). San Diego, CA.
2. **Muñoz, D.F.**, Moftakhari, H (2019). Integrating estuarine hydrodynamics with remotely sensed data to assess marsh migration patterns. 25th Biennial Coastal and Estuarine Research Federation (CERF) Conference. Mobile Bay, AL.
1. **Muñoz, D.F.**, Kästner, K., Hoitink, A.J.F., Moftakhari H. (2018). Influence of coastal morphology on river discharge division and tidal energy transport at tidal junctions in the Kapuas River, Indonesia. American Geophysical Union (AGU). Washington, DC.

PROFESSIONAL LEADERSHIP & SERVICE

National and International Service

April 2022 to present

American Society of Civil Engineers (ASCE). Member of Compound Flooding Task Committee. Manual of Practice.

September 2023

Co-editor of Research Topic in Frontiers in Water. Spatiotemporal Modelling and Assessment of Water-related Multi-hazards.

December 2026

Convener. Multi-Hazard Flood Modeling: From Inland to Coast. AGU - Natural Hazards; Fall Meeting. San Francisco, CA.

December 2025

Convener. Multi-Hazard Flood Modeling: From Inland to Coast. AGU - Natural Hazards; Fall Meeting. New Orleans, LA.

December 2024

Chair and Primary convener. Hybrid Modeling & Digital Twin Systems for Flood Hazard Prediction and Risk Assessment. AGU - Natural Hazards; Fall Meeting. Washington DC.

April 2023

Panelist. Proposal peer review panel for the National Science Foundation.

December 2022

Convener. Compound, Consecutive, and Cascading Events: Challenges for Risk Assessment and Management of Multi-hazards. Natural Hazards; Fall Meeting. Chicago, IL.

University Service

January 2024 to present

Committee member of the PhD Qualifier Exam. Civil and Environmental Engineering, Virginia Tech.

November 2023

Faculty Search Committee. Geotechnical Engineering Program, Virginia Tech.

OUTREACH AND PUBLIC ENGAGEMENT

2024 to present

K-8 and K-12 STEM Collaborator. Kid's Tech University at Virginia Tech in English and Spanish. Blacksburg, VA.

2026

Yahoo News Coverage. On US coasts, storm surge follows 8 patterns, and some linger long after winds stop. <https://www.yahoo.com/news/science/articles/us-coasts-storm-surge-follows-203000202.html>

Earth.com Coverage. Scientists uncover hidden patterns in hurricane storm surges. <https://www.earth.com/climate/scientists-uncover-hidden-patterns-in-hurricane-storm-surges/>

Environmental Coastal & Offshore Coverage. Virginia Tech Study Reveals Eight Repeatable Storm Surge Patterns in Hurricane Flooding. <https://ecomagazine.com/news/coastal/virginia-tech-study-reveals-eight-repeatable-storm-surge-patterns-in-hurricane-flooding>

Virginia Tech News. Research uncovers hidden patterns in hurricane storm surge. <https://news.vt.edu/articles/2026/07/eng-cee-storm-surge.html>

2025

CNN Interview. Improving flood risk and extreme weather predictions with AI. https://drive.google.com/file/d/1R8VEToLNmRHHPINEd_vJNzEEX1IDs1K8/view

FOX Weather Interview. How Researchers Use New Tools To Predict Future Flooding.
<https://www.foxweather.com/watch/fmc-e8s2rnwu786d32z9>

WTOP News Interview. Could AI help predict catastrophic floods?
<https://wtop.com/weather-news/2025/06/could-ai-help-predict-catastrophic-flooding-ahead-of-time-this-vatech-professor-thinks-so/>

Radio IQ/WVTF Public Radio Interview. Machine learning. Can it help predict flooding during hurricane events? <https://www.wvtf.org/2025-06-17/machine-learning-can-it-help-predict-flooding-during-hurricane-events>

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Virginia Tech News Coverage: Researchers use deep learning to predict flooding this hurricane season. <https://news.vt.edu/articles/2025/05/eng-cee-smarter-storm-predictions.html>

PROFESSIONAL EXPERIENCE

February 2013 – May 2015

Civil Engineer

- KIMSA: Azuay Prefecture. Cuenca, Ecuador.
- Amazonas Constructors: Enterprise of Economic Development (EDEC). Cuenca, Ecuador.
- CONSULTORACAV: Environmental and Sanitary Engineering. Ministry of Urban Development and Housing (MIDUVI). Ministry of Transportation and Public Works (MTO). Cuenca, Ecuador.

AFFILIATIONS AND MEMBERSHIPS

December 2018 to present

American Geophysical Union (AGU)

April 2022 to present

American Society of Civil Engineers (ASCE)

May 2025 to present

Coastal Estuarine and Research Federation (CERF)