

NSS+NEES Tampa 2019

National Sustainability Summit & National Extension Energy

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NSS+NEES Tampa 2019

National Sustainability Summit & National Extension Energy

Tuesday, April 16th

Pre-Conference Field Tours (Off-site)

- 8:00 a.m. - 12:30 p.m. Sea-to-Tap & the Energy-Water Nexus at Tampa Bay Water
- 8:30 a.m. - 12:30 p.m. Morning Paddle at Upper Tampa Bay Park
- 8:30 a.m. - 3:30 p.m. Seed-Solar-Suds: Hillsborough Hops to Craft Brews
- 9:30 a.m. - 12:30 p.m. All Aboard at Tampa International
- 1:30 p.m. - 5:00 p.m. Tampa Riverwalk by Water Taxi Airport (TIA)

Conference Events (Bayshore Ballroom & Foyer)

- 4:00 p.m. - 9:00 p.m. Registration Desk Open
- 2:00 p.m. - 6:00 p.m. Poster Set-up
- 7:00 p.m. - 9:00 p.m. Welcome Reception

Wednesday, April 17

Opening Plenary Session - Bayshore Ballroom

- 7:00 a.m. Registration Desk Open
- 7:00 a.m. Breakfast Buffet
- 8:30 a.m. Welcome - Pat Kemp, Pat Gerard, and U.S. Congresswoman Kathy Castor
- 9:00 a.m. Virtual Keynote - Katharine Hayhoe, Ph.D.
- 9:45 a.m. Networking Break
- 10:15 a.m. Keynote - Robert Horton
- 11:15 a.m. Poster Lightning Presentations
- 12:15 p.m. Buffet Lunch
- 2:00 p.m. National Sustainability Summit (NSS) Plenary

- 2:15 p.m. **Major Sustainability Initiatives of Hillsborough County - A Triple Bottom Line Approach**
Sheila McNamara, Hillsborough County Government
- 2:30 p.m. **Creating Partnerships between Universities and Local Governments for Sustainability Goals and Societal Benefits**
Joseph Dorsey, Ph.D., University of South Florida
- 2:45 p.m. **Externships in Community Sustainability Through Cooperative Extension**
Mark Apel, University of Arizona
- 3:00 p.m. **Sustainable You! 4-H Youth Camp: Empowering Youth through Positive, Hands-On Messaging and Activities**
Roslynn McCann, Ph.D., Utah State University
- 3:15 p.m. **CIVIC - A Platform for Community Conversations**
Lara Milligan, University of Florida
- 3:30 p.m. Networking Break
- 4:00 p.m. National Sustainability Summit (NEES) Plenary
- 4:15 p.m. **The Cooperative Extension Service and Its Next Great Challenge**
Wendell Porter, Ph.D., University of Florida
- 4:30 p.m. **Building Resilience Capacity along the Gulf: Community Resilience Indices Development and Implementation**
Jody Thompson, Auburn University
- 4:45 p.m. **Tracing the National Extension Energy Initiative (NEEI) Impact from 2013 to 2019**
Patricia Townsend, Ph.D., Washington State University
- 5:00 p.m. **Government Energy Academy: maximizing Extension's impact in communities**
Cary Weiner, Colorado State University

5:15 p.m. **How Placing a Fee on Fossil Fuels Can Reduce Greenhouse Gas Emissions**

John Cobourn, Ph.D., University of Nevada Cooperative Extension

6:00 p.m. Reception - [Atrium](#)

7:00 p.m. Awards Dinner – [Bayshore Ballroom](#)

Thursday, April 18

8:00 a.m. to 10:00 a.m.

Workshops

8:00 a.m. **Engaging Communities with Sustainability Initiatives on Universities and Colleges**

Whitney Fung, University of South Florida - [Westshore I](#)

Conversing with Clientele about Climate Change

Faith Kearns, Ph.D., University of California - [Bayshore I](#)

9:00 a.m. **Urban Landscape Habitat Restoration and Preservation**

Susan Haddock & Mark Hostetler, Ph.D., UF/IFAS Extension Hillsborough County - [Westshore I](#)

Climate Change Community Level Solutions: Moving from 'Me' to 'We'

Lauren Watkins, University of Florida - [Bayshore I](#)

NEES 15-Minute Oral Presentations - Bayshore II

8:00 a.m. **Electric Avenue: Strategies to Grow Electric Vehicle Adoption in Sarasota County**

Lee Hayes Byron, UF/IFAS Extension Sarasota County

8:15 a.m. **Assessing Potential Peak Energy Demand Management Strategies In Agriculture**

Eric Romich, The Ohio State University

8:30 a.m. **Energy Upgrade: An Equity, Engagement, and Climate Change Mitigation Strategy**

Sara Kane, UF/IFAS Extension Sarasota County

8:45 a.m. **Effectiveness of a National Photovoltaics Education Program for Architects and Engineers**

Michael E. Goldschmidt, M.Arch, University of Missouri

9:00 a.m. **Sweetpotato and Crop Byproducts for Fuel, Feed and Food in Florida**

Wendy Mussoline, Ph.D., UF/IFAS Extension

9:15 a.m. **Promoting Sustainability of Resources: a Tri-County "Water in My Backyard" Program**

Marnie Ward, Ph.D., UF/IFAS Extension Citrus County

NSS 15-Minute Oral Presentations - Bayshore III

8:00 a.m. **Diversified Researchers Come Together to Find Bacteria Sources in Pellicer Creek**

Tricia Kyzar, University of Florida

8:15 a.m. **Artificial Reef Monitoring: A Collaborative Program in Taylor County**

Victor Blanco, UF/IFAS Extension Taylor County

8:30 a.m. **Resilience to Future Flooding in the Gulf of Mexico**

Carrie Stevenson, UF/IFAS Extension Escambia County

8:45 a.m. **Saving Water and Creating Behavior Change Home to Home**

Michelle Atkinson, Ph.D., UF/IFAS Extension Manatee County

9:00 a.m. **Using Community-Based Social Marketing to Expand Water Conservation Impacts**

Laurie Albrecht, UF/IFAS Extension Palm Beach County

9:15 a.m. **Flood Risk & Resilience - Moving the Needles on Research and Outreach**

Sarah Alexander, Cornell University

10:00 a.m. **Networking Break**

10:30 a.m. to 12:00 p.m.

45-Minute Workshops

10:30 a.m. **Research on Issues Facing Academic Efforts to Better Inform Local Policy Making: The Case of Renewable Energy**

Robin Blakely Armitage, Cornell University - [Westshore I](#)

Michigan State University Extension's Programming in the Sustainable Development Era

Holly Tiret, Michigan State University - [Bayshore I](#)

11:15 a.m. **Teaching Energy Through Nanogrid Applications**

Art Nash, University of Alaska Fairbanks - [Westshore I](#)

Building Social Capital to strengthen Community Sustainability

Lauren Bethany Prykucki, Michigan State University - [Bayshore I](#)

NSS 15-Minute Oral Presentations - [Bayshore III](#)

10:30 a.m. **Filling Empty Trucks: The Farm to Rural Grocery to Wholesale Backhaul Model**

Ren Olive & Kathy Draeger, Ph.D., University of Minnesota Extension
Regional Sustainable Development

10:45 a.m. **Utilizing Container Gardens to Reach Food Desert Communities in Southwest Florida**

Lisa Hickey, UF/IFAS Extension Manatee County

11:00 a.m. **Florida Statewide Small Farms Hydroponic Program**

Francisco P. Rivera, UF/IFAS Extension Hillsborough County

11:15 a.m. **Sustainable Food Systems are a Collaborative Effort**

Hannah Wooten, UF/IFAS Extension Seminole County

11:30 a.m. **Participatory Capacity Building**

Jennifer Taylor, Ph.D., Florida Agricultural and Mechanical University

NEES 15-Minute Presentations - [Bayshore II](#)

10:30 a.m. **Harvesting Energy from Our Oceans: What Should I Know?**

Victor Blanco, UF/IFAS Extension Taylor County

10:45 a.m. **Stakeholder Assessment of Poplar for Feedstock and Ecosystem Services in Rural Washington**

Patricia Townsend, Ph.D., Washington State University

11:00 a.m. **Treejuvenation Sarasota: An Urban Forestry Citizen Engagement Extension Program**

Marguerite Beckford, Ph.D., UF/IFAS Extension Sarasota County

11:15 a.m. **Engaging Stakeholders to Expand Dark Skies on Important Sea Turtle Nesting Beaches**

Erik Lovestrand, UF/IFAS Extension Franklin County

11:30 a.m. **Experiential learning at Multiple Scales: Integration of Community Needs with Sustainability Goals**

Carlos V. Licon, Ph.D., Utah State University

12:00 p.m. Lunch on your own

1:00 PM to 1:45 PM

Optional Workshop – Westshore 1

Florida Green Building Coalition Workshop

2:00 PM to 3:30 PM

45-Minute Workshops - Westshore I

2:00 p.m. **Garden Steps**

Michele Ogilvie, Hillsborough County

2:45 p.m. **Designing for Flood: Hillsborough Community Vulnerability Impacts**

Taryn Sabia, University of South Florida

NSS 15-Minute Presentations - Bayshore III

2:00 p.m. **Tipping Point Planner: Addressing Land Use and Management in the Great Lakes**

- Kara A. Salazar, Purdue University
- 2:15 p.m. **The Ecological and Monetary Benefits of Preserving Lands in an Urbanizing County**
- Ross Dickerson, Hillsborough County
- 2:30 p.m. **Model Partnership Between Wildlife and Land/Forest Conservation Organizations and Family Heirs' Property owners**
- Sandra Thompson, Ed.D., Florida Agricultural and Mechanical University,
Kent Wimmer, Defenders of Wildlife
- 2:45 p.m. **Promoting Food System Sustainability through Agritourism: From Suburban Farnettes to School Gardens and Agrihoods**
- Brooke Hansen, Ph.D., University of South Florida
- 3:00 p.m. **Sustainable or Not, Lessons Learned from Coast to Coast Regarding Wildfire**
- Sharon Gamble, UF/IFAS Extension Volusia County

NEES 15-Minute Presentations - Bayshore II

- 2:00 p.m. **Zero Waste Events: Sustainable Communities Workshop Case Study**
- Sara Kane, UF/IFAS Extension Sarasota County
- 2:15 p.m. **Assessing Needs and Interests of Extension Energy Programming in Wisconsin**
- Shiba P. Kar, Ph.D., University of Wisconsin
- 2:30 p.m. **Georgia's Renewable Energy Technical Assistance Program and Model Solar Ordinance**
- Dan Geller, Ph.D., University of Georgia
- 2:45 p.m. **The Design and Deployment of the Better Wood Stove**
- Jonathan Kays, University of Maryland
- 3:00 p.m. **Issues in Transitioning to Renewable Electricity: Focusing on Large Scale Solar**
- Katherine Herleman & David Kay, Cornell University

3:15 p.m. **Powering Conversations about Energy**

David Ripplinger, Ph.D., North Dakota State University

NSS & NEES 30-Minute Roundtable Discussions - Bayshore I

2:00 p.m. to 3:30 p.m. Roundtable sessions are 90-minutes long and occur simultaneously. Participants rotate to a different table after 30- minutes.

Beyond Hours Served: Measuring New Outcomes of Volunteer Programs

Nicole Pinson, UF/IFAS Extension Hillsborough County

Renewable Energy Siting: Community Questions, Opportunities and Concerns

Fritz Ebinger & Lissa Pawlisch, University of Minnesota Extension

Multi-state Extension Energy Programming, Making it Work!

F. John Hay, University of Nebraska

Utah High School Clean Air Poster Contest: Science, Art, Marketing, Behavior Change, and Community Outreach for Better Air Quality

Roslynn McCann, Ph.D., Utah State University

How is Extension Working with Underserved Communities Around Issues of Energy Equity

Joel Haskard, University of Minnesota

Sustainability from the Inside Out: Employee Engagement Strategies in Sarasota County

Lee Hayes Byron, UF/IFAS Extension Sarasota County

Integrating Sustainability into Local Comprehensive Plans

Melissa E. Zornitta, Hillsborough County

3:30 p.m. Networking Break

4:00 PM to 5:30 PM

NSS 25-Minute Hands-On Presentations

- 4:00 p.m. **Community Engagement and Education on Local Food Systems through Virtual Reality**
Brooke Beam, Ph.D., The Ohio State University
- 4:25 p.m. **FACTS Bioreactors - A Valuable Laboratory Instrument for Inquiry-Based Instruction in Energy and Sustainability**
Craig Kohn, Michigan State University
- 4:50 p.m. **Enhancing K-12 Water Education through Cooperative Extension Program**
Yilin Zhuang, UF/IFAS Extension Marion County

NSS 15-Minute Presentations - Bayshore III

- 4:00 p.m. **Florida-Friendly Landscaping™ (FFL): Grass-Roots Horticulture Program that Promote Urban Environmental Stewardship**
Susan Haddock, UF/IFAS Extension Hillsborough County
- 4:15 p.m. **Building Ecological and Community Resiliency through Permaculture Design: The Utah State University (USU) Permaculture Initiative**
Roslynn McCann, Ph.D., Utah State University
- 4:30 p.m. **Building Sustainable Support for School and Community Gardens**
Susan Webb, UF/IFAS Extension Southwest District
- 4:45 p.m. **Creating a Sustainable Future: Evaluating Model Eliciting Activities with K-12 Students**
Deborah Kozdras, Ph.D., University of South Florida
- 5:00 p.m. **Climate Extension: A Review of Programs and Materials**
Caitriana Steele, Ph.D., New Mexico State University

NEES 15-Minute Presentations - Bayshore II

- 4:00 p.m. **Round is Resilient**
Ken Sides, P.E., Sam Schwartz Transportation Consultants

4:15 p.m. **FDACS OOE Multifamily Retrofits Demonstration Project**
Erin Rosica, Florida Department of Agriculture and Consumer Services

NEES 60-Minute Panel Discussion - Bayshore II

4:30 p.m. **ZeroSkin**
Anthony Brower & Charles Berg, Gensler

NSS & NEES 30-Minute Roundtable Discussions - Bayshore I

4:00 p.m. to 5:30 p.m. Roundtable sessions are 90-minutes long. Participants rotate to a different table after 30-minutes.

Driving Economic Development & Clean Energy Through Innovative Financing Partnerships

Peter Lindstrom, University of Minnesota

Volunteerism 101: Recruiting, Training, and Retaining Citizen Science Volunteers

Beth Clawson, Michigan State University Extension

Are We Walking the Talk Yet? Sustainable Living Practices in Light of the Bestseller Drawdown

Chris Jones, University of Arizona

Smart Approaches to Smart Growth - Regional Localism for Water and Sewer Infrastructure

Brian Rahm, Ph.D., Cornell University

Resilient Tampa Bay - Transportation Pilot Project

Allison Yeh, AICP, LEED GA - Executive Planner, Hillsborough MPO –
Moderator/Host, Beth Alden, AICP - Executive Director, Hillsborough MPO
- *Regional Transportation Perspective*, Marshall Flynn, Director of
Information Systems & GIS, Tampa Bay Regional Planning Commission -
Storm Surge and Flood Modeling perspective

Eugene Henry, AICP CFPM- Mitigation Manager, Hillsborough County
Public Works Department – *Hazard Mitigation perspective*

Anita Wang, P.E.- FDOT D7 Assistant District Drainage Design Engineer -
State transportation perspective

**Southern Partnership for Advanced Renewables from Carinata
(SPARC) - A New AFRI CAP**

David Wright, Ph.D., University of Florida

**Profitability for Small to Mid-Size Farms through Local Strategic
Planning**

Jessica Ryals, University of Florida

5:30 p.m. Dinner on your own

Friday, April 19th

Closing Plenary (Bayshore Ballroom)

8:00 a.m. Capnote - Nick Place, Ph.D., UF/IFAS Extension Dean

9:00 a.m. Networking Break

9:30 a.m. Interactive Plenary - Gwen Whiting & Carlyne Abdullah, Everyday
Democracy

11:30 a.m. Conference Concludes

12:00 p.m. NNSLE & NEEI Initiative Group Debrief & Planning Lunch

Poster Presenters

Poster # Title and Author(s)

1 **Flood risk & resilience - moving the needle on research and outreach**
Sarah Alexander, Graduate Research Assistant, Cornell University,
jaz65@cornell.edu

2 **Using Film to Create Sustainable Community Connections**
Ramona Madhosingh-Hector, Urban Sustainability Agent, UF/IFAS
Extension Pinellas County, ramona.m.hector@ufl.edu; T. Ackerman,
Sustainability Program Assistant, UF/IFAS Extension Pinellas County

3 **Does Ownership Structure Affect Forest Management? An Analysis of African American Family Forest Landowners**

Noah Goyke, Doctoral Candidate, University of Georgia's Warnell School of Forestry and Natural Resources, nag61901@uga.edu

4 **Biochemical Processing to Enhance the Value of Agricultural Biomass**

Luiza Brabo-Catala, Graduate Research Assistant, Patel College of Global Sustainability, University of South Florida, brabocatala@usf.edu

5 **Cluster Thinning Effects on Table Grape Cultivars Grown on Three Trellis Systems Under High Tunnel**

Jose Hernandez, Graduate Assistant, University of Arkansas, jah024@uark.edu

6 **Alleviating Pollinator Decline Using Cowpea (*Vigna unguiculata*) in an Intercropping System and the Impact on Crop Yield**

P. C. Omaliko, Department of Natural Resources and Environmental Design, North Carolina Agricultural and Technical State University, Greensboro, pcomaliko@aggies.ncat.edu

7 **Can Pesticide Application be Reduced in Sod-based Rotation?**

Lesley Schumacher, Graduate Student, University of Florida, lesleyschumacher@ufl.edu

8 **Sidewalks: From Traditional Concrete to Permeable Pavement: Does Public Opinion Matter?**

Megan Dettenmaier, Forestry Extension Educator, Utah State University, megan.dettenmaier@usu.edu

9 **Preliminary Investigations of Situated Sustainability Instruction in High School Agricultural Education**

Craig Kohn, Doctoral Student & Research Fellow, Michigan State University, kohncrai@msu.edu

10 **Navigating the Family Heirs' Property Title Clearing Process (FHP)**

Sandra Thompson, Ed.D., Community Resource Development (Faculty, Specialist, Program Leader), sandra.thompson@famuedu

11 **Building Sustainability Through an Urban Green Infrastructure Network**

Patricia A. Townsend, Ph.D., Regional Extension Specialist, Washington State University, patricia.townsend@wsuedu

12 **Can Cover Crops Serve as a Bridge for Beneficial Insects in Watermelon Production Systems?**

Paige Hickman, Graduate Assistant, University of Arkansas, phickma@email.uark.edu

13 **Leveraging Pest Behavior for Implementation of Sustainable Management Tactics for Plum Curculio in Southeastern Peach Production**

Tzu-Chin Liu, University of Georgia, jean2036@uga.edu

14 **Developing Suitable Cover Crop Systems for South Texas: Evaluating Different Late-Summer Cover Crop Species**

Spencer L. Samuelson, Graduate Student, Texas A&M University, samuelson.spencer@tamuedu

15 **Alternatives to Summer Fallow in Continuous Wheat Systems**

Marie Schirmacher, Graduate Research Assistant, Soil and Crop Sciences, Texas A&M University, mariets@tamuedu

16 **A Membrane Biotechnology Platform for Water Recovery**

Talon Bullard, M.S. Student University of South Florida, Department of Civil and Environmental Engineering, james85@mail.usf.edu

17 **Greenhouse Gas Emissions of Water Production at Tampa Bay Water**

Trista Brophy, Doctoral Student, School of Natural Resources, University of Florida, brophy.trista@gmail.com

18 **The Carinata Community of Practice - A Platform for Stakeholder Learning and Engagement**

Benjamin Christ, Ph.D., University of Florida, jbenjamin.christ@ufl.edu;
Wendy-Lin Bartels, Ph.D., Research Assistant Scientist, School of Forest
Resources and Conservation, University of Florida, wendylin@ufl.edu

19 **The Production of Biogas using Anaerobic Biodigesters in a Saline Environment**

Ashlee Painter, Graduate Student, University of South Florida's Patel
College of Global Sustainability, apainter1@mail.usf.edu

20 **Play Greener: How UF is Bringing Green Sports Into and Beyond the Classroom**

Randy Penn, UF/ IFAS Sarasota County - Waste Reduction Extension
Agent, rpenn@ufl.edu

21 **Biomass Residue Fueled Micro-Grid for a Rural Community in Puerto Rico**

Jonathan Pruitt, Masters Student in Conservation Ecology, School for
Environment and Sustainability, University of Michigan, pruittpr@umich.edu

22 **Solar Energy Production on Agricultural Land: Risks and Opportunities**

Drew Schiavone, Ph.D., Energy Conservation and Technology Specialist
University of Maryland Extension, dschiavo@umd.edu

23 **Developing, adopting, and executing 100% renewable energy resolutions at the local level**

Emily Skill Graduate Student Utah State University, Department of
Environment and Society, emily.skill@aggiemail.usu.edu

Abstracts

Using Community-Based Social Marketing to Expand Water Conservation Impacts

Laurie Albrecht, Extension Agent - Environmental Horticulture, UF/IFAS Extension Palm Beach County, lalbrecht@pbcgov.org

The 'Let Every Drop Count' program was developed to address Florida's growing water crisis. Objectives: 1) to use community-based social marketing (CBSM) techniques to encourage participants to implement new water conservation practices on their properties and throughout community associations; and 2) to empower attendees to create positive behavior changes throughout Palm Beach County. Methods: An initial presentation demonstrated how much water and money participants could save by taking simple steps to reduce landscape irrigation, and provided tips on how attendees could serve as community-wide "water ambassadors." Participants then signed a voluntary pledge to participate in the program and created their own irrigation conservation plans. Integrative, experiential and reinforcement methods included follow-up presentations, plus demonstrations, brainstorming sessions, group discussions, and in-person and email pledge reminders. UF/IFAS EDIS publications, fact sheets, and CBSM techniques such as specially-created pledge certificates, pledge cards, prompts and a campaign logo were employed to lower barriers to change and make new practice adoption convenient and desirable. Results: According to a 60-day follow-up study, 110 pledge takers adopted new practices that would reduce landscape irrigation by 13,309,367 million gallons of water a year (Boyer and Dukes, 2015). In addition, 96% of the respondents talked to others, including community associations, schools, clients and friends about irrigation conservation, reaching an additional 466 residents with the message. Conclusion: CBSM techniques can help agents foster large-scale behavior changes in landscape irrigation practices. Extension agents in nearby counties have adopted this program, using it as a model for irrigation conservation and fertilizer reduction trainings.

Flood Risk & Resilience - Moving the Needle on Research and Outreach

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This presentation draws on the work of a number of different teams participating in the Cornell Flood Resiliency Working Group (FRWG). Individual research projects are addressing site-level flood risk planning, climate displacement and relocation dynamics, sea level rise and fiscal stress, climate-adaptive design and more. We will spotlight these and other themes, most associated with individual and community responses to flood risk, and many of which were addressed in our two-day October 2018 Community Development Institute on Flood Risk and Community Resiliency. We will focus in particular on our ongoing work in the Hudson River Valley estuarine system, where both riverine flooding and sea level rise are concerns. The research aspects of that project are intended to strengthen the basis for the outreach efforts throughout the estuary, especially via a partnership with the Hudson River Estuary Program. We are investigating perceptions of flood risk, and responses to that risk, with special consideration given to the factors that influence proactive individual and community relocation decisions. The overall FWRG efforts involve outreach and research specialists from a variety of fields, including development sociology, engineering, urban planning, and landscape architecture. The fundamental FWRG goal is to help prepare New York and other communities facing current and future flood risk. Sponsored by the NYS Water Resources Institute and Cornell's Community and Regional Development Institute, the FWRG is also designed to help foster campus-community and cross-campus collaborative engagement.

Two Paths: Demolish an Existing Home or Create a Sustainable Demonstration

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In 2012, a University dean offered a property that included an old home in disrepair on the edge of campus to the Landscape Architecture and Environmental Planning department that was intended to function as an experiential, sustainable learning facility and lodging for visiting faculty and practitioners. University Facilities administrators felt

the aging property was an eyesore and not worth any investment to rehabilitate. This raised the question of how to address aging infrastructure and real-property on university campuses. Clearly, this is a decision to be made on a case-by case basis. However, in this case, the department and dean persuaded the Facilities office to allow remodeling and improvement of the property. The results have been impressive.

Externships in Community Sustainability through Cooperative Extension

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Land grant universities and their Cooperative Extension departments across the nation have the mission of bringing solutions to bear on practical problems and are in a particularly advantageous position to foster sustainability education. At the University of Arizona, the Externships in Community Sustainability Program is one tool being used by Cooperative Extension to provide creative, cost-effective outreach and education as well as providing service and learning opportunities for university students through community-based sustainability projects. Working with Extension personnel throughout the state's 15 counties since 2011, over 65 students have participated on an array of projects spanning the range of sustainability programming in the areas of local food systems, farmers markets, community and school gardens, water conservation, integrated pest management, youth development, water conservation, and nutrition education. Students are paid minimum wage and earn a non-credit "Engagement" notation on their transcripts while putting sustainability principles into practice for the community they are working in during their summer breaks.

Saving Water and Creating Behavior Change Home to Home

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The Mobile Irrigation Lab (MIL) goals are to provide attendees with an understanding of the value of water, how to conserve water in the landscape, and to provide attendees with knowledge for incorporating outdoor irrigation water saving techniques in their landscape so that they can change their outdoor irrigation behaviors. An on-site evaluation

encourages outdoor water conservation and best management practices in the landscape. The evaluation report addresses landscape plants' cultural needs and recommendations for an efficient irrigation system. The mobile irrigation lab team works one on one with client and provides them information on water conservation techniques and an irrigation system maintenance checklist. Educational workshops are hands-on and lecture. The potable water MIL evaluations (374) from 2014 to 2017 decreased their water consumption by 78 million gallons. All MIL evaluations (1134) making all recommended changes from 2014-2017 could have saved over 200 million gallons of water. Of the 102 follow up survey participants, 68% (65) participants reported at least one behavior change reducing irrigation water usage 3,536,510 gallons or more. Behavior changes reported by workshop participants in an eight month follow survey. Converting gallons saved to dollars using the producer price index, \$2.60 per thousand gallons, this translates into savings of \$54,600 in annual water-treatment and delivery costs for local water utilities. The total water savings among potable water participants is 21 million gallons per year, according to Borisova et al's document "Estimating Benefits of Residential Outdoor Water Conservation: A Step-by-Step Guide", this would translate into \$72,485 in annual savings to all MIL clients. Learning objectives for participants: 1. Participants will understand the water savings that can be attained by educating homeowners on efficient irrigation practices. 2. Attendees will learn how the Manatee County program was established and funded and hear of possible ways to fund a program in their community.

Community Engagement and Education on Local Food Systems through Virtual Reality

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The sustainability of rural communities is a challenge many Extension educators are facing. Local foods systems are a key component of sustainable community development programming (Ikerd, 2008). Less than two percent of Americans are farmers and as a result, the majority of the nation is disconnected from the concepts of food production. Woolpert (2005) and Ikerd (2008) suggest food system education as a key component

for sustainability in communities, and technology and media can be used to achieve these goals. In one rural community, an Extension educator is using virtual reality (VR) technology to educate about local food systems. While new, VR technology is readily available and is gaining popularity with educational institutions through the implementation of virtual field trips. A trial of Extension produced VR videos were tested at a county fair, which resulted in positive feedback from participants. The next steps in this project include forming partnerships with the county school districts, chamber of commerce, and state job development office to expand the project to highlight local employers and manufacturers. This proposed conference session will inform participants on how to use VR technology and provide examples of how VR is being implemented in rural communities to educate youth on local food systems and employment opportunities in the county they reside. The Objectives of this session are: Objective 1: To understand how 360i,° cameras function and basic editing techniques. Objective 2: Demonstration of how VR can be an effective tool in rural communities to educate audiences on community capacity, sustainable careers, and local food systems. Objective 3: To allow participants to experience a 360-video on food systems using a VR headset. In conclusion, this session will demonstrate how to use 360-degree cameras for community engagement in the areas of sustainable workforces and education about local food systems.

Treejuvenation Sarasota: An Urban Forestry Citizen Engagement Extension Program

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This proposal aims to present an overview of the Treejuvenation Sarasota Urban Forestry Citizen Engagement Extension Program. At the end of the Treejuvenation Sarasota overview presentation, conference participants will be able to identify local resources which can be used to promote urban forestry citizen engagement, and describe the process by which the Treejuvenation Sarasota Program can be modeled to promote urban forestry citizen engagement. Rationale: Communities derive many benefits from urban forests including improved air quality, reduced heat island effects, and positive

physical and mental health impacts. In 2013, a tree canopy study in Sarasota County indicated a 35% vegetation cover in the Urban Service Area. Having undergone considerable land development in Sarasota County since 2013, the Treejuvenation Sarasota Urban Forestry Citizen Engagement Extension Program was developed to promote awareness of the benefits of urban trees. In addition to community outreach publications and promotional media campaigns, the Treejuvenation Sarasota program hosted a Florida Arbor Day Scavenger Hunt, five National Arbor Day tree adoption stations, and partnered with one of the local colleges on preparing a Tree Campus USA recognition application, to increase urban forestry community engagement in Sarasota county.

Research on Issues Facing Academic Efforts to Better Inform Local Policy Making: The Case of Renewable Energy

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There is a surprisingly thin research base to inform best practices in University based outreach to local policy makers. While many of us with academic affiliations have deep practice-based knowledge about our work with local officials and policy, we too seldom have a broad theoretical and evidence base supporting our approach to our work. What kind of information and university-based research and other resources are even relevant to local policy makers? What are they aware of, what do they attend to, what do they ignore, and in what contexts? How and when are university sourced resources and research derived information salient to local decision makers who increasingly face complex, often controversial, and culturally polarizing decisions? What are the key relationships and information pathways that connect local policy makers to university resources and research? What do we already know or need to know as applied researchers and educators working on such topics? In this presentation, we will discuss the agenda and progress that has been made in a Multistate Hatch research project that is intended to help create and support a learning community of applied researchers and educators concerned with helping local officials make informed decisions on a variety of topics. We will discuss in particular our work in New York State to learn how local policy

makers do or don't inform themselves about new renewable energy policies that are just starting to face them as they respond to state energy transition initiatives.

Harvesting Energy From Our Oceans: What Should I Know?

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To accomplish sustainability renewables energies are playing a key role. Ocean energy offers the potential for long-term carbon emissions reduction but is unlikely to make a significant short-term contribution due to its nascent stage of development. In 2009, installed ocean capacity was less than 10 MW worldwide with more than 40% of world population living within 100 Km from the coast. A huge amount of energy is contained in the oceans and can be harvested from waves, ocean currents, tidal range, tidal currents, ocean thermal energy, and from salinity gradients using different technologies. The selection of one of these over the other will depend in a case-by-case feasibility assessment. The harvested energy can be then used for different purposes, like electricity generation, cooling or pumping. Despite initially ocean renewable technologies were focused in offshore alternatives, recently these alternatives have been designed for in-shore use, which may also support climate adaptation options, besides the mitigation, by reducing coastal erosion by extreme events. Though ocean energy resource assessments are at a preliminary phase, the theoretical potential for ocean energy easily exceeds present human energy requirements. Despite the early stage of development, technical advances may progress rapidly given the number of technology demonstrations. In the other hand, Government policies are contributing to accelerate the implementation of ocean energy technologies. Ocean energy has the potential to reduce carbon emissions and appears to have low environmental impacts. Still, besides the technological barrier, many obstacles must be overcome. Successful deployments and pilot projects will lead to cost reductions and make the access to this energy more competitive compared with established renewables like solar, wind, geothermal and hydro. The scale of the technologies and the energy storage and or distribution options are other issues to be aware.

Artificial Reef Monitoring: A Collaborative Program in Taylor County

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Since 1995 Taylor County have been deploying artificial reef cubes, tetrahedrons, concrete culverts and scrap metal to create an artificial reef at the Buckeye Reef, located 22 miles offshore and West Steinhatchee. As it has become a popular recreational fishing spot, it is necessary to identify and understand the fish structure associated to the artificial reefs and assess the reef structures on the sea bottom. Grant funds from the Florida Fish and Wildlife Conservation Commission (FWC) were allocated to perform the Buckeye Reef Monitoring Program. A Social media campaign was set to enroll volunteer divers willing to support the monitoring efforts to do fish census and bottom and reef assessments on a Citizen Science-based program. A total of 86 divers initially signed up for this initiative. A training session, including an online module for fish identification in artificial reefs in the Gulf of Mexico, and an in-person training session for fish census, artificial reef structure assessment and fish identification methods was held to train volunteer divers in this citizen science program. A total of 30 volunteer divers were trained. The goal is to collect valid scientific data over fish population and artificial reef structures at 18 different deployment sites in Buckeye Reef to promote this location for recreational fishing and diving and to report the impact of the county program to FWC. To date, volunteer divers involved in the program have invested 708 total hours, of which 56 are diving hours, equivalent to \$7,400 in contributions; they have traveled 7,920 miles on land, and accumulated 704 miles traveled on sea. Preliminary fish data indicates the presence of at least 22 fish species, with relative higher abundance in scrap metal, tetrahedrons, culverts, and Lindberg cubes, respectively. All deployed artificial structure are intact in the bottom with incrusting algae, sponges and anthozoans as predominant coverage species.

Biochemical Processing to Enhance the Value of Agricultural Biomass

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Brassica carinata is a mustard-family inedible crop that can serve as feedstock for the production of renewable aviation fuel, animal feed, and value-added chemicals. Supported by USDA/NIFA, the Southeastern Partnership for Advanced Renewables from Carinata (SPARC) is an academia-industry partnership formed to help develop a bioeconomy that will empower local farmers to grow carinata on fallow land in wintertime without affecting food security. Once the seeds are crushed and the resulting carinata oil is processed to renewable fuels, the seed residue (meal) is enriched in protein and carbohydrates. While meal protein can serve as animal feed, we have started investigating the use of carinata carbohydrates. In this effort we will use the same biochemical processing we have recently applied to another southeastern agricultural crop, sweet sorghum bagasse, successfully converting its cellulosic biomass to high-value organic acids, such as succinic acid, which can serve as renewable building blocks to the chemical industry for production of biobased plastics, resins, films, and other consumer products. Using green chemistry principles, such as low energy and water use and low/no waste generation, we studied the treatment of biomass with phosphoric acid at low temperatures and its subsequent hydrolysis by commercially available enzymes to convert cellulose to readily fermentable glucose. The resulting sugar was then readily fermented by a CO₂-consuming bacterium to succinic acid with high productivity. This methodology will next be applied to carinata meal carbohydrates to enhance the value chain of this promising energy crop. Attendants of this session will (1) learn how SPARC's work with carinata can serve as the cornerstone of a new bioeconomy in the Southeastern United States, while generating additional income for farmers; and (2) understand how sustainable biochemical processes enable the manufacturing of high-value products from agricultural biomass.

Greenhouse Gas Emissions of Water Production at Tampa Bay Water

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The purpose of this study was to strengthen Tampa Bay Water's current methodology for calculating greenhouse gas emissions associated with water production by identifying and integrating unaccounted for emission sources. This study was motivated by the agency's recent pursuit to develop new funding strategies for updated water conservation goals; an identified strategy was to sell carbon emission offset credits and direct the revenue towards conservation programming. We identified that the current methodology did not capture electric transmission loss, chemical use in the production of drinking water, or the management of the sludge by-product. The findings suggest that greenhouse gas emissions can be further reduced if these missing components are combined with previously identified sources. In addition, further reductions can be achieved as electric companies adopt more renewable sources, given emission calculations are heavily based on the fuel consumption at these locations. The results of this study will be used by Tampa Bay Water to develop comprehensive water and emission conservation plans.

Anthony Brower, yatt Frantom, Charles Berg

ZeroSkin

Anthony Brower, Sustainable Design Director, Gensler LA, Anthony_brower@gensler.com

Building performance is now the key driver of design. Rapidly evolving climate conditions, building codes and urban fabrics demand higher and higher performing designs that use less energy, minimize water consumption and reduce carbon emissions. Building technologies and design tools are evolving an equally rapid, if not faster pace. The greatest challenge for us as designers is to understand the implications of all these changes. We must find cost-effective and efficient ways to achieve the code mandates with the best available solutions, all within the context of understanding shifting urban fabric and vision of cities in the future. Building facades are a prime example of how performance, technology and code changes are coming together in real time and affecting

the design process. Facades themselves may only impact a minor portion of energy consumption, but that does not mean we should defer to the status quo and expect infrastructure to make up the difference. The building skin can still have a significant impact on downstream systems. As energy codes grow ever more stringent, we will need to incorporate energy conservation measures anywhere we can. What will the next generation of design professionals bring to the industry and how will they embrace change? How will they design buildings where high performance is the primary driver at an increasingly complex urban scale? Moving beyond basic design parameters like climate zone and sun path, new concerns and typologies emerge. Urban conditions create unique micro-climates, variable shading, solar exposures and diverse program requirements. Design teams need to understand what these conditions mean and how to develop solutions at a rapid pace. This was the challenge presented to four groups of interns, each composed of young architects and engineers. We will examine four case studies that showcase the potential of early collaboration, rigorous analysis, and the desire to truly understand the impact of design.

A Membrane Biotechnology Platform for Water Recovery

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Current water recovery and purification processes utilized in space face challenges for long duration missions. Organic wastes, such as feces and food waste, are often disposed without recovery, due to the lack of mission-ready enabling technologies. The loss of this opportunity to recover and recycle bio-essential elements (i.e., C, N, P, K) necessary for environmental control and life support systems (ECLSS), coupled with the demand for improved water processes systems calls for a sustainable and regenerative treatment train that can meet the requirements for long duration missions. To address such issues, an innovative process, termed anaerobic membrane bioreactor (AnMBR), is proposed to transform complex organic waste into reusable components. Within this system, microorganisms anaerobically digest complex organic matter into simple precursors that become the key components for ECLS systems. This effluent is filtered to produce a permeate that can be subjected to simpler downstream processes to

generate potable water or support plant growth, thereby closing the loop on elemental recycling. This system can be easily integrated with complementary systems to create a sustainable, bioregenerative water treatment train suitable for long duration missions.

Electric Avenue: Strategies to Grow Electric Vehicle Adoption in Sarasota County

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Sarasota County has been a leader in promoting electric vehicles (EVs) as an impactful sustainable transportation strategy since even before they were commercially available. County Commissioners recognize the public benefits offered by this new technology, including energy and cost savings, fuel diversification, emissions and air pollution reduction, and climate change mitigation. In recent years, Sarasota County UF/IFAS Extension and Sustainability has developed and implemented a comprehensive approach to promoting EV adoption in the community. This longstanding commitment to the issue has resulted in Sarasota being the county with the second highest number of EVs per capita in the state.

The comprehensive approach includes fleet EV purchases; installation of charging stations on county facilities for public use; education and collaborative outreach with community advocates to increase awareness of the technology; and an incentive program to support installation of charging stations on business and non-profit facilities. The ChargeUp! Sarasota County program is unique among local governments that do not have a municipal electric utility. It provides rebates to retail, tourism, and major employers, as well as non-profit organizations that install charging stations on their properties. So far, the program has resulted in 5 additional charging ports at three different locations, two of which are solar powered. Whether they want to start a small program with one educational event or develop a comprehensive approach to building an “electric avenue,” Summit participants will be able to find something they can easily replicate in their communities to support the transition to sustainable transportation options.

Sustainability from the Inside Out: Employee Engagement Strategies in Sarasota County

Lee Hayes Byron, County Extension Director, UF/IFAS Extension and Sustainability, Sarasota County lhbyron@scgov.net

Sustainability programs can only be successful if the internal partners within the organization are on board with the mission. Sarasota County has had a sustainability program since 2002, but in 2008, it was realized that despite being seen as a sustainability leader in the state, the program had gotten ahead of the organization. There was resistance to implementing existing policies despite direction from decision makers to prioritize the issue. To address this division, an employee education and engagement strategy was developed to build buy in. Sarasota County now engages employees in a number of ways, which has resulted in a culture shift and increased support internally. A Green Champion training series provides workshops for employees on a variety of sustainability topics. From an overall introduction to county sustainability policies, to specific classes on green driving, sustainable landscaping, energy efficiency, and more, employees get an in-depth understanding. They can obtain certification after completion of 5 courses. An Energy Conservation Team includes representatives from departments across the organization that review energy data, discuss opportunities for savings, and educate their colleagues. The Sustainability STAR Award is a peer to peer recognition program for sustainability leadership. Awardees can get simple recognition as well as selection as the Sustainability STAR of the Quarter or of the year. The latter two receive a water bottle and a paid day off respectively. Sustainability staff present at each New Employee Orientation session monthly. Each new county employee is exposed to the county's commitment to sustainability, key policies each employee should know about, and energy and environmental procurement tips. Presentation objectives include: Participants will understand the importance of employee engagement to sustainability program success. Participants will identify at least one strategy they could consider implementing in their organization to build internal ownership of sustainability.

The Carinata Community of Practice - An Iterative Process for Meaningful Producer Engagement

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Within agricultural research, producers represent a key stakeholder group whose involvement and transdisciplinary knowledge may provide key insight for overall project success. The Southeast Partnership for Advanced Renewables from Carinata (SPARC) is a public-private partnership funded by the United States Department of Agriculture's National Institute of Food and Agriculture (USDA-NIFA) through 2022. SPARC aims to establish *Brassica carinata*, an oilseed feedstock for biofuel production, as an alternative winter crop for producers in the Southeast United States (SE US). So far, producers have primarily engaged with SPARC by attending carinata field days and through participation in field trials. However, more meaningful producer engagement may provide further insight on critical issues such as barriers to producer adoption, phenotype preferences, and overall best practices. To achieve this, SPARC has provided the groundwork for a Carinata Community of Practice (C-COP), an information-sharing platform for producers to engage both each other and research and industry professionals. The creation and delivery of the C-COP has followed an iterative process designed to maximize meaningful producer engagement. First, we began with broad key informant interviews with SPARC researchers, Extension professionals, industry representatives, and producers to identify recurring themes and concerns regarding carinata in the SE US. Second, we highlighted these specific themes in an "incubation phase," using facilitated conversations and collaborative learning to generate points of action and identify those interested in engaging in the C-COP. Finally, broad engagement of the C-COP across in-person and digital spaces may generate solutions to ongoing challenges and provide iterative feedback to SPARC, industry partners, and other interested producers. It is our hope that the C-COP will serve as a "think tank" of ideas and generator of solutions to producer adoption of carinata in the SE US through 2022 and beyond.

Volunteerism 101: Recruiting, Training, and Retaining Citizen Science Volunteers

Beth Clawson, Water Quality Extension Educator, Michigan State University Extension, clawsonb@msu.edu

This workshop discusses working with volunteers that are increasingly relied upon for data gathering, research support and on-the-ground work in conservation, natural resources, water quality, and other science-based conservation programs. Information on recruiting and creating a volunteer base and how to reward and retain volunteers is often overlooked or minimal for leaders in these program areas. This session provides volunteer management basics and resources for managing volunteers. Gain an overview about how to manage volunteers' programs including client safety, training programs, workflow, evaluations, and rewards. This program is broad enough to use generically for a variety of services but is based on the lessons learned from the Michigan Clean Boats, Clean Waters program and its core reorganization as a statewide volunteer-based program.

How Placing a Fee on Fossil Fuels Can Reduce Greenhouse Gas Emissions

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There is widespread scientific agreement that human use of fossil fuels for energy production is contributing to rising average temperatures around the globe. To mitigate this problem, citizens and policy officials have been looking for ways to reduce human emissions of greenhouse gasses. Recent studies have shown that adding a steadily increasing fee to the price of carbon-based fuels can accomplish the desired reduction through free market forces. Variously known as a "carbon fee," a "carbon tax," or a "carbon fee and dividend," this bipartisan proposal has the support of prominent Republicans, including James Baker, Henry Paulson and George Schultz from the Reagan and both Bush Administrations, and Rob Walton of Walmart. (1) All the proceeds from this carbon tax would be returned to American households on an equal and monthly basis via dividend checks.

To determine if this proposal would work, the independent modeling firm, Regional Economic Models, Inc. (REMI), was hired in 2014 to determine the effects on the economy and on carbon pollution of a fee starting at \$10 per metric ton of carbon emissions, with the fee rising \$10 per year for 20 years. (2) They predict that CO2 emissions would decline by 33 percent after 10 years and 52 percent after 20 years. This would occur because of market-driven changes in the ways we make and consume energy. The stimulatory effect on the economy of the dividends and of the development of renewable energy sources would create more than 2.7 million jobs and cause a \$1.3 trillion rise in the GDP over 20 years. The pros and cons of this proposed economic policy will be discussed. Participants will learn the meaning of the “external costs” of carbon-based fuels and find out how this carbon dividend proposal differs from other mitigation approaches.

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Sidewalks: From Traditional Concrete to Permeable Pavement: Does Public Opinion Matter?

Megan Dettenmaier, Forestry Extension Educator, Utah State University, megan.dettenmaier@usu.edu

This talk will detail a local sidewalk replacement project that was made possible through a partnership between Utah State University Forestry Extension and Utah Division of Forestry, Fire and State Lands. The motivation for this project was the cyclic nature of a problem facing many cities: citizens value safe, walkable sidewalks and they value large, urban trees. Tree roots often damage sidewalks, creating conflicts that require creative solutions. The importance of retaining a healthy urban canopy is widely known, but public

acceptability of alternative sidewalk material that mitigate these conflicts are not well known. We compare the results of two sidewalk replacement projects: one that administered pre-construction educational brochures to nearby residents, and one that did not. The objective of this study was to: determine public acceptability of alternative sidewalk material, make recommendations for implementing similar projects on a region-wide scale, and evaluate the impact that education has on public acceptability. Where pre-construction educational brochures were distributed, 92% of residents supported the use of future alternative sidewalk material, and where brochures were omitted from the process, 78% of residents offered support for future usage. These evaluative survey tools provide valuable feedback for future projects addressing the same issues. They are:

- Distribute concise, understandable, educational brochures: the public appreciates the “heads-up”
- Match the alternative sidewalk material (as much as possible) to the existing sidewalk color to minimize the patchwork appearance (between alternative material and traditional concrete)
- Work closely with contractors to minimize neighborhood disturbances during construction, and ensure timely post-construction clean up

This study highlights the importance of integrating a proactive outreach plan when conducting Extension programming that utilizes novel products or practices. We offer recommendations that may benefit Extension professionals seeking sustainable ways to deal with conflicts between sidewalks and tree roots.

The Ecological and Monetary Benefits of Preserving Lands in an Urbanizing County

Ross Dickerson, Environmental Lands Manager, Hillsborough County Conservation and Environmental Lands Management, dickersonr@hcflgov.net

The Jan K. Platt Environmental Lands Acquisition and Protection Program (ELAPP) is Florida’s largest local land preservation program and has been highly successful in protecting more than 62,000 acres of natural lands. As Hillsborough County, FL continues to urbanize, it is necessary to focus preservation efforts on the remaining ecological coordinators that are critical to promote ecological function and enhance biological sustainability. This presentation will highlight three projects that the Hillsborough County Conservation and Environmental Lands Management (CELM) Department has initiated.

1. Carbon Banking on Preserved Lands: Hillsborough County recently developed the first Carbon Improved Forest Management Project at the Lower Green Swamp Nature Preserve. It is estimated that the 3,000 acres will provide over \$1 million dollars in revenue that can be used for future management of the site. 2. Focal Species and Ecological Resource Priority Assessment: With limited acquisition funding and decreasing open space, Hillsborough County, in Partnership with the University of Florida, used scientific based models to classify the remaining most critical lands that should be considered for preservation. These models refined data from the Florida Ecological Greenways Network and other sources to prioritize areas of importance. This data will be used to identify ecological coordinators that should be targeted for acquisition to ensure that existing preserved lands continue to function ecologically and increase their sustainability. 3. Ecosystem Services: Using the H2O Beta model developed by the Environmental Protection Agency, Hillsborough County put a Return on Investment value on preserved lands. This information is used to educate people on the health benefits that we receive from natural lands. In addition to understanding the three projects and why they are important factors in environmental sustainability, attendees will learn how to implement these projects in their respective areas.

Creating Partnerships between Universities and Local Governments for Sustainability Goals and Societal Benefits

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With Mayor Julie Bujalski's announcement that Dunedin, Florida was pledging to obtain 100% renewable energy by 2035, city officials reached out to the University of South Florida (USF) to participate in the Community Sustainability Partnership Program (CSPP) to assist with several local initiatives, including a Solar Energy Leadership Project. The City Commission of Dunedin had requested research on the technical feasibility and economic viability of having all public owned buildings becoming net zero. To address this request, Dunedin city planners communicated with Patel College of Global Sustainability (PCGS) faculty that they were primarily looking at assessing the recently built Community Center, the proposed City Hall, and the Toronto Blue Jays Stadium and

Sports Complex. While the feasibility report presented to the City Commission addresses these buildings in a limited scope, the primary purpose of the research was to focus on a holistic approach that would assist the City of Dunedin in reaching their long-term renewable energy goals. Although this partnership project was mainly focused on solar energy, there were broader lessons to be learned from such a partnership. The use of graduate students to evaluate the feasibility of solar projects created a relatively inexpensive report for the City of Dunedin to understand the implications of going solar, as well as giving the students real world project experience in a municipal setting. The project also presented the city government officials, USF students, and professors with challenges that required systems thinking, technology assessment, and investment analysis. The final outcome was a set of proposed solutions for the City of Dunedin, a general plan for the City Commission to use moving forward, and provide university students with a better understanding of the type of professional work and responsibilities that will be expected of them after graduation.

Filling Empty Trucks: The Farm to Rural Grocery to Wholesale Backhaul Model

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The University of Minnesota Regional Sustainable Development Partnerships are working with a diverse team of partners (including Extension educators, University of Minnesota economists, grocery store owners, professors, post-harvest handling specialists, on farm safety educators, wholesale distributors, and farmers) to research, develop and test a new supply chain model for farmers to access wholesale markets. This session will dive into the sustainability of the economic, logistic, and regulatory aspects of this "Farm to Rural Grocery to Wholesale" (F2G2W) model. The F2G2W model is a breakthrough development in wholesale market access through existing distribution infrastructure, namely the network of 250 rural grocery stores throughout Minnesota and their wholesale suppliers' trucks. Participants will learn about 1) the public-private partnerships that made getting Minnesota grown garlic onto wholesale trucks possible, 2)

the untapped potential of partnering with existing wholesale and transportation sector businesses to benefit rural communities and local foods, and 3) how the model can be replicated in rural areas throughout the country for similar crops.

Engaging Communities with Sustainability Initiatives on Universities and Colleges

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At a time where our societies and world are plagued with sustainability issues related to water, energy, climate change, transportation and other topics: higher education institutions bear a responsibility to work with local communities to tackle such wicked issues. Sustainability initiatives have existed for the past two decades, however, there has not been much of a critical push for all universities to report such efforts. There have also been barriers to engaging internal and external stakeholders with university/college sustainability reporting, which is critical to successfully translate sustainability practices into our communities. This session will provide an overview of sustainability reporting methods for higher education institutions as well as current sustainability initiatives with the University of South Florida as a case study. Opportunities for communities to engage with universities and colleges will be discussed in order to provide ideas and examples of successful collaboration with community partners. Session Objectives: Provide an overview of university and college sustainability reporting with USF an example; Discuss successful sustainability initiatives on USF campus; Identify opportunities for the community to be engaged with university/college sustainability initiatives and involve students with community projects

Sustainable or Not, Lessons Learned from Coast to Coast regarding Wildfire

Sharon Gamble, County Extension Director, UF/IFAS Extension Volusia County, sgamble@ufl.edu

Objectives 1. Participants will learn the importance of sharing information/experiences 2. Participants will learn management perspective from the East and West Coasts. 3. Participants will learn principles of firescaping. What could be more resilient and less

energy consuming than structures that are still standing after challenged by wildfire events and not needing to be re-built? Wildfire events are not new, but our culture has become less familiar with fire and lacks knowledge of fire-dependent ecosystems. Landscaping, building locations, materials, neighborhood design and the human need to “commune” with nature have led to unsustainable building situations that cost billions of tax dollars, degrade air/water quality and risk human life in the process. Fire is a natural phenomenon just like water and wind. It belongs to no particular department, university, agency or organization. Sunshine is how energy is sent to the earth; fire is how that energy is released. As the saying goes, it is not a question if it (the landscape) is going to burn, it is a question of when. Worldwide, but certainly, within the United States, the fuel situation has risen to precarious levels. People are living in high density fuel areas and the need for fire issues education is as intense as the fuels. Variation in fuels, topography and climate vary across the U.S. and much can be learned from the experiences from Florida to California. The Smith-Lever Act of 1914 formalized Extension education. Policies of the 1930’s tasked the United States Forest Service with fire suppression and management. Document after document calls for fire issues education, but the task to educate requires collaboration beyond our traditional thinking. Extension, with its network of offices, is uniquely situated to take a meaningful role in the fire issues education process to address an impending nationwide crisis. This session will provide a brief history of fire dependent ecosystems, educational obstacles and examine collaborative efforts.

Georgia's Renewable Energy Technical Assistance Program and Model Solar Ordinance

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Georgia's Renewable Energy Technical Assistance Program (ReTAP) is a USDA funded program which provides Extension support to rural communities, industry and individuals developing renewable energy projects in Georgia. One of the main outputs of ReTAP is the Georgia Model Solar Ordinance (MSO) and its associated guide. The MSO was developed through collaboration between University of Georgia Cooperative, Extension,

The Georgia Tech Strategic Energy Institute and Emory University's Turner Environmental Law Clinic. The MSO provides communities with scientifically valid guidance on developing zoning ordinances for solar energy systems. This unique collaborative project is being adopted by Georgia communities and ReTAP provides technical support for this process. This talk will provide an overview of ReTAP projects and discuss the challenges faced in providing Extension support to a rapidly developing industry, including developing the MSO.

Effectiveness of a National Photovoltaics Education Program for Architects and Engineers

Michael E. Goldschmidt, Associate Professor/Extension State Specialist, University of Missouri, goldschmidtm@missouri.edu

For the past few years, the Building Codes Assistance Project (BCAP) and the Center for Sustainable Energy (CSE), with funding from the US Department of Energy's (DOE) SunShot initiative, delivered workshops to teach architects and engineers about the benefits and technical requirements of incorporating photovoltaics into their building designs. These workshops were delivered to design professionals in twenty-two cities, representing a range of small to large design firms. Each training was presented to participants by two of seven designated national trainers, using eight lesson modules. Participants were given pre- and post-workshop evaluations to gauge effectiveness of the training, and a three-month follow-up survey was used to study whether these workshops assisted in increasing the probability that a designer would incorporate photovoltaics into their building designs. Based on the responses from the pre- and post-workshop surveys, and the follow-up three-month survey, there was a measurable increase in the knowledge of the fundamentals of photovoltaic systems including technology, design, and financing. Knowledge of the finances and incentives available by state and nationally had the highest change among training participants compared to other lessons from the curriculum. After the training, there was an increase in participants discussing the use of PV systems in design projects with their colleagues and with clients. The number of design projects that participants have incorporated PV has slightly increased, but is difficult to determine a long-term trend due to the short timeframe of the follow-up study.

The objectives of this presentation are: to show Extension Educators can to create an effective curriculum and presentation on the use of photovoltaics in buildings, and how to use the curriculum to increase the use of photovoltaics in buildings.

Does Ownership Structure Affect Forest Management? An Analysis of African American Family Forest Landowners

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In the context of African American family forest landowners in the southern United States, complex ownership structures like absentee ownership and heirs' property could affect their ability to manage their forest. The Theory of Planned Behavior offers a framework for understanding the role of ownership structures, along with other landowner characteristics on forest management intentions and behaviors. We used data from surveys of African American forest landowners in South Georgia to inform logit models of legacy goals, management goals and management planning, and a path analysis model of management activity. Older landowners, male landowners, and landowners who had received technical advice were significantly more likely to have legacy goals, while landowners who did not report obstacles to management were more likely to have management goals. Ownership structures did not have a significant effect on landowners' goals, nor did they have a significant effect on management activities. However, absentee ownership (along with technical advice) significantly affected management planning. The survey data and models suggest that rather than ownership structure the most important factor in determining forest management is technical advice, and a more profound exploration of the data suggest that it is the trust and personal relationship between landowner and forest professional that ultimately determine whether African American forest landowners will engage in active forest management.

Florida-Friendly Landscaping™ (FFL): Grass-Roots Horticulture Program that Promote Urban Environmental Stewardship

Susan Haddock, University of Florida Institute of Food and Agricultural Sciences (UF/IFAS) Extension, szcrmchz@ufl.edu

Proposal Abstract Objectives: a. Utilizing UF/IFAS research based educational principles and methodologies transfer FFL™ environmentally sustainable landscape design, installation and maintenance techniques to residents and homeowners, builders and developers, and landscape maintenance professionals, emphasizing reduction of nonpoint source water pollution through reduced water, fertilizer and pesticide use. b. Utilize a network of statewide Extension Agents and Master Gardeners to engage citizens to implement landscape and water sustainability practices. c. Offer professional programs in multiple languages: English, Spanish and Creole. d. To achieve statewide and stakeholder program recognition through documented knowledge gain, behavior change, principle implementation and professional certifications. The State of Florida projects its population of 20 million will grow to nearly 26 million over the next two decades, increasingly taxing available water resources and polluting surface and ground waters. A recent strategic study on Florida's water resources, "Water 2070: Mapping Florida's Future - Alternative Patterns of Water Use in 2070", found that the state's ongoing FFL™ program is fundamental to reducing future water demand and protecting water quality. Florida's 2009 state legislation found that FFL™ serves a compelling public interest in water conservation, protection and restoration, that participation by homeowner associations and local governments is essential, and that deed restrictions or local ordinances may not prohibit FFL™ use by homeowners. In 2017 alone, this program reached 60,600 homeowners making an impact of 176,405,796 gallons of water saved (enough water to supply 2005 additional households for one year), \$583,903 saved on utility bills and \$458,655 saved by utility companies on water preparation and delivery costs. Additionally, from 2006-2018 over 56,000 landscape professionals have been trained in Green Industries Best Management Practices (FFL™ GIBMP) with over 48,000 becoming GIBMP certified. These professionals report positive changes in fertilizer,

pesticide and irrigation practices, and changes in attitude and ability to communicate FFL™ principles to clients.

Urban Landscape Habitat Restoration and Preservation

Susan Haddock, University of Florida Institute of Food and Agricultural Sciences (UF/IFAS) Extension, szcrmchz@ufl.edu

Objectives: To present a workshop format for target audiences of: builder/developers, county or municipal land development departments, landscape architects, community association managers, Extension educators and other groups that focuses on: a. Providing information and resources on key principles and practices required to conserve biodiversity and natural resources during design, construction, and post construction phases of development. b. Provide information and resources about the major concepts surrounding water quality and quantity problems in Florida, and how plant selection, landscape design, installation and maintenance contribute to the problems and recognize opportunities to improve or provide solutions. c. Presenting an online tool to evaluate different landscape design scenarios and impacts on bird habitat during the breeding and migration season. Ecosystem services, landscape sustainability, water quantity, water quality, invasive species, habitat and community development are covered in this course. After the course, attendees will be better prepared to identify and assess landscape problems, discuss with their clientele and stakeholders key principles and practices required to conserve biodiversity and natural resources during design, construction, and post-construction phases of development, and provide recommendations that will reduce nonpoint source pollution, conserve water, provide for wildlife, prevent invasive species and, in general, improve the health of ecosystems. Attendees are also introduced to a design tool to evaluate different landscape design scenarios and impacts on bird habitat during the migration and breeding seasons. This session will present workshop format, content and marketing, and attendee post workshop reaction and use of content.

Promoting Food System Sustainability through Agritourism: From Suburban Farmettes to School Gardens and Agrihoods

Brooke Hansen, Ph.D., University of South Florida, kbhansen@usf.edu

Agritourism is a growing area of economic development that can be utilized to promote local food production and sustainable tourism in both urban and rural settings. Numerous studies have demonstrated the economic benefits of expanding agricultural activities into tourism. The USDA reports that farms can gain an average of \$25,000 more in annual income, with some operations reporting substantially more. Tourists are increasingly interested in experiences that promote connection with foods and how and where they are produced. Themes related to heritage, nature, health, and sustainable practices are particularly popular. Agritourism over the last several decades has focused more on rural activities such as specialty farm tours, mazes, wine tours, pick your own farms, and petting zoos. More recent trends point to tours that focus on organic farming, urban agriculture, agrihoods, school gardens, community gardens, and small-scale animal husbandry. From Oakland, CA, to Oakland Park, FL, urban agritours are being developed for conferences, local schools, day trippers, and tourists who want to incorporate educational activities into their itineraries. While sustainability themes are often found in rural and urban agritours, urban tours have specifically promoted local food production, organics, hydroponics, aquaculture, carbon offsets, and greening urban spaces. Challenges, best practices, and case examples in developing and promoting sustainable agritourism will be discussed with a specific focus on Florida agritourism.

How is Extension Working with Underserved Communities around Issues of Energy?

Joel Haskard, co-director Clean Energy Resource Teams (CERTs), University of Minnesota's Regional Sustainable Development Partnerships & Extension,aska004@umn.edu

Equity Learning objectives: Attendees will learn from their peers about energy equity work, with emphasis on projects that have bridged across Extension program areas. Attendees will learn about both rural and urban examples of energy equity work and gain insight on how that work has been planned, funded, delivered and measured. Attendees

will learn about resources and best practices around energy equity work. Attendees will discuss partners who are necessary to engage in this work and lessons learned from doing this work in and with communities. During this roundtable discussion, Joel Haskard (co-director, Clean Energy Resource Teams at the University of Minnesota) will lead a conversation about how Extension personnel are working in rural and urban communities around issues of energy equity. Energy Equity refers to the fair distribution of the benefits and burdens of the ways we produce and consume energy. In practice, this means reducing mounting energy costs to ensure that families are able to meet their basic needs, making homes and communities healthier for all by increasing access to energy efficiency and clean energy, and ensuring that decision-making around energy policy is more reflective of the needs of all communities. Share your stories! Have you been able to work on energy issues across Extension program areas (for example with community development or family and consumer services)? How do you fund and coordinate this work? What are some of the opportunities and challenges you are facing working on energy equity issues?

Multi-state Extension Energy Programming, Making it Work!

F. John Hay, Extension Educator, Energy Department of Biological Systems Engineering University of Nebraska–Lincoln, jhay2@unl.edu

Round table discussion related to multistate energy Extension efforts and best practices for making them successful. We will be asking attendees to share examples as well as explore future topics of mutual interest.

Objectives:

Provide brief examples of successful multistate programs utilizing written, web seminars, and face to face teaching methods provided by Solar Electric Analysis Team (F. John Hay NU, Charles Gould MSU, Eric Romich OSU). This team created a solar economic analysis bulletin series published in creative commons which now has been revised and published and distributed by University of Wyoming (UW), Ohio State University, University (OSU) of Nebraska Lincoln (NU), and soon to be Michigan State University (MSU). Utilizing the bulletin series as a framework the team has presented a six part web

seminar series for a multistate audience hosted by MSU as well as in person two day workshop on solar installation hosted by Virginia Tech Extension

Round table discussion focused on examples from participants of successful multistate programs. Discussion will include best practices, roadblocks and methods to improve multistate programming.

As a group, we will work to identify topics suited to multistate efforts where we may want to put future Extension Energy efforts. Attendees will focus on how the needs in their states overlap and how their expertise can be combined with other for multistate cooperation.

Cluster Thinning Effects on Table Grape Cultivars Grown on Three Trellis Systems Under High Tunnel

Jose Hernandez, Graduate Assistant, University of Arkansas, jah024@uark.edu

Hot and humid climate accompanied by high pest pressures in the southern U.S. region require high pesticide inputs making table grape production unsustainable. Previous research at University of Arkansas has demonstrated that table grape production under high tunnels (HT's) is a viable option to overcome biotic and abiotic factors that challenge production in the region. HT's systems provide moderate environmental control (protection from frost and rain), allowing for a reduction of pesticide inputs compared to field conditions. In 2014, table grape cultivars: Faith, Jupiter, and Gratitude, were planted in Fayetteville in an 8 x 61m Haygrove Super Solo HT on three trellis systems using a complete block design. These vines performed exceptionally well (precocity, yield and fruit quality with lower pesticide applications). However, during the 2017 season, despite dormant pruning, excessive yields in some plants (over 48 kg/vine) were seen. This resulted in delayed ripening, reduced fruit quality, and a higher disease incidence. The objective of this project is to implement two cultural techniques for canopy management and control crop load. Both treatments used in the study are techniques used in commercial field vineyards. Vines were treated with dormant balanced pruning formula for crop load control (30+10) to balance growth. Cluster thinning was implemented during two stages of fruit development (pea size and veraison), amount thinned was based on shoot length to control excessive yields. Jupiter cultivar had significantly higher yield per

vine (21.82 kg) than Faith and Gratitude (10.9 and 9.9 kg), respectively. Cultivar had an effect on cluster weight. Gratitude had significantly higher average cluster weight (522.2 g) than Faith (229.4 g) and 'Jupiter (275.0 g) which were not significantly different from each other. This research showed that HT's are great technologies for increasing table grape production sustainability, efficiency and improving fruit quality for the southern US regions.

Utilizing Container Gardens to Reach Food Desert Communities in Southwest Florida

Lisa Hickey, University of Florida IFAS Extension Manatee County, lisa.hickey@ufl.edu

Urban horticulture team members identified that vegetable gardening workshops held at the University of Florida, Manatee County and Pinellas County Extension Offices did not have ethnic diversity matching the demographics of the local communities. Additionally, the Department of Health (DOH) surveyed food desert residents and identified the preference for backyard vegetable gardening versus community gardening. These communities expressed the desire to be taught how to garden in their own backyard on a limited budget. Combining the DOH results and the need for program diversity, the container garden projects were developed in Manatee and Pinellas Counties. By utilizing community-based strategies, interactions with community leaders, availability of funding and materials, and the organization of volunteer teams the project has been a great success. Residents were shown how to effectively grow seasonal vegetables in transportable buckets. The two-year goal of the project was to place 1,000 mobile vegetable gardens in food deserts. At the eighteen-month point, 882 mobile vegetable gardens have been distributed in seven food deserts. The residents have attended workshops, learned how to construct mobile vegetable gardens, planted and have grown seasonal vegetables. Communities who never grew their own food, had an opportunity to harvest over 6,800 vegetables including tomatoes, collards, eggplants, peppers, okra, herbs, sweet potatoes, and a variety of greens. The residents have shared their success stories with the authors of how the project provided an opportunity to eat healthier and affordable, share fresh vegetables with their family, friends and neighbors, and engage their children in growing vegetables. The interactive workshop will show attendees the

ease of creating mobile gardens with a hands-on activity, and how to engage diverse communities in growing healthy vegetables.

Can Cover Crops Serve as a Bridge for Beneficial Insects in Watermelon Production Systems?

Paige Hickman, Graduate Assistant, University of Arkansas, plhickma@email.uark.edu

Overwintering cover crops can provide refuge and springtime resources to beneficial insects before cash crops are planted, which may bridge natural predators of pest insects into the crop following cover crop termination. The goal of this project is to determine the best winter cover crops to promote natural enemies of watermelon pests, which could be used by growers in an integrated approach to pest management. To meet this objective, insects were sampled in various cover crop treatments and in the subsequently planted watermelon to compare numbers of pests and beneficials. The effects of no till and tilled cover crops were also investigated to find the most effective approach to bridge beneficials into the watermelon and maximize pest predation. If cover crops are found to reduce pests in watermelon production, such a strategy would benefit watermelon yield while cutting costs and pesticide use, lessening the non-target effects of pesticides and making production more sustainable.

Are We Walking the Talk Yet? Sustainable Living Practices in Light of the Bestseller Drawdown

Christopher K Jones, Extension Agent, Agriculture Natural Resources, University of Arizona, ckjones@email.arizona.edu

Extension educators are well positioned to achieve positive social and longterm economic and environmental impacts by raising the awareness of sustainable living practices and their adoption by clientele. The more Extension educators model these practices in their own lives and workplaces, the more effective they can be promoting sustainability (Rashash et al, 2015). The authors also point out the need for a consistent Extension message in selecting and adopting specific practices, especially “as the lines between climate change and sustainable living continue to blur”. The New York Times best seller: Drawdown: The Most Comprehensive Plan Ever Proposed to Reverse Global Warming

(Hawken, 2017) provides an intriguing list of solutions to global warming pertaining to these sustainability practices. In Drawdown, one-hundred solutions are presented and ranked according to their effectiveness to mitigate global warming. These include: Refrigerants (#1), Reduced Food Waste (#3), Plant-rich Diet (#4), Educating Girls (#6), Rooftop Solar (#10) and Composting (#60). In this roundtable discussion, Rashash et al's research and Drawdown will be briefly presented. Participants will then engage in a facilitated yet lively discussion of these solutions and their relevance to sustainable living education, using breakout groups as appropriate. At the end of the session, participants will have compiled a list of the top applicable solutions, their corresponding sustainability practices, and common indicators for program evaluation purposes. Citations Rashash, D., Elliott, C. & Madhosingh-Hector, R. (2015). Extension Professionals and Sustainability Practices: Are We Walking Our Talk? Journal of Extension [On-line], 53(2) Article 2RIB4. Available at: <https://www.joe.org/joe/2015april/rb4.php> Hawken, P., editor (2017). Drawdown: The most comprehensive plan ever proposed to reverse global warming. New York, New York: Penguin Books.

Zero Waste Events: Sustainable Communities Workshop

Sara Kane, Sustainability Program Coordinator, UF/IFAS Extension and Sustainability, Sarasota County, skane@scgov.net

Case Study Events, meetings, workshops and conferences can have a significant environmental impact. This presentation will highlight a case study of best practices for sustainable events from UF/IFAS Extension and Sustainability Sarasota County's event: Sustainable Communities Workshop. This year is the 13th Annual Sustainable Communities Workshop and many sustainable event techniques have been learned. The Sustainable Communities Workshop brings the community together to discuss sustainability priorities. Expert speakers provide up-to-date information on community strategies, resources, solutions as well as best practices from other communities. As sustainability professionals, our events and meetings should have minimal impact on the environment. That is often difficult but there are best practices that can be followed. Utilizing these techniques will ensure that we are leading by example and proving that it can be done. Doing everything we can to reduce our negative environmental impact is

important and these lessons can be learned by everyone participating leading to education and behavior change beyond the event. There are many best practices that need to be addressed for an event to be zero-waste. These best practices include:

- Site planning and location
- Having the event at a certified green building
- Reducing energy and water use
- Having sustainable transportation options
- Purchasing or donating carbon credits to ensure the event is carbon neutral
- Supporting local catering businesses that offer locally grown food, have vegan and vegetarian options, do not use plastic or Styrofoam, and use reusable or compostable dinnerware
- Composting food waste
- Limiting paper use for agendas and evaluations
- Highlighting sustainability initiatives from local businesses

Presentation objectives include: Participants will understand the importance of having a sustainable event. Participants will learn techniques they can use to make their conference, meeting or event more sustainable. Participants will be able to identify at least one sustainable event strategy they can implement in their own communities.

Energy Upgrade: An Equity, Engagement, and Climate Change Mitigation Strategy

Sara Kane, Sustainability Program Coordinator, UF/IFAS Extension and Sustainability, Sarasota County, skane@scgov.net

Sarasota County's Energy Upgrade Program has been providing energy and water conservation and efficiency education to residents of Sarasota County since 2012. In 2016, the program was expanded to focus on reaching low-income families. Among low-income families in Sarasota County, over 53,000 households (73%) are "cost burdened" or paying more than 30% of monthly income on housing costs, including high energy bills. In 2018, it was further expanded to reach low-income families living in affordable housing, providing in-home water and energy efficiency installs and education by way of our

community outreach volunteers or “Energy Coaches”. Through in-home energy sweeps in affordable housing units and educational programming and consultations, we aim to reach over 2,000 families at risk. Each family reached could save over \$150 /year in energy costs. Additionally, this program is estimated to reduce local emissions by 2,900 metric tons of CO₂e/year.

Sarasota County engages community volunteers and low-income clients in “Energy Upgrade” education and training, including topics from water and energy conservation to efficiency and financial assistance resources and incentives. This program serves a dual purpose: Climate change mitigation through reductions in energy use and reduced cost of living for low-income residents in Sarasota County. Our “Energy Upgrade” program could be viewed as a model for:

- Energy equity programming
- Community engagement for reaching underserved populations
- Climate Change mitigation strategy that reduces greenhouse gas emissions by reducing electricity use
- Building community partnerships - engaging the local housing authority and utility providers in process and implementation of programming

Assessing Needs and Interests of Extension Energy Programming in Wisconsin

Shiba P. Kar, Ph.D., Sustainable Energy Specialist, University of Wisconsin-Extension, Asst. Professor, University of Wisconsin- Stevens Point shiba.kar@uwsp.edu

An energy transformation is occurring where clean energy is a growing area of local job creation, financial savings and local self-reliance in Wisconsin, nationally and globally. Clean and secure energy generation and supply is essential for sustainable living in rural and urban Wisconsin. However, Extension energy programming in Wisconsin is sparsely offered mostly through a few Extension energy specialists and educators. No specific energy Extension programming needs assessment exists in recent years. The purpose of this study is (i) to assess status and needs of Extension energy programming, and (ii) to identify opportunities and barriers of current and future energy programming. An online

Qualtrics survey was sent by email to all Cooperative Extension educators, specialists/integrated faculty and administrators in Wisconsin and 128 responses were recorded. Results show that two-third of the respondents have low level of knowledge to offer energy programming. Only 13% respondents currently offer energy programming although 44% of the respondents are interested in offering energy programs. Lack of training, information and tools, and lack of time to consider as workload appear to be the principal barriers. Most respondents agree that Extension should do more for energy programming. A significant number of them are interested in offering programs on renewable energy, energy efficiency and conservation and primarily asked for information and training as energy fact-sheets, handouts, case studies success stories, workshop, and energy decision tools. This study findings will help advance and integrate energy programming into ongoing Extension programs in Wisconsin, and can be generalized and applied to similar other states.

Issues in Transitioning to Renewable Electricity: Focusing on Large Scale Solar

David Kay, Sr. Extension Associate, CaRDI Cornell University, dlk2@cornell.edu; Katherine Herleman, Energy Educator and Clean Energy Communities Coordinator, kch227@cornell.edu

One of the great challenges of our age is the need to transition from fossil to alternative fuel sources. In the current polarized political environment, much of the action on this front is occurring at the state and local levels. While for a variety of economic, technical and other reasons, wind generated electricity has led renewables development, solar generation is growing rapidly. Moreover, solar electric energy is a viable option even outside of the parts of the country with greatest insolation. With a policy goal of 50% electricity generated from renewable sources by 2030, New York, among other states, will depend on an as yet unprecedented growth of solar electricity. In trying to meet New York's goals, growth will almost certainly have to come from household, community and utility scale solar options. Ongoing Cornell and Extension research and outreach programming is underway to help evaluate and accelerate, where possible, this desired transition. Even within the options at community and utility scales, many unanswered research and practical questions still exist regarding 1) the potential for distributed versus

centralized solar development, 2) the related question of the number, size, and location of individual generation facilities, 3) the economic and technical feasibility of siting on "least impact" sites that don't compete with valuable existing land uses, 4) the ways an untested regulatory review process will evolve, 5) the acceptability of solar facilities at different scales for the leaders and residents of the more rural communities in which they will be located, and more. In this session, we will discuss Cornell's ongoing research and outreach on these themes to date, inclusive of how local policy makers are learning about this new technology, as well as some of our work looking at approaches taken by other states.

The Design and Deployment of the Better Wood Stove

Jonathan Kays, Extension Forestry Specialist, University of Maryland Extension, jkays@umd.edu

Wood stoves are used by 30 - 60% of homes in many rural and suburban counties around the country, yet, the technology revolution that has swept household appliances in the last 20 years has by-passed wood stove technology. Increasing the use of low-grade wood is a constant challenge and firewood provides a significant market. Unfortunately, over 50% of wood stoves in use were purchased prior to 1988, when EPA required wood stove emissions be less than 7.5 grams of particulates/hour (g/hr). In 2015, EPA updated the wood stove regulations. The basic challenge to reducing emissions is to automate wood stove and minimize poor usage patterns by the operator during the combustion cycle. This requires the use of sensors and smart technology to manage the burning cycle, thereby minimizing long smoldering burns that operators often try to achieve. But this is a new field and much greater awareness is needed to move the market. The heat produced by a wood stove has the potential to produce electrical energy, but development of this technology is only beginning. The Alliance for Green Heat (AGH) is a non-profit committed to promoting wood and pellet heating systems as sustainable and affordable energy solutions. The University of Maryland Extension (www.extension.umd.edu/woodland) has partnered with AGH to advance wood energy in Maryland. The AGH is sponsoring a fourth Wood Stove Design Challenge on the National Mall in Washington, D.C. from November 9-13, 2018 with participants chosen to compete in two events: 1) automation of the wood stove with 21st century technology like sensors

and WI-FI-enabled controls; and 2) thermoelectric wood stoves that generate electricity. This presentation will report on the winners of the competition, and extension programming needed to change the future of wood stove residential use.

Conversing with Clientele about Climate Change

Faith Kearns, Ph.D., Academic Coordinator, California Institute for Water Resources, University of California, Division of Ag and Natural Resources, faith.kearns@ucop.edu

As primary connectors between science and practice, Cooperative Extension educators are uniquely placed to communicate about climate change and encourage sustainable behaviors. However, climate change communication rarely enters the curricula for those training in Extension and outreach. Furthermore, there is no one-size-fits-all strategy for working with different communities, particularly when there are strong opinions! Conventional approaches to climate communication focus on filling information gaps, and assume that if people know how their actions contribute to climate change, they will change their behaviors. In contrast, recent developments in climate communication have seen a shift to more cultural, values-based, and emotionally intelligent approaches. While talking about climate change with any community can trigger discomfort, it is when engaging with those who are “cautious”, “disengaged”, “doubtful” or even “dismissive” that we will likely encounter conflict. And conflict presents us with more of a relationship challenge than a communication challenge. As such, increasing relational capacity is a highly relevant approach for climate communicators because strong emotions such as grief and anxiety are often present for practitioners and those they interact with. This workshop will feature a presentation on increasing relational capacity for successful climate communication. Workshop participants will then engage in interactive exercises to practice engaging with different individuals and communities. We will practice communication as a relationship-driven process, try out subjective skills for navigating our own and others’ emotional states, and discover how listening is as important as talking! Objectives: Workshop participants will

- Learn about relationship-centered approaches for successful climate communication

- Practice pragmatic tools for talking with different individuals and groups about climate change
- Expand their personal libraries of climate outreach resources

FACTS Bioreactors: a Valuable Laboratory Instrument for Inquiry-Based Instruction in Energy and Sustainability.

Craig Kohn, Doctoral Student & Research Fellow, Michigan State University, kohncrai@msu.edu

A key goal of the Next Generation Science Standards (NGSS) is to enable the development of scientific literacy by engaging students in both the content and practices of science. However, providing authentic inquiry-based experiences for students within the constraints of a classroom-based science course can be exceptionally challenging for teachers. Through collaborations with teachers and researchers at the US Department of Energy's Great Lakes Bioenergy Research Centers (GLBRC) as well as the NSF-funded Future of Agriculture Curriculum for Teaching Sustainability (FACTS) research initiative, we have developed specialized low-cost equipment that allows science teachers and agricultural instructors to recreate almost any kind of biological phenomena in manner that students can easily explore in small group settings. Modeled after advanced fermentation equipment used to study ethanol production in the GLBRC labs, these bioreactors can be quickly and easily produced using inexpensive materials available from science supply retailers. The bioreactors allow students to design simplified investigations in order to collect data and develop explanatory models about phenomena such as climate change, ecosystem function, eutrophication, biofuel production, photosynthesis, cellular respiration, carbon sequestration, and much more. Participants will be guided in how to assemble and use the bioreactors for classroom instruction that aligns with three-dimensional science learning through NGSS.

Preliminary Investigations of Situated Sustainability Instruction in High School Agricultural Education

Craig Kohn, Doctoral Student & Research Fellow, Michigan State University, kohncrai@msu.edu

Rural Americans comprise less than 20% of the US population but manage over 97% of the nation's land area. While rural Americans (particularly farmers) have a

disproportionately large impact on the overall sustainability of the nation, they are also more likely to dismiss the validity of anthropogenic climate change and advocate for environmental deregulation. Furthermore, the rate at which farmers have implemented Best Management Practices in order to reduce their ecological impact has been limited. Improved forms of education have the potential to advance the rate at which rural students adopt sustainable knowledge and practice, but traditional positivist portrayals of classroom science can result in conflicts with student's rural identities. Forms of instruction that privilege rural experiences and alleviate identity conflicts may be valuable for enabling more informed decision making and may encourage increased adoption of more sustainable practices. In particular, the situated learning opportunities that are prevalent in secondary agricultural education may be a valuable means to recognize rural expertise while enabling students and instructors to become brokers of sustainable practices in agricultural communities. In this design-based research (DBR) project, we collaborated with rural agricultural instructors to develop, implement, and assess a semester-long sustainability curriculum for secondary agricultural education called the Future of Agriculture Curriculum for Teaching Sustainability (FACTS). The curriculum is aligned to the Next Generation Science Standards (NGSS) and is freely available online. It combines three-dimensional science instruction with community-based learning opportunities in order to engage students in authentic situated instruction about rural sustainability. Assessments, surveys, interviews, and observational data were used to determine the impact that the curriculum and instruction had on the rate at which students adopted more sustainable knowledge and practice.

Creating a Sustainable Future: Evaluating Model

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Eliciting Activities with K-12 Students Ecologist, Babia Dioum stated, "In the end, we will conserve only what we love. We only love what we understand. We only understand what we are taught." How well are we teaching about sustainability in the K-12 curriculum? In the absence of professional development for K-12 educators, issues of sustainability will continue to be lacking in the school curriculum. The sustainability issues we face are

multidisciplinary. We no longer can expect only science teachers, many of whom are ill equipped to delve into sustainability issues, to prepare the next generation of students for the changing world. According to Frisk and Lawson (2011) this education must begin early; achieving a sustainable future requires that individuals adopt different attitudes and behaviors, which are often consolidated at a young age. That is why the university college of education partnered with a local school district to integrate Model-Eliciting Activities (MEAs) about sustainability into the K-12 curriculum. MEAs are problem-based lessons that originated at Purdue University, as “thought-revealing activities” for applied mathematics and science students, which we adapted for elementary education. The lessons are structured as follows. First, students receive a request for proposals from a company. Then they are given data and told to evaluate alternatives based on criteria, which involve the 3P’s of People, Planet, and Profit. During this session, we will: 1) report on how we adapted these lessons to use with K-5 students; 2) illustrate our results of educators using these lessons; and 3) demonstrate successful strategies that helped young learners apply system thinking to consider complex sustainability issues.

Diversified Researchers Come Together to Find Bacteria Sources in Pellicer Creek

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Pellicer Creek, located within the Guana Tolomato Matanzas National Estuarine Research Reserve (GTM NERR) in NE Florida, is an Outstanding Florida Waterbody and an Aquatic Preserve. As a tidally influenced waterbody, it is fed by fresh blackwater branches from the west and bounded by the Intercoastal Water Way from the east. This dynamic estuarine environment is surrounded predominately by conservation and timber lands, yet it is designated as Impaired for fecal coliform (FC) by the Florida Department of Environmental Protection. To understand how and why a watershed with as little development as Pellicer Creek became impaired for FC has become the preoccupation of a team of trans-disciplinary, inter-agency researchers. The team works together on two primary goals: 1) the watershed currently has two TMDLs which will require remediation. Source type and location are necessary to develop remediation plans, and 2) there are two significant mixed-use developments planned within the watershed. Establishing a

baseline of the area now will provide significant insight to changes from developments as they occur. To achieve these goals, the team conducts sampling projects and pursues other opportunities that will lead to narrowing the source of contamination. Recently, funding was secured from FDEP to cover 10 MST analyses to identify the potential source species for FC and source areas in the watershed. Sampling locations were strategically selected at confluences and key locations along the watershed. This sampling was enhanced with additional sampling for nutrients and water quality. Ultimately, these lessons will inform future planning and policies with quantifiable data to limit anthropogenic impacts to this and other watersheds.

Experiential learning at multiple scales: Integration of community needs with sustainability goals

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This presentation describes how a landscape architecture program has incorporated experiential learning while advancing sustainable planning and design practices through applied projects in different locations of the state. Landscape architecture students are exposed to a variety of experiences aimed at enhancing their learning beyond the traditional academic boundaries of the discipline. Extension and outreach projects offer students a unique opportunity to react to issues, concerns, needs and propose solutions to community aspirations. At the same time these projects challenge the student knowledge and help them to connect lessons to real world issues. The university has established multiple opportunities through the students' academic journey. They acquire breadth knowledge through foundational courses in sustainable systems and site analysis, focused on learning principles and creating awareness of sustainable issues. They also participate in annual design charrettes, intense and short-duration vertical studios, always dealing with real situations and invested community stakeholders. Depth learning is achieved through upper level and graduate studios where emerging issues and discoveries from their previous learning experiences are explored in greater detail with more elaborate proposals. This presentation provides case study examples of these learning and community engagement experiences. Projects include two charrettes and several design studios that explored a series of small communities, an expanding ski

resort, a preserve/equine therapy center, a seventy-year old monastery reconfiguration, and a new education and community center. Objectives include:

- Expand the education of landscape architecture students through real projects and community outreach.
- Advance sustainability in education where students engage in community issues and challenge their skills to propose alternative solutions.
- Create a variety of educational experiences with a foundation in sustainability and community service.
- Support the university mission advancing a sustainable future.

Driving Economic Development & Clean Energy Through Innovative Financing Partnerships

Peter Lindstrom, Manager, Public Sector & Community Engagement, Clean Energy Resource Teams (CERTs), University of Minnesota Regional Sustainable Development Partnerships, plindstr@umn.edu

Learning objectives: 1. Attendees will understand and be able to apply best practices around clean energy financing for economic development that will strengthen collective impact; 2. Attendees will learn about the opportunities and challenges facing communities with empty storefronts and businesses with high utility bills, deferred maintenance and new equipment needs; 3. Attendees will better understand effective communication strategies to engage with local government policymakers as well as gain insights on the iterative approach to market clean energy financing to potential users; 4. Attendees will discuss case studies of Property Assessed Clean Energy projects that will enable attendees to implement effective partnerships and carry out clean energy projects. During this roundtable discussion, Peter Lindstrom (Public Affairs & Community Engagement Manager, Clean Energy Resource Teams at the University of Minnesota) will lead a conversation about how Extension personnel are partnering with local governments, economic development agencies, and financial organizations to revitalize businesses and nonprofits through Property Assessed Clean Energy. PACE funds energy upgrades to buildings that create jobs, make properties more valuable, and help states achieve policy goals. It's 100% voluntary and it's being adopted in every region of

our nation. PACE activity for commercial buildings found that the sector grew faster than in any previous year, completing \$251M in funding in a single year, which marked an increase of 75% in cumulative funding compared to 2016. In Minnesota, 150 projects have been completed totaling \$50 million resulting in the creating of over 400 construction jobs. Businesses are saving nearly \$4 million on their energy bills. The University of Minnesota's Clean Energy Resource Teams has enabled PACE in over 60 counties and cities across the state. CERTs is partnering with financing organizations, utilities, local government organizations, chambers of commerce and trade organizations to bring this innovative tool to qualifying organizations.

Leveraging Pest Behavior for Implementation of Sustainable Management Tactics for Plum Curculio in Southeastern Peach Production

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Plum curculio, *Conotrachelus nenuphar* (Herbst) (PC) is a key pest in Southeastern peach production that infests fruit and decreases yield. Currently, peach growers rely heavily on repeated broad-spectrum insecticide applications for PC control. However, frequent insecticide applications can cause non-target effects (e.g. eliminating beneficial insects), insecticide resistance and adverse effects on the environments (e.g. insecticide runoff and drift). Thus, there is a need for the development of more sustainable approaches for PC management. To establish a sustainable PC management program, understanding the pest's behavior is important. The goal of this project is to facilitate the development of sustainable PC management programs for Southeastern peaches by deciphering PC behavior in peach orchards over time. We will intensively monitor the distribution and movement of PC in peach orchards in Georgia and South Carolina throughout the season. The objectives of the proposed project are (1) to investigate if PC in Southeastern peaches migrate from the forested border and move toward the center of the peach orchard, and monitor the distribution of PC within the orchard over time, and (2) to determine the mode of movement (flying or walking) of PC within a peach orchard throughout the season. A better understanding of PC as proposed in this study will facilitate the development of sustainable PC management programs that spatio-temporally target movement behavior and infestation hotspots within a peach orchard.

Thus, sustainable PC management programs may not only reduce insecticide input, but also mitigate the adverse effects caused by repeated insecticide applications.

Engaging stakeholders to expand dark skies on important sea turtle nesting-beaches

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Objective 1: Participants will learn how Extension faculty engaged with local and State government, private businesses and citizens to replace disorienting artificial lighting with sea turtle-friendly, energy saving LED lighting on Northwest Florida beaches in three counties. Objective 2: Participants will also learn that in addition to ecological benefits, there are economic and other environmental incentives for this type of work. This work began in 2014 with funding from the Deepwater Horizon (DWH) Early Restoration program (because of the 2010 DWH oil spill). Artificial lighting is a significant mortality factor for sea turtles on developed coastlines due to its disorientating effects during nighttime emergence of hatchlings. Brightly lit beaches also deter nesting females. Collaboration took place between two Florida natural resource agencies and the University of Florida to focus on creating darker nesting beaches and to assist citizens with their local beach lighting ordinance compliance. Beyond the funding collaboration between state agencies and the University, other key partnerships involved home-owner-associations, county governments, property/rental management companies and individual homeowners. This project illustrates a nexus issue that crosses core conference themes related to energy, green infrastructure, natural resources conservation, and public-private partnerships; creating a more sustainable coexistence between people and endangered/threatened sea turtles. With over 2,700 amber 7-watt LED bulbs installed to-date, clientele will realize a savings in electricity and bulb replacement costs of over \$456,000 during the 35,000-hour lifespan of one LED bulb. Energy consumption is considerably reduced. This effort will also eliminate, by an estimated 32,750, the number of incandescent, CFL and halogen bulbs going to landfills.

Using Film to Create Sustainable Community Connections

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One of the biggest challenges in creating sustainable behavior change is simply getting the conversation started. Film is an appealing approach that uses visual storytelling to lay the groundwork for meaningful discussion and community engagement. By encouraging cross-county collaboration with local institutions, UF/IFAS Extension Pinellas sought to promote sustainability awareness and initiate sustainability discussions about local actions prompted by film screenings. This educational method reached students, faculty, and community members, and collected information on their interests and concerns regarding the topics conveyed in the films. After each film, attendees were also given the opportunity to provide suggestions to improve their institutions' sustainability handprints on campus. Extension faculty developed partnerships with local academic institutions and utilized film screenings, moderated film panel discussions, a community expo, and retrospective evaluations to assess program design and delivery. Film screenings included *A Fierce Green Fire* (2012), *Shattered Sky* (2012), *Just Eat It* (2014), and *Weather Gone Wild* (2015). A total of 833 attendees participated across four (4) film series (13 films) and 18 single film events. Nearly 77% (n=641) felt it was more informative and 73% (n=608) reported it being more engaging than a traditional lecture. Of those who returned the evaluations, 58% (n=483) had no prior knowledge of Extension. When asked what their institution could do differently, comments included more recycling, food waste management, improved energy consumption, and extended educational outreach on sustainability issues. Film screenings are an innovative, non-traditional platform for Extension to educate, promote, and facilitate collaboration to engage community members, stakeholders, and institutions. As a result, many of the institutions implemented policies, as evidenced by the "Recycling Resolution" adopted by University of Tampa to improve its' recycling program.

Building ecological and community resiliency through permaculture design

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The Utah State University (USU) Permaculture Initiative. Permaculture is a design process that guides human communities in achieving the resilience and regenerative capacity of natural ecosystems. The principles and practices are drawn from the ecological knowledge of traditional and indigenous cultures integrated with modern scientific understanding and selected technologies. Permaculture design provides a framework for helping individuals and communities develop innovative, creative and effective strategies for meeting basic needs while preparing for and mitigating the existing and projected impacts of climate change. Permaculture is not a solution in and of itself, but a developmental process for achieving one's goals. It is most effective when integrated or aligned within existing professional approaches, markedly shifting a paradigm to enhance the practical viability of design. This presentation overviews the design, implementation, impacts, and spread of a community-engaged permaculture initiative created through USU Extension Sustainability that is fostering more resilience: on both the community and ecological scales - in preparation for hotter, drier climatic conditions and associated rising social conflict. In attending this presentation, colleagues will be able to: 1. Constructively define permaculture as it relates to their circumstance, situation, or project 2. Identify ways in which process or systems thinking can foster resiliency amidst climate change impacts 3. List various strategies to involve community members throughout the design and implementation process, or create community buy-in 4. Document and report impacts to administrators and community members alike

Sustainable You! 4-H Youth Camp

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Empowering youth through positive, hands-on messaging and activities Sustainable You! Summer Camp was designed to help youth understand what it means to live sustainably through fun, interactive activities based around five major sustainability themes: land, air, food, water, and energy. The camp is broken down into five days, each based around

one of the 5 themes, with the following overarching goals: 1. Help youth develop an understanding of sustainability concepts. 2. Help youth develop a respect for our natural environment. 3. Teach youth about actions they can implement each and every day to lessen their impact on our environment and conserve resources. 4. Encourage attitude and behavior change in youth and their families that leads to their lessened impact on the environment. In attending this presentation, colleagues will be able to: 1. Describe the structure and major themes of the Sustainable You! 4-H Camp 2. Download the free curriculum and associated camp materials 3. List sample activities from the camp 4. Teach one camp activity through active participation during the presentation 5. Apply ways to measure impact from a sustainability-themed youth camp

Utah High School Clean Air Poster Contest

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Science, art, marketing, behavior change, and community outreach for better air quality

The Utah High School Clean Air Poster Contest, led by Utah State University (USU) Extension Sustainability and USU's Huntsman School of Business, combines environmental science, marketing and art to engage teens about ways to improve air quality (e.g., carpooling, refraining from idling, trip-chaining, etc.). In 2017, about two-thirds of surveyed contestants (N=205) reported engaging others (primarily parents and siblings) about local air pollution, although they were not instructed to do so, and 43 percent of those believed they had changed others' behaviors to engage in clean air actions. We called this the "Inconvenient Youth" effect, inspired by a 2007 Wall Street Journal article describing how parents often feel uncomfortable having youth instruct them on social behaviors because they feel pressured to comply in order to maintain the youths' respect. In 2018, over 550 teens took part in the contest and we assessed their self-reported direct personal behavioral impacts and parents about how their teens potentially conversed with and changed their behaviors. Seventy-two percent of responding parents (N=114) reported their teens talked to them about air pollution, and teens discussing specific clean air actions had the most influence on changing parent behaviors. Interestingly, only a few parents described their teens' social influence as discomforting.

Rather, most reported their teens simply initiated a reasoned conversation about air pollution and solutions, and some even welcomed it! Winning posters are displayed at various Utah businesses, with select posters developed into permanent metal signs for school drop-off/pick-up zones. Attending will result in: 1. Identifying factors contributing to Utah's air pollution 2. Discovering strategies to motivate teachers and students to engage in environmental action 3. Viewing student posters ranging from funny to terrifying 4. Learning strategies to engage local businesses and secure their ongoing commitment to an environmental initiative 5. Glean recommendations for measuring outreach impact

Major Sustainability Initiatives of Hillsborough County - A Triple Bottom Line Approach

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Hillsborough County is the 4th largest county in Florida, situated on the Gulf of Mexico, containing the City of Tampa. It is a highly urbanizing locale with 1.4 million people. Hillsborough County has a long history of being a local leader instituting collaborative and nexus-based initiatives that involve and benefit our community (people), environment (planet), and economy (profit); the 3 primary pillars of sustainability.

This presentation highlights major sustainability initiatives, many of which have interconnected systems-based benefits and have been used as a template by other counties throughout the state.

1. Bio-solids and yard waste composting at our landfill converts two problematic waste streams into a usable product that's sold to a private vendor, while also reducing transportation and disposal costs and GHG emissions and saving \$1.5 million.
2. Waste to Watts -Resource Recovery Facility burns 1,800 tons of trash a day, saves the County \$500,000 in utilities, generates \$16 million by selling electricity, powers several County facilities and 30,000 homes, uses recycled water to make steam and reduces landfill space.
3. ICE is used to supply chilled water to cool air in buildings, saving over \$1.1 million in electricity and earning \$50,000 through partnering with TECO annually.

4. Solar installations to date saved over \$266,000 and cut 2,236 tons of CO2 emissions. Via County supported local cooperatives, 463kW installed on 47 homes with a lifetime offset of over 8500 tons of carbon. Transportation signals also utilize solar and LEDs.
5. Mosquito Fish program provides and recycles/reuses fish for natural mosquito control.
6. Largest land conservation program in Florida setting aside 61,000 acres & generating revenue from carbon credits.

The County seeks to collaborate and leverage resources and knowledge to build a resilient and sustainable environment for the health of our community, economy and natural resources.

Florida Statewide Small Farms Hydroponic Program

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Recommendations for small and beginning farmers include starting with hands-on learning and equipment use that helps them to develop agricultural skills and competencies. Additionally, it is essential for them to identify market niches, develop a sales strategy, and take corrective measures that result in a sustainable operation. Growing hydroponically is an alternative that may produce high quality and profitable specialty crops such as herbs, greens and cut flowers in places that are unsuitable for cultivation. Hydroponics also has the advantage of increased production per square foot in comparison with traditional agriculture. 393 people attended the one-day, four-hour workshop replicated in 5 counties. Evaluations reflect knowledge gain in the areas of hydroponic growing systems (47.65%), hydroponics growing media (20.13%) and nutrient solution management (24.83%). Overall, 91.43% of participants found the topics to be useful and 6.67% found the topics to be somewhat useful. In subject matter areas, knowledge gain ranged from 4.03% to 47.65% in post-test evaluations. Participants reported increased confidence to answer questions and to locate resources about hydroponics. Fifty-eight percent (58%) were inspired to build hydroponic systems with participants' preference for NFT (37%) and floating (63%) bed. Due to this interest, we expanded hydroponic outreach and implemented strategies to develop new agricultural

skills and experience in farmers, homeowners, students, and Master Gardeners. This could improve agricultural production in the U.S.

CIVIC - A Platform for Community Conversations

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CIVIC, Community Voices Informed Choices, is a new community engagement program built on Extension's "boots on the ground" approach for responding to community issues on a local scale. CIVIC brings together community partners and Extension agents to address issues that have wide ranging sustainability impacts e.g. water, energy, poverty. The long-term goal is to catalyze local action that supports integrated sustainability efforts and promotes healthier communities. Session attendees will learn how Agents create science-based frameworks to guide public deliberation of issues using underlying value statements, and participants will also be able to explain how the CIVIC model can be applied to existing Extension programs or local issues in their county.

Extension Agents in Pinellas County hosted a series of community forums focused on stormwater and plastic pollution. These forums are designed for participants to hear new perspectives, discuss possible solutions, and create opportunities for Extension to conduct local needs assessments. Additionally, the forums provide an opportunity to design a menu of community responses to local issues. Forums begin with a pre-survey, a guiding question to familiarize participants with each other and the issues, and a "placemat" to guide conversation. Each forum concludes with debrief and post-evaluations to assess participant level of motivation for new action, knowledge of different perspectives, and value of forum as a process. A written report is also provided to the community partner for review and follow-up. Traditional Extension programs relay information using standard one-way delivery and are limited in the capacity to expand participants' views outside the technical subject matter. Community forums support two-way exchange of information which builds community capacity and supports long term success of adopted projects. Challenges inherent in this process include the controversial nature of public issues, time constraints, and the value of facilitation relative to the Extension education mission.

Sweetpotato and Crop Byproducts for Fuel, Feed and Food in Florida

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Sweetpotato is a multi-purpose crop that can be grown on marginal lands in tropical/subtropical climates with tolerance to extreme weather patterns like droughts and flooding. The crop requires minimal inputs of water and nutrients, and the whole plant including both the root and the aerial vines can be utilized for fuel, feed, food or some combination thereof. In 2016, UF completed a 2.5-year, \$1.4 million research effort to grow this crop for bioethanol production. The agronomic ethanol yield of the CX-1 cultivar was 4.2 t/ha. Continued large-scale field trials are investigating vines for livestock feed, and local potato growers are intercropping potatoes and sweetpotatoes to diversify their food markets. The objectives are to (1) evaluate the forage quality of the aerial vines compared with typical forages used in the beef cattle industry, (2) determine the biogas potential of the vines (3) establish the equipment and procedures necessary for mechanically harvesting and ensiling the vines, and (4) evaluate the nutritional aspects of white, orange, and purple-flesh sweetpotatoes. Sweetpotato vines are richer in protein, total digestible nutrients and micronutrients when compared with typical livestock forages. The biogas potential ranges 274 to 305 LNCH₄/kgVS depending on the cultivar. The vines can be harvested using a mechanical roller/gripper and then baled and wrapped. Silage trials showed that the most efficient conversion of sugar to acids occurred when the vines were ensiled fresh versus wilted for 24 or 48 hours. No significant losses in protein or fiber were observed after 60 days. To address the food perspective, a nutritional analysis of roots from various white, orange and purple-flesh cultivars will be completed in December 2018. The goal is to promote nutritional advantages of sweetpotatoes over common tablestock potatoes and provide them to the local school lunch program as a healthier alternative.

Teaching Energy Through Nanogrid Applications

Art Nash, Energy Specialist and Alaska State Indoor Radon Grant Manager Associate Professor, School of Natural Resources and Extension University of Alaska Fairbanks

America's only arctic state has many residents that do not have electricity to their cabins or homesteads and workplaces. While many communities have to utilize hydronic heating

and electrical generation on a microgrid at the community level, and many residents live remotely from communities. They live on a homestead, run a seasonal hunting/fishing lodge spread, or simply locate where it would not be cost effective to extend several power service poles out from their home to an existing service junction. One option is to utilize a nanogrid, often so that local renewable sources compliment or supplant petrol generator usage. Solar can be utilized three quarters of the year up to the Arctic Circle, micro hydro power is often available seasonally near streams draining to coastal area, wind can contribute especially near the coastline, and biomass is almost universally available in brush or tree form throughout the year and gasified. Yet for this scale of 30KW or less, there are a variety of rural solutions utilizing local fuels/resource that can effectively be taught as a cluster for power generation and heat storage from local energy sources for hunters, campers, peppers, homesteaders and residents preparing for emergencies/disasters.

Garden Steps

Michele Ogilvie, Executive Planner, Hillsborough Metropolitan Planning Organization, Ogilviem@plancom.org.

The Hillsborough Metropolitan Planning Organization (MPO) envisions a panel discussion from the perspective of health, community equity and transportation planning. The panel will discuss the use of community engagement, street-level, health and community-collected data and planning as a means of determining safe and effective locations for community gardens in its Garden Steps project. The link between transportation decisions and health impacts is often not explicitly considered even though transportation planning and policy directly impacts the built environment, human economic and social wellbeing. With this connection in mind, the panel explores the value safe, walkable and connected streets have to areas where the impact would affect ethnic and racial minorities, people with movement-related disabilities and people of lower socioeconomic status. Our Citizen led partners include the Green ARTery, a coalition of 23 ethnically and economically diverse central city neighborhoods who champion planning and creation of safe, identifiable, connected walk-bike paths, greenways and trails systems. Their envisioned Perimeter Trail safely connects neighborhoods to

Tampa's Downtown, expanding access to employment, entertainment and regional transit opportunities. The Coalition of Gardens is a community-based organization that is active in promoting policy changes for community gardens in Hillsborough County. Data collection indicates access to a constant source of healthy food due to low income is a barrier to healthy food access. Food insecurity, the other food environment measure is related to negative health outcomes such as diabetes, high blood pressure and premature mortality. Garden Steps combines all the entities we work with to address food security using the model of community capacity building. The partnership of community leadership, health and planning staffs sets a stage for broad participation where everyone is encouraged and permitted the opportunity to explore the common experiences of a healthy life.

Alleviating pollinator decline using Cowpea (*Vigna unguiculata*) in an intercropping system and the impact on crop yield

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Pollinators have been on a decline recently; loss of foraging resources and a host of other causes appear to be responsible for this decrease. This has created potential risks to production of insect-pollinated crops and global food security. There is urgency to mitigate the decline by promoting farming systems that promote flower-rich habitats. Cowpea, *Vigna unguiculata*, is an important crop grown in southern USA, and produces pollen and nectar attractive to pollinators. We conducted studies to identify cowpea varieties highly attractive to pollinators and their effect on crop yield when intercropped with other vegetables. In year one, twenty-four cowpea varieties were grown in 4 replications. Data was collected on number of pollinator flower-visitors. Pollinator types (honey bees, bumble bee, carpenter bees, wasps, and butterflies) totaling 11,415 were recorded. Bees comprised >80% of the insects observed; among them: honey bees (53%), bumble bees (28%) and, carpenter bees (1.0%). Pollinator distribution varied significantly among the cowpea varieties with highest number recorded on Dixielee (24.5 ± 2.1), Penny-Rile (23.5 ± 2.4), Whippoorwill (21.9 ± 2.3) and, Pinkeye purple Hull (20.1 ± 1.9) and least on Iron and Clay (2.7 ± 0.31) and Tohono O'Odham (2.5 ± 0.30). In year two, two varieties: Pinkeye

Purple Hull (PPH) and Whippoorwill (WHIP) were intercropped with three main crops (okra, watermelon, and squash), with cowpea planted on both borders; PPH and WHIP were monocropped for comparison. Control plot (no cowpea) was planted ~20m away from cowpea intercropped plots. Intercropping cowpea with pollinator-dependent crops (squash, okra and watermelon) resulted in increased pollinator abundance and diversity, and crop yield. Number of pollinators recorded on crops with cowpea intercrop was four times higher than in the control. Similarly, crop yield increased in intercrops with cowpea compared to the control. PPH and WHIP cowpea varieties can be recommended for use in a similar intercropping system to enhance pollinator activity to increase crop yield.

The Production of Biogas using Anaerobic Biodigesters in a Saline Environment

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As the Earth's climate continues to change due to the use of fossil fuels and carbon emissions, it is becoming increasingly imperative that renewable energy production increase. For centuries Northern African and Asian countries have utilized anaerobic biodigestion as a form of biogas production. Though this technology has been around for centuries, it has fallen out of practice as the world has become more industrialized. Many communities in developing nations have begun to reincorporate anaerobic biodigesters into their communities to create a reliable and sustainable fuel source for cooking. Biodigesters create a circular waste system where food/organic waste is transformed into biogas for cooking and liquid fertilizer (by-product) for gardening. Almost all biodigesters being built and used today use freshwater in their systems. With the lack of accessible freshwater in a lot of island and coastal communities, the use of saltwater to produce biogas makes more environmental sense. Brackish and full saltwater biodigestion systems were created utilizing marine microbes acquired from large scale aquaculture systems. The systems have both proven that saline environments can produce biogas for energy production from food waste and marine animal waste. Further research is being conducted on how temperature affects the amount of biogas produced and the usefulness of the affluent (liquid fertilizer) on marsh grass growth. Attendants of this session would

learn (1) how biodigesters function as a circular food/energy/water/waste nexus and (2) the practical advantages and uses of saltwater biodigestion for climate and community resilience.

Renewable Energy Siting: Community Questions, Opportunities and Concerns

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Across the country states, cities and utilities are placing an increased focus on electrification of energy loads as a primary pathway to decarbonization. Recent analysis have highlighted that this transition will require a major expansion of renewable energy capacity. This build out means that more and more communities will be approached by wind and solar energy developers. More farmers and landowners will have questions about land use valuations and trade-offs and what to look for in a land lease. More local governments will have to sort through where to site projects, how development might impact local tax revenues and land values, and how a project might impact the overall community sense of place. More communities will have to grapple with what development might mean -- good or bad -- for their neighbors and community and how that may look different to different community members. During this roundtable discussion, Lissa Pawlisch and Fritz Ebinger (Clean Energy Resource Teams, University of Minnesota Extension) will lead a conversation about how Extension personnel are working with communities to plan for and work through siting of renewable energy projects. We will discuss how Extension staff can partner with farmers and landowners, local jurisdictions, and communities to use fact-based information (economic development information, demographics, planning & zoning best practices) to assist communities with their decision-making process. Learning objectives: 1) Attendees will learn from their peers about opportunities and challenges facing communities as they consider siting renewable energy projects. 2) Attendees will better understand how others in Extension are wading into these discussions and will share effective community engagement strategies around renewable energy siting. 3) Attendees will gain insights into best practices for and research around renewable energy siting and approaches (like pairing solar with pollinators and utilization of tax revenues) to address potential concerns.

Play Greener: How UF is bringing green sports into and beyond the classroom

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The University of Florida (UF) has been a leader in implementing sustainable practices, and has taken numerous initiatives to green their campus sports. UF took the first step on this mission in 2006, pledging to reduce carbon emissions and help lead the nation toward a more sustainable future. Since then, UF has become the first “carbon-neutral” athletic program in the country and has committed to a series of related steps, including the construction of the James W. “Bill” Heavener Football Complex, the first LEED Platinum athletic facility in the country. The university is recognized by the National Resources Defense Council's (NRDC) Collegiate as one of the top 10 sustainability Collegiate Game Changers and is a Green Sports Alliance member. Today, UF is taking the next step, one that few colleges have undertaken: bringing sustainability to the world of sports through our new “**Sports and the Environment**” course. The course will focus on the relationship between environmental management and the sports industry, the **first** such environmentally focused offering in the Sports Management Department.

Beyond Hours Served: Measuring New Outcomes of Volunteer Programs

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Public and private entities enlist well-trained volunteers to help with essential programs. The Extension tradition works with volunteers in programs such as 4-H, Family and Consumer Sciences, Master Gardener volunteers and citizen scientists to enhance the local community and increase program outreach. Formal volunteer programs such as these benefit county residents. Volunteer programs allow county and state governments, non-profits, businesses and other organizations to extend or expand services to residents at a relatively low cost. Traditionally, volunteers’ contributions are measured by calculating the number of volunteer hours and the value of those hours as determined by organizations such as the Independent Sector. However, research exists to support the value of volunteer programs beyond economic indicators and organizations may provide greater return on investment to stakeholders. The objectives of this presentation are to 1)

provide professionals and volunteer coordinators with examples of how to quantify their volunteer programs beyond economic value, 2) use research-based resources and data garnered from peer-reviewed journals, reports, and studies that enable participants to form linkages with national, regional, and state reporting agencies, and 3) share resources and volunteer survey data results from the UF/IFAS Extension Hillsborough County. Moving beyond hours served and dollar value of those hours enables volunteer coordinators to better define the impacts of their work, and to report program impacts and long-term outcomes, such as health outcomes, civic engagement, and retention rates, in order to improve relationships, convey relevance, and provide measurable program results to stakeholders such as universities, local governments, peers, and the public.

Biomass Residue Fueled Micro-Grid for a Rural Community in Puerto Rico

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On September 20, 2017, Hurricane Maria struck Puerto Rico, destroying most of the energy infrastructure and triggering an 11-month blackout. This research looks to micro-grids and their potential for energy stability in hopes of revamping the energy system and making further sustainable improvements. Said micro-grids will be powered by already-existing solar panels and newly-constructed biogasifiers located at the headquarters of Puerto Rican NGO, Casa Pueblo, and within the community of El Hoyo, Adjuntas. The biogasifiers will utilize locally available agricultural waste, such as coffee husks and tree prunings, and help communities develop energy independence and resilience in the face of future storms. To gather the data needed to create feasibility models assessing the implementation of potential micro-grids, interviews were conducted within El Hoyo, and data was collected from Casa Pueblo's generation and load demand. It is expected that El Hoyo will not have a high enough baseline demand to implement a hybrid micro-grid. Additionally, Casa Pueblo's solar production was found to be underutilized. Installing a micro-grid with neighboring buildings would put excess electricity to use and also has the potential to be supplemented by a biogasifier. Not only did the hurricane affect the power grid, it also decimated 90% of the island's crops. To address reconstruction of the agricultural sector, a prototype biogasifier was built with the intention of generating

biochar, a byproduct of the energy production process. Biochar is known for its ability to raise pH levels and reduce nutrient leaching, and thus could be used by local farmers to improve crop yield and generate income. Experiments are currently being conducted on its effectiveness as a soil amendment with regards to stimulating plant growth. Ultimately, the future vision of this research is to create a closed-loop system that provides both 100% renewable energy and improves local agricultural output.

Building Social Capital to strengthen Community Sustainability

Bethany Prykucki, Extension Educator Michigan State University Extension, prykucki@msu.edu

Michigan State University Extension's Government and Community Vitality team has designed three signature workshops to help leaders, managers and citizens build important skills and teach tools that promote effective communication, empathy, curiosity, understanding and problem-solving. Our mission is "to deliver innovative educational programming that strengthens leadership capacity, assists strategic decision-making processes and engages Michigan citizens in collaborative and sustainable efforts to achieve goals related to economic development, ecological health and social well-being." Unlocking the treasures for a sustainable future is dependent on our ability to build the social capital within communities that allows citizens to work well with each other, both personally and professionally. The three programs we intend to highlight are: Facilitative Leadership...building group capacity. Communicating through Conflict...because conflict can be positive. Advanced Facilitative Leadership...leading through conflict. Particular emphasis will be placed on how civic participation in urban settings differs from rural communities. Dr. Reumenapp's extensive studies around Urban Extension programming will be threaded throughout the workshop. Although there are many similarities in Extension's work across all geographic settings, dynamic situations in cities and large metropolitan areas present unique challenges and opportunities. As the population of the United States moved to metropolitan areas, so did many of the most pressing national societal challenges. Cities and metropolitan areas are a mixture of cultures, attitudes, norms, and beliefs that have woven together to create a distinctive culture for each city or metropolitan area. Urban challenges are enormously complex with no simple solutions (Beaulieu & Cordes, 2014; Boyer, 1996; Harriman & Daugherty, 1992; National Extension

Urban Task Force, 1996). The complexities of metropolitan issues usually affect multiple entities, are multijurisdictional, and are often politically influenced (https://joe.org/joe/2017october/pdf/JOE_v55_5a2.pdf). It is our intent to demonstrate through a brief programmatic history, evaluative impacts, experiential learning activities and group discussion how the three above programs can be a building block to initiating social capital and creating a sustainable community.

Smart approaches to smart growth - regional localism for water and sewer infrastructure

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States such as Oregon and Maryland are the recognized national leaders in the nation in adopting state level smart growth policies. This is in part because of state leadership that has put high profile smart growth policies into place. In this presentation, we argue that New York State provides another kind of Smart Growth model, one more suited to home rule states in which strong traditions and legal preferences for local control are deeply embedded. We will show how, during the past decade and more, a cumulatively significant weave of policies and legislation has been drawn through New York's existing institutional fabric to condition state and local land use decision making. Moreover, we will discuss how, in the wake of major storm events that have impacted the region, planning for climate change and sea level rise have been increasingly and formally linked to state smart growth policy. Our presentation will draw on a series of reports that have focused, through a smart growth policy lens, on the significance of water and sewer infrastructure development. We consider the outlines of an emerging smart growth policy pattern, its overall coherence, its appropriateness for New York State with its almost 1,600 general purpose local governments, related outreach and training needs, plus policy implications for other states.

Powering Conversations about Energy

David Ripplinger, Ph.D., Assistant Professor, Department of Agribusiness and Applied Economics, North Dakota State University, david.rippinger@ndsu.edu

Learn about the planning, implementation, and impacts of a community discussion of transforming energy. Powering the Red River Valley was a joint effort of NDSU Extension, Clean Energy Resource Teams (CERTs), and others. The evening consisted of resource tables, movie viewing, and discussion of opportunities for individuals and communities to empower themselves. Immediate impacts were tracked by a post-event survey. A second, community discussion is planned for spring 2019.

Assessing Potential Peak Energy Demand Management Strategies

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In Agriculture high demand charges can dramatically increase electricity prices for many commercial electrical consumers. While demand charges are often significant, few consumers understand the costs, how they are calculated, and what impact their electrical usage has on their billing. The purpose of this on-farm research project was to determine the electrical demand on livestock farms, what management strategies and equipment farmers can implement to promote long-term sustainability for their farm. Six Ohio State University owned and/or private farms were enrolled in the project to conduct research to answer questions about energy usage and explore solutions farmers can implement to reduce energy cost. The overriding objective of the agricultural energy management program was to install advanced energy metering equipment in agricultural facilities to track electric demand profiles and monitor power quality to gain knowledge about energy usage patterns and, in turn, the manner by which farmers can implement energy management strategies to minimize costs and foster long-term sustainability. Specifically, we collected energy usage data for individual motor loads allowing our team to analyze how specific operations contribute to the farms overall peak demand charges. Using the detailed energy data from the test facilities, a team from OSU Electrical and Computer Engineering developed simulation models for different loads using MATLAB/Simulink software to construct an aggregated model for the overall facility to analyze energy usage.

The models were validated by comparing the simulation results with data collected from facility measurements. This presentation will provide participants with an overview of the project including: 1) Review the project design, funding structure, and cross disciplinary partnerships. 2) Evaluate relevant data findings and discuss strategies to reduce peak energy demand spikes in swine and dairy facilities. 3) Assess next steps and resources to support the delivery of Extension outreach programs.

FDACS OOE Multifamily Retrofits Demonstration Project

Erin Rosica, Florida Department of Agriculture and Consumer Services, Erin.Rosica@freshfromflorida.com

Targeted energy efficiency retrofits were made to 320 multifamily units. In the year after upgrades were installed, the average electric utility costs for these units decreased by 13 to 30 percent. This presentation describes the steps taken to make energy efficiency improvements including how targeted energy audits helped determine which upgrades to implement.

Profitability for Small to Mid-Size Farms through Local Strategic Planning

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After the serious impacts of Hurricane Irma in 2017, the Southwest Florida Regional Planning Council, UF/IFAS Extension and a number of growers in the region led an effort to develop a “Regional Strategy for Economic Sustainability for Small to Mid-sized Farms in the SWFL Promise Zone”. The Regional Strategy was developed through a grant administered by the Florida Department of Economic Opportunity (DEO). The primary goal of the strategy was to determine which actions, public or private, might result in increased profitability and resiliency for farms in the Promise Zone and the region. The Promise Zone designation are rural economic disadvantaged communities that entitles the area to special consideration for federal and state assistance. The “Agricultural Task Force” consisted of producers, the Regional Planning Council, UF/IFAS Extension faculty and interested stakeholders. The Ag Task Force completed an analysis of strengths, weaknesses, opportunities, and threats to small to mid-sized farms in the region, potential funding sources to benefit new and established small- to mid-sized farms, new market opportunities, and identified five potential project areas for increased profitability. The

SWFL Regional Planning Council has continued the partnership with UF/IFAS Extension and has since leveraged this document to receive a \$206,545 grant from the U.S. Economic Development Administration (EDA) as well an additional \$30,000 grant from the DEO. The new funding will aim to implement some of the priority project areas outlined in the Regional Strategy, which include continuing the work of connecting producers to the regional demand for products, educating consumers about local foods and farms, farm transparency workshops for growers and working towards a regional brand for local, fresh produce. Development of the Regional Strategy touches on the areas of civic engagement by helping small to mid-size growers have a voice in the decision making process; collaboration between regional, state and local private and public entities and the need to maintain dialogue and buy-in to implement proposed actions in the report; and social equity and justice for those living in the Federal Promise Zone. Lessons learned include building trust in the agricultural community, the opportunities and challenges of demonstrating progress in strategic planning and policy, building inclusivity and collaboration between growers of all sizes, and the indispensable need to have stakeholders lead the direction of actions.

Designing for Flood: Hillsborough Community Vulnerability Impacts

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The Florida Center for Community Design and Research and the College of Public Health at the University of South Florida partnered with Hillsborough County to conduct an inventory and vulnerability assessment of the impacts related to flooding from sea level rise and storm event. Through a multidisciplinary, studio-centered approach a Matrix of Impacts was created by the research team to define vulnerabilities across four major categories: the built environment, ecological frameworks, environmental hazards, and public health. These categories are the focus of a series of future scenarios created to inform risk reduction measures. An innovation studio comprised of the disciplines of architecture, landscape architecture, urban design, urban planning, public health, and civil engineering is collaborating to evaluate and envision implementable design strategies for future development in within Hillsborough. The process enacted by the research team

has fostered collaboration across university disciplines and county departments. The visualizations generated by the studio will be used to generate civic dialogue about these future planning efforts. The findings and proposals developed will provide recommendations for the Hillsborough Comprehensive Plan Coastal Management section for Peril of Flood statutory requirements. Participants in this session will 1) learn about specific elements of the Florida Peril of Flood Act and its impacts on future development; 2) gain an understanding of how vulnerable populations will be impacted by coastal and inland flooding; 3) learn risk reduction design strategies for flood events; 4) learn how the Matrix of Impact can be a tool for other communities planning for flood occurrence and sea level rise; and 5) gain an understanding of how to build collaborative partnerships.

Tipping Point Planner

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Addressing land use and management in the Great Lakes Tipping Point Planner (<http://tippingpointplanner.org>) is a research and extension program designed to support local decision makers in Great Lakes coastal communities with identifying impacts of land-based activities that threaten the sustainability of ecosystems in their watershed. The facilitated process using the decision support system enables community visioning discussions and action plan development for watershed management plans and comprehensive plan updates. The program allows for diverse stakeholder participation in land use decisions and exploring policy and management interventions necessary to keep coastal ecosystems from reaching critical tipping points and moving to unstable conditions. Research teams from Illinois - Indiana Sea Grant, NOAA's Great Lakes Environmental Research Laboratory, Michigan State University, the University of Michigan and Purdue University are collaborating with federal, state, and local agencies to integrate new adaptive management tools in the decision support system to plan, implement, and evaluate community planning programs at the watershed scale. Over the past year, the research and extension team has collaborated with the city of Perrysburg,

OH (Lake Erie watershed) to update their land use plan using the Tipping Point Planner decision support system and facilitation process. This session will highlight the decision support system features and facilitation processes, lessons learned from Perrysburg, OH, and applications for extension land use and community planning efforts.

Developing Suitable Cover Crop Systems for South Texas: Evaluating Different Late-Summer Cover Crop Species

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Cover crop systems are widely promoted for their potential benefits on weed suppression, water quality, nutrient cycling, among others. While cover crop systems have witnessed widespread adoption in the Northern parts of the country, adoption in places such as South Texas has been very limited. Some of the major limitations include a lack of knowledge to facilitate cover crop selection, insufficient biomass production of covers prior to crop planting in spring and perceived soil moisture loss caused by cover crop growth. The objectives of this study were to 1) determine the impact of cover crop species selection on late-summer weed suppression, biomass accumulation, 2) assess the impact of cover crops on soil moisture dynamics, and 3) document the impact of cover crops on summer-annual weed densities and ultimately cash crop yield. The study was established at two locations: The Texas A&M University Research Farm, College Station, TX, and the Stiles Farm Foundation, Thrall, TX during the late-summer of 2018. A total of four warm-season cover treatments (sorghum-sudangrass hybrid, sunn-hemp, cowpea, and buckwheat) were established at three planting timings (mid-August; early-September; and late-September) and were arranged in a split-plot design with cover crop species being the main-plot factor and planting timing the sub-plot factor. Soil moisture was determined at biweekly intervals using a Dynamax PR2 multi-depth soil probe at 10, 20, 30, and 40 cm depths. Cover crop and weed biomass were harvested prior to cover crop termination (killing frost). Weed suppression after cover crop termination was also recorded. Buckwheat, sorghum-sudangrass, and sunn-hemp provided excellent suppression of summer-annuals, with sorghum-sudangrass providing continued suppression of winter annual weed emergence and establishment. Findings are expected

to facilitate informed decision making by growers of South Texas and comparable geographies regarding cover crop selection and adoption.

Alternatives to Summer Fallow in Continuous Wheat Systems

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Constraints on food, land and water resources pose a need for conservation practices to maintain viable agricultural lands. In the Texas Rolling Plains (TRP) winter wheat monocropping systems leave concerns for soil degradation from wind and water erosion. Cover crops and no-till systems can reduce erosion and increase soil health; however adoption remains low in the region, due to concerns of limited moisture. The objective of this study was to evaluate cover and double cropping practices under no-till management and effects on soil health and moisture. Compared treatments included cowpea and mungbean as a cover crop (CC; 55-70 Days After Planting, DAP) or a double crop (DC; 70-90 DAP), and the termination timing of mixed species cover crops against a continuous wheat-fallow control. Cover crop mixtures were terminated early, late, or harvested as a hay crop. Soils were analyzed for microbial biomass using phospholipid fatty acid analysis (PLFA), carbon mineralization and aggregate distribution (MWDA). Volumetric water content (VWC) was analyzed at 10 and 20 cm depths. After three rotation years, soil microbial biomass was significantly greater in cover crop mixtures compared to wheat-fallow at early termination. No statistical differences were seen for MWDA in the upper depth however the Mix Late treatment was significantly less than wheat-fallow in the lower depth. No differences were found for carbon mineralization in the upper depth at all sampling times, however, mixtures were significantly greater compared to wheat-fallow at early termination in the lower depth. At wheat emergence, cowpea CC and DC, mungbean DC and Mix Early were significantly greater in carbon mineralization compared to wheat-fallow. At precipitation events prior to wheat planting, VWC was not decreased by treatments compared to wheat-fallow. Results indicate soil health can be increased with cover and double crops while not impacting soil moisture in years of adequate precipitation.

Solar Energy Production on Agricultural Land: Risks and Opportunities

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The University of Maryland is researching and developing educational materials (extension publications and legal education publications) on the economic, legal and community issues associated with solar energy leases on farmland. There is limited research-based information from the land-grant system to guide farmers and landowners on this critical issue, and researcher/extension specialists are being contacted frequently for assistance. Our interdisciplinary team will conduct research and develop a publication focused on practice tips for attorneys related to solar energy contracts, focusing on large solar farm legal issues in the Mid-Atlantic, but providing information useful throughout the country. We will implement a train-the-trainer approach to educate Extension staff in Maryland and host one-day workshops to train farmers, landowners, ag service providers and state officials to provide a general overview of the legal and economic issues of solar energy leases and resources available. Research for this project will be guided based on concerns raised by landowners through interviews and other survey methods. Finally, we will develop and hold a one-day webinar to educate attorneys on how to handle solar energy leases. Our approach will provide rural communities and landowners the information they need to navigate emerging opportunities and potential conflicts associated with large renewable energy projects on farmland.

Can Pesticide Application be Reduced in Sod-based Rotation?

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Cotton (*Gossypium hirsutum*) and peanut (*Arachis hypogaea*) are both important crops in the southeastern United States. For this research, two rotations were evaluated. A conventional crop rotation consists of peanut followed by two years of cotton. An alternative, sod-based rotation uses two years of bahiagrass (*Paspalum notatum*) followed by one year each of peanut and cotton. Including bahiagrass into the rotation reduces pathogen pressure and builds organic matter, which aids in soil water holding capacity as well as improving other soil properties (Wright et al., 2013). Reniform nematode (*Rotylenchulus reniformis*, RN) is a significant pathogen of cotton that

reduces lint yield, boll size, and delays maturity. Traditional RN management options include using nematicides to reduce population densities. Because peanut and bahiagrass are poor/non-hosts of RN, sod-based rotation may be an effective way to manage this nematode. Beneficial nematodes that feed upon bacteria and fungi are important in soil nutrient cycling. It is necessary to develop sustainable farming practices that reduce damage by plant parasites while maintaining populations of beneficial nematodes. Therefore, nematode populations were investigated in cotton phases of sod-based and conventional rotations with or without irrigation and nematicide at a long-term research site at the North Florida Research and Education Center. Soil samples were collected to 30 cm in spring, summer, and fall in 2017 and 2018 using an Oakfield tube and the entire nematode community was analyzed. Cotton yield was collected in October 2017 and 2018. RN populations were greater in conventional cotton than sod-based cotton in the fall of 2017 and 2018 ($P < 0.05$). There were no statistical differences in yield between nematicide treatments for sod-based cotton and first-year cotton in fall 2017. There was a significant yield increase for second-year cotton in nematicide-treated plots compared to plots without nematicide in fall 2017. In the sod-based rotation, plots without nematicide had greater yield than those with nematicide in fall 2018. Both bacterivore and fungivore populations were greater in second-year conventional cotton in fall 2017. Bacterivores and fungivores were both greater in nematicide-treated plots of sod-based cotton in summer 2017. However, bacterivores and fungivores were both greater in untreated plots of second-year cotton than plots with nematicide. Bacterivores were greater in untreated plots of first-year conventional cotton and greater in nematicide-treated plots of second-year conventional cotton in fall 2018. Overall, sod-based reduced RN populations. Sod-based rotation had greater yield than the conventional rotation. Nematicide use may not be needed to improve cotton yield in a sod-based rotation. Furthermore, beneficial nematodes were not negatively impacted.

Round is Resilient

Ken Sides, P.E., Sam Schwartz Transportation Consultants

Modern roundabouts are the most resilient intersections ever invented. They operate equally well before and after major storms and hurricanes, and are far safer than conventional intersections with or without power. In the hurricane's aftermath, no police or power company resources need be diverted from urgent tasks to tend to modern roundabouts. The presentation explains what modern roundabout are and are not, why they are so safe and so self-sufficient, and provides two dramatic roundabout case studies: Hurricanes Florence and Charlie.

Developing, adopting, and executing 100% renewable energy resolutions at the local level

Emily Skill, Graduate Student Utah State University, Department of Environment and Society, emily.skill@aggiemail.usu.edu

The absence of national leadership on climate policy has created a void that many local governments have taken on responsibility to fill. Throughout the country, municipalities are adopting and implementing resolutions to reduce their carbon footprint and transition to clean energy. However, what leads to successful adoption of these resolutions and how to effectively implement climate policy at the community level needs further exploration. Using a qualitative, exploratory case study approach, this thesis examines the resolutions adopted in Salt Lake City, Park City, and Moab, Utah to transition to 100% renewable energy by 2032. This poster will feature 1) the process that led to the successful adoption of these resolutions and 2) how the cities plan to motivate households and businesses to engage in sustainable practices in line with the resolutions. The data collection for each study area consisted of a variety of videos, audio tapes, documents, and semi-structured interviews with government officials and community members involved with the resolution process. A within-in case time series analysis and cross-case thematic analysis was used to trace events over time to determine casual events, and to identify fundamental patterns and themes within the data. Each city's plan for resolution execution was compared to the approaches and techniques outlined in the community based-social marketing framework, the theory of diffusion of innovations, and

climate action plans used in the six US cities that have already reached their 100% renewable energy resolution goals. Identifying similarities and differences across the communities' plans and these frameworks helped detect gaps and key components in resolution implementation strategies. Our findings deliver a transferable “how-to” framework, outlining best practices to assist other cities in adopting and effectively implementing similar resolutions.

Climate Extension: A review of programs and materials

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Cooperative Extension utilize many different formats of climate outreach. At one end of the spectrum, there are active Extension programs with regular training and engagement events that aim to encourage greater community participation in sustainable behaviors. At the other end of the spectrum, information is provided online as a resource, but it is not regularly updated and may be difficult to locate. Some outreach efforts use social media, while others depend upon traditional static web pages. In reviewing all publicly available climate outreach materials, we wanted to find out what types of outreach program exist and if there are any publicly available measures of success. Specifically, we aimed to discover how the “Master” outreach model (based on Master Gardeners) and other “train-the-trainer” formats have been used to increase community engagement in sustainable behaviors. Our objectives here are to present the results of our comprehensive review of Extension approaches to climate outreach. In this review, we will showcase examples of best online practice, and encompass effective communication and/or action strategies for either Extension or volunteers. We also highlight the differences between active and passive climate outreach, demonstrating how “Master” programs have been used to encourage community engagement in sustainable activities. Finally, we provide preliminary insights into the effectiveness of social media use by climate outreach programs.

Resilience to Future Flooding in the Gulf of Mexico

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The Gulf of Mexico is an area of rich culture and beautiful coastlines, but coastal living comes with ever-increasing risk. Communities are already experiencing increased

flooding and storm surge--both due in part to sea-level rise (SLR). Many Gulf communities are already taking steps to become more resilient to current and future hazards, helping them bounce back after storms or in response to future conditions. Through a series of short films, a new video project showcases five communities--one per Gulf state--that have taken on various resilience strategies. Within each video, there is local information about these types of strategies and available resources for the Alabama coast. Additionally, this project generated three "Sea-level Rise 101" videos specific to the northern Gulf of Mexico. The "101" videos cover basic information about SLR in the northern Gulf, how SLR will change storm surge, and information on how SLR resilience can be integrated into planning. Altogether, this collaborative, multi-state project aims to help communities across the northern Gulf of Mexico prepare for this pressing issue. Objectives for participants during this session include: improved understanding of SLR science; appreciation for the efforts of small Gulf Coast communities have taken towards coastal resilience; a source of education and contacts from which other communities can learn.

Participatory Capacity Building

Jennifer Taylor, PhD, Associate Professor, Director Sustainable Agriculture Systems, Florida A&M University, Jennifer.taylor@famu.edu

It is important to ensure local and global food security with agricultural management strategies that encourage sustainable food systems, public awareness and access, and that embrace the benefits of local small farmers.

Florida Agricultural and Mechanical University StateWide Small Farm Program is capacity building program designed to assist and equip farming populations and their communities toward a thriving sustainable development. The Program uses a participatory sustainable development approach to identify needs and provide relevant education programs, hands-on training, and technical assistance to underserved farming populations and their communities, to enhance well-being and quality of life, and enable successful solutions for change.

Objectives for participants attending session:

- To understand the role of sustainable development in agricultural development and extension.
- To identify participatory capacity building strategies in extension.
- To share information, successful strategies and impact.

Navigating the Family Heirs' Property Title Clearing Process (FHP)

Sandra Thompson, Ed.D., Community Resource Development (Faculty, Specialist, Program Leader), sandra.thompson@famu.edu

The goal is to utilize didactic discussion in a workshop setting to assess a planned approach to bring about sustainable system change (dialogue, cooperation, and collaboration) between interdisciplinary stakeholders to increase awareness about FHP and utilization of the FHP title Clearing Process. This proposed workshop is designed to serve as a platform to critique a new sustainable systems approach to making the FHP title clearing process more visible, affordable, simple, and less labor intensive. The workshop is also designed to explain the complicated and multi-dimensional aspects of FHP, including how it is created, economic and familial harms caused, interdisciplinary and often divergent stakeholder positions, title clearing process and its lack of use. Participants will be able to explain the circumstance that triggers creation of FHP and the three ways it is created. Participants will be able to explain the economic harms of FHP and the characteristics that create the harms. Participants will be able to identify at least five disconnected disciplines and at least five disconnected and diverse stakeholders that influence if or how FHP owners convert their FHP into regular private property (behavioral economics). Participants will be able to critique and add to the proposed sustainable interdisciplinary approach that can positively influence planning, coordinating, modification, and delivery of a FHP title clearing process to increase FHP owners' use, and increase coordinated/collaborative support from the diverse cadre of influential stakeholder. Anticipated outcomes: Critique and commitments from participants will help refine the proposed innovative systems approach to addressing the FHP title clearing process. Additionally, it is anticipated that participants' awareness, understanding, and

skills will have grown or developed in context to the FHP Title Clearing Process as a result of their participation in the workshop.

Model partnership between wildlife and land/forest conservation organizations and Family Heirs' Property owners

Sandra Thompson, Ed.D., Community Resource Development (Faculty, Specialist, Program Leader), sandra.thompson@famu.edu and Kent Wimmer, Defenders of Wildlife

The goal is to demonstrate the process being used to establish an emerging partnership between the Wildlife Defenders' Organization and FAMU's Florida Family Heirs' Property Community of Practice Initiative. This proposed workshop is to demonstrate how two organizations with divergent concerns developed an emerging sustainable collaborative partnership that meets the needs of both entities and currently improves each entities business model and cost effectiveness. Objectives: Participants will be able to explain the conflicting perspectives held by FHP owners and conservation entities. Participants will be able to explain the business models employed by each entity and its cost effectiveness. Participants will be able to explain the steps employed and stakeholders engaged to construct a sustainable partnership that meets the individual mission of each entity while all also improving the business model and cost effectiveness of each. Anticipated outcome: Participants gain awareness, understanding, and tools to help oppositional groups in local settings engage in civil dialogue to build sustainable solutions to difficult problems.

Building Resilience Capacity along the Gulf: Community Resilience Indices Development and Implementation

Jody Thompson, Extension Outreach, Auburn University/Mississippi Alabama Sea Grant, Thomp13@auburn.edu

Attendees will: Learn about a simple tool that can be used with communities to identify hazard resilience needs and better understand community resilience. Following the devastation of Hurricane Katrina and other tropical events, it became apparent that coastal municipalities and businesses needed assistance to determine a baseline of resilience and identify areas in which they could begin to address coastal hazard

preparedness and response actions. The Louisiana and Mississippi-Alabama Sea Grant programs, with assistance from the Gulf of Mexico Alliance (GOMA) began to address this need through the development of the Community Resilience Index (CRI). The goal of the CRI is to help municipalities develop a baseline of resilience and to identify needs in resilience planning. This self-assessment is presented a simple and short format designed to complement existing community planning. An index exercise includes not only municipal employees, but community representatives as well. After pilot testing, the CRI was disseminated throughout communities in the five Gulf states using a train-the-trainer model to train place-based neutral facilitators. To date, more than 70 communities along the Gulf have participated, and in many cases, successfully received grant funding to implement resilience projects. An evaluation of the CRI found that, while the tool was very useful to communities, the developers could use similar tools to assist coastal businesses in resilience planning. Based on this feedback and using the Community Resilience Index as a model, developers used stakeholder input to assist in the development of resilience indices for three coastal business sectors: tourism, fisheries, and ports and harbors. Combined with the CRI, these four indices comprise a suite of resilience indicators that assist a wide range of community sectors in planning for hazard events. Participation in these tools has proven valuable to both the facilitators and the end users, resulting in more resilient communities on the Gulf Coast. The tools are easily transferable and are being adapted to other regions and hazards.

Michigan State University Extension's Programming in the Sustainable Development Era

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The United Nations' Envision 2030 Agenda for Sustainable Development listed 17 Sustainable Development Goals (SDGs) as part of a global action plan (United Nations, 2015). This plan seeks to address sustainable development through the economic, social, and environmental dimensions (United Nations, 2015). For over 100 years, Cooperative Extension Systems (CES) have a trusted history of bringing research-based information into local communities to help people improve their lives through educators who are embedded into the very communities they serve (USDA, 2014). We propose that

Michigan State University Extension (MSUE) addresses all 17 SDGs, and as a result could serve as a standard-bearer towards which all Cooperative Extension Systems should strive. An initial scan of MSUE programs in relation to the SDG's was completed. Additionally, 27 MSUE work teams were surveyed to create an inventory of programs being offered to residents of the State of Michigan. The survey was composed utilizing Qualtrics. A brief definition of each of the 17 Sustainable Development Goals was provided with examples for each. Participants were requested to reflect upon those definitions when considering the fit of educational programs into the SDGs. Examples for each of existing programs were provided in the definitions. Participants were asked to give a brief (one to two sentence) description of the program, list the number of people in the state delivering that program, and the number of people reached in the past 12 months. Objective 1: Present the extent that the UN Sustainable Development Goals are addressed in Michigan State University Extension programming and discuss which programs provides address the underlying social determinants of health within the entirety of its work. Objective 2: Discuss how CES can refine programming and develop good practices to intentionally integrate SDGs into their programming.

Stakeholder Assessment of Poplar for Feedstock and Ecosystem Services in Rural Washington

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Growing poplar trees as an energy crop in Washington State could also provide ecosystem services for wastewater management and flood control issues. We conversed with stakeholders in southwest WA to explore the feasibility of a poplar-based industry by gaining an understanding of the local context and stakeholder opinions on converting land to poplar. Growth models show that southwest Washington has enough suitable land to support a poplar-based biofuels industry. In addition, the region's economically depressed rural communities could benefit from a new cropping and production opportunity. This study was conducted as part of Advanced Hardwood Biofuels Northwest, a USDA NIFA-funded consortium of university and industry partners developing the framework for a poplar-based biofuel and bio-based chemical industry in the Pacific Northwest. In this

session, learn about the challenges facing local agriculture, and learn how we linked bioenergy and ecosystem services to reach new audiences. We will discuss land-use planning efforts for flood mitigation and salmon conservation, biorefinery operations, and economic opportunities in this rural community. We will also confront several salient obstacles to industry development that local stakeholders identified, such as past failures producing poplars (for pulp/sawlogs), competing land use practices (for conservation and forage), and limited drivers for alternative wastewater solutions. A successful poplar-based bioproducts industry could meet multiple needs in rural Washington. Overall, if the business model is convincing, participants saw chances for win-win situations where landowners could profit growing poplar on otherwise low-value acreage and achieve ecosystem services for wastewater or floodplain management. By revealing links between bioenergy crop production and ecosystem services, Extension reached a diverse set of stakeholders interested in land use, rural development, and renewable energy. This approach offers opportunities for addressing multiple environmental issues at the landscape level through collaboration and cooperation.

Tracing the National Extension Energy Initiative (NEEI) Impact from 2013 to 2019

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Effective program evaluation can be challenging for Extension programs, particularly those with varied, broad, and long-term goals. Common methods of program evaluation, such as surveys or interviews, are often expensive, time-consuming, and may miss critical outcomes. With surveys, it is difficult to predict all possibilities. Ripple Effect Mapping, which is a technique used to visualize program impacts, can address many of these issues. In this session, participants will learn how to make a Ripple Effect Map as well as the importance of program evaluation. The first National Extension Energy Summit (NEES) was held in Fort Collins, CO in 2013. Since then, summits have been held in Seattle, WA (2015), and Knoxville, TN (2017). To evaluate the impact of NEES, we wanted to get the details on the programs and events that would not have occurred without the NEE Summits. At the Association for Natural Resource Extension

Professionals (ANREP) conference in Mississippi in spring 2018, we gathered many former NEES attendees and held a Ripple Effect Mapping session to visually show the “ripples” or offshoots of NEES conferences. We’ve converted the handwritten map to a more comprehensive digital version and hope to keep adding impacts. So far, we know that NEES have increased cross-state and cross-programmatic sharing, leading to multi-state webinars and bulletins and the creation of replicated programs like community energy stewards. In addition, the NEES meetings provide a much-needed opportunity to network in person, decreasing the feeling of isolation some energy Extension agents experience. Participants who have attended a NEES conference will have the opportunity to add to the map. We plan to continue to expand the NEES Ripple Effect Map and use the information to plan future summits, events, and chart the course forward for the initiative.

Building Sustainability Through an Urban Green Infrastructure Network

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In February 2018, The Western Center for Metropolitan Research and Extension hosted a summit on Urban Green Infrastructure (UGI) near Portland, OR. The goal of the summit was to create new collaborative networks, identify research and education priorities, and share existing resources related to green infrastructure. Topics covered included: 1) landscape scale challenges such as floodplain and riparian management and climate resiliency, 2) green stormwater infrastructure including water quality treatment and runoff reduction, and 3) non-traditional green infrastructure issues related to public health, social justice, economics, regulations, and incentives.

The 70 attendees primarily came from Oregon and Washington and included research and extension faculty from universities, city representatives, and conservation district natural resource planners. Participants found that the summit enabled them to connect with professionals with green infrastructure expertise that was different than their own and improved their understanding of green infrastructure facilities and implementation in the Pacific Northwest.

Going forward we are seeking to build a nationwide UGI network that includes representatives from universities, cities, and counties. We hope to establish networks to facilitate the translation of applied research to support municipality priorities. In addition, we want support peer-to-peer relationships between cities and counties to allow sharing of best practices that may be adopted in other communities to allow a spread of successful green infrastructure projects. We would like to recruit members from both the National Extension Energy Initiative (NEEI) and the National Network for Sustainable Living Education (NNSLE) to expand the UGI network and facilitate cooperation.

Promoting Sustainability of Resources: a Tri-County “Water in My Backyard” Program

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STEM (Science, Technology, Engineering and Math) educators use innovation to reinvent traditional water programs; engaging youth in inquiry-based learning. Objectives: Learn the “ins and outs” of program development and delivery, from project-based learning design to program logistics. Why is the program important? Water is a finite resource, and while this message is widely shared, research has shown young people benefit from participatory, project-based learning models. The demands on local water resources (springs and groundwater) challenge the next generation of leaders, with group-learning strategies youth practice critical thinking, problem-solving and the wise use of resources. Our program immersed 40 young people (ages 10-16) in a week-long program exploring the water resources of central Florida. In collaboration with Extension, local business leaders, conservationists, nature-based educators and government entities engaged youth in expanding their knowledge of water resources. Quantitative and qualitative growth of science knowledge/literacy were assessed with a variety of tools; including a pre/post survey, journaling, recording of observations, group debriefing, etc. Participants attending this session will: learn techniques to connect student actions to environmental impacts. take away experiential tools to use in programming, form strategies to partner with community groups. Multi-county programs leverage creative partnerships, develop stakeholder resources, broaden the exposure of youth to water resources, and develop

project-based learning tools. Experiential in-depth group learning prepares youth to tackle environmental issues.

Climate Change Community Level Solutions: Moving from 'Me' to 'We'

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Without solutions, climate change information is very overwhelming. In order to avoid instilling the sense of crisis that leaves people feeling overwhelmed and helpless, you must describe what can be done about climate change in all of your climate messaging. By presenting practical solutions as the norm and reinforcing that action is happening all around us, you can foster hope, agency, efficacy and issue engagement. The National Network for Ocean and Climate Change Interpretation (NNOCCI) mission is to change the world through better communication techniques around climate change. We know that 64% of the country is currently concerned about climate change, but they lack confidence that anything can or will be done about it. Despite the majority concern, climate change conversation is stifled because people don't believe they hold the majority view, they don't feel confident explaining climate change, and they don't have faith that talking about it will make a difference. Our research shows that through better framing of why it matters, what's going on and what we can do about it - our visitors leave more hopeful and prepared to act on behalf of climate that those who do not visit institutions with NNOCCI trained interpreters. Furthermore, we know that our tools empower people to converse and break the spiral of silence that is hindering effective climate action. The workshop will include hands-on activities and a dynamic presentation of recommendations from Strategic Framing, a research-based approach to communications that is grounded in understanding what's already in people's minds about climate change, knowing where the gaps in understanding are, and using tested tools to productively fill those gaps. The result is an empirically-driven communications process that makes academic research understandable, interesting, and usable to help people solve social problems.

Participants will learn what are the most effective solutions to share and how to craft an impactful solutions story. They will also hear from network members experiences in applying Strategic Framing in their programs, trainings and classes. By the end of the

workshop, participants will try out strategically framed approaches to discussing community-level climate change solutions.

Building Sustainable Support for School and Community Gardens

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School and community garden support organizations across the United States offer varying levels of assistance to gardens. Securing staff and financial resources to support work with school and community gardens can be a challenge. The UF/IFAS Extension Polk County office addresses this challenge by using a stakeholder-driven garden association to serve local school and community garden clientele. The Polk County School and Community Garden Association is a network of community groups, teachers and volunteers developed to create a sustainable infrastructure for more than 30 school and community gardens. In the 2017/18 school year, the association hosted 4 educational events that 159 school and community gardeners attended. The association is managed and led by an advisory committee composed of extension agents, school and community gardeners, and Master Gardeners. The advisory committee meets on an as needed basis at the local extension office. Members lead through participation in subcommittees that perform specific tasks to oversee the association, such as the governing and education subcommittees. The committee has planned educational events for gardens, updated policies and procedures, and sought donations to support school and community gardens. In a competitive environment for resources, the garden association and advisory committee model provide a sustainable solution to supporting school and community gardens using the assets of volunteers and stakeholders. Learning Objectives: 1) Participants will be able to identify the key functions of a school and community garden association. 2) Participants will be able to describe how an advisory committee contributes to the overall function of the garden association. 3) Participants will discuss the application of these strategies in their own work with school and community gardens.

Government Energy Academy: maximizing Extension's impact in communities

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Local governments across the country are becoming more interested in opportunities to save money, increase sustainability, and achieve community energy goals. Some communities have set bold renewable energy targets, while others simply want to reduce their energy bills. A vast array of energy programs and funding opportunities exist that can help local governments move forward however they see fit. At the same time, many local governments don't have the staff or resources available to identify or implement these opportunities. In response, Colorado State University Extension hosted its inaugural Local Government Energy Academy workshop in August 2018. The 1.5-day event was intended to help elected officials and staff understand, prioritize, and implement cost effective opportunities for energy efficiency, renewable energy, and electric vehicles. The LGEA workshop consisted of a high-level overview of energy options as well as deep dives into what local governments can do today to impact both their operations and the broader community. Almost 80 people, including representatives from 25 different local governments in Colorado, attended the workshop. Initial evaluation results show that 100% of respondents rated their overall experience as excellent or good, all sessions provided respondents with new insight, 78% of sessions helped respondents discover a new sustainable energy opportunity, and 89% of sessions will impact the actions of respondents going forward. The NEES presentation will describe how this idea came about, how stakeholder input was used to develop the program framework, the event content, and lessons learned. Main objectives for participants include: 1) understanding motivating factors for such an event and why this can be an opportunity for Extension energy/sustainability programs across the country; 2) increased awareness of common programs that could be discussed at future LGEA events; and 3) general principles for developing a similar workshop in other states.

Sustainable Food Systems are a Collaborative Effort Situation

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Florida produces the second highest vegetable value in the United States, and agriculture is the state's second largest industry. Farms in urbanizing counties face special challenges making it difficult to find sustainable long-term solutions. In Spring of 2018, UF/IFAS Extension and a local food policy council presented the 2018 Central Florida Food System Tour exposing leaders to challenges, opportunities, and collaborations in the local food system. Attendees will describe and reflect on the elements of their local food systems, identify key collaborators, and target an audience of community leaders. Participants included Congressmen and community leaders travelling by bus and learning in the field. The tour featured farmers and food system experts at large rural farms, smaller urban operations, processors, distributors, educational facilities, and a striking display of food waste. The tour hosted 40 participants. Day of, post tour evaluations (n= 40) indicated 100% of participants increased knowledge about the local food system, 98% identified barriers in the local food system, and 80% identified economic development opportunities related to the local food system. 7-month follow-up evaluations (n= 16) indicate: 100% increased knowledge about the local food system, 100% identified barriers in local food system, and 87% identified potential solutions in the local food system. Additionally, 81% increased knowledge about resources for community food production, 81% expanded network of community partners involved in food system, and 56% consider food systems when planning and decision making. Touring the local food system and targeting community leaders is an effective educational approach. Tour participants report initiating community garden projects, hosting farm tours, new farm project partners, applications of sustainable community and building design, academic food system research, and concern for food waste. Exposing challenges and successes from production, processing, distribution, and waste creates prospects for real solutions.

Southern Partnership for Advanced Renewables from Carinata (SPARC): A new AFRI CAP

David Wright, Ph.D., Professor/Director SPARC University of Florida wright@ufl.edu

This panel will present the Southeast Partnership for Advanced Renewables from Carinata (SPARC). SPARC is a new 5-year public-private partnership funded by USDA-NIFA headquartered at the University of Florida with partners from academia and industry. SPARC's goal is to develop a sustainable bioeconomy around Brassica carinata. Carinata (Ethiopian mustard) is an inedible oilseed feedstock that can be processed into renewable aviation fuel, diesel, naphtha, animal feed, and high-value bioproducts. In the southeastern United States carinata can be produced as a cool season crop covering millions of acres of winter fallow land. Its oil can be converted to fuels, whereas meal can provide a high-protein feed source for livestock and a variety of valuable chemicals. These characteristics make carinata a promising energy crop with agronomic, environmental and economic benefits. SPARC has a twofold mission: removing physical, environmental, economic and social constraints of regional carinata production and ensuring stable fuel and bioproduct markets through development of enhanced value across the supply chain. The panel will discuss SPARC's objectives and methodology and expand on its extension, research, and education activities. SPARC has a significant extension objective that is integrated across all research areas and serves to provide internal as well as external communication with farmers and other critical stakeholders across the supply chain by providing best practice guidelines and receiving feedback from the field. This innovative approach is designed to accelerate the successful commercial development of carinata in the region. It is anticipated that attendees of this panel discussion will learn the basics of sustainable carinata production and how this crop can lead to a sustainable bioeconomy.

Resilient Tampa Bay: Transportation Pilot Project

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Transportation is the backbone of a community facilitating the daily flow of jobs, commerce, education and recreation. They are also crucial for the delivery of security and emergency services. The Long-Range Transportation Plan (LRTP) is one tool that communities can use to address resiliency to extreme weather. LRTPs direct federal and state transportation infrastructure funding and looks out 20 years into the future. An example of using LRTPs for resiliency planning is a Federal Highway Administration (FHWA) pilot from in 2015 for the Hillsborough Metropolitan Planning Organization's (MPO) transportation plan which includes a performance measure that calls for reducing the vulnerability of roads to hurricanes to minimize economic loss. For example, if a category 3 storm hits Tampa Bay and the major roadway networks are disrupted, the loss of productivity and wages can cost millions of dollars per week. However, with adequately planned stormwater and flooding investments, recovery time for the roads could be shortened from 8 weeks to 3 weeks. For, Hillsborough County this could mean cutting the economic cost to the community from \$266M to \$119M in the event of a direct hit from a category 3 hurricane. Additional community savings can be realized when mitigation projects are mainstreamed with existing infrastructure upgrade schedules rather than implemented as standalone projects. Since the previous study FHWA has provided additional funding to conduct a vulnerability assessment of the entire Tampa Bay transportation network including Hillsborough, Pinellas, and Pasco County. Findings will be fed into the current 2045 LRTPs for each county as well the regional plan. More information on the MPO's LRTP and resiliency work can be found at <http://www.planhillsborough.org/resilient-tampa-bay-transportation/>. The objective of this session is to demonstrate how resiliency considerations can be integrated into the long-range transportation planning process and provide insight into how transportation resiliency being planned and implemented at the regional and federal level.

Enhancing K-12 Water Education through Cooperative Extension Program

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Most kindergarten through middle school science teachers do not have a strong science background. They have expressed a need for environmental education that provides a means to introduce youth to STEM components in a fun way while they gain an interest in the subject area. Cooperative Extension programs can play a vital role in improving environmental education and STEM achievement. Therefore, the University of Florida Institute of Food and Agricultural Sciences Extension partners with the Marion County Public School Board and develops an annual training for science teachers. It provides teachers with water curricula and prepares them to use these activities in classroom. This training was conducted for elementary school science teachers in 2015 and 2016, and middle school science teachers in 2017. It was a two-day workshop featuring in-class presentations, hands-on demonstrations, and field trips. All the teaching materials incorporate STEM concepts relevant to water and meet the Florida Sunshine State Standards for the corresponding grades. Forty-seven science teachers participated in last three years. All of them indicated that they “have improved their understanding of water curricula as a result of this training” and “have shared the information with other teachers and students.” They have used activities such as water cycle, aquifer, and water properties, reaching 2,793 students in the 2017 school year. Teachers remarked this program was “a fun way to teach water with minimum preparation and cost” and “engaged the students in productive activities and enhanced a sense of environmental stewardship.” This program demonstrates the benefits of connecting environmental education to Cooperative Extension programs and multiplier effects of the train-the-trainer approach. It not only builds self-confidence of the teachers and helps them feel comfortable teaching those topics, but also allows the interactive water educational activities reach more K-12 students in a more time effective way.

Integrating Sustainability into Local Comprehensive Plans

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Comprehensive plans, also called general plans, master plans or land-use plans, are documents that help a community by presenting a vision of the future. It contains long-range goals and objectives for all activities that affect the local government including land use, transportation, community planning, housing, infrastructure, and environment. In 2017, the Planning Commission was recognized by the American Planning Association's (APA) Comprehensive Plan Standards for Sustaining Places Recognition Program, recognizing plans that advance the principles of a livable built environment; harmony with nature; resilient economy; healthy community; and responsible regionalism. The Temple Terrace Comprehensive Plan earned the only gold level recognition in the nation. The Plant City and Tampa Comprehensive Plans each received silver level recognition. A team of professional planners scored the nominated plans based upon the principles of promoting a livable built environment, harmony with nature, resilient economy, interwoven equity, healthy community, and responsible regionalism. The reviewers also looked at community engagement and implementation efforts, and the attributes that shape the characteristics of communities, such as Plant City. "...from innovative community engagement to implementation, these plans represent excellence in comprehensive planning and serve as a model for other communities--large and small--across the country..." said David Rouse, FAICP, ASLA, director of research and advisory services at APA. During this review it was noted, the Imagine 2040: Plant City Comprehensive Plan includes details not usually included in many comprehensive plans, such as green buildings, renewable energy, local food access, jobs-housing balance, public schools, and counseling of developers. The plan has a strong emphasis on refocusing growth and redevelopment in walkable, less auto-reliant neighborhoods. The objectives of this presentation to provide the audience an introduction to the APA Sustaining Places criteria and to showcase how this criterion is being implemented into the planning process in local jurisdictions.

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