Dr. Florian Börgel

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https://florianboergel.github.io/

Professional Employment

2021 – · · · · **Tenure-track researcher** Dynamics of regional climate systems, Leibniz Institute for Baltic Sea Research.

- Remote connection between North Atlantic and Baltic Sea
- Forecasting river runoff using Recurrent Neural Networks
- Oxygen variability during the last millennium

2019 - 2020 **Parental leave** 15 months

2017 - 2020 **Research scientist** Dynamics of regional climate systems, Leibniz Institute for Baltic Sea Research

2016 - 2017 **Research assistant** Biogeochemial modeling, Leibniz Institute for Baltic Sea Research

2014 - 2015 **Research assistant** Energy Systems Analysis, Fraunhofer Institute for Manufacturing Technology and Applied Materials

Technical support EWE Baskets Oldenburg

2013 - 2014 **Student assistant** Planning group for enviroment and climcate concepts for cities, energieLenker GmbH,

Education

09/2017 – 10/2020 **Ph.D., Physics** in Physical Oceanography, with honors (summa cum laude), Leibniz Institute for Baltic Sea Research
Thesis title: *Long-term climate variability of the Baltic Sea*

10/2014 – 09/2017 **M.Sc. Engineering Physics** in Computational physics, very good (1.2), University of Oldenburg
Thesis title: *The influence of sea ice on Baltic inflows.*

09/2010 – 02/2014 **B.Eng. Energy Engineering**, good (2.0), Münster University of Applied Sciences
Thesis title: *Planning of a local area heating system in the historic city of Warendorf.*

Research Publications

Journal Articles

1. **Börgel**, **F.**, Gröger, M., Meier, H. E. M., Dutheil, C., Radtke, H., & Borchert, L. (n.d.). Tracing the fingerprint of multi-decadal fluctuations in the Baltic Sea. *npj - Climate and atmosphere*. under review.
2. Dutheil, C., Meier, H. E. M., Gröger, M., & **Börgel**, **F.** (n.d.). Warming of Baltic Sea water masses since 1850. *Journal of Climate*. under review.
3. Gröger, M., Placke, M., Meier, M., **Börgel**, **F.**, Brunnabend, S.-E., Dutheil, C., … Väli, G. (2022). The Baltic Sea Model Inter-Comparison Project BMIP – a Platform for Model Development, Evaluation, and Uncertainty Assessment. *Geoscientific Model Development Discussions*, 1–34. Publisher: Copernicus GmbH. doi:10.5194/gmd-2022-160

4 **Börgel**, **F.**, Meier, H. E. M., Gröger, M., Rhein, M., Dutheil, C., & Kaiser, J. M. (2022). Atlantic Multidecadal Variability and the Implications for North European Precipitation. *Environmental Research Letters*, *17*(4), 044040. Publisher: IOP Publishing. doi:10.1088/1748-9326/ac5ca1

5 Meier, H. E. M., Kniebusch, M., Dieterich, C., Gröger, M., Zorita, E., Elmgren, R., … Zhang, W. (2022). Climate Change in the Baltic Sea Region: A Summary. *Earth System Dynamics*, *13*(1), 457–593. Publisher: Copernicus GmbH. doi:10.5194/esd-13-457-2022

6 Meier, H. E. M., Dieterich, C., Gröger, M., Dutheil, C., **Börgel**, **F.**, Safonova, K., … Kjellström, E. (2022). Oceanographic Regional Climate Projections for the Baltic Sea until 2100. *Earth System Dynamics*, *13*(1), 159–199. Publisher: Copernicus GmbH. doi:10.5194/esd-13-159-2022

7 Dutheil, C., Meier, H. E. M., Gröger, M., & **Börgel**, **F.** (2021). Understanding Past and Future Sea Surface Temperature Trends in the Baltic Sea. *Climate Dynamics*. doi:10.1007/s00382-021-06084-1

8 **Börgel**, **F.**, Frauen, C., Neumann, T., & Meier, H. E. M. (2020). The Atlantic Multidecadal Oscillation Controls the Impact of the North Atlantic Oscillation on North European Climate. *Environmental Research Letters*, *15*(10), 104025. Publisher: IOP Publishing. doi:10.1088/1748-9326/aba925

9 Meier, H. E. M., **Börgel**, **F.**, Frauen, C., & Radtke, H. (2020). Commentary: Lake or Sea? The Unknown Future of Central Baltic Sea Herring. *Frontiers in Ecology and Evolution*, *8*. Retrieved September 24, 2022, from https://www.frontiersin.org/articles/10.3389/fevo.2020.00055

10 Radtke, H., **Börgel**, **F.**, Brunnabend, S.-E., Eggert, A., Kniebusch, M., Meier, H. E. M., … Placke, M. (2019). Validator – a Web-Based Interactive Tool for Validation of Ocean Models at Oceanographic Stations. *Journal of Open Research Software*, *7*(1), 18. Number: 1 Publisher: Ubiquity Press. doi:10.5334/jors.259

11 Kniebusch, M., Meier, H. M., Neumann, T., & **Börgel**, **F.** (2019). Temperature Variability of the Baltic Sea Since 1850 and Attribution to Atmospheric Forcing Variables. *Journal of Geophysical Research: Oceans*, *124*(6), 4168–4187. doi:10.1029/2018JC013948

12 **Börgel**, **F.**, Frauen, C., Neumann, T., Schimanke, S., & Meier, H. E. (2018). Impact of the Atlantic Multidecadal Oscillation on Baltic Sea Variability. *Geophysical Research Letters*, *45*(18), 9880–9888. doi:10.1029/2018GL078943

Skills

Languages	German (native), English (C1), French (B1)
Coding	**Expert**: python, Matlab, Linux/Unix, git, HPC computing, Twitter API **Advanced**: R, Fortran, Pytorch, julia, docker **Basic**: Django, C, HTML, Java, Tensorflow
Methods	Singular Value Decomposition, low-frequency component analysis, multi regression analysis for data prediction, time series prediction using recurrent neural networks, cluster analysis (kmeans), big data handling (TB), wavelet analysis, multiple correspondence analysis

Software Development

pyTEF	**pyTEF** is a python package that can be used to apply the total exchange analysis framework to analyze the exchange flow of an estuary. https://github.com/florianboergel/pyTEF
Twitter API	**Twitter bot @ozeanforscher** was built using the Twitter API and posts job offers related to marine science. It has about 1,750 followers. For more see https://florianboergel.github.io/outreach/forum_wisskomm_2018

Teaching

WS 2021/2022	**Baltic Earth Winter School** University of Rostock, master and Ph.D. students, Interactive lecture about wavelet analysis and statistics
WS 2021/2022	**Climate of the ocean** University of Rostock, master level, co-instructor
WS 2020/2021	**Climate of the ocean** University of Rostock, master level, co-instructor
WS 2018/2019	**Baltic Earth Winter School** University of Rostock, Interactive lecture about wavelet analysis
WS 2018/2019	**Climate of the ocean** University of Rostock, master level, co-instructor

Supervising

since 2022 **PhD student** Leonie Barghorn, co-supervisor
Thesis title: *Understanding Baltic Sea saltwater inflow dynamics under changing climate*

Scientific Presentations

2022 **Research Unit Climate Modeling, University of Hamburg**, speaker, *Atlantic Multidecadal Variability and the implications for North European Climate*

Baltic Earth Conference, Speaker, *Atlantic Multidecadal Variability and the implications for North European Climate*

2021 **University of Bremen - physics seminar**, speaker, *Atlantic Multidecadal Variability and the implications for North European Climate*

EGU General Assembly *The Atlantic Multidecadal Oscillation controls the impact of the North Atlantic Oscillation on North European climate*

2019 **EGU General Assembly**, poster session, *The impact of the Atlantic Multidecadal Oscillation on Baltic Sea variability*

2018 **Baltic Earth Conference**, speaker, *The impact of the Atlantic Multidecadal Oscillation on Baltic Sea variability*

2017 **Baltic Sea Science Congress**, poster session, *The influence of sea ice on Baltic Inflows*

Outreach

2022 Visit of Katrin Zschau (member of the german parliament), I presented the ongoing activities related to climate modeling

2020 Visit of Dr. Ingrid Nestle (member of the german parliament), I invited Dr. Nestle and organized her visit to the Leibniz Institute for Baltic Sea Research

2019 Coastal Research on Tour, I presented my research to a broad audience, organized by Hereon

Warnemünder Abende, Presenting my research to a broad audience, organized by Leibniz-Institute for Baltic Sea Research

Rostock's Eleven, science communication challenge, nominee for the Leibniz Institute for Baltic Sea Research

2018 Create your own #Scicomm bot, speaker, host of an interactive session at Forum Wissenschaftskommunikation (German forum science communication)