

## **JOELLEN L. RUSSELL**

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### **CHRONOLOGY OF EDUCATION**

**1999 Ph.D.** in Oceanography; Scripps Institution of Oceanography, University of California, San Diego.

Dissertation title: *The Biogeochemistry of Southern Ocean Intermediate and Mode Waters*;  
Primary Advisor: Prof. Andrew G. Dickson

**1993 B.A.** in Environmental Geoscience; Dept of Earth and Planetary Sciences, Harvard University.

Thesis title: *Applying Geology to Atmospheric Research: Modern Analogs to Archean Paleosols*;

### **CHRONOLOGY OF EMPLOYMENT**

**2006 -** Assistant Professor, Department of Geosciences, University of Arizona.

**2002 - 2005** Postdoctoral Research Associate, Program in Atmospheric and Oceanic Sciences, Geosciences Department, Princeton University.

**1999 - 2002** Postdoctoral Research Associate, Joint Institute for the Study of Atmosphere and Ocean, Department of Atmospheric Sciences, University of Washington.

### **HONORS AND AWARDS**

**2008** Nominated by the University of Arizona for the David and Lucille Packard Foundation Fellowship for Science and Engineering

**1989 - 1993** Radcliffe National Scholar, Harvard University.

### **GRANTS AND CONTRACTS**

**09/01/2008 - 08/31/2011** Consultant, NSF Coupled Natural-Human Systems Initiative (NSF 07-598), "Collaborative Research: Urban Vulnerability to Climate Change: A System Dynamics Analysis." \$15,000.

**05/01/2007 – 04/30/2011** Principal Investigator, NOAA Office of Global Programs, "A climate process team on Southern Ocean water mass transformation and the carbon cycle." \$309,762.

**07/01/2005 – 06/30/2008** Principal Investigator, NOAA Office of Global Programs (GC05-146), "Optimal network design to detect spatial patterns and variability of ocean carbon sources and sinks from underway surface CO<sub>2</sub> measurements." \$163,674.

### **SERVICE/OUTREACH**

#### **International:**

**2008** World Wildlife Fund, Antarctic Climate Change Focal Project: Impacts Of 2°C Global Warming On Southern Ocean Cetaceans (With Dr. Cynthia Tynan, WHOI): presented to International Whaling Commission 60<sup>th</sup> Annual Meeting, Santiago, Chile

**2008** World Wildlife Fund, Antarctic Climate Change Focal Project: Impacts Of 2°C Global Warming On Antarctic Penguins (With Dr. David Ainley of H.T. Harvey and Assoc.)

2007 Surface Ocean pCO<sub>2</sub> Variability And Vulnerabilities Workshop, IOC/UNESCO, Paris France

**National:**

- 2009 **Co-Convenor**, New Frontiers in Southern Ocean Biogeochemistry and Ecosystem Research, Ocean Carbon and Biogeochemistry, Princeton, New Jersey.
- 2008 HPC User's Group Meeting, **Invited Presentation**, Tucson, Arizona
- 2008 ExxonMobil, **Invited Presentation**, Houston, Texas
- 2008 Early Career Geoscience Faculty: Teaching, Research, and Managing Your Career Workshop, College of William and Mary, Williamsburg, VA
- 2007 Member, National Research Council for the **National Academy of Science**, Committee to Review the "U.S. Climate Change Science Program's Synthesis and Assessment Product 3.2, Climate Projections Based on Emission Scenarios for Long-lived and Short-lived Radiatively Active Gases and Aerosols".
- 2007 Member, National Research Council for the **National Academy of Science**, Review Committee for "Review of the U.S. Climate Change Science Program's Draft Synthesis and Assessment Product 1.3, Re-analyses of Historical Climate Data and Implications for Attribution"
- 2007 Ocean Carbon and Biogeochemistry Scoping Workshop on Ocean Acidification Research, Scripps Institution of Oceanography, La Jolla, California
- 2007 SGI User Group Annual Meeting, SGIUG 2007, **Invited Keynote**, Minneapolis, MN
- 2006 - Member, Biospheric Processes Team, Geophysical Fluid Dynamics Laboratory, National Oceanic and Atmospheric Administration
- 2006 Amicus brief to the United States Supreme Court (Massachusetts vs. the EPA)

**Regional:**

- 2008 Salt River Project, **Invited Presentation**, Tempe, Arizona
- 2008 Border-Area Climate Change Impacts & Water Sector Adaptation Workshop, **Invited Presentation**, California Department of Water Resources, Tucson, Arizona
- 2007 Salt River Project, **Invited Presentation**, Tempe, Arizona
- 2007 11th Annual Great Divide Workshop, **Invited Presentation**, National Weather Service, Great Falls, Montana
- 2007 Montana Water Center, **Invited Presentation**, University of Montana, Bozeman, Montana
- 2006 Tucson Water, **Invited Presentation**, Department of the City of Tucson, Arizona

**PUBLICATIONS**

- Ainley, D., **J.L. Russell**, S. Jenouvrier, E. Woehler, P. O'B. Lyver, W.R. Fraser, and G.L. Kooyman: Antarctic Penguin Response to Habitat Changes as Earth's Troposphere Reaches 2°C Above Pre-Industrial Levels. *Ecological Monographs*, in press.
- Woodhouse, C.A., **J.L. Russell** and E.R. Cook, 2009: Two Modes of North American Drought from Instrumental and Paleoclimatic Data. *J. Climate*, **22(16)**, 4336-4347.
- McAfee, S.A. and **J.L. Russell**, 2008: Northern Annular Mode impact on spring climate in the western United States, *Geophys. Res. Lett.*, **35**, L17701, doi:10.1029/2008GL034828.
- Toggweiler, J.R. and **J. Russell**, 2008: Ocean circulation in a warming climate. *Nature*, **451**, 286-288.

- deBoer, A.M., D.M. Sigman, J.R. Toggweiler, and **J.L. Russell**, 2007: The effect of global ocean temperature change on deep ocean ventilation. *Paleoceanography*, **22**, PA2210, doi:10.1029/2005PA001242.
- Gnanadesikan, A., **J.L. Russell**, and F. Zeng, 2007: How does ocean ventilation change under global warming? *Ocean Science*, **3**, 43-53.
- Russell, J.L.**, R.J. Souffer, and K.W. Dixon, 2007: Corrigendum. *J. Climate*, **20(16)**, 4287.
- Russell, J.L.**, K.W. Dixon, A. Gnanadesikan, R.J. Stouffer, and J.R. Toggweiler, 2006: The Southern Hemisphere Westerlies in a Warming World: Propping Open the Door to the Deep Ocean. *J. Climate*, **19(24)**, 6382-6390.
- Russell, J.L.**, R.J. Souffer, and K.W. Dixon, 2006: Intercomparison of the Southern Ocean Circulations in the IPCC Coupled Model Control Simulations. *J. Climate*, **19(18)**, 4560-4575.
- Stouffer, R.J., **J.L. Russell**, and M.J. Spelman, 2006: Importance of Oceanic Heat Uptake in Transient Climate Change. *Geophys. Res. Lett*, **33**, L17704, doi:10.1029/2006GL027242.
- Toggweiler, J.R., **J.L. Russell**, and S.R. Carson, 2006: Midlatitude westerlies, atmospheric CO<sub>2</sub>, and climate change during the ice ages. *Paleoceanography*, **21**, PA2005, doi:10.1029/2005PA001154.
- Delworth, T.L., A.J. Broccoli, A. Rosati, R.J. Stouffer, V. Balaji, J.A. Beesley, W.F. Cooke, K.W. Dixon, J. Dunne, K.A. Dunne, J.W. Durachta, K.L. Findell, P. Ginoux, A. Gnanadesikan, C.T. Gordon, S.M. Griffies, R. Gudgel, M.J. Harrison, I.M. Held, R.S. Hemler, L.W. Horowitz, S.A. Klein, T.R. Knutson, P.J. Kushner, A.R. Langenhorst, H-C. Lee, S-J. Lin, J. Lu, S.L. Malyshev, P.C.D. Milly, V. Ramaswamy, **J.L. Russell**, E. Shevliakova, M.D. Schwarzkopf, J.J. Sirutis, M.J. Spelman, W.F. Stern, M. Winton, A.T. Wittenberg, B. Wyman, F. Zeng, and R. Zhang, 2006: GFDL's CM2 Global Coupled Climate Models. Part I: Formulation and simulation characteristics. *J. Climate*, **19(5)**, 643-674.
- Gnanadesikan, A., K.W. Dixon, S.M. Griffies, V. Balaji, M. Barreiro, J.A. Beesley, W.F. Cooke, T.L. Delworth, R. Gerdes, M.J. Harrison, I.M. Held, W.J. Hurlin, H-C. Lee, Z. Liang, G. Nong, R.C. Pacanowski, A. Rosati, **J.L. Russell**, B.L. Samuels, Q. Song, M.J. Spelman, R.J. Stouffer, C.O. Sweeney, G. Vecchi, M. Winton, A.T. Wittenberg, F. Zeng, R. Zhang, and J.P. Dunne, 2006: GFDL's CM2 Global Coupled Climate Models. Part 2: The baseline ocean simulation. *J. Climate*, **19(5)**, 675-697.
- Griffies, S.M., A. Gnanadesikan, K.W. Dixon, J.P. Dunne, R. Gerdes, M.J. Harrison, A. Rosati, **J.L. Russell**, B.L. Samuels, M.J. Spelman, M. Winton, and R. Zhang, 2005: Formulation of an Ocean Model for Global Climate Simulations. *Ocean Science*, **1**, 45-79.
- Russell, J.L.**, and J.M. Wallace, 2004: Annual carbon dioxide drawdown and the Northern Annular Mode. *Global Biogeochem. Cycles*, **18**, GB1012, doi:10.1029/2003GB002044.
- Russell, J.L.**, and A.G. Dickson, 2003: Variability in oxygen and nutrients in South Pacific Antarctic Intermediate Water. *Global Biogeochem. Cycles*, **17(2)**, 1033, doi:10.1029/2000GB001317.
- Hine, A.C., D.A. Feary, M.J. Malone, and the Leg 182 Shipboard Party (M. Andres, C. Betzler, G.R. Brooks, C.A. Brunner, M.D. Fuller, A.E. Holbourn, M. Huuse, A.R. Isern, N.P. James, B.C. Ladner, Q. Li, H. Machiyama, D.J. Mallinson, H. Matsuda, R.M. Mitterer, R.S. Molina, C. Robin, **J.L. Russell**, S. Shafik, J.A. Simo, P.L. Smart, G.H. Spence, F.C. Surlyk, P.K. Swart, and U.G. Wortmann), 1999: Research in the Great Australian Bight Yields Exciting Early Results. *EOS Transactions*, American Geophysical Union, **80**, #44,

Nov. 2, 1999, pp. 521, 525-526.

### **IN PROGRESS:**

- McAfee, S.A., and **J.L. Russell**, Attenuated Orography Contributes to Precipitation Errors Over the Western United States in IPCC-AR4 Report Models, *J. Climate*, submitted.
- McAfee, S.A., and **J.L. Russell**, Impacts of Biases in Model Precipitation on Projected Dryland Ecosystem Response and Carbon Losses in Western North America, *Ecology*, submitted.
- Kapp, P., J.D. Pelletier, A. Rohrmann and **J. Russell**, Wind erosion in the Qaidam Basin of Central Asia: Implications for tectonics and the source of the Loess Plateau, *Geology*, in revision.
- Russell, J.L.**, and J.M. Wallace, Modulation of atmospheric composition by the ENSO cycle: analysis of observations of a suite of trace gases using a simple 12-month, running difference filter, *Global Biogeochem. Cycles*, in revision
- Russell, J.L.**, A. Gnanadesikan, and J.R. Toggweiler, Impact of Westerly Wind Position on the Circulation of the Southern Ocean. *J. Climate*, in revision.

### **SCHOLARLY PRESENTATIONS (since 2006)**

#### **Conferences:**

- Russell, J. (2009) **Invited Keynote**, Ice in Antarctica, 7<sup>th</sup> International Media Forum on the Protection of Nature: Climate is changing: stories, facts and people, Greenaccord, Viterbo, Italy (scheduled)
- Russell, J. (2009) **Invited**, The Westerlies and Global Climate Change, Global Sustainability Workshop, Santa Fe Institute, Santa Fe, NM
- Russell, J. (2009) **Invited**, The Future of the Ross Sea in IPCC class models, International Marine Conservation Congress, Washington, D.C.
- Russell, J. (2009) **Invited**, The Southern Ocean in IPCC class models, CLIVAR/CliC/SCAR Southern Ocean Region Implementation Panel 5th Meeting, Sydney Australia
- Russell, J. (2009) **Invited Keynote**, Intercomparison of IPCC coupled climate models' simulation of the Southern Ocean: climate, circulation and sea ice, 9th International Conference on Southern Hemisphere Meteorology and Oceanography, Melbourne, Australia
- Russell, J. (2009) **Invited Plenary**, The ocean in a warming world: circulation, carbon and calcification, ASLO Aquatic Sciences Meeting, Nice, France
- Russell, J. (2008) An Intercomparison of IPCC Coupled Climate Models' Simulation Of The Southern Ocean: Climate, Circulation And "Carbon", AGU Fall Meeting, San Francisco, California
- Russell, J. (2008) Projected Changes In Antarctic Sea Ice In The AR4 Climate Models: Implications For Adélie And Emperor Penguin Habitats, Ocean Sciences Meeting, Orlando, Florida
- Russell, J. (2007) **Invited**, The Southern Ocean in the AR4 simulations, Southern Ocean Physical Oceanography and Cryosphere Linkages (SOPHOCLES) Meeting, Bergen, Norway
- Russell, J. (2007) **Invited**, Climate Model Projections for the Northern Rockies and the Western High Plains, National Weather Service, Great Falls, Montana
- Russell, J. (2007) **Invited**, Modeling Southern Ocean Anthropogenic Carbon Uptake: The AR4 Climate Models, NOAA Global Carbon Cycle Principal Investigators Meeting, Silver Spring, Maryland

- Russell, J. (2007) *Invited*, Modeling Southern Ocean Anthropogenic Carbon Uptake: The AR4 Climate Models, NOAA Southern Ocean Climate Process Team Workshop, Princeton, New Jersey
- Russell, J. and C. Sweeney (2007) *Invited*, Using surface pCO<sub>2</sub> decorrelation length scales to determine sampling resolution, Surface pCO<sub>2</sub> and Ocean Vulnerabilities Workshop, IOC/UNESCO, Paris, France
- Russell, J., (2007) *Invited Keynote*, Big Changes in the High-Latitude Oceans: The impact of the Westerlies on ocean heat content, stratification and ice, Gordon Research Conference, Ventura, California
- Russell, J. (2006) *Invited*, The Once and Future Battles between Thor and the Midgard Serpent: The Southern Hemisphere Westerlies and the Antarctic Circumpolar Current. 16<sup>th</sup> Annual V.M. Goldschmidt Conference, Melbourne, Australia
- Russell, J. (2006) *Invited*, The Southern Hemisphere Westerlies in a warming world: Propping open the door to the deep ocean. Ocean Carbon Biogeochemistry Workgroup, Woods Hole Oceanographic Institution, Woods Hole, Massachusetts

**Colloquia:**

- Russell, J. (2009) *Invited*, The Once and Future Battles of Thor and the Midgard Serpent: The Southern Hemisphere Westerlies and the Antarctic Circumpolar Current, Department of Geological Sciences, Brigham Young University, Provo, UT
- Russell, J. (2008) Climate Model Projections for the Southwest: The Role of the Westerly Jet, Department of Geosciences Colloquium, Tucson, AZ
- Russell, J. (2007) *Invited*, Modeling Climate-Tectonics interactions in the Andes. Rice University, Houston, TX
- Russell, J. (2006) *Invited*, The Southern Hemisphere Westerlies in a warming world: Propping open the door to the deep ocean. Geophysical Fluid Dynamics Laboratory, Princeton, NJ
- Russell, J. (2006) *Invited*, The Southern Hemisphere Westerlies in a warming world: Propping open the door to the deep ocean. Atmospheric Science Seminar, University of Arizona, Tucson, AZ