Diego A. Casas

Water Resources &
Environmental Engineer

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 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 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 Feb 2027 — **Ph.D. in Water Resources and Environmental Engineering**, Federal University of Paraná (UFPR), Brazil.
- Data analysis and empirical modeling of wind-waves in lakes.

Feb 2023 — **M.Sc. in Water Resources and Environmental Engineering**, Federal University of Paraná (UFPR), Brazil.
- UFPR Academic Excellence Award for best master's dissertation of 2023.
- Hydrodynamic, waves, and sediment transport modeling for the analysis of coastal effluent discharges.

Feb 2020 — **B.Sc. in Civil Engineering**, Universidad del Norte, Colombia.
- Orgullo Caribe scholar (2013–2017).
- Elective coursework on coastal engineering.
- Participation in the university's coastal engineering research group.

Work experience

Nov 2021 – Apr 2022 — **Course Instructor**, Universidad del Magdalena, Colombia.
- Taught course "Modelación en Ingeniería Costera" (Modeling in Coastal Engineering), 52 hours.
- Covered numerical methods, Python programming, processing of marine climate data, and one-dimensional modeling of long waves.

Aug 2020 – Sep 2021 **Design Engineer**, ATE Hydrosystems, Colombia.

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

Mar–Jul 2020 **Engineering Consultant**, Universidad del Norte, Colombia.

- Worked on 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).
- Developed a lattice Boltzmann code for hydrodynamic modeling of a river mouth.

Skills

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

Certifications

Mar 2024 Online School on Lateral Cavity: Hybrid and multi-Lab study of the flow patterns in a Lateral Cavity (PIV and OpenFOAM). International Association for Hydro-Environment Engineering and Research (IAHR).

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

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

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

Apr 2022 Water Waves for the Nearshore Dynamics. Online short course. Marche Polytechnic University, Italy.

Jul 2021 Diplomado Virtual en Cambio Climático y Desarrollo Sostenible en la Región Caribe Colombiana (Online Short Course on Climate Change and Sustainable Development in the Colombian Caribbean Region). Universidad del Norte, Colombia.

Coding projects

APPMAR — Development of a program with graphical user interface (GUI) for downloading and analyzing wind and wave climate data.
- Useful for coastal and ocean engineering.
- Python and wxWidgets GUI toolkit.
- https://github.com/cemanetwork/appmar

GMDApp — Development of a command-line program for selecting time series of seismic ground motion. It is an implementation in Julia language of the PEER Ground Motion Database web application for time series selection.
- Used for structural design and analysis.
- Julia language and Gnuplot interface.
- https://github.com/gaaraujo/GMDApp

Publications

1. Casas DA, Bleninger T, Gobbi MF, Baptistelli SC. 2025. Influence of waves on the transport and fate of outfall sediments. Journal of Applied Water Engineering and Research:1–22. ISSN: 2324-9676. DOI: 10.1080/23249676.2025.2485959.

2. Berrio Y, Rivillas-Ospina G, Ruiz-Martínez G, Arango-Manrique A, Ricaurte C, Mendoza E, Silva R, Casas D, Bolívar M, Díaz K. 2023. Energy conversion and beach protection: Numerical assessment of a dual-purpose WEC farm. Renewable Energy 219:119555. ISSN: 0960-1481. DOI: 10.1016/j.renene.2023.119555.

3. Casas Toro DA. 2023. Influence of waves on the transport and fate of sediments from a submarine sewage outfall in shallow coastal waters. MA thesis. Curitiba, Brazil: Universidade Federal do Paraná. HDL: 1884/82595.

4. Rivillas-Ospina G, Casas D, Maza-Chamorro MA, Bolívar M, Ruiz G, Guerrero R, Horrillo-Caraballo JM, Guerrero M, Díaz K, Rio Rd, Campos E. 2022. APPMAR 1.0: A Python application for downloading and analyzing of WAVEWATCH III® wave and wind data. Computers & Geosciences 162:105098. ISSN: 0098-3004. DOI: 10.1016/j.cageo.2022.105098.

5. Rivillas-Ospina G, Maza-Chamorro MA, Restrepo S, Lithgow D, Silva R, Sisa A, Vargas A, Sarmiento JP, Caes J, Bolivar M, Del Rio R, Campo E, Casas D, Rudas D. 2020. Alternatives for Recovering the Ecosystem Services and Resilience of the Salamanca Island Natural Park, Colombia. Water 12.5:1513. ISSN: 2073-4441. DOI: 10.3390/w12051513.

Presentations

Jul 2023 — “Modeling the transport of outfall sediments under wave action”. Webinar of the IAHR Brazil Young Professionals Network. https://youtu.be/3K7UAPZUYTc

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

Volunteer experience

Dec 2024 — **Workshop Instructor**, VII Symposium of the UFPR Graduate Program of Water Resources and Environmental Engineering, Curitiba, Brazil.
- Workshop on LaTeX for academic writing, 8 hours.

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

Sep 2023 — **Examiner of student presentations**, International Summer School 2023: Sustainability in Water and Wastewater Technology, Curitiba, Brazil.
- Evaluated student poster presentations on sustainable urban drainage.
- Event organized by the Rosenheim Technical University of Applied Sciences, Germany, and the Federal University of Paraná, Brazil.

2022–2024 — **Member of the Organizing Committee**, Symposium of the UFPR Graduate Program of Water Resources and Environmental Engineering, Curitiba, Brazil.
- Participated in the organization of 3 consecutive editions of the symposium: V (2022), VI (2023), VII (2024).

Professional affiliations

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

Languages

Spanish	Native
English	Fluent (CEFR level C1)
Portuguese	Fluent