CReSIS Participates in Middle School Summer Workshop for Sixth Year

// by Lauren Debes

This summer, Elizabeth City State University in North Carolina hosted a CReSIS Middle School Workshop for 11 sixth grade students.

The students, all from local middle schools, were selected by teachers based on academic merit and participated in a number of activities involving math and science during the workshop. Cheri Hamilton, K-12 Outreach Coordinator at CReSIS, attended the event for her sixth

(article continues on the next page)
year and taught the students for two days.

“We talked about climate change and how it could affect their city. We also did a sea-level rise activity that teaches them how to read and look at flooding through a topographic map,” Hamilton said.

Living close to the Pasquotank River bay, the topic of sea-level rise proved highly relevant. The students were asked to mark on a map of Elizabeth City where they would choose to live, then learned about contour lines through an Ice, Ice, Baby! activity. A number of students had recently encountered flooding first-hand and were surprised that the location they chose to live would be underwater if the sea level were to rise.

Hamilton then taught a lesson on the movement of glaciers through a hands-on activity with Glacier Goo. Designing their own experiments, the students used recycled containers to build a glacier chute and tested their hypotheses.

In recent years, the students have proven more knowledgeable on climate change and global warming than ever.

“This year the group was surprisingly knowledgeable about climate change compared to years past, so it must be taught and emphasized in classrooms,” Hamilton said. “There was a time where I couldn’t even talk about global warming. I couldn’t say climate change. Those words weren’t used in classrooms.”

These small changes encourage educators, she said. Fun and educational science-based programs such as these aim to inspire future generations to do their part in helping combat climate change.
Alexis Moyer completed a REU (Research Experience for Undergraduates) in the summer Summer of 2012 with CReSIS. Since then Alexis has graduated from Gettysburg College, completed an internship with NASA, and is now working on her thesis with the University of British Columbia. CReSIS caught up with Alexis to learn more about her trip this summer to Bridge Glacier and her further plans.

What has your focus been since your work with CReSIS? At NASA I was working on calculating sea ice thickness in the Arctic Circle using remotely sensed surface brightness temperatures from a recently launched NASA satellite (Aquarius Mission). After NASA, I moved to Vancouver, British Columbia to start a MSc program in Physical Geography at the University of British Columbia (August 2013). This past summer I spent 19 days (spread over three separate trips) at Bridge Glacier, BC doing fieldwork for my thesis. I am calculating a volumetric budget for a proglacial lake, with a specific focus on input from iceberg concentration and how that influences discharge in a river located downstream from the lake.

Lead me through a basic day working on your thesis at Bridge Glacier. A basic day at Bridge Glacier started with an early morning wake-up call, just as the sun was coming up from behind the mountains (which paints a spectacular view on the lake). Depending on the day, we would hike up to a lower ridge overlooking the north side of the glacier to take aerial photos of the iceberg configuration in the lake (later used to quantify ice cover) or potentially hike up to a higher ridge top on the north side to check on the time lapse camera focused on the glacier terminus. Then we’d climb back down to camp and start the iceberg work for the day, which entails forging a path through the icebergs with a small Kodiak boat. Sometimes this was easy with a clear path, and other times we had to push icebergs out of the way or boat to shore and carry the boat over land until we passed the obstacle. Once out in the lake basin, we boated around selected icebergs, creating GPS trails to quantify iceberg surface area and taking photos for identification purposes. Finally, we took some temperature profiles near and far from selected icebergs to determine the temperature gradient with depth and distance from the iceberg.

Has anything surprised you on your trip? I was surprised by the amount of movement of the icebergs in the lake on a daily basis due to wind. To mark the icebergs for identification on future trips, we tossed painted rocks onto the tops
of the icebergs. However, on our second trip to the glacier, we could only find 1 of the 10 marked icebergs! There is so much movement that the rocks all fell off (due to iceberg rolling or splitting) or were located on inaccessible icebergs.

**What first got you interested in your field of study?** I’ve always been interested in global climate change and its impact on the glaciers of the world. However, what really ignited my desire to study glaciers and icebergs in particular was a study tour to Kangerlussuaq, Greenland in November of 2011. I was studying abroad in Copenhagen, Denmark at the time (at the Danish Institute for Study Abroad) and decided to attend a week-long study tour to Greenland, where I learned about arctic biology, geology, meteorology, and politics. When the plane landed at the little airport in Kangerlussuaq, that was it for me -- I was in love with this environment where ice crystals immediately freeze to the moisture on your eyelashes, where musk oxen and caribou roam the landscape, and where many glaciers are retreating at an alarming rate. In that instant I knew that this is what I wanted to study [glaciology].

**What impact did your REU with CReSIS have on your future endeavors?** My REU with CReSIS jump started my interests in using remote sensing to study glaciers and ice sheets, which is a large component of my MSc thesis research. Over two years later, I am still using the skills and knowledge I gained from working at CReSIS.

Alexis’s REU with CReSIS helped solidify her passion in the field and take notice for all that needs to be done in regard to research and knowledge in glaciology. As Alexis continues to build her resume, her goal remains on a career with NASA.
Southwest Middle School in Lawrence now has a bi-weekly environmental science club.

On Sept. 16, the school established the Environmental Club with the help of middle school teacher, Marci Leuschen and CReSIS Education Outreach staff member, Krystle Neal. Leuschen recognized a need for a club after many students expressed an interest in learning the science outside of the classroom. She asked CReSIS K-12 Education Coordinator, Cheri Hamilton, if education outreach could put a program together. Then, Neal started creating lesson plans.

“One of my favorite activities, and definitely the messiest, was a filtration exercise the students and I did together,” Neal said of her position as the sole teacher for the club.

Neal brought in numerous natural filtering elements and hosted a competition to see which pair of students could create the best filter.

“We measured their filtered water sample with a turbidity scale. One of my students who is sometimes disengaged in our experiments won the competition and he was so proud, showing everyone his clear water sample,” she said. “As a teacher, I live for those moments when students really grasp an idea and they are proud of their work.”

The club aims at educating students with a variety of engaging hands-on activities. The first activity centered around air pollutants, beginning with a dirty air filter as a visual aid. The students then made their own pollution catcher out of paper plates and petroleum jelly. The students raced through the school to hang up their catchers in the spots they thought would contain the most pollutants. The results would be observed the following week.

Leuschen thinks implementing a science club at the school will spark student interest in science and the environment.

“Plus it gives the kids another positive connection to the school, which has been shown to help with their learning and engagement in other classes,” Leuschen said.

The club meets every other Tuesday from 3:15 p.m. until 4 p.m., and is open to all students from sixth to eighth grade.

To get a program started like this in your school, contact Cheri Hamilton at cherihamilton@ku.edu.
This summer, the IEEE Geoscience and Remote Sensing Society joined the Canadian Remote Sensing Society in Québec City for their 35th annual Canadian Symposium on Remote Sensing (CRS) and the 2014 International Geoscience and Remote Sensing Symposium (IGARSS). IGARSS is an annual, international symposium that hosts geoscientists and radar engineers for several days of sessions and tutorials.

Calen Carabajal, a second year KU CReSIS graduate student, attended to present on the CReSIS ultra-wideband radar system that deployed in Antarctica last winter.

“As I walked around, I managed to chat with about half a dozen other presenters about their work,” Carabajal said. “I tended to speak with people whose work was radar-related, as that is my area of study.”

His poster was an overview of the radar as a whole and its subsystems, including amplifier modules, which he helped build during early Fall 2013. The poster presentation spanned over 2 hours, and the UWB poster was one of roughly 100 or so total posters presented at the time.

Carabajal began his undergraduate academic career at the University of Kansas and continued into graduate school. He said electrical engineering piqued his interest because he was certain he enjoyed sound engineering and acoustics. Today, he studies radio frequency engineering and radar engineering.

“After my first semester, I realized ‘wait a minute... I actually really like this stuff!’ Because of KU’s history and current developments with remote sensing and radar, alongside the number of professors who work in that area, I found myself interested in working toward this specialty late into my undergrad,” he said.

Carabajal worked with CReSIS in his first semester of graduate school, and two years later, his work on the Center’s systems has caught the attention of the researchers at IGARSS.

“We work hard to make our radars the best we possibly can, so we can provide solid data to the rest of the remote sensing community,” he said. “This was something that attending IGARSS opened my eyes to, firsthand; over the course of my presentation, I was approached by many scientists and researchers who were excited to see what we were up to and hear about the new system.”

Currently, he is on a four-week deployment in Punta Arenas, Chile, operating the same radar he operated on the MCoRDS last spring. This semester, he is operating on a NASA DC-8.

“Through meeting other researchers in person, I realized just how important our final product is everyone,” he said.
CReSIS Graduate Student Visits Colorado for STC Meeting

// by Vicky Diaz-Camacho

In mid-August of this year, the Center for Remote Sensing of Ice Sheets attended the annual National Science Foundation Science and Technology Center Directors Meeting in Fort Collins, Colorado.

The Science and Technology Centers (STCs) program was established in 1987 as a way to foster complex research and education projects on a national level through long-term support. STCs provide an opportunity for academic institutions, national laboratories, and industrial organizations to collaborate on world-class research. The CReSIS grant was awarded in 2005 and renewed in 2010.

This year’s STC Directors Meeting spanned Aug. 18 to 19. Meeting activities included sessions with researchers, workshops, and presentations by top scientists. Several leading universities attended the meeting, such as the Massachusetts Institute of Technology (MIT), Stanford University and Purdue University.

CReSIS representatives were Deputy Director Carl Leuschen, Managing Director Jennifer Laverentz, Education Coordinator Darryl Monteau, and Jay McDaniel, a second year Master’s student at KU CReSIS. This was his first visit to an STC Directors Meeting.

“I was floored by how diverse the centers were,” McDaniel said. “From mapping the brain to sea floors.”

McDaniel had the opportunity to speak with researchers from MIT and a co-director from Berkley.

“It was a great experience,” he said. “To see [science research] in a nice, compact presentation with elite presenters from institutions.”

Participating centers engaged a wide spectrum of science missions, including atmospheric science, oceanography and biology. Many were involved in climate research.

This year’s meeting was hosted by the Center for Multiscale Modeling of Atmospheric Processes at Colorado State University. The Center focuses on understanding clouds and their roles in the global climate system, according to the CMMAP mission.

Visit from Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research

// by Vicky Diaz-Camacho

The former deputy director and an engineer from the Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research visited the Center for Remote Sensing of Ice Sheets this August as part of a collaborative effort between the two polar research centers.

The Alfred Wegener Institute, or AWI, is the national polar research center of Germany and plays an extensive role in the
Lauren Debes is 19 years old, originally from Wichita, Kansas and starting her first semester at KU. She plans to double major in Journalism and Film and Media Studies, and possibly minor in creative writing. Lauren loves to keep up with local theatre when she can, especially when it involves Shakespeare. When Lauren drinks coffee she usually “smothers it in whipped cream and chocolate” and gets her dosage of sugar and caffeine at the same time. Her favorite comedian is Aziz Ansari, whom she recently saw perform in Wichita. Food wise, Lauren loves anything covered in a cream sauce—which means a lot of Italian and Mexican food. Fun fact: Lauren adores Halloween and all things involving horror—she even plans on focusing on thrillers through her film major!

Kelsee Evans is 22 years old, originally from Eudora, Kansas now living in Lawrence to finish her senior year at KU. She is studying graphic design and creative writing. Kelsee is the student graphic designer at CReSIS. She says she’s a “total bookworm” but also enjoys photography. Kelsee is more of a tea person. Her favorite: chai tea. As for food, she said she likes Mexican food and, well “all of it,” she said. “I’m not picky.” Her comedian of choice is Ellen DeGeneres. Fun fact: Kelsee just recently studied abroad in Germany for a semester.

CReSIS Welcomes New Staff Members

// by CReSIS Media

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To date, AWI research has accrued 310 days at sea, 27 Arctic expeditions and 29 Antarctic expeditions. Its research via the Polarstern cruise has been running since 1982. The center also does meteorology, geophysics and atmospheric chemistry.

Recent highlights in their research are ocean acidification, which is part of national and European programs, ocean warming and its effect on organisms and Antarctic sea ice.