

# RILEY X. BRADY

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## EDUCATION

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<b>University of Colorado Boulder</b>	<i>Boulder, CO</i>
Ph.D. in Atmospheric & Oceanic Sciences	<i>2021</i>
M.S. in Atmospheric & Oceanic Sciences	<i>2018</i>
<b>University of South Carolina</b>	<i>Columbia, SC</i>
B.S. in Marine Science (Emphasis in Physical Oceanography)	<i>2016</i>
<i>Magna Cum Laude</i> , Honors College, Phi Beta Kappa	
Leadership Distinction in Research	
<b>Otto-Friedrich Universität Bamberg</b>	<i>Bamberg, Germany</i>
Minor in German Studies	<i>2014</i>

## WORK EXPERIENCE

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<b>McKinsey &amp; Company</b>	<i>Denver, CO</i>
Senior Data Scientist, Climate Analytics	<i>Jan 2021–Present</i>
<b>University of Colorado Boulder</b>	<i>Boulder, CO</i>
Graduate Research Assistant, Institute of Arctic and Alpine Research	<i>2016–2020</i>
<b>Oak Ridge National Laboratory</b>	<i>Oak Ridge, TN</i>
Graduate Research Assistant, Computational Earth Sciences Group	<i>Summer 2020</i>
<b>Los Alamos National Laboratory</b>	<i>Los Alamos, NM</i>
Graduate Research Assistant, Theoretical Division	<i>Summer 2018</i>
<b>University of South Carolina</b>	<i>Columbia, SC</i>
Undergraduate Research Assistant, Ecosystem Oceanography & Climate Change Lab	<i>2012–2016</i>
<b>NOAA Earth System Research Laboratory</b>	<i>Boulder, CO</i>
NOAA Hollings Scholar, Physical Sciences Division	<i>Summer 2015</i>
<b>UNC Institute of Marine Sciences</b>	<i>Morehead City, NC</i>
NSF REU Scholar, Coastal Fisheries Ecology Lab	<i>Summer 2013</i>

## FUNDED PROPOSALS

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Lead Principal Investigator

**Brady, RX**, 2016-2020: *Department of Energy Computational Science Graduate Fellowship*, ~\$450,000 total award.

**Brady, RX** and Rykaczewski, RR, 2014-2015: Variability in large-scale forcing of the four major Eastern Boundary Upwelling Systems. *U. South Carolina Magellan Research Scholarship*, \$3,000 total award.

**Brady, RX** and Rykaczewski, RR, 2013-2014: The influence of water vapor on upwelling. *SC Honors College Science Undergraduate Research Fellowship*, \$2,900 total award.

**Brady, RX** and Rykaczewski, RR, 2012-2013: Ocean ecosystems in 2100. *SC Honors College Science Undergraduate Research Fellowship*, \$2,700 total award.

## PUBLICATIONS

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### Peer-Reviewed:

6. **Brady, RX**, ME Maltrud, PJ Wolfram, HF Drake, and NS Lovenduski (*in review*), The influence of ocean topography on the upwelling of carbon in the Southern Ocean, *Geophysical Research Letters*.
5. **Brady, RX** and A Spring (2021), climpred: Verification of weather and climate forecasts, *Journal of Open Source Software*. DOI: [10.21105/joss.02781](https://doi.org/10.21105/joss.02781). [\[PDF\]](#)
4. **Brady, RX**, NS Lovenduski, SG Yeager, MC Long, and K Lindsay (2020), Skillful multiyear predictions of ocean acidification in the California Current System, *Nature Communications*. DOI: [10.1038/s41467-020-15722-x](https://doi.org/10.1038/s41467-020-15722-x). [\[PDF\]](#) [\[Supplemental\]](#) [\[Press Release\]](#)
3. Elsworth, GE, NS Lovenduski, KA McKinnon, KM Krumhardt, and **RX Brady** (2020), Finding the fingerprint of anthropogenic climate change on marine phytoplankton abundance, *Current Climate Change Reports*. DOI: [10.1007/s40641-020-00156-w](https://doi.org/10.1007/s40641-020-00156-w). [\[PDF\]](#)
2. **Brady, RX**, NS Lovenduski, MA Alexander, M Jacox, and N Gruber (2019), On the role of climate modes in modulating the air-sea CO<sub>2</sub> fluxes in Eastern Boundary Upwelling Systems, *Biogeosciences*, 16, 329–346, DOI: [10.5194/bg-16-329-2019](https://doi.org/10.5194/bg-16-329-2019). [\[PDF\]](#) [\[Supplemental\]](#)
1. **Brady, RX**, MA Alexander, NS Lovenduski, and RR Rykaczewski (2017), Emergent anthropogenic trends in California Current upwelling, *Geophys. Res. Lett.*, 44, 5044–5052, DOI: [10.1002/2017GL072945](https://doi.org/10.1002/2017GL072945). [\[PDF\]](#) [\[Supplemental\]](#) [\[Press Release\]](#)

### Conference Proceedings:

1. Dutta, S, **RX Brady**, ME Maltrud, PJ Wolfram, and R Bujack (2019), Leveraging Lagrangian analysis for discriminating nutrient origins, *EnvirVis*. [\[PDF\]](#)

### Non Peer-Reviewed:

3. **Brady, RX** (2021), The variable circulation and carbonate chemistry of ocean upwelling systems, *University of Colorado Ph.D. Dissertation*, [\[PDF\]](#)
2. Schlunegger, S, Y Eddebbar, **RX Brady**, and FA Burger (2020), Applications of Large Ensembles for marine biogeochemistry, *US CLIVAR Variations*, 18(2). [\[PDF\]](#)
1. **Brady, RX** (2016), California Current upwelling: Distinguishing anthropogenic impacts from natural climate variability, *University of South Carolina Honors Thesis*

## HONORS AND AWARDS

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### National

Computational Science Graduate Fellow, Department of Energy	2016
Barry M. Goldwater Scholar, United States Congress	2015
Ernest F. Hollings Scholar, NOAA	2014

### Institutional

Departmental (ATOC) Service Award	2020
“For providing technical support to fellow students and for outstanding mentorship to underrepresented undergraduate students.”	
Departmental (ATOC) Service Award	2018
“For successful efforts to involve ATOC students with the oceanography faculty search.”	
Algernon Sydney Sullivan Award, U. South Carolina (3 recipients)	2016
Outstanding Undergraduate in Marine Science, U. South Carolina (2 recipients)	2016
Outstanding Senior Award, U. South Carolina	2016
McNair Scholar, U. South Carolina (Valued at \$130,800)	2012

## Meetings

1 <sup>st</sup> Place, Oceanography, Earth System and Space Science Poster Conference	2016
Best Student Talk, Eastern Pacific Ocean Conference	2015
Outstanding Student Presentation Award, Ocean Sciences Meeting	2014
1 <sup>st</sup> Place, Morning Oral STEM Session, South Carolina Discovery Day	2013

## Visualization

Runner-up, Data Visualization and Storytelling Competition, AGU	2019
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## OPEN SOURCE SOFTWARE

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<b>climpred</b>	<i>Co-founder and core developer.</i> Verification of weather and climate forecasts. <a href="#">[docs]</a>
<b>esmttools</b>	<i>Founder and core developer.</i> A toolbox for Earth system model analysis. <a href="#">[docs]</a>
<b>xskillscore</b>	<i>Core developer.</i> Metrics for verifying forecasts. <a href="#">[docs]</a>
<b>esmlab</b>	<i>Contributor.</i> Tools for working with Earth system multi-model analyses with xarray. <a href="#">[docs]</a>
<b>LIGHT</b>	<i>Contributor.</i> A Lagrangian particle tracking system for the MPAS ocean model. <a href="#">[info]</a>
<b>mpas-analysis</b>	<i>Contributor.</i> Automated analysis of the components of the MPAS model. <a href="#">[docs]</a>

## SKILLS & INTERESTS

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<b>Computer Languages</b>	python, MATLAB, shell scripting, C/C++ (familiar), OpenMP/MPI (familiar)
<b>Data &amp; Databases</b>	Running ESM simulations, CMIP5/6, NetCDF, NCO, CDO, GNU parallel
<b>Design</b>	ParaView, HTML, CSS, L <sup>A</sup> T <sub>E</sub> X, Vector Graphics
<b>Foreign Language</b>	English (native), German (comfortable)
<b>Music</b>	acoustic guitar, blues harmonica, vocals
<b>Hobbies</b>	trail running, road cycling, kickboxing, weightlifting

## GRADUATE COURSEWORK

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Biogeochemical Oceanography	The Global Carbon Cycle
Intro to Physical Oceanography	Intro to Atmospheric Radiation
Dynamics of the Atmosphere and Oceans	Partial Differential Equations
Atmospheric Thermodynamics	Modeling in Applied Mathematics
Introduction to Time Series	Chaotic Dynamics
High-Performance Scientific Computing	

## SHORT COURSES

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\* denotes application-based programs

CMIP6 Hackathon*, National Center for Atmospheric Research, Boulder, CO	2019
Swiss Climate Summer School*, C <sub>2</sub> SM, Ascona, Switzerland	2019
CMIP6 Hackathon, Oak Ridge National Lab, Oak Ridge, TN	2019
ParaView Tutorial, Los Alamos National Lab, Los Alamos, NM	2018
Introduction to Parallel Programming, CU Boulder, Boulder CO	2017
NMFS Marine Resources Population Dynamics Workshop*, Layton, FL	2014

## SERVICE & OUTREACH

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### Mentorship

\* denotes undergraduate mentees

Isis Díaz* (SMART; University of Puerto Rico)	2020
Gabriela Cazares* (SOARS; MIT)	2019

David Feagins* (SMART; St. Mary's College)	2019
Brianna Green* (RESESS; New Mexico Tech)	2019
Holly Olivarez* (SOARS; University of New Mexico)	2019
Gabriela Negrete-Garcia* (SOARS; University of Wisconsin)	2017
Science Fair Judging	
Trout Bowl Science Judge	2020
Boulder Valley School District Science Fair	2019
SOARS Poster Conference	2017
Miscellaneous	
Referee, <i>JGR: Oceans, Earth System Science Data, Biogeosciences, Journal of Open Source Software</i> [Publons]	
Member, Climate Gamers [Ice Ages Video] [Climate Models Video]	2018–2019
Skype a Scientist (video calls with high school science classes)	2018–2019
Committee Lead, oceanography faculty search; prospective students; mentorship	2017–2019
Ambassador, Office of Fellowships; Office of Undergraduate Research; Sustainable Carolina	2013–2016

## TEACHING

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University of Colorado Boulder	
Guest Lecturer, <i>Physical Oceanography and Climate</i> (Eastern Boundary Upwelling Systems)	Fall 2019
Grader, <i>Biogeochemical Oceanography</i> (20 students)	Spring 2019
Guest Lecturer, <i>Our Changing Climate</i> (Latent and Sensible Heat)	Fall 2018
University of South Carolina	
Grader, <i>Ordinary Differential Equations</i> (39 students)	Spring 2016
Lecturer, <i>University 101</i> (20 students)	Fall 2015
University of Texas Rio Grande Valley	
Guest Lecturer, <i>Intro to Scientific Computing for Earth Sciences</i> (From Raw Climate Data to Beautiful Plots) [Github Repo]	Fall 2019
Guest Lecturer, <i>Intro to Scientific Computing for Earth Sciences</i> (Color Theory and Matplotlib)	Spring 2019

## SELECTED PRESENTATIONS

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### Invited Talks:

8. Brady RX and A Spring. climpred: an xarray wrapper for analysis of ensemble forecast models for climate prediction. CESM Workshop: remote. June 2020.
7. Brady, RX, NS Lovenduski, SG Yeager, MC Long, and K Lindsay. Skillful multiyear predictions of ocean acidification in the California Current System. NOAA Physical Sciences Division Seminar Series: Boulder, CO. December 2019.
6. Brady, RX, ME Maltrud, PJ Wolfram, and NS Lovenduski. High resolution simulation of biogeochemical pathways in E3SM. Computational Earth Sciences Group: Oak Ridge, TN. July 2019.
5. Brady, RX, NS Lovenduski, MA Alexander, MG Jacox, and N Gruber. On the role of climate modes in modulating the air-sea CO<sub>2</sub> fluxes in Eastern Boundary Upwelling Systems. EBUS Webinar Series. March 2019.
4. Brady, RX. Effective Use of Color in Scientific Visualization. Scientific Programming and Data Visualization (ATOC Course: Sci Programming, Data Analysis, and Vis Lab). Boulder, CO. November 2018. [Slides]

3. Brady, RX. Effective Use of Color in Scientific Visualization. ATOC Graduate Student Forum: Boulder, CO. October 2018.
2. Brady, RX, M Maltrud, P Wolfram, and NS Lovenduski. Southern Ocean Carbon Hotspots in E3SM. Climate, Ocean, and Sea Ice Modeling (COSIM) Team: Los Alamos, NM. August 2018.
1. Brady, RX, RR Rykaczewski, and MA Alexander. Emergence of Anthropogenic Trends in California Current Upwelling in the Presence of Natural Climate Variability. NCAR Oceanography Section: Boulder, CO. March 2016.

#### Conference Talks:

9. Brady, RX. Lagrangian trajectories of carbon in the topographically influenced Southern Ocean. SOCCOM Annual Meeting: remote. June 2021.
8. Brady, RX. Lagrangian circulation of carbon from the Southern Ocean abyss. Department of Energy Computational Science Graduate Fellowship Annual Review: remote. July 2020.
7. Brady, RX, NS Lovenduski, SG Yeager, MC Long, and K Lindsay. Skillful multiyear predictions of ocean acidification in the California Current System. Eastern Pacific Ocean Conference: South Lake Tahoe, CA. September 2019.
6. Brady, RX, NS Lovenduski, SG Yeager, and MC Long. Skillful multiyear predictions of pH variability in the California Current System. CESM Workshop: Boulder, CO. June 2019.
5. Brady, RX, NS Lovenduski, MA Alexander, MG Jacox, and N Gruber. On the role of climate modes in modulating the air-sea CO<sub>2</sub> fluxes in Eastern Boundary Upwelling Systems. 12th Graduate Climate Conference: Pack Forest, WA. November 2018.
4. Brady, RX, NS Lovenduski, MA Alexander, MG Jacox, and N Gruber. What controls the variability of CO<sub>2</sub> fluxes in Eastern Boundary Upwelling Systems? Ocean Sciences Meeting: Portland, OR. February 2018. [\[Slides\]](#) [\[PDF\]](#)
3. Brady, RX, RR Rykaczewski, and MA Alexander. Emergence of anthropogenic trends in California Current upwelling in the presence of internal climate variability. CESM Workshop: Breckenridge, CO. June 2016. [\[Slides\]](#) [\[PDF\]](#)
2. Brady, RX, RR Rykaczewski, and MA Alexander. The influence of natural variability on future California Current upwelling. AGU Fall Meeting: San Francisco, CA. December 2015. [\[Slides\]](#)
1. Brady, RX, MA Alexander, and RR Rykaczewski. Quantifying natural and anthropogenic variation in California Current upwelling. Eastern Pacific Ocean Conference: South Lake Tahoe, CA. September 2015. [\[Slides\]](#)

#### Conference Posters:

5. Brady, RX, ME Maltrud, PJ Wolfram, NS Lovenduski, and HF Drake. Lagrangian pathways of dissolved inorganic carbon in the Southern Ocean. Ocean Sciences Meeting: San Diego, CA. February 2020.
4. Brady, RX, NS Lovenduski, SG Yeager, and MC Long. Skillful multiyear predictions of pH variability in the California Current System. AGU Chapman Conference on Understanding Carbon Climate Feedbacks: San Diego, CA. August 2019.
3. Brady, RX and NS. Lovenduski. CO<sub>2</sub> flux variability in Eastern Boundary Upwelling Systems. 10<sup>th</sup> International Carbon Dioxide Conference: Interlaken, Switzerland. August 2017.
2. Brady, RX, RR Rykaczewski, and MA Alexander. Emergence of anthropogenic trends in California Current upwelling in the presence of internal climate variability. Ocean Sciences Meeting: New Orleans, LA. February 2016.

1. Brady, RX, and RR Rykaczewski. Consequences of changing high-pressure zones on future coastal upwelling. Ocean Sciences Meeting: Honolulu, HI. February 2014 [\[PDF\]](#)

Workshops:

3. Brady, RX and A Spring. The climpred diagnostics package. Earth System Prediction Working Group, National Center for Atmospheric Research: Boulder, CO. January 2020. [\[Github Repo\]](#)
2. Brady, RX and LB Davis. Effective Use of Color in Climate Science Visualizations. ATOC Graduate Student Forum: Boulder, CO. October 2019. [\[Github Repo\]](#)
1. Brady, RX. Introduction to Git Version Control. ATOC Graduate Student Forum: Boulder, CO. March 2019.