Berkeley Lab
1 Cyclotron Road
Berkeley, CA 94720
United States
Email: asbreret@ucsc.edu

Ashley Brereton, Ph.D.

Curriculum Vitae

Academic Positions

- Postdoctoral Scholar, Institute of Marine Sciences, UC Santa Cruz (2023-present)

- Applications Consultant, EPCC, University of Edinburgh (2022-2023)

- Lecturer, Department of Mathematics and Computer Science, Liverpool Hope University (2021 - 2022)

- Postdoctoral Research Associate, Florida Atlantic University, USA (2020 - 2021)

- Research Associate, Yonsei University, South Korea (2018 - 2020)

- Research Associate, National Oceanography Centre (2013 - 2019)

- Visiting Research Fellow, Department of Mathematics, University of Liverpool (2013-present)

Research Interests

- Comprehensive theoretical knowledge of oceanic processes across scales and biological population dynamics

- Expertise in utilizing advanced computational techniques to gain insight into marine ecosystems and their role in biogeochemical cycles.

- Proficiency in employing numerical modeling techniques and optimization methods to analyze large datasets, uncover patterns, and elucidate mechanisms in complex systems.

- Extensive experience in applying novel deep learning methods to develop meaningful forecasting tools for intricate biochemical systems.

- Highly proficient in programming languages including MATLAB, Python, Fortran, C/C++, Bash, Linux, OpenMP, and MPI.

- Skilled in developing and deploying sophisticated models on high-performance computing platforms.

Education

- Ph.D. in Applied Mathematics, University of Liverpool, 2014

- B.Sc. (1st class hons) in Mathematics, University of Liverpool, 2009

Teaching Experience

- Foundation: Mathematics and computer science

- Undergraduate: Fourier Series, Laplace transforms, Partial and Ordinary Differential Equations, Matlab.

Other Experience

- Scientific computing advisory group representative, National Oceanography Centre

Journal Publications

- **Brereton, A.**, Noh, Y., & Raasch, S. (2020). Modelling a simple mechanism for the formation of phytoplankton thin layers using large-eddy simulation: in situ growth. *Marine Ecology Progress Series*, 653, 77-90.

- Blackford, J., Alendal, G., Avlesen, H., **Brereton, A.**, Cazenave, P.W., Chen, B., Dewar, M., Holt, J. and Phelps, J. (2020). Impact and detectability of hypothetical CCS offshore seep scenarios as an aid to storage assurance and risk assessment. *International Journal of Greenhouse Gas Control*, 95, p.102949.

- James, M.K., Polton, J.A., **Brereton, A.**, Howell, K.L., Nimmo-Smith, W.A.M. and Knights, A.M. (2019). Reverse engineering field-derived vertical distribution profiles to infer larval swimming behaviors. *Proceedings of the National Academy of Sciences*, 116(24), pp.11818-11823.

- **Brereton, A.**, Tejada-Martínez, A.E., Palmer, M.R. and Polton, J.A. (2019). The perturbation method-A novel large-eddy simulation technique to model realistic turbulence: Application to tidal flow. *Ocean Modelling*, 135, pp.31-39.

- **Brereton, A.**, Siddons, J. and Lewis, D.M. (2018). Large-eddy simulation of subsurface phytoplankton dynamics: an optimum condition for chlorophyll patchiness induced by Langmuir circulations. *Marine Ecology Progress Series*, 593, pp.15-27.

- Lewis, H. W., **et al.** (2018). The UKC2 regional coupled environmental prediction system. *Geoscientific Model Development*, 11(1), pp.1-42.

- Graham, J.A., O'Dea, E., Holt, J., Polton, J., Hewitt, H.T., Furner, R., Guihou, K., **Brereton, A.**, Arnold, A., Wakelin, S. and Sanchez, J.M.C., 2018. AMM15: a new high-resolution NEMO configuration for operational simulation of the European north-west shelf. *Geoscientific Model Development*, 11(2), p.681.

- Lewis, D.M., **Brereton, A.** and Siddons, J.T., 2017. A large eddy simulation study of the formation of deep chlorophyll/biological maxima in un□stratified mixed layers: The roles of turbulent mixing and predation pressure. *Limnology and Oceanography*, 62(5), pp.2277-2307.

- Wolf, J., Yates, N., **Brereton, A.**, Buckland, H., De Dominicis, M., Gallego, A. and O'Hara Murray, R., 2016. The Scottish shelf model. Part 1: shelf-wide domain. *Scottish Marine and Freshwater Science*, 7(3), p.151.

- Hughes, V., **Brereton, A.** and Gold, E., 2013. Reference sample size and the computation of numerical likelihood ratios using articulation rate. *York Papers in Linguistics*, 13, pp.22-46.

Referees

Available on request.