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Marcus N. Gomes Jr. Curriculum Vitae

Academic Background

Jan-2024 to **Postdoctoral Appointment**, University of Arizona, Concentration area: present Hydrology and Atmospheric Sciences, NSF Project: Hydrologic closure relationships at different levels of hillslope model complexity

Advisor: Peter A. Troch, Ph.D.

Jan-2020 to **Doctor of Philosophy**, University of Sao Paulo - Sao Carlos School of Dec-2023 Engineering, Title: Advances in open source hydroinformatics for flood modeling and disaster education. Concentration area: Hydraulic Engineering and Sanitation, PhD thesis recently awarded as the best of 2023 in all engineering fields of USP

> Advisor: Eduardo M. Mendiondo, Ph.D. Co-advisor: Marcio H. Giacomoni, Ph.D., P.E.

Jan-2020 to **Doctor of Phylosophy**, University of Texas at San Antonio, Concen-Dec-2024 tration area: Civil and Environmental Engineering, Tentative Title: Realtime Control of Green-Infrastructure and Stormwater Drainage Systems Through Looped-Feedback Control Approaches. Status: Graduation on hold (1 credit missing, currently in a postdoc position and only able to defend afterwards).

Advisor: Marcio Hofheinz Giacomoni, Ph.D., P.E.

Jan-2018 to Master's in Hydraulic Engineering and Sanitation, University of Sao Dec-2020 Paulo - Sao Carlos School of Engineering., Concentration area: Hydraulic Engineering and Sanitation

Status: Graduated. Advisor: Eduardo M. Mendiondo.

Jan-2013 to B.Sc. in Civil Engineering, State University of Maringa - Brazil

Dec-2017 Advisor: Germano Romera, Ph.D.

Professional Interests

Investigating water resources issues in multiple spatio-temporal scales via numerical modeling and data assimilation.

Supervision

Master's Dr. Eduardo Mario Mendiondo

Degree

Ph.D. Degree Dr. Marcio Hofheinz Giacomoni, Dr. Eduardo Mario Mendiondo

Postdoctorate Dr. Peter Troch

Skills and Activities

Programming Matlab, Python, VBA, Javascript

Language

Environment Latex, Microsoft Office, Git, Github, HTML, Wordpress, Google Earth

Engine, QGIS

Operating Windows System

Work Experience

2025—present **Post-doctoral Research Associate II**, University of Arizona - Department of Hydrology and Atmospheric Sciences

Task: Using innovative catchment-scale hydrologic-hydrodynamic modeling and advanced land-surface modeling to particularly account for accurate snow modeling, my current goal is to apply/develop a hillslope-storage-Boussinesq (hsB) model to estimate catchment scale hydrologic signatures. Methodology application is performed in the Beaver Creek catchment, a tributary catchment of the Verde River in Northern Arizona.

2024—present **Post-doctoral Research Associate I**, University of Arizona - Department of Hydrology and Atmospheric Sciences

Task: Taking advantage of the unique and extensively monitored Landscape Evolution Observatory hillslopes high-resolution data, our project aims to assess how simplified 1D vadose Richards model coupled with a 2D Boussinesq saturated groundwater flow model can be adapted to use data assimilation techniques to identify effective material parameters and state-dependent hysteresis properties. In particular, we use a particle filter Monte Carlo ensemble approach to evaluate the temporal variation of soil material properties and discover state-dependent relationships to later use in simplified models.

2024-Spring Teaching Assistant of Fundamentals of Surface Water Hydrology, University of Arizona - Department of Hydrology and Atmospheric Sciences

Task: Course taught by Peter A. Troch and I was responsible for reviewing and grading all assignments, projects, and exams.

2020–2023 **Graduate Research Assistant**, School of Civil and Environmental Engineering, and Construction Management, Department of Civil and Environmental Engineering

Task: Perform stormwater water quality analysis, develop numerical models, and set up and monitor field experiments. I was responsible for setting up autosamplers, rain gauges, v-notch weirs, and collecting and analyzing samples after storm events. In the water quality analysis, I was responsible for performing total suspended solids, volatile suspended solids, heavy metals, bacteria, pH, and temperature analyzes. In this project, I was also responsible for the hydrological and hydraulic design of different permeable pavement structures funded by the City of San Antonio and constructed in January-2023 and under monitoring.

2022–2023 **Teaching Assistant of Hydrology I and II for Civil Engineering**, University of Sao Paulo - Sao Carlos School of Engineering

Task: Course taught by Eduardo M. Mendiondo and I was responsible for developing supporting materials, spreadsheets and numerical models for the applied hydrology classes, as well as teaching some of the classes. Classes were offered for students in the Junior and Sophomore year.

2018–2020 **Graduate Research Assistant**, University of Sao Paulo - Sao Carlos School of Engineering, Department of Hydraulic Engineering and Sanitation

Task: Perform stormwater water quality analysis, develop numerical models and set up and monitor field experiments. I was also responsible for planning, designing and controlling the excecution of a bioretention system funded by FAPESP grants 2017/21940-2 and 2018/20865-0

2018–2019 **Teaching Assistant of Hydrology I and II for Civil Engineering**, University of Sao Paulo - Sao Carlos School of Engineering

Task: Develop supporting materials, spreadsheets, and numerical models for Applied Hydrology classes. Classes were offered for students in the Junior and Sophomore year.

2013–2015 Teaching Assistant, State University of Maringa

Task: Help, teach, and solve tests, exams, and proposed exercises from Physics I and Physics II of Civil Engineering and Environmental Engineering Classes. Classes were ofered for students in the Sophomor year.

2012–2017 **Teaching Assistant**, Curso e Colégio Alfa Preparatory School **Task:** Help, teach, and solve pre-school exams of Physics and Mathematics for students in preparation for college.

Extra Activities

I run a website and a Youtube channel with content of Civil and Environmental Engineering (In Portuguese) and I plan to translate them to english in the near future. I developed more than 60 numerical tools to aid in various engineering calculations such as: design of pipes, design concrete structures, to solve hydrology and hydraulics problems, etc. The website has more than 60.000 downloads from more than 10 countries, which allowed me to network with designers and engineers around the world. My goal is to provide useful content to the engineering and water resources community with high quality and in most cases free of charge. I also write online articles about water resources and civil engineering in overall. The articles are the main source of leads to the website and are top-ranked in Brazilian search engine optimization. The website available at: www.engenheiroplanilheiro.com.br (In Portuguese).

Scholarships

Ph.D Degree Financed by the City of San Antonio - Texas (\$ 153,000 USD). Project - Demonat UTSA strating the Environmental Benefits of Permeable Paved Surfaces over the Edwards Aquifer

Ph.D. Degree Ph.D. Schorlarship by CAPES (R\$ 74,400)

at USP

M.Sc. Degree Master's degree scholarship financed by FAPESP (R\$ 58,116)

Bsc. Degree Free Tuition by State University Schoorlarship

Fields and Keywords of Interest

Civil and Environmental Hydrological Models, Water Quality Transport and Fate, Hydrodynamic Models,
vironmental Hydrological Models, Water Quality Models, Low Impact Development, System
Engineering Analysis, Urban Drainage, Disaster Risk Reduction, Water Resources Planning
and Management, Closure-relationships, Soil Physics

Electrical Linear Systems and Control, Control of Non-Linear Systems, Model Predictive Engineering Control, Linear Quadratic Regulators, Model Predictive Control.

Mathematics Numerical Modeling, Explicit Methods, Implicit Methods, Finite-Difference Methods, GPU Processing, Convex Optimization, Non-linear Non-Convex Optimization, Data Assimilation, Reinforcement Learning, Particle Filter

Reviewer for Scientific Journals

2020-present Journal of Hydrologic Engineering

2020-present Revista Brasileira de Recursos Hídricos

2020-present Revista DAE

2021-present Journal of Hydrology

2021-present Journal of Water Resources Planning and Management

2021-present Revista REGA

2022-present Hydrological Sciences Journal 2022-present Sustainable Cities and Society

2024-present Urban Water Journal

2024-present The International Journal of River Basin Management

2024-present Journal of Flood Risk Management

2024-present Scientific Reports

2024-present Geomatics - Natural Hazards and Risk

2024-present AIMS Geosciences

2024-present Journal of Asian Architecture and Building Engineering

2025-present Hydrology and Earth System Sciences

2025-present Water Resources Research

2025-present Natural Hazards and Earth Systems Sciences

2025-present Water Research - X

2025-present Hydrology

2025-present Applied Sciences

2025-present Environmental Modelling and Software

Publications in peer-reviewed journals - Published or Accepted

Journals

- Gomes, M.N., Jalihal, V., Castro, M. and Mendiondo, E.M., 2025. Exploring the impact of rainfall temporal distribution and critical durations on flood hazard modeling. Natural Hazards, 121(9), pp.10989-11012 https://doi.org/10.1007/s11069-025-07186-3.
- 2. Gomes Jr, M.N., do Lago, C.A. and Mendiondo, E.M., 2025. A Simple Method for Designing Infiltration Low Impact Development Techniques Considering Effects of Urbanization and Climate Change, Brazilian Journal of Water Resources (RBHR) (2025) (accepted).
- Vasconcelos, J.G., Gomes Jr, M.N., Oliveira, P.T.S., Yang, D. and Fang, X., 2025. Reformulating the Rational Method Considering Dissimilar Land Use Types. Journal of Irrigation and Drainage Engineering, 151(4), p.04025017 https://doi.org/10.1061/JIDEDH.IRENG-10431.
- Gomes Jr, Marcus Nóbrega, Ahmad F. Taha, Luis Miguel Castillo Rápalo, Eduardo Mario Mendiondo, and Marcio Hofheinz Giacomoni. "Real-time regulation of detention ponds via feedback control: Balancing flood mitigation and water quality." Journal of Hydrology 643 (2024): 131866. DOI: https://doi.org/10.1016/j.jhydrol.2024.131866
- M. N. Gomes Jr.,, C. A. F. do Lago, L. M. C. R apallo, P. T. S. Oliveira, M. H. Giacomoni, and E. M. Mendiondo, "HydroPol2D Distributed Hydrodynamic and Water Quality Model: Challenges and Opportunities in Poorly-Gauged Catchments," Journal of Hydrology, 2023, DOI: https://doi.org/10.1016/j.jhydrol.2023.129982.
- 6. Gomes Jr, Marcus Nóbrega, Maria de Andrade Rocha Alencar Castro, Pedro Gustavo Câmara da Silva, Marcio Hofheinz Giacomoni, and Eduardo Mario Mendiondo. "Increasing flood awareness through dam-break serious games." International Journal of Disaster Risk Reduction 108 (2024): 104543. DOI: https://doi.org/10.1016/j.ijdrr.2024.104543.
- 7. M. N. Gomes Jr., M. H. Giacomoni, A. F. Taha, and E. M. Mendiondo, "Flood risk mitigation and valve control in stormwater systems: State-space modeling, control algorithms, and case studies," Journal of Water Resources Planning and Management, vol. 148, no. 12, p. 04022067, 2022. [Online]. Available: 10.1061/(ASCE)WR.1943-5452.0001588
- M. N. Gomes Jr., L. M. C. Rapalo, P. T. S. Oliveira, M. H. Giacomoni, C. A. F. do Lago, and E. M. Mendiondo, "Modeling unsteady and steady 1-d hydrodynamics under different hydraulic conceptualizations: Model/software development and case studies," Environmental Modeling and Software, 2023. DOI: https://doi.org/10.1016/j.envsoft.2023.105733.
- M. N. Gomes Jr., M. H. Giacomoni, M. B. de Macedo, C. A. F. do Lago, J. A. Teixeira, T. R. Pereira, and E. M. Mendiondo, "A modeling framework for bioretention analysis: Assessing the hydrologic performance under system's uncertainty," Journal of Hydrologic Engineering, DOI: https://doi.org/10.1061/JHYEFF.HEENG-5705 2023.
- 10. M. N. Gomes Jr., P. H. B. Alves, E. M. Mendiondo, and L. F. R. Reis, "Statistical, visual and non-parametric analyses for the optimization of IDF curve fitting and construction of hydraulic works design abacuses: case study in São Carlos SP". Revista DAE, DOI: https://doi.org/10.36659/dae.2021.013 2020 (In Portuguese).
- 11. Rápalo, Luis MC, Marcus N. **Gomes Jr**, and Eduardo M. Mendiondo. "Developing an open-source flood forecasting system adapted to data-scarce regions: A digital twin coupled with hydrologic-hydrodynamic simulations." **Journal of Hydrology** (2024): 131929. DOI: https://doi.org/10.1016/j.jhydrol.2024.131929.

Journals

- 12. A. S. Ballarin, J. G. S. M. Uchôa, M. S. dos Santos, A. Almagro, I. P. Miranda, P. G. C. da Silva, M. N. **Gomes Jr.**, E. Wendland, P. T. S. Oliveira, "Brazilian water security threatened by climate change and human behavior". **Water Resources Research**, DOI: https://doi.org/10.1029/2023WR034914 2023.
- 13. do Lago, C.A., Giacomoni, M.H., Bentivoglio, R., Taormina, R., **Junior**, M.N.G. and Mendiondo, E.M., 2023. *Generalizing rapid flood predictions to unseen urban catchments with conditional generative adversarial networks.* **Journal of Hydrology**, 618, p.129276, DOI: https://doi.org/10.1016/j.jhydrol.2023.129276.
- 14. K. McClymont, D. G. F. Cunha, C. Maidment, B. Ashagre, A. F. Vasconcelos, M. B. de Macedo, M. F. N. Dos Santos, M. N. G. Júnior, E. M. Mendiondo, A. P. Barbassa et al., "Towards urban resilience through sustainable drainage systems: A multi-objective optimisation problem", Journal of Environmental Management, vol. 275, p. 111173, 2020, DOI: https://doi.org/10.1016/j.jenvman.2020.111173
- 15. M. Batalini de Macedo, M. Nobrega Gomes Júnior, T. R. Pereira de Oliveira, M. H. Giacomoni, M. Imani, K. Zhang, C. Ambrogi Ferreira do Lago, and E. M. Mendiondo, "Low impact development practices in the context of united nations sustainable development goals: A new concept, lessons learned and challenges," Critical Reviews in Environmental Science and Technology, vol. 52, no. 14, pp. 2538–2581, 2022, DOI: https://doi.org/10.1080/10643389.2021.1886889
- 16. Ambrogi Ferreira Do Lago, Cesar, Jose Artur Teixeira Brasil, Marcus Nóbrega Gomes, Eduardo Mario Mendiondo, and Marcio H. Giacomoni. "Improving pluvial flood mapping resolution of large coarse models with deep learning." Hydrological Sciences Journal 69, no. 5 (2024): 607-621. DOI: https://doi.org/10.1080/02626667.2024.2329268
- 17. J. Brasil, M. Macedo, C. Lago, T. Oliveira, M. **Júnior**, T. Oliveira, and E. Mendiondo, "Nature-based solutions and real-time control: Challenges and opportunities," **Water**, vol. 13, no. 5, p. 651, 2021, DOI: https://doi.org/10.3390/w13050651.
- 18. J. A. T. Brasil, M. B. de Macedo, T. R. P. de Oliveira, F. G. Ghiglieno, V. C. B. de Souza, G. Marinho e Silva, M. N. Gomes Júnior, F. A. A. de Souza, and E. M. Mendiondo, "Can we scale digital twins of nature-based solutions for stormwater and transboundary water security projects?" Journal of Hydroinformatics, 2022, DOI: https://doi.org/10.2166/hydro.2022.142
- 19. M. Batalini de Macedo, M. N. **Gomes Júnior**, V. Jochelavicius, T. R. P. de Oliveira, and E. M. Mendiondo, "Modular design of bioretention systems for sustainable stormwater management under drivers of urbanization and climate change," **Sustainability**, vol. 14, no. 11, p. 6799, 2022, https://doi.org/10.3390/su14116799.
- T. R. P. de Oliveira, M. B. de Macedo, T. H. Oliveira, C. A. F. do Lago, M. N. Gomes Jr, J. A. T. Brasil, and E. M. Mendiondo, "Different configurations of a bioretention system focused on stormwater harvesting in Brazil," Journal of Environmental Engineering, vol. 147, no. 12, p. 04021058, 2021, https://doi.org/10.1061/(ASCE)EE.1943-7870.0001938
- 21. Jochelavicius, V., E. M. Mendiondo, M. N. **Gomes Jr.**, and M. B. de Macedo, "Construction of Intensity-Duration-Frequency curves with future climate change scenarios for the city of São Carlos SP aiming at the design of compensatory techniques," **Revista DAE**, vol. 147, p. 19-32, DOI: https://doi.org/10.36659/dae.2022.065 (In Portuguese).

Publications in Conferences

Conference Proceedings

- 1. Gomes Jr. M. N., H. Bauser, P. A. Troch, *Identifying the state dependence of effective material properties in a simplified hydrologic hillslope model*, The Conference on Computational Methods on Water Resources (CMWR), Tucson, 2024.
- Brasil, J.A., Papagiannakis, A.T., Giacomoni, M.H., Johnson, D., Gomes Jr, M.N. and Mendiondo, E.M., 2023. Hydrologic and Water Quality Treatment Performance of Four Permeable Pavement Surfaces. In *International Low Impact Development Conference* 2023 (pp. 114-122).
- 3. M. N. Gomes Jr., Giacomoni, M.H., Taha, A.F. and Mendiondo, E.M., 2022, August. *Model Predictive Control for Stormwater Reservoirs: Investigating Effects of Climate Change and Urbanization*. **IEEE Conference on Control Technology and Applications (CCTA)** (pp. 691-698). IEEE.
- 4. M. N. Gomes Jr., C. A. F. do Lago, M. H. Giacomoni, E. M. Mendiondo, "Expanding the 2-Dimentional Green-Ampt and Non-linear Reservoir Hydrological Model from SWMM to MATLAB®". AGU Fall Meeting, New Orleans, 2021.
- 5. M. N. Gomes Jr., M. H. Giacomoni, E. M. Mendiondo, A. F. Taha, "Real-Time Control of Stormwater Reservoirs for Flood Risk Mitigation". The 2nd International Symposium on Water System Operations, 2021.
- 6. M. N. Gomes Jr., P. A. Braga, M. B. de Macedo, E. M. Mendiondo, "Preliminary design of detention ponds using specific design discharge and orifice stage discharge relationship for different climate patterns". Brazilian Symposium of Water Resources, 2021.
- 7. M. N. Gomes Jr., P. A. Braga, E. M. Mendiondo, "Impact of rainfall changes on the Pacaembu-SP detention reservoir: assessment of water security regarding flood risk". Brazilian Symposium of Water Resources, 2019 (In Portuguese).
- 8. M. N. Gomes Jr., E. M. Mendiondo, F. Dornelles, A. T. Papagiannakis, "Permeable Pavement Hydrological Model to Assess the Long-Term Efficiency of Maintenance Using High-Resolution Temperature and Rainfall Data". World Environmental and Water Resources Congress, 2021, 1103-1117.
- 9. M. N. Gomes Jr., E. O. Pavan, L. M. C. Rápallo, M. H. Giacomoni, E. M. Mendiondo, "Bidirectional Hydrodynamic and Water Quality Model (2DCAWQ): Modeling Challenges in Basins with Scarce Data: Application in the Tijuco Preto São Carlos Basin". XIV National Meeting on Urban Waters and IV Symposium on Revitalization of Urban Rivers, 2022 (In Portuguese).
- 10. M. N. Gomes Jr., M. H. Giacomoni, E. M. Mendiondo, "The role of raster resolution into overland flow and total suspended solids modeling in small urban catchments". Brazilian Symposium of Water Resources, (2021).
- 11. M. N. Gomes Jr., M. H. Giacomoni, A. T. Papagiannakis, "Spatial Assessment of Overland Flow, Pollutant Concentration, and First Flush Using a 2D Non-Point Source Pollution and Hydrological Model for Urban Catchments". World Environmental and Water Resources Congress, 2021, 397-413.
- 12. M. N. Gomes Jr., M. H. Giacomoni, E. M. Mendiondo, "Bioretention Sizing via Process-Based Simulation: Generalized TC-Hydro Model Applied in Design Conditions". XIV National Meeting on Urban Waters and IV Symposium on Revitalization of Urban Rivers, 2022 (In Portuguese).
- 13. M. N. Gomes Jr., T. R. de Oliveira, T. H. Olveira, M. B. de Macedo, M. H. Giacomoni, E. M. Mendiondo, "Nature-based solutions for sustainable stormwater: a model approach and sensitivity analysis for bioretention design using Green and Ampt and reservoir flood routing". Second International Conference of Water, Megacities, and Global Change, UNESCO, 2021.
- 14. M. N. Gomes Jr., L. M. C. Rápalo, E. M. Mendiondo, A Serious Game for societal risk perception of dam-break flood assessment using a hydrodynamic model, Latin American Hydraulic Congress, (2022). Award of Best Paper.

Conference Proceedings

- 15. M. N. **Gomes Jr.**, C. A. F do Lago, M. H. Giacomoni, E. M. Mendiondo, Assessing the role of cross-section shape for flood routing under compound flood events using a hydrodynamic model, **Latin American Hydraulic Congress**, (2022).
- 16. C. A. F. do Lago, M. N. **Gomes Jr.**, E. M. Mendiondo, M. H. Giacomoni, "Application of Artificial Neural Networks to Predict Water Surface Elevation". **AGU Fall Meeting**, 2021, New Orleans.
- 17. T. R. P. de Oliveira, M. N. **Gomes Jr.**, M. B. de Macedo, E. M. Mendiondo, "Análise da sensibilidade do potencial matricial em protótipo de biorretenção". **Brazilian Symposium of Water Resources**, 2019 (In Portuguese).
- 18. CASTRO, M.A.R.A.; Gomes Jr., M.N.; SANCHEZ, M.H.; FILHO, P.B.S., MENDIONDO, E.M. Review of the Risk Index Applied to Dam Failure Simulation in Brazil. XXV Brazilian Symposium of Water Resources. Anais. Aracaju (SE), 2023 (In Portuguese).
- 19. SANCHEZ, M.H; Gomes Jr., M.N.; CASTRO, M.A.R.A.; MENDIONDO, E.M. River flow forecasting methods: A review. XXV Brazilian Symposium of Water Resources. Anais. Aracaju (SE), 2023.
- 20. M. R. de Sousa, M. N. Gomes Jr., E. O. Pavan, L. M. C. Rápalo, F. A. R. Nararro, E. M. Mendiondo, "Physically Distributed Modeling Based on Urban Watersheds: Hydropol2D Model Applied to São Carlos (SP)", XXV Brazilian Symposium of Water Resources. Proceedings. Aracaju (SE), 2023 (In Portuguese).
- 21. E. O. Pavan, M. N. Gomes Jr., L. M. C. Rápalo, M. R. de Sousa, M. S. dos Santos F. A. R. Nararro, E. M. Mendiondo, "Physically Based Modeling of Large Basins Challenges and Opportunities for Applying The Hydropol2D Model", XXV Brazilian Symposium of Water Resources. Proceedings. Aracaju (SE), 2023 (In Portuguese).
- 22. L. F. Roysen, M. N. **Gomes Jr.**, E. O. Pavan, E. M. Mendiondo, "RTC-Stormwater Model: Advances In Flood Modeling And Control Of Urban Drainage Devices", **XXV Brazilian Symposium of Water Resources**. Proceedings. Aracaju (SE), 2023 (In Portuguese).
- 23. A. S. Ballarin, J. G. S. M. Uchoa, M. S. dos Santos, A. Almagro, I. P. Miranda, P. G. C. da Silva, G. J. da Silva, M. N. Gomes Jr., E. C. Wendland, P. T. S. de Oliveira, "The Future of Water Security In Brazil: Separating The Impacts Of Climate Change And Water Demand", XXV Brazilian Symposium of Water Resources. Proceedings. Aracaju (SE), 2023 (In Portuguese).
- 24. M. S. dos Santos, M. N. Gomes Jr., D. A. Bressianim L. L. Ladeira, M. R. Benso, E. M. Mendiondo "Review of the Implementation of Model Predictive Control (MPC) In Urban Reservoirs", XXV Brazilian Symposium of Water Resources. Proceedings. Aracaju (SE), 2023 (In Portuguese).
- 25. G. M. e Silva, M. R. Benso, P. G. C. da Silva, M. N. Gomes Jr., E. M. Mendiondo, "Serious Game on Water Risks For Planetary Health: A New Model For Knowledge Co-Production", XXV Brazilian Symposium of Water Resources. Proceedings. Aracaju (SE), 2023 (In Portuguese).
- L. M. C. Rápalo, M. N. Gomes Jr., D. A. Bressiani, M. R. Benso, E. M. Mendiondo "Threats of Urban Flash Floods on Human Stability for The Next Century", XXV Brazilian Symposium of Water Resources. Proceedings. Aracaju (SE), 2023.
- 27. I. M. Benites, M. N. Gomes Jr., A. Botari, J. C. Botari, L. Vanalli, "Analysis of the Urban Drainage System: Case Study of the Stormwater Galleries at the intersection of Rua Governador Nei Braga and Avenida Brasil in the city of Umuarama-PR". XVII Safety, Health and Environment World Congress, 2017 (In Portuguese).

Publications - Under Review or In Preparation

Professional Memberships

- American Society of Civil Engineering (ASCE) 2020-2021
- American Geophysical Union (AGU) 2021-2022, 2024-present
- o Brazilian Water Resources Association (ABRH) 2019-2020, 2021-2022.

Grant Writing Collaboration

- o Analysis of Unit Hydrograph Models for San Antonio Watersheds
 - P.I Dr. Marcio H. Giacomoni
 - Tasks: I helped to define the methods used to systematically assess the best unit hydrograph theory used for San Antonio observed data. The idea is that the standard PRF 484 unit hydrograph was oversizing the detention ponds in the city. Therefore, investigating the best-fitted unit hydrograph would reduce associated costs of low-impact development designs.
- Curbing Climate Change-Induced Floods via Control Theory for Urban Drainage Systems
 - P.I's Dr. Marcio H. Giacomoni and Dr. Ahmad F. Taha
 - Tasks: Our previous research was the starting point of this proposal. We developed a real-time control model that can potentially increase the efficiency of stormwater systems for flood control. In this proposal, we plan to advance the mathematical modeling to include new stormwater systems (e.g., tunnels, dividers) and actuators (e.g., pumps and gates) to optimally control floods via real-time optimization.
- Collaborative Research: Feedback Control of Air and Water Pressure in Pipelines and Networks: Coupling Water Operation Modeling with Smart Valves
 - P.I's Dr. Marcio H. Giacomoni, Dr. Jose G. Vasconcelos, Dr. Ahmed A. Abokifa, and Dr. Ahmad F. Taha.
 - Tasks: I collaborated in the mathematical description of the hydraulic conceptualization of the filling pipe problem, defining the governing equations, and reviewing the methodology.

Current Collaborators

Peter Troch, Professor at University of Arizona. Google Scholar, Website. Ph.D

Hannes Assistant Professor at University of Nevada, Las Vegas. Google Scholar, Website. Bauser, Ph.D

Paul D. Bates, Professor at University of Bristol. Orcid, Google Scholar, Website.

Ahmad F. Associate Professor at Vanderbilt University. Google Scholar, Twitter, Website. Taha, Ph.D

Eduardo Professor at University of Sao Paulo, Sao Carlos School of Engineering. Orcid, Mario Google Scholar.

Mendiondo,

Ph.D

Ph.D

José Professor at Auburn University. Google Scholar.

Vasconcelos,

Ph.D

Marcio H. Professor at University of Texas at San Antonio. Orcid, Google Scholar, Website.

Giacomoni,

Ph.D, P.E.

Paulo T.S. Associate Professor at Federal University of Campo Grande. Orcid, Google

Oliveira, Ph.D Scholar, Twitter, Website.

Marina B. de Associate Professor at Federal University of Itajubá. Orcid, Google Scholar,

Macedo, Ph.D Website.

A. T. Papa- Professor at University of Texas at San Antonio. Orcid, Google Scholar, Website.

giannakis,

Ph.D, P.E.

César University of Texas at San Antonio. Orcid, Google Scholar.

Ambrogi

Ferreira do

Lago, Ph.D.

Daniele Associate Professor at Federal University of Pelotas. Orcid, Google Scholar,

Bresisani, Website.

Ph.D

Luis Miguel University of Sao Paulo, Sao Carlos School of Engineering. Orcid, Google

Castillo Scholar.

Rápalo, Ph.D.

Fabricio A. University of Sao Paulo, Sao Carlos School of Engineering. Orcid, Google

Richmond Scholar.

Navarro,

Ph.D.

Tiantian University of Arizona. Google Scholar.

Zhou, Ph.D

Languages

Portuguese Native Speaker

English English (TOEFL - Advanced). Lived two years in the US from January 2020

to January 2022 and from January 2024. Ph.D. dissertation written in English, publications and presentations in English. Currently living in the U.S. for the

postdoctoral researching.

Spanish Intermediate

Graduate Research Collaborations César Ambrogi Ferreira do Lago, Ph.D.

Jan/2018 - Present

 During Cesar's Ph.D. at the University of Texas at San Antonio, we worked together creating hydrodynamic models. Cesar also worked with me at the beginning of the development of the HydroPol2D model.

Marina Batalini de Macedo, Ph.D.

Jan 2018 - Present

• We have been working since the beginning of my Master's degree in varied topics related to

floods, water quality, and Low Impact Development.

Luis Miguel Castilo Rápalo, Ph.D.

Jan 2022 - present

• We have been working on at least 3 papers together. His thesis is the first Ph.D. to apply the HydroPol2D model, which was developed primarly by me. His 3 Ph.D. chapters are applications and new developments of the HydroPol2D model. We are also working on different problems, such as Real-Time control of storwmater facilities.

Ivan Cuervo, M.Sc.

Mar 2022 - Jan 2023

 During his Master's at UTSA, Ivan worked with me on data collection and water quality analysis. We also collaborated in the design of permeable pavements and modeling of 2-D runoff distribution.

Artur Brasil, Ph.D Candidate

Jan 2022 - Present

• We share the same project at UTSA. I stayed in UTSA for 2 years, and then Artur will finish the last 2 years of the project. We have collaborated in multiple areas, such as setting up field experiments, analyzing field data, and developing numerical models.

Mateo Hernandez, M.Sc.

Apr 2023 - Present

O Mateo has worked with me by helping me to compare HydroHP Model with HEC-RAS 1-D Model. In addition, I am his co-supervisor in his Master's that aims to develop a closed-loop feedback control algorithm to reduce flood effects via valve and gate control in detention ponds using a distributed hydrologic-hydrodynamic model.

Matheus dos Santos, M.Sc.

2022 - 2024

Matheus has defended (Out-2024) his Masters in USP and used my model (RTC-Stormwater) to
evaluate the model predictive control properties such as prediction horizon for flood mitigation.

Maria Castro, Ph.D Student

2023 - present

• Maria has been used the local-inertial version of HydroPol2D to develop monte-carlo probabilist ensemble estimation of dam-break hazards considering unknown breach characteristics, initial reservoir storage, or terrain roughness coefficients. This is the topic of her Master's degree which is mainly supervised by me, although I am unable to be her official supervisor in USP.

Professional References

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