

# 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, Germany, Rostock
- Regional climate variability and the teleconnection between the North Atlantic and Northern Europe
  - Forecasting river runoff using Recurrent Neural Networks
  - Ocean 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, Germany, Rostock
- 2016 – 2017  **Research assistant** Biogeochemical modeling, Leibniz Institute for Baltic Sea Research, Germany, Rostock
- 2014 – 2015  **Research assistant** Energy Systems Analysis, Fraunhofer Institute for Manufacturing Technology and Applied Materials, Germany, Bremen
-  **Technical support** EWE Baskets Oldenburg, Germany, Oldenburg
- 2013 – 2014  **Student assistant** Engineering company for environment and climate action plans for cities, energieLenker GmbH, Germany, Münster

## Education

- 09/2017 – 10/2020  **Ph.D., Physics** in Physical Oceanography, with honors (summa cum laude), Leibniz Institute for Baltic Sea Research
- 10/2014 – 09/2017  **M.Sc. Engineering Physics** in Computational physics, very good (1.2), University of Oldenburg
- 09/2010 – 02/2014  **B.Eng. Energy Engineering**, good (2.0), Münster University of Applied Sciences

## Honors and relevant responsibilities

- 2023  **Co-Speaker Baltic Earth Working Group** The international working group focuses on the impact of the North Atlantic on the Baltic Sea from synoptic to decadal/centennial time scales (more at [https://baltic.earth/working\\_groups/teleconnections/](https://baltic.earth/working_groups/teleconnections/))
-  **Outstanding Early Career Scientist award** Ocean Science Division, European Geosciences Union, <https://www.egu.eu/awards-medals/>
-  **IOW appointee for the Deutsches Klima-Konsortium (DKK)** The Deutsches Klima-Konsortium (DKK) represents the leading players of German climate and climate impact research.
- 2021  **Google Cloud Research Grant** Forecasting river runoff using Recurrent Neural Networks, worth 2,500€
- 2014  **Fulbright Scholarship** Full scholarship to study in the United States for one year (not attended for personal reasons)

## Skills

Languages	■ German (native), English (C1), French (B1)
Coding	■ <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	■ Singular value decomposition, low-frequency component analysis, multi-regression analysis for data prediction, time series prediction using recurrent neural networks, cluster analysis (k-Means), big data handling (TB), wavelet analysis

## Software Development

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

## Teaching

WS 2022/2023	■ <b>Climate of the Earth</b> University of Rostock, master level, co-instructor, see the interactive online lecture
WS 2021/2022	■ <b>Baltic Earth Winter School</b> University of Rostock, master and Ph.D. students, Interactive lecture about wavelet analysis and statistics
WS 2021/2022	■ <b>Climate of the Ocean</b> University of Rostock, master level, co-instructor
WS 2020/2021	■ <b>Climate of the Ocean</b> University of Rostock, master level, co-instructor
WS 2018/2019	■ <b>Baltic Earth Winter School</b> University of Rostock, Interactive lecture about wavelet analysis
WS 2018/2019	■ <b>Climate of the Ocean</b> University of Rostock, master level, co-instructor

## Supervising

2023	■ <b>Bachelor student</b> Marti Wolff, co-supervisor Thesis title: <i>Analysis of Baltic Sea climate based on climate model data from 6000 BCE to 1850 CE</i>
since 2022	■ <b>PhD student</b> Leonie Barghorn, co-supervisor Thesis title: <i>Understanding Baltic Sea saltwater inflow dynamics under changing climate</i>

## Research Publications

### Journal Articles

- 1 **Börgel, F.**, Neumann, T., Rooze, J., Radtke, H., Barghorn, L., & Meier, H. (n.d.). Deoxygenation of the Baltic Sea during the last millenium. *Frontiers in Marine Science*. under review.
- 2 Dutheil, C., **Börgel, F.**, Gröger, M., & Meier, H. E. M. (n.d.). Changes in spatial structure of weather regimes dominate european precipitation changes since 1950. *Sciences advances*. under review.
- 3 Gröger, M., Dutheil, C., **Börgel, F.**, & Meier, H. E. M. (n.d.). Winter marine heatwaves promoted by warm deepwater showcased in a sub-polar marginal sea. *Communications Earth & Environment*. under review.
- 4 Aue, L., & **Börgel, F.** (2023). From “Bangtan Boys” to “International Relations Professor”: Mapping Self-Identifications in the UN’s Twitter Public. *Politics and Governance*. accepted.
- 5 **Börgel, F.**, Gröger, M., Meier, H. E. M., Dutheil, C., Radtke, H., & Borchert, L. (2023). The impact of atlantic multidecadal variability on Baltic Sea temperatures is limited to winter. *npj - Climate and Atmospheric Science*. accepted.




- 6 Meier, H. E. M., Barghorn, L., **Börgel, F.**, Gröger, M., Naumov, L., & Radtke, H. (2023). Multidecadal climate variability dominated past trends in the water balance of the Baltic Sea catchment area. *npj - Climate and Atmospheric Science*. accepted.
- 7 Dutheil, C., Meier, H. E. M., Gröger, M., & **Börgel, F.** (2022). Warming of Baltic Sea water masses since 1850. *Climate Dynamics*. doi:10.1007/s00382-022-06628-z
- 8 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
- 9 **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
- 10 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
- 11 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
- 12 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
- 13 **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
- 14 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
- 15 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
- 16 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
- 17 **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

## Scientific Presentations

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| 2023 | <div style="display: flex; align-items: flex-start;"> <div style="width: 15px; height: 15px; background-color: #800000; margin-right: 5px;"></div> <div> <b>EGU General Assembly</b>, Speaker - medal lecture, <i>Atlantic Multidecadal Variability and the Implications for North European climate</i> </div> </div>  |
| 2022 | <div style="display: flex; align-items: flex-start;"> <div style="width: 15px; height: 15px; background-color: #800000; margin-right: 5px;"></div> <div> <b>Research Unit Climate Modeling, University of Hamburg</b>, Speaker, <i>Atlantic Multidecadal Variability and the implications for North European Climate</i> </div> </div> <div style="display: flex; align-items: flex-start; margin-top: 5px;"> <div style="width: 15px; height: 15px; background-color: #800000; margin-right: 5px;"></div> <div> <b>Baltic Earth Conference</b>, Speaker, <i>Atlantic Multidecadal Variability and the implications for North European Climate</i> </div> </div>                   |
| 2021 | <div style="display: flex; align-items: flex-start;"> <div style="width: 15px; height: 15px; background-color: #800000; margin-right: 5px;"></div> <div> <b>University of Bremen - physics seminar</b>, Speaker, <i>Atlantic Multidecadal Variability and the implications for North European Climate</i> </div> </div> <div style="display: flex; align-items: flex-start; margin-top: 5px;"> <div style="width: 15px; height: 15px; background-color: #800000; margin-right: 5px;"></div> <div> <b>EGU General Assembly</b>, Speaker, <i>The Atlantic Multidecadal Oscillation controls the impact of the North Atlantic Oscillation on North European climate</i> </div> </div> |









## Scientific Presentations (continued)

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- 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

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- 2022      Visit of Katrin Zschau (Member of the German Bundestag), I presented the ongoing activities related to climate modeling
- 2021      Contributor to the Baltic Sea Climate Change Fact Sheets published within EN-CLIME, a joint expert network by HELCOM and Baltic Earth
- 2020      Visit of Dr. Ingrid Nestle (Member of the German Bundestag), I invited Dr. Nestle and organized her visit to the Leibniz Institute for Baltic Sea Research
- 2019      Reviewer for the IPCC Special Report on the Ocean and Cryosphere in a Changing Climate (SROCC)
-  Coastal Research on Tour, I presented my research to a broad audience, organized by Helmholtz center 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)

## Volunteering

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- 2021-2022      **Board member**, Bündnis 90/Die Grünen, Rostock
- 2021      **Committee member**, urban development, City of Rostock
- 2020-2022      **Deputy speaker**, state working group 'Energy and Climate', Bündnis 90/Die Grünen
- 2019      **Candidate**, local election in Rostock, Bündnis 90/Die Grünen
- 2019-2022      **Member** Radentscheid Rostock, citizen-initiated cycling referendum for the City of Rostock
- 2018      **Co-organization**, young scientists event, Baltic Earth Conference