

Christoph Renkl | Postdoctoral Investigator

Physical Oceanography Department – Woods Hole Oceanographic Institution

266 Woods Hole Road, MS#21, Woods Hole, MA 02543, USA –

✉ christoph.renkl@whoi.edu • 🌐 www.christophrenkl.org

🆔 0000-0002-1261-4099

EDUCATION

Dalhousie University

Ph.D. Oceanography

Halifax NS, Canada

2014–2020

THESIS TITLE: Ocean Model Validation and Downscaling for Subseasonal-to-Seasonal Prediction

ADVISOR: Keith R. Thompson

Rheinische Friedrich-Willhelms-Universität

M.Sc. Physics of Earth and Atmosphere (Specialization in Meteorology)

Bonn, Germany

2011–2013

THESIS TITLE: The Vertical Structure of the Atmosphere in COSMO-DE-EPS: Multivariate Ensemble Postprocessing in the Space of Vertical Normal Modes

ADVISOR: Petra Friedrichs

Universitetet i Bergen

ERASMUS Exchange Programme

Bergen, Norway

2009–2010

Courses in meteorology, oceanography, computer science, and Norwegian language

Freie Universität Berlin

B.Sc. Meteorology

Berlin, Germany

2007–2011

THESIS TITLE: Untersuchung der Vorhersagbarkeit europäischer Winterstürme in den Ensemblevorhersagen des EZMW in Abhängigkeit von der Vorlaufzeit [Analysis of the Predictability of European Winter Storms in ECMWF Ensemble Predictions as a Function of Lead Time]

ADVISORS: Uwe Ulbrich and Philip Lorenz

EXPERIENCE

Woods Hole Oceanographic Institution

Postdoctoral Investigator

Woods Hole, MA, USA

2023–present

ADVISOR: Hyodae Seo

Dalhousie University

Postdoctoral Fellow

Halifax NS, Canada

2021–2022

ADVISOR: Eric C. J. Oliver

Nansen Environmental and Remote Sensing Center

Research Assistant

Bergen, Norway

2014

ADVISORS: Laurent Bertino and François Counillon

Department of Oceanography, Dalhousie University

Visiting Researcher

Halifax NS, Canada

2013

ADVISOR: Katja Fennel

Department of Physics and Astronomy, University of Leicester

IAESTE/SURE Summer Intern

Leicester, UK

2012

ADVISOR: Robert Fear

Leibniz-Institute of Atmospheric Physics e.V.

Summer Intern

Kühlungsborn, Germany

2010

ADVISOR: Christoph Zülicke

PUBLICATIONS

IN PREPARATION

- [3] Ohashi, K., Laurent, A., **Renkl, C.**, Dilmahamod, F., Fennel, K., Oliver, E. C. J., and Sheng, J. "Development and Validation of a Coupled Circulation-Ice-Biogeochemistry Modelling System for the Northwestern Atlantic Ocean". Manuscript in Preparation.
- [2] **Renkl, C.** and Oliver, E. C. J. "Downscaling Future Projections of Northwest Atlantic Circulation and Sea Ice: Importance of Bias Correction and Spatiotemporal Scales". Manuscript in Preparation.
- [1] **Renkl, C.** and Thompson, K. R. "Coastal Mean Dynamic Topography and Implications for Model Validation and Ocean Monitoring". Manuscript in Preparation.

JOURNAL ARTICLES

- [4] **Renkl, C.**, Oliver, E. C. J., and Thompson, K. R. "Downscaling the Ocean Response to the Madden-Julian Oscillation in the Northwest Atlantic and Adjacent Shelf Seas". In: *Climate Dynamics* (in review).
- [3] Richaud, B., Dowd, M., **Renkl, C.**, and Oliver, E. C. J. "Sea Ice Non-Linearities Act to Rectify and Filter Ocean and Atmosphere Forcing". In: *The Cryosphere* (submitted).
- [2] **Renkl, C.** and Thompson, K. R. "Validation of Ocean Model Predictions of Mean Dynamic Topography in Shallow, Tidally Dominated Regions Using Observations of Overtides". In: *Journal of Geophysical Research: Oceans* 127.3 (2022), e2021JC018095. DOI: 10.1029/2021JC018095.
- [1] Merryfield, W. J. et al. incl. **Renkl, C.** "Current and Emerging Developments in Subseasonal to Decadal Prediction". In: *Bulletin of the American Meteorological Society* 101.6 (2020), E869–E896. DOI: 10.1175/BAMS-D-19-0037.1.

REPORTS

- [2] Krastel, S. et al. incl. **Renkl, C.** *Geomorphology, Processes and Geohazards of Giant Submarine Landslides and Tsunami Generation Capacity, as Recorded in the Sedimentary Record of the Only Historic Slide of This Kind: The 1929 Grand Banks Landslide of the Canadian Atlantic Continental Margin - Cruise No. MSM47 - September 30 - October 30, 2015 - St. John's (Canada) - Ponta Delgada, Azores (Portugal)*. MARIA S. MERIAN-Berichte MSM47. DFG-Senatskommission für Ozeanographie, 2016, p. 55. DOI: 10.2312/cr_msm47.
- [1] **Renkl, C.**, Counillon, F., and Bertino, L. *Validation of the 20-Year TOPAZ Reanalysis*. Tech. rep. Bergen, Norway: Nansen Environmental and Remote Sensing Center, 2014, p. 67.

GRANTS AND SCHOLARSHIPS

2023	US CLIVAR Travel Grant to attend the Mesoscale and Frontal-Scale Air-Sea Interactions Workshop in Boulder, CO, USA.	
2021–2022	MEOPAR Postdoctoral Fellowship Award for research project "Future Projections of Northwest Atlantic Circulation and Sea Ice".	CAD\$40,000
2018	World Meteorological Organization (WMO) Travel Grant to attend the International Conferences of Subseasonal to Decadal Prediction in Boulder, CO, USA.	US\$2,000
2017	MEOPAR Travel Grant to attend the Annual Scientific and Training Meetings in Montreal QC, Canada.	
2014–2017	Nova Scotia Scholarship, International Award	CAD\$30,000

AWARDS AND HONORS

- 2021 **Invited Participant, Physical Oceanography Dissertation Symposium (PODS) XI** in Lihue, HI, USA.
- 2016 **Outstanding Student Poster and PICO (OSPP) Award** at the European Geosciences Union (EGU) General Assembly 2016 in Vienna, Austria.
- 2012 **IAESTE Internship/Summer Undergraduate Research Experience (SURE)** at the University of Leicester, UK.

TEACHING EXPERIENCE

Ocean Dynamics (OCEA 5221)

Guest Lecturer

Guest lecture on the Stommel (1961) box model of the thermohaline circulation.

Dalhousie University

Winter 2022

Oceanography Honours Class (OCEA 4201)

Guest Lecturer

Two guest lectures per term on effective data visualization.

Dalhousie University

Fall 2021, 2022

Introduction to Programming with R and Python

Lecturer

Co-organized informal lecture series to introduce basic concepts of programming in R and Python languages to senior undergraduate and early graduate students. Designed curriculum and delivered weekly tutorials on programming with Python.

Dalhousie University

Fall 2018

The Blue Planet (OCEA 2001/2002)

Teaching Assistant

Prepared and delivered short presentations linking class materials to recent research and events that appeared in newspaper articles. Assisted in exam preparation and provided one-on-one assistance for students registered in course. Occasionally substituted for the instructor to deliver the lecture.

Dalhousie University

Fall 2016, 2017 and Winter 2017, 2018

Synoptic Meteorology

Teaching Assistant

Prepared and conducted weekly tutorials for a class of 30 students. Prepared as well as marked weekly assignments and exams.

Freie Universität Berlin

Fall 2010

MENTORING

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|-----------|-------------------|---|
| 2023–2024 | Co-Advisor | Yoo-Jun Kim, University of Tokyo, visiting Ph.D. Student at WHOI |
| 2023 | Inofficial Mentor | Anthony Meza, WHOI/MIT Joint Program, Ph.D. General Exam Project |
| 2022 | Co-Advisor | Alexa MacIsaac, Dalhousie Interdisciplinary Science Program Project |
| 2022 | Co-Advisor | Kaitlyn Quinn, Dalhousie Interdisciplinary Science Program Project |
| 2022 | Co-Advisor | Lilian Musselman, Dalhousie Interdisciplinary Science Program Project |
| 2022 | Co-Advisor | Peter MacGregor, Dalhousie Interdisciplinary Science Program Project |

SERVICE

- Reviewer for Journal of the Atmospheric Sciences, Weather and Climate Dynamics.
- Co-organizer of a scientific retreat for graduate students in ocean-related disciplines at Brigadoon Village, Aylesford NS, Canada (2018).
- President of the Dalhousie Oceanography Students Association (DOSA) at Dalhousie University, Halifax NS, Canada (2016–2018).
- Co-organizer and presenter of Methods in Ten Minutes (MTM) seminar series, Dalhousie University, Halifax NS, Canada (2016–2022).
- Member of the executive of the student society at the Meteorological Institute, University of Bonn,

Germany (2012–2013).

- Student representative at the internal assembly and master studies examination board at the Meteorological Institute, University of Bonn, Germany (2011–2013).
- Member of the organizing committee of “Studentische Meteorologentagung”, the annual meeting of meteorology students from Germany, Austria and Switzerland at Freie Universität Berlin, Germany (2011).
- Member of the executive of the student society at the Institute of Meteorology, Freie Universität Berlin, Germany (2008–2011).

Public Science Engagement

- Q&A sessions about weather, ocean, and climate with 3rd graders at the Lina-Morgenstern-Schule, Bochum, Germany (2016, 2022).
- Guided tours of the weather observatory at the Institute of Meteorology at Freie Universität Berlin, Germany (2010–2011).

SEA TIME

- Sep–Oct 2015 (30 days) **R/V Maria S. Merian - MSM47**: Seismic mapping and coring transects to identify the sedimentary record of the 1929 Grand Banks landslide along the Canadian Atlantic continental margin.

PRESENTATIONS

Invited Seminars

- *Downscaling the Ocean Response to the Madden-Julian Oscillation in the Northwest Atlantic*. U.S. Naval Research Laboratory, Monterey, CA, USA (virtual), February 2022.
- *Downscaling the Ocean Response to the Madden-Julian Oscillation in the Northwest Atlantic*. National Oceanography Centre, Liverpool, UK (virtual), February 2022.
- *Downscaling the Ocean Response to the Madden-Julian Oscillation in the Northwest Atlantic*. Woods Hole Oceanographic Institution, Woods Hole, MA, USA (virtual), February 2022.
- *Ocean Model Validation and Downscaling for Subseasonal-to-Seasonal Prediction*. Physical Oceanography Dissertation Symposium XI, Kaua’i, HI, USA, October 2021.
- *Downscaling the Ocean Response to the Madden-Julian Oscillation in the Northwest Atlantic*. Bedford Institute of Oceanography, Dartmouth NS, Canada, February 2021.
- *Downscaling the Ocean Response to the Madden-Julian Oscillation in the Northwest Atlantic*. Department of Oceanography, Dalhousie University, Halifax NS, Canada, January 2021.
- *Tilt, Tides, and Turbulence: Real-Life Struggles of an Ocean Modeller*. Amec Foster Wheeler Environment & Infrastructure, Dartmouth NS, Canada, April 2017.
- *The Alongshore Tilt of Mean Dynamic Topography and Implications for Nearshore Circulation*. Bedford Institute of Oceanography, Dartmouth NS, Canada, October 2016.

Conference Presentations (First Author)

2024

- *Diabatic Amplification of Atmospheric River Intensity by Marine Heatwaves*. Oral presentation at the 2024 Ocean Sciences Meeting (OSM), New Orleans, LA, February 2024.
- *Impact of Marine Heatwaves on Atmospheric Rivers along the U.S. West Coast*. Oral presentation at the WHOI Postdoctoral Symposium 2024, Falmouth, MA, USA, January 2024.

2023

- *Impact of Marine Heatwaves on Atmospheric Rivers along the Coast of California*. Poster presentation at the WCRP Open Science Conference 2023, virtual, October 2023.
- *Downscaling the Ocean Response to the Madden-Julian Oscillation in the Northwest Atlantic*. Poster presentation at the WCRP Open Science Conference 2023, virtual, October 2023.
- *Impact of Marine Heatwaves on Atmospheric Rivers along the Coast of California*. Oral presentation at the Eastern Pacific Ocean Conference 2023, Fallen Leaf Lake, CA, USA, September 2023.
- *Downscaling the Ocean Response to the Madden-Julian Oscillation in the Northwest Atlantic*. Oral presentation at the 57th Canadian Meteorological and Oceanographic Society (CMOS) Congress, St. John's NL, Canada, May/June 2023.
- *Coastal Mean Dynamic Topography and Implications for Model Validation and Ocean Monitoring*. Oral presentation at the 57th Canadian Meteorological and Oceanographic Society (CMOS) Congress, St. John's NL, Canada, May/June 2023.
- *Impact of Marine Heatwaves on Atmospheric Rivers along the Coast of California*. Poster presentation at the 57th Canadian Meteorological and Oceanographic Society (CMOS) Congress, St. John's NL, Canada, May/June 2023.
- *Downscaling the Ocean Response to the Madden-Julian Oscillation in the Northwest Atlantic*. Poster presentation at the Mesoscale and Frontal-Scale Interactions Workshop, Boulder, CO, USA, March 2023.

2022

- *Bias Correction and Spatiotemporal Scales for Downscaling Future Projections of Northwest Atlantic Circulation and Sea Ice*. Oral presentation at the 56th Canadian Meteorological and Oceanographic Society (CMOS) Congress, virtual, June 2022.
- *Bias Correction and Spatiotemporal Scales for Downscaling Future Projections of Northwest Atlantic Circulation and Sea Ice*. Oral presentation at the EGU General Assembly 2022, Vienna, Austria, May 2022.
- *Bias Correction and Spatiotemporal Scales for Downscaling Future Projections of Northwest Atlantic Circulation and Sea Ice*. Poster presentation at the Ocean Frontier 2022, Halifax NS, Canada, May 2022.
- *Downscaling the Ocean Response to the Madden-Julian Oscillation in the Northwest Atlantic*. Oral presentation at the 2022 Ocean Sciences Meeting (OSM), virtual, February/March 2022.

2021

- *Downscaling the Ocean Response to the Madden-Julian Oscillation in the Northwest Atlantic*. Oral presentation at the 55th Canadian Meteorological and Oceanographic Society (CMOS) Congress, virtual, May/June 2021.

2019

- *The Madden-Julian Oscillation as a Source of S2S Predictability of North Atlantic Sea Surface Temperature*. Oral presentation at the 27th General Assembly of the International Union of Geodesy and Geophysics (IUGG), Montreal QC, Canada, July 2019.
- *The Madden-Julian Oscillation as a Source of S2S Predictability of North Atlantic Sea Surface Temperature*. Oral presentation at the Conference of Dalhousie Oceanography Graduate Students (CDOGS), Halifax NS, Canada, March 2019.

2018

- *Downscaling Subseasonal Predictions of Ocean Extremes*. Poster presentation at the International Conference on Subseasonal to Seasonal (S2S) Prediction, Boulder, CO, USA, September 2018.
- *Using Overtides to Evaluate Ocean Model Predictions of Mean Dynamic Topography in Shallow, Tidally-Dominated Regions*. Oral presentation at the 52nd Canadian Meteorological and Oceanographic Society (CMOS) Congress, Halifax NS, Canada, June 2018.
- *A First Step Toward Downscaling Subseasonal Predictions of Ocean Extremes*. Oral presentation at the Conference of Dalhousie Oceanography Graduate Students (CDOGS), Halifax NS, Canada, March 2018.
- *Using Overtides to Evaluate Ocean Model Predictions of Mean Dynamic Topography in Shallow, Tidally-Dominated Regions*. Poster presentation at the 2018 Ocean Sciences Meeting (OSM), Portland, OR,

USA, February 2018.

2017

- *The Mean Tilt of Coastal Sea Level in Shallow, Tidally-Dominated Regions*. Oral presentation at the 51st Canadian Meteorological and Oceanographic Society (CMOS) Congress, Toronto ON, Canada, June 2017.
- *Tilt, Tides, and Turbulence: Real-Life Struggles of an Ocean Modeller*. Oral presentation at the Conference of Dalhousie Oceanography Graduate Students (CDOGS), Halifax NS, Canada, March 2017.

2016

- *The Alongshore Tilt of Mean Dynamic Topography and Implications for Nearshore Circulation and Regional Vorticity Balance*. Oral presentation at the 50th Canadian Meteorological and Oceanographic Society (CMOS) Congress, Fredericton NB, Canada, May/June 2016.
- *The Alongshore Tilt of Mean Dynamic Topography and Implications for Nearshore Circulation and Regional Vorticity Balance*. Poster presentation at the EGU General Assembly 2016, Vienna, Austria, April 2016.
- *The Alongshore Tilt of Mean Dynamic Topography and Implications for Nearshore Circulation*. Oral presentation at the Conference of Dalhousie Oceanography Graduate Students (CDOGS), Halifax NS, Canada, March 2016.

2013

- *Ensemble Postprocessing and Verification of the Vertical Structure of the Atmosphere*. Poster presentation at the Workshop "Evaluating Probabilistic Forecasts of Multivariate Quantities", Heidelberg, Germany, October 2013.
- *Ensemble Postprocessing and Verification of the Vertical Structure of the Atmosphere*. Oral presentation at the EGU General Assembly 2013, Vienna, Austria, April 2013.
- *Ensemble Postprocessing and Verification of the Vertical Structure of the Atmosphere*. Poster presentation at the COSMO User Seminar, Offenbach, Germany, March 2013.
- *Ensemble Postprocessing and Verification of the Vertical Structure of the Atmosphere*. Poster presentation at the Symposium "Extreme Events: Modeling, Analysis and Prediction", Hanover, Germany, February 2013.