OFFICE OF EDUCATION

Educational Partnership Program

& Student Scholarship News

Volume 4 Issue 1 **January 2010**

A Scholar's Point of View
Page 2

Mentor Profile:
Kristine Holderied
Page 3

Flagship Science Playground Opens
Page 5

People at CREST
Page 6

Scholar News and Activities
Page 9

Scholarship & Internship Opportunities
Page 11

NOAA Science and Education Symposium Awards
Page 12

Events of Interest
Page 12

www.epp.noaa.gov

CSC Distinguished Scientists Gather

While the 5 Cooperative Science Centers' (CSC) directors meet biannually, and have since the Centers opened their doors, their Distinguished Scientists had never had the opportunity to convene as a group. This September, that changed when they, along with their Center directors (see p. 13 for names) gathered at NOAA. These scientists are responsible for developing and directing significant research projects for each of their centers, projects that ensure support of NOAA's mission, as well as furthering the goals of each CSC. Meeting one another in person, engaging with a number of NOAA administrators and scientists, and trading ideas and information with each other were important goals, but an added objective of this assembly was to conceptualize a collaborative project that would involve all 5 centers. The project is expected to capitalize on existing capacity and relate to ongoing research.

Before "putting their heads together," and getting down to business, the scientists spent a morning with Paul Sandifer, NOAA's Acting Chief Scientist. Reviewing NOAA's established priorities for the next 5-10 years, Dr. Sandifer facilitated a discussion of potential research goals. Later, the Center scientists and directors sat down and began generating ideas. Suggestions ranged

Scientists, continued on page 7

CREST: Cooperative Remote Sensing Science and Technology Center

Three words concisely sum up the research focus at CREST: *environmental remote sensing*. Beyond those words, however, are a plethora of training, research, and outreach activities, many of them collaborative with academic, governmental and industry partners

that, together, account for the successes of the Cooperative Remote Sensing Science and Technology Center. Lead by the City College of the City University of New York (CUNY), this consortium of universities includes Bowie State University, Hampton University, University of Maryland at Baltimore County, and University of Puerto Rico at Mayaguez as well as Lehman College, Bronx Community College, New York City College of Technology; LaGuardia Community College and Hunter College. Raytheon and Northrup Grumman comprise the corporate partners.

CREST efforts include sensor development, satellite remote sensing, ground-based field measurements, data processing and analysis, modeling and forecasting. Recruitment and training focuses on mentoring undergraduate and graduate students in scientific and engineering disciplines in which they can specialize in remote sensing. Research concentrates on climate, air quality, hydrology, precipitation and issues in coastal and marine waters.

CREST, continued on page 4

A Scholar's Point of View: Thomas Searles

From SCUBA Diving to Carbon Nanotubes; My EPP Undergraduate Scholarship Journey

By Thomas Searles

Every time I think about my experiences as an Undergraduate Scholar in NOAA EPP, the first thing that always comes to mind is disbelief that it was over 6 years ago! Getting over the shock of getting old, I then realize what a great opportunity I had and how thankful I am for that experience. At that time, the program only accepted 10 students with varying backgrounds and experiences, bringing them into NOAA headquarters in Silver Spring, MD for their first summer internship. Luckily, I was accepted into the program with two good friends, also from Morehouse. Little did I know that I would leave that summer with 7 more lifelong friends, as well as a great mentor in Educational Partnership Program (EPP) Director Jacqueline Rousseau.

The first component of the program was an intense 4-week orientation to NOAA, including exposure to all of the agency's regulatory and scientific endeavors. It was an introduction to the "ins and outs" of a major government scientific organization, plus I learned a lot about hurricanes—particularly useful now that I live in the Gulf region. My research project that summer was to investigate wireless communications for SCUBA divers; as a part of that experience I was certified as a PADI open water SCUBA Diver along with another Undergraduate Scholar, Chaka Johnson. To this day, Chaka and I are still dive buddies.

The second summer, I interned at the in National Marine Fisheries Service in Galveston, TX. I was the only Undergraduate Scholar there, but there were other EPP-affiliated interns, from Savannah State, which made the transition easier. My research mentor, Dr. Ron Hill was terrific throughout my project on ecological modeling of coral reefs. I learned so much about modeling as a tool for describing real ecosystems, and for helping both the environment and society as a whole.

Jacqueline Rousseau was truly instrumental in preparing me for graduate school. Throughout my time as an Undergraduate Scholar, I couldn't understand why she was so demanding; insisting on 10 page proposals and multiple drafts of everything we wrote, from emails to curriculum vitae. But those experiences proved to be essential in preparing me for my day to day life as a graduate student. She also made it a point to keep in touch with all of us throughout our undergraduate

careers and beyond, including five of us currently in graduate school, pursuing PhDs in applied physics, microbiology, atmospheric sciences and electrical engineering.

As a PhD candidate in Applied Physics at Rice University, my research into the magneto-optical spectroscopy of carbon nanotubes has allowed me to solve unanswered problems, make contributions to the scientific community that no one has done before me, and conduct experiments at many labs, including the National Institute of Material Science in Tsukuba, Japan and the National High Magnetic Field Laboratory in Tallahassee, FL. Graduate school has proven to be the rewarding experience that as an undergraduate I would hear my mentors at NASA, NOAA, and Morehouse speak of many times. I even got a chance to return to Washington, DC during my Office of Naval Research Fellowship. I found myself thinking about my first summer at NOAA, not only because of the opportunity it provided me to familiarize myself with metro DC, but because it taught me how government research is done and I have used that to my advantage to have great experiences in graduate school.

Once I have achieved my PhD, I am not sure if I want to pursue academia or research at a government laboratory. But, I am certain that there will come a time when I will collaborate with scientists at NOAA and I know that I want to stay involved with NOAA EPP, helping to shape the next generation of NOAA Scholars.

Thomas Searles won first prize for the SPIE Graduate Student Poster Award at the 2009 Joint Annual Conference of the National Society of Black Physicists and the National Society of Hispanic Physicists. He is also principal author or co-author of 2 technical articles on nanotubes.

NOAA Mentor Profile: Kristine Holderied

If Homer, Alaska is literally the end of the road—i.e., it's where the Alaska Highway System ends-- then how do you describe NOAA's Kasitsna Bay Laboratory (KBL), which is another 45 minutes by water or air taxi beyond Homer? Located on the Kenai Peninsula in south central Alaska and on the southern side of Kachemak Bay in lower Cook Inlet, KBL is approximately 200 miles southwest of Anchorage. Kris Holderied first arrived in 2005 to serve as acting director of the newly renovated laboratory. KBL is the Alaska field station for the Center for Coastal Fisheries and Habitat Research (NCCOS), part of the National Centers for Coastal Ocean Science within the National Ocean Service (NOS).

Charged with supporting the mission of NCCOS-- providing coastal managers with the scientific information and tools needed to balance society's environmental, social and economical goals—one of Ms. Holderied's challenges is how to meet the science needs of Alaska's coastal managers. Northern coastal ecosystems are faced with accelerating climate change and better information is needed to proactively manage the national resources that depend on these environments and to help Alaskan communities adapt to these changes. Currently limited in federal staff, KBL aims to meet part of this challenge through multiple collaborations—with other parts of NOAA, state and local and tribal entities, universities, and the NOAA Ernest F. Hollings Undergraduate Scholarship Program —in which student scholars are afforded an outstanding opportunity to participate in and produce particularly meaningful subarctic coastal research.

Ms. Holderied got her undergraduate degree in oceanography from the U.S. Naval Academy and spent 8 years as an active duty naval officer, during which time she also got her Master's degree in physical oceanography from the Massachusetts Institute of Technology/Woods Hole Oceanographic Institution Joint Program. As a Navy oceanographer based in Spain and Virginia, she forecasted weather and sea state conditions to help ships and aircraft operate safely and provided oceanographic forecasts to support submarine detection and operations. On-the-job training included such things as learning the names and behaviors for all the mountain winds in the Mediterranean, understanding hurricane dynamics in the Atlantic, predicting surf conditions for amphibious landings and using current and weather information to develop safe and efficient ship routes for long ocean voyages.

Continuing her interest in ocean science, after leaving the Navy she took a position as a civilian oceanographer with the U.S. Army Corps of Engineers, providing environmental compliance support to Army facilities around the country. This job introduced a new set of issues on which to apply her science background, from conducting water quality and navigational studies to managing projects that helped ensure compliance with environmental laws such as the Clean Water Act and supported environmentally sound management of Army training lands.

In 2000, following her passion for ocean science, Ms. Holderied came to NOAA in Silver Spring, as a scientist in the NOS Center for Coastal Monitoring and Assessment, part of NCCOS. She

worked as part of a remote sensing team, which developed tools and information from satellite data for better coastal management, such as habitat mapping and harmful algal bloom predictions. One memorable highlight was a unique field research opportunity she had as part of a project to map the shallow water habitats of the northwestern Hawaiian islands with ocean color satellite data. In order to validate satellite data with field measurements, she participated in a research cruise to the outermost northwestern Hawaiian Islands, which include the well-known Midway Islands. While making measurements of bottom habitat by snorkeling with global positioning systems, depth sounders and cameras, the group had the chance to view phenomenal coral reefs in an intact ecosystem, including up close and personal encounters with top predators, aka sharks! This research supported efforts of the National Marine Sanctuary Program to establish the Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve, which was later designated as the Papahanaumokuakea Marine National Monument.

Wanting a broader view of the agency, Ms. Holderied participated in NOAA's Leadership Competencies Development Program (LCDP), which ultimately brought her to KBL and Alaska, "site- unseen." The LCDP rotational assignment turned into a permanent job and new challenges associated with running a remote Alaska field research laboratory. KBL is located in a sentinel subarctic location, at a boundary for different biological communi-

Photo: Glen Seaman

ties along the Gulf of Alaska coast and within the Kachemak Bay National Estuarine Research Reserve (KBNERR). Kachemak Bay has a 28 foot tidal range, one of the largest in North America, is bordered by mountains on the south and lies in the drainages of seven glaciers. Researchers at KBL have exceptional access to seagrass, kelp forest, and salt marsh communities, rocky fjords, mudflats, and glacial rivers and watersheds.

A federal coastal science field station since 1959, KBL underwent a $12.5 million redevelopment project that provided a new pier, flowing seawater system, wet and dry laboratory buildings, scientific diving support facilities, and dormitories that can host up to 48

Mentor Profile, continued on page 8

CREST, continued from Page 1

CREST institutions have modified a number of existing courses to incorporate NOAA-related sciences into the curriculum. CREST students are diverse and multi-disciplinary.

CREST atmospheric work centers on monitoring and studying regional and urban air quality in the eastern United States and Caribbean and is contributing essential data for determining the impact of air quality on regional and global climate in the long term. By conducting unique studies in identifying trace metals and other markers in aerosol formation in urban areas, CREST research helps to provide better local urban models for health exposure, defining correlations between

aerosol sources and health impacts. Remote sensing applications at CREST are also expected to play a key role in future ozone profile monitoring. CREST LIDAR—an optical remote sensing technology-- is being used for observation of aerosol dynamics, cloud properties, planetary boundary layer climatologies as well as both Saharan and Asian dust plumes—whose air quality impacts can be seen even on the east coast of the US.

Remote sensing applications in water resources and hydrology include developing global scale water resources indicators, interactions between soil moisture and climate and the changing seasonality of streamflow and snowmelt in the northeastern US. Work is ongoing in precipitation modeling, including snow dynamics, snow grain size estimation, detection of ice on large water bodies and rain and snowfall estimation in mountain gap areas. Projects include development of global-scale water resources indicators for drought forecasting.

CREST's marine and coastal activities include in-situ coastal water measurements and the development of algorithms suitable for coastal waters to analyze satellite data and compare against satellite algorithms. Unlike ocean algorithms, these algorithms are better suited to coastal waters which have higher turbidity, Colored Dissolved Organic Matter (CDOM) and chlorophyll concentrations. This translates into enhanced utility for remote sensing data in understanding and anticipating problems in coastal water, e.g., CREST is applying unique algorithms to more quickly and accurately map harmful algal blooms in the Gulf of Mexico.

CREST activities have significantly enhanced the student recruitment and training program at CUNY and all partner institutions. Since 2001, CREST has supported 259 undergraduate students, of whom 172 have graduated. Several have gone on to graduate level programs at partner institutions as well as other universities. Five CREST graduates (1 Ph.D., 2 M.S., and 2 B.S.) have joined the NOAA workforce; three others have joined academia as faculty members while many others have accepted positions as post doctoral scientists. Another 3 now work for Northrop Grumman.

CREST institutions have modified a

number of existing courses to incorporate NOAA-related sciences into their curriculums. The City College of CUNY has introduced a new multidisciplinary Bachelor's degree in Engineering and in Science. Hampton University introduced a new minor in Space, Earth and Atmospheric sciences, resulting in a new Department of Atmospheric and Planetary Sciences. Training and outreach targets students from middle school through college, introducing them to NOAA-mission science, engineering and technology areas.

Outreach to the community includes teacher workshops for educators in middle and high school grades. CREST participates in twice-annual citywide career fairs, holds an annual NOAA-CREST Day and invites middle and high

school students for campus visits and holds a summer "weather camp." This year, they participated in the World Science Festival Street Fair, which had an attendance of more than 100,000 people. CREST has also sponsored the Bronx High School of Science Ocean Science Bowl Team for a number of years. Hampton University holds a summer science enrichment program for students, with classroom training, weekly seminars and weekend social functions.

CREST, continued from Page 4

Flagship Science Playground Opened at K-8 Public School in Brooklyn

In mid-September, a brand new playground was opened at the public K-8 school, P.S. 394. In this new landscape, students get to explore the hidden mysteries of physics and weather while enjoying unstructured free play and group activities. A previously barren asphalt lot is now filled with athletic facilities, brightly painted education surfaces, meeting areas and specially selected play equipment. CREST was one of several collaborators on the project, donating a WeatherBug weather station that students can use to track and broadcast live meteorological readings as part of a national reporting system. CREST is further supporting the school through science education and outreach and enrichment, targeted to students in the 6th through 8th grades.

Weatherbug Tracking Station

Schoolyard Before Tranformation

Scholarship Recruitment

The City College of New York holds semi-annual career fairs for science and engineering students. CREST, NOAA's Office of Education and the NOAA Corps shared a booth.

National Oceanic and Atmospheric Administration
Cooperative Remote Sensing Science and Technology Center

CREST Academic Partners:

City College of the City University of New York

Bowie State University

Hampton University

University of Maryland at Baltimore County

University of Puerto Rico at Mayaguez

Lehman College

Bronx Community College

New York City College of Technology

LaGuardia Community College

Hunter College

NOAA Collaborative Research Partner:

National Environmental Satellite, Data, and Information Service

CREST Program Manager:

Dr. Shakila Merchant is the NOAA-CREST Administrator/Program Manager at The City College of New York (CUNY). She began working at CREST when she emigrated from India to the US in 2002. Prior to moving here, Dr. Merchant worked as an environmental scientist for The National Environmental Engineering Research Institute (NEERI) at Nagpur City. She studied Zoology, majoring in Entomology for her Masters in Science and Masters in Philosophy degrees from Nagpur University. Upon graduating, she joined the prestigious Indian Institute of Technology in Roorkee, India, to complete her PhD in "Analysis of Select Ecosystems with special reference to Biodiversity and Tolerance Characteristics," studying the ecosystem health of various terrestrial regions within India as part of some of the national projects sponsored by the World Bank and the Ministry of Environment & Forests Projects of the government of India.

The complexity of ecosystems has fascinated Dr. Merchant since childhood, so when she moved to the US, she was excited by the opportunity to work at CREST, which studies these complex ecosystems through a plethora of sensors aboard several satellites orbiting our earth. She is a happy and passionate part of the CREST family and loves to work around students and faculty members and the whole Educational Partnership Program.

In addition to her scientific research, Dr. Merchant has always been sympathetic to the needs of those "less fortunate women and children" and families around her, motivating her to adopt a small rural community in her home town in India as a part a socio-economic project at NEERI. Dr. Merchant led this project, working closely with the rural community members for 2 years to understand their problems and basic needs in order to create solutions and amenities to improve their quality of life, including safe drinking water; improved sanitation and decent education for their children. She plans to do such projects again in the future--once her own two young kids, to whom she is committed at the moment, are ready to join her mission.

For additional information on the Cooperative Remote Sensing Science and Technology Center at the City College of the City University of New York, , please visit the website: http://crest.ccny.cuny.edu

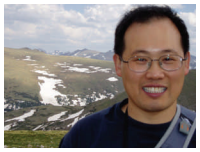
CREST Post-Docs:

Dr. Yajaira Mejia received her B.S. in Civil Engineering from the University of Medellin (Colombia) in 2001, an M.S. in Civil Engineering from the City College of New York in 2004, and her Ph.D. in Civil Engineering from the City University of New York in 2007. Currently, she divides her time evenly between research detecting snowfall using satellite data and community outreach. In June 2008, she published a paper titled, "Robust Neural Network System Design for Detecting and Estimating Snowfall from the Advanced Microwave Sounding Unit" in the Journal of Applied Remote Sensing. She is a member of the IEEE Geosciences and Remote Sensing Society and the American Geophysical Union (AGU).

Dr. Ademe Mekonnen has been working with Dr. William Rossow's Remote Sensing of Climate group as a Post Doctoral Research Associate since May 2008. Dr. Mekonnen received a B.S. in Physics at Addis Ababa University, Addis Ababa, Ethiopia and a Diploma in Meteorology at the Indian Meteorological Department, Pune, India. After attaining his M.S. in Weather, Climate and Modeling at the University of Reading in the UK, he achieved his Ph.D. in Atmospheric Science from the State University of New York, Albany (SUNY Albany). Dr. Mekonnen's research interests are in multiscale interactions between large-scale waves (Madden-Julian Oscillation, Kelvin waves, easterly waves, etc.) and convection, including variability and wave-wave interaction and climate dynamics, atmospheric and oceanic processes that impact weather and climate. He is a member of several professional associations including the American Meteorological Society and the American Geophysical Union. He is a lead or co-author on a number of relevant research papers.

Dr. Tarendra Lakhankar received a Ph.D. in Civil Engineering from The City University of New York, specializing in applications of remote sensing in water resources. At CREST he is part of a multidisciplinary research team developing a new soil moisture mapping model to understand the dynamics of soil wetness under different land cover conditions, using a combination of optical and microwave remote sensing data. He is presently working on the application of data assimilation systems in land surface parameters retrieval from satellite remote sensing data. More details about his research can be found at: http://tarendra.lakhankar.com

Dr. Yonghua Wu, a Research Associate joined CREST in December 2005. He received his Ph.D. in optics from Anhui Institute of Optics and Fine Mechanics, Chinese Academy of Sciences, developing a multi-function lidar to measure aerosol and temperature profiles. He is currently working with professors Moshary, Gross and Ahmed of the Optical Remote Sensing group, in development of a multi-



Postdocs, continued on page 7

Scientists, continued from page 1

from dense and detailed to "big idea" and very general. Discussion was similarly varied—wandering from scientific questions, to raising concerns about obstacles, then back to larger policy issues. At times calm and measured, the discussion also generated moments when emotions ran high and the conversation got louder.

Over the course of a couple of hours, the individuals in the room proffered thoughts and withdrew them, gradually moving toward a consensus; an umbrella project that would draw on the strengths of each Center. They would build on existing data and research, collating and collaborating in a new way. Looking around the table, a wealth of fields were represented; the key lay in taking advantage of this expertise to find a collective, innovative way of looking at data and results. The group acknowledged that plenty of obstacles exist; even getting existing data from other sources isn't simple. It's likely they'll need to work extensively with state programs to gain access to existing data. Directors and distinguished scientists alike were focused on the desire to contribute something useful to NOAA, something that helps to move NOAA sciences forward. Since availability of funding is a big unknown, they'll be trying very hard to build on existing resources.

As Center partners are all East Coast/ Gulf coast/ Caribbean, the project's geographic focus will lean toward eastern coastal ecosystems. Aware of the importance of climate change issues at NOAA, emphasis will likely be on climate variability. The group expected to be looking at physical, chemical and biological parameters to detect responses to changing climate and other anthropogenic stressors. They agreed that their ultimate goals are an informed population, healthy ecosystems and the tools that will help reach those goals.

Above and beyond the value of actual results of this collaboration, a successfully project could provide a model to NOAA for working across multiple centers. NOAA has so many pieces and parts, covering a spectrum of fields—ocean to atmosphere—scientists of all stripes and types, lab types and field researchers, analysts, and management types—that adding to the knowledge base on how to gather it together cohesively and interactively may be as useful as the direct research results of this project!

Postdocs, continued from page 6

wavelength Raman-Mie lidar for profiling aerosol, water vapor and cloud distributions. His research interests include: lidar remote sensing of atmospheric components; aerosol and cloud optical properties; and application and validation of aerosol datasets of satellite remote sensing.

D**r. Amir Eshraghi Azar** started his professional career in remote sensing in 2003 when he began his Ph.D. studies at CREST. He specialized in microwave remote sensing of snowpack properties in which he proposed an algorithm for improvement of microwave estimated Snow Water Equivalent (SWE). His algorithm utilizes a spectral difference of microwave data along with vegetation information represented by NDVI. Currently Dr Azar is working as a research scientist at the City College of New York. He is the author of more than 10 peer-reviewed journal papers and conference proceedings.

Dr. Brian Vant-Hull obtained his M.S. in Physics from Johns Hopkins University and his Ph.D. in Atmospheric Science from the University of Maryland, where he published work on satellite studies of cloud aerosol interactions. He is currently advising a graduate student in the continuation of the cloud aerosol work, while leading the CREST thunderstorm nowcasting team. He is lead or co-author on a number of published papers.

Dr. Eric Tromeur's research interests include cloud physics, atmospheric convection, wave dynamics as well as modeling of boundary layer clouds. After obtaining his B.S. in Physics and his M.S. in Fluid Mechanics, his early work during his Ph.D. in Applied Physics and Mathematics at the French Aerospace Lab in Paris was focused on the characterization of electromagnetic wave degradation in turbulent boundary layers and mixing layers by means of Large Eddy Simulations. Since 2007, his work at CREST has focused on the use of multi-satellite datasets such as ISCCP dataset, to further understand the possible interaction between tropical convection and the Madden-Julian Oscillation (MJO).

Dr. Michael Hill graduated from Hampton University with a Ph.D. in Physics in August 2006. CREST funded part of his dissertation work at Hampton University and is also funding his postdoctoral research there. His Ph.D. dissertation was the construction of a global ozone climatology based on data from the SAGE II, POAM III, and HALOE satellite occultation missions, which collectively spanned 20 years of near-global coverage. His post doctoral work involves identifying, classifying, and collecting statistics on polar stratospheric clouds using data from the CALIOP lidar on CALIPSO. His doctoral and postdoctoral research work has been presented at a variety of conferences and symposiums, including AMS (2008, 2009).

Mentor Profile, continued from page 3

people. The access to diverse habitats and laboratory facilities make KBL an exceptional place to study direct and indirect impacts of climate change on subarctic near shore ecosystems.

NOAA operates KBL in partnership with the University of Alaska Fairbanks (UAF) and collaborates with other NOAA and non-NOAA partners, particularly KBNERR and the Kachemak Bay campus of the University of Alaska Anchorage, to host researchers, college classes, teacher training courses, and student science camps. Since 2006 KBL has also hosted NOAA Hollings scholars for summer internships. The very first student project established a plankton monitoring program for the KBNERR and KBL. The monitoring program was a response to requests from local oyster farmers to track barnacle and mussel larvae and reduce their settling on the oyster shells, because that appearance is less desirable by customers. The first KBL scholar designed a simple sampling protocol that the farmers and KBNERR could continue after the first summer. Three years later the program is still working and use of the information has expanded to other coastal management questions. Other scholars have investigated changes in kelp communities and long-term changes in nearshore temperature and salinity, as well as developed educational outreach materials on the geology of the Kachemak Bay region.

Most recently, 4 Hollings scholars spent this past summer performing much-needed monitoring projects in Kachemak Bay. Kelsey Lane and Erin Satterthwaite worked with KBL, UAF and KBNERR scientists to conduct a challenging field study of intertidal habitats that investigated the effectiveness, spatially and temporally, of sampling sites that are part of a long-term international program to monitor nearshore marine biodiversity. Kelsey and Erin had to plan field work around times of low tides, weather, and boat availability, pulling it off with great success. Trevor Petach worked with KBL and KBNERR researchers to analyze seasonal and interannual trends in oceanic and atmospheric data, which included organizing a new database for KBNERR monitoring data in their "System-Wide Monitoring Program." An early example of the benefits of better data access came about when a large smolt (young fish) die-off occurred in a fish rearing area. Trevor's work ensured that temperature and salinity patterns could be quickly analyzed and ruled out as a potential cause, while information from the plankton monitoring program allowed the researchers to discover a large *Chaetoceros* plankton bloom. These spiny plankton can clog the gills of the smolt and Alaska Department of Fish and Game (ADF&G) managers now know to look for it in the future. The fourth intern, Melanie Beaver, worked with KBNERR scientists as part of a larger sea otter study, working many hours on sorting scat to provide key information on sea otter foraging behavior to complement radio tag and visual studies of otter movement and behavior.

Photo: Betsy Parry

Sea otter eating sea urchin

The KBL intern projects are tightly focused so that the students actually get to carry them out from start to finish. The students themselves have a big role in designing their projects, giving them a strong sense of independence, all the while ensuring that they have access to multiple advisors. Ms. Holderied believes that the opportunity to work independently is essential to the summer internship experience. Students have the opportunity to gather advice from lots of sources, but they have to reach out, gather information, put a plan together and execute it. While making important contributions to the science needs of KBL, KBNERR and local coastal managers, the student scholars also get the chance to experience both Alaska wilderness and hospitality. The projects also expose them to a wide variety of science and resource management careers, including federal, state and tribal agencies, universities and non-profit organizations. As a mentor, Ms. Holderied tries to work with the students' particular interests and strengths; to make certain the projects have well-defined boundaries; that expectations are clear and that students have more than one person they can approach for advice. She wants them to be challenged, and have a project that's a "stretch" for them, as she's found that invaluable in her own career. For KBL, the students become the "face" of the laboratory; part of the KBL research staff when they interact with ADF&G managers, or officials from local communities. It's an exceptional professional opportunity for them. One of the earlier KBL Hollings scholars was subsequently successful in being accepted for a NOAA Graduate Science Scholarship; Dominic Hondolero is now at San Diego State University, and is performing his field research at KBL on how kelp adapt across different latitudes to changing environmental parameters.

Ms. Holderied's got some advice for all students too, as they seek internship placements; Push yourself to get as much as you can out of your internship. Go outside your comfort zone. Try things that are new to you and that you're not sure about; maybe you'll find your lifelong career path, or maybe you'll cross something off your potential career list, but either way, you'll have gained valuable knowledge. Once you've found your internship placement, be sure to talk to your mentor in advance, gain as much familiarity as you can ahead of time, see if there are useful skill sets (such as learning GIS software) you can start to develop before you get there, and ask lots of questions!

Five New NOAA Employees!

NOAA's Office of Education, Educational Partnership Program (EPP) is pleased to announce the achievement of Master's degrees by 5 students in the Graduate Sciences Program (GSP). **Carwyn F. Hammond** completed her Master's Degree in Fisheries Science at the University of Washington, School of Aquatic & Fisheries Science in July 2009. Carwyn is a full-time employee at NOAA's National Marine Fisheries Service, Alaska Fisheries Science Center (AFSC) in Seattle, WA. Carwyn's thesis, entitled "Using Reflex Action Mortality Predictor (RAMP) to Investigate if Trawl Gear Modifications Reduce Unobserved Mortality of *Chionoecetes spp*.," used crab reflex response to determine delayed mortality of snow and tanner crab after they

interacted with bottom trawl gear on the seafloor but were not caught by the trawl net. At a young age, Carwyn fell in love with the ecosystem that is the ocean and pursued this passion by obtaining a Bachelor of Science degree in Marine Resource Development from the University of Rhode Island. Upon graduating, Carwyn gained valuable and diverse experience as a field biologist in fisheries, working in both fresh and salt water ecosystems. In 2004 she began her position at AFSC in the Conservation Engineering Program and was introduced to NOAA's GSP through another GSP participant. She entered the GSP and began graduate school in 2007. As a Research Fisheries Biologist at the Alaska Center, Carwyn will continue her work in cooperative trawl gear research to minimize impact to benthic habitats and to reduce bycatch of commercially important species in the Bering Sea and the Gulf of Alaska.

Lauren M. Heesemann completed her Master's Degree in Human Dimensions of Natural Resources at Colorado State University in August, 2009. Her thesis, entitled "Norm Constructs for Two Recreation Groups in the Florida Keys: Scuba Divers and Snorkelers," looked at the cognitive and emotional components of normative evaluations and used the Potential for Conflict/ Consensus Index2 (PCI2) formula to graphically display those norms.

Lauren's passion for the ocean inspired her to attend the College of Charleston where she received a B.S. in Marine Biology. After graduating, she worked as a Research Specialist at the Center for Coastal Environmental Health and Bimolecular Research (CCEHBR) in Charleston, SC, and as an educator at the Newfound Harbor Marine Institute in the Florida Keys, the South Carolina Aquarium, and Colorado's Ocean Journey, as well as teaching middle school science in Denver, CO.

Lauren has always been an advocate for the protection and conservation of the world's oceans and the desire to understand the human role in those issues compelled her to pursue a degree in Human Dimensions of Natural Resources from Colorado State University. While in graduate school, Lauren was fortunate enough to discover NOAA's GSP and has been part of the program since May 2008. She is now working at the Monitor National Marine Sanctuary as the Research Coordinator. Her position combines her passion for marine-based research and education and she is excited to start her career with such an amazing organization!

Amber Lyne Morris completed her Master's Degree in Marine Science at the University of North Carolina at Wilmington (UNCW) in July 2009. Amber is a full-time employee of NOAA's National Marine Fisheries Service (NMFS) Southwest Regional Office in Long Beach, CA. Amber's thesis, entitled "Space and Place in Fisheries Management: Investigating Catch controls in View of Spatial Stock Structure and MPAs," incorporated the use of spatial models to examine the performance of different catch control strategies designed to set quantitative harvest limits across various spatial stock structure and marine protected area management scenarios.

Since her youth, Amber has had an interest in fisheries and marine ecosystems. She pursued this passion academically and obtained a Bachelor of Science in Marine Biology from the University of North Carolina at Wilmington. Before returning to graduate school at UNCW, Amber coordinated and taught marine science education and outreach programs that took place onboard research and fishing vessels, from kayaks in creeks to barrier islands, and in classrooms and science labs of the Cape Fear Region and offshore areas. After enrolling in a Public

Scholars, continued on page 10

Scholars, continued from page 9

Administration Master's program, Amber became interested in NOAA's policies and applied to NOAA's GSP for an opportunity to expand her understanding of the science and contribute to supporting NOAA's mission. In her new position as a Fishery Policy Analyst in the Sustainable Fisheries Division at the Southwest Regional Office, Amber will continue to research fishery policy development, working primarily on catch share programs and their relationship to other agency goals and actions.

Zane Ruddy completed his Master's Degree in Biology from Texas A&M University-Corpus Christi (TAMU-CC) in August 2009. Zane is a full-time employee at NOAA's National Marine Fisheries Service (NMFS) Protected Resources Division office in Arcata, CA. Zane's thesis, entitled "The Role of Stress in the Post-Release Survival of Hatchery-Reared Juvenile Spotted Seatrout," used the stress indicators cortisol and epinephrine to characterize the stress response of fish during transport procedures, and also created a model that predicted the likelihood of hatchery-reared spotted seatrout to survive transport and subsequently avoid predation in the wild environment.

Growing up in north Texas, a career in the marine sciences seemed far-fetched to Zane as a child, but after an undergraduate research trip to the Gulf of Mexico he knew he belonged on the coast. This passion led Zane to obtain a Bachelor of Science in Biology from Midwestern State University. Upon graduating, Zane entered TAMU-CC's Biology graduate program where he conducted his research at the Harte Research Institute for Gulf of Mexico Studies. In his new position as a Fishery Biologist at the Arcata regional office, Zane is involved in Endangered Species Act Section 7 consultations and recovery planning efforts for threatened and endangered salmonid species.

Jessica Winter completed her Master's degree in Civil and Environmental Engineering from Carnegie Mellon University. Jessica is now a full-time employee of the Office of Response and Restoration (OR&R) at NOAA's Western Regional Center in Seattle, Washington. Her master's thesis, entitled "Analyzing a Model of Sediment Transport in the Lower Duwamish Waterway Superfund Site: Implications for Remediation and Restoration," investigated issues limiting a particular mathematical model's applicability to remediation and restoration planning and proposed changes to the modeling process to improve sediment transport predictions on the Duwamish and at other Superfund sites.

In her new position as a Physical Scientist in OR&R, Jessica will work with other branches of NOAA and with outside agencies to plan and implement remediation and restoration projects at contaminated sites in the Great Lakes region.

The NOAA GSP is designed to provide opportunities for students in NOAA related fields to pursue research and educational training in atmospheric, environmental, and oceanic sciences and remote sensing technology at Minority Serving Institutions, when possible. The GSP's primary objective is to increase the number of graduate students who undertake course work and earn post-graduate degrees in the targeted areas integral to NOAA's mission. NOAA provides program participants with tuition, a housing allowance, travel expenses and a salary for an annual 16-week work period at a NOAA facility. Students are also mentored by NOAA scientists while conducting research. After completing their academic requirements, participants commit to employment at NOAA, based on the length of their training. To date, the NOAA Office of Education EPP has placed 51 graduate students majoring in NOAA-related sciences throughout NOAA.

Photo: Kip Evans

Scholarship and Internship Opportunities

The Educational Partnership Program's Undergraduate Scholarship Program (USP) offers scholarship opportunities for rising current sophomore year students attending Minority Serving Institutions (MSIs) who are majoring in disciplines (i.e., atmospheric science, biology, cartography, chemistry, computer science, engineering, environmental science, geodesy, geography, marine science, mathematics, meteorology, photogrammetry, physical science, physics and remote sensing technology) relating to NOAA's mission. Competitive two year appointments will be awarded to students attending MSIs to facilitate hands-on research experience at approved NOAA offices and facilities. Deadline for submitting an application is **February 17, 2010**. http://www.epp.noaa.gov/epp_uspa/

The Educational Partnership Program's Graduate Sciences Program (GSP) is aimed primarily at increasing opportunities for students in NOAA-related fields to pursue research and educational training in atmospheric, environmental, remote sensing and oceanic sciences, at Minority Serving Institutions (MSI) when possible. The GSP offers between two (master's candidates) to four years (doctoral students) of NOAA-related research and training opportunities. Deadline for submitting an application is **January 22, 2010**. http://www.epp.noaa.gov/ssp_grad_sciences_page.html

NOAA's Ernest F. Hollings (Hollings) Undergraduate Scholarship Program is designed to increase undergraduate training in oceanic and atmospheric science, research, technology, and education and foster multidisciplinary training opportunities; recruit and prepare students for public service careers with NOAA and other natural resource and science agencies at the federal, state and local levels of government; and recruit and prepare students for careers as teachers and educators in oceanic and atmospheric science in the United States. The Hollings Scholarship Program provides successful undergraduate applicants with awards that include financial assistance for full-time study during the 9-month academic year; a 10-week, full-time paid summer internship at a NOAA facility and if reappointed, financial assistance for full-time study during a second 9-month academic year. Deadline for submitting an application is **January 29, 2010**. http://www.oesd.noaa.gov/Hollings_info.html

NOAA's Dr. Nancy Foster Scholarship Program recognizes outstanding scholarship and encourages independent graduate level research -- particularly by female and minority students -- in oceanography, marine biology and maritime archaeology. Congress authorized the program soon after Dr. Foster's death in June 2000, as a means of honoring her life's work and contribution to the nation. The program is administered through NOAA's Office of Education and funded annually with one percent of the amount appropriated each fiscal year to carry out the National Marine Sanctuaries Act. The application period for 2010/11 will be **January 1-March 17, 2010**. http://fosterscholars.noaa.gov/

NOAA's National Sea Grant College Program Dean John A. Knauss Marine Policy Fellowship provides a unique educational experience to students who have an interest in ocean, coastal and Great Lakes resources and in the national policy decisions affecting those resources. The program matches highly qualified graduate students with "hosts" in the legislative and executive branches of government located in the Washington, D.C. area, for a one year paid fellowship. Any student, regardless of citizenship who is in a graduate or professional program in a marine or aquatic-related field at a United States-accredited institution of higher education may apply through their state Sea Grant program. Applicants from states not served by a Sea Grant program should obtain further information by contacting the Knauss Sea Grant Fellowship Program Manager at the NSGO. Deadline for submitting an application is **February 19, 2010.** http://www.seagrant.noaa.gov/knauss/knaussapplicationinfo.html

The US Fish and Wildlife Service, National Wildlife Refuges' recruiting period for summer 2010 Conservation Intern Program (CIP) posts throughout the Northeast Region is expected to begin in **December.** The CIP program is meant to increase racial and ethnic diversity in the natural resources ranks. There are 30 slots to fill. http://www.fws.gov/refuges/mediatipsheet/November2009/index.html

National Science and Education Symposium, July 28-30, 2009

NOAA's Office of Education administers the Ernest F. Hollings Undergraduate Scholarship Program (Hollings) and the Educational Partnership Program's (EPP) Undergraduate Scholarship Program. Both of these provide an opportunity for students to study in a wide range of science, engineering, mathematical, computer, technological and science teacher-education disciplines related to NOAA's mission and objectives. Scholarships are for 2 years of undergraduate study. In addition, scholars participate in at least one 10-week internship at approved NOAA offices or laboratories and present their project results at a culminating conference.

This most recent National Science and Education Symposium included all students from the Hollings Class of 2008 and the EPP Classes of 2008 and 2009. Every scholar presented a summary of their research and education experiences at NOAA. Internship sites included American Samoa, Alaska, Hawaii, Colorado, the Florida Keys, California, Ohio, Puerto Rico and Silver Spring, MD, among others.

Oral and poster presentations were judged by NOAA scientists from each of NOAA's line offices. First place awards for oral presentations were as follows:

National Ocean Service (NOS): **Mary Kelsey Lane**, "Spatial Biodiversity of the Rocky Intertidal in Kachemak Bay, Alaska," mentored by Kris Holderied of the Kachemak Bay Laboratory, NOS.

National Marine Fisheries Service (NMFS): **Sarah Fann**, "Temperature Effects on the Early Life History Features of Shortnose Sturgeon," mentored by Chris Chambers of the NMFS Howard Marine Laboratory at the Northeast Fisheries Science Center in Sandy Hook, NJ.

National Weather Service (NWS): **Luke Madeus**, "Evaluating the Usage, Performance and Limitations of the WSR-88D Doppler Radar System in Alaska," mentored by Jim Nelson of the NWS Weather Forecast Office in Anchorage, AK.

Office of Oceanic and Atmospheric Research (OAR): **Geeta Persad**, " Investigating the Climate Impacts of Absorbing Aerosols in a GFDL Global Climate Model," mentored by Yi Ming of the Geophysical Fluid Dynamics Laboratory, OAR.

NOAA Satellite and Information Service (NESDIS): **Kelsey Watkins**, "Proxy- Model Comparisons of North Atlantic Sea Surface Temperatures Prior to the 8.2 Ka Event," mentored by Amy Wagner, National Climate Data Center, NESDIS.

The first place poster award went to **Alix Lee**, "Age & Length and Other Life History Parameters for Redbanded Rockfish, *Sebastes babcocki,* Along the US West Coast," mentored by Aimee Keller, Fisher Resources Analysis and Monitoring, Northwest Fisheries Science Center, NMFS.

Events of Interest

JANUARY 2010

- **FAMU ESI Summer Camp Application Available** – January 15-March 15, 2010
- **American Meteorological Society (AMS)** - January 16-21, 2010, Atlanta, **Color of Weather Event at AMS** – January 17, 2010, Atlanta, GA – NCAS hosting
- **National Conference on Science, Policy and the Environment (NCSE)** – January 20-22, 2010, Washington, DC
- **2010 NCAS High School Weather Camp Applications Available** – January 29, 2010, http://ncas.howard.edu
- **NCAS Undergraduate Summer Intern Applications Available** – January 29, 2010, http://ncas.howard.edu

FEBRUARY 2010

- **National Society of Black Physicists Conference (NSBP) -** Feb 10-14, 2010, Washington DC
- **ISET Day-** February 22, Tentative
- **NOAA-CREST Annual Remote Sensing Science Symposium** - February 2010, HU or CUNY

MARCH 2010

- **National Ocean Science Spoonbill Bowl –** March 6, 2010, St. Petersburg, FL
- **National Institute of Science Annual Conference/Beta Kappa Chi (NIS/BKC) –** March 24-28, 2010, New Orleans, LA – ECSC participation
- **National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCChE) –** March 29 - April 3, 2010, Atlanta, GA – ECSC participation

APRIL 2010

- **First Deadline for NCAS Weather Camp Applications** – April 30, 2010
- **NOAA-CREST Annual Day** - April 2010, CREST,CCNY and All campus (Simulcast)

MAY 2010

- **NOAA Student Scholars Orientation Training Program** – May 31 - June 4, 2010, Silver Spring, MD

JUNE 2010

- **NCAS Undergraduate Summer Internship Program begins** – June 1, 2010
- **LMRCSC UMES REU Program** – June 1 to Aug. 7, 2010
- **LMRCSC UMES Fish Stock Assessment Course** – June 1 to June 30, 2010
- **ASLO 2010 Meeting** – June 6-11; Santa Fe, NM
- **FAMU ESI Summer Camp** – June 6-June 26, 2010, Tallahassee, FL

JULY 2010

- **Jackson State University High School Weather Camp** – July 5-9, 2010, Jackson, MS
- **University of Puerto Rico, Mayaguez High School Weather Camp** – July 12-26, 2010, Mayaguez, PR
- **NCAS High School Weather Camp** – July 18-31, 2010, Washington, DC
- **ISET High School Weather & Climate Camp** – Date TBA
- **NOAA/NESDIS/STAR/CoRP Annual Science Symposium** - July-August 2010, CICS, North Carolina
- **REU Summer; CREST-SHIP; STEM and Weather Camp** - July-August 2010, CREST, CCNY
- **NESDIS-CI/CREST Summer Exchange Program** - July-September 2010, All NESDIS-Cooperative Institutes (CIMSS, CIOSS, CICS, CIRA)

AUGUST 2010

- **NOAA Scholars Final Presentation Week** – August 2 – 5, 2010, Silver Spring, MD

The NOAA Educational Partnership Program Cooperative Science Centers

The NOAA Environmental Cooperative Science Center at Florida A&M University

Director: Dr. Larry Robinson

Distinguished Scientist: Dr. Charles Jagoe

The NOAA Interdisciplinary Scientific Environmental Technology Cooperative Science Center at North Carolina A&T State University

Director: Dr. Solomon Bililign

Distinguished Scientist: Dr. Yuh-Lang Lin

NOAA's Cooperative Remote Sensing Science and Technology Center at the City College of the City University of New York

Director: Dr. Reza Khanbilvardi

Distinguished Scientist: Dr. Charles Vorosmarty

Distinguished Professor: Dr. William Rossow

The NOAA Living Marine Resources Cooperative Science Center at the University of Maryland Eastern Shore

Director: Dr. Paulinus Chigbu

Distinguished Scientist: Dr. Bradley Stevens

The NOAA Center for Atmospheric Science at Howard University

Director: Dr. Vernon Morris

Distinguished Scientist: Dr. Tsann-wang Yu

www.epp.noaa.gov

301-713-9437

Educational Partnership Program

Office of Education

National Oceanic and Atmospheric Administration

U.S. Department of Commerce