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NOAA GEOPHYSICAL FLUID DYNAMICS LABORATORY
PRINCETON UNIVERSITY PROGRAM IN ATMOSPHERIC AND OCEANIC SCIENCES
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[RESEARCH HOMEPAGE](#) • [GOOGLE SCHOLAR PAGE](#)

RESEARCH STATEMENT

My research is concerned with 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 field measurements. I have active collaborations with numerous scientists from around the world, most notably in America, Australia, and Europe. Particular research 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 and submesoscale eddies; subgrid scale parameterizations of turbulent ocean stirring and mixing; analysis methods aimed at 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 fundamental understanding of physical concepts and their creative use in describing observed and simulated ocean phenomena. Towards this aim, I strive to pedagogically articulate the foundations of ocean fluid mechanics in articles, books, course notes, and lectures. I am particularly interested in revealing how concepts and tools from mathematical physics can be leveraged to deepen our understanding of the ocean, and for nurturing an appreciation of geophysical fluid mechanics within the broader context of theoretical physics.

INTERESTS AND ACTIVITIES

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

EMPLOYMENT AND APPOINTMENTS

| | |
|--------------|--|
| 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 |
| 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 (with Robert Hallberg) "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

| | | |
|--------------|---------------------|---|
| 2018-present | Graeme MacGilchrist | Princeton University post-doc researcher (with Jorge Sarmiento) |
| 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 |
| 2016-2018 | 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 researcher (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 researcher (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 researcher (with Jorge Sarmiento) |
| 2013 | Terrence O'Kane | Visiting senior scientist from CSIRO Marine Laboratory, Hobart, Australia |
| 2012-2017 | Carolina Dufour | Princeton University post-doc researcher (with Jorge Sarmiento) |
| 2012-2013 | Yalin Fan | Princeton University post-doc researcher |
| 2011-2014 | Michael Buetti | 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

- Autumn semester 2018: Princeton University Atmospheric and Oceanic Sciences 571: Geophysical Fluid Dynamics (24 lectures covering the full course)
- Spring semester 2018: Princeton University Atmospheric and Oceanic Sciences 580: Special Topics on Great Papers in Atmospheric and Oceanic Sciences (led one discussion session)
- Autumn semester 2017: Princeton University Atmospheric and Oceanic Sciences 571: Geophysical Fluid Dynamics (24 lectures covering the full course)
- Spring semester 2017: Princeton University Atmospheric and Oceanic Sciences 580: Special Topics on Great Papers in Atmospheric and Oceanic Sciences (led one discussion session)
- Autumn semester 2016: Princeton University Atmospheric and Oceanic Sciences 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 Atmospheric and Oceanic Sciences 571: Geophysical Fluid Dynamics (12 lectures covering the second half of the course)
- Autumn semester 2014: Princeton University Atmospheric and Oceanic Sciences 571: Geophysical Fluid Dynamics (12 lectures covering the first half of the course)
- Autumn semester 1993: Princeton University Atmospheric and Oceanic Sciences 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

- Co-PI for NOAA Modeling, Analysis, Predictions, and Projections Program (01Aug2018–31Jul2020): Addressing Key Issues in CMIP6-era Earth System Models. \$434,000.

- Program advisory board for the UK NERC funded project: Transient tracer-based Investigation of Circulation and Thermal Ocean Change (TICTOC) (2017-2020)
- Partner Investigator for the 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).
- Co-PI for 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.
- Partner Investigator for the for the Australian Research Council (2016-2020) funded project: 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.
- Partner Investigator for the 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 MODELING, 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

- 2016: [Animation of the ocean's role in El Niño](#)
- 2015: [Animation of Southern Ocean circulation](#)
- 2011: [Animation of ocean surface temperatures from an eddying climate model](#)

INVITED RESEARCH PRESENTATIONS SINCE 2008

- May 2018: UNDERSTANDING AND PROJECTING GLOBAL, REGIONAL, AND COASTAL SEA LEVEL: REASONS TO INCLUDE COASTAL OCEAN PROCESSES IN GLOBAL MODELS: Consortium for Ocean-Sea Ice Modelling in Australia (COSIMA) Annual Meeting, Australian National University, Canberra, Australia & University of New South Wales, Sydney, Australia.
- Mar 2018: UNDERSTANDING AND PROJECTING GLOBAL, REGIONAL, AND COASTAL SEA LEVEL: REASONS TO INCLUDE COASTAL OCEAN PROCESSES IN GLOBAL MODELS: ISSI workshop on understanding the relationship between coastal sea level and large-scale ocean circulation, Bern, Switzerland.
- 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

- Mar 2019: scientific advisory committee for the WCRP workshop: Sources and sinks of ocean mesoscale eddy energy, Florida, USA.
- Feb 2018: co-convener for the Town Hall: Process understanding and standardized assessment towards the eddying realm. 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, 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

14. Relating boundary freshwater fluxes to surface salinity forcing, 2018: A.J.G. Nurser and **S.M. Griffies**, *in preparation for Journal of Physical Oceanography*.
13. Concepts and terms for sea level and its change, 2018: J.M. Gregory, J.A. Church, I. Fukimori, N. Gomez, **S.M. Griffies**, C.W. Hughes, R.E. Kopp, F. Landerer, R.M. Ponte, D. Stammer, and M. Tamisiea, *in preparation for Surveys in Geophysics*.
12. 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. Abernathy, and **S.M. Griffies**, *in preparation*.
11. 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)*.
10. Rapid mixing and exchange of deep-ocean waters in an abyssal boundary current, 2018: A.C. Naveira Garabato, E.E. Frajka-Williams, C.P. Spingys, S.A. Legg, K.L. Polzin, A. Forryan, E.P. Abrahamson, C.E. Buckingham, **S.M. Griffies**, S.D. McPhail, K.W. Nicholls, L.F. Thomas, and M.P. Meredith, *in review at Science*.
9. Post-COP 21 challenges for climate science, 2018: D. Stammer, A. Bracco, P. Bracconot, G. Brasseur, **S.M. Griffies**, E. Hawkins, *in review at Future Earth*.
8. Improved Simulations of Tropical Pacific Annual-Mean Climate in the GFDL FLOR and HiFLOR Coupled GCMs, 2018: A.T. Wittenberg, G.A. Vecchi, T.L. Delworth, A. Rosati, W.G. Anderson, W.F. Cooke, S. Underwood, F. Zeng, **S.M. Griffies**, S. Ray, *in review at Journal of Advances in Modeling the Earth System (JAMES)*.
7. Understanding the Equatorial Pacific Cold Tongue Heat Budget, Part I: Diagnostic Framework, 2018: S. Ray, A.T. Wittenberg, **S.M. Griffies**, and F. Zeng, *in revision at Journal of Climate*.
6. Understanding the Equatorial Pacific Cold Tongue Heat Budget, Part II: Evaluation of the GFDL-FLOR Coupled GCM, 2018: S. Ray, A.T. Wittenberg, **S.M. Griffies**, and F. Zeng, *in revision at Journal of Climate*.
5. 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, *in revision at Ocean Modelling*.
4. The water mass transformation framework for ocean physics and biogeochemistry, 2018: S. Groeskamp, **S.M. Griffies**, D. Iudicone, R. Marsh, A.J.G. Nurser, and J.D. Zika, *in revision at Annual Review of Marine Science*.
3. The KPP boundary layer scheme for the ocean: revisiting its formulation and benchmarking one-dimensional simulations relative to LES, 2018: L. Van Roekel, A.J. Adcroft, G. Danabasoglu, **S.M. Griffies**, B. Kauffman, W. Large, M. Levy, B.G. Reichl, T. Ringler, M. Schmidt, *in revision at Journal of Advances in Modeling the Earth System (JAMES)*.
2. 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 revision at Journal of Climate*.
1. 100 Years of Earth System Model Development, 2018: D. Randall, C.M. Bitz, G. Danabasoglu, A.S. Denning, P. Gent, A. Gettelman, **S.M. Griffies**, P. Lynch, H. Morrison, R. Pincus, J. Thurnburn, *accepted for publication in A Century of Progress in Atmospheric and Related Sciences: Celebrating the American Meteorological Society Centennial*.

PEER-REVIEWED PUBLICATIONS

104. Alteration of 21st century climate by Antarctic ice melt, 2018: B. Bronselaer, M. Winton, **S.M. Griffies**, R.J. Stouffer, W.J. Hurlin, O.V. Sergienko, K. Rodgers, J. Russell, *accepted by Nature*.
103. Roles of the ocean mesoscale in the horizontal 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, *Journal of Geophysical Research - Oceans*, doi: 10.1029/2018JC013969.
102. Tarshish, N., R. Abernathy, C. Zhang, C.O. Dufour, I. Frenger, **S.M. Griffies**, 2018: Identifying Lagrangian coherent structures in a mesoscale eddy-permitting ocean model. *Ocean Modelling*, doi: 10.1016/j.ocemod.2018.07.001.
101. JRA-55 based surface dataset for driving ocean-sea-ice models (JRA55-do), 2018: H. Tsujino, S. Urakawa, H. Nakano, R.J. Small, W.M. Kim, S.G. Yeager, G. Danabasoglu, 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. Ilıcak, S.A. Josey, C. Kobayashi, S. Kobayashi, Y. Komuro, W.G. Large, J. Le Sommer, S.J. Marsland, S. Masina, M. Scheinert, H. Tomita, M. Valdivieso, D. Yamazaki, *accepted by Ocean Modelling*, doi: 10.1016/j.ocemod.2018.07.002.
100. 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, *Bulletin of the American Meteorological Society*, doi: 10.1175/BAMS-D-15-00320.1.

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