

John P. Krasting

CLIMATE SCIENTIST AND MODELER

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Education

Rutgers, The State University of New Jersey

PH.D., ATMOSPHERIC SCIENCE

New Brunswick, NJ

2008

Rutgers, The State University of New Jersey

B.S., METEOROLOGY

New Brunswick, NJ

2003

Experience

NOAA - Geophysical Fluid Dynamics Laboratory

RESEARCH PHYSICAL SCIENTIST

Princeton, NJ

2009 - PRESENT

Rutgers University - Dept. of Environmental Science

ADJUNCT FACULTY

New Brunswick, NJ

2011 - PRESENT

University of Delaware - School of Marine Science and Policy

RESEARCH COMPUTING SCIENTIST

Newark, DE

2008 - 2009

WWOR-TV, WNYW-TV, and WTXF-TV

ON-CAMERA METEOROLOGIST

New York, NY and Philadelphia, PA

2003-2010

Awards

- 2021 **Oceanic and Atmospheric Research (OAR) Employee of the Year**
National Oceanic and Atmospheric Administration
- 2014 **Silver Medal Award - Earth System Model Development**
United States Dept. of Commerce
- 2009 **Mid-Atlantic Emmy Award Nomination**
The National Academy of Television Arts and Sciences
- 2006 **Certified Broadcast Meteorologist**
American Meteorological Society

Grants

- 2022–2025 **Contextualizing Existing Sea Level Rise Scenarios in Light of a New Generation of Climate Models**
Co-Principal Investigator – NOAA/OAR Climate Portfolio – \$320,000
- 2021–2024 **An Open Framework for Process-Oriented Diagnostics of Earth System Models**
Co-Principal Investigator – NOAA Climate Program Office (MAPP) – \$2,237,244
- 2020–2022 **Diagnostics and Performance Metrics for Evaluating Ventilation Pathways and Interior Water Mass Properties**
Co-Principal Investigator – Department of Energy Subcontract Award – \$361,600
- 2018–2021 **An Open Framework for Process-Oriented Diagnostics of Global Models**
Funded Co-investigator – NOAA Climate Program Office (MAPP) – \$1,488,078

Publications

1. Dunne, J. P. *et al.* The GFDL Earth System Model version 4.1 (GFDL-ESM 4.1): Overall coupled model description and simulation characteristics. en. *Journal of Advances in Modeling Earth Systems* **n/a**. _eprint: <https://agupubs.onlinelibrary.wiley.com/doi/abs/10.1029/2019MS002015>. ISSN: 1942-2466.
2. Krasting, J. P., De Palma, M., Sonnewald, M., Dunne, J. P. & John, J. G. Regional sensitivity patterns of Arctic Ocean acidification revealed with machine learning. *Communications Earth & Environment* **in press**. doi:10.1038/s43247-022-00419-4 (Apr. 2022).
3. Lim, H.-G. *et al.* Oceanic and Atmospheric Drivers of Post-El-Niño Chlorophyll Rebound in the Equatorial Pacific. en. *Geophysical Research Letters* **49**. _eprint: <https://onlinelibrary.wiley.com/doi/pdf/10.1029/2021GL096113>, e2021GL096113. ISSN: 1944-8007 (2022).
4. Stouffer, R. J. *et al.* The Role of Continental Topography in the Present-Day Ocean's Mean Climate. EN. *Journal of Climate* **35**. Publisher: American Meteorological Society Section: Journal of Climate, 1327–1346. ISSN: 0894-8755, 1520-0442 (Feb. 2022).
5. Yu, Y. *et al.* Increased Risk of the 2019 Alaskan July Fires due to Anthropogenic Activity. EN. *Bulletin of the American Meteorological Society* **102**. Publisher: American Meteorological Society Section: Bulletin of the American Meteorological Society, S1–S7. ISSN: 0003-0007, 1520-0477 (Jan. 2021).
6. Dunne, J. P. *et al.* Simple Global Ocean Biogeochemistry with Light, Iron, Nutrients and Gas version 2 (BLINGv2): Model description and simulation characteristics in GFDL's CM4.0. en. *Journal of Advances in Modeling Earth Systems* **n/a**. _eprint: <https://agupubs.onlinelibrary.wiley.com/doi/pdf/10.1029/2019MS002008>, e2019MS002008. ISSN: 1942-2466 (Aug. 2020).
7. Dunne, J. P. *et al.* The GFDL Earth System Model version 4.1 (GFDL-ESM 4.1): Overall coupled model description and simulation characteristics. en. *Journal of Advances in Modeling Earth Systems* **n/a**. _eprint: <https://agupubs.onlinelibrary.wiley.com/doi/abs/10.1029/2019MS002015>. ISSN: 1942-2466 (Aug. 2020).
8. Stock, C. A. *et al.* Ocean Biogeochemistry in GFDL's Earth System Model 4.1 and its Response to Increasing Atmospheric CO₂. en. *Journal of Advances in Modeling Earth Systems* **n/a**. _eprint: <https://agupubs.onlinelibrary.wiley.com/doi/abs/10.1029/2019MS002043>. ISSN: 1942-2466 (Aug. 2020).
9. Winton, M. *et al.* Climate Sensitivity of GFDL's CM4.0. en. *Journal of Advances in Modeling Earth Systems* **12**. _eprint: <https://agupubs.onlinelibrary.wiley.com/doi/pdf/10.1029/2019MS001838>, e2019MS001838. ISSN: 1942-2466 (2020).
10. Adcroft, A. *et al.* The GFDL Global Ocean and Sea Ice Model OM4.0: Model Description and Simulation Features. en. *Journal of Advances in Modeling Earth Systems* **11**, 3167–3211. ISSN: 1942-2466 (2019).
11. Arora, V. K. *et al.* Carbon-concentration and carbon-climate feedbacks in CMIP6 models, and their comparison to CMIP5 models. English. *Biogeosciences Discussions*. Publisher: Copernicus GmbH, 1–124. ISSN: 1726-4170 (Dec. 2019).
12. Eyring, V. *et al.* Taking climate model evaluation to the next level. en. *Nature Climate Change* **9**, 102–110. ISSN: 1758-6798 (Feb. 2019).
13. Findell, K. L. *et al.* Rising Temperatures Increase Importance of Oceanic Evaporation as a Source for Continental Precipitation. *Journal of Climate* **32**, 7713–7726. ISSN: 0894-8755 (Aug. 2019).
14. Held, I. M. *et al.* Structure and Performance of GFDL's CM4.0 Climate Model. en. *Journal of Advances in Modeling Earth Systems* **11**. ISSN: 1942-2466. doi:10.1029/2019MS001829. <<https://agupubs.onlinelibrary.wiley.com/doi/abs/10.1029/2019MS001829>> (visited on 12/04/2019) (Nov. 2019).
15. Krasting, J. P. *et al.* Role of Ocean Model Formulation in Climate Response Uncertainty. *Journal of Climate* **31**, 9313–9333. ISSN: 0894-8755 (Sept. 2018).
16. Sentman, L. T. *et al.* The Mechanistic Role of the Central American Seaway in a GFDL Earth System Model. Part 1: Impacts on Global Ocean Mean State and Circulation. en. *Paleoceanography and Paleoclimatology* **33**, 840–859. ISSN: 2572-4525 (2018).
17. Zhao, M. *et al.* The GFDL Global Atmosphere and Land Model AM4.0/LM4.0: 1. Simulation Characteristics With Prescribed SSTs. en. *Journal of Advances in Modeling Earth Systems* **10**, 691–734. ISSN: 1942-2466 (2018).
18. Zhao, M. *et al.* The GFDL Global Atmosphere and Land Model AM4.0/LM4.0: 2. Model Description, Sensitivity Studies, and Tuning Strategies. en. *Journal of Advances in Modeling Earth Systems* **10**, 735–769. ISSN: 1942-2466 (2018).

19. Findell, K. L. *et al.* The impact of anthropogenic land use and land cover change on regional climate extremes. en. *Nature Communications* **8**, 1–10. ISSN: 2041-1723 (Oct. 2017).
20. Naiman, Z. *et al.* Impact of Mountains on Tropical Circulation in Two Earth System Models. *Journal of Climate* **30**, 4149–4163. ISSN: 0894-8755 (Feb. 2017).
21. Eyring, V. *et al.* ESMValTool (v1.0) – a community diagnostic and performance metrics tool for routine evaluation of Earth system models in CMIP. English. *Geoscientific Model Development* **9**, 1747–1802. ISSN: 1991-959X (May 2016).
22. Griffies, S. M. *et al.* OMIP contribution to CMIP6: experimental and diagnostic protocol for the physical component of the Ocean Model Intercomparison Project. English. *Geoscientific Model Development* **9**, 3231–3296. ISSN: 1991-959X (Sept. 2016).
23. Krasting, J. P., Dunne, J. P., Stouffer, R. J. & Hallberg, R. W. Enhanced Atlantic sea-level rise relative to the Pacific under high carbon emission rates. en. *Nature Geoscience* **9**, 210–214. ISSN: 1752-0908 (Mar. 2016).
24. Ding, Y. *et al.* Ocean response to volcanic eruptions in Coupled Model Intercomparison Project 5 simulations. en. *Journal of Geophysical Research: Oceans* **119**, 5622–5637. ISSN: 2169-9291 (2014).
25. Frölicher, T. L. *et al.* Dominance of the Southern Ocean in Anthropogenic Carbon and Heat Uptake in CMIP5 Models. *Journal of Climate* **28**, 862–886. ISSN: 0894-8755 (Oct. 2014).
26. Krasting, J. P., Dunne, J. P., Shevliakova, E. & Stouffer, R. J. Trajectory sensitivity of the transient climate response to cumulative carbon emissions. en. *Geophysical Research Letters* **41**, 2520–2527. ISSN: 1944-8007 (2014).
27. Krasting, J. P., Broccoli, A. J., Dixon, K. W. & Lanzante, J. R. Future Changes in Northern Hemisphere Snowfall. *Journal of Climate* **26**, 7813–7828. ISSN: 0894-8755 (May 2013).
28. Shevliakova, E. *et al.* Historical warming reduced due to enhanced land carbon uptake. en. *Proceedings of the National Academy of Sciences* **110**, 16730–16735. ISSN: 0027-8424, 1091-6490 (Oct. 2013).
29. Dunne, J. P. *et al.* GFDL’s ESM2 Global Coupled Climate–Carbon Earth System Models. Part I: Physical Formulation and Baseline Simulation Characteristics. en. *Journal of Climate* **25**, 6646–6665. ISSN: 0894-8755, 1520-0442 (Oct. 2012).
30. Dunne, J. P. *et al.* GFDL’s ESM2 Global Coupled Climate–Carbon Earth System Models. Part II: Carbon System Formulation and Baseline Simulation Characteristics. *Journal of Climate* **26**, 2247–2267. ISSN: 0894-8755 (Oct. 2012).
31. Hallberg, R., Adcroft, A., Dunne, J. P., Krasting, J. P. & Stouffer, R. J. Sensitivity of Twenty-First-Century Global-Mean Steric Sea Level Rise to Ocean Model Formulation. *Journal of Climate* **26**, 2947–2956. ISSN: 0894-8755 (Dec. 2012).

Conference Presentations

- Exploring physical and biological environmental responses to differing rates of carbon emissions
Japan Geoscience Union Meeting, July 2020, invited
- Development of Process-Oriented Diagnostics Through NOAAs Model Development Task Force
CMIP6 Analysis Workshop (Barcelona) March 2019
- Resolution-Dependent Patterns of Heat and Carbon Uptake in GFDLs OMIP simulations
OCB Workshop (Washington, D.C.) December 2018
- The growth of Python-based analyses and infrastructure in support of CM4 development and CMIP6 at NOAA-GFDL
AMS Annual Meeting (Seattle) January 2017
- Enhanced Atlantic sea-level rise relative to the Pacific under high carbon emission rates
AGU Fall Meeting (San Francisco) December 2016
- Advances in GFDLs Analysis and Model Evaluation Capabilities in Support of CM4 and CMIP6
DLR German Aerospace Center (Oberpfaffenhofen, Germany) November 2016, invited
- ESMValTool Activities at NOAA-GFDL
2nd ESMValTool Workshop (Munich, Germany) November 2016, invited
- Progress and Challenges in Integrating ESMValTool and other Outside Analysis Packages into the GFDL Workflow Invited -
ESMValTool Workshop (Munich, Germany) March 2015
- Why Carbon Emission Rates Matter for TCRE and Oceanic Heat and Carbon Uptake
AGU Fall Meeting (San Francisco) December 2014
- Trajectory Sensitivity of the Transient Climate Response to Cumulative Carbon Emissions
AGU Fall Meeting (San Francisco) December 2013
- Scenario Dependence of the Climate Response to Cumulative Carbon Emissions
Univ. of Delaware Geography Dept. (Newark, DE) November 2013, invited
- Ensemble Modeling of Climate-Carbon Cycle Interactions
PPPL Colloquium (Princeton) January 2013, invited
- How Predictable Were the 20th Century Land Carbon Fluxes?
AGU Fall Meeting (San Francisco) December 2012
- ENSO-driven Terrestrial Carbon Flux Variability in a Coupled Climate-Carbon Cycle Model
AGU Fall Meeting (San Francisco) December 2011
- NOAA-GFDL's New Earth System Models: Model Description and Preliminary Results
AGU Fall Meeting (San Francisco) December 2010
- NOAA-GFDLs Workflow for CMIP5/IPCC AR5 Experiments
AGU Fall Meeting (San Francisco) December 2010
- Observed and Simulated North American Snowfall Changes for the Late Twentieth Century.
37th Annual Northeast Storms Conference (Springfield, MA) March 2008
- Influences of Temperature and Precipitation Changes on Model Simulated Monthly Snowfall Trends
American Geophysical Union Fall Meeting (San Francisco) December 2006
- Global warming and Simulated Snowfall Trends in Eastern North America.
85th Annual Meeting of the American Meteorological Society (Seattle) January 2005
- A Statistical Analysis of Thermodynamic and Kinematic Variables Prior to Severe Thunderstorm Events in the North-

eastern United States.

11th Symposium for Undergraduate Research (University of Sao Paolo) November 2003

Teaching Experience

Postgraduate Courses

- Fall 2011 - Climate Dynamics (Rutgers University, 16:107:545)

Undergraduate Courses

- Fall 2015 - PRESENT - Introduction to Meteorology (Rutgers University, 16:670:101)
- 2003 - 2007 - Departmental Teaching Assistant for Atmospheric Thermodynamics, Synoptic Forecasting, and Meteorological Analysis

Peer Review Experience

2017 **Department of Energy - RUBISCO Program**
Program Review Panelist

2010 –
PRESENT **Peer-review Journals**

Nature Geosci., Geophys. Res. Lett., J. Climate, JGR-Atmospheres, Env. Res. Lett., Clim. Dynamics, Curr. Clim. Change Reports, PLOS ONE

Academic Supervision and Mentoring

- 2020-Present – **Dr. Jan-Erik Tesdal** *Postdoctoral Researcher - Water Mass Transformation and Sea Level Rise*
- 2020-Present – **Dr. Rebecca Beadling** *Postdoctoral Researcher - Southern Ocean Dynamics*
- 2018-Present – **Dr. Wenhao Dong** *Postdoctoral Researcher - Climate Model Diagnostics and Hydroclimate*
- 2020 – **Rucha Wani** *Internship - Ocean Acidification at Continental Slopes and the Mid-Atlantic Ridge*
- 2019 – **Maurizia De Palma** *Internship - Anthropogenic carbon uptake and ocean acidification*
- 2016 – **Maria Pulido-Velosa** *Internship - Benchmarking biogeochemical nutrients in ocean models*

Public Speaking and Outreach

- April 2019 – **Pascack Valley Regional High School Hillsdale, NJ**
- April 2019 – **N.J. Audubon Society visit to NOAA-GFDL Princeton, NJ**
- December 2017 – **Public Outreach Event at AGU Fall Meeting Washington, DC**
- May 2017 – **Expert consultation for PBS NOVA documentary series Boston, MA**
- January 2016 – **Live Interview for The Weather Channel Atlanta, GA**
- April 2015 – **Rider University Visit to NOAA-GFDL Princeton, NJ**
- December 2014 – **Princeton Univ. Engineering Department Princeton, NJ**
- June 2014 2014 – **World Science Festival New York, NY**
- December 2013 – **Princeton Univ. Engineering Department Princeton, NJ**
- April 2013 – **Princeton Univ. Engineering Department Princeton, NJ**
- April 2013 – **Rutgers Meteorology Club Career Fair New Brunswick, NJ**
- February 2013 – **Princeton Environmental Film Festival Princeton, NJ**
- December 2012 – **Princeton Univ. Engineering Department Princeton, NJ**
- July 2012 – **Princeton MIRTHE Studies Program Princeton, NJ**
- June 2012 – **UCAR Undergrad. Leadership Workshop Boulder CO, via Telecon.**
- December 2011 – **Gateway H.S. Career Fair Woodbury Heights, NJ**
- December 2011 – **Princeton Univ. Engineering Department Princeton, NJ**
- February 2011 – **Princeton Univ. Engineering Department Princeton, NJ**
- January 2011 – **Rider Univ. visit to NOAA/GFDL Princeton, NJ**

- October 2010 – **American Chemical Society** *Princeton, NJ*
- July 2009 – **Princeton QUEST Program** *Princeton, NJ*
- October 2008 – **Delaware Lego Builders League** *Wilmington, DE*
- October 2007 – **Ecological Change Coalition** *New Brunswick, NJ*
- October 2007 – **Millburn Township Public Schools** *Millburn, NJ*
- April 2007 – **League of Women Voters** *Millburn, NJ*
- March 2006 – **Gateway Academic Decathlon Club** *Woodbury Heights, NJ*
- October 2005 – **United States Postal Service** *Piscataway, NJ*
- October 2002 – **Mantua Lions Club** *Mantua, NJ*