NIOSH Updates in Commercial Fishing Safety Research

presented to the
Commercial Fishing Safety Advisory Committee
Seattle, WA | November 15, 2018

Samantha Case, MPH

The findings and conclusions in this presentation have not been formally disseminated by CDC/NIOSH and should not be construed to represent any agency determination or policy.

Outline

- NIOSH Introduction
- Fatality Data Update
- What's New? – Recent projects
- What's Next? – Ongoing and future activities

Department of Health and Human Services

Centers for Disease Control and Prevention (CDC)

National Institute for Occupational Safety and Health (NIOSH)

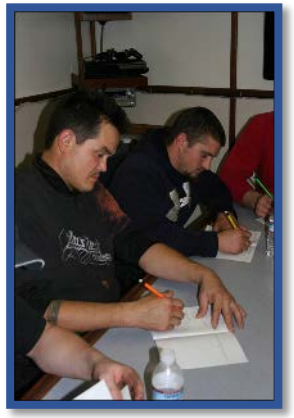
Research, Training, and Prevention Recommendations

Center for Maritime Safety and Health Studies

- Brings focus to safety and health needs for maritime workers in:
  - Commercial fishing
  - Seafood processing
  - Aquaculture
  - Marine terminals
  - Shipyards
  - Marine transportation
- Works to understand problems and how to reduce them
- Collaborates with industry and workers

Commercial Fishing Safety Research and Design Program

Epidemiology



Engineering

Health Communication

USCG/NIOSH Partnership

Memorandum of Agreement (MOA)

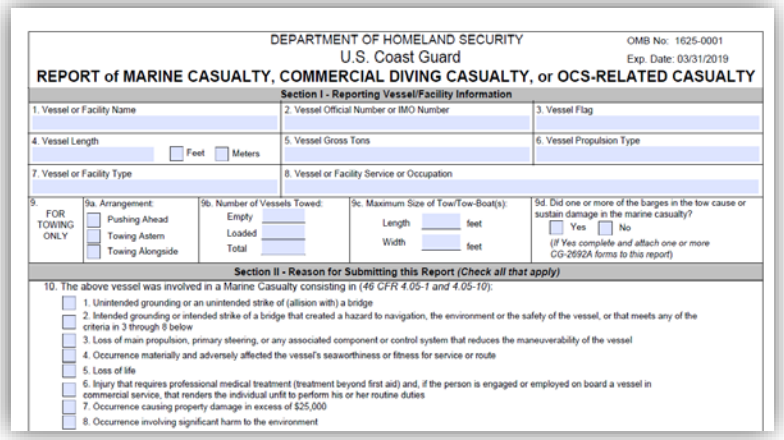
- NIOSH scientists granted USCG credentials as Federal Affiliates
- Access to MISLE to manually review cases
- Conduct statistical analyses of data
- Identify hazards leading to deaths and injuries

March 2014 Signing to expand Memorandum of Agreement

Coast Guard Rear Adm. Joseph Servidio and NIOSH Director, Dr. John Howard

Collecting Data for Analysis

Marine casualty occurs → Coast Guard or local law enforcement investigates → NIOSH reviews reports → Information entered into Commercial Fishing Incident Database (CFID)



DEPARTMENT OF HOMELAND SECURITY
U.S. Coast Guard
OMB No: 1625-0001
Exp. Date: 03/31/2019

REPORT of MARINE CASUALTY, COMMERCIAL DIVING CASUALTY, or OCS-RELATED CASUALTY

Section I - Reporting Vessel/Facility Information

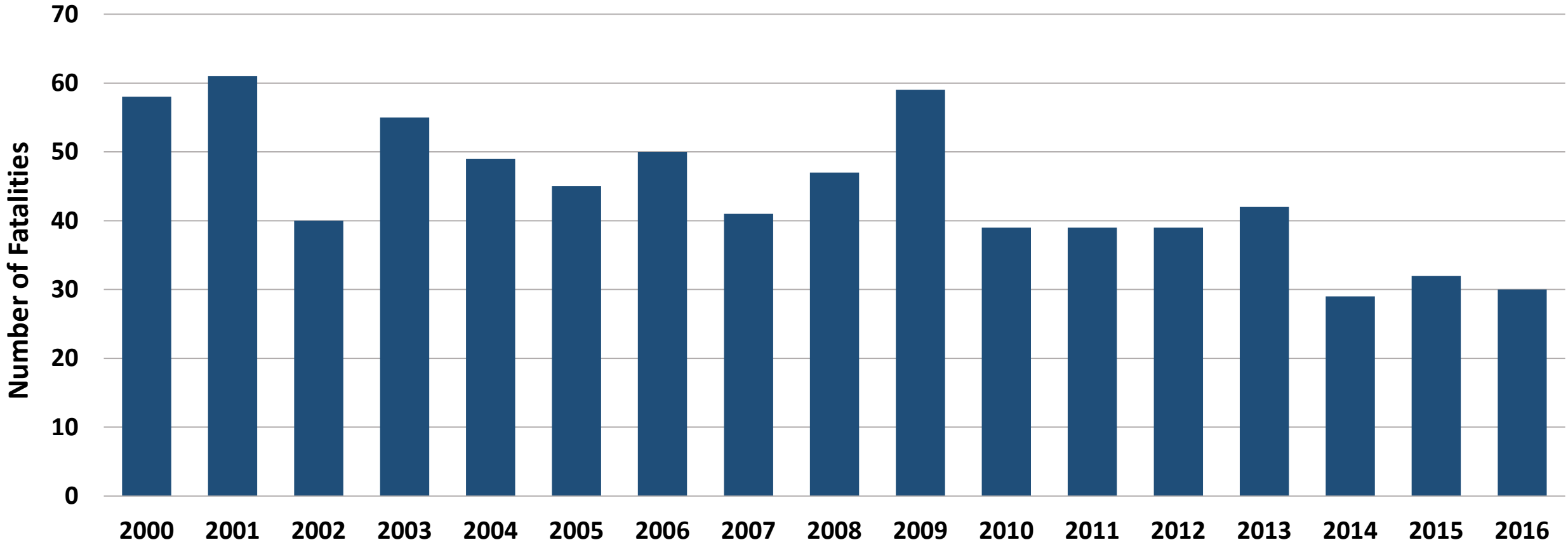
1. Vessel or Facility Name
2. Vessel Official Number or IMO Number
3. Vessel Flag
4. Vessel Length — Feet / Meters
5. Vessel Gross Tons
6. Vessel Propulsion Type
7. Vessel or Facility Type
8. Vessel or Facility Service or Occupation
9. FOR TOWING ONLY
   - 9a. Arrangement: Pushing Ahead / Towing Astern / Towing Alongside
   - 9b. Number of Vessels Towed: Empty / Loaded / Total
   - 9c. Maximum Size of Tow/Tow-Boat(s): Length feet / Width feet
   - 9d. Did one or more of the barges in the tow cause or sustain damage in the marine casualty? Yes / No (*If Yes complete and attach one or more CG-2692A forms to this report*)

Section II - Reason for Submitting this Report *(Check all that apply)*

10. The above vessel was involved in a Marine Casualty consisting in (*46 CFR 4.05-1 and 4.05-10*):
    1. Unintended grounding or an unintended strike of (allision with) a bridge
    2. Intended grounding or intended strike of a bridge that created a hazard to navigation, the environment or the safety of the vessel, or that meets any of the criteria in 3 through 8 below
    3. Loss of main propulsion, primary steering, or any associated component or control system that reduces the maneuverability of the vessel
    4. Occurrence materially and adversely affected the vessel's seaworthiness or fitness for service or route
    5. Loss of life
    6. Injury that requires professional medical treatment (treatment beyond first aid) and, if the person is engaged or employed on board a vessel in commercial service, that renders the individual unfit to perform his or her routine duties
    7. Occurrence causing property damage in excess of $25,000
    8. Occurrence involving significant harm to the environment

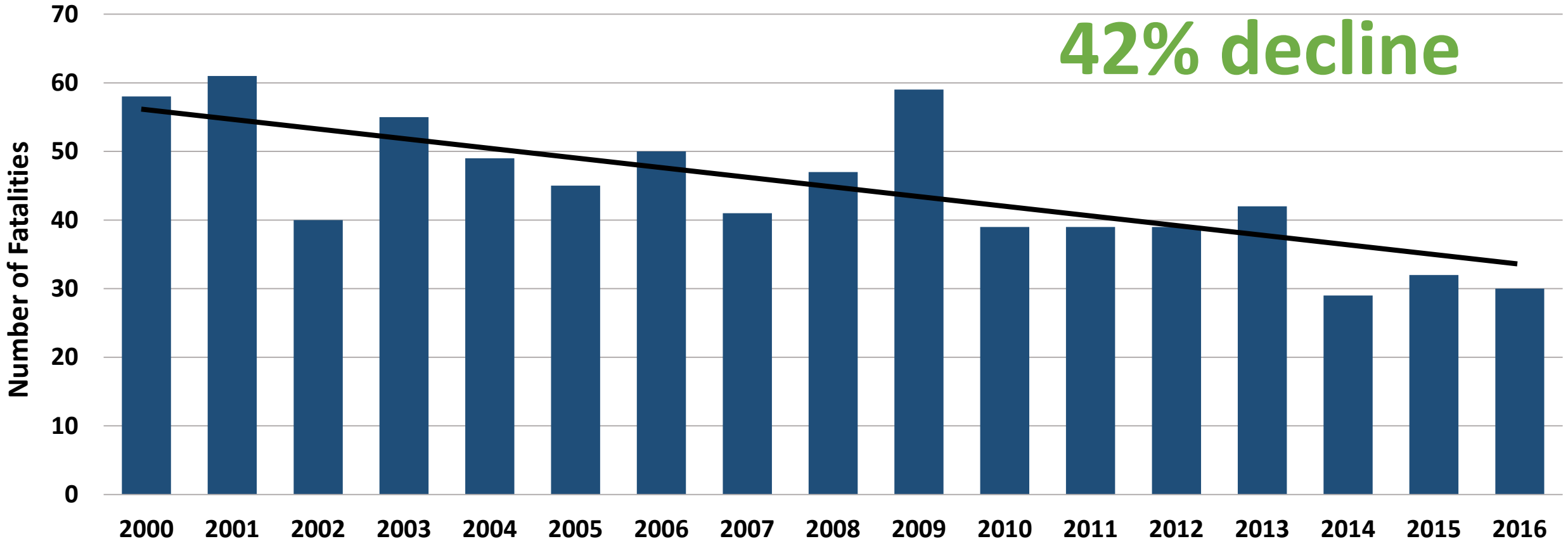
Data Update

Commercial Fishing Fatalities, 2000-2016 (n=755)



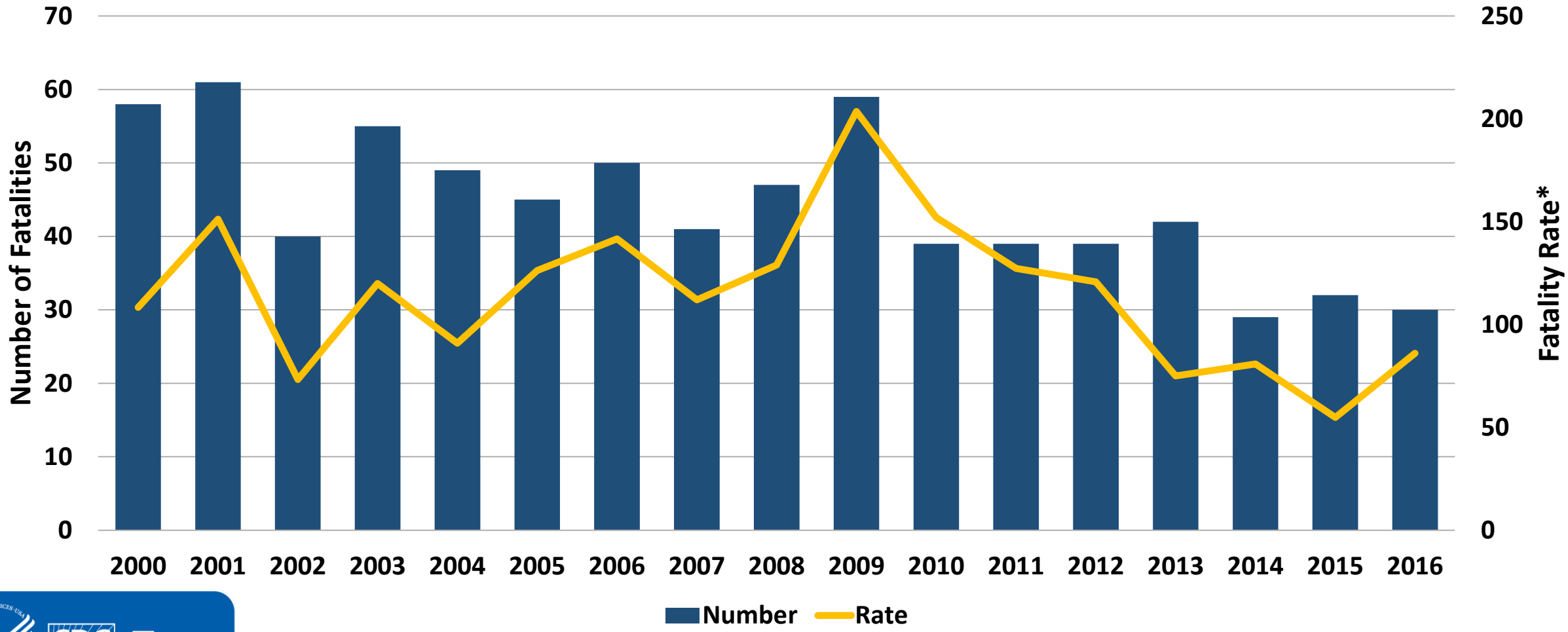
Average = 44 deaths/year

Commercial Fishing Fatalities, 2000-2016 (n=755)



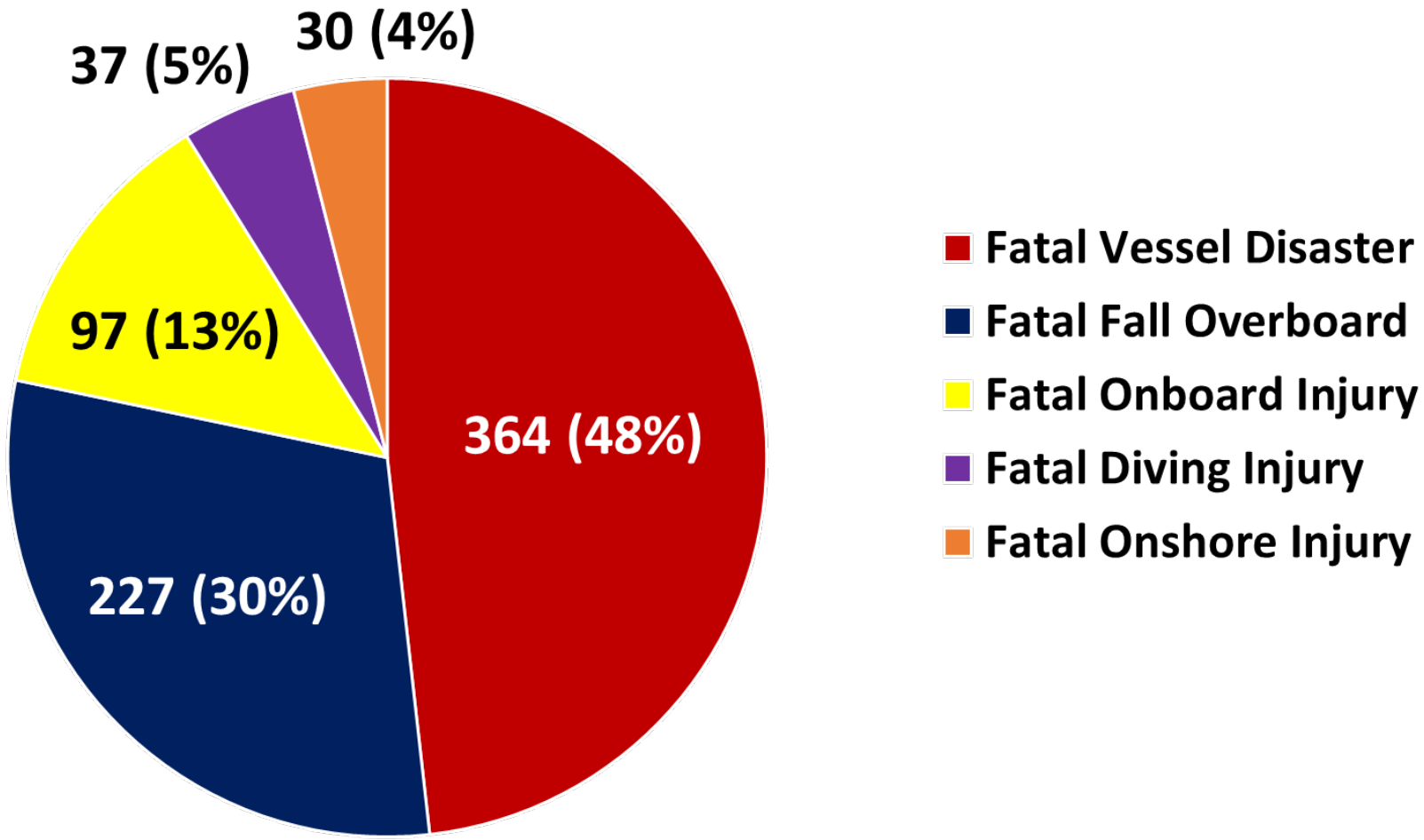
IRR=0.966
p < 0.001

Commercial Fishing Fatalities, 2000-2016 (n=755)

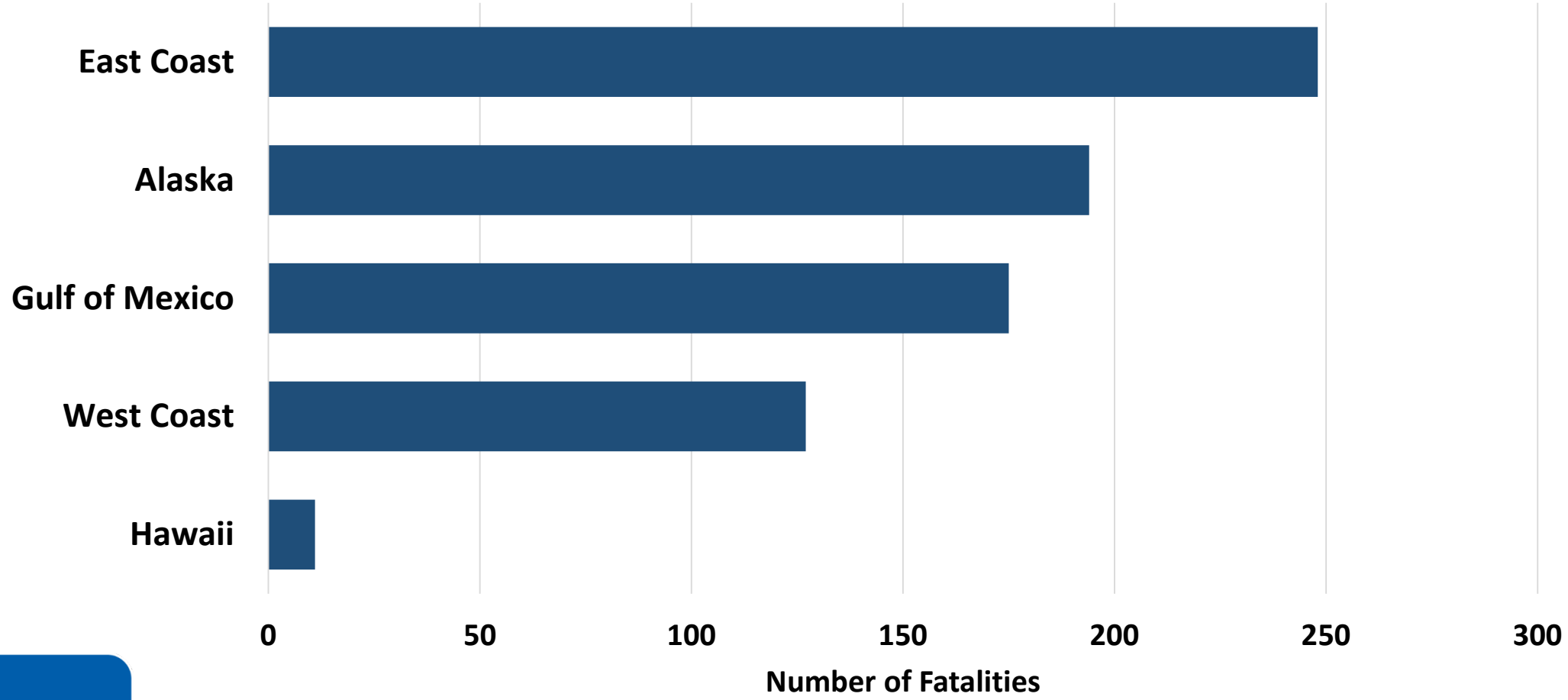


*2000-2005: per 100,000 workers; 2006-2016: per 100,000 FTEs

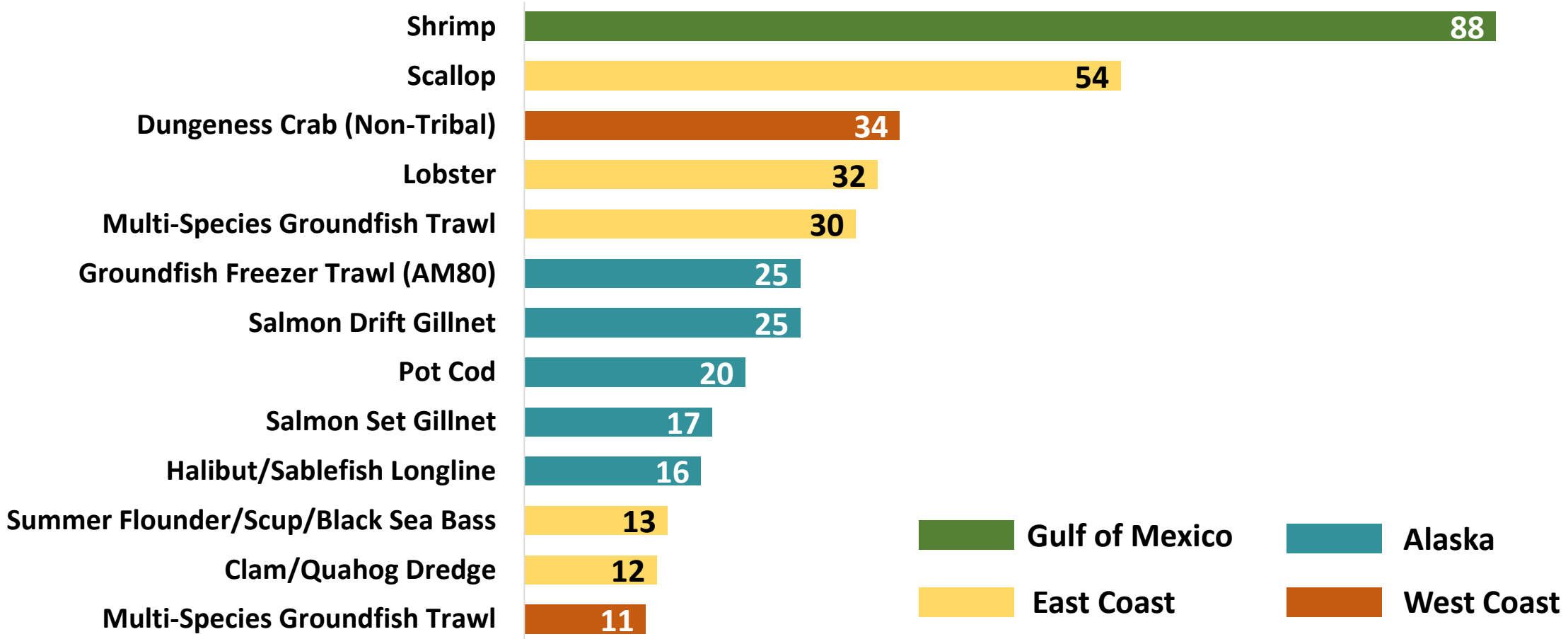
Commercial Fishing Fatalities by Incident Type, 2000-2016 (n=755)



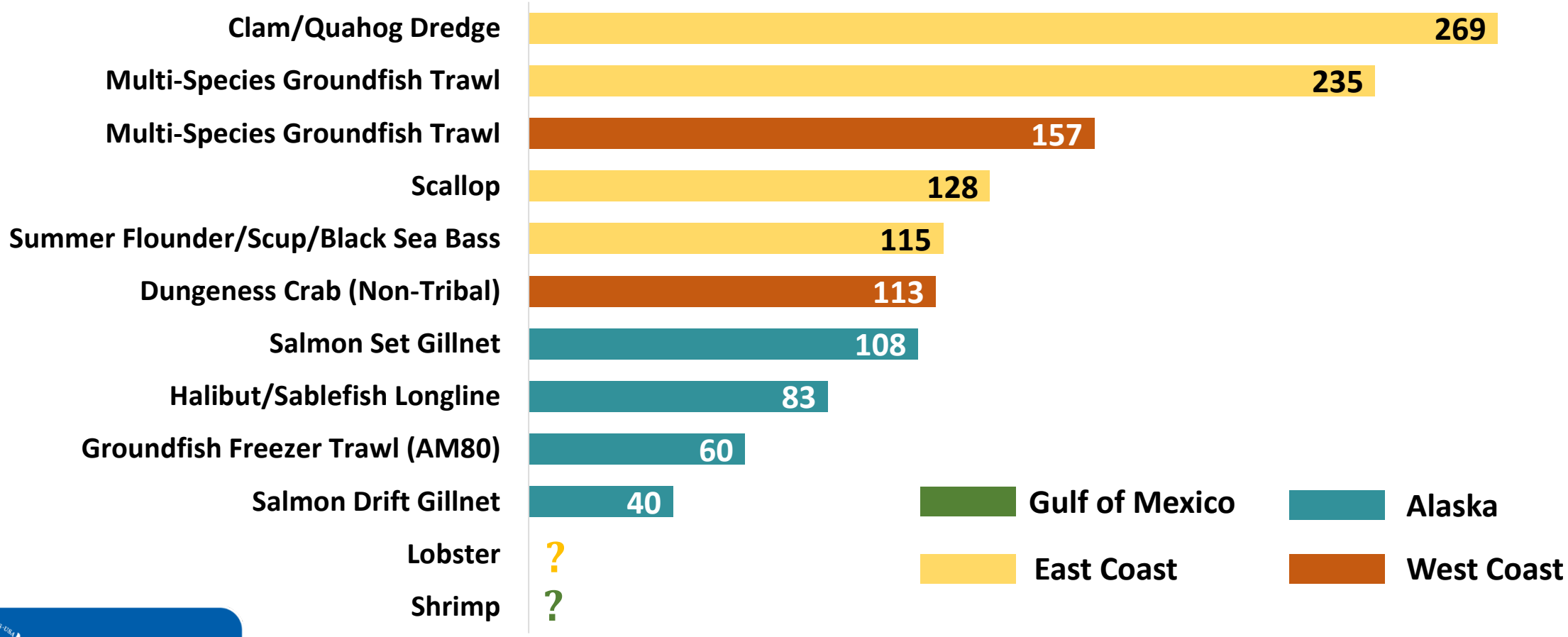
Commercial Fishing Fatalities by Region, 2000-2016 (n=755)



Fleets with the Highest Number of Fatalities, 2000-2016 (n=377)



Fatality Rates by Fleet*, 2000-2016 per 100,000 FTEs

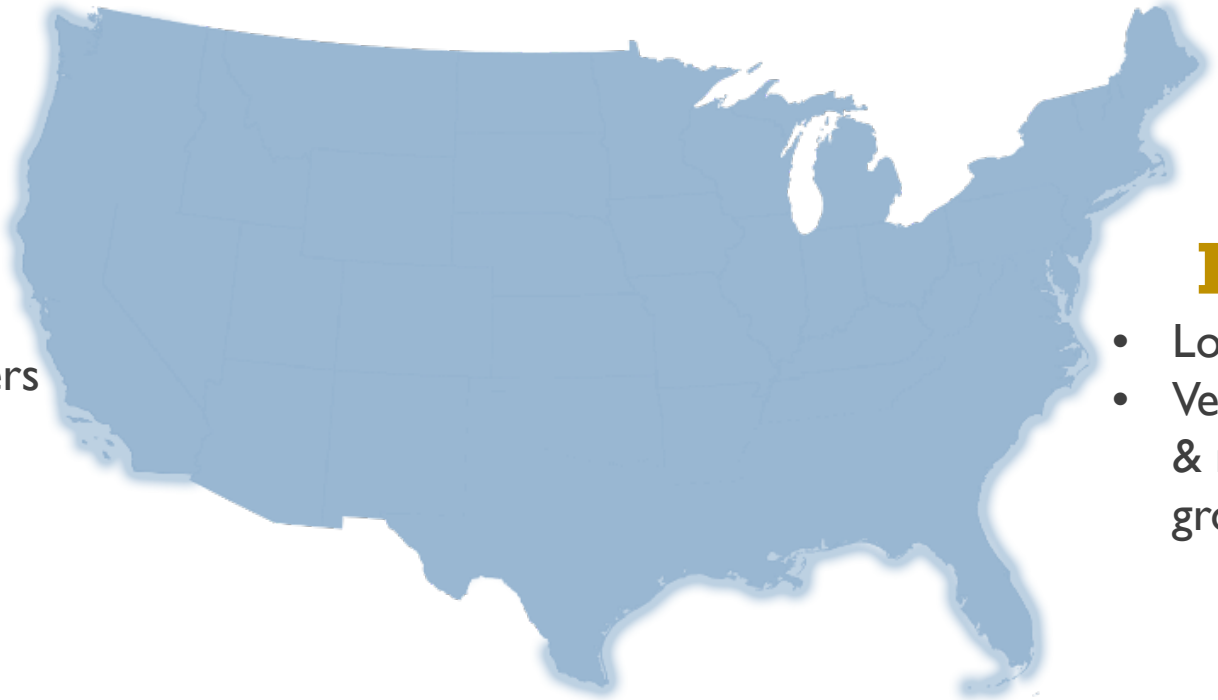


*Fleets with 10 or more fatalities and where denominator data are available

Most Hazardous Fisheries & Events

Alaska

- Salmon skiff capsizings & falls overboard
- Dive harvest incidents



West Coast

- Dungeness crab vessel disasters
- Groundings
- Dive harvest incidents

East Coast

- Lobster falls overboard
- Vessel disasters in scallop & multi-species groundfish

Gulf of Mexico

- Shrimp winch entanglements & falls overboard
- Fires/explosions

CDC NIOSH

Updated Fatality Data

Accepted: 28 July 2017
DOI: 10.1002/ajim.22761

RESEARCH ARTICLE

WILEY

Work-related mortality in the US fishing industry during 2000-2014: New findings based on improved workforce exposure estimates

Devin L. Lucas PhD | Samantha L. Case MPH

Western States Division, National Institute for Occupational Safety and Health, Anchorage, Alaska

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Email: dlucas@cdc.gov

Background: Commercial fishing is a global industry that has been frequently classified as high-risk. The use of detailed surveillance data is critical in identifying hazards.

Methods: The purpose of this study was to provide updated statistics for the entire US fishing industry during 2010-2014, generate fleet-specific fatality rates using a revised calculation of full-time equivalent estimates, and examine changes in the patterns of fatalities and in risk over a 15-year period (2000-2014).

Results: During 2010-2014, 188 commercial fishing fatalities occurred in the United States. Vessel disasters and falls overboard remain leading contributors to commercial fishing deaths. The Atlantic scallop fleet stands out for achieving substantial declines in the risk of fatalities over the 15-year study period. However, fatality rates ranged from 21 to 147 deaths per 100 000 FTEs, many times higher than the rate for all US workers.

Conclusions: Although the number of fatalities among commercial fishermen in the United States has generally declined since 2000, commercial fishing continues to have one of the highest occupational fatality rates in the United States. The sustainable seafood movement could assist in improving the health and safety of fishing industry workers if worker well-being was integrated into the definition of sustainable seafood.

KEYWORDS
fishing, mortality, occupational, surveillance

1 | INTRODUCTION

Commercial fishing is a critical industry for global food security, generating a major source of animal protein for billions of people worldwide.[1] Fishing vessels vary widely in terms of size and configuration, ranging from small undecked vessels with as few as one person onboard to large decked vessels with dozens of crewmembers who catch and process fish into final products in factories onboard the vessels. The fishing industry has been frequently classified as exceptionally high-risk, with workplace fatality rates that are often the highest among all industries in many countries.[2] The life-threatening hazards faced by workers in the fishing industry have been measured and described in many epidemiologic studies for decades,[3] yet public concern over the death toll has been mostly lacking, including within social movements such as for sustainable seafood.

Interest in sustainable seafood has been steadily increasing among wholesalers, retailers, restaurants, and consumers.[3] Market research has predicted a growing awareness and preference for seafood that is environmentally, economically, and socially sustainable.[3] Definitions

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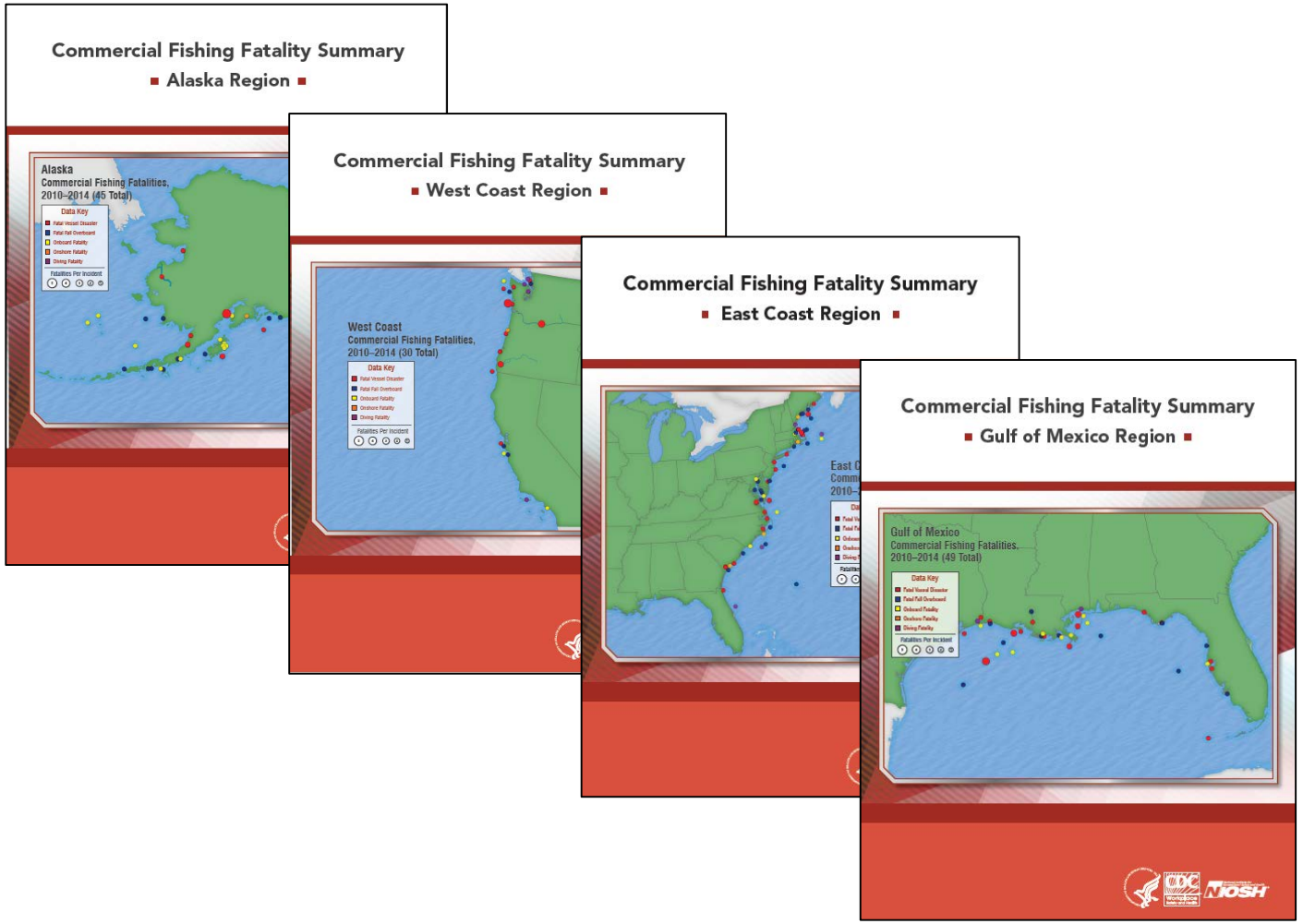


What's New?

Fatal Falls Overboard in Commercial Fishing

204 unintentional fatal falls overboard

- By fishery:
  - Gulf of Mexico Shrimp (34)
  - East Coast Lobster (18)
  - Alaska Salmon Drift Gillnet (16)
- Most common work tasks:
  - Working with gear (hauling/setting)
  - Off duty, on deck
- 59% not witnessed
- 100% no PFDs

Centers for Disease Control and Prevention

MMWR

Morbidity and Mortality Weekly Report

Weekly / Vol. 67 / No. 16 — April 27, 2018

Workers' Memorial Day — April 28, 2018

Workers' Memorial Day, observed annually on April 28,* recognizes workers who were injured, became ill, or died because of exposures to hazards at work. In 2016, work-related injuries claimed the lives of 5,190 U.S. workers, and the fatal injury rate (3.6 per 100 full time equivalent workers)† rose for the third consecutive year, to the highest rate since 2010. Although deaths resulting from work-related injuries are captured through surveillance, most deaths resulting from work-related illness are not. In 2007, an estimated 53,445 persons died from work-related illness (*1*). In 2016, employers reported approximately 2.9 million nonfatal work-related injuries and illnesses to private industry workers.§

Occupational injuries and illnesses also have economic costs. The societal cost of work-related fatalities, injuries, and illnesses was estimated at $250 billion in 2007, based on methods that focus on medical costs and productivity losses (*1*).

New data on fatal falls overboard in the fishing industry, one of the nation's most hazardous industries, are reported in this issue of *MMWR* (*2*). Since 1991, the CDC-NIOSH Western States Division has studied fishing safety and developed interventions to reduce the incidence of injuries and fatalities among the nation's fishermen. More information about commercial fishing safety can be found at https://www.cdc.gov/niosh/topics/fishing/.

* Established in 1970 by the American Federation of Labor and Congress of Industrial Organizations.
† https://www.bls.gov/news.release/pdf/cfoi.pdf.
§ https://www.bls.gov/news.release/pdf/osh.pdf.

References

1. Leigh JP. Economic burden of occupational injury and illness in the United States. Milbank Q 2011;89:728–72. https://doi.org/10.1111/j.1468-0009.2011.00648.x
2. Case SL, Lincoln JM, Lucas DL. Fatal falls overboard in commercial fishing—United States, 2006–2016. MMWR Morb Mortal Wkly Rep 2018;67:465–9.

Fatal Falls Overboard in Commercial Fishing — United States, 2000–2016

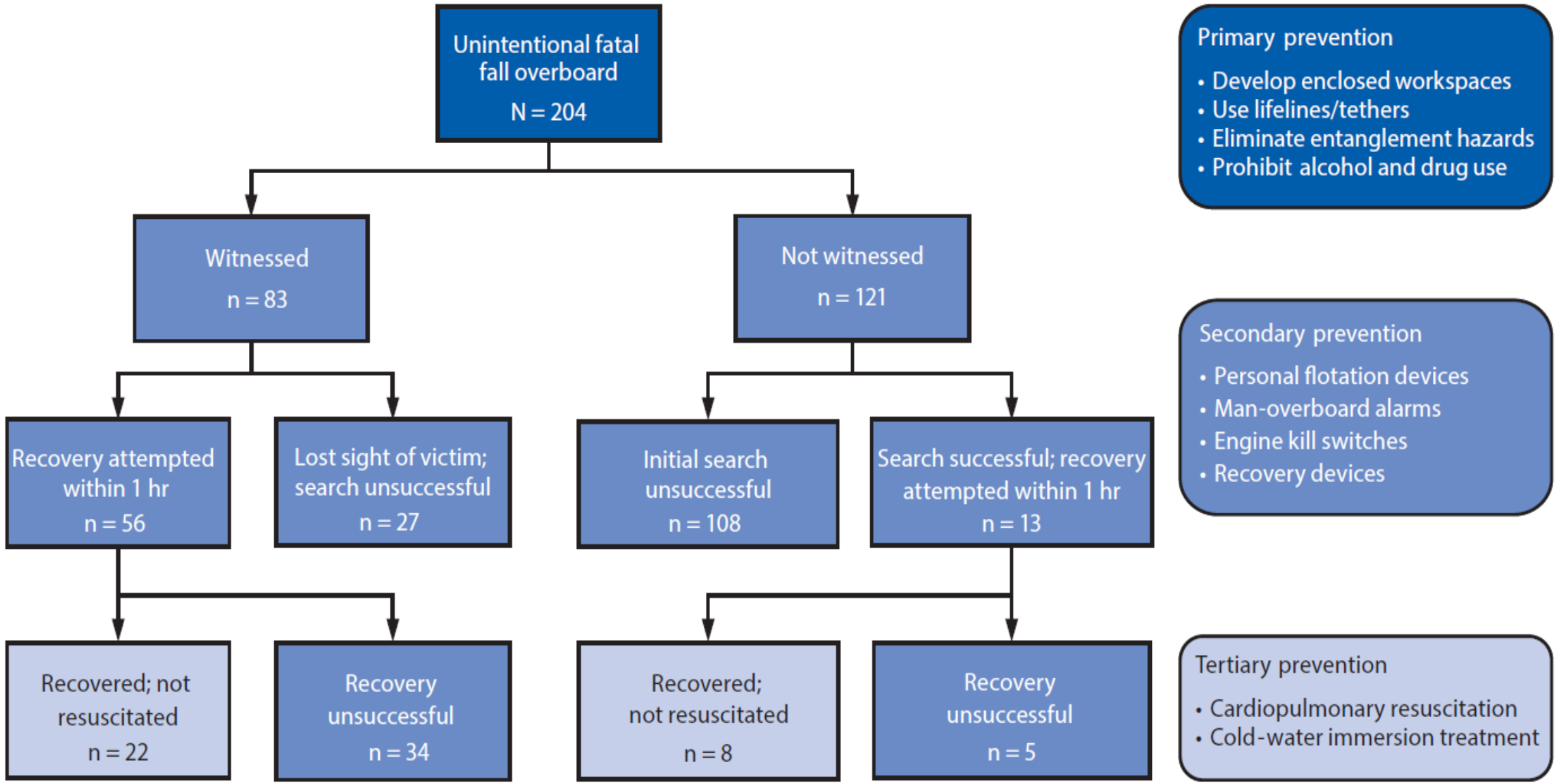
Samantha L. Case, MPH[1]; Jennifer M. Lincoln, PhD[1]; Devin L. Lucas, PhD[1]

Commercial fishing is one of the most dangerous jobs in the United States, with a 2016 work-related fatality rate (86.0 deaths per 100,000 full-time equivalent workers) 23 times higher than that for all U.S. workers (3.6) (*1*). Sinking vessels cause the most fatalities in the industry; however, falling from a fishing vessel is a serious hazard responsible for the second highest number of commercial fishing–associated fatalities (*2,3*). CDC's National Institute for Occupational Safety and Health (NIOSH) analyzed data on unintentional fatal falls overboard in the U.S. commercial fishing industry to identify gaps in the use of primary, secondary, and tertiary prevention strategies. During 2000–2016, a total of 204 commercial fishermen died after unintentionally falling overboard. The majority of falls (121; 59.3%) were not witnessed, and 108 (89.3%) of these victims were not found. Among 83 witnessed falls overboard, 56 rescue attempts were made; 22 victims were recovered but were not successfully resuscitated. The circumstances, rescue attempts, and limited use of lifesaving

INSIDE

Continuing Education examination available at https://www.cdc.gov/mmwr/cme/conted_info.html#weekly.

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

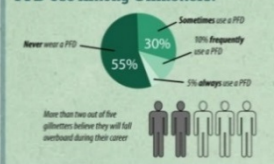

Unintentional fatal fall overboard
N = 204
Witnessed
n = 83
Not witnessed
n = 121
Recovery attempted within 1 hr
n = 56
Lost sight of victim; search unsuccessful
n = 27
Initial search unsuccessful
n = 108
Search successful; recovery attempted within 1 hr
n = 13
Recovered; not resuscitated
n = 22
Recovery unsuccessful
n = 34
Recovered; not resuscitated
n = 8
Recovery unsuccessful
n = 5
Primary prevention
• Develop enclosed workspaces
• Use lifelines/tethers
• Eliminate entanglement hazards
• Prohibit alcohol and drug use
Secondary prevention
• Personal flotation devices
• Man-overboard alarms
• Engine kill switches
• Recovery devices
Tertiary prevention
• Cardiopulmonary resuscitation
• Cold-water immersion treatment

GILLNETTERS

PFDs That Work

Researchers from the NIOSH Alaska Pacific Office conducted an evaluation with commercial fishermen from 4 gear groups to rate the comfort and acceptability of six modern personal flotation devices (PFDs).[1] About 200 fishermen were asked to evaluate a PFD for one month while wo
could be identified. This document shows which

PFD Use Among Gillnetters:



Reasor
- Alm abo
- Cor cre

Doesn't on gear

PFD Evaluation:

After the 30 day on deck evaluation of PFDs, gillnetters said that the Regatta raingear with built in flotation would work on their vessels. Comments on the device include:

- Lightweight, did not interfere with their work
- Did not snag on fishing gear
- Easy to keep clean and easy to put on
- The Stearns inflatable suspenders were also acceptable for work on drift gillnet vessels; they too did not snag the gear and were easy to clean

Lightweight

Does not limit motion

Does not int with work

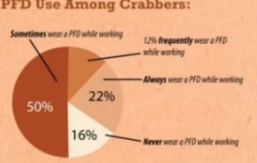
Easy to keep

CRABBERS

PFDs That Work

Researchers from the NIOSH Alaska Pacific Office conducted an evaluation with commercial fishermen from 4 gear groups to rate the comfort and acceptability of six modern personal flotation devices (PFDs).[1] About 200 fishermen were asked to evaluate a PFD for one month while worki
could be identified. This document shows which PF

PFD Use Among Crabbers:

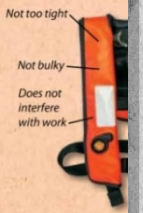


Crabbers'
- Over ha someor
- 60% of saving
- Most cr uncom
although an enta

PFD Evaluation:

After the 30 day on deck evaluation of PFDs, crabbers preferred Mustang and Stearns Inflatable Suspenders. Comments on the devices include:

- Did not constrict motion or snag on gear
- Did not interfere with their work
- Were rated as comfortable to wear because they were not tight or bulky



Mustang Inflata (MD3

OVERVIEW

PFDs That Work

Researchers from the NIOSH Alaska Pacific Office asked commercial fishermen from 4 gear groups (crabbers, trawlers, longliners, gillnetters) to rate the comfort and acceptability of six modern personal flotation devices (PFDs). About 200 fishermen evaluated various PFDs for one month while working on deck so that wearable PFDs could be identified.[1]

Fishermen evaluated inflatable PFDs and foam PFDs that were either integrated into their rain gear or were worn in addition to raingear. Since deck work and fishing season varies for each gear group, fishermen had different preferences. Each gear group identified PFDs that are comfortable and easy to wear and are currently available for sale. The gear group specific results can be found at www.cdc.gov/niosh/topics/fishing .

Personal Flotation Devices Prevent Fishermen Deaths

The key to finding the proper PFD is to try on many to make sure they will work for the specific activities related to your type of fishing. Working on crowded decks and in close proximity to gear make it vitally important that a PFD not become a snagging hazard. Fishermen who work in colder weather may prefer a PFD with more foam padding for insulation against the weather.

Regatta Fishermen's Oilskins with Flotation

NIOSH researchers teach gillnet fishermen about their inflatable PFDs

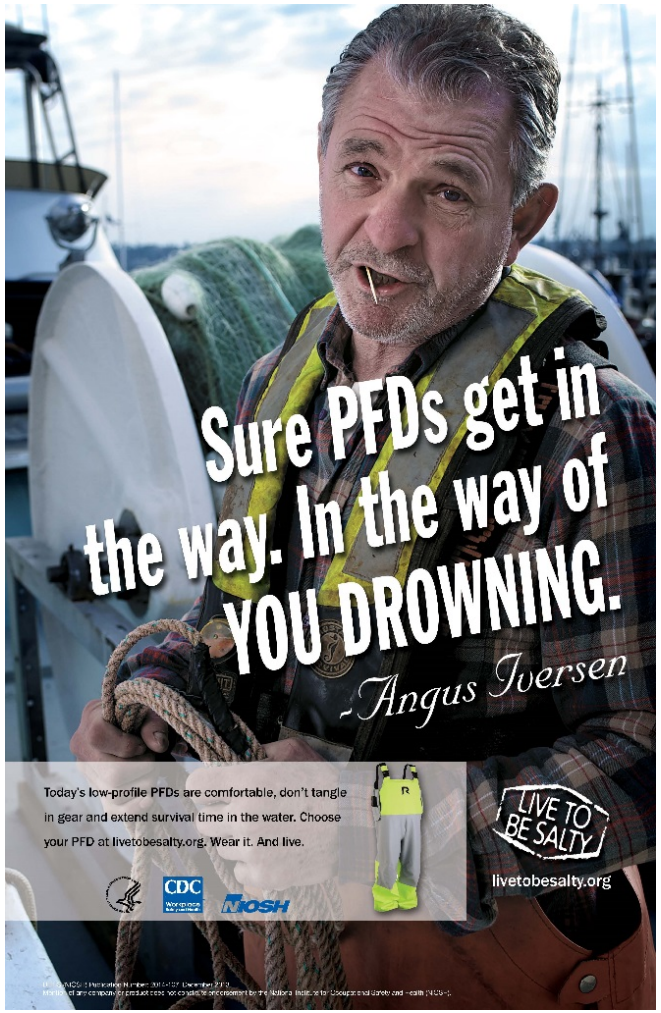
Crab fishermen in Dutch Harbor try on two different inflatable PFDs

Mustang Inflatable Suspenders (MD3188)

Inflatable PFDs
- Slim, lighter weight
- Higher maintenance
- Must purchase re-arm kits
- Must be worn over rain gear
- Slightly more expensive

Stearns Foam Work Vest (I424)

Foam PFDs
- Thicker, sometimes heavier
- Low maintenance
- No accessories needed
- Can be worn under rain gear
- Typically lower cost



DEPARTMENT OF HEALTH & HUMAN SERVICES USA
CDC NIOSH

PFD Studies

Alaska

- Salmon skiff capsizings & falls overboard
- Dive harvest incidents

National Institute for Occupational Safety and Health NIOSH

West Coast

- Dungeness crab vessel disasters
- Groundings
- Dive harvest incidents

CRAB FISHING SAFETY STUDY NIOSH OHSU UW

East Coast

- Lobster falls overboard
- Vessel disasters in scallop & multi-species groundfish

AGRICULTURAL HEALTH INJURY PREVENTION SOUTHWEST CENTER EDUCATION

Gulf of Mexico

- Shrimp winch entanglements & falls overboard
- Fires/explosions

CDC NIOSH

Surviving Fishing Vessel Sinkings in Alaska

Safety Science 101 (2018) 186–196

Contents lists available at ScienceDirect

Safety Science

journal homepage: www.elsevier.com/locate/safety

Factors associated with crewmember survival of cold water immersion due to commercial fishing vessel sinkings in Alaska

Devin L. Lucas*, Samantha L. Case, Jennifer M. Lincoln, Joanna R. Watson

National Institute for Occupational Safety and Health, Western States Division, Anchorage, AK, USA

ABSTRACT

Occupational fatality surveillance has identified that fishing vessel disasters, such as sinkings and capsizings, continue to contribute to the most deaths among crewmembers in the US fishing industry. When a fishing vessel sinks at sea, crewmembers are at risk of immersion in water and subsequent drowning. This study examined survival factors for crewmembers following cold water immersion after the sinking of declared commercial fishing vessels in Alaskan waters during 2000–2014. Two immersion scenarios were considered separately: immersion for any length of time, and long-term immersion defined as immersion lasting over 30 min. Logistic regression was used to predict the odds of crewmember survival. Of the 617 crewmembers onboard 187 fishing vessels that sank in Alaska during 2000–2014, 557 (90.3%) survived and 60 died. For crewmembers immersed for any length of time, the significant adjusted predictors of survival were: entering a life-raft, sinking within three miles of shore, the sinking not being weather-related, and working as a deckhand. For crewmembers immersed for over 30 min, the significant adjusted predictors of survival were: wearing an immersion suit, entering a life-raft, working as a deckhand, and the sinking not being weather-related. The results of this analysis demonstrate that in situations where cold water immersion becomes inevitable, having access to well-maintained, serviceable lifesaving equipment and the knowledge and skills to use it properly are critical.

1. Introduction

Fishing vessel sinkings present extreme survival challenges to those involved. When a fishing vessel sinks at sea, crewmembers are at risk of immersion in water and subsequent traumatic injuries or death. Cold water immersion can cause hyperventilation, muscle tension, reduced cognitive function, and swimming failure; leading to death from drowning or hypothermia (Golden, 1973; Cooper et al., 1976; Hayward and Eckerson, 1984). Among the challenges of surviving a vessel sinking are psychological stressors, which have been shown to significantly affect decision making and response abilities, impairing chances of survival (Singer, 1982; Leach, 2004). To overcome these extreme environmental and psychological factors, crewmembers must be prepared with effective survival equipment, knowledge, and skills. High levels of emergency preparedness have not always been ubiquitous in the US fishing industry, which may have contributed to the long history of deadly vessel sinkings. During 1982–1987, an average of 108 commercial fishing fatalities occurred annually in the United States, the majority of which were due to vessel sinkings (National Research Council, 1991).

The US fishing industry is not alone in facing cold water survival challenges when vessels sink at sea. Commercial fishing is recognized as an extremely hazardous occupation worldwide (Jensen et al., 2014). In Arctic and Nordic countries, fishermen are regularly exposed to the threat of cold water immersion (Jensen et al., 2014; Knuttell et al., 2016). Reducing the risk of exposure to cold water is relevant to the fishing industries of all northern nations.

Attempts to create safety standards for fishing vessels through federal legislation began in the 1930s, but were not successful until 1988 when the Commercial Fishing Industry Vessel Safety Act of 1988 (CFIVSA) was signed into law (Hiscock, 2002). The law required the US Coast Guard (USCG) to issue and enforce regulations for safety equipment and operating procedures on fishing vessels (USCG, 2009). Compliance with specific requirements of the law depends on the characteristics and activities of the particular vessel, such as the type and length of the vessel, area of operation, seasonal conditions, number of people on board, whether the vessel is federally documented or state registered, and the date the vessel was constructed or converted (USCG, 2009).

While the specific requirements of the CFIVSA vary based on individual vessel characteristics, in general the law requires most fishing vessels to carry survival equipment such as personal flotation devices

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0925-7535/ Published by Elsevier Ltd.

Crewmembers who entered the water **for any length of time** were more likely to survive if…

- They entered a life-raft
- The sinking was not related to inclement weather

Crewmembers who were in the water **for over 30 minutes** were more likely to survive if…

- They wore an immersion suit
- They entered a life-raft
- The sinking was not related to inclement weather

Safety Success Story Videos

My Life Vest Saved Me

NIOSH Website: https://www.cdc.gov/niosh/docs/video/2018-107d/

YouTube: https://www.youtube.com/watch?v=HuZPoUjj0vU&feature=youtu.be

I Reached Over and Hit the E-Stop

NIOSH Website: https://www.cdc.gov/niosh/docs/video/2018-153/

YouTube: https://www.youtube.com/watch?v=a3kfUQ3BCr0&feature=youtu.be

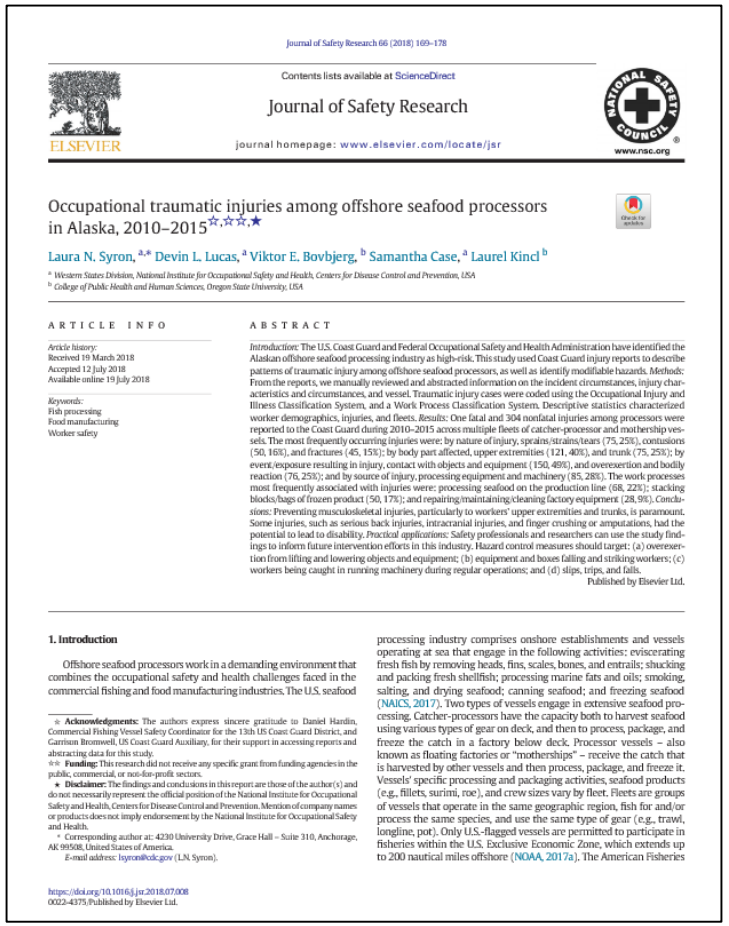
Seafood Processing Safety and Health Research

Control measures should target:

- Overexertion from lifting/lowering
- Equipment/boxes falling and striking workers
- Workers being caught in running machinery
- Slips, trips, falls

Other studies to be published:

- Injuries/illnesses among onshore processors
- Interviews with company safety managers



Journal of Safety Research 66 (2018) 169–178

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www.nsc.org

Occupational traumatic injuries among offshore seafood processors in Alaska, 2010–2015☆,☆☆,★

Laura N. Syron, a,* Devin L. Lucas, a Viktor E. Bovbjerg, b Samantha Case, a Laurel Kincl b

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b College of Public Health and Human Sciences, Oregon State University, USA

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Food manufacturing
Worker safety

ABSTRACT

Introduction: The U.S. Coast Guard and Federal Occupational Safety and Health Administration have identified the Alaskan offshore seafood processing industry as high-risk. This study used Coast Guard injury reports to describe patterns of traumatic injury among offshore seafood processors, as well as identify modifiable hazards. *Methods:* From the reports, we manually reviewed and abstracted information on the incident circumstances, injury characteristics and circumstances, and vessel. Traumatic injury cases were coded using the Occupational Injury and Illness Classification System, and a Work Process Classification System. Descriptive statistics characterized worker demographics, injuries, and fleets. *Results:* One fatal and 304 nonfatal injuries among processors were reported to the Coast Guard during 2010–2015 across multiple fleets of catcher-processor and mothership vessels. The most frequently occurring injuries were: by nature of injury, sprains/strains/tears (75, 25%), contusions (50, 16%), and fractures (45, 15%); by body part affected, upper extremities (121, 40%), and trunk (75, 25%); by event/exposure resulting in injury, contact with objects and equipment (150, 49%), and overexertion and bodily reaction (76, 25%); and by source of injury, processing equipment and machinery (85, 28%). The work processes most frequently associated with injuries were: processing seafood on the production line (68, 22%); stacking blocks/bags of frozen product (50, 17%); and repairing/maintaining/cleaning factory equipment (28, 9%). *Conclusions:* Preventing musculoskeletal injuries, particularly to workers' upper extremities and trunks, is paramount. Some injuries, such as serious back injuries, intracranial injuries, and finger crushing or amputations, had the potential to lead to disability. *Practical applications:* Safety professionals and researchers can use the study findings to inform future intervention efforts in this industry. Hazard control measures should target: (a) overexertion from lifting and lowering objects and equipment; (b) equipment and boxes falling and striking workers; (c) workers being caught in running machinery during regular operations; and (d) slips, trips, and falls.
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1. Introduction

Offshore seafood processors work in a demanding environment that combines the occupational safety and health challenges faced in the commercial fishing and food manufacturing industries. The U.S. seafood processing industry comprises onshore establishments and vessels operating at sea that engage in the following activities: eviscerating fresh fish by removing heads, fins, scales, bones, and entrails; shucking and packing fresh shellfish; processing marine fats and oils; smoking, salting, and drying seafood; canning seafood; and freezing seafood (NAICS, 2017). Two types of vessels engage in extensive seafood processing. Catcher-processors have the capacity both to harvest seafood using various types of gear on deck, and then to process, package, and freeze the catch in a factory below deck. Processor vessels – also known as floating factories or "motherships" – receive the catch that is harvested by other vessels and then process, package, and freeze it. Vessels' specific processing and packaging activities, seafood products (e.g., fillets, surimi, roe), and crew sizes vary by fleet. Fleets are groups of vessels that operate in the same geographic region, fish for and/or process the same species, and use the same type of gear (e.g., trawl, longline, pot). Only U.S.-flagged vessels are permitted to participate in fisheries within the U.S. Exclusive Economic Zone, which extends up to 200 nautical miles offshore (NOAA, 2017a). The American Fisheries

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★ Disclaimer: The findings and conclusions in this report are those of the author(s) and do not necessarily represent the official position of the National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention. Mention of company names or products does not imply endorsement by the National Institute for Occupational Safety and Health.
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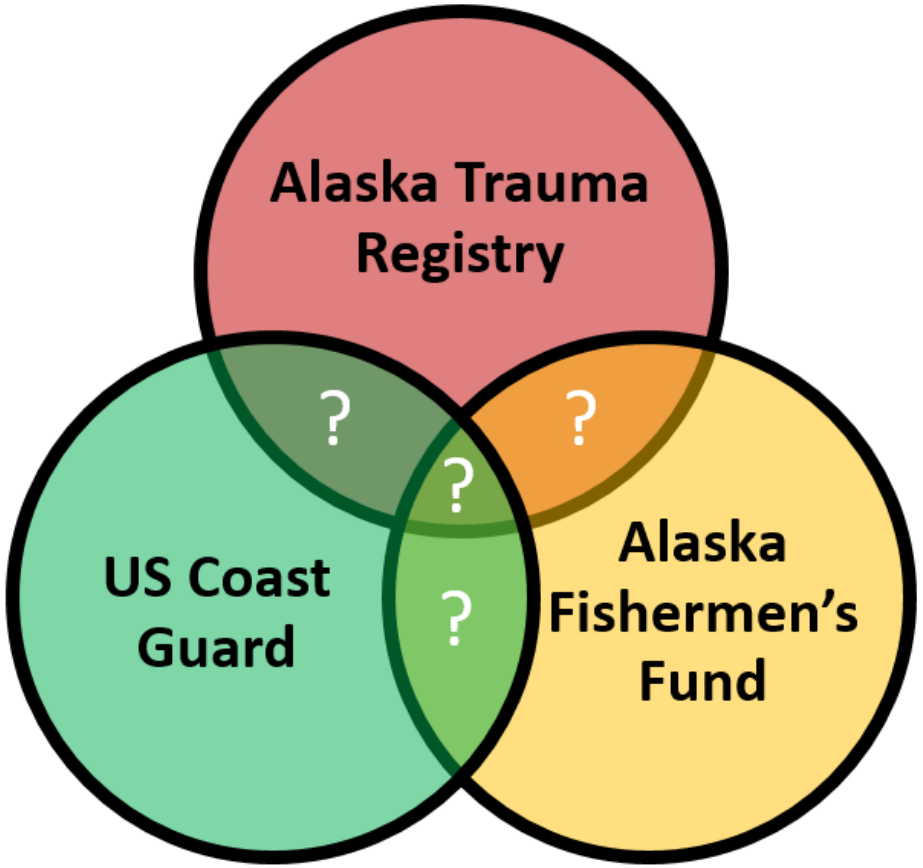
What's Next?

Nonfatal Injuries and Illnesses in Alaska's Fishing Industry



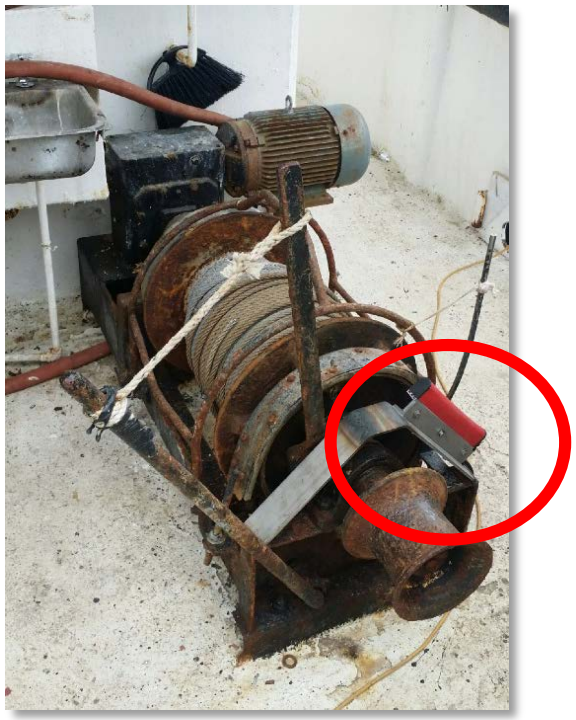
- Linking three Alaskan data sources for more complete understanding of injuries, illnesses, hazards
- Are unique cases captured by multiple sources?
- Calculate numbers, rates by fleet
- Determine injury and illness patterns
- Identify safety problems

CDC NIOSH

Preventing Winch Entanglements in Gulf of Mexico Shrimp Fleet

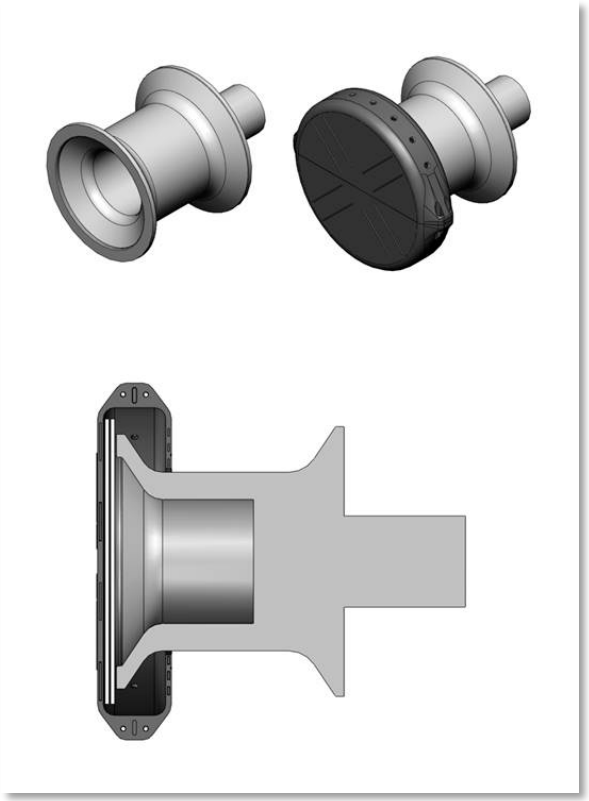
- Design and testing completed for:
  - Stationary guards for deck winches
  - Auxiliary stops for try-net winches

- Fabrication and installation packets in development



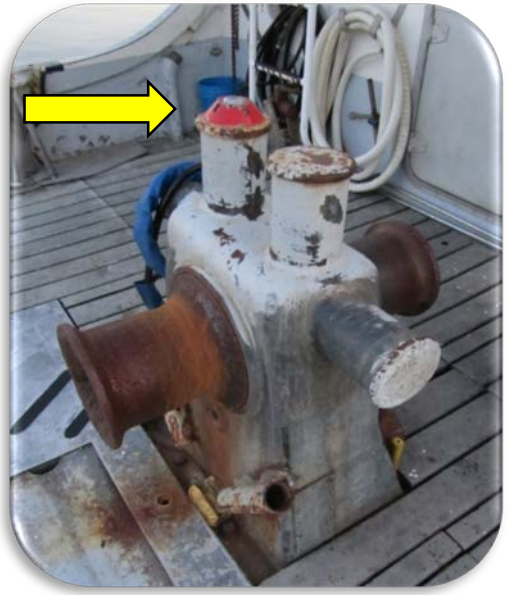
Preventing Winch Entanglements in Gulf of Mexico Shrimp Fleet

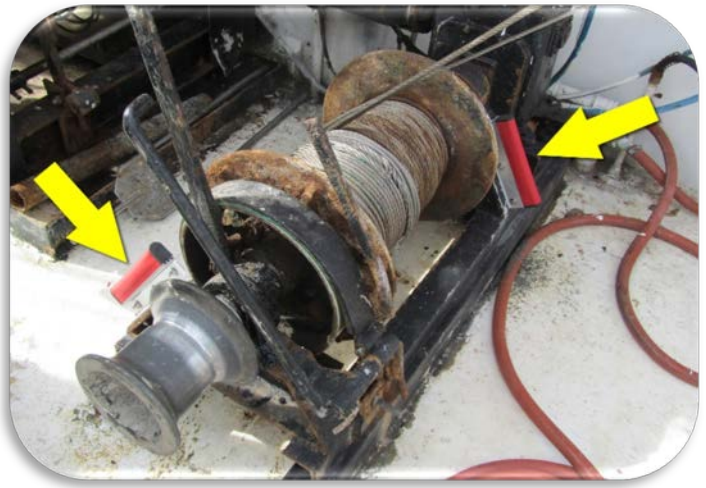
- Evaluation of cathead guard prototype underway



Increasing Adoption of Safety Technologies

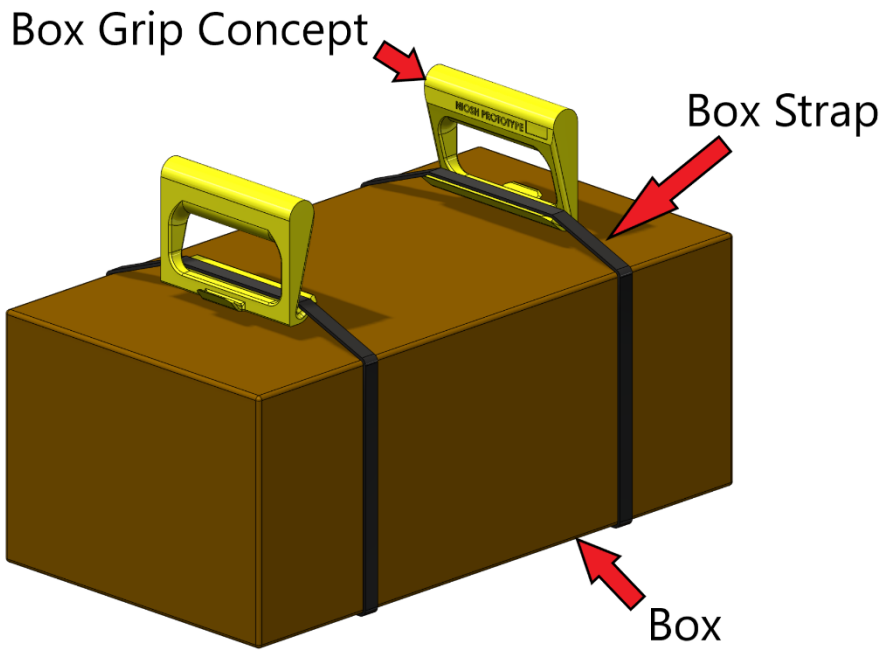
- Goal: Learn how to maximize the impact of NIOSH engineering interventions
- Will these interventions be adopted?
- What might stand in the way?
- Interviews with fishermen





Partnering with Seafood Companies

- Analyzing injury/illness claims data
- Testing prototype interventions to reduce hand injuries while material handling, offloading



Unproven concept

Exposures to Munitions in the Fishing Industry

- Unexploded ordnances an issue, especially with dredgers
- NIOSH working with stakeholders to create guidance
- Documents in review process and expected in late 2018

Recovery of Sea-Disposed Chemical Warfare Material

Learn what to do when you encounter chemical munitions on your vessel

Signs & Symptoms of Exposure to Sulfur Mustard

Exposure to sulfur mustard is usually not fatal, however, it can cause long term health effects, including cancer You may not know right away that exposure to sulfur mustard has happened as there may or may not be a smell or chemical odor. If you handle discarded military munitions, it is recommended that you follow up with a healthcare provider, even if you do not think you have been exposed.

You may not have signs or symptoms immediately after exposure—they may appear up to 24 to 48 hours later. If you or a coworker are exposed to liquid from the munition, rinse your eyes thoroughly with clean water for at least 20 minutes and wash your skin and hair with soap and water being careful not to scratch or break the skin and to seek immediate medical attention.

Sulfur mustard can have the following effects:

SKIN: redness and itching of the skin (2 to 48 hours after exposure); may change to yellow blisters.

EYES: irritation, pain, swelling, and tearing (3 to 12 hours after a mild to moderate exposure; 1 to 2 hours after a severe exposure). Severe exposure may also lead to light sensitivity, severe pain, or blindness lasting up to 10 days.

RESPIRATORY: runny nose, sneezing, hoarseness, bloody nose, sinus pain, shortness of breath, and cough (12 to 24 hours after a mild exposure; within 2 to 4 hours of a severe exposure).

DIGESTIVE: abdominal pain, diarrhea, fever, nausea, and vomiting.

BONE Marrow: decreased formation of blood cells (aplastic anemia) or decreased red or white blood cells and platelets (pancytopenia) leading to weakness, bleeding, and infections.

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Thank You! Questions?

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