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# Knowledge Shared by Alaska Native Commercial Salmon Set Gillnetters in Norton Sound to Reduce Marine Fatalities

Leann Fay Cyr and Mayugiaq Melanie Sagoonick

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## ABSTRACT

**Objectives:** The goal of this exploratory pilot study was to reduce marine fatalities in Norton Sound using knowledge shared from Alaska Native salmon set gillnetters in Unalakleet, AK. The following objectives to address this goal were: 1) identify factors that influence safety for Alaska Native commercial set gillnetters in Norton Sound; 2) use findings from objective 1 to improve commercial fishing training, education, and resources; and 3) disseminate and communicate results from objective 1 to commercial fishers in the Norton Sound fleet, commercial fishing safety partners, and the Alaska Native injury prevention community.

**Methods:** Ten semi-structured interviews were conducted with Alaska Native commercial set gillnetters in Unalakleet, AK. We utilized knowledge shared to identify factors that influence safety for their fleet. Using an Interpretative Phenomenological Analysis Methodology, 10 interviews were recommended for a homogenous sample.

**Results:** Most participants learned to fish at a young age from the family, with safety lessons passed on by family members. Fishing is a lifestyle and interconnected with harvesting and a way of living. Set gillnetters in Norton Sound use open skiffs and have limited access to workable Personal Flotation Devices (PFDs) and safety training. Participants reported health benefits but also negative long term physical effects, financial stress, and difficulty fishing with age. Respect and awareness of the ocean was reported as the most important strategy to reduce risk. Stories were shared of falls overboard, capsizing, and local fatalities and hazards, such as being overloaded with fish, entanglement, and maneuvering a small boat in large waves. Stronger winds and shifting weather patterns were experienced from climate change.

**Conclusion:** This exploratory pilot study identified factors that influence safety for Alaska Native commercial set gillnetters. Findings should be used to 1) determine best methods to influence behaviors to reduce risks in this hazardous fishery; 2) increase awareness and promote expanded application of best practices, equipment, and resources; 3) encourage and promote outreach initiatives targeted for this unique population; and 4) develop tailored training programs for commercial fishing in an open skiff. Research with Alaska Native fishing communities will require value and respect of indigenous knowledge, collaboration with local people, and follow-up to bring findings back to the community.

## KEYWORDS

Alaska native; commercial fishing; fatalities; open skiffs; set gillnet

## Introduction

Commercial fishing is a high-risk occupation, with fatality rates 29 times higher than the average of other US workers.<sup>1</sup> Although commercial fishing fatalities in Alaska are on the decline based on the 15-year period 2004 to 2018, fatalities for Alaska Native workers in the general Alaska work force are on the rise.<sup>2</sup> From 2010 to 2014, the salmon set gillnet fishery had the highest commercial fishing fatality rates in Alaska with seven fatalities: five from vessel disasters and two from falls overboard.<sup>3</sup> Ten out of fifteen fatalities from commercial fishing vessel disasters in Alaska during this period occurred in open skiffs, the type of vessel used in salmon set

gillnet fishing.<sup>4</sup> Occupational health research in commercial fishing has demonstrated a need for tailored interventions,<sup>5</sup> especially for Alaska Native males who are at an increased risk of marine fatality according to older<sup>6</sup> and newer studies.<sup>7</sup> Substantial efforts are needed to improve safety for Alaska Native workers in the salmon set gillnet fishery.

The salmon set gillnet fishing villages in Norton Sound are remote and only accessible by plane or boat. Emergency equipment such as carbon dioxide (CO<sub>2</sub>) cartridges in inflatable personal flotation devices (PFDs) cannot be easily or affordably shipped there because they are labeled as hazardous

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materials. Commercial fishing vessel training offered in larger fishing communities is limited in villages where most of the permit holders are located.<sup>8</sup> Furthermore, the Coast Guard accepted commercial fishing vessel training offered in larger communities is designed for larger boats with different equipment onboard and is limited in addressing the unique needs for open skiff fishing. This training is not required for set gillnet permit holders in Norton Sound. Furthermore, Alaska Native commercial fishers have their own traditional safety knowledge that needs to be acknowledged and utilized in any successful research project or training initiative.<sup>9</sup>

The goal of this research was to improve marine safety in Norton Sound by using knowledge shared from Alaska Native salmon set gillnetters in Unalakleet, AK. Factors that influence safety for Alaska Native commercial salmon set gillnetters in Norton Sound have been identified by fishers in this pilot study. Findings will be used by Alaska Marine Safety Education Association (AMSEA) to improve commercial fishing training, education, and resources in Norton Sound. Preliminary results were disseminated in a usable format to commercial fishers in the salmon set gillnet fleet, commercial fishing safety partners, and the Alaska Native injury prevention community.<sup>10</sup>

## Methods

This exploratory pilot study integrates a qualitative Interpretative Phenomenological Analysis (IPA) with participatory research to address objective 1 and identify factors that influence safety. The IPA approach attempts to understand how participants make meaning of their commercial fishing experiences. The goal is to understand as closely as possible a participant's lived experience and how they make sense of it in relation to their views and relationships.<sup>11</sup> Through this lens, Alaska Native set gillnet fishers in Norton Sound helped answer the question: what are the factors that influence safety in this fishery? These factors were established by first understanding how this homogenous group of fishers experience safety. Commercial fishing safety is a meaningful, shared experience within this cohesive community, an experience ideally suited for IPA inquiry.<sup>10</sup> From

a broader view in the industry, safety is the management of hazards and risks to prevent injuries or loss of life while fishing. Understanding this experience with a lens that considers the participants as experts benefits from the open and exploratory IPA approach.

Ten semi-structured interviews were conducted for an ideal sample size within a homogenous population as no more than 12 participants are recommended using the IPA Methodology.<sup>11</sup> At the time interviews were conducted, there were 42 active set gillnet permit holders in Unalakleet, and this community had the largest population of set gillnetters in Norton Sound. The percentage of fishers within this group who are Alaska Native is not known. Participant inclusion criteria for this study included fishers in Unalakleet age 18-years and older who self-identified as Alaska Native and had commercial fishing experience in Norton Sound. There was no age limit because Elders need to be invited for a culturally respectful study on Alaska Native commercial fishing safety knowledge. Active fishers in this community also reflect a wide age range. To lower study risk, participants were excluded if they had experienced a traumatic event within the past 2 years related to the topic and felt uncomfortable talking about their commercial fishing experiences.

Participants were recruited using community outreach activities in Unalakleet. A 30 second radio advertisement for the study was broadcasted on KNSA, the Unalakleet radio station:

Hello, this is Leann from Alaska Marine Safety Education Association. We are doing a study to try to improve marine safety for Alaska Native commercial fishermen in Norton Sound. I am coming to Unalakleet on June 5<sup>th</sup> and am hoping to interview fishermen to hear your stories. You do not have to be permit holders. We will offer a small gift to thank you and offer \$100 to compensate you for your time. I will also host a meet and greet on June 6<sup>th</sup> at Memorial Hall at 7 pm to talk about the study or sign up for an interview. There will be coffee and donuts and door prizes. Please call or text me at 209-3187 for more information.

Flyers were posted on local Facebook groups including *Native Village of Unalakleet* and *City of Unalakleet* and posted in hardcopy in public locations around town. Finally, a meet and greet

with coffee and donuts was held at the community hall to talk with interested participants and stakeholders about the study. Fourteen fishers volunteered to participate. Two were excluded for not meeting the inclusion criteria and notified respectfully. Ten participants were selected who met the inclusion criteria in the order that they volunteered. After the 10 interviews, the remaining two volunteers were notified that the study had reached the number of participants needed for the study. The interpretive phenomenological analysis framework guided face-to-face, semi-structured interviews no longer than an hour and a half long each. Introductions were made and the process of getting to know each other was slow and at the participant's lead. After personal introductions, the study was re-introduced, and the PI went through the informed consent, confidentiality protocols, and participant bill of rights verbally while participants could read along with paper copies that were theirs to keep. Participants were asked if they had any questions about the study or process and all questions were answered. Informed consent forms were signed and collected before the interview began. Participants were asked to share their personal experiences commercial salmon set gillnetting in Norton Sound with questions on how they learned to fish, crew dynamics, family dynamics, mentorship, boat types and lengths, motors, emergency equipment, preparation, training, weather, good versus bad days fishing, experiences that felt unsafe, physical/emotional/spiritual long-term effects, challenges, and lessons, stories, or knowledge they wanted share.

Interviews were recorded with handwritten notes and via Otter, AI, an artificial intelligent transcription program. The interview was also recorded with an audio recording device as a backup. Open-ended questions and prompts were asked free of presumptions. Long pauses before asking for elaboration or asking new questions were utilized to give the participants time to sit with the question and reflect. Moments of silence were used out of respect for Elders and in alignment with participant dialects. Participants were asked how the information shared might be made useful to other participants, the Norton sound fishing community, and for marine safety education and training in general.

The research team included the principal investigator (PI), who has an extensive marine background, but is not Alaska Native and has no set gillnet fishing experience and one team member who is Alaska Native, from Unalakleet, and has over 30 years of set gillnet experience. Using the IPA approach, a two-part interpretation was conducted with the PI first gaining an insider perspective, then understanding the data from her own sense making.<sup>12</sup> The PI established qualitative experiential clusters and themes to identify factors that influence safety for the Alaska Native commercial salmon set gillnetters who shared their knowledge and experiences. Factors were identified by first analyzing a rich, detailed account of each participant's experience and sense-making. A close, line-by-line analysis evaluated descriptive, linguistic, narrative, and conceptual themes to answer the research question. These were then linked together for similarity as thematic clusters with sub-themes. The research team member who has cultural knowledge reviewed and revised the clusters and sub-themes with her lens as an insider. The PI completed the final coding analysis.

## Results

In 2022, there were 6,171 set gillnet permit holders actively fishing in Alaska. Data on Alaska Native worker numbers are unavailable from the Department of Labor and the Commercial Fisheries Entry Commission. Ten participants were interviewed out of 42 active registered permit holders in Unalakleet. Many permit holders/captains fish with a deckhand, so 84 active set gillnetters is a more accurate estimate. However, out of 84 active fishers, the percentage who are Alaska Native is unknown. Ages ranged from 30 to 80 years-of-age, with nine male participants and one female. Although there was no minimum experience needed to participate, participants had in the range of 17 years (the least experience) to 68 years (the most) of commercial fishing experience. Two participants were deckhands and eight were permit holders/captains. A captain generally ensures the boat and crew are ready, prepares safety and regulatory equipment,

purchases gear, fuel, and supplies, operates the vessel, sets, checks, and hauls the net, delivers fish, and makes all decisions about the operation. A deckhand watches for ocean debris when travelling, helps set, check, and haul the net, unloads fish, helps clean the boat after a delivery, and generally helps as needed. Three participants were retired and seven were actively fishing. Out of the retired fishers, the average number of years retired was 6. Most participants had participated in more than one fishery (herring, salmon trolling, and crabbing), and all had several years of salmon set gillnet experience. Qualitative experiential themes were established to understand factors that influence safety. Themes include: fishing with family, fishing as a lifestyle, survival equipment, preparation, and training, physical and mental health, respect/awareness of water and surroundings, one mistake can lead to death, and changes in fishing over time. Clusters of different experiential themes and quotes that reflect these experiences are detailed in [Table 1](#).

### ***Theme 1: fishing with family***

Safety attitudes and lessons are passed on by family from whom most participants learned to fish at a young age. When asked to describe what got them into fishing, participants reported learning from a young age from family members, especially from parents, grandparents, uncles, and cousins. Most participants explained how subsistence/traditional harvest activities with family are often combined with commercial fishing. When asked about mentorship or how they learned to fish, two participants referenced respect for and learning from Elders.

### ***Theme 2: fishing as a lifestyle***

Participants explained that fishing is a way of life in Norton Sound. When asked to describe what life is like fishing, participants expressed enjoyment, value in being self-sufficient, participation in multiple fisheries, and fishing over the span of one's lifetime. Three participants (two of whom were retired) reported the difficulty fishing and aging, since fishing is a way of life for them.

### ***Theme 3: survival equipment, preparation, and training***

When asked about boat type, participants described use of open skiffs in the 20-foot range. Questions on family dynamics, bad days fishing, experiences that felt unsafe, and other stories emphasized the importance of the need to know how to maneuver a small boat in big waves when weather is rough. When asked to talk about use of personal protective equipment, participants explained that PFDs are often taken off because the type III vests (inherently buoyant, buckle-up vests that are accessible and affordable) are bulky, hot, and pose a major entanglement hazard when working with the net. Three participants explained that many fishermen only wear PFDs when the ocean is very rough on the return to town. When asked about training, most participants reported learning safety practices primarily by personal experience and from family. Two participants had taken marine safety training in larger communities and while participating in a different fishery. When asked what equipment they use to make fishing safer, the following gear was listed or mentioned: PFDs, an oar, anchor, drinking water, a bilge pump, flares, EPIRB (emergency position-indicating radio), working motor, line, tarp, life ring, float plan, and a cell phone for emergency communication. One's own self as a safety resource was referenced by all participants when talking about feeling safe on the water.

### ***Theme 4: physical and mental health***

When asked about the long-term effects of fishing physically, emotionally, and spiritually, participants reported positive and negative effects on their health. All participants described the benefits of fishing to maintain good physical shape, but each participant also explained at least one of the following negative effects including joint aches, arthritis, financial stress, and difficulty fishing as they age. Getting enough sleep and general strategies such as taking breaks, stretching, and getting in shape to prevent injuries were shared.



**Table 1.** Experiential themes and quotes.

<i>Theme 1. Fishing with family</i>	
Learning young from family: parents, grandparents, uncles, cousins, respect for Elders	(1) 5:46 "Well my mom owned a permit, my brother owned a permit, and all my uncles owned permits, so somebody always needed a deckhand."
Subsistence/traditional harvest activities combined with commercial	(1) 5:55 "So I've been fishing since I was basically five, six years old. But I've been in the ocean since I was a baby because that's where my mom and dad would always take us out for camping or go pick berries."
Teaching the next generation at a young age	(4) 6:37 "Kids want to help"
Safety attitudes and lessons passed on from family	(10) 47:22 [Wearing a PFD] "It always depends on the family."
<i>Theme 2. Fishing as a lifestyle</i>	
Enjoying fishing	(4) 7:36 "I enjoy it. When I'm out there I'm free. I'm my own boss. To me that's a big thing, being your own boss, doing your own thing."
Being self-sufficient, not asking for help	(1) 50:31 "Sometimes you just got to learn to not rely on nobody and just learn to rely on yourself because you're the only one that's out there."
Multiple fisheries/fishing for most of life	(8) 3:41 "I never saw it as work. It was just something to go out and do."
Difficulty aging and fishing	(10) 19:58 "Fishing is a lifestyle and it's hard for me to put it aside, and that's where I'm at."
<i>Theme 3. Survival equipment, preparation, and training</i>	
Open skiffs in 20s-foot length range/safety in knowing how to drive a skiff	(10) 22:29 "And there's a lot of skill that's involved with safety in the ocean, especially driving a skiff."
Type III PFD vests are hot, bulky, and entanglement hazard. Many wear only when it's very rough when coming back	(5) 11:34 "I don't want to get tangled in the net. You don't wear PFDs when you're checking net."
Self and family taught, or safety training received in larger communities (not Unalakleet)	(5) 23:09 "No, pretty much all on your own out here. Yeah, and all those years never had any safety training. All the training we learned ourselves."
Safety equipment: PFDs, oar, anchor, water, bilge pump, signals, cell phone, working motor, line, tarp, life ring, float plan, cell phone for emergency communication	(1) 46:37 "You don't want to be dead in the water out in the ocean." [water in fuel]
Feeling safe on the water/self as greatest safety resource	(8) 11:22 Dad taught important lesson: "Knowing what you can handle and what your boat can handle."
<i>Theme 4. Physical health</i>	
Long term physical effects (positive/negative) joint aches, arthritis, difficult to keep fishing with age	(4) 22:22 "I'm almost 60. Keeps me in good shape."
Financial stress/not catching enough fish	(1) 42:23 "You're always rocking, so it's really tough on the body ... trying to keep up right"
Getting enough sleep	(5) 27:51 "It's sad when you're not catching any fish and making any money. That's the bad part of it."
Strategies: relax or take a break, stretching and getting in shape to prevent injuries	(7) 32:14 "I made sure of that. Because you don't want to go out there tired. If you go out there tired, your mind is not all there. And you do stupid things. Once you start doing stupid things that's the end of it. End of your life."
<i>Theme 5. Respect/awareness of water and surroundings</i>	
Rough weather in the fall	(8) 51:54 "I do make sure I stretch ... I can see my dad and how he has, he calls it a back issue, back problem, but I know for a fact that it's him not stretching."
Knowing when it's time to come in	(1) 12:22 "Boy, they can get rough at times. I've been out in Norton Sound where I've seen 25, 30-foot waves."
Being observant: current, wind direction/speed, tides, watching for bad weather approaching	(1) 71:04 "You respect it. Learn to get off when it's time."
Being aware of where you are	(5) 14:54 "The ocean's the boss, it's the boss."
<i>Theme 6. One mistake can lead to death</i>	
Familiarity with marine fatalities	(4) 36:35 "You can replace the net, but you can't replace a life."
Overloaded with fish/stability hazards and strategies	(8) "Things in the land that you can sit there and look, out at Besboro [island] and use that as a weather indicator."
Falls overboard, capsizing, and local fatalities	(7) [Elders taught] 20:48 "They'd tell me what to look for. Tell me what to try to observe. Always look at the water, they said."
	(1) 31:18 "You got to know where you're going"
	(1) 25:51 "All it takes is one goof up and anybody could be done. I've seen it happen in our [river] mouth many of times."
	(8) 28:59 "That's the biggest danger that we have here for the fishermen is the determination to make money over safety."
	(6) 24:16 "I didn't really think like, I almost died, I could've almost died. Holy cow, I almost fell in. In my head I was thinking I would have been able to get myself out, but come to think of it, that was a whole lot more dangerous than I thought about it at the time."

(Continued)

**Table 1.** (Continued).

Driving/maneuvering a small boat in big waves	(7) 5:27 "I found out that you got to be ocean wise to go out there when it's rough because when you hit a wave, you're most likely gonna flip over."
Awareness of entanglement hazards	(2) 49:20 "Watch where you place all your gear or equipment and that's mostly the danger with those is entanglement."
<i>Theme 7. Changes in fishing over time</i>	
Climate change: rougher weather, wind direction changes	(7) 62:06 "Look at this weather. Always windy. It's always windy today. When the kings really start hitting, our winds will shift to the west and southwest and be rough all the time."
Changes in fish populations, species, and sizes: trawlers, climate, salmon disasters, more permits	(10) 38:35 "I think that regardless of what is happening, the high seas fishery doesn't report as much bycatch as they should. And I think the fish are also not coming back because they don't have the feed that they used to have." 34:22 "We have seen enough over the years to know that global warming has affected the mass."

### **Theme 5: respect/awareness of water and surroundings**

Respect of the ocean and awareness of weather and surroundings was reported as the most important strategy to stay safe on the water. Stories of rough weather in the fall season were shared. Strategies included watching for bad weather approaching, knowing when it is time to come in, being observant of current, wind direction/speed, and tides, and knowing where you are located at all times.

### **Theme 6: one mistake can lead to death**

When asked about the dangers of fishing or a day that went wrong out on the water, stories were shared of falls overboard, capsizing, and hazards such as being overloaded with fish, entanglement, remoteness, and maneuvering a small boat in big waves. Another subtheme that emerged from three of the participants was a general familiarity with marine fatalities in the community.

### **Theme 7: changes in fishing over time**

When asked to explain the main differences between fishing in the past and fishing now, dangers were described due to changes in climate such as stronger winds and changes in weather patterns and wind direction. Changes in fish populations, species, and sizes were also experienced with frustrations including trawler bycatch, climate change, regional salmon disasters, and more permits issued in recent years than in the past.

## **Discussion**

The goal of this pilot study was to use knowledge shared by Alaska Native commercial set gillnetters in Norton Sound to reduce marine fatalities. The finding that safety attitudes and lessons are passed on by family suggests commercial fishing training in this fishery and region may benefit from training and outreach that targets families. Training should support Elders and active fishers teaching safety practices to the next generation within their family. Numerous hazards experienced by participants including remoteness, operating a small open skiff in big waves, risk of falling overboard, capsizing, being overloaded with fish, and entanglement in gear help explain high fatality rates in this fishery.<sup>3</sup> These findings may also shed light on the high rate of vessel disasters in open skiffs in the Alaska commercial fishing fleet<sup>4</sup>.

The finding that PFDs are often taken off because they are bulky, hot, and pose a major entanglement hazard when working with the net is consistent with other commercial fishing research on PFD use.<sup>13</sup> Therefore, identifying and promoting PFDs that are wearable for this specific fishery and population should increase PFD use. The numerous strategies participants shared to stay safe on the water can be used to improve training or outreach initiatives to further objective 2. Examples include physical and mental health tips, safety gear to have on the skiff, and strategies for managing bad weather. Implementing strategies for managing bad weather in training will be especially critical, as Norton Sound is at the forefront of climate change.<sup>14</sup> Participants are

experiencing changes in weather patterns that may pose new challenges to strategies using traditional weather knowledge gained through years of experience operating in different conditions. Changes experienced in fish populations, not catching enough fish, and financial challenges also have implications in mental and physical health, because these are significant sources of stress. Changes in fish populations have additional implications for safety if participants choose to take greater risks (i.e., being out in bad weather when there are more fish in order to compensate for days when there are less fish).

This exploratory pilot study was successful in identifying factors that influence safety for Alaska Native commercial salmon set gillnetters in Norton Sound. The 10 participant interviews provided a good representation of Norton Sound set gillnetters, especially since the community is small and cohesive, and participant experiences had many similarities. However, findings are limited to this unique population and region. A full-scale study is recommended to identify factors that influence safety in other Alaska set gillnet fishing communities to make findings usable for training, education, and outreach in those regions. This study also only offered a beginning approach to address objective 2: using findings to improve commercial fishing training, education, and resources. A study to develop and evaluate a community-developed training and outreach effort is recommended for Norton Sound and other unique Alaska set gillnet communities.

In alignment with objective 3 for this study, preliminary findings were disseminated in a usable format to commercial fishers in the Norton Sound salmon set gillnet fleet, commercial fishing safety partners, and the Alaska Native injury prevention community.<sup>10</sup> These early initiatives to disseminate findings do not fully utilize the findings in this study; however, they do begin the process of building respect, making connections, and listening to local needs. Findings were presented at the American Indian/Alaska Native Injury and Violence Prevention Conference. A salmon skiff checklist was created by the researchers using must-dos from participant knowledge shared in interviews and incorporating review and feedback from one participant. Checklists were distributed to 42 commercial

salmon set gillnetters in Unalakleet as a sticker for a steering console and printed on a waterproof bag. The checklist includes pre-departure, emergency equipment, and hazards to avoid while out on the water. Thirty inflatable PFDs have been distributed to active salmon set gillnetters in Unalakleet. This PFD was identified as being more wearable for this fishery with less bulkiness and entanglement hazards than the type III vests participants reported taking off. A summary of the study with preliminary findings was presented to the community with an hour-long radio broadcast and virtual presentation for Norton Sound.

## Conclusion

Although research has been conducted identifying the need to reduce fatalities from falls overboard and vessel disasters in the salmon set gillnet fleet, especially among Alaska Native workers, research to address the unique needs of this fishery, population, and region is in its early stages. This pilot study has identified factors that influence safety for Alaska Native commercial salmon set gillnetters. Findings should be used in future research and programs to 1) establish best methods to influence behaviors to reduce risks in this hazardous fishery; 2) increase awareness and promote expanded application of best practices, equipment, and resources; 3) encourage and promote outreach initiatives targeted for this unique population; and 4) develop tailored training programs for commercial fishing in an open skiff.

Research with Alaska Native fishing communities will require value and respect of indigenous knowledge. Examples of such knowledge in this study include, but are not limited to: passing down safety practices by family, traditional harvest practices, respect for Elders, fishing as a way of life, essential components of survival equipment and preparation for emergencies, physical health strategies, respect of the ocean, awareness of one's surroundings, knowledge of weather, and changes in climate and species populations. In addition to respecting indigenous knowledge, essential respectful practices for future research include listening to local concerns and needs, ongoing community involvement and collaboration, relationship building, openness in research goals, and follow-up to bring findings back to the community.<sup>9</sup>



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## Disclosure statement

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## References

1. NIOSH. *National Institute For Occupational Safety And Health. Commercial Fishing Safety*; 2020. <https://www.cdc.gov/niosh/topics/fishing/default.html>.
2. Lucas D, Fitzgerald E, Case S, O'Connor M, Syron L. Persistent and emerging hazards contributing to work-related fatalities in Alaska. *Am J Ind Med*. 2020;63(8):693–702. doi:10.1002/ajim.23137.
3. NIOSH. *Commercial Fishing Fatality Summary: Alaska Region*. By Case S, Kloczko D, Lucas D, Mason K, Syron L, Teske T. Cincinnati, OH: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health. DHHS, (NIOSH); 2017.
4. Lucas DL, Case SL. Work-related mortality in the US fishing industry during 2000-2014: New findings based on improved workforce exposure estimates. *Am J Ind Med*. 2018;61(1):21–31. doi:10.1002/ajim.22761.
5. Lincoln JM, Carruth A, Cherry D, Kincl L, Syron LN. Occupational health research in the commercial fishing industry. *J Agromed*. 2021;26(1):28–30. doi:10.1080/1059924X.2021.1849494.
6. Lincoln JM, Perkins R, Melton F, Conway GA. "Drowning in Alaskan waters". *Public Health Rep*. 1996;111(6):531–535.
7. Strayer HD, Lucas DL, Hull-Jilly DC, Lincoln JM. Drowning in Alaska: progress and persistent problems. *Int J Circumpolar Health*. 2010;69(3):253–264. doi:10.3402/ijch.v69i3.17627.
8. Alaska Marine Safety Education Association Training Database. *Managed at Alaska Marine Safety Education Association*. Retrieve by emailing: director@amsea.org. AK: Sitka; 2022.
9. Raymond-Yakoubian B, Raymond-Yakoubian J. Research processes and indigenous communities in Western Alaska: Workshop report. *Sandhill Culture craft And Kawerak Inc Soc Sci Progr*. 2017;1–24. doi:10.25607/OBP-1674.
10. AK Native Gillnetters Year End PNASH Report (scroll to the bottom of the blog post) Alaska Marine Safety Education Association Blog. *Managed at Alaska Marine Safety Education Association*. AK: Sitka; 2023. <https://www.amsea.org/post/amsea-conducts-marine-safety-research-with-unalakleet-setnet-fleet>.
11. Smith JA, Nizza IE. *Interpretive Phenomenological Analysis*. Washington, DC: American Psychological Association; 2022.
12. Eatough V, Smith JA. *The SAGE Handbook of Qualitative Research in Psychology*. London. 2008.
13. Lucas D, Lincoln J, Somervell P, Teske T. Worker satisfaction with personal flotation devices (PFDs) in the fishing industry: Evaluations in actual use. *Appl Ergon*. 2012;43(4):747–752. doi:10.1016/j.apergo.2011.11.008.
14. Mustonen T, Van Dam B. Towards a shared understanding of Arctic climate change and urgency in Alaska. *Geogr J*. 2021;187(3):269–277. doi:10.1111/geoj.12382.