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Dear Friend:

On behalf of the Board of Trustees, faculty and staff, welcome to The National Judicial College.

This college was created nearly 60 years ago at the recommendation of a committee headed by Supreme Court Justice Tom C. Clark. Since then, more a quarter of a million judges from around the country and abroad have become NJC alumni by taking one course or many. Past participants and instructors include Warren Burger, Stephen Breyer, Anthony Kennedy, Antonin Scalia, Sandra Day O'Connor and Sonia Sotomayor.

Justice Kennedy has said, "Judicial independence cannot exist unless you have skilled, dedicated, professional judges."

Our goal is to help you carry out your sacred responsibilities confidently and expertly. And sustainably, because judging is often a stressful, isolating experience. Know that as a member of the NJC family, you will never be alone. If you are like most participants, you'll build friendships and mentorships with faculty and classmates that last a lifetime. Please consider me to be a part of your support system. I also invite you to join In Chambers, our new private group on Facebook for judges only.

Our college is a nonprofit organization and is in many ways a cooperative effort. Many NJC judges choose to give back by donating their time as an instructor (nearly all faculty are volunteers) or by making a financial contribution or both. Financial support is necessary to develop new courses, upgrade classrooms, provide scholarships, and for other purposes. You can donate online at any time at the NJC website, Judges.org.

Former federal appeals judge Andre Davis, another NJC alumnus and instructor, has said, "No judge aspires to be average." If this is your first NJC experience, rest assured that you are in good company this week and from this point forward in your career.

Welcome to the NJC family of exemplary judges.

Sincerely,



Hon. Benes Z. Aldana (Ret.)
President

Judicial College Building, MS 358 • Reno, NV 89557
tel (775) 784-6747 • 800-25-JUDGE (800-255-8343) • fax (775) 784-1253 • www.judges.org





Making the world a more just place by educating and inspiring its judiciary

The National Judicial College Cloud

JUDICIAL LEADERS IN CLIMATE SCIENCE

September 12-14, 2022

Dear National Judicial College participant:

The National Judicial College will be utilizing an on-line file repository called **The NJC Cloud** to provide additional resource materials for the course that are not provided in the course binder. You will be able to access the files for this course for one year. Please follow these instructions:

- Go to [redacted]
- Log in with the course user name and password (below)
- Click on the title of the file you want to download in the menu of available files
- In the new screen, click on "download file" and save, open, or cancel when prompted

User name: [redacted]
Password: [redacted]

If you need assistance accessing the files, please contact Erin O'Brien • [redacted] • [redacted]

Thank You!

Judicial Leaders in Climate Science
at Woods Hole Oceanographic Institution
Falmouth, MA – September 12 to 14, 2022

Monday, September 12:

7:30-8:00 am	Transportation to Clark Laboratory, Woods Hole Oceanographic Institution (WHOI) Quissett Campus, located at 360 Woods Hole Road, Falmouth, MA – Room 507, 5th Floor
8:00-9:00 am	Breakfast
9:00-9:20 am	**Welcome and Overview** Presented by: Keith Fisher, Paul Hanle, and Carol Anne Clayson
9:20-10:00 am	**Leadership Review** Review of Main Points from March, 2022 Presented by Yvonne Stedham, Kelly Tait, and Sandra Thiam
10:00-10:10 am	Break
10:10-11:00 am	**Discussion Groups: Status of Action** Facilitated by Yvonne Stedham, Kelly Tait, and Sandra Thiam
11:00-11:10 am	Break
11:10-12:00 pm	**Introduction to Climate Science** Presented by Sarah Das and Caroline Ummenhofer
12:00-12:50 pm	Lunch
12:50-1:50 pm	**Overview of Climate Change Impacts** Presented by Christopher Schwalm
1:50-2:00 pm	Break

2:00-3:00 pm	**Discussion Groups: Impacts and Legal Trends**
	• Extreme events, including storms, flooding, and wildfires
	  o Facilitated by Alexandra Naegele and Dominick Dusseau
	• Heat impacts on agriculture, water, drought, and human health
	  o Facilitated by Kristie Ebi and Caroline Ummenhofer
	• Sea-level rise and ocean impacts now and in the future
	  o Facilitated by Shannon Hulst

3:00-3:10 pm	Break
3:10-4:00 pm	**Human Health Impacts** Presented by Kristie Ebi
4:00-4:10 pm	Break
4:10-5:30 pm	**Tour of WHOI Quissett Campus**
5:45-6:30 pm	Transportation from WHOI to the University of Chicago Marine Biological Laboratory
6:30-9:00 pm	**Shore Dinner at the Marine Biological Laboratory**
9:00-9:30 pm	Transportation from Marine Biological Laboratory to Holiday Inn

Tuesday, September 13:

7:30-8:00 am	Transportation to WHOI Redfield Building, located at 57 Water Street, Woodshole, MA
8:00-8:50 am	Breakfast

8:50-9:00 am	**Recap and Overview** Presented by Paul Hanle and Sandra Thiam
9:00-10:00 am	**Key Note Address by Max Holmes, WCRC President**
10:00-10:10 am	Break
10:10-11:00 am	**Climate Solutions and the Energy Transition** Presented by Daniel Schrag
11:00-11:10 am	Break
11:10-12:00 pm	**Climate Litigation Trends in State Courts** Presented by Sandra Thiam and Jarryd Page
12:00-12:50 pm	Lunch
12:50-1:50 pm	**Science of Attribution** Presented by Kevin Reed
1:50-2:00 pm	Break
2:00-3:00 pm	**Attribution in Tort and Other Kinds of Cases** Presented by Douglas Kysar
3:00-3:10 pm	Break
3:10-4:10 pm	**Preparing for Collaborative Conversations** Presented by Yvonne Stedham and Kelly Tait
4:10-4:20 pm	Break
4:20-5:30 pm	**Tour of WHOI Village Campus**
5:30-6:00 pm	Transportation from WHOI to Holiday Inn
6:30-7:00 pm	Walk or Catch a Ride from the Holiday Inn to La Cucina Sul Mare
7:00 pm	**Dinner at La Cucina Sul Mare**

Wednesday, September 14:

7:30-8:00 am	Transportation to Clark Laboratory, WHOI Quissett Campus, located at 360 Woods Hole Road, Falmouth, MA – Room 507, 5th Floor
8:00-8:50 am	Breakfast
8:50-9:00 am	**Recap and Overview** Presented by Paul Hanle and Sandra Thiam
9:00-10:00 am	**Key Note Address by Peter de Menocal, WHOI President**
10:00-10:10 am	Break
10:10-11:10 am	**Climate Economics** Presented by Michael Greenstone
11:10-11:20 am	Break
11:20-12:00 pm	**International Climate Framework** Presented by Kilaparti Ramakrishna
12:00-1:00 pm	Lunch
1:00-1:30 pm	**Group Discussion: Legal Issues** Facilitated by Sandra Thiam and Jarryd Page
1:30-2:30 pm	**Report on Action Plans**
2:30-3:30 pm	**Next Steps and Graduation**
3:30-4:00 pm	Transportation from WHOI to Holiday Inn



MAKING THE WORLD
A MORE JUST PLACE
BY EDUCATING AND
INSPIRING ITS JUDICIARY

ROSTER

JUDICIAL LEADERS IN CLIMATE SCIENCE

September 12-14, 2022
Falmouth, MA

THE NATIONAL JUDICIAL COLLEGE

Making the world a more just place
by educating and inspiring its judiciary

The National Judicial College is an Equal Opportunity/AffirmativeAction, ADA organization, and admits participants of any age, race, color, gender, sexual orientation, or national or ethnic origin.

WB

Judicial Leaders in Climate Science

September 12, 2022 – September 14, 2022

Falmouth, MA

Participants

Manuel I. Arrieta
Judge
District Court
Dona Ana County
Third Judicial District



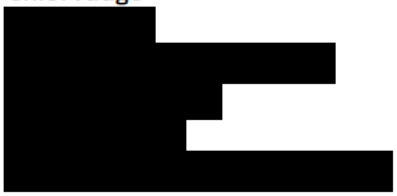
Stacy Boulware Eurie
Associate Justice
Court of Appeal



Ryan M. Cadagin
Circuit Judge



Peter T. Cahill
Chief Judge



Charles L. Cunningham, Jr.
Judge
Circuit Court
Jefferson County
30th Circuit



Michael D. DiReda
Judge
District Court



Rebecca Duncan
Justice
Supreme Court



Thomas Durkin
Presiding Judge
Superior Court
Chittenden County



Judicial Leaders in Climate Science

September 12, 2022 – September 14, 2022

Falmouth, MA

Participants

Elizabeth H. Emerson
Commercial Division Supreme Court State of New York
Supreme Court
Suffolk County
[redacted]

Serge Georges Jr.
Associate Justice
Supreme Judicial Court
John Adams Courthouse
[redacted]

Thomas K. Harmon
Judge
County Court
Douglas County
Fourth Judicial District
[redacted]

Mayra Huergo
Judge
Regional Court
[redacted]

Scott Jackson
Judge
Circuit Court
Carroll County
Nineteenth East Judicial Circuit
P.O. Box 231
[redacted]

Lynn Knight
Administrative Judge
[redacted]

James T. Laster
Vice Chancellor
Court of Chancery
New Castle County
[redacted]

David S. Mann
Chief Judge
Court of Appeals
[redacted]

Joseph A. Montalbano
Associate Judge
Superior Court
[redacted]

Judicial Leaders in Climate Science

September 12, 2022 – September 14, 2022

Falmouth, MA

Participants

William G. Montgomery
Justice
Supreme Court
[redacted]

Stephen E. Scheele
Judge
Superior Court
[redacted]

Thomas Stockard
District Court Judge
District Court
Churchill County
[redacted]

Bonnie Sudderth
Chief Justice
Court of Appeals
2nd Judicial District
[redacted]

Lissette Toro
Judge
Regional Court
Toro, Lissette
Regional Court, Ponce(331791)
[redacted]

Linda R. Warner
Judge
[redacted]

Judicial Leaders in Climate Science

September 12, 2022 – September 14, 2022

Falmouth, MA

Staff

Keith R. Fisher
Distinguished Fellow
The National Judicial College
[redacted]

Judicial Leaders in Climate Science

September 12 – September 14, 2022
Falmouth, MA
Faculty Biographies

CAROL ANNE CLAYSON, Ph.D.

Dr. Carol Anne Clayson is a Senior Scientist in the Department of Physical Oceanography at the Woods Hole Oceanographic Institution (WHOI), a former director of the Ocean and Climate Change Institute, and founder of the Center for Air-Sea Interaction and Marine Atmospheric Sciences. She has served on numerous national and international science panels, including a former position as the co-chair of the Climate Panel for the NASA Decadal Survey for Earth Science and Applications from Space, and the American Meteorological Society Council. She served as chair of the U.S. CLIVAR Executive Committee in 2020, and is currently serving on the TPOS2020 Backbone Task Team, and chairing the World Research Council Program SurFlux Task team and NOAA's Earth System Science and Modeling Division Council. Her current areas of research include understanding upper ocean mixing processes, how air-sea interactions affect the climate scale, and ocean impacts on the global water cycle. Her research has been supported by the Office of Naval Research, the National Science Foundation, NOAA, and NASA. Dr. Clayson is the recipient of an NSF CAREER award and the Office of Naval Research Young Investigator Award.

Dr. Clayson received her BS degree in physics and astronomy from Brigham Young University in 1988, and her MS and PhD degrees in aerospace engineering sciences and atmospheric and oceanic sciences from the University of Colorado, Boulder, in 1990 and 1995.

SARAH DAS, Ph.D.

Dr. Sarah Das is a tenured Associate Scientist in the Department of Geology and Geophysics at the Woods Hole Oceanographic Institution. Her research interests include the reconstruction of past climate from ice-cores; understanding and measuring polar ice sheet mass balance and ice dynamics; exploring the interaction between the coupled cryosphere-atmosphere-ocean systems; and investigating biogeochemical processes in polar environments. Dr. Das has participated in over 20 Antarctic and Greenlandic research expeditions, primarily as lead PI and science team leader. She recently completed two terms as a member of the Polar Research Board of the National Academies, served on the National Research Council's Committee for Future Science Opportunities in Antarctica and the Southern Ocean, and was an invited expert in the AAAS 'What We Know' Climate Change project. Dr. Das is active in training the "next generation" of polar and climate scientists, regularly teaching and mentoring post-docs and Ph.D students as a faculty member of the MIT-WHOI Joint Program in Oceanography, as well as working closely with K-12 teachers and students. She is also committed to sharing the importance and excitement of scientific discovery with policy makers and the public, and has been a featured scientist at the Woods Hole Film Festival, at Climate Science Day on Capitol Hill, on NPR, NOVA, at the Smithsonian National Museum of Natural History Ocean Portal, the MIT Museum, and in the popular science book "Science On Ice," among many other outlets. She received her Ph.D. in Geosciences from Penn State University and her AB in Geological Sciences from Cornell University.

Judicial Leaders in Climate Science

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Faculty Biographies

PETER B. de MENOCAL

Dr. Peter B. de Menocal is the eleventh president and director of Woods Hole Oceanographic Institution, effective Oct. 1, 2020. A marine geologist and paleo-climatologist, de Menocal's research uses deep-sea ocean sediments as archives of how and why Earth's ocean and climate have changed in the past in order to predict how they may change in the future. Prior to assuming leadership of WHOI, de Menocal was the Thomas Alva Edison/Con Edison Professor in the Department of Earth and Environmental Sciences at Columbia University's Lamont-Doherty Earth Observatory. In 2015, he became the founding director of Columbia's Center for Climate & Life, a research accelerator of 120 scientists and other experts dedicated to understanding how climate affects life's essentials-the security of food, water, and shelter-and to exploring sustainable energy solutions in partnership with industry, finance, and government. From 2016 to 2019, de Menocal served as Columbia's Dean of Science for the Faculty of Arts & Sciences, overseeing 240 faculty across the university's nine scientific departments. During his tenure as dean, de Menocal developed and carried out a strategic plan that helped double philanthropic support for the sciences at Columbia, significantly increase success in winning large center and institute awards, and increase faculty hiring rates for women and under-represented minorities in the natural sciences. De Menocal has published more than 150 scientific papers over his decades-long career in oceanography. He has received numerous awards and distinctions, including Fellow of the American Geophysical Union and the American Association for the Advancement of Science, AGU Emiliani lecturer, a Lenfest Columbia Distinguished Faculty award, and a Distinguished Brooksian award. He earned a doctorate in geology from Columbia University and a master's degree in oceanography from the University of Rhode Island, and was awarded an honorary doctorate from St. Lawrence University.

DOMINICK DUSSEAU

Mr. Dominick Dusseau is working on analyzing data from climate models to provide actionable physical climate risk information to decision makers. Prior to joining Woodwell Climate Research Center, his work involved sea level rise modeling and sustainability issues in Miami, FL and inland flood modeling in New York, NY. Mr. Dusseau holds a B.A. in Mathematics and Physics from the University of Virginia and a M.A. in Climate and Society from Columbia University.

KRISTIE EBI; Ph.D.

Dr. Kristie L. Ebi is Professor in the Center for Health and the Global Environment. Ebi’s scientific training includes an M.S. in toxicology and a Ph.D. and a Master of Public Health in epidemiology, and two years of postgraduate research at the London School of Hygiene and Tropical Medicine. She has been conducting research and practice on the health risks of climate variability and change for 25 years, focusing on understanding sources of vulnerability; estimating current and future health risks of climate change; designing adaptation policies and measures to reduce risks in multi-stressor environments; and estimating the health co-benefits of mitigation policies. She has supported multiple countries in Central America, Europe, Africa, Asia, and the Pacific in assessing their vulnerabilities and implementing adaptation policies and programs. She has edited fours books on aspects of climate change, has more than 200 publications, and has been an author on multiple national and international climate change assessments, including the fourth U.S. National Climate Assessment and the IPCC 6th Assessment Report and Special Report on Global Warming of 1.5°C.

Judicial Leaders in Climate Science

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Faculty Biographies

MICHAEL GREENSTONE, Ph.D

Dr. Michael Greenstone is the Milton Friedman Distinguished Service Professor in Economics as well as the Director of the Becker Friedman Institute and the interdisciplinary Energy Policy Institute at the University of Chicago. He previously served as the Chief Economist for President Obama's Council of Economic Advisers, where he co-led the development of the United States Government's social cost of carbon. He is an elected member of the American Academy of Arts and Sciences, a fellow of the Econometric Society, a Carnegie Fellow (aka the "Brainy Award"), and a former editor of the Journal of Political Economy. Formerly, Greenstone was the 3M Professor of Environmental Economics at MIT and directed the Hamilton Project.

Greenstone's research, which has influenced policy globally, is focused on uncovering the benefits and costs of environmental quality and society's energy choices. His current work involves testing innovative ways to increase energy access and improve the efficiency of environmental regulations globally. As a co-director of the Climate Impact Lab, he is producing empirically grounded estimates of the local and global impacts of climate change. He is also the co-director of the King Climate Action Initiative at the Abdul Latif Jameel Poverty Action Lab, which generates evidence and catalyzes the scale-up of high-impact policy solutions at the nexus of climate change and poverty alleviation. He created the Air Quality Life IndexTM that converts air pollution concentrations into their impact on life expectancy and co-founded Climate Vault, a 501(c)(3) that uses markets to allow institutions and people to reduce their carbon footprint.

Greenstone received a Ph.D. in Economics from Princeton University and a B.A. in Economics with High Honors from Swarthmore College.

PAUL HANLE, Ph.D.

Dr. Paul A. Hanle is a Visiting Scholar and the Founder of the Climate Judiciary Project of the Environmental Law Institute in Washington, DC. He retired in 2018 from his role as President and CEO of Climate Central, which he had filled since 2011. Dr. Hanle has devoted his 50-year career to public understanding of science through scholarship, museums, public education, and environmental conservation. From 1987 to 2011, he served serially as chief executive officer of the Maryland Science Center in Baltimore, president of the Academy of Natural Sciences of Philadelphia, and first president of the Biotechnology Institute in Washington, DC. From 1974 to 1987, Dr. Hanle worked at the Smithsonian's National Air and Space Museum as a curator of science and technology and rose to the positions of space department chair and associate director for research. From 1987 to 2000, at the Maryland Science Center and the Philadelphia Academy, Dr. Hanle launched new educational initiatives including major national exhibits on women's health, mathematics, a volunteer-based environmental education program in aquatic ecology, and two IMAX films on the science of the human body and meteorology.

Among his volunteer services, he advised the Obama Administration on the attribution of extreme weather events to climate change, served on the planning group for its "Educate to Innovate" initiative, and served on the Steering Committee of the Business and Industry STEM Education Coalition. Earlier he served on boards of Maryland's State Systemic Initiative and Morgan State University's Minorities in Science Program. He also served on Pennsylvania's 21st Century Environment Commission.

Dr. Hanle earned a Ph.D. in the History of Science and Medicine and an M.S. in Physics from Yale University. He is a former Member of The Institute for Advanced Study in Princeton and in 2018 was a Director's Visitor at the Institute. Dr. Hanle served for eight years on the Board of Trustees of the Bermuda Institute of Ocean Sciences.

Judicial Leaders in Climate Science

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MAX HOLMES

Dr. Max Holmes joined Woodwell Climate in 2005 and served as Deputy Director for five years prior to taking on his current role as President and Chief Executive Officer. He continues to lead multiple large river research networks, including the Arctic Great Rivers Observatory and the Cape Cod Rivers Observatory, and co-directs the Global Rivers Observatory. Dr. Holmes is motivated by a vision of science that connects people with each other and the natural world, and which makes a positive impact in society. This is reflected in the collaborative, community-based river research programs he has created, most recently Science on the Fly, an initiative that unites the fly-fishing and science communities to study and protect rivers around the world. His research spans the globe–from the Siberian Arctic to the tropical Amazon–and focuses on how climate change and other disturbances impact water and chemical cycles in the environment. He is also interested in the vast quantities of ancient carbon held in Arctic permafrost, which may be released as permafrost thaws, exacerbating global warming.

SHANNON HULST

Shannon Hulst is Deputy Director of Cape Cod Cooperative Extension and Floodplain for Barnstable County, MA through Cape Cod Cooperative Extension and Woods Hole Sea Grant. She is a Certified Floodplain Manager® with a Master's degree in Marine Affairs from the University of Rhode Island, and serves on the board of the Massachusetts Association for Floodplain Management. With a strong background in climate change issues related to flooding, Shannon has worked in floodplain management and sea level rise adaptation since 2012. She assists communities, businesses, and residents with the National Flood Insurance Program's Community Rating System (CRS) and flood-related technical assistance with an overall goal of improving flood resiliency. To this end, Shannon works with flood insurance, development regulations, public outreach, and planning.

The regional CRS program Shannon manages for Barnstable County has been recognized nationally, earning the Association of State Floodplain Managers' 2017 James Lee Witt Local Award for Excellence in Floodplain Management and serving as the inspiration for a federal House bill from Congressman Keating in the pending National Flood Insurance Program reauthorization. Shannon is also the recipient of the 2019 CRS Award for Excellence from the Federal Emergency Management Agency.

PROFESSOR DOUGLAS KYSAR

Professor Douglas Kysar is Joseph M. Field '55 Professor of Law at Yale Law School and faculty co-director of the Law, Ethics and Animals Program. His teaching and research areas include torts, animal law, environmental law, climate change, products liability, and risk regulation. Kysar was previously on the faculty at Cornell Law School. He received his B.A. summa cum laude from Indiana University in 1995 and his J.D. magna cum laude from Harvard Law School in 1998. Following law school, he clerked for the Honorable William G. Young of the United States District Court for the District of Massachusetts

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ALEXANDRA NAEGELE, PhD.

With an interdisciplinary background in climate science, environmental science, and international development, Dr. Alexandra Naegele studies the impact of climate change on society. Her current work examines climate impacts on a range of scales—from the intersection of climate change and national and regional security to working with under-resourced communities to build their climate resilience. Dr. Naegele completed a B.S. in Environmental Science from The Ohio State University. After graduating, she served in the Peace Corps and worked on community-based adaptation to climate change in rural Morocco, where communities were facing the challenges of extended drought and extreme rainfall. She returned from the Peace Corps with the goal of bridging the science and the societal impacts of climate change, completing her M.S. and Ph.D. in Atmospheric Science at Colorado State University, where she also earned a graduate certificate in International Development.

JARRYD PAGE

Jarryd is a Staff Attorney at ELI, having previously served as a Law Clerk and Public Interest Law Fellow. Jarryd works on a variety of projects at ELI, including public lands management, coastal protection and restoration, communicating the science of climate impacts, and the fundamental rights aspects of climate change litigation. He has experience in both domestic and international environmental law and policy issues. Prior to joining ELI, Jarryd held law clerk and internship positions at the U.S. Department of Justice's Environment and Natural Resources Division, the Chesapeake Legal Alliance, and the Center for Progressive Reform. He received his J.D. with Honors from The George Washington University Law School, where he earned the Charles and Kathryn Miller Environmental Law Award for excellence in the field of environmental law. He received his B.S. in Environmental Law & Policy from the University of Maryland and holds both an M.A. and B.A. in Art History.

KILAPARTI RAMAKRISHNA, Ph.D

Kilaparti Ramakrishna (Rama) joined the Woods Hole Oceanographic Institution from October 2021 as the Senior Advisor to the President and Director on Ocean and Climate Policy. Prior to this he had worked extensively with the United Nations, as Head of Strategic Planning at Green Climate Fund; head of the UNESCAP ENEA Office, covering six member States of ESCAP- China, Democratic People's Republic of Korea, Japan, Mongolia, Republic of Korea and Russian Federation, and two Associate members – Hong Kong and Macao; as Chief of Cross Sectoral Environmental Issues and Principal Policy Advisor to the Executive Director of UNEP. Dr. Ramakrishna also provided secretariat services to the North-East Asian Subregional Programme for Environmental Cooperation (NEASPEC) and was a lead author of the fifth assessment (and many before it) by the Intergovernmental Panel on Climate Change (IPCC). Before joining the United Nations, Dr. Ramakrishna worked for many years as director of science in public affairs and vice president at the Woods Hole Research Center (now Woodwell Climate Research Center) in Massachusetts. During this time, he taught at several law schools including at the Fletcher School of Law and Diplomacy, Harvard Law School, Boston University and Boston College Law Schools, Brandeis and Yale Universities. He is an elected life member of the US Council on Foreign Affairs. He is also the Chair of Strategic Advisory Group of the Nippon Foundation-GEBCO Seabed 2030 Project, Member of the Advisory Board of Back to Blue – a global initiative of Economist Impact, and a Member of Board of Directors of the Woodwell Climate Research Center. Dr. Ramakrishna holds B.Sc and B.L degrees in sciences and law, masters and Ph.D. degrees in international law.

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Faculty Biographies

KEVIN REED, Ph.D.

Dr. Kevin Reed is the Associate Dean for Research and an Associate Professor in the School of Marine and Atmospheric Sciences at Stony Brook University. Prior to coming to Stony Brook University, Dr. Reed was a Postdoctoral Research Fellow in the Advanced Study Program at the National Center for Atmospheric Research in Boulder, CO and spent time as a Science Policy Advisor in the U.S. Senate through the American Geophysical Union Congressional Science Fellowship. Dr. Reed received his Ph.D. and M.S. in Atmospheric Science from the University of Michigan, where he also completed a Graduate Certificate in Science, Technology, and Public Policy and his B.S. in Physics. At Stony Brook University Dr. Reed founded and leads the Climate Extremes Modeling (CEM) Group, which focuses on investigating how societally-relevant extreme events, such as hurricanes, may change in the coming decades. This research aids in advancing our scientific understanding of the impacts of climate change, as well as developing new methodologies to better translate state-of-the-art science for climate adaptation applications and policies.

DANIEL SCHRAG, Ph. D

Dr. Daniel Schrag is Sturgis Hooper Professor of Geology and professor of environmental science and engineering at Harvard University where he serves as director of the Center for the Environment. He also co-directs the Program on Science, Technology, and Public Policy at the Belfer Center for Science and International affairs at Harvard's Kennedy School. A graduate of Yale University, he received a Ph.D. in geology from the University of California, Berkeley in 1993. His research focuses on climate change over the broadest range of Earth's history as well as on energy technology and energy policy. He has been a member of the external faculty of the Santa Fe Institute since 2002. With John Marshall, Schrag co-founded the Potential Energy Coalition, a non-profit organization that harnesses the best minds from the marketing and advertising world to communicate the risks of climate change to Americans. From 2009 to 2017, he served on President Obama's Council of Advisors for Science and Technology (PCAST), contributing to reports to the President on a variety of topics including energy technology and national energy policy, agricultural preparedness, climate change, big data and privacy, the use of forensic science in criminal justice, and STEM education. He is a member of the American Academy of Arts and Sciences and a fellow of the American Association for the Advancement of Science. In 1999, he was named by Technology Review as one of the one hundred young innovators for the next century and received a MacArthur Fellowship in 2000.

CHRISTOPHER SCHWALM

Dr. Christopher R. Schwalm is an internationally-recognized global change ecologist and Earth system modeler. His research focuses on climate extremes, with emphasis on drought impacts, as well as understanding how carbon, water, and plant nutrients move through land ecosystems. Dr. Schwalm leads Woodwell Climate's Risk Program, which assesses physical climate risk to human and natural systems. He also leads Woodwell Climate Research Center's work with Wellington Management, connecting climate risk to capital markets, and directs Woodwell's initiative with McKinsey & Company, which led to the January 2020 report Climate risk and response: Physical hazards and socioeconomic impacts. His research has been published in leading scientific journals and has been featured by the New York Times, CBS News, and NPR.

Judicial Leaders in Climate Science

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Faculty Biographies

PROFESSOR YVONNE STEDHAM

Professor Yvonne Stedham is professor emerita in the Management Department in the College of Business Administration at the University of Nevada, Reno (UNR) and is a foundation professor. Previously, she served as a professor of management, and chair of the Management Department at the College of Business at the University of Nevada, Reno (UNR). She joined the UNR faculty in 1988 and from 1999-2002 served as chair for the Managerial Sciences Department. Professor Stedham received a Ph.D. in business and M.B.A. from the University of Kansas, and undergraduate degrees in economics and business from the University of Bonn, Germany. She teaches undergraduate and graduate courses in international management and mindful leadership. She is also a faculty member of the social psychology Ph.D. program. Her research covers a broad spectrum of management issues with a special focus on international and gender aspects. Most of her publications address cultural differences in business ethics. She has investigated ethical judgment and gender-based differences in compensation across a variety of countries, including Japan, the U.S., and Australia, and issues related to sexual harassment and business ethics in Germany, Italy, Brazil, Russia, and the U.S. Her most recent research concerns the relationship cultural differences, trust, and business ethics. She has served on the board of directors of numerous non-profit organizations in Northern Nevada and provides consulting and training services to many companies nationally and internationally. Her research has been published in many publications, including the "Journal of Management," "Women in Management Review," "Journal of Management Studies," "Journal of Business Ethics," "Business Ethics: A European Review," "Journal of European Industrial Training," and "Journal of Knowledge Management Practice." Professor Stedham has completed the training required for the teaching certificate for the Mindfulness Based Stress Reduction (MBSR) Program at the Center for Mindfulness at the University of Massachusetts. She has taught MBSR based Mindfulness Programs at a variety of companies and organizations, including Microsoft, Nevada Department of Transportation, Custom Ink, National Judicial College, Nevada Air National Guard, Healing Healthcare Systems, and UNR. Professor Stedham has served as faculty for The National Judicial College since 2004.

PROFESSOR KELLY E. TAIT

Kelly Tait is an adjunct professor of communication at the University of Nevada, Reno (UNR) in the School of Social Research and Justice Studies. She's taught at UNR for over twenty-three years, including classes on intercultural communication, business and professional speaking, and small group communication, among others. In addition, she taught communication for the University of Maryland in Heidelberg, Germany. Professor Tait is also a communication consultant who has specialized in justice system education for about twenty years. Her areas of expertise include courtroom communication skills, procedural fairness, communicating with the self-represented, listening skills, group dynamics and leadership, working with challenging people, diversity and access issues, and faculty development. She has taught justice system professionals across the United States and Canada as well as in Mexico, Russia, Ukraine, Macedonia, Philippines, and the Caribbean. In addition to teaching for NJC, she has taught for organizations including the Canadian National Judicial Institute, Association of Women Judges, Judicial Division of the American Bar Association, National Tribal Judicial Center, National Association for Court Management, National Association of Administrative Law Judges, and state judicial systems across the country. She is a past president of the National Association of State Judicial Educators (NASJE) and is a long-term member of the NASJE Communications Committee and Diversity, Fairness, and Access Committee. One of her recent publications is "Procedural Fairness: A Treat for the Brain" in Case In Point (http://www.judges.org/news/case-in-point/), and she is a co-author of "Handling Cases Involving Self-Represented Litigants: A National Bench Guide for Judges." She has been on faculty of the National Judicial College since 2002.

Judicial Leaders in Climate Science

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SANDRA NICHOLS THIAM

Sandra Nichols Thiam is associate vice president for research and policy and director of judicial education at the Environmental Law Institute, specialized in developing and implementing effective science-based legal and policy approaches to solve sustainable development challenges. Currently, she lead's ELI's flagship judicial education program, the Climate Judiciary Project, training judges on climate science and coordinates the Institute's climate and environmental justice strategies. She has worked across the United States, Latin America and the Caribbean, Africa, Asia and internationally on a broad range of topics including resource rights, trade, forest legality and enforcement, biodiversity protection, climate mitigation and adaption. Previously, Thiam served as an advisor to the European Commission on forest governance, trade and climate matters and as advisor to governments in Liberia and The Republic of Guinea on natural resource governance. She joined the faculty of The National Judicial College in 2022.

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HONORABLE BENES Z. ALDANA (RET.), PRESIDENT

Benes Z. Aldana became the ninth president of The National Judicial College on May 1, 2017. Before joining the NJC, he was on active duty in the U.S. Coast Guard for over 22 years, retiring in the rank of captain and serving as chief trial judge during his last tour of duty. Prior to this assignment, he served as the chief legal officer for the 8th Coast Guard District in New Orleans, Louisiana, overseeing legal advice to Coast Guard operations spanning 26 states and the Gulf of Mexico. He was first appointed a military trial judge in 2005 and as an appellate judge in 2015. Other notable assignments as a Coast Guard judge advocate included: chief counsel, Legal Engagements Division, U.S. Africa Command in Stuttgart, Germany; deputy staff judge advocate, 13th Coast Guard District; special assistant U.S. attorney for the Western District of Washington; trial attorney at the Department of Justice, Environment and Natural Resources Division; legal advisor to the Department of Defense Criminal Investigation Task Force, Guantanamo Bay, Cuba; deputy chief, Office of Environmental Law, U.S. Coast Guard; and appellate and trial counsel. He also served as the commanding officer, personnel services and support unit, Seattle, and executive officer for Coast Guard Base Seattle. He is also a dedicated bar association leader and served as 2009 president of the Asian Bar Association of Washington. Although he grew up in the Seattle area, graduating from Seattle University and University of Washington School of Law, his career has taken him around the world. Among his many other achievements and accomplishments, he served as 2012-2013 chair of the American Bar Association Solo, Small Firm, and General Practice Division, which has approximately 20,000 members and is one of the largest entities in the ABA. He also served in the ABA House of Delegates and on the ABA Rule of Law Initiative Board, ABA Standing Committee on Judicial Independence, ABA Commission on Diversity and Inclusion 360, and as the assembly speaker of the ABA Young Lawyers Division. He recently concluded his service as a member of the ABA Law and National Security Advisory Committee. His military awards include the Defense Meritorious Service Medal, two Coast Guard Meritorious Service Medals, four Coast Guard Commendation Medals, the Army Commendation Medal, two Coast Guard Achievement Medals, and two Commandant's Letters of Commendation, as well as various team and unit awards. Non-military awards include the DHS General Counsel's Award of Excellence, the NAPABA Daniel Inouye Trailblazer Award, ABAW Judge of the Year, ABA Outstanding Young Military Lawyer Award, NAPABA's "Best Lawyer Under 40," and the American Bar Foundation Fellows Outstanding Chair Award.

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JOY LYNGAR, PROVOST

Joy D. Lyngar joined The National Judicial College in 2007 and was named Provost in 2018. As such, she is ultimately responsible for the quality and relevance of all education offered by the oldest and largest school for judges in the U.S. For over fifteen years, she has been an executive leader working to improve the justice system by educating judges, providing technical assistance, facilitating cross-jurisdiction sharing of best practices, encouraging judicial leadership, and by setting the bar for the highest standards of judicial ethics and competence. Over the past decade, Ms. Lyngar has led NJC to record academic achievement; NJC now educates more than 10,000 judges and court service professionals each year through in-person and on-line courses. Before joining the NJC, Ms. Lyngar spent 10 years at the National Council of Juvenile and Family Court Judges, most recently as director of the Juvenile and Family Law Department. Ms. Lyngar is a regular faculty member for NJC, and President-Elect of the National Association of State Judicial Educators. Prior to her work in national judicial education, Ms. Lyngar practiced law in Canada working in a general practice firm that handled criminal defense, civil litigation, and family law. Ms. Lyngar received a bachelor's degree and Juris Doctor from the University of Saskatchewan.

MISHKAT AL MOUMIN

The Academic Director at the National Judicial College, Dr. Mishkat Al Moumin, is the former Iraqi Minister of the Environment, a dedicated scholar, and a speaker on empowerment through laws and policies. Successfully advocated for women's empowerment and their right to run for office and recognized environmental rights as human rights, as currently reflected in the Iraqi Constitution of 2005. Her contributions have centered on empowering women to be the primary users of environmental resources through civil society organizations. Dr. Al Moumin has practiced law as an Attorney in Iraq, representing women. She also taught at the University of Baghdad School of Law, empowering students through research and discussion.

After moving to the U.S., Dr. Al Moumin served as a Mason Fellow and a Public Service Fellow at Harvard University. She also worked as an Educational Advisor for the Institute of Peace. She holds academic appointments at the Environmental Law Institute and Women Waging Peace Network. Dr. Al Moumin published academic and popular articles in both English and Arabic.

After joining the Defense Language Institute, she worked as the Chairperson of the Iraqi Department and received the Commandant Excellence Coin Award for bringing peace and harmony to the department. As a Faculty Development Specialist, Dr. Al Moumin trained thousands of faculty members at the Institute on designing student-centered classes and creating an environment conducive to learning.

Dr. Al Moumin serves as an Adjunct Faculty at the Center for Leadership Development, an organization under the umbrella of the Defense Language Institute, where she trains supervisors and managers on how to become servant leaders, providing them with the tools needed to empower their employees and design inclusive policies. In her latest assignment at the Institute, Dr. Al Moumin served as a Curriculum Designer and Associate Professor. Due to her active involvement with the students, especially during the pandemic, Dr. Al Moumin received the Coin of Excellence for supporting students' learning.

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KEITH FISHER

An honors graduate of Princeton University and Georgetown University Law Center, with many years of experience in large law firm private practice and as a full-time law professor, Keith Fisher is the Distinguished Fellow at the National Judicial College. He is a nationally known expert in several areas, ranging from domestic and international financial services regulation to legal and judicial ethics. He serves as Executive Editor for Professional Responsibility and Legal Opinions for Business Law Today and has chaired several committees and task forces of the ABA Business Law Section, including the International Coordinating Committee and the Professional Responsibility Committee. Previously, he served on the ABA Standing Committee on Ethics and Professional Responsibility. His scholarship has been published in many law reviews, and he has authored two treatises.

Keith has done innovative in-person and online ethics training for judges in the United States and around the world, including judges from Asia, Costa Rica, Ukraine, Suriname, Trinidad & Tobago, Canada, and Greece. He has also worked with the U.N.'s Global Judicial Integrity Network, the Konrad Adenauer Stiftung, and the UNESCO judicial bioethics project.

Prior to his legal training, Keith earned a degree in music theory and composition and studied as a child at the Juilliard School of Music in New York. He had a leading role in the Franco-Swiss docudrama *Cleveland vs. Wall Street*, which was selected for the Cannes Film Festival in 2010. He enjoys travel, touring vineyards, playing racquet sports, bridge, and chess, and has a love of learning about foreign languages and cultures. He speaks French, Italian, German, Spanish, Greek, and a smattering of Japanese. Mr. Fisher joined the faculty of The National Judicial College in 2022.

Konstantina Vagenas

Konstantina Vagenas, Director of Strategic Initiatives at the National Judicial College (NJC) has recently joined the National Judicial College. She has over twenty years of experience as an attorney, starting as a prosecutor in the courts of Essex County, Massachusetts. Nearly her entire legal career has been focused in the public interest arena and specifically on access to justice issues, ranging from judicial independence and the public's perception of the courts to the underfunding of our state courts. She previously served as Director of the ABA Task Force on Preservation of the Justice System which was co-chaired by Ted Olson and David Boies. She served as Project Director of the Conference of Chief Justices National Task Force on Fines, Fees, and Bail Practices and the Community Engagement in the State Courts Initiative. Most recently, she served as lead staff of the National Center for State Courts Racial Justice Blueprint Initiative Communications and Implementation Working Group. She also oversaw the National Center for State Courts Center for Judicial Ethics. Currently, at NJC, she carries a diverse portfolio, including working on Advancement and curricular projects in the area of racial justice and myriad access to justice issues. She is an honors and Phi Beta Kappa key graduate of Boston College and Suffolk University Law School. In addition to working at Athens College as a Teaching Fellow, Tina also served as a Political Section intern for the State Department at the American Embassy in Athens, Greece.

Manuel I. Arrieta is the Chief Judge for the Third Judicial District Court, located in Las Cruces, New Mexico, and focuses on a docket of administrative law, contracts, governmental liability, and personal injury. He is also the designated Water Judge for the busiest water district in the State of New Mexico, the Lower Rio Grande District, which is at the center of current US Supreme Court litigation, *Texas v. New Mexico,* Original No. 141, before the Office of the Special Master, a federal district judge from the Eighth Circuit. The case will determine how much water, if any, the State of Texas should receive from the surface water allocation in the Lower Rio Grande in accordance with a Compact involving these two states. In addition, Judge Arrieta is an attendee of the Los Alamos National Laboratory Judge's Science School, a seminar designed to introduce judges to the process of modern science and technology, discovery, validation, and peer review.

Ryan Cadagin is a Judge of the 7th Circuit of Illinois with years of experience working in the court room handling criminal felonies, civil, and probate cases. Judge Cadagin previously owned and operated his own private law practice, taught Administrative Law at University of Illinois (Springfield), and served as the President of the Sangamon County Bar Association. Judge Cadagin believes that every profession owes a duty to future generations to learn how to reduce carbon dioxide emissions in their own field and how to operate in a more sustainable way. Judge Cadagin lives in Springfield, IL with his wife and two children.

Peter T. Cahill is Chief Judge of the Second Circuit on the island of Maui, Hawaii. He also serves as the environmental court judge. A judge on the Second Circuit court since 2012, Judge Cahill is a graduate of Notre Dame Law School. He has lived in Maui since 1982, where, before ascending to the bench, he practiced personal injury and insurance defense law.

Mayra Huergo Cardoso is a Superior Court Judge in the Judicial Region of Humacao, Puerto Rico, to which she was appointed in 2016 and where since 2018 she has served as Administrative Judge. She is a member of the Judiciary

Academy Board of Directors and of the Technology Committee of the Judicial Power. After private practice, Judge Huergo served as a Property Registrar from 2004 to 2012, and from 2013 to 2016 directed the Real Property Registry of Puerto Rico and served as Associate Secretary of Justice. With a masters and Ph.D. in clinical psychology, Judge Huergo was for many years Dean for Academic Affairs and a professor at the Dr. Carlos Albizu University. She has also been a part time professor at the University of Puerto Rico, the Sagrado Corazón University, and the Inter American University of Puerto Rico.

Charles L. Cunningham, Jr. is a trial judge in Division 4 of Jefferson County Circuit Court in Kentucky. He is the immediate past president of the Kentucky Circuit Judges Association. A graduate of the University of Kentucky College of Law, Charlie also has a degree in environmental engineering and, while a student, worked for the U.S. Geological Survey as a field hydrologist and the Kentucky EPA as a researcher. Prior to his judicial service, he litigated environmental tort cases in Kentucky and Alabama.

Michael D. DiReda was appointed to the Second District Court by Governor Jon M. Huntsman, Jr., in December 2008. He received his law degree from Pepperdine University and served as a judicial law clerk in the Second District Court before joining the Davis County Attorney's Office, where he served as the Litigation Section Chief in the criminal and juvenile divisions. He was a Special Assistant United States Attorney from 2001-2007 and a prosecutor for the cities of Centerville and Clinton. Currently, Judge DiReda is an Adjunct Professor of Law at the University of Utah where he teaches trial advocacy. He is a member of the National Association of Drug Court Professionals, an editorial board member of the Utah Journal of Criminal Law, and a past member of the Standing Committee for Self-Represented Parties.

Rebecca A. Duncan is a member of the Oregon Supreme Court. She joined the court in 2017, after serving on the Oregon Court of Appeals for seven years. Justice Duncan received her bachelor’s degree from the University of Wisconsin-

Madison and her law degree from the University of Michigan. Following law school, she moved to Oregon and worked as a trial attorney for the Metropolitan Public Defender. She later joined the Office of Public Defense Services, where she represented individuals in criminal appeals and served as a manager of the office's appellate division. Justice Duncan's law-related activities have included serving on the Executive Committees of the Oregon State Bar's Criminal Law Section, Constitutional Law Section, and the Board of the Oregon Women Lawyers–Mary Leonard Chapter. She frequently presents at CLE programs on topics including appeals, constitutional law, criminal law, evidence, and family law.

Thomas Durkin is the second Environmental Judge for the State of Vermont for the Environmental Division of the Vermont Superior Court. Its jurisdiction includes appeals from municipal zoning and planning decisions, State land use (Act 250) and other State permit decisions and State and municipal enforcement proceedings. Judge Durkin currently serves as Chair of the Vermont Supreme Court's Character and Fitness Committee that governs attorney licensing and as the judicial representative on the Board of Managers for the Vermont Bar Association and he serves of the Electronic Filing and Technology Oversight Committees. He was previously one of the Vermont representatives to the Board of Managers for the New England Bar Association from 2008 through 2018 and he served as the NEBA Board President in 2017.

Elizabeth Hazlitt Emerson is an Associate Justice of the Appellate Term of the Supreme Court for the 9th and 10th Judicial Districts and a Justice of the Supreme Court of the State of New York for the 10th Judicial District assigned, since 2002, in the Commercial Division in Suffolk County. An alumna of "Big Law," where she engaged in domestic and international transactional practice, she was a member of the Chief Judge's Task Force on Commercial Litigation in the 21st Century and also serves as the co-chair of the Suffolk County Bar Association's Commercial Division Committee. Justice Emerson has authored the "Secured Transactions" chapter of the treatise, *Commercial Litigation in the New York State Courts*, and has served as an adjunct professor in the M.B.A. program at The State University of New York at Stony Brook and has taught or lectured at Fordham

University School of Law, St. Johns University School of Law, and Dowling College.

Stacy Boulware Eurie is a Superior Court judge in Sacramento, California. Prior to her appointment in 2007, she served as the Senior Assistant Attorney General of the Government Law Section of the Office of the California Attorney General. As the Presiding Juvenile Court Judge from 2010 to 2018, she worked with youth and families appearing in both juvenile justice and child welfare cases to protect the child and the public and to preserve and strengthen children's families. Judge Boulware Eurie currently presides over criminal and civil jury trials, coordinated California Environmental Quality Act (CEQA) litigation, as well as civil and CEQA writs. Active in bar association and other legal organizations, she is currently a member of the California Judicial Council and the California Child Welfare Council, and she was an executive member of the Commission on the Future of California's Court System.

Serge Georges has been a Justice on the Massachusetts Supreme Judicial Court since 2020. He previously served as an Associate Justice of the Boston Municipal Court. Previously, Justice Georges was a partner at Barron & Stadfeld, P.C., and had a diverse practice focused on commercial litigation and criminal defense practice in state and federal courts. He is also an adjunct professorships at Suffolk University Law School (2000 – present) and University of Massachusetts School of Law (2019 to present) where he teaches courses in Evidence, Professional Responsibility and Trial Advocacy and frequently presents educational programs at Judicial Education programs, MCLE and Bar Association programs.

Thomas K. Harmon is judge of the 4th Judicial District county court in Douglas County, Nebraska. Prior to his judicial service, he spent over 25 years in private practice. He is a Fellow of the Nebraska State Bar Foundation and in 2019 received the Nebraska Supreme Court's Distinguished Judge for Community Service Award for his leadership in the development and expansion of the high

school mock trial program throughout Nebraska. He also helped establish a legal clinic that provides pro bono legal services to the elderly.

Scott Jackson is a judge of the 19th East Circuit Court in Carroll County, Arkansas. He is currently serving his second term in that capacity. Prior to his judicial career, Judge Jackson worked in private practice and also as a city attorney.

Lynn Knight was appointed in December 2019 as the first female judge of the Circuit Court for Queen Anne's County, Maryland. She sits as the County Administrative Judge. Prior to her judicial appointment, she served as Executive Director of the Mid-Shore Council on Family Violence. This inspired her to go to law school in the evenings at Widener University, after which she was engaged in private practice focusing on family law and civil litigation.

J. Travis Laster is Vice-Chancellor of the Delaware Court of Chancery. Prior to his appointment, he was one of the founding partners of a corporate law boutique specializing in high stakes litigation involving Delaware corporations and other business entities and advising on transactional matters carrying a significant risk of litigation. After graduating from the University of Virginia Law School, he was a law clerk to Hon. Jane R. Roth of the U.S. Court of Appeals for the Third Circuit and practiced corporate law with Richards, Layton & Finger P.A. He is active in the American Inns of Court.

David S. Mann is Chief Judge of Division I of the Washington Court of Appeals. He earned degrees in geology and physics from the University of California, Santa Barbara and then worked as a professional geophysicist for 6 years before attending law school. Judge Mann serves on the court of appeals executive committee and the statewide Board of Judicial Administration. Prior to his judicial service, Judge Mann was a trial and appellate lawyer with an emphasis on state and federal environmental, land-use, real property and administrative law. In his spare

time, Mann builds custom furniture and spends as much time outside on the Puget Sound or hiking the Cascades.

William G. Montgomery is a Justice of the Arizona Supreme Court. Prior to judicial service, he was elected the Maricopa County Attorney, which involved him in a variety of projects, including substance abuse, child safety, human trafficking, and the collection of evidence in sexual assault cases. A graduate of Arizona State (now the Sandra Day O'Connor College of Law), Justice Montgomery began his legal career doing insurance defense work and also did advocacy work on behalf of victims of crime.

Joseph A. Montalbano is an Associate Justice of the Rhode Island Superior Court. He previously served as Magistrate/Clerk of the Rhode Island District Court from 2011 to 2013 and as North Providence Municipal Court Chief Judge from 1997 to 2011. Currently, Justice Montalbano currently serves as the President of the Rhode Island Trial Judges' Association. Prior to his judicial career, he represented District 17, which includes sections of North Providence, Pawtucket and Lincoln, in the Rhode Island Senate from 1989 to 2009. He was elected President of the Senate three times, and served in that capacity from 2004 to 2009. He previously served as the Senate Majority Leader and as the Chairman of the Senate Judiciary Committee.

Stephen E. Scheele is a general jurisdiction Judge for the Lake County Superior Court and primarily oversees civil cases of all varieties. He earned his B.A. from the University of Denver in 1993 and his J.D. from the Indiana University/Maurer School of Law in 1996. From 1996-1997, he participated in a year-long legal fellowship through the German Academic Exchange Service, which included German and European law classes and worked at a Berlin law firm. He has been active in the professional and private communities as a member of various organizations, committees and boards.

Thomas Stockard is the presiding Judge of the 10th Judicial District Court in Nevada and served as President of the Nevada District Judges Association for the 2019-2020 term. He also continues to serve as an alternate member on the Commission on Judicial Discipline. Prior to taking the bench, Judge Stockard served as Assistant District Attorney for Churchill County. He was appointed by the State Bar of Nevada to be a permanent member on the Commission for Judicial Selection from 2006-2012. He is a past member of the executive board of the State Bar of Nevada Transition to Practice Committee. He was previously a member of the State Bar of Nevada Disciplinary Panel.

Bonnie Sudderth is Chief Justice of the Second Court of Appeals in Fort Worth, Texas. Prior to that appointment, she served as a trial for 25 years, including as chief judge of the Fort Worth Municipal Courts. She teaches Texas Trials & Appeals at Texas A&M University Law School. She is a recipient of several awards, including the Outstanding Adjunct Faculty Member Award and the Excellence in Justice Award, and, for her mentorship activities with students and young lawyers, the Outstanding Mentor Award. A prolific writer and speaker on legal topics, Chief Justice Sudderth has twice received the "Outstanding Series of Articles" award from the State Bar of Texas. She is Board Certified in Civil Trial Law and Personal Injury Trial Law and currently serves as a Commissioner for the Civil Trial Examination on the Texas Board of Legal Specialization. She is active in the American Inns of Court.

Lissette Toro Velez is a Superior Court judge in Puerto Rico and also serves as Judge Administrator of the Ponce Judicial Region. Prior to taking the bench, Judge Toro worked as a city attorney and in private practice. She is one of a group of judges specially designated by the Chief Justice of Puerto Rico to preside over the insurance claims arising out of the damages caused in 2017 by Hurricanes Irma and Maria. She has taught at the law school of the Pontifical Catholic University of Puerto Rico in Ponce and is currently a lecturer at the Judicial Academy.

Linda R. Warner is Court of Common Pleas Judge in Meigs County, Ohio. Prior to being elected Judge, she spent many years as a lawyer in private practice, as a prosecutor, as an Impartial Hearing Officer for the Department of Education, and as magistrate for several Courts and Village Mayors. Linda has been actively involved in a variety of legal activities at both the local and state level, including various leadership roles in the local bar association and the Ohio State Bar Association and Foundation, as well as the Ohio Magistrate Association. A graduate of Capital University Law School, Linda has lectured on Ohio's new Domestic Violence Protection Order forms to many groups, including judges, law enforcement officers and Clerks of Courts. As a judge, she has worked hard to update court technology and also established the first Ohio Supreme Court-Certified Drug Court in Meigs County.

THE NATIONAL JUDICIAL COLLEGE

Making the world a more just place by educating and inspiring its judiciary

REVIEW OF MAIN POINTS FROM MARCH, 2022 SESSION

DIVIDER 1

Professor Yvonne Stedham and Professor Kelly Tait, Sandra Thiam

OBJECTIVES:

After this session you will be able to:

1. Describe the current status of climate science initiatives taking place in states represented by course participants; and
2. Discuss information, resources, and assistance available as you move forward on your individual action plans.

REQUIRED READING: **PAGE**

Yvonne Stedham and Kelly Tait, *Climate Science and Law* (Sept. 2022)
[NJC Document] 1



Climate Science and Law
Woods Hole, MA
September 12-14, 2022

Leadership Course Review

September 12, 2022
9:15 to 10:00 pm

Yvonne Stedham, Ph.D.
Kelly Tait, Professor







Learning Objectives



- [ ] Define leadership as influence on others' behavior based on trust, expert, and referent power
- [ ] Explain that leaders in organizations identify the need for change, initiate change, and are the driving force for change
- [ ] Describe transformational leaders as leaders who transcend their self-interest and get others to do the same by engaging in the five leadership practices, MICEE
- [ ] Discuss critical aspects of group dynamics, change management, and communication.



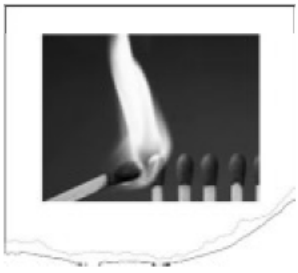
Topics

1. Leadership - Core Concepts and Practices
2. Group Dynamics, Change, and Communication

Leadership
Core Concepts and Practices

Yvonne Stedham, Ph.D.

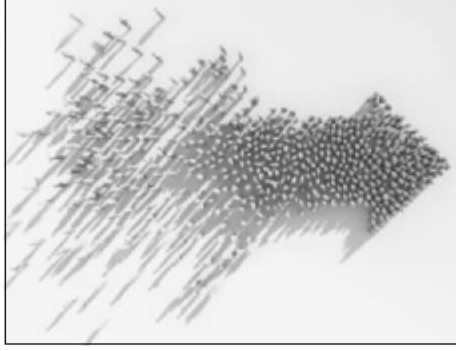
Leadership is about influencing others' behavior!



French and Raven
Five Bases of Power

French and Raven: 5 Bases of Power

Person	Position
1. Expert	3. Legitimate
2. Referent (Charisma)	4. Coercive
	5. Reward



What people value in their leaders



Creating Trust

- Perceived ability
- Perceived integrity
- Perceived benevolence



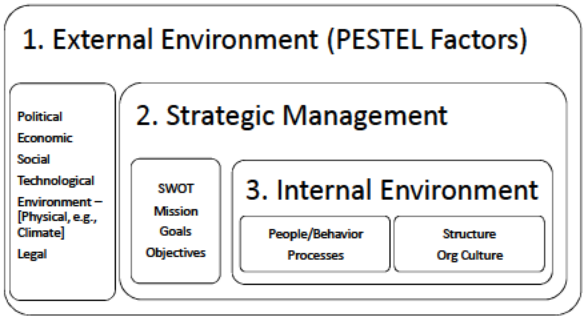
Leadership…

- is a process.
- involves influence.
- occurs in a group context.
- involves goal attainment.



The Need for Effective Leadership

Organizations exist to provide products and services that society wants –
efficiently and effectively.



The Need for Effective Leadership

Dynamic external environment

Continuous need for CHANGE in the organization's internal environment (people/behavior, processes, structure, culture)



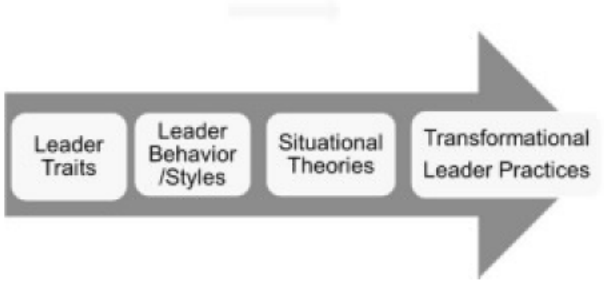
Leaders

- Identify the need for change
- Initiate change
- Implement change

Ensure the efficiency and effectiveness of an organization in the long-term

Resistance to Change

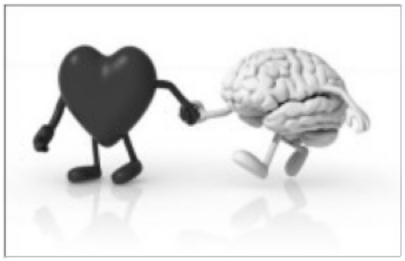




Humility



Emotional Intelligence



Transformational Leadership





Transformational Leadership

Process of engaging with others and creating a connection that results in mutual trust and raises the level of motivation and morality in both the leader and the followers

Tries to help followers to reach their highest potential. Followers become leaders.

Behavioral Sets of Transformational Leadership





The Leadership Practices

Five Leadership Practices (MICEE)

Modeling	Modeling the way
Inspiring	Inspiring a shared vision
Challenging	Challenging the process
Enabling	Enabling others to act
Encouraging	Encouraging the heart

1. Model the Way

4. I set an example of what is expected.
9. I ensure that people adhere to agreed-on standards.
14. I follow through on the promises and commitments.
19. I am clear about my "philosophy" of leadership
24. I ensure that goals and milestones are set.
29. I make progress toward goals one step at a time.

2. Inspire a Shared Vision

2. I talk about future trends.
7. I describe a compelling image of the future.
12. I appeal to others to share a dream of the future.
17. I show others how their interests can be realized.
22. I am enthusiastic and positive about the future.
27. I speak with conviction about the meaning of work.

3. Challenge the Process

1. I seek out challenging opportunities.
6. I challenge people to try out new approaches.
11. I look outside the organization for ways to improve.
16. I ask, "What can we learn from this?"
21. I experiment and take risks.
26. I take the initiative to overcome obstacles.

4. Enable Others to Act

3. I develop cooperative relationships.
8. I listen to diverse viewpoints.
13. I treat people with dignity and respect.
18. I support others' decisions.
23. I let people chose how to do their work.
28. I ensure that people grow in their jobs.

5. Encourage the Heart

5. I praise people for a job well done.
10. I express confidence in people's abilities.
15. I creatively reward people for their contributions.
20. I recognize people for commitment to shared values.
25. I find ways to celebrate accomplishments.
30. I give team members of the team appreciation and support.



Developing and Mastering Transformational Leadership Practices

- Your plan? Were you able to follow your plan?
- These practices will support you in your role as a judicial leader in climate change
- What worked well, what has been difficult?





Leadership and Group Dynamics

- ✓ Groups require both a **task-focus** (accomplishing goals) and a **relational-focus** (socio-emotional aspects)
- ✓ **Norms**—explicit and implicit rules of behavior—can have a huge impact on group performance
- ✓ Groups tend to go through phases of development

Tuckman's **Group Development Model**

1. **Forming**: Cautious, polite, anxious, eager
2. **Storming**: Resistance, conflict, competition
3. **Norming**: Resolving differences, commitment, group ID
4. **Performing**: Getting things done, fluid, supportive



What have you noticed about any of these group dynamics (or others) at work?

Important for Group Development and **Change Management**:

Psychological safety: Confidence they won't be rejected, embarrassed, or punished for speaking up.

Growth mindset: Seeing challenges as opportunities to learn

Change Takes Energy!

- ❑ Lasting change requires addressing three levels: **thinking**, **feeling**, and **behaving**
- ❑ For conflict and disagreement, be proactive and responsive
  - ➢ Establishing and returning to **common ground:** critical
- ❑ Remember conflict can be constructive

Communication

- ✓ Interwoven into ALL leadership topics
- ✓ Much more to come tomorrow afternoon
- ✓ **Key:** Understanding the role of perspective as critical to effective communication

The Continuing Importance of Getting Someone Else's Perspective

- ✓ Perspective taking: Actively imagining being in another person's circumstances. Issue:
  - ❑ Overconfidence in our ability to do it well
- ✓ **Perspective seeking:** Trying to get the other person's perspective directly (ask/listen)
  - ❑ Whenever possible: Ask rather than guessing

Have you had any challenging conversations related to the topic of climate science since our March program?

What did you feel you understood about the other person's perspective?

What challenging questions have people asked you or what questions are you worried they might ask related to climate science and/or your goal(s) for this program?

Write questions on index card, give to Kelly

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INTRODUCTION TO CLIMATE SCIENCE DIVIDER 2

Dr. Sarah Das and Caroline Ummenhofer

OBJECTIVES:

After this session you will be able to:

1. Explain the greenhouse effect;
2. List at least 2 lines of evidence that scientists use for understanding climate change; and
3. Know where to find consensus scientific information related to climate change.

No Materials for this Session

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OVERVIEW OF CLIMATE CHANGE IMPACTS — DIVIDER 3

Dr. Christopher Schwalm

OBJECTIVES:

After this session you will be able to:

1. Articulate the relationship between changes to atmospheric C02 and conditions in the human environment;
2. List at least 2 trends related to climate impacts; and
3. Describe the social justice implications of climate impacts.

REQUIRED READING: **PAGE**

Christopher R. Schwalm, *Climate Impacts Overview (Including Consequences of Sea-Level Rise and Climate Justice)* (Sept. 2022) [NJC Document].....1

Climate Impacts Overview

(including consequences of sea-level rise and climate justice)

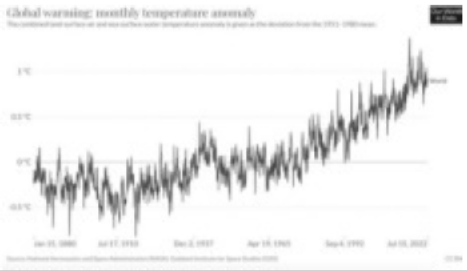
Christopher R Schwalm

September 12, 2022

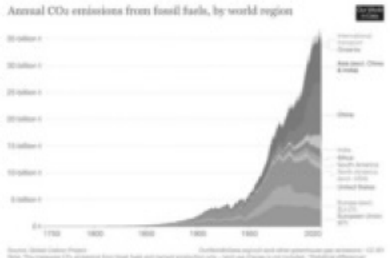
Woodwell Climate Research Center

www.judges.org

Global warming



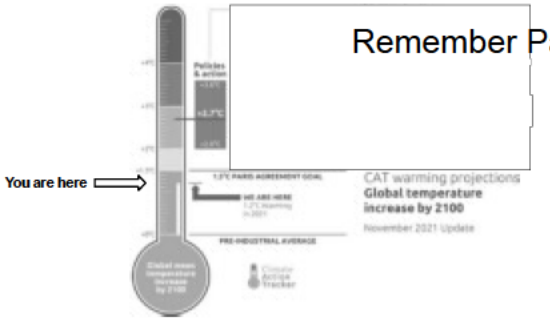
Carbon dioxide emissions



Record emissions in 2021



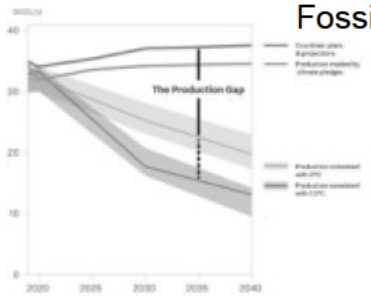
Remember Paris?



Coin toss?

Geneva, 9 May 2022 (WMO) - There is a 50:50 chance of the annual average global temperature temporarily reaching 1.5 °C above the pre-industrial level for at least one of the next five years – and the likelihood is increasing with time. The chance of temporarily exceeding 1.5°C has risen steadily since 2015, when it was close to zero. For the years between 2017 and 2021, there was a 10% chance of exceedance. That probability has increased to nearly 50% for the 2022-2026 period.

Fossil fuel production



National energy plans for fossil fuel production have almost 50% more emissions than would be consistent with limiting warming to 2°C

For 1.5°C the overproduction rate is 110%

Annual Surface Temperature Change
for the Contiguous United States



Research News

Heat-related symptoms affected one-quarter of Americans in summer 2020

Hardships left Americans more vulnerable to extreme heat

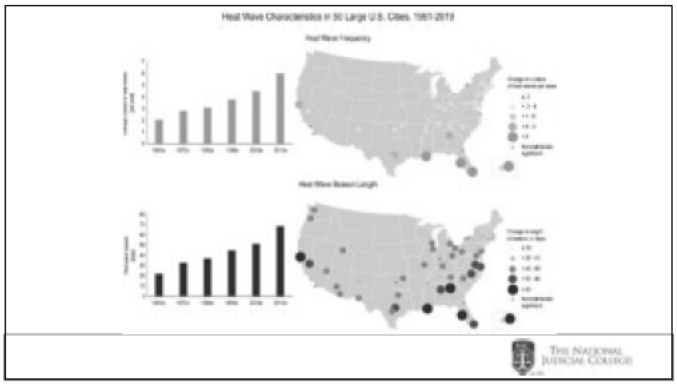
August 16, 2021

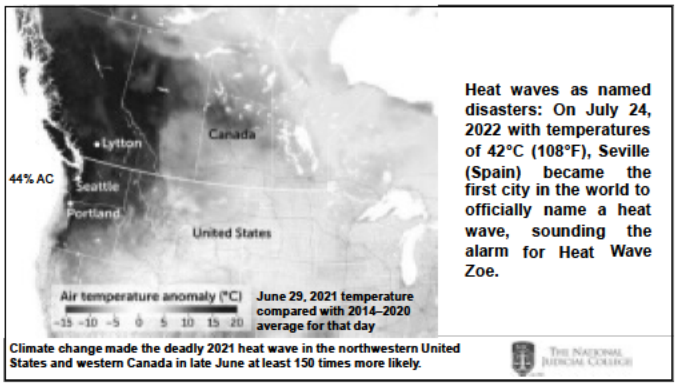
During the summer of 2020, more than one-quarter of the U.S. population suffered from exposure to extreme heat, according to a new study led by scientists at the National Center for Atmospheric Research, or NCAR, in Boulder, Colorado.

The heat-related symptoms people reported, ranging from nausea and muscle cramps to more serious conditions such as fainting and confusion, occurred as the economic downturn and social distancing made it harder to escape sweltering temperatures.

The study found that those who were most vulnerable to the impacts of summer heat included women, those in low-income households or who were unemployed or furloughed, and those who identify as Hispanic or Latino.

The research team surveyed thousands of people to determine the effects of heat at a time when millions of Americans were out of work and fears about the spread of COVID-19 led officials to temporarily shutter community centers, libraries and other cooling centers.





Heat waves as named disasters: On July 24, 2022 with temperatures of 42°C (108°F), Seville (Spain) became the first city in the world to officially name a heat wave, sounding the alarm for Heat Wave Zoe.

Climate change made the deadly 2021 heat wave in the northwestern United States and western Canada in late June at least 150 times more likely.



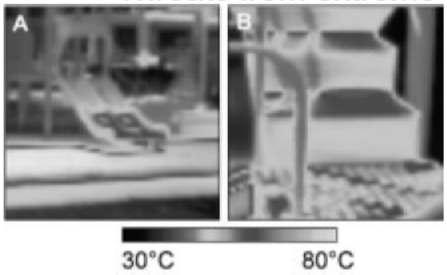
Not just heat stress…



Probability of crop yield failure, defined as at least 10% decline from 1998 to 2017 (present) average

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Threats from extreme heat



(A) A slide and dark rubber surface in the sun (orange/red colors) with temperatures of 71°C (160°F) to 82°C (180°F). The blue/green colors are under a shade sail. (B) Playground steps made of black powder-coated metal at a temperature of 58°C (136°F) in the direct sunlight.

Surface temperatures of playground equipment in metropolitan Phoenix, Arizona from mid-day on September 15, 2014. (Source: NCA4)

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Flooding at Fort Calhoun nuclear station



The flooding was the result of runoff from near-record snowfall totals and record-setting rains in late May and early June. A protective berm holding back the floodwaters from the plant failed, which prompted plant operators to transfer offsite power to onsite emergency diesel generators. Cooling for the reactor temporarily shut down but spent fuel pools were unaffected.

Missouri River floodwaters surround the Omaha Public Power District's Fort Calhoun Station, a nuclear power plant, on June 20, 2011. (Source: NCA4)

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Managed retreat



Isle de Jean Charles, Louisiana

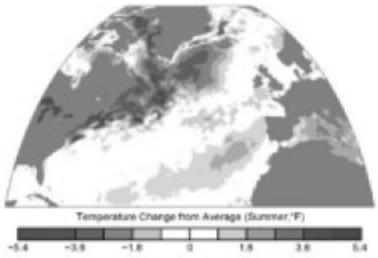


Kivalina, Alaska

As sea level rise and coastal inundation projections are realized, many impacted communities are confronting questions about how to adapt. (Source: NCA4)

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Ocean heat wave of 2012

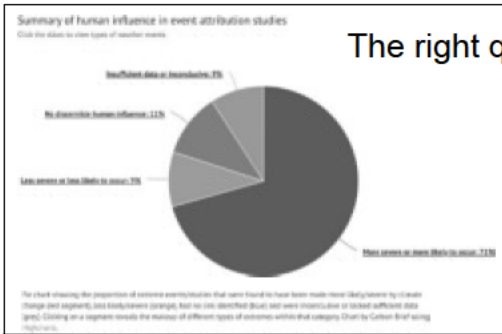


The map shows the difference between sea surface temperatures (SST) for June–August 2012 in the Northwest Atlantic and the average values for those months in 1982–2011.

This heat wave affected the Northeast Continental Shelf ecosystem and fisheries, and similar extreme events will become more common in the future (Source: NCA4)

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The right question?



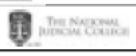
The right question is not if climate change is relevant, but rather why it would not be relevant.

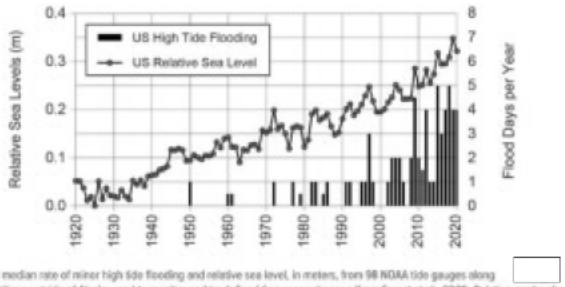
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Sea level rise



Average across Lower 48





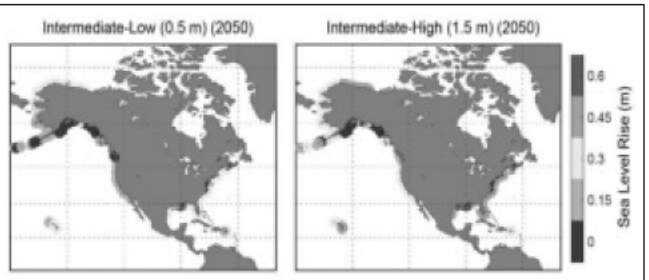
National median rate of minor high tide flooding and relative sea level, in meters, from 98 NOAA tide gauges along U.S. coastlines outside of Alaska used to monitor and track flood-frequency changes (from Sweet et al., 2021). Relative sea levels reference the lowest annual (1925) level.

Past is NOT prologue!



Historical SLR varies by region





Relative sea level rise, in meters, in 2050 for the a) Intermediate-Low and b) Intermediate-High scenarios relative to the year 2000.

Future SLR will also vary by region

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Top 20 at-risk coastal flooding cities

Rank	Country	Urban Agglomeration	Exposed Population Current	Exposed Population Future
1	INDIA	Kolkata (Calcutta)	1,929,000	14,014,000
2	INDIA	Mumbai (Bombay)	2,787,000	11,418,000
3	BANGLADESH	Dhaka	844,000	11,135,000
4	CHINA	Guangzhou	2,718,000	10,333,000
5	VIETNAM	Ho Chi Minh City	1,931,000	9,216,000
6	CHINA	Shanghai	2,353,000	5,451,000
7	THAILAND	Bangkok	907,000	5,138,000
8	MYANMAR	Rangoon	510,000	4,965,000
9	USA	Miami	2,003,000	4,795,000
10	VIETNAM	Hai Phong	794,000	4,711,000
11	EGYPT	Alexandria	1,330,000	4,375,000
12	CHINA	Tianjin	956,000	3,790,000
13	BANGLADESH	Khulna	441,000	3,641,000
14	CHINA	Ningbo	299,000	3,305,000
15	NIGERIA	Lagos	357,000	3,229,000
16	COTE D'IVOIRE	Abidjan	519,000	3,110,000
17	USA	New York-Newark	1,540,000	2,951,000
18	BANGLADESH	Chittagong	255,000	2,846,000
19	JAPAN	Tokyo	1,110,000	2,521,000
20	INDONESIA	Jakarta	513,000	2,248,000

Lack of climate resilience is a global phenomenon, both for population exposure

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Top 20 at-risk coastal flooding cities

Rank	Country	Urban Agglomeration	Exposed Assets Current ($Billion)	Exposed Assets Future ($Billion)
1	USA	Miami	416.29	3,513.04
2	CHINA	Guangzhou	84.17	3,357.72
3	USA	New York-Newark	320.30	2,147.35
4	INDIA	Kolkata (Calcutta)	31.99	1,961.64
5	CHINA	Shanghai	72.86	1,771.11
6	INDIA	Mumbai	46.20	1,598.05
7	CHINA	Tianjin	29.62	1,231.48
8	JAPAN	Tokyo	174.29	1,207.07
9	CHINA	Hong Kong	35.98	1,163.89
10	THAILAND	Bangkok	38.72	1,117.54
11	CHINA	Ningbo	9.26	1,073.93
12	USA	New Orleans	213.69	1,013.45
13	JAPAN	Osaka-Kobe	215.62	968.96
14	NETHERLANDS	Amsterdam	128.33	843.70
15	NETHERLANDS	Rotterdam	114.39	825.68
16	VIETNAM	Ho Chi Minh City	26.86	652.82
17	JAPAN	Nagoya	109.22	623.62
18	CHINA	Qingdao	2.12	601.59
19	USA	Virginia Beach	84.64	585.69
20	EGYPT	Alexandria	28.46	563.28

... and for wealth generation, that features prominent American cities

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Flooding now

Flood risk is mainly concentrated on low income and white communities

Inequitable patterns of US flood risk in the Anthropocene



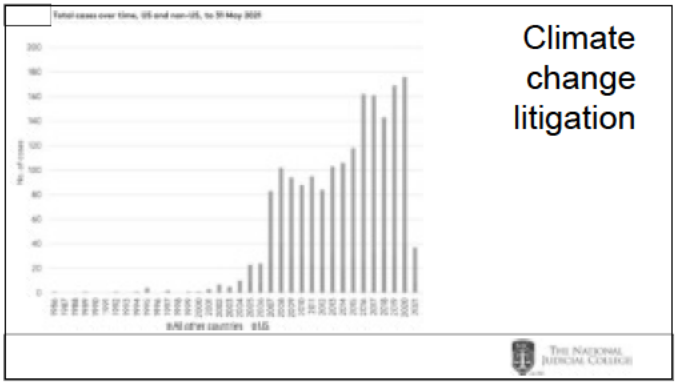
Flooding later

Urban and rural areas alike from Texas through Florida to Virginia contain predominantly black communities projected to see at least a 20% increase in flood risk over the next 30 years.

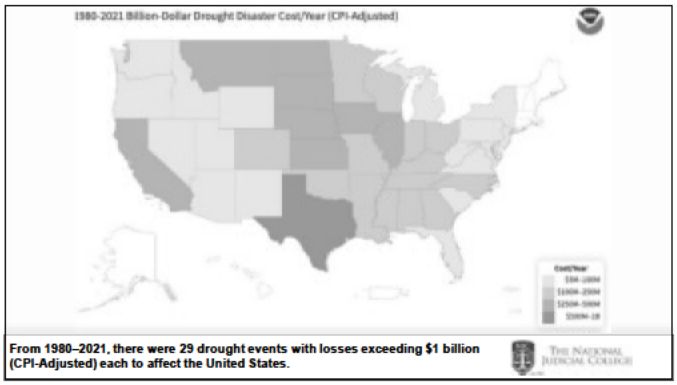
Inequitable patterns of US flood risk in the Anthropocene

What is climate justice?

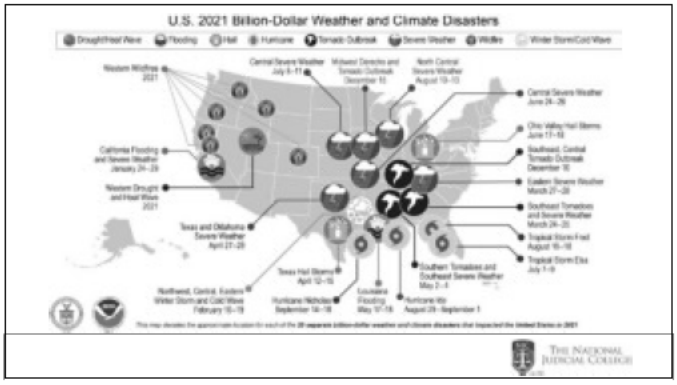
- **Distributional** – how the costs and benefits of climate change and action are shared.
- **Procedural** – ensuring the processes for making decisions about the impacts of and responses to climate change are fair, accountable and transparent.
- **Recognition** – Recognizing differences between groups in how they experience climate change and their right to express these differences.
- **Intergenerational** – Holding the current generation of decision-makers and polluters to account now for failing to act as well as protecting future generations from harm.



Climate change litigation



From 1980–2021, there were 29 drought events with losses exceeding $1 billion (CPI-Adjusted) each to affect the United States.





August 29, 2022 Climate activists glue their hands to the frame of a copy of Leonardo da Vinci's 'The Last Supper' at London's Royal Academy

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HUMAN HEALTH IMPACTS — DIVIDER 4

Dr. Kristie Ebi

OBJECTIVES:

After this session you will be able to:

1. Describe health impacts associated with climate change such as extreme heat, wildfire, and vector-borne diseases;
2. Summarize the current status of research into the impact of climate change on mental health; and
3. List several examples of climate and health co-benefits.

REQUIRED READING: **PAGE**

Kristie E. Ebi, *Climate Changes Health* (Sept. 2022) [NJC Document].....1

Climate Changes Health

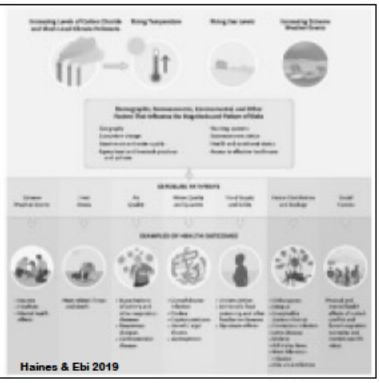
Judicial Leaders in Climate Science Course
12 September 2022

Kristie L. Ebi, Ph.D., MPH
Center for Health and the Global Environment
University of Washington

UW Medicine SCHOOL OF MEDICINE
DEPARTMENT OF GLOBAL HEALTH UNIVERSITY of WASHINGTON
SCHOOL OF PUBLIC HEALTH UNIVERSITY of WASHINGTON



IPCC 2022



Haines & Ebi 2019



Observed impacts

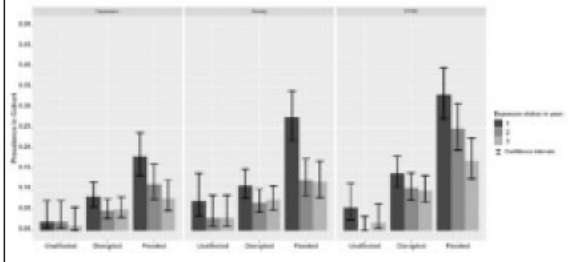
Climate change is adversely affecting the physical health of people globally (very high confidence) and mental health of people in assessed regions

- Extreme heat events human mortality and morbidity****
- Vector-borne diseases from range expansion and/or increased reproduction of disease vectors***
- Animal and human diseases, including zoonotic diseases, emerging in new areas***
- Water and food-borne diseases from climate-sensitive aquatic pathogens, including Vibrio spp. ***, and from toxic substances from harmful freshwater cyanobacteria**
  - Diarrheal diseases, including cholera**** and other gastrointestinal infections**
- Some mental health challenges***
- Climate-sensitive cardiovascular and respiratory distress**
- Health services disrupted by extreme events such as floods***

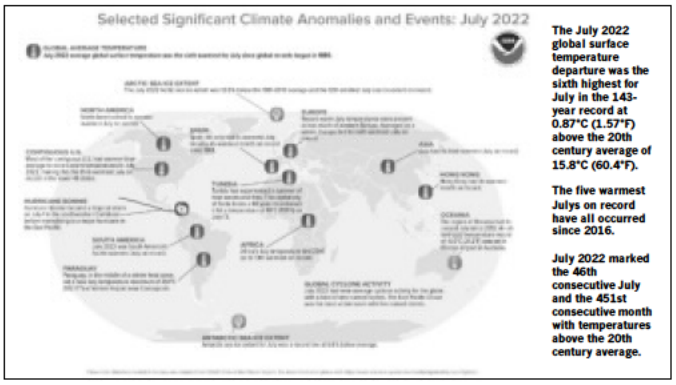
Levels of confidence: ** Very high; *** High; ** Medium; * Low**
IPCC 2022



Prevalence of mental health outcomes over 3 years post-flooding, U.K.



Mulchandani et al. 2020

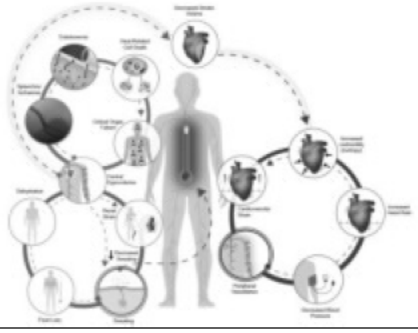


The July 2022 global surface temperature departure was the sixth highest for July in the 143-year record at 0.87°C (1.57°F) above the 20th century average of 15.8°C (60.4°F).

The five warmest Julys on record have all occurred since 2016.

July 2022 marked the 46th consecutive July and the 451st consecutive month with temperatures above the 20th century average.

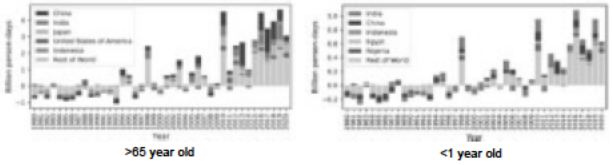
Physiological pathways of human health strain



Ebi et al. 2021

Exposure of vulnerable populations to heatwaves

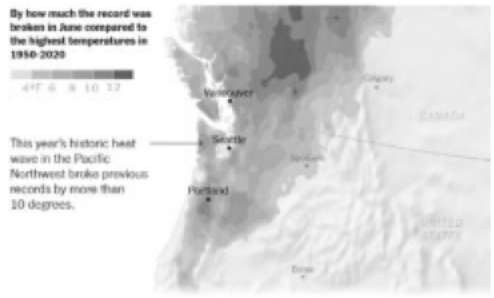
Children younger than 1 year were affected by 626 million more person-days of heatwave exposure and adults older than 65 years were affected by 3·1 billion more person-days of heatwave exposure in 2020 than in the 1986–2005 average



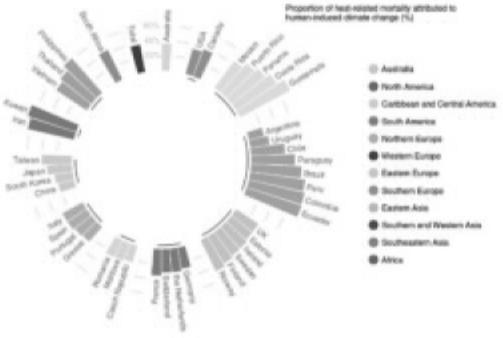
>65 year old <1 year old

Lancet Countdown 2021

https://www.worldweatherattribution.org



Source: ERA5 reanalysis (Copernicus/ECMWF) by Geert Jan van Oldenborgh.

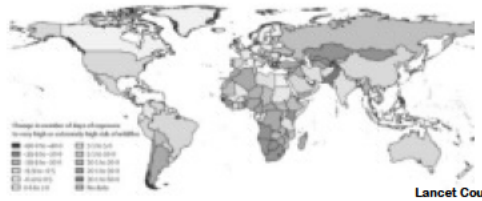


Vicedo et al. 2021

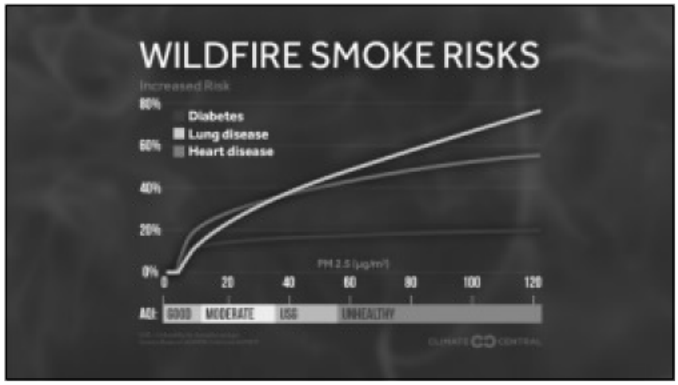
Wildfires

Nearly 60% of countries had an increase in the number of days people were exposed to very high or extremely high fire danger in 2017–20 compared with 2001–04, and 72% of countries had increased human exposure to wildfires across the same period.

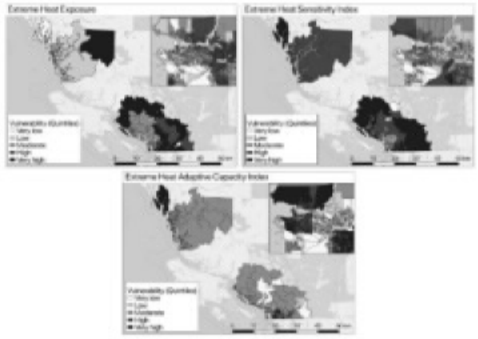
In Western U.S., hotter years have greater wildfire risk.



Lancet Countdown 2021

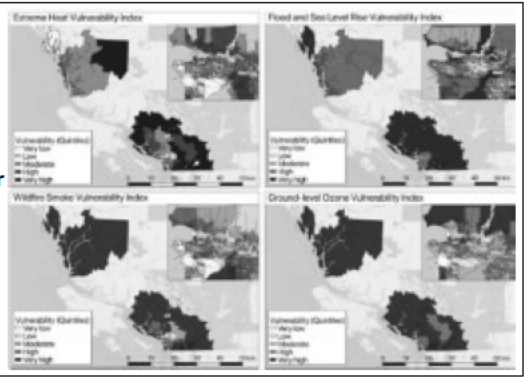


Extreme heat exposure, sensitivity, and adaptive capacity index, British Columbia



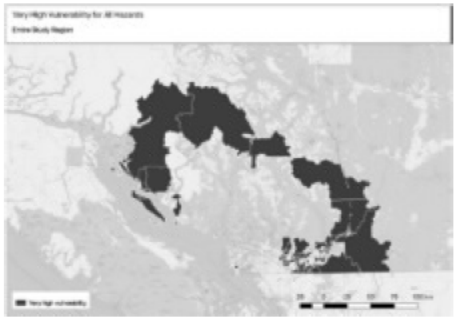
Yu et al. 2021

Overall vulnerability index maps for all hazards, British Columbia



Yu et al. 2021

Very high vulnerability for all hazards, British Columbia



Yu et al. 2021

Projected impacts

- Climate change and related extreme events will significantly increase ill health and premature deaths from the near- to long-term ***
  - Population exposure to heatwaves: increase with additional warming, strong geographical differences in heat-related mortality ****
- Food-borne, water-borne, and vector-borne diseases: increase under all levels of warming without additional adaptation ***
  - Dengue risk: increase with longer seasons and a wider geographic distribution, billions of people at risk by the end of the century ***
- Mental health (including anxiety and stress): increase in assessed regions ****

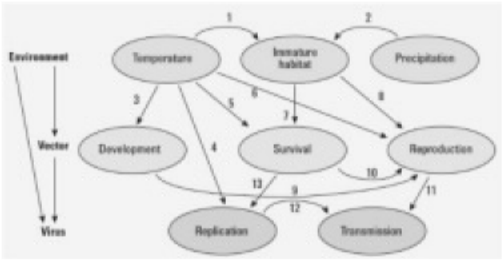
Levels of confidence: ***** Very high; *** High; ** Medium; * Low

IPCC 2022



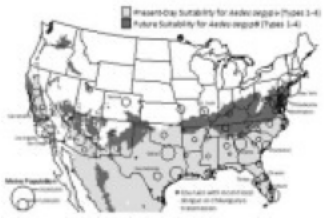
Shindell et al. 2020

Biophysical influences on dengue ecology showing the interactions between climate variables, vectors, and the virus



Morin et al. 2013

Ae. aegypti suitability

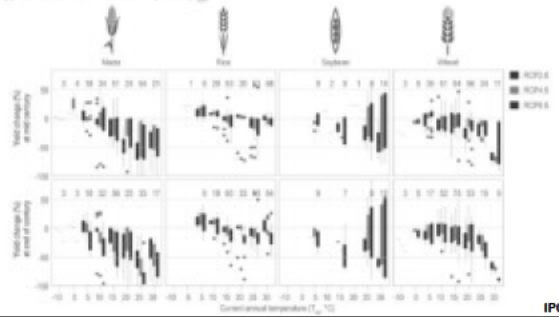


Ae. aegypti transmission suitability



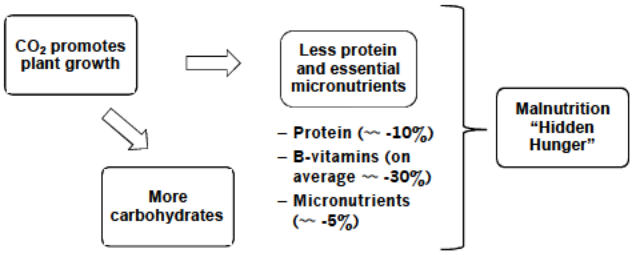
Map shows the range of the *Aedes aegypti* mosquito for present-day (1950-2000) and future (2061-2080 RCP8.5) conditions. Larger cities have higher potential for travel-related virus introduction and local virus transmission. Adapted from Monaghan et al. (2016)

Projected yield changes relative to the baseline period (2001–2010) without adaptation and with CO_2 fertilization effects

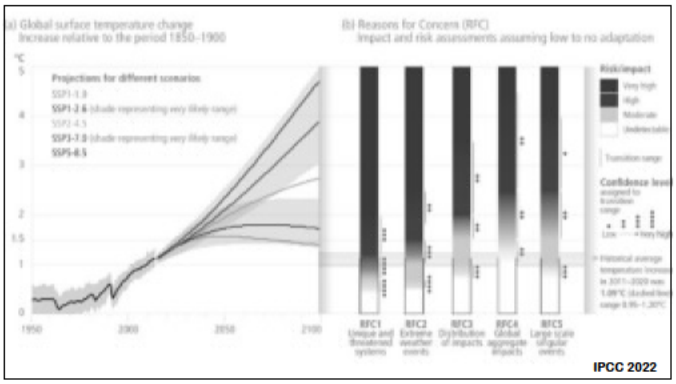


IPCC 2022

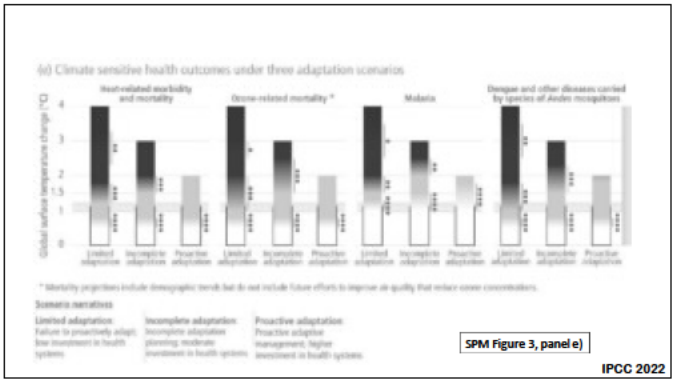
High CO_2 concentrations and warming temperatures are expected to alter the nutritional quality of C_3 crops



Ebi et al. 2021



IPCC 2022



SPM Figure 3, panel e)

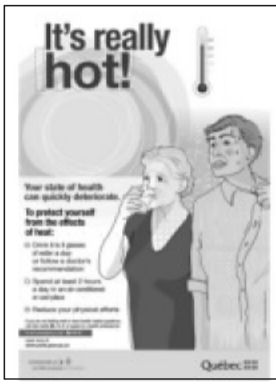
IPCC 2022

Effective adaptation options include

- Strengthening the resiliency of health systems
- Protect against exposure to climate hazards, particularly for those at highest risk
  - Heat Action Plans that include early warning and response systems
- Improve access to potable water, reducing exposure of water and sanitation systems to flooding and extreme weather and climate events, and improving early warning systems
- For mental health, improve surveillance, access to mental health care, and monitoring of psychosocial impacts from extreme weather and climate events
- Integrated adaptation approaches that mainstream health into food, livelihoods, social protection, infrastructure, water and sanitation policies

** Major constraint is limited investment

IPCC 2022





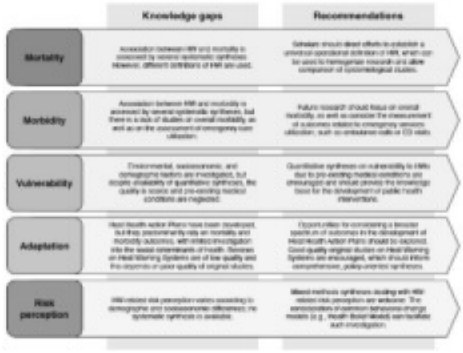
Heat: the next big inequality issue

The deadly global heatwave has made it impossible to ignore: in cities worldwide, we are now divided into the cool haves and the hot have nots

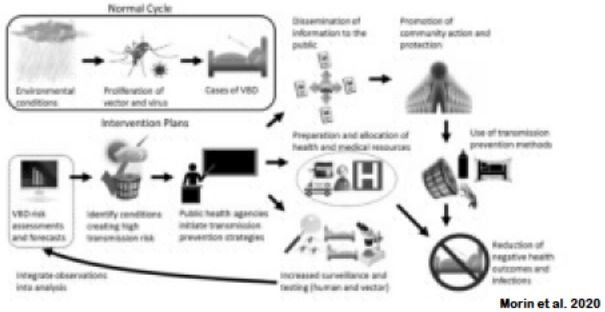
The Guardian 13 Aug 2018

Knowledge gaps and recommendations on the health risks of heatwaves

Conti et al. 2022



Preparing for and managing vectorborne disease risk



Morin et al. 2020

National Adaptation Plans for Health

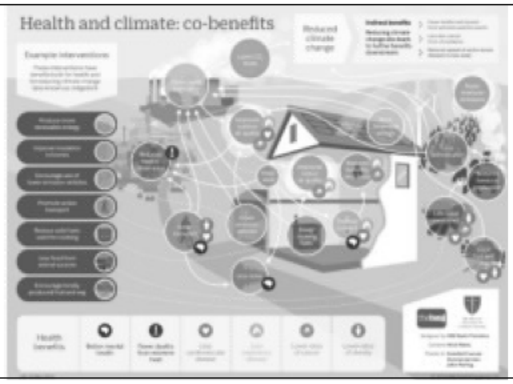
Percentage of countries with a national health and climate change plan or strategy in place



In 2021, 47 (52%) of 91 countries reported having national health and climate change strategies or plans in place

Less than a quarter of countries who responded to the survey reported high or very high levels of implementation

Lancet Countdown 2021



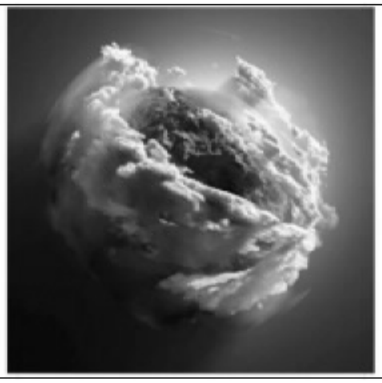
Co-benefits – early health gains from wise climate moves

Shifting 5% of short urban car trips to bicycles in New Zealand would save annually

- 22 million liters of fuel
- 116 deaths due to increased physical activity (vs. 5 extra road crash deaths)
- $200 million in health costs



ANZJPH 2011



THE NATIONAL JUDICIAL COLLEGE

Making the world a more just place by educating and inspiring its judiciary

CLIMATE SOLUTIONS AND THE ENERGY TRANSITION

DIVIDER 5

Dr. Daniel Schrag

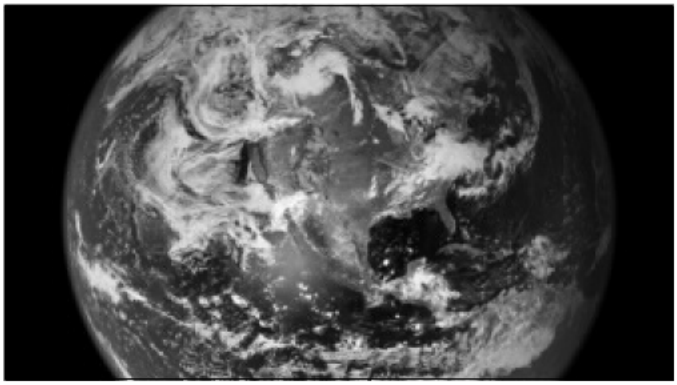
OBJECTIVES:

After this session you will be able to:

1. Summarize society's technical ability to transform the energy system;
2. List various types of renewable energy sources and articulate changes in their cost over time; and
3. Describe trends in energy generation from renewable sources.

REQUIRED READING: PAGE

Daniel Schrag, Climate Solutions and the Energy Transition (Sept. 2022)
[NJC Document] 1

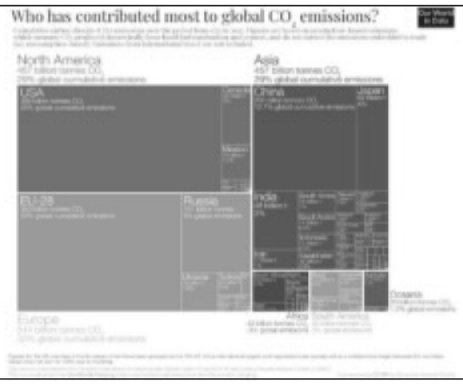


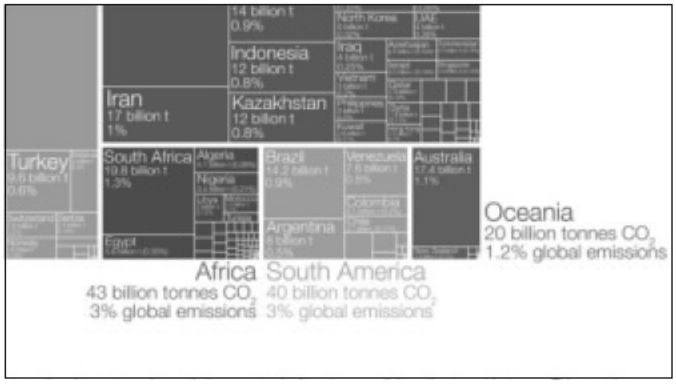
Climate change is a *super-hard* problem for two simple reasons.

1. Climate change is a *collective action* problem that is truly *global*.

(global but not equal…)

2. Almost all aspects of climate change have *long* timescales.

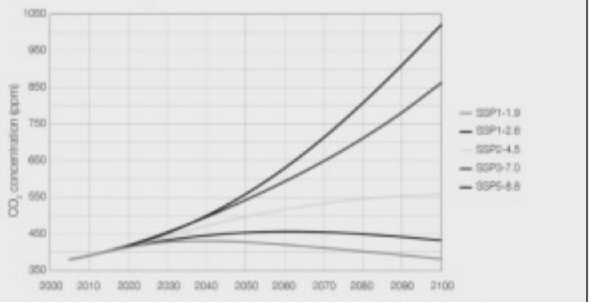




Shared Socioeconomic Pathways (SSPs)

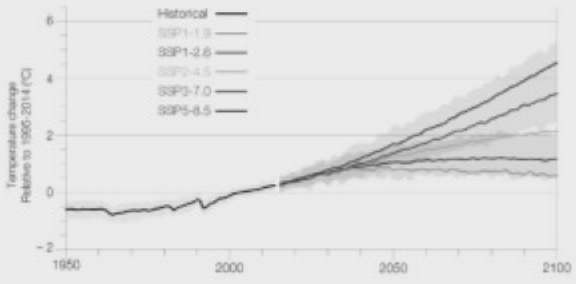
SSP1-1.9	Very low GHG emissions: CO_2 emissions cut to net zero around 2050
SSP1-2.6	Low GHG emissions: CO_2 emissions cut to net zero around 2075
SSP2-4.5	Intermediate GHG emissions: CO_2 at current levels until 2050, then falling but not reaching net zero by 2100
SSP3-7.0	High GHG emissions: CO_2 emissions double by 2100
SSP5-8.8	Very high GHG emissions: CO_2 emissions triple by 2075

Future CO_2 concentrations under different SSPs

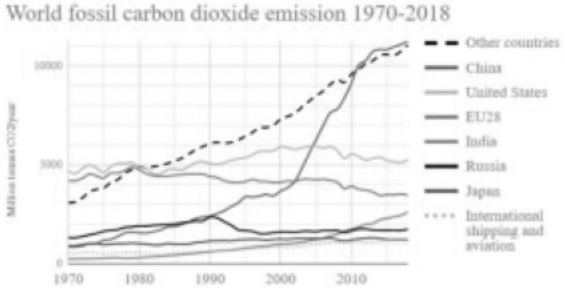


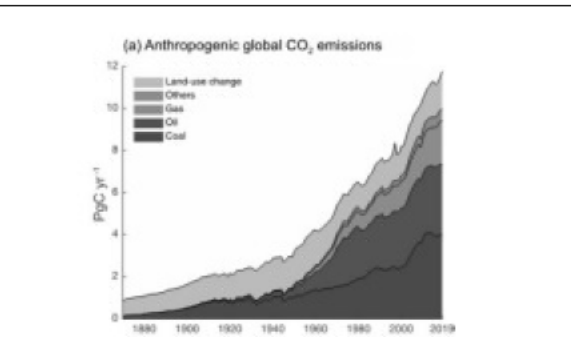
Data: https://tntcat.iiasa.ac.at/SspDb

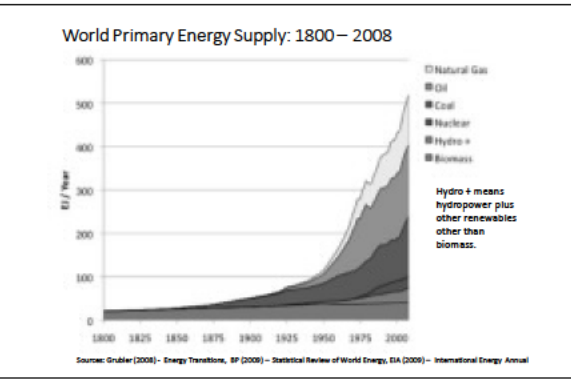
Global temperature change from CMIP6 historical and scenario predictions

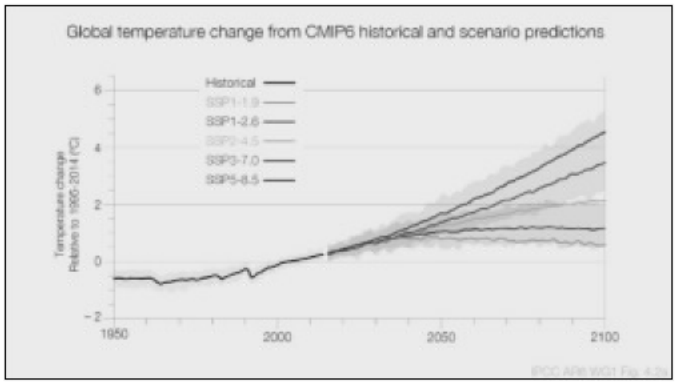


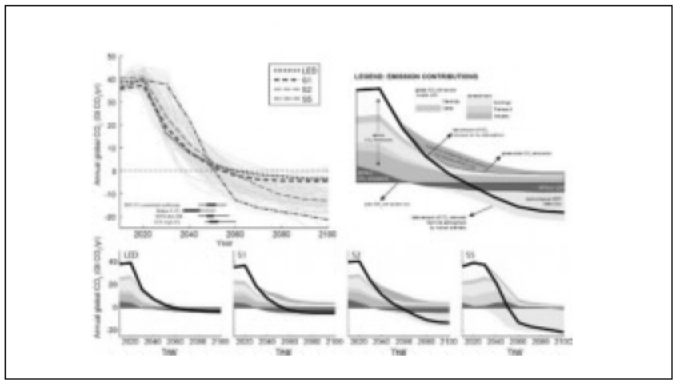
IPCC AR6 WG1 Fig. 4.3a


World fossil carbon dioxide emission 1970-2018
Million tonnes CO2/year
10000
5000
0
1970
1980
1990
2000
2010
Other countries
China
United States
EU28
India
Russia
Japan
International shipping and aviation


(a) Anthropogenic global CO2 emissions
PgC yr-1
Land-use change
Others
Gas
Oil
Coal
0
2
4
6
8
10
12
1880
1900
1920
1940
1960
1980
2000
2019


World Primary Energy Supply: 1800 – 2008
EJ / Year
0
100
200
300
400
500
600
1800
1825
1850
1875
1900
1925
1950
1975
2000
Natural Gas
Oil
Coal
Nuclear
Hydro +
Biomass
Hydro + means hydropower plus other renewables other than biomass.
Sources: Grubler (2008) - Energy Transitions, BP (2009) – Statistical Review of World Energy, EIA (2009) – International Energy Annual



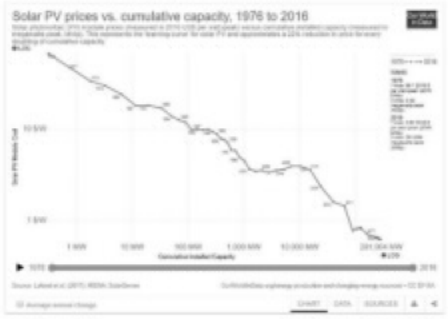


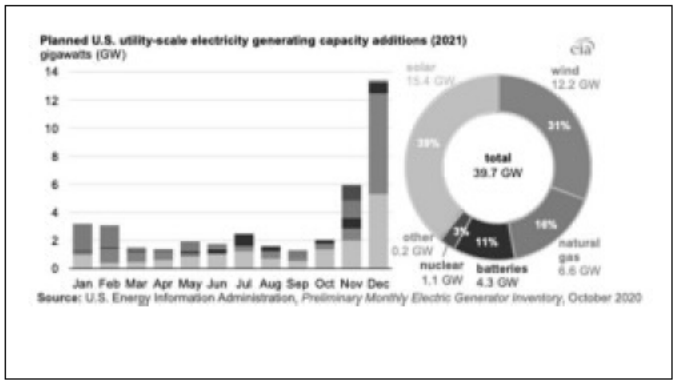
The timescale of decarbonization is longer than many policy makers and climate change advocates imagine. Deep decarbonization requires an array of new technologies (energy storage, advanced biofuels/synthetic fuels, etc.), and a new infrastructure that represents several hundred years of construction at current rates. It seems unlikely to occur in just a few decades.



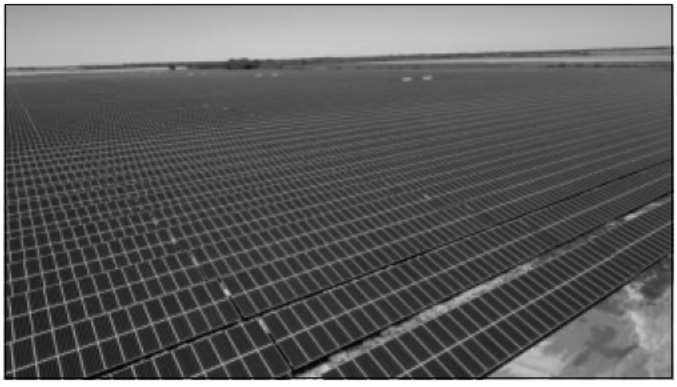
Cartoon from an 1861 *Vanity Fair*: "Grand ball given by the whales in honor of the discovery of the oil wells in Pennsylvania."

Technology is critical to any solution. Global demand for electric vehicles (for example) will happen when electric vehicles are a better choice than internal combustion engine vehicles. Global demand for wind and solar power will happen when wind and solar power are better choices than coal or natural gas power.



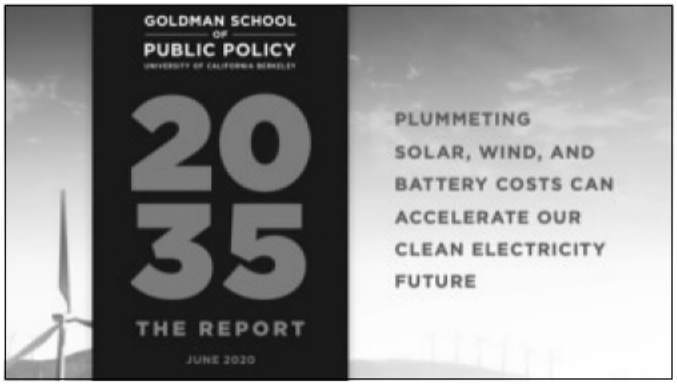

Planned U.S. utility-scale electricity generating capacity additions (2021)
gigawatts (GW)
14
12
10
8
6
4
2
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
eia
solar
15.4 GW
wind
12.2 GW
31%
39%
total
39.7 GW
16%
other
0.2 GW
3%
11%
natural
gas
6.6 GW
nuclear
1.1 GW
batteries
4.3 GW
Source: U.S. Energy Information Administration, Preliminary Monthly Electric Generator Inventory, October 2020

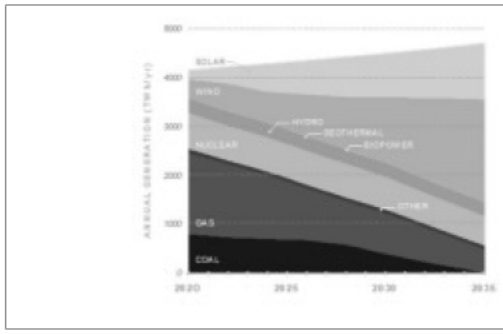


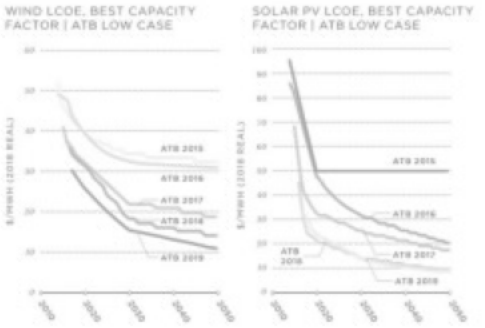


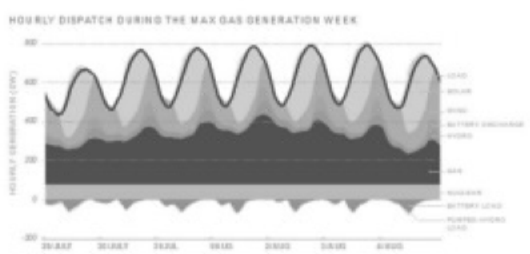
"Plans are worthless, but planning is everything."

-President Dwight Eisenhower









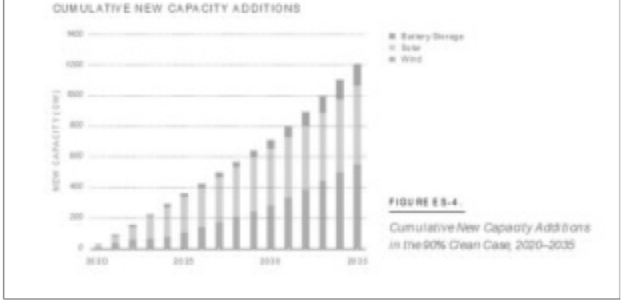


FIGURE ES-4.

Cumulative New Capacity Additions in the 90% Clean Case, 2020–2035



Key assumptions

CO_2 emissions	
Land CO_2 in 2050	~0.8 $GtCO_2$/y (~0.7 $GtCO_2$/y today and declining)
Non-CO_2 in 2050	1 $GtCO_{2e}$/y (50% reduction from today)
Energy/industry CO_2	~0.4 $GtCO_2$ in 2050
Technology installed capital costs in 2020 $ (some later slides express values in 2018$, assuming 4% escalation from 2018)	
Utility solar, $/$kW_{ac}$	$1400/kW (2020) → $900/kW (2050) [including grid connection costs]
Onshore wind, $/kW	$1,500 - $2,700/kW (2020) → $1000 - $1,900/kW (2050) [including grid connection costs]
Nuclear power, $/kW	$6,600/kW (2020) → $5,500/kW (2050)
NG power w/ CC, $/kW	NGCC-CC, $1,200 (2020) → $1,700 (2050); NG-Allam (99% capture, available from 2030), $2,300/kW.
H_2 capex, $/$kW_{H_2,out}$	Biogasification w/CC, $2,600/kW; BIO-SNG w/CC, $800/kW. Electrolysis, $1,100/kW (2020) → $420/kW (2050).
Biopower, $/kW	$3,672/kW (2020) → $3,300/kW (2050)
with CC, $/kW	Bio-IGCC (90% capture), $6,338/kW. Bio-Allam (99% capture, available from 2035), $7,144/kW.
Biopwr] wo. $/$kW_{e,net}$	$2,500/kW
with CC, $/kW	$4,000/kW (available from 2035
Direct air capture, $/tpy	Direct air capture (available from 2035), $1200 per tCO_2/y installed capital cost
Resource costs in 2016 $ (some later slides express values in 2018$, assuming 4% escalation from 2018)	
Oil and gas prices	All 2020 EIA lowest projected prices (2050: crude oil @ $36/bbl & natural gas @ $3.6 - $4.7/$GJ_{HHV}$)
Biomass feedstocks	$30 - $140 per dry tonne delivered, based largely on DOE Billion Ton Study (2016)
CO_2 transport & storage	Cost varies by location and volume stored. Bulk of supply is in the range of $35/$tCO_2$

In the 2040s, light duty vehicles sales are 60%-100% EV. Medium & heavy truck sales are 50%-100% electric drivetrain (EV + H_2FCV)

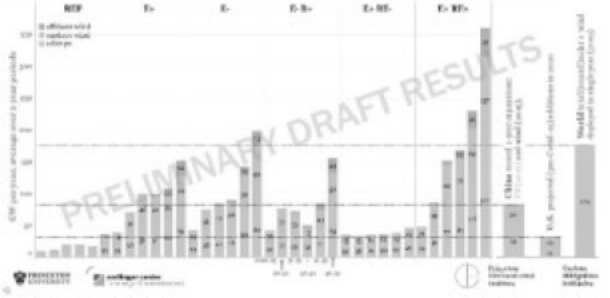
End-use energy productivity improves via same-fuel efficiency gains and via electrification; energy used for oil refining declines.

Solar and wind generated electricity have dominant roles in all net-zero pathways

Annual wind and solar capacity additions are sustained over multiple decades at historically-unprecedented rates

Essentially all available biomass [redacted] rapid growth after 2030. H_2 from biomass [redacted] key technology.

Annual wind and solar capacity additions are sustained over multiple decades at historically-unprecedented rates



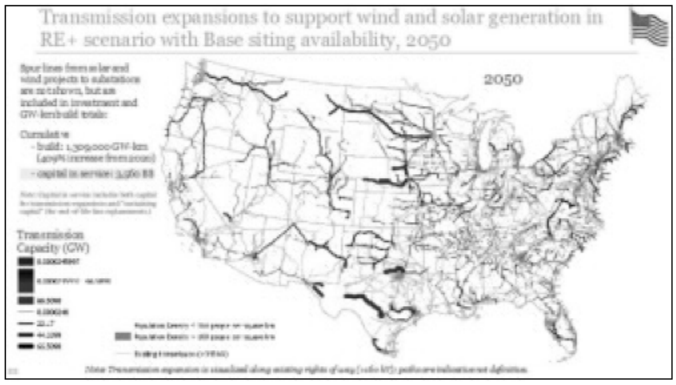
Transmission system in 2020 (≥ 345 kV lines shown)



Transmission expansions to support wind and solar generation in E+ scenario with constrained siting availability, 2050



Note: Transmission expansion is visualized along existing rights-of-way (+160 km); paths are indicative and not definitive.



Lessons from Low- and Zero-Carbon Scenarios:

1) Major uncertainty remains about how much wind and solar can be managed effectively on the grid; but all scenarios have much higher wind and solar penetration than today (60-90%).

2) Rates of infrastructure additions including wind and solar capacity and new transmission are historically high. (U.S. capacity addition of wind and solar by 2040s is higher than current capacity additions for the entire world.)

Lessons from Low- and Zero-Carbon Scenarios:

3) Many studies make use of hydrogen for heavy transport, shipping, and air travel, but these scenarios assume huge decreases in cost of electrolysis. If this does not occur, then other technologies such as synthetic fuels and advanced biofuels may play a larger role. Moreover, intermittent use of electrolysis equipment due to coupling with wind and solar makes the cost of hydrogen production even higher.

4) Demand for biomass is likely to be very high, putting more pressure on land use and conservation.

A Path Forward:

1) Continuing to increase wind and solar capacity is a no-regrets strategy for the next several decades (at least). Acceleration of capacity addition will require either early retirement of existing generation, or expansion of electricity demand through electrification of transportation, industry, and heating.

2) Reform of electricity pricing (including Time-of-Use pricing) will encourage innovation, opening markets for technologies that will help with integration of wind and solar, and with electrification of transportation and other sectors.

A Path Forward:

3) Many other technologies such as renewable hydrogen (for a variety of end uses) and advanced nuclear power, are not yet ready for large-scale deployment. There remains enough uncertainty about whether these technologies will become competitive that it seems unwise to commit to large-scale infrastructure investments at this stage. Demonstration projects that make use of existing infrastructure (e.g., blending hydrogen with natural gas, or hydrogen for fleet transport from a central fueling station) would be more effective at this stage.

The timescale of decarbonization is longer than many policy makers and climate change advocates imagine. Deep decarbonization requires an array of new technologies (energy storage, advanced biofuels/synthetic fuels, etc.), and a new infrastructure that represents several hundred years of construction at current rates. It seems unlikely to occur in just a few decades.

Decarbonizing the U.S., China or Europe as quickly as possible is not the goal. Decarbonizing the world is what matters.

So U.S., Chinese and European leadership is important – maybe even essential. But leadership means getting others to follow – not just charging off ahead.

Our goal is not to decarbonize the U.S. (or China) as quickly as possible. Our goal is to decarbonize the U.S. and China as quickly as possible *in ways that make other countries want to follow.*

If global decarbonization takes longer than current rhetoric among the U.N. climate discussions, then people's experience of climate impacts will grow substantially over the coming decades.

Climate Justice: The fundamental unfairness of climate change

Most of the people who are being affected by climate change did very little to contribute to the problem.

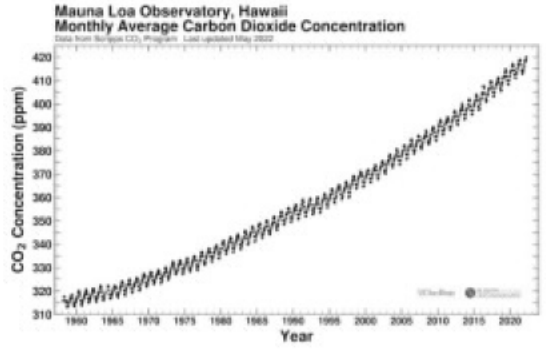
"It is very hard to predict, especially the future."

(attributed to Niels Bohr but apparently an old Danish proverb)

What is the relationship between technology, economics, and social and political attitudes?

How will our perception of the climate problem change as new technologies are developed?

How will the politics of climate change shift as experience of climate impacts grows?

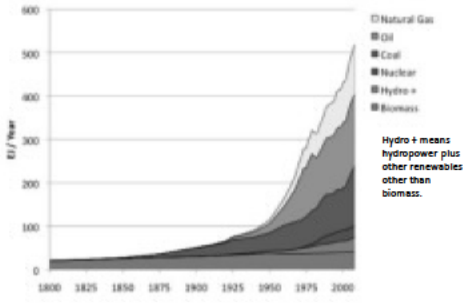


Phase 1 (until 2030 to 2050): Increasing penetration of wind and solar (backed by natural gas); substitution of natural gas for coal; efficiency in all sectors.

Phase 2 (2040 to 2070): Continued expansion of renewables; deployment of storage to manage intermittency of renewables; electrification of passenger vehicles, heating, industry.

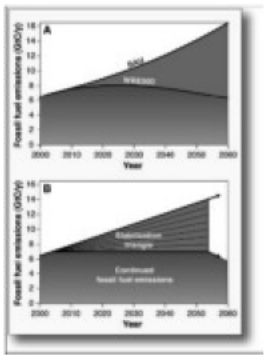
Phase 3: (post-2060?) Carbon capture and storage for natural gas plants, industrial sources; biofuels or synthetic fuels; advanced nuclear.

World Primary Energy Supply: 1800 – 2008



Hydro + means hydropower plus other renewables other than biomass.

Sources: Grubler (2008) - Energy Transitions, BP (2009) – Statistical Review of World Energy, EIA (2009) – International Energy Annual



Pacala and Socolow, Science (2004)

Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies

Special Section

Toward a Hydrogen Economy

Review

Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies

S. Pacala[1]* and R. Socolow[2]*

Humanity already possesses the fundamental scientific, technical, and industrial know-how to solve the carbon and climate problem for the next half-century. A portfolio of technologies now exists to meet the world's energy needs over the next 50 years and limit atmospheric CO_2 to a trajectory that avoids a doubling of the preindustrial concentration. Every element in this portfolio has passed beyond the laboratory (bench and demonstration project); many are already implemented somewhere at full industrial scale. Although no element is a credible candidate for doing the entire job (or even half the job) by itself, the portfolio as a whole is large enough that not every element has to be used.

Conclusions

In confronting the problem of greenhouse warming, the choice today is between action and delay. Here, we presented a part of the case for action by identifying a set of options that have the capacity to provide the seven stabilization wedges and solve the climate problem for the next half-century. None of the options is a pipe dream or an unproven idea. Today, one can buy electricity from a wind turbine, PV array, gas turbine, or nuclear power plant. One can buy hydrogen produced with the chemistry of carbon capture, biofuel to power one's car, and hundreds of devices that improve energy efficiency. One can visit tropical forests where clear-cutting has ceased, farms practicing conservation tillage, and facilities that inject carbon into geologic reservoirs. Every one of these options is already implemented at an industrial scale and could be scaled up further over 50 years to provide at least one wedge.

What can we say about timescale?

In addition to massive infrastructure for non-fossil transportation and industrial systems, we need to build 3500 to 4500 GW of non-fossil generation capacity in the U.S. The current rate of gross construction is ~20 GW per year. (For China, it is ~100 GW/y).

Assuming massive political will and highly favorable economics (which does not yet exist), a huge industrial effort requires 50 to 100 years to reach our goal. (just for the U.S.!)

This long timescale of mitigation requires long-term political strategies to sustain energy innovation and deployment of non-fossil systems. This may mean making uncomfortable alliances (e.g. oil and gas) to achieve long-term climate benefits as we work on technological innovation.

"It is very hard to predict, especially the future."

(attributed to Niels Bohr but apparently an old Danish proverb)

Phase 1 (until 2030 to 2050): Increasing penetration of wind and solar (backed by natural gas); substitution of natural gas for coal; efficiency in all sectors.

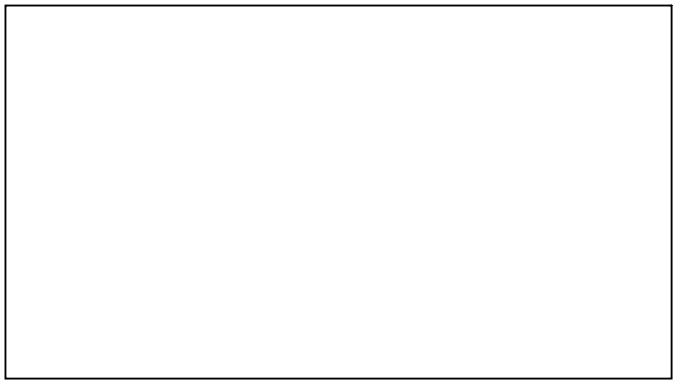
Phase 2 (2040 to 2070): Continued expansion of renewables; deployment of storage to manage intermittency of renewables; electrification of passenger vehicles, heating, industry.

Phase 3: (post-2060?) Carbon capture and storage for natural gas plants, industrial sources; biofuels or synthetic fuels; advanced nuclear.

What is the relationship between technology, economics, and social and political attitudes?

How will our perception of the climate problem change as new technologies are developed?

How will the politics of climate change shift as experience of climate impacts grows?



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CLIMATE LITIGATION TRENDS IN STATE COURTS

DIVIDER 6

Sandra Thiam and Jarryd Page

OBJECTIVES:

After this session you will be able to:

1. Generalize about "climate cases" and articulate various perspectives on them;
2. Be able to list 2-3 trends in state court climate litigation; and
3. Describe the differences of outcome among different state courts and the reasons for those differences.

REQUIRED READING: PAGE

1. Sandra N. Thiam and Jarryd Page, Trends in State Climate Litigation (Sept. 2022) [NJC Document].....1

Trends in State Climate Litigation

By Sandra N. Thiam and Jarryd Page

Part of the Climate Science & Law for Judges Curriculum

September 13, 2022
Woods Hole, MA

Roadmap

1. Defining climate litigation
2. Trends in climate cases
3. Questions arising in state courts
4. Atmospheric trust cases
5. Common law cases
6. Remedies
7. International precedents
8. Climate science in the courtroom
9. Recurring themes
10. Resources for managing science in the courtroom

Climate Change Litigation

Society is responding to climate change by seeking to:

1. Reduce greenhouse gas emissions (GHGs) – ***mitigation***
2. Prepare for expected impacts – ***adaptation***; and
3. Deal with ***impacts*** that are already occurring – insurance coverage, emergency response, cleanup, shifting land use patterns, etc.

Mitigation Cases

- Seeking regulation of GHGs
- Seeking damages for emission of GHGs
- Infrastructure development/land use (pipeline construction) disputes

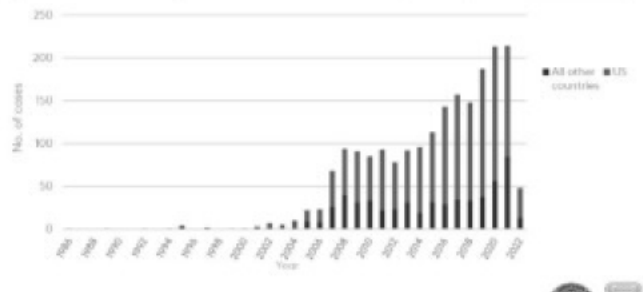
Adaptation Cases

(1) cases seeking adaptation measures; and

(2) cases challenging planned or existing adaptation actions

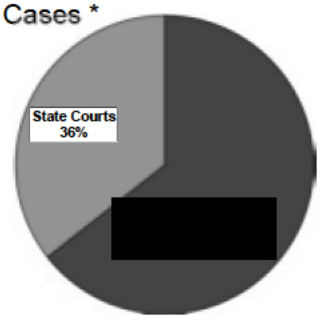
Adaptation cases frequently rely on evidence drawn from scientific research into past and future climate change:
- attribution studies of climate change to date, and
- future projections of climate change and its impacts.

Figure 1.1. Total climate change cases over time, US and non-US (up to 31 May 2022)



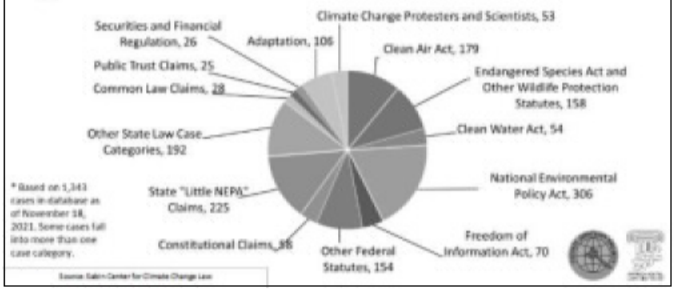
Source: Joana Setzer & Catherine Higham, Global Trends in Climate Change Litigation 9 (June 2022) (based on data from the Sabin Center and Climate Change Laws of the World databases)

U.S. Climate Cases *



*Based on 1,489 cases in Sabin Center database as of September 8, 2022.

Types of U.S. Climate Cases Filed*



* Based on 1,343 cases in database as of November 18, 2021. Some cases fall into more than one case category.

Source: Sabin Center for Climate Change Law

Questions Arising in State Courts – Mitigation of emissions and damages for emissions

- Atmospheric Trust Cases
- Cases involving statutory obligations to regulate GHG emissions
- Cases involving GHG impacts of administrative decisions
- Cases involving obligations to disclose GHG emissions in environmental review, planning, and financial disclosure documents
- Tort and consumer protection claims against fossil fuel companies ("climate nuisance" cases)

Questions Arising in State Courts—Adaptation and Impacts

- Lawsuits challenging the failure to prepare for the effects of climate change on:
  - Infrastructure and facilities
  - Human health
  - Natural resources
- Govt defense of adaptation measures and climate responses
- Foreseeability of climate harms and related duties
- Review of agency environmental law/permitting decisions related to climate science

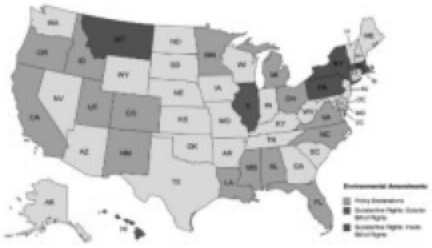
Atmospheric Trust Cases

Series of cases of youth plaintiffs seeking government order to prepare plan to reduce emissions – federal and state cases

Juliana v. US, 947 F.3d 1159 (9th Cir. 2020)
- Substantial scientific evidence in pre-trial proceedings
- Dismissed on redressability element of standing

Held v. State of Montana
- set for trial February 2023 on claims for declaratory relief
- Constitutionality of state energy policy and exception to the environmental policy act
- Alleged violations of the Public Trust Doctrine

State Environmental Rights Amendments (ERAs)



State Environmental Rights Amendments

- ERAs secure a fundamental and inalienable right to a healthful environment (*i.e.*, through clean air, pure water, clean land, etc.) for present and future generations.
  - "Each person shall have a right to clean air and water, and to a healthful environment." (New York Constitution, Art. I, Section 19)
  - Seven states have enacted ERAs — Illinois, Pennsylvania, Montana, Massachusetts, Hawaii, Rhode Island, and New York
  - Consideration in 14 additional states

State Environmental Rights Amendments - Hawaii

- "Each person has the right to a clean and healthful environment, as defined by laws relating to environmental quality, including control of pollution and conservation, protection and enhancement of natural resources . . . " (Hawaii Constitution, Art. XI, Section 9)
- The right to a "clean and healthful environment" described in the state constitution subsumes "a right to a life-sustaining climate system." *In the Matter of the Application of Maui Electric Co., Ltd.*, SCOT-21-0000041 n. 15 (Sup. Ct. Haw. Mar. 2, 2022)

State Environmental Rights Amendments - Pennsylvania

"The people have a right to clean air, pure water, and to the preservation of the natural, scenic, historic and esthetic values of the environment. Pennsylvania's public natural resources are the common property of all the people, including generations yet to come. As trustee of these resources, the Commonwealth shall conserve and maintain them for the benefit of all the people." (Pennsylvania Constitution, Art. I, Section 27)

Robinson Township v. Commonwealth of Pennsylvania, 83 A.3d 901 (Pa. 2013)

Examples: "Atmospheric Trust" Cases

"Climate Rights" and government obligations: Plaintiffs must show that the government has undermined the fundamental rights of citizens through its contributions to climate change.

- **Juliana v. US** – Alleging that U.S. government violated the public trust doctrine and constitutional rights of youth plaintiffs to a stable climate system by causing and contributing to dangerous GHG concentrations
- **Animal Defense Fund v. U.S.** – Alleging that U.S. government violated constitutional rights to be "let alone free from human influence in the wilderness" by causing and contributing to dangerous GHG concentrations
- **Held v. Montana** – Alleging that State of Montana violated state constitutional rights through policies which contribute to climate change, particularly the state's fossil fuel-based State Energy Policy and the "Climate Change Exception" in the Montana Environmental Policy Act
- **Layla H. v. Virginia** - Alleging that Virginia's fossil fuel permitting violated the Public Trust doctrine and the Substantive Due Process rights of youth plaintiffs



Key factual / legal questions implicating climate science in atmospheric trust cases

1. Have plaintiffs suffered actual or imminent harm as a result of climate change?
2. To what extent have government defendants contributed to global climate change (and associated harms) through the policies and decisions at issue in the case?
3. Is the nature/magnitude of the harm sufficient to sustain a determination that government defendants have violated fundamental rights?
4. Can the court provide some form of redress?



Common Law Tort and Consumer Protection Cases

- Two dozen or so cases filed by cities, states, and municipalities against oil companies
- Primary Issue: state court or federal court?
- Jurisdictional ping pong (*BP v. Baltimore*)
- Case dismissed (*City of New York v. Chevron* (2d. Cir. 2021))
- Where are we now? 5/5 federal Courts of Appeals rejected defendants' removal arguments



Common Law Tort and Consumer Protection Cases

- "Climate change is an important problem with national and global implications. But federal courts cannot hear cases just because they are important. The Constitution restricts us to resolving claims that are about federal law or that Congress has expressly authorized us to hear. These claims check neither box. So we cannot hear them." City of Hoboken v. Chevron Corp., No. 21-2728, 36 (3d Cir. Aug. 17, 2022).
- "This is an unprecedented case for any court, let alone a state court trial judge. But it is still a tort case. It is based exclusively on state law causes of action. . . . Here, the causes of action may seem new, but in fact are common. They just seem new – due to the unprecedented allegations involving causes and effects of fossil fuels and climate change. Common law historically tries to adapt to such new circumstances." City & Cty. of Honolulu & BWS v. Sunoco, LP, No. 1CCV-20-0000380, 2, 7 (Haw. 1st Cir. Ct. Feb. 22, 2022).

"Climate Nuisance" Cases

- Tort claims include nuisance, negligence, product liability, failure to warn
- Plaintiffs seeking equitable relief, establishment of abatement funds, monetary compensation for climate damages
- Many parallels to "climate rights" cases
- But additional factual challenges:
  - Linking climate disinformation to climate damages
  - Calculating monetary damages



Remedies in Climate Litigation

- Remedies depend on the cause of action
- Courts have been reticent to reach sweeping injunctive remedies

Remedies in Atmospheric Trust Cases

- Plaintiffs seeking declaratory and injunctive relief
- Many cases dismissed on justiciability or procedural issues when sweeping injunctive relief sought

- *Reynolds v. State of Florida*
- *Kanuk ex rel. Kanuk v. Alaska Department of Natural Resources*
- *Held v. State of Montana*
- *Navahine F. v. Hawai'i Department of Transportation*



Remedies in State Statutory Actions

Injunctive remedies tied to statutory obligations
- Kain v. MASS DEP
- MA Supreme Judicial Court ordered DEP to adopt specific GHG reduction targets

Plaintiffs seeking injunctive relief in consumer protection and investor fraud cases
- Mass v. Exxon Mobil Corp
- Mass seeking injunctive relief as well as civil penalty for each violation
- also seeking disgorgement of profits



Remedies in Common Law Claims

Tort and consumer protection cases
- Seeking damages

E.g., *Mayor and City Council of Baltimore v. BP*
- Baltimore is seeking compensatory and punitive damages, disgorgement of profits, and civil penalties under the MCPA



International Precedents

- *Urgenda Foundation v. State of the Netherlands* (The Netherlands)
- *Milieudefensie v. Royal Dutch Shell* (The Netherlands)
- *Gloucester Resources Limited v. Minister for Planning* (Australia)
- *Demanda Generaciones Futuras v. Minambiente* (Colombia)
- 1 BvR 2656/18, 1 BvR 288/20, 1 BvR 96/20, 1 BvR 78/20 (Germany)
- *Mathur v. Ontario* (Canada)



Recurring themes

- Standing
- Political question doctrine
- Remedies
- Proof of causation at trial



Climate Science in the Courtroom

- Disputes are not on the basic scientific consensus on climate change
- Scientific limitations have not yet posed a significant obstacle to litigation
- Scientific disputes already prominent in some adaptation/planning cases
- Scientific issues especially significant in "atmospheric trust" and "climate nuisance" cases.



Techniques for Managing Scientific Information

- Judge-appointed science experts: help evaluate parties' arguments regarding their own and the other side's experts.

  In 2018, U.S. District Judge William Alsup ordered the parties in a climate change case to give him a tutorial on the science.

- Judges can also often appoint technical advisors to assist them.
- Court-appointed neutrals (formerly known as special masters), especially those with substantive expertise, may also facilitate management of complex cases.
- Reference Manual on Scientific Evidence (FJC and National Academies)



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SCIENCE OF ATTRIBUTION DIVIDER 7

Dr. Kevin Reed

OBJECTIVES:

After this session you will be able to:

1. Define attribution science generally and event attribution specifically;
2. Contrast 2-3 ways of framing attribution statements, such as in percentages, probabilities, magnitudes, and confidence intervals; and
3. Give examples of the role and reliability of models in attribution science.

NO MATERIALS FOR THIS SESSION

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ATTRIBUTION IN TORT AND OTHER KINDS OF CASES — DIVIDER 8

Professor Douglas Kysar

OBJECTIVES:

After this session you will be able to:

1. List traditional legal doctrines that may be relevant in the climate context and where attribution science might be applied;
2. Describe how climate science might relate to traditional legal doctrines such as tort law; and
3. List 3 of the "U.S. 2021 Billion-Dollar Weather and Climate Disasters" and how climate change may relate to these disasters.

REQUIRED READING: **PAGE**

Douglas Kysar, Climate Change, Attribution Science, and Judging Responsibility (Sept. 2022) [NJC Document] 1

CLIMATE CHANGE, ATTRIBUTION SCIENCE, AND JUDGING RESPONSIBILITY

douglas.kysar@yale.edu

13 September 2022

The National Judicial College



CLIMATE CHANGE: THE WHODUNIT AT THE END OF THE WORLD



The National Judicial College

CLIMATE CHANGE, ATTRIBUTION SCIENCE, AND JUDGING RESPONSIBILITY

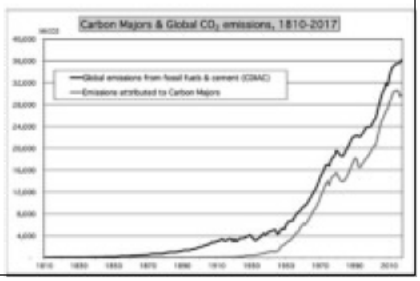
The National Judicial College

CLIMATE CHANGE, ATTRIBUTION SCIENCE, AND JUDGING RESPONSIBILITY

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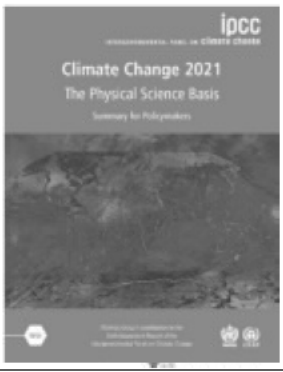
CLIMATE ATTRIBUTION SCIENCE

- *Warming attribution*
- *Impact/ extreme event attribution*
- *Source attribution*



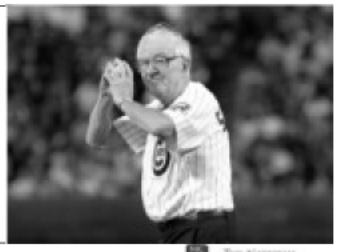
ATTRIBUTION SCIENCE

"It is indisputable that human activities are causing climate change, making extreme climate events, including heat waves, heavy rainfall, and droughts, more frequent and severe."



MASSACHUSETTS V. EPA (2007)

"A well-documented rise in global temperatures has coincided with a significant increase in the concentration of carbon dioxide in the atmosphere. Respected scientists believe the two trends are related."





How cities an
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fossil fuel co
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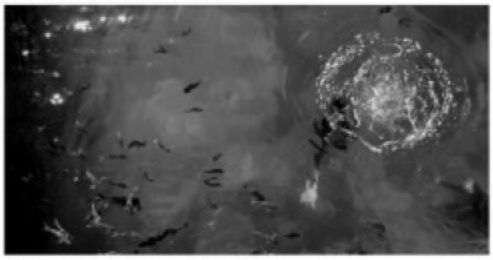
Fishermen Sue Big Oil For Its Role In Climate Change





OCEANS

88 companies caused 50% of acidification — report



A new study has linked ocean acidification to the world's biggest fossil fuel companies, including Exxon Mobil Corp., Chevron Corp. and BP PLC.

Lawmakers study Big Tobacco perjury before Big Oil showdown





Why Cities Suing Over Climate Change Want the Fight in State Court, Not Federal

Oil companies think they'll win in federal court, and they've been trying to get each city, county and state climate lawsuit moved there.

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CITY OF NEW YORK V. CHEVRON (2021)

"To permit this suit to proceed under state law would [] risk upsetting the careful balance that has been struck between the prevention of global warming … and energy production, economic growth, foreign policy and national security."



CITY OF NEW YORK V. CHEVRON (2021)

"Is this a clash over regulating worldwide greenhouse gas emissions and slowing global climate change, or is it a more modest litigation akin to a product liability suit …?"



JULIANA V. UNITED STATES (2021)

"The central issue before us is whether ... [the] court can provide the plaintiffs the redress they seek—an order requiring the government to develop a plan to 'phase out fossil fuel emissions and draw down excess atmospheric CO2.' Reluctantly, we conclude that such relief is beyond our constitutional power. Rather, the plaintiffs' impressive case for redress must be presented to the political branches of government."



HONOLULU V. SUNOCO (2022)

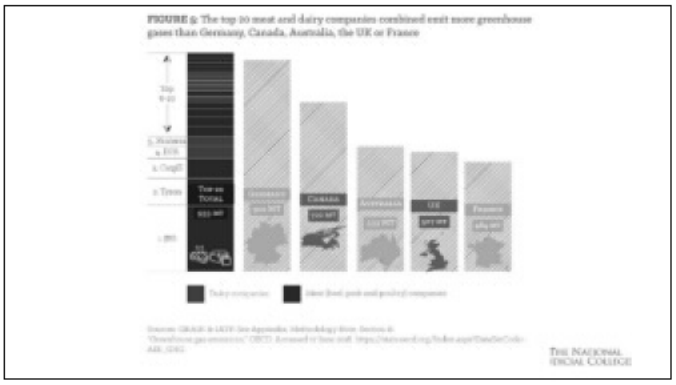
"Here, the causes of action may seem new, but in fact are common. They just seem new – due to the unprecedented allegations involving causes and effects of fossil fuels and climate change. Common law historically tries to adapt to such new circumstances."





Tracing anthropogenic carbon dioxide and methane emissions to fossil fuel and cement producers, 1854–2010

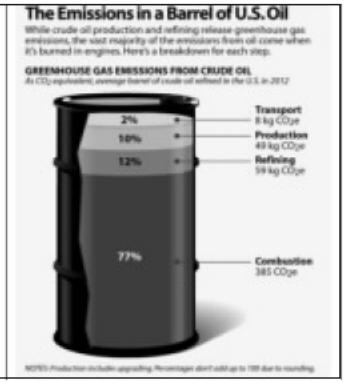
Abstract

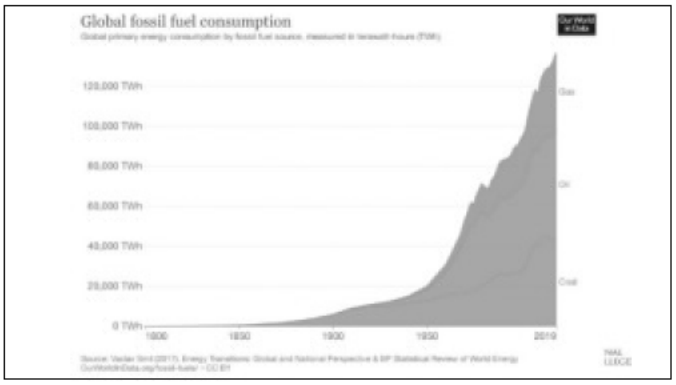




A RESPONSIBLE BALANCE?







ENERGY RESOURCES

There is evidence that the greatly increasing use of the fossil fuels, whose material contents after combustion are principally H_2O and CO_2, is seriously contaminating the earth's atmosphere with CO_2. Analyses indicate that the CO_2 content of the atmosphere since 1900 has increased 10 per cent. Since CO_2 absorbs long-wavelength radiation, it is possible that this is already producing a secular climatic change in the direction of higher average temperatures. This could have profound effects both on the weather and on the ecological balances.

by

M. King Hubbert

Publication 1000-D
National Academy of Sciences—National Research Council
Washington, D. C.
1962

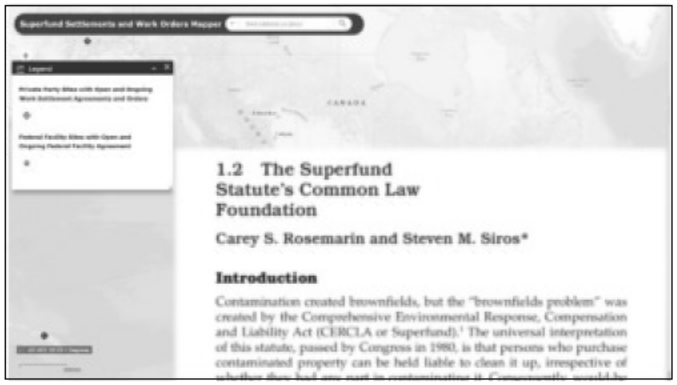
Slide courtesy of David Hawkins, NRDC

The Washington Post

Exclusive: Top companies are undermining their climate pledges with political donations, report says



Some of the nation's best-known corporations are undermining their promises to slash emissions by donating significant sums to elect Republican attorneys general, who have emerged as frequent courtroom foes of climate policies and regulations, according to a report shared exclusively with The Climate 202.



HONOLULU V. SUNOCO (2022)

"This is an unprecedented case for any court, let alone a state court trial judge. But it is still a tort case."







COURTS

Judge advances climate adaptation case against Shell

Conservation Law Fo

Jennifer Hijazi, E&E News reporter

Published: Tuesday, September 29, 2020

v.

ExxonMobil Corpora
ExxonMobil Oil Corp
ExxonMobil Pipeline

A federal judge ruled yesterday that oil industry attorneys failed to prove why a climate adaptation case in Rhode Island against Royal Dutch Shell PLC should be tossed from the courts.

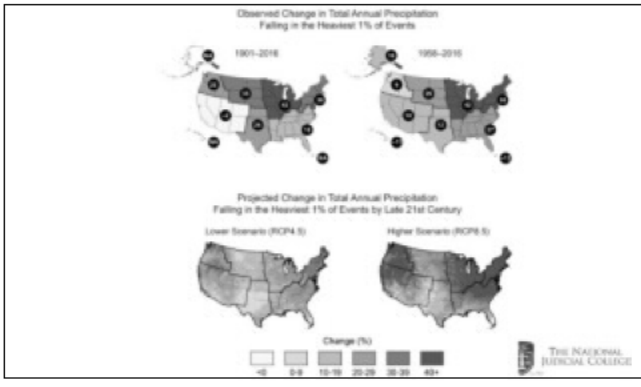
Judge William Smith of the U.S. District Court for the District of Rhode Island issued an order that largely preserves a Conservation Law Foundation (CLF) lawsuit that targets Shell for not insulating one of its storage terminals in the Port of Providence from climate change events like floods and extreme storms.



The judge dismissed some parts of the case, like CLF's assertions about future harms, but he said the group's reasoning on near-term catastrophe is enough to allow the case to continue.

"As to near-term harms from foreseeable weather events, Plaintiff has asserted certainly impending harm, at least at this stage," Smith wrote in his order.

"The Complaint makes clear that a major weather event, magnified by the effects of climate change, could happen at virtually any time, resulting in the catastrophic release of pollutants due to Defendants' alleged failure to adapt the Terminal to address those impending effects," he added.



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An unexpected item is blocking cities' climate change prep: obsolete rainfall records



LATEST NEWS

- Urban stormwater presents pollution challenge
- These scientists are fighting the pandemic with sewage
- An unexpected item is blocking cities' climate change prep: obsolete rainfall records
- Urban@UW Funds Anti-Displacement and Belonging Workshop
- 'We have to adapt': US mystic meets resist weighs plans to cope with extreme weather

AUSTRALIA

Home > Millennial Sues Australian Pension Fund over Climate Change Risks

News November 20, 2019

Millennial Sues Australian Pension Fund over Climate Change Risks

24-year-old says fund broke the law by not providing information about climate change risks.

A 24-year-old Australian pension fund member is suing his pension for allegedly violating the country's Corporations Act by failing to provide information related to business risks associated with climate change, as well as any plans to address those risks.

Mark McVeigh filed a lawsuit in the Federal Court of Australia against the A$57 billion ($38.9 billion) Retail Employees Superannuation Trust (REST), to which he has contributed 9.5% of his salary since 2013. Under the Corporations Act 2001, super fund beneficiaries are entitled to request information they need so they can make informed decisions about the management and financial condition of the fund.

warming (@breakwire, Dec. 9, 2019)

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THE LEARNED HAND FORMULA

"[I]f the probability be called P; the injury L; and the burden, B; liability depends upon whether B is less than L multiplied by P: i.e., whether B < PL."



RESTATEMENT (THIRD) OF TORTS § 20(B)

An abnormally dangerous activity subject to strict liability exists when:

"(1) the activity creates a foreseeable and highly significant risk of physical harm even when reasonable care is exercised by all actors; and

(2) the activity is not one of common usage."



Remains of the Burst Reservoir, **Enallah School**

RESTATEMENT (THIRD) OF TORTS § 20(B)

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RESTATEMENT (THIRD) OF TORTS § 20(B)

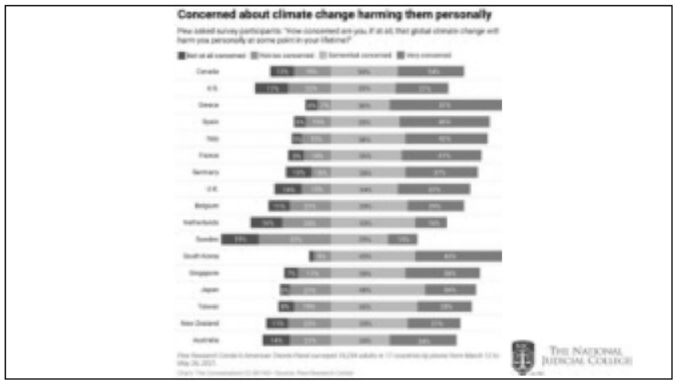
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Remains of the Burst Reservoir, **Enelish School**







Prolonged Siberian heat of 2020 almost impossible without human influence

Abstract

Over the first half of 2020, Siberia experienced the warmest period from January to June since records began and on the 20th of June the weather station at Verkhoyansk reported 38 °C, the highest daily maximum temperature recorded north of the Arctic Circle. We present a multi-model, multi-method analysis on how anthropogenic climate change affected the probability of these events occurring using both observational datasets and a large collection of climate models, including state-of-the-art higher-resolution simulations designed for attribution and many from the latest generation of coupled ocean–atmosphere models, CMIP6. Conscious that the impacts of heatwaves can span large differences in spatial and temporal scales, we focus on two measures of the extreme Siberian heat of 2020: January to June mean temperatures over a large Siberian region and maximum daily temperatures in the vicinity of the town of Verkhoyansk. We show that human-induced climate change has dramatically increased the probability of occurrence and magnitude of extremes in both of these (with lower confidence for the probability for Verkhoyansk) and that without human influence the temperatures seen by experienced in Siberia in the first half of 2020 would have been practically impossible.

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STRAUSS V. BELLE REALTY CO. (1985)

"The courts' definition of an orbit of duty based on public policy may at times result in the exclusion of some who might otherwise have recovered for losses or injuries if traditional tort principles had been applied."



FINAL DAILY NEWS

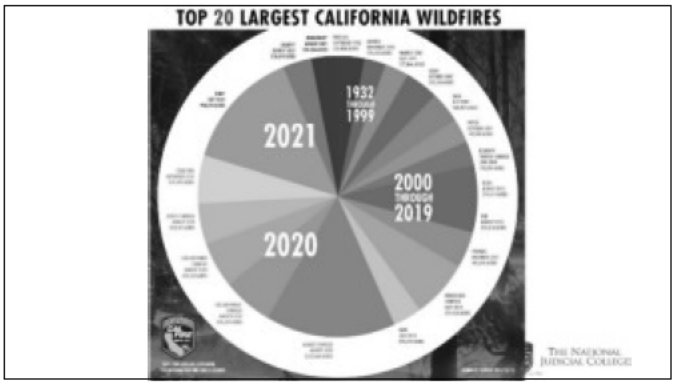
BLACKOUT!

LIGHTNING HITS CON ED SYSTEM

AEGIS INSURANCE SERVICES, INC. V. 7 WORLD TRADE COMPANY, L.P. (2013)

"It is simply incompatible with common sense and experience to hold that defendants were required to design and construct a building that would survive the events of September 11, 2001."

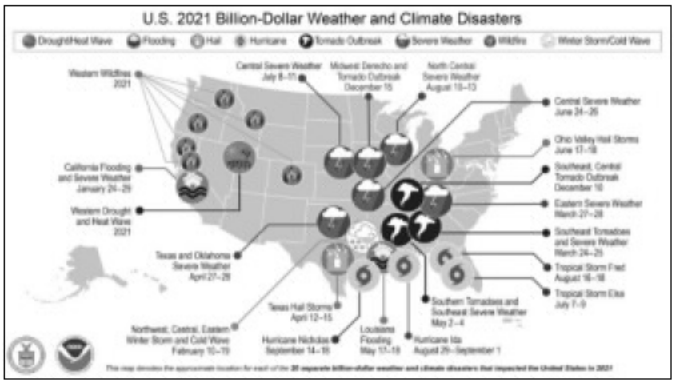



TOP 20 LARGEST CALIFORNIA WILDFIRES
1932 THROUGH 1999
2000 THROUGH 2019
2020
2021
THE NATIONAL JUDICIAL COLLEGE


PLOS CLIMATE
The recent normalization of historical marine heat extremes
Abstract
THE NATIONAL JUDICIAL COLLEGE

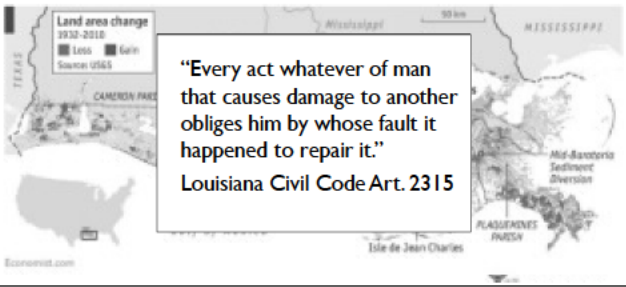

THE NATIONAL JUDICIAL COLLEGE




U.S. 2021 Billion-Dollar Weather and Climate Disasters
Drought/Heat Wave
Flooding
Hail
Hurricane
Tornado Outbreak
Severe Weather
Wildfire
Winter Storm/Cold Wave
Western Wildfires 2021
Central Severe Weather July 8–11
Midwest Derecho and Tornado Outbreak December 15
North Central Severe Weather August 10–13
Central Severe Weather June 24–26
Ohio Valley Hail Storms June 17–18
Southeast, Central Tornado Outbreak December 10
Eastern Severe Weather March 27–28
Southeast Tornadoes and Severe Weather March 24–25
Tropical Storm Fred August 16–18
Tropical Storm Elsa July 7–9
California Flooding and Severe Weather January 29–29
Western Drought and Heat Wave 2021
Texas and Oklahoma Severe Weather April 27–28
Texas Hail Storms April 12–15
Northwest, Central, Eastern Winter Storm and Cold Wave February 10–19
Hurricane Nicholas September 14–15
Louisiana Flooding May 17–18
Hurricane Ida August 29–September 1
Southern Tornadoes and Southeast Severe Weather May 2–4



BARASICH V. COLUMBIA GULF TRANSMISSION CO. (2006)



"Every act whatever of man that causes damage to another obliges him by whose fault it happened to repair it."

Louisiana Civil Code Art. 2315



BARASICH V. COLUMBIA GULF TRANSMISSION CO. (2006)

"By all accounts, coastal erosion is a serious problem in south Louisiana. . . . [P]erhaps a more focused, less ambitious lawsuit between parties who are proximate in time and space, with a less attenuated connection between the defendant's conduct and the plaintiff's loss, would be the way to test their theory."



The National Judicial College

THE NATIONAL JUDICIAL COLLEGE

Making the world a more just place by educating and inspiring its judiciary

PREPARING FOR COLLABORATIVE CONVERSATIONS

DIVIDER 9

Professor Yvonne Stedham and Professor Kelly Tait

OBJECTIVES:

After this session you will be able to:

1. Explain the importance of listening and expanding mindful listening skills;
2. Recognize the importance of intentions in effective conversations and of adopting a "scientist" style, rather than a preacher, politician, or prosecutor style;
3. Mitigate the effects from polarization associated with climate change in conversations; and
4. Use specific phrases that facilitate conversations that lead to collaboration.

REQUIRED READING: **PAGE**

1. Yvonne Stedham and Kelly Tait, *Preparing for Collaborative Conversations* (Sept. 2022) [NJC Document] 1
2. EIT Climate-KIC, *The #TalkingClimate Handbook: How to have Conversations about Climate Change in Your Daily Life* (Dec. 2019) [NJC Document] 26
3. *Resources for Communicating about Climate Science* (Sept. 2022) [NJC Document] 55



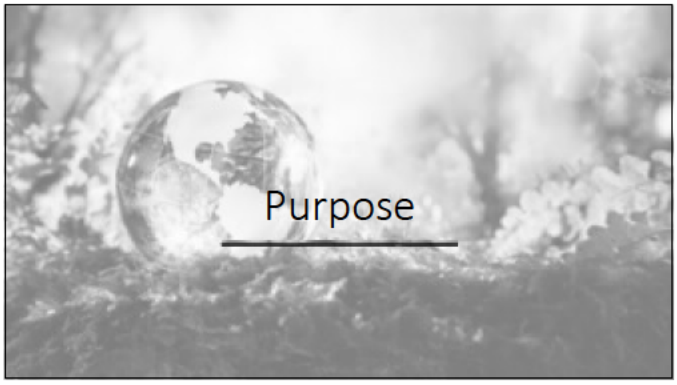
Climate Science and Law
Woods Hole, MA
September 12-14, 2022

Preparing for Collaborative Conversations

9-13-2022 – 3:10 to 4:10 pm

Yvonne Stedham, Ph.D.
Kelly Tait, Professor



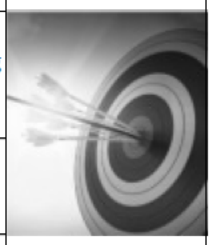


Purpose



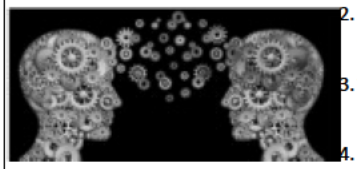


- [ ] Explain the importance of listening & expanding mindful listening skills
- [ ] Recognize the importance of intentions in effective conversations & of adopting a "scientist" style, rather than a preacher, politician, or prosecutor style
- [ ] Mitigate the effects from polarization associated with climate change in conversations
- [ ] Use specific phrases that facilitate conversations that lead to collaboration



Topics

1. Exercise – Listening without responding
2. Mindful Communication
   - Mindful Listening
   - Mindful Speaking
3. Framing - Metaphors, Stories, and Slogans
4. Collaborative Language
   - Examples
   - Role Play

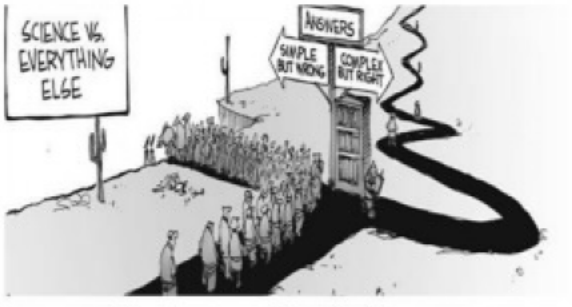


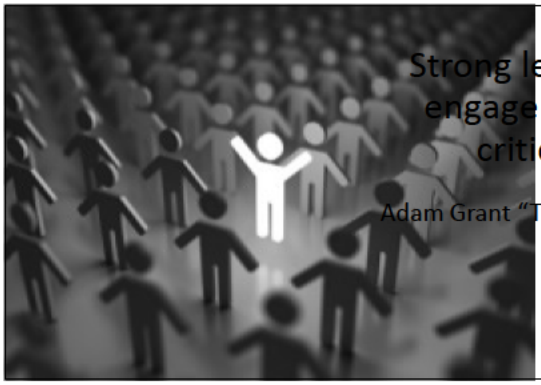
Communication Exercise
Listening Without Responding

1. Dyads
2. One person describes, in a soft voice, a difficult communication they recently experienced.
3. The partner listens without responding in any way. Attentive, but simply listening.
4. Both parties remain mindful, while speaking/listening, of their reactions and thoughts.
5. After time is up, the listener tells the speaker the key points received from the communication.
6. Switch
7. Both partners share observations about non-verbals.

Mindful Communication

Yvonne Stedham, Ph.D.





Strong leaders engage their critics

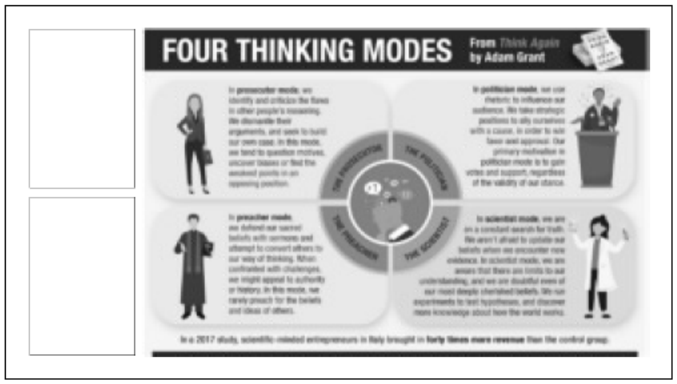
Adam Grant "Think Again"



THINK AGAIN

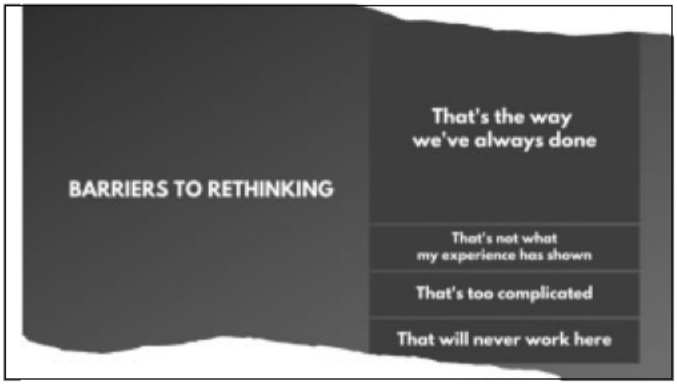
ADAM GRANT

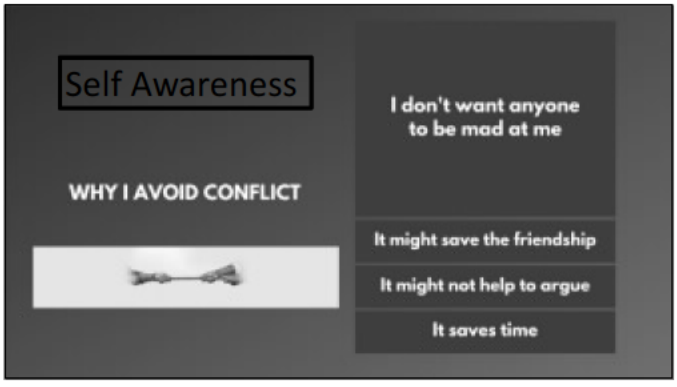

The importance of reflection and cognitive flexibility


FOUR THINKING MODES
From Think Again by Adam Grant
In prosecutor mode, we identify and criticize the flaws in other people's reasoning. We dismantle their arguments, and seek to build our own case. In this mode, we tend to question motives, uncover biases or find the weakest points in an opposing position.
In politician mode, we use rhetoric to influence our audience. We take strategic positions to ally ourselves with a cause. In order to win favor and approval, our primary motivation in politician mode is to gain votes and support, regardless of the validity of our stance.
In preacher mode, we defend our sacred beliefs with sermons and attempt to convert others to our way of thinking. When confronted with challenges, we might appeal to authority or history. In this mode, we rarely preach for the beliefs and ideas of others.
In scientist mode, we are on a constant search for truth. We aren't afraid to update our beliefs when we encounter new evidence. In scientist mode, we are aware that there are limits to our understanding, and we are doubtful even of our most deeply cherished beliefs. We run experiments to test hypotheses, and discover more knowledge about how the world works.
THE PROSECUTOR
THE POLITICIAN
THE PREACHER
THE SCIENTIST
In a 2017 study, scientific-minded entrepreneurs in Italy brought in forty times more revenue than the control group.


Fostering collaboration by using a scientist mindset


Believe In Your Tools
CERTAIN
UNCERTAIN
Believe In Yourself
INSECURE
SECURE
Obsessive Inferiority
Debilitating Doubt
Blind Arrogance
Confident Humility
Scientist mindset

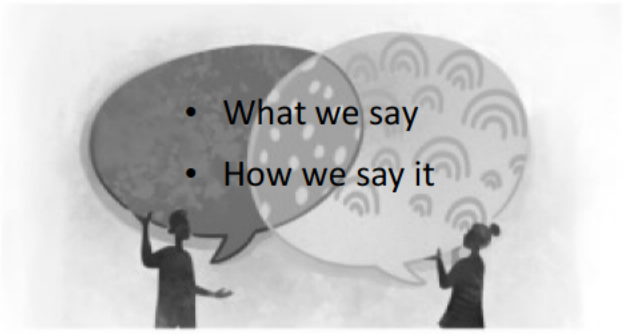

BARRIERS TO RETHINKING
That's the way we've always done
That's not what my experience has shown
That's too complicated
That will never work here


Self Awareness
WHY I AVOID CONFLICT
I don't want anyone to be mad at me
It might save the friendship
It might not help to argue
It saves time

Charged Conversations – Grant
"Think Again" Chapter 8
Depolarizing our divided discussions



Columbia University – Difficult Conversations Lab



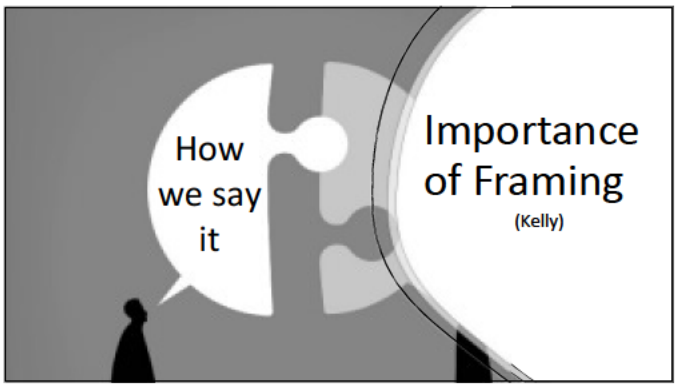
- What we say
- How we say it

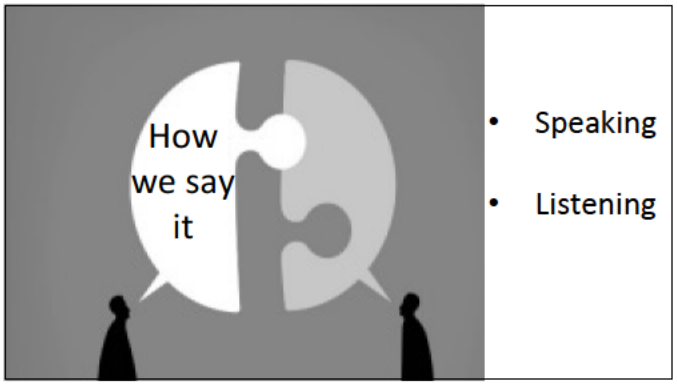
What we say
Content

Beliefs about Global Warming, page 170

72%

Belief in global warming
Concerned
Motivated


How we say it
Importance of Framing
(Kelly)


How we say it
• Speaking
• Listening


Mindful Listening

Self-Assessment

Completed prior to this session!

Listening

For each of the following questions, select the answer that best describes you.

Remember to respond as you have behaved or would behave, not as you think you should behave.

1. I maintain eye contact with the speaker
   Usually Sometimes Seldom

2. I determine whether or not a speaker's ideas are worthwhile solely by his/her appearance
   Usually Sometimes Seldom

3. I try to understand the message from the speaker's point of view
   Usually Sometimes Seldom

4. I listen for specific facts rather than for the big picture
   Usually Sometimes Seldom

5. I listen for both factual content and the emotion behind the literal words
   Usually Sometimes Seldom

6. I ask questions for clarification and understanding
   Usually Sometimes Seldom

7. I withhold judgment of what the speaker is saying until he or she is finished.
   Usually Sometimes Seldom
8. I make a conscious effort to evaluate the logic and consistency of what is being said.
   Usually Sometimes Seldom
9. While listening, I think about what I am going to say as soon as I have my chance.
   Usually Sometimes Seldom
10. I try to have the last word.
    Usually Sometimes Seldom

Listening with Intention





The intention is to learn and foster collaboration.

Adopting a Scientist Mindset

Listening with Empathy



Three types of empathy



Cognitive

Emotional

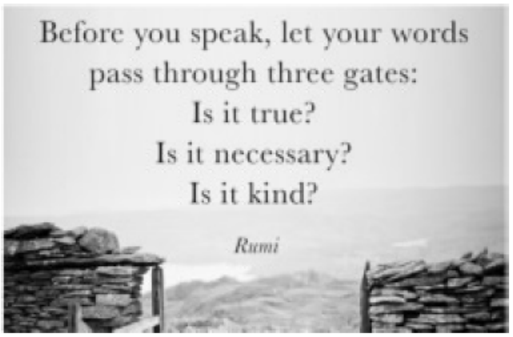
Compassionate



Cognitive empathy

- Awareness of speaker's perspective
- Awareness of speaker's thoughts, feelings, beliefs, experiences
- What is like to be you?
- Impacts decoding of message and response





Is it true?



Is what I am going to say based on facts or is based on my perception or interpretation of events or on what others have told me? [Implicit bias]

Is it necessary?



Being mindful/fully aware of the possible consequences of saying what you are getting ready to say!!!!!



Something that can be helpful with this is remembering the acronym .....

W A I T

Why Am I Talking?

Is it kind?



Useful Communication Phrases – Handout

- Request for dialogue
- Offering empathy
- Eliciting information
- Request for empathy
- Inserting pause
- Taking a break

Adapted from Oren Jay Sofer "Say what you mean"



Framing
Metaphors, Stories, and Visuals

Kelly Tait, Professor

Metaphorical Framing Has Consequences

- ✓ Cannot avoid framing: built-in to how we think
- ✓ Subconsciously shape thinking
  - ❑ Influence problem-solving approaches
  - ❑ "War on Cancer" = more funding for aggressive chemotherapy, less focus on addressing factors that may lead to cancer
  - ❑ War, race, national security issue, public health issue…

"War metaphors lead to reactive rather than reflective actions and can be used to serve ulterior motives or political interests." ~Luke Shors (2020) (www.thinkglobalhealth.org)

Framing the Issue

Consider:

- ❑ What frames are being activated (and strengthened) in people's minds?
- ❑ How does the frame affect perceptions of solutions?
- ❑ What are appropriate frames?

Helpful Hints from Cognitive Science

- ✓ Talk at the level of values; frame issues in terms of values (e.g., public health).
- ✓ Give context and frame numbers/facts so overall significance can be understood.
- ✓ Visuals help.
- ✓ Stories can be a frame. Tell stories that exemplify your values and rouse emotions.
- ✓ The messenger matters. ~Credibility

Numeracy: Understanding how math is used in the real world and being able to apply it in terms of thinking and reasoning

(similar to literacy, just with numbers)

Consider your audience: choose how to present numbers so they have the most impact

Communicating Numbers

"Evidence shows that people are more likely to understand and be motivated by statistics if communicators present them thoughtfully and strategically."

~Peters and Salas 7/2022

"Communicating Statistics on the Health Effects of Climate Change" The New England Journal of Medicine

"**Data is the map, storytelling is the journey**."

~Andrew Thaler, Duke University

"When I talk about Climate Change, I don't talk about science." (2017)

Stories Can Establish a Frame

Jot down any ideas sparked by these questions:

- ❑ Why do you care? How did you get interested? (a particular moment or event?)
- ❑ What compelled you to take action?
  - ✓ e.g., "I did not always feel this way. It really changed for me when…."
- ❑ What will resonate with your audience?
- ❑ What is your common ground with them?

Know Your Audience: The Need for Nuance, Not Just "Believers" & "Deniers"

- ✓Frames it: us vs them
- ✓Human tendency: simplify a complex continuum into two categories (binary bias)
- ✓Fed by news cycle: nuance doesn't go viral

Yale Program on Climate Change Communication and George Mason Center for Climate Change Communication



Some Key Findings

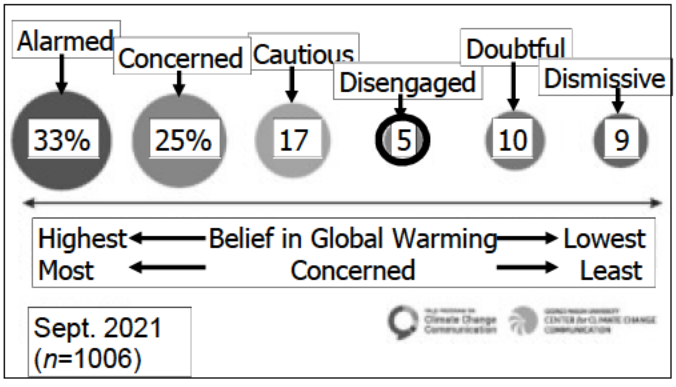
- ✓ **6 to 1** (72% vs 12%) ~ Americans who think global warming is happening vs not
- ✓ **56%** understand that global warming is mostly human-caused [33%: due mostly to natural changes in the environment]
- ✓ **1 in 5** (20%) understand strength of consensus among scientists [~97%: human-caused]

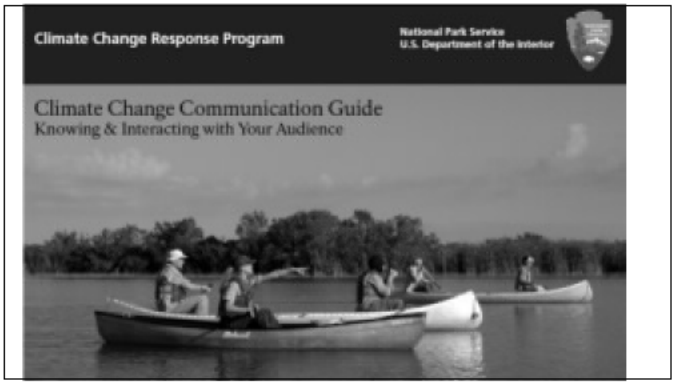
Findings: Feelings

- ✓ **64%** "somewhat" or "very" worried about global warming
- ✓ **48%** being harmed right now by it

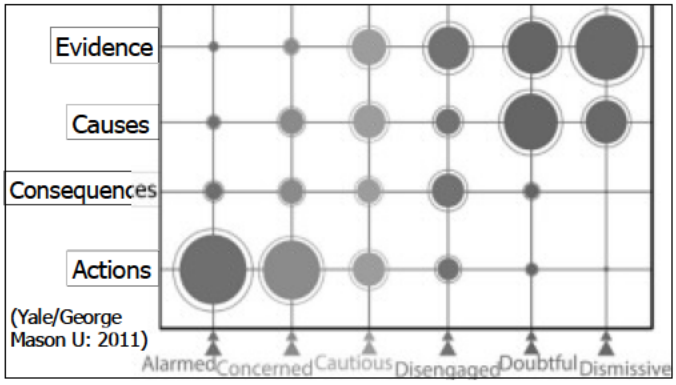
Six Audiences: Categories

Alarmed
Concerned
Cautious
Disengaged
Doubtful
Dismissive





"Burning Question" on Climate Change Based on 6 Audience Categories:



Strategies for Low Involvement: The Cautious and the Disengaged

Challenge: Create content that will draw audiences in and be easy to understand (low effort)

- ✓ Use humor, attractive/credible sources
- ✓ Show rather than tell
- ✓ Personalize: physically close and/or emotionally significant impacts
- ✓ Generate involvement through stories

Strategies for Negative Audiences: The Doubtful and the Dismissive

Nonconfrontational, values-based approaches

For the Doubtful:

- ✓ Emphasize scientific agreement
- ✓ Concrete personal experiences of like others

For the Dismissive:

- ✓ Set a realistic goal: civil dialogue; keep from negatively impacting others

Motivational Interviewing

- ✓ Premise: It's difficult to motivate someone else to change
- ✓ Better: Help them find their own motivation to change
- ✓ See Resources

⇨ Focus on what we can control: How we communicate about climate issues



The #TalkingClimate Handbook

Respect your conversational partner	**T**ell your story
Enjoy it	**A**ction makes it easier
Ask questions	**L**earn from your conversational partner
Listen and show you're listening	**K**eep going and keep connected



Key Elements to Approaching Conversations Constructively

- ✓ Curiosity
- ✓ Perspective-seeking
- ✓ Common ground

Choice of language should reflect these

Phrases that Help Facilitate Collaborative Conversations

Ask Questions and Listen

- ✓ "What is important to you?"
- ✓ "What is your perspective on…?"
- ✓ "How did you come to feel that way?"
- ✓ "What concerns you about _____?"
- ✓ "Can you help me understand why that's important?"
- ✓ "What would you like to happen instead?"

Respect and Connect

- ✓"I hadn't thought of it that way before."
- ✓"Like you said…."
- ✓"I respect the way that you…."
- ✓"It sounds like we agree on that."
- ✓"I appreciate…."
- ✓"I also find that [difficult, important, helpful, interesting, etc.]."

What Do You Say When…

The #TalkingClimate Handbook

HOW TO HAVE CONVERSATIONS ABOUT CLIMATE CHANGE IN YOUR DAILY LIFE



CLIMATE outreach

eit Climate-KIC

Climate-KIC is supported by the EIT, a body of the European Union

This report was commissioned by EIT Climate-KIC as a part of a citizen science #TalkingClimate project, a collaboration between Climate Outreach and EIT Climate-KIC.

Climate Outreach

Climate Outreach is a team of social scientists and communication specialists working to widen and deepen public engagement with climate change. Through our research, practical guides and consultancy services, our charity helps organisations communicate about climate change in ways that resonate with the values of their audiences. We have 15 years experience working with a wide range of international partners including central, regional and local governments, international bodies, academic institutions, charities, businesses, faith organisations and youth groups.

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EIT Climate-KIC

EIT Climate-KIC is a European knowledge and innovation community, working towards a prosperous, inclusive, climate-resilient society founded on a circular, zero-carbon economy. Supported by the European Institute of Innovation and Technology, we identify and support innovation that helps society mitigate and adapt to climate change. We believe that a decarbonised, sustainable economy is not only necessary to prevent catastrophic climate change, but presents a wealth of opportunities for business and society.

www.climate-kic.org
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Cite as: Webster, R. & Marshall, G. (2019) The #TalkingClimate Handbook. How to have conversations about climate change in your daily life. Oxford: Climate Outreach

Cover photo: Allan Beaufoy (CC BY-NC-ND 2.0)

DECEMBER 2019

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Executive summary

We should all be talking about climate change - so why aren't we?

Everyday conversations about climate change - with friends, family, work colleagues, strangers - are not always easy. Even if you are concerned about the implications of the climate crisis, you may find yourself hesitating to talk about it, or feeling awkward when you do.

The #TalkingClimate Handbook aims to get the world talking about the climate crisis. It provides practical advice to help anyone and everyone - whoever or wherever you are - have constructive, interesting conversations about climate change.

It is based on the belief that these exchanges are important not just in themselves, but because they are a part of all of us engaging with the challenge of climate change, and driving the wider social and political response.

When you're talking with someone else about climate change, the handbook suggests you follow the principles of **REAL TALK**:

Respect your conversational partner and find common ground

Find out what you have in common with the person you are talking to and show them that you respect their concerns, priorities and values. Many people feel blamed and judged when they talk about climate change, which is likely to make them defensive or withdraw from the conversation.

Enjoy the conversation

If you enjoy yourself, you are far more likely to be authentically engaged with, and connected to, the person you are talking to - and they are more likely to feel positive about the conversation too.

Ask questions

Ratherthan lecturing your conversational partner about your views, ask about what climate change means to them. Give them the space to reflect on their own experiences and views on the issue.

Listen and show you've heard

Stop talking! Concentrate on genuinely listening to what the other person is really trying to say - and take the initiative to check you've understood them correctly.

Tell your story

You don't need to know everything about climate science to talk about climate change. Your climate change story - how you became engaged in the issue and why it concerns you - is one of the most powerful communication tools available to you.

Action makes it easier (but doesn't fix it)

Taking some kind of action on climate change can make conversations easier to start - and make it feel less overwhelming. People make decisions about their behaviour partly based on what others they respect and trust are doing, so your actions will influence others. You may still struggle with the size of the problem, and it can help to acknowledge that in your conversation.

Learn from the conversation

See the experience as a way to learn about how others think about climate change, about the topic itself - and about how to have a good conversation. Every climate exchange is a small experiment!

Keep going and keep connected

Every climate change conversation you have is valuable. Keep having them, and find opportunities to connect with the many other like minded people around the world who are also now talking about, and taking action on, climate change.

About this report

Have you ever…

...tried to start a conversation about climate change with friends or family, only to have it land into an awkward silence, before somehow prompting everyone to start talking about something else?

…felt stuck and frustrated, as you try to explain why you're concerned about the climate crisis, but the person you're talking to doesn't seem to care?

...thought about mentioning climate change, but decided not to, because it seems too depressing and you don't want to seem like you're judging other people?

> ***Talking about it, in my opinion, actually makes it less anxiety inducing. I am confronting my fears.***
>
> **Hilary, UK**

> ***I have realised that lots of people have a lot of knowledge about this issue, whatever their background. Talking about it breaks down the isolated feeling and makes me feel more supported to take action whereas before I felt too afraid of being judged by others or making others feel judged by me.***
>
> **Joanna, UK**

This guide is for you

This handbook is for anyone who wants to have constructive day-to-day conversations about the climate crisis. It provides pragmatic and evidence-based guidance on how to talk about climate change with friends and family, acquaintances and strangers - on the bus, at work, at a sports event or at home over dinner. The handbook is informed by the idea that you don't have to be a scientist, or live in a certain place, to care about and want to talk about climate change. It is a topic for everybody, whoever and wherever we are.

Why climate conversations matter

"There will never be a point where a vibrant and dynamic public conversation about climate change is not a good idea...at present, this dialogue is almost entirely absent, and as a result, engagement with energy and climate change remains shallow, fragile, and superficial." -Adam Corner and Jamie Clarke, 'Talking Climate'[1]

If the weather seems strange - much too hot for the time of year, perhaps, following the hardest rain you've ever seen - does it matter if you don't mention that you think it's a result of climate change? If you start chatting to a stranger on the train, what difference does it make if you talk about climate change or not?

People around the world are getting more concerned about climate change.[2] In surveys, a majority of people in different countries agree that it will impact their life and increase the chance of wars and economic damage.[3] In the UK, about 60% of people agree we are facing a 'climate emergency'.[4] Avoiding the worst impacts of climate change will mean many people changing profoundly how we live, eat and travel, within just five or ten years.[5]

Yet many people do not talk about climate change - often, or even, ever - in their daily lives. In America, for example, six in ten people say they "rarely or never" discuss it with family or friends.[6] This informal, silent agreement not to talk about a topic that can feel frightening, distant or uncomfortable is known as 'climate silence'.[7]

Day-to-day conversations are a part of social change. As people, we are deeply influenced by those around us - what we see them doing, and the conversations we have with them.[8] Democratic governments have the power to change policy, but they usually need evidence of public consent before they will do it, and that consent comes from public discussion.

Achieving the scale of change necessary will require enthusiastic understanding and creative engagement from people all around the world. No-one - whether acting as politicians, business leaders or individuals - can do it alone.[9] In contrast, government-sanctioned atrocities have often taken place amidst a culture of silence - linked to denial, stasis and an inability to take action.[10]

Your conversation on the bus, or in the queue at the post office, may feel small and insignificant. But in reality, it is crucial.

The evidence for how to have constructive conversations

Since the 1990s, psychologists, sociologists and other social scientists have been investigating how to get people thinking about and acting in response to the crisis. Climate Outreach has been tracking and adding to this growing evidence base, and training people in how to use it, for fifteen years.

The #TalkingClimate Handbook synthesises this considerable evidence base with:

Principles from other initiatives supporting open, non-confrontational conversations. These include Nonviolent Communication (NVC),[11] non-violent direct action,[12] and advice for people talking about their sexuality, politics, faith,[13] and health choices![14]

Further insights were also gathered from a three month #TalkingClimate citizen science experiment, promoted through social media. Participants undertook climate conversations using a basic set of principles and fed back their experiences and reflections. The data gathered consists of: baseline surveys from 549 people in 56 countries; detailed analysis of 175 individual conversations; and 52 final surveys following 604 conversations (see methodology section at the end of this report for further details). Many of the quotes used in this handbook are from statements made by participants in the #TalkingClimate project.

What does a constructive climate conversation look like

It's easy to believe that a 'successful' climate change conversation has to include dramatic moments of revelation, where someone who was initially sceptical about the problem changes their position. But this doesn't have to be the case. It could mean a two minute exchange on the bus with someone who has never talked to a stranger about climate change before; helping a friend who has been struggling with the issue shift closer to joining a local action group; or simply gaining the respect of someone who continues to disagree with you.

This handbook provides advice on strategies for deepening a conversation - perhaps moving from a brief exchange or a more profound exploration of ideas. But many conversations will stay on the surface. These conversations are still part of building the momentum for change, breaking the climate silence, and moving people closer to a position where they participate in the global effort to reduce emissions.

As this handbook will demonstrate, this is not best achieved through persuasion or providing more and more data in an effort to change someone's mind. Instead, it is about building a connection between two people, based on mutual respect and a willingness to listen to one another.

> ***Because people aren't thinking about it, so they aren't acting. Having those conversations can plant seeds. I found that sometimes I only needed to mention the odd thing, then they were more in tune when others mentioned something similar, and it builds.***
>
> **Jennifer, UK**

REAL TALK about climate change

Good conversations aren't about exchanging information or winning an argument - they are about intimacy, experiencing a sense of connection and feeling you have been understood. Conversations about climate change are no different.

For good climate conversations, follow the principles of REAL TALK:

Respect your conversational partner and find common ground

Enjoy the conversation

Ask questions

Listen, and show you've heard

Tell your story

Action makes it easier (but doesn't fix it)

Learn from the conversation

Keep going and keep connected

In the next few pages, the handbook explains more about what these principles mean and how they relate specifically to having constructive climate conversations.

Respect your conversational partner and find common ground

Find out what you have in common with the person you are talking to and show them that you respect their concerns, priorities and values. Many people feel blamed and judged when they talk about climate change, which is likely to make them defensive or withdraw from the conversation.

"People need to be in the place where their anxieties are recognized, to be able to say, "Yes, this is scary; this is hard," and only then can we be truly mature, creative, strategic, and innovative." -Renee Lertzman, psychologist[15]

"The nonviolent resister not only refuses to shoot his opponent but he also refuses to hate him. At the center of nonviolence stands the principle of love." -Martin Luther King[16]

When you're having a conversation about climate change, you may be talking to someone whose views and choices you fundamentally disagree with - perhaps someone who dismisses the climate emergency as a problem, lives a very high carbon lifestyle - or who strongly believes you are in the wrong for worrying about it. Alternatively, they may feel anxious and defensive about their own life choices, and worried about talking about it.

Nonviolent communication (NVC) was developed in the 1960s as a way of helping people to relate to each other more effectively, particularly in situations where there is conflict.[17] Observing the feelings and needs of someone else, without blame or criticism, is core to NVC, creating "a respectful understanding of what others are experiencing".[18]

This means **not judging or blaming** your conversational partner, whatever choices they have made or views they hold. If the person you are talking to feels respected, valued and safe that will build trust - making them more willing to listen to you and to express their own vulnerabilities and concerns. In contrast, fear, guilt, shame and obligation compromise the quality of the connection between you.[19]

> *Sometimes people just did not want to go there, I think the guilt and fear was strong and they were worried that I was going to shame them in some way... I am not the kind of person to do this, but sometimes I was shut down by people who knew me very well.*
>
> **Jennifer, UK**

Respecting a conversational partner creates the groundwork for **seeking common ground and connecting** with them. Find out what you have in common and what you both care about. Even with someone who is very different to you, you may find you share values about the kindness of their friends, for example, or a sense of being successful in the world.

Approaching the conversation as a process of respecting each other and finding common ground **means not treating it as an argument that you are going to win or lose** - even if you are convinced you are right and your conversational partner is wrong. Arguments emphasise the difference between you, but the quality of your exchange is likely to be deeper and more open if you emphasise your similarities.

> *I found [it] easier first to find the common ground... and then connect it to a climate change issue.*
>
> **Mauricio, Canada**

> *Where conflict and differences of opinion came up, which previously I might have found more difficult to deal with, I felt surprisingly well equipped to say, 'OK, that's interesting, I'd not looked at it like that before. Tell me more'.*
>
> **Kate, France**

> *Since [participating in the project] I've toned my attitude down, and tried to speak more helpfully and with less emphasis on shame or humiliation I have definitely had productive climate change conversations since then...*
>
> **Leo, UK**

> *I think the focus on positive action, and showing that you don't have [to] change who you are in order to act, is really important. And also, grace - a lot of my friends and family are considering climate change as a serious issue for the first time, and they are only at the beginning of dealing with it, and what it means for us.*
>
> **Rosie C, UK**

Sample useful phrases

- "I really agree with you on that."
- "I find that really hard as well..."
- "I hadn't really thought about that before/ thought about it that way before."
- "That's a good point, I never thought of that."
- "Like you said…"
- "I respect the way you…"
- "We don't agree on this but…"
- "You know what it's like to have experienced that…"

Enjoy it!

If you enjoy yourself, you are far more likely to be authentically engaged with, and connected to, the person you are talking to - and they are more likely to feel positive about the conversation too.

"A good conversation is like having a good meal: You don't want to race to finish it; you want to appreciate it. Being a good host communicates patience, respect, and goodwill. This creates a strong foundation for a useful and engaged conversation." -Dan Rubin, psychologist[20]

Relax, and take your time

You don't have to pack everything into one conversation. It's better to have an interesting, respectful exchange that leaves you both feeling positive, than to rush towards some kind of conclusion with your partner.

Pickyourmoment

If you're hoping to have a substantial conversation, it's a good idea to think about the situation and the practicalities. Are you both in the mood to be thoughtful and open-minded? Have you got a comfortable and suitable environment? For some conversations, you may want to ask for consent of your conversational partner first, to make sure you are both ready and willing to engage.

Use positive body language

Nonverbal communication - our body language, facial expressions and gestures - makes up a significant proportion of the information flow when two people are talking face to face.[21] For example, if you say you're feeling relaxed, but are sitting tense and hunched up, then the person you are with is unlikely to believe you. It can therefore be helpful to consciously reflect on your body language. Positive body language includes, for example, smiling, keeping eye contact, and making positive sounds and movements to show that you're hearing what the other person is saying.[22]

Seek to end on a positive note

And, if there's more you'd like to discuss, perhaps with an invitation to continue the conversation in some way.

Don't judge yourself too harshly

Remember that there are lots of different sorts of climate conversations, with all sorts of different people. They won't all feel good, or end in a satisfying way. It may also be useful to remember that people who are absorbing what you say may resist, argue or reject your ideas to begin with as a threat to their identity.[23] This doesn't mean they aren't listening. If you think of occasions when you have been changed by a conversation, how did you react at the time?

Ask questions

Rather than lecturing your conversational partner about your views, ask about what climate change means to them. Give them the space to reflect on their own experiences and views on the issue.

"You don't get a Yes or No answer with an open question, and you do get the conversation moving. Open questions also draw out the person's motivations, their thoughts and their feelings about their behaviours." -UK National Health Service advice on talking to doctors about lifestyle choices[24]

In sharing that climate change is something you care about, you may find yourself being pigeonholed as a particular kind of person.[25] For many people, the stereotype of an 'environmentalist' has negative associations - someone who is moralising, earnest and 'not like them', for example.[26]

One way to overcome this is to ask open questions which cannot be answered with a simple yes or no. Give the person you're talking to the space to reflect on what they think, what they are worried about and what solutions they believe in. This breaks any patterns of attack and defence, and creates a sense of shared responsibility. You can ask about their life experiences and story - what personal experiences have led them to form their beliefs? Have they experienced any turning points that have changed their views?

I remembered the advice from this study and asked some really open questions just - what do you think about it all, do you feel like you can do anything, what would you do - and he really stopped to think and I really felt like we moved to a deeper level of understanding.

Joanna, UK

The climate emergency may also feel like a distant problem, separate from day-to-day concerns. Climate Outreach's research shows that people across the political spectrum connect with talking about things they love that may be under threat from climate change.[27] Allowing your conversational partner to explore what they care about can help them to connect with the issue on their own terms.[28]

My conversational partner had the opportunity to talk about whatever he wanted to, because when I started to talk about the topic, I was very vague and open. I think this way the conversation developed rather quickly.

Steffan, Germany

If someone has less power than you in the conversation for some reason - for example, if they are younger than you, or have a more junior grade at work, then it is even more important to ask questions rather than give your own views, as these may be misconstrued as instructions.

I actually think the ordering of the conversation works best let the other person talk first before offering any of own story. And best ice-breaker I have found is to bring up some latest bit of climate change news e.g. Amazon fires and asking what they thought about this.

#TalkingClimate participant, 2019

If you feel the conversation is getting stuck, you can also use questions to guide it in a direction you feel will be more constructive (see 'Tell your story').

Sample questions to consider using

- What would you like to happen instead?
- How do you feel about climate change?
- How did you come to feel like that?
- What have you heard about climate change?
- Compared to when you were young, are today's winters any different?

Listen, and show you've heard

Stop talking! Concentrate on genuinely listening to what the other person is really trying to say - and take the initiative to check you've understood them correctly.

"The more we listen to them, the more people will start to open up and share increasingly deeper and more personal topics… Listening to people, even simply sharing hardships, is better than empty political banter." -Book of Radical Love, Turkey, 2019[29]

"....this Quest [to talk about climate change] I've realised is as much about shutting up as it is about talking." Transition Network blogs, 2018[30]

Real listening requires a genuine desire to hear and understand what the other person thinks. Try not to be too quick to jump in with your opinions and experiences - even if you think the other person is wrong. 'Deep listening' exercises - where you say nothing at all for a few minutes while your conversational partner talks freely, are useful to try as an experiment.

The practice of active listening, used by counsellors, involves paying attention to the person you are listening to, not judging them, and then repeating back your understanding of what the other person said to show you've heard and check you've understood correctly.[31] If you genuinely listen, that can give someone else the much-needed space to talk about their negative emotions about climate change - for example, their shame, or worry about the issue - rather than simply critiquing your arguments.[32]



Active listening.
Photo by Bindaas Madhavi (CC BY-NC-ND 2.0)

I think people just needed permission almost to express their hopes and frustrations out loud and feel someone was listening.

Simon, UK

The conversation my dad started with me blew me away! He started with talking about reusable plastic bottles….and ended with an admission that climate change is probably real... all I had to do was listen.

Rosie C, UK

Listening here was key, especially with such a young person, to avoid interpreting what he was trying to say, or jump to conclusions, or simply try to give him a lot of content and information. Asking about feelings also brought up interesting understanding.

Phil, country unknown

I found the advice about listening to others and looking for common ground useful and interesting, particularly when talking to people with very different opinions to mine (and I have used these techniques in convos about subjects other than climate change - from Brexit to the role of female football commentators!)

Frances, UK

Tell your story

Rather than lecturing your conversational partner about your views, ask about what climate change means to them. Give them the space to reflect on their own experiences and views on the issue.

"...effective public engagement means telling a story about climate change that is both factually accurate and psychologically compelling." -Adam Corner and Jamie Clarke, 'Talking Climate'[33]

"It's not easy to infect the brain of another person with an idea; it can be accomplished only by hitting the small exposed hole in the system. For the brain, that hole is story-shaped...Story not only sticks, it mesmerizes."
-Dan Eagleman, New York Times[34]

We have learned what we know about climate change from scientists. So, if you are not a scientist - it's easy to think that you are not qualified to talk about the climate crisis, because you can't quote statistics about sea level rise in 2050, or you're not sure what you think about nuclear power.

But humans aren't motivated by statistics. We are motivated by stories. They are core to our survival, and a crucial part of how we learn how to behave and interact.[35] You, like the person you are talking to, have been on a journey, during which you have formed your views. As a result, you have a story to tell. When did you first become concerned about climate change? Was it something you read, someone you met, something that happened to you?

In telling your story, you can demonstrate how you came to be where you are. Your personal story is also unarguable - it is your experience, and no-one else's. It is a powerful tool of communication, whoever you are talking to - and however much technical information you know.

This doesn't mean being uninformed about climate change.You can weave what you know about climate change into your story. If it makes you feel more comfortable, do a bit of preparation and research. Map out the stages of your story and look up the relevant facts that fit within it. Create a 'script' and look up the relevant facts so you know you can back up what you say. This can also help identify some anchor points, which you can try to guide the conversation back to if you feel it's going off-track.

When interacting with others, people tend to strongly dislike it if we think someone else is being inconsistent or hypocritical.[36] So if you are able to show that you are living in line with what you believe about the world, that is likely to build credibility and trust between you and the person you are talking to.

Ideas for telling your story

Think about your answers to the following questions. Try and explain them to someone else in a few minutes.

- When did you start caring about climate change? Was there a particular moment?
- What action are you taking on climate change now?
- How do you feel about that?

'I' statements are powerful, where you explain your own perspective and experience. For example, phrases like:

- I am…
- I agree with you that…
- I have a daughter as well and when she said to me…
- I did not always think this. It really changed for me when…
- I feel like I have to do something because…
- So I am…
- It's not always easy when I…
- But it really feels to me like I…

But it's not always easy to make changes - you may be struggling with some of the choices you're making and what they mean for climate change. Climate communications research also shows that authenticity is a crucial part of communication.[37] Sharing honestly about the challenges and limitations you have faced or are facing along the way is therefore likely to lead to you connecting further with your conversational partner.

You can also then follow up on your story by asking the person you're talking to more questions about their own experiences and reflections (see '**Ask questions**').

I listened showed empathy (using body language and words) where I could, instead of challenging her - even though she said Climate Change would not affect her as she was childless. I gave her space and didn't respond/ challenge. It seemed that as a result she went on to mention her concern for her nephews and nieces. So I mentioned my concern for my grandkids (true personal story, as you advised) and we then agreed the need for systems change as well as individual action.

Rosie A, UK

Action makes it easier (but doesn't fix it)

Taking some kind of action on climate change can make conversations easier to start - and make it feel less overwhelming. People make decisions about their behaviour partly based on what others they respect and trust are doing, so your actions will influence others. That said, you may still struggle with the size of the problem, and it can help to acknowledge that.

"What we need to fix this thing is rational hope." -Katharine Hayhoe, climate scientist

If we only talk about what a huge challenge climate change is, then our conversational partner's defence mechanisms may cause them to switch off from what we're saying. We also need to talk about the many, inspiring solutions to climate change that already exist.

In our survey, people who were taking some kind of action - even if it felt small, personal and not in line with the extent of the problem - found it was much easier to start a climate change conversation. The idea of doing 'something' makes the topic easier to address, and the intimidating information about climate change easier to cope with.[38]

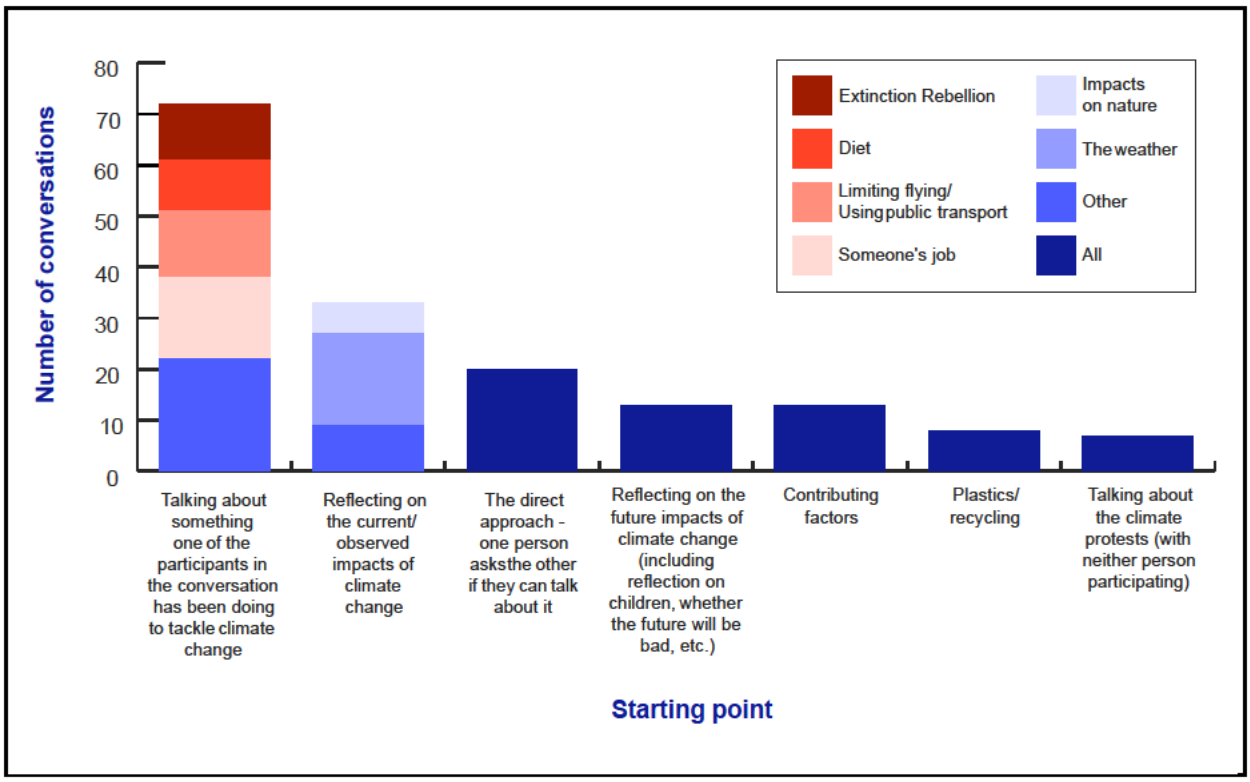
You can use your personal conversation to discuss any changes you have made to your own life, and how they have made you feel - for example, walking and cycling more, changing your eating habits, or joining an activist group. Hopefully, you will feel positive about what you've done: research shows that around the world, people taking action to reduce their emissions also tend to be happier.[39] It's hard to know for sure why this is - it may be because happy people are drawn to low-carbon behaviours. But a growing body of work suggests it is possible to 'live better by consuming less'.[40]

Another option is discussing large scale solutions to climate change which are already gathering pace. Fortunately there is a lot to talk about - including the huge growth in renewable energy around the world.[41]

People make decisions about their behaviour partly based on what others they respect and trust are doing. So if you have chosen to get rid of the car and cycle rather than drive, that will matter to the people who know you and feel like they share your values. Talking about what you've done may move the person you are talking to closer to a position where they want to do something themselves.

Communications research shows that people need a sense of efficacy in order to take

How did conversations start?



action[42] - a belief that they can personally do something, and that the thing they will do will be effective. In presenting your own actions, emphasise that they are doable and realistic. But also encourage your conversational partner to reflect on their own path and what makes sense for the person they are.

For different people, 'taking action' will look very different - for some, it could mean joining a community garden; for others, political activism, changing eating habits or pushing for stronger green policies at work. If the person you are talking to is interested in taking action themselves, you could provide them with relevant information - but not too much: take care not to overwhelm them or tell them what to do. Providing too much information about what you think they should do can undermine their sense of autonomy and personal control over their choices.

My conversations just tended to happen, for the most part without my consciously generating them, because reacting to climate change is just so much part of my day to day life.

Kate, France

[In my conversations] I just start telling them about this thing I'm trying to do, to help people take action....People really don't want to feel the weight of this and not have something concrete to do to feel empowered.

Marna, USA

I think a lot of [my conversations] started cos I was saying I was taking the kids to nursery on my bike trailer which -> use car less -> reduce emissions -> climate change.

Leo, UK

Facing paralysis

Climate change can still feel like an overwhelming problem.[43] In our survey, the most commonly cited reason why participants found it challenging to start a conversation about climate change was 'not knowing what to do about it'. This could reflect a number of different causes - including lack of knowledge, confusion about the implications of different lifestyle changes or a feeling of individual powerlessness in the face of the need for systemic change.

16% of the recorded conversations in our study also struggled because of a feeling of being overpowered by the size of the problem. If this happens, it may help to explicitly acknowledge the sense of paralysis and helplessness. You may then find yourself talking openly and honestly about it. Speak authentically, but try not to drown in it - and perhaps reflect on how you can build your own own sense of resilience.

> ***I also found in more than one case it was difficult to overcome the feeling of powerlessness: blaming turned to some outer agent (the government, politicians...) and then the conversation felt stuck.***
>
> **Deborah, Italy**

> ***[My conversational partners] felt listened to and there was dialogue. The challenges are around talking about systemic change and people feeling helpless about what they can do.***
>
> **#TalkingClimate participant, 2019**

Learn from your conversational partner

See your conversation as a way to learn about how others think about climate change, about the topic itself - and about how to have a good conversation. Every climate exchange is a small experiment!

"Getting people talking about climate change, taking on board the views of their peers, and updating their social misperceptions about others' views are vitally important: catalysing and maintaining a vibrant public dialogue is an end in itself." -Adam Corner and Jamie Clarke, 'Talking Climate'[44]

You may find that people you open conversations with do not conform to your preconceptions about what they are going to say. Polls show that people around the world are getting more concerned about climate change[45] and the vast majority of people say they are at least somewhat worried.[46] So guard against assuming that someone won't care. In the #TalkingClimate survey, many people said they were surprised by the opinions they encountered.

Approaching the conversation with a curious mind, and treating it as a chance to learn from the person you are talking to, is more likely to lead to you **connecting** with each other - and potentially gaining more **insight into how other people think about climate change**. This will enable you to build your skills in talking to different sorts of people about it (see further advice on 'Talking to different audiences about climate change' below).

At the moment, only a few people in the world are consciously engaging in having good conversations about climate change. If you treat every conversation as a **small, informal experiment** learning along the way, you will take the pressure off yourself, enrich your own personal relationships and experience, and add to the sum total of human knowledge on how to do this well.

I learned a lot from the conversations.

David, USA

The Caribbean elders appreciated the opportunity to talk about it especially climate justice.

Penny, UK

I was kind of surprised by one conversation with an old colleague who I didn't know was into any of this stuff but was super interested in how I live now - and in the following days he was sending me links to comparisons of plant-based milks and things like that. Just felt super positive.

Leo, UK

Conversations with strangers were positive in general which I hadn't expected. Most people already very concerned about climate change.

Harriet, UK

My very elderly grandfather was incredibly supportive which I didn't expect necessarily, my best friend was surprisingly sceptical.

Ruth, UK

I was surprised how few people were aware of the gravity & urgency but also surprised just how many people were doing things already.

Pauline, UK



Every climate change conversation you have is valuable.
Photo by Alexis Brown (public domain)

Keep going and keep connected

Every climate change conversation you have is valuable. Keep having climate change conversations, and seek community with others to support you!

"The aftermath of nonviolence is the creation of the beloved community, while the aftermath of violence is tragic bitterness." *-Martin Luther King*[47]

Some of the participants in our survey told us that the most useful part of it wasn't the advice we provided. It was the sense of being part of a wider effort encouraging them to keep having climate change conversations when they might not otherwise have done so.

As people, we are profoundly influenced by the values and behaviour of the people around us, and we seek community with others. Tackling climate change successfully has to be a collective endeavour, shared with other people. Making the effort to keep having conversations about climate change - even if it feels difficult or awkward - will give you the opportunity to make connections and may open up new opportunities for actions you can take with different people. Perhaps most importantly, it will challenge the perception that no-one cares about climate change and there is no-one to build community with.

And don't hesitate to talk to like minded people about your efforts to talk about climate change. Sharing your experiences and learning about this process is as valuable - psychologically, emotionally and practically - as talking about direct climate solutions. So keep #TalkingClimate, and reach out and link up in community with those around you.

This helped me with a project a few of us were beginning in our local community anyway so the timing was brilliant- this will continue.

Penny, UK

I think what I am learning is that the highest value of this project for me has been just to encourage me to initiate these conversations, it's like I have a little anchor in my mind going "oh, yeah, here is a good opportunity for a climate conversation!"

Deborah, Italy

Overcoming challenges to #TalkingClimate

The table below outlines common challenges cited by people attempting to engage in climate conversations and indicates which of the REAL TAL principles are relevant in overcoming these.

Challenge	Suggested solution
As information about the projected impacts of climate change mounts up - rising temperatures, wildfires, storms, falling fish stocks and damaged crops - it's **easy to feel overwhelmed**[48]. Who wants to talk about such a negative and frankly scary topic over dinner?	Pair conversations about the impacts of climate change with discussion about potential solutions - and particularly, what you feel able to do. Acknowledge the negative emotions you may be experiencing, and discuss them if needed - but try not to drown in them (see '**Action makes it easier, but doesn't fix it**').
Many **people don't talk about climate change because they're not sure what to do about it** - either through lack of knowledge, feeling unsure how to affect systemic change, or express their views in a way that feels impactful.	People feel more able to talk about climate change when they are doing something - anything - in response. If the person you are talking to is interested, you can provide information, but not too much - don't overwhelm them or tell them what to do. Let them find their own path (see '**Action makes it easier, but doesn't fix it**').
Feelings of **blame and shame** - about eating or travel habits, for example - often make climate change conversations feel difficult. If someone you are talking to feels like their identity is under attack, they may concentrate on defending themselves, or refuse to engage at all.	Focus on respecting the person you are talking to, rather than judging them for their views or personal choices. Making someone else feel respected, valued and safe will build trust, and strengthen the connection between you (see '**Respect your conversational partner and find common ground**').
Deliberately talking about climate change **can feel awkward, controversial or 'difficult'**. It is, to some extent, breaking a social taboo. People with different political perspectives are also likely to have very differing views on it.	Don't focus on winning an argument, but instead on identifying common ground between you and connecting with each other on some level. Use language that's appropriate to the person you're talking to (see '**Respect**', '**Ask questions**', '**Listen**', '**Tell your story**', '**Learn from the conversation**').
Climate change **can feel like a distant problem** when you compare it to everyday issues involving work and family.	Asking someone else questions about their concerns, feelings and responses to climate change can help them connect with the issue. Telling your own story is a powerful way of bringing it closer to home (see '**Ask questions**', '**Listen**' and '**Tell your story**').

Advice for dealing with particular audiences

"The way messages about climate change are framed matters – not because there are 'magic words' that somehow transform someone's views, but because starting a conversation with people in terms they are comfortable with is the first step to building (and sustaining) their engagement." -Adam Corner and Jamie Clarke, 'Talking Climate'[49]

You may find yourself talking to lots of different sorts of people about climate change. The advice below gives some basic advice about how to talk constructively with different audiences, and some pointers on where to read more.

Young people

More than 90% of young people in Europe aged 15-24 see climate change as a fairly or very serious problem.[50] There is a growing movement for change amongst young people, but different people react differently - don't assume just because you are talking to someone who is young they care the way you do.

Recent Climate Outreach with young campaigners, combined with the growing social science evidence base on engaging young people produced some of the following recommendations:

- Highlight the moral and justice dimensions of climate change. Many young campaigners Climate Outreach has worked with are motivated by concern about the injustice of climate change;[51]
- If you're talking about taking action, focus on short term, specific, achievable and tangible actions for the person you are talking with. The process of building efficacy - the belief that it is possible to do something, and that doing something can make a difference - is particularly important for younger people.[52] Longer term political campaigns may also be a turn off, because of the amount of time younger people may need to invest, or because they have less belief in the success of campaigns with distant aims.[53]

Anecdotal evidence suggests psychologists are concerned about the rise of 'eco anxiety' among younger generations;[54] particularly in parts of the world where serious impacts are already being felt.[55] This makes the recommendations to **respect** and **listen to the person you are talking to** more important. You may also wish to keep information about climate change manageable for the audience you are talking to,[56] and look for groups that can help provide peers, community and support in taking action.



Young people are motivated by the belief that it is possible to do something that makes a difference. Photo: EIT Climate-KIC

People who are strongly opposed to action on climate change

There is no unique guidance for speaking to this audience and the principles of REAL TAL will still apply - if you can, ask the person you are talking to to reflect on their values and life experience, and focus on finding points of agreement and connection between you. Be aware that actively trying to counter disinformation about climate change can have the opposite effect of strengthening it in someone else's mind.[60]

The principle of respecting your conversational partner also applies particularly strongly.

People working in certain industries may for example feel under attack from and judged by environmentalists, and a sense of loyalty to their industry and community.[61] In some cases, it may not be possible to have a constructive conversation if the person you are talking to cannot trust you as a messenger. In that case, it is better to withdraw. But even a short, respectful conversation may result in a small shift, or a sense of increased trust and positivity between you.

NOTES

For further information, see Climate Outreach's previous research including:

- Broadening engagement with just transition: Opportunities and challenges, 2019
- How to talk to a climate change denier - 2012 presentation from George Marshall



Show respect to your conversational partner by finding points of agreement.
Photo by Pedro Ribeiro Simões (CC BY 2.0)

Tips and ideas

Some exercises to try

Try a deep listening exercise

Set up a conversation with a friend, ask them what they think about climate change and listen to them for four minutes without interrupting them once.

Reflect on a conversation that moved you deeply

What happened in it? Why were you affected? How did you react at the time?

Practice telling your own 'climate story'

How did you get interested in climate change? Were there any particular events in your life that affected you? Write it down as a rough script, and research it if needed by for example talking to family members or looking up the climate facts that matter to you.

Have a practice conversation with a friend

Get another friend to listen in and give feedback on what they thought of it. Jot down phrases you find yourself using.

Useful resources and reading

Talking Climate by Adam Corner and Jamie Clarke[64]

Don't Even Think About It by George Marshall[65]

Active Hope by Joanna Macy and Chris Johnstone[66]

Nonviolent communication by Marshall Rosenberg[67]

How to have a climate change conversation, Webinar 1 #TalkingClimate[68]

How to have a climate change conversation, Webinar 2 #TalkingClimate[69]

Methodology of the #TalkingClimate citizen science experiment

In July 2019, Climate Outreach and EIT Climate-KIC advertised via email newsletter and social media for participants in a citizen science project exploring how to have conversations about climate change.[70] The project was particularly targeted at members of the Climate-KIC Alumni Association but open to all.[71]

549 people from 56 countries signed up to the project and filled in an initial survey, which included demographic information and self-reported reflections on attitudes and competence at baseline. In August 2019, Climate Outreach ran an hour-long webinar for participants in the survey outlining key principles for having good climate change conversations. The webinar was then made available online.[72]

Participants were encouraged to have climate change conversations as a part of the project for the next two months. They were supported by email newsletters providing resources and support, and membership of an online 'Slack' community hosted by EIT Climate-KIC. Participants provided detailed reports on 175 different conversations via an online form.

52 participants provided detailed quantitative and qualitative data in response to a final survey asking about their entire experience in October 2019. This reflected a total of 604 conversations, some or all of which may be a repeat of those above. In total participants in the project provided about 30,000 words of feedback in addition to quantitative data. Climate Outreach then ran a second webinar, reflecting on initial analysis of this data.[73]



Member of the Climate-KIC Alumni Association. Photo: EIT Climate-KIC

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Resources for Communicating about Climate Science

Compiled by Kelly Tait

1. **Center for Climate Change Communication**, George Mason University. They "develop and apply social science insights to help society make informed decisions…." https://www.climatechangecommunication.org/
2. **Climate Change in the American Mind**. George Mason Center for Climate Change Communication and Yale Program on Climate Change Communication. "Tracks and investigates public understanding of climate change and support for climate policies." Excellent recent (and on-going) reports and tools. https://www.climatechangecommunication.org/climate-change-in-the-american-mind/
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10. **Yale Program on Climate Change Communication**. Useful resources from a program that conducts scientific studies on public opinion and behavior, with informational, educational goals. https://climatecommunication.yale.edu/

THE NATIONAL JUDICIAL COLLEGE

Making the world a more just place by educating and inspiring its judiciary

CLIMATE ECONOMICS DIVIDER 10

Dr. Michael Greenstone

OBJECTIVES:

After this session you will be able to:

1. Explain fundamentals of climate risk in terms of hazards, exposures, and vulnerabilities;
2. List 2-3 implications of costs of climate impacts for sectors of the U.S. economy such as insurance; and
3. Describe the major costs involved in decarbonizing the economy.

No Materials for this Session

THE NATIONAL JUDICIAL COLLEGE

Making the world a more just place by educating and inspiring its judiciary

INTERNATIONAL CLIMATE FRAMEWORK DIVIDER 11

Dr. Kilaparti Ramakrishna

OBJECTIVES:

After this session you will be able to:

1. Briefly describe U.S. international climate commitments.

No Materials for this Session

THE NATIONAL JUDICIAL COLLEGE

Making the world a more just place by educating and inspiring its judiciary

ACTION PLANNING BRIEF RECAP — DIVIDER 12

Professor Yvonne Stedham and Professor Kelly Tait

OBJECTIVES:

After this session you will be able to:

1. Evaluate responses to people who are uncommitted or resistant to a climate science leadership project;
2. Summarize the "why, what, how, and when" aspects that leaders need to reflect on prior to starting an initiative;
3. List elements of an action plan;
4. Develop an action plan for an initiative in judicial leadership in climate science.

REQUIRED READING: **PAGE**

Yvonne Stedham and Kelly Tait, *Action Planning Recap* (Sept. 2022)
[NJC Document] 1



Climate Science and Law
Woods Hole, MA
September 12-14, 2022

Action Planning Brief Recap

9-14-2022 – 1:00 pm

Yvonne Stedham, Ph.D.
Kelly Tait, Professor





Before you start an initiative, REFLECT on

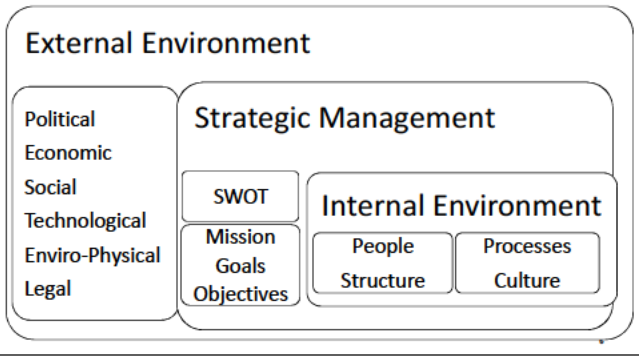
1. Why am I pursuing this/my project?
2. What outcomes do I want to achieve?
3. How will I achieve these outcomes – what actions have to be taken?
4. By when do I want to have accomplished what?

Example Case Study for "Enable others to act"

Recently, upon request by the Chief Judge, Judge Winter has started an initiative related to the creation of a climate science education program. The Chief identified four judges, including Judge McCormack, and assigned them to a committee to be chaired by Judge Winter. The committee's charge is to develop a proposal for the implementation of a climate science education program.



1. Why am I pursuing this/my project?



Long–term effectiveness and efficiency of the organization ……



Requires the creation of a good fit between the external environment and the internal environment of the organization!!

I am pursuing this/my project ….

Because my court needs to be prepared to address climate change cases in order to maintain a good fit with its external environment and stay effective and efficient.

10



2. What outcomes do I want to achieve?

Setting Goals and Objectives

Goals

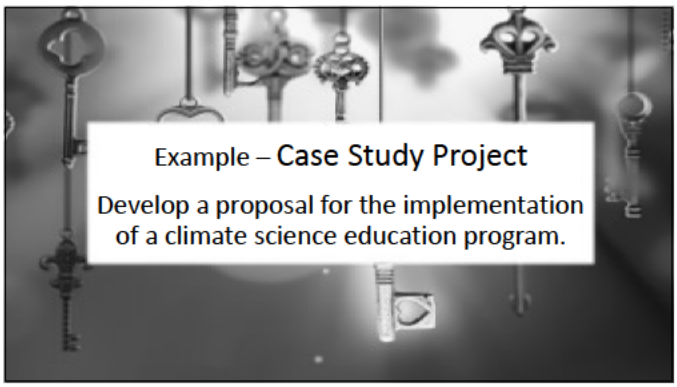
[Longer term outcomes, based on the mission and vision])

- Understandable
- Acceptable
- Flexible
- Inspirational
- Suitable
- Achievable

Objectives

- SMART
  Specific, Measurable, Attainable, Relevant, Time bound





Mission Statement – Example

The mission of the Circuit Court of Lake County is to serve the public. It accomplishes this mission by providing a fair and efficient system of justice, committed to excellence, fostering public trust, understanding and confidence.

19th Judicial Court, Lake County, ILL

Goal Statement – Example

GOAL X:
Commitment to excellence

SMART Objective Statement – Example

Objective Y:
Development of a proposal for the implementation of a climate science education program, including program details concerning number and length of sessions, learning objectives, as well as potential instructors by August 31, 2022.



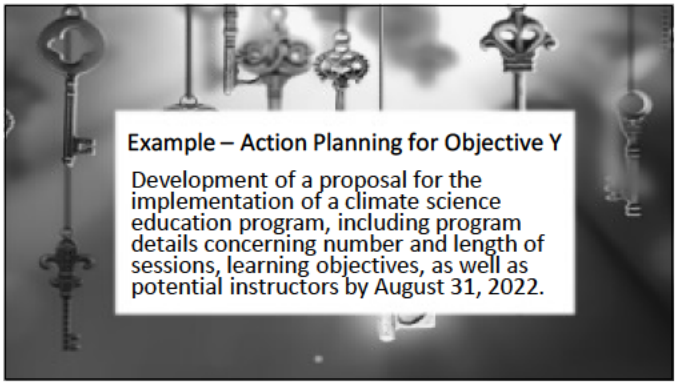
3. How will I achieve these outcomes – what actions have to be taken?
4. By when do I want to have accomplished what?

Strategy Implementation

- Actions/ Steps/ Tasks
- Responsible Person and Resources Required
- Timeline



Actions / Steps / Tasks Specific, measurable, attainable, relevant *(sequentially ordered – what needs to happen first ….)*	**Responsible Person**	**Timeline** *When due*	**Resources Required** **+ = available** **- = needed** *(note plan to get the resource)*	**Potential Barriers** *Possible roadblocks/ resistance. (Consider how to address barriers)*	**Additional Notes**
1.					
2.					
3.					
4.					
5.					
6.					



Actions / Steps / Tasks Specific, measurable, attainable, relevant *(sequentially ordered – what need to happen first ….)*	**Responsible Person**	**Timeline** *When due*	**Resources Required** **+ = available** **- = needed**	**Potential Barriers** *Possible roadblocks/ resistance. (Consider how to address barriers)*	**Additional Notes**
1. Identify 5 interested colleagues	Self	July 1, 2022	+ The following colleagues have already expressed interest - Everyone is super busy	Workload related time – constraints Worry about conflicts associated with the climate issues	Remember leadership practices – especially inspire a shared vision and effective communication skills
2. Schedule a 2 hour meeting with the 5 colleagues to get organized and develop a plan of action and responsibilities	Self	July 15, 2022	+ Availability of several conference rooms - Conflicting schedules	See whether you can get some clerical assistance for scheduling the meetings for this group	Remember leadership practices – especially inspire a shred vision, enable others to act, challenge the process and effective communication skills
3. Determine whether any US courts and non-US courts have a climate science education programs. If there are some, review them	3 Committee members	July 30, 2022	+ Easy access to courts through internet and judicial organizations + worldwide interest in this topic	May not find feasible/ relevant programs – Have to think about developing program ourselves	Remember leadership practices – model the way, inspire a shared vision, encourage the heart
4. Review climate science education programs offered by educational institutions and other by relevant groups	2 Committee members	July 30, 2022	+ ELI + Easy online access to find available programs at colleges and universities	May not find feasible/ relevant programs – Have to think about developing program ourselves	Remember leadership practices – model the way inspire a shared vision, encourage the heart
5. Schedule a second meeting to discuss findings and decide on the format and content of the proposal	Self	First week in August 2022	+ Availability of several conference rooms - Conflicting schedules - Vacation time	Colleagues may have quit the committee because it is too much work or too frustrating	Remember to use ALL of the leadership practices here and effective communication skills
6. Develop a first draft of the proposal	All	August 15, 2022			