

Invitation for Comment on the Biogenic Carbon Emissions Panel Nominees

Environmental Protection Agency Science Advisory Board Staff Office

June 24, 2011

The EPA Science Advisory Board (SAB) Staff Office announced in a *Federal Register* Notice on April 27, 2011 (76 FR 23587-23588) that it was forming a panel to provide independent advice to EPA on a draft greenhouse gas accounting methodology for biogenic carbon dioxide (CO₂) emissions from stationary sources.

To form the panel, the SAB Staff Office sought public nominations of nationally recognized experts in the follow areas:

- Land-use change, specifically the effects of land management practices on the terrestrial biosphere;
- Inventory, measurement and carbon accounting methodologies for national greenhouse gas inventories, or other relevant emissions and sequestration quantification guidelines in use;
- Land use economics, ecological relationships between land use and climate change and/or estimates of biomass supply and demand;
- Environmental science and climate change, particularly with a multidisciplinary perspective;
- Engineering, particularly with respect to the design and operation of solid-fuel-fired boilers and related air pollution control systems for the power and industrial sectors, including pulp and paper applications;
- Design and implementation of regulatory programs at local, state and federal scales, with specific reference to developing and/or implementing monitoring; and
- Accounting approaches for agriculture, land use, land-use change and forestry.

Background information on the project and details on the nomination process appeared in the cited notice.

Based on qualifications, interest, and availability of the nominees, the SAB Staff Office identified the attached "Short List" of nominees. Brief biographical sketches of the eighty-two (82) candidates on the "Short List" are listed below for comment.

The SAB Staff Office Director makes the final decision about who will serve on the panel based on all relevant information. This includes a review of the candidate's confidential financial disclosure form (EPA Form 3110-48) and an evaluation of a lack of impartiality. For the EPA SAB Staff Office, a balanced committee or panel is characterized by inclusion of candidates who possess the necessary domains of knowledge, the relevant scientific perspectives (which, among other factors, can be influenced by work history and affiliation), and the collective breadth of experience to adequately address the general charge. Specific criteria to be used in evaluating a candidate include: (a) scientific and/or technical expertise, knowledge, and experience (primary factors); (b) availability and willingness to serve; (c) absence of financial conflicts of interest; (d) absence of an appearance of a lack of impartiality; and (e) skills working

in committees, subcommittees and advisory panels; and, for the panel as a whole, (f) diversity of, and balance among, scientific expertise, viewpoints, etc.

We welcome information, analysis or documentation for the Staff Office to consider in evaluating the “Short List” candidates. Please provide any comments you may have with respect to the “Short List” candidates no later than July 15, 2011. Please submit your comments to the attention of Dr. Holly Stallworth, Designated Federal Officer at stallworth.holly@epa.gov. Please be advised that comments are subject to release under the Freedom of Information Act.

Biogenic Carbon Emissions Panel Candidates

Abt, Robert

North Carolina State University Department of Forestry and Environmental Resources

Dr. Robert Abt is a Professor of Forest Economics and Management at North Carolina State University where he teaches natural resource management and forest economics. He has 25 years of experience modeling forest-dependent industries and markets. He developed the Sub-Regional Timber Supply (SRTS) modeling framework which was funded by the Department of Energy, the National Air and Space Administration (NASA), the U.S. Department of Agriculture (USDA) Forest Service and the Environmental Protection Agency (EPA). It has been used by NASA and EPA to evaluate the potential impact of climate change and other environmental stressors of southern forests. The model has also been used by the USDA Forest Service in its Southern Forest Resource Assessment. Dr. Abt's forest resource assessment research is supported by a consortium of 22 resource dependent firms who are members of the Southern Forest Resource Assessment Consortium at NC State University. In the last five years, Dr. Abt has focused on the potential impact of bio-energy demand on the sustainability of the forest resource, traditional wood dependent industries, and sequestered carbon. He has provided consultation on this topic to the National Academy of Sciences, the Pinchot Institute, the Heinz Center, the Environmental and Energy Study Institute, the Environmental Defense Fund, and the Southern Agriculture and Forestry Energy Resources Alliance. In addition he has provided resource analysis for the states of Florida, North Carolina, South Carolina, Tennessee, the Southern Group of State Foresters, the Northern Group of State Foresters and the USDA Forest Service Southern Forest Futures Project.

Adair, Janice

State of Washington Department of Ecology

Ms. Janice Adair serves as the Special Assistant for Climate Policy to the Director of Washington State's Department of Ecology. Ms. Adair was the first Chair of the Western Climate Initiative (WCI), a collaboration of 7 US states and 4 Canadian provinces. During her tenure as chair, she helped guide the WCI to agreement on its design for an economy-wide regional cap-and-trade program. She represents Washington as a member of the Board of Directors for The Climate Registry and serves on its Executive Committee. She also represents Washington in a subnational collaboration of approximately 20 states working together to develop greenhouse gas reduction strategies. She has authored or co-authored *Growing Washington's Economy in a Carbon-Constrained World* in 2008; *Design Recommendations for the WCI Regional Cap-and-Trade Program* in 2008, and *Path to a Low-Carbon Economy* in 2010. She has worked in environmental policy for more than 18 years in both Washington and Alaska. Ms. Adair holds a degree in Political Science from the University of Alaska, where she graduated with honors.

Allen, David T.

University of Texas Department of Chemical Engineering

Dr. David T. Allen is the Gertz Regents Professor of Chemical Engineering, and the Director of the Center for Energy and Environmental Resources, at the University of Texas at Austin. He holds a B.S. in Chemical Engineering from Cornell University (1979), and an M.S. (1981) and Ph.D. (1983) in Chemical Engineering from California Institute of Technology. Dr. Allen is the author of six books and over 190 papers in areas ranging from coal liquefaction and heavy oil chemistry to the chemistry of urban atmospheres. For the past decade, his work has focused primarily on urban air quality and the development of materials for environmental education. Dr. Allen was a lead investigator for the first and second Texas Air Quality Studies, which involved hundreds of researchers drawn from around the world, and which have had a substantial impact on the direction of air quality policies in Texas. He has also developed environmental educational materials for engineering curricula and for the University's core curriculum. The quality of Dr. Allen's work has been recognized by the National Science Foundation (through the Presidential Young Investigator Award), the AT&T Foundation (through an Industrial Ecology Fellowship), the American Institute of Chemical Engineers (through the Cecil Award for contributions to environmental engineering and through the Research Excellence Award of the Sustainable Engineering Forum), the Association of Environmental Engineering and Science Professors (through their Distinguished Lecturer Award), and the State of Texas (through the Governor's Environmental Excellence Award). He has won teaching awards at the University of Texas and UCLA. Dr. Allen has held visiting faculty appointments at the California Institute of Technology, the University of California, Santa Barbara, and the Department of Energy.

Barlaz, Morton**North Carolina State University Department of Civil, Construction, and Environmental Engineering**

Dr. Morton A. Barlaz is a Professor in the Department of Civil, Construction, and Environmental Engineering at North Carolina State University. He received a B.S. in Chemical Engineering from the University of Michigan and an M.S. and Ph.D. in Civil and Environmental Engineering from the University of Wisconsin. He has been involved in research on various aspects of solid waste since 1983. Over this time, he has conducted research on biological refuse decomposition, methane production, and the biodegradation of hazardous wastes in landfills. He has participated in two state-of-the-practice reviews of bioreactor landfills. His research forms the basis for much of the work done to assess the impact of landfills on methane emissions inventories. Dr. Barlaz also conducts research on the use of life-cycle analysis to evaluate environmental emissions associated with alternate solid waste management strategies. Dr. Barlaz is the author of over 70 peer-reviewed publications and has made over 150 presentations at conferences throughout the world. In 1992 he was awarded a Presidential Faculty Fellowship from the National Science Foundation. Dr. Barlaz has been active in service throughout his career. He is an Associate Editor for two journals (Waste Management and Journal of Environmental Engineering) and serves as co-chair of the bi-annual Intercontinental Landfill Research Symposium. He has served as chair of the Government Affairs Committee and the Lectures Committee for the Association of Environmental Engineering and Science Professors, and on the advisory board for the NASA Advanced Life Support Research Center at Purdue University. Finally, he serves on the Science Advisory Committee for the International Waste Working Group.

Becker, Dennis**University of Minnesota Department of Forest Resources**

Dr. Dennis Becker is currently an Associate Professor of Natural Resource and Environmental Policy at the University of Minnesota. Dr. Becker's Master's degree was in the social science of natural resource management with a focus on recreation. He is an occasional consultant for forest certification auditing, a Science Review Panel member for the Herger-Feinstein Quincy Library Group Forest Recovery Act. He has presented to Congress on various aspects of forest biomass utilization including carbon implications. His areas of expertise are in the policy and social science aspects of public and private forest management. Dr. Becker has done extensive research on the economic and political barriers to biomass utilization, supply modeling, and supply chain analysis. To inform his policy research, Dr. Becker works on a great variety of projects ranging from forest carbon lifecycle analysis to forest operations, and product development.

Birdsey, Richard**U.S. Forest Service Northeastern and North Central Research Stations**

Dr. Richard Birdsey received a Ph.D. degree in quantitative methods from the State University of New York, College of Environmental Science and Forestry. He has a Master's Degree in World Forestry and a Bachelor's Degree in Anthropology. He spent 2 years as a Peace Corps Forester in Ecuador, 10 years as a Research Forester with the Forest Service in the Forest Inventory and Analysis Project at the Southern Research Station, and 3 years on the Forest Inventory and Analysis Staff in the Washington Office of the Forest Service. He has been Program Manager for Global Change Research for the last 10 years at the Northeastern and North Central Research Stations. Dr. Birdsey is a specialist in quantitative methods for large-scale forest inventories and has pioneered the development of methods to estimate national carbon budgets for forest lands from forest inventory data. Dr. Birdsey pioneered the use of USDA Forest Service Forest Inventory and Analysis (FIA) system for estimating forest carbon at regional and national scales. In his current role as Program Manager, Dr. Birdsey is coordinating a national research effort to analyze the impacts of international protocols on carbon accounting for the US, and to identify forest management strategies to increase carbon sequestration. He is also coordinating an interagency study of large-scale ecosystem monitoring methods in the Delaware River Basin.

Booth, Mary**Partnership for Policy Integrity**

Dr. Mary S. Booth is a co-founder and Senior Analyst at the Partnership for Policy Integrity. She received her Bachelor's degree in Anthropology and Archaeology at the University of Massachusetts, Amherst, followed by a Masters Degree in Botany with an emphasis in Soil Science. She received her doctoral degree in Ecology at Utah State University at Logan with emphases in biogeochemistry and plant ecophysiology, focusing on how invasive grasses alter water balance and nutrient cycling in the cold desert. She completed postdoctoral fellowships at the Ecosystems Center at the Woods Hole Biological Laboratory, focusing on carbon and nutrient cycling in arctic ecosystems, and the Earth Institute at Columbia

University, focusing on human-mediated biogeochemical processes at the urban/hinterland interface in Uganda. Her work incorporates approaches at several scales, including GIS-based watershed modeling and soil microbial nutrient cycling. Dr. Booth completed the only critical review of the Manomet Biomass Sustainability and Carbon Policy Study published to date, the study upon which the State of Massachusetts based its recently issued regulations regarding biomass energy. Her research over the last two years has focused exclusively on biomass power and has incorporated datasets and analyses pertaining to all aspects of the industry, including Energy Information Administration biomass power sector projections, Forest Service data on forest growth and harvesting, life-cycle emissions analysis, biomass fuel availability, and combustion technologies. She has worked with a number of organizations to provide science-based content regarding biomass power, and has authored numerous comment letters and provided input on biomass-related policies at the state and federal level. Her current research includes creating a user-friendly lifecycle model of biomass carbon emissions that calculates net carbon emissions and resequestration for different fuels over time.

Brown, Sandra

Winrock International

Dr. Sandra Brown has been with Winrock International since 1998, where she is now Chief Scientist and Director of the Ecosystem Services Unit. Prior to that she was a Professor in the Forestry Department at the University of Illinois in Urbana Champaign. She has a PhD in systems ecology from the University of Florida, a MS. in engineering science from the University of South Florida, and a BS in chemistry from the University of Nottingham. Dr. Brown has successfully led numerous projects on estimating the carbon dynamics of the world's forests, particularly tropical forests, due to human disturbance; conducting assessments on the economic potential of climate change mitigation programs and activities within the US; developing baseline, leakage, and monitoring methodologies for forest-based carbon projects worldwide; providing guidance on developing Reduced Emissions from Deforestation and Degradation (REDD+) reference scenarios and Monitoring, Reporting and Verification (MRV) systems at national and subnational scales; and apprising a variety of US governmental, multilateral, and non-profits on deforestation issues, carbon trading, and carbon measurement and monitoring systems. Dr. Brown was a recipient of a Nobel Prize diploma from the Intergovernmental Panel on Climate Change where she served as a co-convening lead chapter author on five Intergovernmental Panel on Climate Change (IPCC) reports and she has more than 200 peer reviewed publications.

Buford, Marilyn

U.S. Forest Service National Program Staff

Dr. Marilyn Buford provides national leadership for US Forest Service research programs in silviculture and sustainable forest productivity, and co-leads the Forest Service Biobased Products and Bioenergy Research Program. Marilyn joined the Forest Service Research and Development National Program Staff in August, 1998, serving as National Program Leader for Quantitative Ecology Research and co-lead for Forest Service Global Change Research Program. Marilyn served as scientist and Project Leader in Charleston, SC, (Forested Wetlands) and in Research Triangle Park, NC (Southern Forest Productivity) from 1985 to 1998. During that time, she helped form and lead the Short Rotation Woody Crops (SRWC) Cooperative Research Program located at the Savannah River Site (Aiken, SC). She is a leader of the US Department of Agriculture Biobased Products and Bioenergy Coordination Council, an active member of the USDA Energy Council Coordination Committee and of the Interagency Woody Biomass Utilization Group, and serves on numerous interagency teams providing analysis and technical information for federal bioenergy and biobased products efforts, including Biomass Research and Development (R&D) Board teams. Dr. Buford is immediate past Chair of the Short Rotation Woody Crops (SRWC) Operations Working Group, a public-private partnership to promote collaborative efforts in developing needed science and technology for SRWC plantations. Her personal research and publications have focused on forest stand dynamics, forest carbon management, and forest productivity.

Chanton, Jeffrey

Florida State University Department of Oceanography

Dr. Jeff Chanton received his Ph.D. from the University of North Carolina at Chapel Hill. Dr. Chanton joined the faculty at Florida State University in the Department of Oceanography in 1989. Awards include the title of Distinguished Research Professor and the John Winchester Professorship. He is an Aldo Leopold Fellow and was named the Florida Wildlife Federation's Conservation Communicator of the year in 2005. He has authored or co-authored over 165 papers in the peer reviewed literature and received over 50 grants and contracts to support his research. Funding agencies include Federal

agencies such as the National Science Foundation, the National Oceanic and Atmospheric Administration, National Marine Fisheries, Environmental Protection Agency and the Department of Energy and state agencies such as Florida's Department of Environmental Protection and Department of Health. He teaches classes at the graduate and undergraduate level and is the director of the Universities Aquatic Environmental Science Graduate Program and the Department of Earth, Ocean and Atmospheric Sciences Undergraduate Program. Dr. Chanton works on a variety of research problems that involve fluxes of greenhouse gases methane and carbon dioxide, isotopic chemistry and groundwater issues. Current projects include the effect of permafrost decomposition on methane release from boreal regions, the design of landfill covers to reduce methane emissions and the study of ecosystem respiration (carbon dioxide exchange) in pine forests, wetland and peat bogs. He's also involved in studies of gas hydrate stability and is a member of the Gulf of Mexico Gas Hydrate Research Consortium to establish a sea floor observatory.

Cooper, Geoff

Renewable Fuels Association

Mr. Geoff Cooper is the Renewal Fuel Association's Vice President of Research and Analysis. He oversees research and technical activities for nation's largest trade association representing U.S. ethanol producers. Mr. Cooper conducts public policy and regulatory research and economic analysis for staff and members. He directs strategic planning activities to advance the association's goals. Further, he serves as the association's primary expert and spokesperson on low carbon fuels regulations, lifecycle environmental analysis, sustainability, land use issues, agriculture and energy commodity markets, ethanol co-products, and other priority issues. He directs and collaborates with outside economic and scientific consultants on technical issues and modeling. He is responsible for developing internal and external analyses, reports, and studies to support association's public policy, regulatory, and public relations objectives. He also interacts regularly with financial analysts, public and private sector economists, and federal and state agency staff. Provides testimony and comments at state and federal legislative hearings and agency forums.

Dale, Bruce

Michigan State University Department of Chemical Engineering and Materials Science

Professor Bruce Dale is Professor of Chemical Engineering and former Chair of the Department of Chemical Engineering and Materials Science at Michigan State University. He received his bachelors degree (summa cum laude) in chemical engineering from the University of Arizona (Tucson) in 1976 and the masters degree from that same university in 1976. Dr. Dale then studied under Professor George T. Tsao at Purdue University, receiving his Ph. D. degree in 1979. Dr. Dale's first academic position was in the Department of Agricultural and Chemical Engineering at Colorado State University, where he rose to the rank of Professor in 1988. In that same year he joined Texas A&M University where he became Professor of Chemical Engineering and Professor of Agricultural Engineering. Dr. Dale also directed two large interdisciplinary research centers at Texas A&M: the Engineering Biosciences Research Center and the Food Protein Research and Development Center. In 1996 Dr. Dale became Professor and Chair of the Department of Chemical Engineering at Michigan State University, where he also holds an appointment in the Michigan Agricultural Experiment Station. Also in 1996 he won the Charles D. Scott Award for contributions to the use of biotechnology to produce fuels, chemical and other industrial products from renewable plant resources. In 2001 he stepped down as Chair to return to full time research and teaching. Professor Dale's research and professional interests lie at the intersection of chemical engineering and the life sciences. Specifically, he is interested in the environmentally sustainable conversion of plant matter to industrial products- fuels, chemicals and materials- while meeting human and animal needs for food and feed. He led a National Research Council report entitled "Biobased Industrial Products: Research and Commercialization Priorities" which was published in May 2000.

Darlington, Thomas

Air Improvement Resource, Inc.

Mr. Thomas Darlington is President and Founder of Air Improvement Resource, Inc, a company formed in 1994 that specializes in emissions from mobile sources, air quality impacts of mobile sources and fuels, and lifecycle emissions from alternative transportation fuels. Mr. Darlington served on EPA's Modeling Working Group (MWG) reporting to the Mobile Source Technical Review Subcommittee FACA at the request of both the Alliance of Automobile Manufacturers and the Engine Manufacturers Association. The MWG is a stakeholder group of industry, transportation, and government (state and federal) officials that provide feedback to EPA on a broad range of modeling policy issues related to mobile source emissions modeling. More recently, Mr. Darlington and others at AIR have performed extensive work for a variety of clients

on quantifying land use change emissions impacts of biofuels such as corn ethanol, and soybean and palm oil biodiesel, utilizing several general equilibrium and partial equilibrium models. They have also performed extensive reviews of California's Low Carbon Fuel Standard and EPA's Renewable Fuel Standard.

Draucker, Laura

World Resources Institute

Dr. Laura Draucker is a greenhouse gas (GHG) accounting and Life Cycle Assessment (LCA) expert with the World Resources Institute (WRI), a globally recognized environmental think tank that goes beyond research to create practical ways to protect the earth and improve people's lives. She has spent the past two years as technical lead on the development of the GHG Protocol Product Life Cycle Accounting and Reporting Standard, where her in-depth knowledge and understanding of challenging accounting issues such as the treatment of biogenic carbon and land use change impacts allowed her to propose solutions and gain consensus on those issues among a wide stakeholder group. Dr. Draucker's work has gained recognition outside of the GHG Protocol and WRI. Dr. Draucker was asked to participate in an expert workshop on temporary carbon storage accounting hosted by the European Commission's Joint Research Centre in 2010, and she was invited as one of 50 expert participants in a United Nations Environment Program (UNEP) Society of Environmental Toxicology and Chemistry (SETAC) LCA Global Database Pellston Workshop earlier this year. Dr. Draucker has also been asked to participate in several working groups and paper reviews on the topic of biogenic CO₂ accounting within LCA. She has a PhD in Chemical Engineering from Georgia Institute of Technology, and completed a post doc with the US EPA Office of Research and Development.

Ducey, Mark

University of New Hampshire Department of Natural Resources and the Environment

Dr. Mark Ducey is currently Professor of Forest Biometrics at the University of New Hampshire, where he is also Senior Fellow in the Carsey Institute. Dr. Ducey has nearly two decades of experience in research in forestry and applied ecology, with field experience in the U.S., Canada, Norway, New Zealand, and Brazil. An emphasis of much of his current research is carbon accounting in forests and the forestry sector, including the integration of inventory data, remotely sensed observations, and modeling to provide accurate, spatially-explicit estimate of carbon stocks and fluxes from stand to continental scales. Other current research projects explore the availability of wood for, and social and ecological impacts of, forest-based biomass energy development, as well as the impacts of forestry and land-use change on long-term trends in biodiversity. At the Carsey Institute, Dr. Ducey is a member of the interdisciplinary Community and Environment in Rural America team, conducting policy-oriented analyses of the coupled economic, demographic, sociological, and ecological changes in communities across the United States.

Endres, Jody

University of Illinois Energy Biosciences Institute

Ms. Jody Endres is the Senior Attorney at the Energy Biosciences Institute at the University of Illinois at Urbana-Champaign. She received her J.D. from the University of Illinois College of Law. Her research focuses on agricultural and environmental policy analysis of biomass-based energy alternatives. She has examined various facets of biomass sustainability provisions, including the efficacy of a meta-standard to address environmental, economic and social concerns associated with biomass-based energy from both cropped and forestry resources. Her current work focuses on systems/complexity theory (particularly the application of lifecycle analysis in the agricultural landscape for carbon and non-carbon environmental values), possible reconsideration of forestry policies in light of increased bioenergy demand created by carbon regimes, contracts' role in building biomass supply chains, and governance issues related to an international standard for agricultural-based energy systems. As an adjunct professor in the College of Agricultural, Consumer and Environmental Sciences, Ms. Endres teaches law and policy courses such as environmental law and policy to non-law graduate students pursuing careers in bioenergy, agricultural and natural resource sciences. She will chair the board of the Council for Sustainable Biomass Production (CSBP) in 2012, and currently services as chair of its Field Testing Task Force. In that capacity, she works with other members and international experts in designing a carbon and other sustainability accounting methods for the CSBP's final standard that will be in operation by 2012. She also is a member of the Roundtable for Sustainable Biofuels, the California Low Carbon Fuel Standard's Sustainability Work Group, and co-chair of the environmental subcommittee within Leonardo Academy's American National Standards Institute (ANSI) Sustainability Standard for Agriculture. Ms. Endres sits on the Executive Committee of the Energy Biosciences Institute and the Advisory

Board for its Bioenergy Connections magazine.

Fried, Jeremy

U.S. Forest Service Pacific Northwest Research Station

Dr. Jeremy Fried has been with the Pacific Northwest Research Station's Forest Inventory and Analysis (FIA) unit since 1999, serving as California FIA analyst since 2000 and as team leader from 1999 to 2009. His research focus is interdisciplinary application of systems analysis and geographic information science to contemporary natural resource management issues. Current and recent examples include economic feasibility of landscape-scale fuel treatments, forest carbon accounting, initial attack simulation and optimization, impacts of climate change on wildland fire, and building inventory based models of fire effects. Before joining the Pacific Northwest Research Station, he served on the forestry faculties at Michigan State and Helsinki universities. He has a Ph.D. in forest management and economics at the University of California–Berkeley and an M.S. in forest ecology and soils from Oregon State University. Dr. Fried served as the resource measurements subject area representative on Society of American Foresters' Forest Science and Technology Board and as an officer (secretary, chair-elect, and chair) of both the Management Science/Operations Research and GIS working groups. Most recently, he served on the SAF task force responsible for the report "Managing Forests Because Carbon Matters: integrating energy, policy and land management planning".

Frost, Jeffrey C.

AgRefresh

Mr. Jeffrey C. Frost, AgRefresh's founder, Executive Director, and Director of Bioenergy Solutions, has been a technical carbon accounting professional for over a dozen years. His work has been in the field rather than as an academic scientist. His engagements have evolved from his participation in the development of key general accounting protocols such as the World Resources Institute (WRI) World Business Council for Sustainable Development (WBCSD) greenhouse gas (GHG) Protocol, for both their GHG inventory and project-based standards, to his current specialization in bioenergy ghg accounting solutions. He provided the technical support and facilitation for the 25x'25 fall 2010 Comparative Bioenergy Accounting Work Group (CBAWG) convening and has been the carbon advisor to the 25x'25 farm and forestry policy and practice Carbon Work Group for the past three years. He has participated in the Technical Working Group on Agricultural Greenhouse Gases (T-AGG) and Coalition on Agricultural Greenhouse Gasses (C-AGG) programs as well. During 2010, Mr Frost has also been an invited participant within both the Environmental Defense Fund (EDF) bioenergy accounting workgroup and the WRI time-value accounting work group. Mr. Frost's strategic studies on greenhouse gas emissions policy, implications, and opportunities have covered entities as diverse as the oil and gas industries, state governments, and farm organizations. His work also includes energy, economic, and environmental analyses for the regulatory impact analyses (RIA's) for U.S. Department of Agriculture for the energy titles (Title IX) within the last two Farm Bills. His full life cycle studies have focused upon models and modeling of energy and greenhouse gas concerns for both multi-stakeholder groups such as the Council on Sustainable Biomass Production and for specific sets of commercial value-chain partners such as bioenergy feedstock – biofuels pathway partners. He has also supervised AgRefresh's carbon accounting activities for the Forest Solutions and Agricultural Solutions division within AgRefresh, meaning primarily forest carbon offsets and farm methane offsets for projects under various programs, most recently the California Air Resources Board (CARB).

Giffen, R. Alec

Clean Air Task Force

Mr. Alec Giffen analyzes the role of the world's forests in energy production and climate change mitigation for the Clean Air Task Force (CATF), which he joined in January 2011 as Senior Science and Policy Fellow after spending seven years as the Director of the Maine Forest Service. While directing the Forest Service from 2003-2010, Mr. Giffen managed an annual budget of up to \$20 million, headed a staff of 150 employees, and led the Service's efforts to protect 18 million acres of forest from fire, insects and disease; monitored and reported on the condition of Maine's forests; and advised the Governor and State Legislature on policy issues. Highlights of Mr. Giffen's tenure at the Forest Service include leading successful efforts in bringing a wide range of forest constituencies--from mill and landowners to the conservation community--together to agree on a common vision for keeping Maine's forests as forests and to advance this vision to the U.S. Secretaries of Agriculture and Interior. Mr. Giffen coauthored an extensive report on reducing atmospheric greenhouse gas emissions through improved management of Maine's forests, and modeled the impacts of different management regimes of Maine's forests on carbon storage and atmospheric greenhouse gas levels. Prior to his tenure with the Maine Forest

Service, Mr. Giffen founded and spent 16 years running Land and Water Associates (LWA), a successful environmental consulting firm based in Maine. LWA served a broad diversity of clients, including utilities, non-utility generators, state and federal agencies from Maine to Oregon, local governments, Indian tribes and non-governmental organizations. Projects varied from conflict resolution at a variety of levels, to forest management planning, financial analysis and project design. Mr. Giffen also has an extensive background in working on energy issues. He was assigned by two Governors the task of modernizing the State's rules for licensing hydropower and wind power projects. Mr. Giffen is a licensed Professional Forester, a registered Maine Guide and on the roster of the U.S. Institute of Environmental Conflict Resolution practitioners. He graduated from the University of Maine with a B.S. in Forestry and received an M.S. in Forest and Wildlife Ecology from the University of California at Berkeley.

Goines, Bruce

U.S. Forest Service Pacific Southwest Region

Mr. Bruce Goines is the Rural Community Assistance Program Leader at the U.S. Department of Agriculture Forest Service in Vallejo, California. His responsibilities include management of Rural Development, Forest Products Conservation & Recycling, National Fire Plan, and Conservation Education programs associated with California, Hawaii, and the Pacific Islands, and he serves as program lead on Lake Tahoe Erosion Control and American Heritage Rivers Initiative Programs for the agency's Regional Office in Vallejo, California. He also serves as State & Private Forestry Staff lead for program assistance for Southern California drought impacted counties. He is a Registered Professional Forester in the State of California. He received a B.S. in Natural Resource Management from the University of California at Berkeley. In recent years, Mr. Goines has worked extensively with the California Air Resources Board to understand the implications of forest management activities and climate change mitigation, including scenario analysis of various management options ranging from conservation to use in bioenergy applications. He also is a leading expert in the impacts of natural disturbances on landscape greenhouse gas (GHG) profiles, and the design of policies and management activities to mitigate forest carbon emissions in the western United States. As one of the Forest Service's leading experts in climate change mitigation, he has been actively involved at informing U.S. Forest Service national leadership on issues related to forest carbon and bioenergy policies, and the implications of various policy options on management activities undertaken in the field.

Golub, Alla

Purdue University Department of Agricultural Economics

Dr. Alla Golub, an expert in modeling global land use issues, holds a Research Economist position at the Center for Global Trade Analysis. Alla obtained her PhD from the Department of Agricultural Economics, Purdue University, in 2006 under the direction of Dr. Thomas Hertel. Since her graduation, Alla is working on various climate change mitigation policy issues related to land based activities, including land use change impacts of biofuels and analysis of global GHG mitigation potential in land using sectors. Alla worked on California Air Resources Board project to assess the indirect land use impacts of biofuels production, and on European Commission project aimed at reconciling indirect land use impacts from biofuels which have been estimated using diverse modeling frameworks.

Hailemariam, Temesgen

Oregon State University Department of Forest Engineering, Resources and Management

Dr. Temesgen Hailemariam is Associate Professor in Forest Biometrics and Measurements at Oregon State University (OSU). He holds a Ph.D. degree in Forest Biometrics from University of British Columbia (UBC), M.Sc. degree from Lakehead University, and B.S. degree in Plant Sciences from Alemaya University of Agriculture. His research interests are in developing methods that integrate ground and remotely sensed data to improve biomass estimation and carbon accounting methodologies. His main research areas include developing efficient imputation and sampling methods to assess, monitor, and analyze forest resources. He has authored or co-authored over 40 peer-reviewed articles. He teaches undergraduate and graduate courses in Forest Measurements and Biometrics at OSU. A recipient of the 2009 OSU's Emerging Scholar Award, Dr. Temesgen serves on the editorial boards of Forest Ecology and Management and Western Journal of Applied Forestry Research. He is the president of the OSU's Phi Kappa Phi Chapter. Prior to joining OSU in 2003, Temesgen was a visiting scientist at the Institute of Forest Management and Yield studies at the Univ. of Göttingen, Germany, and Research Associate in Forest Biometrics and Measurements at UBC. He taught Forest Mensuration and Photogrammetry at UBC; Applied Statistics and Growth and Yield Modeling for the Food and Agricultural Organization of the United Nations.

Hamburg, Steven

Environmental Defense Fund

Dr. Steven Hamburg is chief scientist of the Environmental Defense Fund and is an ecosystem ecologist. Trained at Vassar College, Yale and Stanford Universities he has been involved in biogeochemistry research for 25 years. He has published more than 80 scientific papers on biogeochemistry, climate change impacts on forests and carbon accounting approaches and methodologies and has served as a lead author for the IPCC. His involvement with the IPCC resulted in his being acknowledged as one of the contributing recipients of the 2007 Nobel Peace Prize. He was awarded the EPA Environmental Merit Award twice for his climate change related work and was on the faculty of Brown University for 15 years where he was the founding director of the Global Environment Program at the Watson Institute for International Studies. He currently co-chairs the Royal Society's Solar Radiation Management Governance Initiative, and serves on numerous other national science advisory panels. Dr. Hamburg has served as an advisor to both corporations and non-governmental organizations and was awarded an Environmental Merit award by the US Environmental Protection Agency for his climate change-related activities. He has published widely including in Nature and Science and has served as a lead author for the Intergovernmental Panel on Climate Change. Dr. Hamburg's degrees are from Stanford University, Post-doc (1984-1985), Yale University, Ph.D. (Forest Ecology) 1984, Yale School of Forestry and Environmental Studies M.F.S. (1977) and Vassar College, B.A. (1975).

Harmon, Mark

Oregon State University Department of Forest Ecosystems and Society

Dr. Mark E. Harmon is the Richardson Chair and Professor in the Department of Forest Ecosystems and Society at Oregon State University. In addition he is the co-director of CCAL, the Cooperative Chemistry Analytical Laboratory. Until recently he served as the lead principal investigator for the NSF-sponsored H. J. Andrews LTER and lead OSU scientist for the H. J. Andrews Experimental Forest. Dr. Harmon earned his B.A. at Amherst College in 1975 majoring in Biology. He worked for several years as a volunteer and research assistant in Glacier and Great Smoky Mountains National Parks before returning to school to receive his M.S. in Ecology at the University of Tennessee, Knoxville in 1980. In 1981, he moved to Corvallis, Oregon to start a PhD program in the Botany and Plant Pathology Department, Oregon State University. He received his degree in 1986 and moved to the Department of Forest Science at that time. The projects Dr. Harmon has worked on since 1986 include: installation and maintenance of a 200 year wood decomposition experiment, a project to estimate the stores and dynamics of dead trees in forests of the globe, a continental-scale, long-term litter decomposition experiment, studies of long-term patterns of tree growth and mortality, and the development of methods, including models, to estimate stores and fluxes of carbon from forest lands within the Pacific Northwest region. He has published over 120 peer-reviewed journal articles on a topics ranging from tree growth and mortality, decomposition of wood in the natural environment, management of coarse woody debris, carbon dynamics of forests, disturbances, and ecosystem modeling. He has also authored major reviews of coarse woody debris and forest-related heterotrophic respiration as well as methodological reviews and guidelines for inventory of live and dead trees, uncertainty analysis, and laboratory procedures.

Hellwinckel, Chad

University of Tennessee Agricultural Policy Analysis Center

Dr. Chad Hellwinckel's work with the Agricultural Policy Analysis Center focuses on agricultural land use policies, climate change mitigation, biofuels analysis and defining appropriate long-term agricultural policy in an energy constrained future. He maintains and uses computer models designed to estimate the local and national effects of implementing agricultural policies upon land-use, farm incomes and the environment. Recent projects include building a geographically precise terrestrial carbon sequestration model which can also estimate potential quantities of biomass available from agricultural lands for energy uses. This model is being used to analyze the interactions between simultaneous climate change and biomass policies. Additionally, the model is being expanded to capture the effects of management intensive rotational grazing upon net carbon emissions from livestock. Chad is also interested in the potential of regenerative agricultural systems in an energy constrained future. Regenerative agriculture refers to systems of agriculture that mimic the dynamics found in nature and allow natural systems to maintain their own fertility, sponsor their own energy needs, build soil, resist pests and diseases and be highly productive. Chad received a doctorate in geography at the University of Tennessee in 2008. He received his MS in Agricultural Economics from the University of Tennessee in 1996, and a BS in Economics and Urban Studies from St. Olaf College in 1991. Chad has worked at The Land Institute, in Salina Kansas, and served as a Peace Corps volunteer in Panama and with the US Forest Service in Arizona, New Mexico and Utah. He is also the founder

of the Knoxville Permaculture Guild.

Heupel, Erin

POET, LLC

Ms. Erin Heupel, Director of Environment and Technology, joined POET in 2005 and has over 20 years of experience in environmental engineering. Currently, Ms. Heupel is part of POET's Public Policy and Corporate Affairs team. She is responsible for evaluating and understanding impacts to fuel ethanol use and production as a result of congressional and regulatory actions. Ms. Heupel serves as primary environmental contact and liaison with agencies, industry technical groups and trade associations. Prior to joining the Public Policy and Corporate Affairs group, she served as the Lead Environmental Engineer for POET Design and Construction, and was responsible for determining environmental requirements and securing permits for construction and operation of fuel grade ethanol plants. Before joining POET, Ms. Heupel worked as a consultant on environmental projects in multiple states involving the evaluation and cleanup of soil and groundwater contamination at private and federal facilities under the requirements of the Comprehensive Environmental Response, Compensation and Liability Act, commonly known as the Superfund program, and the Leaking Underground Storage Tank programs. As a consultant, Ms. Heupel was the Senior Engineer and Project Manager responsible for researching and evaluating technologies and determining the effectiveness for treating multi-media chemical contamination. Ms. Heupel was responsible for completion of multidiscipline project documentation and negotiation with State and Federal environmental agencies on behalf of clients. She also held the position of Natural Resource Engineer for the South Dakota Department of Environment and Natural Resource, focusing on industrial compliance with hazardous waste regulations.

Hill, Jason

University of Minnesota Department of Bioproducts and Biosystems Engineering

Dr. Jason Hill is an Assistant Professor in the Department of Bioproducts and Biosystems Engineering at the University of Minnesota. He also holds an appointment as a Resident Fellow of the University's Institute on the Environment. His research interests include the technological, environmental, and economic aspects of sustainable bioenergy from traditional and next-generation feedstocks. His current focus is on using life cycle assessment to understand how biofuels affect climate change, biodiversity, and human health. He currently serves on the National Academies Committee on the Economic and Environmental Impacts of Increasing Biofuels Production. Dr. Hill received his A.B. in Biology from Harvard College and his Ph.D. in Plant Biological Sciences from the University of Minnesota.

Houghton, Richard

Woods Hole Research Center

Dr. Richard A. Houghton is Acting Director and Senior Scientist at the Woods Hole Research Center in Falmouth, Massachusetts. The Center is an independent, nonprofit institute focused on environmental science, education, and policy. Dr. Houghton has studied the interactions of terrestrial ecosystems with the global carbon cycle and climate change for nearly 30 years, in particular documenting changes in land use and determining the sources and sinks of carbon attributable land management. He has participated in IPCC Assessments of Climate Change and the U.S. Climate Change Science Program's First State of the Carbon Cycle Report (SOCCR): The North American Carbon Budget and Implications for the Global Carbon Cycle. Dr. Houghton received his Ph.D. in ecology from the State University of New York at Stony Brook in 1979 and has worked as a research scientist at Brookhaven National Laboratory in New York and the Marine Biological Laboratory in Woods Hole, Massachusetts. He has been at the Woods Hole Research Center since 1987, serving for two years (1993-1994) as a visiting senior scientist at NASA headquarters in Washington, D.C.

Huang, Ching-Hsun

Northern Arizona University College of Engineering, Forestry and Natural Sciences

Dr. Ching-Hsun Huang, is an Assistant Professor in Forest Economics and Forest Management with School of Forestry at Northern Arizona University. She holds a B.S. degree in Forestry, M.S. degree in Environmental Management and Ph.D. degree in Forest Economics. She was funded by the Department of Energy from 2000-2006 on terrestrial carbon sinks projects. The titles of the projects were "Enhancement of Terrestrial Carbon Sinks through Reclamation of Abandoned Mine Lands in the Appalachian Region", and "Managing Commercial Tree Species for Timber Production and Carbon Sequestration: Management Guidelines and Financial Returns". She has taught undergraduate and graduate courses including Agricultural Economics, Environmental Economics, Range Economics, Forest Resource Economics and Finance,

Natural Resource Economics, Forest Management and Planning, and Ecosystem Science and Management Principles. She is well-trained in conducting research, writing publications and presenting research results. Her research interests include economic analysis of carbon sequestration, the economic value of selling carbon credits from restored forests, and volume and value of carbon stored in wood products. Dr. Huang has published 15 articles in refereed journals and 8 articles in non-referred journals. She has presented her research papers at 46 international and domestic scientific meetings. She is a member of Society of American Foresters (SAF). She was invited to serve on the National Institute of Food and Agriculture (NIFA) US Department of Agriculture grant review panel in April 2011.

Jenkins, Robin

DuPont

Ms. Robin Jenkins is an expert in Life Cycle Assessment (LCA), primarily with regard to biofuels, and has been an LCA Practitioner for DuPont for 8 years. Beyond biofuels, she provides LCA support for fluoroproducts, packaging, and many other applications within the DuPont Applied BioSciences business. During her 12 years of experience at DuPont, Ms. Jenkins has contributed to a variety of DuPont businesses. In her current role in the Engineering Evaluations and Sustainability group within DuPont Engineering Research and Technology, she guides research and manufacturing teams by analyzing new or existing processes from an engineering, economic, and environmental perspective. She has a Bachelor of Science degree in Chemical Engineering from Pennsylvania State University. As an expert in biofuels LCA, Ms. Jenkins possesses the capability to interpret and apply the latest international biogenic carbon accounting methods and standards, as presented in the International Standards Organization (ISO) 14040 series, the GHG Protocol, Publicly Available Specification (PAS) 2050, and the International Reference Life Cycle Data System (ILCD). Ms. Jenkins is often asked to participate in workshops, panels, and multi-stakeholder discussions by DuPont leadership as well as external business contacts, government agencies, academic institutions, and NGOs. She represents the DuPont Danisco Cellulosic Ethanol Joint Venture on the Council on Sustainable Biomass Production, serving on the Board of Directors and as the Climate Change Working Group co-lead for this Council. Ms. Jenkins serves as a peer reviewer for the International Journal of Life Cycle Assessment. She is also currently working with the U.S. Department of Agriculture, National Renewable Energy Laboratory and academic experts on a project associated with the U.S. Department of Agriculture Greenhouse Gas Reduction through Agricultural Carbon Enhancement network (GRACEnet) research program. In previous roles, she aided manufacturing operations as a process engineer for the Packaging and Industrial Polymers business and managed key customer relationships as a technical services engineer for the Nonwovens business.

Johnson, Gregory

Weyerhaeuser Company

Mr. Gregory Johnson is the Director of Forestry Research at Weyerhaeuser with 30 years of industrial research and research management experience. This includes research project and program management for International Paper (Manager of Research & Technical Services), Willamette Industries (Forest Research Director), and Weyerhaeuser Company (Director Forest Research), and the chairmanship of the Forestry Research Advisory Council to the Secretary of Agriculture. Mr. Johnson's research expertise encompasses forest biometrics and growth modeling, silviculture, tree improvement, and harvest planning. His current work at Weyerhaeuser focuses on enhanced, sustainable productivity, wood quantity and quality (including biomass quantification), nutrition management, and reforestation systems.

Kelley, Stephen

North Carolina State University Department of Forest Biomaterials

Dr. Steve Kelley is a Professor and the Head of the Department of Forest Biomaterials at North Carolina State University. He has a PhD in Chemistry from Virginia Tech, and a MS and BS in Forestry from the University of Wisconsin-Madison and Oregon State University, respectively. His research interests include the sustainable production of energy and materials from biomass, life cycle analysis of wood products and energy systems, and the application of novel analytical tools to biomass characterization. He teaches classes in Sustainable Building Materials, Wood Chemistry, and Wood Composites, and supervises graduate students working on technology and systems approaches to developing bioenergy and biomaterials. He currently serves on the Editorial Boards of three international journals, and is the President of the Consortium for Research in Renewable Industrial Materials (CORRIM), an organization focused on using life cycle analysis tools to evaluate the performance of materials used in home construction. Prior to joining NCSU, he spent 13 years at the DOE's National Renewable Energy Laboratory working on biomass conversion technologies, and systems integration, and 6

years as a researcher in industry working with renewable polymers. As the Department Head he represents the College and University with many outside organizations focused on sustainable Forestry, and the demands for industrial goods and ecological services from natural and managed forests.

Khanna, Madhu

University of Illinois (Urbana-Champaign) Department of Agricultural and Consumer Economics

Dr. Madhu Khanna is a professor in the Department of Agricultural and Consumer Economics at the University of Illinois at Urbana-Champaign. She received her Ph.D. from the University of California at Berkeley. Her research focuses on environmental policy analysis and incentives for adoption of environmentally friendly technologies. She has examined the effectiveness of alternative market based instruments for inducing the adoption of best management practices in agriculture such as precision farming and improved irrigation methods and the targeting of green payment policies for reducing nitrogen run off and sediment from cropland. She also examines the design and performance of voluntary programs such as the Conservation Reserve Enhancement Program to improve water quality in the Illinois River. She is currently examining the economics of using perennial grasses to provide environmental benefits, such as soil carbon sequestration and reduced run-off, as well as a source of bioenergy. Professor Khanna teaches undergraduate and graduate courses in international trade and environmental economics. She has received several teaching and research awards and was supervisor of the recipient of an Outstanding Thesis Award in 2002 from the American Association of Agricultural Economics. She was selected as a University of Illinois Scholar for 2004-07. She has served on review panels for the USEPA and the USDA. She is also on the Board of Directors of the Association of Environmental and Resource Economists. She serves as an associate editor for the American Journal of Agricultural Economics and is on the editorial boards of the Journal of Soil and Water Conservation, Journal of Agricultural and Resource Economics, and Review of Agricultural Economics.

Kling, Catherine

Iowa State University Center for Agricultural and Rural Development

Dr. Catherine Kling is a Professor of Economics at Iowa State University and head of the Resource and Environmental Policy Division of the Center for Agricultural and Rural Development. Prior to her Iowa State appointment, she was an Associate and Assistant Professor in the Department of Agricultural Economics at the University of California, Davis. Dr. Kling holds a B.A. in Business and Economics from the University of Iowa and a Ph.D. in Economics from the University of Maryland. She is a Fellow of the American Agricultural Economics Association and has served as a member of their Board of Directors and awards committee chair. She has also served as vice president and member of the board of the Association of Environmental and Resource Economists, and has held editorial positions at several environmental and agricultural economics journals. Dr. Kling's research addresses methods for improving non-market valuation methods and economic incentives for pollution control, especially in relation to non-point source pollution from agriculture.

Lippke, Bruce

University of Washington School of Forest Resources

Bruce Lippke is Professor Emeritus in the School of Forest Resources, College of the Environment at the University of Washington; former Associate Dean for Research in the then College of Forest Resources; Director of the Rural Technology Initiative operated jointly by University of Washington and Washington State University Extension in order to increase technology transfer of newly emerging sciences to rural forest communities; and President Emeritus of an 18 university and professional research organization known as CORRIM (the Consortium for Research on Renewable Industrial Materials). CORRIM is developing environmental performance measures for every aspect of wood materials and their uses from forest regeneration, harvesting, processing for products or fuels, construction, building use and disposal, including ecosystem impacts such as critical habitat. He has over 40 years of experience in economic forecasting, modeling and industry analysis; environmental impact assessment; market research; and management consulting. His recent research has been focused on the sustainable management of forests for economic, environmental and social values, characterized by market and non-market value systems. He holds degrees in Electrical Engineering (Nebraska & New Mexico State) and Operations Research (UC Berkeley), and completed the Executive Management Program and core Graduate Economic course requirements at University of Washington. He has served on numerous advisory committees including USFS "research needs", State of Washington Department of Natural Resources (Forest Health, Carbon Mitigation, HCPs, Small Forest Landowner needs etc), Governor's Council of Economic Advisors under 3 administrations, and the Ad Hoc Environmental

Science committee leading to the formation of CORRIM as an independent non-profit research corporation supported by 15 universities. He has organized numerous multi-disciplinary workshops and seminars focused on forest resource uses, economic impacts, international trade, and life cycle analysis. blippke@u.washington.edu www.ruraltech.org
www.corrим.org

Liska, Adam

University of Nebraska (Lincoln) Biological Systems Engineering Department

Dr. Adam Liska is Assistant Professor of Biological Systems Engineering and holds the George Dempster Smith Chair of Industrial Ecology. He received his PhD in Biology from the Max Planck Institute of Molecular Cell Biology and Genetics. His research interests include biofuels, life cycle assessment, greenhouse gas emissions, and energy security. He serves as a journal referee for publications such as *Nature*; *Proceedings of the National Academies of Science-USA*; *Environmental Science & Technology*; *Global Change Biology*; *Biofuels, Bioproducts, & Biorefining*; *Biotechnology for Biofuels*; *Journal of Biobased Materials and Bioenergy*, and he serves as an academic reviewer for the U.S. Department of Energy; U.S. Department of Transportation; U.S. Department of Agriculture; Clinton Global Initiative; CRC Press/Taylor and Francis; Environmental Defense Fund; World Resources Institute.

Love, Nancy

University of Michigan Department of Civil and Environmental Engineering

Dr. Nancy Love is a professor and chair of the Department of Civil and Environmental Engineering at the University of Michigan. Prior to 2008, Dr. Love was an Assistant, Associate and Full Professor of Civil and Environmental Engineering and an Adjunct Professor of Biological Sciences at Virginia Tech. Dr. Love has B.S. and M.S. degrees in Civil Engineering from the University of Illinois, and a Ph.D. in Environmental Systems Engineering from Clemson University. After completing her M.S. degree, she worked for approximately 3 years for CH2M Hill, Inc., primarily on the process design, pilot testing, hydraulic design and construction of drinking water treatment plants. Her research covers a broad range of interdisciplinary topics in the general area of environmental biotechnology and water quality with an emphasis on engineered treatment systems. Dr. Love has served on numerous committees associated with professional organizations (including national and international conference program committees), was a gubernatorial appointee to the Scientific and Technical Advisory Committee (STAC) to the Chesapeake Executive Council, and has served on the boards of both a corporation and a professional organization. Her key leadership roles include serving as Vice President (anticipated to be President-Elect and then President) of the Association of Environmental Engineering and Science Professors, and initiating and co-chairing a national workshop that brought various stakeholders together (utilities, regulators, designers and researchers) to successfully establish a vernacular and research agenda for assessing the fate of effluent-derived organic nitrogen in nitrogen-sensitive water bodies. She is the recipient of a number of awards, including the National Science Foundation Faculty Early Career Development (CAREER) Award, the Paul L. Busch Award for Innovation in Applied Water Quality Research, the Harrison Prescott Eddy Medal from the Water Environment Federation, the Civil and Environmental Engineering (Virginia Tech) Alumni Teaching Excellence Award, and the Rudolf's Industrial Waste Management Medal.

Lubowski, Ruben

Environmental Defense Fund

Dr. Ruben N. Lubowski specializes on the economics of land-use change in the US and globally and on policies at the interface of land-use and climate issues, including emissions accounting for bioenergy. He is Senior Economist in the Climate and Air program at the Environmental Defense Fund (EDF) where he oversees EDF's analytical efforts to reduce emissions and increasing sequestration from forests and agriculture as part of US and international climate policies. He has testified before the Senate on the role of offsets in cost containment and been published in various academic journals on the economics of land-use change and agri-environmental policies in the US, tropical deforestation, and climate change. He was a co-author of the Searchinger et al. (2009) *Science Policy Forum* article on "Fixing a Critical Climate Accounting Error" on bioenergy accounting issues and has played a central role in recent efforts to reach agreement on the science and develop practical alternatives for accurate accounting of bioenergy emissions. From 2002 through 2007, Dr. Lubowski was an Economist in the Resource and Rural Economics Division at the U.S. Department of Agriculture's Economic Research Service (USDA-ERS) and was the agency's Subject Specialist on Land Use. He specialized in measuring and modeling land-use changes and the resulting environmental impacts. He was responsible for reporting official US land-use statistics and maintained the Major Land Uses database, the only consistent accounting of all major uses of private and public land in the

United States. He was previously a Research Fellow at the Belfer Center for Science and International Affairs at Harvard University's Kennedy School of Government where he developed the first national-scale econometric model of land-use changes in the US, drawing upon data from the National Resources Inventory (NRI). This model has been used to estimate the costs of sequestering carbon through a forest-sector policy and to project land-use changes in different regions as part of the US Forest Service's Resource Planning Act (RPA) Assessments. Dr. Lubowski has also worked on tropical forests and environmental issues in developing countries at the World Bank, the Harvard Institute for International Development (HIID), and the United Nations Development Program (UNDP). He received his Ph.D. and A.M. in Political Economy and Government from Harvard University and his A.B. from Harvard College.

Malmsheimer, Robert

State University of New York College of Environmental Science and Forestry

Dr. Robert Malmsheimer, is a Professor of Forest Policy and Law at State University of New York (SUNY) College of Environmental Science and Forestry (ESF), where he teaches courses in natural resources policy and environmental and natural resources law. His research focuses on how laws and the legal system affect forest and natural resources management, including how climate change and carbon sequestration policies affect forest and natural resources. Before becoming a professor, Dr. Malmsheimer practiced law for six years. He has a Ph.D. in forest policy from SUNY ESF, a J.D. from Albany Law School, and a B.L.A. from SUNY ESF. He is a Fellow in the Society of American Foresters (SAF) and current chair of the SAF Committee on Forest Policy (CFP). He cochaired the 2007–2008 Society of American Foresters (SAF) Task Force on Climate Change and Carbon Sequestration, and is currently chair of the SAF Task Force on Forest Carbon Offsets and Forest Biomass for Energy. He has also chaired and served on numerous national and state SAF committees and other task forces.

Maness, Thomas

Oregon State University Department of Forest Engineering, Resources and Management

Dr. Thomas Maness is Professor and Department Head of Forest Engineering, Resources and Management at Oregon State University's College of Forestry. He holds a PhD in Forest Economics from the University of Washington. He teaches courses in forest conservation economics and forest modeling. His research interest is in developing innovative forest policies and practices to balance the production of traditional forest products with society's expanding need for ecosystem services, energy, and climate regulation. Over the past 3 years Dr. Maness and his research group have developed decision support tools to determine the carbon and energy balance of producing biomass energy from forests. He is currently completing a project with Genomics British Columbia to conduct life cycle analysis for carbon emissions from intensively managed hybrid poplar plantations grown for ethanol production. He has also recently completed a carbon emissions life cycle analysis project for producing combined heat and power from forest fire fuel reduction thinnings from western conifer forests. In 2008 Dr. Maness served as Senior Policy Analyst for Climate and Energy Policy for the US Forest Service in Washington DC. Some recent publications: Clark, J, J. Sessions, O. Krankina, and T. Maness. 2011. Impacts of thinning on carbon stores in the Pacific Northwest: a plot level analysis. Final Report for Natural Resources Defense Council. C. Ristea and T. C. Maness. 2009. Opportunities, challenges and markets for forest carbon offset projects. 2009, 85:715-718 Forestry Chronicle. Maness, T.C. 2009. Forest management and climate change mitigation: Good policy requires careful thought. 107(3):119-124. Journal of Forestry. Kimbell, G., T.C. Maness and H. Brown. 2009. More energy from wood: What are the prospects? Journal of Forestry. 107(5):267-270. Maness, T.C. 2008. Carbon sequestration on the nation's forests: What's the goal? Policy Analysis Briefing Paper prepared for the USDA Forest Service. August 2008. Maness, T.C. 2008. Forests as a potential feedstock for cellulosic ethanol. Policy Analysis Briefing Paper prepared for the USDA Forest Service and Presented at the 1st Annual Symposium on American Forest Policy. Society of American Foresters. Reno, NV. November 2008.

Mann, Margaret

National Renewable Energy Laboratory

Ms. Margaret Mann is a Senior Chemical Process Engineer and Group Manager at the National Renewable Energy Laboratory (NREL), where she leads the Technology Systems and Sustainability Analysis Group in the Strategic Energy Analysis Center. She has over 17 years experience in process design and simulation, process cost analysis, environmental life cycle assessment (LCA), and technical project management. She is an expert in analysis of the environmental consequences of various renewable and fossil-based energy conversion systems, including LCAs of coal, natural gas,

several biomass power technologies, biofuels, and hydrogen systems. In one of their early publications on the LCA of biopower, Ms. Mann and her colleague defined two new metrics for the life-cycle evaluation of energy use: net energy ratio and life cycle efficiency. Recently, she has assisted in the visioning and performance of a meta analysis of LCAs of electricity-generating technologies, the results of which were used as the basis of greenhouse gas emissions estimates for the Intergovernmental Panel on Climate Change (IPCC) Special Report on Renewable Energy. She is on the executive board of the American Society of Life Cycle Assessment, is an advisory member of the North American Life Cycle Inventory Database Project, and is on the editorial board of the Journal of Power and Energy. Ms. Mann has received funding from the U.S. Department of Energy Office of Energy Efficiency and Renewable Energy (vast majority), the California Energy Commission (2005), the Electric Power Research Institute (2011), the Governors' Ethanol Coalition (2007), and several private corporations under work-for-others agreements at NREL.

McCreery, Lew

U.S. Forest Service, Wood Education and Resource Center

Mr. Lew McCreery is the biomass coordinator for the US Forest Service at the Wood Education and Resource Center in Morgantown WV, working closely with State Foresters, private industry, federal experts, local communities, and forest landowners to implement biomass and bioenergy projects. Mr. McCreery has a strong background in forest management science, as well as the practical realities of implementing biomass and bioenergy projects on the ground. This includes community wood products and energy project feasibility work (both engineering and economic), as well as impacts of biomass projects on forest conditions and ecosystems, etc. Lew McCreery is responsible for the development and implementation of woody biomass utilization efforts across all S&PF Program Areas (Forest Health, Stewardship, Urban Forestry, and Fire Management) in the 20-state Northeastern Area. This position coordinates efforts with 20 state forestry and state energy agencies to support the sustainable use of wood energy. He has over 30 years of USDA Forest Service experience as NA WERC Woody Biomass Coordinator (2007-present); Acting Field Representative, Durham, NH (2006-2007); Rural Development Through Forestry Coordinator (1990-2006); Acting Timber Bridge Program Coordinator (1990-1992); Pri-Ru-Ta and Lumberjack RC&D's Coordinator (Wisconsin) (1985-1990); Forest Products Utilization & Wood Energy Specialist (1985-1990); and Forest Health & Remote Sensing Specialist (1974-1985). His recent Climate Change and Wood Energy Efforts include Climate Change and Wood Energy Roadmap Planning Team for the Northeast and Midwest (FPL, NA, NRS, R9 effort); USDA Forest Service Woody Biomass Utilization National Planning Team; Northern Forest Center Biomass Energy Initiative Planning Team; and Environment and Energy Study Institute – Wood-Based Energy Discussion Series Stakeholder. He received a B.S. in Biology from Marietta College, B.S. in Forestry from the University of Michigan, M.S. in Population Ecology from Ohio State University, and is a Certified Silviculturalist, USDA Forest Service.

McKinstry, Robert

Ballard Spahr, LLP

Mr. Robert McKinstry is a Partner at Ballard Spahr, LLP in Charge of the Climate Change and Sustainability Initiative and co-founder and former Partner in Charge of the Environmental Practice Group. Mr. McKinstry founded and built the firm's Environmental Practice Group. He focuses his practice exclusively in environmental law and litigation. This entails litigation, counseling, planning and transactional work in all areas of environmental law. Since completing his six year term as the Goddard Professor of Forestry and Environmental Resource Conservation, Mr. McKinstry has concentrated particularly on the emerging areas of climate change, sustainability and biodiversity. He was counsel of record for a group of leading scientists supporting the Petitioners as amici curiae before the Supreme Court in Massachusetts v. EPA. In 2010, he received a Lifetime Achievement Award from the Pennsylvania Bar Association Environmental and Energy Law Section for my work in climate change and sustainability. His clients included municipalities, industrial companies, financial companies, developers and non-profit organizations. He holds a joint J.D./ M.F.S from the Yale Law School and the Yale School of Forestry and Environmental Studies, New Haven, CT.

Mellette, Morgan

Mellette Forestry Group, LLC

Mr. Morgan Mellette is Founder & Owner/Managing Partner of Mellette Forestry Group, LLC, a professional forestry consulting firm located in Gainesville, Georgia with operations throughout the southeastern U. S. His firm was established in 1979 and provides forest management and valuation services for non-industrial private forestland owners, state and federal government agencies, and land trusts. He specializes in valuations of conservation easements and forest

management plans on environmentally sensitive forest land, with particular attention to habitat enhancement for endangered plant and animal species. Mellette earned a B.S. degree in Forest Management from Clemson University in 1977 and has completed graduate studies in Forest Appraisal at Duke University.

Milford, Jana

University of Colorado Department of Mechanical Engineering

Dr. Jana Milford is a Professor in the Department of Mechanical Engineering at the University of Colorado at Boulder. She has previously worked as a Congressional Fellow, an Analyst at the Congressional Office of Technology Assessment, an Assistant Professor in the Department of Civil Engineering at the University of Connecticut, and a Senior Scientist and Staff Attorney at Environmental Defense. Dr. Milford holds a B.S. in Engineering Science from Iowa State University, a M.S. in Civil Engineering from Carnegie Mellon University, a Ph.D. in Engineering and Public Policy from Carnegie Mellon University, and a J.D. from the University of Colorado, School of Law. Dr. Milford's research interests focus on photochemical air quality modeling, air pollution receptor modeling, sensitivity and uncertainty analysis of environmental models, and air quality management. She is co-author, with Anu Ramaswami and Mitchell Small, of *Integrated Environmental Modeling: Pollutant Transport, Fate, and Risk in the Environment* (John Wiley and Sons, 2005). She has served on the Colorado Air Quality Control Commission, the National Research Council Committee on Air Quality Management in the United States, and the National Research Council Committee on Energy Futures and Air Pollution in Urban China and the United States. She has also served as a consultant to the Science Advisory Board's National Air Toxics Assessment Subcommittee, Environmental Models Subcommittee, Radiation Advisory Committee, and Air Toxics Monitoring Strategy Subcommittee.

Miner, Reid

National Council of the Paper Industry for Air and Stream Improvement

Mr. Reid Miner is a Vice President at the National Council for Air and Stream Improvement Inc. (NCASI), an environmental research organization focused on the forest products industry. Mr. Miner is responsible for NCASI's work in the areas of carbon and greenhouse accounting and life cycle assessment. He holds B.S. and M.S. degrees in Chemical Engineering from the University of Michigan, Ann Arbor (1972 and 1973). For the last 15 years, he has been engaged in a range of collaborations with government and intergovernmental organizations as well as NGOs focused on the need to better characterize the connections between forest-based activities and atmospheric greenhouse gases. In addition to more than 20 peer-reviewed journal publications, he has contributed to several books and numerous reports, including the IPCC's Fourth Assessment Report (as a contributing author). Shortly after the signing of the Kyoto Protocol, Mr. Miner was engaged by the International Council of Forest and Paper Associations (ICFPA) to work with the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD) to develop tools for estimating GHG emissions. Mr. Miner then participated in the Working Group updating the World Resources Institute (WRI) World Business Council for Sustainable Development (WBCSD) Greenhouse Gas Protocol Corporate Reporting and Accounting Standard and provided comments on Intergovernmental Panel on Climate Change (IPCC)'s first order draft reports on greenhouse gas and carbon accounting (e.g. IPCC Guidelines for National Greenhouse Gas Inventories). Mr. Miner participated in the development of the Forest Industry Carbon Assessment Tool (FICAT) for the International Finance Corporation (IFC) of the World Bank Group. Over the last several years, Mr. Miner has made presentations to four UNFCCC COPs and collaborated in the work of a range of organizations including WBCSD (assisting in understanding carbon accounting proposals), the International Finance Corporation (assisting IFC clients globally in calculating carbon footprints), the Environmental Defense Fund (participating in EDF's working group on biomass energy), the U.S. Forest Service (co-authoring studies on the U.S. forest sector's carbon footprint), the Council for Sustainable Biomass Production (as an expert on biomass carbon accounting), the United Nations Food and Agriculture Organization (in preparing an updated global assessment of the GHG impacts of the forest-based industries), and the Society of American Foresters (as a co-author of report addressing the carbon and greenhouse gas implications of forestry and forest products in the U.S.).

Moomaw, William

Tufts University Fletcher School of Law and Diplomacy

Dr. William Moomaw is Professor of International Environmental Policy and Director of the Center for International Environment and Resource Policy at Tufts University's Fletcher School of Law and Diplomacy. He received a BA from Williams College and a PhD in physical chemistry from Massachusetts Institute of Technology. His research interests include quantitative indicators of environment and development; sustainable development; trade and environment; technology and

policy implications for climate change; water and climate change; economics and geochemistry of the nitrogen cycle; biodiversity; negotiation strategies for environmental agreements. His professional activities include serving on the Intergovernmental Panel on Climate Change (IPCC). In this activity has served as Lead Author, 1995 "Industry" and "Industry, Energy and Transportation: Impacts and Adaptation; Convening Lead Author, IPCC 2001 "Technological and Economic Potential for Emissions Reductions"; Lead Author IPCC 2005 "Introduction", Carbon Dioxide Capture and Storage Special Report; and Lead Author IPCC 2007 "Energy Supply." He serves on the Board of Directors for the Consensus Building Institute; Earthwatch Institute and Clean Air Cool Planet.

Morris, Gregg

Future Resources Associates, Inc.

Dr. Gregory Morris is the Director of the Green Power Institute, and President of Future Resources Associates, Inc. The Green Power Institute is the renewable energy program of the Pacific Institute for Studies in Development, Environment, and Security (Pacific Institute). The Pacific Institute is a non-profit (501c3) public-purpose environmental research and advocacy institution, specializing in water resources, climate change, and renewable energy. Future Resources Associates is a consulting company that provides expert services to developers, owners and operators of renewable energy projects. Dr. Morris is an expert in biomass and renewable energy systems, climate change and greenhouse-gas-emissions analysis, and the environmental impacts of energy production and use. He has made major contributions to the development of California's renewable portfolio standards program, and is actively involved in the implementation of California's greenhouse gas reduction program (AB 32). Dr. Morris has a BS degree in Natural Science from the University of Pennsylvania (1974), an MS degree in Biochemistry from the University of Toronto (1977), and a PhD degree in Energy and Resources from the University of California, Berkeley (1982). He is a member of the affiliated faculty of the University of California's Energy and Resources Group, and has served as a visiting lecturer in renewable energy. Dr. Morris has made major contributions to the understanding of the greenhouse-gas implications of biomass energy use. He has developed a comprehensive carbon-accounting model for biomass power-generation systems (Morris, G., Bioenergy and Greenhouse Gases, Report of the Pacific Institute, May 15, 2008) that is among the most advanced attempted to date. Dr. Morris served on the Western Governor's Association's Biomass Task Force to the Clean and Diversified Energy Advisory Committee, directed the carbon accounting activities for the USFS's pioneering LCA study on the implications of the use of forest fuels for energy production (USDA Forest Service Pacific Southwest Research Station, Biomass to Energy: Forest Management for Wildfire Reduction, Energy Production, and Other Benefits, CEC report no. CEC-500-2009-080, January 2010), and serves on the board of the California Biomass Collaborative.

Muehlenfeld, Kenneth

Auburn University Forest Products Development Center

Mr. Ken Muehlenfeld is Director, Forest Products Development Center at Auburn University, where he directs programs aimed at the development of forest-based industry in Alabama. In this role, Mr. Muehlenfeld provides assistance to existing and prospective industry regarding technology evaluation, resource requirements, and market suitability of new forest-based business opportunities, including many bioenergy projects. He has sixteen years of previous industrial work experience in the forest industry, including progressive responsibilities in timberland management, wood procurement, wood products manufacturing management, capital project management, construction management, new business start-up, and corporate planning. Mr. Muehlenfeld has also been an active private consultant to the forest products and bioenergy industries, specializing in fiber resource analysis, wood products operations analysis and asset evaluation, market studies, new business feasibility studies, and evaluation of biomass resources for energy projects. He earned a B.S. in Forestry, University of Missouri, 1973, and an M.S. in Industrial Management, Georgia Institute of Technology, 1976.

Mueller, Steffen

University of Illinois at Chicago Energy Resources Center

Dr. Steffen Mueller is the Principal Research Economist at the University of Illinois at Chicago Energy Resources Center. My primary research focus includes emissions life cycle analyses of biofuels, energy, and agricultural systems. Dr. Mueller has published in the area of life cycle analysis as well as in the area of stationary source permitting where he has written two guidebooks on the permitting of coal gasification systems and combined heat and power generation technologies. He also teaches a class on onsite energy systems and my lectures include reviews of the carbon and nitrogen cycles as well as stationary source permitting programs. Dr. Mueller just served as a "Special Term Appointment Faculty Appointee" with

Argonne National Laboratory's Energy Systems Divisions where he supports the ongoing Greenhouse Gas Regulatory Emissions and Energy Use in Transportation (GREET) Model development and served on the California Air Resources Board's Low Carbon Fuel Standard Expert Working Group. Dr. Mueller hold a BS in Environmental Engineering from Karlsruhe Germany, an MBA and a PhD in Public Policy/Energy Policy from University of Illinois at Chicago and a Certificate in Energy Trading from Illinois Institute of Technology.

Nelson, Richard

Kansas State University Center for Sustainable energy

Dr. Richard Nelson is program coordinator with the Center for Sustainable Energy at Kansas State University and also heads Enersol Resources, a private energy, environmental, and market assessment consulting firm with over 21 years experience in the biofuels/bioenergy field. He has served as a consultant to the National Renewable Energy Laboratory, Oak Ridge National Laboratory, Idaho National Laboratory, Western Governors' Association, and the National Biodiesel Board concerning biofuel development, marketing, and utilization.

Noble, Duncan

Five Winds / PE International

Mr. Duncan Noble is a senior consultant for Five Winds International. He leads Five Winds' Carbon Management Services, focusing on helping clients respond to the business risks and opportunities associated with climate change. Mr. Noble draws on over 20 years of experience in engineering and business to help clients develop and implement carbon management programs; put in place carbon footprint measurement and reporting systems; and assess and reduce the carbon footprint of organizations, products and projects. Mr. Noble has been involved with developing and/or reviewing organizational GHG inventories for more than a dozen clients in various industrial sectors. He has contributed to the development of leading GHG methodologies including the ISO 14064 Standards and the WRI/WBCSD GHG Protocol (Corporate Standard). He actively participates in the "Methodology" Technical Work Group of the GHG Protocol Product Life Cycle Standard and supported a client Road Test of this Protocol in 2010. He has also been actively involved in the development of the GHG Protocol Scope 3 Standard. On behalf of CSA, he has delivered six 2-day training sessions on the ISO 14064-1 Standard and WRI/WBCSD GHG Protocol (Corporate Standard) during the last 3 years.

Obenshain, Karen

Edison Electric Institute

Dr. Karen Obenshain is Director, Fuels, Technology & Commercial Policy at Edison Electric Institute (EEI), the trade association for the shareholder-owned electric utilities. Dr. Obenshain's primary responsibilities at EEI include educating various audiences on and developing policies to support (1) fuel diversity in electricity generation, in particular, coal, shale gas and biomass and (2) innovative generation and emissions control technologies, especially those that may address global climate change concerns. Prior to joining EEI, Dr. Obenshain worked as a Staff Scientist at a regulatory law firm in DC, as a risk assessor on Department of Energy nuclear weapons facilities contracts, as a university administrator and as a petroleum geologist. Dr. Obenshain holds a M.S. in Geology from the University of Georgia and a Doctor of Science degree in Environmental Health Sciences from Tulane School of Public Health and Tropical Medicine. Dr. Obenshain's primary responsibilities at EEI—the trade association for the shareholder-owned electric utilities—include power generation fuels, in particular, coal, and innovative technologies, especially those that may address global climate change concerns. Prior to joining EEI, Dr. Obenshain worked as a Staff Scientist with a regulatory law firm in DC, as a risk assessor on Department of Energy nuclear weapons facilities contracts, as a university administrator and as a petroleum geologist.

Olander, Lydia

Duke University Nicholas Institute for Environmental Policy Solutions

Dr. Lydia Olander directs the Nicholas Institute's program in ecosystem services. She has worked on a range of issues for the institute, including a multiyear research program on offsets policy design. Currently she is developing the Institute's and Duke's expanding initiative on ecosystem services; coordinating Duke's Ecosystem Services Working Group; maintaining a nascent National Ecosystem Services Partnership; directing the Technical Working Group on Agricultural Greenhouse Gases; and, when time permits, working on the design of multinational efforts to reduce emissions from deforestation and degradation (REDD). Dr. Olander joined the Nicholas Institute after spending a year as an AAAS Congressional Science and Technology Fellow working with Sen. Joseph Lieberman on environmental and energy issues.

Before moving to Washington, D.C., she was a researcher with the Carnegie Institution of Washington's Department of Global Ecology, where she studied the biogeochemical impacts of logging in the Brazilian Amazon and utilized new techniques to extrapolate impacts regionally using remote sensing. She received her PhD from Stanford University, where she studied nutrient cycling in tropical forests, and earned a masters in forest science from Yale University. She has published in a number of professional journals, including *Ecosystems*, *Biogeochemistry*, *Soil Biology and Biochemistry*, *Forest Ecology and Management*, *Earth Interactions*, *Environmental Research Letters* and *Global Environmental Politics*.

O'Laughlin, Jay

University of Idaho College of Natural Resources

Dr. Jay O'Laughlin is Professor of Forestry & Policy Sciences and full-time Director of the College of Natural Resources Policy Analysis Group at the University of Idaho. He earned M.S. and Ph.D. degrees in forestry from the University of Minnesota and a business finance degree from the University of Denver. He served as a U.S. Army artillery officer in Vietnam and then spent three years as a cost accountant and purchasing manager with a recreation products manufacturing firm before enrolling in forestry school. From 1980-1989 he was assistant and associate professor in the Dept. of Forest Science at Texas A&M University, where he specialized in forestry economics and policy and earned tenure. His job at the University of Idaho was created by the Idaho Legislature to provide objective analysis of natural resource issues suggested by an advisory committee of the state's natural resource leaders. He has published many policy analyses, including federal and state lands, endangered species conservation, sustainable forest management, risk assessment applications in natural resources management, water quality best management practices, and air quality and prescribed fire emissions (see <http://www.cnrhome.uidaho.edu/pag>). More recently Dr. O'Laughlin has focused on wildfire policy, wood bioenergy and forest carbon management. He published a policy analysis report on "Accounting for Greenhouse Gas Emissions from Wood Bioenergy: Response to the U.S. Environmental Protection Agency's Call for Information, Including Partial Review of the Manomet Center for Conservation Sciences' Biomass Sustainability and Carbon Policy Study." He currently serves on three wood bioenergy and forest carbon management advisory committees: Forestry Task Force, Idaho Strategic Energy Alliance (chair); Carbon Issues Task Force, Idaho Strategic Energy Alliance (member); Western Governors' Association Forest Health Advisory Committee, Woody Biomass Utilization and Bioenergy Production Subcommittee (co-chair).

Paustian, Keith

Colorado State University Department of Soil and Crop Sciences

Dr. Keith Paustian is a Professor in the Department of Soil and Crop Sciences and Senior Research Scientist at the Natural Resource Ecology Laboratory at Colorado State University. He received a BSc (Forest Science) in 1978 and MSc (Forest Ecology) in 1980, both at Colorado State University, and a PhD in Systems Ecology and Agricultural Ecology at the Swedish University of Agricultural Sciences in 1987. His main area of research deals with soil organic matter dynamics and carbon and nitrogen cycling in managed ecosystems and he has published over 160 journal article and book chapters. A major focus of his work involves modeling and field measurement of soil carbon sequestration and greenhouse gas emissions from soils. Research activities include work on the inventory methodology used to estimate US soil C and N₂O emissions that are reported annually to the United Nations Framework Convention on Climate Change (UNFCCC), and development of web-based tools for estimating on-farm greenhouse gas emissions and carbon sequestration. He and colleagues have developed methods for estimating soil carbon and GHG inventories in developing countries that are being used to support inventory reporting and sustainable land management projects in several countries in Latin America, Africa and Asia. Other research areas include assessment of agricultural climate change mitigation strategies, evaluation of environmental impacts of agricultural bioenergy production, soil organic matter dynamics, and agroecosystem ecology. Professional service activities include serving as a Coordinating Lead Author for the IPCC 2006 National Greenhouse Gas Inventory Methods and the Intergovernmental Panel on Climate Change (IPCC) 2003 Good Practice Guidance for Land Use, Land Use Change and Forestry (LULUCF). He recently served on a 2010 National Academy of Science panel evaluating greenhouse gas measurement methods and verification issues. He is a member of the US Carbon Cycle Science Steering Group, which provides expert input to Federal Agencies involved in climate and carbon cycle research. He serves on the Voluntary Carbon Standard Steering Committee for Agriculture, Forestry and Other Land Use (AFOLU) and the Soil Science Society of America Greenhouse Gas Working Group. He is a Fellow of the Soil Science Society of America and a member of the Ecological Society of America and American Geophysical Union.

Powell, John**Tallahassee Environmental Policy and Energy Resources Department**

Mr. John K. Powell is a registered Professional Engineer, State Certified General Contractor, and licensed attorney in the state of Florida. He has worked as an environmental engineer and attorney for both the private and public sectors, and his diverse background allows him to view and evaluate environmental issues from a variety of different perspectives. John has dedicated his career to addressing environmental and land use matters. Mr. Powell currently works in the Environmental Policy and Energy Resources Department of the City of Tallahassee which provides essential utility services to the north Florida region. He is responsible for ensuring compliance with local, state and federal environmental laws and rules for major stationary facilities such as two fossil-fuel fired electric power plants, a hydroelectric power plant, and two wastewater treatment plants. In addition to his many compliance responsibilities, Mr. Powell also personally developed the City's first carbon footprint inventory in 2005. He independently developed the methodology for determining carbon emissions and has continually maintained and expanded it since that time. This comprehensive inventory calculates emissions associated with both City government operations and the overall community. His work helped the City earn the prestigious Five Milestones for Climate Mitigation Award from ICLEI – Local Governments for Sustainability, and gain national reputation as one of the cleanest fossil-fueled fired power plants in the state and nation and one of the leaders in environmental stewardship. In addition to these various work responsibilities, Mr. Powell is also pursuing an LL.M. in Environmental Law and Policy from the Florida State University College of Law. He has completed his first year in the LL.M. program and has focused his studies primarily on international climate change and environmental human rights.

Recchia, Chris**Vermont Agency of Natural Resources**

Mr. Chris Recchia has 27 years of environmental management experience, including serving as Deputy Commissioner and then Commissioner of the Vermont Department of Environmental Conservation from 1997 to 2003. In addition, he has served as Executive Director of the Biomass Energy Resource Center in Montpelier, and also as director of the Ozone Transport Commission in Washington D.C.

Regan, Edward**Gainesville Regional Utilities**

Mr. Edward Regan, P.E. obtained his master's degree from the University of Florida from the Department of Environmental Sciences and Engineering in 1977. His thesis advisor was Howard T. Odum, world renowned System's Ecologist and General Systems theorist. Ed Regan became a registered professional engineer and has over 32 years of extensive engineering and management experience in a wide range of utility operations. These include demand side management, electrical system planning, generation dispatch and power marketing, demand side management, environmental regulation, fuel supply management, water and wastewater system planning, financial and asset risk management, and utility rate design. He has visited many facilities and is familiar with the wide range of electrical generation technologies and storage systems currently deployed throughout the USA, Japan and Europe. His role in developing fuel price forecasts, acquiring fuels, and managing their costs on a day to day basis has made him keenly aware of the unique energy issues facing his local region, Florida, and the USA. Mr. Regan is on the settlement and operating committee of The Energy Authority™, a municipally owned power marketing company managing in excess of 25,000 megawatts of generating capacity, is on the Board of Directors for the Solar Electric Power Association, and is the past president of the Florida Municipal Electric Authority. The utility he has worked for the last 32 years (Gainesville Regional Utilities - GRU) is double A bond rated by USA's three major rating agencies, has the lowest electrical use per residential customer in Florida, and has among the most aggressive conservation and carbon reduction goals in the state. As head of the Strategic Planning Department, he spearheaded the initiative that led to GRU becoming the first utility in the USA to implement a European style solar feed in tariff. Since 2005 he has worked on a power plant development project which has culminated with the ongoing construction of a 100 MW biomass-fueled power plant. He was closely involved in developing fuel procurement standards and a forest stewardship program to assure compliance with IPCC criteria for carbon neutrality and ecosystem sustainability.

Reilly, John**Massachusetts Institute of Technology Joint Program on the Science and Policy of Global Change**

Dr. John Reilly is the Co-Director of the Joint Program on the Science and Policy of Global Change and Senior Lecturer in the Sloan School at MIT. Much of his 20-year research career has focused on the economics of climate change, including modeling of energy use and carbon emissions and on the economic impacts of climate change on agriculture as well as consideration of agriculture and

forestry sinks. He has published numerous articles, books, and reports on the economics of climate change and on other issues related to natural resources, technology, and energy use and supply. He was a principal author for the agricultural impacts chapter of the Intergovernmental Panel on Climate Change (IPCC) Second Assessment Report, co-chaired the agricultural sector assessment of the US National Assessment on Climate Variability and Change, and has served on many US Federal government and international committees. Prior to joining MIT in 1998, he spent 12 years with the Economic Research Service of USDA, most recently as the Acting Director and Deputy Director for Research of the Resource Economics Division. He has been a scientist with Battelle's Pacific Northwest National Laboratory and with the Institute for Energy Analysis, Oak Ridge Associated Universities. He received his Ph.D. in economics from the University of Pennsylvania in 1983 and holds a B.S. in economics and political science from the University of Wisconsin.

Rice, Charles

Kansas State University Department of Agronomy

Dr. Charles (Chuck) Rice is a University Distinguished Professor at Kansas State University. He is a Professor of Soil Microbiology in the Department of Agronomy. He earned his degrees from Northern Illinois University and the University of Kentucky. Dr. Rice teaches courses in soil microbiology and climate change impacts on agriculture. He has conducted long-term research on soil organic matter dynamics, nitrogen transformations and microbial ecology. Recently, his research has focused on soil and global climate change including C and N emissions in agricultural and grassland ecosystems and soil carbon sequestration and its potential benefits to the ecosystem. His research includes work in Brazil and Argentina. He has advised over 30 graduate students and 7 post-doctorates and has over 100 publications. In addition to his involvement in research and teaching in soil microbiology at K-State, He currently serves on the U.S. Department of Agriculture's Agricultural Air Quality Task Force and the U.S. National Academies Board on Agriculture and Natural Resources. Internationally, he is a lead author for Mitigation Working Group on the 4th and 5th Assessment Reports of the Intergovernmental Panel on Climate Change. He is a Fellow of the Soil Science Society of America, American Society of Agronomy, and the American Association for the Advancement of Science. He chairs the Commission on Soils, Food Security, and Public Health of the International Union of Soil Sciences. He also is the President of the Soil Science Society of America.

Rose, Steven

Electric Power Research Institute

Dr. Steven Rose is a Senior Research Economist in the Global Climate Change Research Group at the Electric Power Research Institute. Dr. Rose has a doctoral degree in environment and natural resource economics from Cornell University, and a Bachelor of Arts in economics from the University of Wisconsin-Madison. Dr. Rose's has expertise in domestic and global agriculture and forestry modeling. His research in this area focuses on the economics of land-use, agriculture and forestry abatement, and bioenergy as it relates to domestic and international climate change and energy policy. Current research includes estimating supplies of bioenergy feedstocks and their net greenhouse gas implications, forest carbon policy design implications, and agriculture and forestry greenhouse gas (GHG) emissions and abatement and net radiative forcing contributions. Dr. Rose also has expertise in forestry and agriculture greenhouse gas flux and carbon stock estimation, inventories and accounting, including crop modeling of yields, organic carbon, and emissions fluxes under baseline and alternative management systems. Dr. Rose has been appointed to various expert and scientific steering groups including a recent appointment to the U.S. Carbon Cycle Science Program's Carbon Cycle Scientific Steering Group, chair of the Land Modeling Subgroup of Stanford University's Energy Modeling Forum (EMF), and expert advisory appointments related to indirect land-use change, bioenergy greenhouse accounting standards, and integrated assessment. Dr. Rose was also a lead author for the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report on the topic of land-use activity, emissions and mitigation. He will be a lead author for the IPCC's forthcoming Fifth Assessment as well. In addition to journal articles and research assessments, Dr. Rose recently published a book on the economic analysis of global land-use in climate change policy. Finally, additional research areas include long-run modeling of climate change drivers, technology, mitigation, aerosols, and potential risks of climate change. Dr. Rose has served as senior technical advisor to domestic policy-making and international negotiations.

Ryan, Michael

U.S. Forest Service , Rocky Mountain Research Station

Dr. Michael G. Ryan is a Research Ecologist for the U.S. Department of Agriculture Forest Service, Rocky Mountain Research Station in Fort Collins, Colorado and affiliate faculty of the Graduate Degree Program in Ecology at Colorado State University. His research focuses on the ecophysiology of forests and factors influencing forest carbon exchange and accumulation including tree species,

nutrition, forest age, fire, management, and environmental effects on landscape carbon storage. Dr. Ryan serves as an editor for Tree Physiology, and is on the editorial review board of Plant, Cell and Environment. He is chair of the IUFRO Canopy Processes Working Group and is Scientist in Charge of Manitou Experimental Forest. He received his B.S. from the University of Pittsburgh, M.S. from Northern Arizona University, Ph.D. from Oregon State University and was a post-doctoral fellow at the Ecosystems Center at the Marine Biological Laboratory. He has worked in temperate, boreal and tropical forests, and was chapter lead author for 'Land Resources' in the Climate Change Science Program's SAP 4.3. He recently led a synthesis of the science on forests and carbon for the Ecological Society of America.

Schlesinger, William

Cary Institute of Ecosystem Studies

Dr. William H. Schlesinger is President of the Cary Institute of Ecosystem Studies, a private ecological research institute on the grounds of the Cary Arboretum in Millbrook, NY. He assumed this position after 27 years on the faculty of Duke University. Completing his A.B. at Dartmouth (1972), and Ph.D. at Cornell (1976), he moved to Duke in 1980, where he retired in spring 2007 as Dean of the Nicholas School of the Environment and Earth Sciences and as James B. Duke Professor of Biogeochemistry. Dr. Schlesinger is the author or coauthor of over 200 scientific papers on subjects of environmental chemistry and global change and the widely-adopted textbook Biogeochemistry: An Analysis of Global Change (Academic Press, 2nd ed. 1997). He has published editorials and columns in the Charlotte Observer, Chicago Tribune, Los Angeles Times, Philadelphia Inquirer, and the Raleigh News and Observer. He was elected a member of the National Academy of Sciences in 2003, and was President of the Ecological Society of America for 2003-2004. He is also a fellow in the American Academy of Arts and Sciences, the American Geophysical Union, and the Soil Science Society of America.

Schrag, Daniel

Harvard University Center for the Environment

Dr. Daniel Schrag is the Director of the Harvard University Center for the Environment, the Sturgis Hooper Professor of Geology and Professor of Environmental Science and Engineering at Harvard University. Dr. Schrag studies climate and climate change over the broadest range of Earth's history. He has examined changes in ocean circulation over the last several decades, with particular attention to El Niño and the tropical Pacific; he investigates Pleistocene ice-age cycles over the last million years; he studies the warm climates of the Eocene, 50 million years ago; and, with colleagues from Harvard, helped to develop the Snowball Earth hypothesis that explains extreme glacial events that occurred over 600 million years ago. Currently he is working on the early history of Mars and Earth, trying to understand the environmental conditions around the time of the origin of life. He is also working on new technological approaches to mitigating future climate change, including advanced energy technologies for low-carbon transportation fuel, and carbon sequestration. Dr. Schrag received a B.S. from Yale and a Ph.D. in Geology from the University of California at Berkeley. He taught at Princeton before moving to Harvard in 1997. Among various honors, he was named a MacArthur Fellow in 2000. He currently serves on President Obama's Council of Advisors for Science and Technology (PCAST).

Searchinger, Tim

Princeton University, German Marshall Fund of the United States

Mr. Timothy D. Searchinger is a Research Scholar and Lecturer at Princeton University, and a Transatlantic Fellow of the German Marshall Fund. Although trained as a lawyer, his work today combines ecology and economics to analyze the challenge of how to feed a growing world population while reducing greenhouse gas emissions from agriculture. Of many writings on agriculture and water policies, Mr. Searchinger is best known for his papers on biofuels, land use and bioenergy accounting of greenhouse gas emissions. He was previously a Senior Fellow of the Law and Environmental Policy Institute at Georgetown University Law Center. For most of his career, Mr. Searchinger worked as a senior attorney at the conservation group, the Environmental Defense Fund, where he directed its work on agricultural policy and wetlands and co-founded the Center for Conservation Incentives. Mr. Searchinger speaks widely to governments, associations and universities and was the keynote speaker at the first meeting last year of the Global Research Alliance on Agricultural Greenhouse Gas Mitigation in New Zealand. He is a graduate, summa cum laude, of Amherst College and holds a J.D. from Yale Law School where he was Senior Editor of the Yale Law Journal, and has also served as Deputy General Counsel to Governor Robert P. Casey of Pennsylvania. Mr. Searchinger was the lead author of the paper in Science magazine that pointed out the error of assuming that bioenergy from all sources is carbon neutral. He has been invited to provide briefings on proper bioenergy accounting to the Association of State Air Use Regulators, the U.S. Environmental Protection Agency, and government officials in New York State, Massachusetts, the European Commission, the European Parliament, the U.K.,

Denmark, New Zealand, the World Bank, and the Food and Agriculture Association of the United Nations.

Sedjo, Roger

Resources for the Future

Dr. Roger A. Sedjo is a Senior Fellow and the director of the Center for Forest Economics and Policy at Resources for the Future (RFF), a position he has held for over thirty years. In his early career he was a tenured professor at Utah State University, an economist in the Department of State (AID) having serviced two years in South Korea as a technical advisor on their economic planning, and a consultant with Nathan Associates, an economic consulting firm. Since he joined RFF his research has focused on a variety of natural resource and forest issues including a host of commercial, biomass energy, climate and environmental issues. He has authored hundreds of peer reviewed journal articles and book chapters as well as authoring or editing fifteen books. His most recent book, *Perspectives on Sustainable Resources in America*, was published in 2008. Dr. Sedjo received his B.S. and M.S. from the University of Illinois and his PhD in economics from the University of Washington (Seattle). Dr. Sedjo has received numerous awards and served on various boards and advisory groups. He is a recipient of the Nobel award given to selected members who prepared the Climate Assessment Reports of the IPCC, was elected a Fellow of the Society of American Foresters, received an honorary doctorate for scholarship from the College of Environmental Science and Forestry of the State University of New York, and received the Best Book Award for 2000 from the Section for Environmental and Natural Resources Administration of the American Society of Public Administration for *A Vision for the U.S. Forest Service: Goals for Its Next Century*. Dr. Sedjo served on the boards of the Renewable Natural Resources Foundation, the Institute of Forest Biotechnology, and the Association of Environmental and Resource Economists as well as on the U.S. Department of Agriculture Second Committee of Scientists (1998-1999). Over the period 1999-2009, he served as both President and Chair for the Environmental Literacy Council, a non-profit environmental educational organization. Dr. Sedjo is currently a member of the National Academies Board of Agriculture and Natural Resources and the Sustainable Forestry Board, a non-profit involved in certifying forestry practices in North America. He has been an official delegate to a number of government sponsor missions including a USDA mission to China on Forest Policy, two international forestry Congresses and as a U.S. Department of State speaker to Indonesia. He was a Visiting Scientist at the International Institute of Applied Systems Analysis in Vienna, a Visiting Scientist at the UN Food and Agricultural Organization in Rome, and a Fulbright Visiting Professor at the University of Alberta.

Seidman, Nancy

Massachusetts Department of Environmental Protection

Ms. Nancy L. Seidman is the Deputy Assistant Commissioner for Climate Strategies within the Bureau of Waste Prevention (BWP) of the Massachusetts Department of Environmental Protection (MassDEP). In that position, she leads BWP efforts on the development on a wide range of criteria pollutant and climate programs. This includes areas such as: the Regional Greenhouse Gas Initiative, ozone nonattainment planning and emission control programs, the Commonwealth's ambient air pollution monitoring network, other efforts to reduce toxics and criteria pollution, low carbon fuels, and biomass. Ms. Seidman has been at MassDEP since 1995; she has also been the Division Director for Transportation and Consumer Programs ('01-08) and the Deputy Director for Air Program Planning ('95-01). She serves as the lead manager for the MassDEP on utility and energy issues. From October 2005 - October 2006, Ms. Seidman served as the President of the National Association for Clean Air Agencies (NACAA), and she co-chairs NACAA's mobile source and fuels committee, a position she has held since 2002. Prior to joining MassDEP, Ms. Seidman worked for US EPA in the New England regional office, and for the Northeast States for Coordinated Air Use Management (NESCAUM). Ms. Seidman holds a Bachelor's degree in Chemical Engineering from Cornell University and an MBA in Public Management from Boston University.

Sessions, John

Oregon State University College of Forestry

Dr. John Sessions received the B.S. degree in engineering from the University of California, Los Angeles in 1966, the M.S. in civil engineering from California State University, Los Angeles in 1968, the M.S. in forest engineering from the University of Washington in 1971, and the Ph.D. in forest management from Oregon State University in 1979. After an early career with the USDA Forest Service and industry he came to Oregon State University in 1983. He was appointed full professor in 1988, University Distinguished Professor in 1999, Stewart Professor of Forest Engineering in 2001 and the Strachan Chair of Forest Operations Management in 2008. He served as a member of the Marcus Wallenberg International Prize Selection Committee from 1996-2000. He served on the editorial board of the *Western Journal of Forestry* (1985-1996) and currently serves on the editorial boards of *Silva Fennica* and the *International J. of Forestry Research*. His research interests are in strategic and tactical forest planning, harvest scheduling, road

and harvest planning, and wildfire management. He has authored or coauthored more than 300 publications and worked in 16 countries for governments, NGO's, and companies. He cochaired the two congressionally mandated decadal assessments of Indian forests and forest management and is one of two academic members of the Interagency Science Team for the National Fire Program Analysis Review.

Shepard, James

Auburn University School of Forestry and Wildlife Sciences

Dr. James Shepard received his BS in forest management from Miss. State University in 1979, a masters degree in tree physiology from Purdue University in 1981, a PhD in forest soils from Miss. State in 1985, and was a postdoc at SUNY-ESF studying the biogeochemical effects of atmospheric deposition in the Adirondack Mountains of upstate New York. In 2011 he began service as Dean and Professor of the School of Forestry and Wildlife Sciences at Auburn University. The School has expertise in climate change and carbon modeling, as well as ecological effects of air pollution. Jim's research has address air pollution effects on forest biogeochemistry, forest wetland ecology and management, water quality, and ecological restoration. Dr. Shepard has served on a planning committee for an EPA interagency wetlands workshop, was a reviewer of a wetlands rapid assessment document for the Corps of Engineers, has provided technical assistance to the USDA Forest Service in research planning, and served as a technical advisor for forestry Best Management Practices in Florida and Texas.

Shmulsky, Rubin

Mississippi State University College of Forest Resources

Dr. Rubin Shmulsky is Professor and Department Head of Forest Products at Mississippi State University. As a faculty member, his research focused on air pollution measurement and control, particularly that of volatile organic compounds, during drying of wood and biobased products. He has cooperated with a variety of industrial sponsors in an effort to develop emission factors for lumber drying. He has also contributed to the development of a mini gas chromatograph that utilized a micro emission sensor to detect and monitor gaseous pollutants in industrial waste streams. As department head he oversees the research, service, and academic activities in forest products. These include but are not limited to renewable energy, wood protection and durability, engineered wood products, environmental conservation, and furniture. He also serves as associate director of the university's Sustainable Energy Research Center where he coordinates much of the energy related activities in the divisions of Agriculture, Forestry, and Veterinary Medicine. Dr. Shmulsky has published extensively in the field of wood emissions from wood products manufacture. He is also co-author of the widely adopted college level textbook titles "Forest Products and Wood Science an Introduction. Published by J.W. Wiley, the sixth edition of this text is in press and is due in college bookstores in July of 2011.

Skog, Ken

U.S. Forest Service Forest Products Laboratory

Dr. Kenneth E. Skog is the Project Leader for the Economics and Statistics Research Group at the USDA Forest Service Forest Products Laboratory in Madison, WI. He holds a B.S. in Mathematics (1971), an M.S. in Forestry (1977) and a Ph.D. Forest Economics (1986) from Michigan State University. Dr. Skog is the author of over 130 papers in areas ranging from forest sector market modeling/projections to national level forest and forest product carbon accounting and estimation. In recent years his work has focused on carbon accounting and estimation of carbon storage in harvested wood products; estimation of forest-based biomass for bioenergy and biofuels; market effects of increased wood energy use; and evaluating sustainability of benefits from forest resources. Dr. Skog was a lead author for the Land use, land use change and forestry (LULUCF) sections of the 2003 IPCC Good practice guidance and the 2006 Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories. He led the Forest Service team to prepare forest-based biomass supply estimates for the revision to the USDA/ DOE Billion ton biomass supply report. He was co-lead in preparing US Department of Energy 1605b guidelines for entities to estimate additions to carbon storage in forests and harvested wood products. He is project leader for team preparing U.S. and global forest sector projections as driven by alternate wood bioenergy scenarios based on IPCC emission/economic scenarios. He is the Forest Service team lead with the Consortium on Renewable Resources in Manufacturing (CORRIM) which is conducting life cycle assessment including greenhouse gas (GHG) emissions for production of wood products, wood-based biofuels and forest management. He was the team lead in preparing U.S. forest sustainability indicators for sustaining benefits from forests under the Montreal process for criteria and indicators for conservation and sustainable management of temperate and boreal forests. His work has been recognized by a USDA Award for Superior Service for leadership in research and by the Intergovernmental Panel on Climate Change for contributions to the Award of the Nobel Peace Prize.

Stokes, Bryce

CNJV

Dr. Bryce Stokes is a Senior Advisor to the Office of the Biomass Program in the Department of Energy (DOE). He is employed by CNJV - a Joint Venture between Corporate Allocation Services, Inc. and Navarro Research and Engineering - a Department of Energy (DOE) contractor in Golden, CO, but works at DOE headquarters in Washington, DC. As a DOE consultant, he provides counsel and analyses on a range of topics such as biomass feedstock availability, costs, and production; feedstock assessments and logistics; land-use change; carbon accounting and LCA; sustainability, and various issues relevant to bioenergy and the environment. He is the co-lead on the update of the Billion Ton Assessment. He has a BS in Biological Engineering and a MS in Forest Engineering from Mississippi State University and a Ph.D in Forestry from Auburn University. Dr. Stokes retired after 30 years of experience as a Research Engineer and National Program Leader with the U.S. Forest Service in Auburn, AL and Washington, DC. He conducted research and led a research program in forest systems development, biomass utilization, and energy crops. He led forest operations and co-led biomass assessment and utilization, climate change and carbon management, and forest productivity programs at the national level. As part of his duties, he provided support to the USDA Climate Change Program Office and was the recipient of two group Secretary Awards for those efforts. He served on three interagency teams with the Climate Change Science Program including the Carbon Cycle and Ecological Working Groups. He served as co-chair on the latter. Dr. Stokes had several leadership positions in the International Energy Agency tasks for over 20 years, in the International Union of Forest Research Organizations, and has served on many national and international working groups on various topics. He is involved in three professional societies where he has held leadership positions.

Thompson, Jon

Texas Tech University Department of Chemistry and Biochemistry

Dr. Jon Thompson is an Associate Professor of Chemistry at Texas Tech. He obtained a Ph.D degree from the University of Florida in 2001. His current work involves developing measurement platforms to monitor light extinction, scattering, and albedo by aerosols and gases. An additional interest is developing sensors for monitoring chemical compounds present in atmospheric particles.

Tilman, G. David

University of Minnesota Department of Ecology, Evolution and Behavior

Dr. G. David Tilman is Regents Professor of Ecology and holds the McKnight University Presidential Chair in Ecology at the University of Minnesota. He is an experimental and mathematical ecologist studying the impacts of the loss of biological diversity and of other types of human-driven global change on the functioning and stability of ecosystems and on the services that ecosystems provide society. Dr. Tilman's research focuses on the causes, consequences and conservation of earth's biodiversity, and on how managed and natural ecosystems can sustainably meet human needs for food, energy and ecosystem services. He is an elected member of the American Academy of Arts and Sciences and the National Academy of Sciences, was the Founding Editor of the journal Ecological Issues and has served on editorial boards of nine scholarly journals, including Science. He serves on the Advisory Board for the Max Planck Institute for Biogeochemistry in Jena, Germany. He has been a Member of the Institute for Advanced Study in Princeton and a Fellow of the National Center for Ecological Analysis and Synthesis. He has received the Ecological Society of America's Cooper Award and its MacArthur Award, the Botanical Society of America's Centennial Award, the Princeton Environmental Prize and was named a J. S. Guggenheim Fellow. He has written two books, edited three books, and published more than 200 papers in the peer-reviewed literature, including more than 30 papers in Science, Nature and the Proceedings of the National Academy of Sciences USA. The Institute for Scientific Information designated him as the world's most highly cited environmental scientist of the decade for 1990-2000 and for 1996-2006. After earning his Ph. D. at the University of Michigan in 1976, Dr. Tilman has spent his academic career at the University of Minnesota, but also has served as a Member of Princeton's Institute for Advanced Study, a Senior Visiting Fellow at Princeton University, and a Fellow of the National Center for Ecological Analysis and Synthesis.

Van Brunt, Michael

Covanta Energy

Mr. Michael Van Brunt is a licensed professional engineer with Bachelor's and Master's degrees in Environmental Engineering from Cornell University and over twelve years of experience in industry and consulting. He has significant environmental management and sustainability experience in a variety of industries including waste management, forest products, steel manufacturing, scrap recycling, electrical generation, transportation, and aluminum manufacturing. In his current role, Mr. Van Brunt is a Director in Covanta's sustainability department where his primary focus is on climate change, carbon offset project development, and life cycle assessment. His current research includes a comparison of instantaneous and temporally distributed emissions of methane and

their relative impact on climate as viewed from the global warming potential and global temperature potential metrics. He is also assessing the climate and greenhouse gas (GHG) emissions implications of using waste biomass, including forestry residues, wood products wastes, and municipal solid waste for both electricity generation and conversion to liquid fuels. Mr. Van Brunt has been very active with GHG accounting protocol development both internationally and nationally. He was a member of The Climate Registry's power and utility protocol workgroup and is currently on the World Resources Institute (WRI) World Business Council for Sustainable Development (WBCSD) Greenhouse Gas Protocol Scope 3 Technical Working Group. He is also currently on the International Council for Local Environmental Initiatives (ICLEI) Community GHG Protocol's Solid Waste and Material Consumption Technical Advisory Committee serving as the lead for the Trans-Boundary Solid Waste Subcommittee. He has guest lectured at Cornell University on greenhouse gas emissions for a senior level environmental engineering class. Has co-authored peer reviewed technical papers and has presented at Technical Conferences on GHG accounting and emissions in the waste and wastewater fields.

Wang, Michael

Argonne National Laboratory Center for Transportation Research

Dr. Michael Wang is the manager of the Systems Assessment Section at Argonne National Laboratory's Center for Transportation Research. His research areas include evaluation of energy and environmental impacts of advanced vehicle technologies and new transportation fuels, assessment of market potentials of new vehicle and fuel technologies, and projection of transportation development in emerging economies. Dr. Wang has been responsible for developing Argonne's GREET (Greenhouse gases, Regulated Emissions, and Energy use in Transportation) software model for the well-to-wheels analysis of vehicle/fuel systems, which he and his team have used to conduct lifecycle analyses of advanced vehicle technologies and new transportation fuels for the U.S. Department of Energy, the U.S. Environmental Protection Agency, the State of Illinois, and General Motors Corporation. The GREET model currently has more than 7,500 registered users worldwide. Dr. Wang has published extensively on the topic of lifecycle analysis of vehicle/fuel systems, especially biofuels, and has authored more than 140 publications and made over 100 invited technical presentations. He has a Ph.D. in Environmental Science from the University of California at Davis.

Weiskittel, Aaron

University of Maine School of Forest Resources

Dr. Aaron R. Weiskittel is the University of Maine's School of Forest Resources Irving Chair of Forest Ecosystem Management and an Assistant Professor of Forest Modeling. He is author of the forthcoming book Forest Growth and Yield Modeling as well as an author/co-author on over 25 technical publications. His publications have appeared in the top scientific journals in forestry including Annals of Forest Science, Canadian Journal of Forest Research, Forest Ecology and Management, and Trees. His research has been funded by the National Science Foundation, Northeastern States Research Cooperative, National Institute of Food and Agriculture, and US Forest Service. He is an expert in forest biometrics, growth modeling, and tree crown structure and dynamics. Dr. Weiskittel received his PhD and MS in forestry from Oregon State University and a BS in Natural Resources with a concentration in forestry from The Ohio State University. His current research concentrates on the development of an Acadian variant of the Forest Vegetation Simulator (FVS), projecting future carbon dynamics of Maine's northern forest, and assessing influence of climate change on forest productivity.

West, Tristram

University of Maryland Joint Global Change Research Institute

Dr. Tris West has over a decade of experience in carbon accounting of agricultural ecosystems. He has developed models and conducted analyses of energy use, fossil fuel emissions, soil carbon change, and both vertical carbon fluxes and lateral carbon transport associated with agricultural production. Dr. West's research is focused on net emissions or the net impact of land management activities on CO₂ emissions. He is currently involved in multiple projects and programs developed to monitor and quantify regional, national, and global carbon budgets. Dr. West received a B.S. in Natural Resources Conservation and Management from University of Kentucky, and received a M.S. and Ph.D. from Ohio State University in Natural Resources and Agronomy, respectively. He spent over 10 years at Oak Ridge National Laboratory quantifying regional carbon fluxes, carbon sequestration potentials, and guidelines for greenhouse gas accounting. He is now at the Joint Global Change Research Institute in College Park, Maryland, conducting research focused on the integration of carbon, energy, and economic models to investigate future changes in carbon stocks and fluxes.

Woodbury, Peter

Cornell University Department of Crop and Soil Sciences

Dr. Peter Woodbury serves as Coordinator of the Bioenergy and Greenhouse Gas Initiative of the Department of Crop and Soil Sciences. He is also the Northeast Sun Grant Region Technical Lead for the Department of Energy (DOE)/ Oak Ridge National Laboratory (ORNL) Feedstock Partnership Geographic Information System (GIS) Atlas Project. He designs and manages research projects, writes grant proposals, creates and oversees project budgets, and manages sub-contracts. Dr. Woodbury works with a multi-disciplinary multi-institutional team to: assess potential bioenergy feedstock production and sustainability in the Northeastern and North-Central US, assess potential mitigation options for greenhouse gas emissions from the agriculture and forestry sectors, model effects of tillage and residue management on soil carbon in the rice-wheat cropping system of the Indo-Gangetic Plains, model nitrogen, phosphorus and sediment loading to surface waters in the Upper Susquehanna watershed. Dr. Woodbury evaluates probabilistic methodologies for assessing risks from fire and invasive species to wildland ecosystems throughout the Western US, writes peer-reviewed publications, presents results at international meetings. and was the Federal Ozone Criteria Document Author 2002 and 2005 (part-time). Dr. Woodbury quantifies the response of forest and agricultural ecosystems to ambient ozone based on a comprehensive literature review and expert subject matter knowledge, writes detailed report as part of the U.S. Environmental Protection Agency (USEPA) technical support document for the National Ambient Air Quality Standard for Ozone as required under the Clean Air Act.

Zalesny, Ronald

U.S. Forest Service Northern Research Station

Dr. Ronald Zalesny is one of the US Forest Service's experts in short-rotation woody crops and their potential application for bioenergy and climate change mitigation. As a team leader in the US Forest Service Northern Research Station, Dr. Zalesny is also familiar with other Northern Station research in carbon accounting, measurement and inventory. Dr. Zalesny's personal research in short-rotation woody crops improves our understanding the underlying genetic and physiological mechanisms which support effective deployment of favorable genotypes that help: 1) reduce impacts from invasive species, 2) provide an energy source that does not contribute to increased atmospheric carbon dioxide (CO₂) and global climate change, and 3) improve the rural agricultural environment through remediation and/or restoration. Overall, the knowledge gained from his research helps researchers and growers increase the success of plantation establishment, which augments supplies of native aspen in the North Central Region and ultimately reduces pressure on native forest ecosystems. In addition, the general public gets a supply of wood and wood products for potential bioenergy or wood products applications while having the native forests for aesthetics and recreation.

Zilberman, David

University of California Department of Agricultural and Resource Economics

Dr. David Zilberman has been a Professor in the Agricultural and Resource Economics Department since 1979. He is currently the Director of the Giannini Foundation and a fellow of the American Agricultural Economics Association. The Giannini Foundation's mission is to promote and support research and outreach activities in agricultural economics and rural development relevant to California. Dr. Zilberman's research interests are in agricultural and nutritional policy, economics of technological change, economics of natural resources and microeconomic theory. He is the recipient of numerous awards, among them the Publication of Enduring Quality Awards in 2005. He received his B.A. in Economics and Statistics from Tel Aviv University in Israel and his Ph. D in Agricultural and Resource Economics from U.C. Berkeley.