

NIOSH Update

April 2016

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Photo: Dutch Harbor, Alaska
Ted Teske (NIOSH)

Outline

- NIOSH
 - Commercial Fishing Safety Research and Design Program
- Data Collection and Analysis
- Progress in Saving Lives
- Personal Flotation Devices
- NMFS and Council Collaborations
 - Technical Document
 - BSAI and AFA
- New NIOSH Center for Maritime Safety and Health Studies



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Department of
Labor

Occupational
Safety and Health
Administration

OSHA

Regulation/Enforcement



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



Commercial Fishing Safety Research and Design Program

- National program
- Provide high quality, relevant, impactful information
- Research findings used by
 - industry
 - government agencies
 - fishing safety advocates
- To inform decisions and educate workers



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Marine
Casualty
Occurs



USCG
Investigates

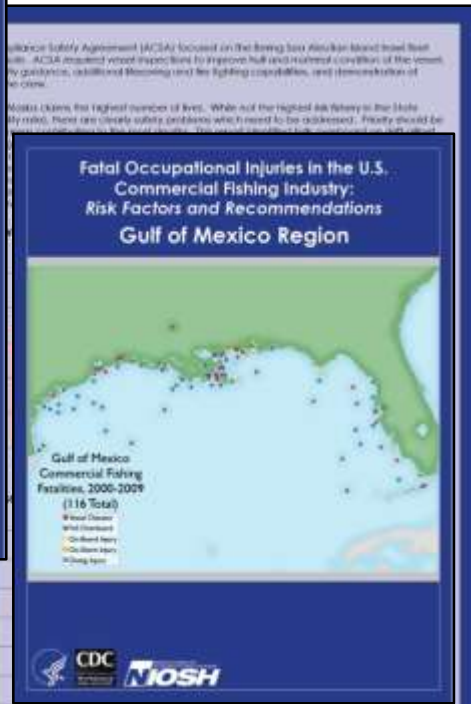
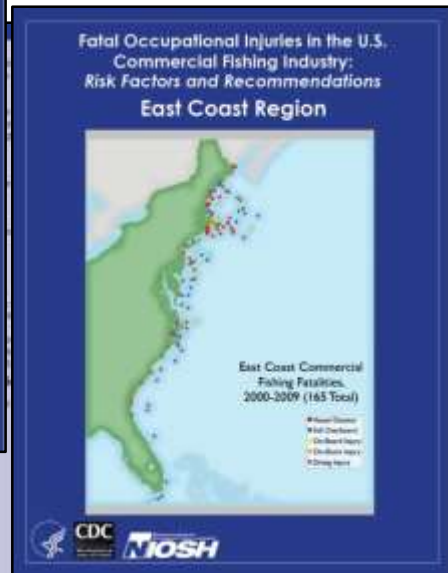
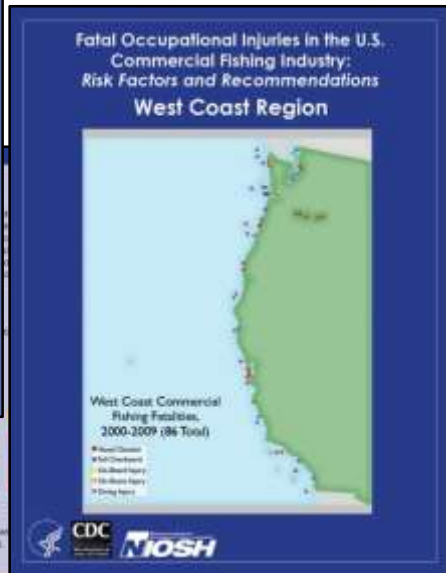
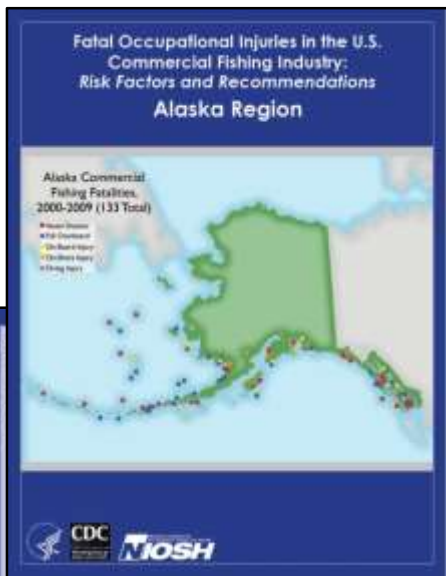


NIOSH collects
information
and enters
into CFID



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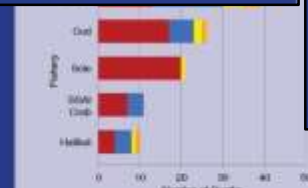
Regional Summaries of Fatality Data



During the decade of 2000-2009, 133 commercial fishermen died while working in Alaska in fatalities. The fatality rates varied from year to year. For example, in 2000 13 fatalities occurred in 2000 and 2009, with eight occupational deaths in each of those years. On average for the decade, 13 fishermen were killed per year. Half of the deaths were caused by drowning following vessel disasters (e.g., sinking, capsizing, etc.) in which the crew was forced to abandon ship (Fig. 2). Another 37% of fatalities were the result of fall overboard. The 12 most common activities on board were the result of being struck by gear (4, 3%), falling from height (3, 2%), getting caught in or struck which (2, 1.5%), apprehension in a confined space (2, 1.5%), and a diving accident (1, .8%).

Although vessel disasters contributed to the most fatalities during the decade of a decade, the fatality rates varied from year to year. For example, in 2000 75% of fatalities resulted from vessel disasters, but in 2007 there were none attributed to a vessel disaster. In 2008 there were no fatal fall overboards, but in 2009 66% of deaths were caused by fall overboard.

Five fatalities contributed to 60% of fatalities in Alaska during 2000-2009 (Fig. 3). Fatalities with fewer than five deaths occurred aboard coast (2), fall overboard, on-board injury, falling, and others. The reason for the high number of fatalities was the most deaths among salmon fisheries (37, 44%). Almost all (13, 75%) occurred on offshore vessels and were usually the result of a slip or trip. Most (13, 75%) were not witnessed. Vessel disasters contributed to 25% of deaths in the salmon fishery. Most of these vessel disasters (6, 42%) occurred on full-time boats and were almost always (4, 100%) witnessed and occurred in poor sea conditions. The coast and offshore fisheries experienced the next highest number of fatalities during the five period (26 and 21 respectively). These fatalities occurred most often either on a vessel disaster with multiple lives lost in each event.



Data Key

- Vessel Disaster
- Fall Overboard
- On-Board Injury
- On-Shore Injury
- Diving Injury

Conclusions

The Coast Guard has developed tailored prevention programs for specific fisheries in Alaska that mitigate hazards found in high risk fisheries such as the Bering Sea crab fleet, as well as the Bering Sea Aleutian Island fleet that fishes for king and cod. As a result of these efforts, the fatality rate in the Bering Sea crab fisheries decreased by 60% during 1980-2009. This improvement was due to the implementation of a permit-to-work safety enhancement effort developed by the Coast Guard in contact with vessel operators. Additionally, in 2005 the largest coast fisheries underwent changes in the way they were managed. The previous "race to fish" was "rationalized" meaning that each vessel was awarded the rights to catch a certain amount of fish. This change resulted in a lower coast fatality and a consolidation of the fleet. A different Coast Guard program known

Region	2000-2007	2008-2009
Alaska Fisheries	28	115

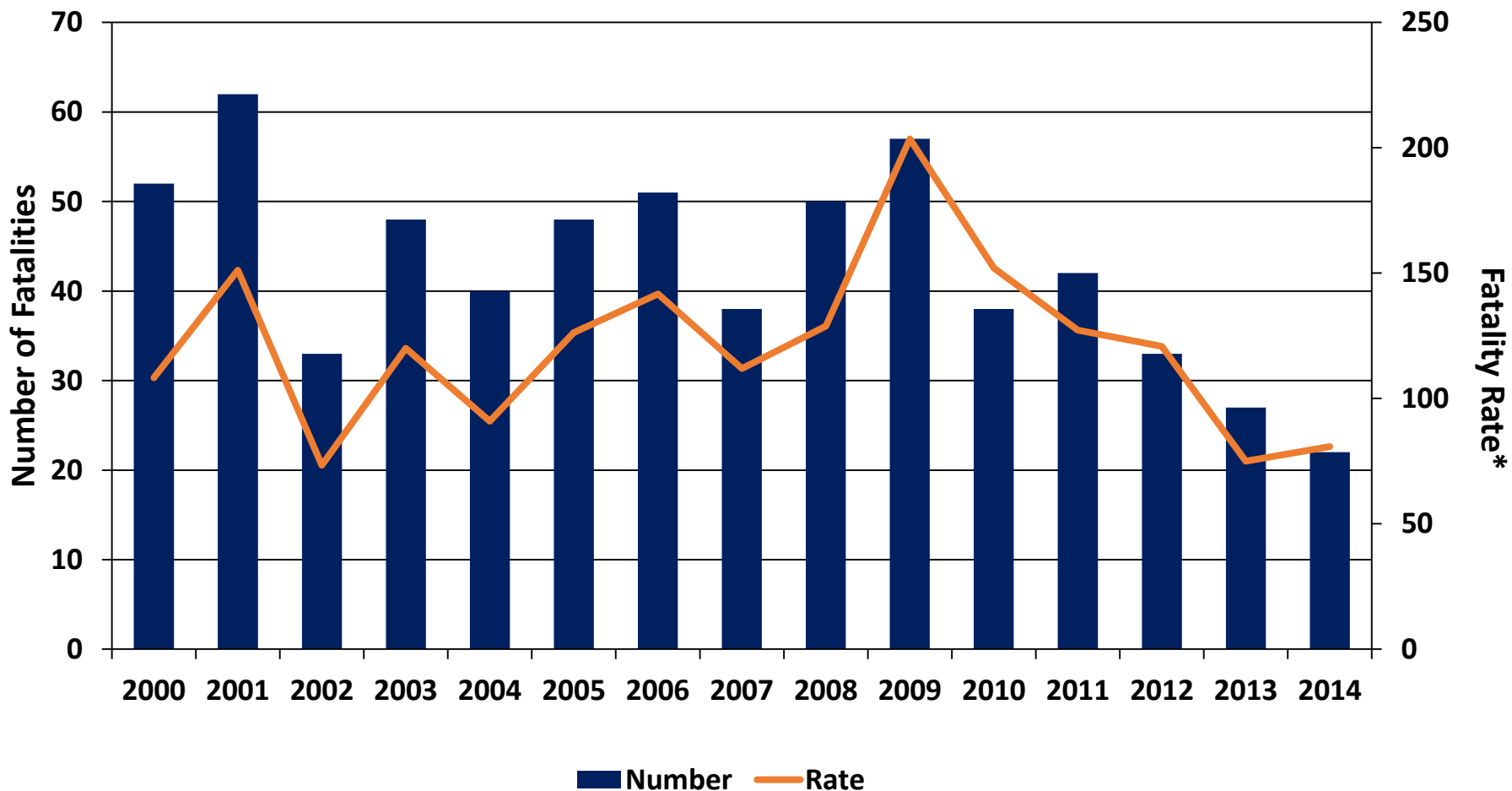
* Rates were calculated by dividing the total number of fatalities for the 10 year period by the total vessel FTE.



Most Hazardous Fisheries & Events



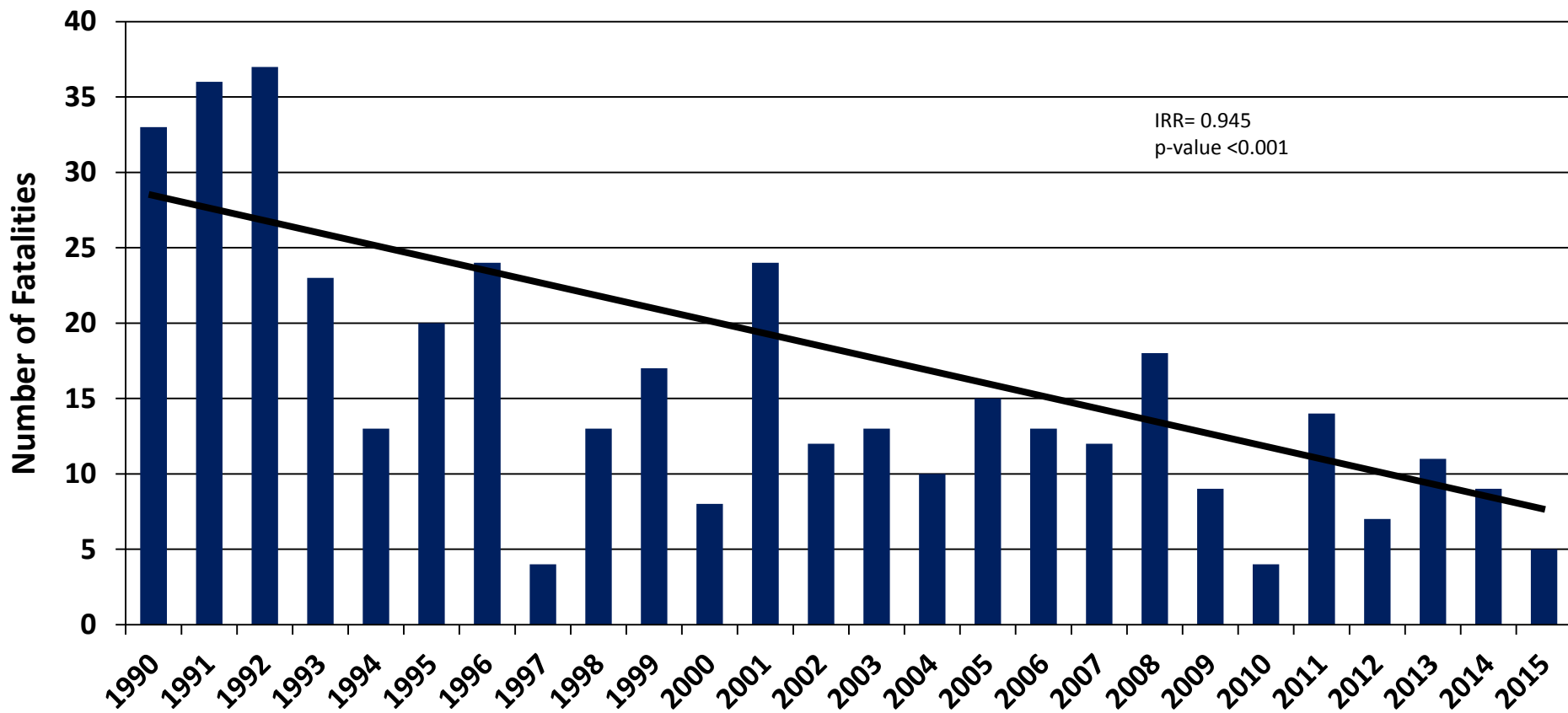
U.S. Commercial Fishing Fatalities, 2000-2014



Data source: BLS

*2000-2005: per 100,000 workers; 2006-2014: per 100,000 full-time equivalent workers

Commercial Fishing Fatalities, Alaska, 1990-2015 (n=404)



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Alaska's fishing fatalities are dropping, no matter how you mix the numbers

Posted: October 18, 2015 - 11:02pm

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Michael Perron | Juneau Empire - Jacob Miller, center, shows U.S. Coast Guard Petty Officer Fernald Cresta Ben Sismud, left, and Petty Officer Second Class Chris Houwenier his safety gear on his 41-foot power trailer at the Don Stamer Memorial Boat Harbor in Juneau Bay on Friday.

By JAMES BROOKS
JUNEAU EMPIRE

The deadliest catch is getting a lot less deadly.

Last week, the U.S. Coast Guard reported to the North Pacific Fishery Management Council that for the first time in known history, no one died on the job while commercial fishing in Alaska during the last federal fiscal year, which ended Sept. 31.

"This is the first year, going back as far as we have records, that we didn't have what I'll characterize as an operational-related death," said Coast Guard Capt. Phillip Thorne, chief of

Government for the Coast Guard in Alaska.

...and Mr. Jennifer Lincoln, who monitors fishing deaths in a health. "It's a case definition issue," ... could define



The Coast Guard's "operational death" category includes deaths that happen in the act of fishing, but it doesn't include the deaths of fishermen that happen while a boat isn't actively working.

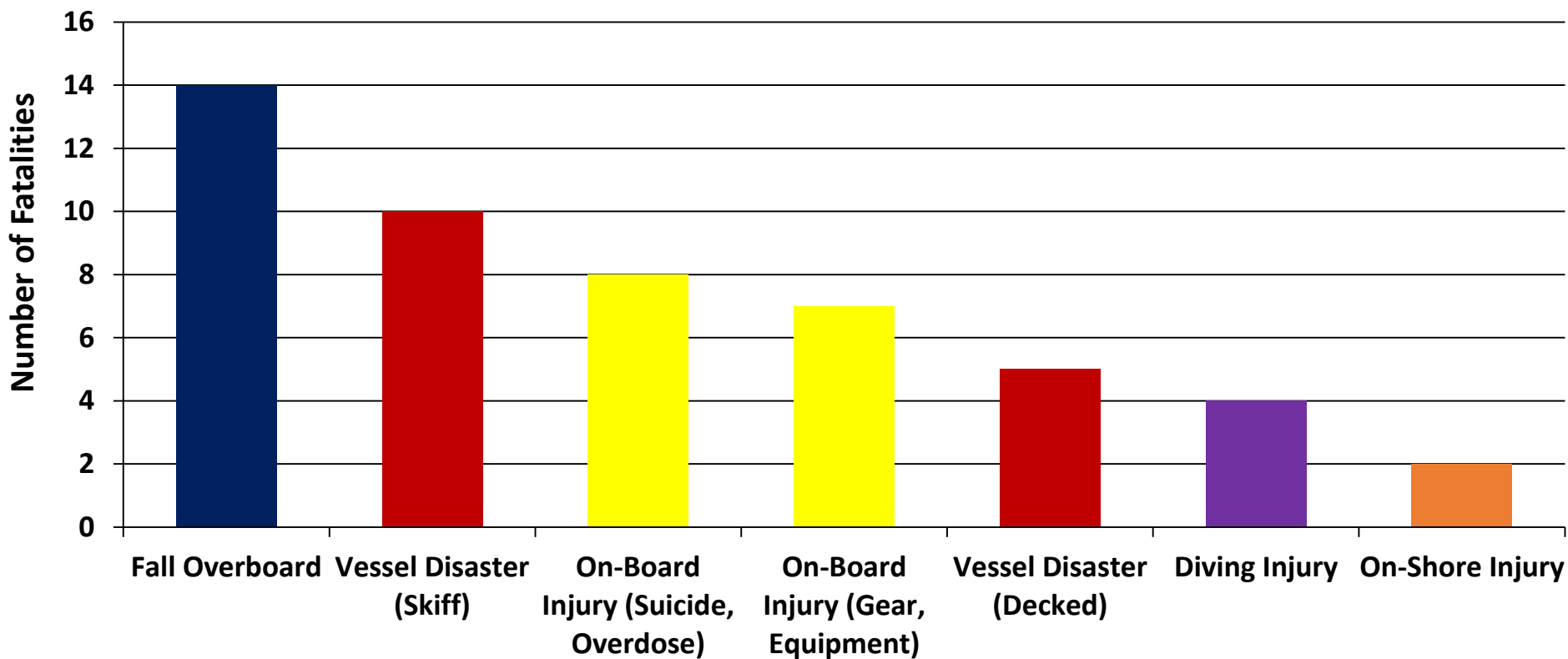
...No one ... died commercial fishing in a vessel-related incident in the past year, for the first time. That's the federal fiscal year, Oct. 1 2014 through Sept. 30 2015. Although six commercial fishing boats sank in the summer of 2015, no one was killed.

Fishermen Still at Risk

- Safety training
- Survival equipment
- Quick rescue by USCG and good Samaritan vessels



Alaska Commercial Fishing Fatalities, 2010-2015 (n=50)



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Predictors of personal flotation device (PFD) use among commercial fishing industry

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 Occupancy assessment
 Occupational safety

ABSTRACT

Introduction: The purpose of this study was to identify predictors in the Alaska commercial fishing industry. **Methods:** This study analyzed data from a questionnaire of commercial fishing vessels in Alaska. Working PFDs and other factors were compared using a mixed-effects logistic regression model. **Results:** PFD usage ranged from 0% reporting alone. Among the statistically significant predictors, PFDs were an amputation hazard was lower (OR: 0.48, 95% CI: 0.30, 0.77) and gillnetters (OR: 0.30) were less likely to use PFDs. **Conclusion:** Interventions to increase PFD use in the industry should focus on addressing the significant barriers to PFD use in the industry.

1. Introduction

Commercial fishing is the most hazardous occupation in the US, with a fatality rate of 116 deaths per 100,000 workers during 2000–2009 (Bureau of Labor Statistics, 2011). During 2006–2009, 155 workers in the US fishing industry (crewmembers on commercial fishing vessels) drowned after falling overboard (Lincoln and Lucas, 2010). None of the victims were wearing a personal flotation device (PFD). These fatal falls overboard were the second largest cause of work-related fatalities, accounting for 31% of all fatalities in the US fishing industry for these years (Lincoln and Lucas, 2010) with only vessel disasters accounting for more.

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Total fall
 1990–2005, a
 overboard in
 that time per
 2000–2009, 7
 fishing vessel
 disasters (4, 11%),
 total safety
 4070 workers
 nets, primary
 anchoring strategy of bottom
 to catch crab
 leaving large
 (NIOSH, 2011)
 The Natio
 (NIOSH) has

Results

- Fishermen working with different gear types have different perceptions of risk, attitudes, beliefs, and preferences for PFDs
- A “one size fits all” approach to increasing PFD use in fishing will likely not be effective
- PFDs and communications must be tailored to individual gear types



Personal flotation devices (PFDs) in the fishing industry:

Somervell, Theodore Teske

Alaska Pacific Office, 4220 University Drive, Suite 300, Anchorage, AK 99508, USA

ABSTRACT

The purpose of this study was to determine which type of commercially available PFD resulted in the highest satisfaction among workers in the fishing industry. Fishing industry workers on four types of boats used and evaluated six different PFDs during their fishing seasons. Linear regression was used to determine mean satisfaction scores, adjusting for clustered data within each vessel type. The data revealed by vessel type to determine the differences in PFD satisfaction within each vessel type had the highest mean satisfaction scores, but satisfaction with particular PFDs varied depending on vessel type. Although the common objection by workers not wearing PFDs was that they are bulky and uncomfortable, scores of the PFDs that were evaluated in this study revealed high scores for comfort and fit. Given the availability of PFDs that are comfortable to wear while working, fishing vessel and operators should consider implementing policies mandating the use of PFDs on deck.

Occupational safety and health (OSHA) has identified falls overboard as a leading cause of death in the fishing industry (Lincoln et al., 2010). In 2009, 155 workers in the US fishing industry (crewmembers on commercial fishing vessels) drowned after falling overboard (Lincoln and Lucas, 2010). None of the victims were wearing a personal flotation device (PFD). These fatal falls overboard were the second largest cause of work-related fatalities, accounting for 31% of all fatalities in the US fishing industry for these years (Lincoln and Lucas, 2010) with only vessel disasters accounting for more.

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After submersion in cold water, experts have identified four stages of which a person may perish. These are commonly referred to as cold shock, swimming failure, hypothermia and post-rescue collapse (Brooks et al., 2005). Cold shock occurs within 2–3 min of submersion. The victim appears to struggle and then gives up before sinking and drowning. Swimming failure occurs within 3–15 min of submersion. The victim is observed floating uncoordinatedly, unable to breathe and has lost consciousness. Hypothermia occurs after 15 min of submersion. The victim is observed floating uncoordinatedly, unable to breathe and has lost consciousness. In both of these stages, a PFD is vital for survival.

There is a lack of published articles or reports examining the barriers to PFD use among fishing industry workers. However, a recent study of recreational boaters in Alaska found that 38 percent cited discomfort as the primary reason for not wearing a PFD (McDowall Group, 2009). It is possible that fishing industry workers share the same opinion.

Several studies have examined barriers to wearing other forms of personal protective equipment (PPE) among different types of workers. Common reasons cited for non-use were discomfort, misperceptions of risk, and negative attitudes about the efficacy of PPE (Alkhatib-Khanzadeh, 1998; Stone et al., 2006; Salazar et al., 2001). An additional study stated that, “improper fit, added weight, out-of-fashion style or color make much PPE unattractive” (Alkhatib-Khanzadeh et al., 1995). Among fishing industry workers, there may be similar perceptions and attitudes; they may feel that a PFD will be uncomfortable and encumber them in their work. There may also be concern that a PFD not designed for their working

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TRAWLERS

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). About 200 fishermen were asked to evaluate a PFD for one month while working on deck so that wearable PFDs could be identified. This document shows which PFDs were preferred by trawlers.

PFD Use Among Trawlers:

Always wear a PFD: 51%
Frequently wear a PFD while working: 12%
Sometimes wear a PFD while working: 26%
Never wear a PFD while working: 11%

Do it this longline before they will be worn during this crew

PFD Evaluation:

After the 30 day on deck evaluation PFDs, trawlers said that the Regatta raingear with built in flotation would be acceptable for work on their vessels. Comments on the devices include:

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

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). About 200 fishermen were asked to evaluate a PFD for one month while working on deck so that wearable PFDs could be identified. This document shows which PFDs were preferred by gillnetters.

PFD Use Among Gillnetters:

Always wear a PFD: 55%
Frequently wear a PFD while working: 12%
Sometimes wear a PFD while working: 30%
Never wear a PFD while working: 3%

Do it this longline before they will be worn during this crew

PFD Evaluation:

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

- Not bulky, did not interfere with their work
- Easy to put on, and did not snag on gear
- Was rated as comfortable to wear because they were not too tight or bulky

LONGLINERS

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). About 200 fishermen were asked to evaluate a PFD for one month while working on deck so that wearable PFDs could be identified. This document shows which PFDs were preferred by longliners.

PFD Use Among Longliners:

Always wear a PFD: 64%
Frequently wear a PFD while working: 4%
Sometimes wear a PFD while working: 31%
Never wear a PFD while working: 1%

Do it this longline before they will be worn during this crew

PFD Evaluation:

After the 30 day on deck evaluation PFDs, longliners said that the Mustang Inflatable Suspender (MD3188) was the only PFD that was acceptable for work on their vessels. Comments on the device include:

- Not bulky, did not interfere with their work
- Easy to put on, and did not snag on gear
- Was rated as comfortable to wear because they were not too tight or bulky

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). About 200 fishermen were asked to evaluate a PFD for one month while working on deck so that wearable PFDs could be identified. This document shows which PFDs were preferred by crabbers.

PFD Use Among Crabbers:

Always wear a PFD: 50%
Frequently wear a PFD while working: 16%
Sometimes wear a PFD while working: 22%
Never wear a PFD while working: 12%

Crabbers' Responses to Survey:

- Over half of the crabbers said they knew someone who had died from a fall overboard
- 60% of crabbers believed PFDs are effective at saving lives
- Most crabbers didn't think that PFDs are uncomfortable or interfere with work, although half of them thought PFDs could be an entanglement hazard

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 interfere with their work
- Were rated as comfortable to wear because they were not too tight or bulky

Mustang Inflatable Suspender (MD3188)
Stearns Inflatable Suspender (1128)

Labels for Mustang: Not too tight, Not bulky, Does not interfere with work.
Labels for Stearns: Doesn't snag on gear, Does not limit motion.

"I feel that the [Mustang suspender PFD] is something that would be received well by the deckhands of the fleet."

— Crabber and study participant



Any Progress?



PFD Use	2008 Survey	2014 Survey	2015 Survey
Never Wear	16%	16%	14%
Sometimes Wear	51%	24%	28%
Frequently Wear	12%	8%	12%
Always Wear	22%	52%	46%

“Rogue” Tactical Deck Vest

Worn under bibs and raingear

12 lbs. flotation

Field-tested for continuous wear

Released November 2014

Winner 2014 Fisheries Supply
Innovation Award (safety
category)

2000 units sold in first year.



NMFS Safety Tech Memo

Guidance on Fishing Vessel Risk Assessments and Accounting for Safety at Sea in Fishery Management Design

Debra M. Lambert, Eric M. Thunberg, Ron G. Felthoven, Jennifer M. Lincoln, and Wesley S. Patrick



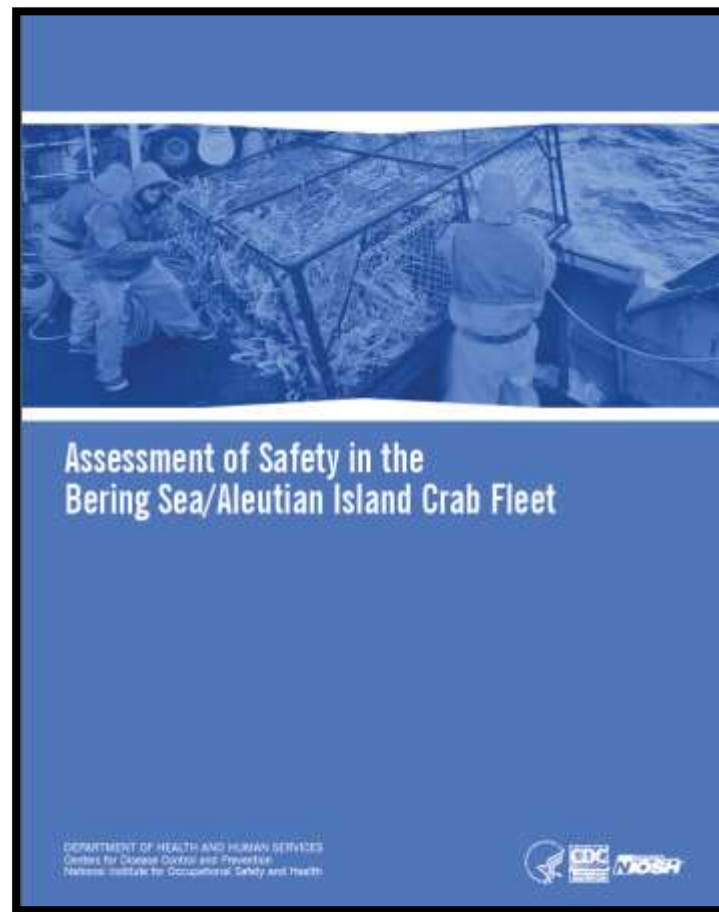
U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service

NOAA Technical Memorandum NMFS-OSF-2
August 2015



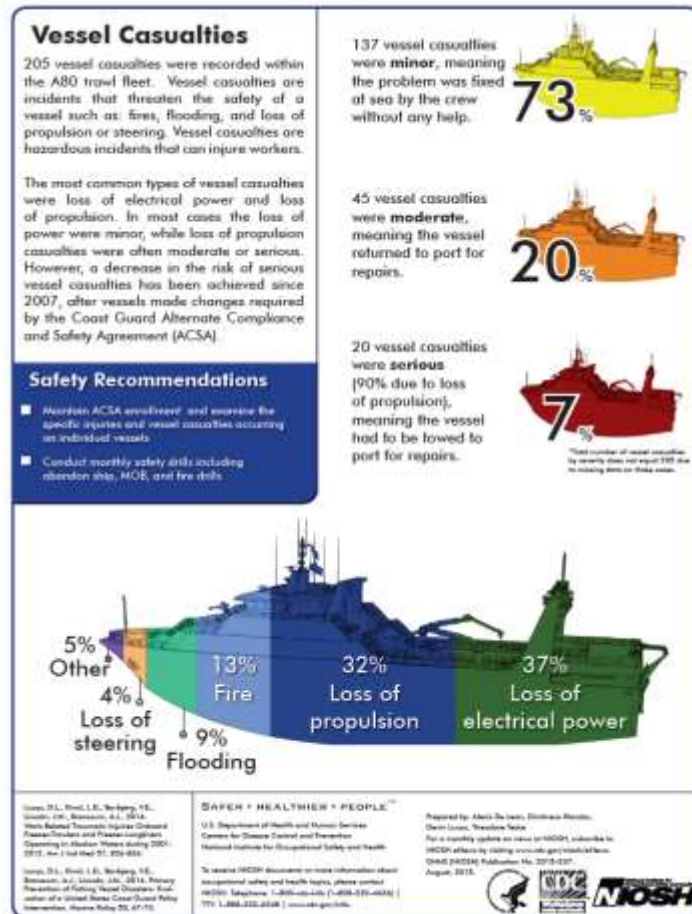
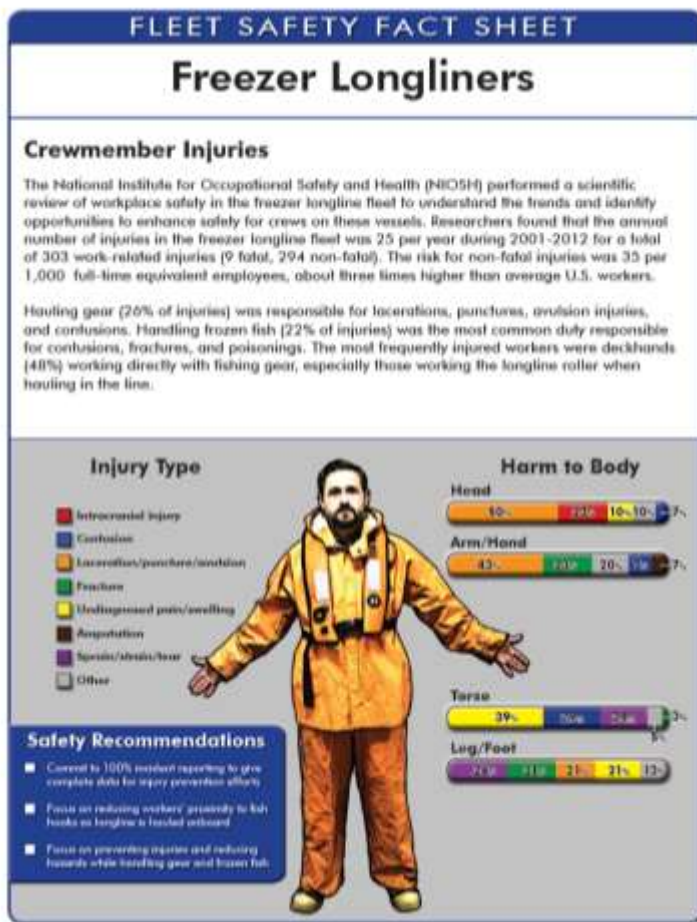
Safety Assessments

- BSAI Crab
 - Fatalities
 - Non-fatal injuries
 - Vessel casualties (including disasters)
- AFA
 - Fatalities
 - Vessel disasters



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Fact Sheets



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NIOSH Center for Maritime Safety and Health Studies



Maritime Worker Definition

Individuals employed:

- On vessels (ship's officer/crew)
- At waterfront facilities, working in and around vessels (shipyard and dock workers, marine terminal employees, longshoremen)
- On shore directly supporting marine operations (seafood preparation and packaging, navigational services)



Core Areas of Focus

- Commercial fishing
- Fish processing
- Shipyard operations
- Marine transportation
- Marine terminal operations
- Longshoring
- Commercial diving



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Fish Processing Research



Photo: Trident Seafoods



Maritime Industry Hazards

- Exposures to toxic chemicals, metals, dust
- Exposures to extreme heat, cold
- Musculoskeletal/ergonomic injuries
- Confined spaces
- Shiftwork and fatigue
- Falls overboard/drowning
- Vessel disasters
- Deck safety
- Falls and traumatic injuries
- Diving injuries

Ongoing Activities

- Collecting burden data
- Exploring data sources
- Establishing relationships
- Developing research priorities



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