

Marine incidents in Queensland—2009



Tomorrow's Queensland:
strong, green, smart, healthy and fair



Foreword

The report, *Marine incidents in Queensland*, is an important tool for furthering our understanding of emerging marine safety trends and challenges, and circulating the marine safety message to the boating community.

2009 turned out to be a challenging year for marine safety in Queensland.

The year was marred by a record number of marine incident-related fatalities.

Although the number of reported marine incidents was in line with previous years, the incidents were more critical.

By year's end, 20 people had died as the result of a marine incident—12 more than in the previous year of record low fatalities.

One-third of the fatalities were associated with extreme weather events in the first quarter of the year—no such incidents had been recorded the previous year.

Further, just over half the deaths in 2009 occurred in multiple fatality incidents. There were no multiple fatalities in 2008.

These two factors in concert pushed the 2009 fatality toll well above Queensland's annual average.

The 2009 report features an analysis of the year's fatal injuries that is specifically designed to identify any patterns that could be addressed to reduce the toll in the future.

That analysis importantly concludes that only one fatality in 2009 could rightly be deemed a sheer mishap: there was much that was foreseeable and avoidable in the remainder.

Maritime Safety Queensland will continue its work of encouraging and fostering safety as a core value and culture, but of course cannot alone ensure the safety of Queensland's boating community.

A collaborative approach is necessary. The boating community, industry and government must work together to ensure that boating can safely meet Queenslanders' varied needs for maritime transport, commerce, tourism and recreation.

Dave Stewart
Director-General
Department of Transport and Main Roads

Key points

- In 2009, 768 marine incidents were reported in Queensland or put differently, there were 321 marine incidents per 100 000 registered vessels.
- Fifty-one per cent of the vessels involved in marine incidents were being used recreationally, 43 per cent commercially and 6 per cent were used in a hire and drive setting.
- The most commonly occurring types of incident were collisions (30%), capsizing incidents (19%), and groundings (18%).
- Approximately 1 in 20 reported incidents were either a fatal or serious injury incident.
- There were 14 fatal marine incidents in 2009 resulting in 20 deaths: that is, 8.4 fatal injuries for every 100 000 registered vessels.
- The consequences of capsizing and person overboard incidents were disproportionate and severe: 187 capsizing and person overboard incidents led to 14 fatal injuries and 4 serious injuries.
- Alcohol and/or illegal drugs were involved in six deaths in four separate marine incidents.
- Twelve of those who died in 2009 were fishing or were on a fishing trip.
- Of the 14 fatal incidents that occurred in 2009, 31 persons ended up in the water and 19 died.

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.

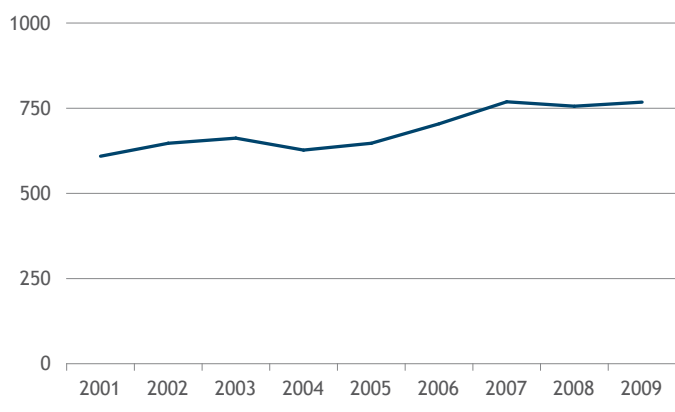
It should be noted that Queensland's marine incident database only captures reported incidents. Despite the mandatory requirement to report a marine incident, many are not reported, particularly those that are less serious in nature and those that occur in remote locations.

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.

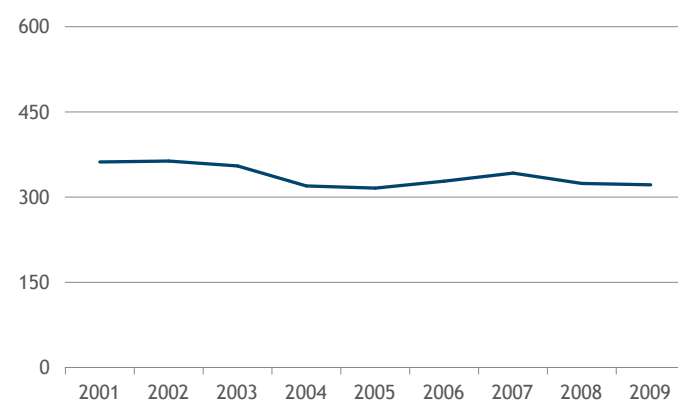
aged 16 or older holds some form of marine driver's licence.

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

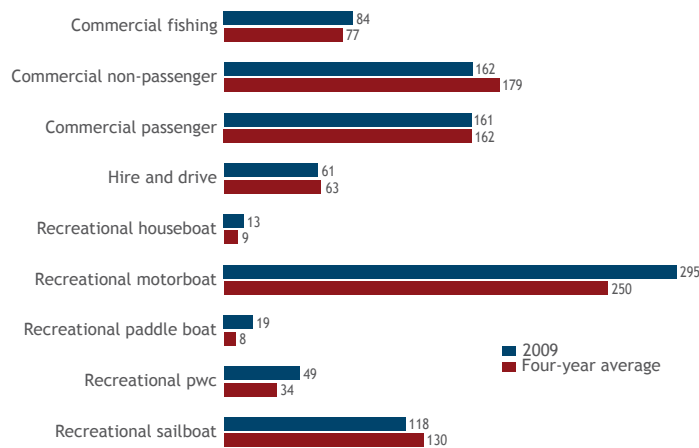
The annual fatality rate increased significantly in 2009, ending a downward trend for this indicator over the preceding three years. Specifically, there were 8.4 fatal injuries for every 100 000 registered vessels last year, compared with the prior four-year average of 6.1 (see Figure 5).

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).

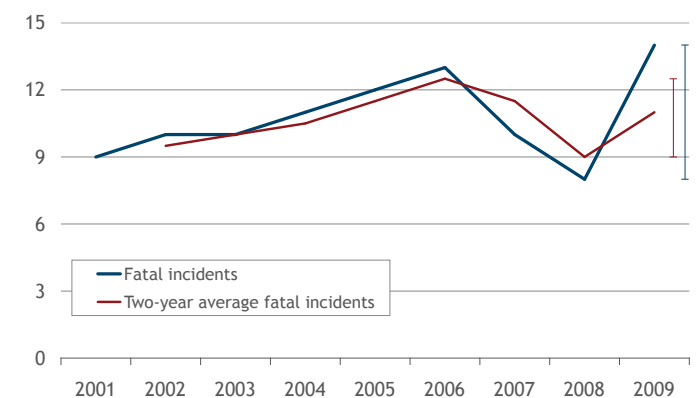
Seven of the incidents (11 deaths) involved a recreational vessel, six incidents (leading to 9 deaths)

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).

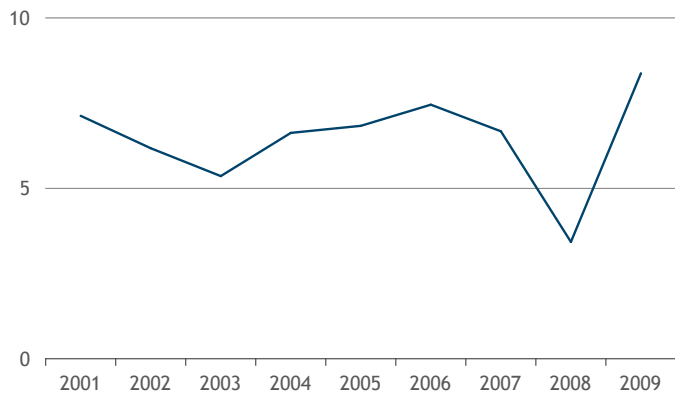
Analysis of these over-time data indicated that whatever forces combined to produce a higher than normal number

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.

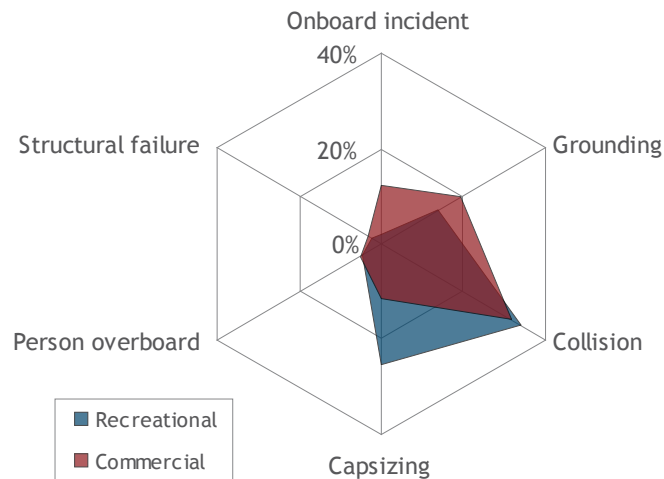
These findings are corroborated by investigation

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.

Maritime region profile

Regional statistics

In all regions across the state, vessel registration growth has eased in the last year. Whereas in recent years the regions have experienced annual growth rates of between three and four per cent, now those rates have fallen below three per cent.

On an annual basis, Gladstone experienced the largest percentage gain in vessel registrations (2.8%) of any region, whereas Brisbane had the largest increase in raw numbers (+2400).

Of the 768 reported incidents in 2009, 33 per cent occurred in Brisbane, 16 per cent both in Gladstone and the Gold Coast, 15 per cent in Mackay, 12 per cent in Cairns and 9 per cent in Townsville.

While Brisbane region had a third of the year's reported marine incidents, it should be noted that it has 39 per cent of the state's registered vessels. It should also be acknowledged that a large share of Brisbane registered vessels are operated on the Gold Coast.

In 2009, Brisbane realised 26.7 marine incidents per 10 000 registered vessels, the lowest incident rate for any region (see Table 1) and well under the state level of 32.1. Three other regions experienced incident rates below the Queensland figure, including Gladstone (28.7), Townsville (29.3) and Gold Coast (31.1).

Although the incident rates for Mackay and Cairns were well above that for the state, both regions experienced marked improvements in 2009 with a 20 and 6 per cent change, respectively.

A number of regions experienced significant increases in the number of fatal incidents in 2009. There were five fatal incidents in Brisbane (leading to 6 deaths), three in Cairns (5 deaths), two in Gladstone (5 deaths), two in the Gold Coast (2 deaths) and one each in Mackay (1 death) and Townsville (1 death).

At the state level, 1 in 20 (5%) of reported marine incidents in 2009 were either a fatal or serious injury incident.

This ratio varies markedly across the regions. In this regard, the leading region in 2009 was Gladstone where 1 in 41 marine incidents were a fatal or serious injury incident (2%), followed by Brisbane with a ratio of 1 in 31 (3%), Mackay 1 in 28 (4%), Gold Coast 1 in 14 (7%), Townsville 1 in 13 (8%) and Cairns 1 in 10 (10%).

Type and location of incident

Thirty per cent of the Gold Coast's 122 incidents involved a collision between ships, well above the Queensland number (19%), and almost twice as many as any other region. Just under half of these took place in the often congested waters of the Gold Coast Broadwater.

A third of Brisbane's 250 marine incidents occurred on the Sunshine Coast, including three fatalities and two serious injuries. Half of the state's person overboard incidents took place in Brisbane region, resulting in the deaths of four people.

Almost a quarter (24%) of Gladstone's 124 marine incidents in 2009 were capsizing incidents, which was the highest level for any region in the state. One of these incidents involving a commercial fishing vessel led to a double fatality.

Three-quarters of Mackay region's 112 incidents took place in the Whitsunday area. Of those, 44 per cent involved a grounding incident and the majority (64%) of them occurred on hire and drive vessels.

Townsville also realised a relatively high number of groundings (30% compared to the state level of 18%), one of which led to a single person fatality.

Cairns recorded 27 capsizing and person overboard incidents for the year (14%), the highest proportion for any region. These types of incidents resulted in five fatalities and two serious injuries in the region.

Vessels in incidents

Of the 122 reported marine incidents in the Gold Coast region from 2009, 54 involved a recreational motorboat and 17 involved a recreational PWC. Whereas recreational motorboats made up 83 per cent of the region's registered vessels, they were involved in 44 per cent of the incidents. PWC were involved in 14 per cent of the region's incidents yet represent 12 per cent of the registrations.

In the Brisbane region, 88 incidents involved a recreational motorboat (35%) and 37 a recreational sailboat (15%). Whereas motorboats were substantially under-represented in incident involvement (they constitute 88% of the region's registered vessels), sailboats were significantly over-represented (4% of the registered vessels).

Last year there was a sharp rise in the involvement of commercial fishing vessels in Gladstone's marine incidents. Fishing vessels were involved in 26 incidents in 2009, compared with 11 in 2008 and an average of 18.8 over the prior four years.

Of the 112 marine incidents in Mackay in 2009, 33 involved a commercial passenger vessel (29%) and 30 involved a hire and drive vessel (27%).

About two-thirds of Townsville's incidents involved a recreational vessel. Recreational motorboats were involved in 38 per cent of incidents, even though they made up 92 per cent of the region's registered vessels. Sailboats were involved in 29 per cent of the incidents but represented just 2 per cent of the registered fleet.

For every year in the last decade, commercially registered vessels were involved in the majority of incidents in Cairns, although the number of incidents where commercial vessels were involved had dropped from a high of 81 per cent in 2000 to a low of 60 per cent in 2009.

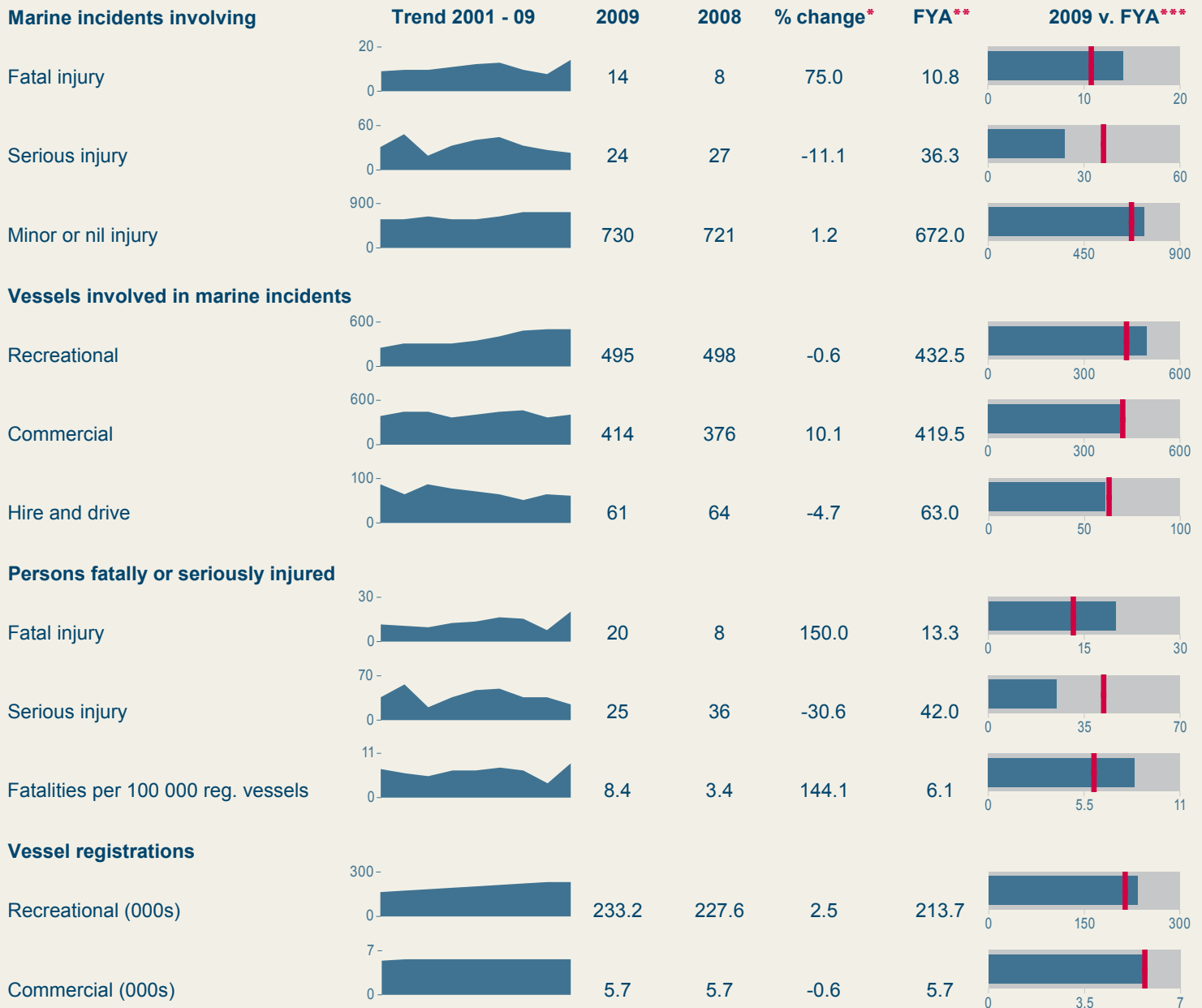
Table 1 Marine incidents by region

	Marine incidents	Incident rate*	Serious injury incidents	Fatal incidents
BN	250	26.7	3	5
CN	94	44.7	6	3
GL	124	28.7	1	2
GC	122	31.1	7	2
MK	112	60.0	3	1
TV	66	29.3	4	1
QLD	768	32.1	24	14

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

*Reported marine incidents per 10 000 registered vessels in the region

Marine incident barometer—2009



Notes

* % change represents the percentage difference between 2008 and 2009

** FYA represents the prior four-year average

*** 2009 data versus the prior four-year average, 2005 to 2008. For example, there were 495 recreational vessels involved in marine incidents in 2009 compared to the prior FYA of 432.5



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