PROGRAM

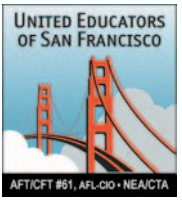
Communicating and Learning About Global Climate Change:

An Event for Teachers, Students, and Other Communicators and Learners

Sunday, 18 February 2007
1:15PM – 5:30PM
Hilton San Francisco

AAAS
ADVANCING SCIENCE, SERVING SOCIETY

This special event has been organized by the American Association for the Advancement of Science (AAAS) – under the auspices of the AAAS Center for Public Engagement with Science and Technology – in collaboration with the California Science Teachers Association (CSTA), National Science Teachers Association (NSTA), and the United Educators of San Francisco (UESF, representing the National Education Association and the American Federation of Teachers).



Dear Colleague:

Welcome to "Communicating and Learning About Global Climate Change: An Event for Teachers, Students, and Other Communicators and Learners". This free public event has been organized by the American Association for the Advancement of Science (AAAS), in collaboration with the California Science Teachers Association (CSTA), the National Science Teachers Association (NSTA), and the United Educators of San Francisco (UESF, representing the National Education Association and the American Federation of Teachers).

The AAAS Board of Directors today has issued its first consensus statement on global climate change. Reflecting a growing torrent of evidence, the statement confirms that "global climate change caused by human activities is occurring now, and it is a growing threat to society." Fossil-fuel burning and deforestation have contributed to an atmospheric carbon-dioxide level that is higher than it has been for at least 650,000 years. As a result, "the average temperature of the Earth is heading for levels not experienced for millions of years," the AAAS Board concluded.

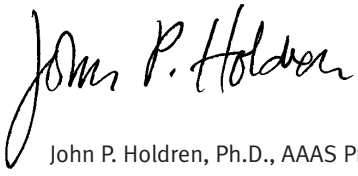
Already scientists are observing rapid melting of glaciers, destabilization of major ice sheets, rising sea levels, shifts in species ranges, and increased frequency of weather extremes. As droughts, heat waves, floods, wildfires, and severe storms intensify, damages to ecosystems and human society are growing apace.

As expected, some of the most dramatic changes are being experienced in the far North, where temperatures have risen much more rapidly than the global average. The plight of the 600 residents of Shishmaref, Alaska, on the shores of the Arctic Ocean, provides a powerful illustration: the retreat of sea ice and the rise of sea level are combining to drive them from their village and destroy their way of life. We are honored to be joined today by several leaders and high-school students from this community.

The problem requires an aggressive and sustained response to transform energy systems and to use energy more efficiently, to halt deforestation, and to help communities adapt to ongoing changes. As an impressive roster of speakers will explain, a variety of existing and proposed strategies show promise for ensuring a more sustainable future.

New solutions will be developed by today's students, who are tomorrow's problem-solvers. Science teachers thus play a tremendously vital role in confronting global climate change by introducing core concepts and by inspiring the next generation of leaders.

This special event at the 2007 AAAS Annual Meeting and the new Project 2061 abbreviated teaching guide mark a significant increase in the efforts of AAAS to support teachers and communicators in the crucial task of conveying the science of climate change and the challenge to society that it represents. The resources available online at www.aaas.org/climate will be growing apace.



John P. Holdren, Ph.D., AAAS President
Director, Woods Hole Research Center, and
Teresa and John Heinz Professor of
Environmental Policy, Harvard University

COMMUNICATING AND LEARNING ABOUT GLOBAL CLIMATE CHANGE

NOON	REGISTRATION OPENS
1:15 PM	VIDEO PRESENTATION *Global Climate Change and Human Well-Being*
1:30 PM	WELCOMING REMARKS **Dr. Alan I. Leshner**, Chief Executive Officer of the American Association for the Advancement of Science (AAAS) and Executive Publisher, *Science*
1:35 PM	AAAS PRESIDENT'S OVERVIEW **Dr. John P. Holdren**, AAAS President; Director, Woods Hole Research Center; Teresa and John Heinz Professor of Environmental Policy, Harvard University
1:45 PM	UNDERSTANDING CLIMATE SCIENCE **Dr. Lonnie G. Thompson**, Professor, School of Earth Sciences, The Ohio State University
2:15 PM	QUESTIONS FOR DR. THOMPSON *Teachers, students, and all other audience members are encouraged to ask questions using microphones or index cards.*
2:30 PM	IN SEARCH OF SOLUTIONS **Dr. Margaret S. Leinen**, Chief Science Officer, Climos, Inc.
2:50 PM	QUESTIONS FOR DR. LEINEN
3:00 PM	PROFITABLE CLIMATE PROTECTION **Dr. Amory B. Lovins**, Chief Executive Officer, Rocky Mountain Institute
3:20 PM	QUESTIONS FOR DR. LOVINS

3:30 PM	CUTTING CARBON EMISSIONS *The Stabilization Wedge concept, a unique, hands-on learning tool, illustrates the impacts of different strategies for reducing greenhouse gases.* **Dr. Robert H. Socolow**, Professor of Mechanical and Aerospace Engineering and Co-Director of the Carbon Mitigation Initiative, Princeton University **Dr. Roberta M. Hotinski**, Science Communicator, Consultant to the Princeton Environmental Institute
4:30 PM	TEACHING FUTURE INNOVATORS **Mr. P. John Whitsett**, President-Elect, National Science Teachers Association (2006-2007) and Physics Teacher, Fond du Lac High School, Wisconsin
4:50 PM	QUESTIONS FOR MR. WHITSETT
5:00 PM	CLOSING REMARKS **Dr. Holdren**

In Alphabetical Order:

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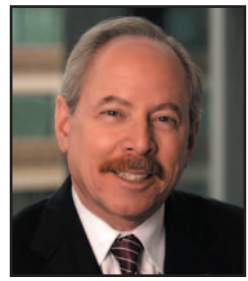
- **Dr. John P. Holdren** is the Director of the Woods Hole Research Center as well as Teresa and John Heinz Professor of Environmental Policy and Director of the Program on Science, Technology, and Public Policy at the Kennedy School of Government, Harvard University. He is also Professor of Environmental Science and Policy in Harvard's Department of Earth and Planetary Sciences and the current president of AAAS. Dr. Holdren was educated at the Massachusetts Institute of Technology and Stanford University in aeronautics/astronautics (fluid dynamics) and theoretical plasma physics, receiving his Ph.D. degree in 1970. After brief stints at the Livermore Laboratory and the California Institute of Technology, he co-founded in 1973 and co-led until 1996 the campus-wide, interdisciplinary, graduate-degree program in energy and resources at the University of California-Berkeley – the Energy and Resources Group (ERG). His work has focused on causes and consequences of global environmental change, fusion science and technology, comparative analysis of energy options, ways to reduce the dangers from nuclear weapons and materials, and the interaction of content and process in science and technology policy. Dr. Holdren is a member of the National Academy of Sciences, the National Academy of Engineering, the American Academy of Arts and Sciences, and the Council on Foreign Relations. From 1993 through 2004 he served as Chair of the Committee on International Security and Arms Control of the National Academy of Sciences, and from 1994 to 2001 he was a member of President Clinton's Committee of Advisors on Science and Technology. Since 2002 he has been Co-Chair of the independent, bipartisan National Commission on Energy Policy. He has been the recipient of a MacArthur Prize Fellowship (1981 to 1986), the Volvo Environment Prize (1993), the Tyler Prize for Environment (2000), and the John Heinz Prize for Public Policy (2001), among other awards. In 1995, he gave the acceptance speech for the Nobel Peace Prize on behalf of the Pugwash Conference on Science and World Affairs (which he served as Chair of the Executive Committee from 1987 to 1997).

- **Dr. Roberta M. Hotinski** is a geoscientist turned science communicator who has worked at *U.S. News & World Report,* the National Science Foundation, and most recently Princeton University. As the Information Officer for Princeton's Carbon Mitigation Initiative, Dr. Hotinski helped to develop the "stabilization wedge" game with Drs. Robert Socolow and Stephen Pacala. She has presented the wedge concept and game to audiences around the world and continues to develop wedge-related resources for educators and the general public. Dr. Hotinski earned her B.A. degree in Environmental Geology at Southern Methodist University in 1993, and her Ph.D. degree in Geosciences at Pennsylvania State University in 2000.

- **Dr. Margaret S. Leinen** in January 2007 became the Chief Science Officer for Climos, Inc., a San Francisco-based company pursuing promising natural processes to help mitigate climate change. Previously, she had served since January 2000 as the Assistant Director for Geosciences at the National Science Foundation; and earlier, as Dean of the Graduate School of Oceanography and Vice Provost for Marine and Environmental Programs at the University of Rhode Island. She also was Interim Dean in the College of the Environment and Life Sciences. Dr. Leinen spent her entire academic career at the University of Rhode Island, one of the country's top institutions for marine studies. She is a well-known researcher in paleo-oceanography and paleo-climatology, with research focusing on ocean sediments and their relationship to global biogeochemical cycles and the history of the Earth's climate. In 1983, on a dive in the deep-water submersible, DSRV ALVIN, off the coast of Washington, Dr. Leinen was the first to discover high-temperature, volcanic vents at depth on the Juan de Fuca Ridge. The "black smokers" that characterize these vents contain unique varieties of "chemosynthetic" life (organisms that depend on inorganic molecules as a source of energy rather than sunlight). Dr. Leinen received her B.S. degree (1969) in Geology from the University of Illinois; her M.S. degree (1975) in Geological Oceanography from Oregon State University; and her Ph.D. degree (1980) in Geological Oceanography from the University of Rhode Island. She is past president of The Oceanography Society. She served on the Board of Governors of the Joint Oceanographic Institutions, Inc., and on the Ocean Research Advisory Council. Dr. Leinen also served as the Vice Chair of the International Geosphere-Biosphere Programme and on the Board on Global Change of the National Research Council/National Academy of Sciences.

- **Dr. Alan I. Leshner** is Chief Executive Officer of the American Association for the Advancement of Science (AAAS) and Executive Publisher of its journal, *Science*. From 1994 to 2001, Dr. Leshner was Director of the National Institute on Drug Abuse at the National Institutes of Health (NIH), and from 1988 to 1994 he was Deputy Director and Acting Director of the National Institute of Mental Health. Prior to that, he spent nine years at the National Science Foundation, where he held a variety of senior positions, focusing on basic research in the biological, behavioral and social sciences, on science policy and on science education. Dr. Leshner began his career at Bucknell University, where he was Professor of Psychology. His research has focused on the biological bases of behavior. Dr. Leshner has been elected a member of the Institute of Medicine of the National Academies of Science, and a fellow of AAAS, the American Academy of Arts and Sciences, and the National Academy of Public Administration. He has received numerous awards from both professional and lay groups for his national leadership in science, mental illness and mental health, substance abuse and addiction, and public engagement with science. He received an A.B. degree in Psychology from Franklin and Marshall College and M.S. and Ph.D. degrees in Physiological Psychology from Rutgers University.



- **Dr. Amory B. Lovins**, a MacArthur Fellow and consultant physicist, has advised the energy and other industries for more than three decades as well as the U.S. Departments of Energy and Defense. His work in more than 50 countries has been recognized by the "Alternative Nobel," Onassis, Nissan, Shingo, and Mitchell Prizes, the Benjamin Franklin and Happold Medals, nine honorary doctorates, and the Heinz, Lindbergh, Jean Meyer, *Time* Hero for the Planet, and World Technology Awards. He advises industries and governments worldwide, and has briefed 19 heads of state. He co-founded and leads Rocky Mountain Institute (www.rmi.org), an independent, market-oriented, entrepreneurial, nonprofit, nonpartisan applied research center that creates abundance by design. Much of its pathfinding work on advanced resource productivity and innovative business strategies is synthesized in Natural Capitalism (www.natcap.org). More than 80 Fortune 500 firms have lately used or invited RMI's consultancy. RMI earns most of its revenue from such programmatic enterprise, including the super-efficient redesign of nearly $30 billion worth of facilities in 28 sectors, and has spun off four for-profit firms (e.g., E source, www.esource.com, and

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Fiberforge, www.fiberforge.com, which Mr. Lovins chairs). His Pentagon-cosponsored 29th book (2004), *Winning the Oil Endgame* (www.oilendgame.com), is starting to be implemented in the private sector.

- **Dr. Robert Socolow's** current research focuses on the characteristics of a global energy system responsive to global and local environmental and security constraints. His specific areas of interest include carbon dioxide capture from fossil fuels and storage in geological formations, nuclear power, energy efficiency in buildings, and the acceleration of deployment of advanced technologies in developing countries. Professor of Mechanical and Aerospace Engineering at Princeton University, Dr. Socolow serves as Co-Director (with ecologist Dr. Stephen Pacala) of the University's Carbon Mitigation Initiative (CMI), a $20-million dollar, 10-year (2001 to 2010) project, supported by BP and Ford. Under the CMI, Princeton has launched new, coordinated research in environmental science, energy technology, geological engineering, and public policy. In a paper in the journal *Science* in 2004, Drs. Socolow and Pacala invented the "stabilization triangle" and the "stabilization wedge" to focus attention on how the world can deploy various portofolios of carbon-saving strategies over the next 50 years to avoid doubling the pre-industrial carbon dioxide concentration in the atmosphere. With Dr. Roberta Hotinski, they are developing associated curricular materials, including a "Wedge Game." Dr. Socolow received the 2003 Leo Szilard Lectureship Award of the American Physical Society (APS) "for leadership in establishing energy and environmental problems as legitimate research fields for physicists, and for demonstrating that these broadly defined problems can be addressed with the highest scientific standards." He was the editor of *Annual Review of Energy and the Environment*i, 1992 to 2002. With Dr. John Harte, Dr. Socolow co-edited *Patient Earth* (Holt, Rinehart, l97l), one of the first college textbooks in environmental studies. He is a AAAS and APS Fellow. Dr. Socolow received his B.A. degree in 1959 and his Ph.D. degree in 1964, both in Physics, from Harvard University.

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- **Dr. Lonnie G. Thompson** is one of the world's foremost authorities on paleo-climatology and glaciology. He has led more than 50 expeditions during the last 30 years, conducting ice-core drilling programs in the world's polar regions as well as in tropical and subtropical ice fields. Recently, Dr. Thompson and his team developed lightweight solar-powered drilling equipment for the acquisition of histories from ice fields in the high Andes of Peru and on Mount Kilimanjaro in Tanzania. The results of these histories, published in more that 200 articles, have contributed greatly toward the understanding of the Earth's past, present, and future climate system. Other Thompson-led expeditions have recovered a 460-meter-long ice core, the world's longest from a mountain range (Alaska, 2002); the first tropic ice core (Peru, 1983); and cores containing the entire sequence of the Last Glacial Stage as well as cores dating over 750,000 years in age, the oldest outside the polar regions (Tibet, 1992). Dr. Thompson's research has resulted in major revisions in the field of paleo-climatology, in particular, by demonstrating how tropical regions have undergone significant climate variability, countering an earlier view that higher latitudes dominate climate change. Dr. Thompson has received numerous honors and awards. In 2005, he was elected to the National Academy of Sciences and was awarded the John and Alice Tyler Prize for Environmental Achievement. He has been selected by *Time* magazine and CNN as one of "America's Best" in science and medicine. His research has been featured in hundreds of publications, including *National Geographic* and the *National Geographic Adventure* magazines. He and his team are the subject of a book entitled: *Thin Ice: Unlocking the Secrets of Climate in the World's Highest Mountains* by Mark Bowen, published in late 2005. In 2006, he was elected member of the *American Philosophical Society* and Alumni member of *Phi Beta Kappa,* and was chosen to receive the Roy Chapman Andrews Society *2007 Distinguished Explorer Award*.

- **Mr. P. John Whitsett**, a Physics Teacher at Fond du Lac High School in Wisconsin, currently is President-Elect of the National Science Teachers Association (NSTA). He will assume the role of NSTA President on June 1, 2007. He began his career in 1970 at LaCrosse Central High School, where he taught chemistry for 23 years. He also served as Supervisor of Science and Math for the LaCrosse School District. He has taught physics at Fond du Lac High School since 1993 and is a curriculum support specialist, serving as his school district's assessment coordinator. Mr. Whitsett has served as the Co-Principal Investigator for four National Science Foundation training and teacher enhancement projects, and he has taught several graduate courses at the University of Wisconsin-LaCrosse campus in laboratory methods, lab safety, and curriculum design. He has served as a laboratory safety consultant for many school districts and has presented lab safety training sessions for the Wisconsin Department of Public Instruction. Mr. Whitsett's honors have included a Presidential Award for Excellence in Mathematics and Science Teaching (1986), the Ron Gibbs Award for Lifetime Achievement in Science Education (2000), the Wisconsin Society of Science Teachers (WSST) Regional Award (1995), and an Outstanding Chemistry Teacher Award from the American Chemical Society (1991), among others. Mr. Whitsett earned a B.S. degree in chemistry and mathemathics from the University of Wisconsin-LaCrosse in 1970, a Master's degree of education in professional development (ME-PD) from the University of Wisconsin-LaCrosse in 1983, and a certification in school administration from the University of Wisconsin-Madison in 1994.

Acknowledgments

AAAS wishes to thank Ms. Judy Scotchmoor, Assistant Director of the University of California Museum of Paleontology, Berkeley; Dr. Ellen P. Metzger, Professor and Co-Director of the Bay Area Earth Science Institute at San Jose State University; and San Francisco Bay-area teachers and others who provided invaluable support for today's program. We are indebted to all external advisers.

Thanks also to all AAAS staff members who served on the internal planning committee and helped to make this event a reality.

AAAS further appreciates the collaboration of the California Science Teachers Association, the National Science Teachers Association, and the United Educators of San Francisco (UESF, representing the National Education Association and the American Federation of Teachers).

Advance focus groups with Bay-area teachers and students were conducted for AAAS by the nonprofit, nonpartisan research firm, Public Agenda (www.publicagenda.org). We are grateful to Ruth A. Wooden, Will Friedman, Alison Kadlec, and colleagues.

Finally, we appreciated the good work of Dave Braun, Chris Duhaime, and colleagues with Braun Film and Video, Inc. (www.braunfilm.com).

Notes

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The American Association for the Advancement of Science, "Triple-A-S" (AAAS), is the world's largest general scientific society, and publisher of the journal, *Science* (www.sciencemag.org). AAAS was founded in 1848, and serves 262 affiliated societies and academies of science, reaching 10 million individuals. *Science* has the largest paid circulation of any peer-reviewed general science journal in the world, with an estimated total readership of 1 million. The nonprofit AAAS (www.aaas.org) is open to all and fulfills its mission to "advance science and serve society" through initiatives in science policy, international programs, science education, and more. For the latest research news, log onto EurekAlert! (www.eurekalert.org), the premier science-news Web site, a service of AAAS.

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