



# Global Warming: What Does It Mean for Upstate New York and the Great Lakes

A report on the June 23, 1998 EPA Regional Conference sponsored by the EPA Office of Policy, Office of Economy and Environment

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## INSIDE

Reflections on Kyoto.....2

Global Warming: Is It Real? .....2

The Clean Energy Revolution .....4

A Changing Climate on Wall Street .....6

And More...



## UPSTATE NEW YORK AND THE GREAT LAKES PREPARE FOR CLIMATE CHANGE

Upstate New York and the Great Lakes region have a "significant stake" in efforts to control global warming, said Anthony Masiello, mayor of the City of Buffalo. "It appears that global warming could have negative impacts on many of our region's strengths, assets, and resources."

Masiello spoke at a conference on global climate change convened by the U.S. Environmental Protection Agency in Buffalo on June 23, 1998. The mayor noted that New York State's top two industries are agriculture and tourism, both of which may be vulnerable to the effects of climate change. "The time to deal with this issue is now," he said.

EPA Region 2 Administrator Jeanne Fox told the conference that actions to minimize global warming will help address other pressing environmental and public health problems, such as air quality. They also may benefit the economy: Fox said that Buffalo is well-positioned to be a center for clean alternative technologies, which are growth industries "with the potential to create thousands of new, well-paying, and sustainable jobs."

In fact, Fox added, 283 companies and organizations within Region 2 already have begun to reduce their greenhouse gas emissions by joining EPA's Green Lights program. Their efforts are saving nearly 2.3 billion kilowatt-hours of electricity per year, preventing emissions of 8 million pounds of nitrogen oxides, 19.4 million pounds of sulfur dioxide, and 2.7 billion pounds of carbon dioxide.

The meeting was co-sponsored by 10 municipalities and organizations, and was attended by more than 100 leaders and representatives from a wide range of businesses; environmental and civic organizations;

federal, state, and municipal agencies; electric and gas utilities; academic institutions; and others. An ABC affiliate in Buffalo and *The Buffalo News* provided news coverage of the meeting.

Following welcoming remarks by Fox and Masiello, participants listened to presentations about the science of global warming, potential economic impacts on the Great Lakes region, and the policies and technologies that will be needed to slow climate change.

Bill White, senior advisor on climate change to EPA Administrator Carol Browner, provided details on the global climate treaty negotiated last December in Kyoto, Japan, calling it an "important achievement

in the best interest of the United States and the global environment," but also a "work in progress." The administration will work to gain commitments from developing countries before submitting the treaty to the Senate for ratification.

Joseph J. Romm, outgoing principal deputy assistant secretary of the U.S. Department of Energy's Office of

Energy Efficiency and Renewable Energy, gave the keynote address in which he outlined U.S. strategies for developing new technologies that will create a cleaner and safer environment. "There are very large opportunities," he said, in technological advances such as fuel cells, cogeneration, biomass energy, and photovoltaics.

Other plenary speakers included representatives from the insurance and chemical industries. Two afternoon sessions focused on strategies and technologies that the public and private sectors could use to mitigate climate change.

Jeanne Fox concluded the conference by focusing on "one very important thing that everyone can do" to help change the course of global warming—education. "We need to help people understand that the road we're heading down is one of great danger, and we must change that course." ♦



Buffalo Mayor Anthony Masiello spoke about the need to revitalize urban centers in order to reduce greenhouse gas emissions from transportation.



EPA Region 2 Administrator Jeanne Fox noted that Buffalo is well-positioned to be an economic center for clean technologies.

*"If Dr. Yarnal is right, my son should buy a beachfront house a half-mile from the ocean, and we may well have to put trillions of dollars into water control."*

George H. Spira  
Manager of  
Government/  
Public Affairs  
CWM Chemical  
Services, Inc.

## REFLECTIONS ON KYOTO

The United States played a vigorous role in shaping the Kyoto Protocol on global climate change, according to EPA Senior Advisor Bill White. The treaty, negotiated last December in Kyoto, Japan, represents an "important achievement in the best interest of the United States and the global environment," White said. But he added that it also remains a work in progress.

White noted that the protocol embodies President Clinton's objectives for an economically sound and environmentally strong agreement. But the President's third objective, significant participation by developing countries, remains to be met. "We're going to work hard to achieve that objective before we sign the treaty and send it to the Senate for ratification," White said.

The agreement includes realistic targets and timetables for reducing emissions among the major industrialized nations. It also features flexible market-based mechanisms for achieving those targets. The targets will be met by averaging emissions over a five-year period, from 2008-2012, rather than in a single year. This flexibility is necessary, White said, because natural variations in weather and economic circumstances make it impossible to control greenhouse gas emissions precisely. Parties to the protocol have 10 years to prepare for their targets, "a substantial transition period" that will help cushion any economic impacts, according to White.



◀ EPA Senior Advisor Bill White called the Kyoto Protocol an economically sound and environmentally strong agreement.

Each of the key industrial powers has its own emissions target, with reduction levels varying slightly based on individual circumstances. The United States must reduce its greenhouse gas emissions to 7 percent below 1990 levels between the years 2008 and 2012.

White emphasized that countries are allowed to meet their obligations through flexible market mechanisms rather than mandatory policies and measures. If EPA's experience with emissions trading under the acid rain program is any indication, the greenhouse gas emissions trading provisions of the Kyoto Protocol will reduce the cost of compliance dramatically while achieving environmentally beneficial results.

He noted that commonsense actions already are underway in the United States to reduce emissions and invest in new technologies. In 1997 alone, businesses and agencies participating in voluntary programs under the President's Climate Change Action Plan together reduced more than 40 million tons of CO<sub>2</sub> emissions and 90,000 tons of NO<sub>x</sub> emissions. In the process they saved more than \$1 billion in energy costs. ♦

## GLOBAL WARMING: IS IT REAL?

"I know of no scientific area of study that has more 'consensus' than the field of global warming, said Brent Yarnal, associate professor of geography at Pennsylvania State University. Thousands of scientists believe that humans are changing the climate, according to Yarnal, while "only a handful" disagree.

There is little doubt that people are enhancing the natural greenhouse effect, Yarnal said, and the preponderance of evidence suggests that global warming is happening. But he cautioned that "great uncertainties" remain, especially when it comes to predicting changes at the regional level.

The warming that the world has experienced in the 1990s is a result of greenhouse gas emissions that occurred just after the Second World War, according to Yarnal. "There's about a 50-year lag in the climate system because of the way the ocean stores and transfers heat," he said. The impact of greenhouse gases that we emit today will be felt by our children and grandchildren.

▶ Penn State Professor Brent Yarnal told the audience that the greatest potential impacts to the region involve changes in the hydrological cycle.



Yarnal noted that higher temperatures are just one likely manifestation of global warming. In fact, he said, people probably will be more affected by impacts on the hydrologic cycle. "Changes in the amount of water available and the timing of that availability will really make a difference to us."

For example, climate change may reduce the amount of water coming into the Great Lakes Basin because of less rainfall. At the same time, higher evaporation rates may result in lower lake levels.

Yarnal emphasized that climate change simply will add to the many other stresses on human and natural systems. Economic and institutional changes may have a bigger direct impact on humans than global warming, he said, "but climate just might be the straw that broke the camel's back." ♦



◀ Audience members asked questions about a number of issues such as the possible connections between El Niño and climate change.

## CHANGE IN THE BASIN

Climate change could affect ecosystems, agriculture, trade, energy generation, and recreation in the Great Lakes-St. Lawrence Basin, according to Peter Sousounis, assistant professor of atmospheric, oceanic,



▲ Peter Sousounis, of the University of Michigan, outlined the potential costs of falling water levels in the Great Lakes.

and space sciences at the University of Michigan.

Global warming could reduce water levels in the Great Lakes by 0.5 to 2.5 meters (1.6 to 8.2 feet), Sousounis said, with potentially significant impacts on wetlands, biodiversity, and the region's infrastructure and economy. Associated costs—such as dredging ship channels and lowering docks—could add up quickly, with dredging costs for Buffalo alone estimated at \$11-\$30 billion. Hydropower generation may decline, and the region's power supply could be strained by higher peak energy demand in summer for air conditioning and refrigeration.

Describing the resources at stake, Sousounis noted that the Great Lakes hold nearly 20 percent of the world's freshwater supply. "Enough water flows through the St. Lawrence River in one minute to fulfill the water needs of the state of New York for an entire day," he said.

The region is home to more than 42 million Canadians and Americans. The St. Lawrence Seaway, the world's longest deep-draft inland waterway, serves 50 regional ports and has accounted for \$300 billion in trade since its opening in 1959. The Great Lakes support globally rare fish and the largest system of freshwater sand dunes in the world.

Global warming could affect the region's wetlands, forests, and specialty crops such as tart cherries and ice wine grapes, Sousounis said. Although a warmer climate could improve growth in some crops, the benefits could be more than offset by damage from changes in precipitation. ♦

## GLOBAL WARMING AND THE INSURANCE INDUSTRY

"There is nothing that an insurer abhors more than uncertainty," declared Eugene Lecomte, president emeritus of the Institute for Business and Home Safety. That makes global warming, with its considerable uncertainties, a problematic issue for the insurance industry.

"There are no guaranteed predictions that the frequency and severity of weather or weather-related events will increase," he said. So insurers currently are taking a wait-and-see attitude on global warming, according to Lecomte. But that doesn't mean they are indifferent. If predictions are accurate, global warming will exacerbate coastal erosion and will lead to more frequent and severe windstorms, a greater number of damaging hail storms, more droughts and heavy rains, floods, and wildfires.

Insurers could find themselves conceivably "overwhelmed" with losses, Lecomte said. "Most people think that insurers have bottomless pockets, but believe me, it isn't so."

How should insurers respond to the issue of climate change? According to Lecomte, they must use their experience and expertise to mitigate losses, improve community safety, and create public awareness and concern. Insurers also should help develop models that would accurately predict occurrences and estimate losses.

The industry currently is pressing for stronger building and energy codes, notably those that would provide for life safety and reduced property damage. "Only 39 states have statewide building codes," Lecomte

noted, "and some have codes that apply only to government buildings, hospitals, and fire stations."

Lecomte added that the industry also must undertake educational efforts to sensitize the public to the risks of natural hazards. ♦

## DUPONT SHOWS THE WAY

DuPont, the energy and chemical giant, has reduced its greenhouse gas emissions worldwide by 18 percent since 1990, and energy-efficiency measures are saving the company \$90 million per year in energy costs, according to Edwin Mongan, environmental stewardship manager at DuPont.

DuPont is a \$40 billion company with 100,000 employees and 150 manufacturing facilities around the world. Mongan said that all of DuPont's facilities are working to reduce greenhouse gas emissions and other environmental impacts. The company has reduced

Continued on page 4

*Global Warming* reports the results of a conference sponsored by the U.S. Environmental Protection Agency entitled, "Global Warming: What Does It Mean for Upstate New York and the Great Lakes?" The conference took place on June 23, 1998, in Buffalo, New York.

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For more information about the conference, visit the U.S. Environmental Protection Agency's global warming conference website at: <http://www.epa.gov/globalwarming/conferences/>.

In addition, EPA publishes a number of fact sheets about global warming and energy conservation. Call EPA's Fax-On-Demand Service (202-260-2860) or access EPA's global warming website at <http://www.epa.gov/globalwarming>.

*"We ran models that showed a statistically significant increase in precipitation and suspected that global climate change could be a possible underlying cause. We determined that based on this data, further investigation was necessary."*

Brian C. Johnson  
Environmental Scientist  
State of New York  
Office of Attorney  
General

DUPONT SHOWS THE WAY *Continued from page 3*



▲ DuPont's Edwin Mongan described how energy efficiency improvements save his company \$90 million annually.

Toxic Release Inventory releases by 78 percent since 1988, reduced waste to landfills by 45 percent, and will eliminate ozone-depleting compounds

completely in the next year or so.

According to Mongan, DuPont has achieved its results through a strong corporate commitment and the use of company-wide networks to share information, expertise, and technologies. DuPont also participates in a number of voluntary government programs, such as the U.S. EPA and DOE Climate Wise program. "Voluntary programs give us a forum to demonstrate performance in the public arena, and they give us the motivation to accelerate our environmental performance improvements," Mongan said.

DuPont's approach to reducing greenhouse gas emissions focuses on improving energy efficiency, eliminating nitrous oxide emissions from the nylon manufacturing process, and reducing emissions of hydrofluorocarbons (ozone-safe replacements for CFCs) through capture and re-use. Each of these efforts contributes a third to DuPont's total greenhouse gas emissions reductions.

Mongan said the company ultimately plans to reach a 50 percent reduction in worldwide greenhouse gas emissions. The goal for its United States facilities is a 40 percent reduction by 2000, "and we're on target to achieve that."

The effort is yielding "tremendous business benefits," Mongan said, noting that DuPont's Niagara Falls facility is now saving \$2 million per year through steam efficiency improvements and other measures. ♦

## THE CLEAN ENERGY REVOLUTION

"Energy use leads to more environmental damage than any other peaceful human activity," said Joseph J. Romm, outgoing principal deputy assistant secretary of the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy. The good news is that there are many technologies that can reduce greenhouse gas emissions and other pollutants at low cost.

The United States is a very wasteful producer and consumer of energy, according to Romm. Each year, he said, two-thirds of the primary energy that is burned in power plants in the United States is lost in the generation, transmission, and distribution of electricity. The amount wasted—21 quadrillion BTUs of energy—is equal to Japan's total annual energy use for all purposes.

### Energy Supply

New technologies can achieve much better results, Romm said. Cogeneration plants, which make electricity and steam for heating, are about 85 percent efficient.



▲ Conference participants were exposed to a range of views on global warming.



▲ Some audience members asked pointed questions about the Kyoto Protocol and emissions trading.



◀ Joseph Romm, of the Department of Energy, discussed a number of promising new technologies that can be used to reduce greenhouse gas emissions.

Fuel cells provide clean, combustion-free electricity at about 45 percent efficiency.

Small fuel cells will be commercially available for homes or office buildings in the next two to three years, according to Romm. Combined with energy efficiency measures, fuel cells may cut the CO<sub>2</sub> emissions of a building by 75 percent without raising the energy bill.

Renewable energy also is an important source of power for the future. The cost of photovoltaics (solar-generated electricity) has fallen dramatically in the past decade, and there has been "remarkable" growth in the field. "We are building a photovoltaics plant in the United States almost every two months," Romm said.

Wind power is growing even faster. The Department of Energy's next-generation wind turbine, which will be available in three to four years, provides power at a very competitive 2.5 to 3.5 cents per kilowatt-hour.

Biomass energy, generated by burning wood and other plant materials, could be the single biggest renewable energy technology by the year 2010, according to Romm. Biomass can be co-fired in existing coal plants to generate electricity with no net carbon emissions.

### Transportation

The average car is only about 15 to 20 percent efficient in converting petroleum into mobility, Romm said. Emerging technologies such as fuel cells, hybrid drive trains, and regenerative braking could significantly improve that performance. Romm noted that three automakers already have committed to produce autos running on fuel cells by 2004.

### Buildings

The building sector has large opportunities for savings. According to Romm, virtually any building in this country could cut its carbon emissions in half over a five-year period through energy efficiency and cogeneration.

For example, the Four Times Square building, a 48-story office building in Manhattan, will generate 40 percent less greenhouse gas emissions than a typical new building. It uses a combination of energy efficiency technologies, daylighting, fuel cells, and rooftop photovoltaics.

A new systems approach to building design has produced residential housing that uses 40 to 50 percent less energy than today's typical home at no extra cost, Romm added.

### Industry

A one-day energy audit in almost any business can point out potential energy savings of 10 to 20 percent, Romm said. And "almost any manufacturing plant" that is willing to make additional efforts can reduce its energy use by 30 to 50 percent.

Romm emphasized that there is no one silver bullet for reducing emissions. Instead, a "spectrum of dozens of technologies" will contribute. He concluded, "We can increase our standard of living while reducing carbon emissions." ♦

## REDUCING EMISSIONS WITH NYSERDA

The New York State Energy Research and Development Authority (NYSERDA) wants to solve some of New York's most difficult energy and environmental problems while improving the state's economy, according to NYSEDA board member Elizabeth Thorndike.

"Climate change is the cumulative impact of countless local decisions about how we use energy and allocate resources," Thorndike said. NYSEDA staff work with industry partners and local governments on a wide range of projects to improve energy efficiency and reduce greenhouse gas emissions.

The organization's Energy Efficiency Services program provides technical and financial assistance to businesses and institutions, and its Flex-Tech program helps businesses evaluate how to reduce energy expenses. NYSEDA also is involved in the research and development of alternatively fueled vehicles, new energy resources, and high-performance buildings. The program on buildings is especially important, Thorndike said, as they account for 62 percent of energy expenditures in New York State. ♦

## FUELING THE FUTURE

Fuel cells will be commercially available to provide clean power in buildings by 2001 and in automobiles by 2004-2005, according to David Applebaum, director of business development at Ballard Generation Systems. Ballard develops, manufactures, and distributes fuel cell

engines and power plants.

Fuel cells generate electricity



David Applebaum, of Ballard Generation Systems, said that fuel cells will be commercially available for buildings in just three years.

through an electrochemical process that involves no combustion. They offer quiet operation, zero or low emissions (depending on the fuel used), reliable power, and low operating costs. Applebaum said that fuel cells are ideal for "anyone who wants reliable, uninterrupted power."

Applebaum cautioned, "At this stage of commercialization, these technologies are not cost-competitive with the grid," but economies of scale should bring the cost down in the future. He added that even at today's prices there is plenty of demand for fuel cells from the automotive industry and from companies that require uninterrupted power. ♦

*"You can't deregulate the utility industry and just hope to come out on the right end of the global warming issue. Deregulation plans are wiping out incentives for energy conservation and efficiency. The end result will be more energy waste and more greenhouse gas emissions. We are going in the wrong direction."*

Walter Simpson  
Energy Officer  
University of Buffalo,  
State University  
of New York

“One reason I attended is so I can direct my students to places to go for more information on global warming.”

Mariana L. Rhoades  
Geologist

## A CHANGING CLIMATE ON WALL STREET

“Most of the finance community has not paid attention at all to environmental issues,” said

Paul Hilton, a research analyst at Smith Barney Asset Management. But this is starting to change as the banking and insurance industries face environmental liabilities.

Insurers have paid out billions for environmental disasters in recent years, and some banks now view global warming as one risk to be considered when they are evaluating loans for businesses that may be vulnerable to changes in climate. In Switzerland, for example, developers cannot get loans for ski resorts below a certain altitude.

On Wall Street, some socially responsible investment firms are reviewing companies' responses to climate change before investing. According to Hilton, companies that anticipate regulatory requirements and develop policies to address climate change will be in a better position to benefit financially in the long term. Hilton also noted that at least one environmental fund has outperformed its benchmark, the Morgan Stanley Capital Investment World Index—by nearly 4 percent after management fees. ♦



▲  
Smith Barney analyst Paul Hilton told how banks, insurers, and Wall Street firms are reacting to the risks of global warming.

## EARLY EXPERIENCE WITH EMISSIONS TRADING

The Niagara Mohawk Power Company has been so successful in lowering its greenhouse gas emissions that it has reductions to spare, said Martin Smith, chief environmental scientist at Niagara Mohawk. The utility began tracking, reducing, and avoiding greenhouse gas emissions in 1991 and already has reduced its net emissions well below what

▶  
Niagara Mohawk's Martin Smith described the terms of an innovative greenhouse gas emissions trade between Niagara Mohawk and a Canadian company.



would be required under the Kyoto Protocol by the years 2008-2012, if ratified by the U.S. Senate.

Niagara Mohawk used some of its “extra” reductions to initiate early experiments in greenhouse gas emissions trading. The company negotiated a sale of 100,000 metric tons of CO<sub>2</sub> equivalent to Suncor Energy in Calgary, Alberta, a utility that expects its emissions to increase in the future. Niagara Mohawk also sold an option on up to 10 million tons of additional greenhouse gas reductions to be delivered to Suncor between 2001 and 2010. Niagara Mohawk will reinvest a minimum of 70 percent of the proceeds from the sale in new projects to reduce greenhouse gas emissions further. ♦

## CITIES DO MAKE A DIFFERENCE

At present, 247 cities and counties worldwide participate in the Cities for Climate Protection Campaign of the International Council for Local Environmental Initiatives, according to Alana Blackall, a project coordinator for the campaign.

She cited five U.S. cities and counties as outstanding examples of municipalities that have taken action to reduce carbon emissions. Measures taken include rebates for alternatively fueled vehicles, employee vanpools, tree planting, photovoltaic street lighting, methane recovery from landfills, expansion of light rail systems, construction of downtown housing, traffic calming strategies, recycling programs, and equipping metropolitan buses with bicycle racks.

Asked how to encourage communities to take part, Blackall spoke of the co-benefits of reducing emissions:



◀  
ICLEI's Alana Blackall noted that 100 million people live in cities that have joined the campaign to protect the climate.

improved air quality, lower municipal operating costs, new jobs, and enhanced neighborhood livability. She added that the campaign holds workshops for mayors and city commissioners every three months.

She concluded, “We need to take it community by community.” ♦

## UPCOMING CONFERENCE

The next regional conference sponsored by the U.S. EPA, “Climate Change: What Does It Mean for the Southwest?” will be held September 24, 1998, in Phoenix, AZ. For more information, contact Monica Duda, Waste Policy Institute, 703-247-2410

## SMART COUNTY

Erie County in upstate New York has a “just do it” attitude, said Richard Tobe, the county’s environmental commissioner.

One thing the county has done is to install motors that deliver air into sewage to speed decomposition, using less energy. Another is eliminating sewer pump stations. “Using gravity instead saves \$90,000 a year in energy costs,” Tobe pointed out.

In cooperation with Buffalo, the county has completed a district heating program. “These things stand on their own because they save money,” said Tobe.



▲ Environmental commissioner Richard Tobe told the audience that 15 of Erie County’s 41 villages and towns are doing master plans to reduce suburban sprawl and encourage smart growth—and thus reduce greenhouse gas emissions.

“The down side is that the public hardly knows what we’ve done,” he said. That may change because the county recently adopted a resolution to develop a five-year plan to reduce energy consumption in county facilities by 20 percent. The resolution calls for the use of sustainable energy technologies and the implementation of “local programs that reduce the level of greenhouse gases to help meet national goals to reduce emissions.” ♦

## HOW FAST CAN TREES WALK?

Wherever the Haudenosaunee, an agricultural people of the St. Lawrence River valley, settled,



◀ “We do not have a right to squander the future of our children,” Henry Lickers told the conference.

they planted black ash, hickory, and other trees important to them. “We know how to shift tree species—but it took us 300 years,” said Henry Lickers, co-chair of the Haudenosaunee Environmental Task Force. When the elders of the Haudenosaunee tribe learned that the climate may change rapidly over the next 100 years, they asked, “How fast can the trees walk?”

The Haudenosaunee are concerned about the melting of the permafrost, saltwater intrusion as sea levels rise, and the impacts of climate change on the St. Lawrence’s spawning beds. “As the rivers become warmer,” said Lickers, “the perch and pickerel seem to be declining.”

Recently, the Haudenosaunee have had to cope with ice storms, floods, and forest fires. “We’re becoming pretty good at dealing with emergencies,” Lickers said. “But what happens when we put the whole system under stress?” ♦

## TRANSPORTATION INNOVATION AT CORNELL

In the 1980s, growth in automobile use at Cornell University far outstripped campus parking facilities. Through car pooling, public transit incentives, and disincentives to single-occupancy vehicles, Cornell reduced the number of vehicles brought to campus by 25 percent, according to David Lieb, communications and marketing manager of Tompkins Consolidated Area Transport and Transportation and Mail Services at Cornell University.

As a result, each year since 1991 Cornell commuters traveled 10 million fewer miles and reduced net annualized carbon emissions by 6.7 million pounds per year.

Nearly 37 percent of Cornell’s faculty members and students participate in the demand management program. As part of a three-tier fee structure, 1,600 perimeter parking spaces were converted from no-fee to fee. Positive incentives include fully paid in-county transit and rebates to members of carpools.

Participants have the security blanket of emergency rides when necessary. “We get only one or two calls per month,” Lieb concluded. ♦



▶ David Lieb, of Cornell University, said, “We reduced demand without being draconian.”

“As a gas distribution company, weather is very important to us.”

Mark D. Pijacki  
Manager  
Market Planning  
National Fuel Gas  
Distribution  
Corporation

## JOIN EPA'S CLIMATE CHANGE MAILING LIST

Receive timely news about global warming via EPA's climate change mailing list—an Internet listserv that provides information on impacts, solutions, international and national policies and programs, and relevant conferences.

### *Climate Change and Public Health* (climate-medical-L)

For medical practitioners, addresses the health risks associated with global warming, such as potential increases in infectious diseases, deaths from heat waves, and water-borne illnesses, and shares research findings, information on disease surveillance, and intervention strategies.

### *Climate Change Innovative Business* (climate-business-L)

For business leaders, includes information on current findings, energy conservation programs, and opportunities to adopt renewable energy technologies.

### *Climate Change and State-Local Governments* (climate-govs-L)

For state and local government officials, discusses the impacts climate change can have on our states and cities, and offers innovative ways to curb global warming while reducing pollution and saving money.

### *Climate Change and Outdoor Recreation* (climate-outdoor-L)

For outdoor recreation enthusiasts, provides hunters, anglers, campers, hikers, and wildlife watchers with the latest scientific developments on climate change and its effects on the natural world.

### *Climate Change and Coastal Communities* (climate-coastal-L)

For coastal communities, provides information on strategies for adapting to or mitigating sea level rise, potential effects on severe storms, and coastal success stories.

### *Climate Change and Meteorologists* (climate-meteor-L)

For meteorologists, includes information on current findings and effects on weather patterns, including severe storms.

### *How to subscribe...*

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## CONFERENCE SPEAKERS

**David Applebaum** Director of Business Development, Ballard Generation Systems

**Alana Blackall** Project Coordinator, Cities for Climate Protection Campaign, The International Council for Local Environmental Initiatives

**Jeanne Fox** Regional Administrator, U.S. Environmental Protection Agency, Region 2

**Paul Hilton** Research Analyst, Smith Barney Asset Management

**Gene Lecomte** President Emeritus, Institute for Business and Home Safety

**Henry Lickers** Co-chair, Haudenosaunee Environmental Task Force

**David Lieb** Communications and Marketing Manager, Tompkins Consolidated Area Transport, Transportation and Mail Services, Cornell University

**Anthony Masiello** Mayor, City of Buffalo

**Edwin Mongan, III** Environmental Stewardship Manager, DuPont

**Joseph J. Romm** Principal Deputy Assistant Secretary, Office of Energy Efficiency and Renewable Energy, U.S. Department of Energy

**Martin Smith, Ph.D.** Chief Environmental Scientist, Niagara Mohawk Power Company

**Peter Sousounis, Ph.D.** Assistant Professor, Atmospheric, Oceanic and Space Sciences, University of Michigan

**Elizabeth Thorndike** Board Member, New York State Energy Research and Development Authority

**Richard Tobe** Environmental Commissioner, Erie County

**Bill White** Senior Advisor to the Administrator for Climate Change, U.S. Environmental Protection Agency

**Brent Yarnal, Ph.D.** Associate Professor of Geography, Pennsylvania State University

### **Moderators**

**Edward Bennett** Air Division, New York State Department of Environmental Conservation

**Tony Savino** Economist, New York Power Authority

**David Shaw, Ph.D.** Professor of Electrical Engineering, SUNY Buffalo

To learn more about global warming, check out EPA's global warming website: <http://www.epa.gov/globalwarming>.