What’s Up with Thunderstorms in Kansas?

Twelve undergraduate meteorology majors and two graduate students in the Integrated Scientific Applications Masters’ program will be participating in cutting-edge research on thunderstorms and their precursor conditions thanks to a $290,000 grant from the National Science Foundation. Student involvement in field research is a hallmark of Millersville meteorology.

Dr. Richard Clark (top photo), professor of meteorology and chair of the department of earth sciences, and Dr. Todd Sikora, professor of meteorology, received the two-year grant to advance the understanding of continental, nocturnal, warm season precipitation in central Kansas. “The research will provide extensive opportunities for students to participate in cutting-edge research, from data collection in the field to co-authoring peer reviewed publications,” said Clark, the project principal investigator. The project, “Stable Boundary Layer Processes and Their Interaction with Nocturnal Convection over the Great Plains in the Plains Elevated Convection At Night,” or simply known as PECAN, will “study the conditions that initiate and maintain the lifetime of nocturnal thunderstorms over the Great Plains,” added Sikora. Most of the summertime precipitation over the Great Plains occurs at night when thunderstorms move eastward across the Plains. Research about the factors affecting warm season precipitation will lead to improvements in the forecasting of critical weather phenomena in the Plains. PECAN will take place from June 1 to July 15, 2015 in collaboration with Dr. Qing Wang and her students from the Naval Postgraduate School in Monterey, Calif., as well as a score of other investigators from several organizations. “We are experimenting with deriving an estimate of heat and momentum fluxes by applying gradient theory to our tethered balloon measurements,” offered Clark. The Millersville research team will stage its operations in Ellis, Kansas, about 10 miles west of Hayes, KS, where students will lodge.

DES Faculty & Students Participate in WACS

Dr. Robert Vaillancourt, Evan Ntonados (OSCS/MET) and Jeremiah Stone (BIOL/OSCS) participated in a NOAA-sponsored project, the West Atlantic Climate Study (WACS II) aboard the research vessel (RV) Knorr, a 279-foot global-class research ship, from May 18 to June 7. The focus of WACS II was to determine the links between surface ocean phytoplankton and the production of freshly-emitted sea-spray aerosols, organic compounds produced by phytoplankton that are then ejected to the lower atmosphere and impact Earth’s climate by attenuating incoming solar radiation and providing cloud condensation nuclei. The multi-investigator study region extended from just south of Nova Scotia to the waters around Bermuda, and was headed by NOAA scientist Dr. Patricia Quinn of the Pacific Marine Environmental Laboratory. Dr. Vaillancourt and his students collected data for determining phytoplankton biomass and species composition in the ocean’s upper mixed layer.

DES Faculty/Alum Collaboration

Dr. Todd Sikora and two meteorology alums, Eric Wendoloski (2013) and Bobby Marter (2013) have co-authored a paper titled “A Climatology of Precipitating Open-Cell Convection over the Northeast Gulf of Alaska” which appeared in the December 2014 issue of the Journal of Applied Meteorology and Climatology. The research was conducted while Eric and Bobby were undergraduates in the meteorology program. Both are now in graduate school (Eric at Penn State, and Bobby at Texas A&M). Dr. Sikora also presented an oral presentation on “Origin and Frequency of Near-Surface Static Stability Layers during the Ontario Winter Lake-Effect Systems (OWLeS) Project” at the 19th Conference on Air-Sea Interaction, AMS, Phoenix, AZ, 4-8 January 2015, with co-authors R. D. Clark, D. T. Eipper, S. J. Greybush, M. L. Jurewicz Sr., D. A. R. Kristovich, and G. S. Young. Daniel Eipper is a 2008 graduate of Millersville meteorology and currently a graduate student at Penn State.
Student Accolades

2014-2015 Awardes

Jeremy Beckley, The William Malcolm Jordan Earth Sciences Scholarship
Alyssa Cannistraci, 2014-15 Clark-Yalda Scholarship in Atmospheric Sciences
Rachel Coulter, Starbarrd Excellence in Science Award
Erik Cunningham, Rettew Associates Scholarship in Geology, and Students of Academic Distinction
Laura Devoe, Earth Science Award for Academic Excellence in Secondary Education
Renee Duff, Henry Franklin Bitner Science Prize—Excellence in Physical Sciences; University nominee for the Syed Ali Zaaidi Award; 1st place in AMS Student Conference Poster Competition
James Fowler, Paul H. Nichols Scholarship
Cara Geiger, Pennsylvania State Athletic Conference Scholar-Athlete Award
Chelsea Hoffman, Dr. William B. Millarne Scholarship in Earth Sciences
Vanessa Hower, Pennsylvania State Athletic Conference Scholar-Athlete Award
Jordan McCormick, Hollons Scholar and Student of Academic Distinction
Charissa Mohn, Class of 1947 Scholar-ship/Scholarship for Research Students in University Honors College
Nathan Murry, Earth Science Award for Academic Excellence in Liberal Arts, Liddell Field Study Scholarship, and Neimmeyer-Hodgson Student Research Grant
Curtis Silverwood, Gary W. and Jacqueline Reighard Award for Outstanding Leadership

Dr. Bobak Karimi Joins DES Faculty for 2014-2015
Dr. Bobak Karimi joined our department for the 2014-2015 academic year as a temporary full-time assis-tant professor of geology. He comes to MU from the University of Pittsburgh where he recently graduated with a PhD in geology. Dr. Karimi specializes in tectonophysics, specifically developing numerical models to evaluate fault strength and geometry of major tectonic faults such as the North Anatolian Fault. Dr. Karimi was hired primarily to teach Sedimentation/Stratigraphy and Structural Geology, plus the labs that accompany the new course in Environmental Geology, a 100-level introductory course for non-science majors.

WIC–PennDOT Winter Forecasting Extended through Winter 2016-2017
For the eighth winter season, the MU Weather Information Center is providing PennDOT with targeted winter storm forecasts for an eight-county region in the lower Susquehanna Valley. PennDOT recently renewed the MOU through the winter of 2016-17. WIC director, Eric Horst, is the lead forecaster for this project, although four junior and senior meteorology majors also serve as paid storm analysts. These forecasts are also used by dozens of municipalities (including Millersville Borough) who have winter partnership agreements with PennDOT. Funding from this PennDOT project has helped finance numerous Weather Center upgrades, including the electronic map wall and Weather Watch production equipment.

It’s a Wrap: DISCOVER-AQ Winds Down after Five Years
It’s been a great run involving 50 students, over $800,000 in NASA funding, multiple papers published and conference presentations, and unique contributions to our understanding of boundary layer pollution. Over the past five years, Dr. Richard D. Clark and his team of student research assistants investigated sea and bay breezes in Edgewood, MD and Smith Point, TX, partic-ulates in Huron, CA, and most recently, upslope transport in Golden, CO (photo above). It was arduous (52-hour cross-country convoys, prairie rattles-nakes, swarms of mosquitoes and African killer bees) and it was awesome (sunrises and water spouts, the wonderful people and local cuisine of Huron CA, starry nights and a visit to Yosemite). We had over 500 student visitors to our field sites as part of our outreach to local schools. There is still plenty of work yet to be done. Students continue to analyze the data and upload QA/QC data to the NASA DISCOVER-AQ Data Portal. We are working on no fewer than three manuscripts for publication. The students will never forget their experience. They form a special group that have gone on to graduate school, the workforce, and even the Peace Corps. We meet at conferences were they are presenting their research, often times an extension of the interest engen-dered during DISCOVER-AQ. Opportunities like this are the hallmark of Millersville meteorology and help to bring national distinction to DES.

Faculty Awards
Dr. Robert Vaillancourt (OSCS) was granted tenure and promotion to associate professor. Dr. Richard D. Clark was awarded sabbatical leave for the fall15/spring16 academic year. Dr. Sikora was awarded one semester sabbatical leave for fall14.

Stay tuned for an important funding announcement coming soon. A group of DES alums is developing a plan to build an endowment for student travel.
Dr. Sepi Yalda continues to serve as the Director of the Center for Disaster Research and Education (CDRE) and the Coordinator of the Master of Science in Emergency Management (MSEM). Dr. Duane Hagelgans joined the Department of Earth Sciences in the fall of 2012 with full-time teaching and advising responsibilities for the MSEM program, undergraduate courses for the minor in Environmental Hazards and Emergency Management (EHEM), and the new major in Multidisciplinary Studies (MDST) with a track in Environmental Hazards and Emergency Management (proposed by Yalda and Hagelgans in 2014).

The fully online MSEM program has demonstrated a notable record of growth since its inception in fall of 2007, and the number of enrolled graduate students has increased to over 100 students from across the nation and abroad as it has gained national and international reputation. Due to the increasing demand for emergency management professionals, the undergraduate program is also growing at a rapid pace.

**CDRE/MSEM Accomplishments:**

- Student Chapter of the International Association of Emergency Managers (IAEM) was selected as the chapter of the year at the IAEM Professional Development Conference in San Antonio, TX in November 2014. Daniel Berndt (IAEM Student Chapter president—Right) accepted the award.

- MSEM student, Heather Beal was the winner of the 2014 IAEM Global Student Council Essay Competition with her paper titled “Emergency Management on Trial: Implications of the 2009 L’Aquila Earthquake Convictions.”

- Twelve MSEM students, alumni, and faculty (left) attended the 2014 IAEM Professional Development Conference in San Antonio, TX where the MU MSEM/CDRE hosted a booth at the IAEM EXPO.

- CDRE hosted the first “Preparedness Day” on September 23. The event was designed to encourage student preparedness at the university. Students were asked to pledge to be prepared in efforts to initiate a culture of awareness on campus. There were a number of external participants including FEMA Region III, Lancaster Emergency Management Agency (LEMA), and Blue Rock Fire Rescue (BRFR), and internal student organizations (AMS, IAEM, and ASSAE).

- CDRE hosted the Global Katrina Effect, 2005-2015: Hurricane Katrina’s Impact on Disaster Management Systems Worldwide. An International Research Symposium on October 2-3, 2014. Invited presentations brought notable speakers from across the nation and abroad including Bill Read (Former Director of the National Hurricane Center), Ken Graham (MIC-NWS, Baton Rouge, LA), Alan Gerard (MIC-NWS, Jackson, MS), and Colonel Pat Santos (Former Chief of Homeland Security) among other presenters from New Zealand, Australia, and France.

- Drs. Yalda, Hagelgans, Rice (Social Work), Felizzi (Social Work), Bookmiller (Government & Political Affairs), and Hernandez (Foreign Languages) traveled to Chile on October 27-31, 2014 as part of a collaborative project with the Pontifical Catholic University of Valparaiso, in Valparaiso. The faculty presented a series of seminars for students, faculty, and members of the community throughout the week on topics of emergency management, fire services, disaster law, social work, natural disasters, and climate change mitigation and adaptation.

Visit CDRE/MSEM at [http://www.millersville.edu/cdre/](http://www.millersville.edu/cdre/)
MU Students and Alumni Make Their Mark in Phoenix

Shown in the photo below are the thirty senior and junior meteorology majors and 10 graduate students in the Integrated Scientific Applications program who attended the 95th Annual Meeting of the American Meteorological Society in Phoenix, AZ in January 2015. Seven Posters were presented, which included many student coauthors and internship supervisors. Renee E. Duff, senior meteorology major, received top honor as the best student poster out of nearly 200 posters presented at the 14th Student Conference, held on 3-4 January 2015 (see photo below). Renee presented the research that she conducted at the Colorado State University in Fort Collins, CO during her summer 2015 internship on “Wildfire Pollution and its Effects on the Microphysical and Electrical Properties of Pyrocumulus.” Other presenters included Jordan McCormick, Matthew Besasparis, Austin Vacek, Timothy See, James Simkins, James Fowler and Kaitlin Rutt.

Alumni were in full force at the annual meeting with many giving oral presentations and posters describing their research. Dr. John Yorks presented a paper on NASA’s Cloud-Aerosol Transport System (CATS) instrument, which was launched from Cape Canaveral on a SPACE-X booster on 10 January 2015. John is the science lead on CATS. Gina Mazzuca (meteorology ’13), now a graduate student at the University of Maryland, presented on her research from the DISCOVER-AQ project. She helped collect the data that she is using in Edgewood, MD while a Millersville student. Rebecca Pauly (meteorology ’13) presented on Lidar applications for the energy sector, work that she is doing at the University of Wyoming. Others include Jon Poterjoy, a NCAR scientist working on data assimilation, James Kurdz, describing his research on phased-array radar applied to the Moore, Oklahoma EF5 tornado, Sara Perfater, representing StormCentral Inc. and Jessica Mackaro representing Vaisala Inc., and Danielle Naegle, a Ph.D. student in disaster science and management.

The students, alumni and friends of Millersville University gathered on Tuesday evening for the annual alumni reception. Millersville University President Dr. John Anderson spoke to the largest-ever gathering of about 180 people about the new strategic plan, “Our Bold Path,” and the general goings-on back at the ‘Ville. This was the beset alumni gathering yet, says Dr. Richard Clark, who with Dr. Todd Sikora represented the meteorology faculty at the reception.

Ocean Sciences Faculty and Students Deploy Moored Current Meter

As part of the Field Methods course taught by Dr. Ajoy Kumar at the Chincoteague Bay Field Station (CBFS) in June 2014, a current meter was deployed by Dr. Kumar and the students at the mouth of the Chincoteague Bay. The moored current meter was deployed for about 30 hours and then recovered. The hourly data from the moorings was used to understand the tidal cycle in the Bay. The tides are the most important physical forcing for circulating the water in the Bay and bringing nutrients and oxygen from the open ocean.

M.S. in Integrated Scientific Applications; that’s the ticket!

The MSISA continues to grow with 13 graduate students currently enrolled in the program. Dr. Joseph Bushey, a civil engineer whose dissertation focused on environmental systems, has been hired as a temporary part-time faculty member to teach courses in environmental sustainability, storm water management, and introduction to environmental systems. Dr. Ajoy Kumar is building the specialization in Geoinformatics, a concentration heavy in remote sensing applications. Presently the business courses that form about 40 percent of the curriculum are currently being offered through Shippensburg University in online format. We are in the process of hiring an instructor who will offer these courses at Millersville where we can better control content and program alignment. Five of the 13 students were awarded graduate assistantships.