Students from the Walsh Lab have been busy this spring presenting their research on the cellular links between obesity and infertility at regional and national conferences. In February, Zack Campbell ’18 and Professor Walsh attended the Indiana Physiological Society’s Annual Meeting at DePauw University. Their poster, entitled “Endoplasmic Reticulum Stress Alters the Transcriptional Profile of GnRH-Producing GT1-7 Cells”, won second place at the meeting’s poster competition. In March, Noah Levi ’17 joined Professor Walsh at the Indiana Academy of Science’s 131st Annual Meeting in Indianapolis, where he also presented the lab’s current research findings. Finally, the Walsh Lab got the opportunity to present their work on the national stage at The Endocrine Society’s Annual Meeting, ENDO2016, in Boston, MA in April. Along with Zack and Noah, Graham Redweik ‘16 and Jared Santana ‘16 presented the lab’s work from the past year to a wide audience at this national meeting. Attending ENDO2016 not only gave these students the chance to interact one-on-one with other scientists and clinicians, but also to attend symposia by leaders in the field of endocrinology, learn about cutting edge biomedical technology, and eat several bowls of New England clam chowder. These students and Professor Walsh thank both the Biology Department and the Undergraduate Research Committee for their generous support of their trip to ENDO2016.
Using Powerpoint slides to learn about mangrove trees as the foundation of an intertidal ecosystem is not the same as tripping over their massive prop roots and tasting the excess salt secreted through their leaves. A chalkboard doesn’t convey the top-predator role of alligators in the Everglades in quite the same way as having one watch you – and consider your potential as prey – as you drift by it in a canoe. Reading a scientific paper describing the execution of a field study doesn’t compare to the feeling of excitement upon capturing your first study organism after weeks of planning and hours of searching under a hot sun. And data on habitats lost to human activity is underwhelming in comparison to observing vast stretches of sugar cane and lettuce where wetlands once extended to every horizon.

The 7 students in Prof. Brad Carlson’s BIO313 Advanced Ecology course learned these lessons after spending the first half of the spring 2016 semester mentally preparing for an immersion trip to the Everglades ecosystem and then – finally – embarking on their trip over Spring Break. They first visited the Archbold Biological Station, a research station and land preserve near Lake Okeechobee, which once served as the headwaters of the Everglades ecosystem. Here they learned about the unusual, desert-like Florida scrub ecosystem and its many rare inhabitants, toured a working cattle ranch and learned about its relationship to both economic and environmental sustainability, and spent a full day and half carrying out research projects that they had designed to study invasive species that occur at the station, including the ubiquitous brown anole lizard that has invaded from Cuba and the deadly toxic rosary pea plant that was introduced from south Asia.

After that, we continued further south to Everglades National Park, driving past levees that stopped the flow of Lake Okeechobee to the Everglades, canals that drained the water from the land for agriculture, and forests dense with invasive Melaleuca and Australian pine trees. In the park, we camped in tents, which was the first such experience for some students. We spent our days hiking trails that featured distinct habitats, canoeing through mangroves and sawgrass to encounter alligators, crocodiles, and manatees, and cruising the park roads at night to find snakes and frogs that had ventured onto its warm surface after sunset. (Evenings also allowed the students to become acquainted with aggressive hordes of mosquitoes.) And with all the long car rides, shared tents, and camp meals (and mosquito attacks), the guys bonded with each other as they shared this unique experience.

It was apparent that this trip helped the students better understand our academic conversations about ecosystem processes, invasive species, and other issues. Aside from understanding, it also fostered an emotional connection: the Everglades, field research, the impacts of man – these are no longer abstract ideas but ones associated with sunburns, mosquito bites, wet hiking boots, and the texture of a water snake’s scales. Hopefully, it fosters a lifetime interest in encountering the wild – and not so wild – parts of the world that still remain.

Students canoe past mangroves and endangered American crocodiles.

The class poses in front of an endless sawgrass marsh that characterized much of the original Everglades.
Students in Developmental Biology (Bio314) spent the semester investigating the mechanisms by which animals create their adult body plans. In the first half of the semester, students learned how animals such as chickens, sea urchins, and fruitflies go through the process of embryonic development. For example, students witnessed live fertilization in sea urchins, then manipulated the environmental conditions to observe how fertilization and subsequent development is altered. Similarly, students examined chicken development outside of the egg, then altered it with chemicals designed to inhibit one of several gene pathways essential to vertebrate development.

In the second half of the course, students take what they've learned and apply it to animal regeneration. Each student designs their own unique independent project on one of three animals capable of significant regeneration – animals you can cut in half and end up with two adults. Student projects ranged from understanding how retinoic acid, a metabolite of Vitamin A, affects neural patterning in annelids (e.g. earthworms) to whether cell proliferation is necessary for regeneration of flatworms. Once complete, students write a comprehensive report on their findings, including detailed research into what is known about the genetic mechanisms of regeneration in their selected animal.

If it’s springtime in an even-numbered year, it must be time for students in Amanda Ingram’s Vascular Plants class to make plant collections. Brandon Wongngammit ‘16 took this Plantie with a huge population of Virginia bluebells (*Mertensia virginica*) in Crawfordsville.
For the past few years, Biology Prof. Eric Wetzel has worked with others on the Wabash Global Health Initiative (http://www.wabash.edu/plus/health), which has grown out of his Bio Dept. courses on Global Health as well as Parasitology. Alongside students from other disciplines, Bio students and alumni have been involved in local and international studies, internships, and service work related to global public health problems.

A few examples: Last summer, Bilal Jawed ’17 worked in Uganda on cryptococcal meningitis through the Jay & Maureen Herrmann Internship in Global Health. (Jay’s an ’87 Bio major alumnus.) Bilal, Max Gallivan ’16, Charlie Mavros ’16, Allen Betts ’17, and Austin Burton ’16 are a few of the biology majors who also have worked locally at the County Health Dept. and Mary Ludwig Free Clinic. You can read more about our partnership with the Montgomery County Health Dept. here: http://www.wabash.edu/news/displaystory.cfm?news_ID=10793

Over spring break, Biology alumni-physicians Tim Hodges ’83, Sam Milligan ’68, and Dennis Stokes ’69 participated in a medical trip to Peru as part of the work on the GHI. Many thanks go to them for their hard work, persistence, and many contributions to the WGHI.

Whether your interests are parasites, ecology, medicine, health policy, or business, please contact Prof. Wetzel (wetzele@wabash.edu) if you’d like to learn more about the work of the WGHI.