Decadal Survey for Earth Science and Applications from Space - Panel on Weather and Air Quality: Minutes to Subseasonal

Committee

Steven A. Ackerman

Co-Chair

STEVEN A. ACKERMAN is a professor of atmospheric and ocean sciences and director of the Cooperative Institute for Meteorological Satellite Studies at the University of Wisconsin, Madison. He also serves as Associate Vice Chancellor for research physical sciences. Dr. Ackerman’s current research focuses on satellite remote sensing and has produced several new methodologies for interpreting satellite observations, which has led to improved understanding of the radiative properties of clouds, a critical factor in weather and climate. He was elected a fellow of the American Meteorological Society (AMS) and a fellow of the Wisconsin Academy of Science, Arts and Letters. He is the recipient of numerous awards, including the NASA Exceptional Public Service Medal and the AMS’s Teaching Excellence Award. He received his Ph.D. in atmospheric science from Colorado State University. Dr. Ackerman has served on the Academies’ Committee for Earth Science and Applications from Space and the Committee on a Framework for Analyzing the Needs for Continuity of NASA-Sustained Remote Sensing Observations of the Earth from Space.

Nancy L. Baker

Co-Chair

NANCY L. BAKER is a meteorologist and head of the data assimilation section in the Marine Meteorology Division at the Naval Research Laboratory. She has more than 30 years of experience with the U.S. Navy in atmospheric data assimilation, observation impact assessment, observation quality control and numerical weather prediction. She has expertise in advanced data assimilation methods such as 3D-Var, 4D-Var and hybrid ensemble/variational 4D-Var, and has had a leading role in the development and transition of those systems to the Navy for operational implementation. Satellite data assimilation has been one of her primary areas for the past 20 years. She currently serves as the Associate Director for the Navy to the Joint Center for Satellite Data Assimilation, and previously served as the Navy technical liaison. She led a Navy-sponsored study to assess the dependency on foreign satellites for environmental characterization. She is currently principal investigator for a Navy-sponsored project designed to assess the impact of the upcoming NASA CYGNSS (GNSS-R) mission on tropical NWP and tropical cyclone track, intensity and structure forecasts. Her dissertation research developed the observation adjoint sensitivity theory which subsequently led to the ground-breaking development of the Forecast Sensitivity Observation Impact with Dr. Rolf Langland. She earned her Ph.D. in meteorology from the Naval Postgraduate School. She served as a member for the Academies' Committee on the Future of Rainfall Measuring Missions.

Philip E. Ardanuy

Member

PHILIP E. ARDANUY is chief science officer of INNOVIM. Dr. Ardanuy's research considers the non-stationary influences of a changing climate on the water security, energy security, and food security aspects of national and economic security—now achieving parity along-side core weather, oceans, and fisheries priorities—and the implications for observing systems architectures and technological maturation. His expertise, developed over 35 years working with NASA and NOAA, spans the development of complex remote sensing flight systems and their cyberinfrastructure, end-user services, and applications to support operational Earth observation missions and research priorities. His experience overs the entire environmental information and intelligence value stream—from algorithm theoretical basis and remote sensing, through architecture and systems engineering, data acquisition and product generation, reprocessing and archive, to modeling, visualization, and decision support delivering environmental intelligence for multiple GEOSS societal benefit areas. Previously, Dr. Ardanuy served as chief scientist and earth science solution architect for Raytheon Intelligence and Information Systems. He was elected to the Nimbus-7 Earth Radiation Budget Science Team, for on-orbit calibration and characterization leadership in 1985. He has been the recipient of multiple NASA GSFC and LaRC group achievement awards, 1983-1995. At Raytheon, he was honored as Raytheon Engineering Fellow in 2007 and as Raytheon Principal Engineering Fellow in 2010, and received the Raytheon Peer Award in 2004. He was honored as a fellow of the AMS in 2011 and elected to the AMS Council in 2015. He earned his Ph.D. in meteorology from the Florida State University. He has previously served on the Academies' Committee on the Assessment of NASA's Earth Science Programs, Committee on Earth Studies, and Committee on Strategy to Mitigate the Impact of Sensor De-scopes and De-manifests on the NPOESS and GOES-R Spacecraft.

Elizabeth A. Barnes

Member

ELIZABETH A. BARNES is an assistant professor at Colorado State University in the department of atmospheric sciences. Her research focuses on large-scale atmospheric dynamics, with specific interests including internal climate variability, climate change, climate statistics, eddy-mean flow dynamics, jet-stream variability, tropospheric transport, cross-tropopause exchange and air quality. Previously, Dr. Barnes was a NOAA Climate and Global Change Postdoctoral Fellow at the Lamont-Doherty Earth Observatory of Columbia University. She is a recipient of the 2014 AGU James R. Holton Junior Scientist Award. She earned her Ph.D. in atmospheric science from the University of Washington. She has not previously served on a committee of the Academies.

Stanley G. Benjamin

Member

STANLEY G. BENJAMIN is chief of the Assimilation and Modeling Branch at the NOAA Earth System Research Laboratory. He is also a research meteorologist in the Global Systems Division. He leads the Earth Modeling Branch, as well as projects on development of advanced regional and global atmospheric prediction models and data assimilation. He won the Department of Commerce Gold Medal in 2015. Besides basic model and assimilation development, he has focused on model applications to global circulation, hydrology, transportation, renewable (wind and solar) energy, severe weather, winter storms, and air quality. Dr. Benjamin earned his Ph.D. in meteorology from Pennsylvania State University. He has not previously served on a committee of the Academies.

Mark A. Bourassa

Member

MARK A. BOURASSA is a professor of meteorology at Florida State University in the department of Earth, Ocean, and Atmospheric Science. He is also the associate director of the Center for Ocean-Atmospheric Prediction Studies. His areas of expertise are remote sensing, air/sea interaction, boundary-layer physics, and the climate observing system. He has been a member of many NASA science teams and NOAA’s team of ocean observations. He has been the team leader for NASA’s Ocean Vector Winds Science Team for the last eight years, during which time this team received the William T. Pecora Award. He has served as co-chair of a US Climate Variability and Predictability Program panel on high-latitude surface fluxes, and is currently a co-chair of a Global Climate Observing System panel. Dr. Bourassa earned his Ph.D. in atmospheric science from Purdue University. He has not previously served on a committee of the Academies.

Bryan N. Duncan

Member

BRYAN N. DUNCAN is a research physical scientist at NASA's Goddard Space Flight Center (GSFC) in the Atmospheric Chemistry and Dynamics Laboratory. He is the deputy project scientist of NASA's Aura Satellite Mission, which has air quality as one of its core science objectives. He has published a number of studies that use satellite data for air quality applications and that show how atmospheric columns (measured by the satellite) relate to quantities that the air quality community knows, such as "nose-level" concentrations. Dr. Duncan authored a review article entitled, "Satellite Data of Atmospheric Pollution for U.S. Air Quality Applications: Examples of Applications, Summary of Data End-User Resources, Answers to FAQs, and Common Mistakes to Avoid." He is a selected member of NASA's Air Quality Applied Sciences Team (AQAST) which works to facilitate the use of satellite data by the air quality community. Dr. Duncan was also involved in NASA's DISCOVER-AQ campaign. In addition to air quality, his research interests include computer modeling of the transport and chemistry of methane and other trace gases. Previously, Dr. Duncan was a postdoctoral fellow at Harvard University and the Swiss Institute of Technology, and a Senior Research Scientist at the University of Maryland Baltimore County. He earned his Ph.D. in earth and atmospheric sciences from the Georgia Institute of Technology. He has not previously served on a committee of the Academies.

Charles E. Kolb

Member

CHARLES E. KOLB (NAE) is the president and chief executive officer of Aerodyne Research, Inc.(ARI). He has extensive experience in atmospheric and environmental chemistry, combustion chemistry and the chemistry and physics of rocket and aircraft exhaust plumes. He has authored or co-authored over 200 peer reviewed journal articles and book chapters on these and related topics, including gas-phase and heterogeneous (gas-surface) chemical kinetics, quantitative trace gas spectroscopy and computer simulations of chemically reacting systems. He initiated ARI's efforts to develop advanced laser spectroscopy and mass spectrometry sensors for atmospheric trace gases and aerosol particles, which are widely used to measure ambient concentrations and emission/deposition fluxes of atmospheric pollutants. He received the 1997 Award for Creative Advances in Environmental Science and Technology from the American Chemical Society (where he has also has been elected a fellow), the American Physical Society, the Optical Society of America, the AGU, and the AAAS. He has served as the atmospheric sciences editor of the journal Geophysics Research Letter, the Editorial Advisory Boards of the International Journal of Chemical Kinetics and Environmental Science & Technology. He earned his Ph.D. in physical chemistry from Princeton University. He was recognized as a National Associate of the National Academies in 2003, and has served on numerous boards and committees of the Academies, including Panel on Information Science at the Army Research Laboratory (thru 4/30/2017), Special Fields and Interdisciplinary Engineering Peer Committee (thru 1/31/2017), and the Committee on Capitalizing on Science, Technology, and Innovation: An Assessment of the Small Business Innovation Research Program-Phase II (thru 6/30/2016).

Ying-Hwa Kuo

Member

YING-HWA KUO is the director of UCAR Community Programs (UCP) at the University Corporation for Atmospheric Research. UCAR consists of seven community-based programs in education and training, science support services, and data services, including the COSMIC Program. COSMIC is a joint US-Taiwan mission, which demonstrated the use of GPS radio occultation technique in operational weather forecasting, climate monitoring and space weather prediction. Dr. Kuo led the COSMIC Program from its inception. His team is currently working with NOAA, Air Force, and Taiwan's NSPO on the development of the follow-on COSMIC-2 mission, which will be launched in the spring of 2017. His scientific interests include GPS atmospheric remote sensing and their research applications, analysis and prediction of hurricanes, extratropical cyclones, mesoscale convective systems, heavy rainfall events. Dr. Kuo also serves as the director of the Developmental Testbed Center, which is jointly funded by NOAA, Air Force, NCAR, and NSF, with the primary mission to facilitate the transition of research in numerical weather prediction into operations. Previously, Dr. Kuo was the head of the Mesoscale Prediction Group at NCAR, responsible for the development and applications of mesoscale weather prediction models. He is a fellow of the AMS. He earned his Ph.D. in meteorology from Pennsylvania State University. He has previously served on the Academies' Committee on Utilization of Environmental Satellite Data: A Vision for 2010 and Beyond.

W. Paul Menzel

Member

W. PAUL MENZEL is a senior scientist at the University of Wisconsin, Madison in the Space Sience Engineering Center (SSEC). His current research is focused on studying cloud and moisture properties derived from 35 years of HIRS data and extending that record with CrIS and IASI data. Previously, Dr. Menzel served as the Verner Suomi Distinguished Professor in the department of atmospheric and oceanic science at UW-Madison; and in sveral roles at the National Oceanic and Atmospheric Administration National Environmental Satellite, Data, and Information Service (NOAA/NESDIS). He was head of the Advanced Satellite Products Project, where he was responsible for the development, testing, and evaluation of procedures for deriving new atmospheric products from space-borne observations, and also their transfer from the research laboratory to the operational weather forecaster. He served as chief scientist of the Office of Research and Applications of NOAA/NESDIS; he was responsible for providing guidance on science issues and initiating major science programs for the Office Director. Dr. Menzel was a Principal Investigator of the MODIS Science Team for over twenty years, where he had primary responsibility for algorithms to derive cloud-top properties, atmospheric profiles, and column water vapor using infrared bands on MODIS (Moderate Resolution Imaging Spectroradiometer). Dr. Menzel received his Ph.D. in theoretical solid state physics at the University of Wisconsin, Madison. He has not previously served on a committee of the Academies.

Maria A. Pirone

Member

MARIA A. PIRONE is the senior manager of business development for the Environmental Solutions at Harris Corporation. At Harris, Ms. Pirone has lead business development offering information technology solutions for satellite ground processing, and weather and climate challenges within the federal government and internationally. Her expertise is in information technology that provides useful information from aggregated disparate data to benefit specific markets and individual users. During her forty year career she has held senior management positions in both the marketing and technical development of weather and climate products and services. At WSI (now The Weather Company), she managed the technical development and later product management of a family of weather radar products based on the first widely used national radar mosaic. She also developed strategic plans for new services, the most memorable included delivering weather in the cockpit for pilot use. Most recently at Atmospheric and Environmental Research, she led the commercialization of key AER research including seasonal forecasts, space weather and ensembles processed into statistically-based, probabilistic forecast products for weather and energy traders. She received her M.B.A. in finance from Suffolk University in Boston. She has previously served as a member of the Academies' Committee on Partnerships in Weather and Climate Services.

Armistead G. Russell

Member

ARMISTEAD G. RUSSELL is the Howard T. Tellepsen Chair and Regents' Professor at the Georgia Institute of Technology in the school of Civil and Environmental Engineering. His primary research is aimed at better understanding the dynamics of air pollutants at urban and regional scales and assessing their impacts on health and the environment to develop approaches to design strategies to effectively improve air quality. Prior to coming to Georgia Tech, he was a professor of mechanical engineering at Carnegie Mellon University. He is a fellow of AAAS and American Society of Mechanical Engingeers (ASME). He earned his Ph.D. in mechanical engineering from the California Institute of Technology. He has previously served on the Academies' Committee on the Review of the Draft Interagency Report on the Impacts of Climate Change on Human Health in the United States (2015) and Board on Environmental Studies and Toxicology. He currently serves on the Committee on the Assessment of the Department of Veterans Affairs Airborne Hazards and Open Burn Pit Registry - Phase 1 (thru 3/31/2017) and the Planning Committee for Black Carbon Issues: A Meeting (thru 12/31/2016).

Julie O. Thomas

Member

JULIE O. THOMAS is a co-principal investigator and program manager for the Coastal Data Information Program (CDIP). She is also executive director of the Southern California Coastal Ocean Observing System (SCCOOS). Based at the Scripps Institution of Oceanography, Ms. Thomas has been focused on real-time data transfers, particularly for physical oceanographic parameters such as waves, winds and currents. In collaboration with the National Data Buoy Center, CDIP disseminated wave data to the National Weather Service and to the general public. She was involved with early efforts to standardize wave data formats, develop metadata, quality control and archive procedures. In this role, with her focus on wave data, she maintained standards for an “end to end” system, collecting and disseminating high resolution data. Her work promotes the primary operational interface with the scientific user community and technical partners and provides direction for the curation and management of the data holdings. She is an advocate for the development of ocean observing systems at regional, state and national levels, promoting inter-agency collaboration, data interoperability and data standards. Ms. Thomas earned her M.A. in French literature from San Diego State University. She has not previously served on a committee of the Academies.

Duane E. Waliser

Member

DUANE E. WALISER is chief scientist of the Earth Science and Technology Directorate at the Jet Propulsion Laboratory. His principle research interests lie in weather-climate prediction and predictability, with emphasis on the Tropics, Earth System processes and the Earth's water cycle. His recent research focus 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. Previously, he was on the faculty in the School of Marine and Atmospheric Sciences at the State University of New York. Dr. Waliser is also 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. He is presently a member of the WCRP-WWRP (World Climate Research Programme) Subseasonal to Seasonal (S2S) Steering Group, Co-Chair of the WCRP Data Advisory Council’s obs4MIPs Task Team, and previous Co-chair of the WCRP-WWRP/THORPEX Year of Tropical Convection (YOTC) Activity, U.S. CLIVAR MJO Working Group, and WCRP-WWRP MJO Task Team. He has previously served on the Academies’ Committee on Assessment of Intraseasonal to Interannual Climate Prediction and Predictability and the Committee on Developing a U.S. Research Agenda to Advance Subseasonal to Seasonal Forecasting.

Xubin Zeng

Member

XUBIN ZENG is professor and director of the Climate Dynamics and Hydrometeorolgy Center at the University of Arizona. Through over 150 peer-reviewed papers, Dr. Zeng’s research has focused on land-atmosphere-ocean interface processes, weather and climate modeling, hydrometeorology, remote sensing, and nonlinear dynamics. His model parameterizations and global value-added, observation-based datasets have been widely used in weather and climate models. He acts as a bridge linking measurement technology, in-situ and satellite data, and modeling communities. Dr. Zeng is a fellow of the AMS, and served on its executive committee and council. He received the Special Creativity Award from the National Science Foundation and the Outstanding Faculty Award from the UA Asian American Faculty, Staff and Alumni Association. He is also a Galileo Circle Fellow - the highest recognition awarded by the UA College of Science. Dr. Zeng earned his Ph.D. in atmospheric science from Colorado State University. He has previously served on the Academies' Board on Atmospheric Sciences and Climate (BASC), co-chaired the Committee on Urban Meteorology: Scoping the Problem, Defining the Needs (A Workshop), and served on the Committee on Progress and Priorities of U.S. Weather Research and Research-to-Operations Activities.

Arthur A. Charo

Staff Officer