Stephen Matthew Griffies

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RESEARCH STATEMENT

My research is concerned with understanding elements of ocean fluid mechanics and the role of the ocean in the earth climate system. I make use of theoretical tools, idealized process models, realistic numerical circulation models, and observation-based analyses. Particular topics in recent years include studies of Atlantic and Southern Ocean dynamics; global and regional sea level variability and change; transport of matter and energy by transient mesoscale eddies; parameterizations for turbulent ocean stirring and mixing; analysis methods for revealing aspects of the ocean as a turbulent fluid; algorithms for ocean circulation models.

EDUCATIONAL STATEMENT

As a lecturer, mentor, author, and editor, I aim to foster a creative understanding of physical concepts and their use in describing observed and simulated ocean phenomena. Towards this aim, I strive to pedagogically articulate the foundations of ocean mechanics in written articles, books, course notes, and spoken lectures. I am particularly interested in revealing how concepts and tools from mathematical physics manifest in geophysical fluid mechanics and thermodynamics, and in so doing to nurture an appreciation for the underlying beauty of physical oceanography as a subfield of theoretical physics.

INTERESTS AND ACTIVITIES

Physics, oceanography, climate, philosophy, yoga, meditation, writing, surfing, skiing, hiking, cultures, sustainability

EMPLOYMENT AND APPOINTMENTS

2017–present	Partner Investigator, Australian Research Council Centre of Excellence for Climate Extremes
2015–present	Lecturer, Atmospheric and Oceanic Sciences Program, Princeton University
2013–2017	NOAA/GFDL Model Development Team Steering Committee
Jun-Aug 2012	Visiting Scientist, National Center for Atmospheric Research, Boulder, USA
2011–2017	Partner Investigator, Australian Research Council Centre of Excellence for Climate System Science
Jan-Jun 2011	CSIRO Distinguished Visiting Scientist Fellow, Hobart, Australia
2011-present	NOAA/GFDL Senior Scientist (equivalent to university full professor)
Mar 2009	Visiting Professor, Universite catholique de Louvain, Belgium
Jan-Nov 2005	Visiting Scientist, CSIRO Marine and Atmospheric Research, Hobart, Australia
2001–2005	NOAA/GFDL Oceans and Climate Group Leader
2000–2011	NOAA/GFDL Ocean Model and Climate Model Development Team (co-lead)
1996-present	NOAA/GFDL Staff Physical Scientist
1995–1996	NOAA/GFDL and Princeton University Visiting Research Scientist
1993–1995	UCAR Climate & Global Change Fellow at Princeton University
1988–1993	University of Pennsylvania Physics Graduate Research Fellow
1986–1987	Northwestern University Engineering Sciences and Applied Mathematics Fellow
1984–1986	Louisiana State University Chemical Engineering Research Laboratory Technician

EDUCATION

1993-1996	Post-doctoral fellow in geosciences	Princeton University
1988-1993	Ph.D in theoretical physics	University of Pennsylvania
1987-1988	Physics undergraduate studies	University of Washington
1986-1987	Masters in engineering sciences & applied mathematics	Northwestern University
1981-1986	Bachelor of science in chemical engineering	Louisiana State University

OCEANOGRAPHIC FIELD WORK

- Mar-May 2017: Eight week cruise on the *RRS JC Ross* to the Orkney Passage and Scotia Sea, as part of the Dynamics of the Orkney Passage Outflow (DynOPO) project. Principal Scientific Officer: A. Naveira Garabato.
- Jul 1993: Two week cruise on the *CCGS Hudson* to the Labrador Sea in support of the WOCE Line AR7W Atlantic Circulation Experiment. Chief Scientist: J. Lazier.

AWARDS AND HONORS

2017	Elected Fellow of the American Geophysical Union "For exceptional and sustained contributions to the understanding of large-scale ocean circulation and physics and seminal advances in ocean modeling"
2017	NOAA Administrator's Award "For scientific leadership for the innovation of the versatile community-based Modular Ocean Model MOM6"
2014	European Geosciences Union Fridtjof Nansen Medal for oceanographic research "For outstanding contribution and leadership in ocean general circulation model development and critical insights in the physical nature and parameterization of ocean processes"
2013	Department of Commerce Silver Medal Award (with nine other GFDL staff scientists): "For development and application of NOAA's first comprehensive Earth System Model that couples the carbon cycle and climate for projection of changes"
2012	NOAA Administrator's Award "For scientific vision, leadership and development of the Modular Ocean Model (MOM4) for climate modeling, research and predictions"
2011	CSIRO Distinguished Visiting Scientist Fellow, Australia
2009	Visiting Professor, Universite catholique de Louvain, Belgium
2001	NOAA/Oceanic and Atmospheric Research Outstanding Scientific Review Paper
1999	NOAA/Oceanic and Atmospheric Research Outstanding Scientific Paper
1998	NOAA/Oceanic and Atmospheric Research Employee of the Year
1997	NOAA/Environmental Research Laboratories Outstanding Scientific Paper

PROFESSIONAL SERVICES AND MEMBERSHIPS

2018-present	Editor of the Journal of Advances in Modeling the Earth System (JAMES)
2014-present	Member WCRP/CLIVAR Scientific Steering Group
2014-2016	NCEP Climate Model Development Task Force (co-lead)
2013-present	WCRP/CLIVAR Ocean Model Development Panel (ex-officio)
2012-2014	CLIVAR/CliC/SCAR Southern Ocean Region Implementation Panel
2012-present	Emeritus member of WCRP/CLIVAR Ocean Model Development Panel
2010-present	Member European Geosciences Union
2009-2015	Scientific Advisory Board for the Catalan Climate Institute *IC3*, Barcelona, Spain
2007-2018	Editor of the journal Ocean Modelling
2006-2009	WCRP/CLIVAR Scientific Steering Group
2004-2009	WRP/CLIVAR Working Group on Coupled Modelling (ex officio)
2004-2007	Editorial Board of the journal **Ocean Science**
1999-2012	WCRP/CLIVAR Working Group on Ocean Model Development (co-chair 2004-2009)
1993-present	Member American Geophysical Union
1993-present	Member American Meteorological Society

Mentoring and sabbatical hosting

2017-present	Houssam Yassin	Princeton University graduate student
2017-2018	Laure Zanna	Princeton University visiting scholar (from Oxford University)
2017	Jianjun Yin	Princeton University visiting scholar (from University of Arizona)
2016-present	Brandon Reichl	Princeton University post-doc researcher
2016-present	Nathaniel Tarshish	Princeton University pre-doc researcher (with Jorge Sarmiento)
2015-2017	Amanda O'Rourke	University of Michigan post-doc researcher (with Brian Arbic)
2015-2016	Henri Drake	Princeton University pre-doc researcher (with Jorge Sarmiento)
2014-2017	Alison Gray	Princeton University post-doc (with Jorge Sarmiento)
2014-2017	Anna FitzMaurice	Princeton University PhD student (with Sonya Legg and Robert Hallberg)
2014-2015	Ivy Frenger	Princeton University post-doc (with Jorge Sarmiento)
2013-2017	Robert Nazarian	Princeton University PhD student (with Sonya Legg and Robert Hallberg)
2013-2016	Adele Morrison	Princeton University post-doc (with Jorge Sarmiento)
2013	Terrence O'Kane	Visiting senior scientist from CSIRO Marine Laboratory, Hobart, Australia
2012-2017	Carolina Dufour	Princeton University post-doc (with Jorge Sarmiento)
2012-2013	Yalin Fan	Princeton University post-doc
2011-2014	Michael Bueti	University of Rhode Island PhD student (with Isaac Ginis)
2008-2011	Michael Bates	University of New South Wales PhD student (with Matthew England)
2005-2009	Andreas Klocker	University of Tasmania PhD student (with Trevor McDougall)
2001-2002	Harper Simmons	GFDL post-doc researcher
1999-2002	Shafer Smith	Princeton University and GFDL post-doc researcher

University teaching

- Spring semester 2018: Princeton University Geosciences 580: Special Topics on Great Papers in Atmospheric and Oceanic Sciences (led one two-hour discussion session)
- Autumn semester 2017: Princeton University Geosciences 571: Geophysical Fluid Dynamics (24 lectures)
- Spring semester 2017: Princeton University Geosciences 580: Special Topics on Great Papers in Atmospheric and Oceanic Sciences (led one two-hour discussion session)
- Autumn semester 2016: Princeton University Geosciences 571: Geophysical Fluid Dynamics (12 lectures covering the second half of the course)
- Spring semester 2016: Princeton University Geosciences 503: Responsible Conduct of Research in Geosciences (co-taught one three-hour discussion session)
- Autumn semester 2015: Princeton University Geosciences 571: Geophysical Fluid Dynamics (12 lectures covering the second half of the course)
- Autumn semester 2014: Princeton University Geosciences 571: Geophysical Fluid Dynamics (12 lectures covering the first half of the course)
- Autumn semester 1993: Princeton University Geosciences 580: Data Assimilation in Atmospheric and Oceanic Models (co-lecturer and coordinator of visiting lectures)
- 1990–1993: Instructor, Undergraduate Physics Laboratory, University of Pennsylvania
- 1990–1993: Teaching Assistant, General Relativity and Quantum Field Theory, University of Pennsylvania

Participant/collaborator on research grants and projects

- Program advisory board for the UK NERC funded project: Transient tracer-based Investigation of Circulation and Thermal Ocean Change (TICTOC) (2017-2020)
- Australian Research Council (2017-2023): Centre of Excellence for Climate Extremes, AU$30,050,000.
- Co-PI for the Ocean Model Intercomparison Project (OMIP), which is part of the Coupled Model Intercomparison Project (CMIP6) (2016-present).

- Co-PI for the Flux Anomaly Forcing Model Intercomparison Project (FAFMIP), which is part of the Coupled Model Intercomparison Project (CMIP6) (2016-present).
- NOAA Modeling, Analysis, Predictions, and Projections Program (01Jul2016–30Jun2018): Development toward NCEP's fully-coupled global forecast and data assimilation system: A coupled wave-ocean system. $316,000.
- Australian Research Council (2016-2020): An Australian Consortium for Eddy-Resolving Ocean-Sea Ice Modelling, AU$599,223.
- US Department of Energy (15Aug2014–14Aug2017): Three-dimensional structure of the Southern Ocean overturning circulation. $624,213.
- US National Science Foundation (01Sep2014–31Aug2020): Southern Ocean Carbon and Climate Observations and Modeling (SOCCOM). $20,983,626.
- NASA (26Jun2014–25 Jun2017): The role of mesoscale eddies in cross-frontal transport and subduction of nutrients and carbon in the Southern Ocean. $715,123.
- NOAA (01Sept2013–31Aug2016): Signature of the Atlantic meridional overturning circulation in the North Atlantic dynamic sea level. $393,172.
- US Department of Energy (15Sep2011–14Sep2015): Mode and intermediate waters in Earth System Models. $519,741.
- Australian Research Council (2011-2018): Centre of Excellence for Climate System Science, AU$21,400,000.
- NOAA Climate Program Office and US National Science Foundation (2010–2015): Climate Processes Team on representing internal-wave driven mixing in global ocean models.
- NOAA Climate Program Office and US National Science Foundation (2003–2008): Climate Processes Team on ocean eddy mixed layer interactions.
- NOAA Climate Program Office and US National Science Foundation (2003–2008): Climate Processes Team on gravity current entrainment.

INVITED PEDAGOGICAL LECTURES AND COURSES

- Jul 2016: Ocean Modelling and sea level analysis: three lectures (two hours each) at the International Centre for Theoretical Physics / Indian Institute for Tropical Meteorology: Advanced School on Earth System Modelling, Pune, India
- Aug 2013: Ocean models and ocean modeling: lectures on the fundamentals and practices: Five lectures (two hours each) at the International Centre for Theoretical Physics School: Fundamentals of Ocean Climate Modeling at Global and Regional Scales, Hyderabad, India
- Mar 2009: Physical Processes Setting the Ocean's Water Masses: four lectures (two hours each) at the Université Catholique de Louvain, Belgium
- Nov 2007: Ocean Model Fundamentals: 10 lectures (two hours each) at the University of Tasmania, Australia
- Aug 2006: Ocean Model Fundamentals: two lectures (one hour each) at the NSF summer school, Modern Mathematical Methods in Physical Oceanography, Breckenridge, USA
- Oct 2004: Ocean Model Fundamentals: 10 lectures (two hours each) at the Indian Intensive School on Large-Scale Ocean Modelling, Bangalore, India
- Sep 2004: Ocean Model Fundamentals: three lectures (two hours each) at the Global Ocean Data Assimilation Experiment Summer School, La Londe Les Maures, France
- May 2003: Ocean Climate Modeling at NOAA-GFDL: two lectures (one hour each) for a workshop on ocean modeling, Hobart, Australia
- May 2002: Ocean Climate Modeling with MOM4: three lectures (one hour each) for a workshop on ocean modeling, Kiel, Germany

- Jan 2001: Ocean Dynamics and Modeling: three lectures (two hours each) at La Escuela de Verano de Universidad de Concepción, Chile
- Mar 1999: Ocean and Climate Modeling: two lectures (90 minutes each) at Conference on Global Climate, Barcelona, Spain

PEDAGOGICAL MEDIA OUTREACH

- Dec 2016: Animation of the ocean's role in El Niño
- Nov 2015: Animation of Southern Ocean circulation
- 2011: Animation of ocean surface temperatures from eddying climate model

INVITED RESEARCH PRESENTATIONS SINCE 2008

- Feb 2018: Subsurface Warming of Antarctic Coastal Waters: a Role for Both Winds and Freshening: American Geophysical Union Ocean Sciences Conference, Portland, Oregon, USA.
- Dec 2017: Localized Rapid Warming of West Antarctic Subsurface Waters by Remote Winds: American Geophysical Union Fall Meeting, New Orleans, Louisiana, USA.
- Nov 2017: Physical mechanisms of sea level variations in a changing climate: International CLIVAR Scientific Steering Group meeting, Indian Institute of Tropical Meteorology, Pune, India.
- Jul 2017: Localized rapid warming of West Antarctic subsurface waters by remote winds: WCRP Conference on Regional Sea-level Changes and Coastal Impacts, Columbia University, New York City, USA.
- May 2017: Localized rapid warming of West Antarctic subsurface waters by remote winds: *RRS JC Ross* research cruise JR16005 to Orkney Passage, Southern Ocean.
- Jan 2017: The ocean mesoscale: observations, theory, and modeling: Banff International Research Station (BIRS) workshop: *Transport in unsteady flows: From deterministic structures to stochastic models and back again*, Banff, Canada.
- July 2016: Elements of sea level in a changing climate: Indian Institute of Tropical Meteorology, Pune, India.
- July 2016: Ocean modelling: an introduction for mathematical physicists: Department of Mathematics, Savitribai Phule Pune University, Pune, India.
- May 2016: Elements of sea level in a changing climate: University of New South Wales, Sydney, Australia & Australian National University, Canberra, Australia.
- Jan 2016: Elements of sea level in a changing climate: Louisiana State University Chemical Engineering Department, Baton Rouge, Louisiana, USA.
- Oct 2015: Impacts on ocean heat from the mesoscale: Lamont-Doherty Earth Observatory / Columbia University, USA.
- Oct 2015: Impacts on ocean heat from the mesoscale: Stony Brook Marine Sciences, Stony Brook, USA.
- Oct 2014: Impacts on ocean heat from the mesoscale: Meeting on ocean heat uptake at National Oceanography Centre, Southampton, UK.
- Jun 2014: Impacts on ocean heat from the mesoscale: University of Stockholm, Sweden.
- Apr 2014: Problems and prospects with ocean mesoscale eddying climate models: Nansen Medal lecture at the European Geosciences Union annual meeting, Vienna, Austria.
- Apr 2014: Problems and prospects with ocean mesoscale eddying climate models: lecture given at a CLIVAR workshop on eddying ocean climate models, Kiel, Germany.
- Sep 2013: Problems and prospects of model comparisons: an ocean process perspective: lecture given at a symposium celebrating the 80th birthday of Gerold Siedler, Kiel, Germany.

- Feb 2013: Sea level in a suite of forced global ocean-ice simulations: CLIVAR workshop on Sea-Level Rise, Ocean/Ice-Shelf Interactions, and Ice Sheets, Hobart, Australia
- Jan 2013: Ocean model numerics and physics: challenges for mesoscale eddying global climate simulations: 10th annual meeting of the Drakkar Ocean Modelling Consortia, Grenoble, France
- Sep 2012: Sea level in ocean climate models: fundamentals and practices: University of Tasmania, Hobart, Australia
- Sep 2012: Ocean modelling with MOM and its relation to Australian ocean climate science: Second meeting of Consortia for Ocean Modelling in Australia, Hobart, Australia
- Feb 2012: Ocean modelling with MOM and its relation to Australian ocean climate science: First meeting of Consortia for Ocean Modelling in Australia, Hobart, Australia
- Mar 2011: Dynamic sea level, static sea level, and the non-Boussinesq steric effect: Australia National University, Canberra, Australia
- Nov 2010: Ocean Climate Modeling at GFDL: Scientific Workshop for the Centre for Australian Weather and Climate Research, Hobart, Australia
- Sep 2010: Sensitivity of Atlantic ocean variability to ocean physics and vertical coordinate: CLIVAR WGOMD/GSOP Workshop on Decadal Variability, Predictability, and Predictions: Understanding the Role of the Ocean. Boulder USA
- Apr 2008: Physical Problems in Simulating the Ocean Climate System: presentation given during a workshop on Oceans and Climate at Yale University
- Mar 2008: Physical Problems in Simulating the Ocean Climate System: presentation given during a special session on Climate Physics at the American Physical Society's March Meeting of Condensed Matter Physics

convener/organizer of workshops & meetings

- Feb 2018: co-convener for the Town Hall: High-resolution ocean climate simulations and their analysis. American Geophysical Union Ocean Sciences Conference, Portland, Oregon, USA.
- Feb 2018: co-convener for the session: Modeling the Climate System at High Resolution, American Geophysical Union Ocean Sciences Conference, Portland, Oregon, USA.
- Sep 2016: Science Organizing Committee and Executive Planning Team for CLIVAR Open Science Conference, Qingdao, China.
- Apr 2014: Physical and biogeochemical ocean modelling: development, assessment, and applications, Session at the European Geosciences Union General Assembly, Vienna, Austria.
- Feb 2014: Physical and biogeochemical ocean modeling: development, assessment and applications, Session at the Ocean Sciences meeting, Honolulu, Hawaii.
- Apr 2013: Physical and biogeochemical ocean modelling: development, assessment, and applications, Session at the European Geosciences Union General Assembly, Vienna, Austria.
- Feb 2013: CLIVAR WGOMD/SOP Workshop on Sea-Level Rise, Ocean/Ice-Shelf Interactions, and Ice Sheets, Hobart, Australia.
- Apr 2012: Physical and biogeochemical ocean modelling: development, assessment, and applications, Session at the European Geosciences Union General Assembly, Vienna, Austria.
- Oct 2011: Ocean Circulation and Ventilation, Session at the WCRP Open Science Conference, Denver, USA.
- Apr 2011: Physical and biogeochemical ocean modelling: development, assessment, and applications, Session at the European Geosciences Union General Assembly, Vienna, Austria.
- Oct 2009: Workshop on Ocean Climate Modeling, GFDL/Princeton, USA.

- Apr 2009: CLIVAR Workshop on Ocean Mesoscale Eddies: Observations, Simulations, and Parameterizations, Exeter, UK.
- Aug 2007: CLIVAR Workshop on Numerical Methods in Ocean Modelling, Bergen, Norway.
- Nov 2005: CLIVAR Workshop on Modelling the Southern Ocean, Hobart, Australia.
- Jun 2004: CLIVAR Workshop on Evaluating the Ocean Component of IPCC Models, Princeton, USA.
- Aug 2002: Workshop on Z-coordinate Ocean Modeling, Massachusetts Institute of Technology, USA.
- Nov 1999: Meeting of Z-coordinate Ocean Modeling at GFDL, LANL, MIT, and NCAR, Princeton, USA.
- Jul 1999: Ocean/Atmosphere Variability and Predictability, Session at the International Union of Geodesy and Geophysics, Session, Birmingham, UK.

STUDENT PARTICIPANT IN COMPETITIVE SPECIAL TOPIC SCHOOLS

- Jan 1998: NATO Advanced Study Institute: Ocean Modeling and Parameterization, Les Houches, France.
- Jan 1996: NATO Advanced Study Institute: Climate Variability and Predictability, Les Houches, France.
- Jul 1994: Meeting of UCAR Global and Climate Change Fellows. Steamboat Springs, USA.
- Jul 1992: Theoretical Advanced Study Institute: From String Theory to Black Holes, Boulder, USA.
- Jul 1991: High Energy Physics and Cosmology School, Center for Theoretical Physics, Trieste, Italy.
- Jun 1991: Theoretical Physics Summer School: Particle Physics in the 1990's, Les Houches, France.

DOCUMENTS UNDER REVIEW OR IN PREPARATION

1. Post-COP 21 challenges for climate science, 2018: D. Stammer, A. Bracco, P. Bracconot, g. Brasseur, **S.M. Griffies**, E. Hawkins, *in preparation for Nature Climate Change*
2. A new algorithm to accurately calculate neutral tracer gradients and their impacts on vertical heat transport and water mass transformation, 2018: S. Groeskamp, P. Barker, T.J. McDougall, R.P. Abernathey, and **S.M. Griffies**, *in preparation*
3. Role of ocean model formulation in climate response uncertainty, 2018: J.P. Krasting, R.J. Stouffer, **S.M. Griffies**, R.W. Hallberg, S.L. Malyshev, B.L. Samuels, and L.T. Sentman, *in preparation for Journal of Climate*
4. An extrema-diminishing general-coordinate implementation of neutral diffusion, 2018: A. Shao, A.J. Adcroft, R.W. Hallberg, and **S.M. Griffies**, *in preparation for Journal of Advances in Modeling the Earth System (JAMES)*.
5. Understanding the Tropical Pacific climatology: progress and insights from GFDLs CM2.1, LOAR1, FLOR, and FLOR-FA Global Coupled GCMs, 2018: A.T. Wittenberg, G.A. Vecchi, T.L. Delworth, A. Rosati, S. Ray, F. Zeng, **S.M. Griffies**, W.G. Anderson, *in preparation for Journal of Climate*.
6. The KPP boundary layer scheme: revisiting its formulation and benchmarking one-dimensional ocean simulations relative to LES, 2018: L. Van Roekel, A.J. Adcroft, G. Danabasoglu, **S.M. Griffies**, B. Kauffman, W. Large, M. Levy, B. Reichl, T. Ringler, M. Schmidt, *in preparation for Ocean Modelling*.
7. JRA-55 based surface dataset for driving oceansea-ice models (JRA55-do), 2018: H. Tsujino, S. Urakawaa, H. Nakanoa, R.J. Small, W.M. Kim, S.G. Yeager, G. Danabasoglub, T. Suzuki, J.L. Bamber, M. Bentsen, C. Böning, A. Bozec, E. Chassignet, E. Curchitser, F.B. Dias, P.J. Durack, **S.M. Griffies**, Y. Harada, M. Ilicak, S.A. Josey, C. Kobayashi, S.a Kobayashi, Y. Komuro, W.G. Large, J. Le Sommer, S.J. Marsland, S. Masina, M. Scheinert, H. Tomita, M. Valdivieso, D. Yamazaki, *submitted to Ocean Modelling*.
8. Surface winds from atmospheric reanalysis lead to contrasting oceanic forcing and coastal upwelling patterns, 2018: F.G. Taboada, C.A. Stock, **S.M. Griffies**, J.P. Dunne, J.G. John, R.J. Small, H. Tsujino, *submitted to Ocean Modelling*.
9. Identifying Lagrangian coherent structures in a mesocale eddy-permitting ocean model, 2018: N. Tarshish, R. Abernathey, C. Zhang, C.O. Dufour, I. Frenger, and **S.M. Griffies**, *submitted to Ocean Modelling*.
10. The benefits of global high-resolution for climate simulation: process-understanding and the enabling of stakeholder decisions at the regional scale, 2018: M. J. Roberts, P. L. Vidale, C. Senior, H. Hewitt, P. Chang, H. Christensen, S. Danilov, M.-E. Demory, **S.M. Griffies**, R. Haarsma, T. Jung, S. Minobe, T. Ringler, M. Satoh, R. Schiemann, E. Scoccimarro, G. Stephens, M.F. Wehner, G. Martin, S. Bertou, C. Bates, *in review at Bulletin of the American Meteorological Society*.

11. Roles of the ocean mesoscale in the lateral supply of mass, heat, carbon, and nutrients to the Northern Hemisphere subtropical gyres, 2018: A. Yamamoto, J.B. Palter, C.O. Dufour, **S.M. Griffies**, C. Dianchi, M. Claret, J.P. Dunne, I. Frenger, and E.D. Galbraith, *in revision with Journal of Geophysical Research*.

12. Lagrangian timescales of Southern Ocean upwelling in a hierarchy of model resolutions, 2018: H.F. Drake, A.K. Morrison, **S.M. Griffies**, J.L. Sarmiento, W. Weijer, A. Gray, *in revision with Geophysical Research Letters*.

PEER-REVIEWED PUBLICATIONS

1. Lagrangian ocean analysis: fundamentals and practices, 2018: E. van Sebille, **S.M. Griffies**, R. Abernathey, T.P. Adams, P. Berloff, A. Biastoch, B. Blanke, E.P. Chassignet, Y. Cheng, C.J. Cotter, E. Deleersnijder, K. Döös, H. Drake, S. Drijfhout, S.F. Gary, A.W. Heemink, J. Kjellsson, I.M. Koszalka, M. Lange, C. Lique, G.A. MacGilchrist, R. Marsh, G.C. Mayorga Adame, R. McAdam, F. Nencioli, C.B. Paris, M.D. Piggott, J.A. Polton, S. Rühs, S.H. Shah, M.D. Thomas, J. Wang, P.J. Wolfram, L. Zanna, and D. Zika, *Ocean Modelling*, **121**, 49–75, doi:10.1016/j.ocemod.2017.11.008.

2. Frequency-domain analysis of forced versus intrinsic ocean surface kinetic energy variability in GFDL's CM2-O model hierarchy, 2018: A.K. O'Rourke, B.K. Arbic, and **S.M. Griffies**, *Journal of Climate*, doi:10.1175/JCLI-D-17-0024.1.

3. Do high-resolution global ocean models promise benefits for coupled prediction on short-range to climate timescales?, 2017: H.T. Hewitt, M.J. Bell, E.P. Chassignet, A. Czaja, D. Ferreira, **S.M. Griffies**, P. Hyder, J. McClean, A.L. New, M.J. Roberts, *Ocean Modelling*, **120**, 120–136, doi:10.1016/j.ocemod.2017.11.002.

4. Multi-decadal weakening of Indian Ocean summer monsoon circulation induces an increasing northern Indian Ocean sea level, 2017: Swapna P., J. Jyoti, R. Krishnan, S. Setti, and **S.M. Griffies**, *Geophysical Research Letters*, doi:10.1002/2017GL074706.

5. Mechanistic drivers of re-emergence of anthropogenic carbon in the Equatorial Pacific, 2017: P. Zhai, K.B. Rodgers, **S.M.** Griffies, R.D. Slater, D. Iudicone, J.L. Sarmiento, and L. Resplandy, *Geophysical Research Letters*, doi:10.1002/2017GL073758.

6. CO2-induced ocean warming around the Antarctic ice sheet in an eddying global climate model, 2017: P. Goddard, C.O. Dufour, J. Yin, **S.M. Griffies**, M. Winton, *Journal of Geophysical Research*, doi:10.1002/2017JC012849.

7. Preconditioning of the Weddell Sea polynya by the ocean mesoscale and dense water overflows, 2017: C.O. Dufour, A.K. Morrison, **S.M. Griffies**, I. Frenger, H.M. Zanowski, M. Winton, *Journal of Climate*, **30**, 7719–7737, doi.org/10.1175/JCLI-D-16-0586.1

8. Spiraling pathways of global deep waters to the surface of the Southern Ocean, 2017: V. Tamsitt, H. Drake, A.K. Morrison, L.D. Talley, C.O. Dufour, A.R. Gray, **S.M. Griffies**, M.R. Mazloff, J.L. Sarmiento, J. Wang, and W. Weijer, *Nature Communication*, doi: 10.1038/s41467-017-00197-0.

9. Localized rapid warming of West Antarctic Peninsula subsurface waters by remote winds, 2017: P.J. Spence, R. Holmes, A. McC. Hogg, **S.M. Griffies**, K.D. Stewart, and Matthew H. England, *Nature Climate Change*, DOI: 10.1038/NCLIMATE3335.

10. Biogeochemical protocols and diagnostics for the CMIP6 Ocean Model Intercomparison Project (OMIP), 2017: J.C. Orr, R.G. Najjar, O. Aumont, L. Bopp, J. Bullister, G. Danabasoglu, S. Doney, J.P. Dunne, J.-C. Dutay, H. Graven, **S.M. Griffies**, J.G. John, F. Joos, I. Levin, K. Lindsay, R. J. Matear, A. Mouchet, G. McKinley, A. Oschlies, A. Romanou, R. Schlitzer, A. Tagliabue, T. Tanhua, and A. Yool, *Geoscientific Model Development*, **10**, 2169–2199, doi: 10.5194/gmd-10-2169-2017.

11. Climate Process Team on Internal-Wave Driven Ocean Mixing, 2017: J.A. MacKinnon, Z. Zhao, C.B. Whalen, A.F. Waterhouse, D.S. Trossman, O.M. Sun, L.C. St. Laurent, H.L. Simmons, K. Polzin, R. Pinkel, A. Pickering, N.J. Norton, J.D. Nash, R. Musgrave, L.M. Merchant, A.V. Melet, B. Mater, S. Legg, W.G. Large, E. Kunze, J.M. Klymak, M. Jochum, S.R. Jayne, R.W. Hallberg, **S.M. Griffies**, P. Gent, S. Diggs, G. Danabasoglu, E.P. Chassignet, M.C. Buijsman, F.O. Bryan, B.P. Briegleb, A. Barna, B.K. Arbic, J.K. Ansong, M.H. Alford, *Bulletin of the American Meteorological Society*, doi: 10.1175/BAMS-D-16-0030.1.

12. Vertical resolution of baroclinic modes in global ocean models, 2017: K. Stewart, A. McC Hogg, S.M. Griffies, A.P. Heerdegen, M.L. Ward, P.J. Spence, M.H. England, *Ocean Modelling*, **113**, 50–65, doi.org/10.1016/j.ocemod.2017.03.012.

13. The Flux-Anomaly-Forced Model Intercomparison Project (FAFMIP) for investigation of sea-level and ocean climate change in response to CO2 forcing, 2016: J. Gregory, N. Bouttes-Mauhourat, **S.M. Griffies**, H. Haak, W.J. Hurlin, J. Jungclaus, M. Kelley, W.G. Lee, J. Marshall, A. Romanou, O.A. Saenko, D. Stammer, and M. Winton, *Geoscientific Model Development*, **9**, 3993–4017, doi: 10.5194/gmd-9-3993-2016.

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