DIEGO A. CASAS

CONTACT@DIEGOCASAS.NET LINKEDIN.COM/IN/CASASD DIEGOCASAS.NET

PROFILE

Water resources and environmental engineer with experience in hydrodynamic, wave, and sediment transport modeling. Holds an M.Sc. and is pursuing a Ph.D. Skilled in data analysis, scientific computing and multidisciplinary teamwork to solve complex engineering challenges. Experienced in teaching and collaborative research.

RESEARCH AREAS

- Coastal hydrodynamics: wind-wave generation 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

Ph.D. in Water Resources and Environmental Engineering — *in progress*

Federal University of Paraná (Curitiba, Brazil)

- Research focus: empirical modeling of wind-wave generation and surface momentum transfer in lakes and reservoirs
- Expected completion: Feb. 2027

M.Sc. in Water Resources and Environmental Engineering — Feb. 2023

Federal University of Paraná (Curitiba, Brazil)

- Research focus: hydrodynamic, waves, and sediment transport modeling for the analysis of coastal effluent discharges
- Academic Excellence Award 2023

B.Sc. in Civil Engineering — Feb. 2020

Universidad del Norte (Barranquilla, Colombia)

- Relevant coursework: River and Coastal Engineering, Urban Drainage
- Participation in the university's coasts and ports research group
- Orgullo Caribe scholar (2013–2017)

PROFESSIONAL EXPERIENCE

Course Instructor — Nov. 2021 – Apr. 2022

University of Magdalena (Santa Marta, Colombia)

- Course on modeling in coastal engineering
- Topics: numerical methods, Python programming, processing of marine climate data, one-dimensional modeling of long waves (52 hours, online)

Design Engineer — Aug. 2020 – Sep. 2021

ATE Hydrosystems (Barranquilla, Colombia)

- Conducted hydrologic studies for tailings storage facilities in Mexico
- Modeled non-Newtonian flow for tailings dam breach studies

Engineering Consultant — Mar. 2020 – Jul. 2020

Universidad del Norte (Barranquilla, Colombia)

- Project on technical/scientific studies and baseline designs for the navigation feasibility of the Magdalena River (Colombia)
- Developed a Lattice Boltzmann Method code for hydrodynamic modeling of a river mouth

SKILLS

- Programming for numerical modeling and data analysis: Python, R, MATLAB, Mathematica, Fortran, C/C++, Go
- Hydrodynamic and wave modeling: Delft3D, OpenFOAM, FLO-2D, custom-developed codes
- Written and verbal communication: publication, presentation, teaching, blogging
- Attention to detail: accuracy and thoroughness in work
- Geographic information systems (GIS) and geoprocessing, including satellite imagery: QGIS, GDAL
- Field measurements of physical and water quality variables in water bodies: beaches, lakes
- Teamwork and collaboration: work in multidisciplinary teams

CERTIFICATIONS

Online School on Lateral Cavity: Hybrid and Multi-Lab Study of the Flow Patterns in a Lateral Cavity (PIV, OpenFOAM). International Association for Hydro-Environment Engineering and Research (IAHR). — Mar. 2024

3rd JoE Webinar on Coastal Stability and Resilience. IAHR. — Dec. 2023

Short Course on Outfall Discharge Modeling and Analysis. IAHR. — Nov. 2023

Webinar on Numerical Simulation of Effluent Discharges. IAHR. — May 2023

Online short course: Water Waves for the Nearshore Dynamics. Marche Polytechnic University (Italy). — May 2023

Online Short Course on Climate Change and Sustainable Development in the Colombian Caribbean Region. Universidad del Norte (Colombia). — Jul. 2021

CODING PROJECTS

APPMAR – Program with graphical user interface (GUI) for downloading and analyzing wind and wave climate data.

- Application for coastal and ocean engineering

- Python and wxWidgets GUI toolkit
- github.com/cemanetwork/appmar

GMDApp – Command-line program for selecting time series of seismic ground motion. It is an implementation in the Julia language of the PEER Ground Motion Database web application for time series selection.

- Application for structural design and analysis
- Julia language and Gnuplot
- github.com/gaaraujo/GMDApp

PUBLICATIONS

1. R. Paludo, T. Bleninger, D. A. Casas Toro, and M. W. Arantes Miguel, *Geração de Energia por Ondas*. Curitiba, Brazil: Lactec, 2025. doi: 10.5281/zenodo.16905820.
2. D. A. Casas, T. Bleninger, M. F. Gobbi, and S. C. Baptistelli, "Influence of waves on the transport and fate of outfall sediments," *Journal of Applied Water Engineering and Research*, pp. 1–22, Apr. 2025, doi: 10.1080/23249676.2025.2485959.
3. 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," *Renewable Energy*, vol. 219, p. 119555, Dec. 2023, doi: 10.1016/j.renene.2023.119555.
4. G. Rivillas-Ospina, D. Casas, M. A. Maza-Chamorro, M. Bolívar, G. Ruiz, R. Guerrero, J. M. Horrillo-Caraballo, M. Guerrero, K. Díaz, R. d. Rio, and E. Campos, "APPMAR 1.0: A Python application for downloading and analyzing of WAVEWATCH III® wave and wind data," *Computers & Geosciences*, vol. 162, p. 105098, May 2022, doi: 10.1016/j.cageo.2022.105098.
5. G. Rivillas-Ospina, M. A. Maza-Chamorro, S. Restrepo, D. Lithgow, R. Silva, A. Sisa, A. Vargas, J. P. Sarmiento, J. Caes, M. Bolivar, R. Del Rio, E. Campo, D. Casas, and D. Rudas, "Alternatives for Recovering the Ecosystem Services and Resilience of the Salamanca Island Natural Park, Colombia," *Water*, vol. 12, no. 5, p. 1513, May 2020, doi: 10.3390/w12051513.

PRESENTATIONS

"Modeling the transport of outfall sediments under wave action". Webinar of the IAHR Brazil Young Professionals Network. https://www.youtube.com/watch?v=3K7UAPZUYTc — Jul. 2023

"Coupled wave-current modeling of outfall sediment dynamics in shallow coastal waters". 4th International Symposium on Outfall Systems. Buenos Aires, Argentina. — Mar. 2023

VOLUNTEER EXPERIENCE

Workshop Instructor – VII Symposium of the Graduate Program of Water Resources and Environmental Engineering, Federal University of Paraná (Curitiba, Brazil) – Workshop on LaTeX for academic writing (8 hours) — Dec. 2024

Committee Member – IAHR/IWA Joint Committee on Outfall Systems, International Association for Hydro-Environment Engineering and Research (IAHR), International Water Association (IWA) — since Aug. 2024

Examiner of Student Presentations – International Summer School 2023: Sustainability in Water and Wastewater Technology (Curitiba, Brazil) – Evaluated student poster presentations on sustainable urban drainage — Sep. 2023

Member of the Organizing Committee – Symposium of the Graduate Program of Water Resources and Environmental Engineering, Federal University of Paraná (Curitiba, Brazil) – Editions of the symposium: V (2022), VI (2023), VII (2024) — 2022 – 2024

PROFESSIONAL AFFILIATIONS

International Association for Hydro-Environment Engineering and Research (IAHR) – IAHR Brazil Young Professionals Network — since Apr. 2023

LANGUAGES

- Spanish (native)
- English (fluent)
- Portuguese (fluent)