

SPRING 2011

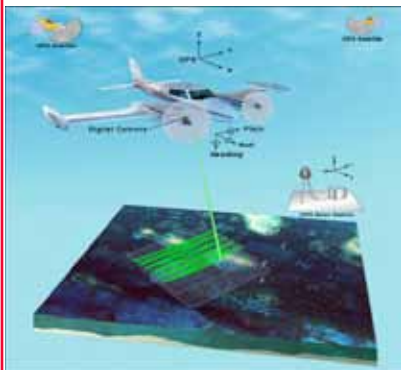
DEPARTMENT OF EARTH SCIENCES

newsletter



PROVIDING A LEARNING EXPERIENCE IN THE EARTH SCIENCES THAT IS SECOND TO NONE

Ocean Scientists Map the Coast



The Remote Sensing group, part of the Ocean Sciences and Coastal Studies program in the Department of Earth Sciences, is working on a grant funded initiative to develop management plans that incorporate impacts of Global Climate Change on coastal wetlands along the East Coast of the US. **Dr**

Ajoy Kumar (Ocean Sciences) from Millersville University (MU) is the PI of the grant along with Dr Shawn Hu from ESU. Dr Kumar, along with MU students Matthias Mizioro and Nate Murry, is developing a Digital Terrain Model (DTM) from LIDAR data collected from NASA aircraft. A number of MU students were also involved with data collection along Wallops Island, VA simultaneously with the NASA aircraft flights. The grant funding has helped setup a state of the art geo-spatial remote sensing laboratory at MU. Specifically, they intend to use remote sensing data, including LIDAR data to map the current distributions of important habitats at the Chincoteague National Wildlife Refuge, VA, detail the likely areas of greatest impact from rising sea levels, quantify the rates of habitat change, and identify areas that may become important wetlands as the coastal systems attempt to migrate inland. This project is a collaborative effort between NASA Goddard Wallops Flight facility, Marine Science Consortium (MSC), US Fish and Wildlife Service and the two PASSHE Institutions of Millersville University of Pennsylvania and East Stroudsburg of Pennsylvania. This research is supported by a grant from NASA.



NSF funds Chemical Weathering Study

The dissolution of calcium-bearing silicate bedrock minerals at the Earth's surface is capable of modifying global climate on geologic timescales by transferring atmospheric CO₂ to ocean bedrock. An important group of minerals in this process are those of the epidote-group which often constitute <1% of bedrock. Whether or not an epidote-group grain is soluble is determined by the extent it has been damaged by radioactivity originating from uranium and thorium hosted by the mineral.



Dr Jason Price (Geology) has received funding from the National Science Foundation to study the maximum radiation dose of the least soluble epidote-group minerals collected from large river delta sediments. Because such minerals are sufficiently resistant to chemical weathering to survive into delta sediments, the maximum radiation dose measured will reflect a threshold of solubility. Epidote-group mineral grains are being extracted from delta sediments of the River Nile in Egypt, and the Yangtze River in China. These rivers possess two of the world's largest watersheds, and the minerals found in their deltas should span the range of radiation damage commonly observed in nature for grains resistant to dissolution. Analytical work associated with this grant is being completed at Princeton University and Memorial University of Newfoundland in Canada.



The research associated with this grant is complemented by the development of an exhibit at the Lancaster Science Factory. The hands-on exhibit will be entitled "Radiation in the Environment," and will provide a digital Geiger counter that can be used for detecting radioactivity among different materials. The materials will include rocks and minerals, including samples of epidote-group minerals, as well as more common household items such as pieces of granite countertop and ceramic bowls.

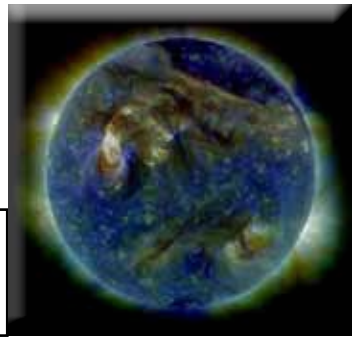
Hands-on, Feet-wet: Earth Sciences at the Marine Science Consortium

Much has happened since Millersville University became a senior full member of the Marine Science Consortium (MSC) at Wallops Island, VA, much to the benefit of Earth Sciences students. New courses, exciting field experiences and research onboard research vessels, new facilities, and a revitalized sense of opportunity for interdisciplinary studies across disciplines such as ocean studies and coastal studies, biology, chemistry, geology and meteorology. The department's two oceanographers, Drs Ajoy Kumar and Bob Vaillancourt are forging ahead in developing new or revised courses that enhance the integration of capabilities provided by MSC and expanding opportunities for students to gain critical skills in ocean technology. We are seeing an increase in students earning double majors in ocean sciences and meteorology or marine biology, or minors in cross-disciplinary fields of study. *Continued on p. 3.*



Earth Sciences Students: carrying on a tradition of excellence

Earth Sciences students continue to be recognized for their high achievements on national, regional, and local levels



Honors and Awards

Clark-Yalda Scholarship in Atmospheric Science Announces First Recipient

JOSEPH (JOEY) MARKIEWICZ was awarded the first Clark-Yalda Scholarship in Atmospheric Science. The scholarship provides \$1000 in tuition assistance for a qualified student majoring in meteorology. Joey is a freshman from Edgewater Park, NJ, a small town on the Delaware River just across from Philadelphia. In addition to meteorology, his interests are sports, playing poker, fishing, and just having a good time with friends.

Joey's reason for choosing MU Meteorology "was because of the friendly atmosphere that I felt when I first visited campus. Also, I liked how here at Millersville the faculty and students know me, and there are opportunities to get involved as a freshman."

Support the Challenge and our Students!

The Clark-Yalda Scholarship offers a challenge: a \$1 for \$1 match to all contributions to the endowment up to \$30,000. Give on-line at <http://www.millersville.edu/services/development/giving-forms/gift.php>. Select "Other" as the designation and in the block provided type *Clark-Yalda Scholarship in Atmospheric Science*. You may also send your gift, payable to Millersville University Foundation to Millersville University, PO Box 1002, Millersville PA 17551-0302. Write Clark-Yalda Scholarship in the memo section of your check.

Other 2010-11 scholarship winners include:

Gregory Boggs, The William Malcolm Jordan Earth Sciences Scholarship

Jeff Rafach, The Dr William B. McIlwaine Scholarship in Earth Sciences

Sigourney Stelma, The Paul H. Nichols Earth Sciences Scholarship

Bradley Gehman, The Rettew Associates Scholarship in Geology

Justin Gilchrist and Kalyn Godziejewski, The Earth Sciences Awards for Academic Excellence



Undergraduate Research

Our students are doing the coolest things! Many of you are already aware of the emphasis we place on undergraduate research either with MU-DES faculty or through external internship experiences. More than ever our students are taking advantage of these opportunities.

Recently, when two large wind turbines were installed about 750 meters away from our acoustic sodar system, **Anthony Sagliani** (left) and **Michael Charnick** wanted to know if the sodar could resolve



the downwind wake. Their results could determine whether we need to move the sodar to ensure representative measurements of the boundary layer. They collected sodar data before and after the installation of the turbines and used the perturbation vertical velocity to assess the wake signature. They found no detectable signature in the time average perturbation velocity. They presented their results at a poster session at the 91st Annual Meeting of the AMS in Seattle, WA.



Justin Gilchrist is earning degrees in meteorology and ocean sciences and coastal studies with the option in physical oceanography. He is amazingly gregarious, having investigated water resources and ecological forecasting in the Chesapeake

Bay and Delmarva Peninsula using MODIS Aqua reflectance data and modeling phytoplankton functional types at the NASA Wallops Island Flight Facility. Working with Dr Ajoy Kumar, he analyzed and shaped raw data files using WinADCP/Matlab and utilized the Regional Ocean Modeling System (ROMS) to de-tide vessel mounted ADCP data. His more recent research experience was with Sigma Space Corporation where he prepared and deployed meteorological and oceanographic instruments and developed programs to operate and collect observational data. He has presented results of his research at the AGU Ocean Sciences Meeting in Portland, OR and the International GHRSSST User Symposium in Santa Rosa, CA. Justin has been accepted to the University of Delaware graduate program in Ocean Sciences.

Adam Jacobs watched intently as Dr Dean Presnell presented "first light" images (above) from the recently launched Solar Dynamics Observatory



(SDO) at the Space Weather Workshop in April 2010. When Presnell finished, Adam rushed to the podium to talk with him and within three days he had secured a

summer internship at NASA Goddard Space Flight Center to work on an atmospheric wave phenomenon that occurred during the SDO launch. Six month later Adam stood before an audience of scientists at the 18th Conference on Planned and Inadvertent Weather Modification at the 91st Annual Meeting of the AMS in Seattle, WA, and gave a stellar oral presentation on "Waves of Destruction" (<http://ams.confex.com/ams/91Annual/flygateway.cgi/id/17708?recordingid=17708>). Adam is passionate about space weather. He will be spending this summer at the University of Colorado working on another space weather REU project. Since 2008 the department has offered a course in *Space Weather and Environment*. Students in this course have the opportunity to attend the Space Weather Workshop sponsored by the NOAA Space Weather Prediction Center in Boulder, CO. As an outgrowth of the focus on space weather, four students have participated in research experiences in the field of space weather. **Mack Jones** (meteo '10) is attending the University of Colorado in aerospace engineering and space physics.



Students get a tour of the SWPC as part of attending the Space Weather Workshop in April 2010

Hands-on, Feet-wet - continued from page 1

There is a critical need for this generation of students to understand the interactions between the air and sea, open ocean and coastal region including the coastal built-environment, and the physical, biological, chemical, geological processes at work in these regions. The MSC is favorably located to offer our students rich and authentic experiences for studies of the coastal environment, opportunities for developing technical skills in the use of research-grade equipment and instruments, and provide the kind of preparation that will be necessary to enter a competitive workforce and contribute



to finding solutions to the complex interdisciplinary problems that face us in the energy-climate-era. Students are involved in a variety of activities as shown in the collage above.

Winter Keeps Weather Center Busy

Once again this winter, the MU Weather Information Center is providing PennDOT with targeted forecasts for an eight-county region in the lower Susquehanna Valley. After many years of providing complimentary forecasts to Lancaster's PennDOT manager, MU Meteorology now has a formal MOU with PennDOT which compensates us for the high-precision long- and short-range forecasts we provide to PennDOT throughout the winter season. WIC director, Eric Hörst, is the lead forecaster for this project, with eight junior and senior meteorology majors who are also paid forecasters. Funding from this PennDOT project has financed numerous Weather Center upgrades including the electronic map wall, the streaming video ScreenWriter system, as well as other meteorological equipment that is used in preparing the PennDOT forecasts, as well as for the Campus Weather Service and in courses offered by the program. For the latest forecast and streaming video, go to <http://www.atmos.millersville.edu/~wic/>.

Disaster Research and Education has close ties to Earth Sciences

The University recently announced that **Dr Sepideh Yalda** (earth sciences - meteorology) has been appointed as the new Director of the *Center for Disaster Research and Education* (CDRE) and coordinator of the Master of Science in Emergency Management (MSEM) and the minor in Environmental Hazards and Emergency Management (EHM). Dr Yalda replaces Dr Hank Fisher, retired Professor of Sociology and former Director of CDRE. Dr Yalda will have a half-time appointment in the Department of Earth Sciences where she will continue to teach courses in Climate Dynamics, Radar Meteorology, Environmental Meteorology, and the History of Meteorology.



The CDRE is developing a campus-community Emergency Response Team (CERT). CERT was originally designed to help communities deal with earthquake hazards in California, but was expanded in 1993 by the Federal Emergency Management Agency (FEMA) and the Emergency Management Institute (EMI) to be more adaptable to diverse hazards and communities. As a result, a number of colleges and universities have begun to develop campus CERT programs to empower



students, faculty, and staff to be knowledgeable of and prepared for the immediate effects of disasters. This provides an excellent opportunity for Millersville to be one of the forerunners in developing a CERT program in the state. Two students, **Pamela Drake** (MSEM graduate student - middle in photo) and **Ethan Etter** (Geography and EHM minor - right) are working through the Center to develop a campus CERT at Millersville University, which will include a community focus on training and education. In addition, **Matthias Miziorako** (MSEM graduate student - left in photo) is working on another component of this project related to National Weather Service StormReady^(R) University which targets preparedness for weather-related high impact events. There are currently only two StormReady universities in PA.

CDRE has also been involved in updating the Commonwealth of Pennsylvania's all-hazard mitigation plan. Dr Yalda represented the University in a process to develop a plan to identify and rank hazards affecting the state and identify available data sources. The updated plan was just recently approved and CDRE will be involved in its implementation.

CDRE offers monthly virtual seminars, attracting speakers from academic institutions, private and public sectors to present research and applied topics on emergency management and disaster research. See <http://www.millersville.edu/cdre/virtual-seminar-series.php> for a complete listing. Seminars are open to the University community.

CDRE is also working with the Business, Industry and Infrastructure Subcommittee (BIIS) of the South Central Pennsylvania Task Force to develop a Regional Business Preparedness Outreach Campaign. The proposed outreach campaign is designed to increase awareness and preparedness of businesses in the region and to improve their resiliency. The Campaign will be a joint effort between BIIS, CDRE, and select business groups. The Campaign will consist of six phases and will span approximately 14 months.

ALUMNI: OUR LITMUS FOR SUCCESS

Dr Patrick Market Elected President of NWA



Patrick Market is a native of Wampum, PA. He graduated from Mohawk High School in Bessemer, PA, in 1987. In 1989, he entered **Millersville University** in pursuit of a Bachelor of Science in Meteorology, which he earned in 1994. While at Millersville University he met and was married to Jennifer Ward (art, '93) in 1990. Jennifer is an accomplished photographer and artist. The

painting shown here that still adorns our hallway was done while Jennifer was a student at MU. Pat and Jen have two sons; Spenser 20, and Timothy 4.

After Millersville and with family in tow, Patrick moved to St. Louis, MO in 1994 to attend graduate school at the Saint Louis University. There he earned an M.S. in Meteorology in 1996 and a Ph.D. in Meteorology in 1999, both under the supervision of the late Dr James T. Moore.

In 1999, he began his professional work at the University of Missouri in Columbia, MO, where he is currently an associate professor. His research interests include synoptic and mesoscale weather systems which produce heavy rainfall and heavy snowfall. In addition to being the current **President of the National Weather Association**, Patrick is also a member of the American Meteorological Society, American Geophysical Union, ΣE , the scientific research organization, and the Missouri Academy of Science. *Millersville University is a corporate member of the NWA.*



Sleepless in Seattle

Well maybe not exactly sleepless, but the 91st Annual Meeting of the American Meteorological Society in Seattle, WA certainly had an abundance of activity. We had to beg and borrow to help defray costs for the 19 current students that attended the meeting, some of whom gave oral and poster presentations. By far, the most exciting event was the 9th Annual Millersville Alumni Reception, which saw a record turnout (> 100) as alumni attending the conference as well as those from the greater Seattle-Tocoma area stopped by to chat with other alums, faculty, students, and long-time friends of the university. Gracing our reception was MU President Dr Francine McNairy and Asst. V. P. of Development Janet Edwards. Dr McNairy welcomed the alumni and students with a call to support opportunities for students. **Mark your calendars for the 10th Annual MU Reception in New Orleans, January 24, 2012.**



President McNairy poses with some of the alumni, students, and faculty that attended the Seattle reception.

Alumni are tour de force at PWAD

The Public Weather Awareness Day (PWAD) sponsored by the MU Student Chapter of the AMS is a growing success story due in large part to the voluntary participation of MU alumni who are representing their organizations. The Saturday event, which takes place in April and is free and open to the public, attracted over 450 attendees - an increase of 125 over the first year. PWAD is a day full of celebrating and experiencing everything about the weather. Alumni from *WeatherBug*, *Weather Trends*, *AccuWeather*, *Kestrel*, *NESDIS*, and the *NWS* tended to their booths and distributed information about their organizations and involved families in weather-related activities. Green-shirted MU students provided games, activities, and snacks for the attendees. The **Third Annual PWAD is scheduled for Saturday, April 2, 2011, from 11:00 am to 3:00 pm in Pucillo Gymnasium.** This is a tremendous public outreach activity that would not be successful without the participation of dedicated alumni...and we thank you for your support.



Right: PWAD landscape; insert: students demonstrating rotating tank.

Left clockwise: Brian Hughes and Tom Renkevans at the NOAA-NESDIS booth; Evan Lowery (left) from Weather Trends Internat'l;

John Feerick (left) and Brian Edwards (right) from AccuWeather Inc.; Chris Sloop (middle) from WeatherBug; and three MU students demonstrate clouds in a bottle to a captivated youth. The parachute was a blast!

