

Commercial Fishing Deaths — United States, 2000–2009

Commercial fishing is one of the most dangerous occupations in the United States (1). During 1992–2008, an annual average of 58 reported deaths occurred (128 deaths per 100,000 workers) (1), compared with an average of 5,894 deaths (four per 100,000 workers) among all U.S. workers. During the 1990s, safety interventions addressing specific hazards identified in Alaska resulted in a significant decline in the state's commercial fishing fatality rate (2). During 2007–2010, CDC expanded surveillance of commercial fishing fatalities to the rest of the country's fishing areas. To review the hazards and risk factors for occupational mortality in the U.S. commercial fishing industry, and to explore how hazards and risk factors differ among fisheries and locations, CDC collected and analyzed data on each fatality reported during 2000–2009. This report summarizes the results, which showed that, among the 504 U.S. commercial fishing deaths, the majority occurred after a vessel disaster (261 deaths, 52%) or a fall overboard (155 deaths, 31%). By region, 133 (26%) deaths occurred off the coast of Alaska, 124 (25%) in the Northeast, 116 (23%) in the Gulf of Mexico, 83 (16%) off the West Coast, and 41 (8%) in the Mid- and South Atlantic. Type of fishing was known in 478 deaths; shellfish (226, 47%) was the most common, followed by groundfish (144, 30%) and pelagic fish (97, 20%). To reduce fatalities in this industry, additional prevention measures tailored to specific high-risk fisheries and focusing on prevention of vessel disasters and falls overboard are needed.

CDC's National Institute for Occupational Safety and Health developed the Commercial Fishing Incident Database (CFID) in 2007 to collect data on deaths in the U.S. commercial fishing industry and to identify high-risk fisheries.* For CFID, a fatality case is defined as a fatal occupational traumatic injury in the commercial fishing industry reported anywhere in the United States. Only cases that met the criteria for an occupational fatality using established guidelines for injury at work are included (3). CDC collects data for CFID from multiple sources in each state, including reports from the U.S. Coast Guard (USCG), local

law enforcement agencies, and local media; death certificates; and state-based occupational fatality surveillance programs. CDC accesses these source documents through agreements with the various agencies that produce them. Causes of death are collected from either death certificates or from investigative reports, and are coded using the *International Classification of Diseases, Tenth Revision*.

Fatality rates were calculated for specific fisheries using estimates of the number of full-time equivalent (FTE) employees working in each fishery for each year during 2000–2009. FTE estimates were generated using the number of vessels participating in a fishery, the number of days at sea, and the average number of crew members onboard each vessel. To calculate the rate, the total number of fatalities for the 10-year period was divided by the total annual FTEs for the period. For certain fisheries, no estimate for the number of FTEs could be generated because of a lack of data regarding vessels and days at sea. For those fisheries, fatal incidents[†] were included in the descriptive statistics but not in rate calculations. Missing data were excluded from percentage calculations.

During 2000–2009, 504 commercial fishing deaths occurred in the United States (Figure). The Alaska region had the highest number of deaths (133, 26%), followed by the Northeast (124, 25%), the Gulf of Mexico (116, 23%), West Coast (83, 16%), and the Mid- and South Atlantic (41, 8%). A total of 491 (97%) of the decedents were male; the mean age was 41 years (range: 10–86 years).

Of the total number of deaths, 261 (52%) occurred after a vessel disaster,[§] 155 occurred when a person fell overboard (31%), and 51 (10%) resulted from an injury onboard. The remaining 37 (7%) deaths occurred while diving or on shore. The 261 deaths that resulted from a vessel disaster occurred in 148 separate vessel disaster incidents (Table 1). Of these incidents with known causes, 37 (28%) were initiated by flooding, 24 (18%) by vessel instability, and 23 (18%) by being struck by a large wave. Severe weather conditions contributed to 61% of the 148 fatal vessel disasters. Among the 155 crew members

* Fishery is defined by species targeted and location of fishing grounds. High-risk fisheries are those with high fatality rates or high numbers of fatalities.

[†] Incident is a single event resulting in one or more fatalities.

[§] Vessel disaster is a sinking, capsizing, or fire in which the crew was forced to abandon ship.

who died from falling overboard, none of them were wearing a personal flotation device (PFD). Of falls overboard with known causes, 43 (33%) were caused by trips or slips, 34 (26%) by losing balance, and 21 (16%) by gear entanglement (Table 1). In addition, the majority of persons (82, 53%) who died when they fell overboard were alone on the deck.

Of total deaths with known fishery type, 226 (47%) occurred while the worker was fishing for shellfish, 144 (30%) while fishing for groundfish, and 97 (20%) while fishing for pelagic fish. The shellfish fisheries with the highest number of deaths by incident type included the Gulf of Mexico shrimp fishery with 29 fatalities from falls overboard; the Atlantic scallop fishery with 27 deaths resulting from nine vessel disasters attributed to instability, collisions, or snagging gear; and the West Coast Dungeness crab fishery with 21 deaths resulting from 10 vessel disasters attributed to crossing a river bar, vessel instability, or being struck by a large wave. All of the vessel disasters in the West Coast Dungeness crab fishery occurred in severe weather.

Of those fisheries for which average annual fatality rates could be calculated, the Northeast multispecies groundfish fishery had the highest rate (600 deaths per 100,000 FTEs), followed by the Atlantic scallop fleet (including the Northeast and Mid-Atlantic regions) (425 deaths per 100,000 FTEs) and the West Coast Dungeness crab fleet (310 deaths per 100,000 FTEs) (Table 2). Other fishery-specific fatality rates were calculated for the Bering Sea Aleutian Island crab fleet (260 deaths per 100,000 FTEs), Alaska halibut (130 deaths per 100,000 FTEs), and Alaska salmon (115 deaths per 100,000 FTEs). The fisheries with the highest number of fatalities were Gulf of Mexico shrimp (55), Atlantic scallop (44), and Alaskan salmon (39) (Table 2).

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Editorial Note

Commercial fishing deaths have been declining gradually since 1992. In the 1990s, the number of deaths per year ranged from 48 to 96 (1). The results in this report indicate that, during 2000–2009, 41 to 61 deaths occurred annually. Vessel disasters and falls overboard continued to be the main incidents leading to fatalities, and the fisheries with the highest fatality rates were along the East Coast of the United States. Risk factors for vessel disasters and falls overboard varied across fisheries.

FIGURE. Number of commercial fishing fatalities, by incident type and year — United States, 2000–2009

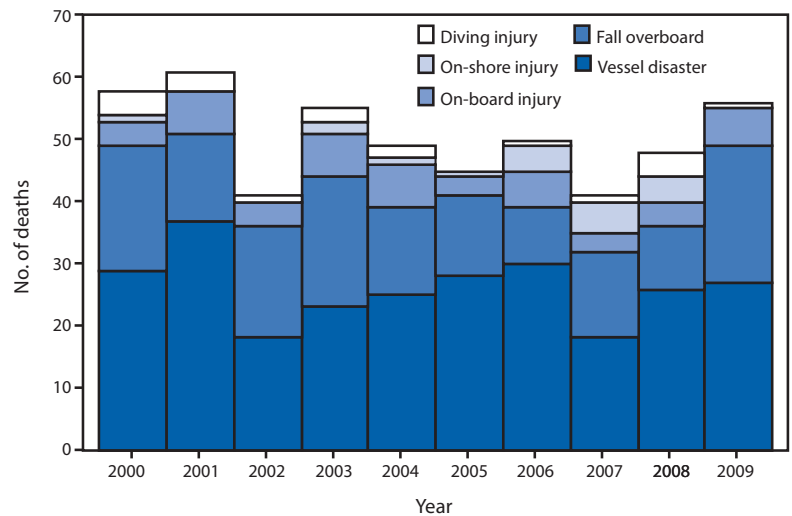


TABLE 1. Number and percentage of incidents and initial causes associated with commercial fishing fatalities* — United States, 2000–2009

Incident/Cause	No.	(%) [†]
Vessel disaster	148 [§]	—
Flooding	37	(28)
Instability	24	(18)
Struck by large wave	23	(18)
Collision/Allision	13	(10)
Propeller entanglement	6	(5)
Fire/Explosion	6	(5)
Struck by wind gust	5	(4)
Gear caught on bottom	4	(3)
Engine failure	4	(3)
Crossing hazardous bar	4	(3)
Struck rocks/bottom	3	(2)
Steering failure	1	(1)
Listing	1	(1)
Falls overboard	155 [¶]	—
Trip/Slip	43	(33)
Lost balance	34	(26)
Gear entanglement	21	(16)
Jumped	16	(12)
Knocked by gear/object	11	(8)
Washed over	7	(5)
Other	88	—
On-board injury	51	(58)
Diving related	19	(22)
On-shore	18	(20)

* Among a total of 504 fatalities, 261 were associated with 148 vessel disasters, 155 with falls overboard, and 88 with other causes.

[†] Percentage of category. Missing values were excluded from percentage calculations. Totals might not equal 100% because of rounding.

[§] Includes 17 incidents of unknown cause.

[¶] Includes 23 incidents of unknown cause.

Current commercial fishing safety regulations[‡] require that vessels carry various pieces of emergency

[‡] Requirements for Commercial Fishing Industry Vessels, 46 C.F.R. Part 28 (1991).

TABLE 2. Commercial fishing fatalities and fatality rates* for full-time equivalent (FTE) employee, by fishery type — United States, 2000–2009

Fishery	Fatalities	FTEs	Annual rate per 100,000 FTEs
Groundfish			
Northeast multispecies groundfish	26	4,340	600
Atlantic snapper/grouper	6	3,622	170
Alaska halibut	10	7,519	130
Alaska cod	26	21,327	120
Alaska sole	21	— [†]	—
Gulf of Mexico snapper/grouper	10	—	—
Shellfish			
Atlantic scallop [§]	44	10,384	425
West Coast Dungeness crab [¶]	25	8,092	310
Bering Sea and Aleutian Islands crab	12	4,658	260
Gulf of Mexico shrimp	55	—	—
Northeast lobster	18	—	—
Gulf of Mexico oyster	11	—	—
Pelagic fish			
Alaska salmon	39	34,287	115
West Coast tribal salmon	10	—	—
Other fisheries**			
Unspecified	165	—	—
	26	—	—

* Rates were calculated by dividing the total number of fatalities for the 10-year period by total annual FTEs.

[†] Unknown.

[§] Includes the Northeast and Mid-Atlantic regions.

[¶] Excludes two Washington tribal crab fatalities, which are not included in the FTE count.

** Fisheries with <10 fatalities each.

equipment depending on vessel size and the operating area. This equipment has been shown to save lives by keeping crew warm and afloat until rescued, thus focusing on survival rather than prevention of vessel disasters, falls overboard, or deck injuries (4,5). In addition, crew members are not required by law to wear a PFD while working on deck.

None of the workers who died from falls overboard during 2000–2009 were wearing PFDs. Increasing industry awareness and use of PFDs (including new styles that are integrated into work clothes) and fall overboard alarms likely would reduce the risk for death. Persons fishing alone should use safety devices that can stop the engine if they fall overboard and all vessel operators and crew should have a plan that will allow them to reenter the vessel. PFD use also would increase survival rates in incidents in which the vessel rapidly capsizes or where immersion suits are not accessible (i.e., in a skiff).

Addressing unique and specific hazards associated with particular fisheries has been effective in reducing fatalities (6). For example, concern over high fatality rates in the Bering Sea Aleutian Island crab fishery during the 1990s led to development of a USCG preseason dockside enforcement program in 1999, which focused on the immediate hazard of vessel

What is already known on this topic?

Commercial fishing consistently has been one of the most dangerous occupations in the United States.

What is added by this report?

Vessel disasters and falls overboard continue to be the main causes of deaths among commercial fishing crews. Risk factors associated with vessel disasters vary across fisheries. The fisheries with the highest fatality rates include Northeast multispecies groundfish (600 per 100,000 full-time equivalent [FTE] employees) and Atlantic scallop (425 per 100,000 FTEs). None of the 155 workers who died as a result of falling overboard were wearing a personal flotation device (PFD).

What are the implications for public health practice?

Safety interventions should be tailored to fishing fleets with high fatality rates or numbers of fatal events to address the specific causes leading to fatalities. Increased use of PFDs is necessary to prevent deaths from falls overboard; all crew members should wear a PFD while working on deck.

overloading. Currently, the USCG does not allow vessels to be overloaded with crab pots (large, 700–800 pound cages) when they leave port, and primary safety equipment must be onboard and maintained. Since implementation of the program, the average annual fatality rate for the Bering Sea Aleutian Island crab fishery has decreased by 60%, from 770 deaths per 100,000 FTEs during 1990–1999 to 305 deaths per 100,000 FTEs during 2000–2006 (6).

In 2008, CDC reviewed commercial fishing deaths that occurred along the West Coast and Alaska (6). The report identified the Dungeness crab fleet as having a higher fatality rate than the Bering Sea Aleutian Island crab fleet and made recommendations that would result in better weather reporting, safer procedures for crossing river bars, continued marine safety training, and increasing PFD usage. These recommendations were made to address the specific hazards faced by crews fishing for Dungeness crab. Since the report, the USCG implemented stricter safety guidelines for all vessels crossing river bars,** and the Oregon Dungeness Crab Commission has increased fleet participation in safety training programs and has sponsored rebates for crew members to purchase PFDs. Incremental progress in implementing these

** Regulated Navigation Areas and Limited Access Areas, 33 C.F.R. Part 165 (2009).

recommendations has been made, but it is too early to determine their impact.

The findings in this report are subject to at least two limitations. First, unlike the methodology used in this study, national fatality rates calculated by the Bureau of Labor Statistics for commercial fishing industry workers are not calculated based on FTEs (Table 2), but are calculated using annual average estimates of employed civilians aged ≥ 16 years and deaths from the *Census of Fatal Occupational Injuries (1)*. Therefore, national rates might not be directly comparable to the fishery-specific rates calculated in this study. Second, complete information (e.g., type of fishery) was not available for all fatal incidents.

Safety improvements in the commercial fishing industry in Alaska occurred as a result of several interventions, including safety regulations, marine safety training, and fishery-specific interventions focusing on unique hazards of those particular fisheries. Further safety interventions should be tailored to other fisheries across the country with an emphasis on the prevention of vessel disasters in the Northeast multispecies groundfish fishery, the Northeast scallop fleet, and the West Coast Dungeness crab fleet. Additional efforts

also are needed to help prevent falls overboard and increase PFD usage among crew members.

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