

Assessment of Intraseasonal to Interannual Climate Prediction and Predictability

Committee

Robert A. Weller

Chair

Dr. Robert A. Weller is the director of the Cooperative Institute for Climate and Ocean Research and Chair of the Physical Oceanography Department at the Woods Hole Oceanographic Institution. His research focuses on atmospheric forcing, surface waves on the upper ocean, prediction of upper ocean variability, and the ocean's role in climate. Dr. Weller has been a pioneer in developing tools and technologies that enable scientists to investigate upper ocean processes on scales from meters to tens of kilometers and with accuracy never before available. In recognition of Dr. Weller's distinguished contributions to ocean science, he was named Secretary of the Navy/Chief of Naval Operations Oceanographic Research Chair by the Office of Naval Research. Dr. Weller has been on multiple mooring deployment cruises and has practical experience with ocean observation instruments. He served as co-chair of the U.S. Climate Variability and Change (CLIVAR) Scientific Steering Group and a member of the international CLIVAR Scientific Steering Group. He serves on the international Ocean Observing Panel for Climate and the NOAA Climate Observing System Council and Climate Working Group. He has served on several NRC committees, including the Committee to Review the U.S. Climate Change Science Program Strategic Plan, the Committee on Implementation of a Seafloor Observatory Network for Oceanographic Research, and the Committee on Utilization of Environmental Satellite Data: A Vision for 2010 and Beyond. He also served on the NRC Board on Atmospheric Sciences and Climate. Weller received his AB in Engineering and Applied Physics from Harvard and his Ph.D. in Physical Oceanography from Scripps Institution of Oceanography.

Jeffrey L. Anderson

Member

Dr. Jeffrey Anderson is a senior scientist at the National Center for Atmospheric Research where he heads the Data Assimilation Research Section. From 1992 to 2000 he was a scientist at NOAA's Geophysical Fluid Dynamics Laboratory; where he led the experimental prediction group. He has made research contributions in theoretical geophysical fluid dynamics, seasonal prediction, predictability, and ensemble data assimilation. His work is focused by a goal to improve geophysical prediction. He has an M.S. in computer science from the University of California, Berkeley and a Ph.D. in atmospheric and oceanic sciences from Princeton University.

Alberto Arribas

Member

Dr. Alberto Arribas is the Manager of the Seasonal Forecasting group at the Met Office Hadley Centre where he is responsible for the research and development of new operational forecasting systems for intraseasonal-to-interannual timescales. Prior to this, Alberto has been heavily involved in the development of ensemble prediction systems for short- and medium-range forecasting, particularly in the area of representing model uncertainties. Other research interests include the application and use of probabilistic weather and climate forecast information. He received his BSc in Physics and PhD in Atmospheric Physics from the University Complutense (Madrid, Spain). He is a fellow of the Royal Meteorological Society and a lecturer for the World Meteorological Organization.

Robert E. Dickinson

Member

Dr. Robert E. Dickinson is a Professor at the University of Texas at Austin, Jackson School of Geosciences. His research interests are in terrestrial and atmospheric interaction, terrestrial remote sensing. He has been contributing to the fields of climate modeling and global change research for over 40 years. Dr. Dickinson joined the staff of NCAR (National Center for Atmospheric Research) in 1966. In 1975, he became Head of the Climate Section and in 1981, Deputy Director of the Climate and Global Dynamics Division. During 1990-1999, Dr. Dickinson was Regents Professor at the University of Arizona in Tucson, where he held joint appointments in the Department of Atmospheric Sciences, the Institute of Atmospheric Physics, the Department of Hydrology and Water Resources, and the Laboratory of Tree-Ring Research. He has been active in committees, panels, and working groups of the NRC, IGBP, WCRP, and IPCC, and is a member of both the National Academy of Sciences and the National Academy of Engineering. His current research aims to improve the understanding of global and regional climate and earth system through the modeling of land, vegetation and radioactive processes. He received his PhD in Meteorology from Massachusetts Institute of Technology in 1966.

Lisa Goddard

Member

Dr. Lisa Goddard is a research scientist at the International Research Institute for Climate and Society (IRI) and an adjunct associate professor within the Department of Earth and Environmental Sciences of Columbia University. She has been involved in El Niño and climate forecasting research and operations since the mid 1990s. She has extensive experience in forecasting methodology and has published papers on El Niño, seasonal climate forecasting and verification, and probabilistic climate change projections. Currently leading the IRI's effort on Near-Term Climate Change, Dr. Goddard oversees research and product development aimed at providing climate information at the 10-20 year horizon and how that low frequency variability and change interacts with the probabilistic risks and benefits of seasonal-to-interannual variability. Most of Dr. Goddard's research focuses on diagnosing and extracting meaningful information from climate models and available observations. She also developed and oversees a new national post-doctoral program, the Climate Prediction Applications Postdoctoral Program (CPAPP), which explicitly links recent climate PhDs with decision making institutions. In addition, Dr. Goddard sits on five scientific advisory panels and co-chairs two working groups. Dr. Goddard holds a Ph.D. in atmospheric and oceanic sciences from Princeton University and a B.A. in physics from the University of California at Berkeley.

Eugenia Kalnay

Member

Dr. Eugenia Kalnay (NAE) is Distinguished University Professor for the Department of Meteorology, University of Maryland. Dr. Kalnay is a former holder of the Robert E. Lowry Chair, School of Meteorology, University of Oklahoma, and former director of the NOAA Environmental Modeling Center at the National Center for Environmental Prediction (NCEP). During Dr. Kalnay's tenure at NCEP, major improvements were made in the National Weather Service models' forecast skill. Her current research interests are in predictability and ensemble forecasting, numerical weather prediction, data assimilation and coupled ocean-atmosphere modeling. Dr. Kalnay is the recipient of several major awards including the AMS Jule G. Charney Award, the NASA medal for Exceptional Scientific Achievement, Dept of Commerce gold medals, and the Senior Executive Service Presidential Rank Award. Dr. Kalnay has served on several NRC committees, including the Panel on Digitization and Communications Science (2000-2002), the Committee on Weather Radar Technology Beyond NEXRAD (2001-2002), and the Board on Atmospheric Sciences and Climate (1988-1991). She also served as a member of the Commission on Geosciences, Environment, and Resources (1999-2000).

Benjamin Kirtman

Member

Dr. Benjamin Kirtman has been a full Professor at the University of Miami - Rosenstiel School for Marine and Atmospheric Science since 2007. From 1993-2002 Dr. Kirtman was a research scientist with the Center for Ocean-Land-Atmosphere Studies and in 2002 joined the faculty of George Mason University as an Associate Professor. Dr. Kirtman uses complex coupled ocean atmosphere general circulation models to investigate the predictability of the climate system on timescales from days-to-decades and to study the influence of tropical variability on mid-latitude predictability and to assess how the annual cycle affects intraseasonal and interannual predictability. Current areas of interest include: El Nino prediction, dynamics and low frequency variations; impact of atmospheric stochastic forcing on coupled climate variability; El Nino Monsoon interactions; and the maintenance of the inter-tropical convergence zone. Currently, Dr. Kirtman is co-Chair of the US Clivar Prediction, Predictability and Applications Interface (PPAI) panel, co-Chair of the NOAA Climate Test Bed - Climate Science Team and co-Chair of the International Clivar Working Group on Seasonal to Interannual Prediction (WGSIP). Professor Kirtman is also an Executive Editor of Climate Dynamics. Professor Kirtman received his BS in Applied Mathematics from the University of California-San Diego in 1987, and his MS and Ph.D. in 1992 from the University of Maryland-College Park.

Randal D. Koster

Member

Dr. Randal Koster has worked at NASA/GSFC since September of 1987, first as a member of the Hydrological Sciences Branch, and currently as a member of the GMAO. His early work focused on the analysis of global water isotope geochemistry. Most of his tenure at GSFC, though, has been dedicated to two research thrusts: (i) the development of improved treatments of land surface physics for atmospheric general circulation models, and (ii) the analysis of interactions between the land and atmosphere, using these models. He has examined many questions regarding land-atmosphere feedback, including: Can knowledge of soil moisture conditions at the beginning of a seasonal weather forecast improve the forecast? Can we find evidence in the observational record that variability in land surface states has an effect on rainfall, air temperature, and other atmospheric variables? Dr. Koster currently leads the development and maintenance of the land surface model component of the GMAO's Earth system model, a resource for the research community at large. Dr. Koster is a fellow of the American Meteorological Society. He has served on GEWEX and CLIVAR panels focused on land modeling and seasonal prediction. He served for many years as a lecturer for the climate program at George Mason University, teaching a course on land-climate interactions. He received his Sc.D from the Massachusetts Institute of Technology and his B.A. from California Institute of Technology.

Michael Richman

Member

Dr. Michael Richman has a wide range of interests, including analysis of global climate models, examination of the climate dynamics associated with El Niño/Southern Oscillation (ENSO), interaction of planetary- and synoptic-scale features, analysis of climate variability on both the intra-seasonal and interannual time scales, application of data mining to different radar platforms and statistical methodology. His work has involved analysis of four-dimensional climate models on supercomputers, using high-performance and massively parallel algorithms. Additionally, his expertise in statistical meteorology has led to development of multivariate techniques that summarize very large data sets, identifying their modal patterns, as well as eigentechniques that search for theoretical patterns in observed and modeled data. He has served several terms on both the American Meteorological Society's Committee on Probability and Statistics and Committee on Artificial Intelligence Applications to Environmental Science PhD, University of Illinois.

R. Saravanan

Member

Dr. R. Saravanan is a Professor at Texas A&M University. His research interests include the variability and predictability of climate on seasonal to millennial timescales, air-sea coupled interaction in both the tropical Atlantic and Pacific Oceans, and large-scale dynamics of the atmosphere and the oceans. His work has also addressed climate theory, hierarchical climate modeling, stochastic dynamics, and short-term climate prediction. Dr. Saravanan received his Master of Science in Physics from the Indian Institute of Technology, Kanpur in 1986 and his Ph.D. in Atmospheric and Oceanic Sciences from Princeton University in 1990.

Duane E. Waliser

Member

Dr. Duane Waliser is a Senior Research Scientist in the Water and Carbon Cycles Group, in the Earth Sciences Section at the Jet Propulsion Laboratory in Pasadena, CA, a Visiting Associate in the Geological and Planetary Sciences Division at Caltech and an Adjunct Professor in the Atmospheric and Oceanic Sciences Department at UCLA. His principle research interests lie in climate dynamics and in global atmosphere-ocean modeling, prediction and predictability, with emphasis on the Tropics. His recent work at JPL involves utilizing new and emerging satellite data sets to study weather and climate as well as advance our model simulation and forecast capabilities, particularly for long-range weather and short-term climate applications. He received a B.S. in Physics and a B.S. in Computer Science from Oregon State University in 1985, a Masters degree in Physics from U.C. San Diego in 1987, and his Ph.D. in Physical Oceanography from the Scripps Institution of Oceanography at U.C. San Diego in 1992. He is presently Co-Chair, US CLIVAR Madden-Julian Oscillation Working Group, Co-Chair of the Center for Multi-scale Modeling and Applications (CMMAP) MJO Working Group, Co-chair of the WMO/THORPEX -WCRP Year of Tropical Convection (YOTC) Activity and a Member of the Scientific Steering Group of WCRP's CLIVAR program.

Bin Wang

Member

Dr. Bin Wang is a Professor of Meteorology at the University of Hawaii. His current research themes include tropical intraseasonal oscillation, Monsoons, ENSO, climate predictability and prediction, tropical cyclones, climate change, wave and instability, large-scale air-sea interaction, intermediate modeling of tropical climate. Dr. Wang's research approaches involve theoretical, numerical modeling, and observational analyses. His research efforts focus on understanding of the fundamental physics governing variations of weather and climate. Dr. Wang serves as Co-Chair of the Asian-Australian Monsoon Panel (AAMP)CLIVAR/WCRP, member, CLIVAR/WCRP Science Steering Group and recently the American Meteorological Society (AMS)/Committee on Interaction of the Sea and Atmosphere. Dr. Bin Wang received his MS in Meteorology from University of Science and Technology of China, Beijing and a Ph.D. in 1984 in Geophysical Fluid Dynamics from Florida State University.