Dr. Jannes Koelling

Research Interests

I am an observational oceanographer who is interested in how ocean physics influences biogeochemical cycling of elements such as carbon, oxygen, and nutrients. The focus of my current research is on the large-scale physical controls of the oxygen cycle, particularly in ventilation regions such as the North Atlantic and Southern Ocean.

Skills and Competencies

Scientific Writing
Authored 14 publications for peer-reviewed international journals (5 as first author); over 500 citations to date

Obtaining research funding
Acquired funding through fellowships and grants, totaling about $550,000 USD

Research dissemination
Held over 15 scientific talks at major international conferences and seminars; participation in school outreach and media

Mentoring
Previously mentored 3 undergraduate and graduate students for summer projects, one as sole mentor

Cruise experience and Fieldwork
Experienced with CTD casts & water sampling, cruise planning, mooring deployment and calibration. Over 150 days at sea

Coding and technology
Proficient in data analysis and visualization in MATLAB & python, experience handling various Earth and Ocean datasets

Employment

University of Washington — **September 2025 – present**
Acting Instructor — Seattle, WA, USA

University of Washington & NOAA PMEL — **2023 – 2025**
CICOES Postdoctoral Scholar — Seattle, WA, USA

Dalhousie University — **2022 – 2023**
Postdoctoral Researcher — Halifax, NS, Canada

Dalhousie University — **2020 – 2022**
Postdoctoral Research Fellow at Ocean Frontier Institute — Halifax, NS, Canada

Education

Scripps Institution of Oceanography | University of California, San Diego — **2013 – 2020**
Ph.D., Oceanography — La Jolla, CA, USA
Dissertation title: "Variability in formation, properties, and transport of North Atlantic Deep Water"
Supervisor: Dr. Uwe Send

Jacobs University — **2010 – 2013**
B.Sc., Earth and Space Sciences — Bremen, Germany
Thesis title: "Erosion of bacterial mats in a gas hydrate field as a function of flow speed"
Supervisor: Dr. Laurenz Thomsen

Publications

1. **Koelling, J.**, Fassbender, A.J., Gray, A., Johnson, G.C. and Sharp, J. (2025). Progressive oxygenation of the North Atlantic subpolar gyre. *Journal of Geophysical Research: Oceans*. https://doi.org/10.1029/2024JC022157

2. Miller, U.K., Palter, J., Park, E., Atamanchuk, D., Fogaren, K., Fu., Y, Karstensen, J., **Koelling, J.**, Le Bras, I., Nagao, H., Nicholson, D.P., Palevsky, H. and Yoder, M. (2025). The central role of the Labrador Sea in North Atlantic ventilation. *Under review in Science*.

3. Moseley, L. A., McKinley, G. A., Atamanchuk, D., **Koelling, J.**, and Wallace, D.W.R. (2025). Using Data-Constrained Modeling to Examine the Drivers of Labrador Sea Oxygen Variability. *In preparation*.

4. Miller, U.K., Fogaren, K., Atamanchuk, D., Johnson, C., **Koelling, J.**, Le Bras, I., Lindeman, M. Nagao, H., Nicholson, D.P., Palevsky, H., Park, E., Yoder, M. and Palter, J. (2024). Oxygen optodes on oceanographic moorings: recommendations for deployment and in-situ calibration. *Frontiers in Marine Science*. https://doi.org/10.3389/fmars.2024.1441976

5. **Koelling, J.**, Atamanchuk, D., Karstensen, J., and Wallace, D. W.R. (2023). Decadal variability of oxygen uptake, export, and storage in the Labrador Sea from observations and CMIP6 models. *Frontiers in Marine Science*. https://doi.org/10.3389/fmars.2023.1202299

6. **Koelling, J.**, Atamanchuk, D., Karstensen, J., Handmann, P., and Wallace, D. W.R. (2022). Oxygen export to the deep ocean following Labrador Sea Water formation. *Biogeosciences*. http://doi.org/10.5194/bg-19-437-2022

7. Atamanchuk, D., Palter, J., Palevsky, H., Le Bras, I., **Koelling, J.** and Nicholson, D., 2022. Linking oxygen and carbon uptake with the meridional overturning circulation using a transport mooring array. *Oceanography*. https://doi.org/10.5670/oceanog.2021.supplement.02-03

8. **Koelling, J.**, Send, U., and Lankhorst, M. (2020). Decadal Strengthening of Interior Flow of North Atlantic Deep Water Observed by GRACE Satellites, *Journal of Geophysical Research: Oceans*. http://doi.org/10.1029/2020JC016217

9. Atamanchuk, D., **Koelling, J.**, Send, U., and Wallace, D.W.R. (2020): Rapid transfer of oxygen to the deep ocean mediated by bubbles, *Nature Geoscience*. http://doi.org/10.1038/s41561-020-0532-2

10. Frajka-Williams, E., et al., 2019. Atlantic meridional overturning circulation: Observed transport and variability. *Frontiers in Marine Science*. https://doi.org/10.3389/fmars.2019.00260

11. Anutaliya, A., Send, U., Sprintall, J., McClean, J.L., Lankhorst, M. and **Koelling, J.**, 2019. Mooring and seafloor pressure end point measurements at the southern entrance of the Solomon Sea: Subseasonal to interannual flow variability. *Journal of Geophysical Research: Oceans*. https://doi.org/10.1029/2019JC015157

12. Frajka-Williams, E., Lankhorst, M., **Koelling, J.** and Send, U., 2018. Coherent circulation changes in the Deep North Atlantic from 16 N and 26 N transport arrays. *Journal of Geophysical Research: Oceans*. https://doi.org/10.1029/2018JC013949

13. **Koelling, J.**, Wallace, D. W. R., Send, U., and Karstensen, J. (2017). Intense oceanic uptake of oxygen during 2014–2015 winter convection in the Labrador Sea, *Geophysical Research Letters*. http://doi.org/10.1002/2017GL073933

14. Turk, D., Dowd, M., Lauvset, S.K., **Koelling, J.**, Alonso-Perez, F. and Perez, F.F., 2017. Can empirical algorithms successfully estimate aragonite saturation state in the subpolar North Atlantic?. *Frontiers in Marine Science*. https://doi.org/10.3389/fmars.2017.00385

Awards

Roger Daley Postdoctoral Publication Award **2023**
Awarded by Canadian Meteorological and Oceanographic Society (CMOS) for Koelling et al. (2022) paper

President's List for Academic Excellence, Jacobs University **2012 and 2013**

Grants and Fellowships

UW Program on Climate Change Research Accelerator **2025**
"Interannual variability in Southern Ocean Ventilation" $30,000

Data Science Postdoctoral Fellowship **2024–2025**
Awarded by the University of Washington eScience Institute $2,000

CICOES Postdoctoral Fellowship **2023–2025**
"Quantifying the uptake of oxygen in the subpolar North Atlantic and its export to the deep ocean" $145,000

U.S. GO-SHIP Postdoctoral Fellowship *(declined)* **2023**
$130,000

"Ocean ventilation in the subpolar North Atlantic Ocean"

Ocean Frontier Institute International Postdoctoral Fellowship **2020–2022**
"Seasonal and interannual variability of oxygen export from the Labrador Sea" $110,000

Ocean Frontier Institute Visiting International Researcher Fellowship **2019**
"Studying the impact of lateral exchanges on carbon, oxygen, and nitrate budgets in the Labrador Sea" $12,000

NASA Earth and Space Sciences Fellowship **2016 – 2019**
"Using GRACE Satellite Data to Investigate Variability in Deep Ocean Transports" $125,000

Teaching & Mentoring

Primary mentor for CICOES undergraduate intern, University of Washington (I. Jaguzny) **2024**
Project title: "The effect of El Niño on ocean biogeochemistry and air-sea fluxes of oxygen"

Co-mentor for visiting summer graduate student, Dalhousie University (L. Moseley) **2023**
Project title: "Using Data-Constrained Modeling to Examine the Drivers of Central Labrador Sea Oxygen Variability"

Co-mentor for undergraduate student, Dalhousie University (S. Wong) **2023**
"Measurements of Ocean Biogeochemistry and Air-Sea Exchanges on the Scotian Shelf from a Wave Glider in 2022"

Guest lecturer for Advanced Chemical Oceanography course, Dalhousie University **2023**
Lecture on use of mass balance approaches to quantify Net Community Production

Earth and Space Sciences Teaching Assistant, Jacobs University **2012 – 2013**
Hosting help desk for first-year undergraduate level Oceanography, Geosciences, and Space Science courses

Service

Organizing committee member, Float data workshop **2025–2026**
Co-organizer for a workshop teaching methods for working with Argo float data

Search committee member, University of Washington **2025–2026**
Serving on the committee for College of the Environment dean search

Reviewer, CICOES internship **2025**
Reviewing applications by undergraduate student for summer research interhsip

Session chair, Ocean Sciences Meeting **2024**
"Physical Transport and Biogeochemical Cycling in the Subpolar North Atlantic"

Reviewer for scientific journals including Geophysical Research Letters, J. Physical Oceanography, Nature Communications, Nature Climate Change, JGR: Oceans, PNAS **2020-**

Outreach

University of Washington outreach event **2024**
Science demonstration to high school students from underrepresented communities through Seattle MESA

Adopt-A-Float school visit **2024**
Science talk and demonstration at Ocean Research College Academy (high school)

Jacobs University lab tour **2012**
Demonstration of underwater robot to middle school students

Invited talks

GO-BGC annual meeting **2024**
"Gridded BGC-Argo products provide new insight on ventilation in the North Atlantic"

IOC-UNESCO global ocean oxygen network (GO2NE) webinar (virtual) **2023**
"On the Decadal variability of oxygen uptake, export, and storage in the Labrador Sea"

University of Washington Banse Early Career Scientist seminar **2023**
"The lungs of the ocean: oxygen uptake and export in the subpolar North Atlantic"

Dalhousie University Oceanography seminar **2023**
"Variability in oxygen uptake, storage, and export in the Labrador Sea"

OSNAP fall workshop (virtual) **2022**
"The oxygen budget in the Labrador Sea and its variability"

European Geophysical Union (EGU) General Assembly - solicited speaker **2022**
"Ventilation and oxygen export in the Labrador Sea"

Dalhousie University Oceanography seminar (virtual) **2021**
"Export of newly oxygenated Labrador Sea Water following convection"

Woods Hole Oceanographic Institution Physical Oceanography seminar (virtual) **2020**
"Decadal changes in NADW circulation revealed by GRACE satellite measurements"

Cruise experience

NOAAS Ronald H Brown, RB-19-07 **Dec 19 – Dec 24, 2019**
St Thomas, US Virgin Islands – Bridgetown, Barbados Tropical Atlantic
Co-chief scientist; cruise objective to acoustically download data and attempt to recover broken mooring

NOAAS Pisces, PC-18-03 **May 30 – June 21, 2018**
Jacksonville, USA – Morehead City, USA Tropical Atlantic
Responsible for data download, processing and analysis, CTD watch, water sampling, acoustic telemetry

RV Sikuliaq, SKQ201606S **May 13 – May 18, 2016**
San Diego, USA – San Diego, USA California Current
Responsible for CTD watch, assisting with mooring work

RV Endeavor, EN573 **January 25 – February 13, 2016**
Narragansett, USA – San Juan, Puerto Rico Tropical Atlantic
Responsible for CTD watch, preliminary data processing and analysis, assisting with mooring work

RV Atlantis, AT26-30 **March 8 – March 26, 2015**
Punta Arenas, Chile – Montevideo, Uruguay Argentine Basin
CTD watch, acoustic telemetry, preliminary data processing and analysis, mooring work

RV Knorr **September 7 – September 27, 2014**
Reykjavik, Iceland – Woods Hole, USA Irminger Sea
Responsible for CTD watch and preliminary data processing and analysis, assisting with Argo float deployments and mooring work

RV Melville, MV1309 **July 15 – July 30, 2013**
Seattle, USA – Seattle, USA North Pacific
Responsible for CTD watch and preliminary data processing and analysis, assisted with mooring work

FS Polarstern, ARK-XXVII/1-2 **June 14 – July 30, 2012**
Bremerhaven, Germany – Tromsø, Norway Arctic Ocean
Responsible for CTD watch and water sampling, assisted with mooring work, plankton nets, bottom trawling, ROVs