Stanford

Christine M Baker

Assistant Professor of Civil and Environmental Engineering and, by courtesy, of Oceans

Bio

BIO

Baker's research examines processes at the land-ocean interface, a highly dynamic region with fragile ecosystems, progressively vulnerable communities, and coastal hazards further magnified by a changing climate. Her research integrates laboratory experimentation with numerical modeling and remotely sensed field observations to build our fundamental understanding of hydrodynamics in coastal regions. The goals of her research include informing predictions of coastal water quality, shoreline evolution, and other coastal hazards and improving coastal resiliency in changing environments. Her ongoing and planned projects include studying wave transformation in shallow waters, surf-shelf transport driven by eddy and rip current dynamics, wave-driven sediment transport, and coupled hydro- and morphodynamics in the context of extreme events.

Baker completed a bachelors degrees in Civil Engineering from Oregon State University and a Masters and PhD in Civil & Environmental Engineering from the University of Washington.

ACADEMIC APPOINTMENTS

- Assistant Professor, Civil and Environmental Engineering
- Assistant Professor (By courtesy), Oceans

LINKS

- Lab Website: https://nearshore.stanford.edu/
- Bob & Norma Street Environmental Fluid Mechanics Lab: https://cee.stanford.edu/bob-and-norma-street-environmental-fluid-mechanics-laboratory-efml

Teaching

COURSES

2025-26

- Coastal Processes: CEE 162F (Aut)
- Ocean Waves: CEE 262F, OCEANS 262F (Spr)

2024-25

- Coastal Processes: CEE 162F (Aut)
- Ocean Waves: CEE 262F, OCEANS 262F (Spr)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Sophie Bodek, Erika MacDonald

Postdoctoral Faculty Sponsor

Simon Treillou

Master's Program Advisor

Anna Goldman, Audrey Jung, Yu-Chian Lin, Yichen Wang

Doctoral (Program)

Ashton Pihl, Alex Washburn

Publications

PUBLICATIONS

- **Tracer Dispersion by Surfzone Eddies: Assessing the Impact of Undertow Vertical Shear** *JOURNAL OF PHYSICAL OCEANOGRAPHY*
  Treillou, S., Marchesiello, P., Baker, C. M., McWilliams, J., Dumas, F.
  2025; 55 (8): 1211-1234
- **Modeled Surf-Zone Eddies on a Laboratory Scale Barred Beach With Varying Wave Conditions** *JOURNAL OF GEOPHYSICAL RESEARCH-OCEANS*
  Nuss, E. S., Moulton, M., Suanda, S. H., Baker, C. M.
  2025; 130 (1)
- **Assessing NOAA Rip-Current Hazard Likelihood Predictions: Comparison with Lifeguard Observations and Parameterizations of Bathymetric and Transient Rip-Current Types** *WEATHER AND FORECASTING*
  Casper, A., Nuss, E. S., Baker, C. M., Moulton, M., Dusek, G.
  2024; 39 (7): 1045-1063
- **Correction of coherent interference in wave-resolving nearshore models and validation with experimental data** *OCEAN MODELLING*
  Treillou, S., Marchesiello, P., Baker, C. M.
  2024; 189
- **Measurements of dune erosion processes during the RealDune/REFLEX experiments.** *Scientific data*
  van Wiechen, P., Rutten, J., de Vries, S., Tissier, M., Mieras, R., Anarde, K., Baker, C., Reniers, A., Mol, J. W.
  2024; 11 (1): 421
- **Two-dimensional inverse energy cascade in a laboratory surf zone for varying wave directional spread** *PHYSICS OF FLUIDS*
  Baker, C. M., Moulton, M., Chickadel, C. C., Nuss, E. S., Palmsten, M. L., Brodie, K. L.
  2023; 35 (12)
- **Remotely sensed short-crested breaking waves in a laboratory directional wave basin** *COASTAL ENGINEERING*
  Baker, C. M., Moulton, M., Palmsten, M. L., Brodie, K., Nuss, E., Chickadel, C.
  2023; 183
- **Modeled Three-Dimensional Currents and Eddies on an Alongshore-Variable Barred Beach** *JOURNAL OF GEOPHYSICAL RESEARCH-OCEANS*
  Baker, C. M., Moulton, M., Raubenheimer, B., Elgar, S., Kumar, N.
  2021; 126 (7)
- **Response of Metal Building Cladding to Tsunami Wave Impact Loads** *JOURNAL OF STRUCTURAL ENGINEERING*
  Baker, C., Higgins, C., Liu, J., Yeh, H.
  2020; 146 (11)