

FORUM *for*
CLIMATE ENGINEERING
ASSESSMENT

FIRST MEETING *of*
ACADEMIC
WORKING GROUP
on
INTERNATIONAL
GOVERNANCE *of*
CLIMATE
ENGINEERING

Washington, DC
March 7, 2016

Table of Contents

<i>Meeting Agenda</i>	4
<i>Working Group Biographies</i>	5
<i>Conference Speakers</i>	10

Welcome

The Forum for Climate Engineering Assessment is pleased to welcome you to the School of International Service at American University, Washington DC, for a day-long conference on the international governance of solar radiation management (SRM) technologies.

This meeting serves to launch a new multi-year process examining international governance pathways for SRM. The project will be based around the sustained deliberations of a newly constituted academic working group. The chief goal of this initial meeting is to bring the working group into conversation with some of the principal architects of prior SRM governance-focused processes, along with some of the leading thinkers working on SRM science, engineering, ethics, policy, and law.

We look forward to your engagement over the full life of the working group's deliberations. To learn more about the international governance pathways project and the other work of the Forum for Climate Engineering Assessment, please visit www.ceassessment.org.

A New Project

This meeting marks the launch of a new multi-year look at international governance pathways for solar radiation management (SRM) technologies. A newly constituted working group has been tasked with:

1. Assessing the existing SRM governance conversation;
2. Identifying key debates and open questions;
3. Providing a fresh, authoritative analysis of governance pathways; and
4. Producing crisp, policy-relevant recommendations.

Importantly, the members of the working group have to this point been largely outside the conversation about SRM governance. By design, we have brought together a group that we hope will offer new insights and perspectives. The first step in the process is for the working group to understand the current state of the SRM governance landscape. We offer our gratitude to the conference speakers, who will lay the foundation for the working group's deliberations.

What is Solar Radiation Management?

Solar Radiation Management (SRM) or “albedo modification” is a class of technologies that could lower global average temperatures and offset some of the worst impacts of climate change by reflecting a portion of incoming solar radiation back into space before that radiation is trapped by greenhouse gases in the atmosphere. Proposals include artificially brightening clouds, increasing the reflectivity of surface-level planetary features, or depositing reflective particles in the earth's upper atmosphere. Such ideas are in the early stages of development. They are also contentious, given a wide array of risks that accompany the potential benefits.

Still, despite the stark risks, interest in research and potential development is growing, due to the feckless response on climate change of the global community to date and the growing recognition that the world may pass critical climatic thresholds in the course of the next few decades.

The governance of solar radiation management (SRM) research and / or deployment poses both fascinating and thorny issues. SRM options raise a large number of challenges, driven by the fact that SRM is:

- ⇒ An enterprise that would have truly global risks and benefits;
- ⇒ Replete with distributional issues;
- ⇒ Potentially a powerful enough technological form that its development or use could trigger or exacerbate conflict;
- ⇒ An uneasy fit with existing international regimes; and
- ⇒ Highly politically charged, while also remaining largely an academic notion to this point

The newly constituted working group will develop a work plan that promotes engagement with these and other important issues raised by SRM, on the way to development of recommendations.

Meeting of the

Academic Working Group on International Governance of Climate Engineering

Monday, March 7, 2016

School of International Service, American University

9:00-9:10 AM	Opening address: Wil Burns & Simon Nicholson, FCEA	
9:10-10:45 AM	Session 1: The Basic State of Knowledge about SRM Panelists will provide a high-level introduction to the SRM conversation. Panelists will help us understand why SRM is now being considered by some as one piece of a climate change response portfolio. We will hear about some major lines of inquiry and some major outstanding questions. The panel will help orient us to the importance and relevance of consideration of SRM governance pathways.	Moderator: Simon Nicholson, FCEA ⇒ Douglass MacMartin, California Technical Institute ⇒ Jane Long, Environmental Defense Fund ⇒ Tom Armstrong, Madison River Group ⇒ Ted Parson, University of California, Los Angeles
10:45-11:10 AM	Coffee break	
11:10AM-12:55 PM	Session 2: The State of SRM Scientific Investigation This panel has three overlapping parts. First, we will hear about the contribution that modeling has made to understandings of the potential benefits and risks of SRM. Second, a group of panelists will introduce proposals for small-scale outdoor experiments, making the case that such experiments may add to the stock of scientific knowledge about SRM. Third, we will hear reflections on a recent SRM research agenda-setting exercise in Japan.	Moderator: Simon Nicholson, FCEA ⇒ Simone Tilmes, National Center for Atmospheric Research ⇒ Frank Keutsch, Harvard University ⇒ Hugh Hunt, Cambridge University ⇒ Tom Ackerman, University of Washington ⇒ Ishii Atsushi, Tohoku University
1:00-2:00 PM	Lunch	

<p>2:00-3:30 PM</p>	<p>Session 3: Prior Reviews of Governance</p> <p>There have been a variety of important prior processes looking at the SRM governance puzzle, along with some nascent efforts to regulate certain forms of climate engineering research under the rubric of existing international regimes. This panel brings together people who have been deeply immersed in the SRM governance conversation, to reflect on prior governance-focused efforts and the current state of understanding.</p>	<p>Moderator: Simon Nicholson, FCEA</p> <ul style="list-style-type: none"> ⇒ Andy Parker, Institute for Advanced Sustainability Studies, Potsdam ⇒ Jane Flegal, University of California, Berkeley ⇒ Steve Rayner, Oxford University ⇒ Mark Lawrence, Institute for Advanced Sustainability Studies, Potsdam ⇒ Dan Bodansky, Arizona State University
<p>3:30-3:45 PM</p>	<p>Coffee break</p>	
<p>3:45-5:30 PM</p>	<p>Session 4: What Needs to be Considered in Governance?</p> <p>This panel builds from session 3 by further identifying and probing open SRM governance questions, major debates, and existing concrete governance proposals.</p>	<p>Moderator: Simon Nicholson, FCEA</p> <ul style="list-style-type: none"> ⇒ Arunabha Ghosh, Council on Energy, Environment and Water ⇒ Stephen Gardiner, University of Washington ⇒ Josh Horton, Harvard University ⇒ Neil Craik, University of Waterloo ⇒ Oliver Morton, The Economist
<p>5:45-7:00 PM</p>	<p>Reception - American University Museum at the Katzen Arts Center</p>	

Academic Working Group



Elizabeth Burleson, PhD, Director, The Burleson Institute

Dr. Elizabeth Burleson received her LLM in International Law from the London School of Economics, is a Fulbright Senior Specialist on energy-climate-water security, and founder of The Burleson Institute – a nongovernmental organization committed to creating and sharing insights that bring together equity and environmental integrity. As a law professor, she has taught Energy Law, Human Rights and Environment, International Environmental Law, Public International Law, UN Law, International Law and China, Property Law, International Economic Law and the Environment, Water Law, and Environmental Law. Focusing on emerging international law, she has been an advisor to UNICEF's Senior Advisor for the Environment and to

the New York Director of UNEP.



Netra Chhetri, PhD, Senior Sustainability Scientist, Center for Science, Policy and Outcomes at Arizona State University, U.S.

Dr. Netra Chhetri is an Associate Professor at the School of Geographical Sciences and Urban Planning (SGSUP) and the Consortium for Science, Policy and Outcomes (CSPO) at Arizona State University (ASU). Dr. Chhetri's expertise lies in the area of climate adaptation, energy and water, agriculture and food security, vulnerability assessment, grassroots innovation, participatory development, and citizen engagement. A common thread of his scholarship sits in the nexus of science and society and the scope of his work is by its nature both local and global. He is currently a principal investigator on a USAID-funded project in Nepal on

climate adaptation and food security. He is also a part of a team studying the sustainability of second-generation biofuel crops in the U.S.



Dan Chong, PhD, Arthur Vining Davis Fellow and Associate Professor, Rollins College, U.S.

Dr. Dan Chong is an Arthur Vining Davis Fellow at Rollins College, teaching courses in international human rights, global poverty, and peace and conflict resolution. He has led international field study courses focused on human rights and poverty to Guatemala, South Africa, Tanzania, and the Thai-Burma border. His first book, *Freedom from Poverty: NGOs and Human Rights Praxis* (University of Pennsylvania Press, 2011), analyzes the methods that NGOs use to advocate for rights to food, housing, and health care. He has also contributed to journals such as *Development and Change*, *Human Rights Review*, and *Global*

Environmental Politics. His most recent book, *Debating Human Rights* (Lynne Rienner Publishers, 2014), examines major controversies in the field of human rights. He is currently working on an undergraduate textbook on human rights for Lynne Rienner Publishers. He also serves as the faculty advisor for the Amnesty International student club, as a member of the strategic task force for the Social Entrepreneurship and Sustainability Initiative (SESI), and on the internationalization committee

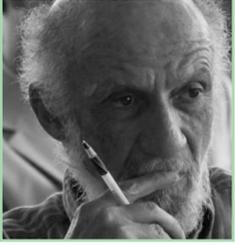


Ken Conca, PhD, Professor, School of International Service, American University, U.S.

Dr. Ken Conca's research and teaching focus on global environmental governance, environmental peacebuilding in war-torn societies, environmental politics and policy in the United Nations system, water governance, and environmental policy analysis. He is the author/editor of several books on international environmental politics, including *Governing Water*, *Confronting Consumption*, *Environmental Peacemaking*, *The Crisis of Global Environmental Governance*, and the widely used teaching anthology *Green Planet Blues*. His latest book is *An Unfinished Foundation: The United Nations and Global Environmental Governance* (Oxford University Press, 2015). Dr. Conca is a two-time recipient of the International Studies Association's Harold and Margaret Sprout Award for best book on international

environmental affairs and a recipient of the Chadwick Alger Prize for best book in the field of International Organization. He is a member of the United Nations Environment Programme's Expert Advisory Group on Conflict and Peacebuilding.

Academic Working Group



Richard Falk, PhD, Fellow, Orfalea Center for Global & International Studies, and Albert G. Professor of International Law and Practice Emeritus at Princeton, U.S.

Dr. Richard Falk is Albert G. Professor of International Law and Practice Emeritus at Princeton where he was a member of the faculty for 40 years. Since 2002 he has been associated with Global & International Studies at UCSB as a research professor. He is currently directing "Global Climate Change, Human Security, and Democracy," a grant-funded research project under the auspices of the Orfalea Center. He has also been associated with two projects that are jointly sponsored by the United Nations University in Tokyo and the Orfalea Center. The first is devoted to "Legality and Legitimacy in Global Politics," which has resulted in a book to be published by Oxford University Press in 2011. The second is entitled "The World in 2030," has held two workshops in Delhi, India, and will lead to an edited book publication. Falk was UN Special Rapporteur for Occupied Palestine, 2008-2014. Since 2008 he has been annually nominated for the Nobel Peace Prize.



Arti Gupta, PhD, Associate Professor, Wageningen UR, Netherlands

Dr. Aarti Gupta holds a PhD in Environmental Studies from Yale University, and a Masters in Political Science from the University of Chicago. Prior to coming to Wageningen university, she was a Research Fellow for two years at Harvard University's Kennedy School of Government, where she participated in the Global Environmental Assessment Project, and focused on the role of science and expertise in global biosafety governance. She has also been a post-doctoral scholar at Columbia University's Center for Science, Policy and Outcomes, based in Washington DC, where she participated in a Rockefeller-funded project on technological divides and anticipatory risk governance in a North-South context. Gupta's research trajectory has evolved from a strong disciplinary grounding in political science and international relations to a growing interest in interdisciplinary (within the social sciences) analyses of environmental and sustainability issues. Her empirical focus has been on the issue-areas of biotechnology, biodiversity, forests and climate governance. Theoretically, she has sought to combine insights from constructivist international relations theories with international law, and science and technology studies (STS).



Sikina Jinnah, PhD, American University, Assistant Professor, School of International Service

Dr. Sikina Jinnah's research focuses on the changing dynamics of power and influence in global environmental politics. Her recent book (*Post-treaty Politics*, MIT Press 2014) examines the role of international bureaucracies in managing the politics of overlapping international regimes in the areas of biodiversity, climate change and international trade. Her most current research focuses on how key norms in global climate change politics shape power relations in global governance, and the intersection of international trade and environmental policy making. Jinnah is co-editor (with Simon Nicholson) of *New Earth Politics: Essays from the Anthropocene* (MIT Press, 2016). Dr. Jinnah's research has also been published in several scholarly journals, including: *Global Environmental Politics*, the *Journal of Environment and Development*, *Environmental Research Letters*, *Berkeley Journal of International Law* *Publicist*, and *Science*. Prior to coming to SIS she was a visiting fellow at Brown University's Watson Institute for International Studies.



Prakash Kashwan, PhD, Assistant Professor, Comparative Environmental Policy and Politics, University of Connecticut

Prakash's research is primarily in the area of international environmental policy and politics, with a particular emphasis on the politics of access to, and control over natural resources. He is an affiliated faculty member of the Vincent and Elinor Ostrom Workshop in Political Theory and Policy Analysis at Indiana University. At University of Connecticut, he is also affiliated with the Center for Environmental Science and Engineering (CESE), and the Economic and Social Rights Group (ESRG).

Academic Working Group



Myanna Lahsen, PhD, Senior Researcher, Center for Earth System Science, The Brazilian Institute for Space Research, Brazil

Dr. Myanna Lahsen is Senior Researcher II in the Earth System Science Center at the Brazilian Institute for Space Research (INPE). A Cultural Anthropologist and STS scholar by training, she studies knowledge politics and other socio-cultural dynamics related to global environmental change, environmental sustainability and development. Before assuming her current position in Brazil, she held positions as Science Officer with the International Geosphere-Biosphere Programme, as Research Scientist in CIRES at the University of Colorado and as Lecturer on Environmental Science and Public Policy at Harvard University. She has served on review panels at the U.S. National Science Foundation and been called to participate in Expert Groups

advising the United Nations on the dynamics of the science-policy interface and the formation of a global sustainability report. She currently serves as advisor to *Nature Climate Change* and as Executive Editor of *WIREs Climate Change*, responsible for the subdomain on The Social Status of Climate Change Knowledge.



Andrew Light, PhD, Director of Institute for Philosophy and Public Policy, George Mason University, U.S. and Distinguished Senior Fellow in the Climate Program at the World Resources Institute

Dr. Andrew Light is University Professor, and Director of the Institute for Philosophy and Public Policy at George Mason University, and Distinguished Senior Fellow in the Climate Program at the World Resources Institute. From 2013 until March 2016, he served as Senior Adviser and India Counselor to the Special Envoy on Climate Change, and as Staff Climate Adviser in the Secretary of State's Office of Policy Planning in the U.S. Department of State. In this capacity he was on the senior strategy team for the UN climate

negotiations, directed the U.S.-India bilateral Climate Change Working Group, and chaired the U.S. government's Interagency Working Group on Climate Change in the Sustainable Development Goals. Prior to his government service he was Senior Fellow and Director of International Climate Policy at the Center for American Progress in Washington, D.C., where he advised the Center's founder John Podesta, and worked primarily on comparative mitigation ambition, transparency, climate finance, and mitigation of short-lived climate pollutants. In his academic work, Light is the author of over 100 scholarly articles and book chapters primarily on the normative dimensions of climate change, restoration ecology, and urban sustainability, and has authored, co-authored, and edited 19 books, including *Environmental Values* (2008), *Controlling Technology* (2005), *Moral and Political Reasoning in Environmental Practice* (2003), *Technology and the Good Life?* (2000), and *Environmental Pragmatism* (1996).



Catriona McKinnon, PhD, Director, Reading Ethics and Political Philosophy Program, University of Reading, U.K. and Visiting Professor, Institute for Public Policy and Climate Change, NUIST, Nanjing, China

Catriona McKinnon is Professor of Political Theory in the Department of Politics and International Relations. She has published widely on issues of climate justice, on topics such as corrective justice and compensation for climate risks, the precautionary principle, triage in climate catastrophes, the ethical implications of the carbon budget, liberal approaches to climate justice, and the role of moral shame in motivating people to take action on climate change. Across all this work she has a particular interest in questions of intergenerational justice. She presently holds a Leverhulme Trust Research Fellowship grant for a project exploring international criminal law as a governance tool for climate change. Dr. McKinnon is also a visiting

Professor at the Institute for Public Policy and Climate Change, NUIST, in Nanjing, China.



Leslie Paul Thiele, PhD, Director of Sustainability Studies, Department of Political Science, University of Florida

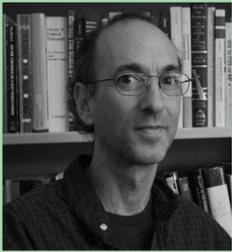
Leslie Paul Thiele's research focuses on sustainability issues and the intersection of political philosophy and the natural sciences. His central concerns are the responsibilities of citizenship and the opportunities for leadership in a world of rapid technological, social, and ecological change. He has authored many books including *Working toward Sustainability: Ethical Decision making in a Technological World*, *Sustainability and Environmentalism for a New Millenium: The Challenges of Coevolution*.

Academic Working Group



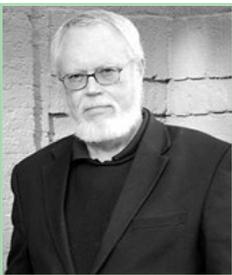
Walter D. Valdivia, PhD

Walter D. Valdivia is a Fellow of Governance Studies at the Center for Technology Innovation, Brookings Institution. Valdivia's published work includes studies of: public values of the Bayh-Dole Act, wage disparities resulting from the emergence of nanotechnologies, and the tensions between academic freedom and national security with respect to export controls. He has also co-authored a policy report assessing R&D investments in Arizona.



Paul Wapner, PhD, Professor, School of International Service, American University

Paul Wapner's research focuses on global environmental politics, environmental thought, transnational environmental activism, and environmental ethics. He is particularly concerned with understanding how societies can live through this historical moment of environmental intensification in ways that enhance human dignity, compassion, and justice, and come to respect and nurture the more-than-human world. His books include: *Environmental Activism and World Civic Politics*, *Principled World Politics: The Challenge of Normative International Relations*, *Living Through the End of Nature: The Future of American Environmentalism*, and, most recently, *Global Environmental Politics: From Person to Planet* (co-edited with Simon Nicholson). He is currently editing a book titled, *Reimagining Climate Change*, and continues to lead workshops for professors that explore contemplative practices and environmental engagement.



Durwood Zaelke, PhD, President, Institute for Governance and Sustainable Development

Durwood Zaelke is founder and President of the Institute for Governance & Sustainable Development (IGSD) in Washington, DC and Geneva; Director of the Secretariat for the International Network for Environmental Compliance & Enforcement (INECE) in Washington, DC and Geneva; and the co-Director and co-founder (with Dr. Oran Young and Matthew Stilwell) of the Program on Governance for Sustainable Development at the Bren School of Environmental Science & Management, University of California, Santa Barbara. Mr. Zaelke currently teaches at UC Santa Barbara's Bren School of Environmental Science & Management and American University law school. He also has taught at Yale Law School, Duke Law School's Brussels's program, and Johns Hopkins.

Conference Speakers

Session 1 9:10-10:45 AM



Douglass MacMartin, Caltech

Dr. MacMartin is currently a Research Professor of Computing and Mathematical Sciences at Caltech. His current research interests are Geo-engineering (intentional climate intervention), and modeling and dynamic analysis of feedback processes in climate systems using tools from control engineering and Control development for the Thirty Meter Telescope (TMT), including modeling, and active, and adaptive optics. This application motivates research on implementable control design for large-scale distributed dynamic



Jane Long, EDF

Dr. Long interests are in strategic approaches to climate change. She is the former Dean of the Mackay School of Mines at University of Nevada, Reno, Director of the Great Basin Center for Geothermal Energy and Chairman of the Nevada State Task Force on Energy Efficiency and Renewable Energy. Dr. Long also worked at Lawrence Berkeley National Laboratory where she served as Department Chair for the Energy Resources Technology Department including geothermal and fossil fuel research, and the Environmental Research Department and at Lawrence Livermore National Lab where she was Associate Director for Energy and



Tom Armstrong, Madison River Group

Dr. Thomas Armstrong is the President of the Madison River Group, LLC (MRG) which launched on January 1st, 2015. He currently serves as Guest Scholar at the International Institute for Applied Systems Analysis (IIASA) in Laxenburg, Austria and is an Affiliate Faculty Member at Montana State University. Prior to MRG, Dr. Armstrong served within the White House Office of Science and Technology Policy as the Executive Director of the United States Global Change Research Program (USGCRP).



Ted Parson, UCLA

Edward A. (Ted) Parson is Dan and Rae Emmett Professor of Environmental Law and Faculty Co-Director of the Emmett Institute on Climate Change and the Environment at the University of California, Los Angeles. Parson studies international environmental law and policy, the role of science and technology in policy-making, and the political economy of regulation. His articles have appeared in *Science*, *Nature*, *Climatic Change*, *Issues in Science and Technology*, the *Journal of Economic Literature*, and the *Annual Review of Energy and the Environment*. His most recent books are *A Subtle Balance: Evidence, Expertise, and Democracy in Public Policy and Governance, 1970-2010* (McGill-Queens University Press, 2015), *The Science and Politics of Global*

Climate Change (with Andrew Dessler) (2nd ed. Cambridge, 2010), and *Protecting the Ozone Layer: Science and Strategy* (Oxford, 2003), which won the 2004 Sprout Award of the International Studies Association and is widely recognized as the authoritative account of the development of international cooperation to protect the ozone layer.

Session 2 11:10 AM-12:55 PM



Simone Tilmes, NCAR -GEOMIP

Dr. Simone Tilmes is a Project Scientist in the NCAR's Earth System Laboratory (www.nesl.ucar.edu), with a joint position in the Atmospheric Chemistry and Climate and Global Dynamics divisions. She is currently the Chemistry-Climate Liaison in support of the Community Earth System Model (CESM1) model and provides community service for the Chemistry-Climate working group. She is further the Chair of the Early Careers Scientist Assembly (ECSA) and co-chair of the NCAR Science Assembly (NSA). Her scientific focus covers the evaluation of chemistry climate models with regard to chemical and dynamical processes in the atmosphere, using remote and in-situ observations. She has investigated past, present and future evolution of the ozone hole in both hemispheres, using both models and observations, and the impact of Geo-engineering on the Earth's system with focus on the stratosphere. In recent years she extended her research towards the troposphere, with focus on long-range transport of pollutants as well as the evolution of tropospheric ozone.

Conference Speakers



Frank Keutsch, Harvard University

Dr. Keutsch is currently a Stonington Professor of Engineering and Atmospheric Sciences and Professor of Chemistry and Chemical Biology, Harvard University, as well as a visiting at the University of Innsbruck in Austria. His current research is aimed at improving our understanding of photochemical oxidation processes of volatile organic compounds (VOCs) that produce tropospheric ozone (O₃) and are central to secondary organic aerosol (SOA) formation.



Hugh Hunt, Cambridge University

Dr. Hugh Hunt is a Senior Lecturer in the Department of Engineering at Cambridge University, and a Fellow of Trinity College. He took his first degree in Engineering from Melbourne University, Australia. His research interests include railway noise and vibration, gyroscopes and boomerangs, wave power, vibration of bell towers, and renewable energy. Dr. Hunt is a recipient of the Royal Academy of Engineering Rooke Award for the public promotion of engineering, and is Keeper of the Clock at Trinity College Cambridge.



Tom Ackerman, University of Washington

Dr. Ackerman is currently the director of the Joint Institute for the Study of the Atmosphere and Ocean Professor at the University of Washington, within the Department of Atmospheric Sciences. His current research interests are Evaluation of cloud properties in the Multi-scale Modeling Framework; Analysis of CloudSat mm-wavelength radar data; Statistical linkage of cloud distributions with synoptic data using a neural net classifier; Understanding the maintenance and formation of thin tropical tropopause cirrus.



Ishii Atsushi, Tohoku University

Dr. Ishii Atsushi is Associate Professor of International Relations, Sociology of Science and Technology. His research focuses on combining Science and Technology and Society studies with international relations theory, international negotiations and domestic policies related to climate change, and international negotiations and environmental cooperation relating to cross-border acid rain in Europe, North America, and Asia.

Session 3 2:00-3:30 PM



Andy Parker, Institute for Advanced Sustainability Studies, Potsdam

Mr. Parker is currently working on a project on Stakeholder engagement and solar geoengineering at the Institute for Advanced Sustainability Studies. His research interests include Solar geoengineering politics and governance and developing world engagement with solar geoengineering. He is a former Research Fellow at the Belfer Center for Science and International Affairs, Harvard University, and senior policy advisor with the U.K. Royal Society.



Jane Flegal, Berkeley, University of California, Berkeley

Ms. Flegal is a PhD student in Environmental Science, Policy, and Management in the College of Natural Resources at the University of California at Berkeley, with a Designated Emphasis in science and technology studies (STS). She currently researches contemporary issues in energy and climate policy through the analytic lenses of STS, political science, and law. Her recent work analyzes the co-production of new forms of regulatory science and environmental governance in unconventional natural gas development. She previously worked as a Senior Policy Analyst at the Energy Project of the Bipartisan Policy Center (BPC) in Washington, DC. While at the BPC, she worked on energy innovation policy, both for the American Energy Innovation Council and the BPC's Strategic Energy Policy Initiative. Additionally, she led the BPC's work on geoengineering research and policy.

Conference Speakers



Steve Rayner, Oxford University

Dr. Steve Rayner is James Martin Professor of Science and Civilization and Director of the Institute for Science, Innovation and Society (InSIS) in the School of Anthropology and Museum Ethnography at Oxford University from where he also Co-directs the Oxford Programme for the Future of Cities, the Oxford Martin Programme on Resource Stewardship and the Oxford Geoengineering Programme. He is a Professorial Fellow of Keble College. He is also Honorary Professor of Climate Change and Society at the University of Copenhagen and Senior Fellow at the Breakthrough Institute of Oakland, California. He previously held senior research positions in two US National Laboratories and has taught at leading US universities. He has served on various US, UK, and international bodies addressing science, technology and the environment, including Britain's Royal Commission on Environmental Pollution, the Intergovernmental Panel on Climate Change and the Royal Society's Working Group on Climate Geoengineering.



Mark Lawrence, Institute for Advanced Sustainability Studies, Potsdam

Prof. Dr. Mark G. Lawrence is a managing scientific director at the Institute for Advanced Sustainability Studies (IASS). Prof. Dr. Lawrence received his Ph.D. in 1996 in Earth and Atmospheric Science from the Georgia Institute of Technology in Atlanta, (USA). His Ph.D. research was mainly conducted at the Max-Planck-Institute for Chemistry (MPIC) in Mainz. Prof. Dr. Lawrence is author or co-author of over 100 peer-reviewed publications. He co-coordinated the EU project "MEGAPOLI" (2008-2011), and now coordinates the EU project "EuTRACE" (European Transdisciplinary Assessment of Climate Engineering). Prof. Dr. Lawrence has served as editor for the journals Atmospheric Chemistry and Physics, and Atmospheric Environment, and has served or serves on various international committees, most notably the Science Team of the UNEP Atmospheric Brown Clouds project (ABC), the Scientific Steering Committee of the International Global Atmospheric Chemistry project (IGAC),



Dan Bodansky, Arizona State University

Daniel M. Bodansky is a preeminent authority on global climate change whose teaching and research focus on international environmental law and public international law. He teaches courses in international law and sustainability and is a key player in the College of Law's new Program on Law and Sustainability. He has served as the climate change coordinator and attorney-advisor at the U.S. Department of State, in addition to consulting for the United Nations in the areas of climate change and tobacco control. Since 2001, Bodansky has been a consultant and senior advisor on the Beyond Kyoto and Pocantico Dialogue projects at the Pew Center on Global Climate Change. He serves on the board of editors of the American Journal of International Law, is the U.S.-nominated arbitrator under the Antarctic Environmental Protocol, and is a member of the Council on Foreign Relations and the American Society of International Law.

Session 4 3:45-5:30 PM



Arunabha Ghosh, Council on Energy, Environment and Water

Dr. Arunabha Ghosh is CEO of the Council on Energy, Environment and Water (CEEW), an independent, policy research institution in India. Arunabha conceptualized and led CEEW (<http://ceew.in>), since its founding in August 2010, to the top-ranked climate think-tank in India in 2013 and 2014. CEEW was ranked best in India (and South Asia) in several categories two years running in the Global Go To Think Tank Index. With work experience in 35 countries and having worked at Princeton, Oxford, UNDP (New York) and WTO (Geneva), Arunabha advises governments, industry and civil society around the world. He is a World Economic Forum Young Global Leader, Asia Society Asia 21 Young Leader, and fellow of the Aspen Global Leadership Network. He is a founding board member of the Clean Energy Access Network (CLEAN) and is board member of the International Centre for Trade & Sustainable Development, Geneva. He writes a monthly column in the Business Standard.

Conference Speakers



Stephen Gardiner, University of Washington

Dr. Stephen M. Gardiner is Professor of Philosophy and Ben Rabinowitz Endowed Professor of Human Dimensions of the Environment at the University of Washington, Seattle. His main areas of interest are ethical theory, political philosophy and environmental ethics. His research focuses on global environmental problems (especially climate change), future generations, and virtue ethics. Steve is the author of *A Perfect Moral Storm: the Ethical Tragedy of Climate Change* (Oxford, 2011), the coordinating co-editor of *Climate Ethics: Essential Readings* (Oxford, 2010), and the editor of *Virtue Ethics: Old and New* (Cornell, 2005). His articles have appeared in journals such as *Ethics*, the *Journal of Political Philosophy*, *Oxford Studies in Ancient Philosophy*, and *Philosophy and Public Affairs*.



Josh Horton, Harvard University

Dr. Joshua Horton is currently a Postdoctoral Research Fellow at the Harvard Kennedy School's Belfer Center for Science and International Affairs, where he conducts wide-ranging research on multiple governance aspects of geoengineering research and potential deployment. Before joining the Belfer Center, he worked as an energy consultant for a global consulting firm. He holds a Ph.D. in political science from Johns Hopkins University.



Neil Craik, Waterloo University

Dr. Neil Craik is Director and an Associate Professor of Law in the School of Environment, Enterprise and Development at the University of Waterloo, where he teaches and researches in the fields of Canadian and international environmental law. His current research examines the role of procedural obligations in governance structures addressing transboundary and global commons environmental issues. Professor Craik has particular interests in the intersection of international and domestic environmental policy, climate and geoengineering governance and environmental impact assessment. Prior to his current appointment at the University of Waterloo, Dr. Craik was an Associate Professor at the University of New Brunswick, Faculty of Law (2004-2009) and



Oliver Morton, The Economist

Oliver Morton is The Economist's briefings editor. Before coming to The Economist as energy and environment editor in 2009, he was the chief news and features editor of Nature, the international scientific journal. He specialises in the energy business, climate science and policy, and other green issues. He is the author of *The Planet Remade: How Geoengineering Could Change the World*, *Eating the Sun: How Plants Power the Planet*, a study of photosynthesis, its meanings and its implications, and *Mapping Mars: Science, Imagination and the Birth of a World*.



About the Forum for Climate Engineering Assessment

The Forum for Climate Engineering Assessment is an initiative of the School of International Service. Without making an argument for or against research or development, the Forum seeks to address the political and social questions that rise in the consideration of climate engineering technologies. The Forum conducts research on anticipatory governance, develops tools and avenues for public consultation, and produces educational resources for environmental NGOs, universities and government agencies on climate engineering technologies.

Co-Directors: Wil Burns, PhD and Simon Nicholson, PhD

Website: www.ceassessment.org

Managing Director: Michael Thompson

Faculty Fellows (2015-2016): Holly Jean Buck and David Morrow, PhD

Program Assistant: Tayeba Batool

Graduate Assistants: Jonathan Cybulski, Lucas Feldman, Aaron Kressig, Dhaval Modi, Celina Pentamah, and Krista Tuomi

Board of Advisors

Neil Craik, PhD, University of Waterloo

Clive Hamilton, PhD Charles Sturt University

Mark Lawrence, PhD Institute for Advanced Sustainability Studies, Potsdam

Jane Long, PhD Environmental Defense Fund

Douglas MacMartin, PhD Caltech

Lynn Russell, PhD Scripps Institution of Oceanography

Pablo Suarez, PhD Red Cross/Red Crescent Climate Centre

David Winickoff, JD University of California, Berkeley

About the School of International Service

The Forum for Climate Engineering Assessment is proud to be housed within the School of International Service at American University. The School of International Service has a long history of producing cutting edge research and preparing the next generation of leaders to address global challenges. To learn more, visit www.american.edu/sis



SCHOOL of INTERNATIONAL SERVICE
AMERICAN UNIVERSITY • WASHINGTON, DC



SCHOOL *of* INTERNATIONAL SERVICE
AMERICAN UNIVERSITY • WASHINGTON, DC

