

# Richard B. Rood

November 23, 2018

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## CURRENT POSITION

**2015 -** : Professor, Department of Climate and Space Sciences and Engineering, University of Michigan, Ann Arbor, MI; Professor, School of the Environment and Sustainability, University of Michigan, Ann Arbor, MI

**2014 -** : Dow Sustainability Distinguished Faculty Fellow, Graham Sustainability Institute, University of Michigan

**2010 - 2015:** Professor, Department of Atmospheric, Oceanic and Space Sciences, University of Michigan, Ann Arbor, MI; Professor, School of Natural Resources and the Environment, University of Michigan, Ann Arbor, MI

**2005 - 2010:** Professor, Department of Atmospheric, Oceanic and Space Sciences, University of Michigan, Ann Arbor, MI

## Consulting and Writing

**2018 –** : Community Lead, Unified Forecast System - Steering Committee, National Oceanic and Atmospheric Administration

**2015 –** : Independent Expert, European Center for Medium-range Weather Forecasts, Copernicus Climate Services

**2015 – 2016:** External Expert, Dynamical-Core Test Group, National Weather Service

**2013, 2016:** American Association for Advancement of Science

**2009, 2012:** Consultant, World Bank

**2007 – 2017:** Expert Content Provider, Wunderground.com, <http://www.wunderground.com/>

## Affiliations at University of Michigan

Graham Sustainability Institute  
Energy Institute, Beyond Carbon Neutral  
Michigan Institute for Computational Discovery and Engineering

**Professional Summary: Richard B. (Ricky) Rood**

Richard B. (Ricky) Rood is a Professor at the University of Michigan, Ann Arbor, in the Department of Climate and Space Sciences and Engineering (formerly, Atmospheric, Oceanic and Space Sciences). He has a courtesy appointment in the School of the Environment and Sustainability and is a Dow Sustainability Distinguished Faculty Fellow.

Rood's research is multi-disciplinary. His natural science research includes investigations of the interaction of atmospheric dynamics and chemistry, computational fluid dynamics, climate and chemical data assimilation, and process-based analysis of models and observations. Rood's present focus is on climate change. He works at the interfaces with many fields. In addition to publications in physical and computational science, he has published in political science, forestry, environmental epidemiology, and communication. This research is focused on improving the usability of climate knowledge in planning and practice.

Professor Rood's current research and teaching activities are highly integrated. In 2006, he initiated a cross-discipline graduate course on climate change, which addresses critical analysis and complex problem solving. This course has attracted students from many colleges and departments at the University. In 2014, with Paul Edwards, he started a course on climate informatics. Rood advises the undergraduate Climate Impacts Engineering Program and the Masters of Engineering in Applied Climate.

A major part of Rood's recent role includes public engagement. He wrote, until 2017, expert blogs on climate change for the Weather Underground and ClimatePolicy.org. His articles in The Conversation have had more than one million readers. He does frequent radio and newspaper interviews.

The National Oceanic and Atmospheric Administration (NOAA) has, since 2015, engaged Professor Rood in strategic leadership positions for their emerging Unified Forecast System.

As a member of the Senior Executive Service at the National Aeronautics and Space Administration (NASA), Rood received recognition for his ability to lead both scientific and high-performance computing activities. He is a Fellow of the American Meteorological Society (AMS) and a winner of the World Meteorological Organization's Norbert Gerbier Award. Richard B. Rood is a U.S. Citizen

### **PREVIOUS POSITIONS**

2011 - 2013: National Climate Predictions and Projections Platform, Lead  
(Intergovernmental Personnel Act Mobility Program, Climate Program Office, National Oceanic and Atmospheric Administration)

2005 - 2005: Chief, Computational and Information Sciences and Technology Office,  
NASA/Goddard Space Flight Center, Greenbelt, MD

2004 - 2005: Visiting Scientist (Intergovernmental Personnel Act Mobility Program),  
Lawrence Livermore National Laboratory, Livermore, CA

2001 - 2005: Chief, Earth and Space Data Computing Division, NASA/Goddard Space  
Flight Center, Greenbelt, MD

2001 - 2002: Founding Director, NOAA/NASA Joint Center for Satellite Data  
Assimilation

1998 - 2001: Senior Scientist, Data Assimilation Office, NASA/Goddard Space Flight  
Center, Greenbelt, MD

1992 - 1998: Head, Data Assimilation Office, NASA/Goddard Space Flight Center,  
Greenbelt, MD

1986 - 1992: AST, Atmospheric Chemistry and Dynamics, NASA/Goddard Space Flight  
Center, Greenbelt, MD

1984 - 1986: Assistant Scientist, Applied Research Corporation, Landover, MD (at  
NASA/Goddard Space Flight Center, Greenbelt, MD)

1982 - 1984: NAS/NRC Research Associate, NASA/Goddard Space Flight Center,  
Greenbelt, MD

1979 - 1982: Research Assistant, Plasma Physics Division, Science Applications Inc.,  
McLean, VA (at Naval Research Laboratory, Washington, DC)

## **EDUCATION**

1982: Ph.D., *Meteorology*, Florida State University, Tallahassee, FL  
1979: M.S., *Meteorology*, Florida State University, Tallahassee, FL  
1976: B.S., *Physics*, University of North Carolina, Chapel Hill, NC

## **PROFESSIONAL SOCIETY**

American Meteorological Society (*Fellow*)  
American Geophysical Union

## **Noted Awards**

2014: Dow Sustainability Distinguished Faculty Fellow  
2004: American Meteorological Society, Elected Fellow  
2003: World Meteorological Organization Norbert Gerbier Award  
2000: NASA Outstanding Leadership Medal  
1995: NASA Exceptional Achievement Medal  
1982: National Research Council Postdoctoral Fellowship

## RESEARCH HIGHLIGHTS

Richard B. Rood has notable contributions in several fields. His work has been interdisciplinary from the beginning, with his thesis focused on the interaction of ozone chemistry and atmospheric dynamics. As an individual researcher, group leader, and science manager, he has focused on the synthesis of science-based knowledge to build modeling and analysis systems, to design and deploy computational systems, and to apply climate science to a portfolio of societal problems. Highlights are:

- Investigation, description, and overcoming the barriers that aggravate the gap between data and knowledge producers and users – the usability gap (e.g., Barsugli et al., 2013; Lemos et al., 2014; Briley et al., 2015; Guentchev et al., 2016)
- Investigation of sub-scale mixing, effective resolution, consistency, and the interface between atmosphere physics parameterizations and dynamical cores (e.g., Whitehead et al., 2011, 2014; Kent et al., 2014; Yorgun and Rood, 2014).
- Advancing the use of weather and climate models and observations in public health applications related to excess heat (e.g., Zhang et al., 2011; Oswald and Rood, 2014).
- Description of the *Uncertainty Fallacy*, the idea that reduction of scientific uncertainty is a primary barrier of the application of climate projections to policy and planning (Lemos and Rood, 2010).
- Development and validation of ozone data assimilation systems and description of value of observing system monitoring (e.g., Stajner et al., 2001; Stajner et al., 2004).
- Design, development, implementation, and analysis of the first reanalysis of atmospheric observations with an unvarying data assimilation system (e.g. Schubert et al., 1993; Douglass et al., 2003; Rood and Bosilovich, 2010).
- Pioneering the application of meteorological data assimilation to chemistry and transport in the atmosphere (e.g., Rood et al.; 1989; Allen et al.; 1996, Chin et al., 2000).
- Introduction, from plasma physics and aeronautics, of shape-preserving, finite-volume numerical methods to atmospheric chemistry and transport models, climate models, and weather models (e.g., Rood, 1987; Allen et al., 1991; Lin and Rood, 1996).
- Untangling the dynamical and photochemical contributions to the relation of temperature and ozone (e.g. Rood and Douglass, 1985; Douglass and Rood, 1986).

### Research Proposals (Current and Ongoing)

- “Environmental Modeling: Integrating Community and Operations,” National Oceanic and Atmospheric Administration, National Weather Service (role PI, July, 2018 – August, 2019)
- “Great Lakes Regional Integrated Sciences and Assessments Center,” National Oceanic and Atmospheric Administration, Climate Program Office (role Co-PI, July, 2010 – August, 2020)
- “Dynamical Core Selection for the Next Generation Global Prediction System (NGGPS),” National Oceanic and Atmospheric Administration, National Weather Service (role PI, April, 2015 – August, 2017)
- “Accelerating the Incorporation of Climate Change Knowledge into Adaptation Planning for National Park Service Assets in the Great Lakes Region,” National Oceanic and Atmospheric Administration, Climate Program Office (role PI, September, 2014 – August, 2017)
- “Accelerating the Incorporation of Climate Change Knowledge into Adaptation Planning for National Park Service Assets in the Great Lakes Region,” Department of Interior, National Park Service, (role PI, April, 2014 – May, 2017)
- “Consideration of the Impact of Climate Change on Lake Levels in the Management Plans of Tribal Fisheries and Culturally Important Sites,” University of Michigan Water Center (role Co-PI, December, 2015 – December, 2016)

### Prior Funding Summary

Richard B. Rood has competed and won research proposals as an individual investigator, co-investigator, and as a team lead. At NASA, he was the principal investigator of an Earth Observing System (EOS), Interdisciplinary Science proposal, *The Development and Use of a Four-Dimensional Atmospheric-Ocean-Land Data Assimilation System for EOS*. This, with related proposals, was awarded at, approximately, \$18M per year (in 1994). Rood managed organizations with budgets up to, approximately, \$35M per year (in 2002).

Rood has been Principal and Co-Principal Investigator in programs with:

- **National Aeronautics and Space Administration (NASA):** Earth Observing System Program; High Performance Computing and Communications Program; Atmospheric Chemistry Modeling and Analysis Program; Atmospheric Effects of Aviation Program; Modeling, Analysis and Prediction Program
- **Department of Energy:** Biological and Environmental Research Program
- **National Science Foundation:** Division of Advanced Cyberinfrastructure
- **National Oceanic and Atmospheric Administration (NOAA):** Climate Program Office, National Weather Service
- **National Institutes of Health:** National Institute of Environmental Health Sciences
- **Centers for Disease Control:** National Center for Environmental Health
- **Graham Environmental Sustainability Institute** (University of Michigan)
- **University of Michigan Water Center**
- **Kresge Foundation**

## **EDUCATION: Teaching and Students**

### ADVISOR:

- Climate Impacts Engineering (Undergraduate)
- Masters of Engineering in Applied Climate

### COURSES:

- *CLIMATE 480 / Natural Resources and Environment 480*: Climate Change: The Move to Action. This is a course-focused on complex problem solving at the intersection of climate science, business, policy, public health, ethics, etc. Started in 2006, the course has attracted graduate students from many departments and schools at the University. Ongoing, Winter Term.
- *CLIMATE 605 / NRE 501*: Conference of the Parties. University Student Delegates work with each other over the months preceding the conference to craft the delegation's priorities and activities around the conference. Fall 2015 – ongoing, Fall Term. (With Avik Basu, School of Natural Resources and the Environment; Paul Edwards, School of Information)
- *CLIMATE 530*: Climate Change in Planning and Design. This seminar-reading-discussion course focuses on special topics on the use of climate-change data and knowledge in planning, design, engineering and management. Topics include uncertainty in the context of decision making, non-stationarity in design and engineering, and vulnerability and risk assessment. Fall 2014 – ongoing, Fall Term
- *CLIMATE 591*: Applied Climate Practicum I. Students work on projects for clients to incorporate climate knowledge and data into clients' problem solving. Fall 2013 – ongoing.
- *CLIMATE 592*: Applied Climate Practicum II. Students work on projects for clients to incorporate climate knowledge and data into clients' problem solving. Winter 2014 – ongoing.
- *CLIMATE 605 / School of Information 614*: Climate Informatics. This course focuses on translating climate change data and information into usable knowledge for specific purposes. Students work on projects for clients, designing tools for searching, presenting, and visualizing climate data for water managers, city planners, and public health officials. Winter 2014, 2015 (With Paul Edwards, School of Information)
- *Atmospheric, Oceanic, and Space Science 749*: Departmental Seminar. Fall 2013 and Winter 2014.
- *Atmospheric, Oceanic, and Space Science 401*: Geophysical Fluids Dynamics. This is a course in atmospheric dynamics for majors, regularly, Fall 2006 – Fall 2013.
- *Atmospheric, Oceanic, and Space Science 605*: Quikclimate: Water in the Atmosphere. Winter 2008.
- *Atmospheric, Oceanic, and Space Science 605*: Quikclimate: General Circulation and Wave-mean flow interaction. Fall 2008.

GRADUATE STUDENTS:

- M. Soner Yorgun, *An Object-Based Approach for Quantification of GCM Biases on the Simulation of Orographic Precipitation* (2008 – 2015; **Position:** Cooperative Institute for Research in Environmental Science (University of Colorado / National Oceanographic and Atmospheric Administration))
- Evan Oswald, *Heat as a hazard to human health: A multiple dataset assessment of extreme heat indices relevant to human health* (2009 – 2013; **Position:** PACE (Postdocs Applying Climate Expertise), now at Climate Prediction Center, College Park, MD)
- Erika Roesler, *Investigation of Aerosol-Cloud Interactions in a Cloud Resolving Model for Comparison to Observed Satellite Data Retrievals*, (Joint with D. Posselt, 2007-2012, **Position:** Sandia National Laboratory)
- Laura Briley, *Uncertainty Description for CMIP3 Precipitation Projections in the Great Lakes Region*, (2011-2012, University of Northern Illinois, Masters of Science, **Position:** Great Lakes Integrated Sciences and Assessment Center, Ann Arbor, MI)
- Jared Whitehead (Applied Mathematics), *Sub-scale mixing in finite-volume numerical schemes* (2007-2011, **Position:** Post-doctoral Fellow Los Alamos National Laboratory, now Assistant Professor Brigham Young University)
- Gabriel Thoumi, *Avoided Deforestation: Carbon trading, Climate, Conservation, and Sustainability* (2007- 2009, Masters of Business Administration, **Position:** Director Capital Markets at Climate Advisers (2016, <http://www.climateadvisers.com/> ))
- Cedric Drui, *Environmental Risk Assessment* (2006-2007, Masters of Science, **Position:** Managing Director, Cartesian Re (2016, <http://www.cartesianre.com/> ))
- William Putman, *Development of the Finite-Volume Dynamical Core on the Cubed Sphere*, (2007, Ph. D., Florida State University, **Position:** NASA Goddard Space Flight Center)
- Rebecca Orris, *Ozone and Temperature: A Test of the Consistency of Models and Observations in the Middle Atmosphere*, (Ph. D., Princeton, 1997; **Position:** National Institutes of Health, National Center for Biotechnology Information (2016))
- Dale J. Allen, *The Effects of Transport and Convection on the Global Atmospheric Distribution of Trace Species as Determined by a Chemistry and Transport Model*, (1996, Ph. D., University of Maryland, **Position:** University of Maryland)
- Glen Schuster (1988, Masters of Science, Florida State University; *Total Southern Hemisphere Ozone, 1978-1987: The Quasi-Biennial Oscillation*, **Position:** Founder and President STEM Education at U.S. Satellite Laboratory)

THESIS COMMITTEES:

- Alex Thompson (Earth and Environmental Sciences), *West African Monsoon during the African Humid Period* (2018 - )
- Jared Ferguson (Applied Physics), *Bridging Scales in 2- and 3-Dimensional Atmospheric Modeling with Adaptive Mesh Refinement* (2018)
- Elizabeth Ultee (Climate and Space Sciences and Engineering), *Constraining 21st-Century sea level rise from Greenland with outlet glacier modeling* (2016 – 2018)



- Xiaojian Liu (Atmospheric, Oceanic, and Space Sciences) *Surface Energy and Ice Balance Model for Greenland Ice Sheet and Future Projections* (2016 – 2017)
- Fang Pan (Atmospheric, Oceanic, and Space Sciences), *Climate change analysis from the TOA spectrally resolved IR radiation* (2017)
- Fei He (Climate and Space Sciences and Engineering), *Systematic Assessment of Simulated Tropical Cyclone Sensitivity to Initial Conditions and Model Parameterizations in an Atmospheric General Circulation Model* (2014 – 2016)
- Greg Teirney (Atmospheric, Oceanic, and Space Sciences), *An Examination of Extratropical Cyclone Sensitivity to Environmental Variability* (2017)
- Austin Boles (Earth and Environmental Sciences), *Low-temperature clay mineralization in the brittle crust records the composition, timing, and pathways of deformation-related fluid flow* (2014 – 2017)
- James Arnott (Sustainability and Environment), *Accelerating the Usability of Global Change Research* (2016 - )
- Anna Savage (Earth and Environmental Sciences), *Sea Surface Height Signatures of Internal Gravity Waves* (2013 – 2017)
- Scott Kalafatis (Natural Resources and Environment), *Focusing Adaptive Capacity: Policy Entrepreneurs' Role in Municipal Climate Change Action* (2013 – 2016)
- Michele Reicher (School of Education), *The Complexities, Persistence, and Relationships among Middle School Students' Climate Change Stances and Knowledge* (2013 – 2014)
- Weiye Yao (Atmospheric Oceanic and Space Sciences), *An Assessment of the Quasi-Biennial Oscillation (QBO) and Sudden Stratospheric Warmings (SSWs) with Idealized General Circulation Models* (2014)
- Abhishek Chatterjee (Civil and Environmental Engineering), *Data Assimilation for Atmospheric CO<sub>2</sub>: Towards Improved Estimates of CO<sub>2</sub> Concentrations and Fluxes* (2010 – 2012)
- Paul Ullrich (Atmospheric, Oceanic, and Space Sciences), *Atmospheric Modeling with High-Order Finite-Volume Methods* (2011)
- Andrew Winkelman (Natural Resources and Environment), *The Clean Development Mechanism and Least Developed Countries: Key Determinants for Enhancing Climate Change Mitigative Capacity through Case Study Analysis in Niger* (2009 – 2011)
- Shanna Shaked (Applied Physics), *Multi-Continental Multimedia Model of Pollutant Intake and Application to Impacts of Global Emissions and Globally Traded Goods* (2008 – 2011)
- Christine Kirchhoff (Natural Resources and Environment), *The Formation of Stakeholder Networks: Linking Assessments and Decision Making in Adaptive Integrative Management* (2006 – 2010)
- Jasper Kok (Applied Physics), *Understanding Wind-Blown Sand and the Electrification of Granular Systems* (2007 – 2009)

- Sharon Gourджи (Civil and Environmental Engineering), *Global grid-scale CO<sub>2</sub> flux estimation, regional application of geostatistical inverse modeling for North America, and carbon management and strategies for maintaining long-lived terrestrial carbon sinks* (2007 – 2011)
- Su-Ting Cheng (Natural Resources and Environment), *A Stream Temperature Model and its Applications* (2006 – 2010)
- Cheng Zhou (Atmospheric, Oceanic, and Space Sciences), *Linear and nonlinear Kelvin waves/tropical instability waves in the shallow-water system* (2010)
- Minghuai Wang (Atmospheric, Oceanic, and Space Sciences), *Aerosol indirect effects in a coupled global aerosol and atmospheric circulation model* (2009)
- Alanood Alkhaled (Civil and Environmental Engineering), *Remote Sensing of CO<sub>2</sub>: Geostatistical Tools for Assessing Spatial Variability, Quantifying Representation Errors, and Gap Filling* (2007 – 2009)
- Huan Guo (Atmospheric, Oceanic, and Space Sciences), *Examining Aerosol Direct and Indirect Effects Using a Radiative Transfer Model and a Cloud Resolving Model* (2007)

SHORT COURSES:

- Lecturer, *The 2012 Dynamical Core Model Intercomparison Project*, Boulder, Colorado, USA (2012)
- Lecturer, *Numerical Techniques for Global Atmospheric Models*, Boulder, Colorado, USA (2008)
- Lecturer, Third ENVISAT Summer School, *Earth System Monitoring and Modeling*, Frascati, Italy (2006)
- Lecturer, Summer Colloquia 2006 (Advanced Study Program and the Climate and Global Dynamics Division of NCAR), *The Art of Climate Modeling*, Boulder, Colorado, USA (2006)
- Lecturer, Modeling of Global Chemistry for Climate Project Summer School, *Use of Models for the Interpretation of Atmospheric Measurements*, Banff, Canada (2005)
- Lecturer, International Summer School of Atmospheric and Oceanic Sciences, *The Need for Observing Systems of Atmospheric Composition*, L'Aquila, Italy (2004)
- Lecturer and Keynote Speaker, NATO Advanced Study Institute Summer School, *Data Assimilation for the Earth System*, Acquafredda, Italy (2002)
- Lecturer, World Climate Research Program, *Tutorial Symposium on Global Tracer Transport Modeling*, Bermuda (1991)

**SERVICE and SPECIAL EXPERIENCE:**

ONGOING AND RECENT:

- Community Model Committee, National Oceanic and Atmospheric Administration (2018 - )
- University Corporation for Atmospheric Research Community Advisory Committee for NCEP (UCACN) Model Advisory Panel (UMAC) (2015 – 2017, Co-Chair)
- Independent Expert, European Center for Medium-range Weather Forecasts, Copernicus Climate Services (2015 – present)
- NASA Earth Science Advisory Committee (2014 – present)
- American Meteorological Society Committee on Open Environmental Information (2013 – present, Chair 2016 – 2018)
- External Expert, Dynamical-Core Test Group, National Weather Service (2015 – 2016)
- Team Member Great Lakes Adaptation Assessment for Cities (GLAA-C)

Review Panels:

- Department of Defense, Strategic Environmental Research and Development Program
- National Science Foundation, Cyber-enabled Discovery and Innovation
- Department of Energy INCITE
- Swiss National Supercomputing Center
- American Association for the Advancement of Science (AAAS) Research Competitiveness Program for the King Abdulaziz City for Science and Technology
- Natural Sciences and Engineering Research Council of Canada (NSERC)

SPECIAL EXPERIENCE:

- External Expert, Dynamical-Core Test Group, National Weather Service (2015 – 2016)
- Independent Expert, European Center for Medium-range Weather Forecasts, Copernicus Climate Services (2015 - )
- Expert's Meeting: Making regional plans and decisions that incorporate global change information, Board on Environmental Change and Society, National Academy of Science, March 2013
- Sackler Forum, National Academy of Sciences and The Royal Society, September 2012.
- Weather Coalition (2012 – 2013)
- National Research Council Study Committee, A National Strategy for Advancing Climate Modeling (2011 – 2012)
- University of Michigan Representative to University Corporation of Atmospheric Research (2006 – present)
- Delegate U.S. - Japan Joint Climate Research Initiatives (Dept. of State, President's Office of Science and Technology Policy, 2002)
- Delegate U.S. - Italy Joint Climate Research Initiatives (Dept. of State, President's Office of Science and Technology Policy, 2002)
- Software Engineering Working Group (National Center for Atmospheric Research, External Co-Chair, 2000 – 2002)
- White House Office of Science and Technology Policy (Lead Author on Plan for National Climate Modeling and Associated Supercomputing, 2000 – 2001)
- National Research Council Board on Competitiveness of U.S. Climate Modeling (National Academy of Science, 2000)
- Detailed to NASA Headquarters (NASA Strategy on Modeling and Supercomputing, 2000)

- *Ad hoc* Task Group on Climate Modeling and Computing Requirements (D. Evans, Chair, report to J. Baker, NOAA and, 1999 – 2000)
- *Ad hoc* committee on Interagency Climate Modeling (L. Gates, Chair, report to US Global Change Research Program, 1998 – 2000)
- Participant in United Nations Environment Program and U.S. assessment activities on the state of atmospheric ozone and the environmental impact of aircraft. Lead author and co-author in assessment reports (1989-1995)

PROFESSIONAL SOCIETIES:

- American Meteorological Society Committee on Open Environmental Information (2013 – present, Chair 2016 – present)
- Editor, Journal of the Atmospheric Sciences (1993 – 1996; UARS Special Issue, 1994)
- Associate Editor, *Geophysical Research Letters* (1989 – 1993)
- AMS Committee on Middle Atmosphere (1988 – 1994, Chairman 1992 – 1994)
- Regular Reviewer of Papers and Proposals

UNIVERSITY OF MICHIGAN COMMITTEES

Departmental:

- Strategic Planning Committee (2016 – ongoing)
- Alumni and Friends (2014 – ongoing)
- Graduate Student Committee (2013 – ongoing)
- Mentoring Committee (2009 – 2011)
- Applied Climate Curriculum Development (2009-2010)
- Undergraduate Curriculum Committee (2008 – 2009)
- Strategic Planning Committee (2007 – 2008, Chair)
- Faculty Search Committee (2007 – 2008, 2009 – 2010, 2010 – 2011)
- Faculty Search Committee (2005 – 2006, Chair)
- Information Technology Committee (Chair), 2005 – ongoing)

College of Engineering:

- Research Computing for Engineering Committee (2007)
- Awards Committee (2007)

University:

- University of Michigan Delegation to Conference of Parties, Copenhagen (2009, Delegation Lead)
- Research Cyber-infrastructure Committee (2006 – 2007)

EXTERNAL REVIEWS AND ADVISORY PANELS:

- University Corporation for Atmospheric Research Community Advisory Committee for NCEP (UCACN) Model Advisory Panel (UMAC) (2015 – present, Co-Chair)
- NASA Earth Science Subcommittee (2014 – present)
- Red Team / Blue Team Review DOE Accelerated Climate Model for Energy (2013)

- Advisory Panel, Climate Change Education Program, National Academy of Engineering, Climate, Engineered Systems and Society (2010-2012)
- External Review NOAA Climate Research and Modeling Program (2008)
- Board of Directors, Canadian-Stratospheric Processes and their Role in Climate (2006-2010)
- Naval Research Laboratory Atmospheric Sciences External Review (2006)
- Community Climate System Model Advisory Board (National Center for Atmospheric Research, 2005-2011)
- Climate, Ocean, and Sea Ice Modeling Project External Review Panel (Los Alamos National Laboratory, 2002)
- Center for Computational Sciences Review Committee (Oak Ridge National Laboratory, 2000)
- Computing Sciences Review Committee (Lawrence Berkeley National Laboratory, 1999)
- ERA-40 External Advisory Panel (European Center for Medium-range Weather Forecasts, 1997-2001)
- Earth Observing System Data Information System (EOSDIS) Advisory Panel (1994 – 1998)
- Computer Environment and Research Requirements Committee (1994)
- Earth Sciences Directorate/National Meteorological Center (NMC) Technical Implementation Agreement on Data Exchange (Principal Author, with Wayman Baker, NMC, 1993)
- Office of Space Science and Applications Supercomputer Requirements at NASA/GSFC (with Michele Rienecker, 1992)
- Goddard Space Flight Center (GSFC) Strategic Planning Task Group on *GSFC's Role as a Science Data and Information Center* (1991)
- Merit Review Board for NASA Historically Black College and University Program (1991)
- Review Board for NASA Graduate Student Research Program (1990, 1991)
- NASA OSO/OSSA Committee on Supercomputing (1989)
- International Review Committee for the Networks of Centers of Excellence (Natural Sciences and Engineering Research Council of Canada, 1989)

## PROFESSIONAL TALKS

**(Since joining University of Michigan, September 2005):**

Richard B. (Ricky) Rood has been a contributing and invited speaker at national and international conferences since 1979. He has given seminars at universities and national laboratories in the United States and Europe. He was Keynote Speaker at the *Earth Systems Processes Conference* (Geological Society of London), Edinburgh, Scotland (2001) and the Dinner Speaker for *Climate Change Science Program* (Dept. of Energy), Seattle, WA (2004). He speaks at community (e.g., Sierra Club) and university (e.g. Students for Clean Energy) events.

### INVITED TALKS:

- Evaluation of Climate Projections for Use in Planning and Adaptation Applications, Richard B. Rood, American Geophysical Union, December 2013.
- Narrative Descriptions to Improve the Salience of Climate Projections to Policy and Planning, Richard B. Rood, American Meteorological Society, January 2013.
- Reducing Barriers to the Use of Climate Data in Adaptation Planning, Richard B. Rood, American Meteorological Society, January 2013.
- Extreme Heat and Human Health, Richard B. Rood, Marie S. O'Neill, American Geophysical Union, December 2010.
- Community Climate Models: Is a new paradigm of model development possible? Richard B. Rood, Supercomputing 2010, November 2010.
- Heat and Human Health: An Integrated Approach, Richard B. Rood, Marie S. O'Neill, et al., American Meteorological Society, January 2010.
- Our Changing Climate: What Next? Richard B. Rood. Michigan Seminars, Palm Beach Florida, February 2009.
- Assimilation of Scientific Information into Complex Problem Solving, Richard B. Rood, National Center for Atmospheric Research, July 2008.
- Dynamical Cores: Design and the Designer, Richard B. Rood, National Center for Atmospheric Research, June 2008.
- Bridging Weather and Climate, Richard B. Rood, Presidential Symposium, American Meteorological Society, January 2007.
- Weather and Climate Research and Operations Infrastructure, Richard B. Rood, History and Theory of Infrastructure Workshop, October 2006.
- Assimilation of Satellite Observations: Why and Why Not, Richard B. Rood, European Geophysical Society, April 2006.

SEMINARS:

- Climate Informatics: Human Experts and the End-to-End System, Richard R. Rood and Paul N. Edwards, National Center for Atmospheric Research, Expeditions Meeting, July 2014.
- The Usability of Climate Data in Climate-Change Planning and Management, Richard B. Rood, Jet Propulsion Laboratory, June 2014
- The National Climate Predictions and Projections (NCCP) Platform: Development of Capacity to Support Planning and Management, Richard B. Rood, NOAA, Climate Program Office, Webinar Series, November 2013.
- Thinking about the Arctic Oscillation, Richard B. Rood, National Park Service, Climate Change in America's National Parks - Post-Sandy: Storms, Barrier Islands, and Implications for the Atlantic Coastline, Webinar Series, August 2013.
- The Validation of Climate Models: The Development of Essential Practice, Richard B. Rood, NCAR, August 2012.
- The Validation of Climate Models: The Development of Essential Practice, Richard B. Rood, NOAA, Earth System Research Laboratory, February 2012.
- Global Warming: Simple Physics in a Complex System, Richard B. Rood, Department of Physics, November 2010.
- Climate Change: In the Moment, Richard B. Rood, Sierra Club Southeast Michigan, November 2010.
- Climate Management 101: Complex Problems with No Known Solutions, Richard B. Rood, Grosse Pointe Audubon, Grosse Pointe, Michigan, November 2007.
- The Impact of the Lin-Rood Dynamical Core on (Modeled) Precipitation, Richard B. Rood and Cedric Drui, Interdepartmental Environmental Geophysical Fluid Dynamics Seminar Series, University of Michigan, April 2006.
- A Walk Through The Science and Observations of Climate Change, Richard B. Rood, SAS Alliance-University Living, Ann Arbor, Michigan, February 2006.
- Regional Analysis of Climate Change, Richard B. Rood, Third Faculty Forum on Climate Change, University of Michigan, December 2005.

## **PUBLIC ENGAGEMENT**

Professor Rood spends significant effort on public engagement. He does frequent radio and newspaper interviews. He speaks at community (e.g., Sierra Club) and university (e.g. Students for Clean Energy) events.

Richard B. (Ricky) Rood wrote, until 2017, an expert blog on climate change for the Weather Underground and the American Meteorological Society's ClimatePolicy.org. These blogs are presently being archived and curated in the ACI Scholarly Blog Index and catalogued using ORCID. His contributions to The Conversation have more than one million readers.

Rood writes short stories, essays, and poems and has been published in *Night Music*, *Bay Weekly*, *Faultline*, *Foreign Service Journal* (*Summer Fiction Winner, 2004*), *Current Magazine* (*Fiction and Poetry Contest, 2006, Honorable Mention*) and *Arnazella*.

Rood was President of Cape Anne Citizens Association (~1988-1992) in Anne Arundel County, Maryland.



**BLOGS, COMMENTARY, ANALYSIS:**

Dr. Ricky Rood's Climate Change Blog –

<https://www.wunderground.com/blog/RickyRood/archive.html>

Climate Policy Blog: An American Meteorological Society Project –

<http://blog.climatepolicy.org/>

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BOOK:

*Demystifying Climate Models: A Users Guide to Earth System Models*

Andrew Gettelman  
Richard B. Rood  
Springer-Verlag, Berlin, Heidelberg  
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2016

This book demystifies the models we use to simulate present and future climates, allowing readers to better understand how to use climate model results. In order to predict the future trajectory of the Earth's climate, climate-system simulation models are necessary. When and how do we trust climate model predictions? The book offers a framework for answering this question. It provides readers with a basic primer on climate and climate change, and offers non-technical explanations for how climate models are constructed, why they are uncertain, and what level of confidence we should place in them.

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