

# CURRICULUM VITAE

10/24/2007

## OREGON STATE UNIVERSITY College of Oceanic & Atmospheric Sciences

ANDREAS SCHMITTNER

Assistant Professor

BIRTHDATE:

December 17, 1966

Citizenship: Germany

Current Position: Assistant Professor  
College of Oceanic and Atmospheric Sciences  
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### EDUCATION

Diploma, Physics, University Bremen, Germany, 1996  
Ph.D., Physics, Department of Climate and Environmental Physics, Institute of Physics,  
University Bern, Switzerland, 1999. Dissertation: On the Large-Scale Atmospheric  
Hydrological Cycle and its Influence on the Global Ocean Circulation.

### ACADEMIC POSITIONS

Postdoctoral Scholar, School of Earth and Ocean Sciences, University of Victoria, Canada,  
1999-2002  
Lecturer, Department of Physics and Astronomy, University of Victoria, Canada, 2001-  
2002  
Postdoctoral Scholar, Max-Planck-Institute for Biogeochemistry, Jena, Germany, 2002-  
2003  
Postdoctoral Scholar, Institute of Geosciences, University Kiel, Germany, 2003-2005  
Assistant Professor, College of Oceanic & Atmospheric Sciences, Oregon State University,  
2005-present

### AWARDS

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

### NON-ACADEMIC POSITIONS, EDITORSHIPS, etc.

Associate Editor with the Journal of Climate (since January 2005)  
Editor of the AGU Geophysical Monograph Series book "Ocean Circulation: Mechanisms  
and Impacts", vol. 173.

### FIELDS OF SPECIALIZATION

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

## PROFESSIONAL ACTIVITIES

### Professional Organizations

American Geophysical Union  
American Meteorological Society  
European Geophysical Union  
American Society of Limnology and Oceanography

### Conference Session Chair, Workshop Convener, etc.

Workshop at the University Kiel, “Pliocene Closure of the Panama Gateway and its Effect on Ocean Circulation, Climate and Evolution”, Kiel, Germany, June 2004.  
Conference Session at the American Geophysical Union Fall Meeting, “Past and Future Changes of Thermohaline Circulation”, San Francisco, USA, December 2005.  
Conference Session at the American Geophysical Union Ocean Sciences Meeting, “Feedbacks Between Marine Biogeochemical Cycles and Climate”, Honolulu, USA, February 2006.

### Committees, Commissions and Boards

CLIVAR/PAGES Intersection Panel (Since 2004)  
Peer review of teaching committee, College of Oceanic and Atmospheric Sciences, Oregon State University (2005/2006)  
Frontiers of Science Seminar Series committee, College of Oceanic and Atmospheric Sciences, Oregon State University (2007/2008)

## PUBLICATIONS

### Peer reviewed papers

(Numbers in brackets at the end denote times cited as of Oct. 1<sup>st</sup>, 2007, ISI, TOTAL=687)

1. Schmittner, A., E. J. Brook and J. Ahn, 2007, Impact of the ocean's overturning circulation on atmospheric CO<sub>2</sub>, in *Ocean Circulation: Mechanisms and Impacts*, AGU Geophys. Monograph, vol. **173**, edited by Schmittner, A., J. Chiang, and S. Hemming, pp. 315-334, American Geophysical Union.
2. Clark, P. U., S. W. Hostetler, N. G. Piasias, A. Schmittner, and K. J. Meissner, 2007, Mechanisms for a ~7-kyr climate and sea-level oscillation during marine isotope stage 3, in *Ocean Circulation: Mechanisms and Impacts*, AGU Geophys. Monograph, vol. **173**, edited by Schmittner, A., J. Chiang, and S. Hemming, pp. 209-246, American Geophysical Union.
3. Schmittner, A., E. D. Galbraith, S. W. Hostetler, T. F. Pedersen, and R. Zhang, 2007, Large fluctuations of dissolved oxygen in the Indian and Pacific oceans during Dansgaard-Oeschger oscillations caused by variations of North Atlantic Deep Water subduction, *Paleoceanogr.*, **22**, PA3207, doi:10.1029/2006PA001384.
4. Schneider, B., M. Latif, and A. Schmittner, 2007, Evaluation of different methods to assess model projections of the future evolution of the Atlantic meridional overturning circulation, *J. Climate*, **20**, 2121-2132.
5. Schneider, B. and A. Schmittner, 2006, Simulating the impact of the Panamanian seaway closure on ocean circulation, marine productivity and nutrient cycling, *Earth and Planet. Sci. Let.*, **246**, 367–380. (3)
6. Schmittner, A., Latif, M. and Schneider, B., 2005, Model Projections of the North Atlantic thermohaline circulation for the 21st century assessed by observations, *Geophys. Res. Letters*, **32**, L23710, doi:10.1029/2005GL024368. (13)

7. Schmittner, A., Oschlies, A., Giraud, X., Eby, M. and Simmons H.L. 2005, A Global Model of the Marine Ecosystem for Long Term Simulations: Sensitivity to Ocean Mixing, Buoyancy Forcing, Particle Sinking and Dissolved Organic Matter Cycling, *Global Biogeochemical Cycles*, **19**, GB3004, doi:10.1029/2004GB002283. (7)
8. Schmittner, A., 2005: Decline of the marine ecosystem caused by a reduction in the Atlantic overturning circulation, *Nature*, **434**, 628-633. (20)
9. Kösters, F., R. H. Käse, A. Schmittner and P. Herrmann, 2005, The effect of Denmark Strait Overflow on the Atlantic Meridional Overturning Circulation, *Geophysical Research Letters*, **32**, L04602, doi:10.1029/2004GL022112. (3)
10. Schmittner, A., M. Sarnthein, H. Kinkel, G. Bartoli, T. Bickert, M. Crucifix, D. Crudeli, J. Groeneveld, F. Kösters, U. Mikolajewicz, C. Millo, J. Reimer, P. Schäfer, D. Schmidt, B. Schneider, M. Schulz, S. Steph, R. Tiedemann, M. Weinelt and M. Zuvela, 2004: Global impact of the Panamanian seaway closure, *EOS*, **85**, 526. (1)
11. Saenko, O. A., Schmittner, A. and A. J. Weaver, 2004: The Atlantic-Pacific seesaw, *Journal of Climate*, **17**, 2033-2038. (8)
12. Ewen, T., A.J. Weaver and A. Schmittner, 2004: Modelling carbon cycle feedbacks during abrupt climate change. *Quaternary Science Reviews*, **23**, 431-448. (1)
13. Schmittner, A., 2003, Southern Ocean sea ice and radiocarbon ages of glacial bottom waters, *Earth and Planetary Science Letters*, **213**, 53-62, doi:10.1016/S0012-821X(03)00291-7. (7)
14. Saenko, O. A., A. J. Weaver and A. Schmittner, 2003, Atlantic deep circulation controlled by freshening in the Southern Ocean, *Geophysical Research Letters*, **30**, 1754, doi:10.1029/2003GL017681. (10)
15. Schmittner, A., O. A. Saenko and A. J. Weaver, 2003, Coupling of the hemispheres in observations and simulations of glacial climate change, *Quaternary Science Reviews*, **22**, 659-671, doi:10.1016/S0277-3791(02)00184-1. (27)
16. Meissner, J. K., A. Schmittner, A. J. Weaver and J. Adkins, 2003, The ventilation of the North Atlantic Ocean during the Last Glacial Maximum - a comparison between simulated and observed radiocarbon ages, *Paleoceanography*, **18**, doi:10.1029/2002PA000762. (16)
17. Saenko, O. A., A. Schmittner and A. J. Weaver, 2002, On the role of wind-driven sea ice motion on ocean ventilation, *Journal of Physical Oceanography*, **32**, 3376-3395. (9)
18. Meissner, K. J., A. Schmittner, E. C. Wiebe and A. J. Weaver, 2002, Simulations of Heinrich events in a coupled ocean-atmosphere-sea ice model, *Geophysical Research Letters*, **29**, 10.1029/2001GL01135114. (2)
19. Schmittner, A., K. J. Meissner, M. Eby and A. J. Weaver, 2002, Forcing of the deep ocean circulation in simulations of the Last Glacial Maximum, *Paleoceanography*, **17**, 10.1029/2001PA000633. (12)
20. Schmittner, A. and A. C. Clement, 2002, Sensitivity of the thermohaline circulation to tropical and high latitude freshwater forcing during the last glacial-interglacial cycle, *Paleoceanography*, **17**, 10.1029/2000PA000591. (8)
21. Schmittner, A., M. Yoshimori and A. J. Weaver, 2002, Instability of glacial climate in a model of the ocean-atmosphere-cryosphere system, *Science*, **295**, 1489-1493. (50)
22. Weaver, A. J., M. Eby, E. C. Wiebe, C. M. Bitz, P. B. Duffy, T. L. Ewen, A. F. Fanning, M. M. Holland, A. MacFadyen, O. Saenko, A. Schmittner, H. Wang and M. Yoshimori, 2001, The UVic Earth System Climate Model: Model Description, Climatology and

- Applications to Past, Present and Future Climates, *Atmosphere-Ocean*, **39**, 361-428. (99)
23. Schmittner, A. and A. J. Weaver, 2001, Dependence of multiple climate states on ocean mixing parameters, *Geoph. Res. Let.*, **28**, 1027-1030. (20)
  24. Schmittner, A. and T. F. Stocker, 2001, A seasonally forced model for paleoclimate studies, *J. Climate*, **14**, 1055-1068. (7)
  25. Appenzeller, C., T.F. Stocker, A. Schmittner, 2001, Climate change and natural climate variability: chance for surprise? *Integrated Assessment*, **1**, 301-306.
  26. Schmittner, A., C. Appenzeller and T. F. Stocker, 2000, Enhanced Atlantic freshwater export during El Niño, *Geoph. Res. Let.*, **27**, 1163-1166. (43)
  27. Schmittner, A., C. Appenzeller and T. F. Stocker, 2000, Validation of parametrizations for the meridional energy and moisture transport used in simple climate models, *Clim. Dyn.*, **16**, 63-77. (5)
  28. Joos, F., G.-K. Plattner, T.F. Stocker, O. Marchal and A. Schmittner, 1999, Global warming and marine carbon cycle feedbacks on future atmospheric CO<sub>2</sub>, *Science*, **284**, 464-467. (74)
  29. Schmittner, A. and T. F. Stocker, 1999, The stability of the thermohaline circulation in global warming experiments, *J. Climate*, **12**, 1117-1133. (43)
  30. Stocker, T. F. and A. Schmittner, 1997, Influence of CO<sub>2</sub> emission rates on the stability of the thermohaline circulation, *Nature*, **388**, 862-865. (167)

#### **Articles in press**

Schmittner, A., A. Oschlies, D. Matthews, and E. D. Galbraith, 2007, Future changes in climate, ocean circulation, ecosystems and biogeochemical cycling simulated for a business-as-usual CO<sub>2</sub> emission scenario until year 4000 AD, *Global Biogeochem. Cycles*

#### **Articles submitted**

Oschlies, A., K. G. Schulz, U. Riebesell, and A. Schmittner, 2007, Significant increase in oceanic suboxia during the 21<sup>st</sup> century, submitted to *Science*.

## **TEACHING AND ADVISING**

#### **Student Thesis Advisor**

Chris Some (Senior Thesis in Physics, OSU) defended in June 2006 with the thesis (PH 403) "Modeling instabilities of the global thermohaline ocean circulation and its effect on the Pacific Ocean oxygen minimum zone"

#### **Student Advisory Committee**

Shannon M. Biedermann (MS Thesis in Mathematics, OSU, Feb. 2007)  
Torrey Johnson (PhD in Mathematics, OSU, 2006)  
Nathan Sky Nebergall (MS Thesis in Applied Physics, OSU, 2006)  
Kyle Champley (PhD Thesis in Mathematics, OSU)

#### **Courses Taught**

- “Introduction to Climate Modeling”, Winter 2006/2007, College of Oceanic & Atmospheric Sciences, Oregon State University  
“Time Series Analysis,” Fall/Winter 2003, 2004, Institute of Geosciences, University Kiel  
“Introduction to Paleoclimate Modeling,” Fall/Winter 2003, Institute of Geosciences, University Kiel  
“Thermodynamics,” Fall/Winter 2001, Department of Physics and Astronomy, University of Victoria

### **Graduate Seminars**

- “Current Topics in Paleoclimate Research”, Interdisciplinary Seminar for Students of Oceanography and Geology, Fall/Winter 2004/2005, Institute of Geosciences, University Kiel, Germany  
“Climate Change and the Carbon Cycle”, Interdisciplinary Seminar for Students of Oceanography and Geology, Fall/Winter 2003/2004, Institute of Geosciences, University Kiel, Germany

### **REFEREEING**

#### **Peer Reviewing of Articles for Scientific Journals**

(Number of papers reviewed for each journal given in parenthesis)

2007

- Science (1)
- Climate Dynamics (1)
- Journal of Geophysical Research (1)
- Geophysical Research Letters (2)
- Journal of Climate (1)

2006

- Geophysical Research Letters (3)
- Journal of Geophysical Research (1)
- Climate Dynamics (1)
- Nature (2)
- Journal of Climate (3)
- Ocean Sciences (1)

2005

- Geophysical Research Letters (4)
- Ocean Modelling (1)
- Global Biogeochemical Cycles (1)
- Journal of Climate (2)

Prior to 2005

- AGU Geophysical Monograph Series (1)
- Atmosphere – Ocean (2)
- Global and Planetary Change (1)
- Geophysical Research Letters (5)
- Journal of Physical Oceanography (1)
- Journal of Climate (8)
- Journal of Oceanography (1)
- Quaternary Science Reviews (2)
- Science (3)

#### **Reviewing of Grant Proposals for Funding Agencies**

2007

- National Science Foundation, Washington DC, USA (4)
- The Petroleum Research Fund, American Chemical Society, Washington DC (1)

2006

- National Science Foundation, Washington DC, USA (2)

2005

- National Science Foundation, Washington DC, USA (2)

Prior to 2004

- Natural Environment Research Council, Swindon, UK (3)

#### **Other Reviews**

2007 Book proposal (Springer)

### **RESEARCH PROJECTS**

#### **Funded Proposals as Principal Investigator**

- “Ocean Circulation, Oxygen and Nutrient Cycles During the Last Glacial Period” NSF, 08/2007 – 07/2010, \$363,481
- “PaleoVar - Past climate variability: Understanding mechanisms and interactions with the mean state” NSF, 06/2006 – 05/2011, \$3.1 M (Schmittner part \$470,932)
- “Impact of ocean gateways on climate, ocean circulation and chemistry, and the distribution of biota in model simulations,” Deutsche Forschungsgemeinschaft (German Research Foundation, DFG), 10/2003 - 09/2005, ~150,000 EUR

#### **Other Past Active Involvements**

- “Past Climate Sensitivity and Variability” 2002-2003: Deutsches Klimaforschungsprogramm (German Climate Research Program, DEKLIM)
- Climate System History and Dynamics (CSHD) Program by the National Science and Engineering Research Council of Canada (NCERC), 2000 - 2002.

### **PUBLIC SERVICE ACTIVITIES**

#### **Outreach Activities**

Inverview with film crew from History Channel about the Younger Dryas, Sep 21<sup>st</sup>, 2007  
Inverview with Boris Bellanger from Science & Vie, France, Nov 13<sup>th</sup>, 2006  
Interview with Rainer Klose from Facts magazin (Switzerland), Aug 15<sup>th</sup>, 2006  
Interview with Judy Scott from COAS Publications/Outreach, Aug 1<sup>st</sup>, 2006  
Email interview with Ute Kehse from “Geo kompakt”, July 26<sup>th</sup>, 2006  
Interview with Briavael O'Reilly for MicrobeWorld Radio ([www.microbeworld.org](http://www.microbeworld.org)) with the American Society for Microbiology, July 12<sup>th</sup>, 2006  
Interview with reporter from Physics Today, February 9<sup>th</sup>, 2006  
Interview with Quirin Schiermeier from Nature. January 2006, Article available at <http://0-www.nature.com.oasis.oregonstate.edu/nature/journal/v439/n7074/full/439256a.html>  
1  
Press conference “Past and Future Changes of Thermohaline Circulation” at the American Geophysical Union Fall Meeting in San Francisco, December 7<sup>th</sup>, 2005  
Interview with Elizabeth Katt-Reinders for Earthwatch Radio (<http://ewradio.org>) “Plankton in Peril” to be broadcast July/August 2005  
COAS Press Release March 2005  
(<http://www.coas.oregonstate.edu/index.cfm?fuseaction=content.display&id=281>)