

Biolaque

Wright State
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Department of Biological Sciences

Inside this Issue:

Amazon Trip.....	2
Fall '09 Graduates.....	2
Community Outreach....	3
Coming and Going.....	3
Bio in the Air Force....	4
Dr. Amon retires.....	4
Student Fact Book.....	5
Winter Seminars.....	5
Winter '10 Calendar...	5
Bio Honors.....	6

A Note From The Chair...

As I write this, delegates from around the world are gathered in Copenhagen to discuss global climate change. At the same time, members of the public avidly express their opinions about the scientific facts, and survey results indicate that fewer Americans now accept the truth of climate change. Doesn't that seem odd? What can we learn from this about the nature of science and its role in societal decision making? Let's consider several aspects of the issue:

What is global climate change? What used to be called "global warming" is now usually called "global climate change." The reason is that climate change is complex. While an overriding element of the pattern a rise in global average temperature, that overall pattern encompasses a variety of manifestations, including warming in some places and cooling in others (not every season, in every locale, will be warmer this year than last), shifts in precipitation patterns, and increased variability or occurrence of extreme climate events.

How does one assess global temperature? You might think that assessing temperature change would be straightforward: take some temperatures, look at trends. However, measuring small

changes in global average temperature is not so easy. In recent decades, that evaluation has included both direct measures of temperature on the ground and by orbiting satellites, as well as evaluation of "proxy" data that can indicate the effects of temperature—for example, the melting of glacial snow or polar ice, the timing of bird migrations, and the dates at which wildflowers bloom. For the years (centuries, millennia) before these sorts of data were collected, other proxies are used, such as widths of tree rings, identity of pollens in lake sediments, and isotopic composition of gases trapped in ice cores. Collectively, these data indicate that climate has changed repeatedly over Earth history, that we are now in a relatively warm period by geologic standards (20,000 years ago, much of Ohio was covered by the Wisconsin glacier), and, according to the consensus view of climatologists, that global climate has measurably warmed in recent decades.

What factors drive climate change? Explaining climate is notoriously difficult; climate is an example of a "complex system," in which many factors contribute and small changes in conditions at one time can lead to significant later consequences (the "butterfly effect"). Among the variables contributing to global temperature are the composition of the atmosphere

continued on page 2...

Summer Research Opportunities

Many institutions across the country offer programs to support student research experiences during the summer. A couple of good sites to check out for these opportunities are Wright State's

Undergraduate Research (UROP) site
(<http://wright.edu/urop/research/summer.html>)

and the National Science Foundation's REU (Research Experiences for Undergraduates) program,
http://www.nsf.gov/crssprgm/reu/reu_search.cfm



Note that applications for most of these programs are due during Winter quarter.

Bio student receives award



Sharon Ochs, a senior biology honors student, received a prestigious student travel award from Pfizer Pharmaceuticals and the Society of Toxicology. The award will support Sharon's attendance at the 2010

meeting of the Society of Toxicology in Salt Lake City, Utah. Sharon has conducted her research in the laboratory of Dr. Courtney Sulentic, studying how dioxin transcriptionally regulates the immunoglobulin heavy chain gene.

1st Annual WSU Student Research Celebration

Keep your eyes open for announcement of the First Annual WSU Student Research Celebration, scheduled for April 16, 2010. Registration and abstract submission will open in early 2010.

See www.wright.edu/urop.

Chair's Note, continued...

(e.g., abundance of “greenhouse gases,” including carbon dioxide, methane, and water vapor), properties of the oceans (e.g., their ability to absorb CO₂ and heat), the reflectivity of the Earth's surfaces (related to the extent of ice cover), and Earth's orbital and rotational path (Milankovich cycles). Thus, predicting the future of global climate depends on complex mathematical models and the interaction of interdisciplinary teams of scientists.

What is the human contribution to climate change? Clearly, only some of the factors noted above can be influenced by humans—most notably, the concentrations of certain gases in the atmosphere, including CO₂. When one considers human-caused global deforestation in the past century (trees absorb CO₂ in photosynthesis), and the accelerating rates of combustion of those trees and of fossil fuels like coal and oil (burning organic fuels liberates CO₂), it seems hard to escape the conclusion that humans are responsible for the well documented rise in atmospheric CO₂. By itself, that rise would be expected to lead to increased “greenhouse effect” (trapping of radiated heat) and, hence, global warming. It remains difficult to quantify the precise contribution to climate change of rising CO₂ relative to other factors. Nevertheless, as noted above, atmospheric CO₂ is likely the contributing factor over which we could have the most control.

What should we do? Although people love to talk about the weather, the real subjects of public interest are the possible consequences of climate change, and the impact of steps that might be required to assert control over that change. If we accept that climate change is real and that humans contribute to that change, what should we do about it? Can we or should we seek to improve energy efficiency (of factories, vehicles, houses), or to develop non-fossil-fuel power sources (solar, wind, tidal, nuclear)? What should be the roles of industry, or of government? What should be the balance of responsibility among various countries or regions of the world? These are tough questions of politics and economics, not of science.

Take home messages: Climate science is challenging; it is interdisciplinary and complex and, by its nature, contains uncertainty. Nevertheless, questions of science, relying on data —like “is climate changing?”--should be resolved by scientists, not by politicians or the media. It is certainly responsible for politicians to ask scientists about their confidence in the data and predictions. But beyond that, science can only inform societal decision processes—for example, it can address the theoretical energy yields of solar power, or the consequences to sea level of a change in global temperature. But the decisions about what to do in the face of that information—those are questions of politics, not of science, and they must weigh national values, economic impacts, and political philosophies.

Climate change is likely to remain a contentious issue that you will be dealing with for many years. Potential consequences of climate change are far reaching, including effects on biodiversity, food crop production, water availability, shipping routes, and more. As science students, you should be in a better position than most to evaluate the evidence, and to weigh the relative risks of alternative courses of action. Personally, I make no claims to expertise in climate science. However, I have come to accept the consensus of the experts, that global temperature is warming. Moreover, I accept the argument, based on relative risks, that was succinctly stated by Thomas Friedman in a recent column (www.nytimes.com/2009/12/09/opinion/09friedman.html):

“If we prepare for climate change by building a clean-power economy, but climate change turns out to be a hoax, what would be the result? Well, during a transition period, we would have higher energy prices. But gradually we would be driving battery-powered electric cars and powering more of our homes and factories with wind, solar, nuclear and second-generation biofuels. We would be much less dependent on oil dictators; our trade deficit would improve; the dollar would strengthen; and the air we breathe would be cleaner. In short, as a country, we would be stronger, more innovative and more energy independent. But if we don't prepare, and climate change turns out to be real, life could become a living hell.” Let's hope that good science, and good policy, prevails!

Read more at: www.globalchange.gov/ Or
www.usda.gov/img/content/EffectsofClimateChangeonUSEcosystem.pdf



Dr. David Goldstein
 Chair, Dept. of Biological Sciences

Congratulations Fall 2009 Graduates

Cassidy Byrd
Erica Dickey
Benjamin Doane
Mary Eaton
Desiree Evans
Amanda Hawkins
Jessica Hirsch
Ali Idrees
Brandon Kollar

Adam Laber
Christine Molla
Lisa Oakley
Jennifer Oellerman
Jennifer Phillips
Aneeka Qureshi
Kim Thieman
Justin Tomlin

Watch commencement live
online!

This year's commencement ceremony may be viewed live via video streaming on the internet. The webcast is free, however, you must register with the Horizon League Network to view.



Applications for June graduation are due March 1st. Make sure to see an advisor for approval.

New Student Organization

Hospice of Miami County has a new chapter at WSU. This chapter was founded to help bring awareness for Hospice and recruit volunteers.

You can volunteer either a caregiver or help with program support (performing administrative duties and helping with special events). You can work with people of all ages, children through adults, and both patients and families at Hospice and the Generations of Life Center, the bereavement center. We are hoping to have a lecture series, bake sales, and participate in many student organization fairs.

If you or know someone who may be interested in becoming involved in the chapter, please contact Erin Naas at naas.11@wright.edu, or visit our page on Facebook. You can find more information about Hospice of Miami County at www.homc.org.

Pb
Un
Week



WSU faculty active in the community

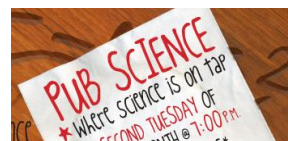
The Biology Department was active during Fall quarter in extending ourselves to the community. Examples include:

--Marcie Wendeln and the student staff in the Introductory Labs hosted several hundred high school students for **Exploring Science**.

--Dr. Lynn Hartzler led experiments in physiology with elementary school students as part of the "Phun Week" program sponsored by the American Physiological Society.

--Dr. David Goldstein gave a presentation at Blind Bob's Tavern on the topic of cryopreservation ("Frozen Alive") to kick off a new initiative (**Pub Science**) by the Boonshoft Museum. Keep on the lookout for the next in the series, scheduled for the 2nd Tuesday of each month (<http://www.boonshoftmuseum.org/>).

--Dr. Jim Amon hosted a **workshop** at Wright State on identifying, understanding, and preserving wetlands. More than 75 professionals, including biologists, developers, consultants, regional planners, and others attended.



WSU students visit Peru

In December, 6 biology students (Anna Holtvoigt, Liz Ervin, Christina Bishop, Ryan Satchell, Eric Woebbe, and Eric Shepard) and 1 chemistry student (Stephanie Gray) traveled to the western Amazon rainforest for a two week course in tropical ecology led by professors Tom Rooney and Marcie Wendeln. The journey began in Dayton, passed through Lima, Peru's capital city and Cusco, the former capital of the Incas high in the Andes Mountains. From there, the journey continued by bus down the eastern slope of the Andes, through the cloud forests, and into the Amazon.

Students traveled by boat to Manu National Park, one of the last great wilderness areas on Earth. The class stayed in lodges and at research stations in and around the park. The class saw 7 species of primates, over 150 species of birds, caiman, giant anaconda, giant river otters, tapir, capybara, leafcutter ants, blue morpho butterflies, lizards, frogs, and many others. They honed their observation skills and learned to identify many species of plants and animals.

The tropical ecology field course has been offered during Winter Intersession for the past two years, and it will likely be offered again next academic year. Enrollment is limited and highly selective. Applications are typically available in the Biology Department office in April. Consider joining us in the future!



Lindy Lauterbach**Wishing you the best of luck!**

Academic Advisor Lindy Lauterbach is now advising at the Wright State University Lake Campus. She left the department in November after advising for Biological Sciences for two years. We wish Lindy all the best on this new adventure!

Baby Roy Baumle**Congratulations Gretchen!**

Department Office Supervisor Gretchen Baumle and her husband Greg proudly welcomed their first child, Roy Gregory Baumle. He was born on December 22, 2009 at 6:41 p.m. weighing 7 pounds 9 ounces. Congratulations Gretchen and Greg!

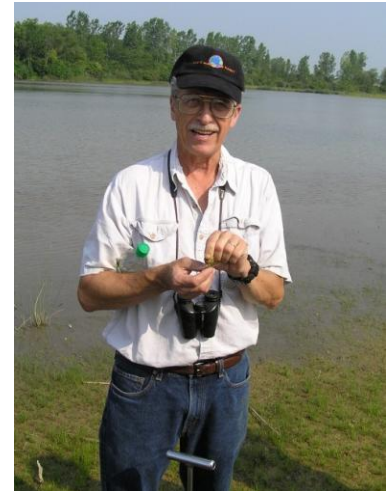
Baby Brooke Rodgers**Congratulations Meredith!**

Lecturer for the department of Biological Sciences, Meredith Rodgers and her husband Scot welcomed their first child to the family. Daughter Brooke Kay was born on September 22, 2009 at 2:13 a.m. weighing 7 pounds 11 ounces. Congratulations Meredith and Scot!

Dr. James Amon retires

Dr. Jim Amon has been a faculty member at Wright State since 1974. During that time he has had a research focus on microbiology and wetlands science, and he has taught popular classes in those subjects, always with substantial hands-on components. Dr. Amon also has had a major focus applying his scientific expertise to the local community; he founded the Beaver Creek Wetlands Association more than 20 years ago, and his efforts have galvanized that group in preserving local wetlands and transforming them into a true community resource.

Dr. Amon is retiring as of the end of 2009. He will continue to maintain a research lab at Wright State, but will also be freer to work on his projects to preserve and restore natural habitats, both locally and abroad (he will be working in Costa Rica in January). Congratulations to Dr. Amon, and thanks for all that he has contributed over his years at Wright State.

**Bio student heads overseas with Air Force**

Danielle Hawker has been an active student in the Biology Department. Danielle has worked as a laboratory preparator in the Freshman Biology Labs for several years, where she is a force for order and neatness! She is pursuing departmental Honors, completing her research project under supervision of Dr. Lynn Hartzler. And Danielle has sought other opportunities, such as travel to the Ecuadorean tropical forest with the Amazon field course in December, 2008.

Now, Danielle is off on a different sort of overseas experience. As a Staff Sergeant in the US Air Force, Danielle completed her training during Fall quarter at the Springfield Air National Guard Base, and just recently she was deployed to Southwest Asia, where she is working in communications. Danielle is just one of our students who have committed to the US Armed Services. We wish her and the others well, and we thank them for their service.

Winter Quarter Departmental Seminars

All Seminars are held at 1:30 p.m. on Mondays in Room 135 Oelman Hall. Students are encouraged to attend.

January 11, 2010	Invasive plants in Ohio: Challenges and Opportunities
January 25, 2010	The human gut microbiome, a pediatric perspective
February 1, 2010	Distinguishing lethal mutations from benign variants: The genetics of Long QT Syndrome
February 8, 2010	Exploring the "Swiss Cheese" effect: The causes and consequences of patchily geographic ranges
February 15, 2010	Multiple migration strategies in sympatric Painted Buntings: Behavioral plasticity of genetic divergence
February 22, 2010	Divergent adaptation and the role of ecology in species formation
March 1, 2010	Body size and development effects on the insect respiratory system
March 8, 2010	Role of ORC and ORC-associated proteins in chromatin

Spring 2010 Class Information

BIO 310 & 311- Clinical Microbiology & Lab

The study of the biological processes of microorganisms, with emphasis on microorganisms that cause human disease (pathogens).

BIO 443- Vertebrate Histology

Study of structure/function relationships in vertebrate tissues, organs and organ systems.

BIO 473- Marine Biology

5 weeks of class at WSU, then a 1 week field trip to the Duke University Marine Lab in North Carolina. This class is by application only. There are approximately 16 spots for upper class/graduate BIO or EES students. For more information, contact Dr. Vadeboncoeur (yvonne.vadeboncoeur@wright.edu or 937-775-2657)

NEW SPRING CLASS!

BIO 401- Ornithology

Bio 401 will give students an exciting glimpse into the lives, biology, ecology and conservation of our feathered friends. Theoretical knowledge on evolution, anatomy, physiology and taxonomy of birds will be complemented with hands-on field methods, identification, ecology and conservation in labs.

Did You Know?

The 2009 Student Fact Book includes the following notable statistics:

- 745 students have either declared or intend to declare **Biological Sciences** as their major (p. 30)
- The average credit hour load for a full time undergraduate student is 14.70 (p. 135).

<http://www.wright.edu/admin/bpra/factbook.html>

Mark Your Calendars!

Winter 2010 Schedule:

Jan. 4	Winter quarter classes begin
Jan. 10	Last day to register, add classes, or withdraw and receive 100% refund of fees
Jan. 11	70% refund of fees begins
Jan. 18	Martin Luther King Jr. Day, University closed
Jan. 29	Last day to withdraw and receive 70% refund of fees
Jan. 22	Last Day for ALL students to drop a class without a grade
Feb. 19	Last day for ALL students to drop a class with a grade of "W"
Mar. 13	Last day of winter quarter classes
Mar. 15-20	Final exams for winter quarter

The Wright State chapter of The Phi Kappa Phi Honor Society initiated 108 students and honorary faculty and staff into the oldest, largest, and most selective interdisciplinary honor society in the US. Only the top 7.5% of juniors and 10% of seniors and graduate students are invited to join each year. **This year's inductees included nearly a dozen Biology majors.** Congratulations to all of them!

Renee Albers
Ariana Bolan
Lan-Anh Bui
Caleb Dukeman
Matthew Hiskey
Heather Hughes
Andrew Krofft
Roopsi Naravan
Spencer Putterbaugh
Adam Stahler
Aaron Wilson



2009 Employee Recognition Awards

The following College of Science and Math individuals were recognized at a ceremony for faculty and staff who have provided continuous service to Wright State University.

10 Years:

Dr. Donald Cipollini

15 Years:

Dr. Scott Baird

Marcia Wendeln

Dean Michele Wheatley

25 Years:

Dr. Roberta Pohlman

30 Years:

Dr. James Runkle

35 Years:

Dr. James Amon

Wright State University

The BioLogue is a quarterly student newsletter that contains important information for students in the Department of Biological Sciences.

Need Advising?

If you need to schedule an appointment with an advisor, please call 937-775-4226 or email bioadvising@wright.edu. Make sure to include the name of the advisor you wish to meet with, along with your availability, and UID number.

Undergraduate Degrees:

Jacqui Neal
Meredith Rodgers

Graduate Degree:

Laura Buerschen

Clinical Lab Sciences:

Bev Schieltz

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