

# CONFERENCE PROGRAM



*Second Annual*  
**CLIMATE CHANGE  
RESEARCH CONFERENCE**  
*and*  
**FIRST SCIENTIFIC CONFERENCE,  
WEST COAST GOVERNORS'  
GLOBAL WARMING INITIATIVE**

**SEPTEMBER 14–16, 2005**  
The Radisson Hotel Sacramento  
Sacramento, California

*From Climate to Economics and  
Back: Mitigation and Adaptation  
Options for California and the  
Western States*

**Sponsors:**

California Energy Commission

California Environmental  
Protection Agency



Arnold Schwarzenegger,  
Governor

**Co-sponsors:**

National Oceanic and Atmospheric  
Administration (NOAA)

Scripps Institution of Oceanography

University of California, Berkeley



FROM CLIMATE TO ECONOMICS AND BACK:  
MITIGATION AND ADAPTATION OPTIONS FOR  
CALIFORNIA AND THE WESTERN STATES



SEPTEMBER 14–16, 2005

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Arnold Schwarzenegger,  
Governor

September 14, 2005  
Sacramento, California

Dear Colleagues,

On behalf of the California Energy Commission, the California Environmental Protection Agency, and our western states neighbors, it is our pleasure to welcome you to the Second Annual Climate Change Research Conference and First Scientific Conference on the West Coast Governors' Global Warming Initiative, "From Climate to Economics and Back: Mitigation and Adaptation Options for California and the Western States."

This year's conference comes at a time of significant developments in the science and policy of climate change in California and the western states. Our work on climate science and measures to reduce greenhouse gas emissions has progressed rapidly since last year's conference. Governor Schwarzenegger's June 1, 2005 announcement on climate change and emissions mitigation targets has garnered worldwide attention and accelerated California's leadership efforts to both address the challenges posed by climate change impacts and seize the opportunities to dramatically reduce our emissions while continuing to enjoy robust economic growth and development.

This year's event promises to be an exciting forum for discussion and debate on climate change and emissions mitigation science and policy. The research presentations, invited speakers, and poster sessions feature the work of leading experts, and are designed to facilitate interchange among scientists, policy practitioners, students, and others engaged in the climate change issue. Your participation will be invaluable in providing feedback and helping us continue to develop and expand our research agenda.

Protecting the global climate has emerged as the paramount environmental issue of the new century, and this conference is occurring at a pivotal time. The work presented here represents the cutting edge of climate change science and policy. We hope you share our excitement at being part of this enterprise, and sincerely thank you for joining us in making this conference an important contribution to our expanding effort to confront the challenge of climate change.

Arthur H. Rosenfeld,  
Commissioner  
California Energy Commission

James D. Boyd,  
Commissioner  
California Energy Commission

Alan C. Lloyd,  
Secretary  
California Environmental  
Protection Agency

# CONFERENCE AGENDA

## WEDNESDAY, September 14, 2005

MORNING SESSION

8:00 AM – 8:15 AM

### WELCOME AND INTRODUCTION

Commissioner Arthur Rosenfeld (California Energy Commission)

8:15 AM – 8:35 AM

### POLICY OVERVIEW INFORMING THE RESEARCH AGENDA

Session Chair: Susan Brown (California Energy Commission)

8:35 AM – 8:55 AM

### Policy Options for Reducing Greenhouse Gases: A California Energy Perspective

Commissioner Jim Boyd (California Energy Commission)

9:00 AM – 9:20 AM

### California's Emerging Responses to Climate Change

Alan Lloyd (CalEPA Secretary)

9:20 AM – 9:40 AM

### REGIONAL RESEARCH STRATEGIES IN THE WEST COAST

Session Chair: Chester Koblinsky (National Oceanic and Atmospheric Administration)

9:40 AM – 10:00 AM

### California Climate Change Center

Guido Franco (California Energy Commission)

### Climate Impacts Group

Philip Mote (University of Washington)

### Climate Change Research in Oregon

Mark Abbott (Oregon State University)

10:00 AM – 10:20 AM BREAK

10:20 AM – 10:45 AM

### POTENTIAL CHANGES IN REGIONAL CLIMATE

Session Chair: Guido Franco (California Energy Commission)

### Regional Climate Modeling for the West Coast

Ruby Leung (Pacific Northwest National Laboratory)

10:45 AM – 11:10 AM

### Insight into Regional Atmospheric Variability from Five Decades of High-Resolution Model Simulation Over California

Masao Kanamitsu (Scripps Institution of Oceanography)

11:10 AM – 11:30 AM

### Have Land Use Changes Affected California's Climate?

Lisa Sloan (University of California, Santa Cruz)

11:30 AM – 11:55 AM

### Development and Exploration of Probabilistic Climate Scenarios for California and the West

Mike Dettinger (U.S. Geological Survey/Scripps Institution of Oceanography)

11:55 AM – 1:25 PM

### LUNCH

### PROBABILISTIC ASSESSMENT OF DANGEROUS CLIMATE CHANGE

*Keynote Speaker:* Professor Steve Schneider (Stanford University)

AFTERNOON SESSION

1:25 PM – 1:45 PM

### POTENTIAL MITIGATION STRATEGIES: PART I

Session Chair: Alan Sanstad (Lawrence Berkeley National Laboratory)

### Reducing Mitigation Costs: Cost Curves for Non-CO<sub>2</sub> Gases in California

Anne Choate (ICF Consulting)

1:45 PM – 2:05 PM

### Estimation of GHG Emissions from Products Manufactured in California

Eric Masanet (Lawrence Berkeley National Laboratory)

2:05 PM – 2:25 PM

### Agriculture's Role in Greenhouse Gas Mitigation

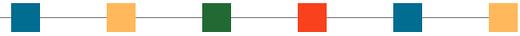
Johan Six (University of California, Davis)

2:25 PM – 2:55 PM

### Analyzing Long-Run Energy-Efficiency Potential in California

Mike Rufo (Quantum) and Max Auffhammer (University of California, Berkeley)

CONFERENCE AGENDA



AFTERNOON SESSION

2:55 PM – 3:15 PM	<b>Avoiding Dangerous Climate Change by Induced Technological Progress: Scenarios Using a Large-Scale Econometric Model</b> Terry Barker (University of Cambridge, United Kingdom)
3:15 PM – 3:30 PM	<b>BREAK</b>
3:30 PM – 3:55 PM	<b>CLIMATE MONITORING AND ANALYSIS – PART I</b> Session Chair: Francis Chung (Department of Water Resources) <b>Has the Troposphere Warmed Since 1979?</b> Ben Santer (Lawrence Livermore National Laboratory)
3:55 PM – 4:20 PM	<b>Climatic Changes in Oregon and Washington</b> Philip Mote (University of Washington)
4:20 PM – 4:45 PM	<b>Designing and Building an Improved Climate Monitoring Network for California</b> Kelly Redmond (Western Regional Climate Center, Desert Research Institute)
4:45 PM – 5:10 PM	<b>Regional Climate Change Detection and Attribution</b> Celine Bonfils (Lawrence Livermore National Laboratory)

**THURSDAY, September 15, 2005**

MORNING SESSION

8:00 AM – 8:20 AM	<b>CLIMATE MONITORING AND ANALYSIS – PART II</b> Session Chair: Eileen McCauley (California Air Resources Board) <b>The Coastal Influence on California Temperatures – How Has It Varied?</b> Dan Cayan (Scripps Institution of Oceanography)
8:20 AM – 8:45 AM	<b>Potential Impacts of Aerosols on Precipitation and Stream Flow in California</b> Daniel Rosenfeld (The Hebrew University of Jerusalem)
8:45 AM – 9:05 AM	<b>Changes in Coastal Waves and Sea Level Along the California Coast</b> Peter Bromirski (Scripps Institution of Oceanography)
9:05 AM – 9:25 AM	<b>Role of Aerosols in Regional Climate: A Research Frontier</b> Mark Jacobson (Stanford University)
9:25 AM – 9:50 AM	<b>DEVELOPMENT OF TOOLS FOR CLIMATE CHANGE IMPACTS AND ADAPTATION STUDIES: PART I</b> Session Chairs: Mike Floyd (California Department of Water Resources) and Nehzat Motallebi (Air Resources Board) <b>Climate Change and Water Supply Impacts</b> John Dracup (University of California, Berkeley)
9:50 AM – 10:15 AM	<b>What to Do When the Weather Changes?: Adaptation and Climate Change</b> Jay Lund (University of California, Davis)
10:15 AM – 10:35 AM	<b>INFORM – Integrated Climate Prediction and Water Management in California</b> Nicholas E. Graham (Hydrologic Research Center and Scripps)
10:35 AM – 10:50 AM	<b>BREAK</b>
10:50 AM – 11:15 AM	<b>Impact of Climate Change on Meteorology and Regional Air Quality in California</b> Mike Kleeman (University of California, Davis)
11:15 AM – 11:40 AM	<b>Potential Shoreline Changes in Southern California in the Next Century</b> Douglas Inman (Scripps Institution of Oceanography)

CONFERENCE AGENDA



**11:40 AM – 1:10 PM**

**LUNCH**

**GLOBAL ACTION TO CONTROL GLOBAL WARMING**

*Keynote Speaker:* Sir David King (Chief Scientific Adviser to the United Kingdom Government)

**AFTERNOON SESSION**

**1:10 PM – 1:35 PM**

**POTENTIAL MITIGATION STRATEGIES – PART II  
 CARBON SEQUESTRATION IN THE WEST COAST**

Session Chair: Larry Myer (Lawrence Berkeley National Laboratory)

**Opportunities for Terrestrial Carbon Sequestration in the West**

John Kadyszewski (Winrock International)

**1:35 PM – 2:00 PM**

**Potential for Carbon Sequestration in Geological Formations in the West**

Sally Benson (Lawrence Berkeley National Laboratory)

**2:00 PM – 2:25 PM**

**Carbon Sequestration as a National and Global Strategy: When Is It Needed?**

Jae Edmonds (Pacific Northwest National Laboratory)

**2:25 PM – 2:45 PM**

**DEVELOPMENT OF TOOLS FOR CLIMATE CHANGE IMPACTS AND ADAPTATION STUDIES: PART II**

Session Chairs: Steve Shaffer (California Department of Food & Agriculture) and

Doug Wickizer (California Department of Forestry and Fire Protection)

**Can Seasonal Climate Forecast Improve California Energy Management?**

David Pierce (Scripps Institution of Oceanography)

**2:45 PM – 3:05 PM**

**Heat Extremes and Energy Demand**

Norm Miller (Lawrence Berkeley National Laboratory)

**3:05 PM – 3:30 PM**

**Climate Change and the Timing of California Songbird Migration**

Dena MacMynowski and Terry Root (Stanford University)

**3:30 PM – 3:50 PM**

**BREAK**

**3:50 PM – 4:15 PM**

**Climate Change and the Pacific Northwest Coastal Marine Ecosystem**

Robert Francis (University of Washington)

**4:15 PM – 4:40 PM**

**Potential Changes in Vegetation Patterns in the West**

Ron Neilson (USDA Forest Service)

**4:40 PM – 5:00 PM**

**Will Climate Change Increase Forest Fire Threat in the Western U.S.?**

Anthony Westerling (Scripps Institution of Oceanography)

**5:00 PM – 7:00 PM**

**POSTER SESSION**

Chair: Ed Vine (Lawrence Berkeley National Laboratory)

CONFERENCE AGENDA



**FRIDAY, September 16, 2005**

**MORNING SESSION**

<b>8:00 AM – 8:25 AM</b>	<b>DESIGN OF EMISSIONS TRADING PROGRAMS TO REDUCE GHG EMISSIONS</b> Chair: Sam Sadler (Oregon Department of Energy) <b>Review of Emissions Trading Programs for Applications at the State or Regional Levels</b> Ned Helme (Center for Clean Air Policy)
<b>8:25 AM – 8:50 AM</b>	<b>Emissions Trading from an Offset Buyer's Perspective</b> Mike Burnett (The Climate Trust)
<b>8:50 AM – 9:20 AM</b>	<b>Use of BEAR, a Macro-economic Model, to Estimate Economic Impacts</b> David Roland-Holst (University of California, Berkeley)
<b>9:20 AM – 9:50 AM</b>	<b>UPDATE OF PROGRESS ON THE PRELIMINARY SCIENCE REPORT TO THE GOVERNOR</b> Chair: Kelly Birkinshaw (California Energy Commission) Dan Cayan (Scripps Institution of Oceanography), Michael Hanemann (University of California, Berkeley)

**9:50 AM – 10:20 AM**     **BREAK**

<b>10:20 AM – 11:45 AM</b>	<b>WHAT DECISION MAKERS WANT TO KNOW AND WHAT THEY SHOULD KNOW</b> Chair: Anne Baker (CalEPA) <b>Panel Discussion:</b> Assemblymember Fran Pavley, Steve Schneider (Stanford University), Gary Smith (Timberland), Jim Marston (Environmental Defense), and Michael Hanemann (University of California, Berkeley)
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**11:45 AM – 12:00 PM**     **FINAL REMARKS**  
Martha Krebs (California Energy Commission)

## SPEAKER AND SESSION CHAIR BIOGRAPHIES

### **ARTHUR H. ROSENFELD**

#### **Commissioner, California Energy Commission**

Arthur H. Rosenfeld, Ph.D., was originally appointed to the California Energy Commission by Governor Gray Davis in April 2000. The Commissioner was reappointed by Governor Arnold Schwarzenegger January 26, 2005. The five members of the Energy Commission are appointed by the Governor to staggered five-year terms and require Senate confirmation. By law, four of the five members of the Energy Commission have professional training in specific areas—engineering or physical science, environmental protection, economics, law, and one commissioner from the public-at-large. Commissioner Rosenfeld fills the physical science position.

Commissioner Rosenfeld is presiding member of the Research, Development and Demonstration Committee and the Dynamic Pricing Committee (Ad Hoc Committee); and the second member of the Energy Efficiency Committee.

Dr. Rosenfeld received his Ph.D. in Physics in 1954 under Nobel laureate Enrico Fermi, then joined the Department of Physics at the University of California at Berkeley. There he joined, and eventually led, the Nobel prize-winning particle physics group of Luis Alvarez at Lawrence Berkeley National Laboratory until 1974. At that time, he changed to the new field of efficient use of energy, formed the Center for Building Science at Lawrence Berkeley National Laboratory (LBNL) and led it until 1994. The Center developed electronic ballasts for fluorescent lamps (which led to compact fluorescent lamps), low-emissivity windows, and the DOE-2 computer program for the energy analysis and design of buildings, for which Dr. Rosenfeld was personally responsible.

Dr. Rosenfeld received the Szilard Award for Physics in the Public Interest in 1986, and the Carnot Award for Energy Efficiency from the U.S. Department of Energy in 1993. He is the co-founder of the American Council for an Energy Efficiency Economy (ACEEE), the University of California's Institute for Energy Efficiency (CIEE), and the Washington-based Center for Energy and Climate Solutions (CECS).

From 1994–1999 Dr. Rosenfeld served as Senior Adviser for the U.S. Department of Energy's Assistant Secretary for Energy Efficiency and Renewable Energy.

SPEAKER AND SESSION CHAIR BIOGRAPHIES

**JAMES D. BOYD**

**Commissioner, California Energy Commission**

James D. Boyd was appointed to the California Energy Commission on February 6, 2002, by Governor Gray Davis to serve a five-year term. Commissioner Boyd presides over the Energy Commission's Transportation and Fuels Committee and oversees Climate Change and International Export Programs. He also presides over the Natural Gas Committee, which includes the Energy Commission's work on Liquefied Natural Gas (LNG). He is the Associate Member of the committee overseeing the preparation of the Energy Commission's 2005 Integrated Energy Policy Report. He is also the Associate Member of the Siting Committee. He chairs the state's Joint Agency Climate Change Team and the state's Natural Gas Working Group. He serves as the state's liaison to the Nuclear Regulatory Commission. He represents California on the Border Governors' Conference Energy Worktable. He represents the Energy Commission on the Steering Teams of the California Fuel Cell Partnership and the California Stationary Fuel Cell Collaborative. He serves on the Board of Directors of WestStart/CALSTART, a California-based, not for profit, advanced transportation technology consortium, and on the Board of Advisors of the University of California Davis's Institute of Transportation Studies.

Prior to his appointment, Commissioner Boyd was Deputy Secretary and Chief of Staff of the California Resources Agency. He served 15 years as the Chief Executive Officer of the California Air Resources Board (CARB), directing the nation's largest state air pollution control program. During this period, CARB led the nation in establishing new pollution control programs for motor vehicles and fuels, toxic air contaminants, consumer products, and industrial and area sources. A California native, Commissioner Boyd received his Bachelor of Science degree in Business Administration from the University of California, Berkeley.

SPEAKER AND SESSION CHAIR BIOGRAPHIES

**ALAN C. LLOYD**

**Secretary, California Environmental Protection Agency**

Alan C. Lloyd, Ph.D., was appointed as the Secretary of the California Environmental Protection Agency by Governor Arnold Schwarzenegger in December 2004.

Dr. Lloyd most recently served as the Chairman to the California Air Resources Board, appointed by Governor Gray Davis in February 1999 and reappointed by Governor Arnold Schwarzenegger in August 2004. The Air Resources Board (Board), a branch of the California Environmental Protection Agency, oversees a \$150 million budget and a staff of nearly 1,000 employees located in northern and southern California.

As Chairman, Dr. Lloyd was committed to cultivate a mindset and an attitude throughout government, industry, and society that zero- and near-zero emission technologies can be put to use now or in the immediate future to help the state meet its air quality goals. He initiated the environmental justice focus within the agency and led the efforts resulting in the adoption of the Environmental Justice Policy and actions to be followed up by the Board.

Dr. Lloyd served as the Executive Director of the Energy and Environmental Engineering Center for the Desert Research Institute at the University and Community College System of Nevada, Reno. Previously, Dr. Lloyd was the chief scientist at the South Coast Air Quality Management District from 1988 to 1996, where he managed the Technology Advancement office that funded public-private partnerships to stimulate advanced technologies and cleaner fuels.

Dr. Lloyd has given many presentations to national and international audiences, focusing on the viable future of advanced technology and renewable fuels, with attention to the urban air quality challenges faced by California and to the impact on global climate change. He is a major proponent of alternate fuels, electric drive, and fuel cell vehicles eventually leading to a hydrogen economy. Dr. Lloyd has also authored many articles on alternative fuels and air pollution control technology, including "Fuel Cells and Air Quality: A California Perspective"; "Electric Vehicles and Future Air Quality in Los Angeles"; "Air Quality Management in Los Angeles: Perspectives on Past and Future Emission Control Strategies"; and "Accelerating Mobile Source Emission Reductions: California's Experience and Recommendations to Developing Counties."

Dr. Lloyd was the 2003 Chairman of the California Fuel Cell Partnership and is a co-founder of the California Stationary Fuel Cell collaborative. He is a past chairman of the U.S. Department of Energy Hydrogen Technical Advisory Panel (HTAP).

Dr. Lloyd, 63, earned both his Bachelor of Science in Chemistry and Ph.D. in Gas Kinetics at the University College of Wales, Aberystwyth, UK.

SPEAKER AND SESSION CHAIR BIOGRAPHIES

**STEPHEN H. SCHNEIDER – KEYNOTE SPEAKER**

**Professor, Stanford University**

Stephen H. Schneider is the Melvin and Joan Lane Professor for Interdisciplinary Environmental Sciences, a professor in the Department of Biological Sciences, a senior fellow in the Center for Environmental Science and Policy, and Professor by Courtesy in the Department of Civil Engineering at Stanford University. He is co-director of the Center for Environmental Science and Policy and serves on the Faculty Leadership Committee for the Stanford Institute for the Environment. Dr. Schneider was honored in 1992 with a MacArthur Fellowship for his ability to integrate and interpret the results of global climate research through public lectures, seminars, classroom teaching, environmental assessment committees, media appearances, Congressional testimonies, and research collaboration with colleagues.

Dr. Schneider has served as a consultant to federal agencies and/or White House staff for the last six administrations. In 1991, he received the American Association for the Advancement of Science/Westinghouse Award for Public Understanding of Science and Technology, for furthering public understanding of environmental science and its implications for public policy. He became a foreign member of the Academia Europaea, Earth and Cosmic Sciences Section in 1998. He was elected Chair of the American Association for the Advancement of Sciences Section on Atmospheric and Hydrospheric Sciences (1999–2001) and was elected to membership in the U.S. National Academy of Sciences in April 2002. He received the National Conservation Achievement Award from the National Wildlife Federation for 2003, as well as the Edward T. Law Roe Award of the Society of Conservation Biology for the same year.

Dr. Schneider received his Ph.D. in Mechanical Engineering and Plasma Physics from Columbia University in 1971. He studied the role of greenhouse gases and suspended particulate material on climate as a postdoctoral fellow at NASA's Goddard Institute for Space Studies. He was awarded a postdoctoral fellowship at the National Center for Atmospheric Research in 1972 and was a member of the scientific staff of NCAR from 1973–1996, where he co-founded the Climate Project.

In 1975, Dr. Schneider founded the interdisciplinary journal, *Climatic Change*, and continues to serve as its Editor. He is also the Editor-in-Chief of the *Encyclopedia of Climate and Weather* and author of *The Genesis Strategy: Climate and Global Survival*; *The Coevolution of Climate and Life*; *Global Warming: Are We Entering the Greenhouse Century?* and *Laboratory Earth: The Planetary Gamble We Can't Afford to Lose*, among others. He has authored or co-authored over 300 scientific papers, proceedings, legislative testimonies, edited books, and book chapters, and 114 book reviews, editorials and popularizations, and has participated in numerous media interviews.

His recent papers include: Schneider, S.H., and M.D. Mastrandrea, 2005: "Probabilistic assessment of 'dangerous' climate change and emissions pathways," *PNAS* (in press); Root, T.L., D.P. MacMynowski, M.D. Mastrandrea, and S.H. Schneider, 2004: "Human-Modified Temperatures Induce Species Changes: Joint Attribution," *PNAS* 102: 7465–7469; Schneider, S.H., 2004: "Abrupt Non-linear Climate Change, Irreversibility and Surprise," *Global Environmental Change*, 14/3, 245–258; and Mastrandrea, M.D., and S.H. Schneider, 2004: "Probabilistic Integrated Assessment of 'Dangerous' Climate Change," *Science* 304 (5670), 571–575. He has served as a Lead Author for the Second, Third, and Fourth Assessment Reports of the Intergovernmental Panel on Climate Change (IPCC) and is co-anchor for the IPCC Cross-Cutting Theme on Vulnerability for the Fourth Assessment Report (AR4).

Recently, Dr. Schneider has also written about his experience fighting cancer. In his book, *The Patient from Hell: How I Worked with My Doctors to Get the Best of Modern Medicine and How You Can Too* (Da Capo Lifelong Books, in press), he has suggested that medical treatments need to be more closely connected to decision analysis principles, in particular, subjective probabilistic analysis, and more individualized testing and treatments.

SPEAKER AND SESSION CHAIR BIOGRAPHIES

**SIR DAVID KING – KEYNOTE SPEAKER**

**Chief Scientific Adviser to the United Kingdom Government**

Sir David King was appointed Chief Scientific Adviser (CSA) to HM Government and Head of the Office of Science and Technology on October 1, 2000. Prior to this appointment, he was head of the Department of Chemistry and Master of Downing College, University of Cambridge. He continues as the 1920 Professor of Physical Chemistry and Fellow, Queens' College, University of Cambridge, where his research is maintained.

He advises the Prime Minister directly on scientific issues. In 2001 he chaired the Foot and Mouth Disease Science Panel and in 2003 chaired the GM Science Review Panel. He chairs a number of other committees including: the Science and Engineering Base Coordinating Committee; Chief Scientific Adviser's Committee (CSAC); the Global Science and Innovation Forum (GSIF); Government Science Advisory Panel; and the High Level Energy Group. He is an invitee to Seven Cabinet subcommittees and co-chairs the Council for Science and Technology. He was heavily involved in producing the UK's ten-year Science and Innovation Framework, 2004–2014. He was made a Fellow of the Royal Society in 1991, Foreign Fellow of the American Academy of Arts and Sciences in 2002, and a Knight Bachelor in 2003.

Sir David has received a number of awards including: Royal Society of Chemistry, Medal and Award for Colloid and Surface Chemistry, 1978 (UK); Royal Society of Chemistry, Tilden Lecturer, 1988/89 (UK); British Vacuum Council, Medal and Award for research, 1991; Procter and Gamble 1990 Lecturer (U.S.); Texas A&M New Frontiers Lecturer, 1993 (U.S.); Dupont Distinguished Lecturer, Indiana, 1993 (U.S.); Dow Chemicals Canada Lecturer, 1994 (U.S.); Visiting Miller Research Professorship, Berkeley, 1996 (U.S.); Liversidge Medal and Lecturer, Royal Society of Chemistry, 1997–98 (UK); South African Institute of Chemistry Catalysis Award, 1999–2000; Schuit Prize and Lecture, Eindhoven, The Netherlands, 2000; and The Royal Society Rumford Medal and Prize, 2002. After reading Chemistry at the Witwatersrand University in 1960, Sir David went on to receive his Ph.D. at the same University in 1964. He was awarded a Sc.D. at the University of East Anglia in 1974 and a Sc.D. at the University of Cambridge in 1999. Sir David holds Honorary Degrees from 10 British, European, and South African Universities and is honorary Professor at Qingdao University, China.

Previous academic appointments include: Teaching Assistant, University of Witwatersrand from 1961 to 1962; Shell Postgraduate Scholar, Imperial College, London from 1963–1966; Lecturer in Chemical Physics, University of East Anglia from 1966–1974; Professor of Physical Chemistry, University of Liverpool from 1974–1988; and 1920 Professor of Physical Chemistry, University of Cambridge, from 1988–present. He has undertaken a number of consultancies for both national and international organizations.

Between 1967 and 2005 Sir David has given over 200 invited lectures at international conferences, symposia, workshops, and summer schools on his research. He has published over 450 papers in scientific journals, including twenty in the past year. As Chief Scientific Adviser to the Government, he has given a number of lectures related to science in government. These include venues throughout the EU, U.S., Japan, China, Russia, Korea, South Africa, India, Brazil, Canada, and Singapore. In 2002 he delivered the Ninth Zuckerman Lecture, on "The Science of Climate Change: Adapt, Mitigate or Ignore?" at The Royal Society. He published "The Scientific Impact of Nations" in *Nature* 430, 311 (2004).

SPEAKER AND SESSION CHAIR BIOGRAPHIES



**FRAN PAVLEY**

**Assemblymember**

Fran Pavley is serving her third term in the State Assembly and represents portions of Los Angeles and Ventura Counties. She serves as Chair of the Budget Committee on Resources and is a member of the Budget, Education, Transportation, and Water Parks and Wildlife Committees.

Her work in the Assembly has focused on quality-of-life issues such as supporting and improving our schools, consumer and privacy protections, children's health and safety, resource protection, and improving air and water quality. She has earned a reputation as one of the brightest and most highly respected members in California's State Legislature. Her landmark climate change legislation, AB 1493, which regulates vehicle emissions and helps reduce the impacts of global warming, has made California first in the nation to take this important step. Other states, as well as other countries are already looking to follow California's lead and adopt "the Pavley Bill."

Prior to serving in the Assembly, Ms. Pavley was elected as the first and ultimately four-time Mayor of the newly incorporated City of Agoura Hills. In order to be as effective as possible, she returned to school and earned a Master's Degree in Planning. She also holds a California teaching credential, and taught history and government for 25 years at Chaparral Middle School in the Moorpark Unified School District. Ms. Pavley's husband Andy is also a public school teacher. They have two grown children—their daughter Jenny and their son David.

## SPEAKER AND SESSION CHAIR BIOGRAPHIES

### **MARK R. ABBOT**

#### **Oregon State University**

Mark R. Abbott is Dean and Professor in the College of Oceanic and Atmospheric Sciences at Oregon State University. He received his B.S. in Conservation of Natural Resources from the University of California, Berkeley, in 1974 and his Ph.D. in Ecology from the University of California, Davis, in 1978. He has been at OSU since 1988 and has been Dean of the College since 2001. He is an Associate Member of the National Academy of Sciences. Under his guidance, the College has developed a new strategic plan, and it has embarked on an ambitious program for the design and construction of an Expedition Support Center and an Earth System Science Center.

Dr. Abbott is an adjunct professor in computer science at OSU, and he has advised the Office of Naval Research and the National Science Foundation on ocean information infrastructure. He has hosted a series of workshops for NASA, bringing leaders in computer science from industry and academia together with Earth scientists. He recently convened an NSF workshop on trends in information technology and their application to ocean sciences.

Dr. Abbott chaired the Committee on Earth Studies (CES) for the National Academy of Sciences. While chair of CES he oversaw the production of three reports on the National Polar-orbiting Operation Environmental Satellite System (NPOESS), including one focusing on climate data services in support of NPOESS. He was a member of the NRC Committee on NASA/NOAA Transition from Research to Operations. He also co-chairs NOAA's Climate Working Group, and he is presently chair of the Coastal Ocean Applications and Science Team for NOAA. He was chairman of the U.S. Joint Global Flux Study Science Steering Committee. He is also a member of the Jet Propulsion Laboratory Advisory Council.

### **MAXIMILIAN AUFFHAMMER**

#### **University of California, Berkeley**

Maximilian Auffhammer is an Assistant Professor of Agricultural and Resource Economics and International Area Studies at the University of California, Berkeley. He specializes in empirical research in the field of environmental and resource economics. One main area of interest is the construction and evaluation of carbon and energy forecasts. He is also interested in estimating the impacts of climate change on agriculture in California, India, and China. For more information visit <http://are.berkeley.edu/~auffham>.

### **ANNE BAKER**

#### **California Environmental Protection Agency**

On January 27, 2004, Governor Arnold Schwarzenegger appointed Ms. Baker as Deputy Secretary for External Affairs for the California Environmental Protection Agency. As Deputy Secretary, she assists the Secretary in shaping and implementing the Governor's environmental policy.

Ms. Baker has spent more than 25 years dealing with public policy issues at the state and local levels, with a primary emphasis on air and water quality. For the last eight years she served as staff in the California Assembly for resource conservation and environmental protection policy and budget issues. Most recently, Ms. Baker was the primary staff member for AB 1493, the landmark greenhouse gas (GHG) emission reduction legislation that requires GHG reductions from automobiles.

Prior to moving to Sacramento, Ms. Baker served as the senior advisor to the General Manager for Metropolitan Water District of Southern California (MWD) where she developed its first strategic plan and Blue Ribbon Task Force. Before joining MWD, Ms. Baker was Director of Environmental Planning at the Southern California Association of Governments for five years. From 1986–87 she was Deputy Controller for Taxation and served as a member of the State Board of Equalization.

During 1983, Ms. Baker worked in regulatory and public affairs at Pacific Telesis Corporation, where part of her job involved providing regulatory support to the first cellular telephone company in Los Angeles.

Prior to moving to California, Ms. Baker was an elected member of the Maryland House of Delegates from Howard County Maryland. Anne graduated in 1983 from the Kennedy School of Government, Harvard University, with a master's in Public Administration.

Ms. Baker and her husband, Bill Stall, a Pulitzer-prize-winning journalist at the *Los Angeles Times*, live in Sacramento.

### **TERRY BARKER**

#### **University of Cambridge, United Kingdom**

Dr. Terry Barker is a Senior Research Associate in the Economics Faculty, University of Cambridge and Chairman of Cambridge Econometrics. He was a Coordinating Lead Author (CLA) in the IPCC Third Assessment Report (2001) for the chapter covering mitigation and the world energy industries. He is a CLA in the Fourth Assessment Report (due in 2007) for

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the chapter on mitigation from a cross-sectoral perspective, covering the macroeconomic costs of mitigation at national, regional, and global levels in the short and medium term (to 2020). His research interests are in GHG mitigation policy, large-scale computable energy-environment-economy and world energy modeling. He has directed and coordinated many large projects building and applying large-scale economic models of the UK, the European Union, and the global economy. He has edited or authored some 12 books and 80 articles and papers, e.g. with Paul Ekins. 2004. "The costs of Kyoto for the US economy." *The Energy Journal* 25 (3): 53–71. See [www.econ.cam.ac.uk/dae/people/barker/index.htm](http://www.econ.cam.ac.uk/dae/people/barker/index.htm).

### **SALLY MERRICK BENSON**

#### **Lawrence Berkeley National Laboratory**

Dr. Sally M. Benson, of the Earth Sciences Division at Lawrence Berkeley National Laboratory, is a group leader for carbon sequestration research. Currently, she is a coordinating lead author for the IPCC's Special Report on Carbon Capture and Storage and the Project Director for the GEO-SEQ Project. Prior to this she has performed research on a wide range of topics related to environmental remediation and geothermal energy production. In addition to her scientific research, she has held several administrative positions at LBNL in past years. Until January 2005, she was the Deputy Director for Operations. Previous to that, she was the Associate Laboratory Director for Energy Sciences and the Earth Sciences Division Director. Dr. Benson received her B.A. from Barnard College and her M.S. and Ph.D. from the University of California, Berkeley.

### **KELLY BIRKINSHAW**

#### **California Energy Commission**

Kelly Birkinshaw is the environmental program manager for the Public Interest Energy Research Program of the California Energy Commission. In this capacity, he is responsible for a \$50 million research project portfolio addressing energy and the environment in the areas of air quality, water resources, land use/habitat, and climate change. As part of an integrated approach to climate change research, Mr. Birkinshaw established a virtual research center for regional-specific studies. This center, known as the California Climate Change Center, has core research activities at the Scripps Institute and University of California (UC), Berkeley. He is deputy director of the West Coast Carbon Sequestration Partnership and is currently creating an air quality research program at the Center for Sustainable Urban Development at UC Riverside. Mr. Birkinshaw received a B.S. and M.S. in Chemical Engineering from UC Davis.

### **CELINE J. BONFILS**

#### **University of California, Merced**

Dr. Bonfils is currently a Postdoctoral Scholar in the School of Natural Sciences at the University of California, working at the Lawrence Livermore National Laboratory under the direction of Philip Duffy and Benjamin Santer. She is currently studying the detection of anthropogenic climate change signal in California during the twentieth century.

Dr. Bonfils earned her Ph.D. in Oceanography, Meteorology and Environment at the University of Pierre and Marie Curie, France. Dr. Bonfils then moved to Berkeley in 2001 to work under the direction of Inez Fung, Professor at the University of California. She studied climate signatures of photosynthesis variability using a global model coupled to the carbon cycle.

Her other research interests include: (1) the use of climate models to estimate the risk of Pierce's disease in Californian grapevines; (2) fluctuations of climate during the last deglaciation (as part of the international Paleoclimate Modeling Intercomparison Project, PMIP); (3) the impact of surface parameterizations on climate sensitivity (monsoon systems, mid-latitudes); and (4) the development of new statistic methods to compare models; and palaeoenvironmental data.

Dr. Bonfils's work was presented in journals such as *Geophysical Research Letters*, *Climate Dynamics*, *Journal of Climate*, and *Proceedings of the National Academy of Sciences*. Her academic contribution includes reviews of scientific papers and proposals.

### **PETER D. BROMIRSKI**

#### **Scripps Institution of Oceanography**

Dr. Peter Bromirski is an Assistant Project Scientist at Scripps Institution of Oceanography. Previously, he has been a researcher at NOAA/SWFSC and at the University of Hawaii, Manoa. Dr. Bromirski's interests are: wave climate variability in the northeast Pacific, microseismic source areas and distribution in relation to wave climate, tide gauge data studies, and shear waves in marine sediments. He holds an M.S. in Natural Resources from Humboldt State University and a Ph.D. in Geology and Geophysics from the University of Hawaii.

### **SUSAN J. BROWN**

#### **California Energy Commission**

Susan Brown currently serves as a Senior Policy Analyst for the California Energy Commission. She is responsible for developing and recommending legislative policy and climate change policy, and recently assumed responsibility for

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coordinating the Energy Commission's Interagency Committee on Bio-Energy.

Ms. Brown has held a variety of policy and management positions at the Energy Commission. For ten years, she has served as a Special Advisor, advising the Commissioners on a broad range of energy policy and technical issues. Ms. Brown has testified on numerous occasions before the California Legislature, the Energy Commission, the California Public Utilities Commission, the Air Resources Board, and the California Transportation Commission on fuels and transportation issues. Susan earned the Energy Commission's *Outstanding Manager Award* in 1989 for her work on a nationally recognized Energy Shortage Contingency Plan.

Ms. Brown graduated *magna cum laude* and Phi Beta Kappa from the University of Southern California and the University of Vienna in Austria. She earned a Bachelor of Arts, a Master of Arts, and a California teaching credential from the USC College of Letters, Arts and Sciences.

### MIKE BURNETT

#### The Climate Trust

Mike Burnett, Executive Director of The Climate Trust, is an environmental engineer with 29 years of executive, management, policy, and technical experience in climate change, energy efficiency, and renewable resources, mostly in the Pacific Northwest.

As The Climate Trust's initial Executive Director, Mr. Burnett took the organization through its startup phase. Under his guidance, The Climate Trust has assembled an 11-project carbon offset portfolio totaling over \$6 million and 2.5 million metric tons of carbon dioxide, and has established an international reputation for quality, innovation, and cost-effectiveness.

Previously, Mr. Burnett was a vice president for Trexler and Associates, a climate change mitigation consulting firm, where he worked on corporate climate change strategies, early action crediting, and carbon offset project feasibility studies.

Mr. Burnett was also the founding CEO for Conservation and Renewable Energy System (CARES), a consortium of public power utilities in Washington State. CARES conducted the largest municipal conservation bond sale to date (\$38 million), which funded an innovative energy conservation program that delivered three times as much energy savings as planned.

Mr. Burnett also has worked in energy conservation, renewable energy, and power planning for two electric utility trade associations, the Bonneville Power Administration, a regional solar energy center, and the National Park Service.

Mr. Burnett earned an M.S. in Environmental Engineering from the University of Florida, studying systems ecology and energy analysis with Dr. Howard Odum while on a National Science Foundation Graduate Fellowship.

### DANIEL R. CAYAN

#### Scripps Institution of Oceanography/U.S. Geological Survey

Dan Cayan is a Researcher with the Scripps Institution of Oceanography Climate Research Division (CRD) and also with the U.S. Geological Survey, Water Resources Division. He is Director of CRD, serving in that position since 1996. Cayan directs two multi-investigator regional climate activities: the California Applications Program (CAP), sponsored by NOAA's Office of Global Programs, and the climate science portion of the California Climate Change Center (CCCC), sponsored by the California Energy Commission. These two entities are providing a better understanding of climate impacts on resources and decisionmakers in the California region. Cayan's research focuses on how hydrologic variability is driven by climate in western North America, and on improving climate monitoring capacity in California's mountains and watersheds.

### ANNE CHOATE

#### ICF Consultant

Anne Choate is a Project Manager with ICF Consulting. Ms. Choate has 10 years experience analyzing greenhouse gas (GHG) emissions and GHG emission reduction strategies for private companies, states, municipalities, the National Park Service, Environment Canada, the Environmental Protection Agency, the Department of Defense, and the Federal Highways Administration.

Ms. Choate developed the *Inventory of California Greenhouse Gas Emissions and Sinks: 1990-1999* under contract with the California Energy Commission. Most recently, Ms. Choate supported the Commission in the development of marginal abatement cost curves for non-CO<sub>2</sub> GHGs in California. Ms. Choate's experience also includes developing GHG inventories for Florida and Texas; creating state-level emission estimation guidance and tools; analyzing co-benefits of mitigation strategies, and tracking state actions to reduce GHG emissions and energy use.

Ms. Choate received a bachelor's degree from Duke University in Environmental Science and Policy and a master's degree from Johns Hopkins University in Environmental Science.

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### FRANCIS ILWHAN CHUNG

#### California Department of Water Resources

Dr. Francis Chung is currently Principal Engineer, Water Resources, and Chief of Modeling Support Branch at the California Department of Water Resources. He has over 25 years of experience in surface and subsurface hydrology, open channel hydrodynamics, water quality, and water resources systems engineering. He earned his B.S. in Civil Engineering from Seoul National University, and his M.S. and Ph.D. in Civil Engineering at the University of California, Davis, with an emphasis on Water Resources Planning and Management.

### MICHAEL DETTINGER

#### Scripps Institution of Oceanography/U.S. Geological Survey

Dr. Michael Dettinger is a research hydrologist for the U.S. Geological Survey, Branch of Western Regional Research, and a research associate of the Climate Research Division at Scripps Institution of Oceanography. Dr. Dettinger has monitored, evaluated, and researched water resources of the West for over 20 years, with emphases in the areas of regional surface water and groundwater systems, water availability, watershed modeling, hydroclimatic influences and causes in the West, and climatic influences on water resources. Among other activities, he received a Vice President's National Performance Review Award for physical-sciences leadership in Mojave Desert Ecosystems science and data management planning efforts in 1996, was an Associate Editor of the journal *Water Resources Research* from 1998–2000, has been the program chair and fundraiser for the annual Pacific Climate (PACLIM) Workshops from 1998 to 2004, is a founding member of the multi-institutional CIRMONT Western Mountain Climate Sciences Consortium, member of CALFED's standing Water Management Science Board, and member of the external Science Steering Group for the multi-agency federal Global Water Cycle Program. He has degrees from the University of California, San Diego (Physics), Massachusetts Institute of Technology (Civil Engineering), and a Ph.D. from the University of California, Los Angeles (Atmospheric Sciences).

### JOHN DRACUP

#### University of California, Berkeley

Dr. Dracup has been a professor in Civil and Environmental Engineering at Berkeley since June 2000. Prior to that he was a professor in the equivalent department at the UCLA from 1965–2000. At UC Berkeley he teaches courses on Design of Environmental and Water Resource Systems; Fluid Mechanics,

Water Resources Planning and Management; and International Water Systems. The focus of his research program is in hydrology and water resource systems analysis. In the area of hydrology he has been involved in the stochastic analysis of floods and droughts and the assessment of the impact of climate on hydrologic processes. In the area of water resources his research interests are in the simulation and optimization of groundwater systems and large-scale river basin systems. He has been a Principal Investigator for research grants from the United Nations Development Program, the National Science Foundation, the Ford Foundation, the Office of Naval Research, the Environmental Protection Agency, the Office of Water Resources Research, the California Air Resources Board, the Metropolitan Water District of Southern California, the UC Water Resources Center, the UC Pacific Rim Research Center and the National Institute for Water Resources Research. In 2000–01 he was a Senior Fulbright Scholar at the University of Melbourne, Australia. He is a Registered Professional Civil Engineer in California and the Fellow of five professional societies.

### JAE EDMONDS

#### Pacific Northwest National Laboratory

Jae Edmonds is a Chief Scientist and Laboratory Fellow at the Pacific Northwest National Laboratory's (PNNL) Joint Global Change Research Institute, and Adjunct Professor of Public Policy at the University of Maryland at College Park. Dr. Edmonds is the principal investigator for the Global Energy Technology Strategy Program to Address Climate Change, an international, public-private research collaboration. His research in the areas of long-term, global, energy, economy, and climate change spans more than 25 years, during which time he published several books and numerous scientific papers, and made countless presentations. He serves on numerous panels and advisory boards related to energy, technology, and climate change. He received his Ph.D. from Duke University in 1975.

### MIKE FLOYD

#### California Department of Water Resources

Mike Floyd is a senior engineer with the California Department of Water Resources' Statewide Planning Branch. His current responsibilities include the coordination of efforts to account for climate change in the next update of the California Water Plan, scheduled for 2010. Mr. Floyd is a surface and groundwater hydrologist with about 25 years of experience.

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### **ROBERT FRANCIS**

#### **University of Washington**

Robert Francis is professor in the School of Aquatic and Fishery Sciences, University of Washington. Much of his research in the past 15 years has involved studying relationships between climate and northeast Pacific coastal marine ecosystems, with a particular focus on coastal fisheries. Since its inception 10 years ago, he has been a principal in the Pacific Northwest Climate Impacts Group, University of Washington.

### **GUIDO FRANCO**

#### **California Energy Commission**

Guido Franco is a technical lead and senior engineer in the Public Interest Energy Research (PIER) Program of the California Energy Commission. Mr. Franco's area of work has focused on air quality and climate change. He has conceived and brought to fruition several air quality research projects for the Energy Commission. For the last five years, he has focused on climate change issues. He was the technical manager and main author of the statewide inventory of greenhouse gas emissions released by the Energy Commission in 1997. This inventory was very well received and prompted the legislature to pass a law requiring the Energy Commission to periodically update the 1997 inventory. Under Mr. Franco's lead, the Energy Commission updated this inventory in 2002. Mr. Franco is now the technical research manager for projects on climate change for the PIER program. He led the development of a long-term research plan on climate change and was one of the main authors of this plan. PIER is implementing this plan through the creation of the California Climate Change Center, which is a joint research effort between the PIER program and the University of California. He provides technical leadership for this Center for the PIER program. Mr. Franco recently prepared a technical paper on climate change impacts and adaptation options for California in support of the *2005 Integrated Energy Policy Report*. He is a certified engineer in California and received his MS from the University of California at Berkeley, in Thermal Sciences and Fluid Mechanics.

### **NICHOLAS GRAHAM**

#### **Hydrologic Research Center and Scripps Institution of Oceanography**

Dr. Nicholas Graham is a research scientist with the Hydrologic Research Center and the Scripps Institution of Oceanography. His research interests include the physics, predictability, and impacts of tropical sea surface temperatures; variability in North Pacific winter cyclone activity and wave climate;

objective assessment of the potential value of climate forecast information for water resource management; implementation of systems for the use of probabilistic weather and climate forecasts in integrated water management of large reservoirs in California; and the causes and impacts of Late Holocene climate variability in the western United States. Recent work for the California Energy Commission includes the completion of a 160-year simulation of North Pacific wave climate covering 1940–2099 using NCAR climate change scenario results, and participation in the development of the INFORM climate-hydrology decision support system for Northern California reservoirs.

### **MICHAEL HANEMANN**

#### **University of California, Berkeley**

Michael Hanemann is a Chancellor's Professor of Environmental Economics and Policy in the Department of Agricultural and Resource Economics and the Goldman School of Public Policy at UC Berkeley, and Director of the California Climate Change Center at UC Berkeley.

His major fields of interest are environmental economics and policy, water resource economics and policy, and climate change economic and policy; he has published extensively in these fields.

He holds a B.A. in Philosophy, Politics and Economics from Oxford University, an M.Sci. in Economics from the London School of Economics, and a Ph.D. in Economics from Harvard University. He was awarded an Honorary Ph.D. by the Swedish University of Agricultural Sciences.

### **EDWARD A. (NED) HELME**

#### **Center for Clean Air Policy (CCAP)**

Ned Helme, President, helped create the Center for Clean Air Policy in 1985, with a number of progressive state governors. He manages day-to-day operations and directs policy work and project development, in addition to leading many of the Center's dialogue groups and contributing to policy papers. Ned directs the Center's extensive fundraising efforts. He is actively involved in the international negotiations on climate change and is a recognized expert and frequent speaker before domestic and international audiences on climate change, emissions trading, air quality, and energy policy. Prior to heading the Center, he served for eight years as Staff Director for the National Governors Association's (NGA) Committee on Energy and Environment and as Director of NGA's Natural Resources Division. He also served five years as Chief Legislative Assistant to former U.S. Representative Ken Hechler and worked closely with the House Science and

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Technology Subcommittee on Energy Research, Development and Demonstration. Ned holds a M.A. in Public Policy from the University of California at Berkeley and a B.A. from Haverford College in political science and psychology.

### **DOUGLAS L. INMAN**

#### **Research Professor of Oceanography**

Dr. Inman is a Research Professor of Oceanography and founding Director of the Center for Coastal Studies at Scripps Institution of Oceanography, University of California, San Diego. He holds degrees in Physics, Geology, Electronics, and a Ph.D. in Oceanography. He is a Guggenheim Fellow, and he has served as a UNESCO Lecturer in Marine Science in a number of countries. Dr. Inman is the author of over two hundred scientific publications, he was Technical Director for the Orbit Award-Winning Film, "The Beach: A River of Sand," and he has received the American Society of Civil Engineers "International Coastal Engineering Award" (1988) and the "Ocean Science Educator Award" (1990) from the Office of Naval Research. During his career, he and his students have pioneered the fields of nearshore and coastal processes. Their research provides the physical-mathematical relations that underlie the modeling of coastal morphology.

### **MARK Z. JACOBSON**

#### **Stanford University**

Mark Jacobson is an Associate Professor in the Department of Civil and Environmental Engineering at Stanford University. He is also the Director and cofounder of the Atmosphere/Energy Program in the Department. His degrees are in Civil Engineering (B.S. with distinction, 1988, Stanford), Economics (B.A. with distinction, 1988, Stanford), Environmental Engineering (M.S., 1988, Stanford), Atmospheric Sciences (M.S., 1991, UCLA), and Atmospheric Sciences (Ph.D., 1994, UCLA). He has been on the faculty at Stanford since 1994. Some goals of his research are to understand better, through numerical modeling, feedbacks of aerosol particles and gases to weather and climate; and the effects of energy use on climate and air pollution. To date, he has published two textbooks, *Fundamentals of Atmospheric Modeling* and *Atmospheric Pollution: History, Science, and Regulation*, and 70 peer-reviewed scientific journal articles. He has also developed computer algorithms that hundreds of researchers in the field have used. He recently received the 2005 American Meteorological Society Henry G. Houghton Award for "significant contributions to modeling aerosol chemistry and to understanding the role of soot and other carbon particles on climate." See: [www.stanford.edu/group/fmh/jacobson](http://www.stanford.edu/group/fmh/jacobson) for more information.

### **JOHN KADYSZEWSKI**

#### **Winrock International**

John Kadyszewski is the leader of Winrock International's Ecosystem Services Group that seeks to bring sound science and economics to help land managers identify and capture ecosystem benefits and potential revenue streams. He is the co-leader of work sponsored by the California Energy Commission's PIER program to establish baselines and quantify terrestrial carbon sequestration opportunities for the State of California, and for new work underway in Shasta County to examine specific terrestrial sequestration options in closer detail. Work carried out for the PIER Program has highlighted: (1) the significant impact fire has and will have on existing and future carbon stocks on forest lands, and (2) the potential to increase carbon storage by planting trees on grazing lands. He also co-leads the terrestrial sequestration work for the West Coast Regional Carbon Sequestration Partnership covering potential terrestrial sequestration activities in California, Oregon, Washington, and Arizona, and for the Southeast Regional Carbon Sequestration Partnership covering potential terrestrial sequestration activities in ten states in the southeast.

He has worked on energy and resource management issues for 28 years with research and development and project implementation experience in the United States and more than 20 countries in Africa, Latin America, Asia, and Europe. He has a B.S. in engineering from Princeton University.

### **MASAO KANAMITSU**

#### **Scripps Institution of Oceanography**

Dr. Masao Kanamitsu is a senior researcher at the Scripps Institution of Oceanography, University of California, San Diego. His research includes climate prediction, historical analysis of atmospheric data and downscaling using numerical models and data assimilation technique. He holds a Ph.D. in Meteorology from Florida State University. Dr. Kanamitsu spent several years at major international meteorological centers in Europe, United States, Japan, and Australia. He was a core member of the NCEP/NCAR reanalysis project and also conducted NCEP/DOE Reanalysis-2.

### **MIKE KLEEMAN**

#### **University of California, Davis**

Dr. Michael Kleeman received his B.A.Sc. in Mechanical Engineering from the University of Waterloo in 1993, his M.S. in Environmental Engineering Science from the California Institute of Technology in 1994, and his Ph.D. in Environmental Engineering Science from the California Institute of Technology

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in 1998. Dr. Kleeman is currently an Associate Professor in the Department of Civil and Environmental Engineering at the University of California at Davis. His research interests focus on the study of urban and regional air quality problems with an emphasis on the size and composition of atmospheric particles and gas-to-particle conversion processes. Dr. Kleeman is conducting a series of measurements and model calculations to determine which sources currently contribute to various aspects of the particulate air pollution problem in California's San Joaquin Valley. Dr. Kleeman is also leading several efforts to study how future air quality in the San Joaquin Valley will be affected by changes at the local, regional, and global scale.

### **CHET KOBLINSKY**

#### **National Oceanic and Atmospheric Administration (NOAA)**

Dr. Chet Koblinsky is the director of the NOAA Climate Program Office. In this role, he oversees the development of all of NOAA's climate activities. He also manages a large external climate grants programs, which includes regional climate science and applications. Prior to joining NOAA two years ago, Dr. Koblinsky conducted ocean research at the Scripps Institution of Oceanography in La Jolla, California, and NASA's Goddard Space Flight Center in Greenbelt, Maryland. He is the author of numerous research papers on oceanographic and remote sensing studies. Dr. Koblinsky was educated at Reed College and received a doctorate degree in oceanography from Oregon State University.

### **MARTHA KREBS**

#### **California Energy Commission**

Dr. Martha Krebs is Director of the Energy Research and Development Division for the California Energy Commission. The Division is responsible for the Public Interest Energy Research (PIER) program, which conducts research that seeks to improve the quality of life for California citizens by developing environmentally sound, reliable, and affordable electricity and natural gas services and products. Before coming to the Energy Commission, she was President of Science Strategies, an analysis and consulting firm that works with public and private organizations to identify critical issues and opportunities in science and technology.

Prior to establishing Science Strategies, she was an Associate Vice Chancellor for Research at the University of California at Los Angeles. She came to UCLA as the founding Institute Director of the California NanoSystems Institute (CNSI), where she was responsible for establishing the initial leadership, strategic direction, and administration of the Institute. The Institute is focused on the understanding and design of nanostructures and their integration into complex

systems with new properties beyond those already found in nature. Earlier, Dr. Krebs was a senior Fellow at the Institute for Defense Analysis, where she led studies in R&D management, planning, and budgeting.

From 1993–2000, Dr. Krebs served as Assistant Secretary and Director of the Office of Science at the Department of Energy, responsible for the \$3.5 billion basic research program that underlay the Department's energy, environmental, and national security missions. She also had the statutory responsibility for advising the Secretary on the broad R&D portfolio of the Department and the institutional health of its National Laboratories. During her tenure, she built international collaborations in particle physics; strengthened interagency collaborations for human genome sequencing, synchrotron radiation, and global climate research; and oversaw the advocacy and successful construction of eight major scientific user facilities. She served on the National Science and Technology Council's Interagency Committee on Science and its Committee on the Environment.

From 1983–1993, she served as an Associate Director for Planning and Development at the DOE's Lawrence Berkeley National Laboratory, where she was responsible for strategic planning for research and facilities, Laboratory technology transfer, and science education and outreach. From 1977–1983, she served on the House Committee on Science, first as a Professional Staff Member and then as Subcommittee Staff Director, responsible for authorizing DOE non-nuclear energy technologies and energy science programs.

She received her bachelor's degree and Ph.D. in Physics from the Catholic University of America. She is a member of Phi Beta Kappa, a Fellow of the American Physical Society, a Fellow of the American Association for the Advancement of Science, and a Fellow of the Association of Women in Science. She is a member of the National Research Council's Board on Energy and Environmental Systems and its Board on Chemical Science and Technology. She is also a Trustee of the Institute for Defense Analyses.

### **L. RUBY LEUNG**

#### **Pacific Northwest National Laboratory**

Dr. Leung is a Laboratory Fellow at the Atmospheric Science and Global Change Division, Fundamental Science Directorate, Pacific Northwest National Laboratory, and an Affiliate Scientist at the National Center for Atmospheric Research (NCAR). Her primary research focus is modeling regional climate variability and change. She has developed a regional climate model that features a subgrid orographic precipitation scheme, coupled to a distributed hydrologic model to represent subgrid variations of orography and landuse and their effects on precipitation and land surface

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processes. She has led several multi-disciplinary projects to examine the impacts of climate variability and change on water resources in the western United States. More recently, she also applies regional climate models to investigate the impacts of climate change on air quality in the United States, and the effects of aerosols on the regional climate and hydrological cycle over Asia. During 1999–2001, Dr. Leung led a working group at NCAR to organize community effort in the development of a regional climate model. In 2001, she organized a Workshop on “Regional Climate Research: Needs and Opportunities,” co-sponsored by the National Science Foundation and Department of Energy, to examine various approaches to modeling regional climate. Currently, Dr. Leung is a member of the Weather Research and Forecasting (WRF) Model Research Applications Board, and is leading the WRF Regional Climate Modeling Working Group at NCAR to coordinate research and development on a next generation community regional climate model based on WRF. Dr. Leung holds a Ph.D. and M.S. in Meteorology from Texas A&M University, and a B.S. in Physics and Statistics from Chinese University of Hong Kong.

### JAY R. LUND

#### University of California, Davis

Jay Lund is a Professor of Civil and Environmental Engineering at the University of California, Davis. He specializes in the integrated management of large-scale water and environmental systems. His modeling activities have included economic engineering optimization modeling of California's extensive inter-tied system, the Columbia River system, the Missouri River system, and other smaller systems—as well as more theoretical and methodological studies of integrated systems, including water marketing, water conservation, and reservoir system operations. He is on the Advisory Committee for the California Water Plan Updates of 1998 and 2005 and is a past Editor of the *Journal of Water Resources Planning and Management*. For more information, visit <http://cee.engr.ucdavis.edu/faculty/lund/>.

### DENA M. MACMYNOWSKI

#### Stanford University

Dr. Dena MacMynowski is a Postdoctoral Fellow at the Center for Environmental Science and Policy in the Stanford Institute for International Studies at Stanford University. Her research interests include the ecological impacts of climatic change, the policy and practice of large-scale environmental management, and the social construction of nature. She is currently investigating the potential for climatic change-induced ecosystem disruption from asynchronous

phonological changes. She completed her D.Phil. at Oxford University in 2003 in social geography. In 1999, she was selected as a Rhodes Scholar. While in high school and as an undergraduate, she owned and operated a small business; for this, she was selected as New Jersey College Entrepreneur of the Year in 1998.

### JIM MARSTON

#### Texas Office of the Environmental Defense

Jim Marston is founding Director of the Texas Office of Environmental Defense, located in Austin. He has continued to serve as Director since 1987. The office is comprised of scientists, attorneys, economists, and policy analysts who address environmental issues related to climate and air, ecosystems, and oceans. Mr. Marston is the former chair of the U.S. Good Neighbor Environmental Board, Presidential Advisory Committee. Mr. Marston served as Vice-Chairman of the Texas Ethics Commission from 1992 to 1994. He has served on numerous other advisory boards for the State of Texas, the City of Austin, electric utilities, and a university. He currently serves on the board of directors of Texas Observer, Texas Environmental Research Consortium, Texas League of Conservation Voters, and the Central Texas Clean Air Force. He has had a variety of positions in many political campaigns. Before coming to Environmental Defense, Mr. Marston was a partner in the law firm of Doggett, Jacks, Marston, and Perlmutter and an Assistant Attorney General of Texas. He is a member of the State Bar of Texas and the Federal Bar Association for the Western District of Texas. Mr. Marston received his doctor of jurisprudence from New York University School of Law, where he was a Root-Tilden Scholar and served on the *Journal of International Law and Politics*. He received his bachelor's degree from Texas Christian University, where he was selected Phi Beta Kappa.

### ERIC MASANET

#### Lawrence Berkeley National Laboratory

Dr. Eric Masanet is a Principle Scientific Engineering Associate at Lawrence Berkeley National Laboratory (LBNL). Dr. Masanet performs research at LBNL in the areas of product life-cycle assessment, industrial energy efficiency, industrial best practice technology assessment, and end use energy modeling. Prior to joining LBNL, Dr. Masanet was a postdoctoral researcher at UC Berkeley's Consortium on Green Design and Manufacturing. He holds a Ph.D. in Mechanical Engineering from UC Berkeley with a specialization in sustainable design and manufacturing.

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### EILEEN MCCAULEY

#### California Air Resources Board

Eileen McCauley is the manager of the Atmospheric Processes Research Section in the Research Division of the California Air Resources Board. The section is responsible for managing research in a number of diverse areas, including atmospheric chemistry, climate change and global air pollution, model improvements, instrument development, and emissions inventory improvement. In addition the section has been responsible for a number of major field studies, most recently the Lake Tahoe Atmospheric Deposition Study, a multimillion dollar effort to estimate atmospheric deposition to Lake Tahoe. She received a Ph.D. in chemistry from the University of California, Davis, for work in the field of low-temperature spectroscopy.

### NORM MILLER

#### Lawrence Berkeley National Laboratory

Dr. Miller is a Staff Hydrometeorologist at the University of California's Berkeley National Laboratory and is an Adjunct Professor in the Department of Hydrology and Water Resources at the University of Arizona-Tucson. He leads the Atmosphere and Ocean Sciences Group at Berkeley Lab, is a founding member of the National Center for Hydrologic Synthesis, and from 1999 to 2003 led the NASA-sponsored California Water Resources Research and Applications Center. His research includes analyzing atmosphere and land surface-subsurface processes at a range of scales, evaluating climate change impacts, and advancing new conceptual and computational techniques for climate simulations. He has published over 60 peer-reviewed journal papers and book chapters, is a contributing author of the Intergovernmental Panel for Climate Change Second, Third, and Fourth Assessment Reports; the Southwestern U.S. National Assessment; and the California Assessment Reports.

### NEHZAT MOTALLEBI

#### California Air Resources Board

Nehzat Motallebi is staff air pollution specialist in the Research Division of the California Air Resources Board (ARB). She has a Ph.D. in Atmospheric Science from University of California, Davis. Her primary responsibility at ARB includes managing research projects in the field of PM monitoring, data analysis, and regional air quality modeling. She is also managing several research projects on global radiative effect of particulate black carbon, improving the carbon dioxide emission estimates from the combustion of fossil fuels in California, and the impact of climate change on meteorology and regional air quality in California.

### PHILIP MOTE

#### University of Washington

Dr. Philip Mote is a research scientist at the University of Washington, in the Climate Impacts Group (CIG), and an Affiliate Assistant Professor in the Department of Atmospheric Sciences. His research interests include Northwest climate and its effects on snowpack, streamflow, and forest fires. A frequent public speaker, he has also written about 50 scientific articles and edited a book on climate modeling, published in 2000. In 2003 he became the Washington State Climatologist.

### LARRY MYER

#### University of California Office of the President/California Institute for Energy and Environment

Dr. Larry Myer is currently Technical Director for the West Coast Regional Carbon Sequestration Partnership, which is evaluating carbon dioxide capture, transport, and sequestration technologies, involving both terrestrial and geologic options, for the region comprising Arizona, California, Nevada, Oregon, Washington, and Alaska. Dr. Myer also co-directs the DOE-funded GEO-SEQ project, which is an applied R&D effort focused on monitoring and verification, subsurface flow, and transport in geologic sequestration. His personal research interests include deformation and failure of rock, seismic wave propagation, and fluid flow in fractured, porous media. Dr. Myer has a Ph.D. in Geological Engineering from the University of California, Berkeley, and a B.S. in Engineering Mechanics from Pennsylvania State University.

### RONALD P. NEILSON

#### USDA Forest Service

Ronald P. Neilson is a BioClimatologist with the USDA Forest Service, Pacific Northwest Research Station, and a Professor (Courtesy) with the Department of Botany and Plant Pathology and the Department of Forest Science at Oregon State University. Dr. Neilson has focused on the theory, mechanisms, and simulation of vegetation distribution for nearly three decades. He received the Cooper Award from the Ecological Society of America for his research on oak distribution in the Rocky Mountain region. Dr. Neilson's MAPSS biogeography model and MC1 dynamic general vegetation model have contributed to national and global assessments by the Intergovernmental Panel on Climate Change (IPCC) and the U.S. Global Change Research Program and to *Our Changing Planet*, the formal description of the U.S. Global Change Research Program. Dr. Neilson was the lead author for the Forest sector for the IPCC's

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special report on the regional impacts of climate change and the convening lead author for an annex to the special report on simulations of global vegetation redistribution under climate change. His current work extends into earth system modeling, landscape system modeling, and large-scale fire forecasting. Dr. Neilson received the Forest Service Chief's 1999 Honor Award for Superior Science and the USDA Secretary's Honor Award for Superior Service in 2003. He received a B.A. in 1971 from the University of Oregon, an M.S. in 1975 from Portland State University, and a Ph.D. in 1981 from the University of Utah.

### DAVID PIERCE

#### Scripps Institution of Oceanography

Dr. David Pierce obtained his B.A. in Physics from the University of California, Santa Cruz, then worked for several years in the memory products division of Intel Corporation. He attended graduate school at the University of Washington on an Office of Naval Research Fellowship, receiving an M.S. and Ph.D. in Physical Oceanography. He then joined the staff in the Climate Research Division of the Scripps Institution of Oceanography, where he has worked on such problems as El Niño prediction, thermohaline variability, large-scale numerical modeling of the ocean and atmosphere, understanding climate variability in the North Pacific, and global climate change. His current work includes studying climate predictability and variability over the western United States, with applications to such fields as agriculture, energy supply and demand prediction, and the regional effects of global climate change.

### KELLY T. REDMOND

#### Desert Research Institute

Since 1989, Dr. Kelly T. Redmond has been the Regional Climatologist at the Western Regional Climate Center, located at the Desert Research Institute in Reno, Nevada. He has been Deputy Director since 1992. His research and professional interests span every facet of climate and climate behavior, its physical causes and behavior, how climate interacts with other human and natural processes, and how such information is acquired, used, communicated, and perceived. Dr. Redmond worked in the Atmospheric Sciences Department at Oregon State University from 1982–1989 (the last six years as State Climatologist for Oregon) and served as President of the American Association of State Climatologists in 1989–1990. He received a B.S. in Physics from the Massachusetts Institute of Technology in 1974, and an M.S. (1977) and Ph.D. (1982) in Meteorology from the University of Wisconsin, Madison.

### DAVID ROLAND-HOLST

#### University of California, Berkeley

Dr. David Roland-Holst is the James Irvine Professor of Economics at Mills College and Director of the Rural Development Research Consortium at the University of California, Berkeley. A leading expert on policy modeling, Computable General Equilibrium (CGE) models, and social accounting matrices, Professor Roland-Holst has extensive research experience on the environment, economic development, and international trade. He has served in several academic posts in Europe and the United States. He has also worked with public institutions, including a variety of federal and state agencies, the Asian Development Bank, Inter-American Development Bank, Organization for Economic Cooperation and Development (OECD), World Bank, and the United Nations—as well as governments in Asia, Latin America, Europe, and the United States. Professor Roland-Holst has undertaken applied research in over 25 countries, has authored numerous journal articles and books, and holds a Ph.D. from the University of California, Berkeley.

### TERRY ROOT

#### Stanford University

Dr. Terry L. Root is a Senior Fellow at the Center for Environmental Science and Policy in the Stanford Institute for International Studies at Stanford University. She primarily works on large-scale ecological questions with a focus on the impacts of global warming. She actively works at making scientific information accessible to decision makers and the public (e.g., she is a Lead Author for the IPCC Third and Fourth Assessment Reports). In 1999, she was chosen as an Aldo Leopold Leadership Fellow, in 1992 as a Pew Scholar in Conservation and the Environment, and in 1990 as a Presidential Young Investigator Award from the National Science Foundation.

### DANIEL ROSENFELD

#### The Hebrew University of Jerusalem

Dr. Daniel Rosenfeld is a professor of meteorology at the Hebrew University of Jerusalem, Israel. Dr. Rosenfeld's research focused on cloud-aerosol interactions impacts on precipitation, water resources, and climate change, from a variety of angles. He conducted and evaluated cloud-seeding experiments in Israel, the United States, and Southeast Asia. He developed new methodologies to assess cloud microstructure, precipitation-forming processes, and rainfall measurements by remote sensing from space, validated them by in situ aircraft measurements, and applied these methods

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for documenting the impacts of smoke and air pollution as well as of cloud seeding on cloud properties and precipitation. He showed that air pollution from densely populated areas can delay precipitation-forming processes in clouds. This leads to net decrease of precipitation in winter clouds, especially those formed over the hills in semi-arid regions, and so decreases the available water resources where they are needed most. Dr. Rosenfeld has documented his research in nearly 100 refereed scientific publications, and has received numerous awards. Dr. Rosenfeld received his M.S. and Ph.D. degrees in atmospheric sciences, and B.S. in geology, all at the Hebrew University of Jerusalem.

### **MICHAEL W. RUFO**

#### **Quantum Consulting, Inc.**

Michael Rufo has over 15 years of experience as an energy consultant focusing on demand-side issues in electricity and natural gas markets. He has developed market analyses for many sectors and industries, conducted evaluations of a wide variety of energy programs, and led numerous energy efficiency potential studies. Mr. Rufo also authored an analysis of the state-of-the-art, limitations, and future research needs associated with energy efficiency and greenhouse gas mitigation supply curves for the California Energy Commission's PIER program. He also manages a national study on best practices for energy efficiency programs. Mr. Rufo has an M.A. in Technology and Human Affairs from Washington University, and a B.A. in Environmental Studies and Planning from California State University, Sonoma.

### **SAM SADLER**

#### **Oregon Department of Energy**

Sam Sadler is a senior analyst in the Renewable Energy Division of the Oregon Department of Energy. Since 1988 he has been the lead staffer for developing climate change strategy for the Oregon Department of Energy. He is the Oregon coordinator for the West Coast Governors' Global Warming Initiative. He served as staff coordinator for the Governor's Advisory Group on Global Warming in 2004. He will serve as lead staffer for the Governor's Task Force on Carbon Allocation Standards and for the Governor's Advisory Group on Adaptation to Global Warming when the Governor creates them in September 2005. Mr. Sadler represented the Department of Energy in negotiating a carbon dioxide (CO<sub>2</sub>) standard for new energy facilities, which the Oregon Legislature adopted in June 1997. He has been project officer for implementing the CO<sub>2</sub> standard for new power plants and for expanding the coverage of the CO<sub>2</sub> standard to other

types of energy facilities. He has also overseen the implementation of CO<sub>2</sub> offset projects by an energy facility site certificate holder.

### **ALAN H. SANSTAD**

#### **Lawrence Berkeley National Laboratory**

Dr. Alan H. Sanstad is a Staff Scientist at Lawrence Berkeley National Laboratory. His interests include the economic and policy analysis of energy efficiency and technological change, and the integrated assessment of global climate change. Dr. Sanstad's work has appeared in journals, including *Energy Economics*, *Energy Policy*, and *Contemporary Economic Policy*, as well as in various monographs, book chapters, and working papers. He holds an A.B. in Applied Mathematics and M.S. and Ph.D. degrees in Operations Research from the University of California, Berkeley.

### **BENJAMIN DAVID SANTER**

#### **Lawrence Livermore National Laboratory**

Dr. Benjamin Santer is an atmospheric scientist at Lawrence Livermore National Laboratory (LLNL). His research focuses on such topics as climate model evaluation, the use of statistical methods in climate science, and identification of natural and anthropogenic "fingerprints" in observed climate records. Dr. Santer's early research on the climatic effects of combined changes in greenhouse gases (GHGs) and sulfate aerosols contributed to the historic "discernible human influence" conclusion of the 1995 Report by the Intergovernmental Panel on Climate Change (IPCC). His recent work indicates that observed increases in tropopause height since 1979 are largely driven by human-induced changes in well-mixed GHGs and stratospheric ozone. He is currently addressing the contentious issue of whether model-simulated changes in tropospheric temperature are in accord with satellite-based temperature measurements. Dr. Santer holds a Ph.D. in Climatology from the University of East Anglia, England, where he studied under Dr. Tom Wigley. After completion of his Ph.D. in 1987, he spent five years at the Max-Planck Institute for Meteorology in Germany, and worked with Professor Klaus Hasselmann on the development and application of climate fingerprinting methods. In 1992, Dr. Santer joined the Program for Climate Model Diagnosis and Intercomparison at LLNL. He served as convening lead author of the climate-change detection and attribution chapter of the 1995 IPCC report. His awards include a MacArthur Fellowship in 1998 and the Department of Energy's E.O. Lawrence Award in 2002.

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### STEVE SHAFFER

#### California Department of Food & Agriculture

Steve Shaffer is Director of the Office of Agriculture and Environmental Stewardship for CDFA, the position he has held since November 2000. The office is comprised of an outstanding group of scientists who address environmental issues related to agriculture using a multidisciplinary approach. In this capacity, Mr. Shaffer represents CDFA on a number of environmental and natural resource management planning, implementation, and monitoring activities as they relate to agriculture. Recently, Mr. Shaffer served on the Governor's California Performance Review, a comprehensive review of State government "to make it work better and cost less."

Mr. Shaffer graduated from University of California, Santa Barbara, with a degree in Biochemistry/Molecular Biology. He just celebrated thirty years at CDFA, serving the public, agriculture, and the environment.

### JOHAN SIX

#### University of California, Davis

Dr. Johan Six, Ph.D., is a Full Professional Researcher in the Department of Plant Sciences at the University of California in Davis.

Dr. Six received his Ph.D. in Soil Science in 1998 from Colorado State University. His Ph.D. research was conducted in the Natural Resource Ecology Laboratory (NREL) under the supervision of Dr. E.T. Elliott and Dr. K. Paustian. His research focused on the mechanisms underlying greenhouse gas mitigation by no-tillage practices. Dr. Six remained as a Research Scientist at NREL from 1998 until 2002. He led and was involved in many projects investigating the effect of land use change and management on greenhouse gas fluxes in agricultural, grassland, and forest ecosystems. Since being at UC Davis in 2002, Dr. Six has further developed this line of research but has also expanded it to water-quality issues; in particular, investigating the effects of ecosystem management on pollutant (i.e. nitrogen, *E. coli*, and carbon) loads in drainage canals.

Dr. Six was the Colorado State University Representative for Task 1. Basic Processes and Mechanisms of the Consortium for Agricultural Soils Mitigation of Greenhouse Gases (CASMGs). He also organized a Symposium titled: "Nitrous Oxide Emissions from Soils: From Controls to Multi-Gas Approach" at the Soil Science Society of America meeting, Denver, Colorado.

### LISA CIRBUS SLOAN

#### University of California, Santa Cruz

Lisa Cirbus Sloan is a Professor of Earth Sciences and the Director of the Climate Change and Impacts Laboratory at the University of California, Santa Cruz. Dr. Sloan received her Ph.D. from Pennsylvania State University in 1990; she did postdoctoral work at the University of Michigan. Dr. Sloan joined the faculty at UCSC in 1995. She has been the National Secretary of the American Geophysical Union's Ocean Sciences Section, a scientific fellow of the David and Lucile Packard Foundation, Editor-in-Chief of the international journal *Global and Planetary Change*, and has co-chaired the National Center for Atmospheric Research's Paleoclimate Working Group. She is currently a member of the Advisory Panel for the Scientific Computing Division at the National Center for Atmospheric Research, and is editor of the international journal *Paleoceanography*. Dr. Sloan's research is concentrated in two broad areas: (1) understanding the mechanisms of past climate changes, and (2) studying and modeling future climate change at regional scales and investigating the possible impacts of future climate change on human and natural systems. She has authored or coauthored more than 50 peer-reviewed articles and book chapters. For more information, see [www.es.ucsc.edu/~lcsloan/](http://www.es.ucsc.edu/~lcsloan/).

### GARY S. SMITH

#### Timberland Company

Gary Smith is the Senior Vice President, Supply Chain Management for The Timberland Company, headquartered in Stratham, New Hampshire. In this capacity, he has worldwide responsibility for developing and implementing the strategy for Timberland's global apparel and footwear operating business system, overseeing product development, manufacturing, sourcing, logistics, and customer service functions. Mr. Smith is also the General Manager of Timberland's Outdoor Performance business, responsible for the design, marketing, and sales of footwear and apparel for active outdoor consumers. In both roles, Mr. Smith monitors the environmental footprint tied to Timberland's business and implements programs and projects that minimize associated impacts. Under his direction, Timberland investments in renewable energy and energy efficiency have helped the company reduce its emissions by nearly 18% over its 2003 baseline. This fall Mr. Smith's team will install one of California's largest ground-mounted solar arrays at Timberland's distribution center in Ontario, California. The

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400 kW system, in combination with renewable energy located or purchased at other Timberland sites, will provide the company with 7% of its global electric demand.

### **EDWARD VINE**

#### **Lawrence Berkeley National Laboratory**

Dr. Edward Vine is Program Manager of the Environmental Program at the California Institute for Energy and Environment (CIEE). He provides technical assistance to the PIER Environmental Area (PIER-EA) Program at the California Energy Commission and is Program Administrator for two PIER-EA programs: the Environmental Exploratory Grant Program and the Climate Change Grant Program. Dr. Vine is also a Staff Scientist at the Lawrence Berkeley National Laboratory, and he has been involved in the evaluation of energy-efficiency programs and technology performance measurement for over 25 years. Dr. Vine is widely published in the professional literature on the evaluation of energy efficiency programs and energy policy and is a member of the American Evaluation Association, the Planning Committee of the International Energy Program Evaluation Conference, Association of Energy Services Professionals, and the California Demand-Side Management Measurement Advisory Committee. He is President of the Board of Directors of the International Energy Program Evaluation Conference and an Affiliated Faculty Member of the Energy and Resources Group at the University of California, Berkeley.

### **ANTHONY WESTERLING**

#### **Scripps Institution of Oceanography**

Dr. Anthony Westerling is an Assistant Project Scientist in the Climate Research Division of Scripps Institution of Oceanography. His research interests include applied climatology and seasonal forecasting for wildfire activity and energy demand in western North America. Dr. Westerling holds a B.A. from University of California, Los Angeles; and a Ph.D. from University of California, San Diego, in Economics.

### **DOUG WICKIZER**

#### **California Department of Forestry and Fire Protection**

Mr. Wickizer is the Department Chief for Environmental Protection, Regulation, and Forest Product Utilization for the California Department of Forestry and Fire Protection (CDF), where he has worked since 1973. His experience includes, Forest Practice Inspector, Forest Practice Review Team Chair, Service Forester, Forest Practice Litigation Coordinator, Environmental Protection Officer for the Department, Regulations Coordinator for the Board and Department of Forestry and Fire Protection, Committee Consultant for the Board, Chief of Department Forest Management Program, and Administrative Chief for Department South Region. The Department's interests and efforts in biomass utilization and Global Climate Change are a portion of his program efforts. He is currently a member of the Society of American Foresters, where he has served in a variety of capacities. Projects that Mr. Wickizer has helped bring to a successful conclusion include: major revision of the Forest Practice Rules during late 1980s and early 1990s, completion of the initial Soil Erosion Study, establishment of the Board Monitoring Study Group, The California Fire Plan, and the 2004 FRAP report. Mr. Wickizer earned a bachelor's degree in Forest Land Management from Northern Arizona University in 1970.

## POSTER SESSION



**1. Research Related to Climate Change in California Performed at the Institute for Research on Climate Change and Its Societal Impacts (IRCCSI)**

Philip B. Duffy (LLNL, UC Merced), Govindasamy Bala (LLNL), Celine Bonfils (UC Merced), Qingyun Duan (LLNL), Ian Ferguson (UC Berkeley), Seran Gibbard (LLNL), Xu Liang (UC Berkeley), David Lobell (LLNL), Art Mirin (LLNL), Benjamin Santer (LLNL).

**2. Modeling Climate Change Impacts on Biodiversity**

Lee Hannah (Conservation International), Frank Davis (UC Santa Barbara), David Stoms (UC Santa Barbara), Jim Thorne (UC Davis).

**3. Asian Sources Dominate the “Background” Aerosol Over North America**

R. VanCuren (California Air Resources Board), S. Cliff (UC Davis), K. Perry (University of Utah).

**4. Measurement Strategies for Advancing Understanding and Forecasting of Sierra Nevada Water Balance**

Roger Bales (UC Merced), Thomas Meixner (University of Arizona), Norman Miller (LBNL), Thomas Harmon (UC Merced), Noah Molotch (University of Colorado), Jeff Dozier (UC Santa Barbara), John Warwick (Desert Research Institute), Dan Cayan (USGS and Scripps Institution of Oceanography), Kelly Redmond (Desert Research Institute), Martha Conklin (UC Merced).

**5. The Warming of Lake Tahoe**

Robert Coats (Hydroikos Ltd.), Joaquim Perez-Losada (Universitat de Girona, Girona, Spain), Geoffrey Schladow (UC Davis), Robert Richards (UC Davis), Charles Goldman (UC Davis).

**6. Past Impacts and Future Scenarios of Climate on Ecosystem Carbon Balance for the Western United States**

Christopher Potter (NASA Ames Research Center), Steven Klooster (CSU Monterey Bay), Vanessa Genovese (CSU Monterey Bay), Seth Hiatt (San Jose State University), Matthew Fladeland (NASA Ames Research Center).

**7. Climate Change Impacts on California’s Energy Security Planning**

Steven Fernandez, Loren Toole, Sam Flaim (Los Alamos National Laboratory).

**8. Monitoring Forest Carbon and Impacts of Climate Change with Forest Inventories, High-Resolution Satellite Images, and LIDAR**

Patrick Gonzalez (The Nature Conservancy), Gregory P. Asner (Stanford University), John J. Battles (UC Berkeley), Michael A. Lefsky (Colorado State University).

**9. California Energy Balances Databases and the 2000 Energy Flow Chart**

S. Murtishaw, L. Price, S. de la Rue du Can, E. Masanet, E. Worrell, and J. Sathaye (LBNL).

**10. Changes in Aggregate-Protected Carbon with Conservation Tillage and Cover Cropping**

Jessica Veenstra, UC Davis.

**11. Trends in Snowfall versus Rainfall for the Western United States, 1949–2004**

Noah Knowles (U.S. Geological Survey), Michael D. Dettinger (Scripps Institution of Oceanography), Daniel R. Cayan (Scripps Institution of Oceanography).

**12. Using a Super High Resolution Atmospheric Model to Simulate, Understand, and Predict Hydrologic Variability in Southern California**

Alex Hall (UC Los Angeles), Sebastien Conil (UC Los Angeles).

**13. Evaluation of IPCC Model Simulations for California Climate Change Research**

Eugene Cordero (San Jose State University), Thomas Rickenbach (San Jose State University).

**14. Evaluating Changes in Organic C and Emission of Greenhouse Gases in a California Agricultural Landscape**

A.P. King, D.E. Rolston, J.W. Hopmans, C. Van Kessel, J. Six, K.T. Paw, R.E. Plant, T.C. Hsiao, R.M. Poch, G. Shaver, A.J. Ideris, J. Lee, A. Wolf, K.J. Evatt, D. Louiel, J.L. MacIntyre, and A.A. Matista (UC Davis).

**15. Air-Sea Exchange and Ship Traffic – What Can Be Learned from Biogeochemical Monitoring at Bodega Bay?**

Ian Faloona (UC Davis).

**16. Estimating Best Practice Energy and Water Use and Carbon Emission Reduction Potentials for the Wine Industry using a New Tool Called BEST**

Christina Galitsky (LBNL).

## POSTER SESSION



**17. The Influence of Climate Change on Regional Air Quality in California**

Allison L. Steiner (UC Berkeley), Shaheen Tonse (LBNL), Ronald Cohen (UC Berkeley), Allen Goldstein (UC Berkeley), Robert Harley (UC Berkeley).

**18. The Role of Air Pollution in Decreasing Trends of Mountain Precipitation and Respective Water Resources**

Daniel Rosenfeld (The Hebrew University of Jerusalem, Israel), Amir Givati (The Hebrew University of Jerusalem, Israel), William L. Woodley (Woodley Weather Consultants).

**19. Developing Manure-DNDC: Building a Process Based Biogeochemical Tool for Quantifying NH<sub>3</sub>, CH<sub>4</sub>, and N<sub>2</sub>O Emissions from California Dairies**

William Salas (Applied Geosolutions, LLC), Changsheng Li (University of New Hampshire).

**20. Application of Regional Climate Model Output to the Assessment of the Impacts of Climate Change in California**

Mark A. Snyder, Lara M. Kueppers, Lisa C. Sloan, Erika S. Zavaleta, and Brian Fulfrost (UC Santa Cruz).

**21. Relating the  $\Delta^{14}\text{C}$  Value of Annual Grasses to Spatially and Temporally Distributed Fossil Fuel Emissions in California**

W.J. Riley (LBNL), J.T. Randerson (UC Irvine), M.L. Fischer (LBNL), D. Hsueh (UC Irvine), and J. Hatch (LBNL).

**22. Climate Effects of Irrigation and Urbanization in California: A Regional Climate Modeling Study**

Lara M. Kueppers, Mark A. Snyder, Sarah Bryant, and Lisa C. Sloan (UC Santa Cruz).

**23. An Evaluation of State Renewable Portfolio Standards as Cost-Effective Climate Mitigation Policies**

Cliff Chen (UC Berkeley).

**24. The Wieslander Vegetation Type Map Digitization Project**

James H. Thorne (UC Davis), Brian Morgan (UC Davis), Lee Hannah (Conservation International).

# NOTES

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*From Climate to Economics and  
Back: Mitigation and Adaptation  
Options for California and the  
Western States*