



✉ STEPHEN MATTHEW GRIFFIES (HE/HIM/HIS) *

NOAA GEOPHYSICAL FLUID DYNAMICS LABORATORY (GFDL)

PRINCETON UNIVERSITY PROGRAM IN ATMOSPHERIC AND OCEANIC SCIENCES

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[RESEARCH AND TEACHING](#)

[ORCID](#)

[GOOGLE SCHOLAR](#)

[WEB OF SCIENCE](#)

RESEARCH STATEMENT

I focus research on elements of geophysical fluid mechanics and the role of the physical ocean in the earth climate system. I make use of theoretical concepts, idealized process physics models, realistic numerical circulation models, and field measurements. Particular research topics include studies of Atlantic and Southern Ocean dynamics; global and regional sea level variability and change; transport of matter and energy by mesoscale and submesoscale eddies; subgrid scale parameterizations of turbulent ocean stirring and mixing; analysis methods aimed at conceptually understanding ocean circulation and transport; physical foundations of 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 and rigorous use in describing observed and simulated ocean phenomena. I am particularly interested in revealing how concepts and methods from mathematical physics can be leveraged to deepen understanding of the ocean and climate, and for fostering an appreciation of geophysical fluid mechanics within the broader context of theoretical mechanics, thermodynamics, and mathematical physics. Teaching and mentoring are my passions, and they form central parts of my work as a research scientist and university faculty member. I strive to generate curiosity and understanding in students while nurturing a rigorous scientific pursuit of how nature works.

COLLABORATION STATEMENT

I nurture collaborations with scientists at all career stages who are passionate about developing a fundamental process understanding of how the ocean works as part of the climate system.

BROADER INTERESTS AND ACTIVITIES

meditation, yoga, walking, writing, sustainability, cultures, surfing, skiing

EMPLOYMENT AND APPOINTMENTS

2020–2024	Team lead for the GFDL Ocean/Cryosphere Division's high resolution climate model project
2015–present	Faculty member of Princeton University's Atmospheric and Oceanic Sciences Program
2013–2017	Member, GFDL Model Development Team Steering Committee
Jun-Aug 2012	Visiting Scientist, National Center for Atmospheric Research, Boulder, USA
Jan-Jun 2011	Distinguished Visiting Scientist Fellow, CSIRO Marine and Atmospheric Research, Hobart, Australia
2011–present	Senior Scientist at GFDL (equivalent to university professor)
Mar 2009	Visiting Professor, Université catholique de Louvain, Belgium
Jan-Nov 2005	Visiting Scientist, CSIRO Marine and Atmospheric Research, Hobart, Australia
2001–2005	Leader of the GFDL Oceans and Climate Group
2000–2011	Co-lead of the GFDL Ocean Model and Climate Model Development Teams
1996–present	Staff Physical Scientist, NOAA/GFDL
1995–1996	Visiting Scientist, GFDL and Princeton University
1993–1995	NOAA Climate & Global Change Fellow at Princeton University
1988–1993	Physics Graduate Research Fellow, University of Pennsylvania Physics Department
1986–1987	Engineering Sciences and Applied Mathematics Fellow, Northwestern University
1984–1986	Chemical Engineering Research Laboratory Technician, Louisiana State University

EDUCATION

1995-1996	Postdoctoral fellow in oceanography/climate (mentor: Kirk Bryan)	Princeton University
1993-1995	NOAA Climate and Global Change Fellow (mentor: Kirk Bryan)	Princeton University
1988-1993	PhD in theoretical physics (advisor: Mirjam Cvetič)	University of Pennsylvania
1987-1988	pre-PhD studies in physics	University of Washington
1986-1987	Masters in engineering sciences & applied mathematics	Northwestern University
1981-1986	Bachelor of science in chemical engineering	Louisiana State University
1978-1981	High school	Biloxi High School, Mississippi

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, Colorado, USA
Jul 1992	Theoretical Advanced Study Institute: FROM STRING THEORY TO BLACK HOLES	Boulder, Colorado, 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

AWARDS AND HONORS

2022	NOAA Administrator's Award (with 26 others) "For advancing the understanding of the Earth System by developing and applying NOAA's state-of-the-art Coupled Carbon-Chemistry-Climate model"
2021	Reuters Hot List of Climate Scientists (#585)
2019	Department of Commerce Silver Medal Award (with Robert Hallberg and Matthew Harrison): "For developing the state-of-the-art Modular Ocean Model version 6 (MOM6) to strengthen the Nation's longer-range environmental prediction capabilities."
2019	Sigma Xi scientific honor society
various	Web of Sciences (Clarivate) Highly Cited Researcher (2018, 2020, 2021, 2022, 2023, 2024)
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, Université 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
1993-1995	NOAA Climate and Global Change Research Fellow

PROFESSIONAL SERVICES AND MEMBERSHIPS

2021-2022	Member of the NEMO Scientific Advisory Committee
2021-present	Editor-in-Chief for AGU's Journal of Advances in Modeling Earth Systems (JAMES)
2020-2022	Member of the Princeton University AOS Diversity, Equity, Inclusion, and Accessibility committee
2019-2023	Chair of the awards committee for the EGU Fridtjof Nansen Medal for Oceanographic Excellence
2018-2020	Ocean/Cryosphere Editor for AGU's Journal of Advances in Modeling the Earth System (JAMES)
2017-2021	Advisory Board for the TICTOC Project, UK
2016-2019	Awards committee for the EGU Fridtjof Nansen Medal for Oceanographic Excellence
2014-2018	Member WCRP/CLIVAR Scientific Steering Group
2014-2016	Co-lead of the NCEP Climate Model Development Task Force
2012-2014	CLIVAR/CliC/SCAR Southern Ocean Region Implementation Panel
2012-present	WCRP/CLIVAR Ocean Model Development Panel ex-officio member
2010-present	Member European Geosciences Union
2009-2015	Scientific Advisory Board for the Catalan Climate Institute <i>IC3</i> , Barcelona, Spain
2007-2018	Editor of the journal Ocean Modelling
2006-2009	WCRP/CLIVAR Scientific Steering Group (ex officio)
2004-2009	WCRP/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 and American Meteorological Society

MENTORING AND SABBATICAL HOSTING

2024	Claire Yung	visiting graduate student (from ANU, Canberra, AUS)
2023	Jan Zika	Princeton University visiting scholar (from UNSW, Sydney, AUS)
2022-present	Matthew Lobo	Princeton University graduate student
2022-present	Wenda Zhang	Princeton University postdoc fellow
2021-2022	Rachel Pang	Princeton University undergraduate student (junior paper mentor)
2021	Abigail Bodner	Brown University graduate student (PhD thesis reader)
2020-present	Jan-Erik Tesdal	Princeton University postdoc fellow
2020	Ruth Moorman	Princeton University predoc intern
2019-2020	Benjamin Taylor	Princeton University predoc intern
2019-2021	Hemant Khatri	Princeton University postdoc fellow
2019-2020	Elizabeth Yankovsky	Princeton University graduate student (PhD committee)
2019	Hussein Aluie	Princeton University visiting scholar (from University of Rochester)
2018-2022	Graeme MacGilchrist	Princeton University postdoc fellow
2017-2022	Houssam Yassin	Princeton University graduate student (primary advisor)
2017-2018	Laure Zanna	Princeton University visiting scholar (from Oxford University)
2017	Jianjun Yin	Princeton University visiting scholar (from University of Arizona)
2016-2019	Brandon Reichl	Princeton University postdoc fellow
2016-2018	Nathaniel Tarshish	Princeton University predoc intern
2015-2017	Amanda O'Rourke	University of Michigan postdoc fellow (with Brian Arbic)
2015-2016	Henri Drake	Princeton University predoc intern (with Jorge Sarmiento)
2014-2017	Anna FitzMaurice	Princeton University PhD student (PhD committee)
2014-2015	Ivy Frenger	Princeton University postdoc fellow (with Jorge Sarmiento)
2014	Magnus Hieronymus	Stockholm University graduate student (PhD thesis reader)
2013-2017	Robert Nazarian	Princeton University PhD student (PhD committee)
2013-2016	Adele Morrison	Princeton University postdoc fellow (with Jorge Sarmiento)
2013	Terrence O'Kane	GFDL visiting scholar from CSIRO Marine Research, Hobart, Australia
2012-2017	Carolina Dufour	Princeton University postdoc fellow (with Jorge Sarmiento)
2012-2013	Yalin Fan	Princeton University postdoc fellow
2011-2014	Michael Bueti	University of Rhode Island PhD student (PhD committee)
2008-2011	Michael Bates	University of New South Wales PhD student (PhD committee)
2005-2009	Andreas Klocker	University of Tasmania PhD student (PhD committee)
2003-2004	Rüdiger Gerdes	GFDL visiting scholar (from AWI, Bremerhaven, Germany)
2001-2002	Harper Simmons	GFDL postdoc fellow
1999-2002	Shafer Smith	Princeton University postdoc fellow

UNIVERSITY TEACHING

- Spring semester 2023, 2024: Princeton University Atmospheric and Oceanic Sciences 572: Waves and Instabilities in the Atmosphere and Ocean (24 lectures covering the full course)
- Autumn semester 2017, 2018, 2019, 2020, 2021, 2022, 2023: Princeton University Atmospheric and Oceanic Sciences 571: Geophysical Fluid Mechanics (24 lectures covering the full course)
- Spring semester 2020: Princeton University Atmospheric and Oceanic Sciences 521: Southern Ocean Seminar (5 lectures covering Southern Ocean dynamics)
- Autumn semester 2014, 2015, 2016: Princeton University Atmospheric and Oceanic Sciences 571: Geophysical Fluid Mechanics (12 lectures covering one-half of the course)
- Spring semester 2017, 2018, 2019, 2024: Princeton University Atmospheric and Oceanic Sciences 580: Special Topics on Great Papers in Atmospheric and Oceanic Sciences (led one discussion session on a chosen paper)
- Spring semester 2016, 2019: Princeton University Geosciences 503: Responsible Conduct of Research in Geosciences (co-taught one three-hour discussion session)
- 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

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.

PARTICIPANT/COLLABORATOR ON RESEARCH GRANTS AND PROJECTS

- Partner Investigator for the Australian Research Council (2021-2025) Centre of Excellence in Antarctic Science (ACEAS), AU\$25M.
- Co-PI for NOAA's Climate Variability and Predictability Program (CVP) *Decadal Climate Variability and Predictability* proposal *Drivers of coastal sea level change along the eastern US* (2020-2023), \$200K.
- Co-PI for NOAA's Climate Variability and Predictability Program Climate Process Team: *Ocean Transport and Eddy Energy* (2020-2024), \$770K.
- PI for DOE subcontract with Princeton University for the *Diagnostics and Performance Metrics for Evaluating Ventilation Pathways and Interior Water Mass Properties in Ocean Models* (2020-2022), \$180K.
- Co-PI for Australian Research Council Discovery Project (2019-2022): *Risks of rapid ocean warming at the Antarctic continental margin*. AU\$582K.
- Co-PI for NOAA Modeling, Analysis, Predictions, and Projections Program (01Aug2018–31Jul2020): *Addressing Key Issues in CMIP6-era Earth System Models*. \$434K.
- Program advisory board for the UK NERC funded project: *Transient tracer-based Investigation of Circulation and Thermal Ocean Change (TICTOC)* (2017-2021).
- Partner Investigator for the Australian Research Council (2017-2023) Centre of Excellence for Climate Extremes, AU\$30M.
- Co-PI for the Ocean Model Intercomparison Project (OMIP), which is part of the Coupled Model Intercomparison Project (CMIP6) (2016-2022).
- Co-PI for the Flux Anomaly Forcing Model Intercomparison Project (FAFMIP), which is part of the Coupled Model Intercomparison Project (CMIP6) (2016-2022).

- 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.* \$316K.
- Partner Investigator for the Australian Research Council (2016-2020) funded project: *An Australian Consortium for Eddy-Resolving Ocean-Sea Ice Modelling*, AU\$599K.
- US Department of Energy (15Aug2014–14Aug2017): *Three-dimensional structure of the Southern Ocean overturning circulation*, \$624K.
- US National Science Foundation (01Sep2014–31Aug2020): *Southern Ocean Carbon and Climate Observations and Modeling (SOCCOM)*, \$20.9M
- NASA (26Jun2014–25 Jun2017): *The role of mesoscale eddies in cross-frontal transport and subduction of nutrients and carbon in the Southern Ocean*, \$715K.
- NOAA (01Sept2013–31Aug2016): *Signature of the Atlantic meridional overturning circulation in the North Atlantic dynamic sea level*, \$393K.
- US Department of Energy (15Sep2011–14Sep2015): *Mode and intermediate waters in Earth System Models*, \$519K.
- Partner Investigator for the Australian Research Council (2011-2018) Centre of Excellence for Climate System Science, AU\$21.4M.
- 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*.

DOCUMENTS UNDER REVIEW OR IN PREPARATION

8. *Geophysical Fluid Mechanics*, 2024: S.M. Griffies, *in preparation*
7. The GFDL-CM4X climate model hierarchy and the mesoscale dominance hypothesis, 2024: S.M. Griffies, A. Adcroft, M.S. Alberty, R.L. Beadling, M. Bushuk, H.F. Drake, R. Dussin, R.W. Hallberg, M.J. Harrison, W.J. Hurlin, H. Khatri, J.P. Krasting, S. Legg, G.A. MacGilchrist, T. Morrison, B.G. Reichl, A. Sane, O. Sergienko, M. Sonnewald, J.M. Steinberg, J.-E. Tesdal, M. Thomas, K.E. Turner, M.L. Ward, M. Winton, N. Zadeh, R. Zhang, W. Zhang *in preparation for Journal of Advances in Modeling Earth Systems (JAMES)*
6. A review of Green's function methods for tracer timescales and pathways in ocean models, 2024: T.W.N. Haine, S.M. Griffies, G. Gebbie, M. Holzer, D. Waugh, and W. Jiang, *in preparation for Journal of Advances in Modeling Earth Systems (JAMES)*
5. The hat average: improved time-averaging for budget analyses in climate models, 2024: C.Bladwell, R.M. Holmes, J.D. Zika, Andrew Kiss, and S.M. Griffies, *in preparation for Geoscientific Model Development*
4. The averaged hydrostatic Boussinesq equations in generalized vertical coordinates, M. Janson, A. Adcroft, S. M. Griffies, and I. Grooms, *in preparation for Journal of Advances in Modeling Earth Systems (JAMES)*.
3. Water mass transformation budgets in finite-volume generalized vertical coordinate ocean models, 2024: H. F. Drake, S. Bailey, R. Dussin, S. M. Griffies, J. Krasting, G. MacGilchrist, G. Stanley, J.-E. Tesdal, J. D. Zika, *submitted to Journal of Advances in Modeling Earth Systems (JAMES)*
2. Improved upper ocean vertical mixing in the tropics in NOAA/GFDL's OM4 model, 2023: B. G. Reichl, A. T. Wittenberg, S. M. Griffies, A. Adcroft, *in revision at Earth and Space Science*
1. Steric Sea Level Rise in GFDL CM4 and ESM4: Insights Into Model Drift and Water Mass Representation, 2023: K. P. Krasting, S. M. Griffies, J.-E. Tesdal, G. A. MacGilchrist, R. L. Beadling, and C. M. Little, *in revision at Journal of Climate*.

PEER-REVIEWED PUBLICATIONS

2024

164. A scale-dependent analysis of the barotropic vorticity budget in a global ocean simulation, 2023: H. Khatri, S. M. Griffies, B. A. Storer, M. Buzzicotti, H. Aluie, M. Sonnewald, R. Dussin, and A. Shao, *accepted by Journal of Advances in Modeling Earth Systems (JAMES)*, <https://doi.org/10.22541/essoar.168394747.71837050/v1>

163. The role of surface potential vorticity in the vertical structure of mesoscale eddies in wind-driven ocean circulations, 2024: W. Zhang, S. M. Griffies, R. W. Hallberg, Y.-H. Kuo, C. L. P. Wolfe, *Journal of Physical Oceanography*, doi:10.1175/JPO-D-23-0203.1
162. Ross Gyre variability modulates oceanic heat supply to the Antarctic continental shelf, 2024: C.J. Prend, G.A. MacGilchrist, G.E. Manucharyan, R.Q. Pang, R. Moorman, A.F. Thompson, S.M. Griffies, Matthew R. Mazloff, Lynne D. Talley, and Sarah T. Gille, *Science Advances*, doi:10.1038/s43247-024-01207-y
161. The role of bottom friction in mediating the response of the Weddell Gyre circulation to changes in surface stress and buoyancy fluxes, 2024: J. Neme, M. H. England, A. McC. Hogg, H. Khatri, and S. M. Griffies, *Journal of Physical Oceanography*, **54**, 216-236, doi:10.1175/JPO-D-23-0165.1

2023

160. A new conceptual model of global ocean heat uptake, 2023: J. M. Gregory, J.S. Bloch-Johnson, M.P. Couldrey, E. Exarchou, S.M. Griffies, T. Kuhlbrodt, E. Newsom, O.A. Saenko, T. Suzuki, Q. Wu, S. Urakawa, and L. Zanna, *Climate Dynamics*, doi:10.1007/s00382-023-06989-z
159. Kinetic energy cascades in the global ocean, 2023: B.A. Storer, M. Buzzicotti, H. Khatri, S.M. Griffies, and H. Aluie, *Science Advances*, 10.1126/sciadv.adl7420
158. Comparing two parameterizations for the restratification effect of mesoscale eddies in an isopycnal ocean model, 2023: N. Loose, G.M. Marques, A. Adcroft, S. Bachman, S.M. Griffies, I. Grooms, R. Hallberg, and M.F. Jansen, *Journal of Advances in Modeling Earth Systems (JAMES)*, **15**, doi:10.1029/2022MS003518
157. The Southern Ocean Freshwater release model experiments Initiative (SOFIA): Scientific objectives and experimental design, 2023: N. Swart, T. Martin, R. Beadling, J.-J. Chen, M.H. England, R. Farneti, S.M. Griffies, T. Hattermann, F.A. Haumann, Q. Li, J. Marshall, M. Muilwijk, A.G. Pauling, A. Purich, I.J. Smith, and M. Thomas, *Geoscientific Model Development*, **16**, 72897309, doi:10.5194/gmd-16-7289-2023
156. Remote versus local impacts of energy backscatter on the North Atlantic SST biases in a global ocean model, 2023: C.-Y. Chang, A. Adcroft, L. Zanna, R. W. Hallberg, S. M. Griffies, *Geophysical Research Letters*, doi:10.1029/2023GL105757
155. Sensitivity of Antarctic shelf waters and abyssal overturning to local wind amplitude, 2023: A. K. Morrison, W. G. C. Huneke, J. Neme, P. Spence, A. McC. Hogg, M. H. England, and S. M. Griffies, *Journal of Climate*, doi:10.1175/JCLI-D-22-0858.1
154. Exploring the non-stationarity of coastal sea level probability distributions, 2023: F. Falasca, A. Brettin, L. Zanna, S.M. Griffies, J. Yin, and M. Zhao, *Environmental Data Science*, doi:10.1017/eds.2023.10
153. Spatio-temporal coarse-graining decomposition of the global ocean geostrophic kinetic energy, 2023: M. Buzzicotti, B. A. Storer, H. Khatri, S.M. Griffies, and H. Aluie, *Journal of Advances in Modeling Earth Systems (JAMES)*, doi:10.1029/2023MS003693
152. Revisiting interior water mass responses to surface forcing changes and the subsequent effects on overturning in the Southern Ocean, 2023: J.-E. Tesdal, G.A. MacGilchrist, R.L. Beadling, S.M. Griffies, J.P. Krasting, and P.J. Durack, *JGR-Oceans*, **128**, doi:10.1029/2022JC019105

2022

151. Effective drift velocity from turbulent transport by vorticity, 2022: H. Aluie, S. Rai, H. Yin, A. Lees, D. Zhao, S.M. Griffies, A. Adcroft, and J.K. Shang, *Physical Review Fluids*, **7**, doi:10.1103/PhysRevFluids.7.104601
150. Global energy spectrum of the general oceanic circulation, 2022: B.A. Storer, M. Buzzicotti, H. Khatri, S.M. Griffies, and H. Aluie, *Nature Communications*, doi:10.1038/s41467-022-33031-3
149. Surface quasigeostrophic turbulence in variable stratification, 2022: H. Yassin and S.M. Griffies, *Journal of Physical Oceanography*, doi:10.1175/JPO-D-22-0040.1
148. On the discrete normal modes of quasigeostrophic theory, 2022: H. Yassin and S.M. Griffies, *Journal of Physical Oceanography*, **52**, 243–259. doi:10.1175/JPO-D-21-0199.1
147. Importance of the Antarctic Slope Current in the Southern Ocean response to ice sheet melt and wind stress change, 2022: R.L. Beadling, J.P. Krasting, S.M. Griffies, W.J. Hurlin, B. Bronselear, J.L. Russell, G. A. MacGilchrist, J.-E. Tesdal, M. Winton, *JGR-Oceans*, **127**, e2021JC017608, doi:10.1029/2021JC017608
146. Kinetic energy transfers between mesoscale and submesoscale motions, 2022: A.C. Naveira Garabato, X. Yu, J. Callies, R. Barkan, K.L. Polzin, E.E. Frajka-Williams, C.E. Buckingham, and S.M. Griffies, *Journal of Physical Oceanography*, **52**, 75–97, doi:10.1175/JPO-D-21-0099.1
145. Local drivers of marine heatwaves: A global analysis with an Earth system model, 2022: L. Vogt, F.A. Burger, S.M. Griffies, and T.L. Frölicher, *Frontiers in Climate*, **4**:847995, doi:10.3389/fclim.2022.847995
144. NeverWorld2: An idealized model hierarchy to investigate ocean mesoscale eddies across resolutions, 2022: G.M. Marques, N. Loose, E. Yankovsky, J.M. Steinberg, C.-Y. Chang, N. Bhamidipati, A. Adcroft, B. Fox-Kemper, S.M. Griffies, R.W. Hallberg, M.F. Jansen, H. Khatri, and L. Zanna, *Geoscientific Model Development*, doi:10.5194/gmd-15-6567-2022
143. A potential energy analysis of ocean surface mixed layers, 2022: B. Reichl, A. Adcroft, S.M. Griffies, and R.W. Hallberg, *JGR-Oceans*, **127**, e2021JC018140, doi:10.1029/2021JC018140

142. Effects of grid spacing on high-frequency precipitation variance in coupled high-resolution global ocean-atmosphere models, 2022: C.X. Light, B.K. Arbic, P.E. Martin, L. Brodeau, J.T. Farrar, S.M. Griffies, B.P. Kirtman, L.C. Laurindo, D. Menemenlis, A. Molod, A.D. Nelson, E. Nyadjro, A.K. O'Rourke, J.F. Shriver, L. Siqueira, R.J. Small, and E. Strobach, *Climate Dynamics*, doi:10.1007/s00382-022-06257-6

2021

141. The interpretation of temperature and salinity variables in numerical ocean model output, and the calculation of heat fluxes and heat content, 2021: T.J. McDougall, P.M. Barker, R.M. Holmes, R. Pawlowicz, S.M. Griffies, and P.J. Durack, *Geoscientific Model Development*, **14**, 64456466, doi:10.5194/gmd-14-6445-2021
140. Role of mixed-layer instabilities in the seasonal evolution of eddy kinetic energy spectra in a global submesoscale permitting simulation, 2021: H. Khatri, S.M. Griffies, T. Uchida, D. Menemenlis, and H. Wang, *Geophysical Research Letters*, e2021GL094777, doi:10.1029/2021GL094777
139. The geography of numerical mixing in a suite of global ocean models, 2021: R.M. Holmes, J.D. Zika, S.M. Griffies, A.McC. Hogg, A.E. Kiss, and M.H. England, *Journal of Advances in Modeling Earth Systems (JAMES)*, **13**, doi:10.1029/2020MS002333
138. A mechanistic analysis of tropical Pacific dynamic sea level in GFDL-OM4 under OMIP-I and OMIP-II forcings, 2021: C.-W. Hsu, J. Yin, S.M. Griffies, and R. Dussin, *Geoscientific Model Development*, **14**, 2471–2502, doi:10.5194/gmd-14-2471-2021
137. On the role of the Antarctic Slope Front on the occurrence of the Weddell Sea polynya under climate change, 2021: J.W. Lockwood, C.O. Dufour, S.M. Griffies, and M. Winton, *Journal of Climate*, doi:10.1175/JCLI-D-20-0069.1
136. What causes the spread of model projections of ocean dynamic level change in response to greenhouse gas forcing?, 2021: M.P. Couldrey, J.M. Gregory, F. Boeira Dias, P. Dobrohotoff, C. Domingues, O. Garuba, S.M. Griffies, H. Haak, A. Hu, M. Ishii, J. Jungclaus, A. Köhlaffil, S. Marsland, S. Ojha, O.A. Saenko, A. Savita, A. Shao, D. Stammer, T. Suzuki, A. Todd, L. Zanna, *Climate Dynamics*, doi:10.1007/s00382-020-05471-4

2020

135. Contribution of ocean physics and dynamics at different scales to heat uptake in low-resolution AOGCMs, 2020: O. Saenko, J.M. Gregory, S.M. Griffies, and F. Boeira Dias, *Journal of Climate*, doi:10.1175/JCLI-D-20-0652.1
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133. A primer on ocean generalized vertical coordinate dynamical cores based on the vertical Lagrangian-remap method, 2020: S.M. Griffies, A.J. Adcroft, and R.W. Hallberg, *Journal of Advances in Modeling Earth Systems (JAMES)*, **12**, doi:10.1029/2019MS001954.
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