

ABE UPDATE

SUMMER 2019

Simulating Our World

EXPLORING UF/IFAS ABE'S WORK IN SIMULATION MODELING



AGRICULTURAL & BIOLOGICAL
ENGINEERING



UF/IFAS UF
UNIVERSITY OF FLORIDA
Herbert Wertheim
College of Engineering
UNIVERSITY OF FLORIDA

Summer 2019

UF/IFAS Agricultural and
Biological Engineering
Department

Kati Migliaccio
Professor and Chair

120 Frazier Rogers Hall
PO Box 110570
Gainesville, FL 32611

352-392-1864

abe.ufl.edu

Editor

Raychel Rabon

Copy Editors

Dr. Kati Migliaccio
Shannon Noble

Writers

Raychel Rabon
Lory Willard

Graphic Designers

Raychel Rabon

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ON THE COVER

(From right to left) UF/IFAS ABE's Dr. Greg Kiker, Ph.D. candidate Valerie Valerio, and Ph.D. candidate Allegra Cohen discuss gender modeling.

We have had an exciting summer in the Agricultural and Biological Engineering (ABE) department. The Florida Section ASABE meeting was held in June at Delray Beach which provided an opportunity to gather as a discipline and learn about research and industry activities throughout the state. We appreciate the efforts of Lisa Collins and Florida Section Chair Taylor Kroll to make this meeting a success. Likewise, the ASABE Annual International Meeting (AIM) in Boston was attended by many from UF ABE, with a special session focused on Grand Challenges – Pesticides in Freshwater Systems: Effects and Mitigation co-led by Dr. Rafael Muñoz-Carpena and a special session focused on National Basin-Scale Water Quality Review: Targets, Trends and Takeaways co-led by Dr. Sanjay Shukla. The 2019 Florida Section meeting and AIM provided a forum to further our ideas and learn from our colleagues, and we appreciate the effort that goes into making these events a success!

While attending research presentations at our society meetings this summer, I observed the leadership UF ABE continues to have in the simulation modeling field. Simulation modeling provides the ability to predict the likely outcomes of real environmental systems using concepts such as mathematical and statistical expressions and relationship logic. Our department has a solid foundation in simulation modeling and continues to innovate by developing new models and model processes that simulate natural and managed environments. Drs. Ken Campbell, Wendy Graham, and Jim Jones contributed to building the highly regarded modeling reputation of UF ABE with their work on water quality/hydrology modeling, groundwater modeling, and crop modeling. This foundation has continued to grow with faculty such as Drs. Senthold Asseng, Gerrit Hoogenboom, Greg Kiker, Rachata Muneeppeerakul and Rafael Muñoz-Carpena. It is no surprise that UF ABE is home to the world's most widely used crop model DSSAT and the Vegetative Filter Strip Modeling System VFSSMOD that is used by environmental consultants, agencies and researchers globally. Likewise, we continue to push boundaries by incorporating human components such as migration and gender in our modeling efforts.

Our research faculty are keenly aware of the power that simulation models provide, and how they are rapidly advancing with the new and expansive sources of data and computational capabilities. Application of simulation models is one of the most powerful ways to identify best paths forward when considering some of the grand challenges our society faces – e.g., climate change, water and food scarcity and environmental health. To help develop professionals ready to tackle these problems, UF ABE recently launched a new graduate certificate, “Certificate in Biological Systems Modeling”. Students who acquire this certificate are uniquely trained in conceptual modeling, model development and design, and model application in biological systems.

This issue of the ABE Update highlights departmental efforts in simulation modeling. These efforts showcase some of the most innovative and talented modeling efforts led by our faculty globally. Please feel free to contact the faculty directly if you would like more information on their modeling research. More information on our modeling certificate is available on our website. *Go Gators!*

Kati Migliaccio

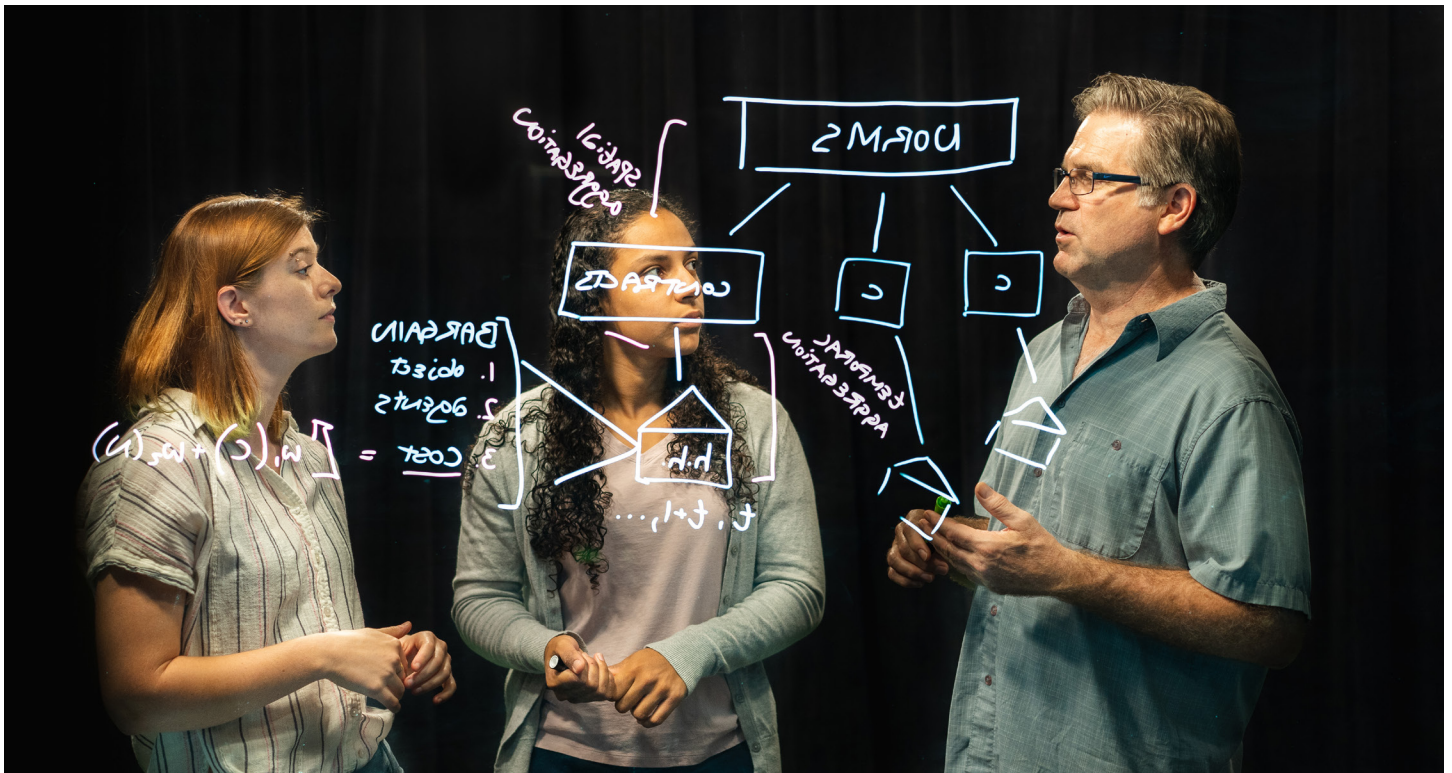
Chair and Professor

🐦 @hydroKati



KATI MIGLIACCIO, PH.D.

CHAIR AND PROFESSOR



Simulating Our World

Exploring UF/IFAS ABE's work in simulation modeling.

Decision Support System for Agrotechnology Transfer (DSSAT)

Predicting crop growth and development is extremely useful to understanding how environmental conditions and crop management influence the agricultural industry and food supply. Crop simulation models are the key to predicting these contributing factors.

Crop models predict crop growth, development and yield as a function of local soil and weather conditions, crop management and plant genetics. These models simulate a dynamic plant and soil water, nitrogen, phosphorus and carbon balance using hourly and daily time steps from planting until final harvest is predicted.

Decision Support System for Agrotechnology Transfer (DSSAT) is a software application program that comprises crop simulation models for over 40 crops as well as tools to facilitate effective use of the models.

These tools include database management programs for soil, weather, crop management and experimental data, utilities and application programs and the crop simulation models that simulate growth, development and yield as a function of the soil-plant-atmosphere dynamics.

DSSAT and its crop simulation models have been used for a variety of applications including on-farm and precision management, impact of climate variability and climate change regional assessments,

gene-based modeling and breeding selection, water use, greenhouse gas emissions, and long-term sustainability through the soil organic carbon and nitrogen balances.

DSSAT has been used extensively for precision management in the private sector and in the classroom as a teaching tool. This program also contributes significantly to the climate change community by the application of DSSAT for climate change impact assessment and potential for adaptation and mitigation. DSSAT has also impacted agricultural research with over 2,775 citations, based on the DSSAT CSM paper published in the European Journal of Agronomy.

The DSSAT development group hosts training workshops, which allows the team to interact with the DSSAT user community and to provide DSSAT users

with hands-on training as well as an introduction to the underlying scientific concept, and computer “hackathons” that help to advance the science of the models and improve the crop models, data tools, and application programs.

The University of Florida currently leads the Decision Support System for Agrotechnology Transfer (DSSAT) development team.

The University of Florida currently leads the DSSAT development team with key contributions by **Gerrit Hoogenboom, Jim Jones, Ken Boote, Senthold Asseng, Vakhtang Shelia, and Cheryl Porter**, and in collaboration with the International Fertilizer Development Center under the leadership of Upendra Singh. Scientists from the University of Passo Fundo, Brazil; University of Guelph, Canada; Oklahoma State University; USDA-ARS, and international CGAIR research centers including CIAT, CIMMYT, and ICRISAT also contribute towards the development of DSSAT.

The Decision Support System for Agrotechnology Transfer (DSSAT) team gathered for the 10th DSSAT Development Sprint Workshop in Gainesville, Florida.



Multidisciplinary University Research Initiative (MURI)

Towards a Multi-Scale Theory on Coupled Human Mobility and Environmental Change

Migration is prevalent in our news today. This problem is important with far-reaching consequences. Social mobility can be caused by a number of instances including environmental changes such as floods, earthquakes, or droughts. New population migration patterns emerge that affect health, crime, and sociopolitical instability. Predicting these interdependencies among environmental change and human social system dynamics remains a challenge.

The overarching goal of this Multidisciplinary University Research Initiative (MURI) project is to develop predictive models that capture these dynamics to anticipate the trajectory of environmental change and human effects on these changes and ultimately create an integrative theory of the interplay between environmental change and human social system dynamics.

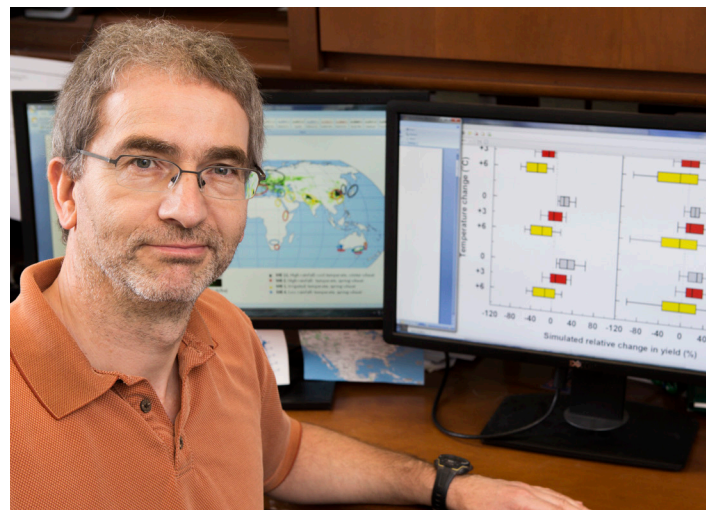
To reach this goal, this team has pursued different lines of research. It has developed a stochastic model and applied Bayesian inference techniques to the Syrian dataset; applied Multiple Regression Quadratic Assignment Procedure (MRQAP) to look for drivers, both biophysical and social, of global refugee networks and performed cluster analysis to group countries based on their ego-networks of migration; and developed agent-based models and coupled them with global sensitivity analysis (GSA) to explore how different factors interplay to affect the resulting migration outputs.

This team has also developed a conceptual framework and a set of stylized facts gleaned from a wide range of chase studies and literature. Moving forward, they will try to put these pieces together in more comprehensive models with clearer connection to the integrative theory being developed.

“These efforts are both intellectually challenging and exciting and will keep us busy for a while!” Rachata Muneeppeerakul, UF/IFAS ABE Associate Professor, said.

The project is funded for five years by a grant from the Department of Defense MURI program. UF/IFAS ABE researchers involved in this project include Dr. **Rachata Muneeppeerakul** and Dr. **Rafael Muñoz-Carpena**. The collaborating team for this initiative includes faculty from three universities—the University of Florida, Columbia University, and East Carolina University—and will be working with complementary expertise: migration, dynamical system modeling, multilayer network approaches, social network analysis, hydrological and climate

Climate Impact Modeling: UF/IFAS ABE Professor Senthod Asseng’s research focuses on crop systems modeling and is the newly appointed director of the Florida Climate Institute.

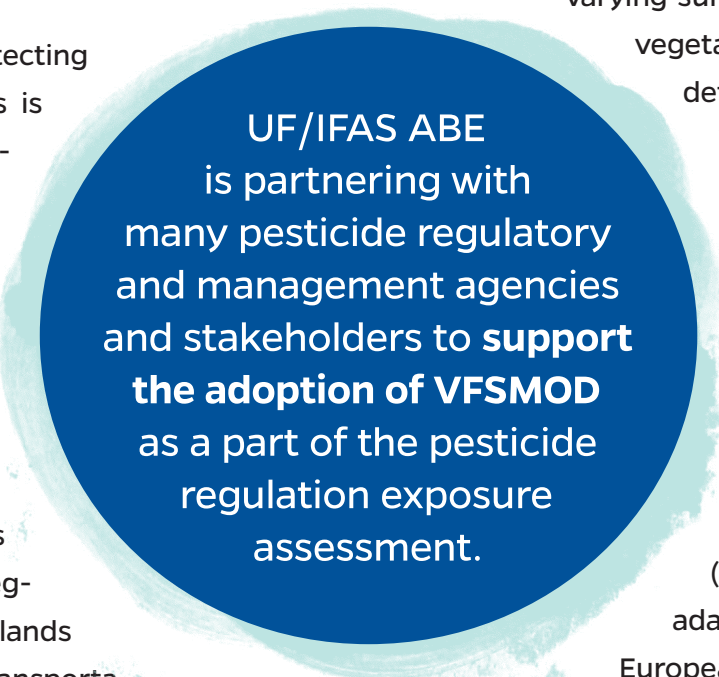


modeling, Bayesian inference, and global sensitivity analysis. Postdoctoral research associates and Ph.D. students across these institutions and disciplines will also be involved in this project.

Vegetative Filter Strip Modeling System (VFSSMOD)

The importance of protecting sensitive water resources is continually growing. Agricultural and biological engineering is leading the effort to protect surface waters by improving the design and analysis of vegetative filter strips. Vegetative filter strips (VFS) are areas of natural or implanted vegetation around disturbed lands (agricultural, urban, transportation) designed to control surface runoff pollution from entering adjacent water bodies. The VFS, sometimes also called vegetation buffers, are one of the most commonly used best management practice (BMPs) for controlling sediment, nutrients, pesticides, pathogens and other water pollutants.

The Vegetative Filter Strip Modeling System is a design-oriented computer simulation model that has been created to study hydrology, sediment, and pollutant transport and trapping through vegetative filter strips. In the last 10 years, VFSSMOD has received an upsurge of interest to inform quantitative mitigation of pesticides in VFS for environmental exposure assessments used in the pesticide registration and regulatory process around the world.



The advantage VFSSMOD has over other approaches is the inclusion of state-of-the-art mechanistic description of filter hydrology including changes in flow derived from sediment deposition, physically based time dependent soil water infiltration, handling of complex storm pattern and intensity and varying surface conditions (slope and vegetation) along the filter, and detailed description of chemical and pollutant fate. The model has been widely validated and applied in the research and technical literature around the world. UF/IFAS ABE is partnering with many pesticide regulatory and management agencies (California, US EPA, Canada PRMA, France IRSTEA, European Union EFSA) and stakeholders (agrochemical companies, agricultural organizations and NGOs) to support the adoption of VFSSMOD as a part of the pesticide regulation exposure assessment.

This modeling research is led by Dr. **Rafael Muñoz-Carpena**, University of Florida.

Climate Impact Modeling

Predicting how the climate will impact our world and our crops is dynamic and essential for planning for our world's future.

Dr. **Senthold Asseng**, UF/IFAS ABE professor and newly appointed director of the Florida Climate Institute, works in the field of climate impact modeling

where he and his team work with climate scientists to translate climate scenario data into an impact by running them through crop simulation models, which simulate how crops grow as it responds to temperature, light, water sources. The climate information is used as drivers of the models.

The advantage of computer crop simulations is that experiments can be done on a computer rather than in a field, taking what would be months of field research and providing reliable results in seconds. These simulations can be run with a variety of crop treatments and crop locations.

Since this type of work provides a great area of collaboration, the Agricultural Model Intercomparison and Improvement Program (AgMIP) has been created to help further connect the network of climate scientists, crop modelers, and other agricultural scientists from around the world. With over 1,000 members, this is one of the largest research networks with a focus on agriculture. In addition to being a member of AgMIP, Dr. Asseng also serves on its global leadership panel.

Climate impact modeling is also looking into the future to find out more about what happens as temperatures raise or when CO₂ levels increase. Other research areas that benefit from climate impact modeling include food security, production quantity and quality, nutrition content in foods, water source effects, pests and diseases, speed of change impacts, and a variety of other research areas that affect agricultural production.

Linking Intra-household Dynamics and Social Norms

Gender has been recognized in the U.N.'s Sustainable Development Goals as a vital component of agricultural systems, but no simulation tool exists to model it as a part of those systems. Existing models overlook the connection between intra-household dynamics and social norms. This gap makes it difficult to model the influence of cultural context on women's empowerment.

While women's activities are often controlled by their families and husbands at the plot, field, and household scales, one might also be interested in

(From left to right) Ph.D. candidate Allegra Cohen, Ph.D. candidate Valerie Valerio, and UF/IFAS ABE Professor Greg Kiker map figures for gender and livestock value chain simulation models.



how changes aggregate at the regional and national levels and how these changes affect households in turn.

Ph.D. candidate **Allegra Cohen**'s claim is that the obstacles to women in agriculture can be formalized and explored through multi-scale simulation modeling. Cohen has designed a conceptual framework linking intra-household dynamics with social norms, and she is operationalizing it in the form of a Python package to aid the development of such models.

Cohen works on this research with her advisor Dr. **Greg Kiker**, ABE Professor who specializes in Ecological Modeling and Management, and in conjunction with the Feed the Future Innovation Lab for Livestock Systems.

Livestock Value Chains

Livestock value chains, which comprise all the steps required for livestock and animal products to go from producers to consumers, are long and complex in developing countries. In Sub-Saharan Africa, livestock value chains contribute to the income, food and nutrition security of millions of people; however, existing tools to model them are highly qualitative, scale- and location-specific.

To address this, Ph.D. student **Valerie Valerio** is designing a modular, scalable Python model of agricultural value chains that combines a traditional process-based production chain with a market network that connects production units (like households) to each other, to middlemen and to markets. This combined approach allows one to quantify and explore, for example, the effects of a household-scale dairy value chain intervention on the

market price for milk, or the effect of vaccine use in food availability in a region.

Another part of Valerio's work concerns providing the first formal description of regional livestock trade in West Africa using a network model. Both the value chain and the trade model can be used to inform policymakers on how to better invest and develop value chains to benefit smallholder farmers in the developing world.

Valerio works on this research with her advisor Dr. **Greg Kiker**, ABE Professor who specializes in Ecological Modeling and Management, and in conjunction with the Feed the Future Innovation Lab for Livestock Systems. ■



For more information on the **VFSMOD - Vegetative Filter Strip Modeling System**, visit abe.ufl.edu/vfsmod or contact Dr. Rafael Muñoz-Carpena at carpena@ufl.edu.

For more information on the **Decision Support System for Agrotechnology Transfer (DSSAT)**, visit dssat.net or contact Dr. Gerrit Hoogenboom at gerrit@ufl.edu.

For more information on the **Multidisciplinary University Research Initiative (MURI)**, visit murimigration.org or contact Dr. Rachata Muneeppeerakul at rmuneepe@ufl.edu.

For more information on the **Florida Climate Institute**, visit floridaclimateinstitute.org.

For more information on the **Agricultural Model Intercomparison and Improvement Program (AgMIP)**, visit agmip.org.



BY LORY WILLARD

Summer in Africa

This summer I went to Mpala Research Centre in Laikipia County, Kenya to jointly participate in Dr. **Cheryl Palm**'s Tropical Agriculture, Environment, and Livelihoods independent study program and gather preliminary data to inform my research for the rest of my time at UF. This area in Kenya has a mixture of pastoralists, smallholder farms, and large-scale farms. Many of the large-scale farms, are experimenting with no-till agriculture and are interested in translating agricultural practices that will improve food security and environmental sustainability to the small-scale farmers.

During my time there, I built on research previously performed by Dr. Palm, Dr. **Rafael Muñoz-Carpena**, graduate, and undergraduate students. We collected water quality data in within the Upper Ewaso N'giro watershed to quantify nutrients, sediment, and bacteria in the water, which is commonly

*TOP PHOTO:
Lory Willard and
Isaac Ndawula
(Makarere
University)
install a modified
Philip-Dunne
permeameter
and mini-disk
infiltrometer at
a smallholder
farm in Laikipia
County.*



used for irrigation and sometimes used for drinking water in rural households. We also conducted field tests for hydraulic conductivity in soils, which allows us to know how fast water moves through saturated and unsaturated soils. With guidance by Dr. Muñoz-Carpena, Dr. Palm, and Kenyan research partners, this information will be used in an ecohydrological model to understand how different agricultural practices, including conventional tillage vs no-till, impact the watershed and river flow at varying spatial scales. This work will help Laikipia County and other semi-arid regions make land

management decisions on a systems level by taking agriculture, hydrology, and ecology all into consideration. As we witnessed on this trip, the rainy seasons are increasingly unreliable and agricultural practices may need to shift for food security in the region.

I was very fortunate during this trip to be funded by the **Ken and Cindy Campbell Graduate Student Travel Scholarship**, and my preliminary work during this summer has become part of a collaboration with The Nature Conservancy for ongoing work in the area. I was also able to meet with some incredible researchers from around the world at Mpala Research Centre, including the other graduate students from Kenya and Uganda participating in the study abroad program. It was priceless to be able to live and work with students so passionate about improving food security in their home countries, and who know and were willing to discuss and debate the intricacies of extension, research, and policy in east Africa. ■



Lory Willard and University of Florida undergraduate student, William Donaghy, collect samples from the Nanyuki River for water quality testing.



Lory Willard, Dr. Cheryl Palm, and Ruth Kinuthia (Kenyatta University) test modified Philip-Dunne permeameter before beginning field visits. This device is filled with water and observed while it drains to determine saturated hydraulic conductivity.

Lory Willard is a Ph.D. student in UF/IFAS Agricultural and Biological Engineering studying Land and Water Resources. Lory's advisor is UF/IFAS ABE Professor Dr. Rafael Muñoz-Carpena.

Dr. Cheryl Palm is a Research Professor UF/IFAS Agricultural and Biological Engineering department with a focus on soil biological and ecological processes.

Dr. Rafael Muñoz-Carpena is a Professor in the UF/IFAS Agricultural and Biological Engineering department with a focus on hydrology and environmental modeling.

ALUMNI SPOTLIGHT



NATALIE NELSON, PH.D.

*Assistant Professor, North Carolina State University
Department of Biological and Agricultural Engineering*

*B.S., Agricultural and Biological Engineering,
University of Florida*

*Ph.D., Agricultural and Biological Engineering,
University of Florida*

 @NatalieGNelson

 natalie_nelson@ncsu.edu

SPECIALIZATION AREAS:

- Data analytics as applied to natural resources management
- Integrated modeling
- Hydrologic sciences
- Eutrophication

RESEARCH INTERESTS:

- Statistical modeling and machine learning
- Geospatial and temporal analysis
- Socio-environmental synthesis
- Land-sea connectivity

WHY DID YOU PURSUE THIS FIELD OF ENGINEERING?

I think there are few, if any, disciplines that are as well-positioned as agricultural and biological engineering to address the grand challenges our society is currently facing. I was really drawn to the potential impact I could have with a degree in ABE, and also to the broad scope of the discipline. I like knowing that I have foundation in principles of life sciences and engineering such that I can study many biological system types. Plus, I get to combine my work with my love of the outdoors.

HOW DID UF/IFAS ABE PREPARE FOR YOUR CAREER?

The UF ABE faculty includes many leading researchers in modeling and analytics, so I was fortunate to receive strong training in the use of process-based models, statistical analyses, and machine learning methods for agricultural and environmental systems analysis. I also had many valuable opportunities to participate in interdisciplinary training, particularly through the Hydrologic Sciences Academic Cluster (HSAC), which is supported by many UF ABE faculty. As a HSAC student, I took classes all over campus - including the law school! My advisor, Rafael Muñoz-Carpena, was hugely invested in my career and helped guide me every step of the way.

WHAT DO YOU HOPE TO DO IN THE FUTURE?

I hope to continue having the privilege of working with graduate and undergraduate students to advance applications of data science in natural resources management. Basically, to keep doing what I'm doing! I don't want to get off this ride.

ALUMNI SPOTLIGHT



DEREK ORSENIGO

Production Manager, Orsenigo Farms/Grower's Management Belle Glade, Florida

B.S., Agricultural Operations Management, Agricultural and Biological Engineering, University of Florida

WHAT DO YOU DO IN YOUR ROLE AS PRODUCTION MANAGER AT ORSENIGO FARMS/GROWER'S MANAGEMENT?

Between the two companies, I am responsible for the production of sugar cane, sweet corn and parsley. This includes the scheduling and coordination of all planting and harvesting activities, hands on management of growing the crop, managing inputs as well as business management related to these crops.

HOW DID UF AOM HELP YOU PREPARE FOR YOUR CAREER?

The Agricultural Operations Management program helped to prepare me for this field by offering a broad range of subject matter that is directly applicable to what I do on a day-to-day basis. By offering good book material along with hands on labs each week, I was able to grasp the real world concepts that I have experienced in the working field since graduating.

WHY DID YOU WANT TO WORK IN THIS FIELD?

I grew up working on the farm that was started by my father, who was also a University of Florida graduate, so I always knew I wanted to be involved in production agriculture.

WHY WOULD YOU RECOMMEND THE AOM PROGRAM TO STUDENTS IN OR ENTERING COLLEGE?

I would recommend the AOM program because of its diversity of topics within the major. It allows the student to explore the many aspects within production agriculture.

The core of Orsenigo Farms is its growth of a wide variety of lettuce and leafy vegetables including Romaine, Iceberg, green and red leaf lettuce, Endive, Escarole, Chinese Cabbage, Butter and Bibb lettuce, Parsley, Cilantro, along with a wide variety of baby spring mix items such as Spinach and Arugala.



GRADUATING STUDENTS

SUMMER 2019 PH.D. AND M.S. GRADUATES



Azadeh Alizadeh
DOCTOR OF PHILOSOPHY
Pollution Remediation
Advisor: Dr. Kati Migliaccio



Jaime Marcelo Calle
DOCTOR OF PHILOSOPHY
Engineering and Entrepreneurship
Advisor: Dr. Wendell Porter



Jonathan Chiputula
DOCTOR OF PHILOSOPHY
Postharvest
Advisor: Dr. Ray Bucklin



Miles Medina
DOCTOR OF PHILOSOPHY
Ecohydrology/Nonlinear Dynamics
Advisor: Dr. Ray Huffaker



Redjino Mompremier
MASTER OF SCIENCE
Hydrology/Modeling
Advisor: Dr. Young Gu Her



Floyd Nicolas
MASTER OF SCIENCE
Land and Water Resources
Advisor: Dr. Kati Migliaccio



Arianna Partow
MASTER OF SCIENCE
Biological Engineering
Advisor: Dr. Zhaohui Tong



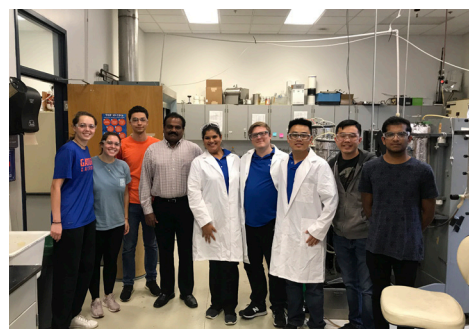
Josue St. Fort
MASTER OF SCIENCE
GIS and Climatology
Advisor: Dr. Clyde Fraise

SUMMER 2019 B.S. GRADUATES

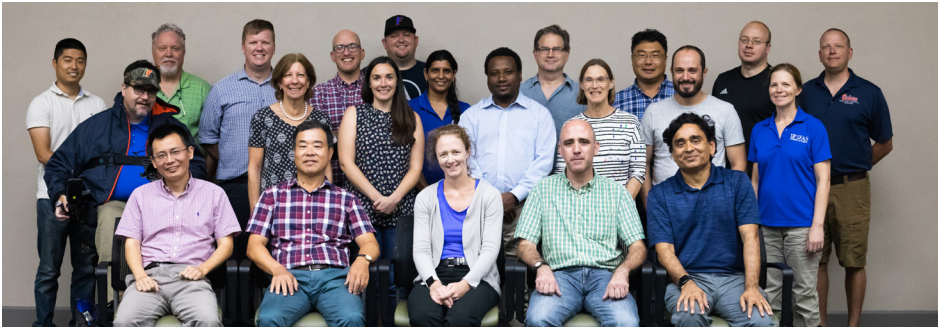
Hannah Pepper
BACHELOR OF SCIENCE
Biological Engineering

Savannah Rhoden
BACHELOR OF SCIENCE
Agricultural Operations Management

Juan Velasco
BACHELOR OF SCIENCE
Agricultural Operations Management



SEMESTER IN REVIEW



(Page 14, from left to right) Chair Dr. Kati Migliaccio welcomes the new class of graduate student at ABE Graduate Student Orientation. | Mentor-Mentee pair Bhagatveer Sangha and George Worrall discuss the upcoming year. | Dr. Pratap Pullammanappallil and his students in the Bioprocessing Laboratory. (Page 15, from left to right, top to bottom) The ABE Faculty gathered for the annual faculty retreat. | Postdoctoral Research Associate Maria Zamora presented her research to the ABE faculty at the annual faculty retreat. | Dr. Zhaohui Tong and graduate student Arianna Partow presented a biological workshop activity for Florida 4-H University. | Dr. Bruce Welt presented his packaging research to State Representative Randy Fine. | Dr. Eban Bean presented his research to the ABE Faculty during the annual faculty retreat. | Dr. Rob Gilbert, UF/IFAS Dean for Research, Chris Petit, FDACS Ag Water Policy in Florida, and Chair Dr. Kati Migliaccio at the ABE faculty retreat. | Dr. Richard Scholtz was selected for the North American Colleges and Teachers of Agriculture (NACTA) Educator Award. | ABE graduate student mentors welcome the department's newest graduate students.

AWARDS AND ACCOMPLISHMENTS

1. Dr. **Kati Migliaccio** was inducted as a fellow of the American Society of Agricultural and Biological Engineers for the Class of 2019.
2. Dr. **Gerrit Hoogenboom** was awarded an International Fellow Award by UF/IFAS.
3. Dr. **Michael Dukes** received the 2019 Evelyn E. Rosentreter Standards award and the 2019 Heermann Sprinkler Irrigation award from the American Society of Agricultural and Biological Engineers.
4. Dr. **Brian Boman** on received the 2019 Netafim Microirrigation award from the American Society of Agricultural and Biological Engineers.
5. Dr. **J. Adam Watson** received the 2019 Teacher of the Year Award from the ASABE Florida Section.
6. Dr. **Sanjay Shukla** received the 2019 Distinguished Achievement Award from ASABE Florida Section.
7. Dr. **Eban Bean** received the 2019 Outstanding Young Researcher Award from ASABE Florida Section.
8. Dr. **Yiannis Ampatzidis** received the 2019 Outstanding Young Extension Worker Award from ASABE Florida Section.
9. Graduate students **Shirin Ghatrehsamani** and **Thiago Borba Onofre** on received first and second place, respectively, in the ASABE Florida Section Graduate Student Presentation Competition.
10. Dr. **Richard Scholtz** was selected for the North American Colleges and Teachers of Agriculture (NACTA) Educator Award.
11. Graduate student **Raminder Kaur** received the 2019-20 A.S. Herlong Sr. Scholarship from the UF/IFAS College of Agricultural and Life Sciences.



NEW HIRES



ANA MARTIN-RYALS, PH.D.

Assistant Professor

Dr. Ana Martin-Ryals earned her Ph.D. in Agricultural and Biological Engineering from the University of Illinois in Urbana-Champaign. Her research focus is on the development of sustainable waste and wastewater treatment processes that incorporate resource recovery to enhance water- energy-food nexus sustainability.


 admartin@ufl.edu



ZIWEN YU, PH.D.

Assistant Professor

Dr. Ziwen Yu received his Ph.D in Environmental Engineering from Drexel University. Dr. Yu's research focused on urban stormwater management using sustainable infrastructure, including green infrastructure system modeling, mediated modeling design, climate change impact assessment, real-time monitoring, and data-oriented decision making.

 ziwen.yu@ufl.edu



JESSICA ABBATE

Receptionist

Jessica began serving as the Receptionist for ABE in August. As the department receptionist, Jessica handles domestic travel authorizations and reimbursements, expense reimbursements and room scheduling.

OTHER NEWS

- Dr. **Rachata Muneeppeerakul** achieved tenure.
- Dr. **William Pelletier** has been promoted to Senior Lecturer.
- Dr. **Senthold Asseng** has been appointed director of the Florida Climate Institute.
- Dr. **Vivek Sharma** will join ABE in early 2020 as an Assistant Professor in Precision Water Management.
- **Ying Zhang** will join ABE in January 2020 as an Assistant Professor in Controlled Environments.
- Dr. **Ziyneet Boz** will be joining ABE in early 2020 as an Assistant Professor in Sustainable Food Systems Engineering.



**UF/IFAS Agricultural and Biological
Engineering Department**

120 Frazier Rogers Hall
PO Box 110570
Gainesville, FL 32611-0570

352-392-1864

abe.ufl.edu



GIVING

Your generous donation to the UF/IFAS
Agricultural and Biological Engineering program
will provide support for our students, faculty and
staff.

To support ABE, our scholarships and more,
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