Environmental Aquatic Resource Sensing

EARS IGERT newsletter

Volume 1, Issue 2

August 2010

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Upcoming events:

- Save the date: Lacawac meeting is September 9-12 (Thursday-Sunday)
- Graduate student professional development workshop series resumes in the Fall

EARS IGERT Newsletter

Greetings, everyone!

This is the second in the series of newsletters for EARS IGERT NSF grant project, "Environmental Aquatic Resource Sensing (EARS): Basic Science, Business Education and Outreach."

Exciting progress has been made during the past few months and we hope that you enjoy reading about the accomplishments of the IGERT faculty and trainees,

We invite you to submit, throughout the upcoming months, your achievements, projects and photos by contacting mlnagell@kent.edu.

Please feel free to share information about IGERT with your colleagues and friends, Copies of the newsletter can be downloaded from our web page at http://bioweb.kent.edu/igert/ . Ask us about marketing materials, too!

Please join us in welcoming new KSU and Miami trainees. Valerie Finnemeyer, Adrienne Hopson, and Patricia Johnson will join the Kent cohort. Rocky Patil and Laura Webb will join the Miami cohort.

Buoy Launch - Miami

The Acton Lake EARS IGERT Buoy has been up and running for two months now, and is actively collecting data. In addition to sensors originally installed on the buoy, a phycocyanin sensor, on loan from the Williamson Lab, has been temporarily added to the buoy to measure concentrations of blue-green algae in Acton Lake. The current buoy conditions are now available online at: http://v4.wqdata.com/webdblink/mj_vanni.php. The alpine EARS IGERT buoy has also been launched in Beartooth Lake, a subalpine lake in northern Wyoming. This buoy was launched just following ice break up in late June and is already giving interesting signals of rapid change in the lake as thermal stratification sets up.

Miami IGERT student Susanna Scott is currently using Acton buoy data in her research to determine the influence of storm events on reservoir metabolism.

Some results were presented in June at the ASLO/NABS joint meeting in Santa Fe, NM. Susanna's research found increases in gross primary production and respiration following storm events, potentially linked to increases in nutrients in the system.

Miami IGERT students Kevin Rose and Jeremy Mack are doing research on optical indicators of environmental change as well as the ecology of infectious disease in the lakes in the Beartooth Mountains. Kevin Rose presented his research at the ASLO/NABS meeting as a poster comparing indicators of allochthony in high mountain lakes.

OUR COHORTS

EARS IGERT is funded by NSF

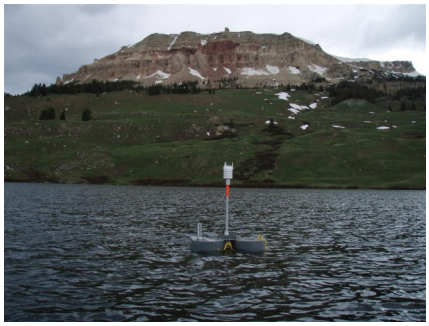
Buoy Launches - Kent

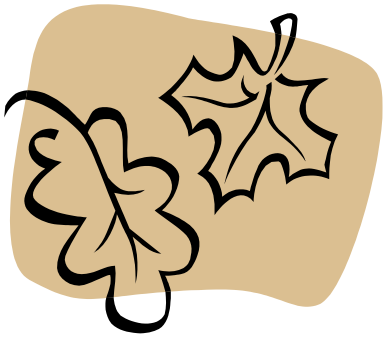
On Thursday, June 24th the final buoy was launched in Kent, Ohio. In addition to the Acton Lake buoy, EARS IGERT has a buoy that has been deployed in Alpine lakes on West Twin Lake in Kent.

The IGERT buoy joins with two others purchased by Kent that were deployed in East Twin Lake and Sandy Lake. We are presently working on establishing web based access to the data collected and plans on how to share the results of the project with the general public.

Darren Bade worked with the local lake associations to get permission for this deployment and has created flyers for distribution to local residents. Given the proximity of the buoys to a local favorite restaurant, they have already gotten lots of attention!

Alpine Buoy Launch





Alpine Buoy Kevin and Jeremy

The Kent buoys were deployed with the assistance from Steve Fondriest and his sons with assistance from Darren Bade and Kent State student, Curtis Clevinger.

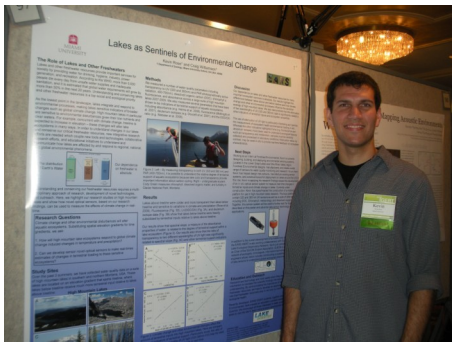
We were also fortunate to have assistance from some local residents who allowed us to use their boats and helped pilot the craft. Other than a massive, but thankfully short, downpour during lunch, the launch went off without a hitch and the buoys began to send back data to the company. One of our goals is to help use these buoys and the data they collect as a tool to help keep residents informed about the lakes and as a platform for education and outreach.

In keeping with the latter goal, information about the buoys and a video of Bade, shot in the field, explaining the buoys was shared with high school students participating in Upward Bound at Kent State this summer. Upward Bound is funded by a federal grant as part of the TRIO program and seeks to " help students overcome, class, social, academic, and cultural barriers to higher education" (http://explore.kent.edu/ub/). This was part of the water week we do with these students and they also learned about microbiology, nutrients and plotted diel oxygen concentrations in the lake.

Annual IGERT PI Meeting in Washington, DC

Annual IGERT PI meeting

Laura Leff and Kevin Rose attended the annual IGERT PT meeting in Washington, DC from May 23-25, 2010 at the Capital Hilton. Each IGERT was represented at this meeting and each trainee presented a poster at an evening poster session. The event included opportunities to network with faculty, trainees, and coordinators from various IGERTs. Presentations and sessions covered: digital science (including presentations on open notebook science, blogging, the Journal of Visualized Experiments, and "teaching science in a digital world") and a keynote presentation on science ethics by Seth Shulman author of "The telephone gambit: chasing Alexander Graham Bell's secret".



There were also various breakout (organized by group or IGERT topic area) and discussion sessions covering topics ranging from broadening participation in your IGERT, post-IGERT trainee careers and paths, science ethics case studies for trainees, use of digital technologies, and the IGERT of the future. During the digital technologies in research and education session, Kevin shared lakescientist.com with the rest of the participants in our session.

The date and location of next year's meeting have not yet been set but we will share that information when it becomes available. As for this year, one trainee will be selected to participate (only one trainee and one faculty member from each IGERT can attend for logistical reasons) and we will share the mechanism for selection of the trainee as the date approaches.

Fondriest Environmental

During the 2009-2010 academic year the first cohort of EARS IGERT students worked to complete a new online education resource dedicated to providing objective and interesting information about important lake issues. This resource, created together with Fondriest Environmental, was part of the EARS IGERT cohort project. Fondriest Environmental of Beavercreek, Ohio, wanted to create an online resource for those interested in lake issues and technology. Partnering with EARS IGERT students provided a means to create original, high quality, education content. Issues include everything from "extreme lakes" to water quality issues such as harmful algal blooms and eutrophication. Content on lake technology is also included, including physical, chemical, and biological sensors. The website also hosts a number of unique lake pictures that rotate across the front page, providing a visually appealing entrance and hook to the site. All EARS IGERT students, faculty, and affiliates are invited to submit photos to be included on the main page as well as generate unique content on the site (email Kevin Rose at RoseKC@muohio.edu if interested). Additionally, students ask that word of the site is spread to highlight important lake issues. It is a hope that the site can be a useful resource for students, professors, educators, scientists, and managers.

Check out
http://www.lakescientist.com/

IGERT Trainee Presents in Europe

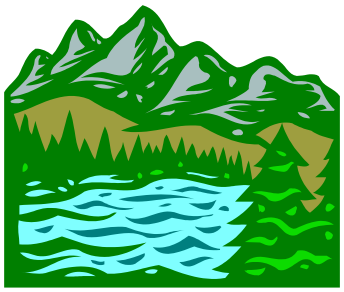
This summer, Ms. Sarah Hicks participated in the CRELIC-IRES fellowship which was funded by the National Science Foundation and under the direction of LCI professor Prof. Antal Jakli (http://www.lci.kent.edu/crelic_ires/index.html). This fellowship sends three to four American students a year to participating laboratories across Europe to conduct research projects on liquid crystals. Ms. Hicks was assigned to Prof. Helena Godinho's laboratory at the University of New Lisbon in Portugal. Her project was developing a liquid crystal display called polymer-stabilized vertical alignment mode LCD using electro-spun liquid crystal cellulose fibers as a stabilizer. For four weeks, she spent the time learning out to make these fibers, assembling samples after depositing the fibers and liquid crystal material, and sample characterization. After her assignment, she attended the 23rd International Liquid Crystal Conference (ILCC) in Krakow Poland where she presented a poster titled "Improvement of response time of VA LCD by polymer stabilization." She credited the EARS-IGERT grant for the research that she presented in ILCC.

Meet our trainees

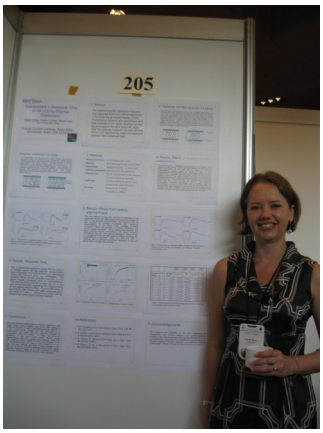
Each issue we will provide a brief profile of some our trainees and faculty members. In this issue we highlight three individuals: Kevin Rose, a student at Miami University, who is part of our first cohort, Sarah Hicks, also a first cohort member and a student at Kent State University, and Darren Bade, an Assistant Professor in Biological Sciences at Kent State.

KEVIN ROSE

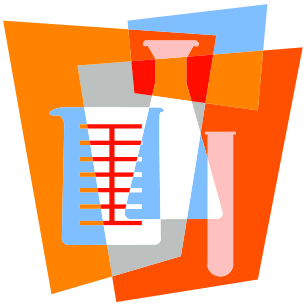
Kevin Rose is a PhD student in the Department of Zoology at Miami University working with Dr. Craig Williamson. Kevin is an EARS IGERT student, an active member of the Global Lake Ecological Observatory Network (GLEON), and recently completed an internship at Fondriest Environmental where he helped construct the EARS IGERT buoys. Kevin's research focuses on understanding optical indicators of allochthony and carbon cycling in aquatic ecosystems. Kevin is interested in developing lake transparency indices to serve as sensitive indicators of how lakes respond to environmental changes. To gather a large data set from a variety of lakes, Kevin has traveled around the world collecting optical data from locations outside the United States such as New Zealand, Chile, and the Canadian Rockies, as well as regions in the U.S. such as Lake Tahoe, the Absaroka-Beartooth Mountains, and the Poconos. He is also involved with GLEON, the Global Lake Ecological Observatory Network where he recently completed his term as chair of the GLEON Student Association. For more information, visit GLEON's website at www.gleon.org.



SARAH HICKS



Sarah Hicks is a 5th year Ph.D. student from the Liquid Crystal Institute. Her research area is studying the physics and applications of liquid crystal and polymer composites. Her project for the EARS-IGERT project, under the direction of her dissertation advisor Prof. Deng-ke Yang and LCI professor Prof. Qi-huo Wei, is creating three dimensional microstructures out of liquid crystal elastomer films in hopes to develop an environmental sensor. Her hometown is Pensacola, FL and her hobbies include studying foreign languages, belly dancing, and skiing.



DARREN BADE

Water Quality Monitoring Buoys

Thanks to cooperation from the Twin Lakes Association, Kent State University has deployed water quality monitoring buoys in both East and West Twin Lakes. These buoys will be used for teaching and research at Kent State and Miami University as part of their Environmental Aquatic Resource Sensing program. This program is funded by a grant program from the National Science Foundation called the Integrative Graduate Education and Research Traineeship to train students in cutting edge technology of environmental science.

The buoys monitor various parameters at high frequency (every 10 minutes). The equipment above the water measures temperature, humidity, barometric pressure, wind speed and direction, rainfall, and solar radiation. Underwater, instruments measure dissolved oxygen, pH, turbidity, conductivity. Finally there is a string of thermistors that measure temperature from the surface to the bottom at 1 meter intervals. All of these combined allow us to better understand the interplay of physics, chemistry and biology in lakes.

The equipment is made to be fairly robust, however if improperly handled thousands of dollars of damage can easily occur. Therefore we **kindly ask to please keep a reasonable distance** by remaining outside of the round buoys which hold the central instrument buoy.

Beyond the research and training that we can garner from this data, we hope that the data will be of interest to those living and recreating in the Twin Lakes Area. Near real-time data will be available on the internet. Swimmers and fishers may want to check water temps, sailboaters might check wind speed and others might just be curious of what is happening in the lakes. To find the data go to http://biology.kent.edu/IGERT/ (Note: our website has not yet been updated to make this data available, but please look for it in the near future).

Similar buoys to this have also been placed in Sandy Lake and Acton Lake. In addition there is a worldwide network of buoys known as the Global Lakes Ecological Observatory Network that these buoys will be linked with.

For further information or questions, please contact Darren Bade, Assist. Prof., KSU at 330-672-4639 or email at dbade@kent.edu

EARS IGERT

Want more information? Contact us at the address , phone number or e-mail below. You can also go to the web page to get contact information for our faculty participants and find links to our participating
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EARS
Environmental Aquatic Resource Sensing

http://bioweb.biology.kent.edu/igert/

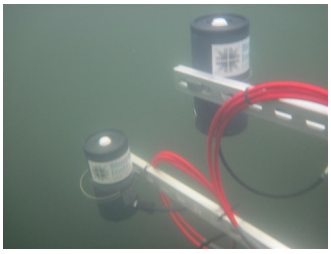
Latest News & Accomplishments

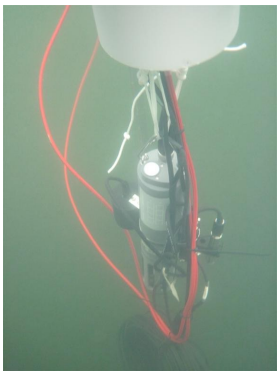
CHRIS WOOLVERTON AND OLEG LAVRENTOVICH , et al. received patent # 7,732,219 awarded by the US Patent and Trademark Office on June8, 2010. This patent further defines the use of optical sensors by creating enzyme based reporting systems to reveal the captured ligand. They have also presented this year: S.E. Fiester and C.J. Woolverton, **Formulation of Chitin as a Liquid Crystal Biosensor** to the Ohio Branch of the American Society for Microbiology, April 16-17, 2010 and S.E. Fiester, A. Jakli, and C.J. Woolverton, **Liquid Crystalline Properties of g8p, The Major Coat Protein of *fd* Bacteriophage** to the 84th Colloid & Surface Science Symposium, Akron, OH, June 20-23, 2010

LAURA LEFF - M. Barlett and L. G. Leff. 2010. The effects of N:P ratio and nitrogen form on four major freshwater bacterial taxa in biofilms. Canadian Journal of Microbiology, 56:32-43.

CRAIG WILLIAMSON and KEVIN ROSE - Paper that resulted from IGERT efforts; to be published week of August 1, 2010. Williamson, C.E., and K.C. Rose. 2010. When UV meets freshwater. Science, 329:637-9.

Alpine buoy!!





Professional Development Workshop

The workshop series resumes in fall with an orientation for new science graduate students and then on ***September 13th Robin Selinger*** will do a presentation on applying for graduate and post-doctoral fellowships. In October, we will cover career pathways in academia.

The students have created a facebook page and a web page about the workshops….details are at:

Facebook:

http://www.facebook.com/topic.php?topic=4&uid=102798126423790#!/group.php?v=wall&gid=102798126423790

Webpage: http://sites.google.com/site/ksumentoringworkships/

Thanks to the members of the EARS INTERNAL COMMITTEE! We've got one representative in each of the participating departments in Kent State and Miami.

THANK YOU!!

Miami

Chemistry, G. Pacey

Geography, W. Renwick

Geology, H. Dong

Microbiology, R. Morgan-Kiss

Zoology, C. Williamson

Kent

Biology, A. Leff

Chemical Physics, Q. Wei

Chemistry, R. Twieg

Geology, A. Smith

Geography, M. Munro-Stasiuk