

Publications

* PhD students or Post-Docs where I acted as main supervisor

+ PhD students where I acted as daily supervisor

In preparation

Brüggemann, N., L. Linardakis and P. Korn: Testing our Knowledge of Submesoscale Ocean Dynamics with a Global Ocean Model. *in prep. for Journal of Physical Oceanography*

Hillenkötter*, D. and **Brüggemann, N.**: Mesoscale eddy dissipation in eddy resolving ocean models.

Karvinen⁺, M., **Brüggemann, N.** and Marotzke, J.: Tropical Cyclones in Decadal High-Resolution Simulations.

Submitted

Ssebandeke⁺, J., **N. Brüggemann**, and J.S. von Storch: Fate of ocean's energetics in a warmer world. *submitted to Journal of Physical Oceanography*

Peer-reviewed publications

Kumar⁺ A.U., **N. Brüggemann**, J. Marotzke, 2026: Ocean Eddies Lower the Global-Mean, Maximum Intensity of Tropical Cyclones in a One-Year Global, Coupled Simulation. *Geophysical Research Letters*, **53**(2), e2025GL116072, 10.1029/2025GL116072.

Nielsen D.M., F. Chegini, N. Serra, A. Kumar⁺, **N. Brüggemann**, C. Hohenegger, T. Ilyina, 2025: Resolved Tropical Cyclones Trigger CO₂ Uptake and Phytoplankton Bloom in an Earth System Model Simulation. *Proceedings of the National Academy of Sciences*, **122**(50), e2506103122, 10.1073/pnas.2506103122.

Epke* M., L. Linardakis, P. Korn, **N. Brüggemann**, 2025: Overturning of Mixed Layer Eddies in a Submesoscale Resolving Simulation of the North Atlantic. *Journal of Physical Oceanography*, -1, , 10.1175/JPO-D-25-0015.1.

Segura H., X. Pedruzo-Bagazgoitia, P. Weiss, S.K. Müller, T. Rackow, J. Lee, E. Dolores-Tesillos, I. Benedict, M. Aengenheyster, R. Aguridan, G. Arduini, A.J. Baker, J. Bao, S. Bastin, E. Baulenas, T. Becker, S. Beyer, H. Bockelmann, **N. Brüggemann**, L. Brunner, S.K. Cheedela, S. Das, J. Denissen, I. Dragaud, P. Dziekan, M. Ekblom, J.F. Engels, M. Esch, R. Forbes, C. Frauen, L. Freischem, D. García-Maroto, P. Geier, P. Gierz, Á. González-Cervera, K. Grayson, M. Griffith, O. Gutjahr*, H. Haak, I. Hadade, K. Haslehner, S.u. Hasson, J. Hegewald, L. Kluft, A. Koldunov, N. Koldunov, T. Kölling, S. Koseki, S. Kosukhin, J. Kousal, P. Kuma, A.U. Kumar⁺, R. Li, N. Maury, M. Meindl, S. Milinski, K. Mogensen, B. Niraula, J. Nowak, D.S. Praturi, U. Proske, D. Putrasahan, R. Redler, D. Santuy, D. Sármany, R. Schnur, P. Scholz, D. Sidorenko, D. Spät, B. Sützl, D. Takasuka, A. Tompkins, A. Uribe, M. Valentini, M. Veerman, A. Voigt, S. Warnau, F. Wachsmann, M. Wacławczyk, N. Wedi, K. Wieners, J. Wille, M. Winkler, Y. Wu, F. Ziemer, J. Zimmermann, F.A. Bender, D. Bojovic, S. Bony, S. Bordoni, P. Brehmer, M. Dengler, E. Dutra, S. Faye, E. Fischer, C.v. Heerwaarden, C. Hohenegger, H. Järvinen, M. Jochum, T. Jung, J.H. Jungclaus, N.S. Keenlyside, D. Klocke, H. Konow, M. Klose, S. Malinowski, O. Martius, T. Mauritsen, J.P. Mellado, T. Mieslinger, E. Mohino, H. Pawłowska, K. Peters-von Gehlen, A. Sarré, P. Sobhani, P. Stier, L. Tuppi, P.L. Vidale, I. Sandu, B. Stevens, 2025: nextGEMS: Entering the Era of Kilometer-Scale Earth System Modeling. *Geoscientific Model Development*, **18**(20), 7735–7761, 10.5194/gmd-18-7735-2025.

Müller W.A., S. Lorenz, T.V. Pham, A. Schneider, R. Brokopf, V. Brovkin, **N. Brüggemann**, F. Chegini, D. Dommenget, K. Fröhlich, B. Früh, V. Gayler, H. Haak, S. Hagemann, M. Hanke, T. Ilyina, J. Jungclaus, M. Köhler, P. Korn, L. Kornbluh, C.A. Kroll, J. Krüger, K. Castro-Morales, U. Niemeier, H. Pohlmann,

- I. Polkova, R. Potthast, T. Riddick, M. Schlund, T. Stacke, R. Wirth, D. Yu, J. Marotzke, 2025: The ICON-based Earth System Model for Climate Predictions and Projections (ICON XPP v1.0). *Geoscientific Model Development*, **18**(23), 9385–9415, 10.5194/gmd-18-9385-2025.
- Bastin S., A. Koldunov, F. Schütte, O. Gutjahr*, M.A. Mrozowska, T. Fischer, R. Shevchenko, A. Kumar⁺, N. Koldunov, H. Haak, **N. Brüggemann**, R. Hummels, M.S. Specht, J. Jungclaus, S. Danilov, M. Dengler, M. Jochum, 2024: Sensitivity of the Tropical Atlantic to Vertical Mixing in Two Ocean Models (ICON-O v2.6.6 and FESOM v2.5). *EGUsphere*, **2024**, 1–44, 10.5194/egusphere-2024-2281.
- Brüggemann N.**, M. Losch, P. Scholz, F. Pollmann, S. Danilov, O. Gutjahr*, J. Jungclaus, N. Koldunov, P. Korn, D. Olbers, C. Eden, 2024: Parameterized Internal Wave Mixing in Three Ocean General Circulation Models. *Journal of Advances in Modeling Earth Systems*, **16**(6), e2023MS003768, 10.1029/2023MS003768.
- Storch J.v., E. Hertwig, V. Lüschor, **N. Brüggemann**, H. Haak, P. Korn, V. Singh, 2023: Open-Ocean Tides Simulated by ICON-O, Version Icon-2.6.6. *Geoscientific Model Development*, **16**(17), 5179–5196, 10.5194/gmd-16-5179-2023.
- Hohenegger C., P. Korn, L. Linardakis, R. Redler, R. Schnur, P. Adamidis, J. Bao, S. Bastin, M. Behraves, M. Bergemann, J. Biercamp, H. Bockelmann, R. Brokopf, **N. Brüggemann**, L. Casaroli, F. Chegini, G. Datseris, M. Esch, G. George, M. Giorgetta, O. Gutjahr*, H. Haak, M. Hanke, T. Ilyina, T. Jahns, J. Jungclaus, M. Kern, D. Klocke, L. Kluft, T. Kölling, L. Kornblueh, S. Kosukhin, C. Kroll, J. Lee, T. Mauritsen, C. Mehlmann, T. Mieslinger, A.K. Naumann, L. Paccini, A. Peinado, D.S. Praturi, D. Putrasahan, S. Rast, T. Riddick, N. Roeber, H. Schmidt, U. Schulzweida, F. Schütte, H. Segura, R. Shevchenko, V. Singh, M. Specht, C.C. Stephan, J.v. Storch, R. Vogel, C. Wengel, M. Winkler, F. Ziemer, J. Marotzke, B. Stevens, 2023: ICON-Sapphire: Simulating the Components of the Earth System and Their Interactions at Kilometer and Subkilometer Scales. *Geoscientific Model Development*, **16**(2), 779–811, 10.5194/gmd-16-779-2023.
- Ssebandeke⁺ J., J.v. Storch, **N. Brüggemann**, 2023: Sensitivity of the Lorenz Energy Cycle of the Global Ocean. *Ocean Dynamics*, **74**, 1–16, 10.1007/s10236-023-01568-6.
- Korn P., **N. Brüggemann**, J.H. Jungclaus, S.J. Lorenz, O. Gutjahr*, H. Haak, L. Linardakis, C. Mehlmann, U. Mikolajewicz, D. Notz, D.A. Putrasahan, V. Singh, J.v. Storch, X. Zhu, J. Marotzke, 2022: ICON-O: The Ocean Component of the ICON Earth System Model—Global Simulation Characteristics and Local Telescoping Capability. *J Adv Model Earth Syst*, **14**(10), e2021MS002952, 10.1029/2021MS002952.
- Gutjahr* O., J.H. Jungclaus, **N. Brüggemann**, H. Haak, J. Marotzke, 2022: Air-Sea Interactions and Water Mass Transformation During a Katabatic Storm in the Irminger Sea. *Journal of Geophysical Research: Oceans*, **127**(5), e2021JC018075, 10.1029/2021JC018075.
- Jungclaus J.H., S.J. Lorenz, H. Schmidt, V. Brovkin, **N. Brüggemann**, F. Chegini, T. Crüger, P. De-Vrese, V. Gayler, M.A. Giorgetta, O. Gutjahr*, H. Haak, S. Hagemann, M. Hanke, T. Ilyina, P. Korn, J. Kröger, L. Linardakis, C. Mehlmann, U. Mikolajewicz, W.A. Müller, J.E.M.S. Nabel, D. Notz, H. Pohlmann, D.A. Putrasahan, T. Raddatz, L. Ramme, R. Redler, C.H. Reick, T. Riddick, T. Sam, R. Schneck, R. Schnur, M. Schupfner, J.v. Storch, F. Wachsmann, K. Wieners, F. Ziemer, B. Stevens, J. Marotzke, M. Claussen, 2022: The ICON Earth System Model Version 1.0. *Journal of Advances in Modeling Earth Systems*, **14**(4), e2021MS002813, 10.1029/2021MS002813.
- Kumar⁺ A.U., **N. Brüggemann**, R.K. Smith, J. Marotzke, 2021: Response of a Tropical Cyclone to a Subsurface Ocean Eddy and the Role of Boundary Layer Dynamics. *Q.J.R. Meteorol. Soc.*, **n/an/a**, 10.1002/qj.4210.
- Gutjahr* O., **N. Brüggemann**, H. Haak, J.H. Jungclaus, D.A. Putrasahan, K. Lohmann, J.v. Storch, 2021: Comparison of Ocean Vertical Mixing Schemes in the Max Planck Institute Earth System Model (MPI-ESM1.2). *Geoscientific Model Development Discussions*, **2020**, 1–47, 10.5194/gmd-2020-202.
- Georgiou⁺ S., S.L. Ypma, **N. Brüggemann**, J. Sayol, C.G.v.d. Boog, P. Spence, J.D. Pietrzak, C.A. Katsman, 2021: Direct and Indirect Pathways of Convected Water Masses and Their Impacts on the Overturning Dynamics of the Labrador Sea. *J. Geophys. Res. Oceans*, **126**(1), e2020JC016654, 10.1029/2020JC016654.

- Georgiou⁺ S., S.L. Ypma, **N. Brüggemann**, J. Sayol, J.D. Pietrzak, C.A. Katsman, 2020: Pathways of the Water Masses Exiting the Labrador Sea: The Importance of Boundary-Interior Exchanges. *Ocean Modelling*, **150**, 101623, .
- Brüggemann N.**, C.A. Katsman, 2019: Dynamics of Downwelling in an Eddyding Marginal Sea: Contrasting the Eulerian and the Isopycnal Perspective. *J. Phys. Oceanogr.*, **49**(11), 3017–3035, 10.1175/jpo-d-19-0090.1.
- Boog C.G.v.d., J.D. Pietrzak, H.A. Dijkstra, **N. Brüggemann**, R.M.v. Westen, R.K. James, T.J. Bouma, R.E.M. Riva, D.C. Slobbe, R. Klees, M. Zijlema, C.A. Katsman, 2019: The Impact of Upwelling on the Intensification of Anticyclonic Ocean Eddies in the Caribbean Sea. *Ocean Science Discussions*, **2019**, 1–28, 10.5194/os-2019-51.
- Gutjahr* O., D. Putrasahan, K. Lohmann, J.H. Jungclaus, J.v. Storch, **N. Brüggemann**, H. Haak, A. Stössel, 2019: Max Planck Institute Earth System Model (MPI-ESM1.2) for the High-Resolution Model Intercomparison Project (HighResMIP). *Geoscientific Model Development*, **12**(7), 3241–3281, 10.5194/gmd-12-3241-2019.
- Georgiou⁺ S., C.G.v.d. Boog, **N. Brüggemann**, S.L. Ypma, J.D. Pietrzak, C.A. Katsman, 2019: On the Interplay between Downwelling, Deep Convection and Mesoscale Eddies in the Labrador Sea. *Ocean Modelling*, **135**, 56–70, 10.1016/j.ocemod.2019.02.004.
- Ypma S.L., **N. Brüggemann**, S. Georgiou⁺, P. Spence, H.A. Dijkstra, J.D. Pietrzak, C.A. Katsman, 2019: Pathways and Watermass Transformation of Atlantic Water Entering the Nordic Seas through Denmark Strait in Two High Resolution Ocean Models. *Deep Sea Research Part I: Oceanographic Research Papers*, **145**, 59–72, 10.1016/j.dsr.2019.02.002.
- Chouksey⁺ M., C. Eden, **N. Brüggemann**, 2018: Internal Gravity Wave Emission in Different Dynamical Regimes. *Journal of Physical Oceanography*, **48**(8), 1709–1730, 10.1175/JPO-D-17-0158.1.
- Waldman R., **N. Brüggemann**, A. Bosse, M. Spall, S. Somot, F. Sevault, 2018: Overturning the Mediterranean Thermohaline Circulation. *Geophysical Research Letters*, **45**(16), 8407–8415, 10.1029/2018GL078502.
- Brüggemann N.**, C.A. Katsman, H.A. Dijkstra, 2017: On the Vorticity Dynamics of the Downwelling Branch of the AMOC. *CLIVAR Exchanges*, **71**, 10–12, .
- Brüggemann N.**, C. Eden, 2015: Routes to Dissipation under Different Dynamical Conditions. *Journal of Physical Oceanography*, **45**(8), 2149–2168, 10.1175/JPO-D-14-0205.1.
- Mohammadi-Aragh M., K. Klingbeil, **N. Brüggemann**, C. Eden, H. Burchard, 2015: The Impact of Advection Schemes on Restratification Due to Lateral Shear and Baroclinic Instabilities. *Ocean Modelling*, **94**, 112–127, .
- Brüggemann N.**, C. Eden, 2014: Evaluating Different Parameterizations for Mixed Layer Eddy Fluxes Induced by Baroclinic Instability. *Journal of Physical Oceanography*, **44**(9), 2524–2546, 10.1175/JPO-D-13-0235.1.
- Brüggemann N.**, C. Eden, D. Olbers, 2011: A Dynamically Consistent Closure for Zonally Averaged Ocean Models. *Journal of Physical Oceanography*, **41**(11), 2242–2258, 10.1175/JPO-D-11-021.1.

Other publications

- Brüggemann N.**, 2014: Ageostrophic effects on large scale circulation, eddy mixing and dissipation in the ocean. PhD thesis, University of Hamburg. Supervisor: Carsten Eden.
- Brüggemann N.**, 2009: A zonally averaged ocean model of the Atlantic circulation. Diplomathesis, Alfred Wegener Institute, Bremerhaven. Supervisor: Dirk Olbers.