A. OVERALL COVER PAGE

Project Title: Improving Crew Overboard Recovery for Commercial Fishing Vessels in the Gulf of Mexico	
Grant Number: 1U01OH011926-01	**Project/Grant Period:** 09/01/2019 - 08/31/2023
Reporting Period: 09/01/2019 - 08/31/2023	**Requested Budget Period:** 09/01/2019 - 08/31/2023
Report Term Frequency: Final	**Date Submitted:** 11/16/2023
Program Director/Principal Investigator Information: JEFFREY L LEVIN , MD MOTH DRPH BA **Phone Number:** 903-877-7270 **Email:** jeffrey.levin@uthct.edu	**Recipient Organization:** UNIVERSITY OF TEXAS HLTH CTR AT TYLER UNIVERSITY OF TEXAS HLTH CTR AT TYLER 11937 US HIGHWAY 271 TYLER, TX 757083154 **DUNS:** 800772337 **UEI:** FPCUDWBE7DX2 **EIN:** 1756001354A1 **RECIPIENT ID:**
Change of Contact PD/PI: NA	
Administrative Official: AUDREY GRAY 11937 US Highway 271 Tyler, TX 757083154 **Phone number:** 9038777585 **Email:** audrey.gray@uthct.edu	**Signing Official:** DAVID ANDERSON Office of Pre-Award Services 11937 US HIGHWAY 271 TYLER, TX 75708 **Phone number:** (903) 877-7486 **Email:** david.anderson@uttyler.edu
Human Subjects: NA	**Vertebrate Animals:** NA
hESC: No	**Inventions/Patents:** No

B. OVERALL ACCOMPLISHMENTS

B.1 WHAT ARE THE MAJOR GOALS OF THE PROJECT?

Specific Aims: This research project to improve crew overboard recovery for commercial fishing vessels in the Gulf of Mexico (GOM) has three specific aims:
1. Distribute crew overboard (COB) recovery slings to 120 commercial shrimp fishing vessel owners at three selected ports/landing sites along the Texas and Louisiana Gulf coast.
2. Provide mandatory training and drill instruction for installation and use of the recovery devices including maneuvering to the COB, securing the COB, and implementing a mechanical advantage to hoist and re-board the COB.
3. Administer surveys at the time of training and at follow-up to obtain information on commercial fishermen's experience with COB; to assess attitudes, beliefs, and intention toward COB recovery methods in this project; and assess perceived ability as well as efficiency of using the recovery sling.

B.1.a Have the major goals changed since the initial competing award or previous report?

No

B.2 WHAT WAS ACCOMPLISHED UNDER THESE GOALS?

File Uploaded : B.2 What was accomplished under these goals_Levin.pdf

B.3 COMPETITIVE REVISIONS/ADMINISTRATIVE SUPPLEMENTS

For this reporting period, is there one or more Revision/Supplement associated with this award for which reporting is required?

No

B.4 WHAT OPPORTUNITIES FOR TRAINING AND PROFESSIONAL DEVELOPMENT HAS THE PROJECT PROVIDED?

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B.5 HOW HAVE THE RESULTS BEEN DISSEMINATED TO COMMUNITIES OF INTEREST?

Multiple tools were created for this project and disseminated to stakeholders upon request.
-"Chain of Survival" graphic
- Survey in English, Vietnamese & Spanish
- Task list tool (also English, Vietnamese & Spanish)
- AMSEA COB recovery video segment to which we added Vietnamese captioning
- Train-the-trainer silent video

Presentations
- Northeast Center PFD Advisory Board- November 19, 2020
- Commercial Fishing Occupational Safety Quarterly Research Meeting- March 16, 2021
- American Occupational Health Conference, Obstacles to Performing Research on Commercial Fishermen in the Gulf of Mexico During the COVID-19 Pandemic (capstone student poster presented by Dr. Alex Nguyen, et al.)- May 2-5, 2021
- NORA AgFF Sector Council Meeting- May 26, 2021
- International Commercial Fishing Workgroup- June 7, 2023
- International Society of Agricultural Safety and Health- June 20, 2023

Manuscript
- Jeffrey L. Levin, Amanda Wickman, Alex Nguyen, Tung Ho, Cynthia Ball, Harrison Ndetan & Ann Carruth (2023): Improving Crew Overboard Recovery for Commercial Fishing in the Gulf of Mexico, Journal of Agromedicine, DOI: 10.1080/1059924X.2023.2226135

B.6 WHAT DO YOU PLAN TO DO DURING THE NEXT REPORTING PERIOD TO ACCOMPLISH THE GOALS?

Not Applicable

B.2 (B.2 What was accomplished under these goals_Levin.pdf)

B.2. What was accomplished under these goals?

Accomplishments are described under the applicable aims (goals).

1. Distribute crew overboard (COB) recovery slings to 120 commercial shrimp fishing vessel owners at three selected ports/landing sites along the Texas and Louisiana Gulf coast. The project originally targeted Port Isabel, TX; Abbeville, LA; and Galveston, TX. However, travel distances were curtailed due to COVID and Port Arthur, TX was selected as an alternative site for the more distant Port Isabel location.
    a. Sling distribution by site listed below:
        i. Port Arthur, Texas –44 slings
        ii. Abbeville, Louisiana –38 slings
        iii. Galveston, Texas –37 slings

2. Provide mandatory training and drill instruction for installation and use of the recovery devices including maneuvering to the COB, securing the COB, and implementing a mechanical advantage to hoist and re-board the COB.
    a. The crew overboard training was developed by the research team. A crew overboard training video produced by AMSEA was adapted with permission to include Vietnamese captions.
    b. Vietnamese translators were confirmed for each training location.
    c. Training flyers were created in English and translated into Vietnamese and approved by the IRB.
    d. Due to COVID concerns and travel restrictions, the training was shifted from dockside simulation aboard vessel to a land-based training. In order to prepare research team members at each training site, a train-the-trainer video was recorded for 1 or 2 rescuers.
    e. 123 fishermen representing 119 vessels were trained in COB recovery methods.
        i. Port Arthur, Texas – 48 fishermen
        ii. Abbeville, Louisiana – 38 fishermen
        iii. Galveston, Texas – 37 fishermen
    f. A task list was prepared, translated, and given to trainees to guide crew overboard recovery aboard vessel including installation and maintenance of the sling, identification of a mechanical advantage, and drills instruction for crew members.

3. Administer surveys at the time of training and at follow-up to obtain information on commercial fishermen's experience with COB; to assess attitudes, beliefs, and intention toward COB recovery methods in this project; and assess perceived ability as well as efficiency of using the recovery sling.
    a. The survey instrument was developed and translated into Spanish and Vietnamese.
    b. The translations and back-translations were reviewed by multiple partners with the appropriate language skills and commercial fishing industry experience.
    c. The survey instruments were approved by the IRB.
    d. Materials were developed in Spanish, but they were not utilized when the third training location was moved from Port Isabel, TX to Port Arthur, TX based upon different commercial fishermen demographics.

e. Follow up surveys were administered to a subset of the original sample of the commercial fishermen from each of the three locations. Simultaneously, task list elements were reviewed with fishermen to ascertain implementation and confidence for use of the recovery sling (yes/no responses).
f. Data analysis was performed on the surveys collected before and after training and 12-18 post initial training. Repeated measures ANOVA of the three surveys showed that positive change in normative beliefs was significant for the importance of quickly and safely maneuvering the vessel to the crew member. This change was most significant over the period from the initial training and receipt of the recovery sling by the vessel captain/deckhand, to the time of follow-up 12-18 months later ($p=0.03$). Regarding control beliefs, training was associated with immediate statistically significant improved confidence that, with assistance, the fisherman would be able to use the sling and other equipment to hoist the COB ($p=0.02$). However, this confidence waned significantly over time ($p=0.03$).
g. A manuscript was prepared by the PI and research teams members. It was accepted for publication in the Journal of Agromedicine.
    i. Jeffrey L. Levin, Amanda Wickman, Alex Nguyen, Tung Ho, Cynthia Ball, Harrison Ndetan & Ann Carruth (2023): Improving Crew Overboard Recovery for Commercial Fishing in the Gulf of Mexico, Journal of Agromedicine, DOI: 10.1080/1059924X.2023.2226135

B.4 (B.4 Opportunities for training_Levin.pdf)

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

This project trained commercial fishermen in crew overboard recovery through classroom instruction and demonstration. Due to COVID-19 the training was shifted from dockside (aboard vessel) to land-based simulation.

Two occupational medicine residents enrolled in the MPH program (Dr. Alexander Nguyen and Dr. Tung Ho) were members of the research team. Through regular periodic meetings with the Principal Investigator (PI), Dr. Jeffrey Levin, co-Investigator (co-I) Dr. Cynthia Ball, the project team, biostatistician, and other stakeholders, these residents received mentoring in a myriad of research methods including but not limited to worker training development, survey design, data collection, IRB, unique factors involving vulnerable worker populations as in commercial fishing and matters of culture and language literacy/translation. This was also considered part of their capstone experiences.

C. OVERALL PRODUCTS

C.1 PUBLICATIONS

Are there publications or manuscripts accepted for publication in a journal or other publication (e.g., book, one-time publication, monograph) during the reporting period resulting directly from this award?

Yes

Publications Reported for this Reporting Period

Public Access Compliance	Citation
N/A: Not NIH Funded	Levin JL, Wickman A, Nguyen A, Ho T, Ball C, Ndetan H, Carruth A. Improving Crew Overboard Recovery for Commercial Fishing in the Gulf of Mexico. Journal of agromedicine. 2023 October;28(4):852-866. PubMed PMID: 37326321; DOI: 10.1080/1059924X.2023.2226135.

C.2 WEBSITE(S) OR OTHER INTERNET SITE(S)

Category	Explanation
Other	https://www.uthct.edu/completed-projects/

C.3 TECHNOLOGIES OR TECHNIQUES

Category	Explanation
Audio or video	Pursuant to research training limitations during the COVID-19 pandemic, the training of commercial fishermen was shifted from a dockside (aboard vessel) hands-on simulation to a land-based simulation. A trainer-the-trainer video was prepared for offsite research team members to ensure consistency in delivering the training to fishermen for 1 or 2 rescuers. The train-the-trainer video can be viewed here: https://youtu.be/S1eJ0lN_3AY.

C.4 INVENTIONS, PATENT APPLICATIONS, AND/OR LICENSES

Have inventions, patent applications and/or licenses resulted from the award during the reporting period? No

If yes, has this information been previously provided to the PHS or to the official responsible for patent matters at the grantee organization? No

C.5 OTHER PRODUCTS AND RESOURCE SHARING

Category	Explanation
Audio or video	A video was produced by NIOSH in cooperation with AMSEA and Alaska Sea Grant. It was used and adapted for this project with permission, https://www.cdc.gov/niosh/docs/2011-126d/default.html.

	o Man Overboard: Prevention and Recovery Training Video dubbed with Vietnamese audio and subtitled in Vietnamese.
Audio or video	Pursuant to research training limitations during the COVID-19 pandemic, the training of commercial fishermen was shifted from a dockside (aboard vessel) hands-on simulation to a land-based simulation. A trainer-the-trainer video was prepared for offsite research team members to ensure consistency in delivering the training to fishermen for 1 or 2 rescuers. The train-the-trainer video can be viewed here: https://youtu.be/S1eJ0lN_3AY.

D. OVERALL PARTICIPANTS

D.1 WHAT INDIVIDUALS HAVE WORKED ON THE PROJECT?

Commons ID	S/K	Name	Degree(s)	Role	Cal	Aca	Sum	Foreign Org	Country	SS
JLEVIN	Y	LEVIN, JEFFREY L.	BA,MOTH,DRPH,MD	PD/PI	0.6	0.0	0.0			NA
JLEVIN	Y	LEVIN, JEFFREY L.	MD,MOTH,DRPH,BA	In-Kind Time and Effort	0.7	0.0	0.0			NA
	Y	Ball, Cynthia	DO, MS	In-Kind Time and Effort	0.7	0.0	0.0			NA
	Y	Wickman, Amanda	MBA	In-Kind Time and Effort	0.7	0.0	0.0			NA
	N	Lang, Sarah	MHA	In-Kind Time and Effort	0.4	0.0	0.0			NA
	N	Ndetan, Harrison	MPH, MD, PhD	Statistician	0.6	0.0	0.0			NA
	Y	Wickman, Amanda	MBA	Program Director	1.2	0.0	0.0			NA
	N	Shelton, Kayla	MBA	Program Manager	1.2	0.0	0.0			NA
	N	Nessim, Dalia	MD, PhD, MPH	In-Kind Time and Effort	0.4	0.0	0.0			NA
	N	Moore, Kevin	PhD, MBA	In-Kind Time and Effort	0.2	0.0	0.0			NA
	N	Shelton, Kayla	MBA	In-Kind Time and Effort	0.5	0.0	0.0			NA
	N	Moore, Kevin	PhD, MBA	Faculty	0.1	0.0	0.0			NA
	Y	Ball, Cynthia	DO, MS	Co-Investigator	0.9	0.0	0.0			NA
	N	Nguyen, Alexander	DO	In-Kind Time and Effort	2.6	0.0	0.0			NA

Glossary of acronyms:
S/K - Senior/Key
Cal - Person Months (Calendar)
Aca - Person Months (Academic)
Sum - Person Months (Summer)
Foreign Org - Foreign Organization Affiliation
SS - Supplement Support
RS - Reentry Supplement
DS - Diversity Supplement
OT - Other
NA - Not Applicable

D.2 PERSONNEL UPDATES

D.2.a Level of Effort

Not Applicable

D.2.b New Senior/Key Personnel

Not Applicable
D.2.c Changes in Other Support Not Applicable
D.2.d New Other Significant Contributors Not Applicable
D.2.e Multi-PI (MPI) Leadership Plan Not Applicable

E. OVERALL IMPACT

E.1 WHAT IS THE IMPACT ON THE DEVELOPMENT OF HUMAN RESOURCES?

Not Applicable

E.2 WHAT IS THE IMPACT ON PHYSICAL, INSTITUTIONAL, OR INFORMATION RESOURCES THAT FORM INFRASTRUCTURE?

The project team, including the critical external partners, developed valuable skills in research flexibility, adaptability, and emergency response. Partners gathered information from local fishermen to determine the feasibility of conducting the data collection and training as planned. Even in the early stages of pandemic, U.S. Coast Guard and LSU Ag Center partners revealed that fishermen were uneasy about congregating in groups for training. Alternative plans were made and subsequently postponed due to the growing problem that resulted in travel restrictions and stay-at-home orders. During the crisis, the project leaders connected with the industry partners regularly to stay current on local recommendations, polices, and community impact related to COVID-19. The Program Director distributed commercial fishing focused coronavirus fact sheets and guidelines to partners for local dissemination. Innovative solutions for completing the research aims under these extenuating circumstances were collaboratively developed and implemented, most notable being the land-based crew overboard recovery simulation.

Falls overboard continues to be one of the top causes of death in the commercial fishing industry and timely recovery is known to improve survivability. Findings from the study add new knowledge on the effects of the intervention on preparedness for efficient recovery of crew overboard victims. Once proven to be an effective measure, the training component of the intervention can be expanded to be included in US Coast Guard training for commercial fishermen in the Gulf Coast region. Findings could also justify further exploration of how best to encourage widespread availability and training for use of COB recovery devices on commercial fishing vessels in the Gulf Coast region. Followed detailed analysis of the pre/post survey data as well as task list responses, the project demonstrated that attitudes and beliefs of commercial fishermen in the GOM can be favorably influenced toward a COB recovery device, as well as their confidence and intention to use such devices. However, results show that attitudes and beliefs may wane over time, emphasizing the importance of repeated training and survival drills in this industry. Texas Sea Grant and AgriLife Extension have requested repeat trainings for commercial shrimp fishermen and training for crab fishermen in the Gulf of Mexico.

E.3 WHAT IS THE IMPACT ON TECHNOLOGY TRANSFER?

Not Applicable

E.4 WHAT DOLLAR AMOUNT OF THE AWARD'S BUDGET IS BEING SPENT IN FOREIGN COUNTRY(IES)?

NOTHING TO REPORT

G. OVERALL SPECIAL REPORTING REQUIREMENTS SPECIAL REPORTING REQUIREMENTS

G.1 SPECIAL NOTICE OF AWARD TERMS AND FUNDING OPPORTUNITIES ANNOUNCEMENT REPORTING REQUIREMENTS

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SF-428-B LEVIN 1926_signed.pdf

hhs568 Final Invention Statement LEVIN 1926_signed.pdf

G.2 RESPONSIBLE CONDUCT OF RESEARCH

Not Applicable

G.3 MENTOR'S 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

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Cumulative Inclusion Enrollment Report LEVIN.pdf

G.4.c ClinicalTrials.gov

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

G.5 HUMAN SUBJECTS EDUCATION REQUIREMENT

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 Not Applicable
G.8 PROJECT/PERFORMANCE SITES Not Applicable
G.9 FOREIGN COMPONENT No foreign component
G.10 ESTIMATED UNOBLIGATED BALANCE Not Applicable
G.11 PROGRAM INCOME Not Applicable
G.12 F&A COSTS Not Applicable

Cumulative Inclusion Enrollment Report

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

Study Title: Improving Crew Overboard Recovery for Commercial Fishing Vessels in the Gulf of Mexico

Comments: PI: Jeffrey Levin, MD, DrPH

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	3	113								116
Native Hawaiian or Other Pacific Islander										0
Black or African American										0
White		7								7
More Than One Race										0
Unknown or Not Reported										0
Total	**3**	**120**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**123**

I. OVERALL OUTCOMES

I.1 What were the outcomes of the award?

Occupational fatality rates in the commercial fishing industry in the United States remain more than 20 times higher than the national average. Falls overboard from a fishing vessel account for the second highest number of commercial fishing related fatalities. The burden of commercial fishing fatalities due to unintentional falls overboard is highest in the Gulf of Mexico shrimp fishery, supporting the need for increased personal floatation device (PFD) use while working aboard vessel, as well as for recovery devices to reduce fatalities from crew overboard incidents. This quasi-experimental, pre-/post-test project focused on the latter by disseminating recovery slings to Gulf of Mexico fishermen, training in their use, and examining impact by assessing the attitudes, beliefs, and intentions of fishermen in their adoption.

The research team used a land-based simulation to train 123 commercial fishermen in crew overboard recovery using life slings and a mechanical advantage. A life sling was provided for each fishing vessel represented at the trainings. The results suggest that attitudes and beliefs of this group of commercial fishermen in the Gulf of Mexico can be favorably influenced toward a recovery device of this nature, as well as their confidence and intention to use such devices. Moreover, these favorable perceptions were extended to use of PFDs. However, the results also show that attitudes and beliefs may wane over time, emphasizing the need for repeated training and survival drills in this industry. Further, there was notable discordance between immediately enhanced attitudes and beliefs toward the importance of PFD use aboard vessel with training, and a significant decline over time of intent to use these devices. Ongoing research and replication of these efforts will be necessary to continue to explore best practices for increasing adoption and optimal use of life-saving recovery devices and PFDs in the Gulf, as well as among other fisheries in the United States. Future considerations might include study efforts involving simultaneous distribution of traditional PFDs with recovery slings. Educational simulation utilizing manikins aboard squared-away vessels as originally proposed would also contribute to measuring the effectiveness of this type of drills training.