Kentucky Academy of Science

NEWSLETTER

www.kyscience.org | Susan Templeton, Editor | August 2011

The Voice of Science in Kentucky

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Faculty, staff and students at Enhanced Affiliates receive:

- ***free KAS membership***
- ***online access to KAS Journal***
- ***KAS Newsletter via e-mail***

☞ Editor's Note: When viewing the Newsletter in Acrobat Reader the Table of Contents (TOC) contains live links to each article; at the bottom right of each page is a link back to the TOC!

The KAS Newsletter is published in January, May and August. Current and archived issues are available at www.kyscience.org. You may contact the KAS Newsletter Editor at susan.templeton@kysu.edu.

From the President...

As we look forward to the coming of fall, we must all turn our attention to the Annual Meeting of the Academy. This year we will be enjoying the hospitality of Murray State University on November 4 and 5. I have had the opportunity of looking at the preliminary program and it looks like it will be another exciting chance to come together and find out what has happened in the state over the last year. So, please submit your abstracts and join your colleagues for a great meeting!

As with any organization, updates to standard operating procedures and policies must be made. Over the summer, revisions to KAS's Constitution and By-Laws addressed changes brought about by our increased use of electronic media and the institution of enhanced memberships for our colleges and universities. These changes must be approved by the membership. Therefore, you will receive by e-mail the proposed revisions by October 1. You will have the month of October to review and comment on the changes. At the annual business meeting in November, a vote will be taken, and the updates will be accepted with a two-thirds majority vote of those present. If you have any questions or comments, please direct them to both Jeanne Harris (executivedirector@kyscience.org) and me (barbara.ramey@eku.edu).

As I reported in the last Newsletter, the Academy received a little over $1200 in donations for the undergraduate research fund last year. To date, no additional donations have been received. This source of support for our students definitely needs to be continued. Please remember that 2011 is a new fiscal year, and that your tax-deductible contribution this year will still be of value in allowing us to continue to support worthy students. You can either send your check to the KAS office or contribute using PayPal through the KAS homepage. The Governing Board is also looking into other fund raising efforts for the Undergraduate Research Grant, and we plan to tempt you with offerings (perhaps a raffle?) during the Annual Meeting. So plan not only to bring but also to open your wallets and purses at Murray!

The Academy has volunteered its expertise to aid the Kentucky Board of Education in resolving claims of factual errors found in textbooks. The KAS Governing Board has determined that a set of formal criteria needs to be in place for membership on the panels, and is in the process of developing the criteria to be used in appointing panels as they are needed. We have had several volunteers step forward to offer their services, and we thank them for their interest. The panels will be formed once criteria are established.

Remember to submit your abstracts and make your reservations early for the Annual Meeting on November 4 and 5. See you in Murray for our Friday night symposium and for a very full day of papers and posters on Saturday!

-- Barbara Ramey, KAS President

☞ Inside this issue

Messages from the Executive Director

I look forward to seeing everyone at the 2011 KAS Annual Meeting on the campus of Murray State University. VERY IMPORTANT: There are a number of events occurring on the MSU campus at the same time as the KAS meeting. IF YOU NEED A HOTEL ROOM PLEASE MAKE YOUR RESERVATION EARLY! After October 1, the rooms may be released to the general public. There are a limited number of quality hotel rooms in Murray. BOOK YOUR ROOMS EARLY!

Online pre registration is now available. To receive a discounted meeting registration please pre register for the meeting at www.kyscience.org by October 6, 2011; after that date all registration must be completed on-site. Meeting pre registrations rates are $10 for students, $35 for regular members and $60 for non KAS members. There will be no refunds after October 6. Onsite registration fees and will be $15 for students, $50 for regular KAS members and $70 for non KAS members.

If you are not a KAS member and plan on joining KAS, please join KAS prior to pre registering for the meeting to receive the member discount rate. Also, if students join KAS as a regular (non student) member you will automatically be charged the regular (more expensive) pre registration rate so please make sure you join KAS with the correct member classification, i.e. student if you are a student. If you have forgotten your KAS membership password you can retrieve the information as well as membership activation from the KAS log in at www.kyscience.org/members/login.php

KAS Annual Awards Banquet tickets will remain $25/each for individuals not participating in the Undergraduate Graduate (URC) or Graduate Research Competitions (GRC). In the past, participants in the URC have received complimentary tickets to the Annual Awards Banquet. Due to the high rate of URC participants requesting complimentary tickets for the banquet and not attending the banquet, KAS is now charging URC participants a modest $5/ ticket fee. GRC participants previously paid $25 to attend the banquet, but in 2011 they will also pay $5/ticket. . Banquet tickets are limited and are first come first serve.

For your convenience, universities can pay for multiple meeting attendees at one time utilizing the Payment Only link found on the KAS website/annual meeting page. Payment should be made prior to attending the meeting to avoid a long wait when you arrive at the meeting.

If you have questions regarding any aspect of the meeting registration please contact Jeanne Harris, KAS Executive Director at 859-227-2837.

Best wishes,

Jeanne Harris, KAS Executive Director
executivedirector@Kyscience.org

Remember: If you would like to follow KAS on Facebook, sign up on the Facebook link off the KAS homepage: www.kyscience.org.

KAS 97th ANNUAL MEETING

Hosted by Murray State University

(Tentative Program - All times listed are Central Time.)

FRIDAY, NOVEMBER 4, 2011

9:00 a.m. - 4:30 p.m.	KBRIN - NIH Proposal Development Workshop
3:00 p.m. - 5:30 p.m.	KAS Governing Board Meeting
6:00 p.m. - 7:30 p.m.	Registration
7:00 p.m. - 8:00 p.m.	SYMPOSIUM

Kentucky Museum of Natural History: Present and Future

Panelists:

Dr. Donald Chesnut, Jr., President, Board of Directors of the KY Museum of Natural History Project

Dr. Frank Ettensohn, Faculty, Dept. of Earth & Environmental Science, U.K.

Mr. Don Dott, Director, Kentucky State Nature Preserves Commission

Mr. Kent Whitworth, Exec. Director, Kentucky Historical Society, Thomas D. Clark Center for KY History.

8:15 p.m. - 9:00 p.m.	KAS Sectional Officers Meeting
8:15 p.m. - 10:30 p.m.	Social

SATURDAY, NOVEMBER 5, 2011

7:00 a.m. - 5:00 p.m.	Registration
8:00 a.m. - 4:00 p.m.	Exhibitors
8:00 a.m. - 9:30 a.m.	Power Point Presentations
8:00 a.m. - 4:00 p.m.	Scientific Posters on Display
9:00 a.m. - 12:00 a.m.	Physics Education Workshop
9:30 a.m. - 9:45 a.m.	Refreshment Break
9:45 a.m. - 11:30 a.m.	Power Point Presentations
10:00 a.m. - 11:30 a.m.	Kentucky Community & Technical College Meetings: Faculty Meeting, Biology Faculty, Chemistry Faculty, Physics Faculty
11:30 a.m. - 12:45 p.m.	Lunch
11:30 a.m. - 12:45 p.m.	KAS Past President's Luncheon
1:00 p.m. - 2:15 p.m.	Power Point Presentations
1:00 p.m. - 4:00 p.m.	Symposium on Geotechnologies and Geography Synergies: *The Mid America Remote sensing Center (MARC) of Murray State University*
2:15 p.m. - 2:30 p.m.	Refreshment Break
2:30 p.m. - 4:00 p.m.	Power Point Presentations
4:15 p.m. - 5:15 p.m.	PLENARY SESSION

Fields of Learning: The Student Farm Movement in North America

Dr. Sean Clark, Associate Professor, Dept. of Agriculture and Natural Resource, Berea College

5:30 p.m. - 6:30 p.m.	Annual KAS Business Meeting / Reception
6:45 p.m. - 9:00 p.m.	ANNUAL AWARDS BANQUET

Additional information on the workshops, the geography symposium, and the plenary speaker is provided on page 3 of this Newsletter; information on abstract submission, posters/ presentations and hotel accommodations can be found on page 4.

NIH R15 AREA Grants — Proposal Development Workshop

Friday, November 4th, 9:00 a.m. - 4:30 p.m.

Mississippi Room, Curris Center, Murray State University

The Kentucky Biomedical Research Infrastructure Network (KBRIN) will again offer an intensive workshop on the development of National Institutes of Health (NIH) R15-Academic Research Enhancement Award (AREA) proposals. AREA grants are specifically designed to support small research projects in the biomedical and behavioral sciences conducted by faculty and students in colleges/universities and health professional schools that have not received more than $6 million in NIH research grants in four of the last seven fiscal years. Thus, faculty at all colleges/ universities in Kentucky, except U of L and UK, are eligible.

The three main goals of the AREA program are: (1) to support meritorious research; (2) to strengthen the research environment of the institution; and (3) to expose students to research.

The workshop will be led by faculty at KBRIN institutions that have been successful in competing for AREA grants. The morning session is designed for faculty with little of no NIH grant writing experience, whereas the afternoon session is designed to enhance the competitiveness of more experienced faculty. Depending upon level of experience with the NIH, registrations will be accepted for the either the full day workshop or the afternoon workshop only.

The morning workshop will begin at 9:00 am CST and the afternoon session will begin at 1:00 pm CST. Lunch will be provided at noon.

The workshop is free and open to interested faculty at all Kentucky public and private institutions.

As space is limited, please register by Friday, October 21st by contacting Ms. Stephanie Dearing, Assistant Director of KBRIN, at stephanie.dearing@louisville.edu or 502-852-3045.

For additional workshop information, contact:
Dr. Nigel Cooper, KBRIN PI
(nigel.cooper@louisville.edu)
or
Dr. Bruce Mattingly, KBRIN Program Coordinator
(b.mattingly@moreheadstate.edu).

This workshop is sponsored by the Kentucky Biomedical Research Infrastructure Network (KBRIN), which is supported by grant #2P20RR16481-11 from the National Institutes of Health - National Center for Research Resources.

Geotechnologies in Geography Symposium

The Geography Section of KAS is organizing a "Geotechnologies in Geography" symposium to be held during the second half of the session. The event is hosted by the Mid-America Remote Sensing Center (MARC) at Murray State University and is scheduled for Saturday November 5th, from 1:00 PM to 3:45 PM. The emphasis of this symposium is on theoretical aspects and practical applications of geospatial sciences and technologies (e.g. GIScience, GISystems, remote sensing, geodesy, GNSS, geostatistics), utilized in answering research questions or addressing issues in geography. Abstracts submitted by authors interested in participating in the Symposium, will have to be marked "GEOGRAPHY SYMPOSIUM", instead of "GEOGRAPHY". For further information, please contact Dr. Glenn Campbell at glenn.campbell@eku.edu or at (859) 622-6474.

Physics Education Workshop

The Kentucky Association of Physics Teachers is pleased to sponsor a free half-day interactive workshop for teachers of physics and physical science as part of the KAS 97th Annual Meeting at Murray State University. From 9:00 a.m. to noon on Saturday, November 5, 2011 teachers at the middle school, high school, and college level are invited to participate in a two-part workshop. A hands-on, interactive experience - "Making Magnetism Visible" - is being paired with a panel presentation - "Benefits and Costs of Student Participation in State and National Science Competitions."

Magnetic fields are a notoriously difficult concept for students to fully grasp. Workshop participants will interact with a series of illustrative, motivating demonstrations of magnetism in action. These demonstrations have been chosen to be relatively inexpensive and easy to integrate into all levels of secondary science classrooms. A series of basic experiments and data analysis will be a part of this presentation along with a brief overview of magnetic sources and strengths.

For a science teacher, preparing students to compete successfully in science competitions can provide some of the best memories, and the biggest headaches, of any activity that can be undertaken. A panel of teacher/mentors and event organizers will share their experiences and answer audience questions regarding science competitions involving rockets, robots, construction, calculation, solo excellence, and solid teamwork.For further information, please contact Dr. Richard Gelderman at richard.gelderman@wku.edu or (270) 745-6203.

Plenary Session Speaker: Dr. Sean Clark

The Plenary Session speaker for the 2011 Annual Meeting will be Dr. Sean Clark. Dr. Clark is an Associate Professor of Agriculture and Natural Resources at Berea College, and Director of the Berea College Farm. With Laura Sayre, a postdoctoral researcher with the French National Institute for Agronomic Research, he co-edited the recently published "Fields of Learning: The Student Farm Movement in North America," a guide to the history and current condition of about a hundred campus farms across North America. A practical handbook that provides readers with an important story of students looking to better the future of our food, our education and our planet, the book offers insights for anyone interested in the sustainability movement and how it can transform the world in which we live.

Guidelines for Submitting an Abstract

The DEADLINE for submitting an abstract for presentation is OCTOBER 6, 2011 Forms will not be available after this date. There are a limited number of positions available for Power Point presentations so submit as soon as possible. If a position is not available upon receiving your abstract you will be notified and given the opportunity to present a poster.

To submit an abstract for presentation, either Power Point or poster, go to the KAS website at http://www.kyscience.org. On the left side of the page click on ANNUAL MEETING and then select SUBMIT AN ABSTRACT. This page will allow you to log on as a member or non-member and then go to the form for Submitting an Abstract. YOU MUST BE PRE-REGISTERED in order to submit an abstract. If you have not there will be a link to the pre-registration page that will allow you to do so after which you will return to the Abstract Submission Form to submit your abstract. It is recommended that you go to the GUIDELINES FOR PREPARATION OF ABSTRACTS to make sure your abstract is in the proper format. Your abstract needs to be submitted in one of the following: Word 2003 (.doc), Rich Text Format (.rtf) or Acrobat PDF (.pdf). You will receive a notice via e-mail that your abstract has been received. The program, upon completion, will be placed on the website at which time you will be able to determine the time and location of your presentation. All presentations will be on Saturday, November 5. If you have any questions, please contact Dr. Robert Creek, Program Coordinator, at robertcreek@bellsouth.net.

Guidelines for Power Point and Poster Presentations

All Power Point presentations should be compatible with Power Point version 2007 for Windows and brought on a USB drive as the computers will not have a CD drive. You must be in your assigned room 15 minutes before your session is scheduled to start in order to load your presentation. At the present time the Poster session will be all day session. Pplease contact Dr. Robert Creek, Program Coordinator, at robertcreek@bellsouth.net if you have any questions.

Annual Meeting Accommodations

Hotel rooms blocked for the KAS meeting (cutoff date is Oct1st):

Hampton Inn and Suites (25 rooms) - $99.00 plus tax

1415 Lowes Drive, Murray, KY 42071

Phone: 270-767-2226

Holiday Inn and Suites (20 rooms) - $94.50 plus tax

1504 N 12th Street, Murray, KY 42071

Phone: 270-759-4449

Baymont Inn and Suites (30 rooms) - $69.00 plus tax

1210 N 12th Street, Murray, KY 42071
Phone: 270-759-5910

KAS Research Funds Available

The following sources of research funding are available:

Marcia Athey and Botany Funds **-** Intended for research planned and conducted by students of Kentucky secondary schools, colleges, and universities under the supervision of a faculty member; consideration will also be given for support of faculty research projects. Faculty sponsors/researchers must be members of the Kentucky Academy of Science. The Marcia Athey Fund award (up to $3,000) and Botany Fund award (up to $750) are made to the institution of the faculty supervisor/researcher.

Special Research Program **-** Directed particularly to faculty in Kentucky institutions, public or private, involved primarily in undergraduate education. Applicants must be a KAS member. Proposals may be for work related to the subject matter of any of the sections of the Kentucky Academy of Sciences. Awards are for one year; funding for an additional year may be requested by reapplying the following year and competing with newly submitted proposals. Two awards of up to $5,000 will be available as funding allows. Progress of the project must be reported within one month after the anniversary of the award, in the form of a report to the KAS President-Elect.

Undergraduate Research Program **-** Funds available for research planned and conducted by undergraduate students of Kentucky colleges and universities under the supervision of a faculty member. Faculty sponsors/researchers must be members of the Kentucky Academy of Science. Currently, two undergraduate research grant programs are available. Students are expected to present their research at the annual meeting of KAS, and submit a final report by January 31st of the following year. Undergraduate Research Supply Grants: Awards up to $500. Summer Undergraduate Research Grants: Awards up to $4,000.

NEW APPLICATION PROCESS IN 2011: All grant proposals must be submitted online through the KAS membership profile webpage. You must be a KAS member to apply for a grant. Applications for all grant types must be received via electronic submission by November 15, 2011. To submit your grant applications visit www.kyscience.org and select the log in tab found at the top of the KAS home page. After logging in as a member, select the "Apply for grants" link. Before submitting your application, please make sure all necessary materials have been prepared properly and are contained within one Adobe PDF document. Your grant application will not be considered if the PDF document is missing any element. If you are unsure about what materials are required, click the "Required documents" link next to the grant name listed on the webpage. Funding recommendations will be announced shortly after the January 2012 Board meeting. Questions should be sent to:

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Science Across the Commonwealth

11th Annual *Posters-at-the-Capitol* to be held January 26, 2012

Posters-at-the-Capitol (P@C**)** is an event hosted collaboratively by Eastern Kentucky University, Kentucky Community and Technical College System, Kentucky State University, Morehead State University, Murray State University, Northern Kentucky University, University of Kentucky, University of Louisville, and Western Kentucky University. The intent is to help Kentucky legislators and the Governor better understand the importance of involving undergraduates in research, scholarly, and creative work.

Visit http://campus.murraystate.edu/services/ursa/ to view guidelines, find contact information for the various campus coordinators, or submit your abstract. **The abstract submission deadline is October 19, 2011**.

Crossing the Divide: On the Adventure of Getting Science Across to the Public

This free one-day science symposium, sponsored by the University of Louisville and Brown and Williamson will be held Friday, October 14, beginning at noon in the U of L Gheens Science Hall. Program speakers include Dr. Mary Anne Wolf, Tufts University, Maryn Mckenna, *Wired* magazine, Dr. Bruce Lewenstein, Cornell University, Janet Raloff, *Science News*, James Bruggers, *Louisville Courier Journal*, Paul Zaloom, *Beakman's World* and Carl Zimmer, Yale University.

All lectures will be in the Gheens Science Hall Rauch Planetarium. The after-dinner panel discussion will begin at 7:30 p.m. in Strickler Hall, room 102. The panel will be led by Dr. Jennifer Gregg, an associate professor in the Department of Communication at the University of Louisville and a research associate for U of L's School of Public Health. For more information, please visit the website below.

http://kysecularsociety.org/aggregator/sources/2

Miriam Kanaan Recognized

Miriam Kannan recently received Northern Kentucky University's Frank Sinton Milburn Outstanding Professor Award. Dr. Kanaan, Regent Professor in Biological Science, is a past President of the Kentucky Academy of Science.

Eastern Kentucky University Center for the Arts: 2011-2012 Chautauqua Lecture Series

Richard Dawkins: The Magic of Reality

Thursday, October 6, 2011, 7:30 pm

Born in Nairobi, Kenya, Professor Richard Dawkins is one of the world's leading scientific intellectuals, specialising in evolutionary biology. Dawkins studied zoology at Balliol College at Oxford, completing a BA in zoology and remaining there to later complete his Masters and his D. Phil. Dawkins is best known for his books which include: *The Selfish Gene*, *The Extended Phenotype*, *The Blind Watchmaker*, and *The God Delusion*. The last of these, widely influential and controversial, has sold 1.5 million copies in its English-language edition and been translated into 31 other languages. The New York Times Book Review has hailed him as a writer who "understands the issues so clearly that he forces his reader to understand them too."

Website: http://richarddawkins.net/

Temple Grandin: Animals, Humans, and Sensory Based Thinking

Thursday, September 22, 2011, 7:30 pm

Temple Grandin, Ph.D., is a designer of livestock handling facilities and a Professor of Animal Science at Colorado State University and is the most accomplished and well-known adult with autism in the world. Dr. Grandin received her Ph.D in Animal Science from the University of Illinois in 1989. Today she teaches courses on livestock behaviour and facility design at Colorado State University and consults with the livestock industry on facility design, livestock handling, and animal welfare. She has appeared on numerous television shows, has been interviewed on National Public Radio, and has been featured in many magazines. In 2010, *Time* magazine named her one of the 100 most influential people. She has also authored over 400 articles in both scientific journals and livestock periodicals on animal handling, welfare, and facility design. She is the author of *Thinking in Pictures*, *Livestock Handling and Transport*, *Genetics and the Behavior of Domestic Animals*, and *Humane Livestock Handling*. Her books *Animals in Translation* and A*nimals Make Us Human* were both on the New York Times best seller list. Her life story has also been made into an HBO movie titled T*emple Grandin*, which shows her life as a teenager and how she started her career. The film will be screened on Wednesday, September 21st, at 6 pm & 8 pm in O'Donnell Hall, Student Success Building.

Website: http://www.templegrandin.com/

These lectures will be held at Eastern's new, state-of-the-art 2100 seat Grand Hall venue. For more information contact Dr. Minh Nguyen at 859-622-8667 or minh.nguyen@eku.edu.. Visit http://www.chautauqua.eku.edu/2011-12-schedule for a complete schedule of chautauqua events.

All Chautauqua Lectures are Free and Open to the Public.

The Kentucky Mesonet

Weather and climate play a fundamental role in shaping society. Quality of life, as well as the cost of living and cost of doing business are affected by weather and climate. Localized variations in temperature, wind, and precipitation and rapid development of severe storms highlight the need for a dense network of stations reporting meteorological conditions in near-real-time. Meanwhile, the ability to isolate climate signals in longer term observational records demands a high-quality network, both in terms of instrumentation and selection of monitoring sites. Information and knowledge derived from weather and climate data can then aid in operational decision making and strategic planning by business and industry, local and state agencies, and individuals.

The Kentucky Mesonet is a new, research-grade network of automated weather and climate monitoring stations (Figure 1) that serves people in communities throughout the Commonwealth of Kentucky. Development of the network was funded via an earmark to the Kentucky Climate Center at Western Kentucky University through NOAA's National Weather Service. The network supports public safety, education and research efforts, while simultaneously benefitting economic interests throughout the state. Since installation of the first station in 2007, the network has grown to include more than 60 monitoring sites with plans for expansion to 100 sites (Figure 2). Each station records observations of air temperature, precipitation, relative humidity, solar radiation, and wind speed and direction. Meteorological parameters are sampled every three seconds and packaged into observations every five minutes.

Site Identification and Selection

Site identification for Mesonet stations is driven by research needs both in climatology and meteorology, while also emphasizing operational needs. Unobstructed sites that are broadly representative of the surrounding terrain, have undisturbed soil, and offer prospects for long-term stability are preferred. Areas with nearly uniform terrain that offer a variety of unobstructed exposures provide the greatest flexibility in site identification. The goal of the site selection process in such areas can be expanded in an effort to geometrically optimize the regional spacing of sites (ideally about 20 miles between sites) or to identify sites that offer unique local benefits (i.e. location at a nature preserve or other publicly accessible site that creates community outreach opportunities, or locations that are likely to provide the best advance warning to population centers during severe weather).

Much of Kentucky is characterized by complex terrain. Ridges and valleys, varying cover of forest, crop, and grass land, and contrasts between areas of rural and urban development pose significant challenges in Mesonet site identification across large portions of Kentucky. In these instances, priority centers on selecting a site that is broadly representative of the regime where settlement and economic activity are concentrated. Over a larger region where multiple terrain regimes are present, efforts are made to ensure that sites are selected that strategically represent different regimes, following the principal of stratified spatial sampling. Hence, the site selection process has both local and regional components based both on geometrical and terrain considerations.

Figure 1. Kentucky Mesonet station on a farm in McLean County.

Scientific Instrumentation

Principles of quality, reliability, and scalability underlie the design of the Kentucky Mesonet. Following the United States Climate Reference Network, the Kentucky Mesonet uses redundant and complementary sensors to facilitate built-in quality assurance checks at each station. For example, near-surface air temperature measurements are made use three identical sensors housed in an aspirated shield. Drawing air from outside through the housing of the shield controls for bias in temperature measurements that would arise from radiation loading on the shield. Otherwise, this bias can reach as much as 3° C under common summer season atmospheric conditions with other common sensor configurations. By using redundant sensors, discrepancies among measurements by the sensors or failure of a sensor can be readily identified.

Scalability is a key aspect of the Kentucky Mesonet. Each station has the capacity to incorporate additional environmental sensors, and additional sites can be added to the network at strategic locations. This ability emphasizes the concept of the Kentucky Mesonet as an environmental monitoring infrastructure and provides for opportunities to partner with public or private entities that have custom needs for collecting environmental data.

Two-way communication between a network operations center and each monitoring station via a secure digital cellular connection facilitates interactive monitoring capabilities. In some cases, problems arising at a station can be troubleshot and fixed remotely, thereby increasing reliability and reducing maintenance costs. Combined with the property of scalability, two-way communication offers the potential to develop intelligent monitoring, wherein observations retrieved from one station trigger instructions to conditionally record data at another site.

Quality Control and Quality Assurance

The Kentucky Mesonet is vertically integrated. Before being deployed in the field, instruments are tested and calibrated in a laboratory or at a field site. Project technicians then construct stations and install instrumentation. Data collected at each station are retrieved, processed, disseminated, and archived using systems develop as part of the project.

Quality control and quality assurance procedures are critical to the integrity of the Kentucky Mesonet. Procedures have been developed and documented for site maintenance. The regular site maintenance schedule includes spring, summer, and fall site passes. Site metadata is documented upon arrival at a site. Each pass includes visual inspection, vegetation maintenance, tower maintenance, and general maintenance of the radiation shields and solar panels, batteries and charge controller, pyranometer, wetness sensor, wind monitor, and datalogger and enclosure. Precipitation gauge maintenance includes emptying the gauge, in-field calibration verification, and adding anti-freeze (fall pass only).

The Kentucky Mesonet has developed and implemented both automated and manual quality assurance (QA) processes. Automated QA is applied to data as it is ingested. Automated QA checks include instrument range checks, step tests, and instrument inter-comparison checks. A series of QA flags are stored in the meteorological database, along with both raw meteorological data and values that reflect adjustments triggered by the QA algorithms. Visualization tools facilitate manual QA checks and serve a vital role in building knowledge of the response and performance behaviors of various environmental sensors. Manual QA reports are produced on a daily basis. QA procedures are used as the basis for a trouble ticket system that prioritizes repair schedules for meteorology/electronics technicians who are charged with maintaining the observing sites.

Quality assurance checks occasionally result in trouble tickets being issued. A trouble ticket reflects a potential problem with a sensor that may result in no data or unreliable data being collected. Technicians make special trips to perform site maintenance when trouble tickets are issued.

All relevant metadata relating to operations of the Mesonet are documented and saved in databases developed as part of the project. Surveys of candidate sites for monitoring stations, complete with site evaluation scores and panoramic site photographs, are saved in a site survey database. Another database stores information about each sensor used in the network, including when and where it was purchased and its history of calibration and deployment within the network. Details of each site visit for routine maintenance or trouble ticket response are documented. Hence, it is possible to reconstruct the history of the network for any point in time. Again, such attention to detail is vital to maintaining the integrity of the network.

Data Dissemination

Data from the Kentucky Mesonet are disseminated to a variety of end users. The Kentucky Mesonet website (www.kymesonet.org) provides free public access to current data and selected historical data summaries. In addition to meteorological variables measured directly, the website also reports derived variables, including such useful measures as heat index, wind chill, and daily heating and cooling degree days. Further, users can customize the display to highlight data from the nearest station to their location. Finally, the website includes a set of grade-appropriate lesson plans that help teachers to bring Kentucky Mesonet data into the classroom to support educational activities in math and science.

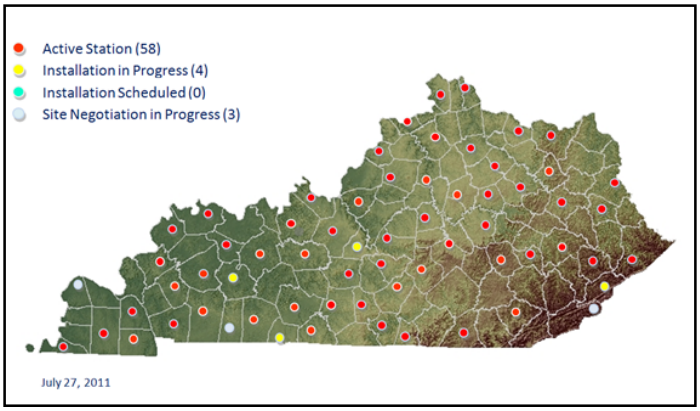


Figure 2. Map showing locations of Kentucky Mesonet stations.

National Weather Service forecast offices serving portions of Kentucky receive a feed of data from the Kentucky Mesonet to aid daily forecasting and provide critical validation of near-surface conditions during active weather situations.

The Kentucky Climate Center partnered with Kentucky's Commonwealth Office of Technology and the Division of Geographic Information to enable a GeoRSS feed of Mesonet data into the Kentucky Event Mapping and Analysis Portal (KEMAP), allowing first responders and Kentucky's citizens to access weather data integrated with other critical databases. This partnership later led to the Kentucky Mesonet receiving a Best of Kentucky Award for Best Application Serving Public Agencies.

Cyberinfrastructure

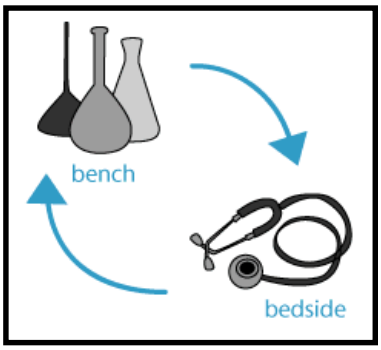
The ultimate value of the Kentucky Mesonet lies beyond the collection of environmental data. Each station in the network collects over 105,000 observations and returns more than 2,700,000 data values over the course of a year. Societal benefits draw from the ability to extract useful information from those data, information that can produce new knowledge and inform decision making. A new high-performance computing center was recently brought online at WKU's Center for Research and Development and will transform the Kentucky Mesonet into a cyberinfrastructure by supporting atmospheric modeling for operational forecasting and basic research.

The Kentucky Climate Center is actively seeking opportunities for public and private partnerships that can advance research, education, and service for the benefit of Kentuckians. For more information about the Kentucky Mesonet, contact Dr. Stuart A. Foster (stuart.foster@wku.edu, 270-745-5983) or Dr. Rezaul Mahmood (rezaul.mahmood@wku.edu, 270-745-5979) at the Kentucky Climate Center in the Department of Geography and Geology at Western Kentucky University.

Submitted by Stuart A. Foster and Rezaul Mahmood, Kentucky Climate Center, Western Kentucky University.

Translational Research

In 2009 the American Association for the Advancement of Science (AAAS), publisher of the journal Science, announced the start of its newest journal dedicated to themes of translational research, Science Translational Medicine. The new journal comes almost 6 years after the start of the Journal of Translational Medicine as an open-access journal with BioMed Central. The appearance of these journals marks recognition by researchers and reporters of the importance of translational research in modern biomedicine.



Implicit in all "translational" research is its goal to benefit human health and wellness. Translational research in medicine is an area that seeks to fill the gap between basic scientific findings and delivery of new medicines and therapeutic interventions after being tested in clinical trials. The application of scientific methods to the development of new medical technologies is seen as an important step that will unite academic medical centers funded by the U.S. National Institutes of Health (NIH) with industry. Problems to overcome in the field of medical interventions are the cost of resources and high failure rates. Future directions of translational medicine may consider: (a) whether there is a real human need for which a proposed therapy is more effective than existing therapies; (b) whether an adequate market exists to ensure commercial success; (c) the extent to which therapeutic interventions for genetic disorders can be supported by the phenotype, and whether a drug can be delivered effectively to its target in an individual; (d) whether an industry partner is available for production; and, (e) whether a pivotal trial, determined by analysis of outcome or statistically, can be attained that constitutes a meaningful and quantifiable endpoint of development (Coller & Califf, 2009).

Topics, Categories, and Open Access Journals of Translational Research

A search in BioMed Central (BMC), which contains 219 open access journals and its own BMC series, using the specific term "translational research" shows that the themes that comprise translational research are carried out in varied disciplines of biomedical and molecular science and using methodologies that range from applied field research to basic research, including genetics, in the context of clinical studies. Over 230 articles contain the term "translational research" in their abstracts. These are grouped into various categories, including Research article, Technical advance, Study protocol, and Methodology. The field of medicine and biomedical research, especially cancer research, contains the greatest number of articles considered to be translational research.

Clinical Field Trials

Examples of field methodology in cancer research range from behavioral interventions to outcomes of specific interventions, and proper procedures during clinical study phases. In one example, "Experiences of outreach workers promoting smoking cessation to Bangladeshi and Pakistani men..." are reported as a research article in BMC Public Health, 2011.

Clinical trials analyses, both pre- and post-intervention, are the subject of the report, "Importance of pre-analytical steps for transcriptome and RT-qPCR (reverse transcription polymerase chain reaction, using a fluorescent report molecule) analyses...in Phase II randomized trials...of...chemotherapy..in breast cancer patients." The researchers established validating criteria for common genetic analyses in Phase II clinical trials, and established limits of acceptability for genetic samples based on the percentage of tumorous cells in the sample and quality of RNA in the tissue sample analyzed. The article is published in BMC Cancer, 2011.

Another Phase II study protocol was about the use of Bevacizumab and Erlotinib as second- or third-line chemotherapy drugs in cancer treatment for patients relapsed after previous treatment, reported in the open access journal Trials, 2011.

Patient Responses to Treatments

Patient responses to specific treatments are important aspects of translational medicine, including research such as the "Expression of thymidine phosphorylase (an enzyme coded genetically that promotes tumor growth) and $-tubulin III (a cellular microtubule element) that predict response...in gastric cancer patients receiving first-line capecitabine plus paclitaxel." This report describes research aimed at predicting response and prognosis of cancer patients given chemotherapy of capecitabine with paclitaxel by analyzing tumor biopsies for expression of specific biomarkers, and associating the biomarkers with response to treatment and survival. The research is published in BMC Cancer, 2011.

Detection of Rare and Infectious Diseases

Genetic translational studies include the analysis of rare, genetically predetermined "Birt-Hogg-Dube" renal tumors as genetically distinct and associated with up-regulation of a mitochondrial gene, reported in BMC Medical Genomics, 2010.

Rare diseases are the subject of a report describing the development of a quantitative immunoassay (ELISA) for the detection of IgA (Immunoglobulin A) autoantibodies specifically associated with rare autoimmune skin-blistering pemphigoid diseases, published in the open access Orphanet Journal of Rare Diseases, 2011.

Another assay reported is a methylation-sensitive assay of DNA for detection of p16 cyclic-dependent kinase inhibitor (CDKN 2A) methylation as a diagnostic biomarker for cancer risk in human tissues, in BMC Medical Genetics, 2011.

Translational research includes studies of infectious diseases common to certain parts of the world. The assessment of a rapid diagnostic test for typhoid fever in rural Tanzania is reported in BMC Infectious Diseases, 2011. Changes in secretion of a protein (IP-10) in response to specific RD1 peptides in whole blood that occur between baseline and therapy completion as a biomarker for monitoring tuberculosis therapy, reported in BMC Infectious Diseases, 2011.

Assays for Cancer Risk

Translational research targets assays for cancer risk, by applying methods and principles of "functional genomics," the analysis of functions of genetically-coded proteins, to define "at-risk" populations.

When mutated, some genes influence cancer susceptibility. The same genes code proteins that function to repair damaged DNA in the cell by homologous recombination. For example, one gene, RAD51, acts with other genes in a DNA-repair process, and in combination with a few of those genes also influences susceptibility to cancer-risk. Therefore, perturbation of the DNA damage-response in cells is theorized to be fundamental in leading to certain cancers. In several studies, the role of the protein MRG15 (MORF4L1 gene) in DNA-repair and its possible association with other gene products known to be associated with increased risk of cancer was investigated. However, although the knowledge of functioning of MRG15 in DNA-repair by homologous recombination was expanded, no strong association with proteins already associated with increased cancer risk was found. The research was reported in Breast Cancer Research, 2011, with an author-list of over 125 researchers representing institutes and consortia of translational, biomedical, and oncological institutes from around the world, including Spain, Netherlands, Germany, China, Australia, the United Kingdom, and the United States.

Translational Research Unites University and Industry

The efforts to make possible a faster delivery of new technologies and chemical compounds that increase positive outcomes in human health practices may bring together universities, research groups, and industry, one aspect of the future envisioned by Kentucky legislators.

The University of Kentucky recently became one of 65 centers funded between 2006-2012 to expand academic homes for translational research, and engage and train new communities of researchers (see below). In 2010 the NIH established the new National Center for Advancing Translational Sciences (NCATS).

However, some critics have questioned the impact of the new institute on the organization and budgets of existing NIH research-funding institutes and centers. Other expressed concerns are related to the proportion of federally-funded translational research centers as opposed to private sector funding of this applied research. In 2006, the National Science Foundation (NSF) reported that the federal government, historically the primary source of support for basic research, funded an estimated 62% of basic US research, and 65% of basic research in universities, and spent 43% more on basic than on applied research in 2004. In the same time, the business and industry sector accounted for half of applied research funding. This trend has continued, and currently, business and industry spend more than four times on applied research than what they spend on basic research (NSF Indicators 2006, 2010). Shifts in funding by NIH institutes may result in shifts in the proportion of federal versus private sector funding of this important line of research.

References

Coller, B.S. & Califf, R.M. (2009). Traversing the valley of death: A guide to assessing prospects for translational success. Sci Transl Med.2009 December 9, 1(10) 10cm9. doi: 10.1126/scitranslmed.3000265 (Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2879158/?tool=pmcentrez)

National Science Board. (2006). Science and Engineering Indicators, 2006. Two volumes. Arlington, VA: National Science Foundation.

National Science Board (2010). Science and Engineering Indicators, 2010. Two volumes. Arlington, VA: National Science Foundation. (Retrieved from http://www.nsf.gov/statistics/seind10/c0/c0i.htm)

Nature News (December 2010). NIH Director wins bid for translational medicine centre. Published online. (Retrieved from http://www.nature.com/news/2010/101208/full/news.2010.650.html

Submitted by Mary Janssen, Ph.D.
Member-at-Large, KAS Governing Board

Bench to Bedside: UK receives $20 million to accelerate research from lab to health-care solutions

In the world of cutting-edge medical research, many pivotal discoveries are made by basic scientists working in laboratories. From there it can be a long and arduous process for these discoveries to find their way into hospitals and clinical settings as new drugs or treatments.

In June, the University of Kentucky was awarded a $20 million grant by the National Institutes of Health (NIH) to help move research discoveries to health care solutions more quickly through translational science, a discipline charged with helping research make the translation "from the bench to the bedside."

The five-year funding, awarded through the NIH's institutional Clinical and Translational Science Awards (CTSA) program, will be used to support research at UK's Center for Clinical and Translational Science, making it part of a select national biomedical research consortium. The NIH launched the CTSA program in 2006 to encourage collaboration across scientific disciplines and spur innovative approaches in tackling research challenges. The UK Center for Clinical and Translational Science (http://www.ccts.uky.edu/) is the only designated CTSA in Kentucky and one of only 60 nationwide.

The UK center is led by Dr. Philip Kern, associate provost for clinical and translational science, who will serve as principal investigator of the program. Kern emphasized the multidisciplinary, collaborative nature of translational research. "One example at UK is the integration of our research strengths in cancer, heart disease and diabetes with our strengths in pharmaceutical sciences and biomedical engineering to develop novel drugs and medical devices," Kern said.

The funding will be used to support essential infrastructure including supporting the Clinical Research Development and Operations Center (CR-DOC) located at UK Albert B. Chandler Hospital, where patients participate in clinical research studies. It also will be used for educational programs for future investigators, for community engagement, to fund research pilot grants and an informatics program.

Submitted by Kristi W. Lopez, Director
UK Medical Center Public Relations

UK's Outreach Center Makes Health Sciences Fun and Accessible

Allison Perry, University of Kentucky News

LEXINGTON, Ky. (Aug. 5, 2011) - The first time you walk through the doors of the University of Kentucky Outreach Center for Science and Health Opportunities, you might be surprised by what you see. Full-size skeletons. Lungs of all shapes and sizes, from the mighty set of a thoroughbred down to the tiny pair from a mouse. A spinal cord, neatly dissected for inspection. All real, all preserved for learning.

It's all part of introducing young Kentuckians to the wonders of the human body. Started in 1993 by Dr. Donald Frazier, who serves as its director, the Outreach Center has helped educate thousands of Kentucky kids about the world of science and has facilitated the progress of young people toward health-related careers including biomedical research. Frazier and other faculty give age-appropriate presentations on gross anatomy, genetics, physiology or health career options.

For the younger set, that may mean something like a discussion and ultrasound demonstration of how the circulatory system works. For older kids, it may mean the chance to hold a real human brain or heart in their hands for some hands-on learning in anatomy.

The Outreach Center was created, says Frazier, because the College of Medicine saw a need to motivate kids to take an interest in science.

"Initially, the Outreach Center was a way to get kids to appreciate the basic tools inherent in science – in other words, not to run away from chemistry or math and other related subjects," Frazier said. "And to really motivate them to stay in school and take care of themselves. We were to be a resource for the classroom teachers throughout the state."

These days, the Outreach Center is multi-faceted. In addition to being a resource for teachers during the school year, the center hosts several summer programs, including ones targeted for minority and rural students. But the center's biggest summer program is the Professional Education Preparation Program for students interested in medicine and dentistry, known as PEPP.

PEPP was developed after the state passed a bill mandating that UK and the University of Louisville make a concerted effort to make young Kentuckians from targeted underserved counties more competitive for careers in health care. To attend this popular program, students must be residents from one of the 90 rural counties or two urban areas designated as an underserved population.

PEPP is divided into two steps – PEPP I, which is for students who have just graduated high school and will be entering college as freshman the following fall, and PEPP II, a more in-depth program for older college students who have completed the first phase and have a definite interest in health care. These students will get to experience medicine being practiced firsthand, with rotations in the operating room and labor and delivery, as well as clinical site visits for dentistry, psychiatry and pediatrics.

"We started with PEPP I by bringing in these high school seniors and introducing them to college professors and exposing them to the level at which these courses would be taught, how to take notes, how to take exams," Frazier said. "Then we sort of said, well, if you're going to get the students motivated and into the program, we need to follow up. PEPP II is focused on helping these kids become more competitive when they start applying to schools in medicine and dentistry."

Outreach Center Director Donald Fazier is also the KAS's Executive Secretary Emeritus.

Korey Brammell, a PEPP II student from Grayson, Ky., says the program has helped solidify the career path he wants to take.

"I did the first PEPP after my senior year, and it was one of the best experiences I've ever had," Brammell said. "It completely confirmed that I wanted to go to medical school. I joined PEPP II because I wanted to get more experience."

Brett Dickens, another PEPP II participant from Owensboro, Ky., says the program is helping to prepare him for what to expect in the real world.

"I think PEPP gives us a better general understanding in both medicine and dentistry, as far as working conditions and what we can expect to see," Dickens said. "They are teaching us a lot as far as patient care, and what it's going to require of us in the future."

Getting help to prepare for the MCAT is another huge benefit to joining PEPP II, says Elliott House of London, Ky., a sentiment his classmates echoed.

"Many of my friends would agree with me that the MCAT preparation is one of the biggest benefits," House said. "Many of us are at that point in our college careers right now where we need to be gearing up for graduate school testing."

One of the biggest draws of the Outreach Center is Frazier himself, who is a professor emeritus in the College of Medicine and Biomedical Engineering. High-energy and personable, Frazier keeps his presentations light and lively, drawing even his quietest students into discussions like ethics and morals in health care.

Though he officially retired from the university 10 years ago, he still serves as director of the Outreach Center, earning his salary from his current grant, which runs until 2014. But Frazier continues his work at the center because he truly loves what he does – getting young people interested in health and science.

"This is fun for me," Frazier said. "The bottom line is that these kids are awesome, the human body is awesome, and they have an awesome responsibility to learn to take care of it."

Teachers from across the state can request a visit to the Outreach Center – or a visit from the center's mobile classroom – by contacting tour coordinator Lisa Stevens at (859) 257-6440 or lmstev4@uky.edu. For more information on PEPP Scholars, contact program director Carol Leslie at (859) 257-1968 or ctsnyd0@uky.edu.

Kentucky Heritage Land Conservation Fund

Invasive species (Part II): Terrestrial species.

Drs. William H. Martin and Richard K. Kessler
Zeb Weese (KHLCF Biologist Consultant) - Contributor

In the last issue we discussed the significance of aquatic nuisance species (ANS) in reducing aquatic biodiversity and the role of the Kentucky Heritage Land Conservation Fund (KHLCF) in addressing this issue. Of no less importance is the role of invasive terrestrial species, including exotic plants and pathogens, in reducing terrestrial biodiversity in the Commonwealth. Whether introduced purposefully or accidentally by man, invasive non-native plants are devastating to natural resource production (eg., chestnut blight and the American Chestnut), costly to control and are one of the leading threats to local, regional and global biodiversity and ecological integrity.

On August 11, 2011, ScienceDaily.com reported approximately $1.4 trillion dollars annually are spent in invasives species control in the United States. While much of this expense is in an agricultural context, the effects of invasives on natural areas are well documented; invasives are generally regarded as the second most significant threat to biodiversity after habitat loss by land development. Some of the species most commonly associated with KHLCF projects include Tree-of-heaven (Ailanthus altissima), bush honeysuckle (Lonicera spp.), garlic mustard (Alliaria petiolata), common chickweed (Stellaria media), and Japanese stilt grass (Microstegium vimineum). Each of these species impacts natural areas slightly differently; some alter soil conditions making it difficult for native plants to adapt, while others simply crowd out their competitors. For example, bush honeysuckle is strongly allelopathic and highly infested areas will typically create large "dead zones" devoid of any native plants under its canopy. Stiltgrass usually invades riparian corridors and crowds out other species through prolific seeding; one tiny seedhead can produce a thousand seeds which will remain viable for seven years.

As with the protection of aquatic biodiversity from ANS, the preservation of intact, functional terrestrial ecosystems is an important tool to reduce the threat of invasive plants. Although most properties acquired through KHLCF funding are fairly high quality, functional ecosystems, all of the sites are impacted by invasives species to some degree. Because of this, KHLCF project managers are required to report and/or document the presence of invasive plants and are provided funds for the management of these unwanted species. However, invasive management is never a simple, short-term process. While many invasives can be effectively controlled by manual removal or chemical application, routine follow-up is required to prevent reestablishment. In some cases more extensive restoration is required, such as the planting of native species of local genotype. On a large site this can be an expensive, labor-intensive, long-term undertaking.

Unfortunately, the list of invasive terrestrial species is not limited to plants. In recent years the hemlock wooly adelgid (HWA), an aphid-like insect of Asian origin, has decimated Eastern and Carolina hemlocks throughout the eastern U.S. After they become established in an area, hemlock mortality is virtually 100%. As hemlocks are a keystone species in many riparian corridors in eastern Kentucky, and less commonly in the Mammoth Cave area, their loss would prove devastating to these natural communities; light availability in these coves would drastically increase, altering habitat for native flora and creating new niches often exploited by invasive plants, as well as increasing water temperature in creeks and streams, potentially reducing habitat for native aquatic fauna. HWA was first found in Kentucky in 2006 and is now found in most areas where hemlocks are located. White-nose syndrome (WNS), a condition which threatens to render extinct most of Kentucky's native bat population within the next few years, is believed to be caused by a cave fungus native to Europe and only recently brought to America. Both of these examples, and many others, point to the importance of early detection of, and rapid response to, invasive species. At times research into the ecology and control of new invasives does not move as fast as the invasions themselves.

While some common invasive plants (stiltgrass, chickweed, et al) have been accidently introduced over the years, many others are planted on purpose as ornamentals. Landscaping throughout the commonwealth frequently includes invasive honeysuckles, wintercreeper (Euonymus fortunei), and burning bush (Euonymus alatus), among others, because the same qualities that make them highly invasive also make them easy to grow and maintain - they reproduce prolifically and are difficult to kill. Often invasive species are unapologetically thrust upon the public by horticulturalists and landscape nurseries with little discussion about the potential negative ramifications for planting such species, and rarely an explanation of suitable native counterparts for the landscape. Although there is increasing interest in native plant gardening, it remains a very small niche market and receives very little support from a horticulture industry.

In order for a site to qualify for KHLCF funding, they much meet specific criteria such as providing habitat for rare, threatened or endangered species or protecting natural functions may be subject to loss or alteration. Because many KHLCF-funded projects are associated with rare plant or terrestrial communities, from large forest blocks in eastern Kentucky to small native prairie remnants in south-central and western Kentucky, controlling invasive plant infestations is critical to the protection of our natural heritage. However, since well over 90% of the Commonwealth is owned and managed by private interests, it is imperative that a greater emphasis be placed on prevention of the introduction of invasive species by the private sector.

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For additional information about the Fund visit our web site at http://heritageland.ky.gov. All KAS members can support the KHLCF by buying a nature license plate at their next renewal; ten dollars goes to the Fund for each plate sold.

Save Kentucky's Hemlocks

Hemlock wooly adelgid infestation. Chris Evans, River to River CWMA, Bugwood.org.

Many of the KHLCF partner agencies have joined together under the "Save Kentucky's Hemlocks" banner to address the hemlock wooly adelgid problem. For more information contact Alice Mandt at the Kentucky Division of Forestry at alice.mandt@ky.gov. The websites below are also excellent sources of information concerning specific invasive species issues facing Kentucky.

The Kentucky Exotic Pest Plant Council:

http://www.se-eppc.org/ky/

The University of Kentucky Invasive Species Working Group:

http://www.ca.uky.edu/invasives/

2011: The International Year of Forests

The United Nations General Assembly declared 2011 as the International Year of Forests to raise awareness on sustainable management, conservation, and sustainable development of all types of forests. The ***Forests 2011*** web site serves as a global platform to celebrate people's action to sustainably manage the world's forests. This web site provides information regarding events being organized throughout the International Year as well as interactive web tools and resources to promote dialogue on forests. Visit ***Forests 2011*** at the URL below.

http://www.un.org/en/events/iyof2011/

Kentucky Space Announcements

Kentucky Space conducted a near space (high-altitude) balloon launch on Saturday, August 27, at Jacobson Park off Richmond Road in Lexington. This mission is part of "Dropzone", a new high-altitude balloon educational effort of KS. Students from the University of Kentucky Space Systems Lab and Morehead State University Space Science Center helped lead the launch and ground tracking operations. These near space balloon missions can reach altitudes of over 100,000 feet and can conduct a variety of experiments.

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On August 17, in Yasny, Russia, on the Kazakhstan border a Dnepr rocket successfully launched a satellite with space hardware designed and built by Kentucky Space (KS) and led by a team at the Morehead State University Space Science Center. The launch was flawless and orbital insertion was confirmed 960 seconds after liftoff.

The satellite, called EduSat, was built by mission partner the University of Rome with components built by the Morehead State University Space Science Center (MSU) and Kentucky Space (KS). Dr. Ben Malphrus, Chair, Department of Earth and Space Sciences, Morehead State University and Space Operations Director at KS, was at the launch site in Russia.

EduSat is a collaboration between the University of Rome, the Italian Space Agency and KS, led by the Morehead State University Space Science Center. EduSat will test a novel orbital deplorer designed to release very small "femto-class" satellites called PocketQubs™ invented by Bob Twiggs, former director of the Space Systems Development Lab at Stanford University and now a professor at Morehead State University.

The mission goal of the overall project is to develop, build, and fly a series of four unique satellites that are designed, built, and operated by university students. These satellites are to be built in Rome and Kentucky, integrated at the University of Rome, launched on Russian Dnepr rockets from Russia and controlled from the lead KS on-orbit ground operations facility at MSU led by students using the 21-meter space tracking antenna there and by Italian students using satellite ground assets in Europe.

"The successful launch of EduSat this morning represents a major step forward in Kentucky Space's ambitious goal of building a dynamic entrepreneurial space enterprise and industry in Kentucky," said Kris Kimel president of Kentucky Space. Dr. Malphrus offers more detail in a videoavailable at http://www.kentuckyspace.com.

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The successful Space Shuttle landing of Atlantis ton July 21 made history…marking the end of an important era in global space exploration....and Kentucky played a role in this historic mission. KS provided real-time ground support operations (Ops) for NanoRacks LLC for several payloads that the company flew on Atlantis. This mission support was led by the KS affiliate Grounds Ops Center at the Systems Space Systems Lab at The University of Kentucky College of Engineering.

The final Ops report filed by KS read as follows "On Atlantis Flight Day 12 at 12 hours and 19 minutes on the final Space Shuttle Mission the last CubeLab® Shuttle ground Ops activities were successfully completed….no anomalies".

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Kentucky Space is a nonprofit enterprise involved in designing and developing R&D, educational and entrepreneurial space platforms. It involves a collaboration of colleges, universities and organizations including Morehead State University, University of Kentucky; University of Louisville; Murray State University; Western Kentucky University; Kentucky Community and Technical College System, NASA Kentucky Space Grant Consortium and EPSCoR Programs, Kentucky Council on Postsecondary Education; Kentucky Science and Engineering Foundation; Kentucky Science and Technology Corporation (Managing Partner) and Belcan.

Shared by Dr. John Mateja, Director, Murray State University McNair Scholars Program