

# ABE UPDATE

SPRING 2019



## OUR IMPACT IN FLORIDA

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**UF|IFAS**  
UNIVERSITY of FLORIDA



AGRICULTURAL & BIOLOGICAL  
ENGINEERING

**DR. JIM LEARY RETIRES • ALUMNI SPOTLIGHTS  
GRADUATE STUDENT GUEST AUTHOR  
GRADUATING STUDENTS • SEMESTER IN REVIEW**



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# ABE UPDATE

Spring 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](http://abe.ufl.edu)

## Editor

Raychel Rabon

## Copy Editors

Dr. Kati Migliaccio  
Dr. Eban Bean  
Shannon Noble

## Writers

Raychel Rabon  
Shirin Ghatrehsamani  
Valentino Collazo  
Victoria Morgan  
Ashley Owens

## Graphic Designers

Raychel Rabon

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## Letter from the Department Chair

Florida is a very diverse state with an abundance of resources – including a tourist industry with visitors spending \$112 billion, an agriculture industry with a total value of production of \$11 billion, and priceless natural features such as the Everglades, estuaries, springs, and beaches. The expertise found in the UF/IFAS Agricultural and Biological Engineering department is critical to identifying sustainable solutions to Florida's future as population grows, climate changes, and demands on resources increase.



Kati Migliaccio, Professor and Chair

The diversity and opportunities in a state like Florida create an ideal environment for applying expertise from our discipline, thus many Agricultural and Biological Engineering (ABE) programs focus on applications close to home. ABE at the University of Florida contributes to efforts statewide with faculty located not only on main campus but also at the Indian River Research and Education Center (REC) in Fort Pierce, the Southwest Florida REC in Immokalee, and the Tropical REC in Homestead. Likewise, UF/IFAS ABE faculty lead state-wide efforts through the Florida Climate Institute and the UF Water Institute. This spring issue of the ABE Update showcases some of the excellent Florida-based programs from our department that are creating positive impact in our state.

While this issue highlights Florida programs primarily from the UF/IFAS ABE department, there are professionals in the ABE discipline throughout the state who contribute to a better Florida. In June, professionals working in the discipline will convene at the Florida Section of the American Society of Agricultural and Biological Engineers – as we do annually – to network, learn, and share information with each other. UF/IFAS ABE faculty and students will be attending to share their research and learn from others. The meeting theme selected for this year is Modernizing Policy for a Resilient Future. This topic provides a clear message for the role agricultural and biological engineers currently have and will continue to have in Florida's future.

As this issue will illustrate, the ABE department serves the state of Florida with impactful programs. We look forward to continuing to help our communities live better.

*Go Gators!*

**Kati Migliaccio**

*Professor and Chair*

 @hydroKati

# OUR IMPACT IN FLORIDA

## URBAN WATER

### 'Kick-starting' Soil Formation in New Residential Developments

Assistant Professor **Eban Bean** is working to make sure we have water in the future. One of the main uses of water in Florida is for landscape irrigation. While other research has focused on the right application of irrigation amounts, Dr. Bean is focused on improving soils to reduce irrigation.

Soils in new residential developments often are of limited quality and are compacted during the construction process. The result is usually a challenging environment for trying to establish a landscape on soil that holds very little water and that is difficult for roots to penetrate. The effects of compaction and poor soil quality will be mitigated over time, but that can take decades. With over 1,000 people moving to the state each day, Florida doesn't have decades.

Dr. Bean's research explores how incorporating compost into new residential landscapes can im-

prove the soil quality, reduce irrigation and runoff, and produce a more resilient landscape. On Top of the World, a 5,000 home active adult community in Ocala, Florida, has been the test site for this research. New home owners who are incorporating compost applying 25% less irrigation than their neighbors. **Jovana Radovanovic**, a graduate student in ABE, measures runoff and infiltration from treated lawns

and collects samples for nutrient analysis. If incorporating compost can also be shown to reduce runoff volumes and nutrients, it would be a greater incentive for builders and developers to adopt the practice and protect Florida's water resources.

As a result of the research at On Top of the World and corresponding extension efforts, it is estimated that **74 million gallons** of water were saved in Florida's urban areas during 2018.

### Robust Decision Making for South Florida Water Resources

Associate Professor **Christopher Martinez** specializes in urban water resources. Dr. Martinez works to understand how climate forecasting can benefit urban water management. The numerous factors that water managers take into account must be handled through a decision-making pro-



(LEFT) Dr. Eban Bean (right) and Marc Thomas (left) works at On Top of the World in Ocala, Florida, to improve residential landscapes. (RIGHT) This unmanned aerial vehicle (UAV) with an attached hyperspectral camera is used by Dr. Yiannis Ampatzidis for precision agriculture analysis.

cess that involves managing large volumes of data. The trend in decision-making situations of this kind is intended to create mathematically-based, computer-run procedures, commonly called models, that analyze the data. Often, managers will run numerous scenarios through the models, and in the end, human judgments must be made about the best actions to take.

Decision-making tools such as this are used in the South Florida Water Sustainability and Climate (WSC) project, a project funded by the Water Sustainability and Climate Program of the National Science Foundation. Given that water in south Florida is subject to competing water allocation targets, exposure to extreme climate variability, and vulnerability to sea level rise, this project seeks to develop hydro-economic models for optimizing water allocations, incorporate economic value information into these models, test schemes for increased the resilience of water resources, engage stakeholders to improve understanding risk management and decision-making, and develop recommendations for adaptive water management that optimize economic and ecological productivity as well as foster sustained public support.

## AGRICULTURE

### Putting Smart Machines to Work

Assistant Professor **Yiannis Ampatzidis** works in the area of mechanization and automation of specialty crop production. He focuses on the design, development, and testing of sensors and control systems for optimal management of inputs, resources, and products.

As part of his research program, Dr. Ampatzidis works with unmanned aerial vehicles (UAV) for agriculture and natural systems, smart sensors and machinery, mechatronics, artificial intelligence and robotics, machine vision and learning, automation, remote sensing, wireless sensor network, and big

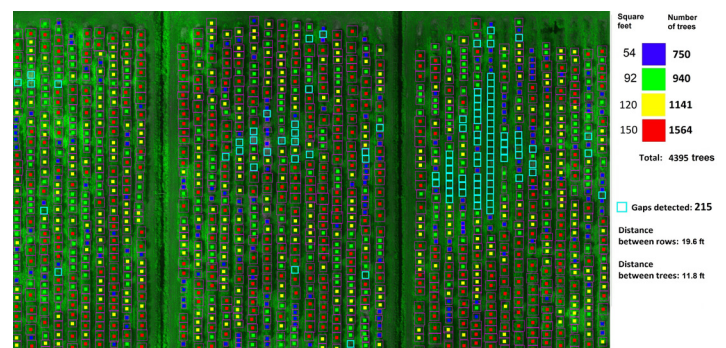
**“These smart and rapid technologies can significantly reduce manual sampling, scouting time, dependence on labor and the overall production cost.” - Yiannis Ampatzidis on precision agriculture technologies**

data application. With emphasis on developing smart machines and equipment for site-specific applications (e.g. precision sprayer for pests and weeds), this technology can be used to reduce agricultural inputs such as water, fertilizer, and pesticides.

Dr. Ampatzidis’ research team is developing ground and UAV-based high throughput phenotyping tools to assess citrus tree growth. These automated tools can detect, geo-locate and count trees and their canopy volume, detect tree gaps, develop individual tree health and stress indices, and estimate number of fruit per tree (yield). Other novel cost-effective technologies can simultaneously scout for a variety of pests (weeds, insect, diseases) and spray only where it is needed. These smart and rapid technologies can significantly reduce manual sampling, scouting time, dependence on labor and the overall production cost.

### Fruit and Vegetable Production under Climate Change

Professor **Senthold Asseng** is currently co-leading a National Institute of Food and Agriculture (NIFA)-funded project with Dr. Dave Gustafson, from International Life Sciences Institute (ILSI) Research Foundation, in which they explore if regions like the Southeast, including Florida, or the Pacific Northwest can produce some of the fruits and



This image shows UAV-based map for tree and tree gap detection, including tree canopy size estimates, used by Dr. Yiannis Ampatzidis.



(LEFT) Dr. Wonsuk “Daniel” Lee (left) and ABE alumnus Hao Gan (right) uses an autonomous robot for immature green citrus fruit yield mapping and imaging design platforms for automatic strawberry counting. (RIGHT) This citrus yield mapping robot is used by Dr. Wonsuk “Daniel” Lee and ABE alumnus Hao Gan to count the number of fruits on citrus trees and can create a yield map of the citrus grove.

vegetables that are becoming harder to produce in California due to less water and an overall warming climate.

To combat the impact of climate change on fruits and vegetables production, Dr. Asseng and Dr. Gustafson work with a team of leading scientists from the International Food Policy Research Institute, University of Arkansas, University of Illinois, Washington State University and the World Agricultural Economic and Environmental Services and use crop, environmental, economic and climate modeling to predict current and future impacts on yield. They also work to study the quality of selected fruit and vegetable crops in states where they are currently grown and identify future locations that will allow for continued or potentially increased production.

In this project, Dr. Asseng and Dr. Gustafson investigate places that have sufficient water to grow fruits and vegetables, ultimately utilizing climate data to see where such produce can be grown in the future including the potential for improving the overall sustainability and environmental profile of

handling, storing, packaging, and market access activities. The team of researchers involved in this project will combine economic and crop models to determine current and future prices and production costs of crops such as carrots, green beans, oranges, potatoes, spinach, strawberries, sweet corn, and tomatoes, which are already grown in Florida.

They hope to improve nutrition and health by growing more, and better, fruits and vegetables through cross-disciplinary research, which will be beneficial to Florida and the nation.

“We developed a model to balance competing water needs between agriculture, urban areas, and environmental flows that can be used to improve decision making in the future in South Florida.” - Christopher Martinez on the South Florida Water Sustainability and Climate project

## Reducing Water Use with Smart Irrigation Controllers

Professor **Michael Dukes** is an irrigation specialist focusing on efficient use of water in irrigated systems. Dr. Dukes and his team are conducting research on high tech irrigation controllers that apply water based on measurements from landscapes, known as “smart irrigation controllers.” These controllers reduce the use of outdoor water use by monitoring and using site condition

information, such as soil moisture, rain, wind, plant type, and more, to apply the proper amount of water needed.

Due to the need for adequate water to produce food and satisfy domestic uses including landscape irrigation, it is important to maximize the efficient use of water. These “smart irrigation controllers” are saving millions of gallons of water each year in Florida and are being adopted across the U.S. With properly installed and programmed “smart irrigation controllers,” irrigation savings in Florida can be around 30-40% in dry conditions and 70-90% in normal conditions. Dukes is often consulted by utilities, decision makers, and groups such as the U.S. Environmental Protection Agency WaterSense program for technical knowledge on this subject.

## Sensing Systems for Florida’s Precision Agriculture

Professor **Wonsuk “Daniel” Lee** specializes in Precision Agriculture and Machine Vision and is the leader of the UF/IFAS ABE Precision Agriculture Laboratory. Currently, Dr. Lee and his team are working to develop novel sensing systems for specialty crops for precision agriculture in Florida. His most recent studies include developing an autonomous robot for immature green citrus fruit yield mapping and designing imaging platforms for automatic strawberry flower counting. Both of

these works have the potential to greatly improve farming efficiency in Florida.

The citrus yield mapping robot is able to count the number of fruits on trees and create a yield map of a citrus grove. The yield map, when combined with decision support tools, could help farmers apply timely treatments to the citrus groves.

The strawberry flower counting platforms consist of an aerial imaging system and a ground-based system, which can provide quick and accurate flower counts in the field. The platforms can lower the pressure of hiring workers in a short time during the high-yield periods through early yield estimations and address the labor shortage issue in Florida’s strawberry industry.

## NATURAL RESOURCES

### Evaluating Impacts of Projected Climate Change on Water Quantity and Quality

Assistant Professor **Young Gu Her** specializes in hydrology and water quality. Currently, Her and his team are working to evaluate the impacts of projected climate change on water quantity and quality of the upstream Everglades systems including Lake Okeechobee and the Kissimmee



(LEFT) Dr. Michael Dukes works with “smart irrigation controllers” to reduce the use of outdoor water use by monitoring and using site condition information. (RIGHT) Dr. Young Gu Her and his team are evaluating the impacts of climate change on water quantity and quality of the upstream Everglades systems including Lake Okeechobee (pictured) and the Kissimmee River basin.

River basin using a spatially integrated modeling approach. To accomplish the goal, they are preparing watershed loading and receiving waterbody models that can describe the loading processes of water and nutrients and the hydrodynamics and water quality processes of the lake, respectively.

The water quality issues of the lake such as algal blooms have been partially or significantly attributed to the loading of nitrogen and phosphorus from their upstream watersheds. The Kissimmee River basin have been reasonably suspected to be the source of nutrients, and the water and nutrient loading need to be managed to improve the water quality of the lake and its downstream estuaries including the St. Lucie and Caloosahatchee estuaries. The current water quality improvement efforts lack a holistic regional perspective on the issues even though the upstream areas of the lake are closely linked to the water quality of the downstream waterbodies.

From this research project, Dr. Her and his team are expecting to deliver a spatially integrated simulation tool that is essential for successful water quantity and quality management of the upstream Everglades system. The developed tool will be able to provide a holistic view of the connection between the upstream and downstream areas, including the Kissimmee River basin, Lake Okeechobee, the Caloosahatchee and St. Lucie estuaries at a regional scale.

## Using Wind-power in Florida

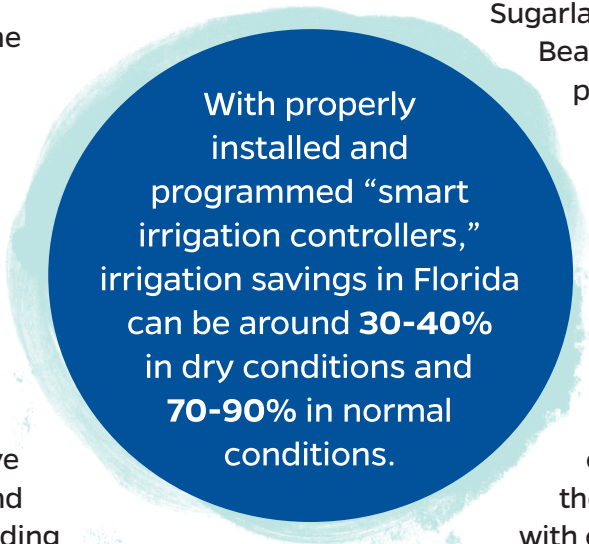
Most wind energy farms in the United States are located in the gusty, high-velocity wind areas of the Midwest. Other regions of the country, such as the Southeast, experience lower wind velocities, yet have a high concentration of population. In

these regions, there exists a mismatch of clean energy demand and the supply available to address it. Research by Professors **Ray Huffaker** (UF/IFAS ABE) and Marco Bittelli (University of Bologna, Italy), published in the PLOS ONE science journal, investigated whether wind power might be economically viable as proposed in the

Sugarland Wind Project of South Palm Beach, Florida. Their research provides new evidence that matching wind energy supply patterns with energy demand patterns can open new markets for wind farms in low wind-velocity areas around the country and the world.

Daily wind speed patterns over land are created by thermal heat exchanges with oceans, yet scientists and engineers involved in energy production

conventionally treat wind speed as a random variable governed by probability. Alternatively, Dr. Huffaker and Dr. Bittelli applied recently developed methods in empirical nonlinear dynamics to demonstrate that wind velocities exhibit expected systematic daily behavior, which can be used to compute long-term daily wind-power supply in southern Florida. Matching supply with daily energy demand patterns in southern Florida, they found that wind supply patterns matched well with peak daily demand patterns in the hot season, thus allowing residents to cool their homes and offices with renewable, clean energy when they needed to. Wind supply patterns also matched well with peak morning demand in the cold season. They did not match well, however, with peak evening demand in the cold season, indicating potential need for increased energy storage if wind power is to supply this period more effectively. ■





# ACHIEVING DREAMS

BY SHIRIN GHATREHSAMANI

It was my dream to join UF/IFAS ABE and earn my Ph.D. from this department because of its prestigious reputation, both nationally as well as worldwide. I was interested in the area of design and manufacturing, which led my research to the agricultural and biological engineering field.

When I came to the University of Florida, I earned a second master's degree in Mechanical Engineering (Manufacturing) from UF Mechanical and Aerospace Engineering department and certificates of Engineering Leadership and Innovation from the UF Engineering Leadership Institution.

As I began my research, I focused on the needs of Florida's 9 billion dollar citrus industry. Due to the spread of the citrus greening disease (HLB), concern for the continuity of the citrus industry in the state had sparked. In this research, I developed integrated computational modeling to simulate and analyze heat distribution throughout the tree canopy and improve the supplementary heat therapy system to generate a uniform temperature. This serves for evaluation of the system to increase the yields and reduce labor works. The outcome of this project and other relevant projects at UF has the potential to save Florida's large citrus industry from the further devastation by HLB.

The reason that I chose this department was for its academic reputation in this field but when I joined the ABE, I also found that this department is a great place not only because of academic reputation but also because of its friendly environment and supportive people. ABE has given me the best level of teaching, work ethic, and research leadership. I have learned a lot from my instructors and mentors at ABE and UF.

Soon I will be graduating but until then I continue seeking opportunities that help me grow within the ABE family and its environment as I aspire to one day be an agricultural and biological engineering faculty member, possibly at the University of Florida. ■

🐦 @GhsShirin

Shirin Ghatrehsamani is a Ph.D. student in UF/IFAS Agricultural and Biological Engineering studying Agricultural Machinery/ Machine Vision. Shirin is originally from Iran and received her Bachelor and Master of Science degrees in Agricultural Engineering from top-ranked universities in Iran. Shirin's advisor is UF/IFAS ABE Assistant Professor Yiannis Ampatzidis.



*Shirin Ghatrehsamani and Dr. Yiannis Ampatzidis at the UF/IFAS Southwest Florida Research and Education Center.*



*Shirin Ghatrehsamani during a field activity for the Advanced Precision Agriculture course with Dr. Wonsuk Lee.*



*Shirin with Henry Frierson, Associate Vice President and Dean of the Graduate School, at the Graduate Research Day Award Ceremony.*

## ALUMNI SPOTLIGHT



### Allison Mica

---

*Project Manager, Bacardi*

*B.S., Packaging Science,  
Agricultural and Biological  
Engineering, University of  
Florida, 2012*

*M.B.A., Warrington College of  
Business, University of Florida,  
2017*

*Advisory Board Member,  
UF/IFAS Agricultural and  
Biological Engineering*

#### **WHAT DO YOU DO IN YOUR ROLE AS A PROJECT MANAGER AT BACARDI?**

As a Project Manager I lead teams of 15-20 cross functional roles to launch new innovations for Bacardi. New innovations range from new liquids, new packaging, or extensions of existing formats to new markets. Additionally, I am part of the strategic planning for long term new initiatives for the Bacardi portfolio and ensuring consistency amongst the brand globally.

#### **WHY DID YOU CHOOSE TO WORK IN THIS FIELD?**

I stumbled across the Packaging Science program at University of Florida when I was a senior in high school from a showcase of the program in the university magazine! I already knew UF was my school of choice and I wanted to study a STEM field. Packaging Science met both of those criteria and peaked my interest beyond measure - what an impactful and opportunistic field. At the time, after researching the packaging industry further I found out it was a highly demanded industry for women, one of the top ten highest paying jobs with a bachelor's degree, and the job placement coming out of UF was 100%. Sounded like the perfect fit to me! After five years as a Packaging Engineer, at the two largest family owned spirits companies, I transitioned into Project Management. The transition between Packaging Engineering and Project Management is a common move and I have found a much more business perspective that I love as well since this transition.

#### **HOW DID UF/IFAS ABE HELP YOU PREPARE FOR YOUR CAREER?**

ABE prepared me with a tremendous skill-set for achieving great things in the work force. The countless team projects that strengthened my interpersonal skills, the chemistry/mathematics/physics fundamental building blocks for engineering, and the focus on packaging technology all prepared me for my future career. Additionally, the professors and staff in ABE took me in as their own from day one at Preview until graduation four years later. The friendships and mentoring, specifically with Dr. Welt, led me to a fantastic internship with Colgate-Palmolive during college, then job placement at Brown-Forman immediately upon graduation.

#### **WHAT DO YOU HOPE TO DO IN THE FUTURE?**

In 2017, I graduated from UF Warrington College of Business with my MBA and am looking to continue gaining a more well-rounded perspective to be an impactful leader at Bacardi. With a strong technical background from my time in the ABE program, I have found the opportunities are endless and keep me challenged. I look forward to a prosperous future!

ALUMNI SPOTLIGHT



# James Hulsey

*Project Manager, Marion County Office of the County Engineer*

*B.S., Agricultural Operations Management, Agricultural and Biological Engineering, University of Florida, 2013*

**WHAT DO YOU DO IN YOUR ROLE AS A PROJECT MANAGER AT MARION COUNTY OFFICE OF THE COUNTY ENGINEER?**

I have been working for Marion County Stormwater for three years. I began as the Stormwater GIS Technician Analyst in 2016 and was promoted to Project Manager II in 2017. My current role as Project Manager II primarily involves Development Review. As the Stormwater staff reviewer, I review proposed developments, such as residential and commercial improvement plans, mass grading plans, major site plans, plats, agricultural lot splits, etc. for compliance with the stormwater technical standards of the Marion County Land Development Code under the guidance of the Stormwater Engineer and County Engineer.

**WHY DID YOU WANT TO WORK IN THIS FIELD?**

Prior to beginning work at Marion County Stormwater, I was involved with a commercial blueberry farm and nursery for two years with two of my fellow AOM alumni. I then accepted a job with the Natural Resource Conservation Service. I worked with farmers in Iowa on developing tailored soil conservation practices for about a year. My background in Agricultural Operations Management (AOM) and those work experiences right out of college exposed me to aspects of stormwater management that made me well qualified for the job. In the three years I have been at Marion County Stormwater, I have felt like my work is valued and that the County is invested in my education and my future. The work is engaging, and fast-paced. Development in the county is currently booming, and I have reviewed over 900 projects in the last two years. I enjoy my job; good salary and benefits, work-life balance, great coworkers and overall a great organization to work for.

**HOW DID ABE HELP YOU PREPARE FOR YOUR CAREER?**

The course of study allowed me to gain practical knowledge in hydrology, soils, irrigation, energy, structures, and environment. The professors and advisors were excellent. I learned there is a lot of science and engineering in agriculture and that agriculture tends to be at the forefront of innovation. I got to learn hands-on with the tools, technology, and programs that are used by the agriculture professionals. I became educated on best management practices, water quality, and the laws, rules and regulations around farming and land development. I also had some great opportunities to be involved in research and conduct my own research. I was able to make some lasting connections with friends, farmers and professors. I regularly work with farmers and engineers who are ABE and AOM alumni.

**WHAT DO YOU HOPE TO DO IN THE FUTURE?**

I will be working towards a Masters in Civil Engineering and P.E. licensure. My plan is to apply to the UF EDGE Program this Fall to complete my degree online while continuing to work for Marion County Stormwater.

# Student Organi



## AOM CLUB

**By Valentino Collazo**

*AOM Club President, AOM Undergraduate Student*

This semester, the Agricultural Operations Management Club hosted several guest speakers, prepared students for the CALS career fair, and is excited to announce a new change in leadership.

Among the guest speakers the club hosted, the AOM club had the privilege of hosting Ed Scott, Director of Corporate Recruiting and Compliance Specialist from Cal-Maine Foods, Inc. With 37.94 million hens and \$1.908 billion in egg sales, Cal-Maine Foods, Inc. is the largest egg producer in the U.S. and the world.

The AOM Club also partnered with the Careers Connection Center this semester. Prior to the CALS career fair, workshops for students were created to help build resumes, practice interview questions, and gain insight into the career searching process.

With several of our leaders graduating this semester, the AOM Club is excited for the new innovations and ideas that will come from the leadership of our new president, Kip Jedlicka. Next semester the AOM Club plans to visit more successful farms and businesses, host guest speakers from the agricultural industry, increase club involvement with club socials and events, hold career and professional development workshops, and start a vertical farm on campus. ■

## GRADUATE STUDENT ORGANIZATION

**By Victoria Morgan**

*ABE GSO President, ABE Graduate Student*

This spring, the ABE Graduate Student Organization had their spring professional development event with their annual ABE Poster Symposium. Both graduate and undergraduate students were able to showcase their current research in the department. First place went to Nicholos Cavallaro for “Laser Carbonized Aptasensors for the Point of Use Detection of *Listeria monocytogenes*”. This opportunity helped Shirin Sa win 1st place in the Engineering category at the UF Graduate Student Research Day for “Evaluation of Mobile Heat Treatment System for Treating In-field HLB-affected Trees by Analyzing Biosensor Survival Rate”. She will continue on to a statewide poster contest.

We also hosted our monthly professional development lunch meetings, mentoring, and social events. These events are special because they allow students to connect and learn from more experienced Ph.D. students in a casual, safe, and fun atmosphere! ABE GSO hosted a service event at Grace Market Place by helping serve meals to those in need.

In the summer and fall semesters, we will continue our monthly professional development lunch meetings, mentoring and social events, and will have our annual Three Minute Thesis (3MT) competition. In addition, we will be hosting a ‘welcome to the department social’ for new faculty and students to kick off our mentoring program. ■

# zations



## PACKAGING CLUB

**By Ashley Owens**

*Packaging Club President, BE Undergraduate Student*

Packaging Club students have participated in two design competitions, attended a conference, and attended a plant tour during the Spring 2019 semester.

The Paperboard Packaging Alliance sponsored competitions prompt was to design an interactive video game console package. The club has two teams and the competition is still ongoing; winners will be announced at this year's PACKEXPO. The other design competition students participated in was 48 Hour Repack. This year's prompt was to redesign the iconic 12 pack Coca Cola paperboard box. The group consisted of Lauren Cunningham, Dylan Green, Kim Hafner, Ashley Phillips, and Ashley Owens.

Packaging Club students also attended the DSCOOP conference in Orlando, Florida for the first time. Students that attended learned more about digital printing solutions and how they can be applied to packaging. ■

# #3

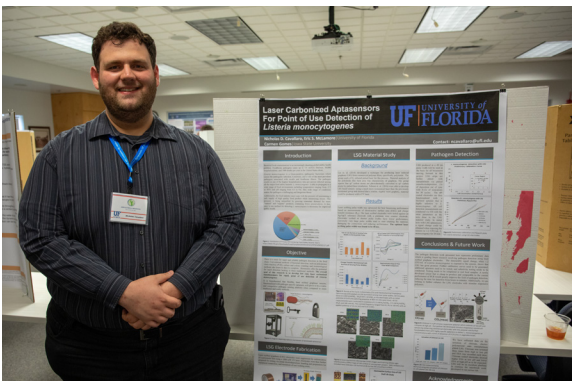
## BIOLOGICAL/ AGRICULTURAL ENGINEERING

### GRADUATE PROGRAM

*Among National Institutions  
By U.S. News and World Report*

Find out more about our graduate program at [abe.ufl.edu/graduate](http://abe.ufl.edu/graduate)





(Top to Bottom, Left to Right) A Remote Pilot License Training was hosted at North Florida Research and Education Center in Quincy, Florida. | Academic advisor Robin Snyder received the 2019 IFAS Superior Accomplishment Awards in the Administrative/Supervisory category. | USDA NIFA National Program Leader Dr. Steven J. Thomson received the UF/IFAS ABE Distinguished Alumni Award. | The ASABAE Florida Student Branch attended the ASABE Southeastern Regional Student Rally in Raleigh, North Carolina hosted by NC State Biological and Agricultural Engineering. | Nick Cavallaro wins first place in the 2019 ABE Poster Symposium with his research poster titled "Laser Carbonized Aptasensors for the Point of Use Detection of Listeria monocytogenes." | Packaging Club students participated in the 48-Hour Repack. This years prompt was to redesign the iconic 12 pack Coca Cola paperboard box. | The 10th DSSAT Development Sprint Workshop, hosted by UF/IFAS Institute for Sustainable Food Systems and ABE, was held to improve the DSSAT program and provide a forum for information exchange among developers and users. | The ABE advisory board visited the Sweetwater Wetlands Park during its biannual meeting in Gainesville, Florida.



## DR. JIM LEARY RETIRES

BY RAYCHEL RABON

**D**r. James “Jim” Leary began working at the University of Florida in 1994 as an Assistant Extension Scientist. In 2000, Dr. Leary began serving as Undergraduate Coordinator for the Biological Engineering program and a Lecturer, and later Senior Lecturer. Dr. Leary taught courses including Introduction to Biological Engineering, Principles of Food Engineering, and Intro to Engineering.

Before his time at UF, Dr. Leary served as an Adjunct Instructor and Mechanical Engineering Research Assistant at Iowa State University. Dr. Leary earned his Ph.D. in Agricultural and Biosystems from Iowa State University, Master of Science and Bachelor of Science degrees in Mechanical Engineering from Iowa State University. In addition, he earned a Master of Education and Bachelor of Science degrees in Psychology from the University of Wisconsin-Superior.

As he was serving as a school psychologist for the Des Moines Public Schools for three and a half years, Dr. Leary decided on a career change to focus on renewable energy. This pushed him to pursue degrees in engineering. While completing his M.S. and Ph.D. degrees, he was hired as an academic advisor and instructor for a Freshman Engineering program where he served for six years. Prior to obtaining his Ph.D., Dr. Leary was hired as an Energy Extension Specialist at the University of Florida. About a year later, Dr. Leary became the

*Left to right: Dr. James Leary, Dr. Kati Migliaccio, and Dr. Wendell Porter celebrate Dr. Leary's retirement and presents his Certificate of Retirement.*

undergraduate coordinator for ABE Undergraduate Program.

During his time in ABE, Leary has served as Chair of the ABE Curriculum Committee for almost 22 years, Chair of the College of Engineering Curriculum Committee for 13 years, and has been involved in several ABET reviews and other committee assignments throughout the years.

“The most rewarding part of my career has been interacting with students in classes, during advising sessions, (or even when students just came in to visit!), and during social gatherings,” Leary said. “Another rewarding part of my career has been being part of the ABE “Family.” I have thoroughly enjoyed the friendships and camaraderie of all staff and faculty in this department.”

Since his retirement, Leary has had the opportunity to train more for his triathlons and running races. His travel plans include visits to Alaska, Ireland, and National Parks within the United States.

Congratulations to Dr. James Leary on his retirement! Thank you for all you have done for UF/IFAS ABE. ■

# GRADUATING STUDENTS

SPRING 2019 DOCTORAL AND MASTER STUDENTS



**FERNANDO ARISTIZABAL**

Master of Science  
Land and Water Resources  
Advisor: Dr. Jasmeet Judge



**JUSTICE DIAMOND**

Master of Science  
Land and Water Resources  
Advisor: Dr. Michael Dukes  
and Dr. Kati Migliaccio



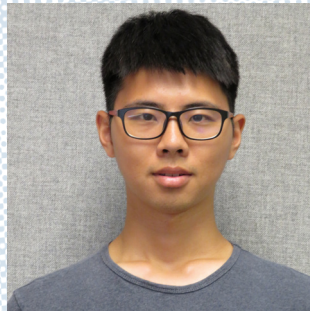
**MADISON KELLER**

Master of Science  
Packaging  
Advisor: Dr. Bruce Welt



**MARY SZOKA**

Master of Science  
Land and Water Resources  
Advisor: Dr. Ray Huffaker



**CLEMENT TSENG**

Master of Science  
Bioenergy  
Advisor: Dr. Pratap Pullammanappallil



**MARIA ZAMORA**

Doctor of Philosophy  
Irrigation  
Advisor: Dr. Michael Dukes

*Congratulations  
to our Graduates!*



# GRADUATING STUDENTS

SPRING 2019 UNDERGRADUATE STUDENTS

**GREGORY AUMANN**

Biological Engineering

**CAROLINE KRUEGER**

Biological Engineering

**NOAH BOLDT**

Agricultural Operations Management

**ERIC LINDER**

Agricultural Operations Management

**COLSON CANNON**

Agricultural Operations Management

**ERIC LUO**

Biological Engineering

**MATTHEW CARTER**

Agricultural Operations Management

**GRAHAM MARCUS**

Biological Engineering

**THOMAS (JAKE) CLOSE**

Biological Engineering

**VY NGUYEN**

Biological Engineering

**VALENTINO COLLAZO**

Agricultural Operations Management

**ASHLEY OWENS**

Biological Engineering

**BEN GELBER**

Agricultural Operations Management

**BRIANNA PIZZANO**

Biological Engineering

**GRAYSON GERHARD**

Agricultural Operations Management

**JACK PREVATT**

Agricultural Operations Management

**TERESITA GONZALEZ SAN MARTIN**

Biological Engineering

**DYLAN SIEGEL**

Agricultural Operations Management

**BLAZE JOHNSON**

Agricultural Operations Management

**PHILIP STANSLY**

Biological Engineering

**DONG KANG**

Biological Engineering

**ANDREW WALDO**

Agricultural Operations Management

**MATTHEW KOLINSKY**

Agricultural Operations Management

**KIRSTEN WALKER**

Agricultural Operations Management



# AWARDS & ACCOMPLISHMENTS

- The **UF/IFAS ABE graduate program** is ranked No. 3 among national institutions by U.S. News and World Report.
- Dr. **Yiannis Ampatzidis'** paper, "Development and Evaluation of a Low-Cost and Smart Technology for Precision Weed Management Utilizing Artificial Intelligence," was selected for the UF Research Promotion Initiative award.
- Dr. **Wonsuk "Daniel" Lee** and his team received a grant from the USDA-NIFA AFRI Agricultural Engineering program for their project on a "Novel Smartphone Vision tool to improve spider mite monitoring."
- Dr. **Christopher Martinez** and his team have received a grant from the National Aeronautics and Space Administration (NASA) for their proposal entitled "Integrating NASA Earth Systems Data into Decision-Making Tools of Member Utilities of the Florida Water and Climate Alliance."
- Dr. **William Pelletier** received the IMAGINE Educational Grant from Campbell Scientific, Inc. for the new ABE Programming for Biological Engineers course.
- Dr. **Richard Scholtz** was selected for the North American Colleges and Teachers of Agriculture (NACTA) Educator Award.
- Academic advisor **Robin Snyder** received the 2019 IFAS Superior Accomplishment Award in the Administrative/Supervisory category.
- Graduate student **Shirin Ghatrehsamani** received first place poster in the Engineering Category at the UF Graduate Student Research Day.
- Alumna **Julianne Chechanover** was selected as the 2019 winner in the College Edition category of "New Faces of ASABE."
- USDA NIFA National Program Leader Dr. **Steven J. Thomson** received the UF/IFAS ABE Distinguished Alumni Award.
- **Nick Cavallaro** received first place in the 2019 ABE Poster Symposium.
- **Satbyeol Shin** received second place in the 2019 ABE Poster Symposium.
- **Xue Zhou** received Best Overall First-year Graduate Student in the 2019 ABE Poster Symposium.
- **Vy Nguyen** received Best Overall Undergraduate in the 2019 ABE Poster Symposium.

# DEPARTMENT NEWS

- Dr. **Senthold Asseng** has been named the new director of the Florida Climate Institute.
- Dr. **Wendy Graham** has been named to the Blue-green Algae Task Force by Florida Governor Ron DeSantis that will make recommendations to reduce nutrients in Lake Okeechobee and downstream estuaries and look at connections to the red tide algal blooms that have affected Florida's coasts.
- Dr. **Michael Dukes** will lead the new Center for Land Use Efficiency (CLUE).
- Dr. **James Leary**, Senior Lecturer and Biological Engineering Undergraduate Coordinator, retired after serving in the ABE department for 25 years.
- Dr. **Ziyet Boz** will be joining ABE this August as an Assistant Professor in Sustainable Food Systems Engineering.
- Dr. **Ana Martin-Ryals** will be joining ABE this May as an Assistant Professor in Agricultural and Biological Engineering.
- Dr. **Ziwen Yu** will be joining ABE faculty this August as an Assistant Professor in Big Data Analytics in Agricultural and Natural Resources Systems.



## WELCOME TO ABE

### DR. VAKHTANG SHELIA

Dr. **Vakhtang Shelia** started as a Research Assistant Scientist in April. Dr. Shelia will be working closely with Dr. Gerrit Hoogenboom. His responsibilities include conducting research, extension and education programs on decision support and agricultural system modeling with an emphasis on sustainable food systems. He will also support developing new crop models and software tools for their application to assess crop production, water and nutrient management, climatic risk, environmental sustainability and yield forecast at different temporal and spatial scales.

## HOW CAN YOU PARTNER WITH US?

*The UF/IFAS Agricultural and Biological Engineering department is seeking industry partners for its courses and student organizations to collaborate with. These collaborations can include tours, guest lectures/seminars, course projects, and more.*

To connect with us, contact **Shannon Noble** at 352-294-6711 or [shannon.noble@ufl.edu](mailto:shannon.noble@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, visit [abe.ufl.edu/give](https://abe.ufl.edu/give).

## UF/IFAS Agricultural and Biological Engineering Department

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

352-392-1864

[abe.ufl.edu](https://abe.ufl.edu)

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