

# 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** Biogeochemical 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 environment and climate 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.*

## Honors and relevant responsibilities

- 2023    📌 **Outstanding Early Career Scientist award** Ocean Science Division, European Geosciences Union
- 2022    📌 **Nominee for the Ocean Circulation & Climate Strategy Group** A joint initiative of the German Climate Consortium and KDM
- 2014    📌 **Fulbright Scholarship** Full scholarship to study in the United States for one year (not attended for personal reasons)

## 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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/10.1029/2018GL078943)







## Skills

Languages	<div></div> German (native), English (C1), French (B1)
Coding	<div></div> <b>Expert:</b> python, Matlab, Linux/Unix, git, HPC computing, Twitter API <b>Advanced:</b> R, Fortran, Pytorch, julia, docker <b>Basic:</b> Django, C, HTML, Java, Tensorflow
Methods	<div></div> 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 @oceanforscher** 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](https://florianboergel.github.io/outreach/forum_wisskomm_2018)








## Teaching

- WS 2022/2023      **Climate of the Earth** University of Rostock, master level, co-instructor
- 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

## Outreach (continued)

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- 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)