

Research interests

- Coastal hydrodynamics: wind-wave growth and propagation, wave-current interactions.
- Transport and mixing processes: jets, plumes, marine outfalls, sediment transport, pollutant dispersion.
- Wave climate: analysis of metocean data, extreme value analysis, statistical modeling.

Education

- Expected 2027 **Ph.D. in Water Resources and Environmental Engineering**, *Federal University of Paraná (UFPR)*, Brazil.
 - Supervisor: Prof. Dr.-Ing. Tobias Bleninger
- 2023 **M.Sc. in Water Resources and Environmental Engineering**, *Federal University of Paraná (UFPR)*, Brazil.
 - Dissertation: "Influence of waves on the transport and fate of sediments from a submarine sewage outfall in shallow coastal waters"
 - Awarded with the UFPR Academic Excellence Award
 - Supervisor: Prof. Dr.-Ing. Tobias Bleninger
- 2020 **B.Sc. in Civil Engineering**, *Universidad del Norte*, Colombia.

Professional experience

- 2021–2022 **Course instructor**, *Universidad del Magdalena*, Colombia.
 - Course: "*Modelación en Ingeniería Costera*" (Modeling in Coastal Engineering), 52 hours
 - Topics: numerical methods; Python programming; processing of marine climate data; one-dimensional modeling of long waves
- 2020–2021 **Design engineer**, *ATE Hydrosystems*, Colombia.
 - Hydrologic studies for tailings storage facilities
 - Non-Newtonian flow modeling for tailings dam breach studies
- 2020 **Consulting engineer**, *Universidad del Norte*, Colombia.
 - Project: "*Estudios técnico-científicos y diseños de referencia para la factibilidad de la navegabilidad del río Magdalena*" (Technical-scientific studies and baseline designs for the navigation feasibility of the Magdalena River)
 - Development of a lattice Boltzmann code for hydrodynamic modeling

Publications

- [1] Y. Berrio, G. Rivillas-Ospina, G. Ruiz-Martínez, A. Arango-Manrique, C. Ricaurte, E. Mendoza, R. Silva, D. Casas, M. Bolívar, and K. Díaz. “Energy conversion and beach protection: Numerical assessment of a dual-purpose WEC farm”. In: *Renewable Energy* 219 (Dec. 2023), p. 119555. DOI: 10.1016/j.renene.2023.119555.
- [2] Diego Andrés Casas Toro. “Influence of waves on the transport and fate of sediments from a submarine sewage outfall in shallow coastal waters”. M.Sc. dissertation. Curitiba, Brazil: Federal University of Paraná, 2023. URL: <https://hdl.handle.net/1884/82595>.
- [3] German Rivillas-Ospina, Diego Casas, Mauro Antonio Maza-Chamorro, Marianella Bolívar, Gabriel Ruiz, Roberto Guerrero, José M. Horrillo-Caraballo, Milton Guerrero, Karina Díaz, Roberto del Rio, and Erick Campos. “APPMAR 1.0: A Python application for downloading and analyzing of WAVEWATCH III® wave and wind data”. In: *Computers & Geosciences* 162 (May 2022), p. 105098. ISSN: 00983004. DOI: 10.1016/j.cageo.2022.105098.
- [4] German Rivillas-Ospina, Mauro Antonio Maza-Chamorro, Sebastián Restrepo, Debora Lithgow, Rodolfo Silva, Augusto Sisa, Andrés Vargas, Juan Pablo Sarmiento, Juan Caes, Marianella Bolivar, Roberto Del Rio, Erick Campo, Diego Casas, and Dennis Rudas. “Alternatives for Recovering the Ecosystem Services and Resilience of the Salamanca Island Natural Park, Colombia”. In: *Water* 12 (5 May 2020), p. 1513. ISSN: 2073-4441. DOI: 10.3390/w12051513.

Presentations

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| 2023 | “Modeling the transport of outfall sediments under wave action”. Webinar of the IAHR Brazil Young Professionals Network. youtu.be/3K7UAPZUYTc . |
| 2023 | “Coupled wave-current modeling of outfall sediment dynamics in shallow coastal waters”. 4 th International Symposium on Outfall Systems. Buenos Aires, Argentina. isos2023.com.ar/presentaciones . |

Honors and awards

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| 2024 | Academic Excellence Award (Federal University of Paraná) |
| 2013–2017 | Orgullo Caribe scholar (Universidad del Norte) |

Professional memberships

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| Since 2023 | International Association for Hydro-Environment Engineering and Research (IAHR); IAHR/IWA Joint Committee on Marine Outfall Systems; Committee on Coastal and Maritime Hydraulics; IAHR Brazil Young Professionals Network. |
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Since 2023

International Water Association (IWA): IAHR/IWA Joint Specialist Group on Marine Outfall Systems.

Relevant skills and experience

- Hydrodynamic and wave modeling: Delft3D, OpenFOAM, FLO-2D, self-made codes.
- Field measurements of physical and water quality variables in beaches and lakes.
- Proficient in programming for numerical modeling and data analysis: Fortran, C/C++, Go, Python, Julia, R, MATLAB.
- Proficient in geographic information systems (GIS) and geoprocessing, including satellite imagery: QGIS, GDAL.
- Shell scripting, server administration and cloud computing: Linux, Windows.
- Development of APPMAR: a program for analysis of wave and wind climate (github.com/cemanetwork/appmar).
- Development of GMDApp: an application for ground motion time series selection (github.com/gaaraujo/GMDApp).

Languages

Spanish	Native
English	Fluent (CEFR level C1)
Portuguese	Fluent