

# Curriculum Vitae

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(previously 'Jadwiga H. Beres')

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***Accomplished scientific and programmatic leader with commitment to developing people, E&O, DEI, strategic planning and implementation.***

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### 1. Education:

<b>Leadership Academy</b> , NCAR/UCAR, Boulder CO	2019
<b>Graduate Certificate in Instructional Design</b> , University of Wisconsin, Menomonie, WI	2015
<b>Ph.D. Atmospheric Sciences</b> , University of Washington, Seattle, WA	2002
• Advisors: Dr. James Holton, Dr. M. Joan Alexander	
• Thesis: Gravity waves generated by tropical convection: generation mechanisms and implications for global circulation models	
<b>B.S. Mathematics</b> , State University of New York, Purchase, NY	1997

### 2. Work History:

<b>Interim Director</b> , CGD, NCAR, Boulder, CO	Spring/Summer 2023
<b>Senior Scientist</b> , CGD, NCAR, Boulder, CO	2022 - present
<b>Assistant to the CGD Director for Strategic Plan Implementation</b> , CGD, NCAR, Boulder, CO	2020 - present
<b>Scientist III</b> , CGD, NCAR, Boulder, CO	2017 - 2022
<b>Project Scientist II</b> , CGD, NCAR, Boulder, CO	2013 - 2017
<b>Scientist II</b> , CGD, NCAR, Boulder, CO	2009 - 2012
<b>Scientist I</b> , CGD, NCAR, Boulder, CO	2006 - 2009
<b>Education and Outreach Visiting Fellow</b> , Cooperative Institute for Research in Environmental Sciences (CIRES), University of Colorado, Boulder, CO	2005 - 2006
<b>Visitor</b> , Atmospheric Chemistry Division (ACD), NCAR, Boulder, CO	2005
<b>ASP Postdoctoral Scientist</b> , Joint appointment between High Altitude Observatory (HAO), CGD, and ACD, NCAR, Boulder, CO	2002 - 2005

<b>Field Project Participant</b> , Convection and Moisture Experiment 4, Jacksonville, FL	2001
• Operated an instrument on the NASA ER-2 and DC-8 aircrafts	
<b>Scientist</b> , Young Scientists Summer Program, International Institute for Applied Systems Analysis (IIASA), Laxenburg, Austria	2000
• Researched climate change and hurricane activity for policy makers	
<b>Research Assistant</b> , University of Washington, Seattle, WA	1997 - 2002
• Modeled convection and gravity waves using a mesoscale model	
<b>Research Assistant</b> , State University of New York, Purchase, NY	1997
• Analyzed turbulence data from British Airways flights	

### 3. Scientific Accomplishments:

#### 3.1 Contributions to Community Models:

[7] Contributed to the development of a high vertical resolution/high top version of CAM	2020
[6] Developed a high vertical resolution version of WACCM in order for WACCM/NCAR to participate in the SPARC quasi-biennial oscillation initiative (QBOi) project. Led NCAR's contribution to QBOi and one of the QBOi core papers. Publications [57, 58, 59, 65, 76]	2015 - 2018
[5] Led the transition from the 2x2.5° to the 0.9x1.25° version of the Whole Atmosphere Community Climate Model (WACCM), version 5. Improved the gravity wave parameterization to obtain an internally generated quasi-biennial oscillation. Publication [31]	2015
[4] Developed a version of Community Atmosphere Model (CAM) with a raised model lid and a realistic representation of sudden stratospheric warmings and internally generated quasi-biennial oscillation. Publications [27, 30].	2014 - 2015
[3] Changed the entire non-orographic gravity wave source representation in WACCM from an arbitrary to a physically based parameterization. Publication [15]	2009 - 2010
[2] Added convective momentum transport parameterization to the convection parameterization in CAM, which resulted in a very large improvement in the representation of the El Nino Southern Oscillation. Publications [12, 13]	2005 - 2006
[1] Changed the convective gravity wave source representation in WACCM from an arbitrary to a physically based representation. Publication [7]	2004 - 2005

#### 3.2 Major Scientific Advances:

[6] Led an innovative study of sources of subseasonal predictability [108]	2021 - 2022
[5] Led the creation of ARISE-SAI ( <b>A</b> ssessing <b>R</b> esponses and <b>I</b> mpacts of <b>S</b> olar climate intervention on the <b>E</b> arth system with stratospheric aerosols) simulations and coordinates analysis among team at various institutions funded by the Safe Climate Research Initiative. Publications [95, 96, 99, 100, 102, 103, 104]	2021 - 2023

- [4] Pioneered the development of a subseasonal prediction system with CESM1, CESM2, and CESM2(WACCM), including the capability for near real-time forecasting. 2016 - 2021  
Publications [70, 71, 72, 79, 83, 84, 89, 93, 94, 106]
- [3] Led a team effort on examining the role of stratospheric SO<sub>2</sub> injections on climate. 2015 - 2018  
Project resulted in the demonstration that surface temperatures in CESM1(WACCM) can be kept at 2020 levels (despite greenhouse gas emissions) using SO<sub>2</sub> injections into the stratosphere at four different locations, and creation of the first Geoengineering Large Ensemble (GLENS).  
Publications [32, 33, 34, 35, 36, 38, 40, 41, 42, 44, 45, 47, 49, 53, 55, 67, 68, 69, 80, 86]
- [2] Demonstrated that with improvements to the gravity wave parameterization and increased vertical resolution, a realistic quasi-biennial oscillation can be obtained in CAM. 2013 - 2014  
Publications [24, 25]
- [1] Used linear theory and mesoscale simulations to describe and quantify the relationships between gravity wave properties and convection properties. Developed the first source spectrum parameterization for convectively generated gravity waves. Publications [2, 3, 4, 5] 2001 - 2004

#### 4. Proposals and Grants (\$22M PI or Co-PI, \$4M Co-I since 2006)

- [20] **DOE, Co-I:** Improving the Quasi-biennial oscillation through surrogate-accelerated parameter optimization and vertical grid modification, PI: James Benedict (LANL), \$1.9M (NCAR), \$8.7M Total 2022 - 2027
- [19] **NOAA, Co-I:** Assessing and comparing impacts of solar climate intervention in CESM2 ensembles utilizing strategically located marine cloud brightening and stratospheric aerosol injection, PI: Chih-Chieh Chen, \$750,000 2022 - 2025
- [18] **DOE, PI:** Improvement and understanding of tropical convection and variability in E3SMv2 and CESM2, \$125,000 2022 - 2023
- [17] **DOE, Co-PI:** Cooperative Agreement To Analyze variability, change and predictability in the earth System (CATALYST), PI: Gerald Meehl, \$8.6M 2021 - 2023
- [16] **SilverLining NGO, PI:** Small ensemble of climate intervention simulations using stratospheric aerosols, \$50,000 2021 - 2022
- [15] **UCAR, PI:** Towards actionable science: assessment of water availability under climate change and climate intervention scenarios, \$161,684 2021 - 2022
- [14] **NOAA, Co-PI:** Marine cloud brightening as a climate intervention strategy simulated by Community Earth System Model version 2, PI: Chih-Chieh Chen, \$125,000 2021 - 2022
- [13] **SilverLining NGO, PI:** Impact of climate intervention using stratospheric aerosols on weather extremes, \$467,000 2021 - 2023
- [12] **NSF, Collaborator:** Collaborative Research: Improving the representation of the Quasi-biennial Oscillation and its surface impacts in NCAR climate models. PI: Martina Bramberger, Northwest Research Associates 2021 - 2024
- [11] **NSF, Collaborator:** What are the fundamental limits/trade-offs of stratospheric aerosol geoengineering? PI: Douglas G. MacMartin 2020 - 2022
- [10] **DOE, Co-PI:** Cooperative Agreement for To Analyze variability, change and predictability in the earth System (CATALYST), PI: Gerald Meehl, \$10M 2019 - 2021

[9] <b>NOAA, Co-I:</b> Benefits of stochastic parameterization on the sub seasonal and seasonal timescales in hindcasts with CESM and UFS; PI: Judith Berner, \$860,000	2019 - 2022
[8] <b>DOE, PI:</b> Improving Momentum Transport Processes in E3SM Co-PIs: M. Moncrieff (NCAR) and S. Xie (LLNL), \$1,050,000	2018 - 2021
[7] <b>NOAA, PI:</b> Subseasonal to Seasonal Prediction with NCAR's CESM2-WACCM Co-PIs: J. Perlwitz (NOAA-ESRL) and D. Collins (NOAA-CPC), \$340,000	2018 - 2020
[6] <b>NSF, Collaborator:</b> EAGER: Introducing a design element into stratospheric aerosol geoengineering, PI: Douglas G. MacMartin	2018 - 2020
[5] <b>DARPA, PI:</b> Building confidence in an intelligently-designed climate intervention strategy. Co-PI: S. Tilmes (NCAR), \$240,000	2017
[4] <b>NOAA, Co-PI:</b> Role of stratospheric processes in predicting ENSO-NAO connections on subseasonal timescale. Pi: J. Perlwitz (NOAA-ESRL), Co-I's: J. Bacmeister (NCAR) and L. Sun (NOAA-ESRL), \$508,505	2016 - 2018
[3] <b>DARPA, PI:</b> A Holistic Assessment of Injection of SO <sub>2</sub> into the Stratosphere, Co-PI: S. Tilmes (NCAR), \$400,000	2015 - 2016
[2] <b>NSF, Collaborator:</b> Examining the Connections between Observed Atmospheric Gravity Waves and Convective Clouds for Improved Climate Simulations, PI: M. Joan Alexander (CoRA)	2014 - 2017
[1] <b>NASA, Co-I:</b> Improving gravity wave parameterizations for next generation of troposphere/middle atmosphere general circulation models. \$500,000	2006 - 2009

## 5. Education and Outreach

### 5.1 Graduate and Undergraduate Student Mentorship

[8] <b>Graduate Student Mentor</b> for Kai Huang, George Mason University	2021 - 2023
[7] <b>Graduate Student Mentor</b> for Todd Rhodes, Coastal Carolina University	2016
[6] <b>Graduate Student Mentor</b> for Oliver Watt-Meyer, University of Toronto	2015
[5] <b>Graduate Student Mentor</b> for Junhong Wei, Pennsylvania State University	2015
[4] <b>Undergraduate Student Mentor</b> for Andre Hernandez-Espiet, U. Metropolitana	2015
[3] <b>Graduate Student Mentor</b> for Weiye Yao, University of Michigan	2014
[2] <b>Graduate Student Mentor</b> for Alex Hassiotis, visitor from Pennsylvania State U.	2006
[1] <b>Undergraduate Student Mentor</b> , SOARS student	2003

### 5.2 Thesis Committees

[4] <b>Ph.D Thesis Committee Member</b> for Kai Huang, George Mason University	2021-2023
[3] <b>Ph.D Thesis Committee Member</b> for Todd Rhodes, Coastal Carolina University	2020-2021
[2] <b>Ph.D. Thesis Committee Member</b> for Weiye Yao, University of Michigan	2014
[1] <b>Ph.D. Thesis Committee Member</b> for Amir Sayed, Carleton University	2014

### 5.3 Public Outreach

<b>Lecturer</b> , NCAR Explorer Series, “Turning down the thermostat: Climate intervention using stratospheric aerosols”	2022
<b>Participant</b> , STEM for all video show case video on the NCAR Explorer Series <a href="https://stemforall2021.videohall.com/presentations/2214">https://stemforall2021.videohall.com/presentations/2214</a>	2021
<b>Science Mentor</b> , Earth Explorers, Westview Middle School	2019 - 2020
<b>Lead organizer</b> , NCAR Explorer Series <ul style="list-style-type: none"><li>• Developed vision for and ensured success of all events</li><li>• Coordinated efforts between 30 team members from NCAR &amp; UCAR</li></ul>	2015 - 2017
<b>Coordinator</b> , CGD/NCAR Education and Outreach Activities <ul style="list-style-type: none"><li>• Contributed to education and outreach strategic planning for NCAR</li><li>• Fostered collaborations related to climate education and outreach with Universities and other education and outreach groups at NCAR/UCAR</li></ul>	2015 - 2017
<b>Participant</b> , 2-day Science: Becoming the Messenger Workshop <ul style="list-style-type: none"><li>• Learnt about effective communication to a lay audience</li><li>• Practiced on-camera interviews and presentations with professional feedback</li></ul>	2014
<b>Volunteer Climate Educator</b> , Climate Reality Project <ul style="list-style-type: none"><li>• Presenter of a climate change education lecture to diverse audiences</li></ul>	2013 - 2015
<b>Participant</b> , Climate Reality Leadership Corps Training with former Vice President Al Gore, Chicago, IL	2013
<b>Keynote Speaker</b> , “Climate and Weather: The Two Go Together”, National Center for Atmospheric Research, Boulder, CO	2006
<b>Education and Outreach Program Designer</b> , CIRES, University of Colorado, Boulder, CO <ul style="list-style-type: none"><li>• “WeatherWise” badge program and kit designer for Girl Scouts</li><li>• “WeatherWise” program testing and implementation</li><li>• “Radiosonde Launch” film design, production and editing</li></ul>	2005 - 2006
<b>Education and Outreach Program Designer</b> , ASP, NCAR <ul style="list-style-type: none"><li>• Created and developed “Climate and Weather: The Two Go Together”, Girls Scouts at the National Center for Atmospheric Research (NCAR) program</li><li>• Program invites Girl Scouts to NCAR twice a year for a day of immersion into atmospheric science and atmospheric science careers</li></ul>	2005
<b>Mentor</b> , Building Bridges in Education Conference	2004
<b>Content Editor</b> , NASA Astroventure program <ul style="list-style-type: none"><li>• Edited content of web-based E&amp;O materials for NASA</li></ul>	2004
<b>Role Model</b> , NASA Astroventure program <ul style="list-style-type: none"><li>• Interviewed and profiled for NASA website to inspire girls to pursue a science career</li></ul>	2004
<b>Online Teacher</b> , National Teachers Enhancement Network <ul style="list-style-type: none"><li>• Developed and taught a 15-week online course: “Weather and Climate for Teachers”</li></ul>	2004 - 2005

- Participant**, 4-day “Education Workshop for Scientists, Engineers and EPO managers” 2003  
Space Science Institute, Boulder, CO
- Learned about effective strategies for involvement of scientists in education and outreach activities
  - Developed a better understanding of the ‘bridging the educational gap’ problem
  - Connected with E&O Program Managers across the US
- Outreach Coordinator**, Department of Atmospheric Sciences, University of Washington, Seattle, WA 2000 - 2001
- Managed department outreach activities to meet the needs of local middle schools
  - Organized department tours, demos, and coordinated outreach volunteer participation
- Outreach Volunteer**, Department of Atmospheric Science, University of Washington, Seattle, WA 1998 - 1999
- Performed science demonstrations at middle school science fairs
  - Taught atmospheric science on science days in middle-schools
  - Introduced kids to atmospheric science through department tours and simple demonstrations
- Lead Teaching Assistant**, Department of Atmospheric Sciences, University of Washington, Seattle, WA 2000 - 2002
- Managed 12 to 15 teaching assistants
  - Supervised classroom visits, developed labs and activities for “Weather 101”

## 6. Science Community Service

- Scientific Steering Group Member**, Stratosphere-troposphere Processes And their Role in Climate (SPARC) 2022 - present
- Member**, AGU James Holton Award Committee 2022 - present
- Organizing Committee Member & Local Host**, SPARC General Assembly 2022
- Co-Lead**, Stratosphere Troposphere Processes And their Role in Climate (SPARC) QBOi Activity 2022 - present
- Advisory Member**, CGD/NCAR Diversity Equity and Inclusion (DEI) Committee 2022 - present
- Member**, CGD Exchange Steering Committee 2021 - 2022
- Assistant to the CGD/NCAR Director** for Strategic Planning 2020 - present
- Co-Chair**, CESM Earth System Prediction Working Group (ESPWG) 2020 - 2022
- Member**, CAM vertical resolution grid taskforce 2020 - 2022
- Member**, NCAR NWSC-3 SRAP Committee 2020
- Member**, NCAR COVID-19 Task Team 2020
- Member**, NCAR response to RFI on Earth System Predictability Committee 2020
- Local Host**, SPARC Scientific Steering Group Meeting 2019
- Co-founder and Scientific Steering Group Member**, Geoengineering Modeling Research Consortium (GMRC) 2019 - 2022
- Co-lead**, NCAR/CGD Earth System Prediction Theme 2019 - 2022

<b>Member</b> , NCAR Strategic Planning Committee	2019
<b>Member</b> , International Commission of the Middle Atmosphere (ICMA)	2019 - present
<b>Associate Editor</b> , Journal of the Atmospheric Sciences	2019 - present
<b>Member</b> , Science Advisory Panel (SRAP) for the NCAR/CISL NWSC-3 Procurement	2018 - 2021
<b>Co-Lead</b> , NCAR/UCAR Innovation Council	2017 - 2020
<b>Developer</b> , Community Atmosphere Model, Community Earth System Model	2005 - present
<b>Developer</b> , Whole Atmosphere Community Climate Model	2003 - present
<b>Reviewer</b> , Journal of the Atmospheric Sciences, Journal of Geophysical Research, Geophysical Research Letters, Bulletin of the American Meteorological Society, Climate Dynamics, Journal of Solar and Terrestrial Physics, Weather & Forecasting	2002 - present
<b>Program Committee Member</b> , 2016 SPARC Gravity Wave Symposium	2015
<b>Co-Chair</b> , Climate and Weather of the Sun-Earth System Working Group	2011 - 2012
• Coordinated research efforts between international group of gravity wave scientists	
<b>Session Organizer</b> , Annual American Geophysical Union Meeting	2006
<b>Retreat Organizer</b> , TIIMES, National Center for Atmospheric Research, Boulder, CO	2006
• Organized a week-long gravity wave retreat consisting of 30 international gravity wave experts	
• Led the effort of putting together a white paper following the retreat	

## 7. Honors and Awards:

<b>NCAR EdEC Special Recognition Award, NCAR Education, Engagement &amp; Early-Career Development</b> , For outstanding work in support of the NCAR Explorer Series	2022
<b>Outstanding Accomplishment in Education and Outreach Award</b> , UCAR	2021
• Recognizing the leadership, talent and efforts of the Explorer Series team	
<b>Scientific and Technological Activities Commission Distinguished Scientific/Technological Accomplishment Award</b> , American Meteorological Society	2021
<b>Best Student Paper</b> , American Meteorological Society Annual Meeting	2000
<b>Irene P. Goldring Award</b> , State University of New York at Purchase, Purchase NY	1997
• In recognition of a graduating woman who has demonstrated promise for a career in science or mathematic	
<b>Best Student Research Project</b> , State University of New York at Purchase, Purchase, NY	1997

## 8. Publications (Citations: 6495, H-index: 43, i10-index 75)

### 8.1 Thesis

Beres, J. H., 2002. Gravity waves generated by tropical convection: generation mechanisms and implications for global circulation models. Ph.D. thesis Dept. of Atmospheric Science, University of Washington, 129 pp.

## 8.2 Book Chapters (1)

- [1] C. Heale, **Richter, J. H.**, M. J. Alexander, J. T. Bacmeister, C. Heale, C. Kruse, J. Wei, 2023: Gravity wave drags in the atmosphere; Ch 11 of: Fast Physics in Large Scale Atmospheric Models: Parameterization, Evaluation, and Observations, *Editors: Yangang Liu; Pavlos Kollias; Leo Donner (advisor), Geophysical Monograph Series, 350 pp.*

## 8.3 Refereed Journal Articles (99)

- [1] Alexander, M. J., **J. H. Beres** and L. Pfister, 2000: Tropical stratospheric gravity wave activity and relationship to clouds. *J. Geophys. Res.*, **105**, 22,299-22,309.
- [2]\* Holton, J. R., **J. H. Beres**, and X. L. Zhou, 2002: On the vertical scale of gravity waves excited by localized thermal forcing. *J. Atmos. Sci.*, **59**, 2019–2023
- [3]\* **Beres, J. H.**, M.J. Alexander, and J.R. Holton, 2002: Effects of tropospheric wind shear on the spectrum of convectively generated gravity waves. *J. Atmos. Sci.*, **59**, pp. 1805–1824
- [4]\* **Beres, J. H.**, M.J. Alexander, and J.R. Holton, 2004a: A method of specifying the gravity wave spectrum above convection based on latent heating properties and background wind. *J. Atmos. Sci.*, **61**, 324– 337.
- [5]\* **Beres, J. H.**, 2004: Gravity wave generation by a three-dimensional thermal forcing. *J. Atmos. Sci.*, **61**, 1805 – 1815.
- [6] Alexander, M. J., M. May and **J. H. Beres**, 2004: Gravity waves generated by convection in the Darwin area during DAWEX, *J. Geophys. Res.*, **109**, D20S04, 10.1029/2004JD004729
- [7] **Beres, J. H.**, R. R. Garcia, B. A. Boville and F. Sassi, 2005a: Implementation of a gravity wave source spectrum parameterization dependent on the properties of convection in the Whole Atmosphere Community Climate Model (WACCM), *J. Geophys. Res.*, **110**, D10108, doi:10.1029/2004JD005504
- [8] **Beres, J. H.**, 2005b: Estimates of mesospheric gravity wave activity over convection from a global model, *Adv. Space Res.*, **35**, 1933-1939
- [9] **Richter, J. H.** and R. R. Garcia 2005: On the forcing of the Mesospheric Semi-Annual Oscillation in the Whole Atmosphere Community Climate Model, *Geophys. Res. Lett.*, **33**, 10.1029/2005GL024378
- [10] Alexander, M. J., **J. H. Richter**, and B. R. Sutherland, 2006: Generation and Trapping of Gravity Waves from Convection with Comparison to Parameterization, *J. Atmos. Sci.*, **63**, 2963–297
- [11] Chang, L., S. Palo, M. Hagan, **J. H. Richter**, R. R. Garcia, D. Riggin, and D. Fritts, 2008: Structure of the Migrating Diurnal Tide in the Whole Atmosphere Community Climate Model, *Adv. Space Res.*, **41**, 1398-1407
- [12] **J. H. Richter** and P. J. Rasch, 2008: Effects of convective momentum transport on the atmospheric circulation in the Community Atmosphere Model, version 3, *J. Climate*, **21**, 1487 - 1499
- [13] Neale, R. B., **J. H. Richter**, and M. Jochum, 2008: The Impact of Convection on ENSO: From a Delayed Oscillator to a Series of Events, *J. Climate*, **21**, 5904–5924
- [14] **J. H. Richter.**, F. Sassi, R. R. Garcia, K. Matthes, and C. A. Fischer, 2008: Dynamics of the middle atmosphere as simulated by the Whole Atmosphere Community Climate Model, version 3 (WACCM3), *J. Geophys. Res.*, **113**, doi:10.1029/2007JD009269



- [15] **J. H. Richter**., F. Sassi, and R. R. Garcia, 2010: Toward a Physically Based Gravity Wave Source Parameterization in a General Circulation Model, *J. Atmos. Sci.*, **67**, 136 – 156
- [16] A. K. Smith, R. R. Garcia, D. R. Marsh, D.E. Kinnison, and **J. H. Richter**, 2010: Simulations of the response of mesospheric circulation and temperature to the Antarctic ozone hole. *Geophys. Res. Lett.*, **37**, doi:10.1029/2010GL045255.
- [17] H.-L. Liu, B. T. Foster, M. E. Hagan, J. M. McInerney, A. Maute, L. Qian, A. D. Richmond, R. G. Roble, S. C. Solomon, R. R. Garcia, D. Kinnison, D. R. Marsh, A. K. Smith, **J. H. Richter**, F. Sassi, and J. Oberheide, 2010: Thermosphere Extension of the Whole Atmosphere Community Climate Model, *J. Geophys. Res.*, **115**, doi:10.1029/2010JA015586
- [18] V. Limapsuvan, M. J. Alexander, Y. J. Orsolini, D. L. Wu, **J. H. Richter** and C. Yamashita, 2011: Mesoscale simulations of gravity waves during the 2008–2009 major stratospheric sudden warming, *J. Geophys. Res.*, **116**, doi:10.1029/2010JD015190
- [19] **H. Richter**., K. Matthes, N. Calvo and L. Gray, 2011: Influence of the quasi-biennial oscillation and El Niño–Southern Oscillation on the frequency of sudden stratospheric warmings, *J. Geophys. Res.*, **116**, doi:10.1029/2011JD015757
- [20] K. Smith, R. R. Garcia, D. R. Marsh, and **J. H. Richter**, 2011: WACCM simulations of the mean circulation and trace species transport in the winter mesosphere, *J. Geophys. Res.*, **116**, doi:10.1029/2011JD016083
- [21] V. Limpasuvan, **J. H. Richter**, Y. J. Orsolini, F. Stordal, O. Kvissel, 2012: The roles of planetary and gravity waves during a major stratospheric sudden warming as characterized in WACCM, *J. Atmos. Sol.-Terr. Phys.*, **78-79**, 84-98
- [22] O. Kvissel, Y. Orsolini, F. Stordal, V. Limpasuvan, **J. H. Richter** and D. Marsh 2012: Mesospheric intrusion and anomalous chemistry during and after a major stratospheric sudden warming, *J. Atmos. Sol.-Terr. Phys.*, **78**, 116 - 124
- [23] Neale, R. B., **J. Richter**, S. Park, P. H. Lauritzen, S. J. Vavrus, P. J. Rasch, and M. Zhang, 2013: The mean climate of the Community Atmosphere Model (CAM4) in forced SST and fully coupled experiments. *J. Climate*, **26**, 5150-5168
- [24] **Richter, J. H.**, J. T. Bacmeister and A. Solomon, 2014: On the simulation of the Quasi-Biennial Oscillation in the Community Atmosphere Model, version 5 (CAM5), *J. Geophys. Res.*, DOI: 10.1002/2013JD021122
- [25] **Richter, J. H.**, A. Solomon, and J. T. Bacmeister, 2014: Effects of increased vertical resolution on the simulation of tropospheric and stratospheric climate, *J. Adv. Mod. Earth Sys.*, DOI: 10.1002/2013MS000303
- [26] A. Solomon, **J. H. Richter**, and J. T. Bacmeister, 2014: An Objective Analysis of the Extratropical QBO in ERA-Interim and the Community Atmosphere Model, Version 5, *Geophys. Res. Lett.*, **41**, 10.1002/2014GL061801
- [27] **Richter, J. H.**, C. Deser, and L. Sun, 2015: Effects of Stratospheric Variability on El Nino Teleconnections, *Env. Res. Lett.*, **10**, doi:10.1088/1748-9326/10/12/124021
- [28] C. Stephan, M. J. Alexander, and **J. H. Richter**, 2016: Characteristics of gravity waves from convection and implications for their parameterization in global circulation models, *J. Geophys. Res.*, **73**, DOI: <http://dx.doi.org/10.1175/JAS-D-15-0303.1>

- [29] Wei J., F. Zhang, and **J. H. Richter**, 2016: An Analysis of Gravity Wave Spectral Characteristics in Moist Baroclinic Jet-Front Systems, *J. Atmos. Sci.*, **73**, DOI: <http://dx.doi.org/10.1175/JAS-D-15-0316.1>
- [30] Polvani, L. M., L. Sun, A. H. Butler, **J. H. Richter** and C. Deser, 2017: Distinguishing Stratospheric Sudden Warmings from ENSO as Key Drivers of Wintertime Climate Variability over the North Atlantic and Eurasia, *J. Climate*, **30**, DOI: 10.1175/JCLI-D-16-0277.1
- [31] Mills, M., S. Tilmes, **J. H. Richter**, B. Kravitz, D. G. MacMartin, A. A. Glanville, J. J. Tribbia, J. F. Lamarque, F. Vitt, A. Schmidt, A. Gettelman, R. B. Neale, C. Hannay, J. T. Bacmeister, D. E. Kinnison: 2017: CESM1(WACCM) at 1°: a new tool for chemistry-climate studies of interactive stratospheric aerosols, *J. Geoph. Res.*, 122, 13,061–13,078. <https://doi.org/10.1002/2017JD027006>
- [32] **Richter, J. H.**, S. Tilmes, M. Mills, J. Tribbia, B. Kravitz, D. MacMartin, F. Vitt, J. F. Lamarque, 2017: Stratospheric dynamic response and ozone feedback in the presence of SO<sub>2</sub> injections, *J. Geoph. Res.*, 122, 12,557–12,573. <https://doi.org/10.1002/2017JD026912>
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#### 8.4 Journal Articles in Preparation or Submitted (9)

- [105] Clark B., L. Xia, A. Robock, S. Tilmes, J. H. Richter, and Daniele Visioni: “The Optimal Climate Intervention Scenario for Crop Production Varies by Nation”, *Nature Food*, *Revised*.
- [106] Davis, N. A., D. Visioni, D. R. Marsh, M. Mills, **J. H. Richter**, S. Tilmes, C. G. Bardeen, R. R. Garcia, A. A. Glanville, A. Gettelman, D. E. Kinnison, D. G. MacMartin, A. K. Smith, F. Vitt: Climate, variability, and climate sensitivity of “Middle Atmosphere” chemistry configurations of the Community Earth System Model Version 2, Whole Atmosphere Community Climate Model Version 6 (CESM2(WACCM6)), *J. Geophys. Res.*, *Revised*
- [107] Li Y, **J. H. Richter**, C-C Chen, Q. Tang, 2023: A strengthened link of the quasi-biennial oscillation and tropical easterly jet in the past decades, *Geophys. Res. Lett.*, *Revised*
- [108] Randall D. A, E. Tziperman, M. D. Branson, **J. H. Richter**, and W. Kang, 2023: The QBO-MJO connection: A possible role for the SST and ENSO, *J. Climate*, *Revised*
- [108] Kremser, S., A. Charlton-Perez, **J. H. Richter**, J. Santos: Decarbonizing conference travel: Testing a multi-hub approach, *Nature Sustainability*, *Submitted*
- [109] Meehl, G. A., B. Kirtman, A.A. Glanville, **J. H. Richter**, N. Rosenbloom and S. Yeager, 2023: Evaluating skill in predicting the Interdecadal Pacific Oscillation in initialized decadal climate prediction hindcasts in E3SMv1 and CESM1 using two different initialization methods and a small set of start years, *Climate Dynamics*, *Submitted*
- [110] Li, H., **J. H. Richter**, A. Hu, G. A. Meehl, 2023: Processes involved with hydrological responses in the subpolar North Atlantic in two sensitivity experiments with increased stratospheric aerosols, *J. Geophys. Res.*, *Submitted*
- [111] C-C. Chen, **J. H. Richter**, M. Moncrieff, and S. Xie, 2023: Effects of an updated organized convection parameterization on E3SMv2, *J. Adv. Mod. Earth Sys.*, *Submitted*
- [112] **Richter J. H.** , A. Glanville, S. Kumar, S. Yeager, G. Danabasoglu: Subseasonal predictability from atmospheric, land, and ocean initial states, *Nat. Geos.*, *In preparation*

#### 8.5 Internally Refereed Publications

- [1] Neale, R. B., **J. H. Richter**, A. J. Conley, S. Park, P. H. Lauritzen, A. Gettelman, D. L. Williamson, P. J. Rasch, S. J. Vavrus, M. A. Taylor, W. D. Collins, M. Zhang, S.-J. Lin, 2010: Description of the NCAR Community Atmosphere Model (CAM 4.0), *NCAR Tech. Note TN-485*.

#### 8.6 Non-referred Written Publications



- [1] **Beres, J. H.** and Freeman, P. K.: Potential effects of climate change on the energy infrastructure in developing countries; case study: Honduras; Institute for Applied Systems Analysis (*IIASA*) *internal report*, 2000
- [2] M. A. Geller, H. Liu, **J. H. Richter**, D. Wu, and F. Zhang, 2006: Gravity Waves in Weather, Climate, and Atmospheric Chemistry: Issues and Challenges for the Community (White Paper)
- [3] **J. H. Richter**, M. A. Geller, R. R. Garcia, H. Liu, and F. Zhang, 2006: Report on the Gravity Wave Retreat, *SPARC Newsletter #28*, January 2007

## 9. Presentations (160)

### 9.1 Invited Presentations (45)

- [1] **Beres, J. H.**, M. J. Alexander, and J. R. Holton: Gravity waves generated by tropical convection: Generation Mechanisms and Implications for General Circulation Models, Atmospheric Chemistry Division Seminar, NCAR, Boulder, CO, 2002
- [2] **Beres, J. H.**: Convectively Generated Gravity Waves: Generation Mechanisms and New Steps Towards Quantifying Their Role in The Atmosphere, Dept. of Physics, University of Toronto, Toronto, Canada, 2003
- [3] **Beres, J. H.**: Convectively Generated Gravity Waves: Generation Mechanisms and Implications for Their Role in The Middle Atmosphere, Meteorological Service of Canada (MSC), Toronto, Canada, 2003
- [4] **Beres, J. H.**: Gravity Wave Excitation by Convection and its Implication for Parameterizations in General Circulation Models, Chapman Conference on Gravity Waves Processes and Parameterization, HI, 2004
- [5] **Beres, J. H.**, R. Garcia, B. Boville, and F. Sassi: Linear theory estimates of global distribution of convectively generated gravity waves, CGU/AGU/ SEG/ EEGS Join Assembly, Montreal, Canada, 2004
- [6] **Beres, J. H.**, R. Garcia, B. Boville, and F. Sassi: Effects of a gravity wave spectrum linked to convection on the circulation of the upper atmosphere, 35th COSPAR Scientific Assembly, Paris, France, 2004
- [7] **Beres, J.H.**: Lower and Upper Atmospheric Coupling: Role of Gravity Waves, Dept. of Astronomy, Boston University, Boston, MA, 2005
- [8] Sassi, F., **J. H. Richter**, B. A. Boville, and R. R. Garcia: Experiments with WACCM: a sensitivity study, The Institute for Integrative and Multidisciplinary Earth Studies (TIIMES) Gravity Wave Retreat, Boulder, CO, 2006
- [9] **J. H. Richter**: Source spectrum parameterizations for convectively generated gravity waves, The Institute for Integrative and Multidisciplinary Earth Studies (TIIMES) Gravity Wave Retreat, Boulder, CO, 2006
- [10] **J. H. Richter**: Convective Momentum Transport in CAM3, The Institute for Integrative and Multidisciplinary Earth Studies (TIIMES) Gravity Wave Retreat, Boulder, CO, 2006
- [11] **J. H. Richter** and J. T. Bacmeister: Sensitivity of the Quasi-Biennial Oscillation to top boundary condition and model grid, Community Earth System Model Annual Meeting, Breckenridge, CO, 2014
- [12] **J. H. Richter**, J. T. Bacmeister, L. Sun and C. Deser: Effects of the vertical grid on the QBO and tropospheric El Nino Response, Pacific Northwest National Laboratory (PNNL) seminar, Pasco, WA, 2015
- [13] **J. H. Richter** and J. T. Bacmeister: QBO in CAM and WACCM, 1st SPARC QBO Intercomparison Workshop, Victoria, CA, 2015

- [14] **J. H. Richter:** Effects of the stratosphere on El Niño Impacts, Association for Talented and Gifted, San Juan, Puerto Rico, 2015
- [15] **J. H. Richter:** Effects of the stratosphere on El Niño Impacts, Universidad Metropolitana, San Juan, Puerto Rico, 2015
- [16] **J. H. Richter:** Pathways to Geosciences: Professional and Personal, Promoting Geoscience Research, Education & Success Workshop, Estes Park, CO, 2015
- [17] **J. H. Richter, L. Sun, C. Deser and J. Bacmeister:** Impacts of a better-resolved stratosphere on El Niño teleconnections, Colorado State University, Ft. Collins, CO, 2015
- [18] **J. H. Richter, L. Sun, C. Deser and J. Bacmeister:** Why do GCMs need a well-resolved stratosphere to get El Niño impacts right?, Geophysical Fluid Dynamics Laboratory (GFDL), Princeton, NJ, 2015
- [19] **J. H. Richter and S. Tilmes,** Climate Intervention Research at NCAR, State Department, Washington, DC 2016
- [20] **J. H. Richter and N. Butchart, Y. Kawatani, A. Bushell, J. Anstey:** The Quasi-biennial oscillation in a warming climate, Max Planck Institute, Hamburg, Germany, 2018
- [21] **J. H. Richter and N. Butchart, Y. Kawatani, A. Bushell, J. Anstey:** The Quasi-biennial oscillation in a warming climate and the role of GW parameterizations, Multiscale Dynamics of Gravity Waves (MS-GWaves) workshop, Kuhlungsborn, Germany, 2019
- [22] **J. H. Richter and N. Butchart, Y. Kawatani, A. Bushell, J. Anstey:** The Quasi-biennial oscillation in a warming climate, NASA-GMAO, Greenbelt, MD, 2019
- [23] **J. H. Richter and C.-C. Chen:** QBO Changes in E3SM, DOE E3SM All-hands Meeting, 2019
- [24] **J. H. Richter, C -C. Chen, M. Moncrieff, and C. Liu:** Impact of mesoscale convection parameterization and convective gravity wave drag in E3SMv1, DOE PI Meeting, Washington DC, 2019
- [25] **J. H. Richter,** Overview of SPARC relevant research at NCAR, SPARC SSG Meeting, Boulder, CO, 2019
- [26] **J. H. Richter,** Future projections of the QBO and QBO teleconnections in global models, Colorado State University, Fort Collins, CO, 2020
- [27] **J. H. Richter,** Subseasonal to decadal prediction with CESM, CESM Scientific Steering Committee (SSC) meeting, 2020
- [28] **J. H. Richter,** Subseasonal prediction with CESM, CGD Advisory Panel, 2020
- [29] **J. H. Richter,** Speaker and Panelist, Sunlight Reflection briefing organized by SilverLining NGO, 2020
- [30] **J. H. Richter,** Class Invited Speaker, Climate Disruption: Emerging Topics in Policy, Politics, and Technology of Climate Change, Harvard University, 2020
- [31] **J. H. Richter,** S2S Prediction with CESM, WMO Working Group on Numerical Experimentation (WGNE) meeting, 2020
- [32] **J. H. Richter,** Panelist, Open Society Foundation, Discussion on Geoengineering and Climate Justice, 2020
- [33] **J. H. Richter,** Panelist, NOAA/CPO/ESSM - DOE/ESSD Precipitation Processes and Predictability Workshop, 2020

- [34] **J. H. Richter**, SAI Simulations in support of the Safe Climate Research Initiative, Geoengineering Modeling Research Consortium Lightning Talks, 2021
- [35] **J. H. Richter**, Subseasonal-to-seasonal (S2S) prediction with CESM1, CESM & CESM2(WACCM), Naval Research Laboratory, 2021
- [36] **J. H. Richter**, Subseasonal to decadal prediction with CESM, UCAR Board of Trustees, 2021
- [37] **J. H. Richter**, Subseasonal Prediction Research Framework with CESM2 and Examples of its use for Understanding Sources of predictability, US Modeling Summit, 2021
- [38] S. Yeager & **J. H. Richter**, Earth System Prediction Research with CESM, NCAR Executive Committee, 2021
- [39] **J. H. Richter** & S. Yeager, Earth System Prediction Working Group Update, CESM Scientific Steering Group Meeting, 2021
- [40] **J. H. Richter**, Role of the stratosphere in sub seasonal-to-seasonal prediction, NCAR/ASP Summer School on Subseasonal-to-seasonal Prediction, 2021
- [41] **J. H. Richter** & S. Yeager, Earth System Prediction Theme & Working Group, CGD/NCAR Exchange, 2022
- [42] S. Yeager & **J. H. Richter**, Earth System Prediction using CESM, CESM Advisory Board, 2022
- [43] **J. H. Richter** & S. Yeager, Earth System Prediction using CESM, CGD Advisory Panel 2022
- [44] **J. H. Richter** & Douglas MacMartin, Turning Down the Thermostat: Climate Intervention Using Stratospheric Aerosols, NCAR Explorer Series Public Lecture, 2022
- [45] **J. H. Richter**, Investigating sources of subseasonal predictability with the Community Earth System Model, NCAR/ASP Summer School on Subseasonal-to-Seasonal Prediction, 2022

## *9.2 Contributed Presentations (115; First author: 66; Substantial contribution: 49)*

- [1] **Beres, J. H.**, M.J. Alexander, and J.R. Holton: Forcing of the stratospheric circulation by convectively generated gravity waves: the role of tropospheric wind shear, Stratospheric Processes And their Role in Climate (SPARC) meeting, Mar del Plata, Argentina 2000
- [2] **Beres, J. H.**, M.J. Alexander, and J.R. Holton: Effects of varying tropospheric wind shear on the spectrum of gravity waves generated by tropical convection, American Meteorological Society Annual Meeting, Long Beach, CA 2000
- [3] **Beres, J. H.**, M.J. Alexander, and J.R. Holton: A representation of the full gravity wave spectrum generated by convection in realistic environmental wind conditions, American Meteorological Society 12th Conference on the Middle Atmosphere, San Antonio, TX 2004
- [4] Alexander M. J., P. May and **J. H. Beres**: Gravity Wave Generation by Small-Scale Transient Convection During the Darwin Area Wave Experiment (DAWEX), Chapman Conference on Gravity Waves Processes and Parameterization, HI 2004
- [5] Sassi, F., **Beres J. H.** , B. Boville and R. R. Garcia: Gravity waves from tropospheric sources: Application to WACCM; Atmosphere Model Working Group Annual Meeting, Boulder, CO 2005
- [6] **Richter, J. H.** and R. R. Garcia: On the forcing of the Mesospheric Semi-annual Oscillation in the Whole Atmosphere Community Climate Model, American Meteorological Society 13th Conference on the Middle Atmosphere, Cambridge, MA 2005

- [7] **Richter, J. H.** and R. R. Garcia: Interaction between gravity waves and the 2-day wave in the Whole Atmosphere Community Climate Model, American Meteorological Society 13th Conference on the Middle Atmosphere, Cambridge, MA 2005
- [8] Chang, L., S. Palo, M. Hagan, **J. H. Richter**, and R. R. Garcia: Mean Structure and Variability of the Diurnal Tide in the NCAR Whole Atmosphere Community Climate Model, Energetics and Dynamics of Atmospheric Regions (CEDAR) Annual Meeting, Santa Fe, NM 2005
- [9] **Richter, J. H.** and R. R. Garcia: On the forcing of the Mesospheric Semi-annual Oscillation in the Whole Atmosphere Community Climate Model, Coupling, Energetics and Dynamics of Atmospheric Regions (CEDAR) Annual Meeting, Santa Fe, NM 2005
- [10] **Richter, J. H.** , A. K. Smith, and F. Sassi: Effects of mesospheric dynamics on the CO<sub>2</sub> concentrations in the mesosphere and lower thermosphere, The International Association of Geomagnetism and Aeronomy (IAGA) Scientific Assembly, Toulouse, France 2005
- [11] Sassi, F., **J. H. Richter**, B. A. Boville, and R. R. Garcia: Model consistent generation of gravity waves and their effects on simulations of the middle atmosphere: A case study with the WACCM model, Atmosphere Model Working Group Annual Meeting, Boulder, CO 2006
- [12] Sassi, F., **J. H. Richter**, B. A. Boville, and R. R. Garcia: Model consistent generation of gravity waves and their effects on simulations of the middle atmosphere: A case study with the WACCM model, European Geophysical Union Meeting, Vienna, Austria 2006
- [13] **J. H. Richter** and P. J. Rasch: Convective momentum transport in the Community Atmosphere Model (CAM3), Community Climate Systems Model Workshop, Breckenridge, CO 2006
- [14] Sassi, F et al.: WACCM simulations in 2006-2007, Community Climate Systems Model Workshop, Breckenridge, CO 2006
- [15] Kristen L. Corbosiero, V. Cheruvu, **J. H. Richter**, C. Johnson, and T. Eastburn: Climate and weather, the two go together: Girl Scouts at the National Center for Atmospheric Research program, Seventh International Conference on School and Popular Meteorological and Oceanographic Education, Boulder, CO 2006
- [16] Chang, L., S. Palo, M. Hagan, **J. H. Richter**, R. R. Garcia, D. Riggan, and D. Fritts: Structure of the Migrating Diurnal Tide in the Whole Atmosphere Community Climate Model, Energetics and Dynamics of Atmospheric Regions (CEDAR) Annual Meeting, Santa Fe, NM 2006
- [17] Hassiotis, A. D., **J. H. Richter**, and T. J. Kane: A numerical study of convectively generated gravity waves over the maritime continent region using the weather research and forecasting (WRF) model, American Geophysical Union (AGU) Fall Meeting, San Francisco, CA 2006
- [18] **J. H. Richter**, and R. Neale: Impact of modifications of convection schemes on CAM3 and CCSM3 simulations, Atmosphere Model Working Group Annual Meeting, Boulder, CO 2007
- [19] Jochum, M., R. Neale and **J. H. Richter**: ENSO mechanisms in the new CCSM, 16th Conference on Atmospheric and Oceanic Fluid Dynamics, Santa Fe, NM 2007
- [20] Chang, L., S. Palo, **J. H. Richter**, and R. R. Garcia: Planetary wave induced migrating diurnal tidal variability in WACCM3, Energetics and Dynamics of Atmospheric Regions (CEDAR) Annual Meeting, Santa Fe, NM 2007

- [21] Sassi, F., **J. H. Richter**, and R. R. Garcia: A sensitivity study of the middle atmosphere to changes in the parameterized momentum drag of gravity waves, International Union of Geodesy and Geophysics (IUGG) Meeting, Perugia, Italy 2007
- [22] Sassi, F., **J. H. Richter**, and R. R. Garcia: A sensitivity study of the middle atmosphere to changes in the parameterized momentum drag of gravity waves, 14th Conference on the Middle Atmosphere, Portland, OR 2007
- [23] **J. H. Richter**, F. Sassi and R. R. Garcia: Effects of Changes in Gravity Wave Parameterization on the Troposphere and Lower Stratosphere, Atmosphere Model Working Group Annual Meeting, Boulder, CO 2008
- [24] **J. H. Richter**, F. Sassi, and R. R. Garcia: Towards a non-arbitrary gravity wave source parameterization in a general circulation model, European Geophysical Union (EGU), Vienna, Austria 2008
- [25] **J. H. Richter**, F. Sassi and R. R. Garcia: Source oriented GW parameterization in WACCM3, Community Climate Systems Model Workshop, Breckenridge, CO 2008
- [26] **J. H. Richter**, F. Sassi, C. A. Fischer and R. R. Garcia: Gravity Waves in CAM3.5, Community Climate Systems Model Workshop, Breckenridge, CO 2008
- [27] **J. H. Richter**, R. R. Garcia, A. Gettleman, D. Kinnison, D. Marsh, and A. K. Smith, Climatology of WACCM3.5, WACCM Working Group Meeting, Boulder, CO 2009
- [28] C. Chen, **J. H. Richter**, R. R. Garcia, J. Bacmeister, and A. K. Smith: A momentum and energy conserving gravity wave drag parameterization in a General Circulation Model, American Geophysical Union (AGU) Fall Meeting, San Francisco, CA 2009
- [29] C. Chen, **J. H. Richter**, R. R. Garcia, J. Bacmeister, and A. K. Smith: Effects of momentum and energy conservation in a high-lid general circulation model, WACCM Working Group Meeting, Boulder, CO 2010
- [30] C. Chen, **J. H. Richter**, R. R. Garcia, J. Bacmeister, and A. K. Smith: A momentum and energy conserving gravity wave drag parameterization in a General Circulation Model, European Geophysical Union (EGU), Vienna, Austria 2010
- [31] **J. H. Richter**, Chih-Chieh Chen, Rolando R. Garcia, Anne K. Smith, and Julio T. Bacmeister: Effects of gravity wave parameterization changes on the middle and upper atmosphere in the Whole Atmosphere Community Climate Model, European Geophysical Union (EGU), Vienna, Austria 2010
- [32] A. Solomon, **J. H. Richter**, and J. Bacmeister: Polar Atmospheric Variability in CAM5 with Enhanced Vertical Resolution, Community Earth System Model Workshop, Breckenridge, CO 2013
- [33] **J. H. Richter**, J. Bacmeister, and A. Solomon: Higher Vertical Resolution in CAM - do we need it?, Community Earth System Model Workshop, Breckenridge, CO 2013
- [34] **J. H. Richter**, J. Bacmeister, and A. Solomon: Effects of increased vertical resolution on the simulation of mean climate and the Quasi-Biennial Oscillation, Community Earth System Model Atmosphere Working Group Meeting, Boulder, CO, 2014
- [35] **J. H. Richter**, J. Bacmeister, and A. Solomon: Effects of vertical resolution, dynamical core, and top boundary condition on the simulation of the Quasi-Biennial Oscillation in the Community Atmosphere Model, Version 5, European Geophysical Union Annual Meeting, Vienna, Austria 2014

- [36] **J. H. Richter** and J. T. Bacmeister: Effects of a higher model lid on the simulation of climate in CAM5, Community Earth System Model Annual Meeting, Breckenridge, CO 2014
- [37] **J. H. Richter**, J. T. Bacmeister, and L. Sun: Influence of the model lid on the simulated tropospheric climate, American Meteorological Society Annual Meeting, Phoenix, AZ, 2015
- [38] **J. H. Richter**, J. T. Bacmeister, L. Sun, and C. Deser: Effects of the QBO on ENSO teleconnections, Climate Variability Working Group Meeting, Boulder, CO 2015
- [39] **J. H. Richter**, J. T. Bacmeister, L. Sun, and C. Deser: Effects of various vertical grids in CAM/WACCM, Atmosphere Model Working Group Meeting, Boulder, CO 2015
- [40] **J. H. Richter**, J. T. Bacmeister, R. R. Garcia, and A. Gettleman: On the simulation of the QBO in WACCM, Community Earth System Model Annual Meeting, Breckenridge, CO 2015
- [41] L. Sun, **J. Richter** and C. Deser: How much can raising model lid improve the stratospheric and tropospheric simulation?, SPARC Regional Workshop, Boulder, CO 2015
- [42] **J. H. Richter**, L. Sun and C. Deser: Effects of the stratosphere on El Niño teleconnections, SPARC Regional Workshop, Boulder, CO 2015
- [43] Hernandez-Espiet A., **J. H. Richter** and C. C. Chen: Analysis of a better-resolved stratosphere on seasonal forecasts of the Northern Hemisphere Winter, American Meteorological Society Annual Meeting, New Orleans, LA, 2016
- [44] **J. H. Richter**, C. Deser and L. Sun: Effects of Sudden Stratospheric Warmings and Quasi-biennial Oscillation on El Nino Teleconnections, American Meteorological Society Annual Meeting, New Orleans, LA, 2016
- [45] **J. H. Richter**, L. Sun, C. Deser and J. Bacmeister: The QBO and Stratospheric-tropospheric coupling, American Meteorological Society Annual Meeting, New Orleans, LA, 2016
- [46] A. K. Smith, **J. H. Richter**, R. R. Garcia: Using gravity waves parameterizations to address WACCM discrepancies, SPARC Gravity Wave Symposium, State College, PA 2016
- [47] Ma, P., P. Rasch, S. Xie, H. Wang, B. Singh, W. Lin, K. Zhang, H. Wan, Y. Qian, C. Golaz, J. Bacmeister, R. Easter, S. Ghan, R. Neale, C. Hannay, J. Richter, S. Burrows, P. Cameron-Smith, P. Bogenschütz, V. Larson, P. Caldwell: Tuning the NE30\_L72 ACME V1 Atmosphere Model, ACME hands-on meeting, 2016
- [48] **J. H. Richter**, R. G. Garcia, A. Smith: Simulations with high vertical resolution WACCM for QBOi. CESM Annual Meeting, Breckenridge, CO 2016
- [49] **J. H. Richter**, S. Tilmes, M. Mills, B. Kravitz, and Doug MacMartin: A Holistic Assessment of SO<sub>2</sub> Injection into the Stratosphere, Defense Advance Research Projects Agency (DARPA), Washington, DC 2016
- [50] **J. H. Richter**, L. Sun, R. G. Garcia, and C. Chen: On the relationship between the QBO and the polar vortex in the NCAR models, SPARC Quasi-biennial Oscillation Workshop, Oxford, UK, 2016
- [51] **J. H. Richter**, R. G. Garcia, and C. Chen: The QBO simulated with the 110-level WACCM, SPARC Quasi-biennial Oscillation Workshop, Oxford, UK, 2016
- [52] C. Chen, **J. H. Richter** and J. Bacmeister: Sensitivity of the QBO to ozone and CO<sub>2</sub> in CAM5, QBOi Jack SPARC Quasi-biennial Oscillation Workshop, Oxford, UK, 2016

- [53] **J. H. Richter**, S. Tilmes, M. Mills, B. Kravitz, and D. MacMartin: Changes to the quasi-biennial oscillation due to SO<sub>2</sub> injections, AGU Annual Meeting, San Francisco, CA, 2016
- [54] L. Sun, **J. H. Richter**, J. Perlwitz: Role of stratospheric processes on ENSO-NAO connections on Seasonal-to-Subseasonal timescale, AGU Annual Meeting, San Francisco, CA, 2016
- [55] **J. H. Richter**: The quasi-biennial oscillation (QBO): Past, present, and the future, CGD/NCAR Seminar, 2017
- [57] **J. H. Richter** and R. G. Garcia, Interactive QBO simulations in a warming climate, CESM working group meetings, Boulder, CO 2017
- [58] **J. H. Richter**, S. Tilmes, M. Mills, B. Kravitz, D. MacMartin, J. Tribbia, S. Glanville: Geoengineering Research at NCAR, CESM Annual Meeting, Boulder, CO, 2017
- [59] **J. H. Richter**, S. Tilmes, M. Mills, B. Kravitz, D. MacMartin, J. Tribbia, S. Glanville: Stratospheric dynamical response and ozone feedbacks in the presence of SO<sub>2</sub> injections, CESM Annual Meeting, Boulder, CO, 2017
- [60] **J. H. Richter**, J. Perlwitz, L. Sun, J. Bacmeister, and J. Tribbia: Role of stratospheric processes in predicting the ENSO-NAO connections on subseasonal time scale, CESM Annual Meeting, Boulder, CO, 2017
- [61] **J. H. Richter**, J. Anstey, N. Butchart, S. Osprey, K. Hamilton: The Quasi-Biennial Oscillation Initiative (QBOi), AMS Middle Atmosphere Meeting, Portland, OR, 2017
- [62] **J. H. Richter**, S. Tilmes, M. Mills, A. Glanville, B. Kravitz, D. MacMartin: Does the QBO have to disappear with geoengineering using sulfate aerosols? Gordon Conference on Geoengineering, Sunday River, ME, 2017
- [63] **J. H. Richter** and others: Response of the QBO in 2x and 4x CO<sub>2</sub> worlds in QBOi models, QBOi Meeting, Kyoto, Japan, 2017
- [64] Garcia R. G. and **J. H. Richter**: An interrupted QBO event simulated with the Whole Atmosphere Community Climate Model, QBOi Meeting, Kyoto, Japan, 2017
- [65] C. Chen and **J. H. Richter**: Sensitivity of the QBO to ozone and CO<sub>2</sub> in CAM5, QBOi Meeting, Kyoto, Japan, 2017
- [66] A. Robock, L. Xia, S. Tilmes, M. Mills, **J. H. Richter**, B. Kravitz, and D. MacMartin: Impacts of stratospheric sulfate geo engineering on PM<sub>2.5</sub>, AGU Annual Meeting, 2017
- [67] **J. H. Richter**, S. Tilmes, B. Kravitz, D. MacMartin, I. Simpson, M. Mills: Building Confidence and Reducing Risks with Strategic Geoengineering, AMS Annual Meeting, 2018
- [68] **J. H. Richter**: Vertical resolution in the next generation CAM & WACCM, AMWG working group meeting, Boulder, CO 2018
- [69] **J. H. Richter**, L. Sun, and J. Perlwitz: S2S simulations with 30-level and 46-level CESM1, NOAA MAPP S2S Taskforce, 2018
- [70] **J. H. Richter**, U. Niemeier, S. Tilmes, & M. Mills: Comparing changes in the Quasi-biennial Oscillation in the presence of SO<sub>2</sub> injections in GCMs, GeoMiP, Zurich, Switzerland, 2018
- [71] **J. H. Richter**: Vertical resolution in the next generation CAM & WACCM, CESM Annual Meeting, Boulder, CO 2018
- [72] **J. H. Richter** and others: Quasi-biennial oscillation in a warming climate. Part I: Overview and Metrics, Kyoto, Japan 2018

- [73] L. Xia, A. Robock, S. Tilmes, D. Lombardozzi, M. Mills, **J. H. Richter**, B. Kravitz, and D. MacMartin: Impacts on Agriculture from Surface Ozone and Ultraviolet Radiation Changes Due to Stratospheric Sulfate Injection, AGU Annual Meeting, Washington DC, 2018
- [74] D. MacMartin, B. Kravitz, S. Tilmes, **J. H. Richter**, and M. J. Mills: Climate Engineering: Design and Feedback, AGU Annual Meeting, Washington DC, 2018
- [75] J. Fasullo, S. Tilmes, **J. H. Richter**, B. Kravitz, D. MacMartin, and M. J. Mills: Persistent Polar Ocean Warming in a Strategically Geoengineered Climate, AGU Annual Meeting, Washington DC, 2018
- [76] **J. H. Richter**, N. Butchart, Y. Kawatani, A. Bushell, J. Anstey (2019): The Quasi-biennial Oscillation in a Warming Climate, AMS Conference on the Middle Atmosphere, Phoenix, AZ, 2019
- [77] L. Sun, J. Perlwitz, **J. H. Richter**, M. Hoerling (2019): Attribution of NAO predictability beyond two weeks, AMS Conference on the Middle Atmosphere, Phoenix, AZ, 2019
- [78] **J. H. Richter**: Uncertainties in stratospheric dynamics and role of parameterized GWs GMRC Workshop, Boulder, CO 2019
- [79] **J. H. Richter** and A. Glanville: S2S Prediction with CESM2 & CESM2(WACCM), CESM Annual Workshop, Boulder, CO 2019
- [80] **J. H. Richter**: Advances in modeling of stratospheric aerosol geoengineering: recent progress and future directions, Geoengineering Modeling Research Consortium Workshop, Harvard University, Boston, MA, 2019
- [81] **J. H. Richter** and others: Whole Earth System Subseasonal Prediction Research Framework, AGU Annual Meeting, San Francisco, CA, 2019
- [82] **J. H. Richter** and others: Subseasonal to Decadal Prediction Research Framework with CESM1 and CESM2, AMS Annual Meeting, Boston, MA, 2020
- [83] H. Kim, **J. H. Richter** and Z. Martin: Insignificant QBO-MJO skill relationship in S2S and SubX reforecasts, AMS Annual Meeting, Boston, MA, 2020
- [84] **J. H. Richter** and others: QBO-MJO teleconnections in S2S reforecasts and CMIP6 models, NCAR-PCMDI telecon, 2020
- [85] **J. H. Richter** and others: Progress in simulating the QBO and QBO-MJO teleconnections in CMIP6 models, CVCWG Meeting, Boulder, CO, 2020
- [86] **J. H. Richter**, Invited Speaker for Emerging Topics in Policy, Politics, and Technology of Climate Change, Harvard University, Boston, MA, 2020
- [87] **J. H. Richter** and others: Response of the QBO to a warming climate in global climate models, EGU, 2020
- [88] **J. H. Richter** and others: S2S Prediction with CESM, ESPWG/CESM annual meeting, 2020
- [89] **J. H. Richter** and others: Subseasonal hindcasts with CESM2(CAM6) and CESM2(WACCM6), ESPWG meeting, 2020
- [90] **J. H. Richter** and others: A subseasonal Earth system prediction framework with CESM2 & its application to the January 2021 Sudden Stratospheric Warming, NOAA S2S Webinar, 2021
- [91] **J. H. Richter** and others: Assessing Responses and Impacts of Solar climate Intervention on the Earth system with Stratospheric Aerosol Injection (ARISE-SAI), Climate Engineering Conference, 2021



- [92] **J. H. Richter** and others: Assessing Responses and Impacts of Solar climate Intervention on the Earth system with Stratospheric Aerosol Injection (ARISE-SAI), AGU Annual Meeting, 2021
- [93] **J. H. Richter** and others: Effects of Varying Stratospheric Aerosol Injection Strategies on Stratospheric Dynamics, American Meteorological Society Annual Meeting, 2022
- [94] **J. H. Richter**, N. Davis, and A. Glanville, Investigating the cause of surface impacts after the January 2021 sudden stratospheric warming with the CESM2 prediction systems, CATALYST & PCDMI telecon, 2022
- [95] **J. H. Richter** and others, Impacts of varying climate intervention strategies utilizing stratospheric aerosols on stratospheric and tropospheric climate, NCAR/CGD Seminar, 2022
- [96] **J. H. Richter** and others: Representation of the Tropical Stratosphere in Global Climate Models, SPARC General Assembly, Boulder, CO, 2022
- [97] **J. H. Richter** and others: Subseasonal predictability from atmospheric, land, and ocean initial states, SPARC General Assembly, Boulder, CO, 2022
- [98] K. Huang, **J. H. Richter**, and K. Pegion: Captured QBO-MJO Connection in a Subseasonal Prediction System, AGU Annual Meeting, Chicago, IL, 2022
- [99] R. G. Garcia and **J. H. Richter**: Effects of coupled chemistry on the quasi-biennial oscillation simulated with WACCM, AGU Annual Meeting, Chicago, IL, 2022
- [100] H. Li, **J. H. Richter**, C. Lee, and H. Kim: Subseasonal Tropical Cyclone Prediction and Modulations by MJO and ENSO in CESM2, AGU Annual Meeting, Chicago, IL, 2022
- [101] C. Chen, **J. H. Richter**, D. MacMartin, B. Kravitz: Efficiency of marine cloud brightening simulated by Community Earth System Model version 2, AGU Annual Meeting, Chicago, IL, 2022
- [102] L. Sun, M. Hoerling, **J. H. Richter**, A. Hoell, A. Kumar, J. W. Hurrell: Attribution of North American Subseasonal Precipitation Prediction Skill, AGU Annual Meeting, Chicago, IL, 2022
- [103] **J. H. Richter**, A. Glanville, and S. Kumar: Subseasonal predictability from atmospheric, land, and ocean initial states, AGU Annual Meeting, Chicago, IL, 2022
- [104] Y. Duan, S. Kumar, and **J. H. Richter**: Land Initializations Contribute Most to the Sub-seasonal Soil Moisture Forecast Skill in the Agricultural Regions of the United States, AGU Annual Meeting, Chicago, IL, 2022
- [105] C-C. Chen, **J. H. Richter**, and M. W. Moncrieff: Effects of organized mesoscale convection on the tropical variability simulated by E3SMv2, AGU Annual Meeting, Chicago, IL, 2022
- [106] W. Lee, C-C. Chen, **J. H. Richter**, D. MacMartin, and D. Visioni: Physical Impacts of Stratospheric Aerosol Injection and Marine Cloud Brightening in the Arctic in CESM2, AGU Annual Meeting, Chicago, IL, 2022
- [107] M. Molina, **J. H. Richter** and others: Defying Chaos Theory: Using Machine Learning to Extend Earth System Prediction, AGU Annual Meeting, Chicago, IL, 2022
- [108] A. Karspeck, B. Dobbins, **J. H. Richter**, J. F. Lamarque, K. Wanser, A. Wong: Community Simulations of Solar Climate Interventions freely available on the AWS ASDI Open Data Store, AGU Annual Meeting, Chicago, IL, 2022
- [109] E. Bednarz, D. Visioni, **J. H. Richter**, A. H. Butler, and D. MacMartin: Impact of the Latitude of Stratospheric Aerosol Injection on the Southern Annular Mode, AGU Annual Meeting, Chicago, IL, 2022

- [110] G. Meehl, B. Kirtmam, **J. H. Richter**, A. Glanville, N. Rosenbloom, and S. G. Yeager: A New Method for Evaluating Skill in Predicting the IPO in Initialized Decadal Climate Prediction Hindcasts in CESM1 and E3SMv1 Using a Small Set of Start Years, AMS Annual Meeting, Denver, CO, 2023
- [111] M. Molina, **J. H. Richter** and others: Defying Chaos Theory: Using Machine Learning to Extend Earth System Prediction, AMS Annual Meeting, Denver, CO, 2023
- [112] L. Sun, M. Hoerling, **J. H. Richter**, A. Hoell, A. Kumar, J. W. Hurrell: Attribution of North American Subseasonal Precipitation Prediction Skill, AMS Annual Meeting, Denver, CO, 2023
- [113] N. A. Davis, J. H. Richter, A. Glanville, J. Edwards, E. LJoie: Leveraging Initial Condition, Annual Meeting, Denver, CO, 2023
- [114] H. Li, **J. H. Richter**, C. Lee, and H. Kim: Subseasonal Tropical Cyclone Prediction and Modulations by MJO and ENSO in CESM2, AMS Annual Meeting, Denver, CO, 2023
- [115] K. Huang, **J. H. Richter**, and K. Pegion: Captured QBO-MJO Connection in a Subseasonal Prediction System, AMS Annual Meeting, Denver, CO, 2023
- [116] **J. H. Richter** and others: Subseasonal predictability from atmospheric, land, and ocean initial states, CESM ESPWG meeting, Boulder, CO 2022