

Center for

LANDSCAPE

CONSERVATION

and

ECOLOGY

2016-2017 Annual Report

Over

\$12 MILLION

in

TOTAL FUNDING

since 2012

In 2016-2017,

\$5.24 MILLION

in active

EXTERNAL FUNDING

and

\$301,596

in

INTERNAL FUNDING

2016-2017 at a GLANCE

15
interdisciplinary faculty

16
affiliate faculty

24
M.S. students

11
Ph.D. students

64
refereed publications
produced

24
proceedings contributed to

20
non-refereed
publications produced

24
EDIS publications produced

5
books contributed to

2nd
Urban Landscape
Summit hosted

104.9 MILLION
gallons of water saved
based on educational
programs delivered

10
webinars hosted with
450
participants

88
in-service trainings and
workshops conducted with
8,892
people served

4,500
Florida Master Gardener
volunteers gave
420,000
hours for a value of
\$9.3 MILLION

588,999
unique website visitors

7,348
e-newsletter subscribers

10,590
Facebook followers

Top 5 Facebook posts
reached over
113,600
and engaged over
24,000
fans

1,293
Twitter followers

75,694
views monthly Pinterest

720
Instagram followers

Director's Message



Enclosed is our 2016-2017 annual report. This past year was again a productive year. By the time you read this, we'll have filled the final faculty position in the Environmentally Resilient, Resource-Efficient Land Use faculty cohort in partnership with the Program for Resource Efficient Communities. Drs. Basil Ianonne, Jorge Barrera, Eban Bean, and A.J. Reisinger have joined us as specialists in Geospatial Analytics, Utility Analytics, Urban Water Resource Engineering, and Urban Soil and Water Quality, respectively, and are getting acquainted with Florida issues.

As you may know, the CLCE budget was impacted this year by the Governor's veto. The impact of the cut affected the legislative budget request (LBR) that funds the UF/IFAS Center for Public Issues Education as well as part of our budget used for faculty enhancement grant program and graduate student funding. Our human resources are our most important resource in IFAS and this budget cut impacts several faculty and staff positions, as well as the graduate students that we support in our competitive graduate student funding program. In a comprehensive response plan, UF/IFAS spread the budget cuts across the entire organization, allowing the preservation of all human resources. Outside the budget cut, we're seeking our own cost efficiencies, such as producing this report only electronically this year. We will continue to look for ways to conduct high quality research and deliver impactful Extension programs at a reduced cost.

Despite budget cuts, we were able to maintain all of our supported graduate students and award funding to a number of innovative new projects. We were also able to continue in our competitive faculty enhancement grant program, some of which are highlighted in this report.

Our second annual Landscape Summit was jam packed again this year! Feedback from attendees was extremely positive. We are in the active planning stages for our 2018 summit with some new ideas, such as embedded Extension In-service training programs and interesting keynote speakers.

As ever, we look forward to continuing our mission to provide research-based education on Florida's urban landscape practices. Thank you for your support.

A handwritten signature in blue ink, appearing to read "Michael D. Dukes".

Michael D. Dukes
Director





MISSION

To conduct interdisciplinary research and provide science-based education on urban landscape practices to protect and conserve Florida's natural resources

VISION

To be the leading source of science-based information and innovations for landscape practices in the urban environment in Florida

GOAL

Seeks to promote research-based best management practices among landscape professionals and other members of the agricultural industry, and to educate homeowners on sustainable landscape practices through its research, education, and outreach.

CLCE also seeks to train students who will enter careers that allow them to engage in and promote sustainable landscape practices.

HISTORY

The center was established in 2006 by an act of the Florida Legislature in response to concerns about the sustainability of current landscape management practices and interests in water availability and quality. With Florida's ever-growing population, it was recognized that a large focus needed to be placed on landscapes, urban water and fertilizer use, plant choice, and maintenance practices. The center serves multiple stakeholders including landscape professionals, trade organizations, commercial developers, urban planners, policy makers, Extension agents, and Florida residents, providing research findings, recommendations, and education.

CLCE Faculty and Affiliates: Interdisciplinary, Collaborative, and Innovative

The Center for Landscape Conservation and Ecology brings together an interdisciplinary team of faculty and affiliate faculty to conduct crosscutting research and deliver innovative, issues-based Extension outreach. The CLCE communications office coordinates faculty outreach efforts and ensures the center's goal and mission are at the forefront of all activities.

CLCE FACULTY

Michael Dukes, CLCE Director, Agricultural and Biological Engineering, Water Conservation and Irrigation

Jorge Barrera, Agricultural and Biological Engineering, Utility Analytics for Resource Efficiency

Eban Bean, Agricultural and Biological Engineering, Urban Water Resources Engineer

Gail Hansen, Environmental Horticulture, Sustainable Landscape Design

Basil Iannone, Forest Resources and Conservation, Geospatial Analytics

Hayk Khachatryan, Food and Resource Economics, Horticultural Economics

Andrew Koeser, Environmental Horticulture, Landscape Maintenance

Chris Marble, Environmental Horticulture, Urban Weed Management

Chris Martinez, Agricultural and Biological Engineering, Water Resource Management

Esen Momol, Florida-Friendly Landscaping™ Program

Paul Monaghan, Agricultural Education and Communication, Community-Based Social Marketing

AJ Reisinger, Soil and Water Science, Urban Soil and Water Quality

Gurpal Toor, Soil and Water Science, Urban Water Quality

Laura Warner, Agricultural Education and Communication, Social Marketing and Program Evaluation

Wendy Wilber, Florida Master Gardener Program

AFFILIATES

Lynn Barber, Hillsborough County, Urban Horticulture

Tatiana Borisova, Food and Resource Economics, Horticulture Economics

Adam Dale, Entomology and Nematology, Landscape Entomology

Zhanao Deng, Environmental Horticulture, Plant Breeding

Erin Harlow, Duval County, Commercial Horticulture

Kevin Kenworthy, Agronomy, Turfgrass Breeding

Jason Kruse, Environmental Horticulture, Sports Turf Management

Ramon Leon, Agronomy, Turfgrass Weed Science

Matt Orwat, Washington County, Urban Horticulture

Sydney Park Brown, Environmental Horticulture,
Consumer Horticulture

Brian Pearson, Environmental Horticulture,
Landscape Management

Joe Sowards, Volusia County, Urban Horticulture

Lloyd Singleton, Sumter County,
Florida-Friendly Landscaping™

Laurie Trenholm, Environmental Horticulture,
Urban Turfgrass Management

Bryan Unruh, Environmental Horticulture, Urban
Turfgrass Management

Sandy Wilson, Environmental Horticulture,
Ornamental and Invasive Plants

CLCE STAFF

Emily Eubanks, Educational Media and
Communications Coordinator

Melissa Friedman, Research Coordinator

Caraline Stephens, Horticulture Writer

Jennifer Sykes, Web Coordinator

FLORIDA-FRIENDLY LANDSCAPING™ STAFF

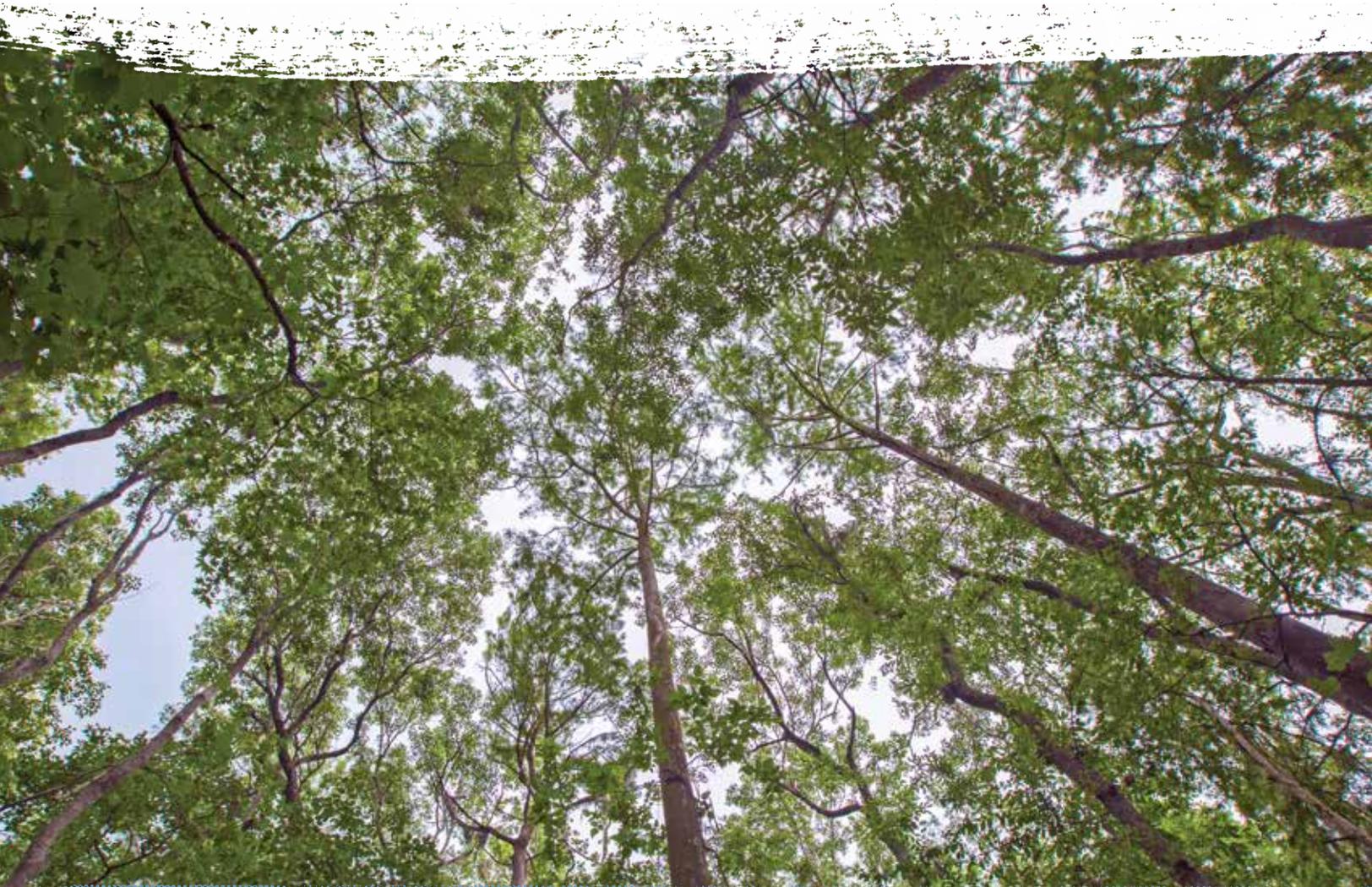
CJ Bain, FFL Website and Information
Tech Coordinator

John Bossart, FFL Education and
Extension Manager

Jen Marvin, FFL/GI-BMP Education Coordinator/
Data Manager

Claire Lewis, FFL/FYN Statewide Coordinator

Don Rainey, FFL/GI-BMP Statewide Coordinator



CLCE Graduate Students

MASTER'S STUDENTS

Seth Blair, Environmental Horticulture
CLCE Faculty: Andrew Koeser

Eliza Breder, Agricultural and
Biological Engineering
CLCE Faculty: Michael Dukes

Matthew Burrows, Auburn University, Horticulture
CLCE Faculty: Chris Marble

Keir Hamilton, Environmental Horticulture
CLCE Faculty: Andrew Koeser

Deborah Hilbert, Environmental Horticulture
CLCE Faculty: Andrew Koeser

Conrado De Leon, Agricultural and
Biological Engineering
CLCE Faculty: Michael Dukes

Matthew Jablonski, Soil and Water Science
CLCE Faculty: Gurpal Toor

Stefan Kalev, Soil and Water Science
CLCE Faculty: Gurpal Toor

Ryan Klein, Environmental Horticulture
CLCE Faculty: Gail Hansen, Andrew Koeser

Gisele Nighswander, School of Forest Resources
and Conservation
CLCE Faculty: Basil Iannone

Karissa Raymond, Agricultural Education
and Communication
CLCE Faculty: Paul Monaghan

Jeremy Robbins, East Carolina University,
Geological Sciences
CLCE Faculty: Eban Bean

Corinn Sprigler, Environmental Horticulture
CLCE Faculty: Andrew Koeser

Cody Stewart, Environmental Horticulture
CLCE Faculty: Chris Marble

DOCTORAL STUDENTS

Amanda Ali, Agricultural Education
and Communication
CLCE Faculty: Laura Warner

Mackenzie Boyer, Agricultural and
Biological Engineering
CLCE Faculty: Michael Dukes, Chris Martinez

Lorna Bravo, Environmental Horticulture
CLCE Faculty: Gail Hansen

Anil Kumar Chaudhary, Agricultural Education
and Communication
CLCE Faculty: Laura Warner

Mun Wye Chng, Environmental Horticulture
CLCE Faculty: Gail Hansen

Taylor Clem, Environmental Horticulture
CLCE Faculty: Gail Hansen, Esen Momol,
Paul Monaghan

Isaac Duerr, Statistics
CLCE Faculty: Michael Dukes

Flavio Hazen, School of Natural Resources
and Environment
CLCE Faculty: Chris Martinez

Siti Jariani Mohd Jani, Soil and Water Science
CLCE Faculty: Andrew Koeser, Gurpal Toor

Jennifer Marvin, Environmental Horticulture
CLCE Faculty: Gail Hansen

John Roberts, Environmental Horticulture
CLCE Faculty: Gail Hansen, Andrew Koeser

Debalina Saha, Environmental Horticulture
CLCE Faculty: Chris Marble

Charlie Stillwell, North Carolina State University
Biological and Agricultural Engineering
CLCE Faculty: Eban Bean

Jeff Van Treese, Interdisciplinary Ecology
CLCE Faculty: Andrew Koeser

Chuan Wang, Statistics
CLCE Faculty: Michael Dukes

Ondine Wells, School of Natural Resources
and Environment
CLCE Faculty: Paul Monaghan

Erin Yafuso, Environmental Horticulture
CLCE Faculty: Andrew Koeser, Laura Warner

Xumin Zhang, Food and Resource Economics
CLCE Faculty: Hayk Khachatryan, Gail Hansen

CLCE Hosts Retreat

In January 2017, the center hosted its 5-year faculty, staff, and advisory board retreat. Dr. Ed Osborne, professor of agricultural education and communication, led the faculty in a strategic planning exercise. The mission and vision of the center were revised to better reflect the work already being done and the planned work. Additionally, faculty were able to formulate four strategic goals for 2017-2020.

STRATEGIC PLAN GOALS

1. **Partner** on major grant proposals.
2. **Increase** awareness and visibility of CLCE.
3. **Identify** subject matter experts to serve as collaborators with faculty in CLCE.
4. **Expand** relationship with Extension to quantify water and water quality savings/reduction.



Research and Extension Highlighted at the Second CLCE Urban Landscape Summit

CLCE hosted its second Urban Landscape Summit in March 2017. More than 100 faculty, staff, and stakeholders participated in research and Extension presentations throughout the event. Adding an additional half-day gave the participants more time for networking and an evening reception.

The event kicked off with keynote speaker Mark Clark, UF/IFAS soil and water science professor, and his talk about urban stormwater quality.

The second keynote speakers were the Water 2070 team of Paul Zwick and Peggy Carr, both of the UF School of Landscape Architecture and





Planning. This insightful presentation showcased the growth in Florida's population and the impact this will have on Florida's lands, waters, roads, and quality of life.

County faculty and state specialists presented in either a lightning round or extended format on topics relating to homeowner insights, landscapes and plants, invasives and pests, and water supply and conservation.

Graduate students also competed in a 2-minute lightning round presentation and poster session. Award winners received \$500 towards their research programs. Xumin Zhang, food and resource economics doctorate student, won for his presentation on "Investigating Homeowners' Preferences for Smart Irrigation Technology Features." Allison Bechtloff, environmental horticulture master's student, won for her presentation, "Producers Value Sterile Cultivar Research for Potentially Invasive Plants for the Horticulture Industry in the Southeastern United States."

"As a brand-new Extension agent, **I CAME AWAY WITH SO MUCH GREAT AND RELEVANT INFO** that I plan to share and/or work into programs and workshops in my county."

"I believe this **SUMMIT IS VITAL TO THE FUTURE** of the state's **LANDSCAPE, PERMITTING, and MITIGATION INDUSTRIES."**

Florida-Friendly Landscaping™ Assists Historic St. Augustine Landscape Design

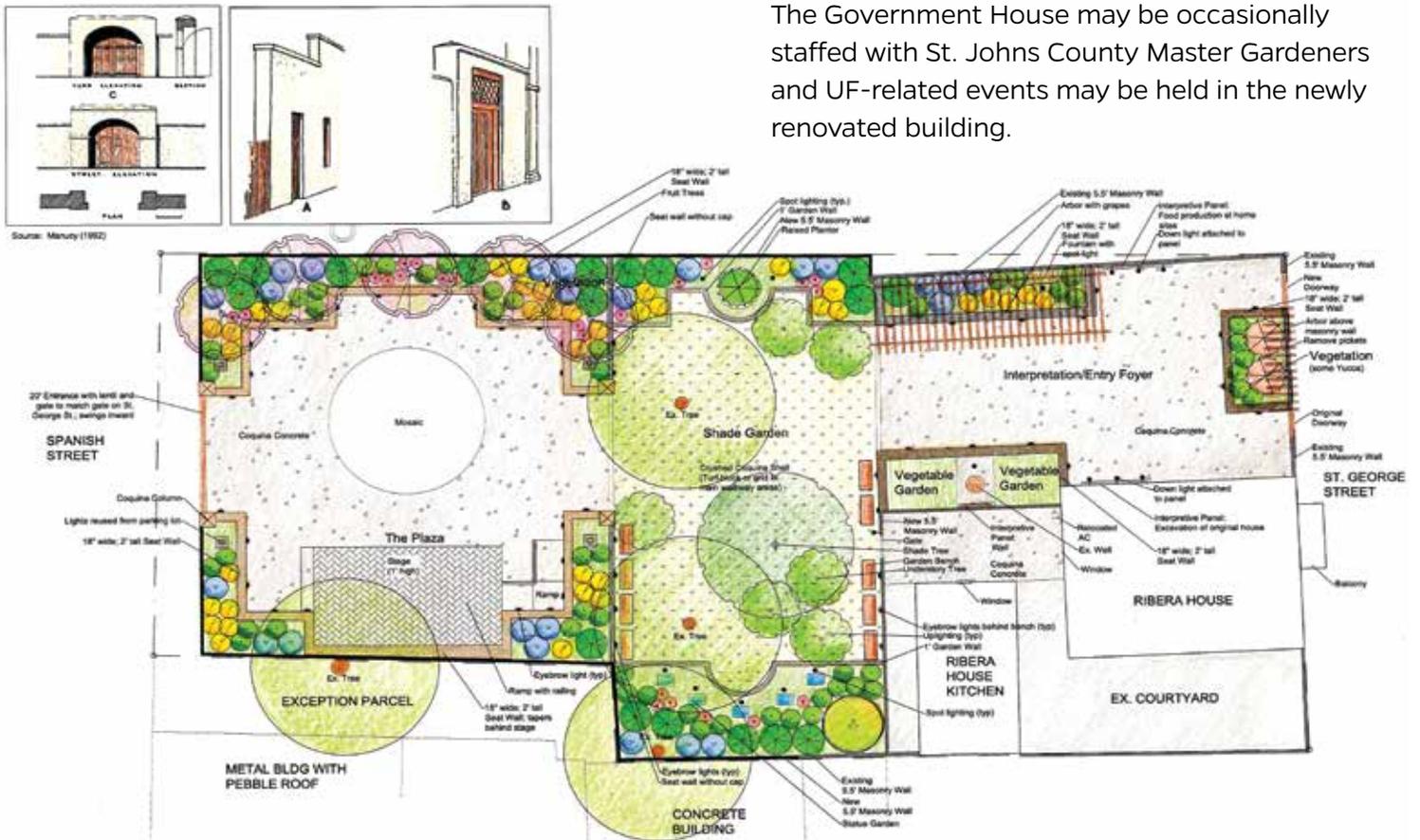
CLCE faculty participated in the University of Florida Historic St. Augustine (UFHSA) project. UFHSA was created to ensure the long-term preservation and interpretation of state-owned historic properties in St. Augustine through historic preservation, archaeology, history, and more. Center faculty Gail Hansen and CLCE graduate student Jennifer Marvin participated in two projects with UFHSA.

GOVERNMENT HOUSE

University of Florida Facilities and the Florida-Friendly Landscaping™ (FFL) program partnered in the re-landscaping of the Government House

as a historically appropriate Florida-Friendly Landscape. In June 2013, Government House was listed in the National Register as a historic place of state significance. FFL researched historically appropriate plants that are also Florida-Friendly, created a concept design, and then consulted with a local landscape architectural firm on the final plans.

As a result of this partnership, signage will be erected on the site touting the Florida-Friendly Landscaping™ program's participation and principles. In addition, one section of the site will be replanted with historically-appropriate fruit trees and have interpretive signage discussing the university's role in Florida's agricultural history. The Government House may be occasionally staffed with St. Johns County Master Gardeners and UF-related events may be held in the newly renovated building.





RIBERA HOUSE

Students in Dr. Hansen’s advanced residential design class were invited to participate in the creation of a park associated with Ribera House. The site is maintained and managed by UF and is currently used as a work space and parking lot. The park would connect Spanish Street to St. George Street. The students were tasked with creating a design and interpretation theme using historically appropriate plants and materials, which required them to first master the building codes dictating historic design. The group created five plans which were presented to UF Facilities administration and a landscape architecture firm, who determined the parts of each design they liked the best. Based on their input, Dr. Hansen and her teaching assistant created a final plan based on the preferred concepts which Hansen then presented to the UFHSA board.

FEATURED PLANTS OF HISTORICAL SIGNIFICANCE

Agave spp.

For thousands of years, native people of the Americas used the agave plant: for fiber, as food, and even as medicine. Stripped of their pulp, the leaves contain fiber strong enough to produce clothing, rope, and baskets.

Parts of the plant, including stalks and leaf bases, were cooked and eaten. The flower stalk, which appears only once during

its lifetime, can be tapped for sweet juices or roasted to eat. Agave leaves were often used to create a poultice for skin problems such as itching and bruising, and today the pulp is critical in the production of steroids for medications such as cortisone and birth control pills.

Other ancient uses have persisted into today. Agave is still used in the production of tequila and a sugar substitute, in the form of syrup available on the grocery store shelves. It should be noted that the juice and pulp of the leaves may contain needlelike crystals called oxalates which irritate the mouth and skin, and if consumed, can cause vomiting and other digestive problems.

Yucca spp.

Yucca alifolia and *Yucca filamentosa* also had

many historical uses.

The fibrous strands from yucca leaves were used to make rope, thread, and even clothing. Early colonists took advantage

of some species’ spiny leaves and used them as a living fences.

The flowers, raw fruits, and stalks are edible, though reportedly bitter. As early as the 17th century, yucca was being used as medicine. Today, laboratory studies suggest that yucca compounds show antitumor, antiviral, and antioxidant qualities. Other compounds have been shown to inhibit cancer and protect the liver and kidneys.



Master Gardener Volunteers Success Story: Parks That Teach

Charlotte County Master Gardener Volunteers operate the Parks That Teach program as a public-private partnership between the City of Punta Gorda, UF/IFAS Extension Charlotte County Master Gardener Program, and Team Punta Gorda with a grant from the Charlotte Community Foundation. Parks That Teach is part of the Punta Gorda Pathways corridor.

Guided tours are led by Master Gardener volunteers who walk participants along this special trail. Master Gardeners conducting these tours have had specialized training regarding the flora and fauna along the pathways. Along the path, visitors view the unique ecosystem of the mangroves, identify trees and shrubs, and learn how these plants can fit into a home landscape. The Master Gardener guides point out Florida-Friendly Landscaping™ plants, many of which have signage, as well as invasive plants found in Southwest Florida.

Parks That Teach was featured on “Florida on a Tankful” with Bay News 9 in Tampa. Not only does Parks That Teach provide a positive educational experience for both tourists and residents, it also promotes tourism in Charlotte County enhancing marketing and economic benefits.

As a result of the Parks That Teach program, 232 individuals participated over a 13 month period on 18 walks in total. An electronic survey was conducted with 38 respondents.

- **When asked**, “Which Florida-Friendly yard topic(s) was reinforced on the walking tour?” 58% selected Right Plant, Right Place.
- **When asked**, “What did you like best about the walking tour?” 74% indicated that the educated and trained guides were impressive.

“I appreciated being
EDUCATED about our
LOCAL ENVIRONMENT
and **IMPRESSED** with the
WEALTH OF KNOWLEDGE
of our Extension
Services Department!”



4,500

Florida Master Gardener
volunteers gave

420,000 HOURS

for a value of

\$9.3 MILLION*



*\$9.3 million based on the National Independent Sector Volunteer time value of \$22.07/hour.

New Research: Restoring Soils to Improve Conservation in Residential Landscapes

Research Question:

Does treating soil before sod installation on new construction sites increase water availability to the plant and lead to less irrigation and better turfgrass quality?

Beginning in 2016, a partnership began between On Top of the World (OTOW), UF/IFAS, and LifeSoils and Earthscapes Unlimited, Inc. to look at ways to reduce irrigation within new development landscapes. OTOW is an active adult community located southwest of Ocala that currently has about 5,200 homes with a projected buildout of approximately 30,000 homes. Previous studies by UF/IFAS and others have shown that the compaction of urban soils that accompanies home construction increases bulk density, reduces porosity, reduces infiltration

rates, and could be limiting to root growth. Only a few studies have looked at mitigating urban soil compaction through tilling and incorporating soil amendments, practices that are commonly applied in agricultural settings. Based on results from agricultural settings and simulated urban soils, it is expected that tillage will increase porosity, promote deeper roots, and increase infiltration while the compost treatments will increase soil organic matter and increase plant-available water of the soil. As soil and turfgrass systems are complex, the interdisciplinary research team spans a wide range of disciplines to evaluate the effects from a diversity of perspectives, including hydrology, soil physics, soil microbiology, turfgrass specialists, insects, and invasive species.



Nine model homes were divided into three treatments: control (compacted soil), tilled soil, and compost.

1. **Control Lots** – treated same as new construction, with sod laid directly on compacted soil
2. **Tilled Lots** – tilled to a depth of five inches across the entire lot after final grading occurred and prior to sod laying
3. **Compost Lots** – received approximately one inch of compost which was tilled into the compacted soil to a depth of approximately five inches prior to sod installation

This study will run for two years and includes continuous monitoring of on-site weather conditions, soil moisture content in each lawn,

and water and irrigation use, in addition to regular samplings of soil, turfgrass, and insects. In this study, the irrigation applications are the same to each lawn, regardless of treatment. A second phase is ongoing to investigate reduced irrigation tolerance of treatments and a third phase is being proposed that would assess the real-world and potential water quality benefits of these treatments.

Eban Bean, Basil Iannone, CLCE Faculty
Jason Kruse, Adam Dale, Lloyd Singleton, CLCE Affiliate Faculty
Allan Bacon, Jim Fletcher, Pierce Jones, Hui-Ling “Sunny” Liao, Ryan McMeekin, Phillip Hisey, other faculty and partners

CLCE Estimates 105 Million Gallons of Water Saved

An estimated 104,860,854 gallons of water were saved in Florida through a direct impact from the center’s major Extension programs in 2015 and 2016. This is enough water to supply the annual household needs of nearly 1,192 homes. About 87,000 people participated in UF/IFAS Extension water conservation programs in 2016.

Using less water also saves Floridians \$347,089 a year in water utility bills. The figures come from a sample of Extension agents in 16 Florida counties, so the savings may be greater. To calculate the financial savings that Extension program participants can see on their water bills, UF/IFAS experts used a statewide survey of water fees, combined with estimates of water savings from various irrigation conservation practices. UF/IFAS researchers are working to help Extension agents estimate the economic benefits of residential outdoor water conservation and to communicate those benefits to homeowners.

Frequently, the biggest barrier to residential water savings is that people don’t understand enough about conservation strategies and the benefits associated with those strategies.

Laura Warner, CLCE Faculty
Tatiana Borisova, CLCE Affiliate Faculty

**“UF/IFAS IS
MAKING A DIFFERENCE
with our limited water resources.
Seemingly small drops in the bucket
REALLY ADD UP
when we look at the
BIG PICTURE
across the state and over time.”**

Laura Warner

Evidence-Based Zoysiagrass Management Workshops - A Unique Approach to Filling an Industry Need

Zoysiagrass has become increasingly more popular across Florida over the last few years. Two large areas in the state where zoysiagrass has been installed in large numbers are Del Webb at Nocatee in St. Johns County and the Villages in Sumter County. Nocatee residents have several hundred acres of zoysiagrass combined, and the Villages maintains 1,000 acres of the turfgrass. With such a large amount of turf, comes problems just as large. The UF/IFAS Extension Duval County Office has been working with developers, residents, and turf management professionals for several years in Del Webb providing information,

on-site consultations, and workshops. In 2016, landscape management companies began calling into the Extension office at an alarming rate indicating they once again were having problems getting their zoysiagrass to respond. For example, one company was in jeopardy of walking away from over \$150,000 in accounts and over six companies indicated they decided to no longer take zoysiagrass accounts in Jacksonville because they couldn't figure out how to manage them. At the same time, Extension turf specialists were receiving multiple phone calls from across the state about concerns with managing zoysiagrass.



The UF Turf Team and UF/IFAS Extension agents decided it was time to team up and begin to address the problem on a statewide level. In 2016, the first Evidence-Based Zoysiagrass Management workshops were held in Duval and Sumter Counties. The target was landscape management companies working in Del Webb and the Villages. The workshops were so successful that in 2017, three more were taught across the state in Tampa, Orlando, and Callaway. A total of 390 professionals have attended the five workshops. The teaching team focused on evidence-based information. In-depth information was presented about why zoysiagrass responded differently than other turf. Equipment was also on display. Of the 125 professionals that provided information about their accounts, 50% indicated that approximately a quarter of their zoysiagrass accounts were struggling. Sixteen percent of the respondents indicated that 76-100% of their accounts were

struggling. Collectively, they indicated that they managed millions of square feet of zoysiagrass from across the state. At the end of the workshop multiple individuals indicated that it was the best workshop they have ever attended.

The UF/IFAS team plans to provide two more workshops in late 2017 or early 2018, in Fort Meyers and the West Palm Beach areas. The UF Turf website is also being revamped to provide a more central location for agents, residents, and companies to access information, FAQs, and most importantly, evidence-based research. Future similar classes have been requested across the state.

Erin Harlow, Bryan Unruh, Lloyd Singleton, Kevin Kenworthy, CLCE Affiliate Faculty
Travis Shaddox, other faculty

Environmentally Resilient, Resource-Efficient Land Use Cohort

A new partnership between CLCE and the Program for Resource Efficient Communities has resulted in a new faculty cohort with four hires. Cohort faculty will work together, along with their home academic departments, CLCE, and Program for Resource Efficient Communities (PREC) to develop new research and Extension programs.

Land development decisions and their impacts on water and energy resources are critical to the resiliency and sustainability of Florida's urban, agricultural, and natural systems—and directly or indirectly impact almost every UF/IFAS program.



The cohort will develop and adopt a systems approach to land use decision-making and management practices.

Three of the faculty were hired in 2016 and the last of the cohort, AJ Resinicker, was hired in 2017.

AJ Resinicker, Urban Soil and Water Quality

60% Extension, 40% Research

This position will be based in the soil and water sciences department and will specialize in the fate and transport of inorganic and organic contaminants in urban watersheds and develop alternative and remediation strategies.

New Pest Research: Investigating the Causal Agent of Bud Galls in Florida Ornamental Plants

Since 2009, landscapers and pest control professionals in the Jacksonville area have been identifying samples with early and late stage bud galls. The gall symptoms have been seen on a host of plant material including ligustrum, loropetalum, hydrangea, oleander, hibiscus, viburnum, schillings, hollies, Shumard oaks, thyrallis and others. The UF/IFAS Extension Duval County office in Jacksonville works closely with the industry and has been monitoring the symptoms for almost a decade. Symptoms have become so bad in the

last few years that pest control companies and landscapers are now losing business because they cannot correct the problem; entire neighborhoods and landscapes have been affected. In the early years, both UF and Division of Plant Industry examined samples and could not locate pests or isolate diseases and thus assigned it as herbicide damage. However, with observations from the Extension office and service records from pest control companies, landscapers, and nurseries in hand, it was clear that very few professionals were



using products that cause this type of damage—and the damage was spreading. Phytoplasma testing on the plant tissue had also been done and came back negative.

In late 2016, UF landscape entomologist Adam Dale and Duval County Extension Agent Erin Harlow were able to collect samples from loropetalum, and found eriophyid mites. The identification of the mite continues to be reviewed, but would be related to the mite responsible for rosette disease in roses. Eriophyid mites are typically host-specific and it is not clear at this time if there is one mite or several that are causing the widespread damage, but at least one mite has been confirmed on ligustrum,

loropetalum, and thyralis. Grant funding is being sought to begin a research project to provide preliminary data about the pest and hopefully begin to provide some answers for landscape professionals on management strategies.

The project has three objectives.

1. **Investigate** the probable cause of the bud distortion.
2. **Examine** the transmission of the mites and bud galls.
3. **Provide** basic training on how to successfully collect samples in the field for submission.

Adam Dale and Erin Harlow, CLCE Affiliate Faculty
Shad Ali, other faculty

FFL Conservation and Conversation Gala with Stakeholders

The Florida-Friendly Landscaping™ program held their first Conservation and Conversation Gala on April 21 at the UF/IFAS Extension Orange County Office. The gala helped to raise awareness and funds for the program through an auction. Remarks were provided by UF/IFAS Dean for Extension Nick Place and Florida Nursery Growers and Landscape Association Executive Director Ben Bolusky. CLCE affiliate faculty Joe

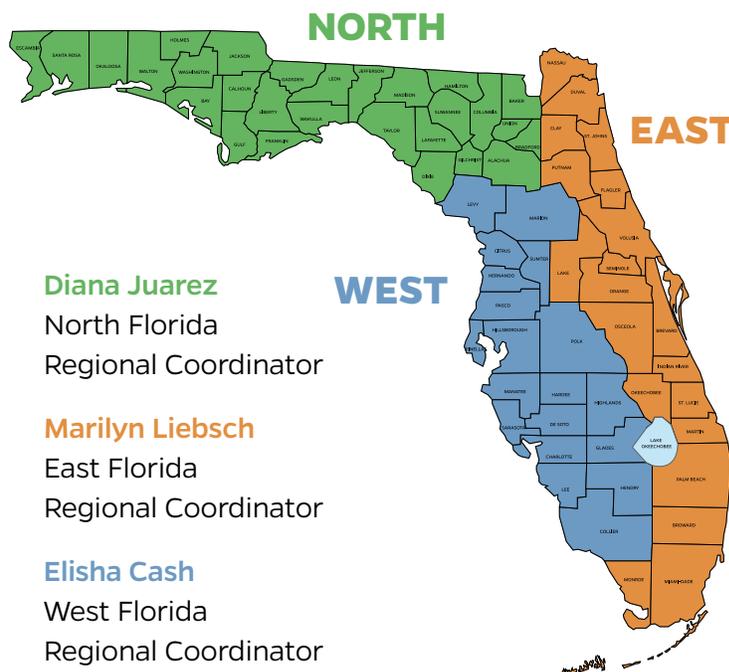
Sewards and staff member Melissa Friedman provided live entertainment. In attendance were many stakeholder groups such as builders and developers, FNGLA members, homeowner associations, homeowner law firms, and Florida Hospital management. Attendees enjoyed the opportunity for networking and learning more about the FFL program. Due to the gala's success, plans are in place to hold another next year.



Green Industries Best Management Practices Hires Three Regional Coordinators

In 2017, the Florida-Friendly Landscaping™ program expanded the Green Industries Best Management Practices (GI-BMP) through an EPA grant. Three GI-BMP regional coordinators were hired to teach and train green industry professionals throughout the state.

Each regional coordinator will conduct GI-BMP Certified Instructor Training to support trainers for this program throughout the state. They will also deliver and assist GI-BMP training and co-training classes throughout their respective regions and provide oversight of trainers to ensure program quality and consistency. They will also work to educate the commercial green industries on the importance of using integrated pest and nutrient management strategies for protecting and enhancing water quality via continuing education collaborations.



Diana Juarez
North Florida
Regional Coordinator

Marilyn Liebsch
East Florida
Regional Coordinator

Elisha Cash
West Florida
Regional Coordinator

CLCE Faculty Participate in the Natural Resource Leadership Institute

As members of the center, CLCE faculty are often called upon to provide expertise in emerging issues such as land use, water quality and quantity, and invasive species. Because controversy surrounds many of these topics, faculty find it helpful to participate in the Florida Natural Resource Leadership Institute.

The Florida Natural Resources Leadership Institute (NRLI) brings together professionals from sectors that impact or are impacted by natural resource issues and NRLI provides them with the training required to find inclusive solutions to seemingly intractable problems. Skills, tools, and strategies are taught to build trust and promote collaboration among competing interests.

For eight months, participants attend intensive three-day sessions that include tours of issue sites, experiential training, and directed work on individual practicum projects.

Upon graduating from the program, CLCE faculty member Paul Monaghan saw so much value in what he learned that he returned to NRLI—this time as an instructor.

NRLI PARTICIPANTS FROM CLCE

Basil Iannone, CLCE Faculty, 2016-2017

Chris Martinez, CLCE Faculty, 2011-2012

Paul Monaghan, CLCE Faculty, 2009-2010

Tatiana Borisova, CLCE Affiliate Faculty, 2008

Carol Lippincott, CLCE Advisory Board, 2008

“The **SKILLS LEARNED** from NRLI are **INVALUABLE** when working on contentious natural resource issues. Through the program, I have become a **BETTER LISTENER** and **MEDIATOR**. Most importantly, I have learned that conflict, when approached properly, **PROVIDES** an **OPPORTUNITY** to **BRING PEOPLE TOGETHER** to find lasting **SOLUTIONS** complex environmental issues.”

Basil Iannone, CLCE faculty member



Extension Educational Efforts

DROUGHT MEDIA TOOLKIT

Florida experienced a severe drought in spring 2017 and CLCE stepped up to develop a 16-article media toolkit on drought for Extension agents to use with their stakeholders. Examples of articles include “Tree Care During a Drought,” “All About Water Restrictions,” and “A Better Lawn on Less Water.”

Emily Eubanks, Jennifer Sykes, Caraline Stephens, Wendy Wilber, CLCE Faculty and Staff

ONLINE CEUS

<http://pd.dce.ufl.edu/>

The Florida-Friendly Landscaping™ program developed online continuing education unit courses for community association managers and landscape architects. Hosted at the UF Online Continuing Education Hub, the courses include:

- Introduction to the Florida-Friendly Landscaping™ Program
- Florida-Friendly Landscaping™ Legislation, Codes, and Your Community
- Florida-Friendly Turfgrass: Selection and Best Management Practices
- Maintenance with Florida-Friendly Landscaping™
- Florida-Friendly Landscaping™ Design Considerations
- Florida-Friendly Landscaping™ Recognition Program

Esen Momol, Gail Hansen, Jen Marvin, Claire Lewis, Kelly Perez, CLCE Faculty and Staff

TREES: SOUTH FLORIDA & THE KEYS

This pocket-sized guide has full-color photographs of leaves, bark, flowers, and trees, together with clear descriptions to make identifying trees easier than ever. The book

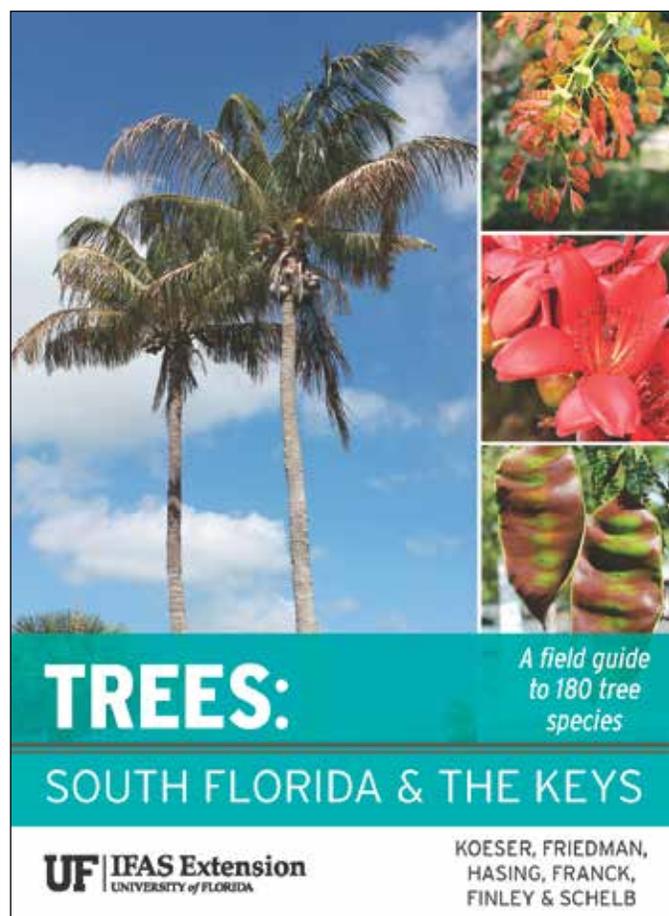
also features a handy identification key, an introduction to plant parts, a glossary, and a ruler to guide you, whether you're a trained botanist or a total beginner.

- 180 Florida native, introduced, and invasive species
- Beautiful color photographs for each species
- Arranged by leaf type for easy identification
- Florida Hardiness Zones
- Special notes about natural history, as well as commercial and cultural uses

Andrew Koeser, Melissa Friedman, Gitta Hasing, CLCE Faculty and Staff

Alan Franck, Holly Finley, and Julie Schelb, other contributors

The book is available through **University Press of Florida**.



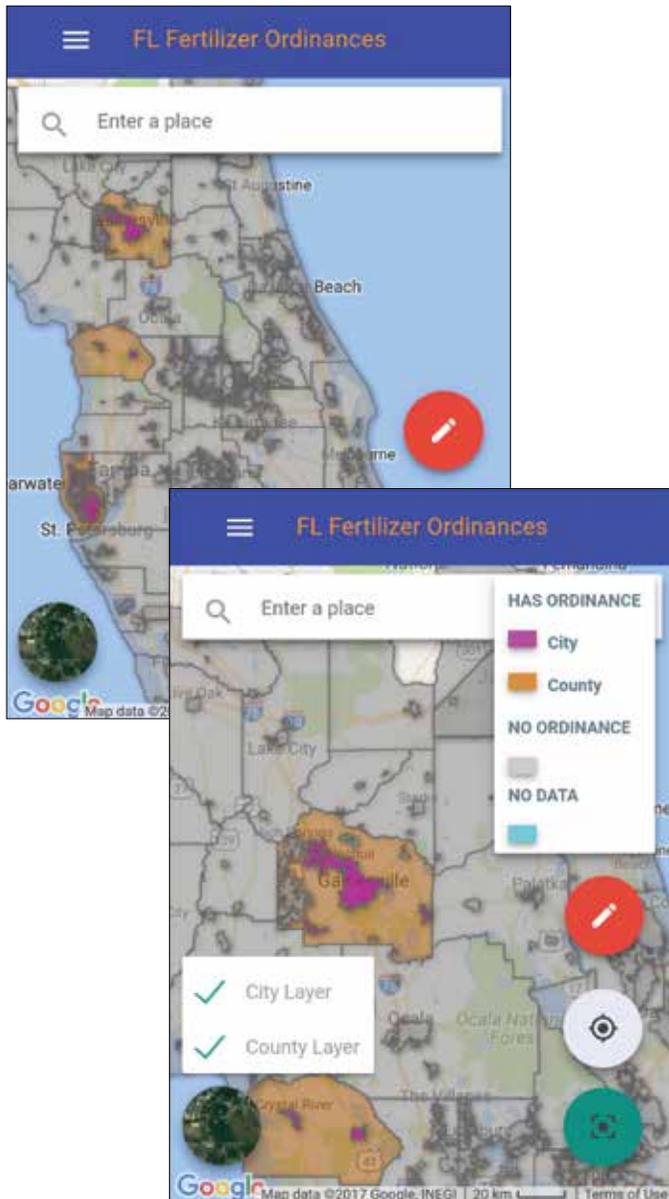
MOBILE WEB APPLICATIONS

Florida Fertilizer Ordinances

<https://ffl.ifas.ufl.edu/fertilizer>

The Florida Fertilizer Ordinances mobile web application provides a quick and convenient reference to the state's many local fertilizer ordinances. Within the app, users can search the map to find ordinance details for a specific address, city, county, or current location. They can also view a summary of key restrictions and requirements and a link to the full ordinance text.

Esen Momol, Bryan Unruh and CJ Bain,
CLCE Faculty and Staff



Florida-Friendly Landscaping Butterfly Gardens

<https://ffl.ifas.ufl.edu/butterflies>

Plant lists, design and gardening tips, and butterfly guides are at user's fingertips with the UF/IFAS Florida-Friendly Landscaping™ program's Butterfly Gardens mobile web app. This app lets users' create a custom plant list based on the garden's location and characteristics. Close to 200 Florida-Friendly, butterfly-attracting plants are listed.

Esen Momol, CJ Bain, Sandy Wilson, Wendy Wilber, Jaret Daniels, CLCE Faculty and Staff



Where are They Now? CLCE Featured Graduates

PARK PLANNER

Taylor Clem graduated from the Environmental Horticulture department in spring 2017. Clem received his doctorate under Dr. Gail Hansen. His dissertation research was on sustainable landscape design.



Clem is the parks planner for the city of Farmington, New Mexico's Parks, Recreation, and Cultural Affairs Department. As a parks planner, Clem serves as a project manager and designer for all parks facilities and amenities, putting emphases on sustainable design standards, techniques, and best management practices. Clem also serves as an alternate for the Farmington Metropolitan Planning Organization's Technical Committee, as the education representative for New Mexico Recreation and Parks Association, and an outreach specialist for the Animas River Partnership and the San Juan Watershed Group.

FROM FIELD TECHNICIAN TO HYDROLOGIST

Eliza Breder graduated from the Agricultural and Biological Engineering department in 2016. A master's student of Michael Dukes, Breder conducted research on irrigation patterns as influenced by smart irrigation technology.



Breder now works as a hydrologist with Suwannee River Water Management District (SRWMD). "There are general hydrology and irrigation principles but sometimes it's helpful to know about specific issues in a specific area – the way groundwater resources work and the way the industry deals with it. It was advantageous for me to stay in the same area given my knowledge."

SOUTH CENTRAL FLORIDA WATER EDUCATOR

Mary Lusk graduated from Soil and Water Science as a doctorate student of Gurpal Toor. She is now the UF/IFAS Water Regional Specialized Agent for the South Central District. Her doctorate research was on reclaimed water in Florida and septic system pollutants.



In her new position, Lusk combines science with communication to the public. She covers large portions of urban Florida, including Tampa/St. Pete, Sarasota, Port Charlotte, and Naples. The leading issue for the South Central district is nutrient storage. Lusk will focus on communicating to Floridians the message of reducing the nutrient footprint and transport of nutrients from land to the water.

Center Faculty and Staff Recognized for Outstanding Efforts

Fellow American Society of Civil Engineers, Environmental and Water Resources Institute

CLCE Director **Dr. Michael Dukes**

was elected to the grade of Fellow by the American Society of Civil Engineers (ASCE) Environmental and Water Resources Institute (EWRI) in 2017. The EWRI defines Fellow as a member with at least 10 years of membership and has demonstrated accomplishments that have contributed significantly to the advancement or application of water resources or environmental engineering, science, and technology.

Fellow American Society of Agricultural and Biological Engineers

Dukes was also elected to the grade of Fellow by the American Society of Agricultural and Biological Engineers (ASABE) in 2017. An ASABE Fellow is defined as a member with at least 20 years membership, possessing unusual professional qualities with outstanding and extraordinary qualifications, and experience in or related to the field of agricultural, food, or biological systems engineering. It is ASABE's highest honor.

International Society of Arboriculture R.W. Harris Author's Citation Award

Andrew Koeser received the International Society of Arboriculture's (ISA) R.W Harris Author's Citation Award. This Award of Distinction is given to authors who consistently publish timely and valuable content related to the field of

arboriculture. Among Koeser's highly-regarded contributions is a series of publications focusing on trees in Florida. So far, the books in the series include *Trees: North & Central Florida* (released in 2014) and *Trees: South Florida & the Keys* (released 2017). A third, *Palms and Palm-like Plants of Florida*, is nearing completion.

Hayk Khachatryan part of \$7 million grant from USDA

CLCE faculty member **Hayk Khachatryan** is part of two projects recently announced as funded by the USDA National Institute of Food and Agriculture (NIFA). The first award is a 5-year project with approximately \$7 million in funding. Funding for the project, titled "Protecting Pollinators with Economically Feasible and Environmentally Sound Ornamental Horticulture," will support 21 scientists and extension experts at 12 different institutions.

University of Florida/IFAS Superior Accomplishment Award

CLCE web coordinator **Jennifer Sykes** was recognized at a spring ceremony in 2017 as an IFAS scientific/technical division winner for the UF Superior Accomplishment Award. UF/IFAS faculty or staff who were exemplary in work performance, community service, or diversity and inclusion activities in the previous academic year can be nominated. She was one of 20 IFAS awardees selected to receive the honor.



Advisory Board

Chair – Ben Bolusky, Florida Nursery, Growers, and Landscape Association

Tom Allen, Florida Irrigation Society

John Davis, UF/IFAS Research Administration

Dale Dubberly, Florida Department of Agriculture and Consumer Services

Tom Frick, Florida Department of Environmental Protection

Deirdre Irwin, St. John's River Water Management District

Carol Lippincott, UF Water Institute

Rosemary Loria, UF/IFAS Environmental Horticulture Department

Betsy McGill, Florida Turf Producers

Saqib Mukhtar, UF/IFAS Extension Administration

Lois Sorensen, Southwest Florida Water Management District

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