

Marine incidents in Queensland

Purpose

Maritime Safety Queensland has prepared this report on marine incidents for the calendar year 2009, in accordance with Section 127 of the *Transport Operations (Marine Safety) Act 1994*.

The purpose of the report is to summarise the major features of reported marine incidents in Queensland to determine if lessons can be learnt from incidents, and to further educate the boating community about potential boating risks and unsafe boating behaviour.

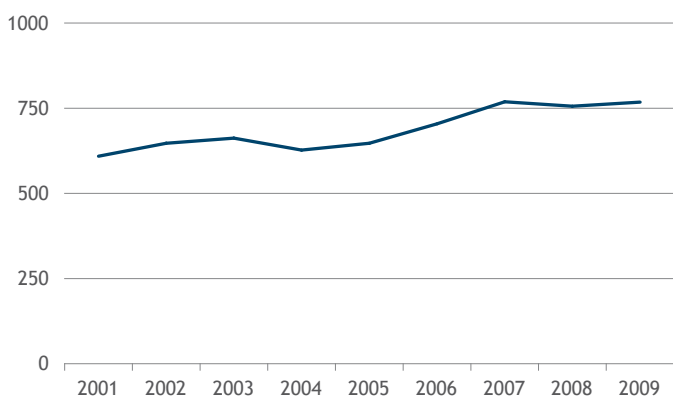
It should be noted that Queensland's marine incident database only captures reported incidents. Despite the mandatory requirement to report a marine incident, many are not reported, particularly those that are less serious in nature and those that occur in remote locations.

Marine incident data used in this report are also subject to change due to lag effects in reporting, collection and investigation.

Incident overview

In 2009, there were 768 marine incidents on Queensland waters: on average, about two incidents were reported each day.

Figure 1 Marine incidents, 2001 to 2009



Source: Caseman, marine incident case management database, 2009

For the most part, reported incidents were relatively innocuous, with most having only a minor safety or environmental impact: in particular, 95 per cent involved minor or nil injury, 33 per cent did not cause any damage and just 2 per cent resulted in marine pollution. A further six per cent of reported incidents were 'close calls' or 'near misses'.

However, a small proportion of marine incidents were more serious including 14 fatal and 24 serious injury incidents, along with the high profile Pacific Adventurer case in which 31 containers of ammonium nitrate were lost overboard and 271 tonnes of oil leaked into waters off Cape Moreton.

In addition, there were 94 vessels that suffered major damage, predominantly as a result of capsizing (35%), collision (25%) and grounding incidents (25%).

Trends

Over time there has been a steady climb in the annual number of reported marine incidents (see Figure 1).

Since 2001 there has been a 26 per cent rise in reported incidents, although the gains have slowed in the last year (+2%).

In part, the growth in incident numbers comes about through Maritime Safety Queensland's ongoing efforts to improve the commitment to and quality of marine incident reporting in the boating community.

The increase in reported incidents has also been a product of higher levels of vessel exposure on Queensland waters.

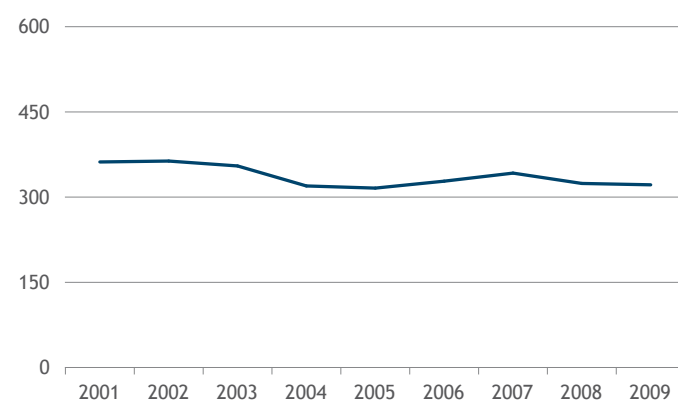
aged 16 or older holds some form of marine driver's licence.

In short, with growing numbers of vessels and people on the water (that is, exposure to risk), the higher the likelihood of an incident occurring.

Rate of marine incidents

An analysis of incident rates over time was performed to

Figure 2 Marine incidents per 100 000 registered vessels



Sources: CASEMAN, marine incident case management database; TRAILS, recreational registration and licensing database; CIRMS, commercial vessel registration database.

At year end 2009, there were 5600 commercially registered and 233 000 recreationally registered vessels in Queensland, approximately 70 000 more registrations than in 2001 (that is, average annual growth in registrations of 4.5 per cent). There have also been strong gains in the number of people holding recreational marine drivers' licences in Queensland. At year end 2009, 662 000 people held some form of recreational marine driver's licence, around 117 000 more licence holders than in 2005 (that is, average annual growth in recreational licences of 5.0 per cent).

About 1 in 15 Queenslanders aged 16 years or older owns a registered recreational boat and 1 in 5 Queenslanders

assess the impact of increased vessel exposure.

It revealed that in 2009 there were 321 marine incidents per 100 000 registered vessels in Queensland, 2 per cent lower than the prior four-year average (328) and the lowest rate since 2005 (see Figure 2). (Using a four-year average helps smooth the data, thereby making for a more useful benchmark comparison).

Vessels involved

In 2009, 970 vessels were involved in reported marine incidents. In line with patterns from recent years, approximately 51 per cent of the vessels were being used recreationally, 43 per cent commercially and 6 per cent were used in a hire and drive setting.

Over the past decade, recreational vessel involvement in marine incidents has been increasing at a slightly higher rate than vessel registration growth.

Last year, recreational motorboats had a higher level of involvement in marine incidents than any other types of vessel (30%), followed by commercial passenger (17%), commercial non-passenger (17%), recreational sailing (12%) and commercial fishing (9%) vessels (see **Figure 3**).

Fatal marine incidents

In 2009, there were 14 fatal marine incidents resulting in 20 deaths.

Three-quarters of 2009's marine incident fatalities (15) took place in the first half of the year. This reversed a long standing trend where the majority of fatalities—64 per cent on average between 2001 and 2008—occurred in the second half of the calendar year. This turnaround could be partially attributed to extreme or cyclonic weather in early

involved a commercial vessel, and one incident (1 death) involved a collision between a recreational and commercial vessel.

The fatality toll was the worst on record in Queensland and this comes on the back of achieving our lowest toll just one year earlier. Compared to the respective prior four-year averages, fatal incident numbers were up 30 per cent while fatality numbers were up 51 per cent.

Relative to other years, 2009 produced an exceptionally high number of 'multiple fatalities' in marine incidents. While there were 10 multiple fatality incidents in the period 2001 to 2008, there were 5 'multiples' in 2009 alone. Analysed differently, over the prior eight years, there was an average of 1.2 deaths per fatal marine incident, whereas in 2009 there was an average of 1.4 deaths.

of fatal incidents in one year tend to balance out in the next, as is evident when you examine the two-year average of fatal incident numbers.

Between 2001 and 2009 the count of fatal incidents ranged from 8 to 14 on an annual basis but just 9 to 12.5 on a two-year average basis.

When compared, the two-year average does not dip as low or extend as high as the annual fatal incident count.

Fatality rate

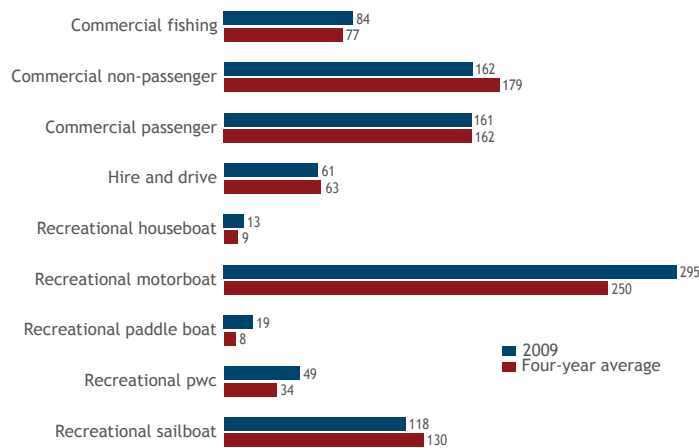
The annual fatality rate increased significantly in 2009, ending a downward trend for this indicator over the preceding three years. Specifically, there were 8.4 fatal injuries for every 100 000 registered vessels last year, compared with the prior four-year average of 6.1 (see **Figure 5**).

Serious injuries

The number of marine incident-related serious injuries, defined here as those that required overnight hospital admission, has declined every year since 2006.

In 2009, there were 25 marine incident-related serious injuries, representing

Figure 3 Vessels involved in incidents, 2009 v. FYA*



Source: Caseman, marine incident case management database, 2009
*FYA represents the prior four-year average

Comparing 2009 with the prior four-year average, in terms of raw numbers the largest increase in vessel involvement in incidents was among recreational motor boats (45), whereas on a percentage basis the most significant gain was among recreational PWC or personal water craft (43%).

The same analysis found that while there was a nine per cent increase in the involvement of commercial fishing vessels in incidents, there was a nine per cent drop in that of recreational sailboats.

2009. Analysis of marine incident fatalities from 2001 to 2008 indicated that none were related to extreme weather conditions.

Of the 14 fatal marine incidents that took place in 2009, five were categorised as person overboard incidents (leading to 8 deaths), five as capsizing incidents (6 deaths), and one each categorised as a grounding (1 death), loss of a ship (3 deaths), collision between ships (1 death) and an other incident (1 death).

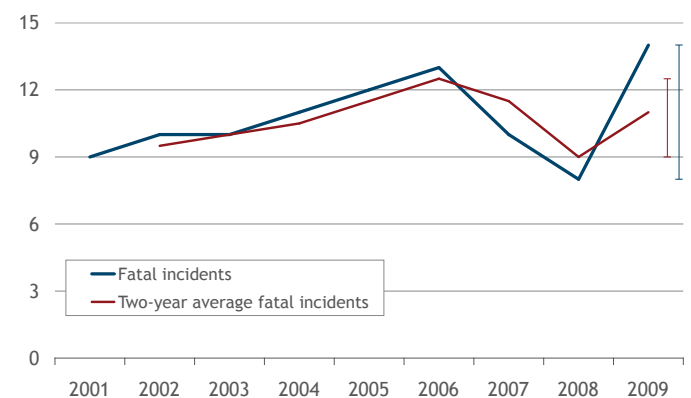
Seven of the incidents (11 deaths) involved a recreational vessel, six incidents (leading to 9 deaths)

Fatal incident trends

Historically there has been a good deal of year-to-year variation in the annual count of fatal marine incidents (see **Figure 4**).

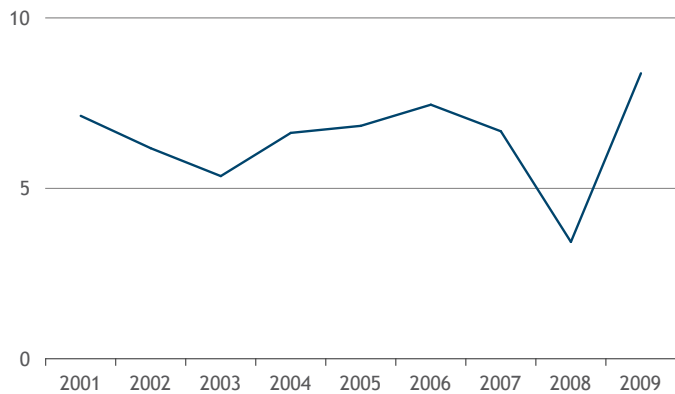
Analysis of these over-time data indicated that whatever forces combined to produce a higher than normal number

Figure 4 Fatal marine incidents—annual toll v. two-year average



Sources: CASEMAN, marine incident case management database; TRAILS, recreational registration and licensing database; CIRMS, commercial vessel registration database.

Figure 5 Fatal marine incidents per 100 000 registered vessels



Sources: CASEMAN, marine incident case management database; TRAILS, recreational registration and licensing database; CIRMS, commercial vessel registration database.

a 31 and 34 per cent decline on the previous year and prior four-year average, respectively.

Among the 25 individuals who were seriously injured, 11 (44%) were on a recreational motorboat and 7 (28%) were on a personal watercraft.

Incident characteristics

In line with previous years, the vast majority of 2009's marine incidents took place in favourable boating conditions: namely, 81 per cent took place in fair or good visibility, 67 per cent in clear weather and 55 per cent in smooth waters.

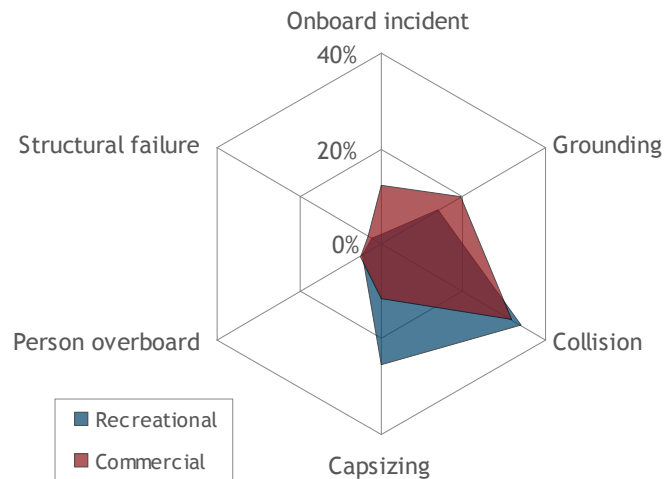
These findings are corroborated by investigation

of the contributing factors assigned to 2009's marine incidents. This analysis determined that environmental factors represented just 29 per cent of the contributing factors identified, compared with 54 per cent for human factors—typically navigational or operational error, inattention or insufficient planning.

For the year, a collision (30%) was the most commonly occurring type of incident, followed by capsizing (19%), grounding (18%), onboard incident (8%) and person overboard (5%) (see Figure 6).

The breakdown of incidents by type of incident was roughly comparable to that for previous years, with the

Figure 6 Marine incidents by category



Source: Caseman, marine incident case management database, 2009

key exception of the number of capsizing incidents where the state recorded a five percentage point gain.

As evidenced in past reports, the consequences of capsizing and person overboard incidents were again disproportionate and severe.

The 187 capsizing and person overboard incidents (amounting to 24% of the incidents) resulted in 14 fatal injuries (70% of the fatalities) and 4 serious injuries (16% of the serious injuries). In sum, one in twenty capsizing and person overboard incidents ended as a fatal incident.

Inattention or operator error was deemed to be a contributing factor in just under a third of the capsizing and person overboard incidents.

Other prominent types of marine incidents were not nearly as consequential in terms of their outcomes: 372 collision and grounding incidents (49% of all incidents) led to 2 fatal injuries (10% of fatalities) and 4 serious injuries (16% of serious injuries). That is, less than one per cent of collisions and groundings ended as a fatal incident.

Fatalities analysis

In 2009, 20 people died in 14 marine incidents. On an annual basis, it was the highest fatality toll recorded in Queensland.

The objective of this analysis is to shed light on the fatal marine incidents that occurred in 2009, identify discernible patterns and determine what can be done to prevent similar incidents in the future.

This analysis drew on a variety of sources of information. Queensland Police Service,

Maritime Safety Queensland or both, investigate fatal marine incidents in Queensland waters. The final reports from those investigations, along with original marine incident reports, coronial reports, incident scene and vessel inspection reports, toxicology and forensic reports, and witness statements, were examined where available.

For comparative purposes, fatal marine incidents that occurred between 2005 and 2008 were also reviewed.

Overview

Seven passengers and seven crew members (including two at the helm) died in marine incidents in 2009. Six people died in their capacity as master of the vessel.

Fishing, or being on a fishing trip, was by far the most common activity at the time of the incident with twelve fatalities (60%). While four of those involved a commercial fishing operation, just two occurred while actually fishing. Other activities at the time of the incident were motoring (2 deaths), sailing (2), white-water rafting (2), cruising

(1) and disembarking a vessel (1).

Of the 14 fatal incidents that occurred in 2009, 31 persons ended up in the water, and of those, 19 died. Only 11 of the 31 were wearing a **personal flotation device** (PFD) at the time of the incident, 8 of whom were on a commercial white-water rafting tour that required PFD use. Three-quarters (15 of 20) of those not wearing flotation devices were either fishing or on a fishing trip.

Drowning was the most common cause of death with all but four deaths a result of immersion following a marine incident.

Contributing factors

Analysis indicated that there was only one fatal marine incident in 2009 that could be deemed a ‘mishap’, defined here as an unforeseeable and unintended event. In all other instances, the incident might have been foreseen, and some combination of contributing factors was identified.

In all but one case, human contributing factors played a primary role in accounting for how the events unfolded. Typically the role of material and environmental contributing factors, where identified at all, was secondary or worked in interaction with human factors (for example, when a human error was made in the assessment of risk associated with imminent extreme weather or sea conditions).

The **operator’s inexperience** (i) in boating generally, (ii) with the specific conditions encountered or (iii) with the particular vessel operated at the time of the incident played a contributory role in five incidents that led to seven deaths. In each case, the operator’s inexperience led to some miscalculation or oversight that, in turn, played a significant contributory role in the incident.

The **consumption of alcohol and/or illegal drugs** was involved in six deaths in four separate marine incidents. In three incidents this determination was made on the basis of toxicology reports, employing 0.05 blood alcohol content and the simple presence of illegal drugs as the benchmark. In the fourth incident, alcohol involvement was inferred from witness statements because the deceased were never recovered.

A high level of alcohol/drug involvement was not peculiar to 2009. Review of fatal marine incidents from 2005 to 2008 indicated that there were 43 fatal marine incidents and 13 (30%) of them involved alcohol and/or illegal drug use.

Over the last five years, a total of 23

people died in marine incidents where alcohol and/or illegal drug use were involved.

Error in judgement was a contributing factor in 10 fatal incidents, which resulted in the deaths of 16 people. Three of these incidents (5 deaths) involved alcohol and/or illegal drugs.

Four of these incidents (8 deaths) involved an error in judgement regarding the **sea state** and **weather conditions**. These incidents all occurred during fishing trips, including one which involved a commercial fishing vessel.

Failure to keep a proper lookout played a contributing role in two separate, single fatality incidents. These incidents occurred in darkness or near darkness.

Excessive speed was an important, although not the sole, contributing factor in one fatality.

There were no other discernible patterns in regards to the contributing factors in the fatal marine incidents that occurred in 2009.

Lessons learnt

Could any of these incidents or fatalities have been averted?

Safety equipment. There was a striking contrast in outcomes for those using and not using personal flotation devices at the time of incident. As noted earlier, of the 14 fatal incidents in 2009, 31 persons ended up in the water. Among those 31 people, 8 of 11 PFD users survived (73%), whereas 4 of 20 non-users survived (20%). Moreover, in those cases where alcohol was involved, just 1 of 7 non-PFD users survived (14%).

That is not to say that the 16 people not using PFDs would have survived had flotation devices been worn. Autopsy reports indicated that ‘drowning’ was not the cause of death in two cases. In another three instances, it would have been highly unusual for a PFD to have been worn given the nature of the activity engaged in at the time.

In total, this investigation revealed that the likelihood of survival would have been increased (perhaps significantly) for eight persons had they been wearing a PFD.

A follow-up analysis of the prior four years of fatal incidents involving persons in the water produced similar results. In these incidents, the survival rates for persons who wore and did not wear PFDs were 71 per cent and 29 per cent, respectively.

For this period it was concluded that

a properly fitted PFD would have considerably improved the likelihood of survival for 28 people who perished in the water as the result of a marine incident.

Alcohol use might be considered more hazardous on the water than in a road environment since it would not only increase the likelihood of a person inadvertently entering the water—say through a person overboard incident—but once there, reduce the odds of survival.

Operator inexperience. The combination of operator inexperience and sea state played an important contributory role in the deaths of six people in three incidents. Courses in safety and sea survival that cover topics such as predicting, preparing for and dealing with extreme weather might be invaluable for inexperienced operators who go offshore.

Safety management plans. A recurring theme in this review of 2009’s fatal incidents was that the person operating the vessel failed to effectively identify or react promptly to a hazard, or take corrective steps to avoid or minimize its impact.

Examination of the use of **safety equipment** underscored this point. Of the five fatal incidents where we might have expected an EPIRB to have been activated (namely, a capsized or person overboard incident occurred out to sea), only in two of these was a current (406 MHz) EPIRB activated. In the remaining cases: an out of date 121.5 MHz EPIRB was activated (these are no longer detected by satellite thus delaying the rescue of one person); the vessel was fitted with a 406 MHz EPIRB that was not activated; and the vessel was not fitted with an EPIRB.

In three incidents, it was revealed that PFDs were not worn, despite being available and accompanied by a reasonable expectation of imminent danger.

What these cases have in common was that there appeared to be an absence of, or a lack of adherence to, a safety management plan for dealing with emergencies.