A. OVERALL COVER PAGE

Project Title: Southeastern Coastal Center for Agriculture Health and Safety (SCCAHS) - Overall	
Grant Number: U54OH011230	**Project/Grant Period**: 09/30/2016 – 09/29/2022
Reporting Period: 09/30/2021 – 09/29/2022	**Date Submitted**: 01/18/2023
Program Director/ Principal Investigator John Glenn Morris, Jr. MD, MPH&TM Director jgmorris@epi.ufl.edu 352-273-7526 Emerging Pathogens Institute P.O. Box 100009 Gainesville, FL 32610	**Administrative Official Information** Stephanie Gray Assistant Vice President ufawards@ufl.edu 352-392-9267 Division of Sponsored Programs 207 Grinter Hall P.O. Box 115500 Gainesville, FL 32611
Change of Contact PD/PI: No	
Human Subjects: No	**Vertebrate Animals:** No
hESC: No	**Inventions/Patents:** No

B. OVERALL ACCOMPLISHMENTS

B.1. What are the major goals of the project?

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 to design and implement interdisciplinary research and educational projects 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.

SCCAHS focus areas and associated research projects include the following:

1. Coastal fishery worker safety and health (Research Project: Occupational health and safety surveillance of Gulf seafood workers)
2. Heat stress (Research Project: Heat stress and biomarkers of renal disease)
3. Pesticide/herbicide exposure (Research Project: Extent of agricultural pesticide applications in Florida using best practices)
4. Innovative approaches to foster research to practice (Research Project: Pesticide and heat stress education for Latino farmworkers through culturally appropriate training).

The overarching goals of the Center include the following:

1. Provide occupational safety and health education and training to the agriculture, fishing, and forestry workforce.
2. Bring evidence-based, safety and health programs, developed through the other NIOSH-funded agricultural centers into the southeastern coastal region.
3. When appropriate, translate programs into Spanish, and assist in supporting multilingual training efforts throughout the region.
4. 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.
5. Conduct further research and applied projects based on needs as they arise.

B.2. What did you accomplish under these goals?

OVERALL OUTCOMES/ACHIEVEMENTS

Planning and Evaluation Core

A. Center Administration

The Planning and Evaluation Core of SCCAHS provides leadership, infrastructure, logistic support, surveillance, biostatistical and evaluation support to enhance research and the translation and dissemination of findings. Year 5 continues to provide central Center administration:

Coordination of awards. Support is provided to the fiscal administration of Research Core awards at UF and for its regional partners. In Year 5 Extended this included technical guidance for R01/R21 projects and two active pilot

awards. Financial management includes budget preparation, development of subcontracts, purchasing, account management and financial reporting according to the policies and guidelines of the CDC and the University. Administration of the Pilot and Feasibility Grants Program. In the supplemental year, seed funding was continued for Drs. Kimberly Dunleavy and Eric Coker.

Biostatistical Support. Dr. Yang Yang assists key personnel with experimental design, power calculations, data management, and data analysis. Dr. Yang met with Research Core and Pilot/Feasibility Program researchers for data analysis and proposal writing. Dr. Yang worked with renewal application PIs to develop statistical methods for new projects.

Center Oversight and Personnel Management. Monthly Internal Operating Committee meetings were convened interactions with external scientific experts and organizations continued. Management of personnel includes reporting on personnel productivity and evaluation.

The Administration is also responsible for communication and information exchange between Center members, regional partner institutions, and the larger agricultural and fisher community. The Administration distributes information of value to Center members using email and the Center website, which the Outreach Core maintains and updates. Administration Core oversees the financial health of the Center and readily collaborates with other University of Florida colleges/departments and other NIOSH Ag Centers to share
resources.

A.1. Administration Task 1: Coordinate/integrate Center components and activities. The
Planning/Administrative Core lead the coordination of internal and external reporting, including progress reports and budget management (i.e. purchasing, subaward invoice processing, monitoring expenditures, approval routing).

Working closely with all Center key personnel and staff, the Final Annual Report was developed. Administration consistently communicates with the Outreach Core communication and media specialists to maintain a web presence. The Center's primary website is http://sccahs.org.

The Center renewed a one-year license to BASECAMP for Year 5 Extended. The value/use of Basecamp's primary features are to do lists, milestone management, forum-like messaging, file sharing, and time tracking. These tools proved to be valuable in our effort to facilitate communication between and amongst the cores and projects.

Administration Task 2: Organize and staff advisory boards and key SCCAHS committees. The Internal Operations Committee (IOC) is made up of Center Director, Glenn Morris; Deputy Director, Andrew Kane; Director of Emerging Issues, Joan Flocks; Director of Evaluation, Glenn Israel; Outreach Core Director, Traci Irani; and each of the Research Core and pilot project PIs. The IOC meeting facilitates core/research project participation across the center. This committee meeting is held the first Friday of each month.

Program PI-to-PI/Director meetings are convened bi-annually to review progress with the Center Director, Glenn Morris, and the Program Manager Farah Arosemena across all Cores and Programs.

Year 5 extended continued with four external scientific advisors Drs. Robert McKnight, BarbaraLee, Judith McKenzie and George Rust.

- Dr. Robert McKnight, retired
- Dr. Barbara Lee, Senior Research Scientist, National Farm Medicine Center & Director of National Children's Center for Rural and Agricultural Health and Safety,
- Judith McKenzie, MD, MPH, FACOEM, Professor, Division Chief, Residency Program Director, Division of Occupational Medicine; Department of Emergency Medicine, Ground Silverstein, University of Pennsylvania Perelman School of Medicine
- George Rust, MD, MPH, Professor & Director, Center for Medicine and Public Health, School of Medicine, Florida State University.

A.2. Administration Task 3: Provide administrative support for Center. Throughout Year 5 Extended Farah Arosemena served as the front-line manager to each Core and Program within the Center – an essential link between key personnel and administration. The Center continues to prioritize surveillance in Year 5 to have a stronger baseline profile of the state of farmworker and fisher health so that we can improve on impact evaluation and better design activities and projects that have the greater potential to lead to the prevention of injury and disease. Although projects in the Research Core offer active, population-based surveillance, Administration is exploring the geographic distribution of chronic disease/injury and associated cultural, occupational, environmental health and built-environment factors of Florida farmworkers. Establishing a surveillance program that partners with UFs One Florida, the Florida Department of Health, Federally Qualified Health Centers and the National Center for Farmworker Health (NCFH) will help support outreach, the pilot/feasibility program and the renewal application to identify and examine emerging patterns in agricultural/fisher worker health.

- Implemented electronic health records (EHR) surveillance opportunities with William Hogan, MD, MS, Director of Biomedical Informatics, Clinical Translation Science Institute. Dr. Hogan will work with the Center and participating Federally Qualified Health Centers to embed EHR from farmworkers and fishers into the UF Health Integrated Data Repository (IDR), a large- scale database that collects and organizes information from across UF Health's clinical and broader research enterprises. The IDR will enable the Center to identify the state of the health of Southeast U.S. farmworkers and fishers and support stronger measurement of health impact from Ag Center interventions implemented.

- Implemented renewal wastewater-based epidemiology (WBE) surveillance approaches with Tara Sabo-Attwood, PhD, SCCAHS Senior Advisor and Chair/Professor of Global Environmental Health. WBE is a rapid and cost-effective technique that measures human metabolic excretion products in wastewater as indicators of the health of a population. This tool provides near real- time information on a *community scale* about health, lifestyle behaviors and wellness without the need for individualized testing/monitoring. This approach has been successfully used to determine population level exposures to chemicals of concern (i.e. pesticides, metals), mental health (i.e. suicide mortality, depression), antibiotic resistance, and pathogen transmission. WBE has also been applied to estimate illicit drug consumption that include drug targets of common concern (i.e. cocaine, amphetamine, hydrocodone) and the emergence of new psychoactive substances. Measuring biological products that are excreted into sewer systems as a measure of 'health' has several advantages over routine public health/epidemiology methods and approaches, such as surveys; (1) wastewater analysis is not subject to response/non-response bias; (2) trends can be determined over short time frames and therefore can serve as an early

warning or hot spot locator; (3) identification of true drugs of pathogens are determined by molecular approaches rather than recollection/belief; (3) contemporary non-targeted chemistry approaches can identify new emerging drugs; It is important to note that comparing data obtained from WBE with data obtained through other indicators (i.e. surveys, medical records) is an important area of continued work.

B.3. Competitive Revisions/Administrative Supplements

Not Applicable

B.4. What opportunities for training and professional development did the project provide?

Not Applicable

B.5. How did you disseminate the results to communities of interest?

The results have been disseminated across regional, national and international meetings and by publication in the Journals of Occupational and Environmental Medicine, Nursing Scholarship, Safety, and Agromedicine. The Outreach Core provides 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 consisted of disseminating relevant risk reduction interventions and research findings and promoting adoption of best practices in the agricultural and fishery workplaces.

B.6 - What do you plan to do during the next reporting period to accomplish the goals?

Final Report - Renewal award began 9/30/22.

C. OVERALL PRODUCTS

C.1. Publications, conference papers, and presentations
2021 – 2022 Publications

Chicas, R. C., Elon, L., Houser, M. C., Mutic, A., Gallegos, E. I., Smith, D. J., Modly, L., Xiuhtecutli, N., Hertzberg, V. S., Flocks, J., Sands, J. M., & McCauley, L. (2022). The Health Status of Hispanic Agricultural Workers in Georgia and Florida. *Journal of immigrant and minority health*, *24*(5), 1129–1136. https://doi.org/10.1007/s10903-021-01326-0 PMID: 34988908.

Flocks, J. and Espinoza, M. (2022). Historical and Current Insights on Environmental Health and Agricultural Guestworkers. *Ecology Law Quarterly,* 48:1015-1049.

Dunleavy, K., Bishop, M., Coffman, A., Reidy, J., & Kane, A. (2022). Chronic lower back pain in aquaculture clam farmers: adoption and feasibility of self-management strategies introduced using a rapid prototype participatory ergonomic approach. *International journal of occupational safety and ergonomics : JOSE*, *28*(3), 1829–1839. https://doi.org/10.1080/10803548.2021.1935543 PMID: 34121632; PMCID: PMC8738770.

Dunleavy, K., Kane, A., Coffman, A., Reidy, J., & Bishop, M. D. (2022). Outcomes of Participatory Ergonomics and Self-management in Commercial Clam Farmers with Chronic Low Back Pain: A Feasibility Study. *Journal of agromedicine*, *27*(2), 217–231. https://doi.org/10.1080/1059924X.2021.2004961 PMID: 34772318.

Radunovich, H. L., Younker, T., Rung, J. M., & Berry, M. S. (2022). The Effects of the Opioid Crisis on Agricultural Industries. *International journal of environmental research and public health*, *19*(9), 5343. https://doi.org/10.3390/ijerph19095343 PMID: 35564739; PMCID: PMC9103207.

Glass, G. E., Ganser, C., & Kessler, W. H. (2021). Validating Species Distribution Models With Standardized Surveys for Ixodid Ticks in Mainland Florida. *Journal of medical entomology*, *58*(3), 1345–1351. https://doi.org/10.1093/jme/tjaa282 PMID: 33386731; PMCID: PMC8122235.

Irani, T., Pierre, B. & Nesbit, T. (2021). Agricultural Professionals' Perceptions of COVID-19 and Occupational Health and Safety. *Journal of International Agricultural and Extension Education.* https://doi.org/jiaee.2021.28106

Irani T, Pierre, B. F, Nesbit, T.S. (2021). Agricultural stakeholders' perceptions of occupational health and safety in the Southeastern U.S. Coastal States. *International Journal of Environmental Research and Public Health,* 18(12):6605. https://doi.org/10.3390/ijerph18126605

Houser, M. C., Mac, V., Smith, D. J., Chicas, R. C., Xiuhtecutli, N., Flocks, J. D., Elon, L., Tansey, M. G., Sands, J. M., McCauley, L., & Hertzberg, V. S. (2021). Inflammation-Related Factors Identified as Biomarkers of Dehydration and Subsequent Acute Kidney Injury in Agricultural Workers. *Biological research for nursing*, *23*(4), 676–688. https://doi.org/10.1177/10998004211016070 PMCID: PMC8726423.

Gorucu, S., Weichelt, B., Diehl, D., & Sebastian, G. (2021). An Overview of Agricultural Injuries in Florida from 2015-2019. *Journal of agricultural safety and health*, *27*(3), 135–146. https://doi.org/10.13031/jash.14533 PMID: 34350746.

2021 – 2022 Presentations

Arosemena, FA, Flocks, J, & Morris, JG. (2022, September 28-29). *Addressing the scarcity of Florida farmworker data: Using geographic information systems to assess vulnerability in H-2A and migrant labor camp housing* [Poster Presentation]. International Society of Exposure Science 2022 "From exposure to human health: New developments and challenges in a changing environment" Lisbon, Portugal. https://intlexposurescience.org/

Lindsey, A., McLeod-Morin, A., Lundy, L., Irani, T., & Telg, R. (2022). *Using Communication Toolkits to Expand Extension Efforts Related to Agricultural Health and Safety Topics.* Abstract presented at the 2022 Extension Professional Associations of Florida Annual Meeting, Panama City, FL.

McLeod-Morin, A., Lundy, L., Lindsey, A. B., Kandzer, M., Telg, R., Irani, T., Stokes, P., Castano, V., & Santa Maria, N. (2022). *It All Goes Back to Trust: A Qualitative Exploration of Extension Professionals' Perceptions of COVID-19 Vaccines in Rural Florida.* Abstract presented at the 2022 National Agricultural Communications Symposium, New Orleans, LA.

McLeod-Morin, A., Irani, T., Telg, R., Lindsey, A., & Lundy, L. (2022). *Empowering Extension Empowers Everyone: Developing Agricultural Health and Safety Outreach Materials for Cooperative Extension.* Abstract presented at the 2022 International Society for Agricultural Safety and Health Annual Conference, Fort Collins, CO.

Flocks, J. (2022). "Farmworkers and Heat-Related Illness" (invited presenter). *Farmworker Justice – Environmental Justice Symposium,* Online, May 18, 2022.

Flocks, J. (2022). "Agricultural Safety and Health" (invited presenter) with Serap Gorucu. *Florida Health Policy Leadership Academy*, Online, May 6, 2022.

Flocks, J. (2022). "Centering Unheard Voices: Community-Driven Collaboration for Health and Safety with Farmworkers in the U.S." (panel) with Becca Berkey, Maria Carmona, Jeannie Economos, Joseph Grzywacz, and Benita Lozano. *Northeastern University's Myra Kraft Open Classroom,* Online, March 2, 2022.

Flocks, J. (2021). Gators Going Green, Gainesville, FL, October 8, 2020. Presentation on farmworker health at University of California Davis law school panel, February 25, 2021.

C.2. Website(s) or other Internet site(s) – include URL(s)

The Outreach Core has developed multiple education and training videos, including webinars, related to topics of agricultural health and safety, such as heat-related illness, pesticide exposure, mental health, workplace-related illnesses, injuries, and deaths and COVID-19. Videos have been produced in both English and Spanish.

● COVID-19 Related Videos ○ Screening and testing video: https://www.youtube.com/watch?v=oAByapLmi0I&feature=youtu.be **awarded third place in the Educational Video Critique and Awards program by the Association for Communication Excellence.*

- Adapted CDC guidance video: https://www.youtube.com/watch?v=dZ-jn3V1C4U&feature=youtu.be
- Narrated PPT video for CDC guidance: https://youtu.be/9FWHMFi9NQE
- Narrated PPT video for CDC guidance (Spanish): https://www.youtube.com/watch?v=8z11u6fsyzE
- Face coverings (English): https://www.youtube.com/watch?v=6QZQvUDYvus
- Face coverings (Spanish): https://www.youtube.com/watch?v=VJEfF5SnScE
- Social distancing (English): https://www.youtube.com/watch?v=o0dWBoXCOZg
- Social distancing (Spanish): https://www.youtube.com/watch?v=kQAFBtTV-_c

● Heat-Related Illness Videos ○ How to Prevent Heat-Related Illness (English): https://vimeo.com/349769151 **awarded third place in the Educational Video for External Audience Critique and Awards program by the Association for Communication Excellence.*

○ How to Prevent Heat-Related Illness (Spanish): https://vimeo.com/351035856

Webinars

- **Serap Gorucu** November 17, 2021 Available Data Sources for Agricultural Injury Surveillance
- **Cindy Prins** October 28, 2021 What's Next? Understanding the current status of COVID-19 and future projections
- **Latoya O'Neal** January 20, 2022 Advancing Health Equity as a Core System Value
- **Dawn E. Burton** February 23, 2022 Practical Steps to Advancing Health Equity and Minimizing Bias in Health Related Programming Efforts
- **Erika Scott** March 9, 2022 Why Agriculture Remains Undercounted in Fatal and Non-Fatal Occupational Injury Surveillance Systems
- **Samantha Murray and Styliana Resvanis** April 27, 2022 Communicating with Vulnerable Populations about Pandemic Related Health Risks
- **David Buys** June 29, 2022 Film, Farmers, and Finding a New (Old) Tool for Education: On the Farm
- **Ashley McLeod-Morin** July 14, 2022 Emerging Topics and New Collaborations in the Southeastern Coastal Center for Agricultural Health and Safety

C.3. Technologies or techniques

NOTHING TO REPORT

C.4. Inventions, patent applications, and/or licenses

NOTHING TO REPORT

C.5. Other products and resource sharing

Awards

- **Third place people's choice poster**, 2022 National Agricultural Communications Symposium
  - *It All Goes Back to Trust: A Qualitative Exploration of Extension Professionals' Perceptions of COVID-19 Vaccines in Rural Florida*
- **Silver Award: Issue Management, 2022 Association for Communication Excellence**
  - COVID-19 Vaccine Information Campaign
- **Bronze Award: Publications for Diverse Audiences, 2022 Association for Communication Excellence**
  - COVID-19 Vaccine Translated Info Sheets
- **Gold Award Winner: Digital-only Publications, 2022 Association for Communication Excellence**
  - Mental Health in Agriculture Impact Report

Opioid Epidemic

Opioid use and abuse has been described as "a crisis" and "an epidemic" (CDC, 2021) in American society (Paulozzi, 2006). The impacts have had far-reaching consequences in families, communities, and workplaces in the agricultural industry. In response to this epidemic, the Outreach Core partnered with the Florida Nursery, Growers and Landscape Association (FNGLA) to develop and make available to FNGLA chapter members a set of the best online resources on opioids, with a special focus on opioids in the agriculture/environmental horticulture workplace. A webpage was created that housed resources related to prevention, treatment, and human resources related to the opioid epidemic, and a social media toolkit. This page received 154 page views.

COVID-19

The coronavirus pandemic sparked an emerging issue disproportionately affecting the agricultural industry. In response to the threat and impact of COVID-19, the Outreach Core created and developed two toolkits for Extension professionals. The first toolkit was comprised of curated resources, which included social media messages, images, videos, and infographics that Extension professionals could share on their own social media platforms and web pages (http://www.sccahs.org/wp-content/uploads/2020/08/COVID-19_ExtentionToolkit.pdf). This toolkit was developed for agricultural supervisors and Extension to help deliver a COVID-19 training program to agriculture, forestry, and fishery (AgFF) supervisors and workers, and curated based on CDC materials and resources that were adapted to meet the needs of workers in the region. This toolkit received second place in the Crisis Communication Critique and Awards program by the Association for Communication Excellence.

The second toolkit was developed to support rural communities; agricultural communities; workers in agriculture, fishing, and forestry; and Extension professionals in the Southeastern coastal region to help them communicate about the COVID-19 vaccine (http://www.sccahs.org/wp-content/uploads/2021/03/COVID-19-Vaccine-Toolkit-3.9.pdf). Resources in this toolkit included expert contacts, frequently asked questions and informational sheets, social media messages and graphics, a sample guest news column, outside links to trusted sources, a messaging schedule, and best practices for communication. The content was developed in partnership with experts in public health and epidemiology, and UF Health developed a similar toolkit for their stakeholders based on the toolkit developed by SCCAHS.

Ag Centers' Evaluators, Coordinators and Outreach (ECO) Group

The Center will continue to collaborate with other NIOSH-funded Ag Centers through the Evaluators, Coordinators, and Outreach (ECO) group. In 2012, the ECO group launched with the goal to enhance cross-center collaboration through 1) sharing resources and learning, and 2) workgroups focused on collective outreach campaigns. With a

membership of 74 center personnel across all currently funded Centers and select NIOSH representatives, the ECO group meets regularly and functions as a foundation for center collaboration and public communications for the national AFF safety and health initiative. ECO works in close collaboration with the NIOSH/CDC. Workgroups include **Awareness** – safety campaigns promoted through two nationally recognized events: National Farm Safety and Health Week and Ag Safety Awareness Program Week and **YouTube Channel** - a peer-reviewed channel for AFF produced educational videos. The ECO group also coordinates response efforts related to significant emerging issues like the COVID-19 pandemic, natural disasters mental health.

D. PARTICIPANTS

D.1. What individuals have worked on the project? Please include calendar, academic, and summer months.

Commons ID	S/K	Name	Degree(s)	Role	Cal	Aca	Sum	Foreign Org	Component(s)	Country	SS
JGMORRIS	Y	Morris, John Glenn	MPH,MD	PD/PI	6.21	0.0	0.0		Admin Core- 6237 (Planning& Evaluation Core)		N/A
ANDKANE	Y	Kane, Andrew Scott	BS,MS, PHD	Deputy Director and PI, Research Project	2.4/ 3.6	0.0	0.0		Admin Core- 6237 (Planning & Evaluation Core) Project-6239 (Occupational Health and Seafood Workers)		N/A
SABO123	Y	Sabo-Attwood, Tara	PHD	Senior Advisor	7	0.0	0.0		Admin Core- 6237 (Planning& Evaluation Core)		N/A
FAROSEMENA	N	Arosemena, Farah Adriana	MPH	Overall Program Coordinator	12.0	0.0	0.0		Admin Core- 6237 (Planning & Evaluation Core)		N/A
JFLOCKS	Y	Flocks, Joan	JD	Director, Emerging Issues Program	3.0	0.0	0.0		Admin Core- 6237 (Planning & Evaluation Core)		N/A
	N	Bisesi, Sarah E.	MS	Emerging Issues, Research Assistant	3.0	0.0	0.0		Admin Core- 6237 (Planning & Evaluation Core)		N/A
sgalindo	Y	Galindo, Sebastian	PHD	Co-Investigator, Evaluation Program	1.8	0.0	0.0		Admin Core- 6237 (Planning & Evaluation Core)		N/A

DCDIEHL	Y	Diehl, David Christopher	PHD,MA, BS	Co-Investigator, Evaluation Program	0.6	0.0	0.0		Admin Core-6237 (Planning & Evaluation Core)		N/A
GDISRAEL	Y	Israel, Glenn D	PHD	Associate Director, Evaluation Program	0.6	0.0	0.0		Admin Core-6237 (Planning & Evaluation Core)		N/A
	N	Ward, Cassandra	MS	Program Coordinator	12	0.0	0.0		Admin Core- 6237 (Planning & Evaluation Core)		N/A
HHASAN	N	Hasan, Hasibul		Graduate Research Assistant	3.6	0.0	0.0		Admin Core- 6237 (Planning & Evaluation Core)		N/A
yang@scharp.org	Y	Yang, Yang	PHD	Statistician	1.8	0.0	0.0		Admin Core- 6237 (Planning & Evaluation Core)		N/A
	N	Chun, Dain	MS	Graduate Student (research assistant)	6.0	0.0	0.0		Admin Core- 6237 (Planning & Evaluation Core)		N/A
amaurelli	Y	Maurelli, Anthony	PHD	Co-Investigator, GatorWatch	0.84	0.0	0.0		Admin Core- 6237 (Planning & Evaluation Core)		N/A
jhbisesi	Y	Bisesi, Joseph	PHD	Co-Investigator, GatorWatch	0.96	0.0	0.0		Admin Core- 6237 (Planning & Evaluation Core)		N/A
	N	Kozuch, Marianne		Lab Technician, GatorWatch	12	0.0	0.0		Admin Core- 6237 (Planning & Evaluation Core)		N/A
hoganwr	Y	Hogan, William	MD	Co-Investigator, OneFlorida EHR Surveillance	0..12	0.0	0.0		Admin Core- 6237 (Planning & Evaluation Core)		N/A
	N	Weinbrenner, Donald		Program Coordinator, OneFlorida EHR Surveillance		0.0	0.0		Admin Core- 6237 (Planning & Evaluation Core)		N/A
	N	White, Sonya			0.24	0.0	0.0		Admin Core- 6237 (Planning & Evaluation Core)		N/A
TAIRANI	Y	Irani, Tracy	PHD	Core Lead, Outreach Core		0.0	0.0		Core-6238 (Outreach Core)		N/A

RWTELG	Y	Telg, Ricky W	PHD,MS, BS	Co-Investigator, Outreach Core	1.8	0.0	0.0		Core-6238 (Outreach Core)		N/A
ABLINDSEY	Y	Lindsey, Angela B	PHD	Co-Investigator, Outreach Core	0.6	0.0	0.0		Core-6238 (Outreach Core)		N/A
LISALUNDY	Y	Lundy, Lisa	PhD	Co-Investigator, Outreach Core	0.96	0.0	0.0		Core-6238 (Outreach Core)		N/A
ASHLEYNMCLEOD	N	Mcleod-Morin, Ashley N		Marketing Specialist	12	0.0	0.0		Core-6238 (Outreach Core)		N/A
HRADUNOVICH	Y	Radunovich, Heidi	PHD	Co-Investigator	0.24	0.0	0.0		Core-6238 (Outreach Core)		N/A
MLGILLEN	Y	Gillen, Martie L	PHD,MBA, BA	Co-Investigator, Outreach Core	0.6	0.0	0.0		Core-6238 (Outreach Core)		N/A
	N	Stokes, Phillip		Education Specialist	0.6	0.0	0.0		Core-6238 (Outreach Core)		N/A
	N	Michael, Ashlyn Noelle		Graduate Research Assistant	6	0.0	0.0		Core-6238 (Outreach Core)		N/A
	N	Castano, Valentina		Graduate Research Assistant	6.0	0.0	0.0		Core-6238 (Outreach Core)		N/A
	N	Sadler, Katherine		Undergraduate Research Assistant	3.0	0.0	0.0		Core-6238 (Outreach Core)		N/A
BROOKSUF	N	Brooks, Ross M		Technician, Research Project	12.0	0.0	0.0		Project-6239 (Occupational Health and Seafood Workers)		N/A
	N	Rash, Rebecca	BA	Graduate Student (research assistant)	6.0	0.0	0.0		Project-6239 (Occupational Health and Seafood Workers)		N/A
CVULPE	Y	Vulpe, Christopher D.	BS, MD, P HD	Co-Investigator	1.0	0.0	0.0		Project-6244 (Heat and Pesticide Stress in the Kidney)		N/A

NDENSLOW	Y	Denslow, Nancy D	PHD,MS, BS	Co-Investigator	1.0	0.0	0.0		Project-6244 (Heat and Pesticide Stress in the Kidney)		N/A
MNOURIDEL AVAR	N	Nouridel avar, Moham madz Aman		Non-Student Research Assistant	0.5	0.0	0.0		Project-6244 (Heat and Pesticide Stress in the Kidney)		N/A
LSEARCY	N	Searcy, Louis Alan	BA	Research Assistant	3.0	0.0	0.0		Project-6244 (Heat and Pesticide Stress in theKidney)		N/A
	N	Munson, John W.		Technician		0.0	0.0		Project-6244 (Heat and Pesticide Stress in theKidney)		N/A
	N	Manrique, Andres	BS	Graduate Research Assistant		0.0	0.0		Project-6244 (Heat and Pesticide Stress in theKidney)		N/A
STEVEROBERTS	Y	Roberts, Stephen M	PHD	Co-Investigator	1.2	0.0	0.0		Project-6244 (Heat and Pesticide Stress in the Kidney)		N/A
john.roberts1	Y	Roberts, John F.	PHD	Co-Investigator	1.0	0.0	0.0		Project-6244 (Heat and Pesticide Stress in the Kidney)		N/A
JGRZYWACZ	Y	Grzywacz, Joseph G.	BS,MS,PH D	PI, Research Project	1.0	0.0	0.0		Project-6240 (PISCA)		N/A
JOSEANTON IOTOVAR	Y	Tovar, Jose Antonio	BA,MA, PHD	Co-PD/PI, Research Project	7.0	0.0	0.0		Project-6240 (PISCA) Project-6243 (Using Social Marketing…)		N/A
	N	Gudino, Cecilia Ordaz		Community Advocate	12.0	0.0	0.0		Project-6240 (PISCA)		N/A
	N	Morin, Antonio		Project Manager	2.4	0.0	0.0		Project-6240 (PISCA)		N/A
	N	Trejo, Mirabel		Field Coordinator	12.0	0.0	0.0		Project-6240 (PISCA)		N/A
MELINDA_G ONZALESBA CKEN	N	Gonzales-Backen, Melinda		Co-Investigator, Research Project	1.3	0.0	0.0		Project-6240 (PISCA)		N/A

Pmonaghan	Y	Monaghan, Paul		PI, Research Project	0.24	0.0	0.0		Project-6243 (Using Social Marketing…) Project 6242-Pilot/Feasibility Program		N/A
MMORERA	Y	Morera, Maria	PhD	Co-Investigator, Research Project	6.0	0.0	0.0		Project-6243 (Using Social Marketing…) Project 6242-Pilot/Feasibility Program		N/A
ERIC.COKER	Y	Coker, Eric	PHD	Co-Investigator, Research Core	2.4	0.0	0.0		Project-6239 (Occupational Health and Seafood Workers) Project 6242-Pilot/Feasibility Program		N/A

D.2 Personnel updates

a. Level of Effort: No
b. New Senior/Key Personnel: No
c. Changes in Other Support: No
d. New Other Significant Contributors: No

E. IMPACT

E.1 - What is the impact on the development of human resources, if applicable?

Not Applicable

E.2 - What is the impact the Public Health Relevance and Impact? The investigator should address how the findings of the project relate beyond the immediate study to improved practices, prevention or intervention techniques, legislation, policy, or use of technology in public health.

Refer to Core and Project sections.

F. CHANGES

F.1 – Changes in approach and reasons for change, including changes that have a significant impact on expenditures

Not Applicable

F.2 - Actual or anticipated challenges or delays and actions or plans to resolve them

COVID-19 had a major impact on research from March, 2020 (Year 4) through Year 5 Extended. Projects tackled their timelines and attempted to regain momentum in reaching milestone markers and complete aims as originally planned. Florida State University's Research Core project (PISCA, Joseph Grzywacz) faced overwhelming challenges with community health worker staff, a hallmark component in participant recruitment and outreach. The PISCA CHW's faced at a higher proportion of personal hardships related to the coronavirus. Dr. Grzywacz closed his project early in April 2022.

Although, activities were suspended in Year 4, CDC/NIOSH flexibilities allowed SCCAHS to mobilize and respond to the emerging needs of our Southeast communities. Throughout the crisis the Planning and Evaluation Core supported a Center-wide strategic plan (Figure 1) to partner and invest in activities to explore the differential burden experienced by farmworker/fisher communities and agricultural extension workers, create a repository of outreach materials to improve access to fundamental COVID-19 knowledge and prevention strategies, and to enhance testing of our Southeast underserved, under-resourced populations. SCCAHS key personnel have played leadership roles in the response to better understand the 2019 Novel Coronavirus, have initiated research partnerships and have collaborated in the set-up of a high-volume testing facility for SARS CoV-2 that served as a base for testing and associated outreach programs in farmworker and fisher community settings.

F.3 - Significant changes to human subjects, vertebrate animals, biohazards, and/or select agents

No Change

G. Special Reporting Requirements

G.1 Special Notice of Award Terms and Funding Opportunities Announcement Reporting Requirements

Nothing to Report

G.2 Responsible Conduct of Research

Not Applicable

G.3 Mentor's Research Report or Sponsor Comments

Not Applicable

G.4 Human Subjects

G.4.a Does the project involve human subjects?

Yes

G.4.b Inclusion Enrollment Data

Included with Research Core (Kane, Monaghan and Grzywacz).

G.4.c ClinicalTrials.gov

Not Applicable

Does this project include one or more applicable clinical trials that must be registered in ClinicalTrials.gov under FDAAA?

No

G.5 Human Subject Education Requirement

Are there personnel on this project who are newly involved in the design or conduct of human subject's research?

No

G.6 Human Embryonic Stem Cells (HESCS)

Does this project involve human embryonic stem cells (only hESC lines listed as approved in the NIH Registry may be used in NIH funded research)?

No

G.7 Vertebrate Animals

Does this project involve vertebrate animals?

Yes (Research Core, Christopher Vulpe)

G.8 Project/Performance Sites

University of Florida
Florida State University

G.9 Foreign Component

No

G.10 Estimated Unobligated Balance

The estimated total cost unobligated balance (including prior year carryover) is estimated at $377,895.37 (DC + IDC) or 20% of the Year 5 extended Overall total budget.

G.10.a Is it anticipated that an estimated unobligated balance (including prior year carryover) will be greater than 25% of the current year's total approved budget?

Not Applicable

G.11 Program Income

Is program income anticipated during the next budget period?

No

G.12 F&A Costs

Is there a change in performance sites that will affect F&A costs?

No

I. OUTCOMES

I. Provide a concise summary of the outcomes or findings of the award, written for the general public in clear and comprehensible language, without including any proprietary, confidential information or trade secrets

Note: project outcome information will be made public in NIH RePORTER

The Southeastern Coastal Center for Agricultural Health and Safety (SCCAHS) is organized around broad disciplines and capabilities, from occupational medicine, toxicology, environmental pathology, engineering, biomedical informatics, infectious disease, kinesiology, prevention research, and implementation science to address community burden and need, generate findings, and create tailored prevention and preparedness strategies. SCCAHS is driven by impact – delivering unique solutions for the Southeast and U.S. Caribbean (Virgin Islands and Puerto Rico) regions.

The SCCAHS overarching objectives to 1) provide occupational safety and health education and training to the AgFF workforce, 2) bring evidence-based, safety and health programs, developed through the other NIOSH-funded agricultural centers, 3) support multilingual training efforts throughout the region and 4) conduct research to practice projects were achieved by developing, implementing, and cultivating synergistic cores, programs and projects that represented reliable collaboration from community-based organizations and academic institutions in the region.

SCCAHS will broaden its reach in the renewal cycle by adding strengths, diversity and resources for public health research. The Specific Aims for the second funding cycle are focused on expansion, enhancement, and even greater added value to etiological, intervention, surveillance and translational research in our region.

A. COVER PAGE

Project Title: Planning and Evaluation Core	
Grant Number: U54OH011230	**Project/Grant Period**: 09/30/2016 – 09/29/2022
Reporting Period: 09/30/2021 – 09/29/2022	**Date Submitted**:
Program Director/ Principal Investigator John Glenn Morris, Jr. MD, MPH&TM Director jgmorris@epi.ufl.edu 352-273-7526 Emerging Pathogens Institute P.O. Box 100009 Gainesville, FL 32610	**Administrative Official Information** Stephanie Gray Assistant Vice President ufawards@ufl.edu 352-392-9267 Division of Sponsored Programs 207 Grinter Hall P.O. Box 115500 Gainesville, FL 32611
Change of Contact PD/PI: No	
Human Subjects: No	**Vertebrate Animals:** No
hESC: No	**Inventions/Patents:** No

B. ACCOMPLISHMENTS

B.1. What are the major goals of the project?

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 to design and implement interdisciplinary research and educational projects 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.

SCCAHS focus areas and associated research projects include the following:

1. Coastal fishery worker safety and health (Research Project: Occupational health and safety surveillance of Gulf seafood workers)
2. Heat stress (Research Project: Heat stress and biomarkers of renal disease)
3. Pesticide/herbicide exposure (Research Project: Extent of agricultural pesticide applications in Florida using best practices)
4. Innovative approaches to foster research to practice (Research Project: Pesticide and heat stress education for Latino farmworkers through culturally appropriate training).

The overarching goals of the Center include the following:

1. Provide occupational safety and health education and training to the agriculture, fishing, and forestry workforce.
2. Bring evidence-based, safety and health programs, developed through the other NIOSH-funded agricultural centers into the southeastern coastal region.
3. When appropriate, translate programs into Spanish, and assist in supporting multilingual training efforts throughout the region.
4. 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.
5. Conduct further research and applied projects based on needs as they arise.

B.2. What did you accomplish under these goals?

OVERALL OUTCOMES/ACHIEVEMENTS

I. CENTER ADMINISTRATION

The Planning and Evaluation Core of SCCAHS provides leadership, infrastructure, logistic support, surveillance, biostatistical and evaluation support to enhance research and the translation and dissemination of findings. Year 5 continues to provide central Center administration:

Coordination of awards. Support is provided to the fiscal administration of Research Core awards at UF and for its regional partners. In Year 4 this included technical guidance for four R01/R21 projects and five active pilot awards. Financial management includes budget preparation, development of

subcontracts, purchasing, account management and financial reporting according to the policies and guidelines of the CDC and the University.

Administration of the Pilot and Feasibility Grants Program. In Year 5 Extended seed funding was continued for Drs. Kimberly Dunleavy and Eric Coker. Oversight of progress and grant forecasting with Pilot PIS was handled through the Planning and Evaluation Core.

Biostatistical Support. Dr. Yang Yang provided biostatistical expertise and support for data analysis and reporting of funded research projects. Qualitative data support was available for consultation at all stages of development of a study and Dr. Yang provided services in the following areas:

- refining study objectives, research questions and identifying key variables,
- power analysis
- choosing the data collection methods and instruments that will best accomplish the investigator's objectives,
- managing and preparing quantitative data for analysis,
- conducting and interpreting quantitative analyses of research data, and
- reporting research results, including development of abstracts, presentations for professional meetings, and manuscripts submitted to professional journals.

Center Oversight and Personnel Management. Monthly Internal Operating Committee meetings were convened interactions with external scientific experts and organizations continued. Management of personnel includes reporting on personnel productivity and evaluation.

The Administration is also responsible for communication and information exchange between Center members, regional partner institutions, and the larger agricultural and fisher community. The Administration distributes information of value to Center members using email and the Center website, which the Outreach Core maintains and updates. Administration Core oversees the financial health of the Center and readily collaborates with other University of Florida colleges/departments and other NIOSH Ag Centers to share resources.

A. Administration Task 1: Coordinate/integrate Center components and activities. The Planning/Administrative Core lead the coordination of internal and external reporting, including progress reports and budget management (i.e. purchasing, subaward invoice processing, monitoring expenditures, approval routing). Working closely with all Center key personnel and staff, the Year 4 Annual Report was developed. Administration consistently communicates with the Outreach Core communication and media specialists to maintain a web presence. The Center's primary website is. The Center renewed a one-year license to BASECAMP for Year 5. The value/use of Basecamp's primary features are to do lists, milestone management, forum-like messaging, file sharing, and time tracking. These tools proved to be valuable in our effort to facilitate communication between and amongst the cores and projects.

B. Administration Task 2: Organize and staff advisory boards and key SCCAHS committees. The Internal Operations Committee (IOC) is made up of Center Director, Glenn Morris; Deputy Director, Andrew Kane; Director of Emerging Issues, Joan Flocks; Director of Evaluation, Glenn Israel; Outreach Core Director, Traci Irani; and each of the Research Core and pilot project PIs. The IOC meeting facilitates

core/research project participation across the center. This committee meeting is held the first Friday of each month. Program PI-to-PI/Director meetings are convened bi-annually to review progress with the Center Director, Glenn Morris, and the Program Manager Farah Arosemena across all Cores and Programs. Year 5 Extended of SCCAHS continued with four external scientific advisors Drs. Robert McKnight, Barbara Lee, Judith McKenzie and George Rust.

- Dr. Robert McKnight, retired
- Dr. Barbara Lee, Senior Research Scientist, National Farm Medicine Center & Director of National Children's Center for Rural and Agricultural Health and Safety,
- Judith McKenzie, MD, MPH, FACOEM, Professor, Division Chief, Residency Program Director, Division of Occupational Medicine; Department of Emergency Medicine, Ground Silverstein, University of Pennsylvania Perelman School of Medicine
- George Rust, MD, MPH, Professor & Director, Center for Medicine and Public Health, School of Medicine, Florida State University.

Administration Task 3: Provide administrative support for Center. Throughout Year 5 Extended the Program Manager served as the front-line manager to each Core and Program within the Center – an essential link between key personnel and administration. As research productivity, outreach activities and evaluation oversight increased, SCCAHS had an expanded reliance upon the Coordinator to maintain open lines of communication with PIs and Directors, informing them on University and grantee agency policies and guide them through central/departmental administration. Bi-weekly meetings occurred with the College of Public Health & Health Professions Grants Core to navigate University and agency requirements, manage post-award spending and work with investigators to ensure spending compliance with federal regulations.

As part of administration support, the Center has made surveillance a priority in Year 5 to have a stronger baseline profile of the state of farmworker and fisher health so that we can improve on impact evaluation and better design activities and projects that have the greater potential to lead to the prevention of injury and disease. Although projects in the Research Core offer active, population-basedsurveillance, Administration is exploring the geographic distribution of chronic disease/injury and associated cultural, occupational, environmental health and built-environment factors of Florida farmworkers. Establishing a surveillance program that partners with UFs One Florida, the Florida Department of Health, Federally Qualified Health Centers and the National Center for Farmworker Health will help support outreach, the pilot/feasibility program and the renewal application to identify and examine emerging patterns in agricultural/fisher worker health.

Administration Task 4: Provide biostatistical support for research projects. The biostatistical support is led by Yang Yang, Professor, Department of Biostatistics at the University of Florida. The biostatistics group is a shared Center-wide resource for biostatistical consulting and related methodological research. During Year 5, Dr. Yang and the Graduate Assistant, Hasibul Hasan, have provided valuable biostatistical support to each Research Core and Pilot Program PI.

- Convened meetings with investigative teams to review progress and the data collection timeline.

- Provided statistical expertise in the design of studies, including sample size determination, plans for interim and final analysis, and writing statistical components of manuscripts.
- Reviewed integrity and statistical soundness of human subjects studies.

II. Evaluation Program

The Evaluation Program provides leadership and guidance to connect program activities and goals for strengthened PI evaluation capacity and improved quality measurement. This includes building strategic relationships and collaborations with other universities, organizations, and professionals in agricultural health and safety. Center activities were significantly derailed in 2020 due to the COVD-19 pandemic, shifting some the program focus and initiatives while still seeking to meet evaluation program goals: 1) Engage stakeholders to maintain a responsive and focused evaluation program and 2) Collect relevant monitoring and evaluation data from the center as a whole, the Outreach Core, and individual research projects.

The Evaluation Program provided leadership and guidance to connect program activities and goals for strengthened PI evaluation capacity and improved quality measurement.

- The team joins the PI-to-PI/Director meetings to review ongoing work through the lens of each project's logic model – assisting PIs/Director's in connecting their short-term outcomes with broader long-term goals.
- Expanded Extension follow-up study data analyzed and disseminated to Extension leadership and academic community
- Completion of NIOSH cross-center heat-related illness contribution analysis project
- Progress on development of novel common evaluation framework and impact assessment approach
- External Learning Evaluation exercise results shared internally were used to inform strategic planning efforts across the center

III. Emerging Issues Program

The Emerging Issues Program (EIP) explores critical community concerns. EIP is charged with providing a better understanding of the nature and cause of farmworker health disparities so that research PIs and the Outreach Core can have a better understanding of community research priorities and work synergistically to address concerns and develop solutions. Continued comprehensive research on the H-2A temporary agricultural guestworker program, and regional farmworker health for publications in *Journal of Immigrant and Minority Health and Ecology Law Quarterly.*

- Continued support and consultation for researchers applying for extramural funding to investigate field-based interventions to prevent heat-related illness and chronic kidney disease among agricultural workers.
- Provided input and support for ongoing SCCHAS research on agricultural worker housing in Florida.
- Made presentations on community-based research with agricultural workers; heat-related illness; and general agricultural worker health to Northeastern University's Myra Kraft Open

Classroom; Farmworker Justice's symposium on environmental health; and the Florida Health Policy Leadership Academy.

- Prepared public comment document re: the Advanced Notice of Proposed Rulemaking for the Heat Injury and Illness Prevention in Outdoor and Indoor Work Settings Docket No. OSHA 2021-0009 on behalf of a group of community-based and academic researchers who have worked together for more than a decade to address occupational and environmental health concerns, including heat exposure and heat-related illness (HRI), facing farmworkers in the United States. https://www.regulations.gov/comment/OSHA-2021-0009-0678
- Reviewed and provided commentary on the Farm Bill Law Enterprise's June 2022 Report on Farmworkers, developed to provide concrete recommendations for the 2023 Farm Bill. *http://www.farmbilllaw.org/wp-content/uploads/2022/06/Farmworkers-Report.pdf*

B.3. Competitive Revisions/Administrative Supplements

Not Applicable

B.4. What opportunities for training and professional development did the project provide?

NOTHING TO REPORT

B.5. How did you disseminate the results to communities of interest?

The Planning and Evaluation Core worked with Outreach in the release of webinars.

B.6. What do you plan to do during the next reporting period to accomplish the goals?

Not Applicable for Final RPPR

PRODUCTS

C.1. Publications, conference papers, and presentations

Publications

Rainey, A.L., Loeb, J.C., Robinson, S.E., Davis P., Song, L., Lednicky, J.A., Coker, E., Sabo-Attwood, T., Bisesi, J.H., and Maurelli, A.T. Assessment of a mass balance equation for estimating community-level prevalence of COVID-19 using wastewater-based epidemiology in a mid-sized city. *Sci Rep* 12, 19085 (2022). https://doi.org/10.1038/s41598-022-21354-6 PMID: 36352013; PMCID: PMC9645338.

Chicas, R. C., Elon, L., Houser, M. C., Mutic, A., Gallegos, E. I., Smith, D. J., Modly, L., Xiuhtecutli, N., Hertzberg, V. S., Flocks, J., Sands, J. M., & McCauley, L. (2022). The Health Status of Hispanic Agricultural Workers in Georgia and Florida. *Journal of immigrant and minority health*, *24*(5), 1129–1136. https://doi.org/10.1007/s10903-021-01326-0 PMID: 34988908.

Flocks J and Espinoza M. (2021). Historical and Current Insights on Environmental Health and Agricultural Guestworkers. *Ecology Law Quarterly.* 48:1015-1049.

Houser, M. C., Mac, V., Smith, D. J., Chicas, R. C., Xiuhtecutli, N., Flocks, J. D., Elon, L., Tansey, M. G., Sands, J. M., McCauley, L., & Hertzberg, V. S. (2021). Inflammation-Related Factors Identified as Biomarkers of Dehydration and Subsequent Acute Kidney Injury in Agricultural Workers. *Biological research for nursing*, *23*(4), 676–688. https://doi.org/10.1177/10998004211016070 PMID: 34018403; PMCID: PMC8726423.

Conferences and Presentations

Arosemena, FA, Flocks, J, & Morris, JG. (2022, September 28-29). *Addressing the scarcity of Florida farmworker data: Using geographic information systems to assess vulnerability in H-2A and migrant labor camp housing* [Poster Presentation]. International Society of Exposure Science 2022 "From exposure to human health: New developments and challenges in a changing environment" Lisbon, Portugal. https://intlexposurescience.org/

Flocks, J. (2022). "Farmworkers and Heat-Related Illness" (invited presenter). *Farmworker Justice – Environmental Justice Symposium,* Online, May 18, 2022.

Flocks, J. (2022). "Agricultural Safety and Health" (invited presenter) with Serap Gorucu. *Florida Health Policy Leadership Academy*, Online, May 6, 2022.

Flocks, J. (2022). "Centering Unheard Voices: Community-Driven Collaboration for Health and Safety with Farmworkers in the U.S." (panel) with Becca Berkey, Maria Carmona, Jeannie Economos, Joseph Grzywacz, and Benita Lozano. *Northeastern University's Myra Kraft Open Classroom,* Online, March 2, 2022.

Anna Gonzalez, Jimmy DiLoreto, Mauro Colombo, Samantha Latsko, Cassandra Ward, Sebastian Galindo, Serap Gorucu, and Glenn D. Israel. "Examining Work-related Challenges of Extension Professionals during the COVID-19 Pandemic". Annual meeting of the Rural Sociological Society, Westminster, Colorado, August, 2022. Oral presentation.

David C. Diehl, Glenn D. Israel, July Nelson, Cassandra Ward, Damilola Ajayi, & Sebastian Galindo. "Work-Life Balance during the COVID-19 Pandemic: Impacts on Extension Professionals' Stress and Anxiety". Annual meeting of the Rural Sociological Society, Westminster, Colorado, August, 2022. Oral presentation.

Diehl, D., Nelson, J., Israel, G., Galindo, S. (pending). Changes in Work-Life Balance during the COVID-19 Pandemic: Insights from a Survey of Extension Professionals. Journal of Extension. Submitted February 2022.

Gonzalez, A., Di Loreto, J., Colombo M., Latsko, S., Ward, C., Galindo, S., Gorucu, S., Israel, G. "Examining Work-related Challenges of Extension Professionals during the COVID-19 Pandemic." Rural Sociological Society Conference. August 2022. Oral Presentation.

Israel, G. D., Gariton, C. E., & James, H. E. 2022. Anxiety Symptoms among Extension Professionals' During the COVID-19 Pandemic with the GAD-2. Journal of Rural Social Sciences, 37(2), Article 6. Available at: https://egrove.olemiss.edu/jrss/vol37/iss2/6

Nelson, J. (2022). "Developing a Common Evaluation Framework For The NIOSH Centers for Agricultural Safety and Health." International Society of Agricultural Safety and Health Conference. June 12-16, 2022. Oral Presentation.

C.2. Website(s) or other Internet site(s) – include URL(s)

www.sccahs.org

C.3. Technologies or techniques

Nothing to Report

C.4. Inventions, patent applications, and/or licenses

Nothing to Report

C.5. Other products and resource sharing

One Florida electronic health record methods working with Florida FQHCs
Migrant Labor Camps Inspection Reports Database

D. PARTICIPANTS

D.1. What individuals have worked on the project? Please include calendar, academic, and summer months.

Commons ID	S/K	Name	Degrees(s)	Role	Cal	Aca	Sum	Foreign	Country	SS

Refer to Overall Section D.1.

D.2 Personnel updates

a. Level of Effort: No
b. New Senior/Key Personnel: No
c. Changes in Other Support: Not Applicable
d. New Other Significant Contributors: No

E. IMPACT

E.1 - What is the impact on the development of human resources, if applicable?

Not Applicable

E.2 - What is the impact the Public Health Relevance and Impact? The investigator should address how the findings of the project relate beyond the immediate study to improved practices, prevention or intervention techniques, legislation, policy, or use of technology in public health.

Across the 5-year award and the 1-year extension, SCCAHS aimed to establish and sustain an impact on reducing morbidity and mortality in the AgFF workforce. The Planning and Evaluation Core was the center of strategic planning with PIs and Core/Program Leads to advance our activities to decrease adverse health

outcomes for this workforce disproportionately affected in comparison with other industrial sectors. SCCAHS was sensitive to regional work practices and how these practices can be modified and improved to increase protections for the worker population. Ag Centers should also attempt to facilitate the use and adaption of new approaches or best practices in similar segments of the workforce or regions of the country through collaboration and coordination with fellow Ag Centers, academic institutions, nonprofit entities, industry, and labor organizations.

In Year 5 Extended a surveillance program was added to the Planning and Evaluation Core. Two programs, GatorWATCH (wastewater analysis and tracking) and One Florida (development of a de-identified EHR database) were developed to provide the Center with a real time state of health for AgFF communities using water sampling and electronic health records. These programs complement current surveillance and epidemiologic studies of underserved working populations – GatorWATCH shows the impact of environmental science in context to public health and One Florida has the potential to improve clinical care in its next steps into the renewal exploring CKDu.

F. CHANGES

F.1 – Changes in approach and reasons for change, including changes that have a significant impact on expenditures

Not Applicable

F.2 - Actual or anticipated challenges or delays and actions or plans to resolve them

NOTHING TO REPORT

F.3 - Significant changes to human subjects, vertebrate animals, biohazards, and/or select agents

No Change

G. Special Reporting Requirements

G.1 Special Notice of Award Terms and Funding Opportunities Announcement Reporting Requirements

Not Applicable

G.2 Responsible Conduct of Research

Not Applicable

G.3 Mentor's Research Report or Sponsor Comments

Not Applicable

G.4 Human Subjects

G.4.a Does the project involve human subjects?

Not Applicable

G.4.b Inclusion Enrollment Data

Not Applicable

G.4.c ClinicalTrials.gov

Does this project include one or more applicable clinical trials that must be registered in ClinicalTrials.gov under FDAAA?

Not Applicable

G.5 Human Subject Education Requirement

Are there personnel on this project who are newly involved in the design or conduct of human subject's research?

Not Applicable

G.6 Human Embryonic Stem Cells (HESCS)

Does this project involve human embryonic stem cells (only hESC lines listed as approved in the NIH Registry may be used in NIH funded research)?

None

G.7 Vertebrate Animals

Does this project involve vertebrate animals?
None.

G.8 Project/Performance Sites

University of Florida

G.9 Foreign Component

Not Applicable

G.10 Estimated Unobligated Balance

The estimated total cost unobligated balance (including prior year carryover) is estimated at $125,005.81 (DC + IDC) or 14% of the Year 5 Extended Evaluation and Planning Core total budget.

G.10.a Is it anticipated that an estimated unobligated balance (including prior year carryover) will be greater than 25% of the current year's total approved budget?

Not Applicable

G.11 Program Income

Is program income anticipated during the next budget period?

Not Applicable

G.12 F&A Costs

Is there a change in performance sites that will affect F&A costs?

Not Applicable

I. OUTCOMES

I. Provide a concise summary of the outcomes or findings of the award, written for the general public in clear and comprehensible language, without including any proprietary, confidential information or trade secrets

Note: project outcome information will be made public in NIH RePORTER

The Planning and Evaluation Core serves as a critical component of the SCCAHS, with responsibility for Center leadership and successful implementation of the Center vision across all Cores and research projects. Central to the activities of the Center is a focus on defining disease burden, identifying current research needs, and assessing impact (burden/need/impact, or BNI). The Planning and Evaluation Core has maintained a robust, multiple channel communications strategy among investigators from partner universities, NIOSH, other NIOSH Centers for Agricultural Health and Safety, and the general scientific community. The Core facilitated meaningful dialogue on the planning and execution of the overall research plan and individual research projects, administration of resources, and sharing of the science behind the discoveries; and prioritized a cross-disciplinary collaborative environment. Additionally, the Core integrated monitoring and evaluation to document and assess if and how activities and products are contributing to positive health and/or safety impacts by reducing the identified burdens, determine if the implemented activities require modifications to better address the identified needs, and achieved a better understanding of the most important health and safety issues (i.e., actual or potential burdens) to be addressed in its geographic Southeast U.S. and Caribbean areas.

A. COVER PAGE

Project Title: Outreach Core	
Grant Number: U54OH011230	**Project/Grant Period**: 09/30/2016 – 09/29/2022
Reporting Period: 09/30/2021 – 09/29/2022	**Date Submitted**:
Program Director/ Principal Investigator Tracy Irani (Project Lead, University of Florida) John Glenn Morris, Jr. MD, MPH&TM (Overall)	**Administrative Official Information** Stephanie Gray Assistant Vice President ufawards@ufl.edu 352-392-9267
Change of Contact PD/PI:	
Human Subjects: **No**	**Vertebrate Animals:** **No**
hESC:	**Inventions/Patents:** **None.**

B. ACCOMPLISHMENTS

B.1. What are the major goals of the project?

The Outreach Core will be comprehensive in nature, providing knowledge transfer support for the proposed research projects, integration with all proposed educational and extension activities, and effective and culturally competent communication and information dissemination to stakeholders across the six state region. Outreach Core activities will align with the National Occupational Research Agenda (NORA AgFF) plan. Our outreach plan will follow NORA AgFF's Strategic Goal 3 – Outreach, Communications and Partnerships, which indicates the intention to "move proven health and safety strategies into agricultural, forestry and fishing workplaces through the development of partnerships and collaborative efforts" (CDC, 2013). As in the NORA AgFF plan, our outreach will consist of disseminating relevant risk reduction interventions and research findings and promoting adoption of best practices in the agricultural and fishery workplaces. Because we propose to establish a new AgFF Center, the Outreach Core will begin by carefully benchmarking the other NIOSH Ag Centers and engaging their Outreach Core personnel in discussions to determine what has been effective in agricultural safety and health outreach. Effective and efficient strategies and tools will be shared with project PIs and stakeholders and evaluated and adapted where possible. This sharing process will continue over the five year grant period, 2016-2021, and effective strategies that are developed by our new center will be shared with the other centers around the country.

Outreach strategies and approaches for this center will need to address potential barriers related to language and literacy levels of farm and fisheries workers and their families, differing agendas among stakeholders and differences in preferred information sources. Our outreach approach and strategy will utilize two-way participatory and social marketing strategies. This includes working with a Community/Stakeholder Advisory Board (CSAB) comprised of representatives of relevant stakeholders. The CSAB will be a significant research to practice mechanism designed to engage stakeholders, communicate research findings and review and evaluate interventions and materials. The outreach team will work in concert with research project PIs to solicit input on their findings from the CSAB, develop educational and communications materials, test key messages and message frames within these materials, and conduct content analysis of relevant media information sources utilized by target study populations. Findings will be utilized to develop and refine outreach materials and to inform training and workshop activities conducted by all project PIs. Outreach will be closely coordinated with the Planning and Evaluation Core to ensure that there is shared understanding of roles and responsibilities and scheduling of activities. The Outreach Core will work directly with the evaluation team on collection of data and evaluation of tools, including conducting a joint needs assessment to identify needs and gaps in year one of the project. The needs assessment will be utilized to help inform the communications strategies in the outreach plan as well as the overall development of the center and research pilot projects.

Specific Aims

1. Develop a robust, comprehensive plan to disseminate research to practice (r2p) findings and promote adoption of health and safety strategies in agricultural workplaces among the Center's target populations, including underrepresented, vulnerable and culturally diverse subpopulations.

2. Translate r2p best practices and approaches to the workplace through prevention and promotion activities targeted to farmworkers, farm employers and supervisors and farm family members.

3. Develop, test and implement culturally competent communications and education materials utilizing a wide range of traditional and social media on agricultural and seafood workers' health and safety issues.

B.2. What did you accomplish under these goals?

I. MAJOR ACTIVITIES

Specific Aim 1. Develop a robust, comprehensive plan to disseminate research to practice (r2p) findings and promote adoption of health and safety strategies in agricultural workplaces among the Center's target populations, including underrepresented vulnerable and culturally diverse subpopulations.

The Outreach Core 2021 State of the Science Meeting, Pathways to Health Equity in Agriculture, Fishery and Forestry represented cross-cutting research themes to enable the Center to more rapidly address health equity, injury and illness disparities and communication of pandemic-related health risks. The priority is to engage with regional experts in the fields of public health, occupational medicine, psychology, nursing, social work, community health worker training, public health and occupational health and safety to learn about research discoveries that can have the greatest impact on the health and well-being of farmworkers.

Planning of the 2023 State of the Science meeting began in Year 5 Extended. The meeting will be held on March 7, 2023 in Gainesville, FL. Topics will include climate change impact on heat stress, heat-related consequences, natural disasters
Breakout session focused on grant collaborations/ funding

Specific Aim 2. Translate r2p best practices and approaches to the workplace through prevention and promotion activities targeted to farmworkers, farm employers and supervisors and farm family members.

Eight webinars related to health equity, injury surveillance, and emerging resources in agricultural health and safety.

The Outreach Core hosted two meetings for the Community Stakeholder Advisory Board. One meeting, hosted in March 2022, served as a final meeting for the grant cycle, delivered final research updates, provided plans for the future. The other meeting, hosted in September 2022, welcomed many returning CSAB members as well as many new members. The newly restructured CSAB is more geographically representative of the center's catchment area. Valuable feedback was received that will be applied as the team embarks on new outreach initiatives that will build on the foundation built in the previous grant cycle.

Specific Aim 3. Develop, test and implement culturally competent communications and education materials utilizing a wide range of traditional and social media on agricultural and seafood workers' health and safety issues.

Development of Town Hall, Science by the Slice and Podcast Series

II. SPECIFIC OBJECTIVES

Communication with the Community Stakeholder Advisory Board (CSAB). The CSAB meets formally as a group with project staff twice a year. In addition, public education and outreach 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. SCCAHS seminars/webinars in agricultural safety and health/occupational health have proven reach to all stakeholders and academic partners. The seminar/webinar series adds to the library of outreach materials and 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.

The Outreach Core also welcomed Ashley McLeod-Morin, Ph.D. in October 2021 as the associate director of strategic communication. McLeod-Morin has been instrumental in building relationships with existing and new stakeholder partners in the agricultural community and applied research. McLeod-Morin has also led the planning of applied research projects focused on message testing and audience analysis that will guide the development of communication products related to agricultural health and safety. team members will personally meet with each of the board members during the summer months.

Monthly seminars/webinars in agricultural safety and health. The seminar/webinar series draws on SCCAHS investigators as well as external speakers. At least one of the sessions is devoted to short project presentations by investigators in the pilot/feasibility grant program. All seminars were webcast and archived on the SCCAHS website, to facilitate inclusion of investigators at collaborating institutions. The Outreach Core webcast all seminars, and the Public Issues Education (PIE) Center, led by Co-Investigator Ricky Telg, will ensure necessary facilities are available for webinar participation.

Website management. The outreach team strives to provide effective utilization of cutting edge communication techniques, including an interactive public outreach web site 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 website is continually maintained to more effectively display the resources that SCCAHS has curated for users.

Social media updates. Communication strategies continue to have fewer posts on social media to allow new staff members to determine an effective social media plan to promote the research being conducted by affiliates of SCCAHS, provide resources on agricultural health and safety topics, and highlight researchers with the center.

III. OUTCOMES AND ACHIEVEMENTS

The goals of the Outreach Core were to translate and disseminate research-to-practice (r2p) findings in the agricultural, fishery and forestry sectors, develop and implement inclusive communications, and grow the Center's network to foster valuable collaborations. These goals were accomplished through the use of traditional and innovative media efforts and effective collaborations with industry stakeholders.

Since its inception in 2016, the Center's audience growth has reached 2,370 email subscribers, 586 social media followers, and 44,000 website views with an annual average growth of 36% year over year. The Center's Outreach Core has hosted a series of ongoing training and development opportunities, including 27 webinars, seven Community Stakeholder Advisory Board Meetings, four State of the Science research events with over 35 unique presentations, and eight issue guides, white papers, and Extension documents. The Outreach Core has developed multiple education and training videos, including webinars, related to topics of agricultural health and safety, such as heat-related illness, pesticide exposure, mental health, workplace-related illnesses, injuries, and deaths and COVID-19. Videos have been produced in both English and Spanish and have received over a total of 1,403 views.

Many of the communication products developed by the SCCAHS Outreach Core received awards from the Association for Communication Excellence, including videos, crisis campaigns, and print materials. The Outreach Core also supported key issues in the agricultural, fishery, and forestry sectors, including mental health first-aid, opioid misuse, and the COVID-19 pandemic. To support these issues, the outreach team hosted specialized training and developed curated educational resources.

Community Stakeholder Advisory Board. The Southeastern Coastal Center for Agricultural Health and Safety (SCCAHS) is committed to stakeholder involvement. The Outreach Core prioritizes community-based participatory research, and

has included representatives from Extension, industry, public agencies, regulatory agencies, academia, advocacy organizations, and medicine on our Center's Community Stakeholder Advisory Board. A high-functioning CSAB allows our Center to better engage stakeholders in receiving input on research findings, educational and communications materials and message testing to make our work accessible to the community at large.

The Outreach Core hosted two meetings for the Community Stakeholder Advisory Board. One meeting, hosted in March 2022, served as a final meeting for the grant cycle, delivered final research updates, provided plans for the future. The other meeting, hosted in September 2022, welcomed many returning CSAB members as well as many new members. The newly restructured CSAB is more geographically representative of the center's catchment area. Valuable feedback was received that will be applied as the team embarks on new outreach initiatives that will build on the foundation built in the previous grant cycle.

State of the Science Meeting. Hosted by the Southeastern Coastal Center for Agricultural Health and Safety (SCCAHS) headquartered at the University of Florida in Gainesville, FL, the annual State of the Science Meetings combine esteemed speakers to present research relevant to 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 Outreach Core has begun planning for the State of the Science 2023, including determining a meeting theme, potential speakers, and possible vendors.

Webinars. Webinars hosted by SCCAHS Outreach Core (October 2021 – Present):

- **Serap Gorucu** November 17, 2021 Available Data Sources for Agricultural Injury Surveillance
- **Cindy Prins** October 28, 2021 What's Next? Understanding the current status of COVID-19 and future projections
- **Latoya O'Neal** January 20, 2022 Advancing Health Equity as a Core System Value
- **Dawn E. Burton** February 23, 2022 Practical Steps to Advancing Health Equity and Minimizing Bias in Health Related Programming Efforts
- **Erika Scott** March 9, 2022 Why Agriculture Remains Undercounted in Fatal and Non-Fatal Occupational Injury Surveillance Systems
- **Samantha Murray and Styliana Resvanis** April 27, 2022 Communicating with Vulnerable Populations about Pandemic Related Health Risks
- **David Buys** June 29, 2022 Film, Farmers, and Finding a New (Old) Tool for Education: On the Farm

Awards:

- **Third place people's choice poster**, 2022 National Agricultural Communications Symposium
  - *It All Goes Back to Trust: A Qualitative Exploration of Extension Professionals' Perceptions of COVID-19 Vaccines in Rural Florida*
- **Silver Award: Issue Management, 2022 Association for Communication Excellence**
  - COVID-19 Vaccine Information Campaign
- **Bronze Award: Publications for Diverse Audiences, 2022 Association for Communication Excellence**
  - COVID-19 Vaccine Translated Info Sheets
- **Gold Award Winner: Digital-only Publications, 2022 Association for Communication Excellence**
  - Mental Health in Agriculture Impact Report

B.3. Competitive Revisions/Administrative Supplements

NOTHING TO REPORT

B.4. What opportunities for training and professional development did the project provide?

NOTHING TO REPORT

B.5. How did you disseminate the results to communities of interest?

Community Stakeholder Advisory Meetings
State of the Science Meetings
Webinars
Comprehensive Website
Slice of Science Newsletter
Center Community Membership

B.6 - What do you plan to do during the next reporting period to accomplish the goals?

Final Report- Renewal awarded for new cycle.

C. PRODUCTS

C.1. Publications, conference papers, and presentations

Irani, T., Pierre, B. & Nesbit, T. (2021). Agricultural Professionals' Perceptions of COVID-19 and Occupational Health and Safety. Journal of International Agricultural and Extension Education. https://doi.org/jiaee.2021.28106
Irani T, Pierre, B. F, Nesbit, T.S. (2021). Agricultural stakeholders' perceptions of occupational health and safety in the Southeastern U.S. Coastal States. International Journal of Environmental Research and Public Health, 18(12):6605. https://doi.org/10.3390/ijerph18126605

Lindsey, A., McLeod-Morin, A., Lundy, L., Irani, T., & Telg, R. (2022). Using Communication Toolkits to Expand Extension Efforts Related to Agricultural Health and Safety Topics. Abstract presented at the 2022 Extension Professional Associations of Florida Annual Meeting, Panama City, FL.

McLeod-Morin, A., Lundy, L., Lindsey, A. B., Kandzer, M., Telg, R., Irani, T., Stokes, P., Castano, V., & Santa Maria, N. (2022). It All Goes Back to Trust: A Qualitative Exploration of Extension Professionals' Perceptions of COVID-19 Vaccines in Rural Florida. Abstract presented at the 2022 National Agricultural Communications Symposium, New Orleans, LA.

McLeod-Morin, A., Irani, T., Telg, R., Lindsey, A., & Lundy, L. (2022). Empowering Extension Empowers Everyone: Developing Agricultural Health and Safety Outreach Materials for Cooperative Extension. Abstract presented at the 2022 International Society for Agricultural Safety and Health Annual Conference, Fort Collins, CO.

C.2. Website(s) or other Internet site(s) – include URL(s)

www.sccahs.com

C.3. Technologies or techniques

NOTHING TO REPORT

C.4. Inventions, patent applications, and/or licenses

Not Applicable

C.5. Other products and resource sharing

Category	Explanation
Audio or video	
Audio or video	
Audio or video	
Educational aids or curricula	
Other	Press Release

D. PARTICIPANTS

D.1. What individuals have worked on the project? Please include calendar, academic, and summer months.

Commons ID	S/K	Name	Degrees(s)	Role	Cal	Aca	Sum	Foreign	Country	SS

Refer to Overall Section D.1.

D.2 Personnel updates

a. Level of Effort: No
b. New Senior/Key Personnel: No
c. Changes in Other Support: No
d. New Other Significant Contributors: No

E. IMPACT

E.1 - What is the impact on the development of human resources, if applicable?

Not Applicable

E.2 - What is the impact the Public Health Relevance and Impact? The investigator should address how the findings of the project relate beyond the immediate study to improved practices, prevention or intervention techniques, legislation, policy, or use of technology in public health.

Activities within the Outreach Core have contributed to improvements within the community in affecting change among AgFF populations in health literacy, including knowledge of health disparities, heat stress, kidney disease, COVIF-19 and ways to recognize, prevent, reduce or eliminate them.

F. CHANGES

F.1 – Changes in approach and reasons for change, including changes that have a significant impact on expenditures

Not Applicable

F.2 - Actual or anticipated challenges or delays and actions or plans to resolve them

NOTHING TO REPORT

F.3 - Significant changes to human subjects, vertebrate animals, biohazards, and/or select agents

No Change

G. Special Reporting Requirements

G.1 Special Notice of Award Terms and Funding Opportunities Announcement Reporting Requirements

Not Applicable

G.2 Responsible Conduct of Research

Not Applicable

G.3 Mentor's Research Report or Sponsor Comments

Not Applicable

G.4 Human Subjects

G.4.a Does the project involve human subjects?

Not Applicable

G.4.b Inclusion Enrollment Data

Not Applicable

G.4.c ClinicalTrials.gov
Does this project include one or more applicable clinical trials that must be registered in ClinicalTrials.gov under FDAAA?

Not Applicable

G.5 Human Subject Education Requirement

Are there personnel on this project who are newly involved in the design or conduct of human subject's research?

Not Applicable

G.6 Human Embryonic Stem Cells (HESCS)

Does this project involve human embryonic stem cells (only hESC lines listed as approved in the NIH Registry may be used in NIH funded research)?

No

G.7 Vertebrate Animals

Does this project involve vertebrate animals?

No

G.8 Project/Performance Sites

Not Applicable

G.9 Foreign Component

Not Applicable

G.10 Estimated Unobligated Balance

The estimated total cost unobligated balance (including prior year carryover) is estimated at $83,135.43 (DC + IDC) or 22% of the Year 5 Outreach Core total budget.

G.10.a Is it anticipated that an estimated unobligated balance (including prior year carryover) will be greater than 25% of the current year's total approved budget?

Not Applicable

G.11 Program Income

Is program income anticipated during the next budget period?

Not Applicable

G.12 F&A Costs

Is there a change in performance sites that will affect F&A costs?

Not Applicable

I. OUTCOMES

I. Provide a concise summary of the outcomes or findings of the award, written for the general public in clear and comprehensible language, without including any proprietary, confidential information or trade secrets

Note: project outcome information will be made public in NIH RePORTER

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.

The goals of the Outreach Core for the supplemental year were to translate and disseminate research-to-practice (r2p) findings in the agricultural, fishery and forestry sectors, develop and implement inclusive communications, and grow the Center's network to foster valuable collaborations. These goals were accomplished through the use of traditional and innovative media efforts and effective collaborations with industry stakeholders.

Since its inception in 2016, the Center's audience growth has reached 2,370 email subscribers, 586 social media followers, and 44,000 website views with an annual average growth of 36% year over year. The Center's Outreach Core has hosted a series of ongoing training and development opportunities, including 27 webinars, seven Community Stakeholder Advisory Board Meetings, four State of the Science research events with over 35 unique presentations, and eight issue guides, white papers, and Extension documents. The Outreach Core has developed multiple education and training videos, including webinars, related to topics of agricultural health and safety, such as heat-related illness, pesticide exposure, mental health, workplace-related illnesses, injuries, and deaths and COVID-19. Videos have been produced in both English and Spanish and have received over a total of 1,403 views.

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A. COVER PAGE

Project Title: Heat and Pesticide Stress in the Kidney	
Grant Number: U54OH011230	**Project/Grant Period**: 09/30/2016 – 09/29/2022
Reporting Period: 09/30/2021 – 09/29/2022	**Date Submitted**:
Program Director/ Principal Investigator Christopher Vulpe, PhD (Project Lead, University of Florida)	**Administrative Official Information** Stephanie Gray Assistant Vice President ufawards@ufl.edu 352-392-9267
Change of Contact PD/PI: No	
Human Subjects: No	**Vertebrate Animals:** Yes
hESC: No	**Inventions/Patents:** No

B. ACCOMPLISHMENTS

B.1. What are the major goals of the project?

Agricultural workers are exposed to multiple occupational stressors, including heat and agricultural chemicals that may impact health. Recently, an increasing incidence of chronic kidney disease of unknown cause in agricultural workers has led to increasing concern about occupational renal health in farm workers. The overarching goal of the project is to further evaluate a potential relationship between agricultural chemical exposure, occupational heat stress and renal disease. In a model rodent system, the study team directly assessed the relationship between exposure to occupationally relevant agricultural chemicals of concern and renal disease. Similarly, investigators sought to determine if heat stress equivalent to that experienced by farmworkers in the Southeastern USA results in renal injury. The team also worked to determine if the combination of heat stress and agricultural chemical exposure interact together to impact renal health. Together this work will further our understanding of potential risks to renal health in agricultural workers in the US and enable the development of occupational health strategies to mitigate adverse outcomes.

The specific aims were an essential component of the overall goal of the University of Florida's Southeastern Coastal Center for Agricultural Health and Safety to identify and mitigate potential occupational risks to farmworkers. Experimental aims and hypotheses related to this central hypothesis are as follows.

Aim 1: Characterize the nephrotoxicity of the most commonly used formulations of an insecticide, permethrin, and two herbicides, paraquat and glyphosate in the rat.

Hypothesis: Subchronic exposure to permethrin, paraquat, and glyphosate commercial formulations produces renal injury in the rat.

Aim 2: Develop a model of hyperthermia and mild dehydration in the rat resembling heat stress in Southeastern US agricultural workers.

Hypothesis: Hyperthermia and dehydration comparable to that observed in Southeastern U.S. farmworkers produces minimal evidence of renal injury using standard assessment methods.

Aim 3: Determine the combined effect of heat stress and pesticide exposure on renal injury in rats.

Hypothesis: Heat stress produces a significant increase in the renal injury produced by pesticides

Extended Aims – Year 3

Aim 4: Compare the effect of repetitive versus single acute heat stress and pesticide exposure on renal injury and renal function recovery in rats.

Hypothesis: Repeated heat stress and pesticide co-exposures, similar to that experienced by farmworkers, will result in progressively more severe acute renal disease injury and poorer renal function recovery than single acute co-exposures.

Aim 5: Assess novel urinary biomarkers of renal disease in farmworker population with documented kidney disease.

Hypothesis: Novel exosome based biomarkers of renal disease identified in animal studies will provide sensitive indicators of renal disease in farmworkers

B.2. What did you accomplish under these goals?

We continued work on Aim 1-3, particularly the analysis of short term exposure studies. We also carried out work for Aim 4 and Aim 5 in the reporting period.

For Aim 1, we further analyzed the histologic findings in the acute exposure studies. Previously, we noted changes in glomerular size and an increased size of podocyte nuclei and increased cytoplasm in selected glyphosate and paraquat exposure using trichrome staining and confirmed with IHC for desmin antibody. We did not observe any evidence for interstitial inflammation or fibrosis in any of the previous short term exposure regimens used, although we did note increased desmin immunoreactivity in glomerular podocytes in paraquat and glyphosate exposed rats.

In this reporting period, we used digital analysis software (Halo, Indica labs), to quantify desmin immunobiological expression and Image J to quantitate glomerular area in randomized manually selected renal glomeruli for various

concentrations of glyphosate and paraquat. Quantitative analysis of our pilot data revealed glomerular size was decreased by exposure to paraquat for 3 weeks as analyzed by one-way ANOVA and Tukey's multiple comparisons test, which demonstrated a significant decrease in the 25 mg-3wk group compared to the controls ($p<0.01$). There was a significant difference between 25 mg-2wk and 25 mg-3wk groups ($p<0.01$). Additionally, in rats subjected to acute exposure to paraquat for 24 hr glomerular shrinkage was observed.

In addition to the histology studies, we carried out additional analysis of data collected for existing urinary biomarkers to assess any relationship with chemical exposure in the rats. Urine collected over 24 hr after the last dose had creatinine concentrations within normal limits, as well as BUN. We used a Luminex panel containing 5 biomarkers of kidney disease. Osteopontin (OPN) and KIM1 showed a dose-related increase above control values. Other biomarkers evaluated were not increased by the pesticides at these doses.

We completed trials of different housing temperatures to induce heat stress in rats comparable to the heat stress experienced in farmworkers during a work shift. We monitored the core body temperature with telemetry implants in a temperature and humidity controlled environmental chamber for 7-8 h and noted that 35 °C housing condition successfully raised rat core body temperature about 1 °C (median 37.27 °C to 38.30 °C) similar to that noted in heat stressed farmworkers.

Based on the heat trials, we performed an extended 8-week heat exposure study in rats. Heat exposure rats (N=4) were placed in the environmental chamber (35 °C, 55% humidity) for 8 hours per day and 5 days per week. Control rats (N=3) were housed at room temperature (24 °C, 55% humidity). Similar to the previous pilot study, we observed that rat core body temperature started increasing after being exposed to heat stress for about 1 h, with an average raise of 1.32 °C for the entire 8-h period (median 37.89 °C to 39.21 °C). Urine samples were collected at baseline (0 wk), every two weeks, and at the endpoint (8 wk) for future renal function biomarker investigation. Rat kidneys, livers, and blood samples were harvested at the endpoint for histopathologic analysis.

For Aim 4, we completed a repeated exposure dosing study of glyphosate (200 mg/kg-day), and paraquat (25 mg/kg-day) on rats for 8 weeks. Rats were gavaged with glyphosate for 5 days per week or paraquat for 1 day per week. Control group rats were dosed with water for 5 days per week. Urine samples were collected at baseline (0 wk), every two weeks, and at the endpoint (8 wk) for renal function biomarker investigation. Rat kidneys, livers, and blood samples were harvested every two weeks, and at the endpoint for time-response renal damage analysis. Rat kidneys from exposed and control rats will evaluated for renal disease through histology with multiple stains and different analyses. Analyses will include complete hematoxylin and eosin (H&E), Jones stain, PAS (Periodic acid–Schiff) and selected trichrome and immunohistochemistry (IHC) for desmin, smooth muscle actin (SMA). Interstitial inflammation will be assessed with IBA1 (Monocytes), CD3 (T lymphocytes), CD20 (B-lymphocytes) and CD79a (B-lymphocytes). Both biomarker and renal histology data analysis is currently in progress.

For Aim 5, we initiated a collaboration with investigators at the University of Colorado who have existing urine samples gathered during the 2016 to 2017 sugarcane harvest from an existing cohort of ~105 farmworkers in Guatemala. The sugarcane harvest season runs from November until May each year. In this longitudinal study, we prospectively assessed cross-work shift changes in eGFR, biomarkers of renal function, and biomarkers of heat stress in 105 workers at three separate time points during the harvest season. Urine samples were collected immediately before and after each work shift. For the initial work, we analyzed urine samples collected before the work-shift and after the work shift including 14 individuals with no overt evidence of kidney disease (by eGFR), 10 individuals with acute kidney injury (AKI) individuals, and 13 with reduced kidney function. The farmworkers were assigned to one of these groups based on normal kidney function, reduced kidney function at the start of the work shift (<60 eGFR), and those with acute kidney injury during the work shift. Pre-work shift (AM) and post-work shift (PM) urine samples were analyzed. The urine samples for all of the individuals were collected during the last study time point in April. Urine samples that were collected in March were also analyzed for 3 individuals.

The urine samples were tested with two novel Luminex kidney panels, provided as beta test kits by ThermoFisher. In aggregate we measured urine response to 21 biomarkers (IP-10, Osteoactivin, RBP4, Calbindin, GSTA1, Renin, MCP1, KIM1, EGF, NAG, IL18, Clusterin, VEGFA, NGAL, Beta-2 microglobulin, TIMP1, TFF3,CystatinC, Uromodulin, Osteopontin, Alpha-1 microglobulin). We carried out an initial analysis of the data (nonparametric analysis of variance (Kruskal-Wallis test)) and identified RBP4, Calbindin, Renin, MCP1, clusterin, NGAL, Beta-2-microglobulin, TIMP1, TFF3, and CystatinC as candidates biomarkers of renal disease in this population. Further analysis is ongoing using more sophisticated statistical analysis.

We also prepared exosomes from the human urine samples in an effort to identify potential novel biomarkers. We extracted exosomes from the human urine samples and characterized them via Nanosight. We carried out lipidomic analysis of the exosomes and identified several phospholipids, including ceramide (CER 24:00), Sphingomyelin (SM16:0) and the ether linked phosphatidyl ethanolamine (PE(O-16:0/22:4)) as candidate biomarkers. We also prepared miRNA from the exosomes and carried out miRNA sequencing. miRNA libraries were constructed from 20 farmworkers' AM and PM collected urine samples and sequenced on the NovaSeq 6000 system. miRNA NGS data showed that 1) PM collected urines identified more differentially expressed miRNAs; 2) miR-30a-5p and miR-10a-5p were significantly elevated in the individuals with reduced kidney function (FDR<0.05, p-value<0.01). Potential human miRNA biomarkers will be further validated and compared to the urine exosomal miRNA profile of herbicide-exposed and heat-exposed rats.

B.3. Competitive Revisions/Administrative Supplements

Not Applicable

B.4. What opportunities for training and professional development did the project provide?

This project brought together basic scientists with clinical scientists, bringing expertise from two relevant disciplines to solve problems with renal disease. We had weekly meetings where research results were reported. In addition, we had a postdoctoral associate, a chemist and laboratory manager working on the project, each contributing their expertise. We engaged a graduate student with statistical knowledge to help evaluate the biomarker results. He also was involved in the animal testing experiments. The postdoctoral associate learned how to manage animal dosing projects and handle the animals under an experimental setting.

B.5. How did you disseminate the results to communities of interest?

We collaborated with a biomarker company (ThermoFisher) to help them improve the Luminex panels for human kidney disease. Three publications on this work are being prepared for publication.

1. Products (10/2021 to 9/2022)

Publications

1. Roberts, J. F., Zhou, J., Manrique, A. F., Roberts, S., Denslow, N. D., Vulpe, C. Sublethal exposure of rats to agricultural pesticides and heat alter kidney morphology and biomarkers of kidney disease.
2. Zhou, J., Butler-Dawson, J., Manrique, A. F., Roberts, J. F., Roberts, S., Denslow, N. D., Vulpe, C. Evaluation of a cohort of farmworkers from Central America with a panel of kidney disease biomarkers.
3. Zhou, J., Butler-Dawson, J., Manrique, A. F., Roberts, J. F., Roberts, S., Denslow, N. D., Vulpe, C. Isolation, characterization, and analysis of urine exosomal biomarkers that correlate with cKDu.

B.6 - What do you plan to do during the next reporting period to accomplish the goals?

Not Applicable, final progress report for 2016-2022 cycle.

PRODUCTS

C.1. Publications, conference papers, and presentations

None

C.2. Website(s) or other Internet site(s) – include URL(s)

None

C.3. Technologies or techniques

NOTHING TO REPORT

C.4. Inventions, patent applications, and/or licenses

Not Applicable

C.5. Other products and resource sharing

The investigative team collaborated with a biomarker company (ThermoFisher) to help them improve the Luminex panels for human kidney disease

D. PARTICIPANTS

D.1. What individuals have worked on the project? Please include calendar, academic, and summer months.

Commons ID	S/K	Name	Degrees(s)	Role	Cal	Aca	Sum	Foreign	Country	SS

Refer to overall section D.1.

D.2 Personnel updates

a. Level of Effort:
b. New Senior/Key Personnel:
c. Changes in Other Support:
d. New Other Significant Contributors:

E. IMPACT

E.1 - What is the impact on the development of human resources, if applicable?

Not Applicable

E.2 - What is the impact the Public Health Relevance and Impact? The investigator should address how the findings of the project relate beyond the immediate study to improved practices, prevention or intervention techniques, legislation, policy, or use of technology in public health.

The rat study findings suggest that short term exposure to two of three pesticides studied, paraquat and glyphosate, can result in observable histologic changes in the kidney in the rat model system. These results suggest further evaluation of renal effects of short term exposure to these pesticides is warranted in farmworkers. The biomarker studies in farmworkers identified multiple candidate biomarkers, including novel lipidomic and exosome miRNA biomarkers, associated with acute and chronic kidney disease. These biomarkers should be further evaluated to assess their utility in pre-symptomatic detection of renal damage and disease in farmworkers which could allow more effective intervention to prevent the development of severe renal disease.

F. CHANGES

F.1 – Changes in approach and reasons for change, including changes that have a significant impact on expenditures

Not Applicable

F.2 - Actual or anticipated challenges or delays and actions or plans to resolve them

One challenge faced by the project was related to the procurement and installation of an environmental chamber for the heat exposure studies. There were delays, perhaps related to Covid-19, in both the initial purchase, renovation of Animal Care Facilities Space, and in the installation of the environmental chamber which led to delays in the heat exposure studies. We thus focused the work initially on the pesticide exposure studies and then prioritized the heat exposure studies once the environmental chamber was installed.

F.3 - Significant changes to human subjects, vertebrate animals, biohazards, and/or select agents

Not Applicable

G. Special Reporting Requirements

G.1 Special Notice of Award Terms and Funding Opportunities Announcement Reporting Requirements

Not Applicable

G.2 Responsible Conduct of Research

Not Applicable

G.3 Mentor's Research Report or Sponsor Comments

Not Applicable

G.4 Human Subjects

G.4.a Does the project involve human subjects?

No

G.4.b Inclusion Enrollment Data

Not Applicable

G.4.c ClinicalTrials.gov

Does this project include one or more applicable clinical trials that must be registered in ClinicalTrials.gov under FDAAA?

Not Applicable

G.5 Human Subject Education Requirement

Are there personnel on this project who are newly involved in the design or conduct of human subject's research?

No

G.6 Human Embryonic Stem Cells (HESCS)

Does this project involve human embryonic stem cells (only hESC lines listed as approved in the NIH Registry may be used in NIH funded research)?

No

G.7 Vertebrate Animals

Does this project involve vertebrate animals?

Yes

G.8 Project/Performance Sites

University of Florida

G.9 Foreign Component

Not Applicable

G.10 Estimated Unobligated Balance

The estimated total cost unobligated balance (including prior year carryover) is estimated at $17,034.73 (DC + IDC) or 5% of the Year 5 Extended Research Core (Vulpe) total budget.

G.10.a Is it anticipated that an estimated unobligated balance (including prior year carryover) will be greater than 25% of the current year's total approved budget?

Not Applicable

G.11 Program Income

Is program income anticipated during the next budget period?

Not Applicable

G.12 F&A Costs

Is there a change in performance sites that will affect F&A costs?

Not Applicable

I. OUTCOMES

I. Provide a concise summary of the outcomes or findings of the award, written for the general public in clear and comprehensible language, without including any proprietary, confidential information or trade secrets

Note: project outcome information will be made public in NIH RePORTER

Chronic Kidney Disease of Unknown Etiology (CKDu) is prevalent in some populations of agricultural workers in sub-tropical and tropical regions and can result in significant effects on worker's health and ability to work. The cause or causes of CKDu remains controversial, and likewise the diagnosis of the disease, particularly before overt renal failure is challenging. The work funded by this award enabled the development of an animal model (rat) to enable evaluation of possible causes of CKDu. We used this model to begin to evaluate the role of pesticide exposure and heat stress in the development of kidney disease. The findings, although preliminary, suggest that acute short term exposure to some pesticides can result in observable pathologic changes in the kidney. Additional efforts funded by this work was focused on identifying new diagnostic approaches of kidney disease using urine samples. Initial results, requiring confirmation in independent studies, identified several candidate indicators of kidney disease (biomarkers) in a small population of agricultural workers.

A. COVER PAGE

Project Title: Using Social Marketing to Prevent HRI and Improve Productivity among Farmworkers	
Grant Number: U54OH011230	**Project/Grant Period**: 09/30/2016 – 09/29/2022
Reporting Period: 09/30/2021 – 09/29/2022	**Date Submitted**:
Program Director/ Principal Investigator Paul Monaghan, PhD (Project Lead, University of Florida)	**Administrative Official Information** Stephanie Gray Assistant Vice President ufawards@ufl.edu 352-392-9267
Change of Contact PD/PI: **No**	
Human Subjects: **Yes**	**Vertebrate Animals:** **No**
hESC: **Not Applicable**	**Inventions/Patents:** **Not Applicable**

B. ACCOMPLISHMENTS

B.1. What are the major goals of the project?

As climate change leads to warmer temperatures and higher humidity in the southeastern United States, the risk of heat related illness (HRI) and associated injuries for farmworkers is growing (Mirabelli et al., 2010; FDOH 2015; Schramm, 2012). Currently, only California, Washington, and Minnesota have agricultural worker regulations regarding HRI (Gubernot et al., 2013; Stoecklin-Marios et al., 2013). Even in these states, agricultural piece rate payment dis-incentivizes workers from adopting many safety practices (Spector et al., 2015). Improved training content and methods for farmworkers will continue to have limited success because they do not address other modifiable workplace factors (Horton, 2016; Mac and McCauley, 2017; Spector et al., 2015). Research is needed to show the costs and potential productivity benefits of HRI prevention to workers, supervisors and employers (Bodin et al. 2016; Jackson and Rosenberg; 2010). To increase organizational support for farmworker safety we need to quantify the educational, economic and health outcomes of training.

Three key problems are: i) insufficient documentation of the comparative effectiveness of competing models of farmworker safety promotion, ii) a paucity of observational data linking safety behaviors to health outcomes, and iii) a lack of translation between health outcomes and industry benefits. The objective of this proposal is to measure the impacts of different models of HRI safety promotion on hydration and productivity among farmworkers employed in Florida agricultural production. We hypothesize that a) farmworker training alone does not significantly increase prevention behaviors; trained farm labor supervision and personalized incentives are also necessary to overcome structural barriers and b) changes in behavior are associated with productivity levels measured at the company level. The project is guided by three specific aims:

1. Utilize social marketing research to educate and motivate field supervisors and piece rate harvesters to follow HRI recommendations, including culturally appropriate social media platforms to reinforce behavior adoption in the field.

2. Determine the comparative effectiveness of the social marketing approach to the existing HRI educational programming currently used in Extension and employer-based models of safety promotion. The investigative team will document changes in knowledge of HRI symptoms, attitudes towards hydration, self-reported behavior and biophysical measures to compare the success of the different approaches have with worker hydration.

3. Establish the relationship between hydration interventions, changes in safety culture and productivity levels by measuring output per worker using piece rate pay slips. Translating research on behavior change is a crucial part of the diffusion model. Companies, supervisors and workers will learn the efficacy of better hydration and productivity levels in order to incentivize investment in farmworker safety.

B.2. What did you accomplish under these goals?

This project had three aims; to use social marketing behavioral research to understand the difficulties that workers and supervisors have when following heat safety best practices and use that information to develop better training and recommendations for them; then to evaluate the new approach with existing HRI educational programming currently used by employers; and finally, to establish a relationship between the improved heat safety training and whether it affects worker productivity. The project used a variety of measures in the field to understand heat safety behaviors and attitudes and to evaluate the intervention. These included surveys before and after the training programs, daily questionnaires given to workers to understand their heat safety practices (did they practice periodic resting and hydration) and their experience self-reported symptoms of heat stress, analysis of urine samples at the beginning and end of each workday to measure levels of dehydration (urine specific gravity, or USG), detailed productivity figures on each worker that were provided by the employer and heat index data collected during the hours that workers were in the field in order to understand the environmental conditions they faced. In addition to the field data, we conducted three focus groups in Immokalee with tomato harvesters in February 2020 to better understand worker's perceptions

and practices regarding heat safety. Finally, in September of 2022, we conducted a two-day training with 70 employees of our agriculture industry partner in Clewiston, Florida, so that his workers could receive the latest information on heat safety protection.

The research protocol was implemented in the field three times. First, as a pilot study in May 2019 to test our tools and methods with a tomato producer in Manatee County, Florida, we enrolled 39 workers and collected data over three days of harvesting. In May 2021 we established a partnership with a new grower in Clewiston and we repeated the data collection with four harvesting crews (n= 89). Two of these crews (n=51) received a 45- minute training one week before data collection using the PISCA heat safety curriculum. The third round of field data collection in May 2022, compared a modified training intervention with one crew (n=21) with two crews (n= 38) that only received company provided training.

In addition to the research on heat safety practices, as the COVID-19 pandemic restricted field research in 2020, we conducted a phone survey with the Farmworker Association of Florida of 67 farmworkers using their membership list. These interviews focused on the impact of COVID-19 on their work, their knowledge of the illness and their attitudes towards a vaccine.

Final Year: 2021 - 2023

The final year of the project was devoted to preparation and execution of the third wave of field data collection in Clewiston, developing the modified training curriculum, and the cleaning and organizing of the complete database into SPSS. Weekly meetings were held with the community partner (FWAF) to plan for the field data collection and we made several trips to Clewiston to meet with our grower partner and make visits to farmworker housing to introduce the project and establish relationships. This was the first opportunity for the new director of FWAF (Neza Xuiticutli) to participate in this NIOSH grant and to get to know our grower partner and his operation. A review was conducted of existing online heat safety curricula (PNASH, WCAHS, PISCA) and a synthesized version focusing on best practices was developed and delivered in April and May, 2022, followed by three days of data collection. Since May, the team has been cleaning and organizing the data set, editing a draft publication, and meeting with researchers (IFAS, University of South Florida, University of Illinois Chicago) to begin collaborations on data analysis and publications. These collaborators have expertise in occupational health, agricultural economics and statistics. In July the team worked together to submit a successful award nomination to the EPA “Lets Talk About Heat Challenge” (https://www.epa.gov/innovation/lets-talk-about-heat-challenge).

B.3. Competitive Revisions/Administrative Supplements

Not Applicable

B.4. What opportunities for training and professional development did the project provide?

NOTHING TO REPORT

B.5. How did you disseminate the results to communities of interest?

Results of all research has been disseminated through conference presentations, seminars, and internal meetings. Project personnel have participated in the following outreach activities:

Results have been presented to a diverse audience of researchers, students, and professionals from a wide range of settings including public health, medicine, business, law, and government during a video presentation at the

- Annual Meeting of the Society for Applied Anthropology
- Agricultural Safety & Health Council of America
- East Coast Migrant Stream Forum
- Seminars presented to the University of Florida Department of Agricultural and Biological Engineering

- Seminars presented to the University of Florida Department of Agricultural Education and Communication
- North American Agricultural Safety Summit

B.6 - What do you plan to do during the next reporting period to accomplish the goals?

Not applicable, the grant has ended.

C. PRODUCTS

C.1. Publications, conference papers, and presentations

Matthew, O. O., Monaghan, P. F., & Luque, J. S. (2021). The Novel Coronavirus and Undocumented Farmworkers in the United States. *New solutions : a journal of environmental and occupational health policy : NS*, *31*(1), 9–15. https://doi.org/10.1177/1048291121989000. PMID: 33517834; PMCID: PMC8193739.

Monaghan, P.F. & Morera, M.C. (2021). Using social marketing to prevent HRI and improve productivity among farmworkers. Presentation delivered at the 2021 Southeastern Coastal Center for Agricultural Health and Safety Community Stakeholder Advisory Board Meeting, March 11.

Morera, M.C., Tovar-Aguilar, J.A., Monaghan, P.F., Roka, F.M., & Perez-Orozco, J. (2021). Going the [social] distance: Safety and productivity in Florida agriculture during COVID-19. Upcoming presentation at the 2021 Virtual Meeting of the Society for Applied Anthropology, March 26.

Morera, M.C., Gusto, C., Monaghan, P.F., Tovar-Agular, J.A., and Roka F.M. (2020). We force ourselves: Productivity, workplace culture, and HRI prevention in Florida's citrus groves. *Safety.* 6(3), 41. doi:10.3390/safety6030041.

Monaghan, P., Raskin, K., Morera, M., Tovar Agular, J.A., Mac, V., and Flocks, J. (2020). What the agricultural sector in Florida needs to know about health-related illness. *Electronic Data Information Source of UF/IFAS Extension* (*EDIS).* 5.

Morera, M.C., Tovar-Aguilar, J.A., & Gonzalez, R.J. (2019). Hydration and productivity: Creating incentives for heat safety among H2A workers through social marketing. Workshop delivered at the 32nd Annual East Coast Migrant Stream Forum, October 11, Carolina, Puerto Rico.

Morera, M.C. (2020). Personalizing safety: Integrating culture and technology to incentivize injury prevention in Florida agriculture. Seminar presented to the Department of Agricultural and Biological Engineering, University of Florida, January 21, Gainesville, Florida.

Morera, M.C. (2020). Using a client-centered approach to move research into practice for injury prevention in Florida agriculture. Seminar presented to the Department of Agricultural Education and Communication, University of Florida, February 24, Gainesville, Florida.

Morera, M.C., Monaghan, P.F., Tovar-Aguilar, J.A., & Roka, F.M. (2020). Developing a social marketing intervention for heat safety among Florida tomato harvesters: Preliminary findings of formative research. Poster presentation at 2020 North American Agricultural Safety Summit, March 19, Las Vegas, Nevada.

Morera, M.C., Monaghan, P.F., Tovar-Aguilar, J.A., & Roka, F.M. (2020). Resisting heat-related illness in a changing Florida climate. Oral presentation at 80th Annual Meeting of the Society for Applied Anthropology, March 20, Albuquerque, New Mexico.

C.2. Website(s) or other Internet site(s) – include URL(s)

www.sccahs.org

Webinar - Using Social Marketing to Prevent Heat-related Illness and Improve Productivity Among Farmworkers | Southeastern Coastal Center for Agricultural Health and Safety (sccahs.org), April 17, 2019

C.3. Technologies or techniques

Not Applicable

C.4. Inventions, patent applications, and/or licenses

NOTHING TO REPORT

C.5. Other products and resource sharing

NOTHING TO REPORT

D. PARTICIPANTS

D.1. What individuals have worked on the project? Please include calendar, academic, and summer months.

Commons ID	S/K	Name	Degrees(s)	Role	Cal	Aca	Sum	Foreign	Country	SS

Refer to Overall Section D.1.

D.2 Personnel updates

a. Level of Effort: No
b. New Senior/Key Personnel: No
c. Changes in Other Support: No
d. New Other Significant Contributors: No

E. IMPACT

E.1 - What is the impact on the development of human resources, if applicable?

Not Applicable

E.2 - What is the impact the Public Health Relevance and Impact? The investigator should address how the findings of the project relate beyond the immediate study to improved practices, prevention or intervention techniques, legislation, policy, or use of technology in public health.

Farmworkers face a variety of economic, structural and cultural barriers to adopting safety practices in the field especially with prevention of heat related illness (HRI) and associated injuries. Farmworkers are at increased risk for HRI and even death because they are exposed to extreme heat while engaged in strenuous physical activity such as harvesting crops. Piece-rate models of payment encourage rapid work and serve as an economic disincentive to paying attention to safety messages. Cultural barriers, such as language and the limits of traditional employer- education on heat risks may result in workers that are unaware of the symptoms of HRI, their personal risk factors or what it means to be sufficiently hydrated at the start of the day. All of these features of the socio-ecologic setting of farm work create gaps in training, knowledge transfer and the adoption of recommended behaviors.

F. CHANGES

F.1 – Changes in approach and reasons for change, including changes that have a significant impact on expenditures

Not Applicable

F.2 - Actual or anticipated challenges or delays and actions or plans to resolve them

None in the final year 2021-2022.

F.3 - Significant changes to human subjects, vertebrate animals, biohazards, and/or select agents

No Change

G. Special Reporting Requirements

G.1 Special Notice of Award Terms and Funding Opportunities Announcement Reporting Requirements

Not Applicable

G.2 Responsible Conduct of Research

Not Applicable

G.3 Mentor's Research Report or Sponsor Comments

Not Applicable

G.4 Human Subjects

G.4.a Does the project involve human subjects?

Yes.

G.4.b Inclusion Enrollment Data

PHS Inclusion Enrollment Report

This report format should NOT be used for collecting data from study participants.

OMB Number: 0925-0001
Expiration Date: 3/31/2020

*Study Title (must be unique): Using Social Marketing to Prevent HRI and Increase Productivity Among Farmworkers

* Delayed Onset Study? ☐ Yes ☒ No

If study is not delayed onset, the following selections are required:

Enrollment Type: ☐ Planned ☑ Cumulative (Actual)

Using an Existing Dataset or Resource: ☐ Yes ☑ No

Enrollment Location: ☑ Domestic ☐ Foreign

Clinical Trial: ☐ Yes ☑ No

NIH-Defined Phase III Clinical Trial: ☐ Yes ☑ No

Comments:

Racial Categories	Ethnic Categories									
	Not Hispanic or Latino			Hispanic or Latino			Unknown/Not Reported Ethnicity			Total
	Female	Male	Unknown/ Not Reported	Female	Male	Unknown/ Not Reported	Female	Male	Unknown/ Not Reported	
American Indian/ Alaska Native	0	0	0	0	0	0	0	0	0	0
Asian	0	0	0	0	0	0	0	0	0	0
Native Hawaiian or Other Pacific Islander	0	0	0	0	0	0	0	0	0	0
Black or African American	0	0	0	0	0	0	0	0	0	0
White	0	0	0	5	191	0	0	0	0	0
More than One Race	0	0	0	0	0	0	0	0	0	0
Unknown or Not Reported	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	5	191	0	0	0	0	196

Report 1 of 1

G.4.c ClinicalTrials.gov

Does this project include one or more applicable clinical trials that must be registered in ClinicalTrials.gov under FDAAA?

Not Applicable

G.5 Human Subject Education Requirement

Are there personnel on this project who are newly involved in the design or conduct of human subject's research?

Not Applicable

G.6 Human Embryonic Stem Cells (HESCS)

Does this project involve human embryonic stem cells (only hESC lines listed as approved in the NIH Registry may be used in NIH funded research)?

No

G.7 Vertebrate Animals

Does this project involve vertebrate animals?

Not Applicable

G.8 Project/Performance Sites

University of Florida

G.9 Foreign Component

Not Applicable

G.10 Estimated Unobligated Balance

The estimated total cost unobligated balance (including prior year carryover) is estimated at $17,081.14 (DC + IDC).

G.10.a Is it anticipated that an estimated unobligated balance (including prior year carryover) will be greater than 25% of the current year's total approved budget?

Not Applicable

G.11 Program Income

Is program income anticipated during the next budget period?

Not Applicable

G.12 F&A Costs

Is there a change in performance sites that will affect F&A costs?

Not Applicable

I. OUTCOMES

I. Provide a concise summary of the outcomes or findings of the award, written for the general public in clear and comprehensible language, without including any proprietary, confidential information or trade secrets

Note: project outcome information will be made public in NIH RePORTER

Project accomplishments include the development of a comprehensive data base that documents the attitudes, behaviors and lived experiences of agricultural laborers working in high heat conditions in Florida. The three field data collection efforts yielded over 900 variables from nine days of harvesting work, including baseline measures of hydration from urine specific gravity (USG), before work, mid-day measures of dehydration taken at lunchtime, and end of day measures of dehydration for a total of 1,300 urine samples. In addition, we collected detailed information from 177 workers on their knowledge, attitudes and self-reported behaviors regarding heat safety, hourly measures of their productivity, along with the environmental conditions (heat index) for each of the hours they worked over those nine days.

An important project outcome was a complete review of available heat safety programs including one developed by the Southeastern Coastal Center for Agricultural Health and Safety (SCCAHS), and the Heat Illness Prevention curriculum, developed by the Western Center for Agricultural Health and Safety (WCAHS), the Heat Education Awareness Tools developed by the Pacific Northwest Agricultural Safety and Health along with publicly available NIOSH materials. We have synthesized the most relevant components specifically for the conditions of agricultural work in Florida into a draft curriculum called PROTECTORES which highlights 11 best practices for farmworkers to prevent heat related illness. The training was delivered to 70 farmworkers in September 2022 and results are currently being evaluated.

A. COVER PAGE

Project Title: Research Core: Pesticide & Heat Stress Education for Latino Farmworkers That is Culturally Appropriate (PISCA)	
Grant Number: U54OH011230	**Project/Grant Period**: 09/30/2016 – 09/29/2022
Reporting Period: 09/30/2021 – 09/29/2022	**Date Submitted**:
Program Director/ Principal Investigator Joseph Grzywacz, PhD (Project Lead, Florida State University Subaward)	**Administrative Official Information** Stephanie Gray Assistant Vice President ufawards@ufl.edu 352-392-9267
Change of Contact PD/PI: No	
Human Subjects: Yes	**Vertebrate Animals:** Not Applicable
hESC: No	**Inventions/Patents:** No

B. ACCOMPLISHMENTS

B.1. What are the major goals of the project?

Exposure to pesticides and extreme heat (with or without humidity) are among the dominant health threats to farmworkers in crop production (Arcury & Quandt, 2007; NIOSH, 2009; Hansen & Donohoe, 2003). The United States Environmental Protection Agency (US EPA) reports 10,000-20,000 physician-diagnosed pesticide poisonings each year. This official count grossly overlooks the substantial number of workers whose daily activities bring them into contact with low-dose exposures in the form of residues and drift (Arcury et al., 2006). Indeed, Grzywacz along with Arcury and his colleagues (2009a), documented that at least 30% of workers had known pesticide metabolites in their urine one or more times cross the agricultural season. Likewise, some reports indicate that 40% of farmworkers experience symptoms of heat-related illnesses (HRIs) (Mirabelli et al., 2010). The U.S. Centers for Disease Control (CDC) suggests the death rate for heat illness is 20-times greater for farmworkers in crop production than the general U.S. worker (Luginbuhl et al., 2008).

Farmworkers are a vulnerable, medically underserved and health disparate population (Arcury & Quandt, 2007; Villarejo, 2003; Villarejo & Baron, 1999). The most recent estimates from the National Agricultural Workers Survey (NAWS) survey estimate approximately 2.4 million farmworkers are employed in the production of plant and animal commodities. The national employed farmworker population became predominantly Latino and Mexican in the 1990s (Mines, Gabbard, & Steirman, 1997). Today fully, 82% of farmworkers in the U.S. are Latino, 74% were born in Mexico (Carroll et al., 2005). Just over 50% of farmworkers lack legal authorization to work in the U.S. The combination of ethnic minority, foreign-born status and legal liminality conspire with occupational marginality to create a "perfect storm" of vulnerability and poor health outcomes. The creation or refinement of culturally-appropriate health and safety education is an essential step in eliminating health threats to farmworkers from exposure to pesticides and extreme heat. Although the Association of Farmworker Opportunity Program (AFOP) has trained over 27,000 farmworkers in pesticide safety and heat stress, rigorous scientific scrutiny of whether these training programs produce changes in relevant worker behavior is scant. Further, recent changes in the Worker Protection Standards (WPS), which were finalized in the Federal Register in September 2015, necessitate substantial changes to existing training for farmworkers. These new materials need rigorous assessment, including demonstration of whether the commonly used community health worker (or promotora) vehicle for educating farmworkers is efficacious. The overall goal of this project is to reduce poor health outcomes among Latino farmworkers results 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.

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.

This project, implemented under the auspices of the proposed Center's themes of "Heat Stress" and "Pesticide Exposure," contributes to the Agriculture, Forestry and Fishing Sector Program Agenda and Strategic sub-goals 2.4 (Use innovative and proven techniques to tailor programs for vulnerable workers), 3.2 (Create new studies to meet needs where proven strategies do not exist, 5.3 (Reduce acute and chronic illnesses associated with exposure to pesticides.), and 5.5 (Develop and promote interventions to minimize the adverse effects of weather).
The work is significant because it: targets a vulnerable and health disparate occupation group, addresses the major sources of poor occupational health outcomes, and quantifies differential effectiveness of professional educators relative to the widely embraced (but under-documented) promotora model. The proposed work is innovative because it creates new training curricula responsive to the revised WPS, uses a rigorous randomized attention control placebo

design which is novel to this field, and it demonstrates commitment to research-to-practice (R2P) by moving from basic research to demonstration and translation into practice in a single project.

B.2. What did you accomplish under these goals?

1. Demonstration that pesticide-specific training does produce more frequent practice of behaviors advocated for reducing pesticide exposure. Specifically, the results of this study indicated more frequent practice of behaviors advocated by the WPS to reduce pesticide exposure among individuals who received the WPS curriculum than those who received the attention-placebo control.

2. Findings related to the mode of intervention - The results of this study demonstrated that both EPA-approved trainings (revised WPS and PISCA study curriculum) resulted in significant changes in knowledge from pre-intervention to post-intervention. However, only farmworkers who receive the culturally and contextually tailored EPA curricula from the PISCA study in conversational Spanish delivered by a facilitator retained acquired knowledge over time.

3. The WPS, like all mandated training programs assume that training and the resultant knowledge obtained from training is essential for facilitating behavior change. The results from the study support this theory of action; approximately 12.2% of the observed difference in pesticide safety behavior was attributed to knowledge gained and retained by those who received the culturally and contextually tailored curricula. Previous results have shown cross-sectional associations between pesticide-related knowledge and greater practice of some WPS-advocated behaviors.15,16 But this study provides the first evidence that effective WPS training facilitates growth and retention of pesticide-related knowledge that can be drawn upon to support more frequent use of behaviors believed to minimize pesticide exposure over time.

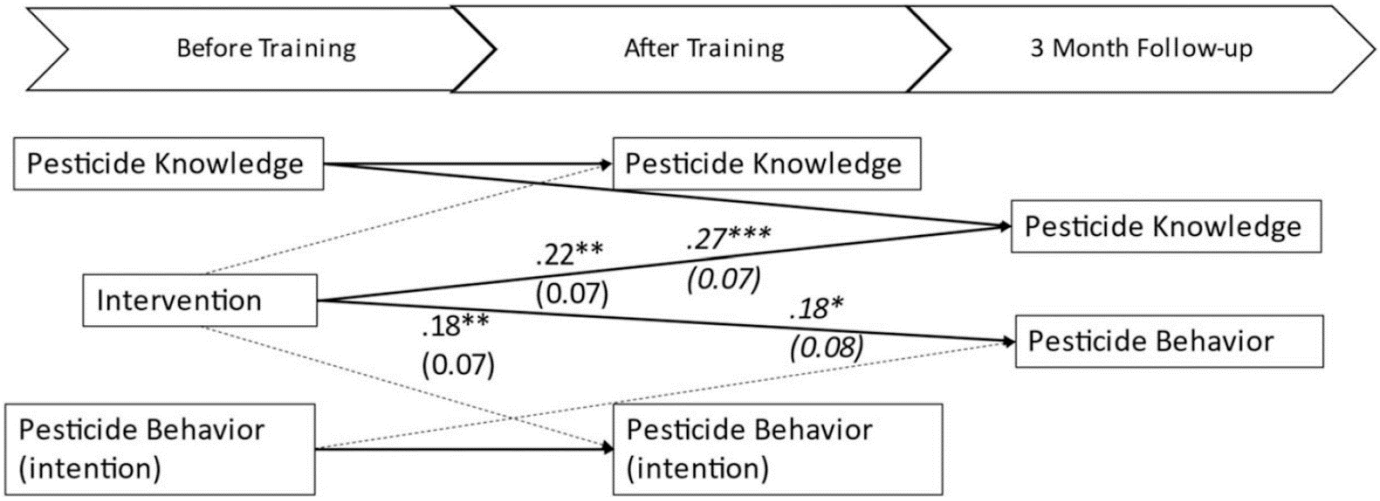

Figure 1. Summary of results from a path model illustrating the effects of the PISCA culturally tailored WPS curriculum compared to control conditions in predicting change in pesticide and behaviors that prevent/minimize pesticide exposure among immigrant Latino farmworkers.

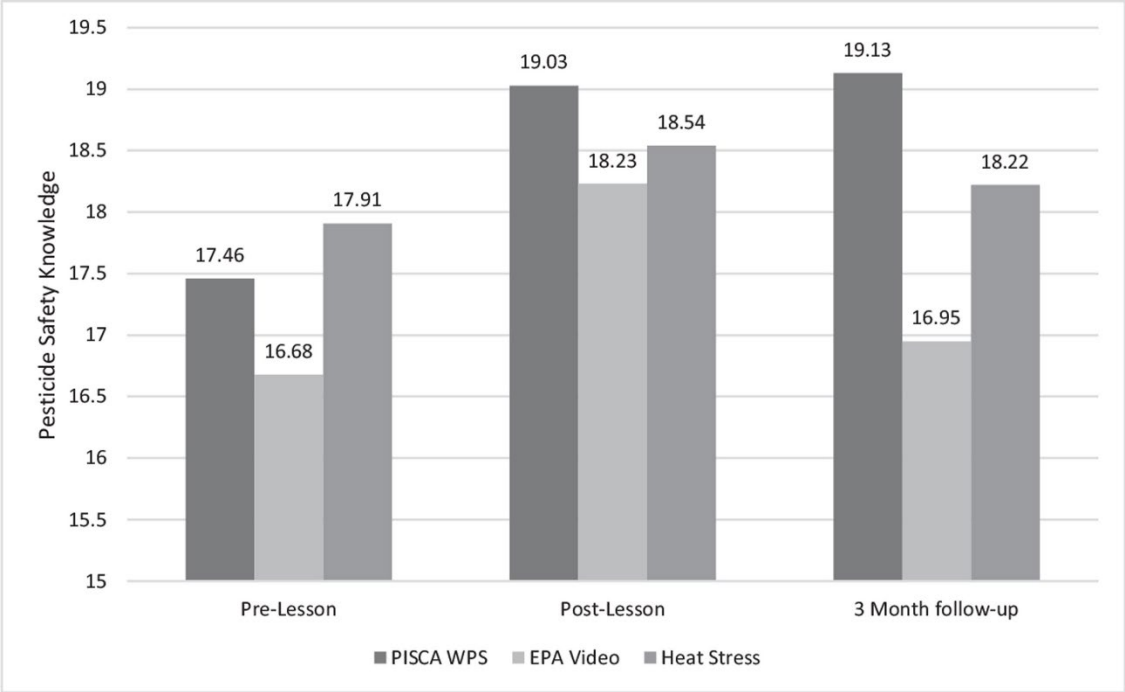

Figure 2. Marginal means of pesticide knowledge across time by treatment.

B.3. Competitive Revisions/Administrative Supplements

Not Applicable

B.4. What opportunities for training and professional development did the project provide?

NOTHING TO REPORT

B.5. How did you disseminate the results to communities of interest?

Publication and presentations.

B.6 - What do you plan to do during the next reporting period to accomplish the goals?

Not applicable, the study has ended.

C. PRODUCTS

C.1. Publications, conference papers, and presentations

Publications

Grzywacz, J. G., Gonzales-Backen, M., Liebman, A., Trejo, M., Ordaz Gudino, C., Trejo, M., Economos, J., Xiuhtecutli, N., & Tovar-Aguilar, J. A. (2022). Comparative Effectiveness of Training Alternatives for the EPA's Worker Protection Standard Regulation Among Immigrant Latino Farmworkers. *Journal of occupational and environmental medicine*, *64*(2), 140–145. https://doi.org/10.1097/JOM.0000000000002368. PMID: 34456324.

Grzywacz, J. G., Gonzales-Backen, M., Liebman, A., Marín, A. J., Trejo, M., Gudino, C. O., Economos, J., & Tovar-Aguilar, J. A. (2019). Attending to Pesticide Exposure and Heat Illness Among Farmworkers: Results From an Attention Placebo-Controlled Evaluation Design. *Journal of occupational and environmental medicine*, *61*(9), 735–742. https://doi.org/10.1097/JOM.0000000000001650. PMID: 31205205.

Conferences

American Public Health Association Meeting, Philadelphia, PA (November, 2019) Denis-Luque, M., Luque, J., Sanit-Louis, C. Tovar, A., & Grzywacz, J.G. Research to practice (R2P in occupational safety and health: Reducing pesticide exposure and preventing heat-related illness. Round Table Presentation, 11/4/2019.

Luque, J., Becker, A., Bossak, B., Grzywacz, J.G., Tovar, A. & Guo, Y. Knowledge and practices for adapting to working in the heat among Latino farmworkers in the Florida-Georgia border region. Round Table Presentation, 11/5/2019. East Coast Migrant Stream Forum, San Juan, Puerto Rico (October, 2019)

Tovar, A., Trejo, M. PISCA: Entrenamiento en Pesticidas e Insolación que es Culturalmente Apropiado – Community Health Workers (CHW) Training on the Delivery of the updated Workers Protection Standard (WPS).

C.2. Website(s) or other Internet site(s) – include URL(s)

SCCAHS Webinar. (2019). Pesticide & heat stress education for Latino farmworkers that is culturally appropriate. http://www.sccahs.org/index.php/webinars/pesticide-heat-stress-education-for-latino-farmworkers-that-is-culturally-appropriate/

C.3. Technologies or techniques

NOTHING TO REPORT

C.4. Inventions, patent applications, and/or licenses

Not Applicable

C.5. Other products and resource sharing

Category	Explanation
Educational aids of curricula	Comic Book - Juan Abre los Ojos, Como Protegerse de los Pesticidas. Authors: Amy K. Liebman, Salvador Sáenz, Antonio Marín, Maribel Trejo, J. Antonio Tovar-Aguilar and Joseph G. Grzywacz. Arte y Diseño: Salvador Sáenz, Asistente de arte: Uriel Sáenz, 2019
Educational aids of curricula	Tovar, A., Trejo, M. PISCA: Entrenamiento en Pesticidas e Insolación que es Culturalmente Apropiado – Community Health Workers (CHW) Training on the Delivery of the updated Workers Protection Standard (WPS).
Educational aids of curricula	Liebman, A.K., Marin, A.J., Hopewell, J., Trejo, M., Tovar Aguilar, A., Ordaz Gudino, C., Garcia Rendon, M., & Grzywacz, J.G. (2018). Normas de Protección al Trabajador Agrícola, [Kit]. Tallahassee, FL: Florida State University.
Other	Grzywacz, J. G., Gonzales-Backen, M., Liebman, A., Trejo, M., Ordaz Gudino, C., Trejo, M., Economos, J.,

	Xiuhtecutli, N., & Tovar-Aguilar, J. A. (2022). Comparative Effectiveness of Training Alternatives for the EPA's Worker Protection Standard Regulation Among Immigrant Latino Farmworkers. *Journal of occupational and environmental medicine*, *64*(2), 140–145. https://doi.org/10.1097/JOM.0000000000002368. PMID: 34456324.
Other	Luque, J. S., Becker, A., Bossak, B. H., Grzywacz, J. G., Tovar-Aguilar, J. A., & Guo, Y. (2020). Knowledge and Practices to Avoid Heat-Related Illness among Hispanic Farmworkers along the Florida-Georgia Line. *Journal of agromedicine*, *25*(2), 190–200. https://doi.org/10.1080/1059924X.2019.1670312. PMID: 31544652; PMCID: PMC7075471.
Data or Databases	Luque, J., Becker, A., Bossak, B., Grzywacz, J.G., Tovar, A. & Guo, Y. Knowledge and practices for adapting to working in the heat among Latino farmworkers in the Florida-Georgia border region. Round Table Presentation, 11/5/2019.
Data or Databases	American Public Health Association Meeting, Philadelphia, PA (November, 2019) Denis-Luque, M., Luque, J., Sanit-Louis, C. Tovar, A., & Grzywacz, J.G. Research to practice (R2P in occupational safety and health: Reducing pesticide exposure and preventing heat-related illness. Round Table Presentation, 11/4/2019.
Audio or video	Grzywacz, J. (December 11, 2018). Pesticide & Heat Stress Education for Latino Farmworkers that is Culturally Appropriate [Webinar]. https://vimeo.com/312819433

D. PARTICIPANTS

D.1. What individuals have worked on the project? Please include calendar, academic, and summer months.

Commons ID	S/K	Name	Degrees(s)	Role	Cal	Aca	Sum	Foreign	Country	SS

Refer to Overall Section D.1.

D.2 Personnel updates

a. Level of Effort: Yes, the study closed early due to challenges.
b. New Senior/Key Personnel: No
c. Changes in Other Support: No
d. New Other Significant Contributors: No

E. IMPACT

E.1 - What is the impact on the development of human resources, if applicable?

Not Applicable

E.2 - What is the impact the Public Health Relevance and Impact? The investigator should address how the findings of the project relate beyond the immediate study to improved practices, prevention or intervention techniques, legislation, policy, or use of technology in public health.

The relative absence of comparative effectiveness research creates a critical point of vulnerability for the mandatory training requirement of the WPS. In a world driven by ''show me the data,'' the current best-case scenario is that training improves knowledge and attitudes, but it has an unknown effect for reducing pesticide exposure. In a worst-case scenario training is subject to elimination as unnecessarily burdensome because there is insufficient evidence to support its continuation. The most significant contribution of this study is demonstration that pesticide-specific training does produce more frequent practice of behaviors advocated for reducing pesticide exposure. Specifically, the results of this study indicated more frequent practice of behaviors advocated by the WPS to reduce pesticide exposure among individuals who received the WPS curriculum than those who received the attention-placebo control.

F. CHANGES

F.1 – Changes in approach and reasons for change, including changes that have a significant impact on expenditures

The study closed early due to challenges (refer to section F.2).

F.2 - Actual or anticipated challenges or delays and actions or plans to resolve them

During Year 5 (2020-2021) of the Ag Center award the 2020-2021, activities for Specific Aim 3 were set to be implemented (*Identify the comparative effectiveness of promotora-based implementation of developed pesticide and HRI curricula relative to the use of professional educators).* This phase of the project was most impacted by the COVID-19 crisis. Nevertheless, in August the project finished recruitment, intervention, and data collection. PISCA continued into the Year 5 extended supplement, however progress significantly slowed when study staff did not return and replacing team members became difficult. Additionally, the new research activities proposed in the supplement were not achievable with farmworkers reluctant to participate and many suffering family loses during the pandemic. Dr. Grzywacz closed his project early in April 2022.

F.3 - Significant changes to human subjects, vertebrate animals, biohazards, and/or select agents

No Change

G. Special Reporting Requirements

G.1 Special Notice of Award Terms and Funding Opportunities Announcement Reporting Requirements

Not Applicable

G.2 Responsible Conduct of Research

Not Applicable

G.3 Mentor's Research Report or Sponsor Comments

Not Applicable

G.4 Human Subjects

G.4.a Does the project involve human subjects?

Yes

G.4.b Inclusion Enrollment Data

Cumulative Inclusion Enrollment Report

This report format should NOT be used for collecting data from study participants.

Study Title: PISCA: Pesticide and heat education for Latino farmworkers that is culturally appropriate

Comments:

Racial Categories	Ethnic Categories									Total
	Not Hispanic or Latino			Hispanic or Latino			Unknown/Not Reported Ethnicity			
	Female	Male	Unknown/ Not Reported	Female	Male	Unknown/ Not Reported	Female	Male	Unknown/ Not Reported	
American Indian/ Alaska Native										0
Asian										0
Native Hawaiian or Other Pacific Islander										0
Black or African American										0
White										0
More Than One Race										0
Unknown or Not Reported				142	478	2				622
Total	**0**	**0**	**0**	**142**	**478**	**2**	**0**	**0**	**0**	**622**

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Cumulative Inclusion Enrollment Report

G.4.c ClinicalTrials.gov

Does this project include one or more applicable clinical trials that must be registered in ClinicalTrials.gov under FDAAA?

Not Applicable

G.5 Human Subject Education Requirement

Are there personnel on this project who are newly involved in the design or conduct of human subject's research?

Not Applicable

G.6 Human Embryonic Stem Cells (HESCS)

Does this project involve human embryonic stem cells (only hESC lines listed as approved in the NIH Registry may be used in NIH funded research)?

No

G.7 Vertebrate Animals

Does this project involve vertebrate animals?

Not Applicable

G.8 Project/Performance Sites

Florida State University

G.9 Foreign Component

Not Applicable

G.10 Estimated Unobligated Balance

The estimated total cost unobligated balance (including prior year carryover) is estimated at $103,465.37 (DC + IDC).

G.10.a Is it anticipated that an estimated unobligated balance (including prior year carryover) will be greater than 25% of the current year's total approved budget?

No carryover /no cost extension is requested. The PISCA Research Core project closed early to unexpected challenges and is not a part of Cycle 2.

G.11 Program Income

Is program income anticipated during the next budget period?

Not Applicable

G.12 F&A Costs

Is there a change in performance sites that will affect F&A costs?

Not Applicable

I. OUTCOMES

I. Provide a concise summary of the outcomes or findings of the award, written for the general public in clear and comprehensible language, without including any proprietary, confidential information or trade secrets

Note: project outcome information will be made public in NIH RePORTER

The Pesticide & Heat Stress Education for Latino Farmworkers That is Culturally Appropriate (PISCA) Project's overall goal was to reduce the burden of poor occupational health outcomes among Latino farmworkers resulting from pesticide exposure and heat illness. To achieve this goal the project built a community-advocate-university partnership to create reproducible and culturally - and contextually- appropriate curricula and to distribute the PISCA EPA-approved Worker Protection Standard Training materials. In this project, an attention-placebo control design, we analyzed data from 622 farmworker participants to evaluate the effectiveness of the PISCA pesticide exposure (i.e., WPS) and heat illness curricula simultaneously. These were some of the main accomplishments and findings:

- PISCA's EPA-Approved Worker Protection Standard training performed comparably to the EPA-Certified video in improving farmworkers knowledge of pesticides (i.e., routes of pesticide exposure, strategies to reduce occupational exposure to pesticides, possible health effects of pesticide exposure).
- The results of this study clearly demonstrated the potential occupational safety and health value of the PISCA heat illness curriculum for Latino farmworkers. Relative to farmworkers assigned to the PISCA pesticide safety curriculum, those assigned to the PISCA heat illness curriculum showed greater improvements in knowledge about heat illness as well as greater changes in intention to engage in behaviors to prevent heat illness.
- The knowledge gained from PISCA's EPA-Approved Worker Protection Standard Training was retained across three months. At the three-month follow-up, farmworkers trained with PISCA materials reported more behaviors that minimize pesticide exposure than farmworkers trained with the EPA-Approved video.

The most significant contribution of this study is demonstration that pesticide-specific training does produce more frequent practice of behaviors advocated for reducing pesticide exposure. Specifically, the results of this study indicated more frequent practice of behaviors advocated by the WPS to reduce pesticide exposure among individuals who received the WPS curriculum than those who received the attention-placebo control.

A. COVER PAGE

Project Title: Occupational Health and Safety Surveillance of Gulf Seafood Workers	
Grant Number: U54OH011230	**Project/Grant Period**: 09/30/2016 – 09/29/2022
Reporting Period: 09/30/2021 – 09/29/2022	**Date Submitted**:
Program Director/ Principal Investigator Andrew Kane, PhD (Project Lead, University of Florida)	**Administrative Official Information** Stephanie Gray Assistant Vice President ufawards@ufl.edu 352-392-9267
Change of Contact PD/PI: No	
Human Subjects: Yes	**Vertebrate Animals:** No
hESC: No	**Inventions/Patents:** No

B. ACCOMPLISHMENTS

B.1. What are the major goals of the project?

This community-based surveillance project focuses on filling an important gap on non-fatal injuries health outcomes for Gulf coastal commercial fishers. Data from in-person interviews and workplace observations will provide feedback, empowerment, and some interventions to support a culture of safety and reduce the burden of injuries and medical care for this vulnerable and mostly self-insured population.

Specific Aim 1a. Establish project-specific working relationships with community partners and seafood workers in participating port cities within the study area. These partnerships are critical to gain trust in the community, facilitate participant enrollment, support the project team in piloting and implementing in-person interviews, conduct workplace observations, and engagement with the seafood worker community to develop community specific project feedback and support.

Specific Aim 1b. Develop, pilot, validate and implement an in-person questionnaire in Gulf coast fishery communities to relate occupational health and safety with environmental and personal risk factors.
Specific Aim 1c. Conduct workplace observations with fishery workers on boats, in processing facilities, and at points of distribution to supplement questionnaire-based health and safety.

Specific Aim 2: Develop behavioral and/or mechanical interventions with community partners and seafood workers, and conduct field piloting. Points of intervention for outcomes that have greatest adverse consequences (morbidity, death), and that are common and contribute to (a) lost productivity and/or (b) reduced quality of life, will serve as a focus. Implement a limited number of hazard interventions with community partners and provide metrics to discern acceptance and functionality of the interventions.

B.2. What did you accomplish under these goals?

This community-based surveillance project focuses on filling an important gap on non-fatal injuries health outcomes for Gulf coastal commercial fishers. Data from in-person interviews and workplace observations has provided feedback, empowerment, and some interventions to support a culture of safety and reduce the burden of injuries and medical care for this vulnerable and mostly self-insured population.

Specific Aim 1a. Establish project-specific working relationships with community partners and seafood workers in participating port cities within the study area. These partnerships are critical to gain trust in the community, facilitate participant enrollment, support the project team in piloting and implementing in-person interviews, conduct workplace observations, and engagement with the seafood worker community to develop community-specific project feedback and support.

Dr. Kane and project team members have engaged with partners in participating communities in Florida, Alabama, and Mississippi, representing shrimping, fishing, oystering, crabbing, and coastal shellfish aquaculture. Project communications and updates have been shared with partners and stakeholders through with OysterSouth (national shellfish growers association with focus on Gulf and southeastern US), Cedar Key Aquaculture Association (clam farmers), Franklin County Seafood Workers Association and Water Street Seafood in Apalachicola (oyster harvesters, fishers, crabbers, shrimpers), Panacea Oyster Growers Association (oyster farmers), and Mississippi Commercial Fisheries United (shrimpers, oyster harvesters, fishers, crabbers, shellfish farmers).

Specific Aim 1b. *Develop, pilot, validate and implement an in-person questionnaire in Gulf coast fishery communities to relate occupational health and safety with environmental and personal risk factors.*

The questionnaire was validated and piloted in YR01 and 02 and implemented in YR02-04. Full set data analyses were conducted in YR05 with extension into "YR05-Extended." Expansion of participant numbers was limited in the second half of the project due to COVID-related travel restrictions and logistics. Excluding pilot studies, 55/73 participants representing 113 cross-sector commercial fishing jobs contributed data for 184 self-reported injuries. Participants represented multiple work sectors including commercial shrimping, oyster dredging, crabbing, oyster tonging, oyster farming and clam farming, each with varying vessel configurations, equipment and job tasks.

Participants across fishing sectors were predominantly white, male, with average age of 49 years. representing an aging workforce. Worker age and number of years work experience appear to be risk factors for number of injuries reported per FTE-year. Higher injury rates per FTE-year were associated with lower age quartiles ($p=0.026$); similarly, higher injury rates per FTE-year were associated with fewer years work experience ($p=0.001$).

Injury classifications and severity were defined by BLS's Occupational Injury and Illness Classification System (OIICS) and injury reports were normalized to worker FTE-years in their respective fishing sectors. Two-thirds of participants reported working in more than one fishing sector. Across fishing sectors there were 3,793 injuries per 10,000 FTE-worker years, including 2,104 injuries per 10,000 FTE-worker years that were associated with days away from work (DAFW) and/or limited worker ability to perform job tasks. Injury rates determined from this study are comparable to non-fatal injury rates reported for dungeness crab harvesters (2,470/10,000 FTE), and for workers engaged in multiple fishing sectors in North Carolina (5,836) and in Denmark (2,048). Comparatively, BLS non-fatal injury rates for commercial fishers in 2020 under-reports by an order of magnitude (490/10,000 FTE).

Traumatic injuries and disorders were the most commonly reported types of injuries, followed by diseases and disorders of body systems, and infectious and parasitic diseases. Open wounds were the most common traumatic injury reported, primarily associated puncture injuries from stingray and catfish spines, followed by traumatic injuries to muscles, tendons, ligaments, joints, that were associated with overexertion, back and shoulder strain, and soft tissue injuries to the hand or ankle. Overexertion across fishing sectors was associated with heavy lifting of harvest containers, baskets, bags, or coolers, and soreness/pain/hurt. Soft tissue traumatic injuries also included back strains, shoulder strains, and hand/ankle strains, as well as jellyfish contact dermatitis. More commonly reported injuries tended to have lower injury severity scores compared with infrequently-reported injuries that tended to be more severe and associated with more DAFW. The majority of reported injuries were involved with the work processes of setting/fishing/retrieving gear and processing the catch, with most injuries affecting upper and lower extremities (Figure 2).

Specific Aim 1c. *Conduct workplace observations with fishery workers on boats, in processing facilities, and at points of distribution to supplement questionnaire-based health and safety.*
Workplace observations were recorded using photos and video, and when possible, engine room and grading equipment noise levels were measured. Workplace observations were conducted in YRS03-05 when COVID-related travel restrictions permitted. Onboard workplace observations from provided crucial insights to interpret survey data and provide hazard imagery to assess and compare across vessels and fisheries. Photo- and videographic data from workplace observations have been compiled and have been used to visualize risk factors as described by surveyed participants, discern variability of vessel structure and operations within fishing sectors, and consider opportunities for risk and hazard reduction that can be communicated in participating communities as part of project outreach and feedback.

Specific Aim 2. *Assess the potential to apply functional intervention(s) to address risk factors associated with specific hazards and negative health outcomes in the different fishery subsectors in the study region.*

Data from questionnaires, workplace observations, and stakeholder discussions were used to inform a list of intervention opportunities to reduce injury risk hazards. With input from community partners, we observed severe or acutely debilitating injuries were more common on shrimp boats compared with vessels used in other fishing sectors and included winch-related injuries and being struck by gear. Less severe, but more common types of injuries include chronic lower back pain from heavy lifting and repetitive tasks, and hearing loss from working adjacent to engines, tumblers or sorters. Rushing, fatigue and working solo are risk factors across fishing sectors associated with a spectrum injury outcomes. Relevant intervention opportunities will be complied from surveillance data and shared with stakeholders as part of community outreach. Discussions for implementation options will provide pilot data to inform future adoption frameworks and the development of evidence-based intervention that provide efficacy and value across work sectors. Intervention opportunities discerned from current data include (1) dampening pads to reduce noise exposure associated with shellfish sorters, (2) hearing protection to reduce noise exposure associated with shellfish tumblers, (3) mechanical and behavioral adaptations to reduce risk of traumatic stingray puncture injuries, and (4) job task ergonomic considerations to reduce lower back strain and pain.

Workplace observations provided important perspectives for surveillance data analyses, discerning opportunities for hazard risk reduction and interventions that could have value and can be adopted by working fishers.

B.3. Competitive Revisions/Administrative Supplements

Nothing to Report

B.4. What opportunities for training and professional development did the project provide?

Nothing to Report

B.5. How did you disseminate the results to communities of interest?

Project updates and summary results have been shared with participating communities and fishing sectors during online or in-person stakeholder meetings throughout the project. This includes project engagement with the Cedar Key Aquaculture Association, Panacea Oyster Growers Association, Franklin County Seafood Workers Association, Mississippi Commercial Fisheries United and OysterSouth. Efforts in YR05+ have included communications with community and project partners to organize and implement outreach and future opportunities based on lessons learned. Partners included Mississippi Commercial Fisheries United, OysterSouth, Cedar Key Aquaculture Association, the Panacea Oyster Cooperative, the Florida Shellfish Aquaculture Association and the Seafood Management and Resource Recovery Team.

B.6 - What do you plan to do during the next reporting period to accomplish the goals?

The project has closed and will not continue into the renewal.

C. PRODUCTS

C.1. Publications, conference papers, and presentations

Publications

Dunleavy, K., Bishop, M., Coffman, A., Reidy, J., & **Kane, A.** (2022). Chronic lower back pain in aquaculture clam farmers: adoption and feasibility of self-management strategies introduced using a rapid prototype participatory ergonomic approach. *International journal of occupational safety and ergonomics : JOSE*, *28*(3), 1829–1839. https://doi.org/10.1080/10803548.2021.1935543 PMID: 34121632; PMCID: PMC8738770.

Dunleavy, K., **Kane, A.**, Coffman, A., Reidy, J., & Bishop, M. D. (2022). Outcomes of Participatory Ergonomics and Self-management in Commercial Clam Farmers with Chronic Low Back Pain: A Feasibility Study. *Journal of agromedicine*, *27*(2), 217–231. https://doi.org/10.1080/1059924X.2021.2004961 PMID: 34772318.

Sabo-Attwood, T., Apul, O. G., Bisesi, J. H., Jr, **Kane, A. S.**, & Saleh, N. B. (2021). Nano-scale applications in aquaculture: Opportunities for improved production and disease control. *Journal of fish diseases*, *44*(4), 359–370. https://doi.org/10.1111/jfd.13332 PMID: 33559228.

Stuchal, L. D., Charles-Ayinde, M. K. S., **Kane, A. S.**, Kozuch, M., & Roberts, S. M. (2020). Probabilistic risk assessment for high-end consumers of seafood on the northeastern Gulf coast. *Journal of exposure science & environmental epidemiology*, *30*(3), 478–491. https://doi.org/10.1038/s41370-019-0119-4 PMID: 30728481; PMCID: PMC6684874.

Myers, Melvin & Durborow, Robert & **Kane, Andrew**. (2018). Gulf of Mexico Seafood Harvesters: Part 3. Potential Occupational Risk Reduction Measures. Safety. 4. 33. 10.3390/safety4030033.

Myers, Melvin & Durborow, Robert & Kane, Andrew. (2018). Gulf of Mexico Seafood Harvesters, Part 2: Occupational Health-Related Risk Factors. Safety. 4. 27. 10.3390/safety4030027.

Myers, Melvin & Durborow, Robert & **Kane, Andrew**. (2018). safety Gulf of Mexico Seafood Harvesters: Part 1. Occupational Injury and Fatigue Risk Factors. Safety. 4. 10.3390/safety4030031.

Presentations

Kane, AS. (2022). Occupational Health and Wellness: Lesions Learned from Clam and Oyster Farmers." Annual meeting of the Florida Shellfish Aquaculture Association, Wakulla Environmental Institute, Panacea, FL

Kane AS (2022). Stingray puncture injuries and chronic back pain: Staying Healthy While Working. Annual meeting of the Cedar Key Aquaculture Association, May 3, 2022.

Kane AS. Co-host and Panel Lead: Emerging Issues in Occupational Health and Safety in the Southeastern US at 5th Southeast Regional Research Symposium (SERRS), March 21-23, 2022. This symposium serves five NIOSH centers in the SE region including faculty, professional students and trainees, departments of health and industry stakeholders within the region. Over 250 registrants and approximately 175 attendees with active engagement in sessions.

Rash R and Kane AS. Environmental and Human Behavioral Risk Factors for Traumatic Stingray Puncture Injuries in Cedar Key Clam Harvesters. Presented at the 4th Southeast Regional Research Symposium (SERRS), February 17-18, 2021.

Dunleavey K, Kane AS, Coffman A, Reidy J and Bishop M. Effectiveness of participatory ergonomic self-management strategies for clam farmers with chronic low back pain. 4th Southeast Regional Research Symposium (SERRS), February 17-18, 2021.

Kane AS. Co-host and Panel Lead: Industry Challenges Lunch-and-Learn with representatives from agriculture, fisheries, small and minority businesses and hospitality at 4th Southeast Regional Research Symposium (SERRS), February 17-18, 2021. This symposium serves five NIOSH centers in the SE region including faculty, professional students and trainees, departments of health and industry stakeholders within the region. Over 400 registrants and approximately 230 attendees with active engagement in (virtual) attendance.

Kane AS. (2020). *The Southeastern Coastal Ag Center, and Seafood and Seafood Worker Health in the Gulf of Mexico*. Southeastern States Occupational Network (SouthON) Annual Meeting and SEER Annual Meeting. Birmingham, AL. February 25-28, 2020.

Kane AS, Myers M, Durborow R, Dunleavy K, Rash R and Brooks R. (2020). Extending Oyster Farmer Shelf life: Staying Safe and Healthy Working on the Water. 4th Annual meeting of Oyster South, Wilmington, NC February 20-22, 2020.

Kane AS, Myers M, Durborow R, Dunleavy K, Rash R and Brooks R. (2020). *The Tough People Behind the Tender Clams: Occupational Health and Safety Support for Clam Mariculturists in Cedar Key, FL*, National Shellfisheries Association Annual Meeting, Baltimore, MD March 30-April 2, 2020.

Kane AS. 2018/2019. Seafood and Seafood Worker Health in the Gulf of Mexico. Southeastern States Occupational Network (SouthON) Annual Meeting. Savannah, GA; Tampa, FL.

Kane AS, Durborow RM and Myers M. 2019. UF's Southeastern Coastal NIOSH Ag Center News: Surveillance Studies to Support Seafood Worker Health and Safety in Gulf Coast Communities. Emerging Pathogens Research Day, University of Florida, Gainesville, FL.

Kane AS, Durborow RM and Myers M, Brooks RM, Hartsfield SA, Cantwell R, Colson S, Turpin R. 2018. Southeastern Coastal NIOSH Center State-of-the-Science Symposium on Heat Stress: Surveillance Studies to Support Seafood Worker Health and Safety in Gulf Coast Communities. Tampa, FL.

Myers ML. 2018. Aquacultural Safety and Health (Invited Keynote Speaker). 5th International Fishing Industry Safety & Health (IFISH) Conference, St. John's, Canada.

Myers ML, Durborow RM and Kane AS. 2018. Fish Harvester Fatigue: A Review. 5th International Fishing Industry Safety & Health (IFISH) Conference, St. John's, Canada.

Durborow RM, Kane AS and Myers ML. 2018. Clam Mariculture in South Carolina. 5th International Fishing Industry Safety & Health (IFISH) Conference, St. John's, Canada.

Kane AS, Durborow RM and Myers ML. 2018. Health and Safety Surveillance of Seafood Harvesters in Gulf Coast Communities. 5th IFISH Conference, St. John's, Canada.

Kane AS, Brooks RM, Hartsfield SA, Cantwell R, Colson S, Durborow R and Myers M. 2018. Seafood Workers are Aquatic Animals Too: Surveillance of Health, Injuries and Fatalities Along the US Gulf Coast. 8th International Symposium on Aquatic Animal Health (ISAAH), Charlottetown, PEI, Canada.

Kane AS, Myers ML, Durborow RM. 2017. Seafood Worker Health and Safety in Gulf Coast Communities. American Public Health Association (APHA) National Meeting, Atlanta, GA, November 4-8, 2017.

C.2. Website(s) or other Internet site(s) – include URL(s)

Current Research - Southeastern Coastal Center for Agricultural Health and Safety - SCCAHS
Andrew Kane Profile

C.3. Technologies or techniques

Nothing to Report

C.4. Inventions, patent applications, and/or licenses

Nothing to Report

C.5. Other products and resource sharing

Nothing to Report

D. PARTICIPANTS

D.1. What individuals have worked on the project? Please include calendar, academic, and summer months.

Commons ID	S/K	Name	Degrees(s)	Role	Cal	Aca	Sum	Foreign	Country	SS

Refer to Overall Section.

D.2 Personnel updates

a. Level of Effort: None
b. New Senior/Key Personnel: No
c. Changes in Other Support: No
d. New Other Significant Contributors: No

E. IMPACT

E.1 - What is the impact on the development of human resources, if applicable?

Not Applicable

E.2 - What is the impact the Public Health Relevance and Impact? The investigator should address how the findings of the project relate beyond the immediate study to improved practices, prevention or intervention techniques, legislation, policy, or use of technology in public health.

This community-based NIOSH research project developed new, and strengthened existing, academic-industry partnerships in commercial fishing communities along the northeastern Gulf coast. Research efforts provide non-fatal injury surveillance data for commercial Gulf fishers in Florida, Alabama and Mississippi. Project efforts have expanded stakeholder networks based on engagement with the project team. Working relationships with community partners within these industry sectors afford prospects for long-term working partnerships, opportunities for longitudinal surveillance, and development of numerous behavioral and mechanical interventions. Application of dissemination and implementation science approaches to discern intervention barriers and facilitators offers great opportunity to have "culture of safety" discussions, offer interventions based on community input and surveillance data, and develop evidence-based interventions that can be adapted for different stakeholder groups with similar hazard exposures.

Dissemination and translation of surveillance data, and application of implementation research in out-years will provide metrics to discern diffusion of knowledge shared with stakeholders, intervention adaptability for individuals and specific work sector environments, and facilitators and barriers to intervention adoption. Topical areas informed by our current studies might include: (a) "Winch Talk:" Community forum to discern self-reported winch injuries and close calls, risk factors, solutions, alternate configurations, and procedures for operating specific gear; (b) being a professional; (c) keeping your deckhand; (d) hearing loss; (e) chronic lower back pain; and (f) use of PFDs (life jackets).

F. CHANGES

F.1 – Changes in approach and reasons for change, including changes that have a significant impact on expenditures

Not Applicable

F.2 - Actual or anticipated challenges or delays and actions or plans to resolve them

Nothing to Report

F.3 - Significant changes to human subjects, vertebrate animals, biohazards, and/or select agents

No Change

G. Special Reporting Requirements

G.1 Special Notice of Award Terms and Funding Opportunities Announcement Reporting Requirements

Not Applicable

G.2 Responsible Conduct of Research

Not Applicable

G.3 Mentor's Research Report or Sponsor Comments

Not Applicable

G.4 Human Subjects

G.4.a Does the project involve human subjects?

Yes

G.4.b Inclusion Enrollment Data

PHS Inclusion Enrollment Report

This report format should NOT be used for collecting data from study participants.

OMB Number: 0925-0001
Expiration Date: 3/31/2020

*Study Title (must be unique): Occupational Health and Safety Surveillance of Gulf Seafood Workers

* Delayed Onset Study? ☐ Yes ☒ No

If study is not delayed onset, the following selections are required:

Enrollment Type	☐ Planned	☒ Cumulative (Actual)
Using an Existing Dataset or Resource	☐ Yes	☒ No
Enrollment Location	☒ Domestic	☐ Foreign
Clinical Trial	☐ Yes	☒ No

NIH-Defined Phase III Clinical Trial ☐ Yes ☒ No

Comments:

Racial Categories	Ethnic Categories									
	Not Hispanic or Latino			Hispanic or Latino			Unknown/Not Reported Ethnicity			Total
	Female	Male	Unknown/ Not Reported	Female	Male	Unknown/ Not Reported	Female	Male	Unknown/ Not Reported	
American Indian/ Alaska Native	0	2	0	0	0	0	0	0	0	2
Asian	0	0	0	0	0	0	0	0	0	0
Native Hawaiian or Other Pacific Islander	0	0	0	0	0	0	0	0	0	0
Black or African American	0	0	0	0	0	0	0	0	0	0
White	8	58	0	1	0	0	0	0	0	67
More than One Race	0	4	0	0	0	0	0	0	0	4
Unknown or Not Reported	0	0	0	0	0	0	0	0	0	0
Total	8	64	0	1	0	0	0	0	0	73

Report 1 of 1

G.4.c ClinicalTrials.gov

Does this project include one or more applicable clinical trials that must be registered in ClinicalTrials.gov under FDAAA?

No

G.5 Human Subject Education Requirement

Are there personnel on this project who are newly involved in the design or conduct of human subject's research?

No

G.6 Human Embryonic Stem Cells (HESCS)

Does this project involve human embryonic stem cells (only hESC lines listed as approved in the NIH Registry may be used in NIH funded research)?

No

G.7 Vertebrate Animals

Does this project involve vertebrate animals?

No

G.8 Project/Performance Sites

University of Florida

G.9 Foreign Component

Not Applicable

G.10 Estimated Unobligated Balance

The estimated total cost unobligated balance (including prior year carryover) is estimated at $6,279.61 (DC + IDC). This total balance was carryover from Year 5 to Year 5 Extended and will not be requested into renewal Cycle 2.

G.10.a Is it anticipated that an estimated unobligated balance (including prior year carryover) will be greater than 25% of the current year's total approved budget?

Not Applicable

G.11 Program Income

Is program income anticipated during the next budget period?

No

G.12 F&A Costs

Is there a change in performance sites that will affect F&A costs?

Not Applicable

I. OUTCOMES

I. Provide a concise summary of the outcomes or findings of the award, written for the general public in clear and comprehensible language, without including any proprietary, confidential information or trade secrets
Note: project outcome information will be made public in NIH RePORTER

Commercial ocean fishing is one of the most dangerous occupations in the world. Workplace-related illnesses, injuries and fatalities are not uncommon for commercial seafood harvesters, and many of these injuries are avoidable in this mostly self-employed, uninsured workforce that feeds our nation. This community-based research project focused on filling an important gap on non-fatal injuries for Gulf coastal commercial fishers. Data from in-person interviews and workplace observations were used to provide feedback, empowerment, and insights relative to interventions to support a culture of safety and reduce the burden of injuries and need medical care for this vulnerable and mostly self-insured population.

Non-fatal injuries are often not reported by coastal fishers since many are self-employed, or work in workplaces with fewer than 10 employees where mandatory reporting and worker's compensation are not the rule. Therefore, state and federal data underestimate injury reports and workers' compensation claims for non-fatal injuries. For example, of the 13,883 Workers' Compensation claims submitted 2011-2015 from agriculture, forestry and fishing sectors in Florida, only one was related to fishing. Non-fatal injuries constitute the vast majority of workplace incidents, can be severe, and result in lowered productivity, lost worktime and wages, and lowered quality of life and disability.
This study was one of the first opportunities to learn about the types of non-fatal occupational injuries and illnesses that impact coastal seafood harvesters in the Northeastern Gulf of Mexico (FL, AL, MS). In-person interviews and workplace observations collected data to better understand the range of occupational hazards and injuries that impacted workers across different fishing sectors. Participants contributing to this study represented multiple fishing sectors including shrimping, oyster dredging, crabbing, oyster tonging, oyster farming and clam farming, each with varying vessel configurations, equipment and gear, and job tasks.

188 injuries reported by 52 out of the 72 seafood harvesters surveyed, that represented commercial shrimpers, oyster dredgers, blue crabbers, oyster tongers, and oyster and clam farmers. The impact and burden of injuries, based on the number of limiting injuries and injuries involving days away from work, were estimated based on yearly effort by fishing sector. Two-thirds of participants worked in more than one fishing sector, hence injury data were normalized by each fisher's sector effort

Overall, seafood harvesters reported 0.33 injuries/work-year, including 0.21 injuries per work year that limited the ability of the worker to perform job tasks or required days away from work. In other words, on average, seafood harvesters in this study reported 1 injury for every three years' work experience, with 2 out of every 3 injuries limiting job function or requiring DAFW. Injury rates per work-year by fishing sector were 0.16, 0.29, 0.08, 0.45, 0.89 and 0.21 for shrimping, oyster dredging, crabbing, oyster tonging, oyster farming and clam farming, respectively. Injury rates varied by fishing sector and were not necessarily predictive of injury severity, ability to perform job tasks, or number

of days away from work. For comparison, the rate of non-fatal injuries reported by dungeness crab harvesters, and multi-sector fishers in North Carolina and in Denmark was 0.25, 0.58 and 0.20 injuries per worker-year, respectively. Non-fatal injury rates for commercial fishers from the US Bureau of Labor Statistics (2020) are under-reported by an order of magnitude (0.049 per work-year).

Worker age, as well as years' work experience, are risk factors for number of injuries reported. In general, more injuries were associated with younger employees and fewer years' work experience. Severe or acutely debilitating injuries, e.g., winch-related injuries and being struck by gear, were more commonly reported on shrimp boats compared with other coastal fishing vessels in the region. Less severe, but more common types of injuries included chronic lower back pain from heavy lifting and repetitive tasks, and animal-related puncture injuries. Rushing, fatigue, working solo, and alcohol and drug use were identified as risk factors across fishing sectors and injury outcomes. The most commonly reported injury type was traumatic injury. Open wounds were the most common traumatic injury, primarily associated puncture injuries from stingray and catfish spines, followed by injuries to muscles, tendons, ligaments, and joints, associated with overexertion, back and shoulder strain, and soft tissue injuries to the hand or ankle. Overexertion was typically associated with heavy lifting of harvest containers, baskets, bags, or coolers, and soreness/pain/hurt. Soft tissue traumatic injuries included back strains, shoulder strains, and hand/ankle strains, as well as jellyfish contact dermatitis. The largest proportion of injuries reported were associated with the work processes of setting/fishing/retrieving gear and processing the catch, with most injuries affecting arms, legs, hands and feet.

Participant perceptions and concerns about "the most dangerous occupational hazards they encounter while working," e.g., working with winch/machinery, extreme weather/rough seas, and setting/retrieving gear, tended to be reported by fishers with injuries resulting from such hazards. Workers did not report concerns associated with less-commonly reported injuries. For example, bacterial infections from puncture wounds, cuts and scrapes, were only reported by 2 out of 72 workers as an occupational hazard, yet there were 16 bacterial infections reported in this study, three requiring an average of 7 days away from work.

Important workplace perspectives and industry-level challenges were shared by participants through survey data and discussion:

- Profit margins have tightened due to competing markets, inflating the cost of fishing relative to dockside value. Vessels are aging and fewer leave the docks. Tight economics are not supportive of regular preventative maintenance to vessels, equipment, and gear.
- Working extreme work hours and shrimping alone may become more common to make ends meet.
- Fewer younger workers are coming into the industry, leading to an aging workforce.
- Keeping deckhands/crew as "regulars," on shrimp boats has become increasingly challenging. Regular crews provide better continuity and safety in the workplace.
- At the time of survey, most fishers were self-employed and self-insured, and access to healthcare was challenging in some coastal communities.
- 0% of survey participants in this study reported wearing personal floatation devices (PFDs) while working on the water.
- For some workers, getting injured and enduring pain are "part of the job." Fatalistic thinking ("getting hurt is part of the job description") and "working through the pain" were common among study participants.

For many of the hazards associated with injuries in this study, good news is that low-cost and procedural interventions hold promise to reduce the burden of injuries for this workforce. For example:

- Routine observations of vessel rigging, equipment and gear for damage, wear or improper stowage can point to impending failures and accidents before they happen.
- Deep cuts and puncture wounds can be cleaned, antibiotic ointment applied and wrapped at sea to prevent

secondary bacterial infections.

- Back injuries associated with heavy lifting and poor ergonomics can be, at least partially, addressed through team rather than individual lifting of heavy containers and improved ergonomics.
- Open wounds associated with traumatic stingray puncture injuries, accompanied with an excruciating venom, may be addressed with combination of mechanical and behavioral approaches to reduce risk of stingray encounters and attacks.
- Hearing loss associated with engine noise, graders and tumblers can be addressed by personal hearing protection and dampening pads on the graders to reduce harmful noise exposure.

The community-based nature of this study, and excellent partnerships in participating coastal communities, has afforded a dialog and degree of trust for the study team by the workers and their professional organizations. In-person project outreach by the study director and team, with seafood workers in different communities and fishing sectors, was well-received. There are few other non-regulatory enterprises looking out for the health and well-being of seafood workers. Future efforts will build upon existing working relationships to develop a “culture of safety,” and make commercial fishing a viable and safe opportunity for this and the next generation of hard-working, dedicated seafood workers.

A. COVER PAGE

Project Title: Research Core: Pilot Feasibility Program	
Grant Number: U54OH011230	**Project/Grant Period**: 09/30/2016 – 09/29/2022
Reporting Period: 09/30/2021 – 09/29/2022	**Date Submitted**:
Program Director/ Principal Investigator John Glenn Morris, MD, MPH&TM Phone Number: 352-273-7526 Email: jgmorris@epi.ufl.edu	**Administrative Official Information** Stephanie Gray Assistant Vice President 207 Grinter Hall P.O. Box 115500 Gainesville, FL 32611 ufawards@ufl.edu 352-392-9267
Change of Contact PD/PI: No	
Human Subjects: Yes	**Vertebrate Animals:** No
hESC: No	**Inventions/Patents:** No

B. ACCOMPLISHMENTS

B.1. What are the major goals of the project?

The Pilot Feasibility Program will provide seed funds to stimulate projects in worker safety and health in the areas of agriculture, forestry, and fishing (AgFF). Projects may include basic/etiologic research, translational research, intervention studies, and/or surveillance. Our primary goal is to provide early pilot/feasibility support to projects that ask innovative/important questions, and which lay the groundwork for subsequent research grant submissions, either to NIOSH or other federal or state funding agencies. We anticipate that many of these projects will be "high risk, high reward," exploring novel ideas/approaches which have not been previously tested, and for which preliminary data are limited. Projects will be solicited from the 6-state region included in the SCCAHS (Florida, Georgia, Alabama, Mississippi, and North and South Carolina) and the U.S. territories of Puerto Rico and the Virgin Islands. There will be a strong effort made to include institutions outside of the University group included in the initial proposal and specifically from the Historically Black Colleges and Universities (HBCU's) within the region.

Task 1: Advertisement and assistance for pilot project applications. A straightforward and transparent process will be developed to advertise and encourage participation in the pilot projects opportunity among investigators interested in agricultural safety and health in the six-state SCCAHS region. Guidance/mentorship in pilot grant proposal preparation will be provided to persons interested in the program, to assure that investigators (particularly junior investigators) are able to optimally express their ideas. The biostatistical group within the Planning and Evaluation Core will also be involved in this pre-submission process, to assure that projects have a sound statistical base.

Task 2: Selection of pilot projects. All project proposals will be reviewed by internal and/or external reviewers (selected by the Pilot Projects Research Committee [PPRC]), who will score the projects based on written criteria. Projects will be ranked by points and presented to the PPRC, which will recommend funding based on ranking and potential value of the project to understanding/improving regional agricultural, fisheries, and forestry worker safety and health. Junior investigators (assistant professor, post-doctoral fellows) whose projects are selected for funding will have a SCCAHS mentor assigned by the PPRC.

Task 3: Monitoring of projects and converting pilot projects to federally funded grants. Six months after awarding of funds, investigators will be asked to report progress to the PPRC. The PPRC will assess progress and provide recommendations regarding ongoing project activities. The goal of this review will be to monitor productivity, identify areas where staff and other SCCAHS resources may be of assistance, and facilitate plans for preparation and submission of larger, more comprehensive proposals by the investigator within a year of receipt of the original award.

Task 4: Development of metrics for evaluating the Pilot Projects Program. Measured outcomes will include publications and grant submissions. In collaboration with the Evaluation Program in the Planning and Evaluation Core, the value and effectiveness of the Pilot Projects Program will also be evaluated with a questionnaire provided to- SCCAHS investigators and key representatives from universities in the region.

Four pilot projects were supported in Year 5 Extended, 2021 – 2022.

1. Chronic low back pain in seafood workers: a pilot intervention study to identify modifiable work and movement solutions (Kimberly Dunleavy)
2. A Pilot Study to Assess Personal PM2.5 Exposure and Respiratory Virus Infections among Farmworkers in the Southeast (Eric Coker)
3. Exploring Mental Health and Natural Disasters in Agricultural Communities in Puerto Rico (Pagan-Santana)
4. Developing an Integrated Decision Support Tool and Network for WPS Respirator Compliance in Florida Agricultural Industries (Morera)

B.2. What did you accomplish under these goals?

YEAR 5 SUPPLEMENT OUTCOMES/ACHIEVEMENTS

I. Chronic low back pain in seafood workers: a pilot intervention study to identify modifiable work and movement solutions (Kimberly Dunleavy)

Dr. Dunleavy's pilot study has established the feasibility of new methods of self-management strategies in clam farmers with low back pain (LBP). Clam farmers with LBP in the Cedar Key Florida area participated in the study. Twenty-eight clam farmers from 7 teams met inclusion criteria; 19 completed the study. Participants were mostly male (90%), white (93%), achieved high school or beyond education (70%), with a mean age of 34 and 9.5 years' experience in the industry. They reported lifting >50 lbs on average for 17.3 hours per week and experiencing back pain for an average of 4 years. Participatory rapid prototyping provided a feasible and efficient option to introduce strategies for clam farmers with small teams, variable work processes and workloads, and time restrictions. Strategies were considered acceptable and easy to use, and most increased productivity.

Participants selected a mix of team and individual strategies. The 3 most frequent choices were team strategies; team lifting (58%), rotating tasks in the team (47%), and using mechanical equipment (42%). The most frequent individual strategies chosen were pacing or taking small breaks (42%) and changing lifting position (32%). Participants used individual strategies 3 to 6.5 days per week, and 46-92% of the time. Although workers selected more team rather than individual strategies, team approaches were used slightly less often. Participants felt that the strategies were relatively easy to use (30 on a scale of 0=*very easy* to 100=*very difficult*). (see Figure 2- Appendix) Most strategies were recommended (74%) or possibly recommended (19%).

Participants reported general appreciation of the importance of training, with those individuals who had been in the industry for a long time commenting on the relevance for their longevity in the industry. The videos of themselves or other crews were noted as being very helpful; along with reminders both from the researchers and their team. One of the concerns often expressed during initial focus groups was the potential that any work process change would impact productivity. In the final survey, most strategies assisted productivity, particularly if there was less pain, and some participants reported that they were able to lift for longer or work faster. There were a few strategies that did not change productivity or slowed down processes. Challenges for uptake included changing habit, culture, and team dynamics. Some participants were more comfortable with their routine while others did not want to be perceived as being unable to do the job or less capable than others. Culture, ego, and team dynamics were a barrier in some teams, but participants did comment on positive changes with asking for help. Time and workflow pace were mentioned as factors limiting implementation.

Participatory methods provided opportunities to introduce, support, and build worker capacity to adjust processes in the workplace and build team buy-in. Overall, participants were receptive and appreciative of opportunities to manage pain and implemented strategies relatively consistently. Future projects using these methods will need to build strong community linkages, buy-in, and local presence to facilitate workplace intervention and data collection. Participatory ergonomic approaches provided a viable option to introduce work-related changes in this pilot study of clam farmers with small teams, variable work processes, time restrictions and workloads.

II. A Pilot Study to Assess Personal PM2.5 Exposure and Respiratory Virus Infections among Farmworkers in the Southeast (Eric Coker)

The pilot generated new PM2.5 exposure assessment data among farmworkers within the southeastern U.S., including exposure data among those working on different types of crops. The investigative team is using a real-time exposure monitoring device (MicroPEM). Real-time exposure monitoring data will enable us to not only determine the distribution of farmworker exposures and differences in exposure between the types of crops worked on, but also to assess within-day variability of personal PM2.5 exposures. Capturing within-day variability could be important in terms of pinpointing high-exposure episodes that could eventually lead to more targeted investigations aimed at identifying exposure-mitigation strategies.

The collection/analysis of farmworker nasal swab samples for the detection of viral carriage is another innovative approach characterizing viral carriage for multiple respiratory pathogens provides important baseline data. This is the first study that will characterize upper airway viral infection and co-infections among agricultural farmworkers using a highly sensitive, specific and state-of-the-art molecular detection technique to explore the feasibility of accessing and utilizing electronic medical records from MHCs for the purposes of active surveillance of ARIs.

The supplement Year 2021-2022 supported accomplishments of the final two aspects of the project –

- To use OneFlorida Data Trust and geospatial analysis to conduct respiratory and chronic kidney disease surveillance among Hispanic crop farmworker communities (IRB202102349)

- To investigate whether exhaled breath condensate (EBC) is a suitable sample for identifying respiratory infections and biological biomarkers in humans.

III. Exploring Mental Health and Natural Disasters in Agricultural Communities in Puerto Rico (Pagan-Santana)

Climate change and related natural disasters impact the physical health and well-being of the population. Community and individual livelihood may be damaged or altered because of property loss or damage, lack of resources, job, housing, and food insecurity. Effects of the climate crisis, such as flooding, drought, and storms, are expected to affect Puerto Rico. Agricultural workers may be significantly affected by these events, considering their exposure to various environmental stressors during their workdays and intrinsic psychosocial factors of the agricultural community such as labor and social conditions. Recent studies present the perception of farm workers in Puerto Rico regarding climate change, exploring agricultural workers and farmers' preparedness and adaptation methods (Rodriguez, L. & Niles, M. 2018). However, the effect of stressors caused by climate-related disasters on the agriculture worker population has not yet been explored.

This project prosed to adapt and pilot an assessment tool to explore the mental health status of farmworkers in Puerto Rico using previously developed resources. We assessed current tools and resources to address mental health, climate change, and disasters. The study team gathered the validated tools and created a survey to test the cultural and linguistic appropriateness of questions. After testing, recommendations and observations were documented to further tailor the tool. Finally, guidance on the methods and environment needed to use this tool were developed. When validated, we expect that the implementation and use of this tool will provide a pathway to effectively assess the mental health and resilience of agricultural workers in Puerto Rico as it relates to climate change and disasters. We expect that the implementation and use of the developed tools will provide a pathway to effectively assess agricultural workers' mental health and resilience in Puerto Rico as it relates to climate change and disasters.

Review of previous tools. A literature review was carried out with the objective of identifying tools related to the impact of the climate crisis on farmers or vulnerable populations and the impact of the climate crisis on the mental health of individuals. The main criterion for the use of these tools was that they be validated

and accessible for use, an attempt was also made to select tools that were culturally appropriate and consistent with the educational level of the population to be served. A total of 9 tools were identified (SRQ-20, The Stress in Farming Questionnaire, MFWSI, NAWHS, CAGE, CES-D, Climate Change in the American Mind Survey, Puerto Rican Farmers' Climate Change and Adaptation Perceptions after Hurricane Maria, and the Psychological Distance of Climate Change). Questions that could be used or adapted for use in the target population were discussed and put in a questions bank. The questions were modified, including translation or change in terminology to adapt the Spanish used. Some of the terms were consulted through interviews with farmers to verify terms that could be considered very technical or alien to the community.

Study Location and Participants. Castañer is located the central rural and mountainous region of Puerto Rico, where a large part of the island's agricultural activity takes place. Given the amount of agricultural activity in the area, the risk and vulnerability to climate related disasters and crisis is significant. Historically, this region is severely impacted by flooding and landslides that can be either due to atmospheric events or weather-related. The number of historical events in combination with the projections that present the increase and continuation of these events, add to the need to understand how these events can impact the residents of the region, especially those whose income and source of employment is also being impacted. for these events.

In Castañer, primary health services specialized in agricultural workers are mostly provided through Hospital General Gastañer (HGC), which is a primary healthcare center founded by the U.S. Health Resources & Services Administration (HRSA). Health centers whose primary population is composed of agricultural workers act to establish programs that focus on educating on the hazards of agricultural work and how to protect farmworkers' families, providing culturally appropriate enrollment assistance, linkages to other community resources, and proper primary care. The study team carried out this research in collaboration with a partner community health center, Hospital General Castañer (HGC), that serves agricultural workers in rural Puerto Rico. HGC is in a high activity agricultural industry zone, and 37% of their patient population is classified as agricultural workers, providing a significant pool of participants. Individuals participating were those identified as agricultural workers by HGC and who complied with following the inclusion criteria: individual is 18 years or older, primary income comes from agriculture, and primary residence is in Puerto Rico. The recruitment process for the focus group, and pilot was a combination of self-recruitment and direct approach to possible subjects using HGC to advertise and recruit individuals that visit the clinic or participate in any of the health center programs. Taking into consideration recruitment and participation rates a sample size of 30 agricultural workers was established to complete the interview and 6 to 10 workers to participate in the focus group for a maximum of 40 participants. 48 agricultural workers were recruited to participate. Due to COVID-19 restrictions and other challenges there was a significant loss of participants where only 8 participated in the interviews and 14 completed the survey.

Interviews and questionnaires. Interviews were completed with eight workers to gather input language and to explore terminology and concepts. The purpose of the interview was to discuss the questions and topics that are used in questionnaires and surveys that assess mental health and changes in climate, in agricultural workers and the general population. The goal of this discussion was to gather farmworkers' opinion and suggestions to improve the questions, words, and language used in these materials. We adapted the questions and language following the recommendations made by the participants and the observations of the interviewer. The resulting tool has the objective of gathering knowledge to understand how agricultural workers respond to climate related events like hurricanes and heat. This preliminary tool was not validated as we did not reach the sampling size required to perform internal and external validity. However, the observations and preliminary results allow the team to further adapt this tool in sustain the project and move onto validation.

Results. Despite having recruited 48 participants for the validation of the questionnaire, only 14 were able to participate. The loss of the group was largely due to the recurring postponement of interviews due to the local COVID-19 situation and the need to conduct interviews in person. Most of those registered had technological limitations, so it was not possible to carry out adaptations to the methodology to perform remote interviews. Similarly, there was a risk that some of the questions to the participants could result in the need for immediate psychological attention, so it was preferred to keep the location of the interviews in the health center, providing a private and safe environment where to carry them out (Tables 1 and 2).

Table 1. Socio-Demographic Characteristics

Characteristics	**Men** (64%) n=9	**Women** (36%) n=5	**All (%)** n=14
Age (years)			
30-49	11%	60%	28%
50-64	33%	40%	35%
65<	55%	0%	35%
Municipality			
Adjuntas	67%	80%	71%
Lares	33%	20%	29%
Education level			
Primary	11%	0%	7%
Secondary and some high school	22%	20%	21%
High School (or equivalent)	44%	20%	36%
Some higher education	22%	20%	21%
Associate degree	0%	40%	14%
Health Insurance			
Uninsured	22%	0%	14%
Private	14%	0%	8%
Public	86%	100%	92%
Health Conditions			
CVD	40%	20%	32%
Respiratory	0%	30%	12%
Endocrine	21%	20%	20%
Musculoskeletal	21%	10%	16%
Neuro	0%	20%	4%
Reproductive	7%	0%	4%
Mental Health	7%	0%	4%
Are any health conditions affecting your capacity to do your work?			
Yes	67%	20%	50%
No	33%	80%	50%

Table 2. Emergency and Disasters Impact

Type of impact	Men (64%) n=9	Women (36%) n=5	All (%) n=14
Loss of work or product due to disaster			
Yes	100%	100%	100%
No	0%	0%	0%
Loss of work or product by disaster			
Hurricane María	35%	50%	39%
Hurricane Irma	31%	20%	28%
COVID-19	12%	20%	14%
Southwest Earthquakes	12%	10%	11%
Flooding in region	12%	0%	8%
Affected financially			
Yes	78%	80%	79%
No	22%	20%	21%
Loss of property			
Yes	78%	60%	71%
No	22%	40%	29%
Loss of family member, friend or colleague			
Yes	11%	40%	21%
No	89%	60%	79%
Place of work impacted			
Yes	89%	100%	93%
No	11%	0%	7%
Agricultural work is vulnerable			
Yes	100%	100%	100%
No	0%	0%	0%
Housing work is vulnerable			
Yes	89%	80%	86%
No	11%	20%	14%
Health is vulnerable			
Yes	78%	80%	79%
No	22%	20%	21%

IV. Developing an Integrated Decision Support Tool and Network for WPS Respirator Compliance in Florida Agricultural Industries (Morera)

AIM 1: Evaluate needs for translational materials in respiratory protection through a survey of key stakeholders.

- Results of needs assessments, conducted through multiple surveys of key stakeholders including growers, pesticide handlers, and healthcare professionals in Miami-Dade County, were used to tailor educational and graphic content on a nine-page website dedicated to respiratory safety decision-support tools.
- Stakeholder-requested materials, including CDC fact sheets, OSHA procedures and videos, and sample forms, were used to supplement the educational content and linked to the website's resources page.
- Frequently-used pesticides identified by key stakeholders in Miami-Dade County were used to tailor a respirator selection tool, created with decision-tree software and featured on its own webpage.

AIM 2: Pilot-test the use of socially marketed audience-tailored decision support tools to clarify hazard communication labels, respirator selection, medical evaluation procedures, and fit-testing.

- The comprehensive website, featuring informational content on respiratory protection requirements outlined in the Worker Protection Standard (WPS), including respirator selection, medical evaluation, fit-testing, and training procedures, was completed.
  - Ten multistage decision-tree models based on pesticide labels and incorporating updated NIOSH terminology were integrated into a single online interactive respirator selection tool to facilitate their dissemination.
  - Images, illustrations, and other visual aids were incorporated throughout the website to enhance education and communication, as recommended by external reviewers.
  - A language selector was added to each webpage to make the content accessible in Spanish and Creole.
- Links to the website were disseminated to a statewide farmworker group, specialty crop growers, extension agents, academics, and healthcare providers in Miami-Dade County including a migrant clinic.

AIM 3: *Perform an outcome evaluation to assess usage of translational materials per audience*.

- A web analytics service was added to the website to track usage.
- An evaluative survey was distributed to UF/IFAS Extension clients.

AIM 4: *Apply for funding to transition the support tool to a web-based format, scale up the intervention, and evaluate its impact on respiratory safety in Florida's agricultural workforce*.

- Transition of the support tool to a web-based format was completed, consolidating pesticide-related respirator selection models and respiratory safety resources for nursery growers, pesticide handlers, and their intermediaries into a single interactive site.

B.3. Competitive Revisions/Administrative Supplements

Not Applicable

B.4. What opportunities for training and professional development did the project provide?

NOTHING TO REPORT

B.5. How did you disseminate the results to communities of interest?

The Pilot Feasibility Program worked with the Outreach Core to disseminate findings at CSAB meetings and findings were used to develop outreach materials.

B.6 - What do you plan to do during the next reporting period to accomplish the goals?

Release new RFA for renewal pilot projects, January 2023.

PRODUCTS

C.1. Publications, conference papers, and presentations

Dunleavy, K., Bishop, M., Coffman, A., Reidy, J., & Kane, A. (2022). Chronic lower back pain in aquaculture clam farmers: adoption and feasibility of self-management strategies introduced using a rapid prototype participatory ergonomic approach. *International journal of occupational safety and ergonomics : JOSE*, *28*(3), 1829–1839. https://doi.org/10.1080/10803548.2021.1935543. PMID: 34121632; PMCID: PMC8738770.

Weisfeld, C. C., & **Dunleavy, K.** (2021). Strategies for Managing Chronic Pain, Chronic PTSD, and Comorbidities: Reflections on a Case Study Documented over Ten Years. *Journal of clinical psychology in medical settings*, *28*(1), 78–89. https://doi.org/10.1007/s10880-020-09741-5. PMID: 32889675.

Clarke, K., Manrique, A., Sabo-Attwood, T., & **Coker, E. S.** (2021). A Narrative Review of Occupational Air Pollution and Respiratory Health in Farmworkers. *International journal of environmental research and public health*, *18*(8), 4097. https://doi.org/10.3390/ijerph18084097. PMID: 33924663; PMCID: PMC8070429.

Pagán-Santana, M., Liebman, A. K., & López-Correa, A. Y. (2022). Looking at the gaps and program needs to address the impact on children of agricultural workers in Puerto Rico during and after public health emergencies. *Frontiers in public health*, *10*, 1046701. https://doi.org/10.3389/fpubh.2022.1046701. PMID: 36419994; PMCID: PMC9677091.

Pagán-Santana, M., Liebman, A. K., & Seda, C. H. (2022). Deepening the Divide: Health Inequities and Climate Change among Farmworkers. *Journal of agromedicine*, 1–4. Advance online publication. https://doi.org/10.1080/1059924X.2022.2148034. PMID: 36384449.

Pagán-Santana, M., Amaya, C., Rivera-Gutiérrez, R., & Caporali, S. (2021). Chronic Diseases among Agricultural Workers in a Rural Area of Puerto Rico. *Journal of agromedicine*, *26*(2), 211–219. https://doi.org/10.1080/1059924X.2020.1824829. PMID: 33143555.

Radunovich, H. L., Younker, T., Rung, J. M., & Berry, M. S. (2022). The Effects of the Opioid Crisis on Agricultural Industries. *International journal of environmental research and public health*, *19*(9), 5343. https://doi.org/10.3390/ijerph19095343. PMID: 35564739; PMCID: PMC9103207.

Younker, T., & **Radunovich, H. L.** (2021). Farmer Mental Health Interventions: A Systematic Review. *International journal of environmental research and public health*, *19*(1), 244. https://doi.org/10.3390/ijerph19010244. PMID: 35010504; PMCID: PMC8751007.

C.2. Website(s) or other Internet site(s) – include URL(s)

Not Applicable

C.3. Technologies or techniques

NOTHING TO REPORT

C.4. Inventions, patent applications, and/or licenses

Not Applicable

C.5. Other products and resource sharing

Questionnaire titled *Explorando la Salud Mental y los Desastres Naturales en las Comunidades Agrícolas en Puerto Rico* (Marysel Pagan-Santana, Pilot PI)

D. PARTICIPANTS

D.1. What individuals have worked on the project? Please include calendar, academic, and summer months.

Commons ID	S/K	Name	Degrees(s)	Role	Cal	Aca	Sum	Foreign	Country	SS

Refer to Overall Section D.1.

D.2 Personnel updates

a. Level of Effort: No
b. New Senior/Key Personnel: No
c. Changes in Other Support: No
d. New Other Significant Contributors: No

E. IMPACT

E.1 - What is the impact on the development of human resources, if applicable?

Not Applicable

E.2 - What is the impact the Public Health Relevance and Impact? The investigator should address how the findings of the project relate beyond the immediate study to improved practices, prevention or intervention techniques, legislation, policy, or use of technology in public health.

The Pilot/Feasibility Program was fundamental to the Research Core in filling the science gaps in Southeast AgFF research. Specialized research funding announcements were released that contributed to successful operationalization, engaging new and early-stage investigators across multiple disciplines. The mission was to fund small-scale projects that address real-time community burden, effectively providing agriculture and fisher populations access to research expertise they informed the Center was needed. As a whole the program disseminated tools (mental health first aid), methods (low back pain assessment/management, sweat patches to monitor pesticide exposure) and resources (translational materials in respiratory protection) to facilitate translational research.

F. CHANGES

F.1 – Changes in approach and reasons for change, including changes that have a significant impact on expenditures

Not Applicable

F.2 - Actual or anticipated challenges or delays and actions or plans to resolve them

Not Applicable

F.3 - Significant changes to human subjects, vertebrate animals, biohazards, and/or select agents

No Change

G. Special Reporting Requirements

G.1 Special Notice of Award Terms and Funding Opportunities Announcement Reporting Requirements

Not Applicable

G.2 Responsible Conduct of Research

Not Applicable

G.3 Mentor's Research Report or Sponsor Comments

Not Applicable

G.4 Human Subjects

G.4.a Does the project involve human subjects?

Yes

G.4.b Inclusion Enrollment Data

Not Applicable

G.4.c ClinicalTrials.gov

Does this project include one or more applicable clinical trials that must be registered in ClinicalTrials.gov under FDAAA?

Not Applicable

G.5 Human Subject Education Requirement

Are there personnel on this project who are newly involved in the design or conduct of human subject's research?

Not Applicable

G.6 Human Embryonic Stem Cells (HESCS)

Does this project involve human embryonic stem cells (only hESC lines listed as approved in the NIH Registry may be used in NIH funded research)?

No

G.7 Vertebrate Animals

Does this project involve vertebrate animals?

Not Applicable

G.8 Project/Performance Sites

University of Florida

G.9 Foreign Component

Not Applicable

G.10 Estimated Unobligated Balance

The estimated total cost unobligated balance (including prior year carryover) is estimated at $24,585.56(DC + IDC).

G.10.a Is it anticipated that an estimated unobligated balance (including prior year carryover) will be greater than 25% of the current year's total approved budget?

Not Applicable

G.11 Program Income

Is program income anticipated during the next budget period?

Not Applicable

G.12 F&A Costs

Is there a change in performance sites that will affect F&A costs?

Not Applicable

I. OUTCOMES

I. Provide a concise summary of the outcomes or findings of the award, written for the general public in clear and comprehensible language, without including any proprietary, confidential information or trade secrets

Note: project outcome information will be made public in NIH RePORTER

Pilot programs are integral to advancing research within NIOSH Ag Centers. The structure and operationalization of the SCCAHS Pilot/Feasibility Program positively impacted the Research Core and successfully fulfilled the program mission while meeting the needs of a diverse group of researchers. Between 2017 and 2022 the program received 37 specialized applications and funded 12 projects, ranging from $25,000 - $30,000 in amount, with an overall funding rate of 32%. Pilot funding allowed SCCAHS to develop new technologies and explore novel methods of assessing population health. The funding announcements were informed by the Community Stakeholder Advisory Board, State of the Science Meetings, the Emerging Issues Program and NIOSH research priorities.

FEDERAL FINANCIAL REPORT

(Follow form instructions)

1. Federal Agency and Organizational Element to Which Report is Submitted	2. Federal Grant or Other Identifying Number Assigned by Federal Agency (To report multiple grants, use FFR Attachment)
HHS-CENTERS FOR DISEASE CONTROL & PREVENTION	**011230OH16**

3. Recipient Organization (Name and complete address including Zip code)

UNIVERSITY OF FLORIDA

1523 Union Rd Rm 207, ___, Gainesville, FL 32611-1941 USA

4a. UEI	4b. EIN	5. Recipient Account Number or Identifying Number (To report multiple grants, use FFR Attachment)	6. Report Type	7. Basis of Accounting
NNFQH1JAPEP3	**1596002052A1**	**AWD00538**	☐ Quarterly ☐ Semi-Annual ☒ Annual ☐ Final	☐ Cash ☒ Accural

8. Project/Grant Period (Month, Day, Year)		9. Reporting Period End Date (Month, Day, Year)
From: **September 30, 2020**	To: **September 29, 2022**	**September 29, 2022**

10. Transactions	Cumulative
(Use lines a-c for single or combined multiple grant reporting)	
Federal Cash (To report multiple grants separately, also use FFR Attachment):	
a. Cash Receipts	$10,313,202.63
b. Cash Disbursements	$10,313,202.63
c. Cash on Hand (line a minus b)	$0.00
(Use lines d-o for single grant reporting)	
Federal Expenditures and Unobligated Balance:	
d. Total Federal funds authorized	$10,691,098.00
e. Federal share of expenditures	$10,313,202.63
f. Federal share of unliquidated obligations	$0.00
g. Total Federal share (sum of lines e and f)	$10,313,202.63
h. Unobligated balance of Federal funds (line d minus g)	$377,895.37
Recipient Share:	
i. Total recipient share required	$0.00
j. Recipient share of expenditures	$0.00
k. Remaining recipient share to be provided (line i minus j)	$0.00
Program Income:	
l. Total Federal share of program income earned	$0.00
m. Program income expended in accordance with the deduction alternative	$0.00
n. Program income expended in accordance with the addition alternative	$0.00
o. Unexpended program income (line l minus line m and line n)	$0.00

11. Indirect Expense	a. Type	b. Rate	c. Period From	Period To	d. Base	e. Amount Charged	f. Federal Share
	Predetermined	52.5	September 30, 2016	September 29, 2022	$5,300,066.88	$2,782,535.11	$2,782,535.11
				g. Totals:	$5,300,066.88	$2,782,535.11	$2,782,535.11

12. Remarks: Attach any explanations deemed necessary or information required by Federal sponsoring agency in compliance with governing legislation:

Final Report carry forward to new segment $377,895.37 - Revision needed due to revised final expense amount

13. Certification: By signing this report, I certify to the best of my knowledge and belief that the report is true, complete, and accurate, and the expenditures, disbursements and cash receipts are for the purposes and intent set forth in the award documents. I am aware that any false, fictitious, or fraudulent information may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 18, Section 1001)

a. Typed or Printed Name and Title of Authorized Certifying Official	c. Telephone (Area code, number, and extension)
Andes, Joseph **Grant Accountant III**	**+1 (352) 273-3089** d. Email Address **jandes@ufl.edu**
b. Signature of Authorized Certifying Official	e. Date Report Submitted (Month, Day, Year)
Andes, Joseph	**December 21, 2022**

Standard Form 425
OMB Approval Number: 4040-0014
Expiration Date: 02/28/2025

Federal Agency & Organization	:	HHS-CENTERS FOR DISEASE CONTROL & PREVENTION
Federal Grant ID	:	011230OH16
Recipient Organization	:	UNIVERSITY OF FLORIDA 1523 Union Rd Rm 207, ___, Gainesville, FL 32611-1941 USA
UEI	:	NNFQH1JAPEP3
UEI Status when Certified	:	ACTIVE (as of 12/21/2022)
EIN	:	1596002052A1
Reporting Period End Date	:	September 29, 2022
Status	:	Awarding Agency Approval
Remarks	:	Final Report carry forward to new segment $377,895.37 - Revision needed due to revised final expense amount

Federal Agency Review

Reviewer Name	:	Knox, Tonya
Phone #	:	+1 (678) 475-4937
Email	:	srq0@cdc.gov
Review Date	:	December 29, 2022
Review Comments	:	Unobligated balance $377,895.37

TANGIBLE PERSONAL PROPERTY REPORT
SF- 428

Page 1	of Pages 2

1.Federal Agency and Organization Element to Which Report is Submitted	2. Federal Grant or Other Identifying Number Assigned by Federal Agency	3a. DUNS	3b. EIN
CTRS FOR DIS CNTRL INST OCCUP SFTY HLTH	U54OH011230	969663814	59-6002052

4. Recipient Organization (Name and complete address including zip code)	5. Recipient Account or Identifying Number
University of Florida PO Box 115300 Gainesville, FL 32611	

6. Attachment (Check applicable)	7. Supplemental Sheet
____Annual Report (SF-428-A) _X_ Final (Award Closeout) Report (SF-428-B) ___ Disposition Report/Request (SF-428-C)	_X_ Yes ____ No

8. Comments

Please see attached

9a. Typed or Printed Name and Title of Authorized Certifying Official	9c. Telephone *(area code, number, extension)*
Yang Lu Accountant II, MSA	(352) 294-1141
	9d. Email address: y.lu1@ufl.edu
9b. Signature of authorized Certifying Official: Yang Lu	9e. Date report submitted *(Month, Day, Year)*: 12/8/2022
	10. Agency use only

SF- 428 Tangible Personal Property Report
OMB Approval Number: 3090-0289
EXPIRATION DATE: 04/30/2013

Form Approved Through 03/31/2020
OMB No. 0925-0002

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Procedure for Submission of Final Invention Statement and Certification (For Grant or Award) Form HHS 568

A Final Invention Statement and Certification (Form HHS 568) shall be executed and submitted within 90 days following the expiration or termination of a grant or award. The Statement shall include all inventions which were conceived or first actually reduced to practice during the course of work under the grant or award, from the original effective date of support through the date of completion or termination. The Statement shall include any inventions reported previously for the grant or award as part of a non-competing application. This reporting requirement is applicable to grants and awards by Department of Health and Human Services in support of research.

The Final Invention Statement and Certification does not in any way relieve the person responsible for the grant or award, or the institution, of the obligation to assure that all inventions are promptly and fully reported directly to the National Institutes of Health, as required by terms of the grant or award. Information regarding the reporting of inventions, including the reporting form to be followed, may be obtained from the Office of Policy for Extramural Research Administration, Division of Extramural Inventions and Technology Resources, 6705 Rockledge Drive MSC 7980, Bethesda, Maryland 20892-7980, Telephone: (301) 435-1986.

The original of the completed Final Invention Statement and Certification is to be returned to the awarding component that funded the grant or award. The entire grant or award number must appear in the designated box on the form. The period covered by the Final Invention Statement is the project period of the grant or award at a particular grantee institution. If no inventions were involved, insert the word "None" in the first block under item Title of Invention. Each Statement requires the signature of an institution official authorized to sign on behalf of the institution.

Privacy Act Statement. The NIH maintains application and grant records as part of a system of records as defined by the Privacy Act: NIH 09-25-0225 https://era.nih.gov/privacy-act-and-era.htm.

Form Approved Through 03/31/2020
OMB No. 0925-0002

Department of Health and Human Services

Final Invention Statement and Certification

(For Grant or Award)

DHHS Grant or Award No.
U54OH011230

A. We hereby certify that, to the best of our knowledge and belief, all inventions are listed below which were conceived and/or first actually reduced to practice during the course of work under the above-referenced DHHS grant or award for the period

09/30/2016 *original effective date* through 09/29/2022 *date of termination*.

B. Inventions (Note: If no inventions have been made under the grant or award, insert the word *"NONE"* under

NAME OF INVENTOR	TITLE OF INVENTION	DATE REPORTED TO DHHS
None		
(Use continuation sheet if necessary)		

C. Signature — This block ***must*** be signed by an official authorized to sign on behalf of the institution.

Title
Compliance Specialist

Typed Name
Sally Helgeson

Signature
Sally Helgeson

Date
1/13/2023

Name and Mailing Address of Institution
University of Florida Board of Trustees
219 Grinter Hall
PO Box 115500
Gainesville, FL 326115500

PROGRESS REPORT PUBLICATION LIST (OVERALL)

Publications and Presentations 2016 – 2022

Planning and Evaluation Core

2018-2022

1. Flocks, J. and Espinoza, M. (2022). Historical and Current Insights on Environmental Health and Agricultural Guestworkers. *Ecology Law Quarterly,* 48:1015-1049.
2. Gorucu, S., Weichelt, B., Diehl, D., & Sebastian, G. (2021). An Overview of Agricultural Injuries in Florida from 2015-2019. *Journal of agricultural safety and health*, *27*(3), 135–146. https://doi.org/10.13031/jash.14533 PMID: 34350746.
3. Lauzardo M, Kovacevich N, Dennis A, Myers P, Flocks J, Morris JG Jr. An Outbreak of COVID-19 Among H-2A Temporary Agricultural Workers. Am J Public Health. 2021 Apr;111(4):571-573. doi: 10.2105/AJPH.2020.306082. PMID: 33689435; PMCID: PMC7958039.
4. Israel, G. D., Diehl, D. C., Galindo, S., Ward, C., Ramos, A. K., Harrington, M., & Kasner, E. J. (2021). Extension Professionals' Information Use, Protective Behaviors, and Work-Life Stress During the COVID-19 Pandemic. *The Journal of Extension, 58*(6), Article 5. https://tigerprints.clemson.edu/joe/vol58/iss6/5
5. Israel, G. D., James, H. E., & Gariton, C. E. Anxiety disorders among Extension Professionals' during the COVID-19 Pandemic. Paper presented at the virtual annual meeting of the Southern Rural Sociological Association, February 2021.
6. Flocks J. The Potential Impact of COVID-19 on H-2A Agricultural Workers. J Agromedicine. 2020 Oct;25(4):367-369. doi: 10.1080/1059924X.2020.1814922. Epub 2020 Aug 28. PMID: 32856557.
7. Israel, G. D., James, H. E., & Gariton, C. E. Anxiety disorders among Extension Professionals' during the COVID-19 Pandemic. Paper presented at the virtual annual meeting of the Southern Rural Sociological Association, February 2021.
8. Mitchell, C., Israel, G. D., Galindo, S. & Diehl, D. C. (February, 2020). From Plan to Action: Adapting Evaluation to Serve the Developmental Needs of a Newly-Funded Multidisciplinary Research Center. Evaluation and Program Planning. 78. ISSN 0149-7189
9. Mitchell RC, Israel GD, Diehl DC, Galindo-Gonzalez S. From plan to action: Adapting evaluation to serve the developmental needs of a newly-funded multidisciplinary research center. Eval Program Plan. 2020 Feb;78:101729. doi: 10.1016/j.evalprogplan.2019.101729. Epub 2019 Oct 18. PMID: 31698318.
10. Flocks J, Tovar JA, Economos E, Thien Mac VV, Mutic A, Peterman K, McCauley L. Lessons Learned from Data Collection as Health Screening in Underserved Farmworker Communities. Prog Community Health Partnersh. 2018;12(1S):93-100. doi: 10.1353/cpr.2018.0024. PMID: 29755052.

Presentations

11. Arosemena, FA, Flocks, J, & Morris, JG. (2022, September 28-29). *Addressing the scarcity of Florida farmworker data: Using geographic information systems to assess vulnerability in H-2A and migrant labor camp housing* [Poster Presentation]. International Society of Exposure Science 2022 “From exposure to human health: New developments and challenges in a changing environment” Lisbon, Portugal. https://intlexposurescience.org/
12. Flocks, J. (2022). “Farmworkers and Heat-Related Illness” (invited presenter). *Farmworker Justice – Environmental Justice Symposium,* Online, May 18, 2022.
13. Flocks, J. (2022). “Agricultural Safety and Health” (invited presenter) with Serap Gorucu. *Florida Health Policy Leadership Academy*, Online, May 6, 2022.
14. Flocks, J. (2022). “Centering Unheard Voices: Community-Driven Collaboration for Health and Safety with Farmworkers in the U.S.” (panel) with Becca Berkey, Maria Carmona, Jeannie Economos, Joseph Grzywacz, and Benita Lozano. *Northeastern University’s Myra Kraft Open Classroom,* Online, March 2, 2022.
15. Gators Going Green, Gainesville, FL, October 8, 2020. Presentation on farmworker health at University of California Davis law school panel, February 25, 2021.
16. Flocks J. “The Potential Impact of COVID-19 on H-2A Agricultural Workers.” Journal of Agromedicine 25(4): 367-369, 2020. “Southeastern Coastal Center for Agricultural Health and Safety (SCCAHS)” (invited presentation)

17. Environmental Protection Agency's Virtual Farmworker Community Visit, October 28, 2020. Occupational Pesticide Exposure and Pregnancy Health in Vulnerable Workers" (invited speaker).
18. Florida Local Section of the American Industrial Hygiene Association, October 16, 2020. "Environmental Justice Panel" (panel) with C Zimring, T Thomas-Burton, and H Young.
19. Halverson, C. & S. Galindo. (2019, April). Creating an Organizational Culture Responsive to Emerging Public Health Threats. Presented at the 2019 National Conference of the American Association of Occupational Health Nurses (AAOHN), Jacksonville, Florida.
20. Galindo, S., Mitchell, C., Saqib, H., Israel, G. D., & Diehl, D. C. (2019). Assessing SCCAHS' economic impact: Return on investment thematic approach for heat-related illness. Poster presented at the annual conference of the International Society for Agricultural Safety and Health, Des Moines, Iowa, June, 2019.
21. Nelson, J. D., Galindo, S., Israel, G. D., & Diehl, D. C. (2019). Developing a Common Evaluation Framework for the Centers for Agricultural Safety and Health. Oral presentation at the annual conference of the International Society for Agricultural Safety and Health, Des Moines, Iowa, June, 2019.
22. Galindo-Gonzalez, S., Mitchell, R. C., Diehl, D., Israel, G. D., Williams, D. Saqib H, Galindo S, & Irani T. Surfacing Strategies: Organizational Learning for the Strategic Development of an Agriculture, Forestry, and Fishing Occupational Health and Safety Research and Outreach Center. Poster presented at: International Conference on Sustainable Development; September 23-24, 2019; Columbia University, New York.
23. Galindo, S., Mitchell, C., Saqib, H., Israel, G. D., & Diehl, D. C. (2019). Assessing SCCAHS' economic impact: Return on investment thematic approach for heat-related illness. Poster presented at SCCAHS State of the Science Meeting, Saint Petersburg, Florida, September, 2019.
24. 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.
25. 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.
26. 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
27. 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.
28. 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.
29. 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.
30. 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.
31. 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.
32. 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.
33. 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.

Outreach Core

2018-2022

34. Lindsey, A., McLeod-Morin, A., Lundy, L., Irani, T., & Telg, R. (2022). *Using Communication Toolkits to Expand Extension Efforts Related to Agricultural Health and Safety Topics.* Abstract presented at the 2022 Extension Professional Associations of Florida Annual Meeting, Panama City, FL.
35. McLeod-Morin, A., Lundy, L., Lindsey, A. B., Kandzer, M., Telg, R., Irani, T., Stokes, P., Castano, V., & Santa Maria, N. (2022). *It All Goes Back to Trust: A Qualitative Exploration of Extension Professionals' Perceptions of COVID-19 Vaccines in Rural Florida.* Abstract presented at the 2022 National Agricultural Communications Symposium, New Orleans, LA.
36. McLeod-Morin, A., Irani, T., Telg, R., Lindsey, A., & Lundy, L. (2022). *Empowering Extension Empowers Everyone: Developing Agricultural Health and Safety Outreach Materials for Cooperative Extension.* Abstract presented at the 2022 International Society for Agricultural Safety and Health Annual Conference, Fort Collins, CO.
37. Irani, T., Pierre, B. & Nesbit, T. (2021). Agricultural Professionals' Perceptions of COVID-19 and Occupational Health and Safety. *Journal of International Agricultural and Extension Education.* https://doi.org/jiaee.2021.28106
38. Irani T, Pierre, B. F, Nesbit, T.S. (2021). Agricultural stakeholders' perceptions of occupational health and safety in the Southeastern U.S. Coastal States. *International Journal of Environmental Research and Public Health,* 18(12):6605. https://doi.org/10.3390/ijerph18126605
39. Santa Maria, N., Irani, T., Telg, R., Lundy, L.K., Lindsey, A.B., McLeod-Morin, A., Stokes, P., Kandzer, M., Castano, V., Morris, G., McCue, L., Millerick-May, M., Zhong, Y., Halverson, C., Baker, L.M., Andrews, D., Abler, D., Court, C., Galindo, S., Ramos, A.K., & Sampson, S.; Rampold, S., Kelly-Begazo, C., Pierre, B.F. (2021). State of the Science: Global Pandemics and the Agricultural Workforce: Research and Policy Implications. SCCAHS2020/21-03. Gainesville, FL.: University of Florida/ Southeastern Coastal Center for Agricultural Health and Safety. Whitepaper-2020-FINAL.pdf (sccahs.org)
40. McLeod-Morin, A., Baker, L. M., Lindsey, A. B., Lundy, L. K., & Telg, R. (2021, February). A tale of two agencies: Comparing Americans' attitudes and behaviors toward the CDC and Local Health Departments During COVID-19. Emerging Pathogens Institute Research Day, Gainesville, FL.
41. McLeod-Morin, A., Baker, L. M., Lindsey, A. B., Lundy, L. K., & Telg, R. (2021, February). The dimensions of the organization-public relationship of the Centers for Disease Control and Prevention during the COVID-19 pandemic. National Agricultural Communications Symposium, virtual.
42. Baker, L. M., Rampold S. D., McLeod-Morin, A., Lindsey, A. B., Telg, R. W., & Oglesby, M. (2021, February). Spreading information instead of COVID-19: Examining public communication networks in the early stages of a zoonotic disease pandemic. Paper presented at the 2021 National Agricultural Communications Symposium, virtual.
43. Schaper, TA. (2021). Characterizing major crop change trends in Florida from multiple sources: a comparison of USDA Cropland Data Layer and statewide Random Forest Classifications of the top five crops. M.S. thesis University of Florida.
44. Sampson, S., Mazur, J., Israel, G., Galindo, S., & Ward, C. (2020). Competing Roles and Expectations: Preliminary Data from an Agricultural Extension Survey on COVID-19 Impacts. Journal of agromedicine, 25(4), 396–401. https://doi.org/10.1080/1059924X.2020.1815619. PMID: 32945240.
45. Baker, L., Kandzer, M. S., Rampold, S. D., Chiarelli, C., Peterson, H. H., McLeod-Morin, A. (2020). Agriculture and natural resources business owners economic and communication concerns early in the COVID-19 pandemic. Advancements in Agricultural Development, 1(3), 95-110. https://doi.org/10.37433/aad.v1i3.83
46. Mitchell, R. C., Kandzer, M. S., Irani, T., Lindsey, A. B., Lundy, L. K., Telg, R. W., McLeod-Morin, A., Stokes, P., Chasek, C., Scheyett, A., Leeman, R., Stacciarini, J. M., Wennerstrom, A., Smithwick, J., Grattan, L., Dunleavy, K., Radunovich, H. L., Kane, A., Arosemena, F., & Honeycutt, S. (2020). State of the Science: Mental Health Issues in Agricultural, Vulnerable and Rural Communities. SCCAHS2020/21-02. Gainesville, FL.: University of Florida/ Southeastern Coastal Center for Agricultural Health and Safety. whitepaper2020_final1.pdf (sccahs.org)
47. Mitchell, R.C., Irani, T, Arosemena, F. A., Pierre, B., Bernard, T.E., Grzywacz, J.G., McCauley, L.A., Vi Thien Mac, V., Lopez, R.M., Ashley, C.D., Sawka, M.N., Misra, V., Pierre, B., & Morris, J.G. SCCAHS2019-

02. Gainesville, FL: University of Florida/Southeastern Coastal Center for Agricultural Health and Safety. SOS_WhitePaper.pdf (sccahs.org)
48. Lundy, L. K., Rogers-Randolph, T. M., Lindsey, A. B., Hurdle, C., Ryan, H., Telg, R. W., & Irani, T. (2018). Analyzing Media Coverage of Agricultural Health and Safety Issues. Journal of Applied Communications, 102(4), 5.
49. Rogers, T., Lundy, L.K., Lindsey, A.B., Irani, T., Telg, R.W., McLeod, A., Stokes, P., Mitchell, R.C. Identifying Influencers in Agricultural Health and Safety Twitter Conversations. Southern Association of Agricultural Scientists Conference. 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, LA.
50. 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
51. 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.

State of the Science Meetings

The SCCAHS Outreach Core has hosted annual State of the Science Meetings since Year 3 (2018). The meetings are convened to educate the Southeast regional academic community and frontline professionals on clinical and public health science driving new thinking in areas of heat related illness and stress and resilience among agricultural, fishery, and forestry workers. Given our southern location, the work of SCCAHS has included a major focus on heat-related illness. Additionally, addressing mental health remains a public health concern. Those who work in agriculture face many stressors, including financial uncertainty, family and relationships issues, social isolation, disaster, accidental injury, and acute and chronic diseases, that can affect their mental health. While some mental health issues, such as the high rate of farmer suicides, have been discussed widely, other mental health stressors that affect agriculture workers in vulnerable rural communities have not been discussed as broadly. Multidisciplinary research, strategies, and policies are needed 1) to identify the mental health issues that farmworkers, farm operators, farm owners and others in these communities face; 2) address the social, environmental and built-environment associations with mental health in rural communities; and 3) understand the inequities in farmworker/fishery/ forestry community mental health (depressive or substance use disorder rates) and how we might close these gaps to encourage individual, family, and community-level resilience. A recap of the Southeastern Coastal Center for Agricultural Health and Safety 2018 and 2019 State of the Science Meetings can be found at the below websites:

52. September 9, 2021, Pathways to Health Equity in Agriculture, Fishery and Forestry
53. September 11/18, 2020, Global Pandemics and the Agricultural Workforce: Research and Policy Implications
54. September 26/27, 2019, Stress and Resilience Among Agricultural Workers in Vulnerable Rural Communities
55. October 25/26, 2018, Heat-related Illness State of the Science Meeting

Websites and Other Internet Sources

56. SCCAHS Website: http://www.sccahs.org/
57. COVID-19 resources webpage http://www.sccahs.org/index.php/covid-19/
    - Screening and testing video: https://www.youtube.com/watch?v=oAByapLmi0I&feature=youtu.be
    - Adapted CDC guidance video: https://www.youtube.com/watch?v=dZ-jn3V1C4U&feature=youtu.be
    - Narrated PPT video for CDC guidance: https://youtu.be/9FWHMFi9NQE
    - Narrated PPT video for CDC guidance (Spanish): https://www.youtube.com/watch?v=8z11u6fsyzE
    - Face coverings (English): https://www.youtube.com/watch?v=6QZQvUDYvus
    - Face coverings (Spanish): https://www.youtube.com/watch?v=VJEfF5SnScE
    - Social distancing (English): https://www.youtube.com/watch?v=o0dWBoXCOZg
    - Social distancing (Spanish): https://www.youtube.com/watch?v=kQAFBtTV-_c

58. COVID-19 training toolkit: http://www.sccahs.org/wp-content/uploads/2020/08/COVID-19_ExtentionToolkit.pdf
59. COVID-19 training toolkit for Florida Extension: https://extadmin.ifas.ufl.edu/resources/grower-and-worker-education/
60. COVID-19 vaccine webpage: http://www.sccahs.org/index.php/covid-19-vaccine/
61. SCCAHS webinars (archived): http://www.sccahs.org/index.php/media/webinars/

- **Dawn Burton** February 23, 2022 Practical Steps to Advancing Equity
- **LaToya O'Neal** January 20, 2022 Advancing Health Equity as a Core System Value
- **Serap Gorucu** November 17, 2021 Available Data Sources for Agricultural Injury Surveillance
- **Cindy Prins** October 28, 2021 What's Next? Understanding the current status of COVID-19 and future projections
- **David Abler** July 22, 2021 COVID-19 and Resilience in Food Supply
- **Charlotte Halverson** June 16, 2021 Protecting Agricultural Communities During the COVID-19 Pandemic: Respiratory Fit Testing and Personal Protective Equipment
- **Lauri Baker** May 19, 2021: Communicating Vaccine Adoption Based on U.S. Perceptions of COVID-19
- **Melissa Millerick-May** April 14, 2021: Facilitating Pandemic Preparedness in Agricultural Industry via COVID-19 Hazard Assessment and Mitigation Plan (CHAMP) e-tool
- **Sarah (Ying) Zhong** March 31, 2021 Fighting Coronavirus with Corona Discharge
- **Christa Court**, February 17, 2021: Assessing the Impact of COVID-19 on Florida's Agricultural and Marine Industries
- **Glenn Morris and Ira Longini** January 26, 2021 COVID-19 Vaccine Town Hall
- **Leigh McCue** December 15, 2020 Development and Deployment of a Farmworker Housing Simulator for COVID-19 Risk Mitigation
- **LeiAnna Tucker and Danielle Andrews** November 19, 2020 Adapting Agriculture in Florida during the COVID-19 Pandemic: COVID-19 testing for migrant workers in Florida and the Farm to You
- **Sebastian Galindo** August 20, 2020 Impacts of COVID-19 on Extension
- **Ricky Telg, Saqib Mukhtar, Cindy Prins** August 7, 2020 COVID-19 Training Toolkit for Extension in Agriculture
- **Jeffrey Lindsey** August 6, 2020 Preparing for the 2020 Hurricane Season in the Midst of a Pandemic
- **Jeanne-Marie Stacciarini** June 18, 2020 Rurality, Social Networks and Mental Well-being in Rural Latinos (no recording)
- **Robert Leeman** May 14, 2020 Stressors, Resilience Factors and Applicability of New Interventions for Substance Misuse
- **Gülcan Önel** March 10, 2020 Uncovering Patterns of Mental, Physical, and Occupational Health Issues Among Migrant Farmworkers with Different Socio-Cultural Networks (no recording)
- **Anna M. Scheyett** February 14, 2020 Death on the Farm: Characteristics and Contextual Factors in Farmer and Agricultural Worker Suicide in Georgia from 2008-2015
- **Christine Chasek** January 8, 2020 Investigating Opioid and Alcohol Risk and Misuse Among Agricultural Workers
- **Vasubandhu Misra** October 10, 2019 Heat-related Illness in a Changing Climate and Demography of Florida
- **Kim Dunleavy** September 13, 2019 Chronic Low Back Pain in Seafood Workers: A Pilot Intervention Study to Identify Modifiable Work and Movement Solutions
- **Heidi Radunovich** June 4, 2019 Understanding the Scope of the Opioid Epidemic for Agricultural Industries
- **Angela Lindsey** May 14, 2019 Preparing for the 2019 Hurricane Season: Applying Lessons from Hurricanes Irma and Michael
- **Paul Monaghan** April 17, 2019 Using Social Marketing to Prevent Heat-related Illness and Improve Productivity Among Farmworkers
- **Linda McCauley** February 12, 2019 Heat Stress and Biomarkers of Renal Disease
- **Joseph Grzywacz** January 22, 2019 Pesticide & Heat Stress Education for Latino Farmworkers that is Culturally Appropriate
- **Jose A. Perez** November 6, 2018 The Need for a Safety Focus in Agriculture

- **Andrew Kane** October 24, 2018 Occupational Health and Safety Surveillance of Gulf Seafood Workers.
- **Martie Gillen** September 18, 2018 Assessing Agriculture Liability

62. The training toolkit webinar: https://vimeo.com/447806944
63. 2020 SOS meeting website: http://www.sccahs.org/index.php/state-of-science/2020-global-pandemics-and-the-agricultural-workforce-research-and-policy-implications/
64. Podcast: https://piecenter.com/media/podcast/

Research Core

2022

65. Radunovich, H. L., Younker, T., Rung, J. M., & Berry, M. S. (2022). The Effects of the Opioid Crisis on Agricultural Industries. *International journal of environmental research and public health*, *19*(9), 5343. https://doi.org/10.3390/ijerph19095343 PMID: 35564739; PMCID: PMC9103207.
66. Chicas, R. C., Elon, L., Houser, M. C., Mutic, A., Gallegos, E. I., Smith, D. J., Modly, L., Xiuhtecutli, N., Hertzberg, V. S., Flocks, J., Sands, J. M., & McCauley, L. (2022). The Health Status of Hispanic Agricultural Workers in Georgia and Florida. *Journal of immigrant and minority health*, *24*(5), 1129–1136. https://doi.org/10.1007/s10903-021-01326-0 PMID: 34988908.
67. Dunleavy, K., Bishop, M., Coffman, A., Reidy, J., & Kane, A. (2022). Chronic lower back pain in aquaculture clam farmers: adoption and feasibility of self-management strategies introduced using a rapid prototype participatory ergonomic approach. *International journal of occupational safety and ergonomics : JOSE*, *28*(3), 1829–1839. https://doi.org/10.1080/10803548.2021.1935543 PMID: 34121632; PMCID: PMC8738770.
68. Dunleavy, K., Kane, A., Coffman, A., Reidy, J., & Bishop, M. D. (2022). Outcomes of Participatory Ergonomics and Self-management in Commercial Clam Farmers with Chronic Low Back Pain: A Feasibility Study. *Journal of agromedicine*, *27*(2), 217–231. https://doi.org/10.1080/1059924X.2021.2004961 PMID: 34772318.

2021

69. Houser, M. C., Mac, V., Smith, D. J., Chicas, R. C., Xiuhtecutli, N., Flocks, J. D., Elon, L., Tansey, M. G., Sands, J. M., McCauley, L., & Hertzberg, V. S. (2021). Inflammation-Related Factors Identified as Biomarkers of Dehydration and Subsequent Acute Kidney Injury in Agricultural Workers. *Biological research for nursing*, *23*(4), 676–688. https://doi.org/10.1177/10998004211016070 PMCID: PMC8726423.
70. Glass, G. E., Ganser, C., & Kessler, W. H. (2021). Validating Species Distribution Models With Standardized Surveys for Ixodid Ticks in Mainland Florida. *Journal of medical entomology*, *58*(3), 1345–1351. https://doi.org/10.1093/jme/tjaa282 PMID: 33386731; PMCID: PMC8122235.
71. Dunleavy K, Bishop M, Coffman A, Reidy J, Kane A. Chronic lower back pain in aquaculture clam farmers: adoption and feasibility of self-management strategies introduced using a rapid prototype participatory ergonomic approach. Int J Occup Saf Ergon. 2021 Jul 7:1-11. doi: 10.1080/10803548.2021.1935543. Epub ahead of print. PMID: 34121632.
72. Dunleavy K, Kane A, Coffman A, Reidy J, Bishop MD. Outcomes of Participatory Ergonomics and Self-management in Commercial Clam Farmers with Chronic Low Back Pain: A Feasibility Study. J Agromedicine. 2021 Nov 23:1-15. doi: 10.1080/1059924X.2021.2004961. Epub ahead of print. PMID: 34772318.
73. Grzywacz JG, Gonzales-Backen M, Liebman A, Trejo M, Gudino CO, Trejo M, Economos J, Xiuhtecutli N, Tovar-Aguilar JA. Comparative Effectiveness of Training Alternatives for the EPA's Worker Protection Standard Regulation Among Immigrant Latino Farmworkers. J Occup Environ Med. 2021 Aug 27. doi: 10.1097/JOM.0000000000002368. Epub ahead of print. PMID: 34456324.
74. Mac V, Elon L, Mix J, Tovar-Aguilar A, Flocks J, Economos E, Hertzberg V, McCauley L. Risk Factors for Reaching Core Body Temperature Thresholds in Florida Agricultural Workers. J Occup Environ Med. 2021 May 1;63(5):395-402. doi: 10.1097/JOM.0000000000002150. PMID: 33560064.
75. Houser MC, Mac V, Smith DJ, Chicas RC, Xiuhtecutli N, Flocks JD, Elon L, Tansey MG, Sands JM, McCauley L, Hertzberg VS. Inflammation-Related Factors Identified as Biomarkers of Dehydration and

Subsequent Acute Kidney Injury in Agricultural Workers. Biol Res Nurs. 2021 Oct;23(4):676-688. doi: 10.1177/10998004211016070. Epub 2021 May 21. PMID: 34018403.

76. Chicas R, Xiuhtecutli N, Elon L, Scammell MK, Steenland K, Hertzberg V, McCauley L. Cooling Interventions Among Agricultural Workers: A Pilot Study. Workplace Health Saf. 2021 Jul;69(7):315-322. doi: 10.1177/2165079920976524. Epub 2020 Dec 24. PMID: 33357122.
77. Chicas R, Xiuhtecutli N, Dickman NE, Flocks J, Scammell MK, Steenland K, Hertzberg V, McCauley L. Cooling Interventions Among Agricultural Workers: Qualitative Field-Based Study. Hisp Health Care Int. 2021 Sep;19(3):174-181. doi: 10.1177/1540415321993429. Epub 2021 Feb 19. PMID: 33601922; PMCID: PMC8363586.
78. Mac VV, Elon L, Smith DJ, Tovar-Aguilar A, Economos E, Flocks J, Hertzberg V, McCauley L. A modified physiological strain index for workplace-based assessment of heat strain experienced by agricultural workers. Am J Ind Med. 2021 Apr;64(4):258-265. doi: 10.1002/ajim.23230. Epub 2021 Feb 4. PMID: 33543496.
79. Matthew OO, Monaghan PF, Luque JS. The Novel Coronavirus and Undocumented Farmworkers in the United States. New Solut. 2021 May;31(1):9-15. doi: 10.1177/1048291121989000. Epub 2021 Jan 31. PMID: 33517834; PMCID: PMC8193739.

Presentations

80. Morera, M.C., Tovar-Aguilar, J.A., Monaghan, P.F., Roka, F.M., & Perez-Orozco, J. (2021). Going the [social] distance: Safety and productivity in Florida agriculture during COVID-19. Presentation at the 2021 Virtual Meeting of the Society for Applied Anthropology, March 26, 2021.
81. Morera, M.C. & Campoverde, E.V. (2021). Developing a customized decision-support tool for respiratory protection in Florida agriculture: Preliminary findings of a pilot project [Poster session]. Agricultural Safety and Health Council of America 2021 North American Agricultural Safely Summit, March 22-24.
82. Rash, R. and Kane, A.S. (2021). Environmental and Human Behavioral Risk Factors for Traumatic Stingray Puncture Injuries in Cedar Key Clam Harvesters. Presented at the 4th Southeast Regional Research Symposium (SERRS), February 17-18, 2021.

2020

83. Grattan LM, Lindsay A, Liang Y, Kilmon KA, Cohen S, Irani T, Morris JG. The Short- and Long-Term Impacts of Hurricane Irma on Florida Agricultural Leaders as Early Emergency Responders: The Importance of Workplace Stability. Int J Environ Res Public Health. 2020 Feb 7;17(3):1050. doi: 10.3390/ijerph17031050. PMID: 32046012; PMCID: PMC7038044.
84. Monaghan P, Raskin K, Morera M, Tovar Aguilar JA, Mac V, Flocks J. “What the Agricultural Sector in Florida Needs to Know about Heat-Related Illness (HRI).” EDIS (5). https://doi.org/10.32473/edis-wc359-2020.

2019

85. Mix JM, Elon L, Thein Mac VV, Flocks J, Economos J, Tovar-Aguilar AJ, Hertzberg VS, McCauley LA. Physical activity and work activities in Florida agricultural workers. Am J Ind Med. 2019 Dec;62(12):1058-1067. doi: 10.1002/ajim.23035. Epub 2019 Aug 16. PMID: 31418883.
86. Luque JS, Becker A, Bossak BH, Grzywacz JG, Tovar-Aguilar JA, Guo Y. Knowledge and Practices to Avoid Heat-Related Illness among Hispanic Farmworkers along the Florida-Georgia Line. J Agromedicine. 2020 Apr;25(2):190-200. doi: 10.1080/1059924X.2019.1670312. Epub 2019 Sep 23. PMID: 31544652; PMCID: PMC7075471.
87. Chicas R, Mix J, Mac V, Flocks J, Dickman NE, Hertzberg V, McCauley L. Chronic Kidney Disease Among Workers: A Review of the Literature. Workplace Health Saf. 2019 Sep;67(9):481-490. doi: 10.1177/2165079919843308. Epub 2019 Jun 10. PMID: 31179873.
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Presentations

90. Luque, J, Becker, A, Bossak, B, Grzywacz, J, Tovar, A, Guo, Y. "Knowledge and Practices for Adapting to Working in the Heat among Latino Farmworkers in the Florida-Georgia Border Region," roundtable paper presented at the APHA Conference (November 2019), Philadelphia, PA.
91. Adhikari, A, Dotherow, JE. Respiratory deposition modeling for PM10, PM2.5, and PM1 exposure in cotton farms for standard and heavy workers. Third Aerosol Dosimetry Conference, Inhaled Aerosol Dosimetry: Models, Applications and Impact (October 2019), Irvine, CA.
92. Stacciarini, J.M., Onel, Gulcan, & Tovar, A. A Rural State of Mind: Addressing Mental, Physical, and Economic Health of Farm Communities in Florida. East Coast Migrant Stream Forum. (October 2019), San Juan, Puerto Rico.
93. Flocks, J. "Prevention of Heat Stress among Farmworkers" (roundtable discussion moderator) Western Agriculture Safety & Health Conference, Seattle, WA, August 7-9, 2019.
94. Flocks, J., Saville, A., & Economos, J. "Differing Reponses and Perspective to Environmental Justice, Lessons from Lake Apopka, FL" (panel) with A Saville and J Economos. Association for Environmental Studies and Sciences Annual Conference, Orlando, FL, June 27, 2019.

2018

95. Mix J, Elon L, Vi Thien 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. J Occup Environ Med. 2018 May;60(5):e253-e260. doi: 10.1097/JOM.0000000000001261. PMID: 29271837.
96. Alterman T, Grzywacz JJ, Muntaner C, Shen R, Gabbard S, Georges A, Nakamoto J, Carroll DJ. Elevated Depressive Symptoms Among Hired Crop Workers in the United States: Variation by Sociodemographic and Employment Characteristics. Rural Ment Health. 2018 Apr;42(2):67-68. doi: 10.1037/rmh0000090. PMID: 31777642; PMCID: PMC6880944.
97. Myers ML, Kane AS and Durborow RM. 2018. Gulf of Mexico Seafood Harvesters: Part 1. Occupational Injury and Fatigue Risk Factors. Safety doi:10.3390/safety4030031.
98. Myers ML, Durborow RM, Kane AS. 2018. Gulf of Mexico Seafood Harvesters, Part 2: Occupational Health-Related Risk Factors. Safety doi: 10.3390/safety4030027.
99. Myers ML, Durborow RM and Kane AS. 2018. Gulf of Mexico Seafood Harvesters: Part 3. Potential Occupational Risk Reduction Measures. Safety doi:10.3390/safety4030033.

Presentations

100. 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.
101. 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/

2017

102. Mutic AD, Mix JM, Elon L, Mutic NJ, Economos J, Flocks J, Tovar-Aguilar AJ, McCauley LA. Classification of Heat-Related Illness Symptoms Among Florida Farmworkers. J Nurs Scholarsh. 2018 Jan;50(1):74-82. doi: 10.1111/jnu.12355. Epub 2017 Oct 12. PMID: 29024370.
103. Mathews AE, Al-Rajhi A, Kane AS. Validation of a photographic seafood portion guide to assess fish and shrimp intakes. Public Health Nutr. 2018 Apr;21(5):896-901. doi: 10.1017/S1368980017000945. Epub 2017 Dec 29. PMID: 29284548; PMCID: PMC5848755.

Presentations

104. 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.
105. 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.

106. 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.
107. 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.
108. 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.
109. 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.
110. 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.
111. 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.

2016

112. Runkle J, Flocks J, Economos J, Dunlop AL. A systematic review of Mancozeb as a reproductive and developmental hazard. Environ Int. 2017 Feb;99:29-42. doi: 10.1016/j.envint.2016.11.006. Epub 2016 Nov 23. PMID: 27887783.
113. Mac VV, Tovar-Aguilar JA, Flocks J, Economos E, Hertzberg VS, McCauley LA. Heat Exposure in Central Florida Fernery Workers: Results of a Feasibility Study. J Agromedicine. 2017;22(2):89-99. doi: 10.1080/1059924X.2017.1282906. PMID: 28118110; PMCID: PMC5682629.
114. Hertzberg V, Mac V, Elon L, Mutic N, Mutic A, Peterman K, Tovar-Aguilar JA, Economos E, Flocks J, McCauley L. Novel Analytic Methods Needed for Real-Time Continuous Core Body Temperature Data. West J Nurs Res. 2017 Jan;39(1):95-111. doi: 10.1177/0193945916673058. Epub 2016 Oct 22. PMID: 27756853; PMCID: PMC5797491.

AWARDS 2016-2022

Evaluation and Planning Core

David Diehl and Serap Gorucu. USDA AgrAbility Grant Award. AgrAbility is a USDA-funded program that provides education, assistance and support to agricultural workers with disabilities.

Outreach Core
2022

National Agricultural Communications Symposium
Third place people’s choice poster, 2022 National Agricultural Communications Symposium: It All Goes Back to Trust: A Qualitative Exploration of Extension Professionals’ Perceptions of COVID-19 Vaccines in Rural Florida

Association for Communication Excellence in Agriculture, Natural Resources, and Life and Human Sciences
Silver Award: Issue Management, 2022 Association for Communication Excellence: COVID-19 Vaccine Information Campaign

Bronze Award: Publications for Diverse Audiences, 2022 Association for Communication Excellence: COVID-19 Vaccine Translated Info Sheets

Gold Award Winner: Digital-only Publications, 2022 Association for Communication Excellence: Mental Health in Agriculture Impact Report

2021
Association for Communication Excellence in Agriculture, Natural Resources, and Life and Human Sciences
Crisis and Issues Management
Silver Award Winner: COVID-19 Crisis Communication for Extension and Agricultural Workers, COVID-19 Toolkit for Extension and agricultural workers

Diversity
Bronze Award Winner: State of the Science: Mental Health Issues in Agricultural, Vulnerable and Rural Communities White Paper, 2019 State of the Science White Paper

Publishing
Bronze Award Winner: Screening and Testing of Agriculture Farm Workers and Employers for COVID-19, Electronic Media and Audio for Targeted Audiences, video with Dr. Glenn Morris on COVID-19 testing and screening for agricultural workers

Pilot/Feasibility Program
Heidi Radunovich. Co-Investigator. (2019). Agrisafe Network, Inc. (PI: Natalie Roy) Southern region farm and ranch stress assistance network. Develop a clearinghouse of farmer assistance programs in the region inclusive of programs providing professional agricultural behavioral health counseling and referral. Heidi Radunovich. (2018).

Florida Nursery, Growers and Landscape Association (FNGLA). Endowed Research Fund. Research Enhancement Award. During August 2017, FNGLA leadership identified opioid misuse as a problem within their industries and contacted the Southeastern Coastal Center for Agricultural Health and Safety (SCCAHS) to gain assistance with addressing the issue of opioid misuse. SCCAHS created a resource section dedicated to opioids in order to help support FNGLA. However, it is unclear the extent to which opioids are a problem for FNGLA, what the economic impact might be, how individuals and families are affected, and what resources or programs might be useful for these industries. This project seeks to document the impact that opioid abuse has had on Florida's nursery, grower and landscaper industries, as well as their families, and determine how best to help them. In order to do this, information will be obtained from relevant stakeholders, and stakeholders will be informed of findings. This project will involve both assessment and information dissemination, which will be outlined below.

Gülcan Önel and Antonio Tovar. (2018). Robert Wood Johnson Foundation. Interdisciplinary Research Leaders Award. The broad goal of the Interdisciplinary Research Leaders (IRL) program is to produce diverse interdisciplinary leaders who conduct and apply high-quality, community-engaged, action-oriented, equity-focused health research in order to drive improvements in the health of communities.