Alexandra BOZEC

PhD, Physical Oceanography | Senior Research Associate
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Areas of Interest

• Physical oceanography and numerical ocean modeling
• Global circulation dynamics with a focus on the Gulf of Mexico
• Data assimilation and model evaluation
• Ocean model intercomparison and reanalysis (HYCOM, OMIP, MOM6)
• Climate variability and ocean-atmosphere interactions

Current Research

Currently working on high-resolution ocean modeling and data assimilation strategies in the Gulf of Mexico using HYCOM (hycom.org) and the data assimilation system TSIS (tendral.com). Focus areas include mesoscale eddy dynamics and the integration of "high-resolution" observations into predictive frameworks.

Professional experience

Aug 2023 – present	Senior Research Associate at COAPS
Aug 2015 – Jul 2023	Associate in Research at COAPS
Sep 2011 – Jul 2015	Assistant in Research at COAPS
Sep 2009 – Aug 2011	Assistant Scholar/Scientist at COAPS
Sep 2006 – Aug 2009	Postdoctoral fellow at COAPS on the variability of the Mediterranean outflow using the HYCOM ocean model (E. Chassignet)
Feb 2006 – Aug 2006	Postdoctoral fellow at Laboratoire des Sciences du Climat et de l'Environnement (LSCE) on the thermohaline circulation of the Mediterranean Sea during the Last Glacial Maximum (M. Kageyama, G. Ramstein)
Nov 2001 – Dec 2002	Engineer at Laboratoire d'Océanographie Dynamique et de Climatologie (LODYC, now LOCEAN) on the development of the NEMO model (G. Madec)

Education

Jan 2003 – Jan 2006	PhD on the thermohaline circulation of the Mediterranean Sea under present and future climates (P. Bouruet-Aubertot, L. Li) at Laboratoire d'Océanographie et de Climatologie –Expérimentations et Approches Numériques- (LOCEAN), Université Paris VI, Paris, France
Oct 2000 – Jul 2001	Master in Oceanology, Meteorology and Environment at Université Bretagne Occidentale, Brest, France
Sep1996 – Sep 2000	Bachelor degree in Fundamental Physics at Université Bretagne Occidentale, Brest, France

Publications in the last 5 years

Gahounzo, Y., et al. (A. Bozec), 2025: High-order discontinuous Galerkin schemes for the barotropic-baroclinic splitting in two-dimensional layered shallow water equations, Journ. Of Comput. Phys., submitted.

Zavala-Romero, O., A. Bozec, E. P. Chassignet, and J.R. Miranda, 2025: Convolutional neural networks for sea surface data assimilation in operational ocean models: test case in the Gulf of Mexico, Ocean Sci., 21, 113–132, https://doi.org/10.5194/os-21-113-2025.

Hiron, L, et al. (A. Bozec), 2025: The influence of vertical resolution on internal tide energetics and subsequent effects on underwater acoustic propagation. Journal of Advances in Modeling Earth Systems, 17, https://doi.org/10.1029/2024MS004389.

Ntaganou, N., et al. (A. Bozec), 2024: Impact of Horizontal Model Resolution on Mixing and Dispersion in the Northeastern Gulf of Mexico, Journ. Geophys. Res., vol 129,11, https://doi.org/10.1029/2024JC021315.

Ivanov, L., et al., (A. Bozec), 2024: Process-Oriented Validation of HYCOM-TSIS reanalysis runs for the Northern Gulf of Mexico, Offshore Technology Conference, Houston, Texas, OTC-35402-MS, https://doi.org/10.4043/35402-MS.

Voss, D., et al. (A. Bozec), 2024: Data Assimilation with Ocean Models: A Case Study of Reduced Precision and Machine Learning in the Gulf of Mexico. In: Zeinalipour, D., et al. Euro-Par 2023: Parallel Processing Workshops. Euro-Par 2023. Lecture Notes in Computer Science, vol 14352. Springer, Cham., https://doi.org/10.1007/978-3-031-48803-0_33.

Wang, Q. et al., (A. Bozec), 2024: Impact of increased resolution on Arctic Ocean simulations in Ocean Model Intercomparison Project phase 2 (OMIP-2),Geosci. Model Dev., 17, 347-379, https://doi.org/10.5194/gmd-17-347-2024.

Raja, K. J., et al. (A. Bozec), 2023: Spurious internal wave generation during data assimilation in eddy resolving ocean model simulations, Ocean Modelling, 188, https://doi.org/10.1016/j.ocemod.2024.102340.

Tréguier, A.-M., et al. (A. Bozec), 2023: The Mixed Layer Depth in the Ocean Model Intercomparison Project (OMIP): Impact of Resolving Mesoscale Eddies, Geosci. Model Dev., 16, 3849–3872, https://doi.org/10.5194/gmd-16-3849-2023.

Dukhovskoy, D., Chassignet E.P., Bozec A. and S. Morey, 2023: Assessment of predictability of the Loop Current system in the Gulf of Mexico from observing system experiments and observing system simulation experiments, Frontiers of Marine Science, doi:10.3389/fmars.2023.1153824.

Chassignet, E.P., Xu, X. and A. Bozec, 2023: Impact of the New England seamount chain on Gulf Stream pathway and variability, Journ. Of Oceanogr, 53, 1871-1886, doi:10.1175/JPO-D-23-0008.1.

Hiron, L. et al (A. Bozec), 2022: Lagrangian coherence, source of water, and cross-shelf exchange associated with Loop Current Frontal Eddies in the Gulf of Mexico, Prog. in Oceanogr., https://doi.org/10.1016/j.pocean.2022.102876.

Chassignet, E.P et al. (A. Bozec), 2020: Impact of horizontal resolution on the energetics of global ocean-sea-ice model simulations, CLIVAR Variations/Exchanges, 18(1), 23-30, doi:10.5065/g8w0-fy32.

Chassignet, E.P. et al (A. Bozec), 2020: Impact of horizontal resolution on global ocean-sea-ice model simulations based on the experimental protocol of the Ocean Model Intercomparison Project phase 2 (OMIP-2), Geosci. Model Dev., doi:10.5194/gmd-2019-374.

Tsujino, H. et al. (A. Bozec), 2020: Evaluation of global ocean-sea-ice model simulations based on the experimental protocols of the Ocean Model Intercomparison Project phase 2 (OMIP-2), Geosci. Model Dev., https://doi.org/10.5194/gmd-13-3643-2020.

Products

Bozec, A., Chassignet, E.P., Srinivasan, A., 2024: HYCOM-TSIS Gulf of Mexico reanalyses at 1km and 4km, available for download on https://www.hycom.org/dataserver/gom/gom-reanalysis .

Bozec, A., Chassignet, E.P., 2017: HYCOM-BB86 package or HYCOM for Dummies: How to create a double gyre configuration with HYCOM from scratch, https://github.com/abozec/BB86_PACKAGE.