



MIT Joint Program on the Science and Policy of Global Change

XLII GLOBAL CHANGE FORUM

28–29 March, 2019

MIT Samberg Conference Center

50 Memorial Drive, 6th Floor, Building E52

Sloan School of Management, Cambridge, MA USA

Global Changes: Risks and Opportunities

The XLII (42nd) Global Change Forum will focus on how global change is creating challenges and opportunities in agriculture, finance, energy, weather extremes, water and ecosystem thresholds, and security.

Drawing approximately 100 invited representatives of industry, government, non-governmental organizations, national and international policymaking bodies, and research groups, the MIT Global Forum provides a non-official, neutral setting for analysis and discussion of science and policy aspects of global environmental change, and for independent assessment of studies and policy proposals.

Adhering to the “Chatham House Rule,” the meeting is off the record, with no press and no attribution of speakers’ comments without permission. Each session consists of the presentation of recent research results or insights on the topic, followed by a moderated, open discussion with all participants.

Agenda

Thursday 28 March 2019

8:00 REGISTRATION AND LIGHT BREAKFAST

8:30 1. Agriculture

Moderator: Dr. Niven Winchester • MIT Joint Program • *Principal Research Scientist*

Dr. John Reilly • MIT Joint Program • *Co-Director*

Ms. Constance Cullman • Farm Foundation • *President and CEO*

10:00 COFFEE BREAK

10:30 2. Finance

Moderator: Horacio Caperan • MIT Joint Program • *Executive Director of External Affairs*

Dr. Barbara Buchner • Climate Policy Initiative • *Executive Director, Climate Finance Program*

Dr. John Parsons • MIT Sloan School of Management • *Senior Lecturer*

12:30 LUNCH – FEATURING ROUNDTABLE DISCUSSION ON SESSION TOPICS

14:00 3. Energy

Moderator: Dr. Sergey Paltsev • MIT Joint Program and MITEI • *Sr. Research Scientist; Deputy Director*

Ms. Mathilde Fajardy • Imperial College London, Center for Environmental Policy • *Doctoral Candidate*

Dr. Jennifer Morris • MIT Joint Program • *Research Scientist*

Dr. Michael Davidson • Harvard Kennedy School, Belfer Center • *Postdoctoral Fellow*

15:30 COFFEE BREAK

16:00 4. Weather Extremes

Moderator: Dr. C. Adam Schlosser • MIT Joint Program • *Sr. Research Scientist; Deputy Director*

Dr. Suzana J. Camargo • Columbia University • *Lamont Research Professor; Executive Director of the Extremes Initiative*

Prof. Laura Kuhl • Northeastern University • *Assistant Professor of Public Policy and Urban Affairs and International Affairs*

Dr. Xiang Gao • MIT Joint Program • *Research Scientist*

Thursday 28 March 2019

17:45 RECEPTION

18:30 Dinner and Keynote Address

Introduction: Dr. John Reilly • MIT Joint Program • *Co-Director*

Hon. Alex Beehler • U.S. Department of Defense • *Assistant Secretary of the Army*

Friday 29 March 2019

8:00 REGISTRATION AND LIGHT BREAKFAST

8:30 5. Thresholds

Moderator: Ms. Anne Slinn • MIT Joint Program • *Executive Director for Research*

Dr. Charles Stock • U.S. National Oceanic and Atmospheric Administration • *Research Oceanographer*

Prof. Patrick Heimbach • University of Texas at Austin • *Associate Professor, Jackson School of Geosciences*

Dr. C. Adam Schlosser • MIT Joint Program • *Senior Research Scientist; Deputy Director*

10:00 COFFEE BREAK

10:30 6. PANEL: Implications for Security

Moderator: Prof. Henry Jacoby • MIT Joint Program • *Professor Emeritus*

Dr. Shenggen Fan • International Food Policy Research Institute • *Director General*

Dr. Atyia Martin • Northeastern University, Global Resilience Institute • *Distinguished Senior Fellow*

Ms. Melanie A. Kenderdine • Energy Futures Initiative • *Principal*

Mr. James Goudreau • Novartis Business Services • *Head of Climate, Global HSE&BCM, Novartis Campus*

12:30 Closing Remarks

Prof. Ronald G. Prinn • MIT Joint Program • *Co-Director*

12:45 LUNCH

Biographies

Hon. Alex Beehler



Hon. Alex Beehler is the Assistant Secretary of the Army for Installations, Energy and Environment at the U.S. Department of Defense. In January, 2019, Mr. Alex A. Beehler was confirmed by the U.S. Senate and sworn in as the 16th assistant secretary of the U.S. Army for Installations, Energy and Environment. In this capacity he is the primary advisor to the Secretary of the Army and Chief of Staff of the Army for all matters related to Army installation policy and oversight, and coordination of energy security and management. In addition, he is responsible for policy and oversight of sustainability and environmental initiatives; resource management, including design, military construction, operations and maintenance; Base Realignment and Closure (BRAC); and privatization of the Army real estate portfolio and installations' Safety and Occupational Health programs.

Hon. Beehler previously served from 2004 to 2009, in the Office of Under Secretary of Defense for Installations and Environment, first as the Assistant Deputy for Environment, Safety and Occupational Health, then Principal Deputy, and Acting Deputy Under Secretary. In those capacities, Hon. Beehler served as the principal assistant and advisor for all environmental, safety and occupational health policies and programs in the Department of Defense (DoD). Those programs included cleanup at active and closing bases, compliance with environmental laws, conservation of natural and cultural resources, pollution prevention, environmental technology, fire protection, safety and explosive safety, and pest management and disease control for defense activities worldwide. He also was the first Chief Sustainability Officer of the DoD.

Hon. Beehler also has extensive experience in private industry, where he served as a director of environmental and regulatory affairs. He has maintained a strong background in federal environmental policy, having served in the Department of Justice as a senior trial attorney for environmental enforcement and at the Environmental Protection Agency as a special assistant for legal and enforcement counsel. He also served as staff counsel on the U.S. Senate Judiciary Committee. Hon. Beehler is a member of the bar of Maryland, Virginia and the District of Columbia. He received a bachelor's degree from Princeton University in public and international affairs and a law degree from the University of Virginia.

Dr. Barbara Buchner



Dr. Barbara Buchner is Executive Director of Climate Finance at Climate Policy Initiative. Named one of the 20 most influential women in climate change, she advises leaders on climate, energy and land-use investments around the world. Dr. Buchner is lead author on CPI's Global Landscape of Climate Finance, a paper that has set the benchmark for climate finance tracking. She directs CPI's work as Secretariat of the Global Innovation Lab for Climate Finance (the Lab). The Lab identifies, develops and launches innovative climate finance instruments that resolve financing barriers for clean energy, sustainable land use, adaptation and other green growth projects. Instruments from the Lab have mobilized over \$1 billion for sustainable development in in just four years.

Dr. Suzana J. Camargo



Dr. Suzana J. Camargo is a Lamont Research Professor at the Lamont-Doherty Earth Observatory of Columbia University. She has been working at Columbia University at the Lamont campus since 1999, first at the International Research Institute for Climate and Society (IRI) before becoming part of the Ocean and Climate Physics Division of the Lamont-Doherty Earth Observatory in 2007. Dr. Camargo's main expertise is on tropical cyclones (hurricanes and typhoons), in particular the relationship of tropical cyclones and climate in various timescales. She has published

over 100 publications in peer-reviewed journals. Since 2015, Dr. Camargo is the executive director of the Columbia University Initiative on Extreme Weather and Climate. She joined the Columbia University Earth Institute Faculty as an Associate Member in January 2018. Dr. Camargo has been an editor of *Geophysical Research Letters* since 2018 and an associate editor of the *Journal of Climate* since 2016. She has also been a member of the World Meteorological Organization Expert Team on Climate Change Impacts on Tropical Cyclones since 2017.

Mr. Horacio Caperan



Mr. Horacio Caperan is the MIT Joint Program's Executive Director for External Affairs. He has over 20 years of experience in strategic planning, marketing, business development and program management for organizations in the transportation, agroindustry, life sciences and technology sectors in the U.S. and international markets. He is an alumnus of the MIT Sloan School of Management where he earned an MBA with honors. Previously Mr. Caperan received a Fellowship in the Management of Clean Energy Ventures from Boston University and the New

England Clean Energy Council. He holds a dual Master's degree in Biology and Biotechnology from Tufts University. He earned a BS in management and economics in Chile, where he later held positions as a professor of economics and finance.

Ms. Constance Cullman



Ms. Constance Cullman is President and CEO of Farm Foundation, an agricultural policy institute that cultivates dynamic nonpartisan collaboration to meet society's needs for food, fiber, feed and energy. In this role, she works to connect leaders in farming, business, academia, organizations and government through proactive, rigorous debate and objective issue analysis. Prior to joining Farm Foundation, Ms. Cullman was U.S. Government Affairs Leader with Dow AgroSciences. She previously served as Associate Administrator for the Foreign Agricultural Service of

the U.S. Department of Agriculture. She also worked at the Corn Refiners Association, Ohio Farm Bureau Federation, and the Ohio State University College of Food, Agricultural and Environmental Sciences.

Ms. Cullman is a graduate of Ohio State, earning her bachelor's degree in agricultural economics, and a master's degree in agricultural economics with an emphasis on international trade and agricultural policy.

Dr. Michael Davidson



Dr. Michael Davidson is a postdoctoral fellow in the Harvard Kennedy School's Belfer Center for Science and International Affairs. Dr. Davidson studies the engineering implications and institutional conflicts inherent in deploying renewable energy at scale, with a focus on China. His work has looked at integration challenges in China's wind sector, ongoing market creation efforts, and the implications for China's future decarbonization pathways. He holds a PhD in engineering systems from the MIT Institute for Data, Systems and Society, and was a researcher with the MIT Joint Program. Michael holds an MS in technology and policy from MIT, and a BS in mathematics and physics and BA in Japanese studies from Case Western Reserve University.

Ms. Mathilde Fajardy



Ms. Mathilde Fajardy is a third-year PhD student at the Centre for Process Systems Engineering and the Centre for Environmental Policy at Imperial College London. She is investigating the potential of carbon dioxide removal for climate mitigation, with a focus on bioenergy with carbon capture and storage (BECCS). She holds a Bachelor's degree in Energy Engineering and a Master's degree in Fluid Mechanics and Thermosciences from Ecole Centrale Paris.

Dr. Shenggen Fan



Dr. Shenggen Fan (樊胜根) has been director general of the International Food Policy Research Institute (IFPRI) since 2009. Dr. Fan joined IFPRI in 1995 as a research fellow, conducting extensive research on pro-poor development strategies in Africa, Asia and the Middle East. He led IFPRI's program on public investment before becoming the director of the Institute's Development Strategy and Governance Division in 2005. He is one of the Champions of Target 12.3 of the Sustainable Development Goals, dedicated to inspiring ambition, mobilizing action and accelerating progress toward cutting global food loss and waste. He serves as a member of the Lead Group for the Scaling Up Nutrition (SUN) Movement appointed by UN Secretary General Ban Ki Moon, and as an advisor to many national governments (including China and Vietnam) on agriculture, food security and nutrition. In 2017, Dr. Fan received the 2017 Fudan Management Excellence Award, which China refers to as the "Nobel Prize for Management." This highly prestigious award recognizes individuals who have made outstanding contributions to the field of management. In 2014, he received the Hunger Hero Award from the World Food Programme in recognition of his commitment to and leadership in fighting hunger worldwide. Dr. Fan received a PhD in applied economics from the University of Minnesota and bachelor's and master's degrees from Nanjing Agricultural University in China.

Dr. Xiang Gao



Dr. Xiang Gao is a Research Scientist at the MIT Joint Program. Dr. Gao's research is focused on the development and application of land-surface models, and using satellite remote sensing data to investigate precipitation events and hydrologic properties, including storm frequency and duration, soil wetness and vegetation biophysical parameters. Her recent work has addressed land-climate interactions, the global water cycle, Arctic processes and remote sensing of vegetation biophysical parameters. Prior to joining MIT, Dr. Gao was a Research Scientist at the Center for Ocean Land

Atmosphere Studies (COLA) in Calverton, MD.

Mr. James Goudreau



Mr. James Goudreau currently serves as the Head of Climate for Novartis Business Services. He crafts strategy and policy for Novartis to increase climate resilience, reduce greenhouse gas emissions and increase energy resilience across their global operations. These efforts include managing a diverse portfolio of efforts in technology, partnerships and procurement designed to achieve efficiency, resilience and greater shareholder value. Prior to joining Novartis, he culminated a military career as a U.S.

Navy Captain working on energy and climate resilience issues in the Pentagon. As the

Acting Deputy Assistant Secretary of the Navy (Energy) he focused on increasing operational capabilities and resilience globally for the U.S. Navy and U.S. Marine Corps. Mr. Goudreau also works to improve sustainability and climate resilience in the Boston area as a member of the Board of Directors for the Cambridge Compact for a Sustainable Future and a member of the Board of Directors for A Better City. He holds a BS degree from Norwich University, a Masters in Management degree from Troy University, and has completed the Tuck Executive Program at the Dartmouth College Tuck School of Business.

Prof. Patrick Heimbach



Prof. Patrick Heimbach is Associate Professor at the University of Texas at Austin's Jackson School of Geosciences and Fellow of the W. A. "Tex" Moncrief, Jr., Chair III in Simulation-Based Engineering and Sciences in the Oden Institute for Computational Engineering and Sciences. Previously, he worked for 16 years at MIT. His main research interest is understanding the global ocean circulation and its role in climate. Another is the marine cryosphere, in particular the Arctic sea ice-ocean system, the dynamics of the polar ice sheets, their interaction with the

ocean, and their contributions to global sea-level rise. Prof. Heimbach serves on the National Academy of Sciences' Ocean Studies Board, and on the National Science Foundation's Advisory Committees for the Office of Polar Programs and the Office for Advanced Cyberinfrastructure. He is science team member of NASA's SWOT and GRACE missions, and co-founder of the Advanced Climate Dynamics Courses (ACDC), held annually since 2009. Prof. Heimbach earned his PhD in 1998 in Geosciences from the Max-Planck-Institute for Meteorology and the University of Hamburg, Germany.

Prof. Henry Jacoby



Prof. Jacoby is a founding Co-Director of the MIT Joint Program, and William F. Pounds Professor of Management, Emeritus at the MIT Sloan School of Management. An undergraduate mechanical engineer at the University of Texas at Austin, he holds a PhD in Economics from Harvard University where he also served on the faculties of the Department of Economics and the Kennedy School of Government. Prof. Jacoby has served as Director of the Harvard Environmental Systems Program, Director of the MIT Center for Energy and Environmental Policy Research, Associate Director of the MIT Energy Laboratory, and Chair of the MIT Faculty. He currently serves on a U.S. National Academies Committee to advise the U.S. Global Change Research Program.

Ms. Melanie A. Kenderdine



Ms. Melanie Kenderdine is a principal of Energy Futures Initiative and a non-resident Senior Fellow at the Atlantic Council. She is also a Visiting Fellow at the Energy Policy Institute at the University of Chicago. She served at the Department of Energy from 2013 to 2017 as Energy Counselor to the Secretary and Director of the Office of Energy Policy and Systems Analysis. She oversaw analysis and policy development in the DOE's annual review of the Renewable Fuel Standard Program requirements, energy innovation and climate change; produced two installments of the *Quadrennial Energy Review*; and helped conceive of and develop the Energy Security Principles adopted by G-7 leaders in 2014. As Energy Counselor to the Secretary, Ms. Kenderdine provided key strategic advice on multiple issues including Mission Innovation, a 22-country+EU initiative that supports transformational clean energy RD&D; North American grid integration and security; and the modernization of the Strategic Petroleum Reserve. Prior to her service at the DOE, she helped to establish the MIT Energy Initiative and served as its executive director for six years. She also started the C3E Symposium series, a joint MIT-DOE program to support the careers of women in clean energy with cash prizes; she still serves as a DOE C3E Ambassador. Before joining MITEI, Ms. Kenderdine served as the Vice President of Washington Operations for the Gas Technology Institute from 2001 to 2007. From 1993 to 2001, she was a political appointee in the Clinton administration, where she served in several key posts at the DOE.

Prof. Laura Kuhl



Prof. Laura Kuhl is Assistant Professor in the School of Public Policy and Urban Affairs and the International Affairs Program at Northeastern University, where she is also the Associate Director of Strategic Research Collaborations at the Global Resilience Institute. Prof. Kuhl's research examines climate adaptation and resilience in developing countries. Her work centers on innovation for adaptation, adaptation and development policy, with a focus on adaptation finance, and critical perspectives on resilience. She has conducted fieldwork in East Africa, Latin America and the Caribbean and has collaborated with the United Nations Development Programme, Global Environment Facility and U.S. Agency for International Development. Prior to Northeastern, she completed a postdoctoral fellowship at the Center for International Environment and Resource Policy at the Fletcher School at Tufts University. She has a PhD and MALD in international affairs from the Fletcher School, Tufts University, and a BA in environmental studies and anthropology from Middlebury College.

Dr. Atyia Martin



Dr. Atyia Martin is currently the CEO & Founder of All Aces, Inc., a social enterprise education and training firm that deals a control hand to clients by activating the power of consciousness, critical thinking and community to catalyze the critical action necessary to advance equity and resilience. She serves as a Distinguished Senior Fellow at Northeastern University's Global Resilience Institute. Most recently, Dr. Martin was the City of Boston's first Chief Resilience Officer appointed by Mayor Martin J. Walsh to focus on making advancing racial equity the foundation of

Boston's Resilience Strategy (Resilient Boston: An Equitable, Connected City). Her previous experience includes Director of Public Health Preparedness at the Boston Public Health Commission, Boston Police Department, City of Boston Mayor's Office of Emergency Management, Federal Bureau of Investigation and the U.S. Air Force assigned to the National Security Agency.

Dr. Jennifer Morris



Dr. Jennifer Morris is a Research Scientist at the MIT Joint Program. Much of her research focuses on risk analysis, uncertainty analysis, and decision-making under uncertainty in energy and environmental systems. This work involves quantifying key uncertainties (e.g. changes in world markets, policies, technologies, climate, etc.) and applying different methodological approaches to models in order to formally represent such uncertainties and explore how they impact near-term decisions. A key focus is evaluating risks to different investment options in energy and water and

identifying those that are robust to potential risks. Dr. Morris also works on the assessment of energy technologies and energy/climate policies, and contributes to the development of the Joint Program's computable general equilibrium model, the Economic Projection and Policy Analysis (EPPA) model. She holds a PhD in Engineering Systems and an MS in Technology and Policy from MIT.

Dr. Sergey Paltsev



Dr. Sergey Paltsev is a Deputy Director of the MIT Joint Program and a Senior Research Scientist at the MIT Energy Initiative. He is an author of more than 90 peer-reviewed publications in scientific journals and books on the topics of energy and climate economics and policy, taxation, advanced energy technologies and international trade.

Dr. Paltsev is an Advisory Board Member for the Global Trade Analysis Project (GTAP) Consortium, and was a Lead Author of the Fifth Assessment Report (AR5) of the Intergovernmental Panel on Climate Change (IPCC). He is a recipient of the 2012 Pyke

Johnson Award (by the Transportation Research Board of the National Academies, USA, for the best paper in the area of planning and environment), the Best Policy Analysis Paper of 2012 by *Environmental Science and Technology*, a journal of the American Chemical Society, and the Best 2004 Research Award by Tokyo Electric Power Company, Japan. Before joining MIT in 2002, Dr. Paltsev worked as a consultant at The World Bank, and as an executive director of the Program in Economics and Management of Technology at Belarusian State University. He holds a PhD in Economics from University of Colorado at Boulder.

Dr. John Parsons



Dr. John Parsons is a Senior Lecturer in the Finance Group at the MIT Sloan School of Management. His research focuses on the valuation and financing of investments in energy and environmental markets, and problems of risk management. Dr. Parsons was a Co-Director of the recently released MIT study on the Future of Nuclear Energy in a Carbon-Constrained World. He was previously a member of the MIT Future of Solar Energy study group, the MIT Future of the Nuclear Fuel Cycle study group, and the MIT Future of Natural Gas study group, and a member of the Advisory Committee

of the MIT Utility of the Future study. For ten years Dr. Parsons worked in the Finance Practice at the economics consulting firm CRA International, where he was a Vice President and Principal. He worked with major international oil companies, mining companies and commodity processors, electric utilities and international pharmaceutical companies, among others, on a wide variety of risk management and valuation matters. He has been a Visiting Scholar at the U.S. Federal Energy Regulatory Commission, and has served on the Global Markets Advisory Committee of the U.S. Commodity Futures Trading Commission, on the Scientific Council of the Chaire European Electricity Markets (CEEM) at Université Paris-Dauphine, on the Ad Hoc Expert Group for the IEA and NEA's report on the Projected Cost of Generating Electricity, and on the Scientific Advisory Board of the E.ON Energy Research Center at RWTH Aachen University. Dr. Parsons is currently the Co-Chair of the Energy Oversight Committee at the Global Association of Risk Professionals.

Prof. Ronald G. Prinn



Prof. Ronald Prinn, who serves as Co-Director of the MIT Joint Program and Director of the MIT Center for Global Change Science, works extensively with social scientists to link the science, economics and policy aspects of global change. He co-led the development of the MIT Integrated Global System Modeling (IGSM) framework, which is central to this effort. A faculty member at MIT since 1971, Prof. Prinn is the TEPCO Professor of Atmospheric Science and headed the MIT Department of Earth, Atmospheric and Planetary Sciences from 1998 to 2003.

Along with his work in linking the science, economics and policy aspects of global change, his research incorporates the chemistry, dynamics and physics of the atmospheres of the Earth and other planets, and the chemical evolution of atmospheres. Prof. Prinn has made significant contributions to the development of national and international scientific research programs in global change. He leads the Advanced Global Atmospheric Gases Experiment (AGAGE), which for the past 40 years has measured the rates of change of the concentrations of the trace gases involved in the greenhouse effect and ozone depletion. Prof. Prinn was a lead author in the Fourth Assessment of the Intergovernmental Panel on Climate Change. His work is published in more than 200 articles, reports and volume chapters.

Dr. John Reilly



Dr. John Reilly is a Co-Director of the MIT Joint Program and a Senior Lecturer at the Sloan School of Management. As an energy, environmental and agricultural economist, he focuses on understanding the contribution of human activities to global environmental change and the effects of environmental change on the economy and society. Key to his work is the integration of models of the global economy with models of the Earth system, with the primary goal of enabling the design of policies that can effectively limit the contribution of human activity to environmental change,

to facilitate adaptation to unavoidable change, and to understand the consequences of the deployment of large-scale energy systems that will be needed to meet growing energy needs. Dr. Reilly's research is published in more than 150 articles, reports and volume chapters. He has served in multiple capacities on the Intergovernmental Panel on Climate Change, among other committees. Prior to joining MIT in 1998, Dr. Reilly spent 15 years with the U.S. Department of Agriculture's Economic Research Service, and previously for the Pacific Northwest National Laboratory and the Institute for Energy Analysis, Oak Ridge Associated Universities. He holds PhD and MS degrees in economics from the University of Pennsylvania.

Dr. C. Adam Schlosser



Dr. Schlosser is a Deputy Director of the MIT Joint Program and a Senior Research Scientist at the MIT Center for Global Change Science. Previously, Dr. Schlosser was an Associate Research Scientist at the NASA Goddard Space Flight Center (2001–2003), a research scientist at the Center for Ocean Land Atmosphere Studies (1997–2001), and postdoctoral researcher (1995–1997) at NOAA's Geophysical Fluid Dynamics Laboratory. His primary interests are the modeling, prediction and risk assessment of the natural, managed, and built water-energy-land systems

using the MIT Integrated Global System Modeling (IGSM) framework, including model development of the Global Land System (GLS) and Water Resource System (WRS). Dr. Schlosser has undertaken studies of hydrology, weather and climate and their predictability and limits-to-prediction. These studies have engaged a wide range of numerical models, ranging from process-level to global-scale models, as well as observational data for evaluation and complementary analyses. He also has participated in and led international experiments aimed at assessing the performance of Earth-system model simulations and predictions. In earlier work, he served as a member of the NASA Energy and Water Cycle Study Science Integration Team to improve our observational capabilities for monitoring, understanding and predicting the Earth's global water and energy cycles. His current collaborative research activities include: the study of extreme events and associating their potential changes and risks on the natural, managed and built environments; water-resource assessments to inform mitigation and adaptation strategies; and renewable-energy resource and intermittency assessments.

Ms. Anne Slinn



Ms. Anne Slinn is Executive Director for Research at the MIT Center for Global Change Science, and the MIT Joint Program. An engineer by training and an alumna of MIT, she has over 25 years of experience organizing activities that address the research challenges intersecting the global environment, climate, energy, economics and policy. She oversees a diverse portfolio of fundamental research on Earth-system science, and applied research on global change issues. Ms. Slinn's key contributions are to the alignment of priorities and resources, the synthesis of scientific description, research administration, communication and fiscal oversight, and coordination of multi-institutional and international collaborations.

Dr. Charles Stock



Dr. Charles Stock is a research oceanographer at the National Oceanic and Atmospheric Administration's Geophysical Fluid Dynamics Laboratory (GFDL) in Princeton, New Jersey. Dr. Stock's research is focused on understanding interactions between the ocean, marine life, and climate. He is part of GFDL's Global Earth-System Model development team, which is working to develop global Earth-system predictions on timescales ranging from months to centuries. These simulations help inform the U.S. National Climate Assessment and those conducted by the Intergovernmental Panel on Climate Change. Dr. Stock received the Presidential Early Career Award for Scientists and Engineers for his efforts to enhance understanding of, and our response to, climate impacts on marine resources. He obtained his PhD from the MIT/Woods Hole Oceanographic Institution Joint Program in Oceanography.

Dr. Niven Winchester



Dr. Niven Winchester is a Principal Research Scientist at the MIT Joint Program, a Senior Fellow at Motu Economic & Public Policy Research, and a Principal at Vivid Economics. His research analyzes climate, energy and trade policies using applied general equilibrium models. His recent studies assess the economy-wide impacts of policies to meet Paris greenhouse gas emission targets, the implications of a large-scale global biomass industry, and the use of tariffs to enforce Paris climate commitments. Dr. Winchester's research has been published in major academic journals and has informed several organizations on policy issues, including the OECD, the U.S. Federal Aviation Administration and the New Zealand Ministry of Foreign Affairs and Trade. Dr. Winchester is a founding co-editor of the *Journal of Global Economic Analysis*, and he was awarded Global Trade Analysis Project research fellowships for outstanding research for the periods 2013–2016 and 2017–2020. He previously held a faculty position at the University of Otago and earned a PhD from the University of Nottingham.

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