

## Professional Experience

- 2021– **Climate Scientist**, *Danish Meteorological Institute*, Copenhagen, Denmark
- Present
- Implementing local refinements of the ocean grid in the CMIP7 version of a climate model (EC-Earth4).
  - Assessing analog data assimilation methods for decadal prediction of the North Atlantic (NA).
  - Identifying early-warning indicators of AMOC tipping in CMIP6 climate models.
  - Running dedicated freshwater forcing experiments for the TIPMIP-OCEAN project with an Earth System Model (EC-Earth-ESM).
  - Contributed to the tuning exercise of the EC-Earth4 climate model.
  - Analyzed links between NA surface temperature and the Arctic Eurasian Basin in CMIP6 climate models.
  - Developed a local database of CMIP6 climate model output.
  - Conducted freshwater fluxes sensitivity experiments using observation-based forcing.
- 2018–2021 **Postdoctoral Researcher**, *EPOC, CNRS*, University of Bordeaux, France
- Developed a new dataset of runoff fluxes and solid ice discharge from Greenland Ice Sheet melting.
  - Produced a 20-member ensemble of historical simulations forced by freshwater fluxes.
  - Investigated AMOC changes, convection variability, and connected salinity and temperature trends with observations in the subpolar gyre.
  - Contributed to CMIP6 decadal prediction experiment on the impacts of volcanic eruptions.
- 2016–2018 **Postdoctoral Researcher**, *Geophysical Institute*, University of Bergen, Norway
- Advanced supermodelling methods combining several Earth system models using data assimilation (EnOI).
- 2014–2016 **Research Engineer**, *CEA*, Paris, France
- Modeled two-phase flow dynamics in nuclear reactors.
- 2012–2014 **Postdoctoral Researcher**, *F2DP & Ifremer*, Lorient, France
- Developed and published an auto-adaptive mesh refinement scheme for permeable-wall flows.

## Education

- 2009–2012 **Ph.D. in Environmental Sciences**, *CEREA Lab., IPSL & INERIS*, Paris, France
- Improved the CHIMERE chemistry transport model for nanoparticle dynamics.
  - Developed a hybrid scheme for condensation/evaporation processes.
- 2019 **Summer School**, *ORSS2019: Ocean Remote Sensing Synergy*, Brest
- 2006–2008 **Master's Degree**, *Univ. Toulouse III Paul Sabatier*, Mathematical Engineering
- 2005–2006 **Master's Degree**, *Complutense Univ. of Madrid (Erasmus)*, Mathematical Engineering
- 2004–2005 **Bachelor's Degree**, *Univ. Toulouse III Paul Sabatier*, Mathematical Engineering
- 2002–2004 **Undergraduate Studies**, *Univ. Paris IX Dauphine*, Mathematics and Economics
- 2002 **Baccalauréat**, *Lycée Richelieu*, France, Mathematics major

## Research Projects and Leadership

**AIMOC** — Coordinator. AI-Enhanced Modelling and Projection of the AMOC (to be submitted to HORIZON-CL5-2026 - submitted to Novo Nordisk Foundation, invited to stage 2 in 2025).

**ECMWF Special Project PI** — Impact of horizontal ocean grid refinement and Greenland freshwater fluxes on AMOC predictability in EC-Earth4 (AGRIF), 2026–2028

**ObsSea4Clim** — Task Leader. Coordination of ocean observation and modeling activities.

**TipESM** — Lead Scientist. Analysis of Earth System Model simulations to detect tipping points.

**TIPMIP-OCEAN** — Hosing experiment to explore AMOC sensitivity and reversibility.

**Independent Research Fund Denmark** — Recipient of DFF grant for Arctic research.

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## Lead Author Roles

- AMAP Chapter lead for the upcoming Arctic Monitoring and Assessment Programme report.
- JPI Oceans– Chapter lead for the Joint Initiative review on AMOC changes and impacts.
- Climate

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## Selected Conference Presentations

- 2026 Session lead, CMIP Workshop (Tokyo); Ocean Science Meeting (Glasgow).
- 2025 Subpolar Gyre Workshop (Utrecht).
- 2018–2024 EGU General Assembly (Vienna).
- 2024 Irish AMOC Meeting (Maynooth); TIPMIP General Assembly (Baltimore).
- 2023 Nansen Legacy Symposium (Tromsø).
- 2022 ASOF Meeting (Reykjavik); YOPP Summit (Montreal).

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## Selected Publications

- Under review M. Devilliers et al., *Comment on Pontes and Menviel (2024)*, Nature Geoscience.
- Under review O. Mehling et al., *Limited impact of Greenland meltwater on abruptness and reversibility of future AMOC changes*, Science Advances.
- 2025 M. Devilliers et al., *Constraining CMIP6 simulations for the deep Arctic using an AMOC–SST index*, Frontiers in Climate.
- 2024 A. Drews et al., *The crucial role of the Subpolar North Atlantic for decadal climate prediction skill*, Geophysical Research Letters.
- 2024 M. Devilliers et al., *Ocean response to a century of observation-based freshwater forcing around Greenland*, Climate Dynamics.
- 2023 R. Bilbao et al., *Impact of volcanic eruptions on CMIP6 decadal predictions: a multi-model analysis*, Earth System Dynamics.
- 2023 F. Schevenhoven et al., *Supermodeling: improving predictions with an ensemble of interacting models*, Bulletin of the American Meteorological Society.
- 2023 F. Counillon et al., *Framework for an ocean-connected super-model of the Earth System*, Journal of Advances in Modeling Earth Systems.
- 2022 D. Swingedouw et al., *AMOC recent and future trends: the role of oceanic resolution and Greenland melting*, Frontiers in Climate.
- 2021 M. Devilliers et al., *A realistic Greenland and surroundings melting in a coupled climate model*, Climate Dynamics.

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## Communication and Outreach

- 2022–2023 Teaching assistant, SALMO-Skol summer school on North Atlantic climate & salmon decline.
- 2022 Organized climate & ecosystems lecture series with "Maison de la Rivière et de la Biodiversité".
- 2018 Facilitator, "Train du Climat" science outreach exhibition.

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## Technical Skills & Languages

- Modeling EC-Earth3/4/ESM, IPSL-CM6A-LR, NorESM, CESM
- Programming Python, Fortran, bash, git.
- Languages French: Native, English and Spanish: Advanced, Danish: Beginner

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## Activities and Interests

- Sports Scuba diving, basketball, swimming, jogging, yoga, tai chi.
- Hobbies Literature, chess.

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## References

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