Alaska Fatal and Non-Fatal Drowning Report, 2009–2023

CDC Foundation

Alaska Fatal and Non-Fatal Drowning Report, 2009–2023

May 2026

Funding provided by *Bloomberg Philanthropies Initiative to Prevent Drowning*. The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the CDC Foundation.

Table of Contents

Acknowledgements

This report is the result of a collaboration between the CDC Foundation and the Alaska Department of Health (AKDOH).

Alaska's state report benefited from the contributions of various collaborators and staff from Alaska Department of Health and partners who facilitated access to and provided technical assistance on the data included in this report, including: Riley Fitting from the Injury Prevention Surveillance Unit with AKDOH, Hillary Strayer from the Alaska Native Tribal Health Consortium (ANTHC), Joe McCullough from the Office of Boating Safety (OBS), Devin Lucas, from the National Institute of Occupational Safety and Health (NIOSH), and Bryan Emmons, from the Office of Emergency Medical Services (EMS) within the AKDOH.

Special thanks are extended to those partners who provided valuable insight through completion of the drowning prevention scoping questionnaire: AKDOH, ANTHC, EMS, NIOSH, and OBS.

Riley Fitting, Ashley Hannigan, and Chantel Prater provided invaluable support to this report, connecting partners to facilitate access to the data included and carefully reviewing the report to ensure accuracy and impact. The CDC Foundation project leadership team (Tessa Clemens, Danielle Fernandez, Briana Moreland, and William Koon) provided essential strategic direction, editing, and statistical expertise that significantly enhanced the quality of the report. Additionally, through a multi-state initiative, valuable connections were established with CDC Foundation field employees and collaborators in Arizona, California, Georgia, Louisiana, Michigan, New York, and Oklahoma.

Lastly, a special thank you is extended to Ana Chavez, who worked directly with Alaska Department of Health as a CDC Foundation field employee and led the report writing, completion of the scoping questionnaire, and data analysis.

Introduction

State background

Alaska is the largest state in the nation and is synonymous with nature, adventure, and extreme weather. Alaska accounts for over 40% of the surface water resources in the United States (US), with over three million lakes and more than 365,000 miles of rivers.[1] Alaska also has the longest coastline in the country with over 48,000 miles of shoreline.[2] With about 741,147 residents and a density of 1.3 people per square mile, Alaska has one of the lowest total populations in the nation, despite having the largest land mass.[3]

The population of Alaska is distributed across villages, towns, and a few cities over 30 boroughs/census areas. The boroughs/census areas are grouped into seven Public Health Regions: Anchorage, the Gulf Coast, the Interior, Matanuska-Susitna (Mat-Su), the Northern Region, the Southwest, and the Southeast. The Anchorage Municipality contains 40% of the overall state residents and is the most densely populated area in the state (approximately 170 people per square mile). In contrast, the least densely populated borough/census area is the Yukon-Koyukuk census area (0.04 people per square mile).[4,5] Across Alaska, low population numbers may be due to limited infrastructure, geographic isolation, and the overall high cost of living throughout the state.[6]

State-specific drowning risks

Transportation

With rural areas geographically isolated by roadless terrain, mountain ranges, permafrost and bodies of water, transportation differs greatly compared to the rest of the country. Many Alaskan towns and villages are not connected to each other by roads (Image 3), requiring residents and visitors to utilize water and air transport to commute. Travel also varies by season, as sub-freezing temperatures that occur for many months throughout the year cause rural transportation to shift from boating on lakes and rivers to driving all-terrain vehicles (ATVs) and snowmachines on frozen surfaces (rivers, sloughs, lakes, and established ice roads). Airplanes are used for personal and commercial travel in all seasons, with frequent flights over water.

Map of waterways of Alaska.

Alaska's transportation requirements increase exposure to water and elevate the associated risk of drowning in a unique way that is not seen in other states. Northern regions experience extreme cold, and it is common for trips, especially via airplane, to be prolonged as weather conditions may inhibit a traveler from returning on schedule. Spring, also known as break-up season, begins when the temperature increases to above freezing, the snow begins to melt, and the ice present for the past six to eight months begins to thaw. This creates unstable ice conditions and increases the risk of falling through ice while traveling via snowmachines, ATVs, by foot, or other means on frozen water bodies. During warmer months, boating on rivers or ocean channels for recreation or transportation is common in all areas. Rivers and coastlines also often have adjacent roads for ATVs and automobile traffic.[7]

Economy and lifestyle

Significant portions of Alaska's economy rely on its rivers, lakes, and coastline. Many Alaskans and visitors participate in outdoor activities such as boating (including motor-propelled boating, kayaking, rafting, and canoeing), swimming, and scuba diving. Sport fishing, cruise ships, and tour boats are integral to the economy. With halibut and salmon season occurring in the warmer months and crab and sablefish in the colder months, fisheries operate at full capacity year-round, leading Alaska to be one of the top seafood industries in the US. This industry accounts for about 60% of the country's seafood yields and represents a significant portion of the state and national economy.[8]

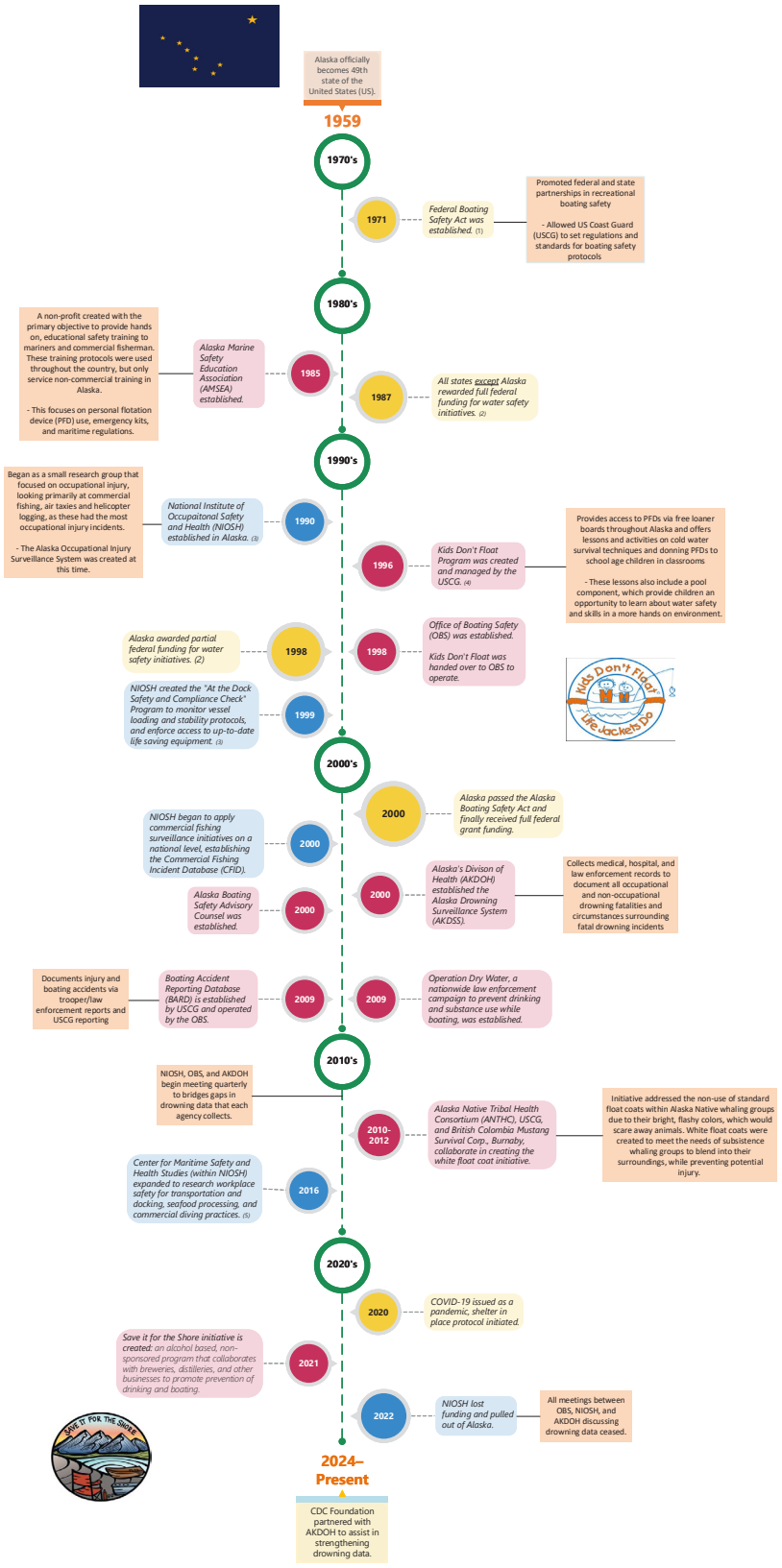
Fishing and hunting on navigable bodies of water is a vital part of life for many Alaska Native people and Alaskan residents. The practice of subsistence living is a way to "live off the land" through harvesting and hunting for food and creating essentials like clothing, tools, and shelter. It is also a way of preserving Alaska Native culture, developing connections between youth and elders by sharing Tribal knowledge and techniques. Subsistence hunting and fishing provides Alaska Native communities with essential and healthy foods that contribute to the Tribal economy, as shipping or travelling to retrieve these goods is prohibitively costly for rural Alaskans.[9] From hunting, subsistence practice, occupation, travel, and recreation, waterways are an integral aspect of daily life, year-round. While unavoidable, constant exposure poses an increased risk of drowning injury and fatality.

Map of official roadways in Alaska.

Drowning prevention landscape

The timeline below provides some brief context for when institutional Alaskan water safety initiatives were established and some of the key agencies and organizations involved.

Figure 1. Timeline of water safety events and program implementation from Alaska's statehood to present day.



In 1971, the Nixon administration established the Federal Boating Safety Act, which awarded states funding to create water safety programs and granted the US Coast Guard the responsibility of setting boating safety protocols and standards. While all states received full funding in 1987, Alaska did not receive any funds until 1998 when Alaska received partial funding. Prior to receiving new funding, the Alaska Marine Safety and Education Association (AMSEA) was established, providing hands-on safety training to mariners and commercial fishermen; the National Institute of Occupational Safety and Health (NIOSH) began developing the Alaska Occupational Injury Surveillance System to track occupational-related injury; and the Kids Don't Float program began in the Gulf Coast through a collaboration by Homer Safe Kids, the US Coast Guard Auxiliary, and the Homer School District to teach elementary school children proper personal flotation device use and provide PFDs at local boat launches.

In 2000, Alaska received full funding from the Federal Boating Safety Act. Several initiatives and departments were established, including: the creation of the Office of Boating Safety (OBS), which established the Boating Accident Reporting Database (BARD) and began managing the Kids Don't Float program; the establishment of the Alaska Drowning Surveillance System (AKDSS) within the Alaska Department of Health (AKDOH); and the creation of the NIOSH Commercial Fishing and Incident Database (CFID). These agencies collaborated to share data collected from their respective systems. Additional programs were conducted in the subsequent years, including: Operation Dry Water, which aimed to decrease drinking and substance use while boating; the White Float Coat Initiative, a collaborative effort from the Alaska Native Tribal Health Consortium, US Coast Guard, and Mustang Survival Corporation from British Columbia called Burnaby, to create white-colored float coats for Alaska Native whaling groups practicing subsistence hunting. In 2020, uncertainty due to the global COVID-19 pandemic impacted public health budgets across the nation. Among other impacts in Alaska, NIOSH lost funding in 2022, resulting in closing their headquarters in Alaska and removing their physical presence, which halted the collaborative efforts between NIOSH, OBS, and AKDOH.

Kids Don't Float station at Westchester Lagoon in Anchorage, Alaska.

Project details

This project aimed to recognize and distinguish resources for drowning data and collaborate with the Alaska Department of Health (AKDOH) and other essential agencies and programs that are integral to water safety. A survey was provided to participating agencies to gain insight into drowning data collection, surveillance, and data usage. Participants were also able to describe desired agencies to collaborate with and programs that would enhance drowning prevention efforts. Data collected in the Alaska Drowning Surveillance System (AKDSS), along with hospital and emergency department data, were used to describe the burden and circumstances of fatal and non-fatal drowning throughout Alaska. Information collected throughout this project allowed an opportunity to create potential considerations for data collection efforts and to enhance drowning prevention efforts within the state.

Spring break-up on the Knick River between Anchorage and Wasilla, Alaska.

Situational assessment of drowning data in Alaska

Drowning events are monitored through fatal and non-fatal data sources that are managed both internally by the Alaska Department of Health (AKDOH), and externally by other agencies. Main data sources include death certificates, the Health Facilities Data Reporting Program, syndromic surveillance data, Emergency Medical System (EMS) reporting, and the Alaska Drowning Surveillance System (AKDSS). All but EMS data are regularly utilized by the Injury Prevention and Surveillance Unit (IPSU) within the AKDOH to guide water safety initiatives. Key external agencies that maintain datasets useful for drowning surveillance include the Office of Boating Safety, and the National Institute of Occupational Safety and Health (NIOSH).

Death certificate data

Death certificate (DC) data are managed by AKDOH under the Alaska Statute, AS 18.50. Death certificates are typically entered into the Alaska Electronic Vital Records System by hospital or funeral home staff members, and medical information is certified by the attending physician or medical examiner. Certificates of death should be filed with the state within three days of the death. Physicians or medical examiners are responsible for completing the cause of death and providing a narrative description of the immediate cause, consequences, other significant conditions, and/or injuries involved. These descriptions are provided to the National Center for Health Statistics, who code the record based on the World Health Organization's International Classification of Diseases, 10th Revision (ICD-10) manual. An ICD-10 code for the "underlying" cause of death (defined as the disease or injury which initiated the train of morbid events leading directly to death, or the circumstances of the injury or violence which produced the fatality) is then returned to the AKDOH Section of Health Analytics and Vital Records to query. In addition, up to 19 "contributing" cause codes (defined as all other causes in the train of morbid events resulting in death) are also provided.

Health Facilities Data Reporting Program data

The Alaska Health Facilities Data Reporting Program (HFDR) collects inpatient and outpatient discharge data from Alaska healthcare facilities. Facilities required to report include private, municipal, state, or federal hospitals; hospitals operated by Alaska Native organizations; psychiatric hospitals; independent diagnostic testing facilities; residential psychiatric treatment centers; intermediate care facilities; and ambulatory surgical facilities. The data collected from these facilities comprise the Alaska Inpatient Database and the Alaska Outpatient Database. Health facilities discharge data show utilization of health services and provide evidence of the conditions for which people receive treatment. Population health status assessment, analysis of health care utilization trends, and health system planning are examples of uses of data from the reporting program. The information can inform planning and decision-making at all levels, including facilities, communities, and the state. Data provide valuable information for emerging issues in health status and health service delivery, and need for expanded services and facilities.

Syndromic surveillance data

Syndromic surveillance is a tool that provides rapid access to emergency department data. In Alaska, this data is provided to the Section of Epidemiology through healthEconnect, Alaska's health information exchange. Information from hospital emergency department visits is collected automatically, analyzed, and reviewed by epidemiologists. Alaska started with the BioSense program in 2014. Today, a newer system called ESSENCE is used, with many more hospitals taking part. This upgrade is part of the National Syndromic Surveillance Program.

Emergency Medical Services data

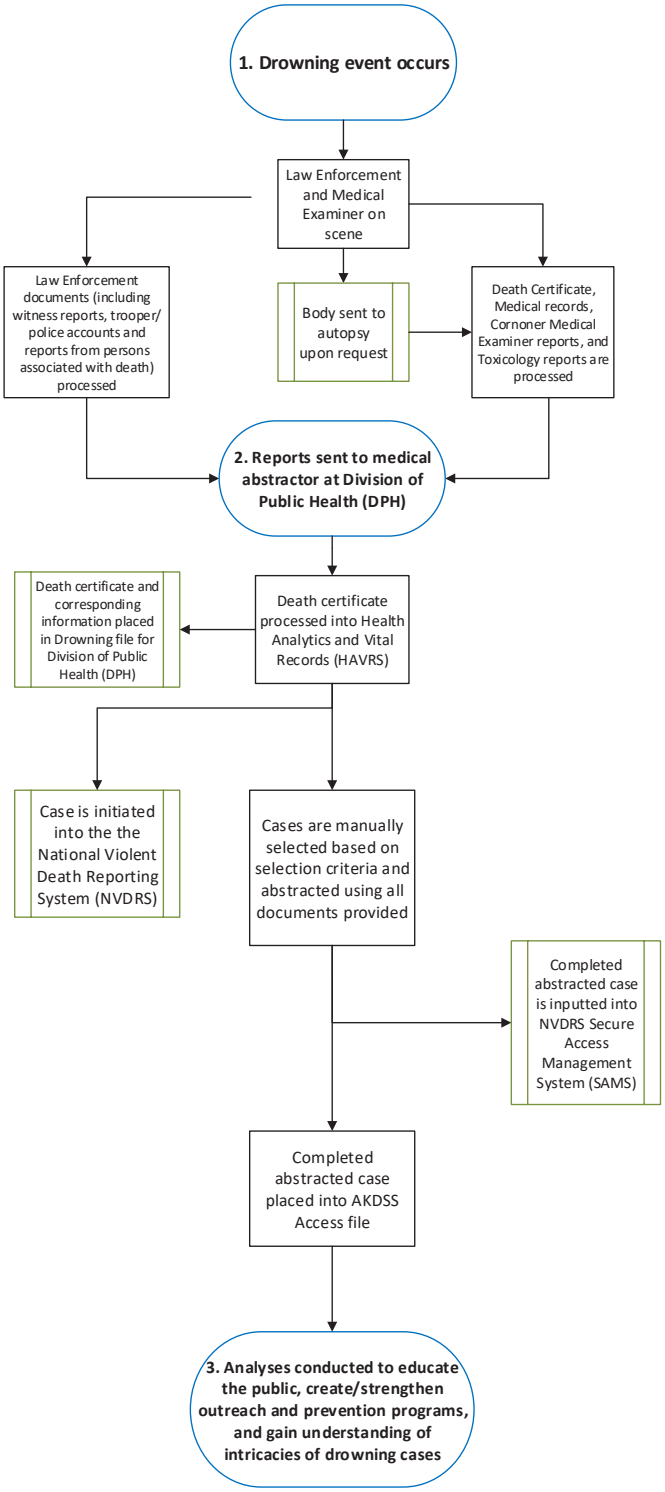
Emergency Medical Services (EMS) data are a relatively untapped drowning data resource housed within the National Emergency Medical Services Information System (NEMSIS). In some cases, NEMSIS data are also included in law enforcement investigative reports when additional information from EMS is required for legal proceedings. However, several factors complicate the collection and representation of drowning data within this platform. EMS technicians are not authorized to provide official medical diagnoses and rely on narrative reporting to indicate if someone was being treated for a suspected drowning. This can make EMS data less reliable in reporting drowning incidents compared to emergency department (ED) data which better capture confirmed drowning events through International Classification of Diseases, 10th Revision, Clinical Modification (ICD-10-CM) codes; however, the case report narratives from EMS data is a valuable resource for circumstantial information, and linking this data with hospital and ED data may assist in strengthening all data sources. While EMS data are available to use, agencies or organizations must formally request authorization to gain access. The utility of EMS data may be limited due to the geographic infrastructure of Alaska. Ambulatory care is mainly accessible in metropolitan areas, making rural towns and villages limited to first responder care, also referred to as an EMS desert. This may reduce a person's potential for recovery following a drowning incident, possibly contributing to the higher fatality rates in these regions.

The Alaska Drowning Surveillance System

The Alaska Drowning Surveillance System (AKDSS) was established in 2000 and is managed by the Injury Prevention and Surveillance Unit (IPSU). The database includes documentation of drowning fatalities using hospital records, and Coroner and Medical Examiner (CME) records that are sent to IPSU, as well as media reports and law enforcement records, when available. The AKDSS is known for being one of the first established databases in the country that monitors fatal drowning cases and includes detailed accounts of risk and protective factors. The flowchart below shows how data are collected and collated in the database (Figure 2). To describe the fatality rate in Alaska, both the AKDSS and death certificate (DC) data were examined. Linking DC and AKDSS data, the AKDOH conducted a cross analysis to determine sensitivity and specificity of the AKDSS through a probabilistic linkage with DC data. Results of this linkage and subsequent sensitivity analyses determined that the AKDSS has a higher sensitivity and specificity in collecting data on drowning fatalities than DCs (Appendix Table 10). This is due to the AKDSS capturing drowning cases that do not have an official DC—cases where the body was not recovered.

Float plane lands on unknown lake in Talkeetna, Alaska.

Figure 2. Flowchart of Alaska Drowning Surveillance System (AKDSS) data collection and surveillance for fatal drowning cases.



The AKDSS provides important data for public health recommendations and decision making, but improvements to accommodate recent epidemiological trends could enhance insights on drug-related drowning fatalities and potential links to drowning fatality incidents by season and region. The AKDSS has been used to identify the added risks that substance and alcohol use introduce to drowning, and the protection that personal flotation devices provide. With an increase in substance and alcohol use-related drowning occurring in urban regions, more comprehensive collection and addition of toxicology data to the AKDSS would allow for a more accurate understanding of this specific manner of fatal drowning cases. Additionally, law enforcement documents are used for select cases, but the inclusion of these reports for all incidents, and potential collaboration with these entities to include more drowning related questions to their respective investigations, may improve data collection efforts and provide vital information that would otherwise not be collected for drowning prevention initiatives.

Boating Accident Reporting Database

Located within the Department of Natural Resources, the Office of Boating Safety (OBS) manages the Boating Accident Reporting Database (BARD), which uses US Coast Guard data, law enforcement data, and media reporting to document all fatal and non-fatal boating incidents. Since data on incident circumstances and contributing factors are voluntarily reported by boaters, the database may be incomplete and may not capture all desired data.

Commercial Fishing Incident Database

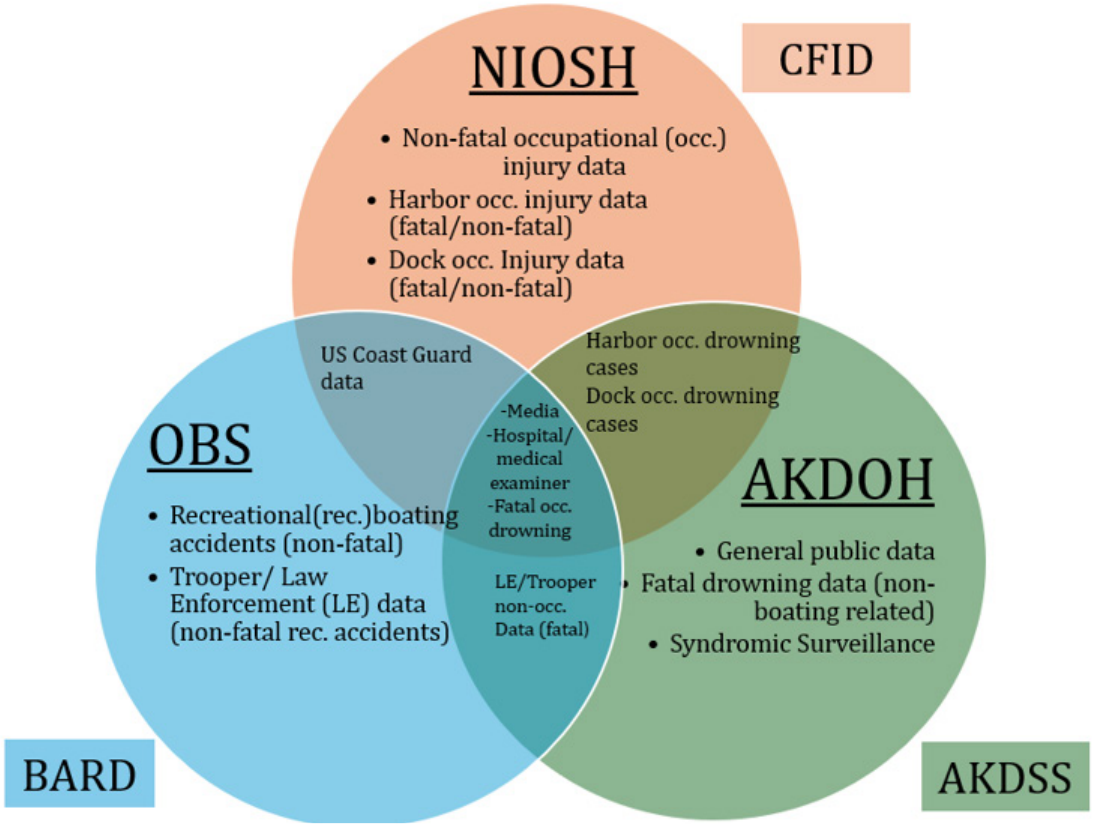
Operated by the NIOSH, the Commercial Fishing Incident Database (CFID), like BARD, utilizes US Coast Guard data, along with linked hospital records and Coroner Medical Examiner records, and is cross referenced with media reporting. CFID is responsible for collecting data pertaining to occupational-related boating incidents, which includes all occupational incidents occurring both at sea and at dock or harbor, the latter of which are not collected within BARD.

Once OBS, NIOSH, and AKDOH were all established in Alaska, quarterly meetings between the three agencies were conducted to share information on water safety and address gaps in data not collected in their respective databases (Figure 3, Table 1). This data sharing and collaboration effort was halted in 2022 when NIOSH funding in Alaska was redirected out of the state. Collaborative efforts and data sharing between the agencies have not resumed as of the publication of this report.

Other programs and partners

Other agencies, like the Alaska Native Tribal Health Consortium (ANTHC) and the Alaska Marine Safety and Education Association (AMSEA) use data from vital statistics, syndromic surveillance, law enforcement, and media reporting, as well as data requested from existing databases, such as the National Drug Overdose Surveillance and Epidemiology System, Youth Risk Behavioral Survey or Behavioral Risk Factor Surveillance System, to support their injury prevention programs. ANTHC focuses on the Alaska Native community and collects data to enhance public health efforts and assist drowning prevention initiatives within tribal regions. AMSEA provides water safety education for youth audiences, mainly within the northern region, and conducts research and outreach in the Northern region's fishermen community to meet community needs and reduce injury.

Figure 3. Venn diagram of water safety database information collected by agency.*



*Acronyms are as follows: National Institute of Occupational Safety and Health (NIOSH) (database: Commercial Fishing Injury Database [CFID]); Alaska Department of Health (AKDOH) (database: Alaska Drowning Surveillance System [AKDSS]); Office of Boating Safety (OBS) (database: Boating Accident Reporting Database [BARD]).

Drowning prevention and data sources survey

The Injury Prevention and Surveillance Unit in AKDOH surveyed other state agencies to gauge accessible drowning data sources. Those agencies included OBS, NIOSH, ANTHC, and EMS. Key issues identified by the survey that impact drowning data collection include: lack of communication, funding, and designated staff. Existing information on drowning events is not easily accessible, and often data are only shared when requested or when summary reports are released.

The agencies that collect drowning data note a lack of completeness within their records, and that current collection and reporting forms and tools limit the amount of information that's collected on each case (Table 1). For example, two key concerns emerged from hospital records: completeness, in terms of which hospitals within Alaska participate in data sharing, and accuracy in defining what constitutes a non-fatal drowning incident. Documenting non-fatal drowning events through hospital, emergency department and first responder data is vital to understand the circumstances of drowning cases and potential best practices to prevent fatalities. These insights may assist in determining potential shifts in prevention or public health education strategies. It was also expressed that there may be discrepancies in what data are available and collected in databases, and what is perceived to be available by an agency, potentially limiting data usage. When information on data use was provided by survey respondents, most shared that they use data for reporting or data sharing and surveillance (Table 2). Additional efforts are needed to bridge gaps in the knowledge of available data

variables to better inform all entities who access this information.

Despite EMS data not currently being utilized, all drowning prevention and water safety agencies expressed the importance of using EMS, Fire, and emergency management databases in the future. To gain a better understanding of drowning events among the youth population, a desire to collaborate with Child Protection Services to document fatal or non-fatal drowning incidents has been noted. As drowning events do have a relative connection to seasons, partnering with the National Oceanic and Atmospheric Administration would be beneficial in tracking weather patterns and drowning events, and documenting weather events with drowning incidents involving multiple victims.

Table 1. Variables collected and used for drowning prevention activities as reported by survey respondent agencies in Alaska.

Variable	Alaska Department of Health	Emergency Medical Services	Office of Boating Safety	National Institute of Occupational Safety and Health	Alaska Native Tribal Health Consortium
Activity	X	X	X	X	X
Age	X	X	X	X	X
Alcohol/substance use	X	X	X	X	X
Comorbidities	X	X			X
Date of drowning	X	X	X	X	X
Environmental conditions	X		X	X	
Location	X	X	X	X	X
Personal flotation device (PFD) use	X	X	X	X	X
Race/ethnicity	X	X	X		X
Rescue attempted	X	X	X	X	
Sex	X	X	X	X	X
Swim skills			X		
Time of drowning	X		X	X	X
Water type	X	X	X	X	
Other		X	X		X

* Variables such as structural barriers and supervision were also explored but were not available/used by any participating agency.

Table 2. Reasons for data use as reported by agencies engaged in drowning prevention activities in Alaska.

	Alaska Department of Health	Emergency Medical Services	Office of Boating Safety	National Institute of Occupational Safety and Health	Alaska Native Tribal Health Consortium
Awareness	X		X		X
Linked with other data	X	X			
Program implementation			X		X
Public facing reports	X		X	X	X
Recordkeeping	X	X	X		
Reporting/data sharing	X	X	X		X
Resource allocation		X	X		
Surveillance	X		X	X	X
Other		X			X

Commercial fishing in Valdez Harbor.

Burden and circumstances of drowning in Alaska

The Injury Prevention and Surveillance Unit (IPSU) within the Alaska Department of Health (AKDOH) uses death certificates (DC) and the Alaska Drowning Surveillance System (AKDSS) data to surveil fatal drowning incidents, and the Health Facilities Data Reporting Program to describe non-fatal drowning. Other data sources described in Section 3 of this report are available to supplemental drowning analyses, but they are not included in routine surveillance activities.

Fatal drowning surveillance using DC data is based on International Classification of Disease, 10th Revision (ICD-10) codes and includes all victims meeting the criteria outlined in Appendix Table 6. Fatal drowning surveillance using AKDSS data is based on underlying cause of death as determined by the Coroner Medical Examiner and includes all victims that meet the criteria outlined in Appendix Table 6. Non-fatal drowning surveillance using HFDR data include emergency department (ED) visits that did not result in hospitalization or death, and hospitalizations that did not result in death and met ICD-10 code criteria outlined in Appendix Table 6.

Traditionally, hospitalizations are considered drowning-related if the primary diagnosis is an injury and there is a drowning International Classification of Diseases, 10th Revision, Clinical Modification (ICD-10-CM) code in a subsequent field, while ED visits are considered drowning-related if there is a drowning ICD-10-CM code anywhere in the record. This report considers non-fatal drowning incidents as those with an unintentional drowning ICD-10-CM code anywhere in the record and did not result in death. Non-fatal data were limited to 2016–2023 due to coding changes in 2016 going from the 9th to 10th Revision of ICD clinical modification codes.

Rates were calculated as the number of drowning deaths, ED visits, or hospitalizations per 100,000 state residents overall, and by year, sex, age group, race/ethnicity, and region using population estimates from the US Census Bureau (vintage 2023 estimates for 2020 to 2023, vintage 2020 estimates for 2010 to 2019, and intercensal 2010 estimates for 2009 from: https://www2.census.gov/programs-surveys/popest/datasets/). Rates were age adjusted to the 2000 US standard population using the direct method. Unless otherwise noted, the data provided in this report describes unintentional drowning among state residents.

Fatal drowning

The AKDSS is used for fatal drowning surveillance and DCs are used to supplement information when necessary. Alaska averaged 45 drowning fatalities per year from 2009–2023. Of fatalities among state residents, the large majority were unintentional incidents, and few were either self-harm or assault (Appendix Table 10). Among non-state residents, on average, 10 drowning fatalities occurred per year from 2009–2023, the majority of which were unintentional.

Age

Unlike other states with warmer climates and where swimming pools are common, fatal drowning rates in Alaska are typically higher among adults than children.[10] Fatal drowning rates were highest among those 35–44 years old, followed by those 65–74 years (Table 3). Children under 10 years have the lowest drowning fatality rates compared to all other age ranges.

Table 3. Average annual counts and rates of fatal and non-fatal drowning by sex, age, race/ethnicity, and geographic region of residence, Alaska.

Variable		Emergency Department (ED) visits (2016–2023)		Hospitalizations (2016–2023)		Deaths (2009–2023)	
		Annual average count	Rate per 100,000 residents*	Annual average count	Rate per 100,000 residents*	Annual average count	Rate per 100,000 residents*
Sex	Male	15.75	4.15	3.12	0.89	31.87	8.34
	Female	7.12	2.10	1.50	0.41	7.47	2.18
Age	<1 year	1.25	8.80	0.25	2.51	1.00	0.63
	1-4 years	3.88	9.59	0.88	2.16	1.20	2.89
	5-9 years	1.75	3.40	0.25	0.49	1.00	1.68
	10-14 years	1.00	2.00	0.38	0.75	1.00	1.99
	15-19 years	1.50	3.26	0.62	1.36	1.40	2.93
	20-24 years	1.38	2.64	0.38	0.72	2.87	5.24
	25-34 years	3.62	3.11	0.38	0.32	7.27	6.39
	35-44 years	2.62	2.66	0.12	0.13	7.33	7.67
	45-54 years	2.50	2.89	0.38	0.43	5.60	5.88
	55-64 years	1.62	1.77	0.38	0.41	6.07	6.64
	65-74 years	1.38	2.22	0.25	0.40	3.80	7.24
	75+ years	0.75	2.48	0.38	1.24	1.87	7.16
Race/ ethnicity	American Indian or Alaska Native	5.62	4.95	1.38	1.26	19.73	19.76
	White	12.88	3.08	2.00	0.50	16.13	3.33
Residence region	Anchorage Municipality	7.00	2.24	1.75	0.57	4.47	1.55
	Gulf Coast	2.75	3.52	0.75	0.63	5.93	7.20
	Interior	2.12	1.81	0.75	0.58	4.27	3.86
	Matanuska-Susitna Borough	2.88	2.40	0.75	0.35	3.73	3.48
	Northern	1.50	5.14	0.75	0.82	4.33	17.37
	Southeast	4.62	6.86	0.75	0.57	6.67	8.60
	Southwest	2.00	4.32	0.75	1.33	9.20	22.79

* Rates per 100,000 residents for Sex, Race / Ethnicity, and Residency Region are adjusted for age; Rates for age groups are age-specific. Hospitalizations and emergency department (ED) visits resulting in death were excluded from ED and hospital estimates. ED visits and Hospitalizations represent mutually exclusive incidents.

The circumstances of drowning also differ among age groups (Table 4). Drowning among those aged 21–54 years old most frequently occurred while boating, compared to older and younger groups where most drowning occurred during non-transport activities, such as walking along a river. Among adults older than 55 years, drowning deaths more commonly occurred at home, mostly while bathing. The most common body of water for drowning among people younger than 54 years old was a moving body of water (e.g., a river, creek, slough or ditch).

Alaska fisherman using a gill net by unknown waterfall.

Table 4. Fatal drowning risk and environmental factors by age group—Alaska Drowning Surveillance System, 2009–2023.

Variable	0–20 years		21–54 years		55+ years		Total
	n	%	n	%	n	%	n
Body of water							
Lake	12	17.9	43	64.2	12	17.9	67
Ocean/harbor	13	8.7	96	64	41	27.3	150
Residential location water	6	8.0	24	32	45	60	75
River/slough/creek/ditch	35	15.0	143	61.4	55	23.6	233
Unknown/other	8	11.6	37	53.6	24	34.8	69
Main activity							
Boating	17	7.6	160	71.1	48	21.3	225
Non-transportation activities	37	24.5	64	42.4	50	33.1	151
Other modes of transport (motorized)	11	11.1	59	59.6	29	29.3	99
Drug/alcohol use							
Alcohol use alone	8	6.3	87	68.5	32	25.2	127
Drug use alone	7	9.6	42	57.5	24	32.9	73
Drug and/or alcohol use	20	6.8	194	66	80	27.2	294
Personal flotation device (PFD) use							
No	41	14.3	177	61.7	69	24	287

Sex

Males in Alaska experienced a higher rate of fatal drowning than women from 2009–2023, where roughly four men died from an unintentional drowning to every one woman (Table 3). The most common activities that led to drowning among males was boating, whereas among females it was a non-transportation activity—specifically in residential bodies of water, typically bathtubs (Table 5).

Although bathing-related drowning only accounted for 11% of all unintentional drowning incidents, it was the top activity in drowning deaths among women. Of these drowning deaths, the majority involved a loss of consciousness due to a drug overdose. This differs greatly from bathing-related drowning among males, where most were attributed to an individual suffering from a medical condition.

Race/ethnicity

From 2009–2023, 50% of all unintentional drowning fatalities were among Alaska Native/American Indian people (AI/AN) and 41% were Non-Hispanic White people. All other races/ethnicities accounted for the remaining unintentional drowning fatalities (Table 3). There was a clear disparity between people of different races/ethnicities and drowning rates—only 15% of the Alaskan population is AI/AN while non-Hispanic White people comprise 61% of the entire population. The fatal drowning rate among AI/AN people was almost six times that of the rate for Non-Hispanic White people (Table 3).

Table 5. Key circumstances of fatal drowning incidents by gender—Alaska Drowning Surveillance System, 2009–2023.

Variable	Male		Female		Total
	n	%	n	%	n
Body of water					
Lake	57	85.1	10	14.9	67
Ocean/harbor	131	86.8	20	13.2	151
Residential location water	43	57.3	32	42.7	75
River/slough/creek/ditch	196	84.1	37	15.9	233
Unknown/other	54	78.3	15	21.7	69
Main activity					
Boating	199	88.1	27	11.9	226
Non-transportation activities	105	69.5	46	30.5	151
Other modes of transport (motorized)	79	79.8	20	20.2	99
Walking	43	76.8	13	23.2	56
Unknown/other	55	87.3	8	12.7	63
Drug/alcohol use					
Alcohol use alone	102	80.3	25	19.7	127
Drug use alone	58	79.5	15	20.5	73
Drug and/or alcohol use	237	80.6	57	19.4	294
Personal flotation device (PFD) use					
No	246	85.7	41	14.3	287

Location

Although Alaska Native individuals experienced higher fatal drowning rates than other racial groups across the state, drowning risk is intrinsically linked to place, or region, regardless of a person's demographic characteristics.

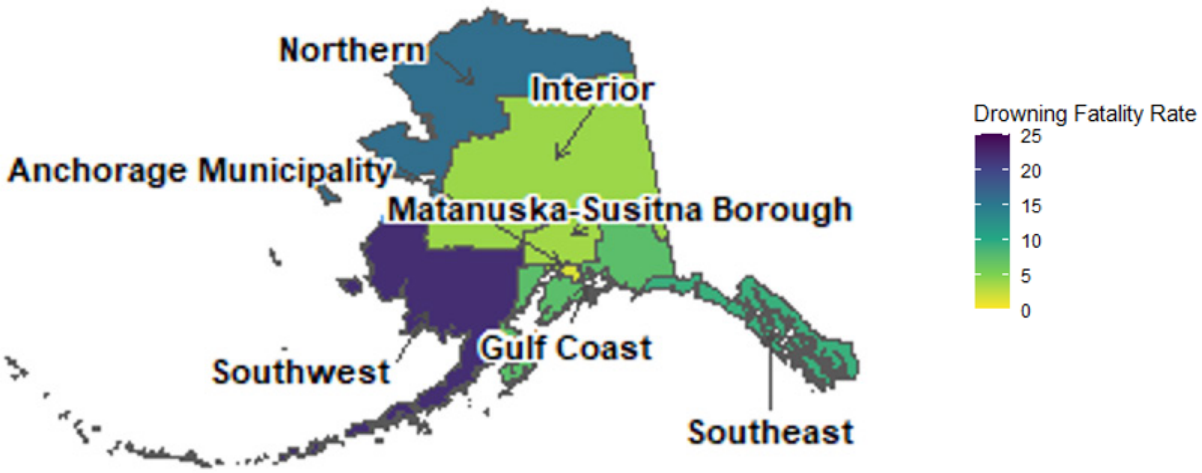
Alaska is divided into seven Public Health Regions (PHRs): the Northern, Interior, Southwest, Southeast, Anchorage Municipality, Matanuska-Susitna Borough, and the Gulf Coast. Each region is unique with respect to lifestyle, common activities, seasonality, and circumstances which impact the potential for a drowning incident. Figure 4 describes the rate of fatal drowning by region.

A breakdown of fatal drowning by Alaska's PHRs is outlined below. Supplementary data tables by geographic region and seasonality can be found in the appendix.

Anchorage and the Matanuska-Susitna (Mat-Su)

The Anchorage Municipality is the most populated PHR in Alaska, which included 40% of the population between 2009–2023. Anchorage is situated at the north end of Cook Inlet—a mix of ocean saltwater and freshwater runoff from the multiple rivers—and has several ponds, lakes, and municipal public pools. The Mat-Su borders the Anchorage Municipality to the north and is similar to the Anchorage Municipality as it has a coastline along Cook Inlet, many rivers, ponds, and lakes. The Anchorage Municipality had one of the lowest drowning fatality rates in the state with an age-adjusted rate of 1.55 per 100,000 people (Table 3). Overall, 11% of Alaska's drowning fatalities occurred in Anchorage (Table 3). The most prevalent activity at the time of fatal drowning in Anchorage was bathing; this was in stark difference from most of the state's regions, where boating was a main activity in drowning fatalities (Appendix Table 8). Of all bathing-related drowning deaths, loss of consciousness was reported in half of incidents, with the majority involving substance use (data not shown). The Mat-Su had 9% of drowning fatalities in Alaska and had an age-adjusted rate of 3.48 per 100,000 people (Table 3). The most frequently reported activity at the time of drowning was boating (Appendix Table 8).

Figure 4. Rate of drowning fatalities reported to the Alaska Drowning Surveillance System by Public Health Region, 2009–2023.



Gulf Coast

The Gulf Coast region consists of the Kenai Peninsula, Kodiak, and Valdez-Cordova (formerly known as the Chugach and Copper River before being renamed in 2019). The Gulf Coast region has a coastline along Cook Inlet, populated islands and remote communities in/on the Pacific Ocean, and multiple strong glacial rivers and large lakes.

The Gulf Coast had an age-adjusted rate of 7.2 per 100,000 people, and 15% of Alaska's overall drowning fatalities occurred here (Table 3). Most of these fatalities occurred while boating—mostly after falling overboard or capsizing (Appendix Table 8). When observing the number of individuals who drown in a specific region, compared to the region in which a drowning victim resides, many drowning incidents in the Gulf Coast were among residents of the Anchorage Municipality or the Interior Public Health Region (data not shown).

Interior

Known for sub-zero winters and warm summers, the Interior region includes Denali, Yukon-Koyukuk, Southeast Fairbanks, and Fairbanks Northstar. This region does not have a saltwater coastline, but contains innumerable ponds, lakes, rivers, and creeks.

Among all unintentional drowning fatalities in Alaska, 11% occurred in this region, with an age-adjusted rate of 3.92 per 100,000 people (Table 3). Boating was the most common activity at the time of drowning (Appendix Table 8). Nearly half of all drowning fatalities were reported to involve substance use and nearly half of fatal drowning among males involved alcohol use alone (Appendix Table 8).

Northern

The Northern region consists of the North Slope, Nome, and Northwest Arctic boroughs. With the Dalton Highway being one of the only developed roads throughout the region, residents rely heavily on boats, snowmachines, and aircraft for transportation. The region has an arctic climate with short summers and long, sub-zero winters.
The Northern region accounted for 11% of overall drowning fatalities, with an age-adjusted rate of 17.37 per 100,000 people (Table 3). Here, the most frequently reported activities at the time of drowning were boating and riding snowmachines (Appendix Table 8). Drowning related to snowmachine use often occurs when riding over thin ice or overflow (data not shown). Ice overflow refers to a phenomenon where water breaks through a thick layer of ice, often leading to the formation of layered ice structures.

Southeast

The Southeast contains the boroughs and census areas of Yakutat, Prince of Wales, Petersburg, Skagway, Hoonah-Angoon, Sitka, Wrangell-Petersburg, Ketchikan Gateway, Juneau, and Haines. This Public Health Region is comprised largely of islands in the Pacific Ocean, with many rivers and mountainous terrain. Private boats and the Alaska Marine Highway System are common modes of transportation between communities and islands. The Southeast had an age-adjusted rate of 8.60 per 100,000 people, and 17% of overall drowning fatalities (Table 3). The most frequently reported activity at the time of drowning was boating, often while working (Appendix Table 8).

Southwest

The Southwest region includes Aleutians East, Aleutians West, Bethel, Bristol Bay, Dillingham, Lake and Peninsula, and Wade Hampton (formerly known as Kusilvak prior to renaming in 2015). The Southwest is comprised of many islands in the Pacific Ocean and Bering Sea, and a land area with many bogs, ponds, lakes, and rivers. With few connecting roadways, residents rely on water and air transport.

The Southwest region had 23% of all drowning fatalities in Alaska within the past 14 years, and a fatality rate of 22.73 per 100,000 people (Table 3). Transportation was a risk factor, with most drowning incidents occurring while boating or travelling via a snowmachine (Appendix Table 8).

Non-fatal drowning

According to the AKDSS, the rate of an individual dying from a drowning incident among those aged 25–34 years (6.39 per 100,000 residents) was higher than the rate of being seen at the emergency department (3.11 per 100,000 residents) or being hospitalized for a drowning event and surviving (0.32 per 100,000 residents) (Table 3). Non-fatal drowning incidents were less common than fatal incidents, with roughly 31 cases per year from 2016–2023. The geographic isolation and harsh weather conditions of Alaska pose significant barriers to EMS and healthcare access, which is reflected in the comparatively low non-fatal drowning count. All non-resident, non-fatal drowning cases that were seen in the ED or that were hospitalized were determined to be unintentional incidents.

While non-fatal drowning numbers are low, a notable difference between non-fatal and fatal drowning is that ED and hospitalization rates were highest among children younger than 5 years old—in contrast to fatality rates, which are higher among Alaska adults.

Guide discussing Tlingit heritage at the Jilkaat Kwaan Heritage Center at Klukwan in Haines, Alaska.

Lessons and considerations for strengthening drowning prevention strategies and data systems for Alaska

Lesson 1. The Alaska Drowning Surveillance System (AKDSS) has been a vital source of drowning data for the past two decades but requires an update.

Since its establishment in 2000, the AKDSS has been one of the leading databases throughout the country on drowning surveillance. Collecting several circumstantial and contributing factors associated with drowning fatalities, the AKDSS provides insight into the complexities of each drowning case. To strengthen data collection efforts, updates to this database are needed to observe more recent shifts in drowning trends.

Consideration 1. To increase the granularity of this database, an update conducted by the Alaska Department of Health (AKDOH) is needed to accommodate modern epidemiological shifts, such as including more in-depth toxicology data and additional variables that collect circumstantial factors, like adult supervision in children, or whether an individual was engaging in subsistence practices. A surveillance evaluation is currently underway to identify areas for improvement.

Lesson 2. Data partnerships improve the quality and effectiveness of drowning data.

State agencies and organizations within Alaska that collect and/or use drowning data have noted limited data sharing amongst one another, creating silos, limiting opportunities for collaboration, and hindering prevention efforts and potential statewide partnerships.

Consideration 2. Re-establishing a formal inter- and multi-agency partnership to improve collaboration and strengthen water safety data collection among all parties, like previous meetings with the AKDOH, the Office of Boating Safety (OBS), and the National Institute of Occupational Safety and Health (NIOSH), for example. Quarterly meetings and potential database collaboration between these agencies would reduce siloed data. To increase public and institutional awareness, at least one yearly publication or presentation by AKDOH on drowning data is encouraged.

Lesson 3. Non-fatal drowning data are limited.

Health facilities discharge records and syndromic data may not be sensitive to all non-fatal drowning. This may be due to difficulty in determining an accurate definition of a non-fatal drowning case, or due to non-fatal drowning not resulting in contact with the health care or emergency responders' system. Additionally, due to the diverse terrain from urban sprawl to extremely rural communities, limited access to emergency medical services (also known as EMS deserts) may contribute to the disproportionately higher fatality rates in more rural areas compared to urban areas (e.g., proportion of drowning fatalities in Southwest region: 24% vs. Anchorage: 11%).

Consideration 3. For accurate non-fatal drowning counts, particularly in areas with limited health facilities, considering a different approach to non-fatal data collection, such as proposing a drowning experience category within the Behavioral Risk Factor Surveillance System (BRFSS) or similar statewide surveys may be beneficial.

Furthermore, additional studies to determine the severity of EMS deserts in rural areas are imperative in gaining insight into drowning

fatalities within these regions. This may assist in creating a needs assessment to potentially bridge gaps between life and death. Linking EMS data with hospital/emergency department data can also help create richer and more complete data in non-fatal cases.

Lesson 4. Personal flotation devices (PFDs) may save lives beyond boating activities.

Drowning fatalities in Alaska have been shown to occur beyond boating-related activities, such as ice fishing, all-terrain vehicle ATV and snowmachine use. Using a conventional PFD normally used for water specific activities can obstruct mobility and may not be considered an essential item.

Consideration 4. To address the broader landscape of drowning risk in Alaska, alternatives to conventional PFDs can be explored and considered for promotion as a drowning prevention measure for other activities, such as an adaptable float coat or attachable personal flotation device for transportation over ice, for example.

Lesson 5. Qualitative data on perceptions of water safety may improve recommendations from quantitative data within the rural Alaska population.

Perceptions of water safety, swimming abilities, and drowning hazards are under-documented among rural Alaskan communities, where drowning fatality rates are highest and have more potential to succumb to drowning due to lack of medical resources and geographic makeup.

Consideration 5. To understand the needs of rural communities, a statewide survey, or state specific questions within the BRFSS survey could be conducted to quantify non-fatal drowning events and learn perceptions of water safety, swimming abilities, and drowning hazards by region. These survey data can present gaps in prevention methods or a call to conduct further research to improve public health surveillance on non-fatal drowning and improve prevention methods for rural populations. Additionally, other data sources outside of fatal/non-fatal drowning reporting should also be considered to gain insight into perceptions of water in rural areas.

Lesson 6. Alcohol and substance use is a major risk factor for drowning fatalities and requires focused prevention efforts.

Alcohol or substance use is a factor in 49% of all drowning fatalities in Alaska, especially within ages 25-34 years (63%), as well as in cases where the victim was boating (42%). In Alaska, operating a motorized vehicle, watercraft, or aircraft under the influence of a substance or alcohol is a class A misdemeanor offense which can result in imprisonment for a minimum of 72 hours, impounding an individual's vehicle, water or aircraft, and possible license revocation for first time offenders.

Consideration 6. Drowning data can be used to bolster other prevention programs that address alcohol and substance use. Supporting the prevention of contributing factors may assist in inadvertently reducing drowning fatality cases.

Lesson 7. PFD use among adults while boating is protective—but not mandatory.

Wearing a PFD as a recreational boat operator or passenger is not legally required for adults. Of the boating-related drowning deaths, a high percentage of adults who drowned were reported to not be wearing a PFD during the incident.

Consideration 7. Increasing program marketing to encourage wearing a PFD could change social perceptions of PFD use and necessity. Along with program implementation, including adults in the policy should be considered.

References

1. Alaska Fish and Game. (2025). *National Wild and Scenic Rivers System*. Retrieved from National Wild and Scenic Rivers System: https://www.rivers.gov/alaska
2. Office of Response and Restoration. (2025, January). *National Oceanic and Atmospheric Administration*. Retrieved from Alaska ShoreZone: Mapping over 46,000 Miles of Coastal Habitat: https://response.restoration.noaa.gov/about/media/alaska-shorezone-mapping-over-46000-miles-coastal-habitat.html
3. Department of Labor & Workforce Development. (2025, January 7). *State of Alaska*, 25-1. (D. Howell, Editor) Retrieved from Alaska's population grew 0.3 percent from 2023 to 2024: https://labor.alaska.gov/news/2025/news25-1.htm#:~:text=The%20state's%20population%2C%20which%20had,the%20population%20to%20grow%20overall
4. United States Census Bureau. (n.d.). *QuickFacts*. Retrieved from United States Census Bureau: https://www.census.gov/quickfacts/
5. Alaska Department of Labor and Workforce Development. (2019). *Alaska Boroughs and Census Areas*. Retrieved from Alaska Population Overview: https://live.laborstats.alaska.gov/pop/estimates/pub/chap2.pdf
6. Robinson, D., & Schultz, G. (2023, July). *Alaska Economic Trends: The Cost of Living in Alaska*. (S. Whitney, Ed.) Retrieved from Department of Labor and Workforce Development: Research and Analysis: https://live.laborstats.alaska.gov/trends-magazine/2023/July/the-cost-of-living-in-alaska
7. Alaska Department of Transportation. (2019, July). *Alaska Statewide Active Transportation Plan*. Retrieved from Alaska Department of Transportation: https://dot.alaska.gov/stwdplng/areaplans/modal_system/docs/AK-Statewide-Active-Transportation-Plan.pdf
8. Smith, G. (2024, April 24). *Economic Value Reports Shows Alaska Seafood Industry Responsible for Employing Over 48,000 Workers, $2.3 Billion in Labor Income, and $6 Billion in Economic Impact in Alaska*. Retrieved from Alaska Seafood Marketing Institute: https://www.alaskaseafood.org/news/release-of-the-the-2024-update-of-the-economic-value-of-alaskas-seafood-industry-report/#:~:text=Alaska's%20seafood%20industry%20contributes%20to%20the%20global,creates%2081%2C100%20full%20time%20equivalent%20jobs%20nati
9. Wooten, D. (2024). *Alaska Subsistence Program*. Retrieved from U.S. Department of the Interior: Indian Affairs: https://www.bia.gov/service/alaska-subsistence-program
10. Centers for Disease Control and Prevention. (2021, July). *Unintentional Drowning Deaths Among Children Aged 0–17 Years: United States, 1999–2019, NCHS Data Brief No. 413*. (M. Spencer, H. Hedegaard, & M. Warner, Editors) doi:https://dx.doi.org/10.15620/cdc:107521

Appendix

Table 6. International Classification of Disease 10th revision (ICD-10) and ICD-10-Clinical Modification (ICD-10-CM) codes used to identify drowning deaths (ICD-10) and emergency department visits and hospitalizations (ICD-10-CM).

Fatal

Unintentional drowning: Underlying cause of death = V90, V92, W65-W74 OR multiple cause of death = V90, V92, W65-W74 and the underlying cause of death ≠ X60-X99, Y00-Y34, Y87, U01-U03.

Intentional drowning: Underlying cause of death = X71, X92 OR underlying cause of death = X60-X99, Y00-Y09, Y87.0, Y87.1, U01-U03 and multiple cause of death = V90, V92, W65-W74, Y21, OR multiple cause of death = X71, X92 and underlying cause of death ≠ V90, V92, W65-W74, Y21.

Undetermined intent drowning: Underlying cause of death = Y21 OR underlying cause of death = Y10-Y34, Y87.2 and multiple cause of death = V90, V92, W65-W74, X71, X92 OR multiple cause of death = Y21 and underlying cause of death ≠ V90, V92, W65-W74, X71, X92.

T75.1: In the multiple cause of death field T75.1 is considered unintentional drowning if there are no intentional or undetermined injury codes present in the record: X60-X99, Y00-Y38, Y87, U01-U03. If intentional or undetermined injury codes are present in the record, T75.1 is coded as intentional or undetermined intent.

Non-fatal (ED visits and hospitalizations): All codes have a 7th character of A or missing.

Unintentional drowning: V90, V92, W16 with 6th character=1, W16.41, W16.91, W22.041, W65-W74 anywhere in the record.

Intentional drowning: X71, X92 and no other drowning codes present.

Undetermined intent drowning: Y21 and no other drowning codes present.

Primary diagnosis of injury (only traditional hospitalizations): S00-S99, T07-T34, T36-T50 with a 6th character of 1, 2, 3, or 4 except T36.9, T37.9, T39.9, T41.4, T42.7, T43.9, T45.9, T47.9, and T49.9 with fifth character of 1, 2, 3, or 4, T51-T76, T79, O9A.2-O9A.5, T84.04, M97.

T75.1: Considered unintentional drowning if there are no intentional or undetermined intent injuries anywhere in the record: X71-X83, X92-X99, Y00-Y09, Y21-Y33, Y38, R45.88, T14.191, T36–T50 with 6th character=2,3,4 except T36.9, T37.9, T39.9, T41.4, T42.7, T43.9, T45.9, T47.9, and T49.9 where fifth character=2,3,4, T51–T65 with 6th character=2,3,4 except T51.9, T52.9, T53.9, T54.9, T56.9, T57.9, T58.0, T58.1, T58.9, T59.9, T60.9, T61.0, T61.1, T61.9, T62.9, T63.9, T64, and T65.9 where the fifth character = 2,3,4, T71 with sixth character=2,3,4, T74, T76. If there are intentional or undetermined intent injuries in the record drowning was coded as intentional or undetermined intent.

Table 7. Counts and percents of unintentional fatal drowning incidents among Alaska state residents reported by the Alaska Drowning Surveillance System (AKDSS) and death certificates, 2009–2023.

Variable		AKDSS (n=597)		Death certificates (n=480)	
		n	%	n	%
Sex	Male	482	80.7	394	82.1
	Female	114	19.1	85	17.1
	Unknown	1	<1	1	<1
Age	0–4 years	21	3.5	15	3.1
	5–9 years	13	2.1	11	2.3
	10–14 years	15	2.5	12	2.5
	15–19 years	22	3.7	17	3.5
	20–24 years	43	7.2	37	7.7
	25–34 years	111	18.6	86	17.9
	35–44 years	110	18.4	98	20.4
	45–54 years	85	14.2	71	14.8
	55–64 years	91	15.2	72	15.0
	65–74 years	58	9.7	45	9.4
	75+ years	28	4.7	16	3.3
Race/ ethnicity	American Indian or Alaska Native	296	49.6	237	49.4
	White	245	41.0	197	41.0
	Neither Alaska Native or White	56	9.4	46	9.6
Residence region	Anchorage Municipality	68	11.4	59	12.3
	Gulf Coast	89	14.9	78	16.3
	Interior	65	10.9	48	10.0
	Matanuska-Susitna Borough	56	9.4	37	7.7
	Northern	65	10.9	44	9.2
	Southeast	102	17.1	99	20.6
	Southwest	138	23.1	108	22.5
	Unknown	14	2.3	7	1.5

Table 8. Fatal drowning risk and environmental factors by Public Health Region, 2009–2023.

Variable	ANC and Mat-Su*		Gulf Coast		Interior		Northern		Southeast		Southwest		Other/ unknown		Total
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n
Purpose															
Occupational-related	<6	–	7	14.9	<6	–	<6	–	14	29.8	17	36.2	<6	–	47
Body of water															
Lake	29	43.3	15	22.4	7	10.4	<6	–	<6	–	7	10.4	<6	–	67
Ocean/harbor	10	6.6	36	23.7	0	0.0	16	10.5	55	36.2	25	16.4	10	6.6	152
Residential location water	45	60.0	11	14.7	<6	–	0	0.0	12	16.0	<6	–	0	0.0	75
River/slough/creek/ditch	30	12.9	20	8.6	46	19.7	35	15.0	11	4.7	90	38.6	<6	–	233
Unknown/other	8	11.6	7	10.1	8	11.6	9	13.0	20	29.0	13	18.8	<6	–	69
Main activity															
Boating	22	9.7	39	17.2	21	9.3	25	11.0	37	16.3	74	32.6	9	4.0	227
Non-transportation activities	58	38.4	24	15.9	15	9.9	10	6.6	25	16.6	17	11.3	<6	–	151
Other modes of transport (motorized)	20	20.2	<6	–	15	15.2	26	26.3	<6	–	30	30.3	<6	–	99
Walking	12	21.4	8	14.3	7	12.5	<6	–	14	25.0	9	16.1	<6	–	56
Unknown/other	12	19.0	15	23.8	6	9.5	0	0.0	20	31.7	9	14.3	<6	–	63
Drug/alcohol use															
Alcohol use alone	23	18.1	15	11.8	14	11.0	13	10.2	22	17.3	39	30.7	<6	–	127
Drug use alone	20	27.4	10	13.7	7	9.6	9	12.3	16	21.9	11	15.1	0	0.0	73
Drug and/or alcohol use	59	20.1	34	11.6	31	10.5	32	10.9	61	20.7	75	25.5	<6	–	294
Personal flotation device (PFD) use															
No	47	16.4	43	15.0	38	13.2	37	12.9	44	15.3	77	26.8	<6	–	287

*ANC and Mat-Su: Anchorage and the Matanuska-Susitna

Table 9. Fatal drowning risk and environmental factors by season, 2009–2023.

Variable	Break-up/Spring		Summer		Fall		Winter		Total
	n	%	n	%	n	%	n	%	n
Purpose									
Occupational-related	7	14.9	20	42.6	11	23.4	9	19.1	47
Body of water									
Lake	12	17.9	36	53.7	10	14.9	9	13.4	67
Ocean/harbor	30	19.7	48	31.6	39	25.7	35	23.0	152
Residential location water	22	29.3	13	17.3	14	18.7	26	34.7	75
River/slough/creek/ditch	42	18.0	107	45.9	59	25.3	25	10.7	233
Main activity									
Boating	24	10.6	116	51.1	60	26.4	27	11.9	227
Non-transportation activities	35	23.2	58	38.4	25	16.6	33	21.9	151
Other modes of transport (motorized)	27	27.3	18	18.2	23	23.2	31	31.3	99
Walking	17	30.4	16	28.6	13	23.2	10	17.9	56
Unknown/other	11	17.5	24	38.1	17	27.0	11	17.5	63
Drug/alcohol use									
Alcohol use alone	24	18.9	58	45.7	26	20.5	19	15.0	127
Drug use alone	14	19.2	25	34.2	15	20.5	19	26.0	73
Drug and/or alcohol use	56	19.0	110	37.4	73	24.8	55	18.7	294
Personal flotation device (PFD) use									
No	59	20.6	140	48.8	55	19.2	33	11.5	287

Table 10. Fatal drowning case counts reported to the Alaska Drowning Surveillance System (AKDSS) and death certificates by residency status, 2009–2023.

Data source type	Death certificates		AKDSS	
	State residents	Non-state residents	State residents	Non-state residents
Unintentional	480	101	597	126
Intentional	13	3	15	6
Undetermined intent	66	9	60	12
Total	559	113	672	144

Glacier Bay in Juneau, Alaska.

Alaska Fatal and Non-Fatal Drowning Report, 2009–2023

CDC Foundation