

Curriculum Vitae

OREGON STATE UNIVERSITY
College of Earth, Ocean, and Atmospheric Sciences

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ANDREAS SCHMITTNER

Professor

EDUCATION

Ph.D., Physics, University Bern, Switzerland, 1999

Department of Climate and Environmental Physics, Institute of Physics

Dissertation Title: On the Large-Scale Atmospheric Hydrological Cycle and its Influence on the Global Ocean Circulation.

Diploma, Physics, University Bremen, Germany, 1996

ACADEMIC POSITIONS

Professor, College of Earth, Ocean, and Atmospheric Sciences, OSU, 2017-present

Associate Professor, College of Earth, Ocean, and Atm. Sciences, OSU, 2011-2017

Affiliated Faculty, Environmental Arts and Humanities, OSU, 2013-present

Assistant Professor, College of Oceanic and Atmospheric Sciences, OSU, 2005-2011

Postdoctoral Scholar, Institute of Geosciences, University Kiel, Germany, 2003-2005

Postdoctoral Scholar, Max-Planck-Institute for Biogeochemistry, Jena, Germany, 2002-2003

Lecturer, Department of Physics and Astronomy, University of Victoria, Canada, 2001-2002

Postdoctoral Scholar, School of Earth and Ocean Sciences, U. of Victoria, Canada, 1999-2002

HONORS AND AWARDS

2006 Early Career Award, Ocean Sciences Section of the American Geophysical Union

FIELDS OF SPECIALIZATION

Earth System Modeling, Climate Dynamics, Climate Change, Paleoclimate, Paleoceanography, Ocean Circulation, Marine Ecosystem and Biogeochemical Cycles, Ocean Acidification

PROFESSIONAL ACTIVITIES

Professional Organizations

American Geophysical Union (AGU), American Meteorological Society (AMS)

European Geosciences Union (EGU)

Conference Session Chair, Workshop Convener, etc.

Workshop Convener “Final OC3 meeting: New knowledge and more questions about the ocean during the last deglaciation”, San Francisco, USA, Dec 14, 2019.

Conference Session Chair “Deep-Ocean Circulation Changes and Their Impacts”, AGU Fall Meeting, San Francisco, Dec. 9, 2019.

Workshop Convener “Ocean Circulation and Carbon Cycling During the Last Deglaciation: Global Syntheses of Carbon Isotope Data”, Cambridge, UK, Sept 6-9, 2018.

Workshop Convener “Ocean Circulation and Carbon Cycling During the Last Deglaciation: Regional Syntheses of Carbon Isotope Data”, Corvallis, Oregon, June 27-29, 2017.

Organizing Committee Member “Connecting Paleo and Modern Oceanographic Data to Understand AMOC over Decades to Centuries”, Boulder, Colorado, May 23-25, 2016.

Workshop Convenor “Deglacial Deep Ocean Circulation and Biogeochemical Cycling”, Bern, Switzerland, Sep. 30 - Oct. 3, 2014.

Workshop Convenor “PMIP Ocean Workshop 2013”, Corvallis, Dec. 4-6, 2013.

Committees, Commissions and Boards

Chair of the Scientific Advisory Board for the German Climate Modeling Initiative PALMOD, <https://www.palmod.de/>, 2016-present

Ocean Circulation and Carbon Cycling (OC3) Chair, OC3 is a Past Global Changes Working Group, <http://www.pastglobalchanges.org/ini/wg/oc3/intro>, 2014-present

Investigating Past Ocean Dynamics (IPODS) Co-chair, IPODS is an INQUA (International Quaternary Association) International Focus Group, 2014-present

Chair and vice-chair of Task Team 4 of the US AMOC Program, which is part of the US Climate Variability and Predictability Program, 2014-2016

Recent Refereed Papers

1. Mulitza, S., T. Bickert, H. C. Bostock, C. M. Chiessi, B. Donner, A. Govin, N. Harada, E. Huang, H. Johnstone, H. Kuhnert, M. Langner, F. Lamy, L. Lembke-Jene, L. Lisiecki, J. Lynch-Stieglitz, L. Max, M. Mohtadi, G. Mollenhauer, J. Muglia, D. Nürnberg, A. Paul, C. Rühlemann, J. Repschläger, R. Saraswat, A. Schmittner, E. L. Sikes, R. F. Spielhagen, and R. Tiedemann (2022) World Atlas of late Quaternary Foraminiferal Oxygen and Carbon Isotope Ratios, *Earth System Science Data*, 14, 2553–2611, doi: 10.5194/essd-14-2553-2022.
2. Kwon, E. Y., A. Timmermann, B. J. Tipple, and A. Schmittner (2022) Projected reversal of the oceanic stable carbon isotope ratio depth gradient with continued anthropogenic carbon emissions *Nature Communications Earth & Environment*, 3, 62, doi: 10.1038/s43247-022-00388-8.
3. Repschläger, J., N. Zhao, D. Rand, L. Lisiecki, J. Muglia, S. Mulitza, A. Schmittner, O. Cartapanis, H. Bauch, R. Schiebel, and G. Haug (2021) Active North Atlantic Deepwater Formation during Heinrich Stadial 1 *Quaternary Science Reviews*, 270, 107145, doi: 10.1016/j.quascirev.2021.107145.
4. Wilmes, S.-B., J. A. M. Green, and A. Schmittner (2021) Enhanced vertical mixing in the glacial ocean inferred from sedimentary carbon isotopes *Communications Earth & Environment*, 2, 166, doi: 10.1038/s43247-021-00239-y.
5. Somes, C., A. Dale, K. Wallmann, F. Scholz, W. Yao, A. Oeschies, J. Muglia, A. Schmittner, and E. Achterberg (2021) Constraining global marine iron source and scavenging fluxes with GEOTRACES dissolved iron measurements in an ocean biogeochemical model *Glob Biogeochem Cy*, 35, (8), doi: 10.1029/2021GB006948.
6. Muglia, J., and A. Schmittner (2021) Carbon Isotope Constraints on Glacial Atlantic Meridional Overturning: Strength vs Depth *Quat Sci Rev*, 257, 106844, doi: 10.1016/j.quascirev.2021.106844.
7. Cliff, E., S. Khatiwala, and A. Schmittner (2021) Glacial deep ocean deoxygenation driven by biologically mediated air–sea disequilibrium, *Nat Geosci*, 14, 43-50, doi: 10.1038/s41561-020-00667-z.
8. Walczak, M. H., A. C. Mix, E. A. Cowan, S. Fallon, L. Keith Fifield, J. Alder, J. Du, B. Haley, T. Hobern, J. Padman, S. K. Praetorius, A. Schmittner, J. S. Stoner, and S. D. Zellers

- (2020) Phasing of millennial-scale climate variability in the Pacific and Atlantic Oceans, *Science*, eaba7096, doi: 10.1126/science.aba7096.
9. Mengis, N., D. P. Keller, A. MacDougall, M. Eby, N. Wright, K. J. Meissner, A. Oschlies, A. Schmittner, H. D. Matthews, and K. Zickfeld (2020) Evaluation of the University of Victoria Earth System Climate Model version 2.10 (UVic ESCM 2.10), *Geosci. Model Dev.*, *13*, 4183–4204, <https://doi.org/10.5194/gmd-13-4183-2020>.
 10. Khider, D., J. Emile-Geay, N. P. McKay, Y. Gil, D. Garijo, V. Ratnakar, M. Alonso-Garcia, S. Bertrand, O. Bothe, P. Brewer, A. Bunn, M. Chevalier, L. Comas-Bru, A. Csank, E. Dassié, K. DeLong, T. Felis, P. Francus, A. Frappier, W. Gray, S. Goring, L. Jonkers, M. Kahle, D. Kaufman, N. M. Kehrwald, B. Martrat, H. McGregor, J. Richey, A. Schmittner, N. Scropton, E. Sutherland, K. Thirumalai, K. Allen, F. Arnaud, Y. Axford, T. T. Barrows, L. Bazin, S. E. Pilaar Birch, E. Bradley, J. Bregy, E. Capron, O. Cartapanis, H. W. Chiang, K. Cobb, M. Debret, R. Dommmain, J. Du, K. Dyez, S. Emerick, M. P. Erb, G. Falster, W. Finsinger, D. Fortier, N. Gauthier, S. George, E. Grimm, J. Hertzberg, F. Hibbert, A. Hillman, W. Hobbs, M. Huber, A. L. C. Hughes, S. Jaccard, J. Ruan, M. Kienast, B. Konecky, G. Le Roux, V. Lyubchich, V. F. Novello, L. Olaka, J. W. Partin, C. Pearce, S. J. Phipps, C. Pignol, N. Piotrowska, M. S. Poli, A. Prokopenko, F. Schwanck, C. Stepanek, G. E. A. Swann, R. Telford, E. Thomas, Z. Thomas, S. Truebe, L. von Gunten, A. Waite, N. Weitzel, B. Wilhelm, J. Williams, J. J. Williams, M. Winstrup, N. Zhao, and Y. Zhou, 2019, PaCTS v1.0: A Crowdsourced Reporting Standard for Paleoclimate Data, *Paleoceanography and Paleoclimatology*, *35*, 1570-1596, doi: 10.1029/2019PA003632.
 11. Davis, C. V., J. F. Ontiveros-Cuadras, C. Benitez-Nelson, A. Schmittner, E. J. Tappa, E. Osborne, and R. C. Thunell, 2019, Ongoing increase in Eastern Tropical North Pacific denitrification as interpreted through the Santa Barbara Basin sedimentary $\delta^{15}\text{N}$ record, *Paleoceanography and Paleoclimatology*, *PALO20782*, doi: 10.1029/2019PA003578.
 12. Wilmes, S.-B., A. Schmittner, and J. A. M. Green, 2019, Glacial ice sheet extent effects on modeled tidal mixing and the global overturning circulation, *Paleoceanography and Paleoclimatology*, doi: 10.1029/2019PA003644.
 13. Lacerra M., D. C. Lund, G. Gebbie, D. W. Oppo, J. Yu, A. Schmittner and N. Umling, 2019, Less remineralized carbon in the intermediate depth South Atlantic during Heinrich Stadial 1, *Paleoceanography and Paleoclimatology*, doi: 10.1029/2018PA003537.
 14. Gottschalk, J., G. Battaglia, H. Fischer, T. L. Fröhlicher, S. L. Jaccard, A. Jeltsch-Thömmes, F. Joos, P. Köhler, K. J. Meissner, L. Menviel, C. Nehrbass-Ahles, J. Schmitt, A. Schmittner, L. C. Skinner and T. F. Stocker, 2019, Mechanisms of millennial-scale atmospheric CO_2 change in numerical model simulations *Quat. Sci. Rev.*, *220*, 30-74, doi: 10.1016/j.quascirev.2019.05.013.
 15. Khatiwala, S., A. Schmittner and J. Muglia, 2019, Air-sea disequilibrium enhances ocean carbon storage during glacial periods, *Science Advances*, *5*(6), doi: 10.1126/sciadv.aaw498.
 16. Muschitiello, F., W. J. D'Andrea, A. Schmittner, T. J. Heaton, M. L. Balascio, N. deRoberts, M. W. Caffee, T. E. Woodruff, K. C. Welten, L. C. Skinner, M. H. Simon, T. M. Dokken, 2019, Deep-water circulation changes lead North Atlantic climate during deglaciation, *Nature Communications*, *10*(1), 1272, doi: 10.1038/s41467-019-09237-3.
 17. Thibodeau, B., C. Not, A. Schmittner, D. Noone, C. Tabor, J. Zhang, and Z. Liu (2018) Last century warming over the Canadian Atlantic shelves linked to weak Atlantic Meridional

- Overturning Circulation, *Earth and Planet. Sci. Let.*, 496, 47-56, doi:10.1029/2018GL080083.
18. Muglia, J., Skinner, L., and A. Schmittner (2018) Weak overturning circulation and high Southern Ocean nutrient utilization maximized glacial ocean carbon, *Earth and Planet. Sci. Let.*, 496, 47-56, doi:10.1016/j.epsl.2018.05.038.
 19. Muglia, J., Somes, C. J., Nickelsen, L., and A. Schmittner (2017) Combined Effects of Atmospheric and Seafloor Iron Fluxes to the Glacial Ocean, *Paleoceanography*, 32(11), 1204-1218, doi:10.1002/2016PA003077.
 20. Lacerra, M., D. C. Lund, J. Yu, and A. Schmittner (2017) Carbon storage in the mid-depth Atlantic during millennial-scale climate events, *Paleoceanography*, 32, 780-795, doi:10.1002/2016PA003081.
 21. Schmittner, A., H. C. Bostock, O. Cartapanis, W. B. Curry, H. L. Filipsson, E. D. Galbraith, J. Gottschalk, J. C. Herguera, S. Jaccard, L. E. Lisiecki, D. C. Lund, G. Martínez-Méndez, J. Lynch-Stieglitz, A. Mackensen, E. Michel, A. C. Mix, D. W. Oppo, C. D. Peterson, E. L. Sikes, H. J. Spero, and C. Waelbroeck (2017) Calibration of the Carbon Isotope Composition ($\delta^{13}\text{C}$) of Epibenthic Foraminifera, *Paleoceanography*, 32(6), 512-530, doi:10.1002/2016PA003072.
 22. Somes, C. J., Schmittner, A., Muglia, J. and A. Oschlies (2017) A three-dimensional model of the marine nitrogen cycle during the Last Glacial Maximum constrained by sedimentary isotopes, *Frontiers in Marine Science*, 4, 108, doi:10.3389/fmars.2017.00108.
 23. Ullman, D. J. and A. Schmittner (2017) A cloud feedback emulator (CFE, version 1.0) for an intermediate complexity model, *Geoscientific Model Development*, 10, 945-958, doi:10.5194/gmd-10-945-2017.
 24. Bakker, P., Schmittner, A., Lenaerts, J. T. M., Abe-Ouchi, A., Bi, D., van den Broeke, M. R., Chan, W.-L., Beadling, R. L., Marsland, S. J., Mernild, S. H., Saenko, O. A., Swingedouw, D., Sullivan, A. and J. Jin (2016) Fate of the Atlantic Meridional Overturning Circulation - Strong decline under continued warming and Greenland melting, *Geophysical Research Letters*, 43(23), 12,252-12,260, doi:10.1002/2016GL070457.
 25. Bakker, P., Clark, P. U., Golledge, N. R., Schmittner, A., and M. E. Weber (2016) Centennial-scale Holocene climate variations amplified by Antarctic Ice Sheet discharge, *Nature*, 541, 72-76, doi:10.1038/nature20582.
 26. Hertzberg, J. E., Lund, D. C., Schmittner, A. and A. L. Skrivaneck (2016) Evidence for a Biological Pump Driver of Atmospheric CO₂ Rise during Heinrich Stadial 1, *Geophysical Research Letters*, 43(23), 12,242-12,251, doi:10.1002/2016GL070723.
 27. Schmittner, A., and C. J. Somes, 2016, Complementary Constraints from Carbon (^{13}C) and Nitrogen (^{15}N) Isotopes on the Efficiency of the Glacial Ocean's Soft-Tissue Biological Pump, *Paleoceanography*, 31, doi:10.1002/2015PA002905.
 28. Muglia, J., and Schmittner, A., 2015, Glacial Atlantic overturning increased by wind stress in climate models, *Geophysical Research Letters*, 42, doi:10.1002/2015GL064583.
 29. Buizert, C., and Schmittner, A., 2015, Southern Ocean Control of Glacial AMOC Stability and Dansgaard-Oeschger Interstadial Duration, *Paleoceanography*, 30, doi:10.1002/2015PA002795.

30. Green, J. A. M., and Schmittner, A., 2015, Climatic Consequences of a Pine Island Glacier Collapse, *Journal of Climate*, 28, 9221-9234, doi:10.1175/JCLI-D-15-0110.1.
31. Kvale, K. F., Meissner, K. J., Keller, D. P., Eby, M., and Schmittner, A., 2015, Explicit planktic calcifiers in the University of Victoria Earth System Climate Model, Version 2.9, *Atm.-Ocean*, 53:3, 332-350, doi:10.1080/07055900.2015.1049112.
32. Lund, D., Tessin, A., Hoffman, J., Schmittner, A., 2015, Southwest Atlantic water mass evolution during the last deglaciation, *Paleoceanogr.*, 30, doi:10.1002/2014PA002657.
33. Schmittner, A., Green, J. A. M., and Wilmes, S.-B. (2015) Glacial Ocean Overturning Intensified by Tidal Mixing in a Global Circulation Model, *Geophysical Research Letters*. doi:10.1002/2015GL063561.
34. Schmittner, A., and Lund, D. C., 2015, Early deglacial Atlantic overturning decline and its role in atmospheric CO₂ rise inferred from carbon isotopes ($\delta^{13}\text{C}$), *Climate of the Past*, 11, 135-152.

Other

I have written an open textbook on climate science for undergraduates: Schmittner, A. (2017) *Introduction to Climate Science*, Open Oregon State, <http://library.open.oregonstate.edu/climatechange/>.

I have been contributing author to two IPCC Assessment Reports: AR4 and AR5. Chapter 6 (Ciais et al. 2013: Carbon and Other Biogeochemical Cycles) of *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Stocker et al. (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. Chapters 8 (Randall et al. 2007: Climate Models and Their Evaluation) and 10 (Meehl et al. 2007: Global Climate Projections) of *Climate Change 2007: The Physical Science Basis. Contribution of Working Group 1 to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Solomon et al. (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. The IPCC was awarded the Nobel Peace Prize in 2007.

TEACHING AND ADVISING

I have been teaching 18 courses at OSU since 2007 on topics such as climate change and climate modeling. I have advised four post-doctoral researchers and two graduate students and various undergraduate students. Currently I'm advising two post-doctoral researchers, two graduate and one undergraduate students.

RESEARCH

I have been awarded 16 major research grants from the National Science Foundation and the National Oceanic and Atmospheric Administration.

SERVICE

I have served on 20 College and University committees, 2 NSF panels, and 1 NOAA Advisory Panel. I have reviewed more than 100 manuscripts for scientific journals and more than 60 grant proposals. I have given numerous lectures on climate science for the general public. I engage in outreach activities to improve climate literacy such as organization of teacher workshops and participation in climatefeedback.org, which is a fact checking network of climate scientists.