2017/2018 Annual Report

Southeastern Coastal Center for Agricultural Health and Safety

Southeastern Coastal
Center for Agricultural
Health and Safety

For More Information

Contact the Southeastern Coastal Center for Agricultural Health and Safety at http://sccahs.org

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Contents

Section I – Who We Are

Center Summary

The **Southeastern Coastal Center for Agricultural Health and Safety** (SCCAHS) explores and addresses the occupational safety and health needs of people working in agriculture, fishing, and forestry in Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina, Puerto Rico, and the U.S. Virgin Islands.

The University of Florida is the lead institution of this center, partnering with the University of South Florida (USF), Florida State University (FSU), Florida A&M University (FAMU), Emory University, and the University of the Virgin Islands. These universities are working together on a range of interdisciplinary research and educational projects designed to promote occupational health and safety among the 240,000 farms — estimated by U.S. Department of Agriculture — to be operating in the region, their operators, families, employees, and contractors, as well as those in the forestry and fishery industries.

Our Focus Areas

- Coastal fishery worker safety and health
- Heat stress and related illness
- Pesticide/herbicide exposure
- Opioid epidemic impact on farming communities
- Disaster vulnerability of migrant and seasonal farmworkers
- Innovative approaches to foster research to practice

Goals of the Center

- Provide occupational safety and health education and training to the agriculture, fishing, and forestry workforce.
- Bring evidence-based, safety and health programs, developed through the other NIOSH-funded agricultural centers into the southeastern coastal region.
- When appropriate, translate programs into Spanish, and assist in supporting multilingual training efforts throughout the region.
- Conduct research to practice projects focused on:
  - Evaluating whether safety and education materials produce changes in safety behaviors.
  - Documenting hazards and risks in fishery worker populations; testing training materials aimed at reducing injuries.
  - Utilizing remote sensing technology to map pesticide uses.
  - Looking at heat stress tolerance.
- Conduct further research and applied projects based on needs as they arise.

Key Personnel

Planning and Evaluation Core

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Valerie Mac, Co-Investigator
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Pilot/Feasibility Program

Pilot study of the acute psychological and health impacts of Hurricane Irma in UFAS extension workers
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Uncovering patterns of mental, physical, and occupational health issues among migrant farmworkers with different socio-cultural networks: A pilot study among Haitian and Mexican farm workers in Immokalee, FL
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Chronic low back pain in seafood workers: a pilot intervention study to identify modifiable work and movement solutions
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Pilot study of mobile app monitoring to prevent heat-related symptoms among Hispanic farmworkers
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Understanding the scope of the opioid epidemic for agricultural industries
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A novel approach (sweat patches) to monitoring pesticide exposure in farmworkers
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Agro-ecological practices in the face of climate change: Resilience, sustainability, and preparedness in Puerto Rico
Antonio Tovar-Aguilar, Pilot Project PI
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Section II – Research Projects

Occupational Health and Safety Surveillance of Gulf Seafood Workers

Project PI: Andy Kane, Principle Investigator, UF Environmental and Global Health
Melvin Myers, Consultant, Emory University
Robert Durborow, Consultant, Kentucky State University

Overview

Commercial fishing is one the most dangerous work sectors in the world. Occupational fatalities and injuries in the fishing sector occur at rates much higher than national averages for all occupational fatalities and injuries. In the southeastern US, Florida has the highest fatality rate for seafood workers, ranked third nationally only to Alaska and Massachusetts. Non-fatal, occupational injuries and illnesses are common across southeastern fishery sectors and include traumatic injuries and amputations, fractures, trunk and lower back strains; sprains; skin cancers; infections due to cuts, bites, punctures and entanglement; dehydration and heat stress. Frequency of injuries, illnesses and specific hazards, however, are largely undocumented, hence the risk factors are not well understood.

This community-based research project aims to support the safety and well-being of our regional fishery workforce through collaborative engagement with coastal seafood harvesters using a translational research-to-practice approach. This 5-year project is conducting surveillance using in-person survey interviews, and workplace observations on boats to discern hazards and risk factors associated with inshore occupational injury and health outcomes for regional shrimp, fish, and crab, oyster and clam harvesters. Data will be shared with fishers, community partners and extension engineers to support a culture of safety within these heritage fisheries, and provide valued interventions to keep the Southeastern US fishery workforce safe and on the water.

Key Accomplishments in 2017-2018

Assessments

The paper-based survey instrument was field-evaluated, reviewed and approved by University of Florida's Institutional Research Board (IRB), and was launched in three participating Gulf communities, Cedar Key, Eastpoint and Apalachicola, FL. A total of 24 surveys and 6 workplace observations provided the initial data set and deeper insights into how to optimize the in-person survey instrument. The paper-based survey was redeveloped for implementation using REDCap, an electronic format that allows project team members to type participant responses to injury-related questions. This updated REDCap survey instrument was reviewed and approved by UF's IRB. The project field team is currently undergoing training with the new survey tool prior to continued data collection.

Establishing a Cohort and Observations

Work to support community and stakeholder engagement with this project was required to continue to building trust in participating coastal communities. Although time-consuming to uniquely develop in each community, trust and project team integration into local networks positions our SCCAHS team to provide valued services and meaningful support.

Seafood workers who contributed to the survey through Year 2 were mostly male (84%), Caucasian, 21-59 years old (median age was 46yo), and worked as commercial fishers between 6 and 40 years (median # years worked was 21 years). The vast majority of fishers harvested product inshore from vessels with an overall length ranging from 20-28 feet. Approximately half of the participants were multigenerational fishers.

Figure 1. After a long day of planting, hauling and harvesting - clam producers tumble and wash product prior to sorting, bagging and distributing. This crew reduces back strain by trailering their boat to an elevated position relative to the tumbler to off-load 100-pound baskets of product into the hopper (avoiding having to lift from ground level). Heavy lifting is also done with the assistance of a second person, when possible.

Survey responses and workplace observations from Cedar Key, Eastpoint and Apalachicola provided initial insights into risk factors for hazards that likely span multiple fishing sectors. Initial descriptive data indicate that many seafood workers are self-employed and self-insured; seafood workers have relatively high pain tolerance, where harvesters often continue to work under stressful environmental conditions while enduring moderate to severe pain; chronic exposure to heat and sun may reduce worker focus and increase risk of injury; open-healed footwear, such as flip-flops, present a slip hazard but are commonly worn in some fishing sectors; winch guards on shrimp boats were not observed; personal flotation devices not worn while working on the water; the majority of workers have sustained multiple injuries that required medical attention and were associated with lost work days.

The majority of operations in the hard clam production sector involve bending, repetitive motion and torsional lifting, all of which contribute to universal complaints of chronic lower back pain (Figure 1). Use of a winch to lift heavy bag nets full of clams out of the water is a logical solution to reduce these injuries, but many fishers are reluctant to use winches because "it slows them down." This project has connected harvesters with Dr. Kim Dunleavy, physical therapist, specializing in working with community-based issues. While that's great news for fishers suffering with chronic lower back pain, Dr. Dunleavy can do little to provide aid for the clam producers whose feet are pierced by stingray spines when harvesting. This hazard is not uncommon, and is considered to be one of the most painful injuries endured by fishers. Stingray stings often put fishers out of work for several weeks. The SCCAHS Seafood Worker Team is working on functional solutions to this issue.

Outreach and Dissemination

Project team members Andy Kane, Mel Myers and Robert Durborow attended and contributed to the IFISH-5 Conference, Prince Edward Island, Canada; the Annual Conference of the American Public Health Association, Atlanta, GA, and at the 7th Annual Southeastern States

Occupational Network (SouthON) Meeting in Savannah, GA. These meetings provided important opportunities for national and international networking relative to SCCAHS project efforts and seafood worker health and safety.

Dr. Kane and his project team met with community partners to design project outreach and participant engagement in the different Gulf Coast communities in the SCCAHS region. In addition to the finfish, shrimp, crab, oyster and clam sectors, the project is extending coverage for inshore coastal aquaculture farms. The latter is supported through new project partners, Oyster South, that supports farmed oyster production throughout the region.

Three manuscripts pertaining to seafood worker occupational injury risk factors and fatigue, health hazards and fatigue, and risk reduction measures were developed to support this project's efforts and to promote occupational well-being of seafood workers. These manuscripts were submitted to the journal *Safety* and published during Project YR02:

Myers, M.L., Kane, A.S. and Durborow, R.M. (2018). Gulf of Mexico Seafood Harvesters: Part 1. Occupational Injury and Fatigue Risk Factors. *Safety*. 4(31). doi:10.3390/safety4030031. https://www.mdpi.com/2313-576X/4/3/31/pdf

Myers, M.L., Durborow, R.M., and Kane, A.S. (2018). Gulf of Mexico Seafood Harvesters, Part 2: Occupational Health-Related Risk Factors. *Safety*. 4(27). doi: 10.3390/safety4030027. www.mdpi.com/2313-576X/4/3/27/pdf

Myers, M.L., Durborow, R.M. and Kane, A.S. (2018). Gulf of Mexico Seafood Harvesters: Part 3. Potential Occupational Risk Reduction Measures. *Safety*. 4(33). doi:10.3390/safety4030033. https://www.mdpi.com/2313-576X/4/3/33/pdf

Extent of Agricultural Pesticide Applications in Florida Using Best Practices

Project PI: Gregory Glass
Co-PI: Jane Southworth

Overview

Although agriculture represents a key industry in Florida, little, recent information is available on the potential exposure for workers from various herbicides and pesticides that are needed to grow commercial food crops. This project is working to develop estimates of the potential site-specific environmental exposures that should be expected, based on geographic extents of specific crops, daily local temperature and precipitation regimes when 'best practices' are applied to the use of important pesticides and herbicides.

This surveillance project uses an integrated remote sensing (RS) system (time series of high and moderate resolution) to create an analytic framework to establish the levels of various, selected herbicides/pesticides (H/P) on specific, commercially grown crops within the state of Florida. The extent of health risks for agricultural workers depends, as an initial step, on the amounts of H/P that they contact during their work activities. Although acute unintentional exposures are serious risks for individuals, the more extensive, lower dosage exposures of the workers may be a more serious issue. Unfortunately, estimates of amounts of H/P used in the industry were last gathered between 2007-2009. This report aggregated H/P usage by target pests and crops but was insufficiently detailed to establish potential worker exposure from the environment. Given the continued absence of exposure data, the proposed work is essential for subsequent research projects seeking to correlate health impact with H/P exposure.

Key Accomplishments in 2017-2018

Classification Validation Suspense: Random Forest Classification Code Suspense

The random forest classifier for mainland Florida has been completed for 2008-2009. Classification improvements required increasing the number of classes identified beyond the targeted five crops to a 13 class categorization. The obvious north-south striping in the classifier reflects different days that imagery were obtained (Figure 1). The 2015-2016 classification is in progress.

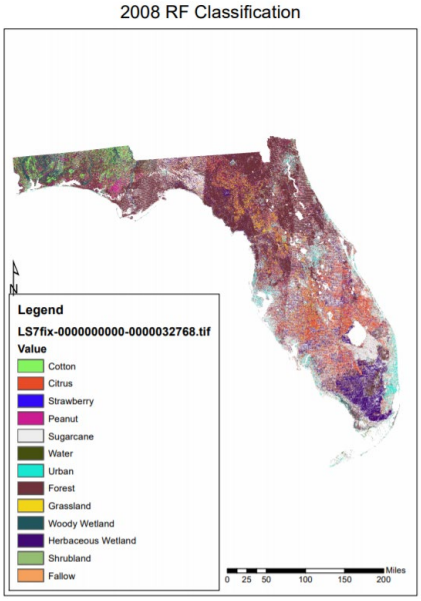


Figure 1. 13 Class Categorization

Acreage Validation from Classification Suspense

Initial acreage validation was completed. High resolution imagery was used to 'ground truth' the crops being grown during the time periods in question. Fifty sites for each of five crops (250 sites total) were randomly identified from the USDA classification. Figure 2 compares the current classifier used by the USDA remote sensing algorithm (orange bars), with the new, Random Forest (RF) classifier (blue bars). With the exception of strawberries, the RF classifier substantially outperformed the USDA algorithm in correctly identifying where the crops are located. The classification for RF identifying that a site would not

be the specific crop (gray bar) is also generally quite high (with the exception of citrus). In epidemiologic parlance the RF classifier shows both good sensitivity and specificity in crop identification.

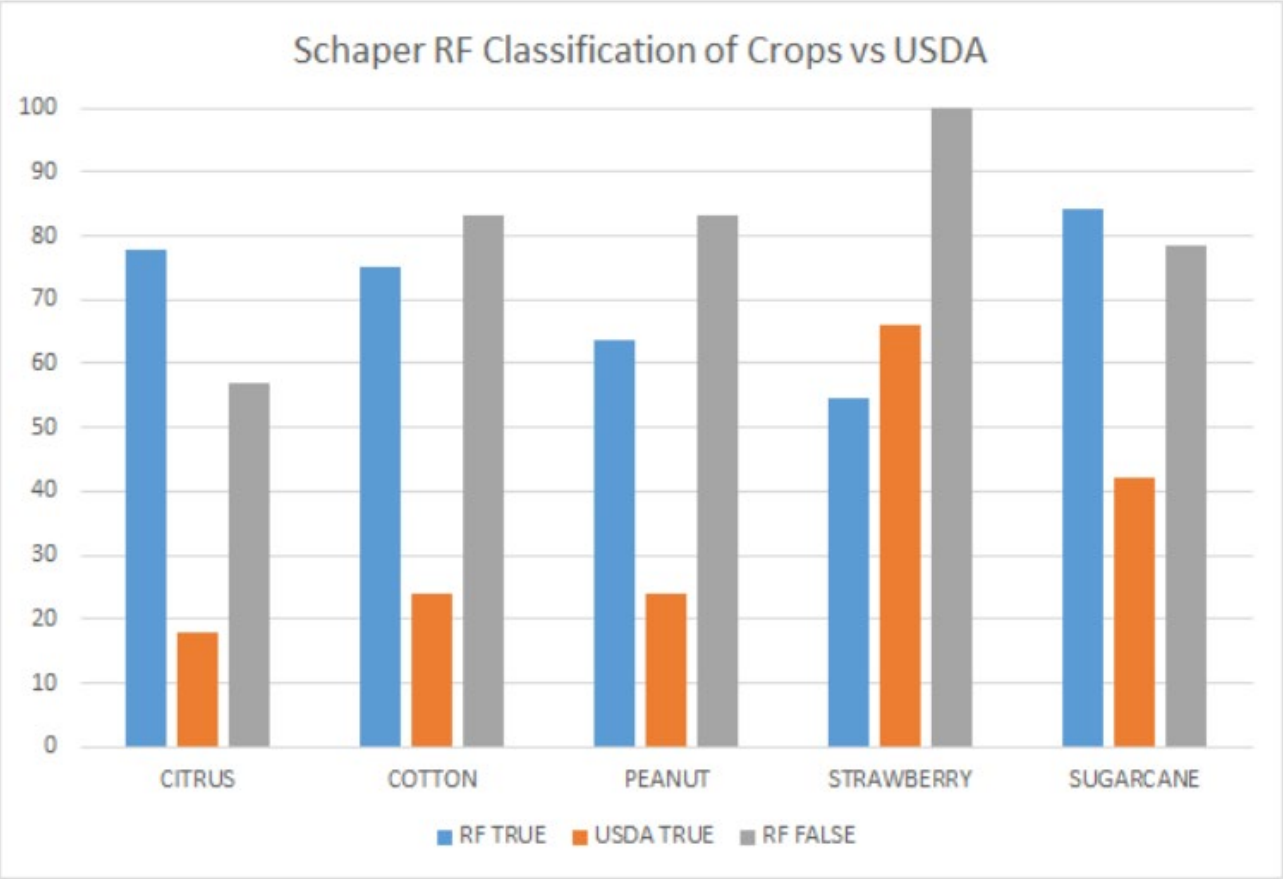
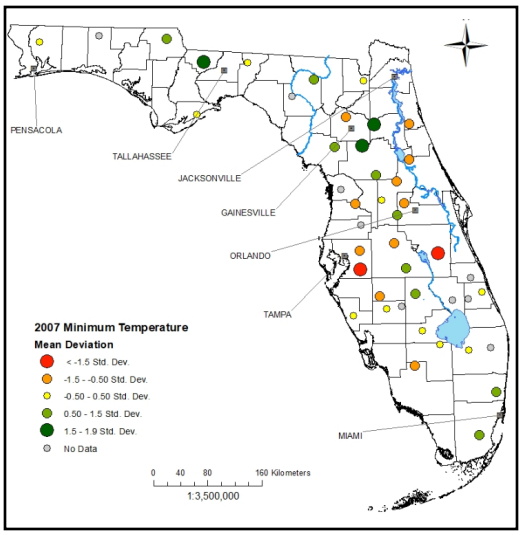
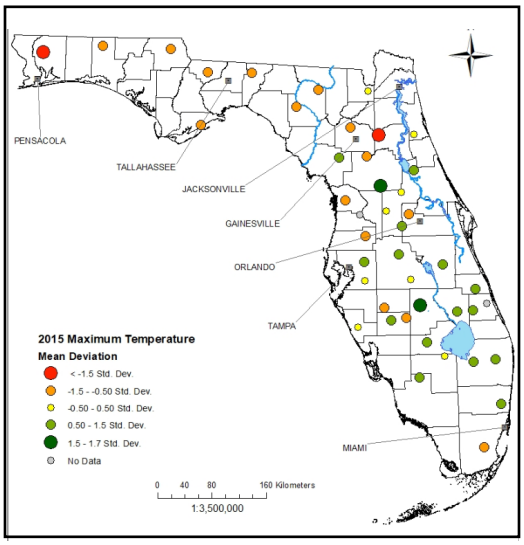


Figure 2. Comparison of USDA (orange) classifier and RF (blue) classifier in correctly identifying listed crops. The RF (gray) classifier's ability to exclude non-target crops. Vertical axis is % correct.

Meteorological Data Validation

The investigative team ensured Meteorological Data was valid for model input suspense. DayMet data were acquired from Oak Ridge National laboratory for 1 square kilometer (sq km) resolution for the entire region of mainland Florida. The sq km centered on each of the FAWN weather stations maintained by UF IFAS was identified for each weather station. A random sample of thirty days throughout the study years were selected and the deviation between the maximum, and minimum temperatures and precipitation between DayMet and FAWN (presuming FAWN is 'truth') was calculated. Average deviations of < 2 units was considered not significantly different. Results indicated that the DayMet data were within the range of acceptable error and could be used to estimate temperature and precipitation regimes within mainland Florida. (Figure 3)





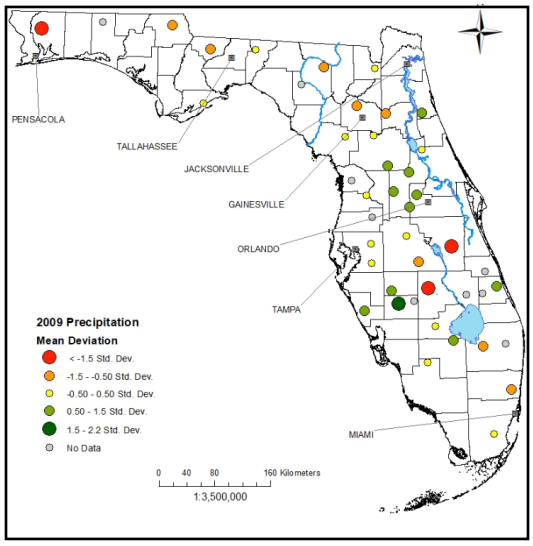


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Figure 3. Comparison of DayMet and FAWN meteorological data for mainland Florida. (Top) Minimum temperature, (Bottom, left) Maximum temperature, (Bottom, right) Precipitation. Note that the differences are < 2 Standard deviations indicating good concordance.

PISCA: Pesticide & Heat Stress Education for Latino Farmworkers That is Culturally Appropriate

PD/PI: Joseph Grzywacz
Co-PD/PI: Antonio Tovar-Aguilar

Overview

Farmworkers, the majority of whom are Latino immigrants from Mexico, experience elevated rates of occupational injury and illness. Chronic low-dose exposure to pesticides and extreme heat and humidity are major sources of poor occupational health outcomes. Recent revisions to the EPA's Worker Protection Standard (WPS-r) and growing concern over heat-related illness (HRI) necessitate the creation of safety education curricula that to minimize pesticide exposure and the deleterious effects of exposure to heat and humidity. Use of community health workers or *promotoras de Salud* (*promotoras*) is common in farmworker occupational health, but few WPS or HRI curricula have been developed for dissemination by *promotoras*, and there is scant evidence that *promotoras* are equally effective as "professional educators" who often have college degrees or highly specialized training in the cognate material. The overall goal of this project is to reduce poor health outcomes among Latino farmworkers resulting from exposure to pesticides and extreme heat and humidity. To achieve this goal the proposed project will build a community-advocate-university partnership to accomplish three primary aims. We will:

1. Create reproducible, culturally- and contextually-appropriate appropriate curricula for Latino farmworkers targeting pesticide exposure (suitable for meeting employer requirements under the revised WPS) and heat-related illness (HRI).

2. Determine the effectiveness of the developed pesticide and HRI curricula implemented by professional educators in promoting advocated safety behaviors.

3. Identify the comparative effectiveness of promotora-based implementation of developed pesticide and HRI curricula relative to the use of professional educators.

Key Accomplishments in 2017-2018

Cognitive Interviews and Assessments

The PISCA research team conducted cognitive interviews using a demonstrated "think aloud" protocol wherein a question is read to the participant and the participant explains the meaning of the question in their own words. The cognitive interviews were used to inform the pre- and post- assessments, which required modification to address ambiguity found in question meaning, or to minimize difficulty selecting valid responses. Assessment development is complete – cognitive interviews confirmed that participants understood the content and intention of the questions, and that they were able to place responses into the options provided.

Phase I Results Submitted for Publication

The PISCA team analyzed the data from Phase I of the project, and developed and submitted a manuscript. That manuscript is currently under review by the American Journal of Public Health.

Finalized PISCA Curricula and Facilitator Guides

Substantial effort this year was placed on ensuring optimal design for the PISCA curricula. The PISCA research team, working closely with a team of instructional designers from, finalized the curricula to ensure visual appeal, enhance reinforcement of key concepts, and strengthen the cultural and contextual-relevance of the materials. The team also created Facilitator guides, ahead of schedule, to ensure seamless entry in to Phase III of the project.

Safety Training Sessions

The fundamental goal of the safety training sessions is to determine if the PISCA developed Worker Protection Standards (WPS) training materials perform comparably to those being developed by the EPA. Trainings began in March of 2018 and are anticipated to be completed by Project Year 3 in June 2019.

- Year 2 training sessions were scheduled in partnership with local community partners and stakeholders approximately 3-4 weeks in advance.
  - Lake Park Georgia
  - Tifton, Georgia
  - Dundee, Florida
  - Homestead, Florida

- One of three curricula – EPA WPS-r, ***PISCA*** WPS-r, or ***PISCA*** HRI – were randomly assigned to each scheduled training session.

- Participants did not know which curricula they receive upon arriving to the training.

- Follow-up assessments are implemented 3 months after training to capture changes in behavior related pesticide safety and prevention of heat-related illness.

- In Year 2 a total of 120 Latino farmworkers were recruited and enrolled in either the ***PISCA*** WPS-r or ***PISCA*** HRI training sessions. The EPA WPS-r was not available for randomization until August 2018. Since August, 115 additional Latino farmworkers were recruited, enrolled, and randomized to one of the three interventions. Three-month follow up data were collected from 69 of those 115 farmworkers. Loss to follow-up is 23%, well-below the anticipated 33%.

Preliminary Findings

As hypothesized, multivariate analyses indicated that pesticide knowledge (Figure 1a) changed for individuals exposed to both curricula (perhaps because of a testing effect), but individuals receiving the ***PISCA*** WPS-r curricula changed more than those receiving the ***PISCA*** HRI curricula ($F(1) = 2.84$, $p < .05$). There was no evidence that individuals exposed to the ***PISCA*** WPS-r curricula improved in their behavioral intentions related to pesticides (Figure 1b), but behavioral intention changed more for those in the ***PISCA*** WPS-r curricula relative to those in the ***PISCA*** HRI curricula ($F(1) = 2.97$, $p < .05$). No evidence was found suggesting the PISCA WPS-r curricula resulted in changed attitudes about pesticides.

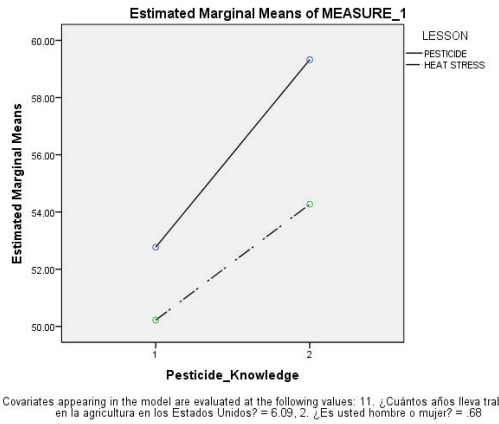

Figure 1a

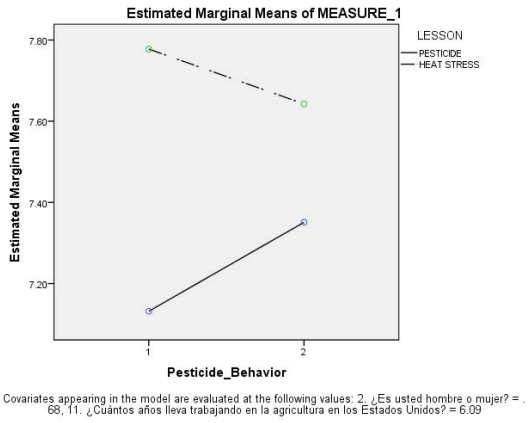

Figure 1b

Also as hypothesized, multivariate analyses indicated that heat stress-related knowledge (Figure 2a) changed more for individuals exposed to ***PISCA*** HRI curricula compared to the ***PISCA*** WPS-r curricula ($F(1) = 13.12$, $p < .001$). There was also evidence that that heat stress-related behavioral intention (Figure 2b) changed more for individuals exposed to ***PISCA*** HRI curricula compared to the ***PISCA*** WPS-r curricula ($F(1) = 6.85$, $p < .05$). No evidence was found suggesting the ***PISCA*** HRI curricula resulted in changed attitudes about heat-related illness.

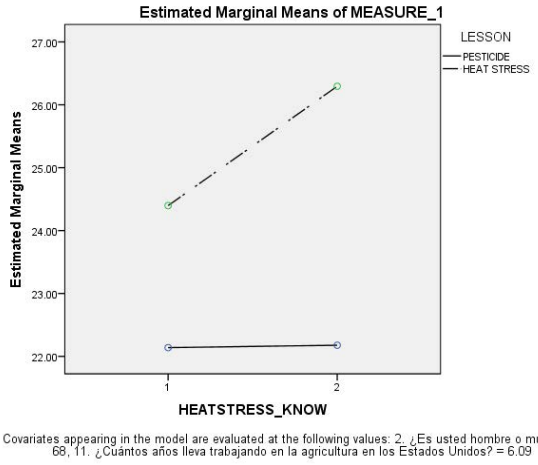

Figure 2a

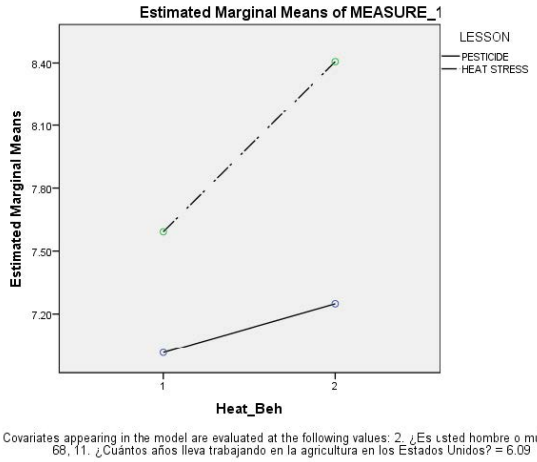

Figure 2b

Outreach and Dissemination

The PISCA investigative team continues to work closely with their Southeast communities to disseminate findings and build their network of key stakeholders. Nearly 1,000 Hispanic/Latino participants were reached during Year 2 outreach events. Year 2 outreach opportunities captured include the following:

- State of the Science Meeting: Health Related Illness, St. Petersburg, Florida
- East Coast Migrant Forum, Portland, Maine
- Midwest Migrant Stream Forum, New Orleans, Louisiana
- SCCAHS CSAB/ESAB Annual Meeting, Gainesville, Florida
- Migrant Farmworkers Clinic, Quarterly Meetings, Lake Park, Georgia
- Familia Adelante Training, Valdosta, Georgia
- Echols County Fall Festival, Statenville, Georgia
- Jennings Fall Festival, Jennings, Florida
- Echols County Career Day, Echols County High School, Statenville, Georgia
- Valdosta Latino Networking Monthly Meeting, Valdosta, Georgia
- Fiesta Latina, Lake Park, Georgia
- Peach State Hispanic Heritage Month, Moultrie, Georgia
- Lowndes County College Day, Valdosta, Georgia

Publications and accepted national conference abstracts include the following for Year 2:

Grzywacz, J. G., & Allen, J. W. (2017). Adapting the Ideas of Translational Science for Translational Family Science. *Family relations*, 66(4): 568-583. PMID: 29422702

Grzywacz, J.G., Gonzales-Backen, M.A., Aguilar Tovar, A., Marin, A., Trejo, M., Ordaz Gudino, C., Garcia Rendon, M., & Liebman, A.K. (2018*). Improving pesticide and heat stress knowledge among Latino farmworkers: Phase I of* ***PISCA***. American Public Health Association Annual Meeting. November, 2018. San Diego, CA.

Tovar-Aguilar, A., (April 10, 2018). A Web of Immigration and Labor Regulation and How it Binds Farmworkers. *American Association of Geographers Annual Meeting*. New Orleans, LA.

Tovar-Aguilar, A., (April 4, 2018). Translating Scientific Research on Heat Related Illness into Extension Education for Florida Farmworkers. *Society for Applied Anthropology Annual Meeting*. Philadelphia, PA.

Heat Stress and Biomarkers of Renal Disease

PD/PI: Linda McCauley
Co-I: Vicki Hertzberg
Project Manager: Valerie Mac

Overview

In recent years there has been a marked increase in the occurrence of Chronic Kidney Disease (CKD) in agricultural workers in Mesoamerica. The potential mechanism for this increase in this occupational population remains elusive, but is thought to possibly be associated with working in hot environments causing recurrent dehydration leading to decreased renal blood flow, high demands on tubular reabsorption and increased levels of uric acid or perhaps activation of the fructokinase pathway in the kidney resulting in chronic tubular injury resulting in fibrosis. In this exploratory study we will measure physiological indicators of heat stress in farmworker populations in Florida and incorporate a metabolomics approach to enhance our understanding of the pathways through which perturbation of renal function occurs in farmworkers working in hot environments. We propose to investigate whether the biomarkers of renal damage shown in the Mesoamerica region are also present among farmworkers from similar ethnic backgrounds who have immigrated to the U.S. to work in agriculture. (Figure 1)

Figure 1. Farmworker Association of Florida Office, Homestead, FL next to an okra field.

Key Accomplishments in 2017-2018

Training

Five Community Health Workers (CHWs) were hired and trained from local communities to assist in the implementation of study procedures in community settings. CHWs were on-site in Homestead, FL to disseminate project information and administer questionnaires and surveys April through August 2018. A three-hour training was implemented for six Emory University project personnel, followed by on-site training in Homestead, FL (approximately 10 hours per person). The training curriculum included collection of biological samples, biomonitoring equipment, equipment software and biological sample storage.

Figure 1. Farmworker Association of Florida Office, Homestead, FL next to an okra field.

Accrual

Data collection has been completed. Baseline, pre-work, post-work, and osmolarity/renal function data from treatment and comparison groups in Homestead, FL was collected between April and August 2018. Sixty-two fernery workers were recruited along with 28 non-agricultural workers from the comparison group. Frozen samples were obtained for analysis at our Emory laboratory, and were safely transported back to Emory. Preliminary data analysis is underway.

In September 2018, biological samples were inventoried and prepped for the analysis of kidney biomarkers and metabolomics that will begin in November 2018.

Outreach and Dissemination

The investigative team met with an environmental horticulture specialist, Miami-Dade County Extension Agent Vanessa Campoverde, to facilitate collaboration with growers and allow for additional recruitment access. Working closely with local extension agents and growers was a Year 2 priority to bring attention to heat-related illness and to develop avenues for future dissemination of research findings. Ms. Campoverde learned about project recruiting needs and conducted a site visit of data collection in a nursery learn about the research process and assist with recruitment of other interested growers. Dr. Mac attended a training on H2A worker hiring and completed recruitment outreach throughout Year 2. In August 2018, the project conducted a heat illness prevention training for crew leaders, growers and farmers build relationships with growers and farmers.

Publications and presentations include the following:

Mac, V.V.T., Herzberg, V., and McCauley, L.A. (2018). Examining Agricultural Workplace Micro and Macroclimate Data Using Decision Tree Analysis to Determine Heat Illness Risk. *Journal of Occupational and Environmental Medicine*. [Epub ahead of print] PMCID: 30335678

Mac, V.V.T. and McCauley, L. (2017) Farmworker Vulnerability To Heat Hazards: A Conceptual Framework. *Journal of Nursing Scholarship* 49(6): 617-624. PMID: 28806486

Mix, J., Elon, L, Mac, V.V.T., Flocks, J., Tovar-Aguilar, A.J., Hertzberg, V.S., and McCauley, L.A. (2018). Hydration Status, Kidney Function, and Kidney Injury in Florida Agricultural Workers. *Journal of Occupational and Environmental Medicine*. 60(5):e253-e260. PMID: 29271837

Mutic, A.D., Mic, J.M., Elon, L., Economos, J., Flocks, J., Tovar-Aguilar, A.J., and McCauley, L.A. (2018). Classification of Heat-Related Illness Symptoms Among Florida Farmworkers. *Journal of Nursing Scholarship*. 50(1): 74-82. PMID: 29024370

J., Hertzberg, V.., McCauley, L.(June, 2018) Physiologic and Environmental Monitoring of Heat Hazards in the Girasoles Study of Florida Farmworkers. Poster presented at the NIDDK Chronic Kidney Diseases in Agricultural Communities Meeting, Bethesda, MD.

Mix, J., Elon, L. E., Hertzberg, V. S., Economos, J., Flocks, J., Tovar-Aguilar, A., & McCauley, L. A. (June, 2018) Work Intensity and Work Tasks in Florida Agricultural Workers. Poster presented at the NIDDK Chronic Kidney Diseases in Agricultural Communities Meeting, Bethesda, MD,

Mix, J., Elon, L. E., Hertzberg, V. S., Economos, J., Flocks, J., Tovar-Aguilar, A., & McCauley, L. A. (June, 2018) Work Intensity and Work Tasks in Florida Agricultural Workers. Poster presented at the NIDDK Chronic Kidney Diseases in Agricultural Communities Meeting, Bethesda, MD.

McCauley, L. (October, 2018). The Girasoles (Sunflower) Study: Exploring the Physiologic Heat Stress Response. Oral presentation. State of the Science Meeting, St. Petersburg, FL.

Pilot/Feasibility Program

J. Glenn Morris, Jr.
Farah A. Arosemena

Overview

The Pilot/Feasibility Program is a key component of the Southeastern Coastal Center for Agricultural Health and Safety (SCCAHS). This program will provide seed funds to stimulate original projects relevant to health and safety in the agricultural, forestry, and fishery (AFF) industries. Projects may include basic/etiologic research, translational research, intervention studies, and/or surveillance. Our goal is to provide early pilot/feasibility support to projects that ask innovative and important questions, and which lay the groundwork for subsequent research grant submissions or interventions, including outreach or extension projects. Some of the projects we select will be "high risk, high reward" novel ideas and approaches, with limited preliminary data, but with the potential for having a major impact. SCCAHS anticipates that most projects will provide preliminary/feasibility data for subsequent, larger proposals and projects. In our first year, the *Southeastern Coastal Center for Agricultural Health and Safety* awarded more than $56,000 to three pilot research projects to improve the safety and health of agricultural workers.

2017-2018 Pilot Grant Awards

SCCAHS recently announced its third round of pilot project requests for funding. The Pilot/Feasibility Program will provide seed funds to stimulate original projects relevant to health and safety in the agricultural, forestry, and fishery (AFF) industries. Projects may include basic/etiologic research, translational research, intervention studies and/or surveillance. The program's goal is to provide early pilot/feasibility support to projects that ask innovative and important questions, and which lay the groundwork for subsequent research grant submissions or interventions. The following pilot awards have been funded to date –

Pilot study of the acute psychological and health impacts of Hurricane Irma in UFAS extension workers Lynn Grattan, Pilot Project PI, University of Maryland

Uncovering patterns of mental, physical, and occupational health issues among migrant farmworkers with different socio-cultural networks: A pilot study among Haitian and Mexican farm workers in Immokalee, FL Gulcan Onel, Pilot Project PI, University of Florida

Chronic low back pain in seafood workers: a pilot intervention study to identify modifiable work and movement solutions Kim Dunleavy, Pilot Project PI, University of Florida

Pilot study of mobile app monitoring to prevent heat-related symptoms among Hispanic farmworkers Juan Luque, Pilot Project PI, Florida A&M University

Understanding the scope of the opioid epidemic for agricultural industries
Heidi Radunovich, Pilot Project PI, University of Florida

A novel approach (sweat patches) to monitoring pesticide exposure in farmworkers
Gregg Stanwood, Pilot Project PI, Florida State University

Agro-ecological practices in the face of climate change: Resilience, sustainability, and preparedness in Puerto Rico Antonio Tovar-Aguilar, Pilot Project PI, University of Florida

Emerging Issues Program

Joan Flocks, MA, JD

Overview

The Emerging Issues Program (EIP) works within the center to maintain connections with all projects, cores, advisory boards and other stakeholders to identify, prioritize, and address issues that appear during the life of the center. The tasks of the EIP include: identifying new AgFF worker safety and health issues in the region; prioritizing these issues; addressing prioritized emerging issues through small investments; and referring other emerging issues to appropriate resources.

Key Accomplishments in 2017-2018

Emerging Issues Forecast

Throughout Year 2 EIP participated with SCCAHS Internal Operations Committee meetings, the Outreach Core and key personnel from the Research Core. The EIP works closely with Core and Research Project PIs to share any issues they encounter during the course of their research. The following regional issues were considered priority areas in Year 2:

- Reproductive Health – Training collaboration with the Farmworkers Association of Florida and Emory University
- Domestic violence and reproductive health - Training offered by the Rural Women's Health Project (RWHP)
- Research field support to assist with implementation of culturally competent in-field data collection for SCCAHS Research Projects.

EIP participated in meetings with external organizations and individuals such as: the nationwide NIOSH Ag Center Directors, Florida Department of Agriculture and Consumer Services (FDACS), the Farmworker Association of Florida, the Rural Women's Health Project, the Institute of Food and Agricultural Sciences (IFAS) extension, the University of Florida Health Street, and the Southwest Center for Agricultural Health, Injury Prevention and Education.

Additional emerging issues identified during Year 2 included,

- Support for efforts by FDACS and IFAS Extension agents to provide training within the Florida agricultural industry on revised Worker Protection Standard respirator requirements.
- Internal and external meetings have led to multiple projects being organized and/or funded in collaboration with EIP.
  - **Updated FWAF/Emory Reproductive Health Training:** The training focuses on risks associated with reproductive health caused by occupational hazards such as pesticides and heat stress. The 2014 training curriculum was updated in mid-July. On August 22, 2018 the 60 minute revised training was presented to 4 FWAF staff members and 11 community members in Immokalee, Florida.

- **Extending training offered by the Rural Women's Health Project (RWHP):** Within the work of Project S.A.L.U.D., the RWHP is offering programming to Latinos in Levy, Alachua and Marion counties. Funding from EIP will support meetings on domestic violence for farmworker women in the Florida counties of Alachua, Marion and Levy to build participants' capacity to offer peer assistance to a person experiencing domestic violence. EIP funding will also be used to train community health workers in Marion County on reproductive health issues using the RWHP produced, *Pongamanos de Acuerdo* magazine and their interactive birth control education materials. On August 31, 2018 the RWHP, *Madres Sin Fronteras*, and Peaceful Paths held a domestic violence presentation with 12 women. On September 1, 2018 RWHP, the Ocala Farm Ministry, and Peaceful Path held a domestic violence presentation with 12 women. On September 13, 2018 RWHP trained 6 health workers on reproductive health.

- **Support for research assistants to assist with culturally competent in-field data collection for SCCAHS Research Projects.** A history of conducting community-based research projects with vulnerable populations such as farmworkers has revealed a need for students and research assistants to be trained in culturally sensitive in-field data collection methods. The EIP provided support to train research assistants to conduct in-field data collection in conjunction with SCCAHS research projects. EIP staff also assisted with data collection and research assistant training in Immokalee, Florida, from August 6-10, 2018.

Reapplication Planning Committee

EIP Director, Joan Flocks, Chaired the *Reapplication Planning Committee*. The Committee was formed to develop a strategy to continue along an upward trajectory to meet long-term goals and generate prospective Year 2021 specific aims. All available SCCAHS quarterly evaluation reports and publications were reviewed to identify strengths and weaknesses in advancing the scientific progress of SCCAHS. The EIP presented the Reapplication Planning Committee Final Report to SCCAHS IOC.

Publications/Presentations

Flocks J, Tovar JA, Economos E, Mac V, Mutic A, Peterman K, McCauley L. "Lessons Learned from Data Collection as Health Screening in Underserved Farmworker Communities." *Progress in Community Health Partnerships: Research, Education, and Action* 12:93-100, 2018.

Mix J, Elon L, Mac V, **Flocks J**, Economos E, Tovar-Aguilar AJ, Stover-Hertzberg V, McCauley LA. "Hydration Status, Kidney Function and Kidney Injury in Florida Agricultural Workers." *Journal of Occupational and Environmental Medicine* 60:e253-e260, 2018.

Mutic A, Mix J, Elon L, Mutic N, Economos J, **Flocks J**, Tovar-Aguilar JA, McCauley L. "Classification of Heat-Related Illness Symptoms Among Florida Farmworkers." *Journal of Nursing Scholarship* 50:1-9, 2017.

Flocks J. "Immigration Policy and Agricultural Labor in Florida" *University of Florida, Department of Agricultural Education and Communications Seminar Series,* Gainesville, FL, October 27, 2017.

Mutic A, Mix J, Elon L, Tovar J, **Flocks J**, Economos E, and McCauley L. "Classification of Heat Related Illness Symptoms among Florida Farmworkers." *American Public Health Association Annual Meeting,* Atlanta, GA, November 7, 2017.

Tovar J, Economos E, and **Flocks J**. "Community Based Research on Heat-Related Illness in Florida Farmworkers." *American Public Health Association Annual Meeting,* Atlanta, GA, November 7, 2017.

Flocks J. "Immigration, Farm Labor, and Food Justice" *University of Florida, Center for the Study of Race and Race Relations, Race Matters in the News Seminar Series,* Gainesville, FL, November 9, 2017.

Flocks J, Monaghan P, and Tovar-Aguilar A. "Southeastern Coastal Center for Agricultural Health and Safety (SCCAHS): Current Projects at the Newest NIOSH Center for Agricultural Disease and Injury Research, Education, and Prevention." *2018 North American Agricultural Safety Summit*, Scottsdale, AZ, February 21-23, 2018.

Tovar-Aguilar A and **Flocks J**. "A Web of Immigration and Labor Regulation and How it Binds Farmworkers." *American Association of Geographers Annual Meeting*, New Orleans, LA, April 10-14, 2018.

Flocks J, Grzywacz J, Tovar-Aguilar A, McCauley L, Mac V, Chicas R, Vulpe C, Roberts S, and Denslow N. "Current Occupational Heat and Pesticide Research in Southeastern Coastal States," (poster) *NIDDK-NIEHS Workshop on Chronic Kidney Diseases in Agricultural Communities*, Bethesda, MD, June 25-26, 2018.
http://www.sccahs.org/index.php/2018/07/11/joan-flocks-presents-on-behalf-of-sccahs-at-national-conference/

Flocks J. "The Environmental and Social Injustice of Farmworker Pesticide Exposure," (online guest lecture) for Vanessa Casanova's Environmental Justice class at the University of Texas Health Science Center at Tyler, July 11, 2018.

Bronstein J, Economos E, **Flocks J,** and Grzywacz J."Pesticides and Health: What We Need to Know" (panel) *19th National Our Community, Our Health Town Hall,* University of Florida Health Street, Gainesville, FL, August 29, 2018.
https://mediasite.video.ufl.edu/Mediasite/Play/e7e8e15cc65c462b93bfb0c1d22da2371d

Section III – Outreach Core

Project PI: Tracy Irani
Ricky Telg; Lisa K. Lundy; Angela B. Lindsey; Martie Gillen; Paul Monaghan

The Outreach Team leads a comprehensive Core, providing knowledge transfer support for the Research Core and Pilot/Feasibility Program, integration with all proposed educational and extension activities, and effective and culturally competent communication, and information dissemination to stakeholders across the six-state region. The Outreach Core activities consist of disseminating relevant risk reduction interventions and research findings and promoting adoption of best practices in the agricultural and fishery workplaces.

Community Stakeholder Advisory Board

Overview

The semi-annual meetings of the Community Stakeholder Advisory Board (CSAB) serves as a means to update participants on the progress and results of ongoing research and also to develop outreach strategies, test messages and programs, and synthesize evaluation results.

Key Accomplishments in 2017-2018

At the start of Year 2, the Outreach Core was able to utilize their completed database of approximately 100 individuals who had an interest in the work of SCCAHS. In order to bring these individuals together to provide more information about the center, a Community Stakeholder Advisory Meeting was held on October 24, 2017. The meeting was held simultaneously in three locations (Apopka, FL; Gainesville, FL; and Valdosta, GA) and was connected via ZOOM technology and Facebook Live for those who were unable to attend in-person. Objectives of the meeting were to raise awareness about the center, identify regional safety issues, determine potential CSAB members, and to obtain feedback regarding center goals.

After registering for the meeting, participants were asked to complete an online survey. In addition, data was collected via worksheets and note taking at each of the locations. Data was organized according to theme and category. Within the survey and at each of the locations, participants were asked to indicate if they would be willing so serve on the 20-member CSAB board.

- Through the information registrants provided, the Outreach Core was able to identify gaps in connecting a Southeast Region broader network of partners.
- Survey results provided insight into top issues that need to be addressed, resources gaps and needs, current best management practices, and potential community partners.
- The Outreach Core was able to identify potential CSAB members.

Twenty-five potential CSAB members were identified. Letters of invitation to join the CSAB were sent to potential members and, to date, 23 serve on the CSAB. The initial CSAB meeting was held jointly with the center's annual scientific advisory meeting on March 15, 2018, in Gainesville, FL.

Over the summer and fall 2018, the Outreach Core connected with the CSAB members through one-on-one meetings and, when possible, by attending the annual meeting for CSAB member organizations. Semi-structured interviews were conducted on member feedback on the board's evolving structure and perceptions about communications materials and messages that the Outreach Core is developing.

Now that the CSAB has been formed in its initial, Florida-centric incarnation, the Outreach Core is in the process of developing the board's structure in such a way as to accommodate expansion into the SCCAHS's ultimate six state regional configuration. CSAB members were chosen to represent five specific sectors – industry (agriculture, forestry, fisheries); Extension; farmworkers' organizations; regulatory and training organizations; and public agencies. As the center moves into other states in the coming year, a plan is needed to organize the growing membership and promote regional interaction. The Outreach Core sought feedback from CSAB members about the following organizational options:

- Regional Committees – Committees grouped by states (i.e. – North Carolina & South Carolina; Florida & Georgia; etc.). Committees would be required to meet independently twice a year (can be electronically) in addition to an annual group meeting to be held in Gainesville, FL.
- Organizational Committees – Committees grouped by industry, nonprofit, service, policy, etc. This would allow for mission-similar organizations to come together to advise the center. Committees would be required to meet independently twice a year (can be electronically) in addition to the yearly group meeting to be held in Gainesville, FL.
- Research/Topic Specific Committees – These committees would be grouped based upon the key research areas of the center. Committee members would advise for particular subject matter and research specific areas. Committees would be required to meet independently twice a year (can be electronically) in addition to the yearly group meeting to be held in Gainesville, FL.

Members' feedback will be compiled and analyzed in the fall, and the Outreach Core will follow up with all CSAB members with a survey to finalize any structural changes.

Additionally, the Outreach Core has reached out to agricultural health and safety experts in the six-state SCCAHS region in preparation for Year 3 tasks of engaging stakeholders outside of Florida. Conference calls were conducted with experts at the University of Georgia at Tifton, North Carolina Agromedicine Institute and North Carolina State University. The Outreach Core also spoke with faculty at the Sunshine Education and Resource Center (ERC) to develop formal relationships with these NIOSH-funded institutions, and will be following up with ERCs throughout the Southeast region as well.

The Outreach Core is developing an affiliate faculty program to enhance connections with stakeholders outside our center. Affiliate faculty will be informed about upcoming grant opportunities from SCCAHS, and will be invited to present webinars through SCCAHS channels on topics of their expertise.

Educational Materials and Digital/Social Media

Overview

A key element for success will be in translating what researchers learn and then moving these findings into best practices that can be disseminated throughout the region to diverse audiences of fishing, aquaculture, and agricultural sector families, workers, and employers. An overarching goal of the Outreach Core is to gain a better understanding of stakeholder perspectives by documenting their needs via needs assessment, engaging stakeholders in advisory and participatory group processes, and examining and testing the most effective and culturally relevant ways of reaching the target communities.

Key Accomplishments in 2017-2018

A community based social marketing (CBSM) approach, utilizing social marketing techniques with community organizing and engagement was led by Dr. Paul Monaghan and completed in Year 2. Focus groups and semi-structured interviews were conducted with seasonal farmworkers, year-round agricultural laborers and supervisors. Research participants were recruited, consented and participated in audio recorded focus groups/interviews. Focus groups and interviews were translated when applicable and transcribed for qualitative data analysis. In total 51 study subjects participated - 32 seasonal harvesters, 17 full-time employees and 2 supervisors. A number of constructs were identified and categorized into three broader themes that helped the Outreach Core better understand the barriers and facilitators to heat-related illness (HRI) prevention and behavior change:

1. Perception of supervisors: mistrust, lack of caring
2. Demands of agricultural work: piece rate work, heavy lifting/carrying, repeated actions, hydration practices
3. Culture of safety in the workplace: conditions in the fields, toilet availability

The CBSM team conducted trainings on HRI throughout Year 2. Dr. Paul Monaghan and Co-Investigator, Dr. Antonio Tovar, facilitated seminars and attended regional and national conferences that included the Florida Citrus Expo, The Southwest Florida Research and Education Center (SWFREC) Farm Safety Days, the Migrant Stream Forums, the Agricultural Safety and Health Council of America, the Central States Center for Agricultural Health and Safety Agrimedicine Course, the SCCAHS State of the Science Meeting and the American Public Health Association.

The use of CBSM resulted in successful practice change campaigns, tailored for hard-to-reach audiences and engaging local groups in collaborative efforts that address the real barriers to change in ways information-based campaigns cannot. The center's work on the Agricultural Safety Awareness Campaign provided a relevant social media toolkit to regional partners. The campaign reached 1,290 people on Facebook with an average reach of 145 people per day of the campaign. During the campaign, the SCCAHS's Facebook page received 93 clicks, 21 shares, 20 likes, and 14 comments. The center's Twitter activity garnered 2,411 impressions.

Social Media Analysis

Overview

In an effort to keep the center apprised of important agricultural health and safety topics, special attention was given to social networks such as Facebook and Twitter to listen to conversations related to agricultural safety and health. The sampling frame was Facebook posts and tweets identified through a Twitter search using the English and Spanish keywords, such as "agricultural safety," "farm safety," and "farm risk." If tweets and posts had links to articles, photos, or videos, this material was archived, coded, and analyzed. Influential voices in these conversations were identified that included, but were not limited to, media outlets, community leaders, and religious leaders. The objective was to listen to these voices to elevate the teams understanding of perceptions and increase capacity to develop messages that effectively communicate about agricultural safety and health in authentic ways.

Key Accomplishments in 2017-2018

The University of Florida/Institute of Food and Agricultural Sciences' Center for Public Issues Education in Agriculture and Natural Resources (PIE Center) led the utilization of cutting-edge communication techniques, including an interactive public outreach website containing information databases, downloadable print fact sheets for use by county extension faculty and Sea Grant agents, and brochures, video interviews, blogs, and social media.

The PIE Center provided access to Sysomos, a social media analysis program that allowed the team to examine Twitter and Facebook messages to inform a stronger understanding of emerging health-related topics.

1. The first objective was to describe the top five most authoritative influencers in Twitter agricultural health and safety issues conversations in Alabama, Georgia, Florida, Mississippi, North Carolina, and South Carolina.

2. The second objective was to describe the credentials and areas of specialty of the top five most authoritative influencers in agricultural health and safety issues conversation in Alabama, Georgia, Florida, Mississippi, North Carolina, and South Carolina.

Key findings included the following characteristics of the leading authoritative influencers, across Alabama, Georgia, Florida, Mississippi, North Carolina, and South Carolina, contributing to the agricultural health and safety conversation:

- Contributors had more than 55,000 followers
- All were considered social media influencers (beyond operational definition for this study)
- 1 out of 30 was a community marketing/promotion team
- 2 out of 30 were personal accounts
- 3 out of 30 were political officials (including the governor of Mississippi)
- None had direct connections to agriculture, food, or natural resources

In-Service Trainings

Overview

A core objective was to develop promotional tools and Extension In-Service Trainings (ISTs) to promote effective worker protection strategies and training of county Extension agents and Sea Grant Extension agents in Florida and Georgia for training delivery to crew leaders, workers, independent contractors, and supervisors in support of the findings from all of the research projects. In Year 2, four one-day training workshops webinars, and multiple train-the-trainer activities throughout the region were supported by the SCCAHS Outreach Core.

Key Accomplishments in 2017-2018

The Outreach Core created a list of over 200 agricultural Extension agents and County Extension Directors who were contacted to participate in a Needs Assessment Survey. Based on feedback, the first topic for Extension ISTs was identified as Worker Protection Standard respirator regulations. Dr. Paul Monaghan worked closely with the Outreach Core communications team to design IST webinars to distribute through the UF/IFAS Program Development and Evaluation Center to reach agricultural Extension agents and Directors.

During Year 2 farm risk-management themes were identified, including basic liability insurance, agritourism liability, worker liability, and health insurance. Webinar in-service training sessions were recorded for each topic. *An Overview of Risk Management and General Liability Insurance* was the first training released on March 5, 2018, in conjunction with the National Ag Safety Awareness campaign.

Seminars/Webinars

Overview

SCCAHS seminars/webinars in agricultural safety and health/occupational health are planned annually. The seminar/webinar series is intended to draw on SCCAHS investigators as well as external speakers. Seminars are webcast and archived on the SCCAHS website to facilitate inclusion of investigators at collaborating institutions.

Key Accomplishments in 2017-2018

The Outreach Core and Planning/Evaluation Core worked synergistically to host quarterly webinars in agricultural crew leader training, farm risk-management trainings, and general topic trainings. In Year 2 Quarter 2, a leading researcher in farmworker safety and SCCAHS research project PI, Linda McCauley, PhD, presented a seminar which convened on March 16, 2018. Dr.

McCauley, who is the Dean and Professor at the Emory University Nell Hodgson Woodruff School of Nursing, spoke about the evolution of academic/community partnerships between Emory University and the Farmworker Association of Florida. The partnerships have focused on farmworker health and safety issues, including pesticide exposure and heat-related illness.

Dr. McCauley discussed major findings, publications and future research directions. Her work with the Farmworker Association of Florida, as well as her published studies, shed light on the

health and safety challenges faced by agricultural workers throughout the state, specifically female farmworker health and the danger pesticides and other chemicals can pose to laborers in this sector. University of Florida faculty, staff, and CSAB members attended in the College of Public Health and Health Professionals.

The SCCAHS webinar series began in Year 2 Quarter 4. Webinars will initially feature host speakers who are Principal Investigators for research projects on the grant. The first webinar launched in Year 2 on September 18, 2018 with speaker Dr. Martie Gillen on the topic of assessing agricultural liability.

Communications

Overview

The Outreach Core prioritizes a connection with center leadership to develop messages for farm families, laborers, supervisors, and company owners (all the stakeholders) to communicate important points about workplace safety. These messages are developed with different frames to ascertain which frame will be most effective.

Key Accomplishments in 2017-2018

Dr. Lisa Lundy and Dr. Tracy Irani formulated a plan for message testing in 2018. The Outreach Core discussed key messages related to the center and to each research program. Key messages were revised and a framework developed to test messages with the Community Stakeholder Advisory Board through Cognitive Response Testing methods via in-depth interviews.

State of the Science Meeting

Overview

In Year 2 the *State of the Science* meeting was developed in response to feedback received across our center PI-to-PI meetings to disseminate progress. An organizing committee was formed and the meeting was designed to educate the Southeast regional academic community and frontline professionals on clinical and public health science driving new thinking in the prevention of heat related illness in agricultural, fishery, and forestry workers. It is anticipated that attendees will not only improve their knowledge of novel intervention approaches, but also leave the meeting with a stronger purpose to apply innovative strategies in the field. Although this is the first State of the Science Meeting for SCCAHS, it is anticipated that the meeting will become an annual SCCAHS event dedicated to the latest research in an emerging issue.

Key Accomplishments in 2017-2018

The final quarter of project Year 2 was dedicated to planning time for the State of the Science meeting focusing on heat related illness. Areas of responsibilities included: 1) venue selection and contract management; 2) content and design of the meeting web site and program; 3) promotion materials and marketing; 4) budget support; 5) poster abstract submissions and review; 6) keynote speakers; 7) local organization; 8) awards; 9)audio visual services; and 10)

published proceedings framework for Year 3. The meeting was convened in Quarter 1 of Year 3 on October 25-26, 2018. Dr. Tracy Irani, Outreach Core Director, will follow-up on discussions with journals to publish the conference proceedings and a webinar will be implemented and co-hosted with the Sunshine Education and Research Center for CSAB members.

Publications and Presentations

Tovar J.A., (September 10-12, 2018). Processes of Development and Implementation of Training Conducted by Community Health Workers. *Midwest Migrant Stream Forum*. New Orleans, NA.

Mitchell, R.C. (August 15-16, 2018). Southeastern Coastal Center for Agricultural Health and Safety. *Citrus Expo.* Ft. Meyers, FL. Available at: https://public.3.basecamp.com/p/5M5WdbGzHTWYoA3TTPw5zzsb

Monaghan, P., (July 10-13, 2018). The Role of Labor Supervisors in Florida Citrus and Vegetable Production and How that Shapes Safety Behaviors. *University of Nebraska Medical Center Agricultural Health and Safety Course*. Omaha, NE.

Monaghan, P., (April 3-7, 2018). Preliminary findings. *Society for Applied Anthropology Annual Meeting.* Philadelphia, PA.

Section IV – Evaluation Program

Overview

A formal monitoring and evaluation strategy is an interwoven component of SCCAHS. The Evaluation Program provides a framework to for longitudinal, center-wide evaluations to assess the processes, outcomes and impact of program and core activities; assists the leadership team in developing and implementing evaluation plans/logic models; and provides quarterly reporting as well as accountability information to the sponsoring agency.

The Evaluation Program aims to 1) Engage stakeholders to maintain a responsive and focused evaluation program; 2) Collect relevant monitoring and evaluation data from the center as a whole, the Outreach Core, and individual research projects; 3) Analyze and interpret data to establish the quality and effectiveness of the center as a whole, the Outreach Core, and the individual research projects; 4) Report and share evaluation findings and recommendations with key stakeholders; and 5) Maintain an open line of communication and engagement with other Ag Centers across the country.

Key Accomplishments in 2017-2018

Indicators and Data Reporting

The Evaluation Program developed indicators based on the grant submission narrative and subsequently developed logic models for each research project, program and Core. Indicators are organized into forms describing activities and products, and are assigned to SCCAHS team members annually to assess and improve center projects, infrastructure, and overall performance.

Utilizing this process-oriented evaluation complements standard traditional measures of research output (e.g., peer-reviewed publications, participant accrual, influence on practice and policy), especially in the early years of a multidisciplinary center. Information generated by process evaluation is useful for the SCCACS Internal Operating Committee, Community Stakeholder Advisory Board and the External Scientific Advisory Board to inform approaches that improve overall efficiency and quality of the research process and program implementation.

Quarterly data reporting systems were tailored to each program or Core, and were designed to not only help researchers track their own activities and products, but to determine fidelity to project timelines and goals. Once reporting data were collected, the EP summarized the activities and products, and sent them back to project and core leaders. They were then posted on the SCCAHS project management website. The data reporting process facilitates open communication with programs and cores ensures improved efficacy and efficiency in reporting progress to stakeholders and funders.

Developing/Adapting Tools for Measuring Center-wide Hallmarks

The Evaluation Program provided logic models to help the SCCAHS leadership identify the key relationships and transactions between the different elements that make up the center; this results in a more dynamic and productive interaction among the center's cores and programs. Utilizing the logic models as a guide, the Evaluation Program keeps in regular contact with

internal stakeholders, such as project PIs and project staff about upcoming reporting, and to identify efficient ways to integrate evaluation and monitoring activities in their projects as their information needs evolve. To better prepare for quarterly data collection, the evaluation team developed a plan to review the indicators calendar for each project at the first IOC meeting of the quarter and fill in any questions about what will be due at the end of the upcoming three-month period.

Return on Investment

With the development and implementation of monitoring/process evaluation, the Evaluation Program team began planning its approach to measuring the impact of the Center as a whole. The Evaluation Program met with Co-Investigator, Dr. Fritz Roka to discuss strategies to evaluate return on investment. Dr. Roka explained that outcomes for his current crew leader training project include fewer fines and lawsuits because employers are made aware of what can lead to punishable violations. A barrier for agricultural safety training is that other than required EPA worker protection standards training, safety trainings are not mandatory. Typically, only farms that are concerned with public perception of the treatment of their workers participate in non-required training programs. As an industry, agriculture is very focused on the bottom line, so a worker safety and health program that can increase worker production would be seen as more attractive by employers. These programs could focus on how worker productivity is affected by heat stress, ergonomic strains, warm-up exercises or breakfast provisions.

Employers who recruit H-2A Temporary Agricultural Program workers might be more amenable to adopting non-mandatory training because of the high financial investment in these contracted workers. Employers want their workers to be healthy enough to make it through the entire growing season and to return to their farm the following season. This is in contrast to employers who use domestic, "at will" workers who are not under contract to work at their farms. Dr. Roka suggested that trainings could be more effective if the intended audience is crew leaders rather than workers, seeing that workers are often not empowered to make health and safety decisions in the field, where crew leaders are. The return on investment impact is on higher level when trainings are done with employers-- crew leaders also work with crews of 25 workers, meaning they can disseminate their training to dozens of workers.

Following the discussion with Dr. Roka, the Evaluation Program reviewed the most recent annual reports from other NIOSH funded Ag Centers to learn how they have evaluated return on investment. Examples of return on investment included a cost/benefit rubric and an economic evaluation of an injury prevention course for youth and adult farmers. The Evaluation Program will broaden the scope of the overarching center evaluation plan to include an approach that explores return on investment in implementing interventions that promote health and well-being and stronger adherence to occupational safety of workers – specifically as it relates to heat-related illness, which is one of the Center's core areas of work. (Figure 1)

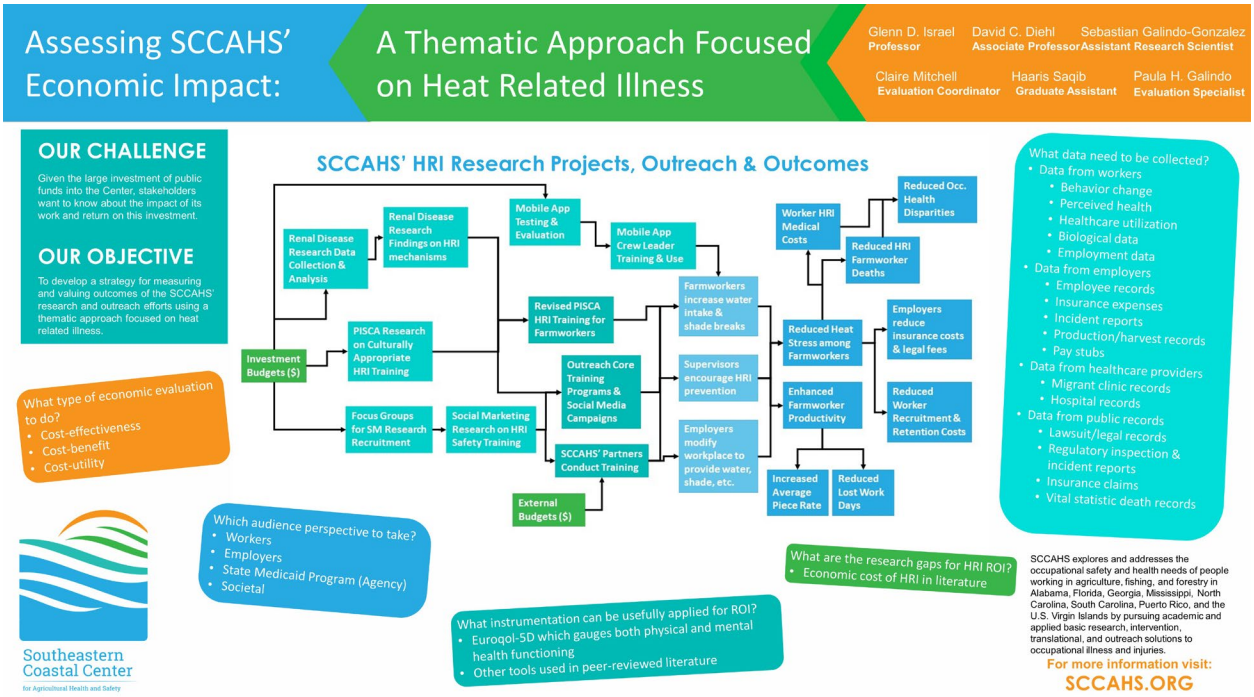

Figure 1. Assessing SCCAHS: Economic Impact

Publications and Presentations

Galindo-Gonzalez, S., Mitchell, R. C., Diehl, D., Israel, G. D., Williams, D. F., Avalos, N., & McLoed, A. The agricultural safety and health innovation, information and knowledge system: Considerations for its evaluation. Poster presented at the annual conference of the International Society for Agricultural Safety and Health, Halifax, Nova Scotia, Canada, June, 2018.