

CLIMATE ALERT

Fall 1988

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Toronto Climate Conference Calls for Sharp Cuts in Carbon Dioxide Emissions

The concluding statement of the World Conference on the Changing Atmosphere hosted June 27-30 in Toronto by the Canadian government called for a 20 percent cutback of global carbon dioxide emissions from current levels by 2005, and a phaseout of fully halogenated chlorofluorocarbons by 2000. This product resulted from four days of deliberations among over 300 policymakers, scientists, corporate and environmental leaders from 48 countries.

The conference statement also called for the creation of a World Atmosphere Fund to finance the development of technologies that will reduce greenhouse gas emissions. This resembled a proposal ad-

vanced in an Editorial in the Summer 1988 issue of *Climate Alert* (p. 2). The Fund would be financed largely through contributions from the industrialized countries although much of its focus would be on applications within the Third World. Despite the strong support for the creation of a World Atmosphere Fund, there was sharp disagreement among conference participants concerning the source

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Ambassador Stephen Lewis.

NASA Scientist Testifies Greenhouse Warming Has Begun

Testifying before the Senate Committee on Energy and Natural Resources on June 23, Dr. James E. Hansen became the first prominent scientist to state that greenhouse warming is no longer a threat but a reality. Basing his assessment on the record of average global temperatures and on computer simulations of the probable influence of the greenhouse effect, Dr. Hansen of the Goddard Institute of Space Studies said he arrived at his conclusion "with a high degree of confidence."

The hearings were called, said Committee Chairman J. Bennett Johnston, to highlight the rapidity with which global climate change is entering the public and political consciousness and the dramatic decrease in projected time before the impact of climate change, sea level rise, and deterioration of our living conditions may be felt.

Dr. Hansen declared, "Present global temperatures are the highest in the history of instrumental records." Not only are temperatures higher, but the rate of global warming has increased, he continued. The earth has become warmer more rapidly in the last twenty years than at any time in our records. The 1980s have seen the four warmest years in the last 100. (See *Climate Alert*, Summer 1988 issue.)

The first five months of this year were so warm, not only in the U.S. but around the world, that 1988 is on its way to becoming the warmest year unless there is a "remarkable, improbable cooling" in the remaining months, said Hansen. The most recent two seasons, December to February, and March to May, are the hottest in the entire record.

In the last 30 years, the average temperature has risen four-tenths of a degree Centigrade. Based on meteorologists' standard "climatology"—the average of the 30 years from 1951-1980—a typical fluctuation would have been not four-tenths but only 1.3 tenths of a degree C. The probability that a fluctuation or standard deviation warming of not one but three standard deviations would occur by chance is

Second North American Conference Expected to Draw 600-700

The Second North American Conference on Preparing for Climate Change December 6-8, 1988 in Washington is expected to be the largest and most comprehensive meeting ever held on response strategies to climate change. The conference will include 36 panels on implications of global warming and stratospheric ozone depletion for regions, natural systems and economic sectors, international and regional energy response strategies and coastal protection measures. During the first day of the conference many of the world's leading climatologists, atmospheric scientists, oceanographers, and health scientists will provide an overview of the underlying scientific issues.

Plenary speakers include:

Sir Crispin Tickell, Ambassador from the United Kingdom to the United Nations.

Ambassador Stephen Lewis, Chairman of the World Conference on the Changing Atmosphere held in Toronto in June 1988.

Senator Albert Gore, Jr. of Tennessee.

See pages 3 to 8 for detailed CONFERENCE AGENDA and REGISTRATION forms.

Conference registration will entitle you to a copy of the December 1988 *Proceedings of the Second North American Conference on Preparing for Climate Change*. Last year's conference volume, *Proceedings of the First North American Conference on Preparing for Climate Change: A Cooperative Approach* is the most up-to-date, comprehensive book on climate change now available.

Registration has reached half of total conference capacity as of September 15.

To insure your participation, please send registration forms promptly to:

Conference Registrar
Climate Institute
316 Pennsylvania Ave., SE
Suite 403
Washington, DC 20003

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Climate Institute Stages Symposium for UN Missions

Ambassador Crispin Tickell, Permanent Representative of the United Kingdom to the United Nations, warned that climate change could aggravate refugee problems, in a luncheon address to a Climate Institute symposium, *Climate Change and Economic Growth* on June 13 in New York City. Besides those uprooted by war or fleeing persecution, Tickell said, climate effects—rising sea levels, drought and an increased number of severe storms—can drive many more to an exodus from their homelands.

The symposium was held at the request of the UN Environment Programme and was a repeat performance in modified form—including more developing country presentations—of last March's very successful Washington symposium, *The Impact of Climate Change on the Third World*.

Representatives from about 30 permanent UN missions and United Nations agencies, and from international development groups, New York area foundations, business and industry, and some prominent private citizens gathered to hear some of the world's leading climate experts speak.

As Symposium Chairman, Ambassador Richard Benedick, Diplomat in Residence at the Conservation Foundation, welcomed the participants. After remarks by Dr. Noel Brown, Director of the New York Office of the United Nations Environment Programme, Dr. Stephen Schneider of the National Center for Atmospheric Research spoke on, "The Implications of Climate Change for Humanity."

"Society does not have the resources to hedge against all possible negative future outcomes of climate change," Schneider said. What simple principle is there, he

asked, that can help us choose which problems to spend our resources on?

The most long lasting and most potentially irreversible global problem is the greenhouse effect. One guideline to help us choose what to spend our resources on is what Schneider calls the "tie-in strategy," actions which provide widely agreed societal benefits even if the predicted change does not occur. Possible priority policy responses to the advent or prospect of the greenhouse effect which would have societal benefits—even if present estimates turn out to be exaggerated—include development of alternative crop strains, trading agreements with nations for food or other climatically dependent strategic commodities, development of alternative energy technologies, and energy conservation.

Dr. Michael Prather of the Goddard Institute for Space Studies briefed participants on stratospheric ozone depletion trends as well as the Antarctic ozone hole. Dr. George M. Woodwell, executive director of the Woods Hole Research Center, discussed the potential of biotic feedbacks such as release of emissions from the soils to aggravate global warming already underway.

Other speakers examined impacts on specific economic sectors. Dr. Amulya K. N. Reddy, of the Indian Institute of Science in Bangalore, spoke on Third World energy strategies, indicating that greater energy efficiency should be an integral part of the economic development strategies of Third World countries. Professor Cynthia Rosenzweig of Columbia University described the potential effects on crop yields of a significant global warming. As the climate becomes warmer, monsoon lands are mostly wetter, Dr. Hassan Virji of the National Science Foundation reported.

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Greenhouse Warming

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about one percent. Thus Hansen states "with about 99 percent confidence" that the temperature rise in the last 30 years represents a real warming trend, not a chance occurrence.

Besides studying temperature records, Dr. Hansen has run computer simulations of the greenhouse effect covering the years since 1958 when CO₂ first began to be accurately measured. These model simulations also yield a warming result close to 0.4 degrees C, the 99 percent level of confidence and very similar to recorded observations.

The model runs suggest that certain regional characteristics of greenhouse

warming would begin to appear soon: greater warming at high latitudes than low, over continents as opposed to oceans, and a cooling in the stratosphere while the troposphere warms.

While detection of a "global greenhouse signal" is only a first step in analysis, Hansen concluded that global warming has reached a level at which a cause-and-effect relationship can be inferred.



Dr. James Hansen.

Climate Conference

Continued from page 1

of its funding. Reflecting the view of a majority of participants the final conference statement asked that the Fund be "financed in part by a levy on the fossil fuel consumption of industrialized countries to mobilize a substantial part of the resources needed for these measures." A sizable minority of participants questioned the wisdom of relying on such a tax, either on grounds that this would engender unneeded political resistance or on the grounds that fossil fuel emissions, the source of only half the greenhouse forcing, should not bear all the burden of financing the Fund.

The other area of greatest contention concerned the role of nuclear power in reducing emissions of greenhouse gases. The statement concluded, "Apart from efficiency measures, the desired reduction will require (i) switching to lower CO₂ emitting fuels (ii) reviewing strategies for the implementation of renewable energy especially advanced biomass conversion technologies (iii) revisiting the nuclear power option, which lost credibility due to problems related to nuclear safety, radioactive wastes, and nuclear weapons proliferation."

Colorado Senator Timothy Wirth in a dinner speech June 27 had called for just such a revisiting of the nuclear option, conditioned on development of a new generation of nuclear reactors. Even the statement of the Nongovernment Organizations, i.e. environmental group caucus, did not flatly rule out nuclear power, although it gave it a much lower priority than energy conservation and development of renewable energy.

The Conference Chairman, Stephen Lewis, Canada's eloquent Ambassador to the United Nations, skillfully presided over the sessions, weaving consensus from the diverse assemblage of participants.

The strong opening session statements

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CLIMATE ALERT

Quarterly Newsletter published by the Climate Institute

Stephen Leatherman, *Chairman*
John C. Topping, Jr., *President*
Mark Goldberg, *Publications Chairman*
Nancy C. Wilson, *Editor*

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316 Pennsylvania Avenue, SE
Washington, DC 20003

(202) 547-0104

TENTATIVE CONFERENCE AGENDA

Second North American Conference on Preparing for Climate Change: A Cooperative Approach

December 6-8, 1988

Mayflower Stouffer Hotel
1127 Connecticut Avenue, N.W.
Washington, D.C. 20036

CONVENED BY THE CLIMATE INSTITUTE

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NATIONAL SCIENCE FOUNDATION

IN COOPERATION WITH PARTICIPATING AGENCIES
AND UNIVERSITIES OF THE CANADIAN CLIMATE PROGRAM

First Day: Tuesday, December 6, 1988

Morning: Scientific Overview

8:30–11:30

Opening Remarks of Conference Chairman, Joseph Cannon, *President*, Geneva Steel

Scientific Keynote, Dr. Stephen Schneider, National Center for Atmospheric Research

"Likely Climate Changes in North America and the Caribbean," Dr. James Hansen, Goddard Institute of Space Studies

"The Role of Ocean Circulation in Climatic Change," Dr. Wallace Broecker, Lamont Doherty Geological Observatory

"Likely Sea Level Rise," Dr. Stephen Leatherman, University of Maryland and *Chairman*, Climate Institute

"Stratospheric Ozone Depletion," Dr. Robert Watson, NASA

"Health and Environmental Effects of Ozone Depletion," John Hoffman, U.S. EPA

Luncheon Panel: 12:15–1:45

"Is Antarctic ozone hole broadening? Review of 1988 results. Is there an Arctic ozone hole?" Dr. Robert Watson, NASA, Dr. Alex Chisholm, Atmospheric Environment Service, Canada, Dr. Michael McElroy, Harvard University

Afternoon: Resolving Scientific Uncertainties

1:45–3:30 p.m. Simultaneous Panels

A. Role of Climate Feedbacks in Global Warming

Chairman, Dr. Stephen Schneider or Dr. Roger Revelle

"Potential volume and rate of methane hydrate release," Dr. Gordon MacDonald, MITRE Corporation

"The contribution of soil feedbacks to global warming," Dr. George Woodwell, Woods Hole Research Center

"Feedback processes that may affect future concentrations of greenhouse gases," Dr. Daniel Lashof, U.S. EPA

"The role of clouds in enhancing or reducing greenhouse warming," Dr. Robert A. Schiffer, NASA

B. The Role of Oceans in Climate Change

Chairman, Dr. James Baker, President, Oceanographic Society

"Understanding El Nino and long term climate variability over oceans," Henry Diaz, NOAA-ERL

"The cost of obtaining decent ocean data," John Bond, Climate Institute

C. Role of Agriculture in Altering Climate

"Role of rice production and nitrogen fertilizers in producing greenhouse gases," Dr. Connie Delwiche, University of California at Davis

"Greenhouse gas contribution of deforestation to create farmland," Dr. Richard Houghton, Woods Hole Research Center

"The potential role of increased animal productivity in reducing methane emissions," Dr. Henry Tyrrell, U.S. Department of Agriculture

"Reducing greenhouse gases through shifting staple production to woody plants," Philip Rutter, American Chestnut Foundation

D. Potential Impact of Global Warming on Public Health in North America

"An overview of potential impacts of global warming on public health," Dr. Janice Longstreth, ICF Clement

"Changes in mortality from extreme heat or cold," Dr. Larry Kalkstein, University of Delaware

"Changes in vulnerability to extreme weather related events (e.g., fires, hurricanes, floods, tornados)," Dr. William Riebsame, University of Colorado

E. Potential Effects of Global Warming and Stratospheric Ozone Depletion on Ground Level Air Quality

Chairman, Thomas Grumbly, President, Clean Sites

"Interactive effects of climate change, ground level ozone and UVB on natural systems," Dr. Chris Bernabo, Science and Policy Associates

"Implementation of future air quality control strategies to prepare for climate change," Gerald Emison, Director, EPA Office of Air Quality Planning and Standards

F. Status and Greenhouse Effect Implications of Renewable Energy and Conservation Technologies

Chairman, Dr. William Chandler, Battelle Pacific Northwest Laboratories

"Potential of sea thermal energy," J. Hilbert Anderson, President, Sea Solar Power, Inc.

"Potential energy uses and greenhouse implications of hydrogen," Peter Hoffman, Editor, Hydrogen Letter

"Status of photovoltaic solar technology," Dr. Dan Arvizu, Sandia National Laboratory

"Potential of geothermal energy," Dr. Jefferson W. Tester

3:45–5:30 p.m. Simultaneous Panels

A. Changes in Weather Circulation Patterns

Chairman, Jim McCulloch, Richmond Hill, Ontario, Canada, Climate Institute

"Potential shifts in monsoon patterns associated with climate warming," Dr. Eugene Rasmusson, University of Maryland

"Potential changes in seasonality of precipitation and in temperature variability," Dr. David Rind, GISS

"Implications of urbanization for local and regional temperatures in the United States," Dr. Arthur Viterito, George Washington University

B. Projections of Global Emission Trends

Chairman, Dr. Michael Barth, *Senior Vice President*, ICF

"Base case emission scenarios," Dr. Daniel Lashof, U.S. EPA

"Effect of policy options on emission forecasts," Dennis Tirpak, U.S. EPA

"Uncertainties in energy models," Dr. Jae Edmonds, Battelle Pacific Northwest Laboratories

C. Addressing Impacts of Climate on Agriculture

Chairman, Prof. Cynthia Rosenzweig, Columbia University

"An overview of effects of climate on agriculture," Dr. Martin Parry, University of Birmingham, U.K.

"Likely effects of climate change on U.S. agriculture," Dr. Leon Hartwell Allen, Jr., University of Florida

"Likely impact of climate change on Canadian agriculture," Dr. Barry Smit, University of Guelph

"Likely impact of climate change on Mexican agriculture," Dr. Cassio Luiselli, InterAmerican Institute for Cooperation in Agriculture, Costa Rica

"Translating climate impacts into legislative responses," James Cubie, U.S. Senate Agriculture Committee

D. Impact of Stratospheric Ozone Depletion on Human Health

Chairman, Dr. Charles W. Powers, Resources for Responsible Management

"An overview of health risks from stratospheric ozone depletion," Dr. Janice Longstreth, ICF Clement

"Implications of UVB for skin cancer and eye disease," Dr. Andrea Kornhauser, Food and Drug Administration

E. Uncertainties in Our Understanding of Atmospheric Change

Chairman, Rafe Pomerance, World Resources Institute

"An overview of interrelationships among changes in the stratosphere, troposphere and biosphere," Dr. Michael McElroy, Harvard University

"Reducing uncertainties in regional climate models," Dr. Peter Jutro, U.S. EPA or Dr. Anthony Janetos

F. Status and Greenhouse Implications of Nuclear Energy Technologies

Chairman, Dr. Gordon MacDonald, *Vice President and Chief Scientist*, MITRE Corporation

"An overview of the greenhouse implications of various nuclear energy technologies," Mark Mills, President, Science Concepts

"Directions in advanced reactor technology," Dr. Michael Golay, Massachusetts Institute of Technology

"Status of aneutronic fusion energy," Dr. Bogdan Maglich, President, Advanced Research Corporation

7:00–10:00 p.m. AWARDS Reception and Dinner
Chairman, Sir Crispin Tickell, Ambassador from the United Kingdom to the United Nations

Remarks by Ambassador Tickell

Announcement of 1989 Cairo World Conference on Preparing for Climate Change, Paul Pritchard, President, National Parks and Conservation Association

Award Presentations, Dr. Stephen Schneider

Entertainment by Captain Sea Level, Balladeer of the Climate Community

Second Day: Wednesday, December 7, 1988

Morning 8:30 a.m.–11:30: **Plenary, Agenda for the Next Decade**

Policy Keynote Speaker, Ambassador Stephen Lewis, *Chair*, Toronto Conference on the Changing Atmosphere

"Status of USA-USSR Global Climate Agreement," Dr. Alan Hecht, Director, U.S. National Climate Program Office

"Lessons from UNEP Protocol for a Greenhouse Convention," Ambassador Richard Benedick, The Conservation Foundation

"A Caribbean Perspective," H.E. Keith Johnson, Ambassador of Jamaica to the U.S. (Tentative)

"A View from Mexico," Dr. Alicia Barcena-Ibarra, *Cultura Ecologica* (Tentative)

"A Canadian Viewpoint," Howard Ferguson, Head, Atmospheric Environment Service, Canada

Luncheon Panel: Noon–1:30 p.m.

How do we build a constituency for credible responses to climate change?

Chairman, Michael Brewer, *Vice President*, Dun & Bradstreet

ASSESSING REGIONAL IMPACTS

1:45–3:30 p.m. Simultaneous Panels

A. Potential Effects of Climate Change and Sea Level Rise in Caribbean

Chairman, Anthony Desir, Trinidad and Tobago

"Likely sea level rise in the Caribbean," Frank Gable, Woods Hole Oceanographic Institution (Tentative)

"Implications for Caribbean society of climate change, sea level rise and shifts in storm patterns," Dr. Orman Granger, University of California at Berkeley

"Implications of climate change for coral reefs and islands, mangrove swamps and wetlands in the Caribbean," Dr. David Stoddard, University of California at Berkeley

B. Potential Impact of Changes in Climate in California

Chairman, Dr. Peter Gleick, Pacific Institute

"Impact on water resources," Dr. Joseph Knox, Lawrence Livermore National Laboratory

"Potential effects on irrigated agriculture," Dr. Daniel Dudek, Environmental Defense Fund

"Impact of climate change on water quality in the San Francisco Bay," Philip Williams (Invited)

C. Potential Impact of Climate Change and Sea Level Rise on Chesapeake Bay

Chairman, Dr. Stephen Leatherman, Climate Institute

"Marsh loss and shore erosion," Dr. Michael Kearney and Dr. J. Court Stevenson, University of Maryland

"Impact on aquatic animals and fisheries," Dr. Victor Kennedy, University of Maryland

"Implications of climate change for environmental protection strategies for the Chesapeake Bay," James Seif, Esq., Regional Administrator for EPA, Region III

D. Likely Impact of Rapid Warming on Arctic

Chairman, Dr. Fred Roots, Science Advisor, Department of Environment, Canada

"Implications of expected change in ice cover," Dr. Claire Parkinson, NASA

"Effects on migratory birds and other wildlife," Dr. J.P. Myers, National Audubon Society

"An overview of potential effects of rapid warming on the Canadian Arctic," Dr. Stephen C. Loneragan, McMaster University

E. Potential Impact of Climate Change on Southern U.S.

Chairman, Daniel Power, Nashville, Tennessee, Climate Institute

"Implications of global climate change for TVA reservoir system," Dr. Barbara Miller, TVA Engineering Laboratory

"Potential impact of climate change on water quality in the Southern U.S.," Dr. Ellen Cooter, Oklahoma Climatological Survey

"Implications of climate change for Southeastern forests," Dr. H. Shugart, University of Virginia

"Policy implications of potential climate change in Southern U.S.," Dr. Mark Meo, University of Oklahoma

3:45–5:30 p.m. Simultaneous Panels

ASSESSING IMPACTS ON MAJOR SECTORS

A. Impacts on Water Resources

Chairman, Dr. Paul Waggoner, *Chairman*, AAAS Water Panel

"The state of future water resource supply and demand in North America even without climate change," Dr. J.E. Scheffer, U.S. Geological Survey

"Vulnerability of North American water systems to climate change," Dr. Peter Gleick, Pacific Institute

"Likely changes in evapotranspiration," Dr. Norman Rosenberg, Resources for the Future

"Likely changes in water quality related to climate change," Dr. Henry D. Jacoby, Massachusetts Institute of Technology

B. Impacts of Climate Change on Urban Planning

Chairman, Neal R. Peirce

"Likely effects of climate change on municipal infrastructure in Miami, New York and Cleveland," Dr. Ted Miller, Urban Institute

"Effects of climate change on coastal infrastructure," Jim Titus, U.S. EPA

"Emergency preparedness to address climate change," Dr. Sherry Oaks, Pennsylvania State University

"Perspectives of a civil engineer and planner," Daniel Power, Climate Institute

C. Impact of Climate Change on Fish and Wildlife

Chairman, Dr. Robert Peters, World Wildlife Fund

"Potential implications of climate change for mammals," Dr. Dewey McLean, Virginia Polytechnic Institute and State University

"Potential impact of climate change on Great Lakes fisheries," Dr. Henry Regier, University of Toronto

"Potential impact of climate change on U.S. wildlife refuges," Robert Breckenridge, Idaho Falls Engineering Laboratory

"Implications of potential effects of climate change for Department of Interior wildlife and resource management," Dr. Indur Goklany, U.S. Department of Interior

D. Impact of Climate Change on Forests

Chairman, Rev. Herman Cole, *Chair*, Adirondack Park Agency

"An overview of the likely impact of climate change on North American forests," John Wells

"Climate change and U.S. forest markets," Dr. Larry Regens, University of Georgia

"Implications of climate change for Canadian forests," Dr. James B. Harrington, Canadian Forestry Service

"Climate change and forest fires," Dr. Michael A. Fosberg, U.S. Forest Service

E. Potential Impact of Stratospheric Ozone Depletion on Food Chain and Vegetation

Chairman, John Hoffman, U.S. EPA

"Impact on marine food chain," Dr. Robert Worrest, U.S. EPA

"Impact on crops," Dr. Alan Teramura, University of Maryland (Tentative)

"Impact on vegetation," Dr. Martyn Caldwell, Utah State University (Tentative)

Wednesday Evening

7:00–10:00 p.m. Dinners in private homes in the Washington area for conference participants

Third Day: Thursday, December 8, 1988 Response Strategies

8:30–10:15 a.m. Simultaneous Panels

A. Prospects for CFC and Halon Substitutes

Chairman, Dr. Stephan Andersen, U.S. EPA

"Halon substitutions," Carl Jewell, Halon Research Institute

"Substitutes in mobile air conditioning," Simon Oulouhajian, Mobile Air Conditioning Society

"Incentives for substitution and efficiencies among CFCs and halons," Prof. Alan Miller, University of Delaware Law School

B. Preparing for Climate Change in the Great Lakes

Chairman, Dr. Stewart Cohen, Canadian Climate Centre

"An overview of EPA studies of climate change impacts on Great Lakes region," Joel Smith, U.S. EPA

"A summary of U.S.-Canadian Great Lakes Climate Change Conference recommendations," Dr. William Bolhofer, U.S. National Climate Program Office

"Policy considerations concerning climate change and water diversion in the Great Lakes," Dr. Murray Clamen, International Joint Committee, Canada

"Implications of changing Great Lakes levels for commercial shippers," Angus Laidlaw, Dominion Marine Association (Tentative)

C. Preparing for Climate Change in New England and Atlantic Canada

Chairman, Greg Watson, Executive Director, Massachusetts Office of Science and Technology

"Strategies to respond to climate change and sea level rise in Atlantic Canada," Dr. Peter Stokoe, Dalhousie University

"Upland erosion in New England," Dr. Graham Giese, Woods Hole Oceanographic Institution

"Strategies for Cape Cod to respond to sea level rise," Dr. Stephen Leatherman, Climate Institute

D. Factoring Climate Change into Corporate Planning

Chairman, Roger Strelow, Vice President, General Electric Company

"Implications of climate change for U.S. electrical demand," Ken Linder, ICF

"Implications of climate change for environmental engineering and construction industry," Dr. James J. Ferris or J. F. Silvey, Ebasco Services

"Implications of climate change for insurance industry," Dr. Donald Friedman, Travelers Insurance

"Implications of climate change for securities underwriting," Freda Ackerman, Executive Vice President, Moody's (Invited)

E. Energy Strategies to Restrict Emissions Growth

Chairman, Ted Williams, U.S. DOE

"Supply side strategies to reduce greenhouse emissions," Philip Jessup, Energy Probe, Toronto

"Government strategies to limit buildup of greenhouse gases," David J. Bardin, Esq., Arent, Fox, Kintner, Plotkin & Kahn

10:30 a.m.–12:15 p.m. Simultaneous Panels

A. How to Protect the North American Coastline

Chairman, Thomas Magness, Ebasco Services

"Relative vulnerability of North American coasts to shoreline erosion," Jim Titus, U.S. EPA

"Limitations of fortification and beach nourishment strategy," Dr. Stephen Leatherman

"Policy considerations in coastal protection," Lynne Edgerton, Esq., Natural Resources Defense Council

"Risk-cost evaluation of coastal protection projects with sea level rise and climate change," Dr. David A. Moser, U.S. Army Corps of Engineers

B. International Control of Stratospheric Perturbants?

Chairman, Ambassador Richard Benedick, The Conservation Foundation

"Status of Montreal Protocol ratification and potential revisions," Dr. Noel Brown, United Nations Environment Programme (Invited)

"Reopening the negotiations," Prof. Konrad von Moltke, Dartmouth College and The Conservation Foundation

"A Canadian perspective," Victor Buxton, Environment Canada

C. Preservation of Tropical Forests

Chairman, Dr. George Woodwell, *Executive Director*, Woods Hole Research Center

"Role of deforestation in regional climate change," Dr. Richard Houghton, Woods Hole Research Center

"Strategies to finance retention of tropical forests," Dr. Ata Qureshi, Climate Institute

"Role of development assistance organizations in forest preservation," Prof. Eneas Salati, InterAmerican Development Bank

D. Developing Country Energy Strategies

Chairman, Dr. Amulya K.N. Reddy, Indian Institute of Science (Invited)

"An overview of the climate implications of energy strategies," Dr. Irving Mintzer, World Resources Institute

"Transfer of low greenhouse technologies to developing countries," Dr. Richard Morgenstern, Director, Office of Policy Analysis, U.S. EPA

"The impact on global climate of energy strategies in Asia," Dr. William Chandler, Battelle Pacific Northwest Laboratory

"Making efficiency and conservation a priority in World Bank energy lending," David Wirth, Esq., Natural Resources Defense Council

E. Development of Legal and Institutional Mechanisms for Climate Cooperation

Chairman, Dr. Alan Hecht, *Director*, U.S. National Climate Program Office

"Next steps for climate cooperation," Dr. Kilaparti Ramakrishna, Woods Hole Research Center

"Mobilizing a global citizens movement," Dr. Hind Sadek

"Impact of climate change on availability of Colorado River water in the U.S. and Mexico," Dr. Peter Gleick, Pacific Institute

"Legal mechanisms for water sharing in time of drought," James Strock, Esq.

12:45-2:30 p.m. Luncheon: Concluding Speaker, Senator Albert Gore, Jr.

CONFERENCE REGISTRATION

Second North American Conference on Preparing for Climate Change: A Cooperative Approach

December 6-8, 1988

Mayflower Stouffer Hotel

1127 Connecticut Avenue, N.W.
Washington, D.C. 20036

- YES**, I will attend the conference.
- NO**, I will not be able to attend this year—
- Please enroll me as a member of the Climate Institute so I may receive its publications and special meeting rates.
- Please accept my tax-deductible contribution to the Climate Institute in support of its efforts concerning global climate issues.

Please find a check enclosed for the following:

- Conference registration—
\$350 per person

(Fee includes registration materials, Tuesday Banquet, Tuesday and Wednesday luncheons, Wednesday dinner, Thursday luncheon, break refreshments, and a copy of the Conference proceedings.)

- 1 year membership in the Climate Institute—
\$50 each *(with conference registration or to employees of environmental, educational or governmental organizations.)*
- 1 year membership in the Climate Institute—
\$100 each *(without conference registration.)*

Total Amount Enclosed: _____ *

Please duplicate for additional reservations.

**Residents of Canada may pay amounts listed in Canadian dollars.*

Mail Conference Registration to:

Conference Registrar
Climate Institute
316 Pennsylvania Avenue, S.E.
Suite 403
Washington, D.C. 20003
Phone: (202) 337-1502

HOTEL RESERVATION

Second North American Climate Change Conference December 6-8, 1988

Name _____
Address _____
City _____ State _____
Zip _____ Phone _____
Arrival Date _____
Number of Nights _____
Number in Party _____
All major credit cards
Credit Card Type _____
Credit Card No. _____
Exp. date _____
Signature _____

Accommodations Desired (Check One)
Standard Single, \$75 Double, \$75
Deluxe Single, \$140 Double, \$140
(Please allow for current D.C. taxes.)

Return to: Mayflower Stouffer Hotel
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In order to receive group rate, please respond by November 14, identifying yourself as attendee of Climate Institute Conference.

In case of unanticipated cancellation of plans, please notify hotel as soon as possible *(before 6 p.m. on arrival date)*.

Name _____
Organization _____
Title _____
Address _____
City _____ State _____
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Is There a Drought/Greenhouse Effect Connection?

Senator Timothy E. Wirth asked the \$64,000 question at a Senate Energy and Natural Resources Committee hearing in June, "Is this summer's drought a harbinger of things to come? Is this the first greenhouse stamp to leave its impression on the fragile environment?"

In the cautious words of careful scientists, both Syukuro Manabe of NOAA and James E. Hansen of NASA answered that while present data would certainly not permit drawing a definite cause-and-effect conclusion, it is possible that the processes set in motion by increased CO₂ and other trace gases in the atmosphere could be involved. (The bulk of Dr. Hansen's testimony is the subject of another article in this issue of *Climate Alert*.)

Dr. Manabe of NOAA's Geophysical Fluid Dynamics Laboratory (GFDL) has studied large-scale changes in soil wetness under a hypothetical doubling of carbon dioxide. The results yielded by the GFDL model show that in summer the soil becomes drier over extensive, mid-continental areas of North America, Southern Europe and Siberia.

Snow cover, which reflects a large frac-

tion of incoming sunshine in winter over Siberia and Canada, melts earlier in the spring under a global warming scenario, and the soil in those areas and over the North American Great Plains becomes drier earlier. In the middle latitudes of North America and Southern Europe, warm, moisture-rich air penetrates farther north, increasing precipitation in the northern half of the rainbelt and decreasing it in the south. Because the ground is drier, there is less evaporation from it and less cloudiness, allowing more sunshine to further dry out the soil.

In winter, on the other hand, more precipitation increases soil wetness in the central continent. Because of the rainbelt's more northerly swing, Southern California, Mexico, and some other southern areas receive less rain and have drier soil.

Dr. Manabe concluded that with doubled CO₂ there is a clear indication that reduced soil moisture in summer in mid-continent "results from the global warming and is a very large scale phenomenon." It is likely, he added, that "severe mid-continental dryness will occur more frequently with increasing atmospheric temperature," and

that the processes identified by the model are "involved in aggravating the current dry condition."

Computer runs of expected climate change during the next few decades with trace gas emissions at *current* rather than doubled CO₂ rates reveal, according to GISS scientist Dr. James E. Hansen, abnormal July temperatures for several years between 1986 and 2029. In the 1980s, there are barely detectable trends, but in another ten years the area with above normal temperatures becomes much larger. Hansen's simulations also show trends in the late 1980s and in the 1990s for greater than average warming in the Southeast and Midwest, usually accompanied by below normal precipitation.

"It is not possible," Hansen said, "to blame a specific heat wave/drought on the greenhouse effect. However, there is evidence that the greenhouse effect increases the likelihood of such events." Improved understanding, he asserted, depends on the development of more realistic global climate models which can only be improved by more comprehensive global observations.

Update on Ozone Treaty

Seven nations have now ratified the Montreal Protocol on Substances that Deplete the Ozone Layer: United States, Mexico, Canada, Norway, Sweden, New Zealand, and Egypt. Thirty-seven nations originally signed the protocol which was negotiated in September 1987. Supporters expect to have the treaty gain the necessary total of 11 ratifications (representing two-thirds of

the world's CFC consumption) by December 31, 1988 in order that it may go into force on January 1, 1989.

The Protocol is the result of an agreement made in 1985, the Vienna Convention on Protection of the Ozone Layer. The Convention has now been ratified by more than 20 nations, the minimum necessary for it to take effect.

Large Wetlands Loss Projected

An Environmental Protection Agency study released in mid-August has made the first attempt to inventory the impact global warming on U.S. wetlands and urges action now by Federal and state agencies

to protect coastal swamps and marshes.

Sea levels, which have been rising six inches per century, may rise as much as 5 to 15 inches by the year 2025, and two to

Continued on page 12

Climate Conference

Continued from page 2

of Canadian Prime Minister Brian Mulroney and Norwegian Prime Minister Gro Harlem Brundtland provided considerable momentum to the proceedings. Both called for a global treaty to protect the atmosphere, with Mulroney calling for a "Law of the Air."

Prime Minister Brundtland, who chairs the United Nations World Commission on Environment and Development, stated, "The impact of climate change may be greater and more drastic than any chal-

lenges mankind has faced with the exception of nuclear war."

Mrs. Brundtland advanced a number of specific proposals such as a technology transfer program to enable developing countries to increase energy efficiency and to become less dependent on fossil fuels, international negotiations on reducing energy use and international research programs on renewable energy. These proposals all were reflected in the final conference statement.

Symposium for UN Missions

Continued from page 2

Tropical and subtropical countries dominated by their ocean environments have unique problems not shared by developed nations in the temperate zones, Dr. Robert W. Buddemeier of the Lawrence Livermore National Laboratory pointed out. Changes in winds, currents, storm patterns and nearshore biological communities may be at least as important as changes in temperature and sea level. Population growth rates are high and economies less developed. Local preparations may be at least as important as preparing for long run sea level change.

Dr. Stephen Leatherman of Maryland University's Laboratory for Coastal Research showed in a series of vivid slides the effects of rising sea levels on vulnerable coastal areas in South and North America.

The conference concluded with a presentation by Dr. Kilaparti Ramakrishna, an international lawyer from India currently working at the Woods Hole Research Center, on the perspective of developing countries concerning global climate protection.

The meeting was convened by the Climate Institute with co-sponsorship of The Conservation Foundation, the William Bingham Foundation, and the Woods Hole Research Center.

Oslo Meeting Promotes Sustainable Development

Prime Minister of Norway Gro Harlem Brundtland, Chairman of the World Commission on Environment and Development, invited the Secretary-General of the United Nations and the executive heads of 22 UN organizations to Oslo on July 9 and 10, 1988 to explore ways that UN development strategies can show greater respect for environmental concerns.

"The gravest problems facing the world today beside the threat of nuclear war," according to a conference summary, "are the deterioration of the environment and its link with poverty and the bleak prospects for development." The participants agreed that alleviating poverty and pre-

serving the environment can be cost effective components of development plans.

Among priority issues identified in advancing development were: protecting the atmosphere and the global climate, ocean and water resources; halting desertification and countering deforestation; controlling dissemination of dangerous wastes and aiming at their elimination; controlling soil erosion.

The conference established a task force, under the UN Secretary-General, to provide a framework for sustainable development activities and chose the year 1990 for its next meeting.

International Workshops Propose Policy Options to Counter Greenhouse Effect

We should focus on near-term policy options in our effort to control the degree and pace of global warming, said Senator J. Bennett Johnston at a hearing of the Senate Committee on Energy and Natural Resources on June 23. Taking the proper steps will not be easy, he pointed out.

"We tend to overlook the fact that 5 billion people now occupy the globe, twice the number present as recently as 1950," Dr. George M. Woodwell of the Woods Hole Research Institute testified at the committee hearing, reporting on two international workshops held last year under the auspices of the Beijer Institute. The two sessions reviewed the details of apparent climate change and explored the implications for government policies.

"Before 2030 the human population could be 10 billion," said Woodwell. "The 5 billion we now have use half or more of the energy available from plants globally. Big changes in the human condition will be occurring without climatic change. The climatic changes will compound the difficulties in accommodating such extraordinary rates of growth."

The first of the two conferences, held during the fall of 1987 in Villach, Austria, Woodwell said, revealed a consensus by meteorologists and other scientists of the extent of global warming that appears to be underway. The second, held in Bellagio, Italy, drew up a list of possible policy options.

The consensus among scientists:

The dominant influence on global cli-

mate for the indefinite future is expected to be a continuous warming caused by the accumulation of gases, especially carbon dioxide and methane, but also nitrous oxide and the CFCs. The earth has warmed between 0.5 and 0.7 degrees C over the past century and the rate appears to be accelerating. Estimates based on models suggest a global average of 1.5 to 5.5 degrees by the period 2030 to 2050. The warming in the tropics will be less than the mean for the whole earth. In the middle and high latitudes it will exceed the mean and fall in the range of 0.5 to 1.5 degrees C per decade. This exceeds the rate at which forests migrate and will result in their destruction at their warmer and drier margins, releasing additional carbon dioxide.

The warming will cause accelerated glacial melting, increasing sea level 30 cm to 1.5 m over the next 50 to 100 years. Climatic zones will move poleward, shifting arable zones and causing large dislocations of natural vegetation and flooding in low-lying areas. The warming will be greatest in winter, and will be accompanied by more precipitation in high latitudes.

Nearterm possibilities for reducing or eliminating the imbalance:

1. Reduction in the use of fossil fuels globally.
2. Reduction in or cessation of deforestation.
3. A vigorous program of reforestation.

Exchanging Information on Climate Change

The first issue of a monthly publication, *Global Climate Change Digest: A Guide to Current Information on Greenhouse Gases and Ozone Depletion*, was published in July by Elsevier Science Publishing Co., Inc., and the Acid Rain Information Clearinghouse of the Center for Environmental Information. The new digest contains short summaries of reports, books and proceedings, journal publications, calendar items, and other news, providing timely access to technical and general information related to climate change. The editor is Dr. Robert W. Pratt, R.D. #1, Box 185, Valley Falls, NY 12185.

Subscriptions may be obtained from Elsevier Science Publishing Co., Inc., 52 Vanderbilt Avenue, New York, NY 10017. Price per year is \$175.00, plus \$33.00 for air mail outside United States, Canada, and Mexico.

Job Openings

Senior Project Scientist with advanced degree to work with organization's lawyers and technical specialists analyzing effects and advocating policy responses to threat of global atmospheric degradation, especially the greenhouse effect. Send application to Beth Dessel, National Resources Defense Council, Suite 300, 1350 New York Ave., NW, Washington, D.C. 20005.

Junior and Mid-Level Analysts with MA and 2-5 years experience to work on research and policy in fields involving climate change. Send resume to The Bruce Company, Suite 410, 3701 Massachusetts Ave., NW, Washington, D.C. 20016.

Howard U. Will Host CI Africa Conference

The Climate Institute is making plans for a conference on Implications of Climate Change for Africa, to be held on May 2-3, 1989 at the Armour J. Blackburn Center of Howard University, Washington, D.C.

This meeting is part of a Climate Institute series of regional conferences planned for 1989 and 1990 to focus more closely on the problems of a specific part of the world. They are parallel to a similar set of specialized seminars planned to cover different parts of the United States and Canada.

Calendar of Climate-Related Events

1988-89

September 27-28 *Washington, DC*

Committee on Meteorological Analysis Prediction and Research, National Research Council, Georgetown Facility, Green Building, Room 120. Open to public but please give advance notice.
Contact: Ken Bergman, 202/334-3511

September 27-29 *Chicago, IL*

First U.S.-Canada Symposium on Climate Impact on the Great Lakes, co-sponsored by Canadian Climate Program, National Climate Program Office (NOAA), U.S. EPA.

Contact: William Bolhofer, 202/443-8981

September 29-October 1 *Boulder, CO*

Conference on Wildfire Severity and Global Climate Change, sponsored by National Center for Atmospheric Research and U.S. Forest Service.

Contact: Michael Fosberg, 202/235-8195 or Mary Rickle, 303/497-1632

October 3-7 *Tokyo, Japan*

Second International Conference on Atmospheric Sciences and Applications to Air Quality

October 4-6 *Washington, DC*

Conference on Consequences of the Greenhouse Effect for Biological Diversity, sponsored by World Wildlife Fund/Conservation Foundation, National Science Foundation, U.S. EPA, National Park Service, Dept. of Energy, et al. Education Building Auditorium, National Zoological Park

Contact: Stacy Roberts, 202/778-9572 or Robert Peters, 202/778-9610

October 5-6 *Washington, DC*

Meeting of Climate Research Committee, National Research Council, Georgetown Facility, Green Building, Room 120.

Open to public but please give advance notice.

Contact: Ken Bergman, 202/334-3511

October 6 *White Plains, NY*

Biosphere Problems, The Scientific and Technological Basis for Environmental Law. Pace University School of Law, Center for Environmental Legal Studies, 78 North Broadway, White Plains, NY 10603.

Contact: Professor Richard L. Offinger, 914/681-4324

October 6-9 *Lincoln, NB*

Symposium on Global Climate Change and the Future of the High Plains Aquifers, sponsored by the Institute for Tertiary-Quaternary Studies.

Contact: Lee Anderson Smith or George H. Coleman, 713/661-4038

October 18 *Washington, DC*

Symposium on '88 Drought in U.S., Board on Atmospheric Sciences and Climate, National Research Council, Georgetown Facility, Green Building, Room 130. In afternoon. Open to public but please give advance notice.

Contact: Ken Bergman, 202/334-3511

October 18-19 *Washington, DC*

Meeting of Board on Atmospheric Sciences and Climate, National Research Council, Georgetown Facility, Green Building, Room 130.

Open to public but please give advance notice.

Contact: Ken Bergman, 202/334-3511

October 19 *Washington, DC*

Second meeting of World Resources Institute Policy Panel on Responses to the Greenhouse Effect and Global Climate Change.

October 20-21 *Washington, DC*

Meeting of Committee on Solar and Terrestrial Research, National Research Council, Georgetown Facility, Green Building, Room 124.

Open to public but please give advance notice.

Contact: Ken Bergman, 202/334-3511

October 24-25 *Irvine, CA*

Meeting of Committee on Atmospheric Chemistry, Arnold Beckman Center.

Open to public but please give advance notice.

Contact: Ken Bergman, 202/334-3511

Oct. 24-Nov. (tentative) *Leningrad(?), USSR*

Annual Meeting of Working Group 8, US/USSR Bilateral Commission on Environmental Protection
Contact: Bob Elkins, 202/443-8981

November 7-10 *Hamburg, FRG*

Climate and Development: Climatic Change and Variability and the Resulting Social, Economic and Technological Implications. In cooperation with the UN Centre for Science and Technology for Development; under patronage of FRG President Richard von Weizsacker. Congress Centrum.

Contact: Prof. Dr. D. Otten, (0541) 441024-5

Deutsches Institut zur Erforschung der Informationsgesellschaft (di). An der Blankenburg 64, D-4500, Osnabruck

November 9-10 *Washington, DC*

Meeting of Committee on Global Change, National Research Council, National Academy of Sciences Building, 21st and Constitution Ave., Room 250. Open to public but please give advance notice.

Contact: Ken Bergman, 202/334-3511

November 14 *London, UK*

The Politics of the Atmosphere, The Joint Energy Programme, Royal Institute of International Affairs.

Contact: Jonathan P. Stern, 01-930 2233

November 14-18 *Mexico, D.F., Mexico*

Third Interamerican Congress on Meteorology and Third National Congress

November 15-16 *Washington, DC*

Conference on Global Climate Change Linkages: Acid Rain, Air Quality, and Stratospheric Ozone. Sponsored by Center for Environmental Information, Inc.

Contact: Linda Wall, 716/546-3796

November 21 *San Francisco, CA*

Workshop on the Implications of Climatic Change for California, sponsored by Pacific Institute for Studies in Development, Environment, and Security, Hyatt Regency, San Francisco.

Contact: Naomi Kleinfeld, 415/843-9550

November 23-28 *Pune, India*

International Symposium on Monsoon: Understanding and Prediction

November 28-29 *London, UK*

Ozone Depletion International Conference, sponsored by Consumers' Association, European Campaign Against Cancer, Friends of the Earth.

Contact: Robin Russell Jones, 01-486 5544

2 Marylebone Rd., London NW1 4DX

November 28-December 2 *Paris, France*

World Ocean Circulation Experiment Implementation Meeting, UNESCO. Sponsored by World Meteorological Organization, International Council of Scientific Unions, Scientific Committee for Ocean Research, International Oceanographic Commission.

December 1 *Anaheim, CA*

Impact of CO₂, Trace Gases, and Climate Change on Global Agriculture, sponsored by American Society of Agronomy, Soil Science Society of America, Crop Science Society of America, and US Department of Agriculture—Agricultural Research Service.

Contact: Bruce A. Kimball, 602/261-4356

December 6-7 *Washington, DC*

Second North American Conference on Preparing for Climate Change, convened by Climate Institute, Mayflower Stouffer Hotel.

Contact: John Topping, 202/547-0104. See the Fall 1988 issue of Climate Alert for registration information.

December 13-14 *Washington, DC*

Meeting of Ocean Sciences Board, National Research Council, 2104 Constitution Avenue, NW. December 13—Room 250; December 14—Room 180. Open to the public but please give advance notice.

Contact: Mary Hope Katsouras, 202/334-2714

1989

January 29-February 3 *Anaheim, CA*

Symposium on the Role of Clouds in Atmospheric Chemistry and Global Climate.

Contact: American Meteorology Society, 617/227-2425

February 21-23 *Delhi, India*

Climate Change Meeting

Contact: George Woodwell, 508/540-9900

February 28-March 3 *Ithaca, NY*

Conference on Global Environment Change: Connecting Science and Policy. Sponsored by Global Environment Program, Center for Environmental Research, Cornell University, and National Patent Development Corporation.

March 7-10 *Charleston, SC*

Sixth Conference on Applied Climatology

Contact: American Meteorology Society, 617/227-2425

April 17-21 *Ottawa, Canada*

Tenth Conference on Fire and Forest Meteorology

May 2-3 *Washington, DC*

Symposium on "Implications of Climate Change for Africa." Armour J. Blackburn University Center, Howard University. Sponsored by Climate Institute and UN Environment Programme.

Contact: John Topping, 202/547-0104

May *Washington, DC*

Symposium on Implications of Climate Change for Hazard and Insurance Planning. Sponsored by Climate Institute.

Contact: John Topping, 202/547-0104

May 16-19 *San Diego, CA*

18th Conference on Hurricanes and Tropical Meteorology.

Contact: American Meteorology Society, 617/227-2425

May 16-19 *San Diego, CA*

Fourth Conference on Satellite Meteorology and Oceanography.

Contact: American Meteorology Society, 617/227-2425

June *Canada*

Symposium on "Implications of Climate Change for the Forest Industry." Sponsored by Climate Institute, US Forest Service and Canadian Climate Program.

Contact: John Topping, 202/547-0104 or J.A.W. McCulloch, 416/737-2064

July 31-August 11 *Reading, UK*

Fifth Scientific Assembly, International Association of Meteorology and Physics. Local organizing committee, Department of Meteorology, University of Reading.

Contact: Ross Reynolds, +44 734 875123

2 Earley Gate, Whiteknights, Reading RG6 2 AU

August 21-25 *Seattle, WA*

Symposium on Ice and Climate with the International Glaciological Society

Fall *Ottawa, Canada*

Symposium on "Impact of Climate Change in the Arctic," sponsored by Climate Institute

Contact: John Topping, 202/547-0104 or J.A.W. McCulloch, 416/737-2064

September/October *Annapolis, MD*

Symposium on "Impact of Climate Change on the Chesapeake Bay," sponsored by Climate Institute and Laboratory for Coastal Research, University of Maryland.

Contact: John Topping, 202/547-0104 or Stephen Leatherman, 301/454-5167

November 13-17 *Buenos Aires, Argentina*

Third International Conference on Southern Hemisphere Meteorology and Oceanography.

Board Welcomes UK Scientist as New Member

A Senior Lecturer and Reader in Geography at the University of Birmingham, UK, Dr. Martin L. Parry was elected to serve on the Climate Institute's Board of Directors. Dr. Parry is co-author of a recent two-volume work, *The Impact of Climatic Variations on Agriculture*, published under the aegis of the International Institute for Applied Systems Analysis (IIASA) and the United Nations Environment Programme (UNEP). The first international study of its kind, it is a set of case studies in 11 regions of the world, investigating the effects of climatic change on agriculture.

Dr. Parry is also Coordinator of the Atmospheric Impacts Research Group, and a member of the Scientific Advisory Com-

mittee of UNEP's Climate Impacts Programme. From 1983-86 he was Director of the Climate Impacts Project of IIASA.

Dr. Parry, who is widely regarded as the world's leading expert on implications of climate change for agriculture, will be a panel speaker at the Climate Institute's Second North American Conference on Preparing for Climate Change this December.



Dr. Martin L. Parry.

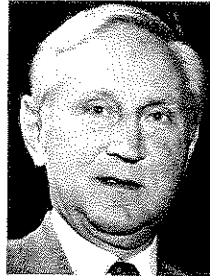
British UN Ambassador Joins Climate Institute Board

Sir Crispin Tickell, Permanent Representative of the United Kingdom to the United Nations, has agreed to serve on the Board of Directors of the Climate Institute. "You may rely on me to give you the best help and advice that I can in a cause to which both of us I know are fully committed," Sir Crispin wrote to CI President John Topping, in accepting the invitation to join the Board in July.

Sir Crispin has had a distinguished career in the British Diplomatic Service, including serving as Ambassador to Mexico, 1981-83, and Deputy Under Secretary of State (Economic), Foreign and Commonwealth Office, 1983-84. From 1984-

87 he was permanent Secretary to the Overseas Development Administration, and he has also served as Chef de Cabinet to the President of the Commission of the European Communities.

Climatology is one of his special interests, and he has written a book, *Climatic Change and World Affairs*, which was published after he spent a year as a Fellow in the Center for International Affairs, at Harvard University.



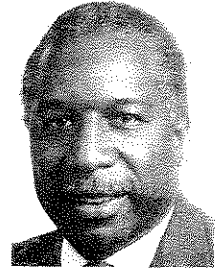
Sir Crispin Tickell.

CI Recruits Carl Cole to Direct Administration

A personnel and management consultant and civic leader in Washington, D.C., Carl Cole has become Director of Administration for the Climate Institute.

Mr. Cole was recently field director of a home ownership study of the Greater Anacostia area of the District and is a prominent leader in the Washington community. Active in environmental affairs, he is also a boating and canoeing enthusiast and an avid fisherman.

In addition to his overall responsibilities for administration of the Climate Institute, Cole is serving as conference coordinator for the Institute's symposium on "Implications of Climate Change for Africa," to be held in May 1989 at Howard University.



Carl Cole.

Wetlands

Continued from page 9

seven feet by 2100, if a warmer planet causes oceans to expand and glacial ice to melt. An increase of five to seven feet would lead to a loss of 30 to 80 percent of the nation's wetlands, according to the report.

Copies of the report, "Greenhouse Effect, Sea Level Rise and Coastal Wetlands," may be obtained from Karen Zambri at EPA, 202/328-2776.

CLIMATE INSTITUTE

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SECOND N.A. CONFERENCE

The Climate Institute is convening a *Second North American Conference on Preparing for Climate Change* Dec. 6-8, 1988 in Washington, D.C. Besides Canada, special efforts are being made to include Mexico and other nations in Central America and the Caribbean area.

See pp. 3-8 for agenda.

The Climate Institute is a private, nonprofit organization formed to advance public understanding of global warming produced by the greenhouse effect and of strategies to avert stratospheric ozone depletion.