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Research Experience for Undergraduates

From the Chair...

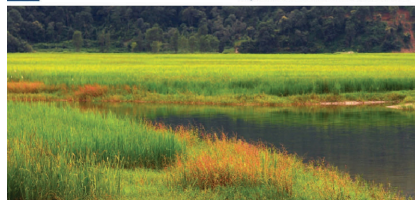
The Soil and Water Science Department (SWSD) offers a major in Soil and Water Science (with tracks in Soil Science and Water Science) and an interdisciplinary studies undergraduate program in Environmental Management in Agriculture and Natural Resources (IS-EMANR). The EMANR program is also offered via distance education at the Indian River Research and Education Center (IRREC) and plans are to offer the program at other RECs. The SWSD provides training to undergraduate students interested in managing our land and water resources in a wide range of ecosystems including agricultural, forested, range, urban, and wetland ecosystems through three different degree programs as noted below. Specializations within these degree programs are designed to give the student a strong background in Soil and Water Science and Environmental Management with a core of required courses during their junior and senior years. Beyond the core courses, students can select from groups of electives to provide flexibility in their program. Additional information can be found at: <http://soils.ifas.ufl.edu/academics/undergraduate.htm>.

Undergraduate courses offered by SWSD faculty are well attended. For example, the Spring 2012 student enrollment in undergraduate courses was 954, the highest in the history of the department. In addition, our faculty also advise biology undergraduate students. At present we are exploring opportunities for undergraduate students to actively participate in interdisciplinary research program the department offers. We recognize that research experience for undergraduates (REU) is one of the most effective paths for attracting talented undergraduate students into our programs and retaining them in our graduate programs, while meeting the needs of potential employers. In this newsletter, we present select examples of REU in the department.

In the current economic environment, the SWSD is facing some new challenges. With our senior faculty retiring, replacement of these positions is vital to maintaining the department's ability to serve our clientele. The department is blessed with excellent faculty, staff and students and as this group has done in the past, once more they will be ready to meet any new challenges.

Please Join Us...

9th INTECOL INTERNATIONAL WETLANDS CONFERENCE
Wetlands in a Complex World
June 3-8, 2012, Orlando, Florida, USA
<http://conference.ifas.ufl.edu/INTECOL>



UF FLORIDA USGS

The joint meeting of the International Association for Ecology (INTECOL)- Wetlands Group, the Society of Wetland Scientists (SWS) and the Greater Everglades Ecosystem Restoration (GEER) is *the largest wetlands conference in the world*. The conference is an international event held every four years and second time in the US. The 9th INTECOL conference will showcase over 1100 presentations (oral and posters) from 40 countries on a range of topics. The SWSD is a major player in organizing this conference.

**June 3-8, 2012
Orlando, FL**

<http://conference.ifas.ufl.edu/INTECOL>

Tips on Finding and Getting a Research Position on Campus that will Prepare You for Your Dream

Max Teplitski

For Undergraduate Students:

Throughout this issue of Myakka, you will learn about research projects that your peers are conducting. They are successful. Their research on campus is a path toward a dream job that they will undoubtedly get. Isn't it time you started charting your path to your own dream job?

Finding a place to start could be daunting. Below, are the 5 Steps that you need to take to prepare for your dream job.

Step 1. Start with your dream job. Decide what your dream job is going to be. Check monster.com, usajobs.gov or sciencecareers.com to learn about realistic career options. Do not look for your first, entry-level job. Keep scanning the ads until you find your dream job! Once you narrowed your list, learn as much as you can about the associated responsibilities and required skills. Make a list. How many of these experiences can you gain on campus? Find time to discuss these with your academic adviser.

Step 2. Build your skill set. Now that you have a list of skills that you need to gain, start your search for a research experience on campus. Have multiple strategies that you will pursue at once. Only one of them will be successful. Your success will depend on how well you plan, and on how well you recover from setbacks.

Step 3. Promise yourself to be proactive. Most of the undergraduate researchers profiled in this issue began their search in the classroom. Learn about your professor's research program, pay attention to a guest lecturer or consider enrolling in Science for Life IDH3931 course. It is important to have a good working relationship with your mentor, but don't pursue the project only because the professor is "nice". Remember, you have a goal and a plan. Once you rationally choose a potential research project, approach your professor. After you receive the final grade for the class (and assuming that you did well), send a quick email to the professor describing your interest in the project, and how it fits with your long-term goal(s). Attach resume to your email.

Step 4. Have your professional face on. Be ready for an unexpected opportunity to pop up. Have a draft of your short cover letter and a professional resume ready. Your cover letter should contain three paragraphs: in the first paragraph you will describe your dream job and how a research opportunity will fit with your long-term career goals.

In the second paragraph describe what makes you stand out from the crowd of other applicants: what experiences do you have had that prepared you for this project. It may have been a laboratory exercise in a class or a project you conducted in high school. This is where you want to impress your future mentor: describe the experiences you had in some detail, and include measurable outcomes. What did you learn in the process?

In the third paragraph you must communicate that you are curious, responsible and dependable. Professors recognize that most undergraduates do not have an extensive list of research experiences. We want to see that you are willing to learn, that you know how to learn and that you know how to juggle multiple responsibilities successfully. If you had summer jobs, list them.

Step 5. Job interview: put it all together. You identified your dream job, you figured out what experiences you can realistically gain through the on-campus employment to better position you for the dream job, you sent an inquiry email and a resume to your potential on-campus employer. In most cases, you will not hear anything back. Follow-up only once with a polite inquiry.

Prepare for the job interview. Think of examples of your successes, analyze your failures. Your interviewer will undoubtedly ask you about the projects that you started and didn't finish, and about the projects that failed. Everybody has those; we just differ in how we learn from failures. *What was the most significant project that you started and did not finish?* Be candid! Your interviewer will evaluate how honest you are, and how well you learn from your mistakes. It is important because when conducting research, we all make mistakes: "wrong" ingredients are added, the "wrong" experimental protocol is followed. Sometimes, these "mistakes" lead to a break-through discovery. Oftentimes they result in a failed experiment. Your future research mentor will rely on you to be candid: honestly describing what you did without hiding experimental details will help you and your mentor untangle experimental problems.

After the interview, follow up with a quick email note thanking your interviewer. Even if your first attempt at landing the dream research experience were not successful, go back to Step 3. Remember: you will eventually succeed if you have a plan, a strategy and follow through. You will eventually succeed if you don't give up.

Learning about the Way the University Works... Through Undergraduate Research: *Max Teplitski Interviews Andree George*

Andree George (A.G.), a native of US Virgin Islands, grew up in Kissimmee, Florida. Andree is now applying to the PhD program in the Soil and Water Science Department. His research mentor, Max Teplitski (M.T.), interviews Andree George:

M.T.: *Andree, what is the most valuable thing you learned through your research experience?*

A.G.: I learned more than I expected throughout this experience. I learned how to apply what I learned in my classes: PCR, dilution plating, cloning - all seemed like ethereal concepts when I was learning about them in my classes. Now I can scan the dizzying strings of A's, T's, G's and C's for restriction enzyme sites, start and stop codons, I can run a PCR, clone a gene and construct a mutant. This research experience made it so real. It also made me realize how important it is to synthesize information: those bits and pieces of information I learned in chemistry, biology, and microbiology are all now coming together.

M.T.: *What is the most un-expected thing you learned through your research?*

A.G.: As a student, you are not really exposed to many other aspects of the University. Before working in the laboratory and interacting with you, I thought - quite honestly - that college professors are just glorified high school teachers. Now I know that the career of an academic scientist encompasses so much more: teaching, mentoring, research, travel - not just lesson plans! This experience has changed my career outlook, and now I would like to pursue a career of an academic researcher. It is rewarding!

M.T.: *What are the top 5 most important things you realized while conducting research?*

A.G.: Here's my Top 5 list:

I learned how the University system works. The good, the bad, and - sometimes - the not-so-pretty!

I begin to appreciate how integrated the research really is: scientists from many departments and disciplines come together to address a specific question of scientific and societal importance.

I learned better critical thinking. It takes some skill to analyze experimental data: what worked and what didn't, and why? Sometimes the experiments that "didn't work" are the most interesting ones. It just takes time to see the meaning of the negative result.

I realize how much time and thought goes into planning experiments. In classrooms, we are often handed reagents and protocols, follow them almost blindly. Once you are in charge of your own research project, you realize just how careful one needs to be with planning.

I recognize how important mentoring is. Learning from graduate students and post-docs, asking lots of questions, and taking their advice are a great way to learn!



Tracing the Fate of Nitrogen in the Everglades *Andrew Brestel*

Andrew Brestel is an undergraduate student working in **Patrick Inglett's** lab, where he began as part of an IFAS summer internship. His current degree program is pre-professional with the intent to begin Pharmacy school next fall. Andrew's internship project was to perform isotopic analyses for use in a map of soil $\delta^{15}\text{N}$ concentrations in the Everglades. Andrew said the opportunity, "brought more context to my classes, as well as shown me how real-world projects and experiments take place." During his internship, Andrew also accompanied the lab graduate students on a field sampling trip where he says, "the chance to see the areas that we studied in class, really made the Everglades come to life."

Following his experience, Andrew decided to continue to work in the lab. He is now preparing a manuscript based on his summer project, about which he adds, "I learned a lot about writing and how to structure a research paper." The process has been more challenging than Andrew expected, however. "It is very different from class papers," he says. "There is so much pressure to get it right."

Andrew still encourages other undergraduates to get involved in faculty labs. Even those like him who are not really planning on research for their career. "I never even knew I could do it," he said. "But, I definitely recommend for undergrads to get involved in research with faculty."

Boston-Guam-Sarasota-Gainesville: My Journey of Discovery

Alexandra Rozin



Alexandra Rozin and Rex Ellis examine a soil sample

About a month into my first semester at the University of Florida, I was listening to Dr. Rex Ellis lecture about Onsite Sewage Treatment Design Systems in his Soil, Water, and Land Use class when something clicked. Soil science was where I wanted to be because there was such a need in soil science for current, meaningful research.

I began the process the next semester, tagging along with my professor in the Florida Keys, Ft. Pierce, and Cedar Key, exploring subaqueous soils as they relate to seagrass restoration, mangrove mitigation, and clam aquaculture. Beginning work on my undergraduate thesis has brought about more challenges. I selected Dr. Todd Osborne as my adviser and together we designed a project on organic soil structure in the Everglades and applied for funding.

The most important knowledge acquired from my research as an undergraduate has not been the significant results at the end of a study but the inconclusive outcomes. I have learned that my field of science is wide open and it is up to my peers to select the direction of the discipline over the next half-century. I've learned to assess if the research I enjoy has commercial value. Is there a career channel aligned with my research interests that already exists? If not, am I going to refocus my interests to fit an already established path, or carve my own channel and prove the value to the scientific community?

Research experience takes undergraduate students out of the lecture hall and introduces them to the scientific process. Projects take the knowledge attained from textbook learning and apply it to current scientific questions, testing the fundamentals and encouraging further inquiry. For faculty members, undergraduate research is the perfect testing ground for students, a chance to look at undergrads as potential graduate students and recruit their talent to further the science. It is the role of a faculty advisor to take undergraduate students in the minor leagues and draft them for the major leagues of science.

Life Lessons Learned while Working with Undergraduate Researchers

Cory Krediet

Working with undergraduate researchers is - oftentimes - the first introduction of graduate students to mentoring. One graduate student, Cory Krediet, shares the life lessons he learned while working with undergraduate researchers. His comments and observations will be helpful to other graduate students and post-docs who are considering working with undergraduates.

When selecting undergraduate researchers, look for potential not experience
Oftentimes it is easy to want to pick the most experienced candidate to join your lab. However, it can be equally rewarding and beneficial to choose a less experienced researcher that you can train and see flourish.

Look for good Emotional Intelligence (EQ)

Undergraduates will undoubtedly have to receive honest evaluation about their work so it is important to choose a student with good emotional intelligence. Poor EQ = defensiveness, inability to receive honest feedback and harsh relationships will not allow them to grow as they need to. Good EQ combined with their potential is key.

Help students understand their strengths and abilities

Everyone is different. Cloning a mini-me should not be your mission as a mentor. Learn how your students are wired and how they work. Then help them to see their potential and use their strengths and abilities to their fullest.

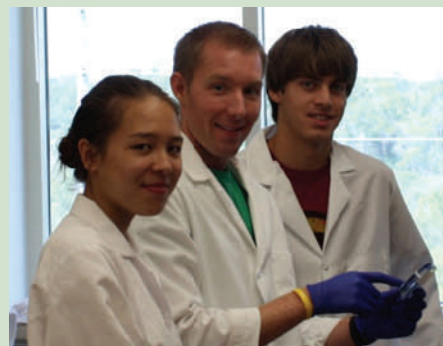
Have a constant dialogue

Be open and responsive to your student when they have questions and need help troubleshooting. Keep measure of their progress while still giving them independence. Make it a two-way dialogue so that both parties are clear on the expectations and status of the project.

Ask lots of questions

Ask questions of your student and expect them to ask questions as they come up. Asking questions of your students allows them to think critically about their project and enhance their understanding of what they

Continued on next page



Cory Krediet (center) and his undergraduate mentees, Jasmine Meinke and Nick Gimbrone

Renewable Energy from Agricultural Waste: My Research Experience

Tim Sink

Tim Sink (BS-Dec'11) conducted research with Dr. Wilkie on sustainable energy practices. My research with Ann C. Wilkie was through the [Bioenergy and Sustainability Summer School](#).

When I started to look for research opportunities on the UF campus, I --quite honestly-- wasn't even aware that Soil and Water Science was such an important part of agriculture. I had taken a few classes and learned so much new information from professors that I realized the potential that this field holds. I began to look up internship opportunities within UF and found that there were quite a few of them so I decided that that is what I would do. I found this research opportunity because of a guest lecture by a grad student who works in Dr. Wilkie's lab. I was impressed by their research and decided to pursue applying for this internship.

Overall, this research experience was very rewarding! I would absolutely consider pursuing research in the future. I always enjoy the opportunity to learn more and hands-on research is my favorite way to do it. I learned that research takes quite a bit of patience. Some of my experiments took a few months to run and some of the research that I read about took several years to conduct. It definitely takes a lot of dedication to undertake a real research endeavor. The most useful thing that I learned while conducting research is that the research itself does not always go as planned and you may end up learning something totally different than what you started off trying to learn. I think that this ties into the scientific method really well because research is a way to figure out something unknown and not just figuring out an answer to something that is already understood.

I would strongly recommend that other undergraduate students pursue research opportunities on campus. First, it really is good to get hands-on experience doing something that not only you haven't done, but perhaps no one has even thought about doing. Second, research is an excellent thing to add to your resume and companies and agencies are always impressed by someone who has worked on research. It is also a great time to get started on doing research because if an undergrad decides to go to grad school they've got a real step up on what will be expected of them.



Tim Sink building an anaerobic digester for generating biogas

are doing. It also gives them a chance to “teach” you about their work and teaching others is one of the best ways to show how much you know.

Give honest feedback

A good mentor does not point out failures and flaws in public. The Donald Trump method of “You’re Fired!” is probably not the best method of giving feedback. Rather, ask for permission to give feedback and deliver the message in an appropriate setting so as not to embarrass the student in front of their peers. Again, this is where good EQ is important.

Let students figure it out and even fail

Keep the micromanaging to a minimum. Show them the basics they need but then let the leash out. Give them independence to try things and fail. If everything they do succeeds, they will not learn as much. Dealing with failure allows them to think about what went wrong and how to address it the next time.

Let the students shadow you

The students are working with you to learn as much as they can. Therefore, allow them to shadow you in performing tasks that may not be directly related to their research. This allows them to gain more experience than the limited scope they may be working with.

Be transparent

Don't fantasize research life. Help students to understand what research entails without pushing them away. Show them the importance of balancing life and how to deal with it when it seems to be dominated by research.

Keep their plate full

Without overwhelming them, keep the students as busy as possible with new tasks and experiments. This keeps them engaged and interested and wanting more. If there is too much repetition everyone can lose interest.

SWS Alumni

Konstantinos C. Makris is a Soil and Water Science Alumni who graduated with a PhD in 2004. Makris is currently an assistant professor of Environmental Health in the Cyprus International Institute for Environmental and Public Health, within the Cyprus University of Technology. Makris also holds an adjunct assistant professor appointment in the Department of Environmental Health, Harvard School of Public Health and the director of the Water and Health research laboratory. Konstantinos and his wife Eliana, have a 6-month old baby, Eva Makris.

My Study and Research in Taiwan

Sara Wynn

I went to Taiwan to study Chinese intensively while taking classes at the National Taiwan University (NTU) towards my EMANR degree. I lived in Taipei for about 11 months, taking two hours of Chinese and agriculture classes every day. It was an incredible experience that changed my life and my goals for the future in many ways.

I learned something new almost every day while living in Taiwan, but the greatest and most unexpected thing Taiwan gave me was actually an introduction to the field of agricultural economics. Besides my Chinese language classes, I ended up enrolling mostly in classes from the graduate Department of Agricultural Economics, which was a big change from what I study as an EMANR major, where coursework is more focused on environmental science. Classes, classmates, and professors from NTU taught me that agriculture occupies a special branch of economics, and the policy decisions that agricultural economists make affect everything from the welfare of the poorest farmer to trade relations of developed countries. My favorite class was Agricultural Policy Analysis, which was taught by a professor who had retired from Taiwan's Ministry of Agriculture. We studied how different economic models of development have been applied to the agricultural sectors of different countries, and how such policies have shaped national and global development. In this class especially, I learned as much from discussion with my classmates as I did from our readings and the lectures. Many of my classmates came from agricultural families and developing countries. It was so enlightening for me to hear their experiences and learn how the agricultural sector functioned (and sometimes failed) all over the world. Oddly enough, I found the field I want to focus my UF studies on while I was halfway around the world. I now plan to go back to NTU after graduating from UF and earn my masters from the same program. In the future, I hope I can use what I have learned at UF and NTU to work in rural and agricultural development in poor countries.

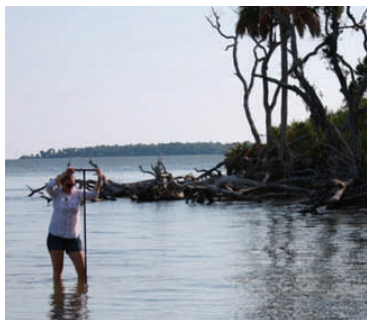
Studying in a foreign country is an important experience for a student because it can expose you to different ways of thinking about the topics you study. In my case, I discovered a new perspective on the study of agriculture, and I met people and made memories that I will always cherish.



Sara Wynn on a visit to a shrimp farm in Taiwan

Research Credits for Studying Carbon Credits

Ashley Phillips



Ashley Phillips excavating a Bh horizon using a bucket auger at Atsena Otie key, FL

Tampa Bay area native, Ashley Phillips is a fourth-year UF student, pursuing a dual major in Environmental Science and Soil and Water Science with concentration in African Studies. Ashley's dream is to continue her research in soils, soil biogeochemistry and climate change. She would like to learn how climate change affects sub-Saharan Africa and how well the societies in the region will adapt to it.

Ashley's research at the Soil and Water Science Department, mentored by Rex Ellis, focused on the Bh horizons from coastal areas, where coastal forests drowned due to water level rising. To land this research experience, Ashley approached her professor, whose research interests in soil taxonomy and carbon sequestration coincided with her own. She was specifically interested in learning how these Bh horizons contribute to carbon budget and the implications of discovery of the Bh horizons on soil taxonomy.

When asked about most important things she learned during her research, Ashley mentions the "publishing vs perishing dilemma" and comments on her realization that she had much more time to invest in research than she thought. "It is also important to be well-read..."; she adds, "it is important to be patient, and do things right the first time. A little planning goes a long way as far as research is concerned, and that will make a lot of difference in data interpretation." The research experience in Ellis' lab gave Ashley an opportunity to learn field and laboratory techniques, many of these techniques will help her in the future.

Faculty, Staff, and Students

Our congratulations ...

Lena Ma was selected as a Fellow of the American Association for the Advancement of Science.

Amy Shober received the *ASA Environmental Quality Section 2011 Inspiring Young Scientist Award*. The award was presented annual meeting of the Soil Science Society of America in San Antonio.

The Florida Blue Key recently recognized **Ann Wilkie** with the *Distinguished Research Mentoring of Undergraduates Award*. The award was part of the [Homecoming 2011 Education Celebration](#)

Mike Sisk was selected to receive IFAS - Superior Accomplishment Award in the category of Clerical/Office Support.

SWSD Bill Reve Superior Accomplishment Award: **Lacey Rhea**

The following received awards at the **ASA/CSSA/SSSA Annual Meetings in San Antonio Texas, October 2011.**

Debolina Chakraborty (Nair) received the Association of Agricultural Scientists of Indian Origin (AASIO) *Outstanding Graduate Student in Soils Award* for 2011.

Rupesh Bhomia (Reddy): 2nd prize in the oral presentation competition (S10 Wetland Soils division)

Pasicha Chaikaew (Grunwald): 3rd prize in the poster presentation competition (S5 Pedology division)

Dakshina Murthy Kadiyala (Li and Mylavarapu): 1st prize in the poster presentation competition (S04 Soil Fertility & Plant Nutrition/S08 Nutrient Management & Soil & Plant Analysis divisions)

Jason Lessl (Ma): 2nd prize in the poster presentation competition (S02 Soil Chemistry division)

Rishi Prasad (Hochmuth and Martinez): 4th prize in the poster presentation competition in (S04 Soil Fertility & Plant Nutrition/S08 Nutrient Management & Soil & Plant Analysis divisions)

SWS Department Awards

Outstanding Undergraduate Award: **Alexandra Rozin** (Bonczek, Ellis and Osborne)

Frederick B. Smith Scholarship: **Ashley Phillips** (Bonczek, Ellis, and Osborne)

Donald A Graetz Education Award: **Leland Alston** (Curry)

Victor W. Carlisle Scholarship Award: **Chumki Banik** (Harris)

Sam Polston Scholarship Award: **Lisa Gardner Chambers** (Reddy)

William K. Bill Robertson Graduate Fellowship: **Julius Adewopo** (Silveira and Gerber); **Rupesh Bhomia** (Reddy)

Ben Skulnick Fellowship: **Bryce Van Dam** (Osborne)

Quantitative Environmental Soil Science/Pedometrics Award: **Xiong Xiong** (Grunwald)

Rupesh Bhomia (Reddy) - winner of a poster award in Research in The State of Florida Category - at the National Science Foundation Research Day (October 25, 2011), Gainesville, FL

Piyasa Ghosh (Lena Ma) was featured in the [University of Florida News](#) and the [Institute of Food and Agricultural Sciences News](#). Her research is on "Bacteria can aid toxic environmental cleanups, may boost agricultural production".

Deborah Spalding, Master of Science Distance Education Student (Sabine Grunwald) recently received a Lecturer appointment in School of Forestry and Environmental Studies, at Yale University,: <http://environment.yale.edu/news/6094>

Family news

Davie Kadyampakeni & Iness Mhango: Atikonda Kadyampakeni was born on October 16, 2011 in Naples, FL at 19:54 weighing 6 lbs 14 oz, 20 inches long.

Manmeet Waria Pannu (PhD SWSD 2011 with O'Connor and currently a post-doc with Ogram) received the perfect Christmas present in the form of 7 lb 8 oz Aviraaj Singh Pannu at 12:40 pm Dec 25, 2011.

Welcome Incoming Students —Spring 2012!

PhD

Mace Bauer (Obreza)

Eduardo Francisco Chavez (Li)

MS

Jing Guan (Jawitz)

Francisca Ordenez Hinz (K. Inglett)

MS

Stephanie McLean (Toor)

Editorial - Virtues of Soil

As part of the final given to SWS 5050 students, **George O'Connor** asks the students to prepare a one-page description of the value/virtues of soils for an educated, but non-technical audience. This year, it was supposed to be a letter to the editor of a newspaper and students have done excellent job in writing these articles. Best article selected for publication is written by **Charlie Nealis** (Mark Clark's PhD student) is presented below:



When asked to comment on the splendors of nature, one may speak of the beauty of wildlife, the serenity of a secluded creek, or the brilliant colors a field of wildflowers offers while in full bloom. Few, if any, would speak to the marvels of the canvas these natural masterpieces are born on; soil. Soils give rise to so much of what we enjoy and need, while also mitigating and supporting our not so beautiful byproducts of existence. Without soils we are without life, and without an understanding of soils we will find ourselves in an ever more unbalanced foothold on the precipice of disaster. The functions of soils are diverse and commonly interrelated with the more popular environmental concerns, such as plants, animals, water and air. Soils recycle and soils create, and it is about time we stop treating soils like dirt.

To start simply, how would we live without soils? Soil not only provides us with a medium for structures and travel, but it also is the foundation for nearly every other living organism, either directly or indirectly. Plants, the suppliers of oxygen and base of many food chains, depend heavily on this essential medium. Soils provide plants with several essential components for their survival, including physical support, air, water, temperature moderation, protection from toxins, and the nutrients they need to survive and flourish. Proper management and understanding of these benefits is what allows us to produce higher yields of foods our ever growing population is dependent upon. We also utilize the benefits of the soil organisms to ensure a productive food supply. Microorganisms, like certain bacteria, and more familiar larger organisms, like earthworms, assist in cycling nutrients, removing contaminants, and protecting plants from harmful diseases and predators. Even the fungi in the soil can help, with mycorrhizae helping plants access more water and nutrients through a symbiotic relationship.

These microorganisms also assist in another important function of soil we should be incredibly appreciative of: recycler of raw materials and potentially hazardous wastes. Soils have the great ability to decompose organic matter, both from our wastes and naturally occurring matter, and recycle the nutrients back into the system for reuse. They also can modify the atmosphere by capturing carbon beneath the soil surface, but may also release large amounts CO₂ when we are foolish and disturb certain natural systems that store large amounts of this greenhouse gas. This assimilative capacity is also important to us when we aren't so wise as stewards and leak, spill, or dump hazardous materials into our natural systems. Beyond the munching and crunching of microorganisms, soils themselves can sorb, or capture, these contaminants and prevent them from influencing another precious resource: our water.

The assimilative capacity of soils provides us with what some may call Mother Nature's Brita filter. As water seeps through the soil profile, contaminants can be removed and nutrients utilized or captured, providing us with safe, clean water. Soils also offer us the great favor of storing this water for future use by us in aquifers or by plants in the soil profile itself. Different sized pores in the soil allow it to hold water for plants to use when there is no rain, and the texture even can allow plants to "pull" water up from the water table in times of droughts.

Hopefully you now have a better understanding of why we should probably stop every now and then and "smell the soil." It is vital to our survival, aiding in every aspect of our livelihoods, from clean air to clean water. Soils are a precious resource to be protected, too.

Congratulations! Fall 2011 Graduates

PhD

Julie Padowski (Jawitz)
Casey Adam Schmidt (Clark)

MS

Sean Fromang (Wilson)
William Higginbotham (Li)
Ben Hogue (Inglett)
Timothy Hull (Osborne)

MS

Rueben Koch (Wilson)
Jamie Lewis (Wright)
Julia Maki (Jawitz)
David Mitchell (Fitz)
Tae-Goo Oh (Clark)
Brant Phelps (Harris)
John Sain (Thomas)

MS

Samuel Vacca (Inglett)
Erin Yancey (Thomas)

BS

Diana Gijsselaers—ISEMANR
Tim Sink—ISEMANR