Commercial Fishing Safety Research Updates from NIOSH

Samantha Case, MPH, CSP
Richie Evoy, PhD

North Pacific Fishery Management Council Meeting

April 6, 2023
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
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)
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)

57% decrease

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

- Fatal Vessel Disaster: 25, 28%
- Onboard Fatality: 11, 12%
- Fatal Fall Overboard: 4, 5%
- Diving Fatality: 11, 5%
- 2022 data are preliminary

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

- Fatal Vessel Disaster: 91, 39%
- Onboard Fatality: 86, 36%
- Fatal Fall Overboard: 40, 17%
- Diving Fatality: 7, 3%
- 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

- **Salmon Drift Gillnet**
  - Fatal Vessel Disaster
  - Fatal Fall Overboard
  - Onboard Fatality
  - Onshore Fatality

- **Pot Cod**
  - Fatal Vessel Disaster
  - Fatal Fall Overboard
  - Onboard Fatality
  - Onshore Fatality

- **Salmon Tender**
  - Fatal Vessel Disaster
  - Fatal Fall Overboard
  - Onboard Fatality
  - Onshore Fatality

- **Cod Longline**
  - Fatal Vessel Disaster
  - Fatal Fall Overboard
  - Onboard Fatality
  - Onshore Fatality

- **Salmon Set Gillnet**
  - Fatal Vessel Disaster
  - Fatal Fall Overboard
  - Onboard Fatality
  - Onshore Fatality

- **BSAI Crab**
  - Fatal Vessel Disaster
  - Fatal Fall Overboard
  - Onboard Fatality
  - Onshore Fatality

- **Salmon Seine**
  - Fatal Vessel Disaster
  - Fatal Fall Overboard
  - Onboard Fatality
  - Onshore Fatality

*2022 data are preliminary
Recent Products and Activities
Winch-related Injuries in Alaska’s Commercial Fishing Industry

- 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%)

Winch-related Injuries in Alaska’s Commercial Fishing Industry

- 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

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

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?

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

<table>
<thead>
<tr>
<th>Characteristics of Interest</th>
<th>10-Year Casualty History</th>
<th>Fishing Vessel Safety Decal</th>
<th>Documentation</th>
<th>Vessel Age (years)</th>
<th>Vessel Length (feet)</th>
<th>Hull Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-Year Casualty History</td>
<td>None</td>
<td>Current</td>
<td>Federally Documented</td>
<td>&lt; 25</td>
<td>&lt; 50</td>
<td>Fiberglass</td>
</tr>
<tr>
<td></td>
<td>One or More</td>
<td>Expired</td>
<td>State Registered</td>
<td>≥ 25</td>
<td>50 – 78</td>
<td>Aluminum</td>
</tr>
<tr>
<td></td>
<td></td>
<td>None</td>
<td></td>
<td></td>
<td>≥ 79</td>
<td>Steel</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Wood</td>
</tr>
</tbody>
</table>
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
- < 25: 19%
- ≥ 25: 81%

Controls
- < 25: 21%
- ≥ 25: 79%
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
Limitations

- 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

- 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/](https://cdc.gov/niosh/oep/commercial-fishing-research-training/)

Photo: NIOSH
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
Eligible Organizations

- 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?

Samantha Case, MPH, CSP
scase@cdc.gov

Richie Evoy, PhD
revoy@cdc.gov

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

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.