



NOAA-ISETCSC *news*

VOL. 3, ISSUE 3 • DECEMBER 2010

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)
INTERDISCIPLINARY SCIENTIFIC ENVIRONMENTAL TECHNOLOGY (ISET)
COOPERATIVE SCIENCE CENTER (CSC)
EDUCATIONAL PARTNERSHIP PROGRAM (EPP)

From the Director's Desk



ISETCSC CONTINUES to promote its educational goals primarily through student participation in high-quality interdisciplinary research, thereby relating classroom knowledge to real-life technological applications. ISETCSC pursues a holistic approach that integrates classroom learning with research experience. In the most recent ISETCSC NOAA Advisory Committee meeting held at CSU-Fresno on Nov. 1 and 2, the committee noted that "the meeting held this year in Fresno, CA was the best of the ISETCSC reviews to date. The level of the student presentations was commendable and speaks well for the professionalism of the ISETCSC students. The links to NOAA interests were addressed in the presentations and the posters. The interactive poster presentations were effective and students were well prepared and articulate in describing the details of their projects." This is a testimony to the effectiveness of the Center's educational strategies. This issue highlights ISETCSC's new education initiatives and the various outreach activities that took place from June through December 2010.

ISETCSC continues to be successful in developing strategic partnerships with major universities for the purpose of diversification of the Center's support and continues to enhance research productivity. Since March 2010 ISETCSC faculty submitted 25 proposals and ten were funded for a total of \$11,728,672. Most significant among these was the prestigious \$10 million NSF Expeditions-funded project at the University of Minnesota which resulted from the ISETCSC Thrust Areas II and III's collaboration among Kumar (UM), Steinbach (UM), Semazzi (NCSU) and Homaifar (NC A&T). Also, the \$999,000 NSF Center for Advanced Multi-scale Computational Algorithms was funded for principal investigators Rastigejev and Tang – both NC A&T ISETCSC PIs. A new Pre-Proposal: Climate Literacy for Elementary Educators in North Carolina for a NOAA-OED grant worth \$1,432,752 was also selected for full submission. This proposal will be submitted by the ISETCSC's Associate Director (Bohn) in collaboration with NCSU. The ISETCSC faculty and students made fifty-one presentations and published or submitted 31 journal articles since March 2010. This issue highlights significant faculty accomplishments.

ISETCSC collaborated with NCDC and ESRL to provide summer experiences in NOAA labs for 10 ISETCSC students. A PhD student from NC A&T was also part of the field campaign of CalNex in the San Joaquin Valley near Bakersfield, California for three months. The student page highlights these summer experiences as expressed by the students.

This issue highlights ISETCSC's new education initiatives and recent outreach activities.

ISETCSC submitted its renewal proposal this month. ISETCSC will continue strengthening its collaboration with the National Center for Atmospheric Research (NCAR), NOAA-OAR and the proposed Climate Services. Six NCAR scientists will visit NC A&T as seminar speakers in 2010-2011, and in the spring of 2011, NCAR scientists will provide an online graduate atmospheric chemistry course to students at NC A&T and Fresno. The Department of Meteorology at the University of Wyoming (UW) is the other new partner. UW will provide ISETCSC's students with the opportunity to participate in field operations doing research with an airborne system instrumented for atmospheric research and participate in the investigation in the laboratory of sensor characterization and calibration, and the development of processing algorithms.

— Solomon Bililign



Fall 2010

EDUCATION HIGHLIGHTS



*ISETCSC Education Leadership:
Schimmel, Bililign and Bohn*

VIRTUAL ASSEMBLIES – FALL 2010

Students from ISETCSC's partner institutions participated in a partnership-wide student videoconference on Sept. 28, 2010. The videoconference was hosted by NC A&T, and included participation from FISK, UAS, CUNY, NCSU and NC A&T students. Jessica Bohn, Associate Director of ISETCSC, was the moderator for the virtual meeting. Dr. Ranajit Talukdar, from NOAA's Earth Systems Research Laboratory, was a featured guest speaker who shared information about ESRL's research problems and discussed how to choose a problem area. Keren Cepero, a PhD student at NCSU, gave a research presentation on storm-related flooding in the NC coastal plain. All students shared a brief description of their current area of research. The second ISETCSC student virtual meeting took place Nov. 1, 2010 while the NOAA Advisory Committee meeting was in session. Aside from a few technical difficulties, the virtual assembly provided a unique opportunity to connect students at partner institutions with the NOAA Advisory Committee. Dr. Steven Koch shared an informative presentation with students about opportunities in NOAA. Dr. Marc Fiddler shared a presentation on behalf of Anthony Cochran about Anthony's summer experiences at CalNex and ESRL.

EVALUATOR ASSESSES ISETCSC'S IMPACT ON RESEARCH SKILLS AND RETENTION STRATEGIES

ISETCSC desires to be a leader among the Cooperative Science Centers and other NOAA education programs in the effective use of assessment and evaluation toward achieving the Center's and students' successes. Toward this end, during its 5th year of operation ISETCSC hired an external evaluator to help with the generation of student data that will inform decisions regarding current retention and student development strategies. The evaluator, Dr. Amy Germuth from EvalWorks, used online student and faculty surveys across all partner institutions and NC A&T student interviews to assess the impact of ISETCSC on students' research skills, as well as the support base that exists in ISETCSC (Germuth, 2010).

STUDENT SUPPORT AGREEMENT

ISETCSC has created a new form for communicating ISETCSC's expectations to students at the beginning of the school year. The purpose of this form is to provide students with a clear and consistent understanding of the program's activities and benefits. This new document, entitled "Student Support Agreement," lists the student's funding as being contingent upon meeting ISETCSC's requirements. When ISETCSC's students agree to receive support, they sign this document agreeing to meet ISETCSC's expectations. The students are told that these expectations are actually professional development activities that will make them more marketable job candidates upon graduation. This enhances the connection between ISETCSC's activities and the students' objective of developing a solid career.

STUDENT DEVELOPMENT PLAN

ISETCSC has implemented a revised version of the common student development plan for all students at all institutions. Students use the reporting form to chronicle their progress at the end of each semester, and possibly the summer session (a total of two or three reports per year). The students' faculty advisors will review the reports, sign, and submit a copy to the center. Additionally we have now included the expectations for ISETCSC's students on the student development plan.

ISETCSC'S WEBSITE GETS UPDATED TO ENHANCE RECRUITMENT AND STUDENT COMMUNITY

The ISETCSC's website was recently revised to increase the ease of use by prospective students and current students. New menus and formatting changes allow high school students and current college students to find relevant information about NOAA-ISETCSC's offerings quickly and easily. New menus include "For Prospective Students," "For Current Students," and "For K-12 Teachers." In addition new content has been added, as well as links to our new AMS student chapter. Formatting changes have provided "Quick Link" information at the top of the page, rather than the bottom. These changes should aid in recruiting new students who visit the website. Additionally, students have been entered in the system to begin creating their own web pages.



OUTREACH

ISETCSC PARTNER SPOTLIGHT: CSU-FRESNO



Undergraduate students Kennedy Vu (chemistry) and Stacy Brown (geography) with a SUMMA canister, which is used to collect air samples.

DAIRY RESEARCH

Fresno State researchers from the chemistry and geography departments spent the summer investigating the impacts of dairy facilities on regional air pollution. The project uses support from ISET, and involves researchers from the National Laboratory for Agriculture and the Environment (NLAE) in Ames, Iowa. The research team is using a suite of instrumentation to measure emissions of volatile organic compounds (VOCs), which react in the atmosphere to form ozone, a major component of smog. Over the summer the group, which includes undergraduate and graduate students majoring in chemistry, geology, physics, geography and engineering tested their equipment at the Fresno State dairy. Six students also had the opportunity to visit the NLAE laboratory in Iowa and participate in air quality measurements at a cattle feedlot in Kansas. Over the next two years, the focus will shift to measuring emissions from commercial

Students prepare a tethered balloon for a test flight. Back from left to right: Julie Steele (undergraduate), Olivia Yang (high school intern) and Kaitlyn Sims (high school intern). Front: Jesse Paz (high school intern).

dairy operations within the San Joaquin Valley. The results will be used to refine computer models that are used to predict regional air quality. The dairy measurements conducted during July were featured on the front page of the *Fresno Bee* newspaper, and the story (www.fresnobee.com/2010/08/05/2031238/fresno-state-balloon-tracks-dairies.html) was also carried by several regional newspapers around the country.

HIGH SCHOOL OUTREACH

During the spring semester, ISET faculty visited four local school science classes (approximately 120 students) to promote NOAA-related science, careers and degree programs.

SUMMER INTERNSHIPS

High school students from three local high schools near Fresno, CA participated in an eight-week air quality internship in ISET's research laboratories at CSU-Fresno over the summer. The students, selected from a large pool of applicants, participated in the program to gain knowledge and experience in both the science and politics of air pollution. The students worked in the atmospheric chemistry research group at Fresno State under the guidance of Alam Hasson, where they carried out experiments to understand the chemistry of smog-forming pollutants. The students also interned with the Fresno Madera Medical Society, which works to raise awareness of the health impacts of poor air quality. Students had the opportunity to travel to Sacramento and meet with state lawmakers to discuss air quality issues through the internship.



High school summer workshop students in Yosemite Valley.

HIGH SCHOOL SUMMER CAMP

A five-day camp was held for middle and high school students during June 2010. The camp was built around the theme of "Deciphering Earth's History" and featured elements of paleoclimatology, paleontology and stratigraphy. A series of hands-on interactive demonstrations and activities were used to engage the students in these topics. The camp culminated in a field trip to Yosemite National Park. Twelve students participated; of these, 70% were from minority groups.

TEACHER WORKSHOP

A six-day teacher workshop that mirrored the topics covered in the high school camp was held in June 2010. The workshop included both instruction on each topic as well as a discussion of strategies to incorporate these topics into the classroom.

ISETCSC OUTREACH

AT NC A&T



High School Summer Camp

On NC A&T's campus, 21 high school students attended ISETCSC's fourth annual high school Weather and Climate Camp from July 19-23, 2010. Students were selected through an application process. They received instruction in weather phenomena, performed a number of weather related experiments, visited atmospheric chemistry labs and the NC A&T television studio, and completed a research project. Throughout the week, presentations were made by ISETCSC's faculty and partners: Dr Yuh-Lang Lin (hurricanes), Dr Marc Fiddler (atmospheric chemistry), local television meteorologist Grant Gilmore (developing and presenting weather forecasts), AP/IB Chemistry teacher and Kenan fellow Kathleen Eckersly (inquiry based research on atmospheric gases), science teacher and Keenan fellow Martha Tedrow (inquiry based learning about aquifers and the water cycle).



Elementary/Middle/Other Summer Camps

ISETCSC partnered with several existing summer programs, utilizing the expertise in NC A&T's personnel in atmospheric science to enhance both program effectiveness and the exposure of NOAA programs. ISETCSC worked with the Natural Science Center of Greensboro to enhance their existing summer camp for grades 3-8. ISETCSC's staff member Michael Porter presented information and organized activities for two week-long sessions of Catastrophes! (July 5-9, 2010 & Aug. 2-6 for 3-4 grade students) and one week-long session of Way out Weather (July 5-9, 2010 for 6-7 grade students). Similarly, on June 21, 2010 ISETCSC provided activities for SOAER: Summer Orientation to Aerospace/Engineering/Sciences Retreat. Michael Porter led a dozen middle school students in hands-on activities and computer simulations, collaborating with Ronnie Bolick (NC A&T). Also on June 21, ISETCSC hosted a combined middle and high school Energy Camp organized by Harmohindar Singh (NC A&T). Michael Porter explained fundamental interactions of energy production and climate systems.

K-12 Teachers Summer Workshops

ISETCSC hosted its fourth annual Earth Science Teacher Summer Workshop in partnership with IRIS on NC A&T's campus from July 12-16, 2010 in an effort to equip teachers with practical earth science knowledge and lesson plans for use in the classroom. The atmosphere, oceans and seismology were emphasized. NOAA content was delivered by Darryl Lee Baynes of Interactive Science Programs, featuring many hands-on experiments. John Taber (E&O Program Manager, IRIS Consortium) and Michael Hubenthal (Education Specialist, IRIS) demonstrated the application of geoscience lesson plans. The teachers attended a lecture by Franco Einaudi (former director of NASA GSFC) on global climate change, in conjunction with the Guilford County Schools/ NASA summer research experience participants. Michael Porter (ISETCSC Geoscience Education specialist) and Angela Reusch (post-doctoral researcher in seismology at NC A&T) assisted in facilitating the workshop throughout.

On June 25, ISETCSC provided content for one day of a two-week Energy Educators workshop held at NC A&T. For the ISETCSC's contribution, Michael Porter provided information about climate systems and worked closely in a lab setting with 20 middle and high school teachers to explore available online NOAA resources.

OUTREACH AT PARTNER INSTITUTIONS

continued from page 4

CUNY OUTREACH

Eight high school students participated in 6-week Summer High School Internship [SHIP] program organized at City College of New York. The high school students were given a three-hour MATLAB course training in the morning each day followed by hands-on research training in the afternoon.



CUNY Summer High School – Outreach activities at ISET/CUNY, Aug. 2010

UNIVERSITY OF ALASKA SOUTHEAST OUTREACH

ISET PI Connor has been the faculty lead for three summers of science outreach to high school students. Design Discover Research has attracted Alaska Natives and other minority students to learn about research in biology, earth science, and oceanography, all NOAA emphasis areas.

NAC member Dr. Brian Gross, acting Chair Dr. Sharon LeDuc and incoming Chair Dr. Scott Hausman

James Spinks, student presentation



Students at the evening reception in CSU-Fresno's Science Museum

NOAA ADVISORY COMMITTEE MEETING 2010

THE NOAA ADVISORY COMMITTEE meeting was held in Fresno, California on Nov. 1-2, 2010, and hosted by ISETCSC partner CSU-Fresno. The meeting was a great success, as ISETCSC shared progress in the last year and learned how to further develop the program in a way that aligns with NOAA's priorities. ISETCSC's Director, Deputy Director and Associate Director presented information about the educational progress and evaluation of the NOAA-ISET Center. Thrust area faculty and students presented information about the progress in research. A total of 14 ISETCSC faculty members from all partner institutions made presentations, including many new presenters. Four student oral presentations were given and 23 student poster presentations were made at this year's meeting. The levels of students ranged from sophomore to PhD candidate, and students from all partner institutions were present. An evening reception and planetarium show was provided by Dr. Fraka Harmsen, Dean of Arts & Sciences at CSU-Fresno and ISETCSC PI, and CSU's hospitality was greatly appreciated by all. NAC Chair Dr. Sharon LeDuc led the committee and reported excellent progress from NOAA-ISET at the conclusion of the two-day meeting. Technical Monitor and NOAA scientist Dr. Steven Koch shared useful feedback regarding the direction of research and education efforts. The NAC Report stated "Educational progress and successes were significant. Faculty, both those initially with the program and those who have been hired, provide capability that position ISET to provide outstanding educational opportunities for NOAA science." ISETCSC will welcome a new NAC Chair, Dr. Scott Hausman from NOAA NCDC, next year. Details of the Committee's report can be found at www.noaaiset.org/nac2010.



Fausto Hernandez presenting his poster to ISETCSC faculty Zerihun Assefa



Bao, Homaifar, Gross and Ahmed

Faculty Highlights



The proposal submitted by **Dr. Yevgeniy Rastigeyev** at NCATSU to establish the NSF HBCU-RISE Center for Advanced Multi-scale Computational Algorithms (AMCA) at North Carolina A&T State University (NC A&T) was funded for \$999,452 for three years. Numerical modeling of many important physicochemical phenomena (atmospheric chemical transport, combustion, industrial chemically reactive flows, etc.) present an enormous challenge due to a wide range of spatial and temporal scales associated with the described phenomena and an enormous number of chemical species and chemical reactions required for detailed description of the chemical kinetic mechanisms. The proposed project would allow NC A&T to develop a new research and educational capacity in the area of scientific computing, advanced numerical methods and their application to a variety of multi-scale physicochemical problems of practical interest. This project will provide students from NC A&T with expertise in several areas – atmospheric chemistry, applied mathematics and numerical methods. It will help build institutional technical capability, as well as cultivate and nurture interest among minority students, leading to an integration of research and education while enhancing diversity in atmospheric science and applied mathematics.



Kumar

Three ISETCSC PIs were recently announced as winners of a very prestigious NSF New Expeditions in Computing Award, worth \$10 million dollars. **Dr. Vipin Kumar**, ISETCSC PI from the University of Minnesota, and Professor and Chair of the Department of Computer Science, is the lead PI for the project. He is working in collaboration with NC A&T's **Dr. Abdollah Homaifar** (Professor of Electrical and Computer Engineering and ISETCSC's Thrust Area III leader), and NCSU's **Dr. Fredrick Semazzi** (Professor, Marine, Earth and Environmental Sciences and ISETCSC's Thrust Area II leader). **Dr. Michael Steinbach** (University of Minnesota Researcher and ISETCSC PI) is also working on the project. Northwestern University, the University of Tennessee and Oak Ridge National Laboratory are also partners in the project. ISETCSC would like to congratulate this very outstanding team and Dr. Kumar for his leadership. A link to the official press release from NSF is here: http://www.nsf.gov/news/news_summ.jsp?cntn_id=117560&org=NSF&from=news.

UAS's Juneau Campus NOAA-ISETCSC faculty presented a poster at AGU about their successful research partnership with the U.S. Forest Service through the Mendenhall Glacier Visitor Center. UAS undergraduates monitor glacier change

through research guided by their faculty mentors (**Connor, Hood, Heavner and Hekkers**). They have been measuring the rapid recession of the Mendenhall Glacier through a sensor network of weather stations and terminus cameras as well as through year-long campaign of field work to measure glacier mass balance and proglacial lake expansion. In addition UAS's students and faculty present the yearly "state of the glacier" lecture for the 30,000 member Juneau community as one of a series of spring public lectures at the Visitor Center-sponsored "Fireside Chats." <http://www.fs.fed.us/r10/tongass/districts/mendenhall/firesides.shtml>. See the glacier's face through a web camera that is refreshed every 5 minutes at: <http://www.fs.fed.us/r10/tongass/districts/mendenhall/mendwebcam.shtml>.

Dr. Solomon Bililign has received several recent awards:



He has been named a 2010 Alumni Fellow of the College of Liberal Arts and Sciences at the University of Iowa, his doctoral alma mater. On his visit to Iowa City last month to accept the award, Bililign presented a public lecture, "Research and Education in Geosciences – the Need for an All-Inclusive Interdisciplinary Approach to Address Problems of Global Significance." <http://www.clas.uiowa.edu/events/2010/09/21alumnifellows.shtml>.



Faculty Highlights, continued from page 6

Dr. Bililign will be honored as one of 100 notable black individuals in the science, technology, engineering and mathematics fields at the World Festival on Black Arts and Culture to be held in Dakar, Senegal from Dec. 10-31, 2010. This honor comes from the Robert R. Taylor Network based at the Center for Educational Computing Initiatives at the Massachusetts Institute of Technology as they prepare an exhibit honoring 100 individuals.

Dr. John Paul (J.P.) Roop received an NSF grant in the Division of Mathematical Sciences (DMS) in the amount of \$83,389 entitled "Transcending POD: Model Reduction for Complex Fluid Flows." The aim of the grant is to apply reduced order modeling strategies to geophysical fluid flows. Reduced order modeling essentially exploits the statistical technique of principal component analysis in order to significantly reduce the amount of computational time required to estimate the solution to a dynamical system.

Dr. Abdollah Homaifar's proposal entitled "Development of the Satellite Image Base Retrieval Application (SIBRA) in support of Structural Indexing of Satellite Images (SISI)" was funded by NOAA. The amount of funding is \$50,000.00. The Defense Meteorological Satellite Program (DMSP) imagery data collected and processed daily by NOAA/NGDC is voluminous and complex, due to the high dimensionality of each image set. The thermal and visual components also pose a different level of complexity when fusing these images. The dynamic nature of the data

requires a large computer memory for storing the data. The Satellite Image Based Retrieval Application (SIBRA) project is directed towards building a user-friendly similar search engine for DMSP satellite imagery database. The goal is to find similar image matches to any query image and this is to be done in sub-linear search time complexity.

Africa Array Workshop

Bililign and two ISETCSC thrust area leaders (**Semazzi** from NCSU; and **Ahmed** from CUNY) attended a workshop on June 2-4, 2010 regarding the expansion of the Africa Array network to support interdisciplinary and multidisciplinary science in Africa (<http://africaarray.psu.edu/about/default.asp>). The workshop was hosted at Howard University in Washington D.C. Over 100 participants from a variety of African (20 from sub Saharan Africa) and European countries assembled, representing a range of science fields. The attendees are interested in exploring the benefits of a single instrumentation initiative addressing the science needs of several geosciences disciplines, including, but not limited to, climate and atmospheric science, geodesy, hydrology, seismology, ecology, space weather, social sciences and the human dimensions of climate change. Program managers from NSF, NOAA, USAID, NASA, the US Air Force and Office of Naval Research engaged in geosciences research in Africa were also part of this meeting.

Primary support for this workshop has been provided by the National Science Foundation. Other sponsors were the European Office of Aerospace Research and Development, Air Force Office of Scientific Research, United States Air Force Research Laboratory, UNAVCO, NOAA, U.S. State Department, United Nations Office on Outer Space Affairs, World Climate Research Programme of the World Meteorological Society, and the Office of Naval Research Global. The expected outcome was the development of major international collaboration and initiatives involving multiple universities, countries and funding agencies. A follow up meeting was held in November in South Africa.

THIS FALL, ISETCSC WELCOMED THE FOLLOWING NEW NC A&T PHD STUDENTS:
Fuhong Liu, Van Nguyen, Patrick Pete, Steve Stegall, Stephany Taylor

Student Highlights

SUMMER 2010 RESEARCH EXPERIENCES OF ISETCSC STUDENTS



Mohamed Gebril, a PhD student at NC A&T State University worked on a summer research project under NOAA advisor Eric Kihn to study the structural indexing of satellite images. The main goal of this research is to build an accurate and fast retrieval query based on the information extracted from satellite image data. His abstract was accepted for IEEE Aerospace Conference for a paper to be published.

Chaunte Lacewell, an MS student at NC A&T State University worked on a summer research project at NCDC under the direction of NOAA advisor Dr. Dave Levinson. Her research topic is "Tracing the Origins and Propagation of African Easterly Waves and Mesoscale Convection Systems Using Pattern Recognition and Data Fusion." According to Chaunte, this summer's experience at NCDC had a huge impact on her thesis because she learned about tracking and analyzing clouds, as well as learning IDL scripting, which she thinks has better graphics than Matlab and it's easier to program.



Anthony Cochran, a PhD student at NC A&T participated in two summer activities. First, he participated in the ground based portion of the CalNex field campaign in Pasadena California. He assisted in the pre-deployment tests at NOAA ESRL in Boulder, Colorado which were designed to simulate the actual experimental environment in the field. The second portion of his efforts at ESRL was to design, build, and test an experiment to investigate heterogeneous kinetics of

gas phase isocyanic acid with aqueous surfaces. He worked under NOAA advisor Dr. James Roberts at ESRL. Anthony is a co-author in two publications, one of which to be submitted to Nature. He is also a co-author in six abstracts to be presented at AGU- 2010 and he will make an oral presentation at AGU-2010. Anthony expects to graduate in Aug. 2011.



David Etim, undergraduate student at NC A&T, worked on a summer research project at ESRL under the mentorship of Tracey Hansen. The purpose of his research was to collect data on the locations of weather forecast offices and emergency management centers in the United States. David said this experience was extremely valuable.



Delonte Duff, undergraduate at NC A&T completed an internship at ESRL, working on creating images that display relative humidity on a global scale. The purpose of the research was to be able to measure the amount of water vapor throughout the air globally during hurricane season, in order to compare the years that had a vastly active hurricane season to those that did not have as active of a season. Delonte feels this project was very successful, but more data and analysis is needed.



Alok Hota, undergraduate at FISK University under the advisement of Dr. Qian, worked on a summer research project to be able to simultaneously receive and manipulate data from two weather stations. One of these stations is located at North Carolina A&T State University, while the other is located at Fisk University. This work is a pilot for NOAA's Earth Information System project. He also presented this research at the NOAA Advisory Committee meeting in Nov. 2010.



Wilsharo Scott, undergraduate at FISK University under the advisement of Dr. Qian, worked as an intern at the National Marine Fisheries Service in Miami under the direction of Carlos Rivero from NOAA's Southeast Fisheries Science Center (SEFSC). The purpose of his project was to integrate newly available VMS data into one database and develop a user friendly web application that will query the database and display information that the user is seeking. Wilsharo states, "I learned a lot from this project and feel that the skills I have obtained will make me very marketable when seeking a job."



Galen Smith, PhD student at NC A&T under Dr. Lin, worked under the advisement of Dr. Steven Koch at NOAA ESRL this summer. His research topic is gravity wave impact forecasting/analysis. He developed the necessary connections to set up NOAA ISET's computer systems to retrieve data from the MADIS and run the STMAS data assimilation software. Additionally, he will be configuring our existing computer cluster to run the high resolution model. Several aspects of his summer research will lead to publications as the research is continued.

Student Highlights, continued from page 8



Yi-Chih Huang, a PhD student at NC A&T, worked at GSD under the advisement of Dr. Jin Lee. His ISETCSC Advisor is Dr. Lin.

James Spinks, PhD student at NC A&T, worked at NOAA Earth System Research Lab (ESRL) this summer. He attended the FIM workshop to understand the usage of the new global model. He worked under the direction of Dr. Jin Lee and Dr. Steve Koch. He worked with Dr. Lee to solve some technical issues with the model. He used his previous thesis research, which focused on the development of the pre-Helene African easterly wave using the Weather Research and Forecasting regional model, to compare with the new FIM Global Model.

Van Nguyen, a PhD student at NC A&T participated in a summer research experience at the NOAA Earth System Research Lab under Dr. Jin Lee and Dr. Steve Koch. Her goals were to investigate a mountain removal technique for orographic study of tropical cyclone genesis, attend the summer school in atmospheric modeling, a 3 day workshop introducing participants to the global model FIM developed at NOAA ESRL, and collaborate with research scientists.



William Wright, PhD student at NC A&T, worked at NCDC this summer under the advisement of Dr. Rich Baldwin. He also worked with Brian May at the

National Climatic Data Center. The Data Access Branch would like its web services to provide NCDC data in a useful XML format. His role with the Data Access Branch has been to create a set of Java formatter classes that convert the standard CDO data output to the O&M or WaterML data output for the client. William states that his work has been extremely successful.



SEAN CAMPBELL (ABOVE), A RECENT BS GRADUATE AT CSU - FRESNO WAS AWARDED THE OUTSTANDING STUDENT PRESENTATION AWARD AT THE 31ST CENTRAL CALIFORNIA RESEARCH SYMPOSIUM.

Malcolm and **Martin Blow**, twin brothers and undergraduates at NC A&T, were selected to participate in NOAA EPP's summer program. Malcolm's project was to develop an analysis of alternative solutions using unmanned aerial systems (UAS) to help with future efforts to clean up oil spills. He worked under the direction of Dr. Robbie Hood at OAR, Department of UAS in Silver Spring, MD. Martin Blow interned with NOAA's Office of Marine and Aviation Operations under the mentorship of NOAA Corp. Commander John Adler. Martin's first project was to design a test for the vertical and horizontal positioning of an autonomous underwater vehicle (AUV). For his second project, he designed a mission for three underwater gliders in the Gulf of Mexico to test mainly for pollution concentrations. The third project was to improve the flow of data from the sensors on board NOAA's ships to the public repository.

GRADUATIONS AND DEFENSES

Van Nguyen graduated with a MS in computational sciences and engineering (CSE) from NC A&T. She successfully defended her MS thesis entitled "Effects of Orography and the African Easterly Waves on the Genesis of Hurricane Javier (2004) in the Eastern Pacific Ocean." Dr. Steve Koch was her NOAA external examiner. Van is currently a PhD student in CSE at NC A&T. (Defense date: June 18, 2010)

Colon-Pagan, Ian C graduated with a MS from the Department of Physics at NC A&T. She successfully defended her MS thesis entitled "Orographic Effects on Rainfall Induced by the Passage of Tropical Cyclones a Mountainous Island." Dr. Steve Koch was her NOAA external examiner. Ian is currently a PhD student at Georgia Tech. (Defense Date: June 18, 2010)

Samuel Hernandez graduated with a MS in chemistry from CSU-Fresno and is now in a PhD program at UCLA. His MS thesis topic was "The Atmospheric Chemistry of Peroxy Radicals."

Sean Campbell graduated with a BS in biology from CSU-Fresno and is a medical student at the University of California, Irvine.

Robert Mera graduated with a PhD in meteorology from NCSU and is a post-doc at the University of Oregon.

Sherod Jackson graduated with a BS in mathematics from CUNY and was admitted to graduate school at Vanderbilt University.

Lwin Maung graduated with a PhD in engineering from CUNY and is a post-doctoral scientist at Utah State's University Energy Dynamics Lab. His research topic was "Mid Infrared Quantum Cascade Laser for Trace Gas Sensing."

Hannah Aizenman graduated with a BE in computer engineering from CUNY and was admitted to a PhD program at CUNY.

Carlos Padilla graduated with a BE in engineering from CUNY and is pursuing masters degree at CUNY.

continued on page 10

Student Highlights, continued from page 9

Keren Cepero, an MS student at NCSU defended her thesis “Inundation Mapping Employing Hydraulic Modeling and GIS: Case Studies on Neuse River and Tar River” and is finishing the MS program this semester and beginning the PhD program at NCSU next semester. (Defense date: Oct. 28, 2010)

Katif Peay is a PhD student in Energy and Environmental Systems at NC A&T, completed his PhD preliminary exam; his dissertation topic is “Analysis of Ground-Based Remote Sensing Measurements of Ozone and Its Precursors in Greensboro, NC and the Local Region: A Study of Their Effects on Air Quality and Climate.” (Defense date: Sept. 10, 2010)

OTHER STUDENT HIGHLIGHTS

NC A&T SU

Stefan Boskovic, a sophomore in atmospheric sciences & meteorology at NC A&T presented his research at the State of North Carolina Undergraduate Research and Creativity Symposium, hosted at Meredith College on Sat., Nov. 20, 2010. The citation for the presentation follows: Boskovic, Stefan; Fiddler, Marc N.; Bililign, Solomon. “Characterizing the fourth O-H overtone of peracetic acid using cavity ring-down spectroscopy.” State of North Carolina Undergraduate Research and Creativity Symposium, Raleigh, NC, Nov. 20, 2010.



UNIVERSITY OF ALASKA SOUTHEAST

UAS NOAA student **Nat Kugler** will participate in UAS International Student Exchange program and spend a semester in Austria. Also, UAS environmental science student **Cameron Piscoya** (pictured above on the left) has joined our NOAA “Icefield to Oceans” research group. http://www.juneauempire.com/stories/091310/loc_707291431.shtml



Dr. Yuh-Lang Lin, Dr. Solomon Bililign and Dr. Keith Schimmel met with Dr. Alfred Rodi, Chair of the Department of Meteorology at the University of Wyoming's airplane hanger.

New Collaborations

ISETCSC- UNIVERSITY OF WYOMING COLLABORATION

On June 11, the ISETCSC’s Director, Senior Scientist and Director of Education visited the Meteorology Department at the University of Wyoming to meet with UW faculty members and discuss possible collaboration with ISETCSC. The University of Wyoming (UW) Department of Atmospheric Science has acquired, instrumented and operated a series of research aircraft during the past 40 years. This effort began in the 1960s with a C-45 Twin-Beech, then upgraded to a Queen Air in 1971, and finally to the present Hawker Beechcraft King Air 200T (N2UW or UWKA) acquired in 1977. The University of Wyoming has agreed to host ISETCSC’s students to conduct observational research using the airplanes and instrumentation developed by the group. The University of Wyoming has joined ISETCSC as a partner in the renewal proposal.

JUNEAU ICEFIELD RESEARCH PROGRAM (JIRP)

UAS faculty member **Cathy Connor** has expanded her collaboration with the Juneau Icefield Research Program (JIRP) as it changes leadership. She has joined the nonprofit Board of Directors of the Foundation for Glacier and Environmental Research that supports the JIRP. By continuing this 8-week summer glacier field course into the future, students from across the UAS will be provided access to glacier field research through the use of the high mountain camp system developed by the JIRP. A paper authored by Connor and published by the *Geological Society America* last spring in a special volume on geological field science camps, describes this program, its history, and its achievements. UAS faculty member **Eran Hood** has been collaborating with colleagues at Virginia Tech and in Juneau to expand his biogeochemical studies of deglaciating watersheds and their influence on North Pacific marine ecosystems. His publications about this work in *Nature* and *Nature Geoscience* have distinguished him in this discipline.

NSF-CLIMATE CHANGE EDUCATION

Fresno State submitted a proposal to NSF’s Climate Change Education Program in partnership with San Diego State University, the National Center for Atmospheric Research, Moss Landing Marine Laboratory, the National Laboratory for Agriculture and the Environment, California State University’s Chancellor’s Office, the Fresno County Office of Education and the Tulare County Office of Education. NC A&T also collaborated on a similar proposal with Penn State. While these proposals were not funded, the connections made through the preparation of these proposals will be used to develop new initiatives in climate change education.

IBETCSC Seminar Series



SEMINARS at NC A&T

AUGUST 4, 2010

Recent Rapid Changes in Arctic Climate and Intensification of Arctic-Midlatitude Interactions
Dr. Xiangdong Zhang, International Arctic Research Center, University of Alaska Fairbanks

SEPTEMBER 27, 2010

Laboratory Studies of Atmospheric Chemical Processes
Dr. Ranajit Talukdar, NOAA Earth Systems Research Laboratory, Boulder, CO

OCTOBER 21, 2010

Dr. Solomon Bililign organized and chaired the session "the role of Physics in Geosciences" at the South Eastern Section of the American Physical society meeting in Baton Rouge, LA. The invited speakers were:

The Role of Physics in Atmospheric, Ocean and Earth Science
Dr. Franco Einaudi

Mesoscale Eddies and Vertical Mixing in the Ocean
Dr. Annalisa Bracco

Tracking the Movement of Magma through the Crust in the East African Rift
Dr. Cynthia Ebinger

Exploring the Interior of an Active Volcano with Deformation Models
Dr. Timothy Masterlark

UPCOMING SEMINARS at NC A&T

FEBRUARY 2, 2011

Chemistry in the Arctic Troposphere: An Overview of the OASIS (Ocean - Atmosphere - Sea Ice - Snowpack) 2009 Field Campaign held In Barrow Alaska
Dr. John Orlando, National Center for Atmospheric Research, Boulder, CO.

FEBRUARY 11, 2011

IBETCSC Day at North Carolina A&T State University
Symposium speakers to be announced

FEBRUARY 24, 2011

Ambient Measurements of Atmospheric Constituents Employing Difference Frequency Generation IR Absorption Spectroscopy
Dr. Alan Fried, National Center for Atmospheric Research; Boulder, CO.

MARCH 2, 2011

Predicting Turbulence for Aviation: Strategies and Challenges
Dr. Bob Sharman, National Center for Atmospheric Research; Boulder, CO.

MARCH 21, 2011

Observations of Atlantic Tropical Weather Disturbances from PREDICT
Dr. Chris Davis, National Center for Atmospheric Research; Boulder, CO.

APRIL 11, 2011

Toward a Greater Understanding of Climate Forcing: Laboratory Studies of Atmospheric Dust
Dr. Paul Kleiber, Professor and Associate Chair for Physics, University of Iowa

APRIL 27, 2011

Effects of Turbulence on Hurricane Intensity
Dr. Rich Rotunno, National Center for Atmospheric Research; Boulder, CO.

SEMINARS at CUNY

AUGUST 17, 2010

Evaluation of the Impacts of Ingesting TRMM Data on the Accuracy of Quantitative Precipitation Estimates Obtained via the ScaMPR Framework
Dr. Yu Zhang

JUNE 24, 2010

A Multi-Platform Analysis of Aerosol-Cloud-Precipitation Interactions
Dr. Armin Sorooshian

JUNE 10, 2010

The Longwave Band-by-band Fluxes and Cloud Radiative Forcings: New Dimensions in the GCM Diagnostics and the Study of Cloud Feedbacks
Dr. Xianglei Huang

JUNE 8, 2010

Near-Roadway Air Pollution: From Science to Engineering
Dr. Juan B. Valdés

NOAA-ISET CENTER



North Carolina A&T State University
1601 East Market Street
Greensboro, NC 27411

336-285-2336

www.noaaiset.org

ISETCSC Partner Universities



DR. SOLOMON BILILIGN, *Center Director*
North Carolina A&T State University
1601 East Market Street
Gibbs Hall, Suites 301-307
Greensboro, NC 27411
336-285-2336
bililign@ncat.edu



DR. SAMIR AHMED
City College of The City of New York
Steinman Hall, T-107
140th St. @ Convent Ave.
New York, NY 10031
212-650-7250
ahmed@ccny.cuny.edu



DR. ALAM HASSON
California State University, Fresno
2576 East San Ramon Ave.
Fresno, CA 93740
559-278-2420
ahasson@csufresno.edu



DR. CATHY CONNOR
University of Alaska Southeast
11120 Glacier HWY
Juneau, AK 99801
907-796-6293
cathy.connor@uas.alaska.edu



DR. VIPIN KUMAR
University of Minnesota
200 Union Street SE
Minneapolis, MN 55455
612-625-0726
kumar@cs.umn.edu

DR. FREDRICK SEMAZZI
North Carolina State University
116 Cox Hall
Raleigh, NC 27695
919-515-1434
fred_semazzi@ncsu.edu



DR. LEI QIAN
Fisk University
1000 17th Avenue N.
Nashville, TN 37208
615-329-1269
lqian@fisk.edu

NC STATE UNIVERSITY