Commercial Fishing Safety Research Updates from NIOSH

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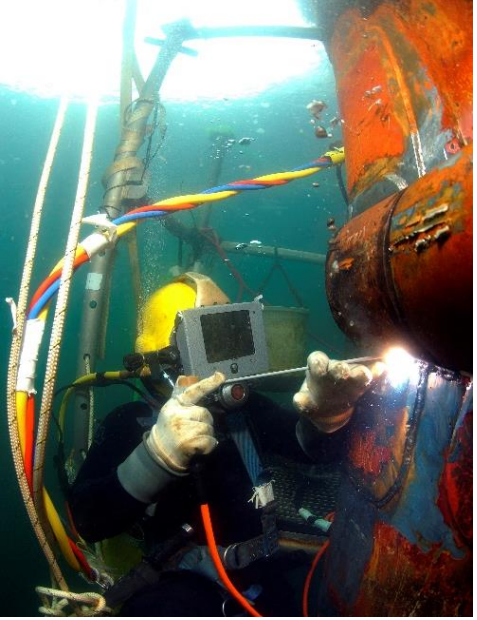
North Pacific Fishery Management Council Meeting

April 6, 2023


Department of Health and Human Services
Centers for Disease Control and Prevention (CDC)
National Institute for Occupational Safety and Health (NIOSH)
Research and Prevention Recommendations
Department of Labor
Occupational Safety and Health Administration (OSHA)
Regulation/Enforcement
Department of Homeland Security
United States Coast Guard (USCG)
Regulation/Enforcement



Center for Maritime Safety and Health Studies (CMSHS)

- Brings focus to safety and health needs for maritime workers in:
  - **Commercial fishing**
  - **Seafood processing**
  - Aquaculture
  - Marine terminals
  - Shipyards
  - Marine transportation
- Internal and external researchers work to understand and reduce hazards
- Collaborates with industry and workers

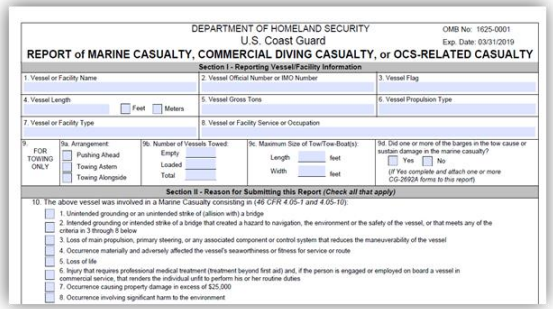
Outline

- Commercial fishing fatality update
- Recent products and activities
  - Spotlight: study on the predictors of vessel disasters
- USCG-NIOSH commercial fishing safety research and training grants

Commercial Fishing Fatality Update

Collecting Fatality and Vessel Disaster Data

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

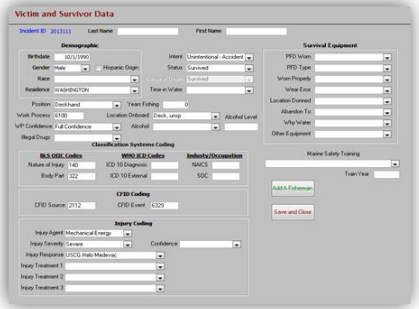
1. Vessel or Facility Name	2. Vessel Official Number or IMO Number	3. Vessel Flag
4. Vessel Length ☐ Feet ☐ Meters	5. Vessel Gross Tons	6. Vessel Propulsion Type
7. Vessel or Facility Type	8. Vessel or Facility Service or Occupation	

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)

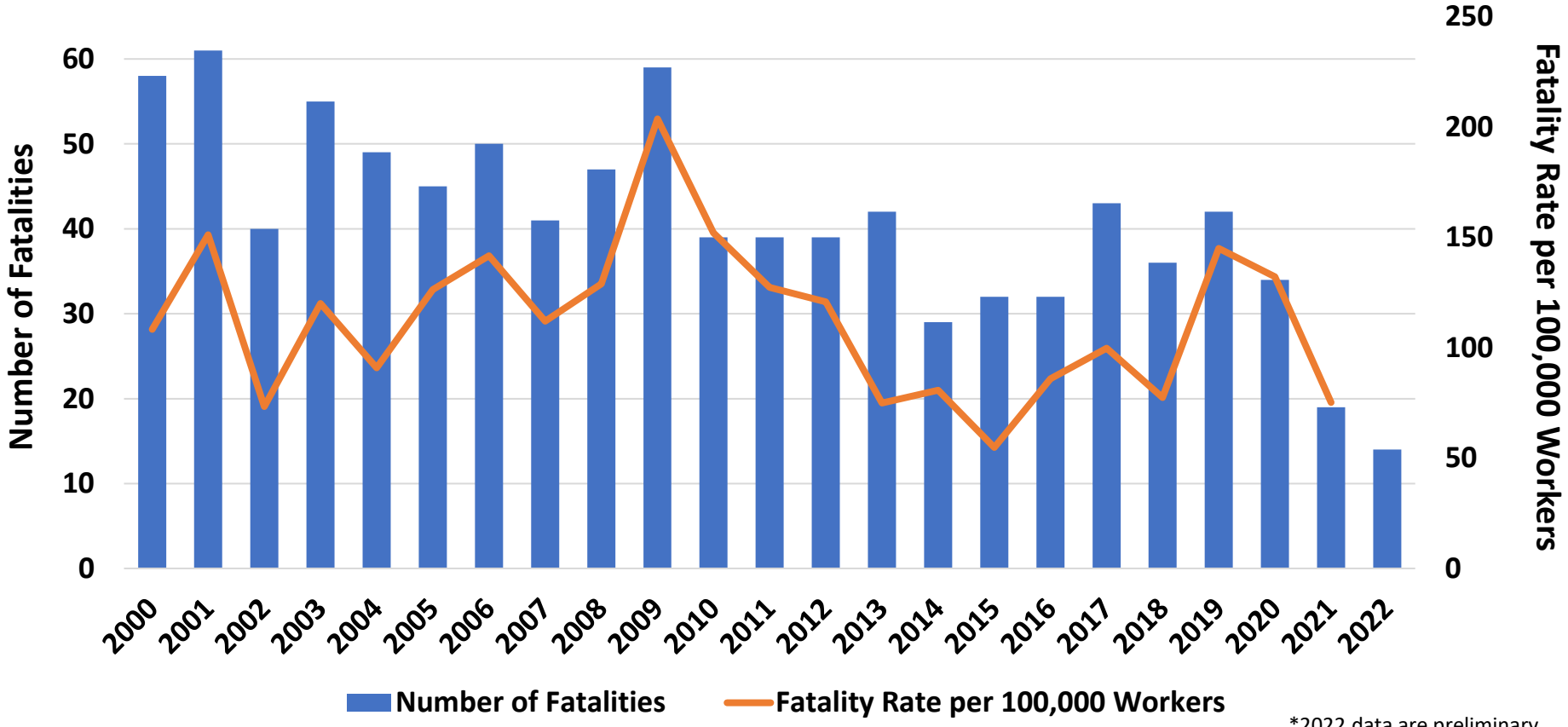
Section II - Reason for Submitting this Report (*Check all that apply*)

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

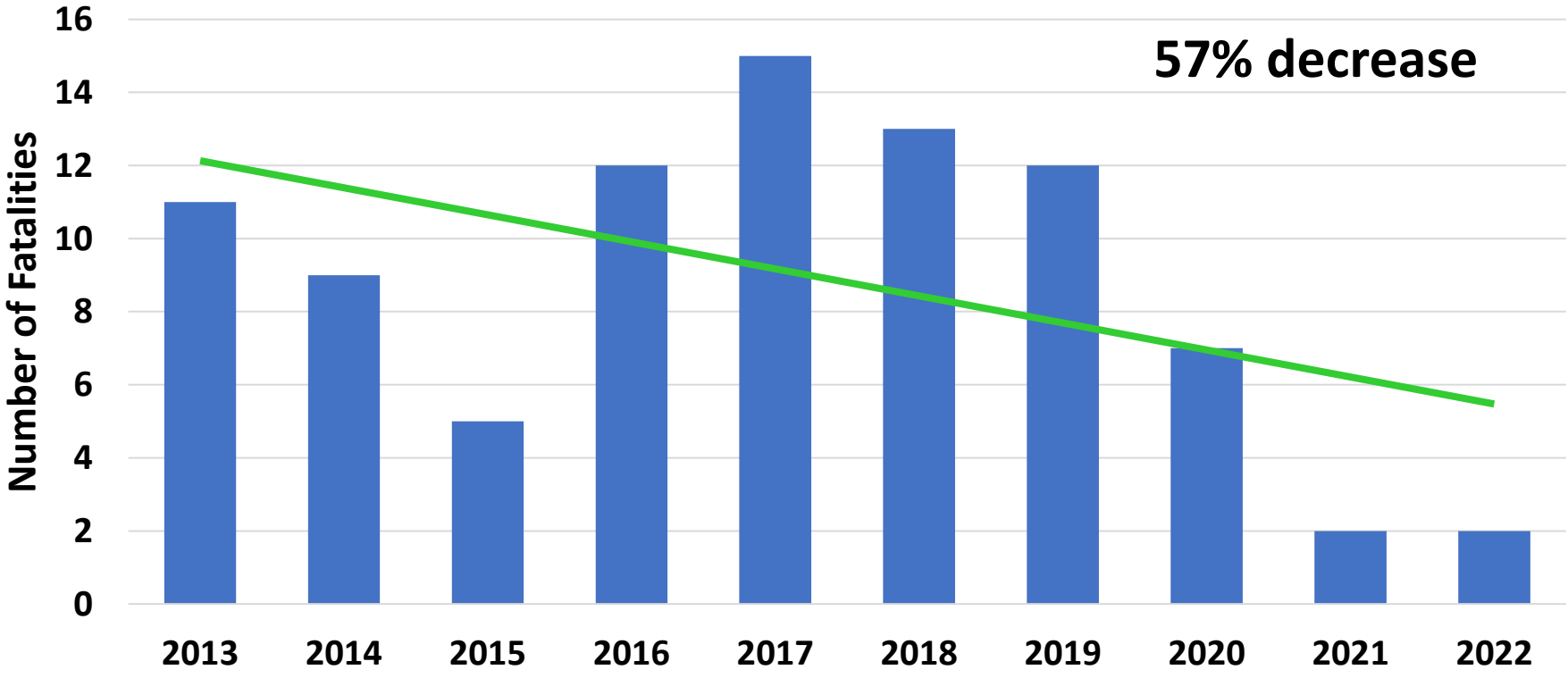


US Commercial Fishing Fatality Totals and Fatality Rate per 100,000 Workers, 2000-2022* (n=945)



*2022 data are preliminary

Alaska Commercial Fishing Fatalities by Year, 2013–2022* (n=88)



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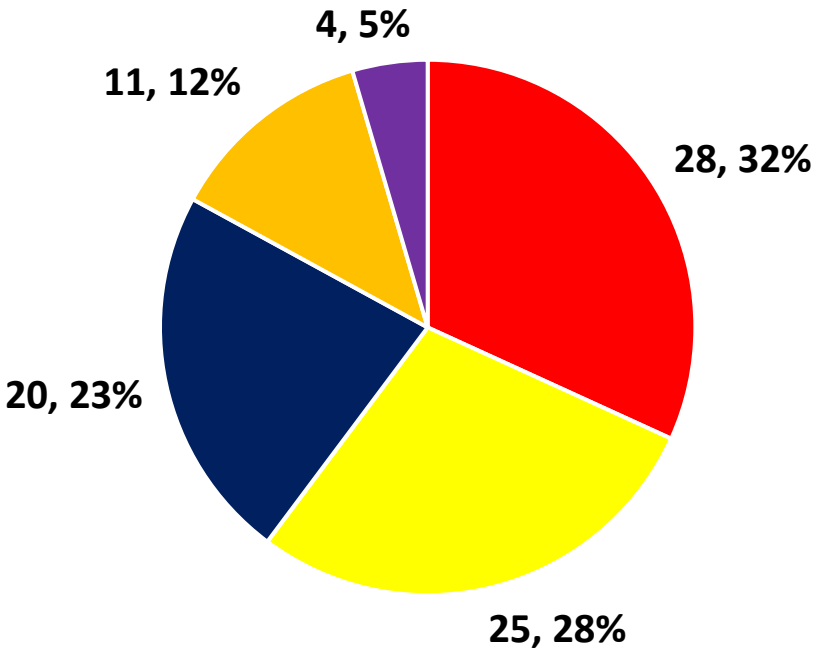
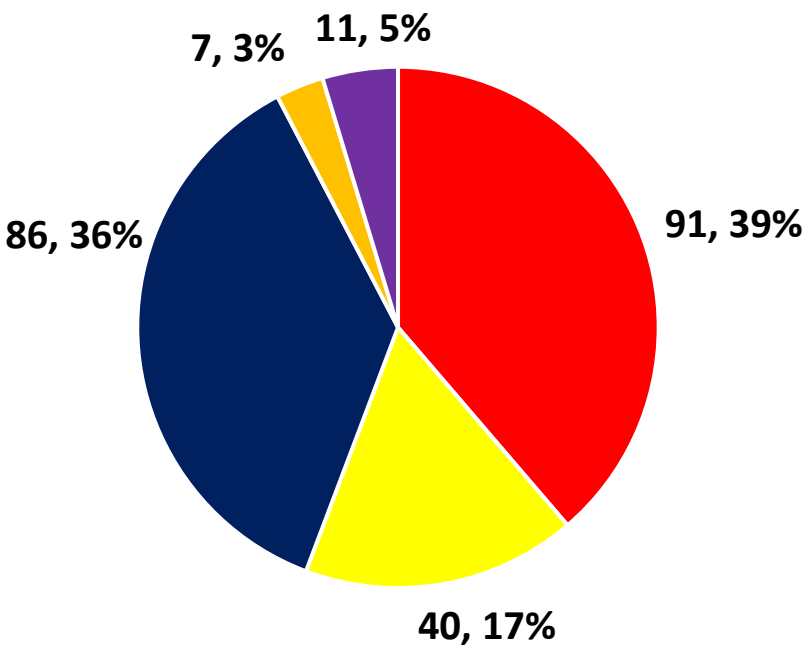
Alaska Commercial Fishing Fatalities by Incident Type, 2013-2022* (n=88)



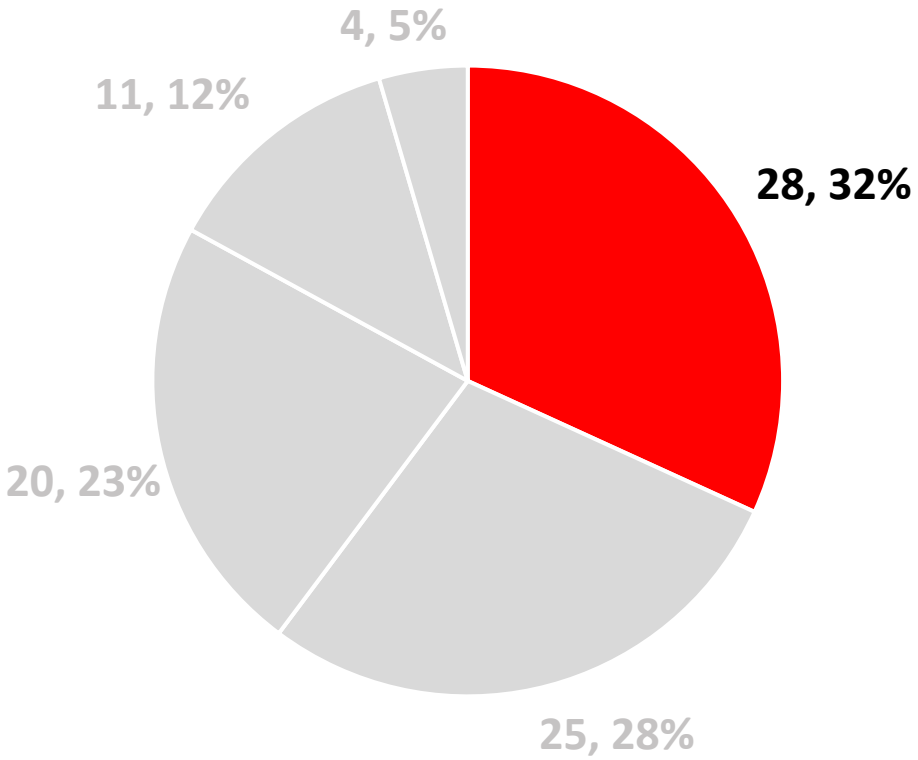
Rest of US Commercial Fishing Fatalities by Incident Type, 2013-2022* (n=235)



Fatal Vessel Disaster | Onboard Fatality | Fatal Fall Overboard | Onshore Fatality | Diving Fatality

*2022 data are preliminary

Alaska Commercial Fishing Vessel Disaster Fatalities, 2013-2022*

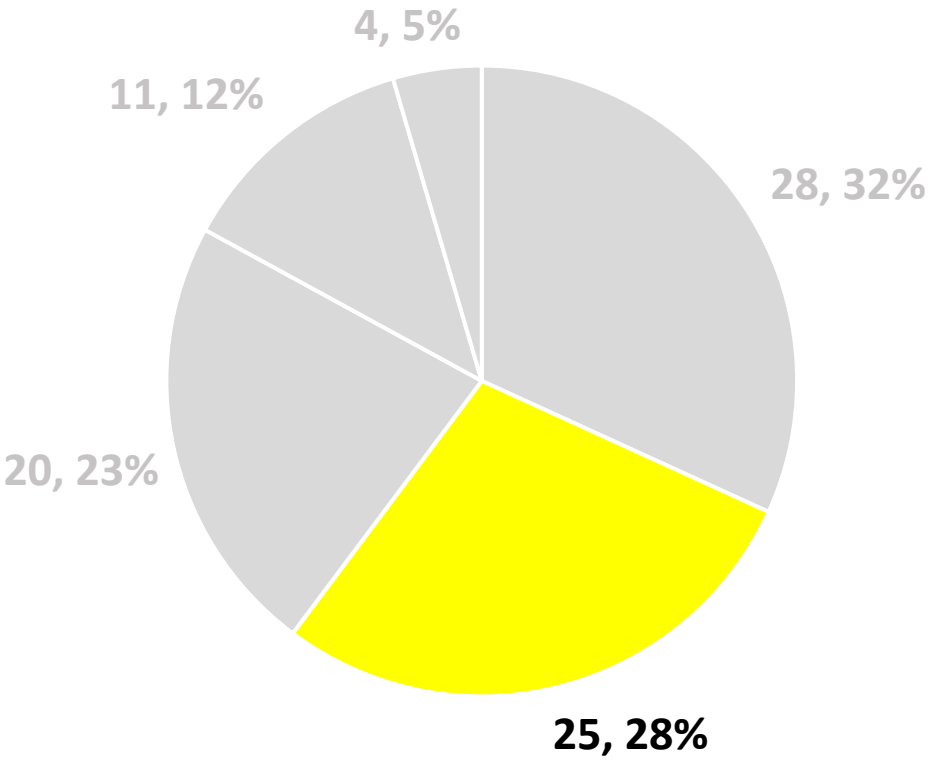


28 fatalities

- **14 vessel disasters**
  - **Primarily salmon vessels (12, 86%)**
  - **6 (43%) related to inclement weather**
  - **Most common initiating events:**
    - **Instability (5)**
    - **Fires (2)**
    - **Flooding (2)**

*2022 data are preliminary

Alaska Commercial Fishing Onboard Fatalities, 2013-2022*

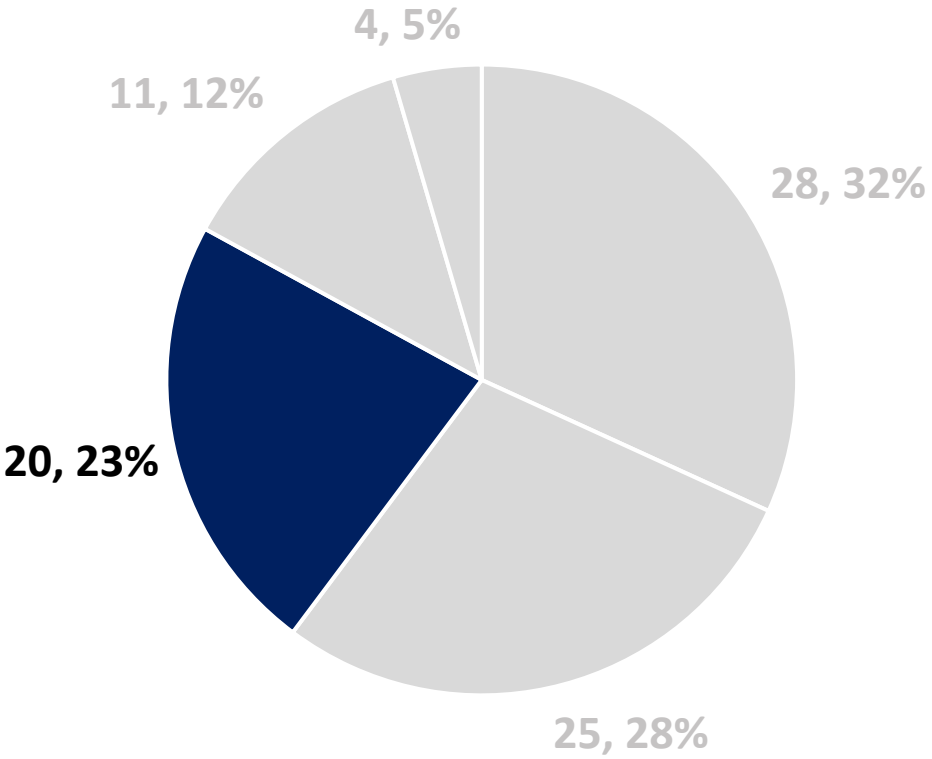


25 Fatalities

- **8 related to fishing vessels/systems/gear**
  - **Blunt force trauma (6)**
  - **Ammonia chemical burns (1)**
  - **Freon asphyxiation (1)**
- **17 non-operational**
  - **Drug overdoses (9)**
  - **Suicides (7)**
  - **Homicide (1)**

*2022 data are preliminary

Alaska Commercial Fishing Fall Overboard Fatalities, 2013-2022*

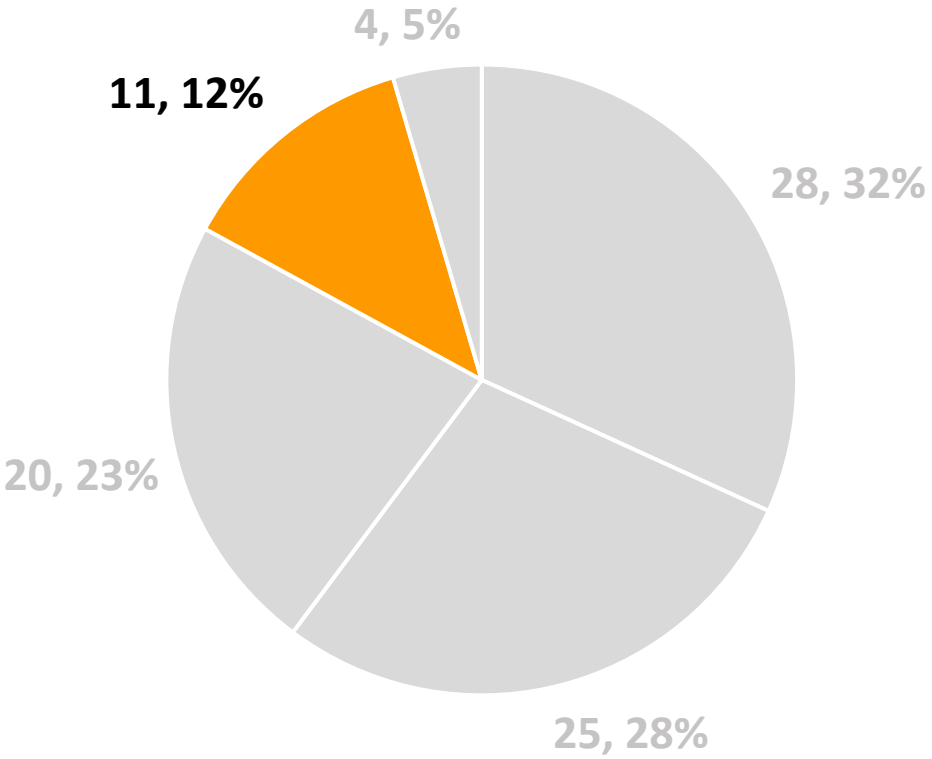


20 Fatalities

- **Most common in salmon fisheries (16, 80%)**
- **12 (60%) not witnessed**
- **None were wearing PFDs**

*2022 data are preliminary

Alaska Commercial Fishing Onshore Fatalities, 2013-2022*

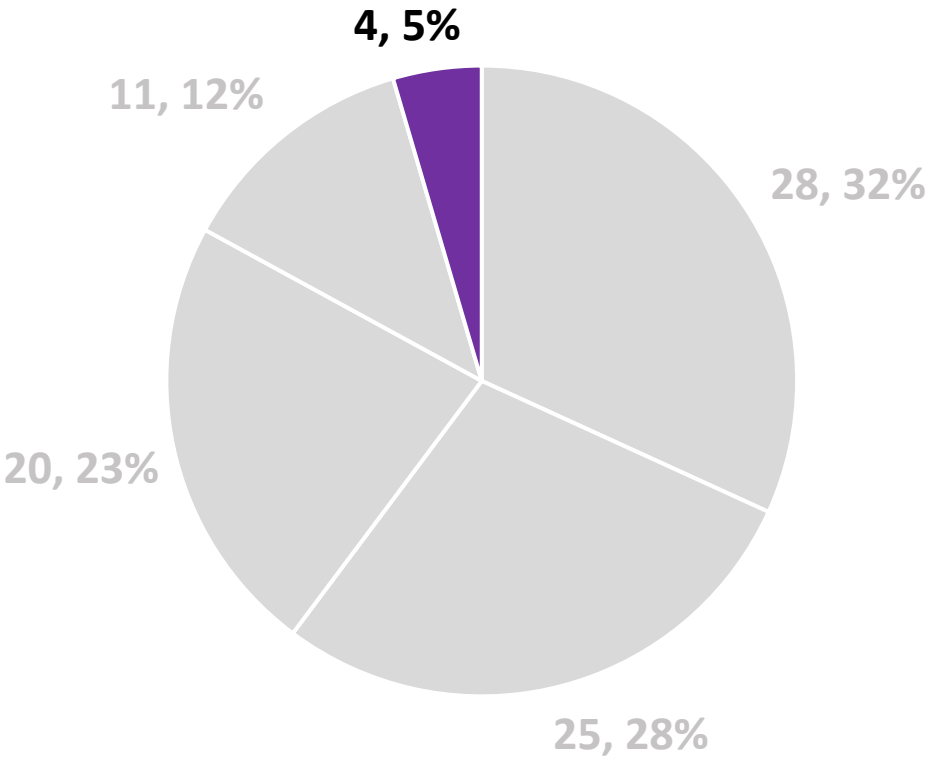


11 Fatalities

- **Fall from dock (9)**
- **Drug overdose (1)**
- **Suicide (1)**
- **Drug/alcohol involvement in 8 cases (73%)**

*2022 data are preliminary

Alaska Commercial Fishing Diving Fatalities, 2013-2022*



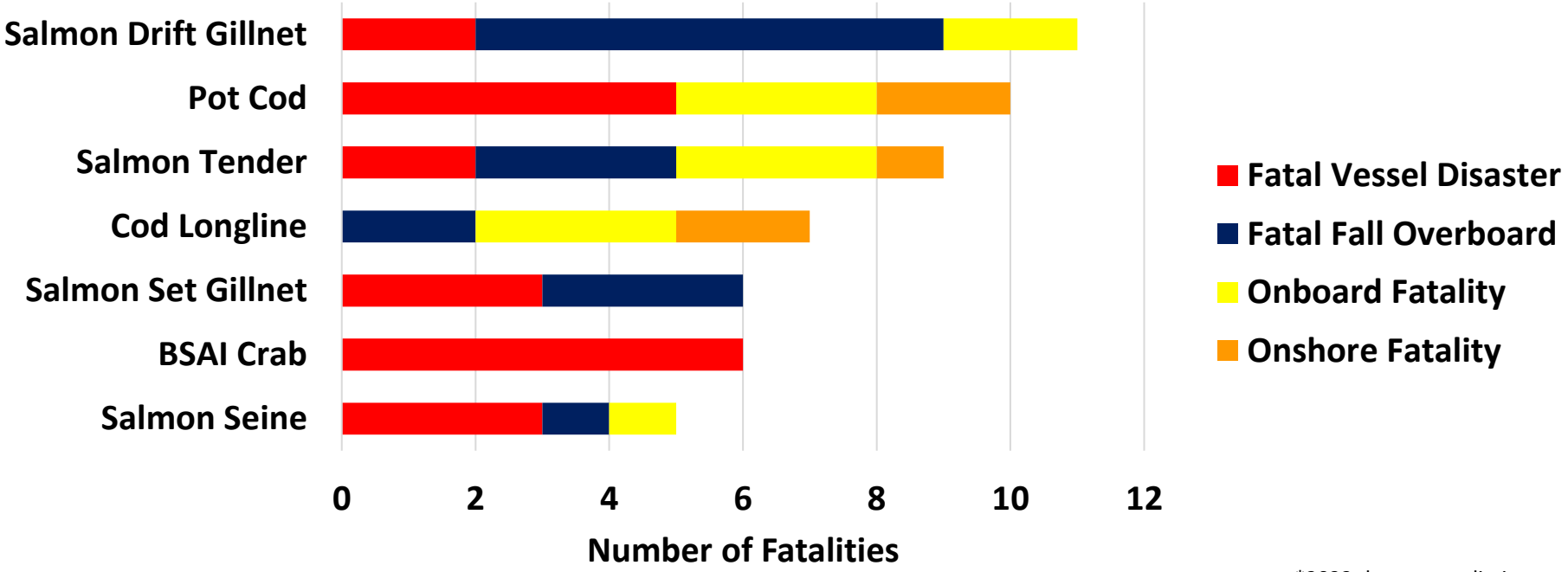
4 Fatalities

- **By fishery:**
  - **Geoduck (2)**
  - **Cucumber (2)**
- **Causes of death:**
  - **Drowning (2)**
  - **Embolism (1)**
  - **Carbon monoxide poisoning (1)**

*2022 data are preliminary

Alaska Commercial Fishing Fatalities by Incident Type, Fisheries with ≥5 Deaths, 2013–2022* (n=54)

61.3% of all fatalities



*2022 data are preliminary

Recent Products and Activities

Winch-related Injuries in Alaska's Commercial Fishing Industry

- Analyzed injury data from the Alaska Fisherman's Fund (2000-2020)
- 125 winch-related injuries
  - Fractures (29, 23%)
  - Amputations (22, 18%)
  - Lacerations (20, 16%)
- Most common winches:
  - Purse seine deck winches (34, 27%)
  - Drift gillnet anchor winches (31, 25%)

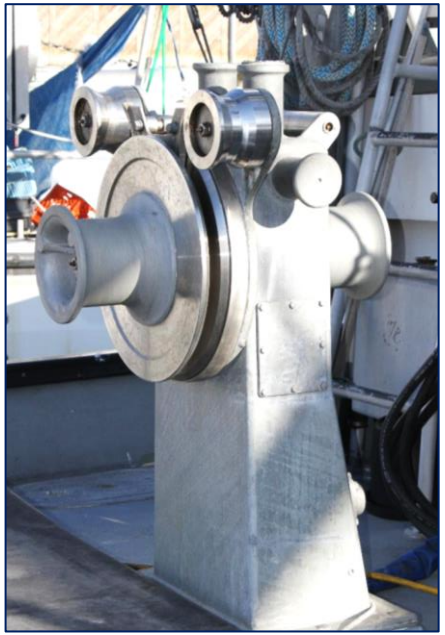


Photo: NIOSH

Victoroff TM, Case SL, Robertson LD, Syron LN. (2022). Workplace Injuries Caused by Commercial Fishing Winches – Alaska, 2000-2020. Journal of Agromedicine, https://doi.org/10.1080/1059924X.2023.2171524.

Winch-related Injuries in Alaska's Commercial Fishing Industry

Photo: NIOSH

- Anchor winches warrant focused attention
- Prevention strategies:
  - Engineering controls (e.g., emergency stop)
  - Administrative controls (e.g., training)
- Efforts to promote e-stop adoption are ongoing

Victoroff TM, Case SL, Robertson LD, Syron LN. (2022). Workplace Injuries Caused by Commercial Fishing Winches – Alaska, 2000-2020. Journal of Agromedicine, https://doi.org/10.1080/1059924X.2023.2171524.

Young Worker Safety in Alaska, 2014-2018

- Analysis of injuries (n=12,886) and fatalities (n=20) among young workers (≤24 years of age) in Alaska
- Highlights young worker injuries in commercial fishing (n=342) and seafood processing (n=829)
  - 9% of all injuries
  - 20% of all fatalities were fishermen
  - Underreported
- Similar injury types and causes as found in previous studies
- Clear need to prioritize young worker safety using an integrated approach

Photo: NOAA Fisheries

Evoy R, Syron L, Case S, Lucas D. (2023). Traumatic injuries among Alaska's young workers: Linking cases from four data systems. BMC Public Health, https://doi.org/10.1186/s12889-022-14676-7.

Spotlight: Predictors of Fishing Vessel Disasters

- Vessel disasters are the leading contributor to commercial fishing fatalities
- Several crew at risk in a single event
- Existing policies emphasize secondary prevention (e.g., life rafts, EPIRBs, immersion suits)
- **Do vessel-related characteristics predict vessel disasters?**

Photo: USCG

Case SL, Lucas DL. (2020). Predicting commercial fishing vessel disasters through a novel application of the theory of man-made disasters. Journal of Safety Research, https://doi.org/10.1016/j.jsr.2020.07.005.

Study Design

Cases (n=70)

- A commercial fishing **vessel** involved in a **catastrophic event** that resulted in the entire crew abandoning the vessel in **Alaska** during **2010-2015**.
- Source: NIOSH Commercial Fishing Incident Database

Controls (n=210)

- A commercial fishing **vessel** that was **likely active in Alaska** during **2010-2015** and **did not experience a vessel disaster**.
- Sources: State of Alaska, National Marine Fisheries Service
- Three controls randomly selected for each case based on inclusion year

Characteristics of Interest

10-Year Casualty History	None One or More
Fishing Vessel Safety Decal	Current Expired None
Documentation	Federally Documented State Registered
Vessel Age (years)	< 25 ≥ 25
Vessel Length (feet)	< 50 50 – 78 ≥ 79
Hull Material	Fiberglass Aluminum Steel Wood

Predictors of Vessel Disasters

Vessels were…

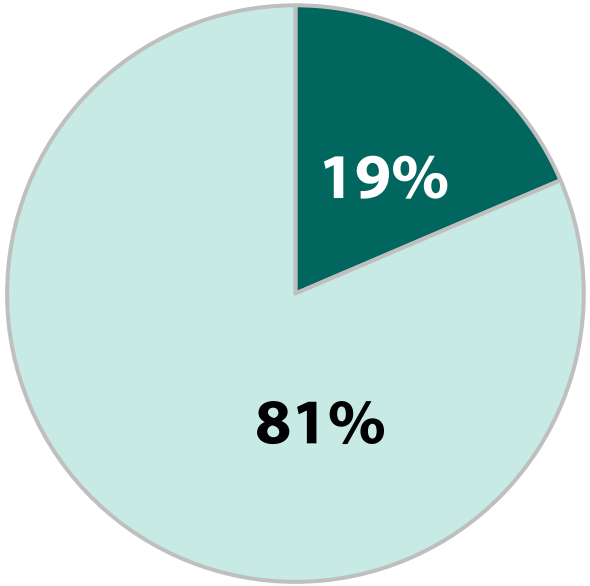
- **3x more likely** to experience a disaster if they had **reported vessel casualties** in the previous 10 years

- **2.4x more likely** to experience a disaster if they had an **expired fishing vessel safety decal**
  - Could be due to larger safety problems, such as poor safety culture/climate

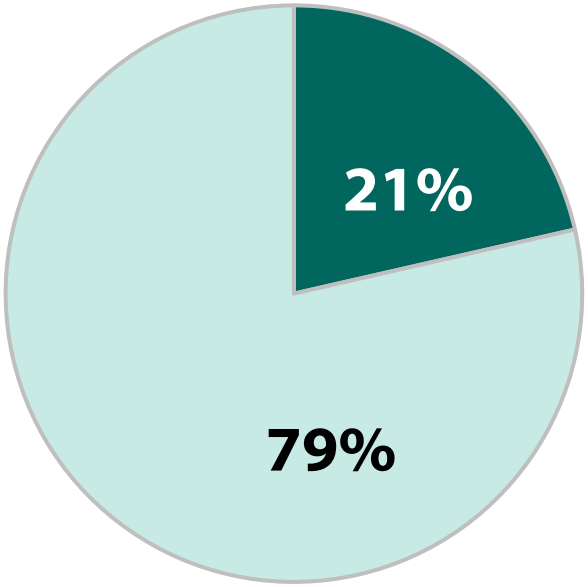
- **3.3x more likely** to experience a disaster if they had **steel hulls**
  - Correlation with vessel length
  - Could be indicative of the types of fishing operations (e.g., winter fishing; farther offshore)

Vessel Characteristics: Age (years)

Cases



Controls

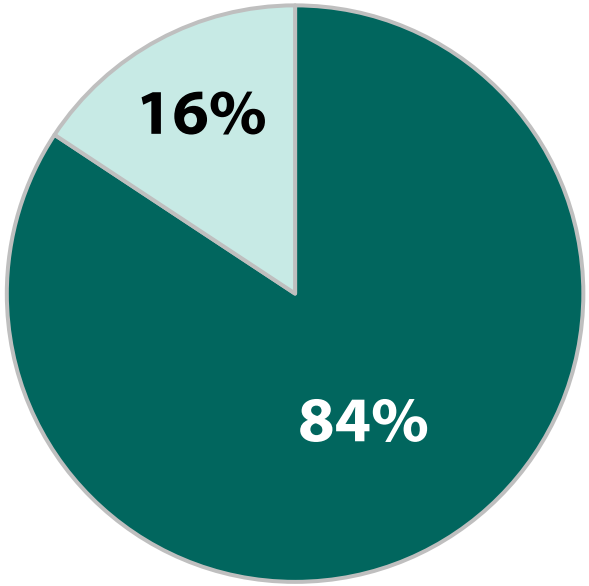


< 25

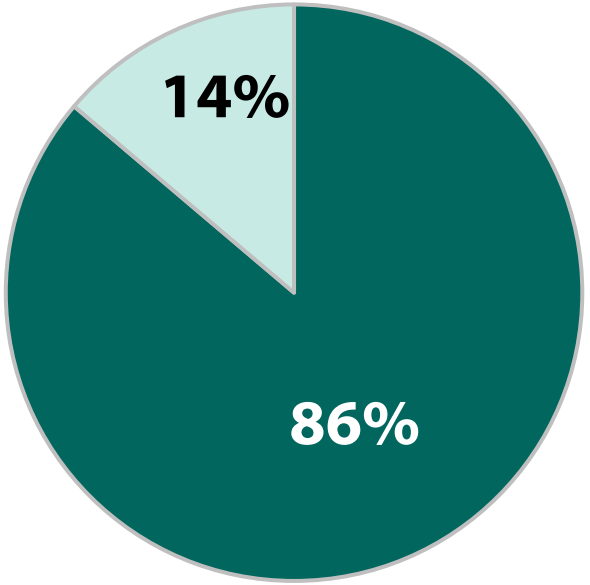
≥ 25

Vessel Characteristics: Documentation

Cases



Controls



Federally Documented

State Registered

Conclusions

- Findings provide support for Coast Guard-led initiatives
  - **Alternate Safety Compliance Programs (ASCPs) / Voluntary Safety Initiatives and Good Marine Practices**: safety guidance for unclassed vessels ≥50’ and ≥25 years old
  - **Dockside Examinations**: Now mandatory for vessels operating >3 nautical miles offshore

- Vessel casualties as risk factor
  - Preventative maintenance plan
  - Complete repairs when casualties do occur

Photo: USCG

Limitations

Photo: USCG

- Unknown generalizability outside of Alaska or to other vessel types
- Did not allow for adjustment for other factors that may contribute to disasters (e.g., season, weather, fishery, human factors)
- Control vessels may not have been participating in the same fishery, region, etc.
- Potential underreporting of casualties

USCG-NIOSH Commercial Fishing Safety Research & Training Grants

Commercial Fishing Occupational Safety Research & Training Program

Photo: NIOSH

- Foster and enhance new **research** to improve commercial fishing safety
- Enhance the quality and availability of **safety training** for fishermen
- USCG and NIOSH signed Memorandum of Understanding in 2018 to administer the grants

cdc.gov/niosh/oep/commercial-fishing-research-training/

Examples of Funded Research Projects

- Developing a near-miss sharing system (American Bureau of Shipping)
- Assessing sleep deprivation in fishermen (Northeast Center for Occupational Health and Safety)
- Improving fall overboard recovery in the Gulf of Mexico (University of Texas)
- Reducing ergonomic hazards associated with Dungeness crab fishing gear (Oregon State University)

Photo: Northeast Center for Occupational Health and Safety

Examples of Funded Training Projects

- National fishing safety training infrastructure (AMSEA)
- Community-based safety training in New England (Fishing Partnership)
- Fishermen first aid and safety training (Oregon State University)
- Comprehensive safety and wellness program in Maine (Maine Center for Coastal Fisheries)

Photo: NIOSH

Funding Information

- $6 million available in FY2023
- Individual grant awards are $150,000 - $975,000
  - Funding is for 3 years
  - Requires 25% cost match of amount awarded
- Last cycle – January 31, 2023
  - Nine applications awaiting review
- Next application deadline – August 29, 2023

Photo: NIOSH

Eligible Organizations

Photo: USCG

- Higher education institutions
- Non-profits
- Businesses
- Governments (state, local, tribal)
- Tribal organizations
- Fishing associations
- Faith-based or community-based organizations

cdc.gov/niosh/oep/commercial-fishing-research-training/

Thank You! Questions?

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www.cdc.gov/niosh/topics/maritime/