



Florida Association of

FANREP

Natural Resource Extension Professionals

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<http://anrep.ifas.ufl.edu/>

MESSAGE FROM FANREP PRESIDENT!

Hello FANREP Colleagues,

I am very pleased to serve as your 2018 FANREP president. I am also very proud to be associated with an organization that supports professionals engaged in preserving and restoring natural resources and systems. Over my years as an extension agent I have seen outstanding work, ideas and practices come from our organization both individually and as collaborative efforts.

The 2017 EPAF meeting was both a success and a challenge. The EPAF Board has reviewed the post conference survey, and gathered valuable input from all who attended and participated in the survey. There were a number of common issues with and suggestions for future conferences, as well as many topics of interest that the board will make every effort to address. The schedule format will be basically the same with some improvements including: an on-site flexible activity for Monday night, half day tours that focus on programmatic relevance, a return of the communications breakfast to break up the awards presentations, and a little more time between day and evening events. The conference will be August 27-30, 2018 at the Sawgrass Marriott Resort and Spa, Ponte Vedra Beach.

Other news from the EPAF Board Meeting is that there will be no Extension Symposium in 2018, however, mark your calendars as the 2019 dates have been set for May 7-9, 2019, and will take place in Gainesville. The tenure and promotion process has changed requiring a greater number of Agent IVs to participate on the review committee. Administration may be recruiting two agents per district to serve on the committee. Administration is considering nine month appointments for campus faculty including our IFAS specialists. This may have an indirect effect on county faculty if specialists are not available during the summer term.



A very important event in 2018 is the 11th ANREP biennial conference being held April 29-May 3, 2018 in Biloxi, Mississippi (<http://www.anrep.org/conferences>). The theme "Blues, Bayous and Beyond: The Nexus of Natural Resource Stewardship" sounds both fun and intriguing. I hope to see you there.

The past several presidents have encouraged an annual theme on which to focus, at least, our contributing articles to the newsletter. This year I would like to suggest invasive species. I thought invasive species a relative theme as all natural resource, Sea Grant, forestry and horticulture professionals deal with invasive species to some extent. At times, I believe that we as humans are the invasive species as we continue to alter natural habitats with urban sprawl and contribute to water quality issues. That is another reason why our work is so important. Keep in mind that the National Invasive Species Awareness Week (NISAW) is coming up from February 26-March 3, 2018.

My final messages are to encourage you to invade your colleague's lives by creatively collaborating on projects and mentoring new agents, and to participate to the fullest extent you can with your professional organization. I will close with a favorite quote: "Here is your country. Cherish these natural wonders, cherish the natural resources, cherish the history and romance as a sacred heritage, for your children and your children's children. Do not let selfish men or greedy interests skin your country of its beauty, its riches or its romance."

— Theodore Roosevelt

**FANREP President
Susan Haddock**

'Twas a Storm... Irma

We all remember, many would like to forget it, some are still dealing with it – but it was one heck of a storm.



It began as typical hurricane seasons do. Late summer early fall the Bermuda High begins to slide eastward across the Atlantic Ocean removing the protective barrier that keeps most tropical storms at bay in late spring and early summer. Then they began. **Harvey** made landfall in Texas on August 25 as a category 4 storm with winds near 130 mph. The photos from the Houston area were unbelievable. I saw a flooded street where the traffic light was the only thing visible to give you reference as to what you were looking at. It was also amazing to see how the citizens of Texas immediately stepped up to help their neighbors. There was a lot of media attention, and there should have been, to the plight and the resiliency these people showed battling this unbelievable storm. Then the attention moved...

On August 30, tropical storm **Irma**, off the coast of Africa, quickly intensified into a hurricane and within 24 hours reached Category 3 status... amazing how quickly that happened. As it approached the West Indies on September 5, it reached Category 5 status with winds reported at 185 mph. The world watched in disbelief as the small volcanic islands took on this intense storm, some say the strongest to ever hit the Leewards. There was concern here in Pensacola because the path was very similar to Hurricane Ivan, which caused a lot of damage to our area in 2004. Then the forecast suggested it might take a sharp turn and "skid" the east coast of Florida. With **Matthew** still on peoples' minds, this news was not comforting. Maybe... just maybe... the eye would be far enough offshore that the major winds would not make landfall. But, that's not what happen.

Almost unbelievably, Irma's track moved westward—

you can never tell with these storms. The forecast was straight up the middle of the state. The Panhandle was still on watch because of the unpredictability of these things, but the idea of a major hurricane moving up the middle of the state impacting BOTH coasts was unreal. But, it was all too real.

On September 10, the storm hammered Florida. The live feeds of flooding in Miami, rain blowing sideways in Ft. Myers, a diver being pulled from the Intracoastal in Palm Beach (still trying to find out what that guy was up to?), and water leaving Tampa Bay was surreal. Of course, we had NO idea what was going on in the Keys, but knew it could not have been good. The storm was so large that it pulled water out of the bays as far west as Mobile Alabama, and really lowered the hammer on the northeast coast of Florida. It was a complete washout of the entire state.

Irma was one of only five hurricanes with 185 mph winds, which it maintained for 37 hours – the longest on recorded. Winds were reported at 130 mph (category 4) when it crossed the Florida Keys. With costs reaching into the billions for Florida alone, this storm had a major impact on almost every community in the state – and for many, it still does.

This edition includes some articles discussing what happened in communities around the state and how extension responded. We hope that all communities are recovering and that it will be awhile before we have to deal with this type of storm again.

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NATURAL RESOURCE AGENTS RECOGNIZED

Natural Resource Agent for UF/IFAS Extension in Pinellas County Named 2017 Project Learning Tree Educator of the Year

Lara Milligan Honored by Florida Project Learning Tree

Florida Project Learning Tree (FL PLT) awarded **Lara Milligan** with the 2017 Educator of the Year award at their annual advanced professional development conference, “ConnectiviTREE: Sand Hills to Sandy Shores,” held at the Suncoast Youth Conservation Center, Apollo Beach November 3-5, 2017.

Each year Project Learning Tree (PLT) recognizes and awards one educator who has demonstrated exceptional commitment and service to the program. The nonprofit environmental education program succeeds with dedication and contributions of educators.



Lara photographed with Dr. Robert Raze (PLT)

In addition to Lara’s Extension work focusing on wildlife, water, and general environmental education, delivering programs for all ages, she helps run Brooker Creek Preserve Environmental Education Center in Tarpon Springs. Lara believes in the value of environmental education and knows first-hand of its impacts as a graduate of the Jupiter Environmental Research and Field Studies Academy, where her love for nature first began. Lara and her volunteers use PLT activities for youth programs throughout the year and always incorporates PLT into her nationally-award winning ECO (Exploring Environmental Education Curriculum Options) Teacher Training Workshop every summer. She uses PLT activities with diverse groups, making PLT and environmental education relevant to all.

PLT is a versatile and interdisciplinary environmental education program with an award-winning curriculum that engages students in both indoor and outdoor activities. To find out more about Florida Project Learning Tree and its affiliation with the national Project Learning Tree program, as well as its relationship with the University of Florida’s SFRC, visit <http://www.sfrc.ufl.edu/plt>.

NATURAL RESOURCE AGENTS RECOGNIZED

Alicia Betancourt

Elected as Southeastern Rep
For ANREP

Alicia Betancourt was elected as the new southern regional representative for the Association of Natural Resource Extension Professionals. She will begin her two year term in 2018.



Rick O'Connor

Receives the Don Sweat Award
For Florida Sea Grant

Rick O'Connor was selected for the 2017 Don Sweat Award from Florida Sea Grant. This award recognizes creativity, leadership, and initiative.



FANREP TRAVEL SCHOLARSHIPS
FANREP Travel Scholarship Program

We have a rolling application cycle to help with travel costs to conferences, workshops, in-service trainings, etc.

You must be an active FANREP member.

No more than one award / person each year

Maximum amount for the scholarship is \$300

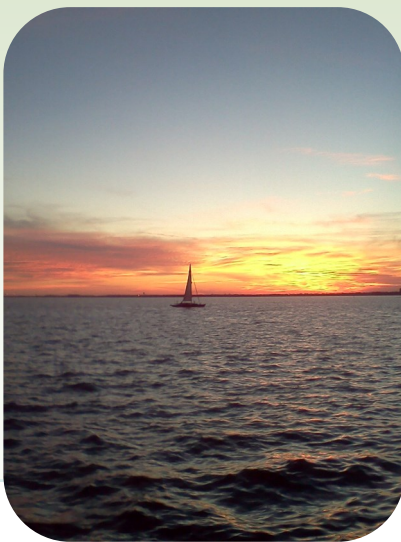
The due dates for the 2018 cycles are:

January 15

March 15

June 15

September 15



Each recipient will be asked to write a brief summary of their experience for the newsletter.

Applications can be found at <http://anrep.ifas.ufl.edu/Scholarship.shtml>.

All applications should be sent to Lloyd Singleton at lsingleton@ufl.edu

Greetings, FANREP!

It is my pleasure to introduce myself through this guest article and give you some “Food (Web) for Thought” about agroecology and its relevance for natural resource Extension. I hope that you will enjoy my column and it will inspire you to reach out to me, so we can work together to enhance the impact and scope of our Extension

Natural, agricultural, and social systems are inextricably interconnected. Indeed, in the age of the Anthropocene, it appears human’s influence may have reached every corner of the globe. Even without a clear demarcation in the rock strata used by geologists to identify a new era, the ideas presented by the Anthropocene concept are important food for thought. For example, how can we understand the interaction of natural and managed systems? And, how do we reconcile seemingly competing goals between conservation of natural resources and agricultural production? ...Enter agroecology.

Agroecology is a ‘new’ scientific discipline with its roots in the resource-constrained way everyone farmed before synthetic fertilizer and the movement to prioritize social and environmental sustainability of food production. As was mentioned in an earlier Food (Web) for Thought column, “Agroecology moves beyond any view of agriculture solely involving increased yields and improved profit margins.” Crafted from a systems approach, agroecological solutions are designed to sustain production, conserve resources, and maintain social equity. Agroecological practices improve agricultural systems, or ‘agroecosystems’, by promoting environmental health and biological diversity.

Through the agroecology framework, natural resource and agricultural management share goals aimed at the sustainability and resilience of Earth and its stewards. Natural areas provide ecosystem services useful for farming systems, while agroecosystems buffer the impacts of human consumption on natural resources. Although the broad and unifying goals of agroecology are relegated to abstract concepts and logic, real-world and place-based examples of transformative agroecological practices abound. The key is to promote diversity and resilience in the way best suited to your system.

Agroecology at UF is developing Extension resources in print and electronic media to make sure you have what you need to share our framework with your stakeholders. Part of that effort is to identify the impacts of the creative, real-world, agroecological practices existing in Florida. By our definition, an agroecological practice is an agricultural or natural resource management practice that conserves natural resources through the interaction of natural, agricultural, and social systems. We could use your help to identify these environmentally and socially conscious solutions in Florida.

In addition to the agroecological practices investigation, I am also

putting together a diverse set of research projects related to the interaction of agriculture and natural areas. I am trained as a spatial ecologist with a focus on whole plant physiology and plant communities. My research projects broadly seek to identify the beneficial contribution of biodiversity in and surrounding agricultural areas and characteristics of cropping systems that promote ecosystem function. My approach is to develop data-driven adaptive management strategies that monitor the complexity and dynamics of agroecosystems and inform the implementation of transformative management strategies, such as cover crops, intercropping, crop rotations, and integration of natural areas to agriculture (think, pollinator habitat).

I am just getting started putting together my plan for agroecology in Florida and I know that many of you are already involved. I look forward to meeting you and learning more about your hard work protecting Florida’s natural resources. Please, take a minute to introduce yourself and tell me how my work might help you (brymz@ufl.edu, 786.217.9238).

Cheers,

~Zack Brym

UF/IFAS Tropical Research and Education Center



THE BENEFIT FROM URBAN TREES

Hurricane Irma's winds swept through our area and caused quite a few trees to break, lean, or fall over. You might be wondering - should I plant another tree?

There are several reasons trees are worth the trouble of replanting. Trees are very important for our health. They create feelings of relaxation and well-being, provide privacy and a sense of solitude and security. Trees block city noise. They also reduce air pollution by trapping and holding onto pollutants such as dust, ash, pollen and smoke that can damage our lungs. They absorb carbon dioxide and other dangerous gases. Most importantly, they produce the oxygen we breathe. Trees also help conserve water and reduce soil erosion. Trees create mulch by dropping their leaves on the soil surface that protects the soil, and their roots increase the amount of water that can flow into the soil and recharge our water source. This reduces runoff from storms and reduces soil erosion that can pollute our water. Without trees, cities would need more storm water drainage canals and sewer treatment facilities to handle the increased water runoff.

They help us to save energy by insulating our houses and providing much needed shade to keep our houses cooler. They can provide windbreaks in the winter to help reduce our heating costs. All this helps to lower the amount of energy used, the amount of pollution produced, and helps to reduce our cooling and heating costs. Having trees will lower greenhouse gas emissions that heat up our planet. Trees do this by removing the carbon from carbon dioxide and storing it as cellulose.

Having many trees in the city is good for the economy because it attracts businesses and tourists. People will stay and shop longer along a tree-lined street. People want to live and have businesses where there are many trees, and these properties are more valuable. Having healthy trees on your property can increase its value by

15 percent. In wooded developments, workers are more productive and sickness is reduced.

Lastly, trees add beauty and provide for wildlife. They provide beauty with colors, flowers and scents, shapes, forms and textures. They screen ugly scenery and help to soften the hard edges of buildings. They create the structure for ecosystems that provide habitat for other plants, and food, space and housing for birds and animals.

As you can see from this list, trees are very important in our lives. We may not notice all the things they do for us until they are suddenly gone. So, should you plant another tree – YES, most definitely!

For information on tree selection: <http://hort.ifas.ufl.edu/woody/selection.shtml>

For information on the wind resistance of trees: <https://edis.ifas.ufl.edu/pdf/FR/FR17500.pdf>



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HURRICANE IRMA'S IMPACT ON THE LOBSTER FISHERY

Caribbean spiny lobster is Florida's largest commercial fishery, with 5.9 million pounds netting almost \$48 million in 2015. Monroe County leads the state in annual landings and the fishermen and women that make up the fleet are important members of the Florida Keys community and economy. While hurricanes always have an effect upon the spiny lobster season, Hurricane Irma was unprecedented in the breadth and scope that affected the entire South Florida fishery, and displaced and damaged an untold number of spiny lobster traps.

Shelly Krueger, the Florida Sea Grant agent in Monroe County for the UF/IFAS Extension, contacted the Florida Keys Commercial Fishermen's Association (FKCFA) and Florida Fish and Wildlife Conservation Commission (FWC), and they indicated a rapid assessment was needed in order to locate the traps lost during Hurricane Irma. With funding from NOAA, Florida Sea Grant was able to contract two experienced spotter pilots to fly the length of the Florida Keys, bayside and oceanside, and identify traps for retrieval and recovery, thus saving local fishermen hundreds of hours of boat time and diesel fuel searching for lost traps.

Harry Crissy, UF/IFAS Extension Monroe County economic resource development agent, flew with the pilots and turned the GPS points into maps that were distributed to local marinas in a coordinated response with the FKCFA and FWC. The FWC is easing regulations that do not allow a person to have a lobster trap on-board a vessel that does not belong to them, which will allow quicker turnaround for trap retrieval,



recovery and redeployment. Next to tourism, fishing is the Florida Keys second most important economic driver, and these fishermen and women need to get back on the water to support their families, employees and our local economy.

Shelly Krueger

Florida Sea Grant

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In light of the forecast of Hurricane Irma and the Florida coast, University of Georgia Marine Extension Agent **Jill Gambill** reached out to Florida Extension with some lessons learned from their experience with Hurricane Matthew.

She collaborated with the National Center for Atmospheric Research (NCAR) to conduct seven focus groups on **storm surge risk communication during Hurricane Matthew** in Beaufort, SC; Savannah, GA; and Brunswick, GA. Though the storms have passed, the lessons are still here and the information is still useful for future storms.

In the following pages are some of the initial findings, which outline reasons that people may not evacuate, challenges in forecast comprehension, and recommended strategies for messaging and mapping hurricane risks. Also attached is a visualization of how storm surge, rainfall and drainage issues can create complex flood impacts.

Jill Gambill
Coastal Resilience Specialist and Public Service Faculty

University of Georgia Marine Extension and Georgia Sea Grant
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PLANNING AHEAD SAVES LIVES!

During Hurricane Matthew, some residents did not evacuate due to caring for pets or elderly family members.

Do not wait until it is too late to make an evacuation plan.

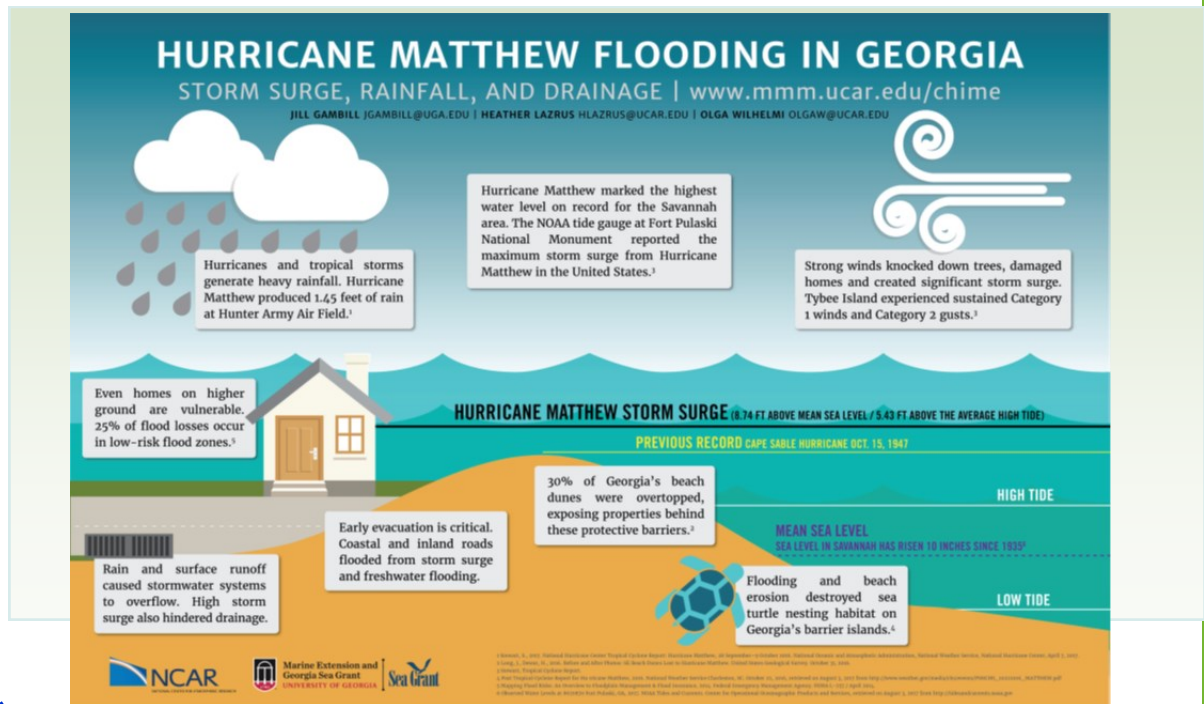


MEANINGFUL OUTREACH

STORM SURGE is flooding from water that is pushed onto land from the ocean as a hurricane approaches the shore. It can cause significant damage and threaten life and safety. When a hurricane threatens a community, it is important for coastal residents to understand the risks from storm surge and know what to do to be safe. However, communicating storm surge risk is difficult because of the complex interactions between storms, coastlines, and communities. Hurricane Matthew caused extensive flooding from storm surge and precipitation along the Atlantic coast, from Haiti to Canada, **KILLING 603 PEOPLE** (47 in the United States) and causing over **\$15 BILLION WORTH OF DAMAGE**.

To understand how to best communicate storm surge risks, a team of researchers from the National Center for Atmospheric Research and the University of Georgia conducted seven focus groups in June 2017 with residents of three communities in Georgia and South Carolina that were affected by Hurricane Matthew. Participants of the focus groups included those from diverse communities in **BEAUFORT, SC, BRUNSWICK, GA, AND SAVANNAH, GA.**

One initial finding of this project is the need for accurate and easy-to-understand information on the causes and extent of flooding during severe storm events. These visualizations attempt to explain the data from Hurricane Matthew and tell the story of how interactive and compounding flood risks can compromise personal safety. The infographic will be shared in outreach throughout the affected communities so that residents can make informed decisions when facing future threats.



CONVERSATIONS WITH COMMUNITIES AFFECTED BY HURRICANE MATTHEW

Storm surge is flooding from water that is pushed onto land from the ocean as a hurricane approaches the shore. It can cause significant damage and threaten life and safety. When a hurricane threatens a community, it is important for coastal residents to understand the risks from storm surge and know what to do in order to be safe.

To understand how best to communicate storm surge risks, a team of researchers from the National Center for Atmospheric Research and the University of Georgia conducted focus groups in June 2017 with residents affected by Hurricane Matthew in Beaufort, SC, Brunswick, GA, and Savannah, GA.

Focus group participants discussed their understanding of storm surge, shared their experiences from Hurricane Matthew, and analyzed a series of experimental maps (Figure 1) and 3D animations (Figure 2) that were created for the purpose of this research and depicted hypothetical storm surge forecasts.

The final findings from this research will be included in articles, reports, and outreach to community members, media outlets, forecasters, emergency managers, and policymakers. Here, we present some initial findings. We welcome feedback on the following reflections.

INITIAL FINDINGS:



COMMUNICATING STORM SURGE RISK:

Conversations with Communities Affected by Hurricane Matthew

EVACUATION DECISIONS

Half of focus groups participants in Beaufort, SC, Savannah, GA, and Brunswick, GA, evacuated for Hurricane Matthew. Reasons for evacuating included:

- » Concern about becoming isolated after the storm due to impassable roads
- » Having no water or electricity
- » Living close to the coast
- » Previous experience with hurricanes
- » Concern for safety of family and young children
- » The evacuation was mandatory and required by law

Some reasons for not evacuating included:

- » Not knowing about the hurricane or the potential for storm surge flooding
- » Believing house was high enough not to be affected by flooding
- » Negative previous experiences with traffic (for example, during Hurricane Floyd)
- » Waiting until it was too late to safely leave
- » Responsibilities including pets or dependent family members
- » Wanting to be home to address flood, rain, or wind damage immediately



VISUALIZING STORM SURGE

- > Maps with recognizable landmarks and titles help people locate themselves and assess surge risks.
- > Showing surge risk at multiple scales is important because the regional scale indicates the spatial extent of the potential flooding, while the local scale indicates how specific places may be affected.
- > Realistic visualizations alongside the map legend, such as this image of a flooded home (Figure 1), provided an effective illustration of water height and helped interpret the information presented on the map.
- > Participants assumed that storm surge depths would be a bit higher or lower than the ranges presented in the maps, inferring some additional uncertainty.
- > The 3D animations drove home the severity and rapid advancement of storm surge risks.



MESSAGES ABOUT STORM SURGE

- > Reference to “above ground” or “above mean sea level” was confusing to many participants. Barrier island residents were more aware of their home’s elevation above sea level while other coastal residents often did not know the elevation of their houses.
- > Storm surge maps should indicate that hurricane intensity and tracking can rapidly shift, compromising evacuation routes.
- > Flooding can be caused by overlapping risks, including severe rainfall, overwhelmed storm water systems, phase of the tide, and storm surge.



STAY SAFE BY STAYING AWAY!

Hurricanes can result in the loss of power, water and emergency services.

**Protect your children and family
by following your city or county's
evacuation orders.**



Marine Extension and
Georgia Sea Grant
UNIVERSITY OF GEORGIA



RECOMMENDATIONS

Hurricane Matthew affected millions of lives and revealed the complexity of forecasting and communicating about storm surge. Participants left us with several important recommendations for communicating potential storm surge risk:

- > Forecasters and broadcasters can encourage people to connect with their social networks to ensure that neighbors and family members understand storm surge risks and have access to evacuation information and resources.
- > Tide cycle information can be presented alongside the storm surge height forecasts.
- > Static maps can be paired with animations to more effectively communicate surge risks.
- > Storm surge risk maps can provide information on potential road closures at the regional and city scale.
- > More information prior to a hurricane's arrival about the impacts and aftermath can help manage post-storm expectations. Examples include when people may be able to return home and/or have running water and electricity.



SHARE YOUR KNOWLEDGE!

Do your neighbors and family members understand hurricane and storm surge risks?
Make sure your social networks have access to evacuation information and safety resources.



Hurricane Irma is now two months behind us. While most of us are familiar with, and may still be dealing with the impacts of the storm on land, the impacts to coastal environments can also be significant, though often overlooked because they are generally out of sight. Hurricane Irma may have left some lasting impacts on our coastal environments that will have both good and bad implications. While it is too early to understand the full extent of Irma's impact, below is a brief overview of Hurricane Irma's influence on coastal water quality throughout the state of Florida.

The large wind and rain events associated with hurricanes often bring storm surge and flood waters into our streets and neighborhoods, and Irma is no exception. When these waters receded, they took with them land-based pollutants such as fertilizers, pesticides, chemicals, oil, and large debris items. In systems with good flushing, these contaminants will quickly dissipate. However, in slow-moving or enclosed areas, pollution and debris will stick around for a while. To complicate matters, seasonal wind and high-tide events kept many of Florida's east coast waters higher than normal, with areas continuing to be flooded well after Irma. The excess nutrients entering these waters led to drops in dissolved oxygen resulting in fish kills as seen in the St. Johns River and may help facilitate the growth of algal blooms, an inherent problem in the Indian River Lagoon. Biscayne Bay in southeast Florida has generally been considered the most pristine estuary in the state. NOAA scientists measuring water quality in the region noticed elevated levels of chlorophyll (an indicator of algal biomass), and areas of hypoxia which are generally unusual for the bay.

In addition to excess nutrients, hurricanes bring increased sedimentation into coastal water bodies and Irma's large rain events removed soils from the land. The stormwater runoff from land into adjacent waters carries these sediments with it, depositing them into our coastal waters. These sediments can degrade water quality and block sunlight critical for seagrass and coral health, growth and development. The Florida Keys, known for their crystal-clear Outstanding Florida Waters, experienced significant runoff and sedimentation. In many areas, water visibility was impaired and water depths have even changed because of Hurricane Irma. Scientists from the Florida Keys National Marine Sanctuary, NOAA, and others found extensive shifting of sand and heavy sediment accumulation during a rapid assessment of the coral reef tract after Irma. Already stressed corals were observed covered in a fine layer of sediment, which can smother corals, in addition to

limiting the amount of sunlight they receive. Despite this, corals may also benefit from hurricanes as they mix warm coastal waters with cooler offshore waters, and relieve the thermal stress associated with hot Florida summers. Some coral bleaching (a reaction to elevated water temperature) has occurred in the Florida Keys and throughout the entire Florida Reef Tract, but it is not certain how or if these events are associated with Irma, or if they would have been worse if Irma had not hit.

In Florida Bay, the story is mixed. Scientists saw high levels of turbidity in the area, though this favored juvenile trout populations. Salinity levels were stable at around 34 parts per thousand (ppt) in the bay, which is unusual for this hypersaline bay that can reach 45 ppt (normal seawater has a concentration of around 35 ppt). Hurricane Irma also helped to flush out much of the dead seagrass in the areas that were immediately impacted by the storm, though dead seagrass mats were seen throughout other areas of the bay, which can trigger an algal bloom like the 2015 seagrass die-off event.

(CONTINUED)



Image credit: NOAA/CIRA

According to NOAA, suspended sediments and increases in colored dissolved organic matter (CDOM) were seen along the West Florida Shelf along Florida's Gulf Coast following Hurricane Irma. CDOM is a measure of the dissolved organic matter in the water. Both CDOM and sediments diminish the amount of sunlight that can penetrate the water inhibiting photosynthesis. However, the situation could have been much worse. Areas along the Gulf coast saw an unusual natural phenomenon when the coastal waters receded, leaving the bay bottoms exposed. Tampa and the surrounding areas could have seen extreme storm surge had Irma's strength not weakened by the time it hit. Thus, polluted runoff was limited going into Tampa Bay and other gulf coast waters as compared to what it may have been.

While the rain may have been welcome to the thirsty Florida and Apalachicola Bays, it resulted in unwanted freshwater discharges to the west and east coast. Excessive rain in the Kissimmee Basin drained into Lake Okeechobee and increased lake levels to more than 17 feet, the highest level since 2005. Constraints to the lake's dike system requires the U.S. Army Corps of Engineers to discharge lake water out to the estuaries. Nearly 354,000 and 152,000 cubic feet per second (cfs) of regulatory releases have been sent out to the Caloosahatchee and St. Lucie Estuaries, respectively. These estuaries are not adapted to deal with the massive freshwater pulses associated with the releases. During these releases, turbidity and water clarity are reduced, oyster populations become stressed and may die, and the commercial shellfish harvesting areas were closed off in the gulf due to freshwater inputs associated with Irma.

Finally, one of Hurricane Irma's greatest impacts was the demonstration of the state of Florida's old and failing sewage system. With the exception of the Panhandle, most of the state experienced sewage spills of some extent. In certain areas, such as along the Indian River Lagoon, these spills have continued long after the hurricane passed. Groundwater and stormwater flow was so great that it inundated our system. As the power went down, so did lift stations and sewage was discharged into residential canals, onto streets, and into our estuaries. According to the Florida Department of Environmental Protection's Public Notice of Pollution, millions of gallons of treated and untreated wastewater were released throughout the state. Wastewater effluent brings a risk of bacteria and other pathogens associated with sewage systems and septic tanks. While the public health impact from these widespread sewage leaks is currently unknown, the Department of Health issued numerous boil water notices and avoid-water advisories because of high levels of *Enterococci* bacteria and potential negative health effects from these spills.

Hurricane Irma brought with it a number of impacts, lessons learned, and in some instances a welcome relief to our coastal systems. While the overall impact of Irma is not yet understood, we do know that hurricanes have long-term impacts that are felt and seen long after they hit. Throughout the state, scientists are studying these long and short-term ramifications, the results of which remain to be seen. In the meantime, it is important to remember that hurricanes are natural events and human inputs of debris, chemicals, nutrients, and sewage exacerbate their impacts and stress our coastal systems.

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PINELLAS COUNTY PARKS AND IRMA

Pinellas County Parks and Conservation Resources (PCR) department manages more than 20,000 acres of parks and preserves enjoyed by more than 17 million visitors annually. When Hurricane Irma struck, PCR worked fast to have these valuable resources operational and open to the public, but it wasn't without the help of faculty and staff from partner organization, UF/IFAS Extension.

Highlighted efforts involved cleanup by a north county team from Pinellas County Extension's satellite office located at Brooker Creek Preserve Environmental Education Center. The Preserve buildings and trails fared well in the storm, but help was needed to cleanup other local, county parks. The team consisted of Lara Milligan, Natural Resources Agent; James Stevenson, Extension Specialist; Julia Myers, Education Support Specialist; Sheree Scheuer, Education Support Specialist; and Trevor Ackerman, Sustainability Program Assistant.

The north county team helped to clear large debris from the 121 acre Philippe Park in Safety Harbor, piling large tree branches in piles that would be picked up by a contractor, and leaving smaller vegetation to be cleared by the mowing crew. The following day, the same team headed to 255 acre John Chestnut Sr. Park in Palm Harbor to do similar work.



Photo: Jim Goodburn

A south county team from Pinellas County Extension's satellite office located at Weedon Island Preserve Cultural and Natural History Center also pitched in to help. This team consisted of Brian Niemann, Florida-Friendly Landscaping™ Agent; Allison Saltoft, Education Support Specialist; and Jim Goodburn, Pinellas County volunteer. The south county team cleared over five miles of hiking trails and one mile of a paddling trail at the 3,190 acre Weedon Island Preserve in St. Petersburg, a preserve enjoyed by outdoor enthusiasts of all ages for biking, hiking, fishing, paddling and more!

This partnership between PCR and Extension helped Pinellas County open their parks sooner for anxious residents.



Pile of vegetation collected and removed from John Chestnut Sr. Park in Palm Harbor by team of UF/IFAS Extension Pinellas County faculty and staff.

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IRMA AND SEA TURTLE NESTING

The UCF Marine Turtle Research Group FB page <https://www.facebook.com/ucfmtrg/> posted many articles and news items related to sea turtle nests being destroyed by Hurricane Irma.



The beaches in the Archie Carr National Wildlife Refuge are the number one loggerhead sea turtle nesting site in the world and any loss of nests is devastating for this species as well as green sea turtles. This year has been a record year for green sea turtles nests in the refuge. The FB page posted this in their newsfeed on October 3rd:

Through the end of September, we have recorded the following totals in our study area on the [Archie Carr National Wildlife Refuge](#):

Loggerheads - 9,690 nests (8 new since Irma)

Green turtles - 15,744 nests (466 new since Irma)

Leatherbacks - 23 nests* (0 new since Irma)

This has been quite a year for green turtles, with the 2015 record of 12,905 nests shattered, and we were still seeing an average of 13 nests per day on the refuge during the last week of September.

Many nests have been lost to erosion (estimates coming soon!), but all sea turtle species lay multiple



nests each season and nest approximately every other year, giving populations a buffer against periodic large losses of eggs.

Here are related links to news stories:

<https://today.ucf.edu/hurricane-exposes-washes-away-thousands-sea-turtle-nests/>

http://www.orlandosentinel.com/news/hurricane-irma-recovery/os-green-turtle-disaster-20171016-story.html?utm_campaign=trueAnthem%3A+Trending+Contentutm_content=59ee747800bd4700079666e0utm_medium=trueAnthemutm_source=facebook

https://www.washingtonpost.com/news/animalia/wp/2017/10/06/hurricane-irma-wiped-out-thousands-of-sea-turtle-nests/?utm_term=.3085492ec848



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National Association of County Agriculture Agents (NACAA) Annual Meeting Salt Lake City UT

By: Carrie Stevenson, Coastal Sustainability, Escambia County

I am grateful to FANREP for the travel scholarship that helped enable my attendance to the National Association of County Agriculture Agents (NACAA) Annual Meeting and Professional Improvement Conference (AM/PIC) in Salt Lake City, Utah this summer. Agents from Utah and Florida organized the natural resources pretour, and several of us Florida agents were given the rather daunting task of driving over 1,000 miles in 2 days, sometimes down 15% grade mountains with no side rails. However, we did get the opportunity to explore a beautifully implemented stream restoration project, see ancient petroglyphs and fossil dinosaur prints, hike Bryce Canyon, learn about native plant restoration at Zion National Park, and walk to the highest (and possibly coldest) peak in Utah. We saw mule deer at sunset, were fed a gourmet steak dinner cooked via Dutch oven, and made friends from all over the country. And all of that was before the conference started!

In Salt Lake City, an impressive contingent of Florida agents gave presentations, earned awards, and took advantage of great food and culture in downtown Salt Lake. UF IFAS Extension's own Gene McAvoy from Hendry County was elected the Vice President of NACAA, a huge honor among a membership of over 1,000.

Petroglyphs



Drive to Zion

We also tried Salt Lake City's innovative public transportation projects, including electric trains and a bicycle-sharing program. The solar-powered bike stations were placed strategically around the downtown area, which was also full of safe bike lanes. For a small fee, patrons could check out bicycles for 30 minutes at a time, for up to 24 hours. This ensured there were plenty of bicycles available for other users, and stations were close enough to one another that it was easy to check bikes in and out. The 2017 NACAA meeting in Utah was full experiences and learning opportunities I will not soon forget. I encourage all of the FANREP members to attend national meetings when possible—you will not regret it.

Urban Extension Conference Bloomington MN

By: Lara Milligan, Natural Resource, Pinellas County

This year I was able to attend the Urban Extension Conference in Bloomington, Minnesota thanks in part to a FANREP scholarship. This conference and this state were a first for me, so I was excited about the opportunity. Though I didn't find the abstract sessions to be super relevant to my area of work in natural resources, the conference overall gave me a whole new perspective of "urban" and the challenges facing those communities.

You've probably heard our claim to fame in Pinellas that we are the most densely populated county in the state and thus we are very urban, right? Well, what I found out from this conference is...it depends. There aren't many counties that find themselves in our situation where the entire county is developed out, but instead they are focusing on very urban centers, think big cities. These urban centers come with lots of challenges demographically, geographically, and socially.

I'll be frank about this next part because I think it's important and highlights a major theme of this conference and that was diversity. This was by far the most diversity (in terms of participants) I have ever seen at a conference.



There were many sessions when I was (for once) a minority. It was eye-opening for me in many ways 1) the feeling of being the minority 2) the importance of diversity in the workplace, especially to reach urban audiences, and 3) how passionate all conference attendees were to meet the needs of their community taking this diversity into account.

I was greatly inspired by the keynote speech by Deputy Mayor of the City of St. Paul and her efforts to serve all members of her community equally. Everything from traffic stops to library size, it was very important to her that all residents of her city were being treated the same and had access to the same service no matter where they lived (east or west St. Paul). Her presentation really hit on the conference theme of #collectivepurpose.

In Urban Extension, in order to achieve #collectivepurpose, it takes partnerships and community engagement. As Richard DeFour said it so well, "Educators who are building a professional learning community recognize that they must work together to achieve their collective purpose of learning for all."

American Fisheries Society Annual Meeting

Tampa FL

By: Savanna Barry, Sea Grant, Nature Coast Biological Station, Cedar Key FL

The American Fisheries Society (AFS) held their 147th Annual Meeting at the Tampa Convention Center in August 2017. AFS is one of the oldest and most prestigious fisheries organizations in the world, with peer-reviewed periodicals dating back to 1872!

With such a big meeting so close to home, there were few Florida Sea Grant faculty that could resist the opportunity to present their research and extension work to an international audience. Extension agents, specialists, and graduate students alike presented in multiple sessions out of the 23 concurrent sessions each day.

Of specific interest to many Florida Sea Grant faculty were the sessions on Artificial Reefs, Cooperative Research and Citizen Science, and Stakeholder Outreach and Extension.



Each of these sessions was co-chaired by at least one Florida Sea Grant faculty, and all of the session co-chairs are to be congratulated for the success of their sessions. Each of these sessions received enough submissions to fill two full days, highlighting the excellent leadership our faculty exhibited to bring forward key issues relevant to conference attendees from across the country.

I was fortunate to receive a FANREP Travel Scholarship to partially support my attendance at this meeting. Thanks to the FANREP Scholarship program, I was able to present to a broad audience about the Florida Horseshoe Crab Watch citizen science effort I am leading collaboratively with the Florida Fish and Wildlife Conservation Commission.

As a result of my attendance and presentation, I am collaborating with at least 5 more faculty that want to be involved in expanding the Horseshoe Crab Watch program and one researcher who investigates volunteer motivations. Without the opportunity to present this work, I would not have been able to progress so rapidly with expanding the program and improving my evaluation methods. Thank you, FANREP, for your support of these important professional development experiences!

National Urban Extension Conference Bloomington MN

By: Theresa Badurek, Urban Horticultural, Pinellas County

FANREP awarded a travel scholarship that funded this agent's travel to the National Urban Extension Conference in Minneapolis, MN, May 8-11, 2017. This conference gave me the opportunity to learn the latest innovative tools for extension working in urban areas and network with others who do the same kind of work. The skills and ideas learned at the conference will help make my extension programming more relevant to an urban audience. Additionally I met with other urban extension professionals and shared challenges and successes. The atmosphere of the conference was one of inclusion and a willingness to tackle difficult issues to benefit the community.

While there I had the opportunity to present a project that nearly our entire extension office collaborated on in recent years, the "Pinellas County School Board Employee Wellness Class Series", T. Badurek, UF/IFAS Extension, Pinellas County; N. Jensen, UF/IFAS Extension, Pinellas County, H. Landis, UF/IFAS Extension, Pinellas County, R. Madhosingh-Hector, UF/IFAS Extension, Pinellas County, B. Niemann, UF/IFAS Extension, Pinellas County. Brian Niemann, our Florida-Friendly Landscaping™ Agent also traveled to the conference and co-presented.

This project evolved from the relationship of one agent (Nan Jensen, Family and Consumer Sciences) who offered a variety of worksite wellness classes to the Pinellas County School Board since 2010. In 2015 Extension expanded class offerings into other subject areas like gardening, energy savings, rain-water collection, and more.



This class series included providing worksite wellness programs to school board employees and enhancing revenue in each extension discipline. Agents from the Family and Consumer Sciences, Florida-Friendly Landscaping™ Program, Sustainability, and Urban Horticulture submitted class topics to the school board for site wellness programming. Each agent charged the client a \$50 speaker fee per one-hour class. Classes were held during work hours in classrooms, administration offices, and maintenance facilities; attendees included teachers, administrators, and other staff.

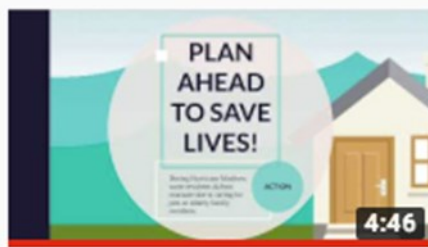
49 classes were held with 875 participants, and generated \$2313.00 in revenue. Of those surveyed for knowledge gain and practice change, over 70% (n=152) intended to improve lifestyle habits or practices. This series is a successful way to reach new audiences and work together to provide a variety of extension information. Most employees have little time in their schedules to attend classes and this allowed extension to bring knowledge directly to them. The class fees also provided a source of revenue that helps further support program and professional development. The program was an innovative way to reach working urban professionals.



REFERENCES AND RESOURCES

HURRICANE IRMA: LESSONS LEARNED FROM HURRICANE MATTHEW

The following resources were developed by Georgia Sea Grant and provided by Holly Abeels with Florida Sea Grant

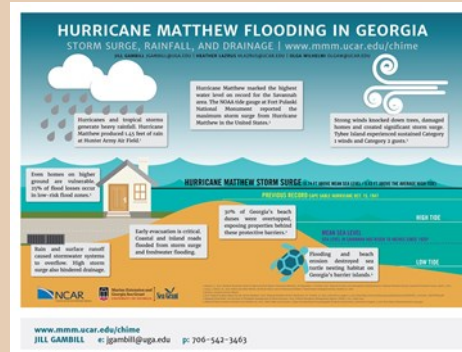


Reduce Your Hurricane Risk

GeorgiaSeaGrant

Video made of critical hurricane messages that were identified in focus groups as knowledge gaps or key motivators. This video is accessible for the vision and

hearing impaired. <http://youtube/GZX5EgqCwA>



Facebook: As Hurricane Irma draws closer, what lessons can we learn from Hurricane Matthew? See how storm surge,

rainfall and drainage failures created complex flood impacts.

<https://www.ready.gov/hurricanes>

Twitter: As Hurricane Irma draws near, what lessons can we learn from Hurricane Matthew? <https://www.ready.gov/hurricanes>



Facebook: Why do some coastal residents evacuate, while others stay behind? The National

Center for Atmospheric Research and the University of Georgia conducted 7 focus groups in Beaufort, SC; Savannah, GA; and Brunswick, GA in the aftermath of Hurricane Matthew.

Here are reasons that participants gave. <https://www.ready.gov/hurricanes>

Twitter: Why do some evacuate, while others stay behind? See what focus groups said after Hurricane Matthew. <https://www.ready.gov/evacuating-yourself-and-your-family>

Facebook: Know Your Flood Risk! Storm surge can advance quickly and conditions can rapidly change depending on the shifts in the



hurricane's intensity or tracking and the timing of the tide cycle. Check the latest advisories from the National Hurricane Center

for storm surge updates. <http://www.nhc.noaa.gov/>

Twitter: Storm surge advances quickly! Conditions can rapidly change w/ shifts in hurricane intensity, tracking & tide cycle. www.nhc.noaa.gov



FANREP is a statewide association for Cooperative Extension Service (CES) professionals working in environmental education, fisheries, forestry, wood sciences, Florida Friendly Landscaping (FFL), waste management, water, wildlife, community development and related disciplines. Our main objectives are to:

- Bring Extension professionals together to discuss mutual natural resource issues, needs, and opportunities.
- Advance natural resource Extension through continuing education for Extension professionals.
- Promote cooperation among states and regions, agencies, associations, and businesses on natural resource education programs.
- Develop, sponsor, and promote education and training programs that advance natural resource management.
- Strengthen communication with Extension administrators

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