

Review of the Draft 2013 National Climate Assessment (NCA) Report

Committee

Warren M. Washington

Chair

Warren M. Washington (NAE, Chair) is a Senior Scientist at the National Center for Atmospheric Research (NCAR). He has published more than 150 papers in professional journals and co-authored a book entitled, *An Introduction to Three-Dimensional Climate Modeling*. He has served on the National Science Board (chair, 2002-2006), the NOAA Science Advisory Board, President's National Advisory Committee on Oceans and Atmosphere, several panels of the National Research Council, the Secretary of Energy's Advisory Board, among others. Washington areas of research are in the development and use of climate models for climate change studies. He has also served as President of American Meteorological Society and a member of the AAAS Board of Directors. He is a member of the National Academy of Engineering, American Philosophical Society, and the American Academy of Arts and Sciences. He has received many awards, including the Le Verrier Medal of the Societe Meteorologique de France, the National Weather Service Modernization Award, and the AMS Dr. Charles Anderson Award. He has honorary degrees from the Oregon State University and Bates College. In 2010 he was awarded the National Medal of Science by President Obama.

Kai N. Lee

Vice Chair

Kai N. Lee (Vice Chair) leads the Science subprogram in Conservation & Science at The David and Lucile Packard Foundation. The science subprogram provides support for science that informs decision making in the near term, advancing the strategies guiding the conservation activities of the Foundation. He also provides program support and liaison for the Monterey Bay Aquarium Research Institute, the Center for Ocean Solutions, and the Aldo Leopold Leadership Program. He taught at Williams College from 1991 - 2007 and is the Rosenberg Professor of Environmental Studies, emeritus. He directed the Center for Environmental Studies at Williams from 1991-1998 and 2001-2002, and taught from 1973 - 1991 at the University of Washington in Seattle. He is the author of *Compass and Gyroscope* (1993) and coauthor of *Our Common Journey* (NRC, 1999). He is a National Associate of the National Research Council. He was a member of the National Academies Roundtable on Science and Technology and served as vice-chair of the National Academies panel that wrote *Informing Decisions in a Changing Climate* (2009). Earlier, he had been a White House Fellow and represented the state of Washington as a member of the Northwest Power Planning Council. He was appointed in 2009 to the Science Advisory Board of the EPA. He holds a Ph.D. in Physics from Princeton University and an A.B., Magna Cum Laude in Physics, from Columbia University.

Mark R. Abbott

Member

Mark R. Abbott is dean of the College of Earth, Ocean and Atmospheric Sciences at Oregon State University, Corvallis. His research focuses on the interaction of biological and physical processes in the upper ocean, remote sensing of ocean color and sea surface temperature, phytoplankton fluorescence, and length and time scales of phytoplankton variability. He deployed the first array of bio-optical moorings in the Southern Ocean as part of the United States Joint Global Ocean Flux Study (JGOFS). Dr. Abbott chairs the U.S. JGOFS Science Steering Committee and was a member of the MODIS and SeaWiFS science teams. He is currently a member of the board of trustees for the Consortium for Ocean Leadership and a member of the National Science Board. Dr. Abbott has also served as the chair of the SSB's Committee on Earth Studies. Other prior NRC service includes the Committee on Indicators for Understanding Global Climate Change, the Committee on the Role and Scope of Mission-Enabling Activities in NASA's Space and Earth Sciences Missions, and the Panel on Land-Use Change, Ecosystem Dynamics, and Biodiversity for the 2007 decadal survey on Earth science and applications from space. Dr. Abbott is currently a member of the NRC's Committee on an Assessment of NASA's Earth Science Program, which is carrying out a mid-decade assessment of the implementation of the Earth science and applications from space decadal survey. He is also a member of the board of trustees for the University Corporation for Atmospheric Research.

Doug Arent

Member

Doug Arent is Executive Director of the Joint Institute for Strategic Energy Analysis at the National Renewable Energy Laboratory (NREL). He specializes in strategic planning and financial analysis competencies; clean energy technologies and energy and water issues; and international and governmental policies. In addition to his NREL responsibilities, Arent is Sr. Visiting Fellow at the Center for Strategic and International Studies. Arent was recently appointed as a Coordinating Lead Author for the 5th Assessment Report of IPCC. He is a member of Policy Subcommittee of the National Petroleum Council Study on Prudent Development of North America Natural Gas and Oil Resources, and the American Academy of Arts and Sciences Steering Committee on Social Science and the Alternative Energy Future. Arent served from 2008 to 2010 on the National Academy of Sciences Panel on Limiting the Magnitude of Future Climate Change. Arent is, a Member of the Keystone Energy Board and is on the Advisory Board of E+Co, a public purpose investment company that supports sustainable development across the globe. He served on the Executive Council of the U.S. Association of Energy Economists from 2008-2010. Prior to coming to his current position, Arent was Director of the Strategic Energy Analysis Center at NREL from 2006-2010. Prior to joining NREL, he was a management consultant to clean energy companies, providing strategy, development and market counsel. Dr. Arent has a Ph.D. from Princeton University, and an MBA from Regis University.

Susan K. Avery

Member

Susan K. Avery took office as President and Director of the Woods Hole Oceanographic Institute in 2008. She holds a Master's in Physics and a Doctorate in Atmospheric Science from the University of Illinois. Avery was on the faculty of the University of Colorado at Boulder from 1982 - 2008, most recently holding the academic rank of Professor of Electrical and Computer Engineering. Her research interests include studies of atmospheric circulation and precipitation, climate variability and water resources, and the development of new radar techniques and instruments for remote sensing. She also has a keen interest in scientific literacy and the role of science in public policy. She is the author or co-author of more than 80 peer-reviewed articles. A Fellow of CIRES since 1982, Avery became its Director in 1994. In that role, she facilitated new interdisciplinary research efforts spanning the geosciences and including the social and biological sciences. She spearheaded a reorganization of the institute and helped establish a thriving K-12 outreach program and a Center for Science and Technology Policy Research. She also worked with NOAA and the Climate Change Science Program to help formulate a national strategic science plan for climate research. Recently she served on two NRC panels: One produced a decadal plan for earth science and applications from space, and the other provided strategic guidance for the atmospheric sciences at the National Science Foundation. Avery is a Fellow of the Institute of Electrical and Electronics Engineers, the American Association for the Advancement of Science, and of the American Meteorological Society, for which she also served as President. She is a past chair of the board of trustees of the University Corporation for Atmospheric Research.

Glen T. Daigger

Member

Glen Daigger (NAE) is Senior Vice President and Chief Technology Officer at CH2M HILL with responsibility for the technology function for the firm's water businesses (water resources, water supply and treatment, wastewater). He is also the first Technical Fellow for the firm, an honor which recognizes the leadership that he provides for CH2M HILL and for the profession in the development and implementation of new wastewater treatment technology. Dr. Daigger has more than 30 years of experience in wastewater treatment plant evaluation, troubleshooting, and process design. His areas of expertise include biological wastewater treatment and treatment process design. Between 1994 and 1996 he served as professor and head of the Environmental Systems Engineering Department at Clemson University. Dr. Daigger is a member of the American Society of Civil Engineers, American Water Works Association, Association of Environmental Engineering, International Water Association, Water Environment, as well as numerous other professional societies. Dr. Daigger received his PhD in Environmental Engineering from Purdue University. He has served on numerous NRC committees and is currently active with the Roundtable on Science and Technology for Sustainability.

Evan H. DeLucia

Member

Evan DeLucia is the G. William Arends Professor of Biology at the University of Illinois at Urbana-Champaign; he was the founding Director of the Program in Ecology and Evolutionary Biology, served as the Head of the Department of Plant Biology, and currently he is the director of the School of Integrative Biology. DeLucia completed a PhD (1986) in plant ecology and physiology at Duke University. He joined the faculty at Illinois in 1986, where he was recognized as a University Scholar in 1997. In 1994, DeLucia was a Bullard Fellow at Harvard University and in 2002 he was a Fulbright Fellow at Landcare Research in New Zealand. DeLucia became a Fellow of the American Association for the Advancement of Science in 2005. He is a member of the American Association of Plant Physiologists, the International Union of Forest Research Organizations, the Ecological Society of America, the American Geophysical Union and the American Association for the Advancement of Science. He was elected Chair of the Physiological Ecology Section of the Ecological Society (1996-98). He currently provides editorial services for several prominent journals, including Ecology, Oecologia, Tree Physiology, and Global Change Biology. The responses of forest and agro-ecosystems to elevated carbon dioxide and other elements of global change are at the center of DeLucia's research interests. Using ecological, physiological and genomic approaches, DeLucia seeks to understand how global change affects the carbon cycle and the trophic dynamics between plants and insects. He has served in an advisory capacity to members of the US congress and the National Academy of Sciences.

Robert E. Dickinson

Member

Robert E. Dickinson (NAS,NAE) is a respected leader in dynamic meteorology, physical climatology and climate modeling for the last four decades. He first delineated the way planetary scale Rossby waves interact with the mean flow--a process central to understanding the general circulation of the atmosphere. He has also established the major role of foliage in climate dynamics and made major contributions to other problems. His areas of interest include the dynamics of atmospheric planetary waves, stratospheric dynamics, models of global structure and dynamics of terrestrial and planetary thermosphere, NLTE infrared radiative transfer in planetary mesospheres, global climate modeling and processes, the role of land processes in climate systems, the modeling role of vegetation in regional evapotranspiration, and the role of tropical forests in climate systems. His recent research has focused on climate variability and change, aerosols, the hydrological cycle and droughts, land surface processes, the terrestrial carbon cycle, and the application of remote sensing data to modeling of land surface processes. He is an elected member of both the US National Academy of Sciences and the National Academy of Engineering, an honorary member of the European Geophysical Society and the European Geo-sciences Union and a Foreign member of Chinese Academy of Sciences. He has been a member of numerous scientific advisory organizations, including the National Research Council. He holds a M.S. (1962) and Ph.D. (1966) in Meteorology from the Massachusetts Institute of Technology.

Thomas Dietz

Member

Thomas Dietz is Assistant Vice President for Environmental Research, Professor of Sociology, Environmental Science and Policy, and Animal Studies at Michigan State University. His current research examines the human driving forces of environmental change, environmental values and the interplay between science and democracy in environmental issues. Dietz is also an active participant in the Ecological and Cultural Change Studies Group at MSU. He is a Fellow of the American Association for the Advancement of Science, and has been awarded the Sustainability Science Award of the Ecological Society of America, the Distinguished Contribution Award of the American Sociological Association Section on Environment, Technology and Society, and the Outstanding Publication Award, also from the American Sociological Association Section on Environment, Technology and Society. He has served on numerous National Academies' panels and committees and chaired the Committee on the Human Dimensions of Global Change and the Panel on Public Participation in Environmental Assessment and Decision Making. He holds a Bachelor of General Studies degree from Kent State and a PhD in Ecology from the University of California at Davis.

Durland Fish

Member

Durland Fish is a Professor of Epidemiology in the Yale School of Public Health and Yale School of Forestry and Environmental Studies. He studies the ecology of vector-borne pathogens. Recent emphasis has been on tick-borne pathogens causing Lyme disease, and on mosquito-borne West Nile virus and dengue fever. Current projects include experimental manipulation of natural transmission cycles, vaccination of wildlife reservoirs against vectors and vector-borne pathogens, interactions among multiple pathogens in vectors and hosts, vector competence for viral and bacterial pathogens, and pathogen population genetics. Spatial analysis of pathogen prevalence using satellite imagery and geographic information systems forms the basis for applied studies in landscape epidemiology. His laboratory maintains colonies of ticks and mosquitoes for experimental studies, and a network of field sites is available for ecological studies. Professor Fish is Director of the Yale Center for EcoEpidemiology, an interdisciplinary center that seeks to integrate environmental science and ecology with medical epidemiology. He is also on the Steering Committee of the Yale Climate and Energy Institute where he coordinates campus wide research on climate and human health.

Debra Hernandez

Member

Debra Hernandez is a professional engineer and her background is in coastal management and engineering. Ms. Hernandez is currently the Executive Director of Southeast Coastal Ocean Observing Regional Association (SECOORA). She was the President of Hernandez and Company and previously worked as Director of Program and Policy Development for the South Carolina Department of Health and Environmental Control. She is an acknowledged leader in coastal management with 18 years of experience and extensive policy, legislative, and technical expertise. Ms. Hernandez's expertise lies in federal and state coastal and environmental management laws, regulations, and policies. She currently serves on the Ocean Research and Resources Advisory Panel. Ms. Hernandez is also a founding board member and current vice-chair for the Coastal States Stewardship Foundation, whose purpose is to support healthy coasts and vibrant coastal communities. Additionally, she chaired the Coastal States Organization (CSO) from 2002 to 2004. CSO represents the interests of 35 governors from coastal states on federal activities relating to coastal management.

Haroon S. Kheshgi

Member

Haroon S. Kheshgi is the Global Climate Change Science Program Leader at ExxonMobil's corporate Strategic Research. He studied chemical engineering at the University of Illinois (Urbana, B.S. 1978) and the University of Minnesota (Minneapolis, Ph.D. 1983). He pursued research at Lawrence Livermore National Laboratory (1983-1986) before joining ExxonMobil Research and Engineering Company in 1986. At ExxonMobil Corporate Strategic Research his research addresses many aspects of global climate change including carbon cycle, detection and attribution of climate change, paleoclimate implications, and the mitigation of greenhouse gas emissions. He has contributed to the Intergovernmental Panel on Climate Change (IPCC) as lead author, contributing author, and review editor in the IPCC's last three assessment reports and its Special Reports on Carbon Dioxide Capture and Storage, and on Land Use Change. Recent activities include participation in the International Petroleum Industry Environmental Conservation Association's Climate Change Working Group, the Engineering Founder Societies' project on carbon management, the Society on Petroleum Engineering's committee on carbon capture and storage, and the American Institute of Chemical Engineers Energy Advisory Board. He is currently Associate Editor of the journal Adaptation and Mitigation Strategies for Global Change, and a member of the US Carbon Cycles Science Steering Group.

Robin Leichenko

Member

Robin Leichenko is an Associate Professor in the Department of Geography at Rutgers University. She is an economic geographer and her research addresses the urban and regional impacts of global economic and environmental change in both advanced and developing countries. Her latest book [Environmental Change and Globalization: Double Exposures. 2008] focuses on how processes of globalization and climate change jointly affect vulnerable regions, social groups and ecosystems. Other current research includes a study of the effects of the globalization of consumption practices on housing demand and suburbanization patterns., a study of climate change vulnerability and adaptation in U.S. cities, and a study of the effects of globalization trends on U.S. firms and workers. Recently completed research projects include a study of the impacts of international trade on employment and income inequality across U.S. regions. She is current serving on the NRC Committee on Assessing the Impacts of Climate Change on Social and Political Stresses.

Maria C. Lemos

Member

Maria Carmen Lemos is Professor of Natural Resources and Environment at the University of Michigan, Ann Arbor and Senior Policy Scholar at the Udall Center for the Study of Public Policy at the University of Arizona. She has MSc and PhD degrees in Political Science from the Massachusetts Institute of Technology, MIT. During 2006-2007 she was a James Martin 21st Century School Fellow at the Environmental Change Institute at Oxford University. Her research focuses on environmental public policymaking in Latin America and the U.S., especially related to the human dimensions of climate change, the co-production of science and policy, and the role of technoscientific knowledge and environmental governance in building adaptive capacity to climate variability and change response. She is a co-founder of Icarus (Initiative on Climate Adaptation Research and Understanding through the Social Sciences), which seeks foster collaboration and exchange between scholars focusing on vulnerability and adaptation to climate change. She is a lead author of the Intergovernmental Panel on Climate Change (IPCC) and a contributor to the US Climate Change Science Program Synthesis Reports. She has served in number of NRC/NAS committees including Restructuring Federal Climate Research to Meet the Challenges of Climate Change, America Climate Choice Science Panel and the Human Dimensions of Environmental Change Committee.

Ian R. Noble

Member

Ian Roy Noble has spent 10 years with lead responsibility for the World Bank's activities in adaptation to climate change. He has also worked with the Carbon Finance Unit on emissions reductions through reduced deforestation and forest degradation. Before coming to the Bank in 2002 he was Professor of Global Change Research at the Australian National University. He has had senior roles in the IPCC process and in international cooperative research on climate change as part of the IGBP (International Geosphere Biosphere Program) including chairing the Global Change and Terrestrial Ecosystems for some years. An ecologist by training, he holds a PhD from the University of Adelaide, and his research interests cover animal behavior, vegetation and biodiversity management, ecosystem modeling, expert systems and the science-policy interface. In 1999 he was elected as Fellow of the Australian Academy of Technological Sciences and Engineering.

Camille Parmesan

Member

Camille Parmesan's early research focused on multiple aspects of population biology, including the ecology, evolution and behaviors of insect/plant interactions. For the past several years, the focus of her work has been on current impacts of climate change in the 20th century on wildlife. Her work on butterfly range shifts has been highlighted in many scientific and popular press reports, such as in Science, Science News, New York Times, London Times, National Public Radio, and the recent BBC film series "State of the Planet" with David Attenborough. The intensification of global warming as an international issue led her into the interface of policy and science. Parmesan has given seminars in DC for the White House, government agencies, and NGOs (e.g., IUCN and WWF). As a lead author, she was involved in multiple aspects of the Third Assessment Report of the IPCC (Intergovernmental Panel on Climate Change, United Nations). Parmesan received her B.S. degree from the University of Texas at Austin in 1984 and received a Ph.D. in Biological Sciences from UT Austin in 1995.

Connie Roser-Renouf

Member

Connie Roser-Renouf is an Assistant Research Professor with the George Mason University Center for Climate Change Communication. Her research focuses on understanding how diverse publics use, interpret and respond to information on the issue of climate change. The guiding objective of her work is the identification of effective communication strategies that inform and engage audiences. Connie has participated in the design of the Climate Change in the American Mind surveys, and with the Global Warming's Six Americas analyses. She is sharing this research with a number of organizations to assist in their message development, including the Science Museums of Minnesota and Virginia, NASA, NACCHO (National Association of County and City Health Officials), AASHTO (American Association of State Highway and Transportation Officials), the California Department of Public Health, and the National Audubon Society. Connie earned her PhD in Communication Research at Stanford University in 1986. Prior to joining the Center at George Mason, she taught and conducted research at the University of California at Santa Barbara; the University of Denver; the University of Pittsburgh; and Humboldt State University. Her research interests centered on the design and evaluation of public information campaigns, and on the use of mass media to facilitate positive social change. She has an MS in Mass Communication from San Diego State University and a PhD in Communication Research from Stanford University.

Kathleen Segerson

Member

Kathleen Segerson is a Professor of Economics at the University of Connecticut. She was the Head of the Department of Economics from 2001–2005. Dr. Segerson specializes in natural resource economics, and in particular, the economics of environmental regulation. She is currently a member of both the Chartered Executive Board of the Environmental Protection Agency's Science Advisory Board, and the Vice Chair of the Advisory Board's Committee on Valuing the Protection of Ecological Services and Systems. She was a member of the U.S. General Accounting Office's Expert Panel on Climate Change Economics from 2007–2008 and frequently serves on external review committees for the U.S. Department of Agriculture. She has also served on three National Research Council study committees: the Committee on Assessing and Valuing the Services of Aquatic and Related Terrestrial Ecosystems (2002–2004), the Committee on the Causes and Management of Coastal Eutrophication (1998–2000), and the Committee on Improving Principles and Guidelines for Waste Resources Planning by the U.S. Army Corps of Engineers (2008– present). In 2008, she was named a Fellow by both the American Agricultural Economics Association and the Association of Environmental and Resource Economists. Dr. Segerson earned a PhD from Cornell University in 1984.

Karen C. Seto

Member

Karen C. Seto is an Associate Professor at the School of Forestry and Environmental Studies at Yale University. Professor Seto studies the human transformation of land and the links between urbanization, global change, and sustainability. A geographer by training, her research includes understanding urbanization dynamics, forecasting urban growth, and examining the environmental consequences of land-use change and urban expansion. She is an expert in satellite remote sensing analysis and has pioneered methods to reconstruct historical land-use and to develop empirical models to explain and forecast the expansion of urban areas. Her geographic region of specialization is Asia, where she has worked on urban development issues for more than fifteen years. Currently she has active research projects in China and India. Professor Seto is Co-Chair of the IHDP (International Human Dimensions Programme on Global Environmental Change) Urbanization and Global Environmental Change Project (UGEC), and a Coordinating Lead Author for the IPCC Fifth Assessment Report. She also serves on the U.S. Carbon Cycle Scientific Steering Group, the U.S. National Research Council (NRC) Committee to Advise the U.S. Global Change Research Program, the NRC Geographical Sciences Committee, and the NRC Committee on Needs and Requirements for Land-Change Modeling. She is the Executive Producer of "10,000 Shovels: Rapid Urban Growth in China," a documentary film that integrates satellite imagery, historical photographs, and contemporary film footage to highlight the urban changes occurring in China. Professor Seto is an Aldo Leopold Leadership Fellow and recipient of a NASA New Investigator Program Award, a NSF Career Award, and a National Geographic Research Grant. She has a Ph.D. in Geography from Boston University.

Kathleen J. Tierney

Member

Kathleen J. Tierney is a Professor of Sociology and Director of the Natural Hazards Research and Applications Information Center at the University of Colorado. The Hazards Center is housed in the Institute of Behavioral Science, where Prof. Tierney holds a joint appointment. Dr. Tierney's research focuses on the social dimensions of hazards and disasters, including natural, technological, and human-induced extreme events. With collaborators Michael Lindell and Ronald Perry, she recently published *Facing the Unexpected: Disaster Preparedness and Response in the United States* (Joseph Henry Press, 2001). This influential compilation presents a wealth of information derived from theory and research on disasters over the past 25 years. Among Dr. Tierney's current and recent research projects are studies on the organizational response to the September 11, 2001 World Trade Center disaster, risk perception and risk communication, the use of new technologies in disaster management, and the impacts of disasters on businesses.

Charles J. Vorosmarty

Member

Charles J. Vorosmarty is a Professor of Civil Engineering, a Distinguished Scientist with NOAA-Cooperative Remote Sensing Science and Technology Center and Director of The City University of New York's Environmental Crossroads Initiative at The City College of New York. His research focuses on the development of computer models and geospatial data sets used in synthesis studies of the interactions among the water cycle, climate, biogeochemistry and anthropogenic activities. His studies are built around local, regional and continental to global-scale modeling of water balance, discharge, constituent fluxes in river systems and the analysis of the impacts of large-scale water engineering on the terrestrial water cycle. He is a founding member of the Global Water System Project that represents the input of more than 200 international scientists under the International Council for Science's Global Environmental Change Programs. He is spearheading efforts to develop global-scale indicators of water stress, to develop and apply databases of reservoir construction worldwide and to analyze coastal zone risks associated with water diversion. He recently won one of two national awards through the National Science Foundation to execute studies on hydrologic synthesis. Dr. Vorosmarty also is on several national and international panels, including the U.S. Arctic Research Commission, the NASA Earth Science Subcommittee, the National Research Council Committee on Hydrologic Science, the National Science Foundation's Arctic System Science Program Committee and the Arctic HYDRA International Polar Year Planning Team. He also was on a National Research Council panel that reviewed NASA's polar geophysical data sets, the decadal study on earth observations, and is Co-Chair of the National Science Foundation's Arctic CHAMP hydrology initiative. He has assembled regional and continental-scale hydro-meteorological data compendia, including the largest single collection, Arctic-RIMS (covering northern Eurasia and North America).

John M. Wallace

Member

John M. Wallace's research has been directed at improving our understanding of global climate and its year-to-year and decade-to-decade variations, making use of observational data. He has contributed to the identification and understanding of a number of atmospheric phenomena, including the vertically propagating planetary waves that drive the quasi-biennial oscillation in zonal winds in the equatorial stratosphere, the 4-5-day period easterly waves that modulate daily rainfall over the tropical oceans, and the dominant spatial patterns in month-to-month and year-to-year climate variability, including the one through which the El Nio phenomenon in the tropical Pacific influences climate over North America. He has contributed to documenting the existence of El Nino- like variability on a decade to decade time scale (the so called 'Pacific Decadal Oscillation'). He earned a B.S. in Naval Architecture (1962) from the Webb Institute of Naval Architecture. He then went on to earn a Ph.D. in meteorology from the Massachusetts Institute of Technology in 1966.