

COLEMAN P. BLAKELY, PH.D.

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EDUCATION

Ph.D. in Civil Engineering

August 2023

University of Notre Dame, Notre Dame, IN, USA

Dissertation title: "Understanding Nonlinear Interactions between Barotropic and Baroclinic Processes in a Global Tide and Storm Surge Model"

Advisor: Joannes Westerink, Ph.D.

B.S. in Civil Engineering, *cum laude*

May 2019

University of Notre Dame, Notre Dame, IN, USA

AWARDS AND HONORS

Arthur J. Schmitt Presidential Leadership Fellowship, University of Notre Dame

August 2019–August 2023

Outstanding Young Scientist Award, International Workshop on Modeling the Ocean

June 2022

Chi Epsilon Honor Society, University of Notre Dame Student Chapter

March 2018

RESEARCH EXPERIENCE

Argonne National Laboratory, Environmental Science Division

November 2023–Present

Postdoctoral Research Associate

Lemont, IL, USA

- Performed long-term flood risk assessment for critical infrastructure under present and future climate scenarios using CMIP6 climate data, hydrodynamic and wave numerical models, and statistical analysis.
- Developed coupling infrastructure within the Department of Energy's ocean model to better capture coastal inundation due to changes in ocean climate including using version control (Git) and ensuring code upgrades pass necessary testing before being merged.
- Simulated large ensembles of synthetic tropical cyclones using a finite-element based numerical model on HPCs.

University of Notre Dame, Computational Hydraulics Laboratory

August 2023–November 2023

Postdoctoral Research Associate

Notre Dame, IN, USA

- Collaborated with colleagues at the National Oceanic and Atmospheric Administration (NOAA) to develop a global coastal flooding forecast system including upgrades to capture the effects of changing mean sea level on coastal flooding.
- Developed new capability for a community, finite-element based, coastal flooding numerical model.
- Mentored graduate students in developing research goals and provided guidance in solving research challenges.

University of Notre Dame, Computational Hydraulics Laboratory

August 2019–August 2023

Graduate Research Assistant

Notre Dame, IN, USA

- Aided in the creation of a high-resolution coastal flood model for the United States east and gulf coasts for use in flood forecasting.
- Devised and implemented an error minimization methodology to improve the performance of global and local tide predictions within a flood forecasting model.
- Performed multi-year simulations of global total water levels using HPCs and advanced hydrodynamic numerical models.
- Collaborated on the development of an open-source toolbox for the creation of finite-element meshes of coastal regions.

PUBLICATIONS AND PRESENTATIONS

Journal Articles (peer reviewed)

- [1] **C. P. Blakely**, W. J. Pringle, and V. R. Kotamarthi. “Projections of Tropical Cyclone-driven Coastal Flooding Risk to Critical Infrastructure in the Bay of Bengal”. In: *npj Natural Hazards* (2026), p. 175. DOI: 10.1038/s44304-026-00175-x.
- [2] A. Cerrone, L. Westerink, G. Ling, **C. P. Blakely**, D. Wirasaet, C. Dawson, and J. Westerink. “Correcting physics-based global tide and storm water level forecasts with the temporal fusion transformer”. en. In: *Ocean Modelling* (Feb. 2025), p. 102509. ISSN: 14635003. DOI: 10.1016/j.ocemod.2025.102509.
- [3] **C. P. Blakely**, D. Wirasaet, A. R. Cerrone, W. J. Pringle, E. D. Zaron, S. R. Brus, G. N. Seroka, S. Moghimi, E. P. Meyers, and J. J. Westerink. “Dissipation Scaled Internal Wave Drag in a Global Heterogeneously Coupled Internal/External Mode Total Water Level Model”. In: *Journal of Advances in Modeling Earth Systems* 16.12 (2024), e2024MS004502. DOI: 10.1029/2024ms004502.
- [4] **C. P. Blakely**, G. Ling, W. J. Pringle, M. T. Contreras, D. Wirasaet, J. J. Westerink, S. Moghimi, G. Seroka, L. Shi, E. Myers, M. Owensby, and C. Massey. “Dissipation and Bathymetric Sensitivities in an Unstructured Mesh Global Tidal Model”. In: *Journal of Geophysical Research: Oceans* 127.5 (May 2022), e2021JC018178. ISSN: 2169-9291. DOI: 10.1029/2021jc018178.

Technical Reports and Pre-Prints

- [1] G. Ling, D. Wirasaet, J. Westerink, M. T. Contreras Vargas, M. Choi, W. Pringle, **C. P. Blakely**, D. Richter, A. Abdolali, A. Van Der Westhuysen, K. Steffen, C. Dawson, A. Fujisaki-Manome, J. Wang, E. Myers, S. Moghimi, C. Janzen, R. Bochenek, and J. Lopez. *Development and validation of an Alaskan coupled storm surge, tide, wind wave, and sea ice forecasting system*. June 2023. DOI: 10.31223/x5837k.
- [2] M. T. Contreras, B. Woods, **C. P. Blakely**, D. Wirasaet, J. J. Westerink, Z. Cobell, W. J. Pringle, S. Moghimi, S. V. Vinogradov, E. Myers, G. Seroka, M. Lalime, Y. Funakoshi, A. J. van der Westhuysen, A. Abdolali, Z. Ma, F. Liu, E. Valseth, and C. N. Dawson. *A channel-to-basin scale ADCIRC based hydrodynamic unstructured mesh model for the US East and Gulf of Mexico Coasts*. Tech. rep. Silver Spring, MD: NOAA Technical Memorandum NOS CS 41, 2022, p. 47.

Conference Presentations

- [1] **C. P. Blakely**, S. Brus, V. Mahadevan, and I. Grindeanu. “Simulating ocean mesoscale activity with variable resolution mode splitting: a test case”. In: *18th U.S. National Congress on Computational Mechanics* (July 20–24, 2025). USACM. Chicago, IL, USA, July 2025.
- [2] **C. P. Blakely**, W. Pringle, and V. R. Kotamarthi. “Projections of Tropical Cyclone-driven Coastal Flooding Risk to Critical Infrastructure in the Bay of Bengal”. In: *American Geophysical Union Fall Meeting 2024* (Dec. 9–13, 2024). Poster presentation. AGU. Washington, DC, USA, Dec. 2024.
- [3] **C. P. Blakely** and S. Brus. “Accurately Capturing Coastal Water Levels through Variable Resolution Mode Splitting in MPAS-Ocean”. In: *9th European Seminar on Computing* (June 10–14, 2024). Pilsen, Czech Republic, June 2024.
- [4] **C. P. Blakely**, W. Pringle, D. Wirasaet, and J. J. Westerink. “Accurately Capturing Global Tides in a Loosely-Coupled Ocean Circulation and Global Storm Tide Model”. In: *3rd International Workshop on Waves, Storm Surges, and Coastal Hazards Incorporating the 17th International Waves Workshop* (Oct. 1–6, 2023). Notre Dame, IN, USA, Oct. 2023.
- [5] **C. P. Blakely**, D. Wirasaet, J. J. Westerink, and W. Pringle. “Efficiently Incorporating Baroclinic Effects in a Global, Depth-Averaged Storm Tide Model”. In: *American Geophysical Union Fall Meeting 2022* (Dec. 12–16, 2022). Poster presentation. AGU. Chicago, IL, USA, Dec. 2022.
- [6] **C. P. Blakely**, W. Pringle, and J. J. Westerink. “Coupling Global Ocean Circulation and Global Tide and Storm Surge Model”. In: *15th World Congress on Computational Mechanics & 8th Asian Pacific Congress on Computational Mechanics* (July 31–Aug. 5, 2022). Virtual. Yokohama, Japan, Oct. 2022.
- [7] **C. P. Blakely**, G. Ling, D. Wirasaet, and J. Westerink. “Coupling Global Ocean Circulation and Barotropic, Global, Tidal and Storm Surge Model”. In: *12th International Workshop on Modeling the Ocean* (June 28–July 1, 2022). Outstanding Young Scientist Award. Ann Arbor, MI, USA, June 2022.

- [8] **C. P. Blakely**, G. Ling, W. J. Pringle, M. T. Contreras-Vargas, D. Wirasaet, J. Westerink, S. Moghimi, G. Seroka, and L. Shi. "Dissipation Processes in an Unstructured Mesh Global Tidal Model". In: *102nd American Meteorological Society Annual Meeting* (Jan. 23–27, 2022). Virtual. AMS. Houston, TX, USA, Jan. 2022.

SKILLS

Coding Languages	Fortran, Python, C++, MATLAB
Numerical Models	ADCIRC, MPAS-O, E3SM
Tools	Git, Vim, Bash, Amazon Web Services