

Climate Alert



A Publication of the Climate Institute
"Protecting the balance between Climate and Life on Earth"

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World's Highest Climate Observatory to be Named For Sir Crispin Tickell

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On September 24, 2007 the Climate Institute announced that it is naming for Sir Crispin Tickell a new High Altitude Climate Observatory in Pico De Orizaba National Park. The Tickell Climate Center will be the first high-altitude climate observatory in Mexico and the highest of its kind in the world. The project was announced in conjunction with a speech on vulnerability and climate change by Sir Crispin Tickell, the Chairman Emeritus of the Climate Institute and the author of *Climatic Change and World Affairs*, one of the first books to highlight the dangers of human-induced global climate change, first published in 1977.

Although Sir Crispin had been instrumental in building support for the observatory, he was unaware that it would be named for him until a few minutes before delivering the prestigious Miguel Aleman Lecture at the Miguel Aleman Foundation in Mexico City. Soon after learning from Luis Roberto Acosta, Director of Mexico and Latin American Regional Affairs of the Climate Institute and driving force behind the climate center, that the observatory would be named in his honor, Sir Crispin indicated his great delight. He noted that this was the third thing to be named in his honor—the first an Amazonian moth and the second an asteroid. What he found most appealing about the observatory was that the data it gathered would be of great value to humanity and other living things.

"This new center will watch over the greater number of parameters that make up the vital signs of the planet, including the stratospheric ozone layer, suspended particulates, greenhouse gases and ultraviolet solar radiation," said Sir Crispin.

The data gathered at the observatory, which will commence in 2008, will contribute to the Global Atmospheric Watch and the Global Earth Observing Systems.



Sir Crispin Tickell and Luis Roberto Acosta being interviewed by television reporter



Dr. Aurora Elena Ramos, Sir Crispin Tickell and Barbara Hernandez



From Left to Right: Luis Roberto Acosta, Carlos Diaz Leal and John Topping



From Left to Right: Roberto Hernandez, Luis Roberto Acosta, Aurora Elena Ramos, Sir Crispin Tickell

The observatory will be located about 4,581 meters above sea level (about 15,000 feet) on the mountaintop of the inactive Sierra Negra volcano and on about the same latitude as the climate observatory at Mauna Koa in Hawaii. There are currently 21 climate monitoring centers around the world, with two others in Latin America, one in Argentina and another in Brazil.

Instruments for the observatory are being provided by the US's National Oceanic and Atmospheric Administration (NOAA, and its National Aeronautics and Space Administration (NASA) and by Sun Microsystems. Three Mexican government agencies have played a key role in the launch of the High Altitude Climate Center. The National Institute for Astrophysics, Electronics and Optics (INAOE), has made space available in a high altitude science park near the world's most powerful radio telescope that it will operate; INAOE will also provide electricity, security and infrastructure support for the Climate Center. Mexico's Meteorological Service is already helping to calibrate instruments and will help link data from the Climate Observatory and meteorological stations in Mexico to online systems the Climate Institute is seeking to have available both for computer users and in museums. The National Protected Areas Commission that has responsibility for National Parks is planning to build a visitors center to service both the radio telescope and the climate center.

Funding for construction of the Tickell Climate Center has been provided by La Fundación Pedro y Elena Hernández, A.C., the leading private funder of restoration of historic sites in Mexico and one of Mexico's leading funders of environmental conservation. Instrumental in the support of the observatory was Barbara Hernandez, President of the Hernandez Foundation.

In part because of its location beside what will be the world's most powerful radio telescope the soon- to- be built Tickell Climate Center not only will fill a significant gap in the Global Climate Observing System, it already has stimulated much greater interest in climate protection. Luis Roberto Acosta has pointed out that the Mayans were advanced in astronomy and when the telescope is operational Mexico will move into the forefront again in this field. With the opening of the High Altitude Climate Observatory Mexico will jump to the fore in climate science. Several major museums have already asked the Climate Institute to set up links to computers that will enable visitors to access data from the observatory. The Institute is also working closely with CICEANA, Mexico's leading environmental awareness group, to design and implement a national campaign to generate awareness of climate challenges and solutions. The national pride generated by the Tickell Observatory and High Altitude Science Park has helped greatly to jump start this effort. □

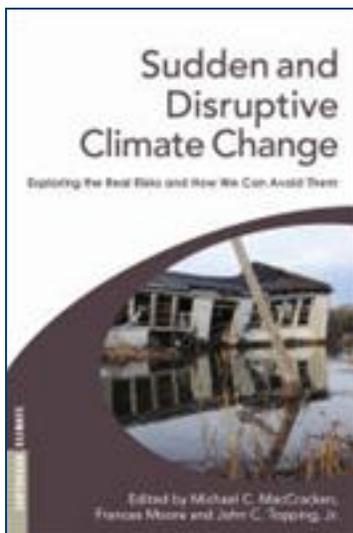


Climate Institute Book Release: “Sudden and Disruptive Climate Change: Exploring the Real Risks and How We Can Avoid Them”

The Climate Institute announces the launch of its book, *Sudden and Disruptive Climate Change: Exploring the Real Risks and How We Can Avoid Them* (Earthscan 2007). The contents of the book, edited by Climate Institute Chief Scientist, Michael MacCracken, former Climate Institute Research Associate, Frances Moore, and Climate Institute President, John Topping, Jr., are compiled from presentations given at the Washington Summit on Climate

Stabilization, hosted by the Climate Institute from September 18-21, 2006 in Washington, DC. The book investigates the potential of sudden climate change, and includes submissions by international experts and researchers in the field of climate change. In five comprehensive sections, the possibilities of rapid changes to the weather, rapid melting of ice and amplification of sea level rise, dramatic changes in coastal regions, rapid changes in ecosystems, and accelerating action to limit

climate change are explored. An essential read for government and policy makers wishing to become more familiar with the science behind rapid climate change, *Sudden and Disruptive Climate Change* additionally provides suggestions for plans of action to mitigate climate change. With its book, the Climate Institute sounds the alarm on the necessity to take action sooner rather than later. The Climate Institute will hold a book launch at the Climate Institute Ballroom Conference Room in early 2008.



The editors: From left to Right: Mike MacCracken, Frances Moore and John C Topping Jr.

“This book makes it clear for all of us that, while risks of abrupt climate change are increasing, opportunities to solve the climate crisis are abundant. It’s an impressive accomplishment.”
Al Gore

Margie Simon de Ortiz, Barbara Hernandez, Tom Casten and Bob Corell Join the Climate Institute Board

Two outstanding Mexican environmentalists, Margie Simon de Ortiz and Barbara Hernandez, were recently elected to the Climate Institute board of Directors. Their election to the Board of the world's first climate protection organization came only two months after Thomas R. (Tom) Casten, a successful Illinois entrepreneur who has spearheaded combined heat and power development in the US and many



Margie Simon de Ortiz

other countries, decided to accept an invitation extended by the Board following its meeting during the September 2006 Washington Summit on Climate Stabilization. At the Climate Institute's December 6, 2007 board Meeting attended by Margie Simon de Ortiz, Barbara Hernandez and Tom Casten the Climate Institute voted to add Dr. Robert (Bob) Corell to its Board. Chairman of the Arctic Climate Impact Assessment, Bob Corell received the Climate Institute's first Roger Revelle Memorial Award for Scientific Achievement at the Climate Institute's 20th Anniversary Dinner September 20, 2006.

Margie Simon de Ortiz is Director General of Centro de Información y Comunicación Ambiental de Norte America, A.C. (CICEANA). Set up soon after the North American Free Trade Agreement came into force, CICEANA has sought to encourage environmental communications among Mexico, the US and Canada. The group has emerged as the leading environmental awareness group in Mexico. Under Margie Simon's leadership CICEANA has developed partnerships with major Mexican and international firms to promote awareness of environmental challenges and of steps individuals and civic groups can take to address them. Even before joining the Climate Institute Board Margie had been working actively with the Climate Institute to develop a major climate awareness effort in Mexico and Latin America.

Barbara Hernandez heads the Fundación Pedro y Elena Hernandez, that has emerged in recent years as the leading private sponsor of efforts to restore Mexico's antiquities, particularly Mayan sites. Barbara Hernandez has been actively involved in environmental activity especially biodiversity preservation. She serves on the Board of RARE, a US based biodiversity group especially active in the Caribbean.

She has been very interested in climate protection and an active proponent of the high altitude observatory that the Climate Institute has been working for several years to create. At her initiative the Hernandez Foundation provided the crucial funding to begin final design and construction of the observatory. The Hernandez Family have been close friends of Sir Crispin Tickell since he was British Ambassador to Mexico nearly a quarter century ago; all were quite enthusiastic over the idea of naming the observatory in honor of Sir Crispin.

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Barbara Hernandez

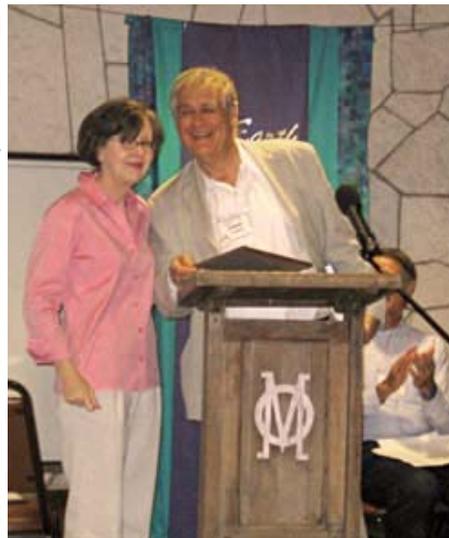


Climate Institute President Receives the Environmental Justice Award

John C. Topping Jr., the Climate Institute's President, was awarded the William Gibson Award for Lifetime Commitment in Environmental Justice. On Saturday, October 27th, 2007 Pam McVety of the Presbyterians for Restoring Creation (PRC) presented the award, stating that "John's work seeks to empower the poor to give their voices to this issue, and to provide ways for the rich to hear their message." The PRC was founded in 1995 to promote ecological action and environmental justice within the denomination, and in 2006 the Presbyterian Church USA became the first denomination in any nation to ask its members as a matter of faith to commit to carbon neutrality. A ten member Task Force led by Pam McVety laid the groundwork for this decision. John Topping served on this task force and drafted the background paper that supported this proposal. The Award was based both on John Topping's leading the Climate Institute for two decades and his work more recently on the PCUSA energy

The award is the first by the PRC in honor of the late William Gibson, a remarkable leader who spearheaded the movement to unify religious communities and environmental groups to act on justice issues. He initiated the Eco Justice Project and Network (EJPN), that conducted "extensive education and outreach to churches, campuses, and communities in collaboration with others — focused on the big picture of the crisis as well as specific environmental problems along with issues of hunger, energy, lifestyle, sustainable economy, good work, peacemaking, and environmental justice for people of color and women — all in eco-justice perspective." In his presentations to the Conference John Topping urged PRC members to work at the state level to topple barriers to cogeneration, the removal of which, he stated, could save US industry and consumers tens of billions annually while slashing greenhouse emissions by as much as 20%.

He also invited Presbyterian Churches and Colleges to link with international efforts with which the Climate Institute is involved such as the Endangered Islands Campaign and the Mexico Climate Protection Program and in the United States with the incipient Tribal Colleges Climate Protection Initiative. The William Gibson Award is the second award that John Topping has received for environmental justice work. In January 2002 he received the first Martin Luther King, Jr. Social Justice Award for Lifetime Achievement from his alma mater, Dartmouth College.



Pam Mc Vety and John Topping

Climate Institute December Reception Honors Mexican Climate Leaders



John Topping giving an award to Carlos Diaz Leal



John Topping giving an award to Ro Acosta

On December 5th, 2007 just before its December 6 Board meeting the Climate Institute threw a reception Dinner at the Tabard Inn, Dupont Circle and welcomed around two dozen guests, to meet the Institute's Mexican Board members. Guests included Dr. Brent Holben, AERONET Project Scientist, in the Biospheric Science Branch, and Dr Nancy Maynard Associate Director, Environment and Health of NASA's Goddard Space Flight Center, Ambassador Richard E. Benedict, President of the National Council for Science and the Environment, Dr Lester Brown, President of the Earth Policy Institute, Carlos Diaz Leal, International Liaison for the Climate Institute and President of The Yu-Bal-Cah Nature Conservancy,

Also present were the Institute's three Mexican Board members-Luis Roberto Acosta, Director of Mexico and Latin America Programs for the Climate Institute, Barbara Hernandez, President of the Pedro and Elena Hernandez Foundation, Margie Simon de Ortiz, Director General of CICEANA, and eight US Board members; Dr, Devra Lee Davis, Director of the Center for Environmental Oncology at University of Pittsburgh Medical Center; Dr. Lee W. Huebner, Di-

rector of the School of Media and Public Affairs of George Washington University; Daniel Power, President of Oceana Energy Company; Chris Flavin, President of Worldwatch Institute; John Noel, President of the Southern Alliance for Clean Energy; Bill Nitze, Chairman of the Climate Institute; and John Topping, President of the Climate Institute and Mike McCracken, Chief Scientist of the Climate Institute.

Bill Nitze welcomed the guests, complimenting the Mexican climate leaders present for their success in moving Mexico to the forefront in climate protection. The same evening, John Topping presented awards plaques to four distinguished individuals : Barbara Hernandez for Providing Crucial Philanthropic Support to Make The Sir Crispin Tickell High Altitude Climate Possible; Luis Roberto Acosta, for Spearheading Climate Protection Efforts in Mexico and Climate Observation Efforts In Latin America; Carlos Diaz Leal; for Pioneering

Activity in Training Youth in Nature and Climate Protection; and Margie Simon de Ortiz For Enabling CICEANA to Become an In-



From left to right: Brent Holben, Carlos Diaz Leal, Margie Simon de Ortiz, Fran Moore, Barbara Hernandez, Compton Tucker

ternational Leader in Building Awareness Of Global Environmental Challenges. A highlight of the evening was a power point presentation by Luis Roberto Acosta of plans for the Sir Crispin Tickell High Altitude Global Climate Observation Center.



Luis Roberto Acosta doing a presentation on the Climate Observatory Center



Latin Americans Thirst for Alternative to Glacier

For hundreds of years, the glaciers of South America have been used by nearby inhabitants for a myriad of purposes, including drinking, irrigation, refrigeration and most recently to provide hydroelectric power. People living in South America have used the melting ice of the Andean glaciers for drinking water during the summer, when it is needed most while during the winter months, the glaciers are not used as much, helping enable them to regenerate.

In her recent article, "Global Warming Melts Andean Glaciers Toward Oblivion", Monica Mochicao reports that "small glaciers are scattered across the Andes and have for long been a crucial source of fresh water... but global warming has driven them into retreat."¹

In recent years, rapid glacier melting due to human-induced climate change in the Andes has captured widespread attention. Although the problem may seem insurmountable and irreversible, some actions can be taken to address the problem of glacier loss in the South American Andes. Recently, 20 UK-based environment and development groups compiled statistics showing unprecedented shocking rates of glacier retreat throughout Latin America and concluded that deglaciation is being accelerated by climate change.

This trend could prove dramatic for people depending on the glacier for their water consumption. Mochicao offers a real-life example of the consequences of shrinking glaciers in describing the typical routine of Daniel Cuenca, a father of four and a resident of El Alto. El Alto is a small lower-class city just north of La Paz, Bolivia. It is also the country's fastest growing city, with an annual population growth of 10%. But it also has growing problems. In the late 1990s, UNICEF estimated that 20% of people in El Alto lacked potable water and it was inevitable that El Alto as well as La Paz would have an increasing demand for water in the future.

Cuenca describes how he draws water that he and his family use from a river not far from his home. The source of this water is from melted ice from the nearby Chacaltaya glacier that supplies many others in the area.

According to Bolivian officials, roughly one third of the drinking water supply to La Paz comes from melting glaciers in the area. Glaciologist Edson Ramirez has stated that there is a strong possibility that the Chacaltaya glacier, which was once home to the world's highest ski resort, will be gone in a couple of years.

The nearby 18,000-foot Tuni Condoriri glacier is also rapidly melting. This

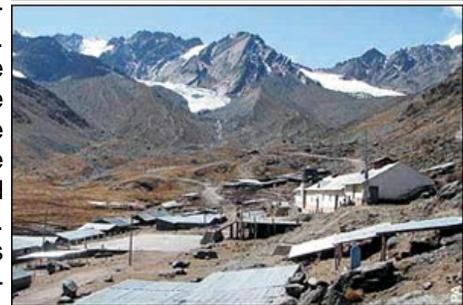
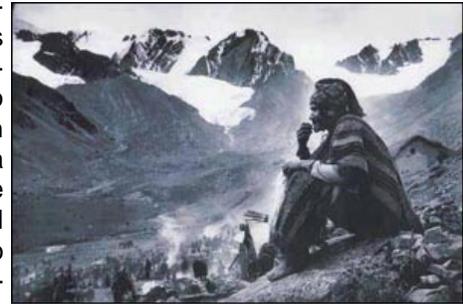
is of great concern to Bolivians living in or near the capital because eighty percent of their drinking water comes from this glacier.

The Condoriri provides not only drinking water to over a million people in La Paz and the neighboring El Alto, but also water for irrigation and generating electricity. A disturbance of the balance between the glacier and the people would be disastrous. Writer James Painter mentions that the

Tuni Condoriri is especially important during dry seasons because of its slow water release. It is thus alarming that one third of its glacial cover has melted since 1983. The problem will only be exacerbated for the people in this area as glaciers in the region continue to melt and population increases, especially in the rapidly growing city of El Alto.

Issues with water have already been a concern for people in El Alto for a number of years. In 2005, El Alto residents took to the streets in protest

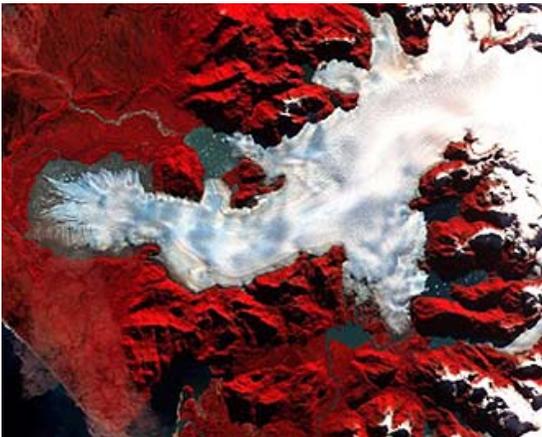
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"small glaciers are scattered across the Andes and have for long been a crucial source of fresh water...but global warming has driven them into retreat"

Glaciers in the Andes (continued)

Similar scenarios abound in the Andean region, where water scarcity has affected many people. Peru's famous Huascarán Mountain has lost over 3,000 acres of ice (roughly 40% of the mountain) in the last 30 years. The Chilean O'Higgins glacier has shrunk nine miles over the past century and the Upsala glacier in Argentina is losing ice at a rate of 46 feet per year.



In Lima, one of the biggest cities in South America with roughly eight million inhabitants, the people strongly depend on glaciers in the Cordillera region of the Andes for water in the dry season and also for most of the city's hydroelectric power. However, these glaciers have been in retreat, losing one third of their total volume since 1970. Nevertheless, scientists and policymakers are designing solutions to respond to the rapid shrinking of the

glaciers. A World Bank expert, engineer Walter Vergara, offers a few policy suggestions and adaptation steps that are leading examples on how to combat the glacier problem.²

Vergara believes that small steps need to be taken for adaptation, such as "building awareness and strengthening the knowledge base" and monitoring glaciers of economic importance. The logic behind this solution is to build awareness about the situation in order to pressure each country's respective governments to take strong action. Monitoring the glaciers would inform area governments about the magnitude of the problem at all times. The final steps of Vergara's proposed plan are to carry out various adaptation projects. One of his ideas is to have strict water regulations to combat over consumption and runoff.

In terms of agriculture, he proposes alternative crops and advanced irrigation systems, resulting in decreased water demands due to greater efficiency. Rainfall collection is another idea to combat glacier loss and has been considered a safe alternative by general manager at the La Paz water company, Robert Bianchi. Many Latin Ameri-

can countries are already instituting adaptation projects to address the water problem. Bolivia is one of a few countries carrying out a project for adaptation to climate impacts on glacierized basins. These projects focus on water supply, taking into consideration alternative sources and demand management. Diversification of supply and advanced irrigation systems are also part of the project. Additionally, Ecuador has a wetland conservation program and Colombia has an integrated national adaptation plan that includes demand management and heavy conservation efforts. The Global Environmental Facility (GEF), an independent financial organization that has provided over a billion dollars in grants to developing countries looking to start projects that benefit the global environment, will support these multimillion-dollar projects.

According to Carmen Felipe, President of the Water Management Institute of Peru, another growing concern may also be triggered by the accelerated rate of glacier melting that "could cause overflows of reservoirs and trigger mudslides, and in the long term cut water supplies."

To be continued p. 12



Four Newly Elected Board members (continued)

Just as Ro Acosta was threading together a remarkable climate protection coalition in Mexico in which Margie Simon de Ortiz and Barbara Hernandez were to play such an important role the Climate Institute's next newest Board member, **Tom Casten**, was engineering perhaps the most significant clean energy development in the US in 2007. Having built or financed cogeneration, combined heat and power (CHP) or energy recycling facilities with a value of over two billion dollars, Casten has combined a Midas touch in energy management with a shrewd analysis of the perverse incentives in the US electric utility system. Fossil fuel prices have ballooned so much in the past year that even with a perverse incentive system in place, his startup, Recycled Energy Development, was able to arrange private equity financing of \$1.5 billion apparently drawing significantly from funds in which Bill Gates and Harvard University were centrally involved. Casten has traveled widely in the US and Canada, pointing out that consumers and industry could save tens of billions of dollars annually with North American greenhouse emissions being slashed as much



Tom Casten

has also agreed to Chair an Energy Policy Committee that will identify measures that might be taken to remove barriers to local generation, energy recycling and permitting and licensing of other clean energy systems. Serving on this are four other Institute Board Members- John Noel, President of the Southern Alliance for Clean Energy; Chris Flavin, President of Worldwatch Institute, Claudine Schneider, President of the Solar Alliance and John Topping, President of the Climate Institute.

Bob Corell, one of the world's most highly regarded climate scientists, is Program Director of the H. John Heinz III Center for Science Economics and the Environment. Just before assuming this post, he led the Arctic Climate Impact Assessment, an effort of the eight Arctic Nations to assess the risks that climate change poses to the Arctic and its inhabitants including humans and flora and fauna. Prior to January 2000, Dr. Corell was Assistant Director for Geosciences at the National Science Foundation where he had oversight for the Atmospheric, Earth, and Ocean Sciences and the global change programs of the National Science Foundation (NSF).

While at the NSF, he also served as the chair of the National Science and Technology Council's committee that has oversight of the U.S. Global Change Research Program and was chair of the international committee of government agencies funding global change research. Further, he has served as chair and principal U.S. delegate to many international bodies with interests in and responsibilities for climate and global change research programs. Prior to joining the NSF in 1987, he was a professor and academic administrator at the University of New Hampshire. Dr. Corell is an oceanographer and engineer by background and training, having received Ph.D., M.S., and B.S. degrees at Case Western Reserve University and MIT. He has held appointments at the Woods Hole Institution of Oceanography, the Scripps Institution of Oceanography, the University of Washington, and Case Western Reserve University.



President Grimsson of Iceland, Luis Roberto Acosta and Robert Corell at the Washington Summit where Corell received the Climate Institute Roger Revelle Memorial Award for Scientific Achievement

Climate Institute News

Over the years about 150 interns from over 20 nations have served at the Climate Institute. Many have gone on to have careers in the environmental or energy arena. Two of the most spectacular and immediate professional advances were achieved by individuals who served during the summer of 2006 as graduate level research interns.

Nalin Srivastava

A veteran of over a decade in the Indian Forestry Service, Nalin worked as a research intern at the Climate Institute during the middle of a two year graduate program at Yale School of Forestry and Environmental Studies. Soon after his graduation from Yale he joined the staff of the Intergovernmental Panel on Climate Change (IPCC) where he serves as a Program Officer in the NGGIP Technical Support Unit with principal responsibility for analyses related to land use change. He works out of the Institute for Global Environmental Strategies (IGES) in Hayama, Japan. During his time at the Climate Institute Nalin worked on the GSEII and on developing a possible cooperative bio-energy initiative that might be launched at the state or provincial level in both India and Pakistan once the time is ripe.

Mariam Ubilava

A Muskie Fellow, Mariam served at the Climate Institute during the middle of a two year masters program at Evergreen State University in Olympia, Washington. Following her graduation from Evergreen she returned to her native Republic of Georgia where she recently assumed a position as director of the department of hydrometeorology and climate protection. During her service at the Climate Institute Mariam prepared an article, Non-Carbon Energy Trends in Ukraine, Kazakhstan and Russia that is posted in both Russian and English. She also prepared links to climate, energy and environmental sites in Georgia, Ukraine, Russia and Kazakhstan.

Magali Devic chosen as Editor-in-Chief of Climate Alert and Research Director

John Topping, President of the Climate Institute, announced that the Institute has chosen **Magali Devic** to be its new Director of Research and Editor-in-Chief of *Climate Alert*, a quarterly publication of the Climate Institute. A national of France, Ms. Devic is a graduate of the Institut des Etudes Politiques in Toulouse, France where she majored in International Development, Security and the Environment. Magali will be responsible for the Climate Institute's website maintenance and will direct efforts to translate key sections of the Climate Institute's website into Spanish, Portuguese and French in order to reach Latin American, Caribbean, European and African audiences. She will also serve as the key liaison between the Washington and the Latin American offices and assist in carrying out projects with the Institute's overseas partners.

Claudine Schneider Becomes President of Solar Alliance



Claudine Schneider

Long-time Climate Institute Board member Claudine Schneider recently was named President of the Solar Alliance, a concerted effort by the rapidly growing solar industry to develop policies at the

state and local level to speed the introduction of solar energy.

Claudine served in the US House of Representatives from 1981-1991 where she was a leader on climate protection and clean energy issues. A few years later she relocated from Rhode Island to Boulder, Colorado which has been her home for just over a decade.

Claudine has been active in several environmental and clean energy groups. She played a crucial role in the success of the Washington Summit on Climate Stabilization, chairing the Congressional panel and recruiting a number of corporate participants.



Magali Devic



Interns at the Climate Institute — Fall 2007

The Climate Institute would like to thank the Spring 2007 Interns for all their hard work and dedication that contributed greatly to the Institute's operations. We wish them all the best in their future endeavors.



Sergio Meza

School: University of Maryland– College Park

Major: Government and Politics

Hobbies: travelling

At the Climate Institute: Translated articles into Spanish and wrote some articles for the Climate Institute's website, handled some administrative tasks.



Chrissy Runyan

School: Johns Hopkins University

Major: Environmental Science

At the Climate Institute: Authored website topic section about the hydrological impacts of climate change along with research articles including: The Effects of Maintaining Projected Coal Consumption Patterns, and Energy Efficiency Developments in the Caribbean; Edited the Climate Alert, and GSEII newsletter



Cassandra Gugoff

School: American University

Major: International Studies

Hobbies: singing

At the Climate Institute: Edited the GSEII Newsletter, helped with the Green Gala event, wrote articles, assisted in doing research.



Cari Shiffman

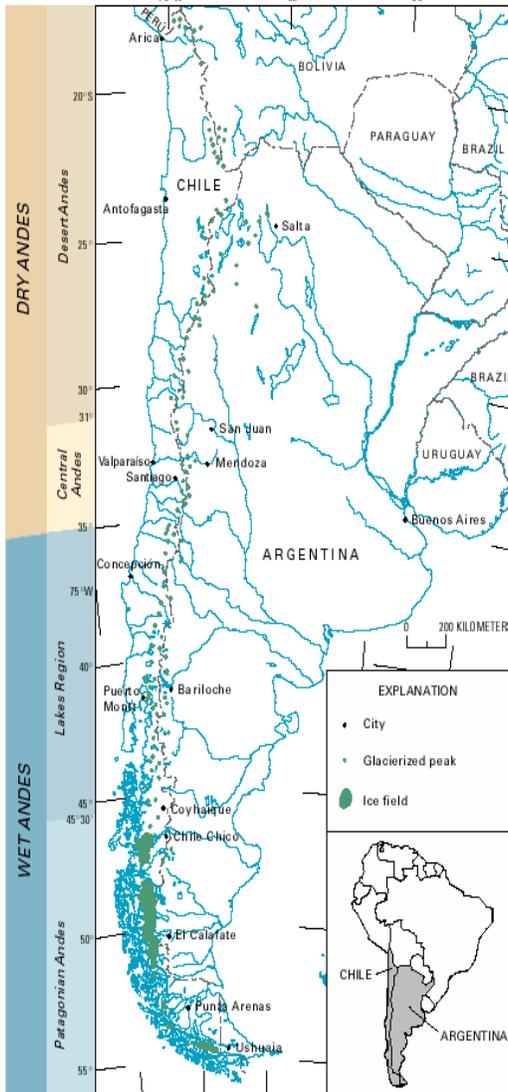
School: American University School of International Service

Major: International Affairs

Hobbies: Reading, Cooking

At the Climate Institute: Updated International Action section of website, wrote articles for Climate Institute publications, researched information on Florida's climate change policy

Glaciers Andes (continued)



With ideas like wetland conservation programs and engineered reservoirs, many countries are taking the right steps. One of the most important aspects of the adaptation process is that many Latin American countries are pushing to solve the problem early, before a problem of mass environmental refugees occurs with water shortages. Still, the problem of rapid glacier brought about by human induced climate change has been caused not by just the countries in which the glaciers are located, but as a result of actions taken across the globe. The world as a whole, especially the coun-

tries that are major greenhouse gas emitters, has a responsibility to address the problem. Francisco Grijalva, the environmental director of Cotacachi, Ecuador, points out that, "Unfortunately we are suffering the consequences of environmental problems that other countries are producing. We in Cotacachi can pass a resolution to use our resources in a more sustainable manner, but other countries have yet to do that." What Grijalva is trying to convey is that in order to eradicate the problem, the world as a whole has to recognize the consequences of their actions and work together.⁴

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