AN ANXIOUS ATMOSPHERE

THE LEAD-UP TO COPENHAGEN

by Katie Oberthaler & Ashley Thompson

Connie Hedegaard, Danish Minister for Climate and Energy, said that delivering an internationally encompassing political agreement at the 15th United Nations Climate Change Conference will be “one of the defining challenges of our century.”

This challenge began on Dec. 7 in Copenhagen, when leaders from many of the 192 UN member states begin the unenviable effort to strike a fully international, legally binding climate proposal to take effect upon the Kyoto Protocol’s termination in 2012.

The future course of emission regulations will go head to head with country-specific economic interests and sharp arguments over how to ethically allocate the burden of a changing climate, as poor nations set to suffer the most demand that developed nations implement stricter CO2 emission cuts. Countries will have to decide if emissions trading should continue or if stricter action should define climate policy after 2012. Anxiety rises as ratification of policy by major countries such as the United States remains uncertain.

RECENT REACTIONS

Throughout 2009, the prospect of failing to reach such an agreement during the weeklong conference was denounced as simply not an option. Leaders from nations rich and poor acknowledged the calamitous effects ecologically, morally, and economically as a result of climate change. However, “not an option” soon became the increasingly likely reality. Mini conferences before Copenhagen have peppered international boardrooms over the past year. Feelings ranged from fatalist to optimistic. Twenty-two days before the Copenhagen conference was set to begin, leaders decided that reaching a binding deal to replace the Kyoto Protocol in Copenhagen was all but impossible, after a lead-up year slowed and beset by dissatisfaction and conflicts.

Then, the United States, China, and India released their intended emission targets by 2020 within the final two weeks of preparation. These last-minute announcements by the three top emitters shifted the defeatist tone preceding the conference to a more hopeful outlook, and defined the countries’ positions going into conference deliberations.

Although these deliberations will not result in a legally binding international agreement by the conference’s close on Dec. 14, the parties have set a new goal date of June 2010. The 15th Conference of the Parties (COP 15) in Copenhagen will act as the first stage of continual talks in an effort to reach this new goal.

THE HARDEST HIT

Developing countries, including several African nations that staged a boycott of a string of UN climate talks in Barcelona this October, insist that developed countries have the capability of reducing emissions far more than current goals dictate. African leaders have challenged developed countries with high CO2 emissions to reduce levels by 40 percent off 1990 levels by 2020. Most top emitters have pledged to cut 25 percent or less off 1990 emission levels. CONTINUED ON PAGE 6
The Meridian Unpiloted Aerial Vehicle earned its proverbial wings this autumn, after passing a string of flight tests in Kansas and Utah.

Next stop: McMurdo Station, Antarctica, where it will be equipped with a CReSIS radar and antennas, which its wings are custom-designed to handle, and undergo a third series of flight tests. By the end of January, the Meridian could be one of the largest unpiloted aircrafts ever to collect remote sensing data in Antarctica or Greenland.

It’s been five years since Rick Hale, University of Kansas aerospace engineering professor, and Bill Donovan, chief designer and PhD student in aerospace engineering, started down the road of designing and building a UAV nearly entirely in-house, with the help of undergraduates and graduates enrolled in one of the 17 classes that implemented UAV-related curriculum.

“The Meridian Unpiloted Aerial Vehicle earned its proverbial wings this autumn, after passing a string of flight tests in Kansas and Utah.

Not that the decision to resist outsourcing in the process of crafting such a unique, 1,100-pound plane didn’t come without frequent frustration.

“What could go wrong, did go wrong,” said Andy Pritchard, the team’s Aircraft and Power (A&P) mechanic. However, the setbacks, including rebuilding the fuselage, difficulty in choosing an engine, finding a runway that would allow them to fly, and the daily difficulties that presented themselves, were well worth it for Donovan.

“It’s definitely been cool to go all the way through a project like this,” Donovan said. “Learning how to deal with the problems we encountered, learning how to manage a team, and just getting the practical experience of doing something very similar to what you’d do in industry has been a cool experience.”

Donovan’s team included 30 students and staff members, along with hundreds of undergraduates and graduate students working on the UAV each semester in classes. Four technology teams, as well as the CReSIS radar team, worked together to create an aircraft ideal for the harsh Polar environments.

“Largely we are in support of them. This platform exists to fulfill their (CReSIS’s) missions.” – HALE

The uniqueness of the CReSIS mission has been what’s molded this extremely adaptable, rugged UAV. Though it was built using federal aviation regulations (following FAR 23 standards) to size the aircraft, several technological features set the Meridian apart from most vehicles of its size class.

The Meridian is equipped with a fully digital fly-by-wire system, and a fully automated digital control system for the engine. Electronic signals are all sent to actuators, not wires, which is what is typical for an aircraft of this size. It features four modes of communications with the vehicle – two radio modems to satellite communications, and two 900 megahertz transmitters. And key to survival in Antarctica, the UAV will be equipped with a de-icing system.

The wings are designed with eight hard points where radar antennas and sensors can be mounted. There are also eight soft points for small-scale sensors, and eight access panels in the wings making wiring for the radars easily accessible. The wings themselves are removable, and take only 10 minutes to remount, which allows for swift exchange and repair of radar arrays in the field.

“This is also important in Antarctica because we won’t have a hanger big enough to leave the wings on the airplane.” – DONOVAN

Donovan also created the paint scheme with the idea of an Arctic or Antarctic mission in mind. The red and white scheme is designed to help the pilot (Lance Holly, University of Kansas Alum), stationed next to the runway, to see the UAV as easily as possible during its flight route. The rest of the team will remain at McMurdo and monitor the plane’s programmed flight path during the autonomous portion of
TOUCHING THE GROUND AT HELHEIM

» by Leigh Stearns

During the summer of 2009, I participated in three separate field campaigns all focused on Helheim Glacier in East Greenland. Several glaciers in Greenland have doubled Greenland’s sea level rise contribution in the last ten years.

Despite global team efforts, the glaciology community does not entirely understand the impact of glacier behavior on sea level. A broad scientific objective connected each expedition: to comprehend the behavior of Greenland glaciers so we can predict how they will respond to climate changes in the future.

At Helheim glacier, we pilot-tested a new ground-based laser scanner called TLS (Terrestrial Laser Scanner). TLS provides detailed and highly accurate 3-dimensional data of glacial surface features. With TLS, two to five kilometer swaths of ice can be imaged in a few minutes. Scans can be repeated to measure horizontal and vertical displacements over short time scales. On glaciers, these displacements are the result of tidal forcing or changes in hydrology below the glacier. TLS’ fine detailing will hopefully yield new insights into the dynamic flow of glaciers.

In May, I went to Tasiilaq, East Greenland along with Gordon Hamilton from the University of Maine and Dave Finnegan from the U.S. Cold Regions Resource Center. In 24 hours, we traveled from Boston, MA to Reykjavik, Iceland, and onto Tasiilaq via two planes, a bus, and a helicopter.

We were charged at each step of our trip for excess luggage: science equipment is rarely small, light or inconspicuous. Considering I almost brought a rifle, I was glad to avoid any extra security.

I have spent the past four summers in Tasiilaq, but I have never visited in May. I found some glaring differences from our usual late summer trips. First, the town looked incredibly clean since it was still blanketed by white snow. After all the snow has melted by August, a shocking amount of litter covers this town of 1000 occupants. Second, the grocery store was incredibly bare. Ships that supply the towns in East Greenland with food begin arriving in June. Tasiilaq receives roughly four resupply ships each summer; some towns farther north only get one. They were down to the bare necessities at the store by the time we arrived. I have always considered myself incredibly adaptable, but I struggled with a full ten days of just rye crackers with jam.

Getting to Helheim Glacier requires a helicopter for transport. This same helicopter shuttles people to neighboring settlements. Most fieldwork stress in Greenland revolves around helicopter access and weather. Fortunately, we made it out to Helheim after only a few days of delays. CONTINUED ON PAGE 4
GREENLAND CONFERENCE SUMMARIZES RECENT CRYOSPHERE CHANGES

» by Katie Oberthaler

Over 160 scientists convened in Nuuk, Greenland from August 25-27 for the Nuuk Climate Days conference. Dr. Prasad Gogineni served on the scientific committee for the conference and gave a presentation titled “Radar Sounding of Jakobshavn, Kangerdlugssuaq and Helheim Glacier.”

The conference aimed to provide a comprehensive and current assessment of the Greenland Cryosphere. The Cryosphere refers to Greenland’s ice sheets, permafrost and surrounding sea ice. Pooling knowledge from a wide variety of sources, scientists compared multiple types of measurements such as satellite, radar, and in-situ data. Attendees concentrated not just on the process and increasing rate of ice sheet discharge, but how the ice interacts with fjords and ocean water to alter the Arctic.

The conference specifically focused on how these changes will impact Greenlandic society in the coming years. The National Space Institute at the Technical University of Denmark, the Danish Meteorological Institute, and the Greenland Climate Research Center organized the conference. Nuuk Climate Days was held in tandem with the “Arctic Freshwater Budget (FreshNor)” and “Changes in the Greenland Cryosphere” workshops.

The general atmosphere of the conference was one of accelerated anxiety over the Cryosphere’s recent and rapid alterations. Findings explicated widespread knowledge about climate change into detail. The scientists concluded that the Greenland ice sheet has seen a marked increase in mass balance loss in the past decade due largely in part to iceberg calving into the ocean as well as amplified melting on the glaciers’ surfaces. They determined that in the past five years the ice sheet has lost an average of 240 cubic kilometers of ice per year. Ice has begun melting in the northern regions in addition to south Greenland. Ice sheet replenishment on inland locations has also decreased in recent years.

Scientists also determined that Arctic sea ice has shrunk more than satellite measurements have shown. Notably, conference attendees predicted that the Arctic Ocean could contain no sea ice as early as 2015.
THE OPENING UP OF THE ARCTIC OCEAN BRINGS WITH IT A FLOOD OF CONCERNS AND DEBATES OVER SOCIAL, ECONOMIC AND TERRITORIAL ARRANGEMENTS IN ARCTIC REGIONS. WHILE CLIMATE CHANGE IS THE REASON FOR THIS ALARMING LOSS OF ICE, IT IS MERELY THE TIP OF THE ICEBERG OF COMPLEX ISSUES FACING THIS REGION IN TRANSITION.

On Sept. 11, Dr. David Braaten, CReSIS deputy director, along with 51 other participants from 10 countries, gathered in Quebec City for a three-day Ditchley Foundation conference entitled, “The Arctic Region in the 21st Century.” Members of the Arctic Council, representatives of indigenous people, policymakers, and scientists met to discuss the implication of Arctic climate change in all its complexities, and the effects these changes are having on northern peoples.

Dr. Braaten participated in the working group, “Economic Opportunities and the Environment.” Conference attendees were divided into three working groups, with the two others being “Governance and Security,” and “Law and International Context.”

“What is clear is that we don’t have all the answers yet, and continued research has to be a part of this situation. Countries outside the Arctic nations can contribute in that way.”

For countries within the Arctic, debates regarding ownership and accessibility continue. And as the scientific community focuses squarely on the Arctic for answers about our changing climate, those who call the Arctic home hope for more involvement in the decision-making of issues such as regional mineral extraction, tourism, as well as the scientific research itself.

“We do have a responsibility to involve them in our research, and help them build local expertise. And indigenous peoples, too, have a lot to offer the scientists with their unique insight on the environment.”

The Ditchley Foundation was founded in England in 1958, aiming to advance international learning and to foster transatlantic discussions of issues of global concern.
The African continent is already experiencing changes in weather patterns that could be linked to global climate change. Four years of failed rainy seasons have led to devastated crops and livestock in East Africa, the worst drought in over a decade. Starvation now affects 23 million people throughout the region. And melting glaciers in the mountains looming above the Ugandan and DR Congo border are responsible for the altered course of the river that separates the two countries.

“It’s a moral stance, it points out the difference between a good and a bad deal,” said Saleemul Huq of London’s International Institute for Environment and Development in the UK’s Guardian. “A good deal is defined by what is good for the planet. Africa will feel the consequences most of a bad deal. If you are an African country you have much more at stake than a rich country”.

**THE RIFT OF THE RICH VERSUS POOR**

Meanwhile, developed nations are speaking out against the passive role developing nations have taken in the climate change fight. Todd Stern, a top U.S. diplomat on climate change, accused developing countries of skewing language in their favor in two important climate documents (the UN Framework Convention on Climate Change and the 2007 Bali Action Plan), both of which outline expected responsibilities and roles of rich versus poor countries in combating anthropogenic greenhouse gas emissions. In a similar fashion, the European Union has struggled with how to handle the broad spectrum of economies within the 27 nations. Nine Eastern European countries protested the EU’s current burden-sharing concept, which states that all EU nations set aside money for worldwide developing nations to deal with the effects of climate change. Eastern European leaders aren’t keen on doling out money to other emerging economies, and insist that the majority of fiscal responsibility within the EU should be placed on wealthier nations.

**KYOTO PROTOCOL**

**THE CURRENT STANDARD**

The Kyoto Protocol will once again come on the chopping block at the COP15. In 1997, it marked the first effort by international partners to not only assess global climate change, but to create legally binding action to curtail its effects.

The Protocol held developed nations, called Annex 1 countries, largely responsible for reducing global greenhouse gas (GHG) emissions under the logic that they have contributed the most to man-made climate changes since the Industrial Revolution. These countries agreed to reduce their shared GHG emissions by 5.2 percent from 1990 levels.

The Protocol’s solution emphasized a market-friendly approach. First, it established a system of international emissions trading. Developed countries were allocated a cap on their GHG emissions, but if a country exceeds its limit a country can purchase emission “credit” from other countries which have emission levels below their restrictive level. Each credit is equivalent to about one ton of CO2. Countries that lowered their GHG emissions turned a profit, while those who exceeded their limits lost revenue. Countries could also earn credit by implementing emission-reducing strategies in developing countries. A full list of these projects can be found at: http://cdm.unfccc.int/Projects/MapApp/index.html. Lastly, countries could collaborate to jointly earn credit. The Protocol requires all agreeing countries to produce annual emission reports. Those that exceeded their limits incur a penalty of an additional 30 percent reduction tacked onto their target.

So far, 187 countries have ratified the Protocol. Significantly, the United States has excluded itself. Its resistance cripples the Protocol’s international cap and trade system. U.S. critics blame the Protocol’s high cost and unenforceable regulations as an impractical approach. The top-down approach may regulate specific industries or companies that depend on the oil and gas contributing to GHG levels.

Since Kyoto, other nations besides the U.S. have gained momentum in policy debates. The rise of development in previously (relatively) low-emitting countries since Kyoto such as China and India has shifted the global policy framework. Also in the past decade, the rate of Greenland glaciers ice loss has doubled, exacerbating the need for lower and uniform emission targets to stop this retreat.

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**COASTAL CONCERNS**

Coastal and island nations have also expressed concern about the outcome of the Copenhagen conference, as the potential for sea level rise may cause forced migration in the future. The Intergovernmental Panel for Climate Change (IPCC) estimates there will be 50 million environmental refugees worldwide by 2010, and 150 million by 2050.

Cabinet members in the Maldives, a country that has pledged carbon neutrality by 2020, held underwater meetings in October 2009 to highlight the imminent threat their country faces from rising seas caused by melting polar ice caps. And in a particularly striking stance, the Alaskan town of Kivalina sued several of its own country’s energy companies to seek damages for contributions to anthropogenic global warming. The town’s future is in peril as a result of thinning ice and increasingly intense waves as a result of the melting of sea ice that had previously stymied waves from crashing into Kivalina’s precariously located shores.
THE BIG FIVE

The biggest emitters of CO2 based on 2007 measurements are China, the United States, India, Russia, and Japan. Amidst this global discontent, here is what each of the key players have proposed regarding emission cuts post-Kyoto.

CHINA

Between 2000 and 2007, China nearly tripled its CO2 emissions and in August 2008 passed the United States as the top CO2 emitter in the world. In the past year, China has signed agreements with India and the United States that will foster cooperation in addressing the issue of climate change. On Nov 26, in the same week the U.S. revealed its carbon reduction targets, China announced its plans to reduce its own carbon intensity (CO2 emitted per unit of gross domestic product) 45 percent by 2020.

UNITED STATES

The United States faces worldwide tension that stems from failure to ratify the Kyoto Protocol. This time around, U.S. involvement – and leadership – is considered a logistical and moral imperative. On Nov. 25, President Obama announced the intention to reduce U.S. greenhouse emissions 17 percent below 2005 levels by 2020, and 83 percent below 2005 levels by 2050.

INDIA

When China and India signed a five-year agreement on climate change in October 2009, the countries gained “a moral force,” according to UN top climate scientist Rajendra Pachauri. In going beyond what is expected of them, India and China now have an ability to lead by example of sorts, allowing them to set expectations for developed nations. Less than a week before COP15 opened, India announced its emission target of 25 percent below 2005 levels by 2020.

RUSSIA

On Nov. 17, Russian Prime Minister Dmitry Medvedev spoke of the potential “catastrophic” effects of climate change, taking a stronger stance than ever before by Russia, relatively invisible in climate negotiations past. Russia has agreed to reduce its CO2 emissions by 25 percent from 1990 levels by 2020 if other countries agree to the same standard. Its previous emission target was 10 to 15 percent off 1990 emission levels.

JAPAN

The world’s fifth-largest emitter of CO2, Japan has promised a 25 percent reduction from 1990 levels by 2020. Japan struggled, however, to reach its less stringent goals domestically under the Kyoto Protocol, which called for a 6 percent reduction between 2008 and 2012 off 1990 emission levels. To compensate for the struggles within its borders, Japan buys emission rights from other countries, the most recent of which have been the Czech Republic, Latvia, and Ukraine.

UNFCCC Executive Secretary Yvo de Boer Outlines 4 Key Issue for COP15

1. How much are the industrialized countries willing to reduce their emissions of greenhouse gases?
2. How much are major developing countries such as China and India willing to do to limit the growth of their emissions?
3. How is the help needed by developing countries to engage in reducing their emissions and adapting to the impacts of climate change going to be financed?
4. How is that money going to be managed?

CO2 emissions of the United States, China, Russia, India, Japan and Germany. USSR/Russian drop-off between 1990 and 2000 signifies the breakup of the Soviet Union, and not a tangible decrease in CO2 emissions in the region. Source: Energy Information Administration (Department of Energy)
CReSIS WELCOMES KRISTIN BARKUS

In August 2009, Dr. Kristin Barkus joined the CReSIS staff as the new Education Coordinator. With a background in the life sciences (she received her PhD in Cell and Developmental Biology at the University of Kansas), Barkus said her passion for science has easily transferred over to CReSIS-related science.

“I’ve had a lifelong interest in the earth and life sciences. Though my education lies primarily in life sciences, the backdrop for the life sciences, our biosphere, interests me, too.”

— Barkus

Barkus received undergraduate degrees in biology and chemistry from the University of Northern Colorado, where she also completed an honors research thesis about the evolution of the platypus. She received her PhD from KU in 2006. Her dissertation research addressed interactions of proteins involved in nerve signaling. In 2005, Barkus began working as an educator at Baker University, as well as full-time at Highland Community College, where she developed the biology program at a new satellite campus.

In her new position at CReSIS, Barkus intends to use her skills as educator, mentor, and curriculum developer in order to contribute to the Center’s productivity and outreach. //

PSU TEAM TAKES ON THWAITES

» by Katie Oberthaler

Find a half-kilometer-long cable. Walk 15 feet. Dig a hole in the ground. Secure a large pole compacted in a bucket into the opening. Repeat 24 more times. Find three more cables, and begin again.

Then, using the propane-driven automatic fence post pounder you’ve brought, drill a 30 meter hole in the ground. Pack with explosives. Detonate. Repeat, repeat, repeat.

Did I mention you’ll have to fly to Antarctica first?

Add in chilling -60ºF, winds and snow as far as the eye can see, and you have Knut Christianson and Rebecca Boon’s winter break.

Christianson and Boon, Pennsylvania State University graduate students, are part of a six-person team from PSU that began stationing in a remote camp on Thwaites glacier in November and will conduct research there for two months.

The team will repeat these labor-intensive seismic measures using the devices, called geophones, which record the time between the surface explosion and reverberation back to the ice’s surface. From the recordings, the team can determine the geological makeup below the bedrock and how it might interact with the glacier.

The team’s bustling activity above the ice mirrors the glacial movement below Thwaites, dubbed the “weak underbelly” of the West Antarctica Ice Sheet (WAIS). The area of Thwaites the team is studying sits in part on a 50km “wedge” of land. The grounding line - the point which separates the ice forming solid ground from the ice shelf floating in the surrounding ocean water – rests on this ridge. If the ice retreats just slightly beyond this line, warmer water from the coast could circulate near the ice, which would accelerate its break up and ultimately contribute to increased sea level.

Glaciers like Thwaites and its neighbor, Pine Island Glacier, that drain into basins resting below sea level remain vulnerable to faster retreat. Thwaites’ drainage basin lies approximately 2 kilometers below sea level. Together, Thwaites and Pine Island account for five percent of the West Antarctica Ice Sheet’s yearly drainage.

The glacier’s relatively small floating ice shelf which surrounds its deep catchment makes it further susceptible to these effects. Only a small amount of ice shelf melting and grounding line retreat would need to occur to catalyze a large-scale break-up.

This expedition completes a three-year campaign by the team on Thwaites to refine this poorly understood phenomenon. Between the first and second seasons, the team measured a 1 to 1.6 percent acceleration of Thwaites. Beyond this observation, the glacier’s stability remains undetermined.
“We really don’t have a good handle on it,” said Christiansen.

The team has improved their research setup to increase their understanding and simplify logistics. This year, they will use wireless GPS sensors, which are not as cumbersome to move. They also created “shop boxes” which separate the recording system in the geophones from the glacier’s dynamic system and ensures that recording begins exactly at the time of detonation. In addition to the geophones, the team will deploy 40 GPS devices this year that will monitor the glacier’s movement. They will also fly a tight grid of radar over the ridge. An aggregate of data collection systems will allow the team to measure the change in topography on a small scale and the change in ice flow over ridges. The team cannot approach the ridge directly due to the deep and dangerous crevasses surrounding the grounding line.

“They could eat planes,” Christianson notes of the crevasses, which often remain invisible beneath snowfall.

Christianson has accompanied the team for the past two field seasons, but Boon will be braving these traps for the first time. She’ll need those planes to stay in tact, though, when she analyzes the radar data, or “picks the bed,” to determine the bedrocks’ topography. Joining her and Christianson on the survey from PSU are Sridhar Anandakrishnan, Don Voigt, Luke Zoet, and Leo Peters. They’ll all endure a hefty work-out for the next two months moving geophones, but untangling all those half-kilometer cables will also unravel Thwaites’ complexity. //

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Christianson and Boon plan their upcoming Antarctic field season.
Gary Wesche, a middle school science teacher, is the latest PolarTREC teacher to accompany a CReSIS team to the field. Wesche, who teaches at St. Regis Francis Catholic School in Kansas City, Mo., left Nov. 19 for an eight-week stay on the West Antarctica Ice Sheet (WAIS), where he will keep in touch with his 130 students by blogging from the ice. Shortly before he left, he talked with CReSIS journalists about his expectations for the trip, how his students reacted to their teacher spending the holidays on an ice sheet, and where his passion for teaching science comes from.

What past travel experiences have you had that have prepared you for this trip?

I spent six months in remote Paraguay. I didn’t speak any English. I was by myself, living remotely. I had cold, wet days all the time. I know what to do when you’re bored. My children [Wesche is a father of six] know not to tell Dad that they’re bored.

As part of prepping you for the harsh environment in Antarctica, you attended an orientation session in Fairbanks, Alaska. What types of survival skills did you learn during your weeklong PolarTREC training?

I learned how to make a pair of boots out of a plane seat and a rain parka out of a trash bag.

How do your students react to finding out you’ll be traveling to Antarctica this winter?

For kids to understand there’s really something outside their hometown, even that is tough to grasp. This is such a different thing – their teacher is going to the continent with three miles of ice. They can’t fathom that. They live on a prairie. How to do you explain to someone that the ice is three miles thick? How far is three miles up? Even to tell them that it is nine Empire State Buildings is hard to imagine. They just have this idea that penguins cover the whole thing. And it’s not like we have a populous that already understands the science. The general public is about at a middle school level as far as understanding Earth science.

How will you change this view and engage your readers while in the field?

I plan to write daily and send updates via satellite with mostly text and low resolution pictures. I address my kids as PolarTrekkers to engage them. I will have a “Who’s in the Red Parka?” theme where I feature everyone I meet wearing my red jacket. I ask them to explain their role in this mission.

Why do you teach science?

My take on middle school science is a lot of it is outdated. Most people in science had an early science experience that was memorable. Others will tell you a horror story. I have to compete with television and video games. I need to generate their enthusiasm for science. If I can excite them about science, they will choose to continue learning about it. I have to make it exciting or motivating. Science is still a discovery, a new place, for 6th, 7th, and 8th graders.

Why is CReSIS research so important to your classroom?

When I attended the CReSIS teachers workshop, science once again became a real discovery. This science isn’t being done in white coats in a lab somewhere. CReSIS science brings excitement. It’s seeking more knowledge for our own good.

And if I can get my middle school students enthused about CReSIS science and science in general, all will win. Children begin to choose their academic or professional direction in middle school. So for me, textbooks make great doorstops in my class. I want these kids to have a good experience with science in middle school, so that when they get to high school they won’t avoid elective science classes like the plague. They’ll get jazzed about it.
Cheri Hamilton and Dana Atwood-Blaine made the rounds of science education conferences this fall, presenting formal talks as well as hands-on Ice, Ice Baby activities, CReSIS-generated lesson plans for K-8 classrooms.

From Oct. 7-11, Hamilton and Atwood-Blaine were in Portland, Ore., for the North American Association for Environmental Education (NAAEE) conference. Hamilton, CReSIS K-12 Outreach Coordinator, led a hands-on presentation on her popular Ice, Ice Baby lesson plans. Atwood-Blaine, Education Program Evaluator and PhD student, gave a presentation entitled “Connecting Scientists with K-12 Educators.”

The CReSIS team held three sessions at the National Science Teachers Association (NSTA) conference on Oct. 28-31 in Minneapolis. Two sessions featured hands-on activities derived from Ice, Ice, Baby lesson plans. The other session was devoted specifically to Glacier Goo. Glacier Goo is an interactive lesson that introduces students to the basics of glacier movement. Teachers who attended the sessions were given the recipe (warm water, glue and Borax) to goo success, along with suggestions for how to best present this activity. In Hamilton’s traditional Glacier Goo lesson, the concoction slides slowly down a chute representing bedrock, mimicking glacial flow.

“The key is to not use non-running glue,” Hamilton revealed. “I can’t say it enough.” Hamilton is now a seasoned veteran of concocting Glacier Goo, and must bring along supplies to make mounds of the goo in her hotel room bathroom when she takes the show on the road.

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Gary Wesche completed the CReSIS teacher professional development workshop “The Heat is On! Confronting Climate Change in the Classroom” at KU, June 2008. The workshop will be held at the PSU campus July 2010.
EDUCATION TEAM... >> CONTINUED

Carol Landis (Ohio State), Ryan Bowman (former MA student at KU and current high school science teacher), Atwood-Blaine, and Hamilton were able to set up different tables to answer questions and hold demonstrations.

“I think everyone got a lot out of it because they were more closely involved, and could ask questions about how to best to teach and explain glacier science with this demonstration,” Hamilton said. In previous years, Hamilton and Atwood-Blaine held just one larger session, and hands-on personal attention wasn’t possible.

“I have already visited your site, and have been talking to colleagues, administrators and the parents’ association about how excited I am to implement some of your lessons into our curriculum.”

– DeeDee Stacy, 4th-grade teacher
Mounds Park Academy (St. Paul, MN)

Overall, more than 75 conference attendees opted to receive CReSIS updates and follow the Center’s K-12 education-related developments. Between both conferences, 135 teachers were introduced to CReSIS lesson plans. //