



Transportation  
Safety Board  
of Canada

Bureau de la sécurité  
des transports  
du Canada



## STATISTICAL SUMMARY MARINE TRANSPORTATION OCCURRENCES IN 2019

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# Table of contents

Accidents.....	2
Overview of accidents and casualties .....	2
Shipping accidents .....	3
Incidents .....	8
Overview of incidents.....	8
Data tables.....	9
Definitions.....	16
Marine occurrence.....	16
Marine accident.....	16
Marine incident.....	16
Serious injury .....	17
Vessels covered.....	17
Miscellaneous .....	17
TSB regional offices' areas of responsibility .....	18



# Statistical Summary

## Marine Transportation Occurrences in 2019

The TSB gathers and uses transportation occurrence data during the course of its investigations to analyze safety deficiencies and identify risks in the Canadian marine transportation system.

It should be noted that certain characteristics of the data constrain statistical analysis and identification of emerging trends. These include the small totals of accidents and incidents, the large variability in the data from year to year, and changes to regulations and definitions. The reader is cautioned to keep these limitations in mind when viewing this summary to avoid drawing conclusions that cannot be supported by statistical analysis.

The 2019 data were collected according to the reporting requirements described in the TSB Regulations in force during that calendar year.

The statistics presented here reflect the TSB Marine Safety Information System (MARSIS) database at 19 February 2020. Since the occurrence data are constantly being updated in the live database, the statistics may change slightly over time.

Also, as many occurrences are not formally investigated, information recorded on some occurrences may not have been verified.

# Accidents

## Overview of accidents and casualties

In 2019, 267 marine accidents<sup>1</sup> were reported to the TSB, down from the 2018 total of 289 and below the 10-year (2009–2018) average of 298 (Figure 1). In 2019 the proportion of shipping accidents (as opposed to accidents aboard ship) was 78% of marine accidents, below the previous 10-year average of 83%.

There were 207 shipping accidents in 2019, down from the 2018 total of 232 and down 16% from the 2009–2018 average of 247. The majority of shipping accidents involved fishing vessels (29%), followed by solid-cargo vessels (27%).

Figure 1. Shipping accidents and accidents aboard ship, 2009 to 2019



In 2019, there were 60 accidents aboard ship, up from 57 in 2018 and up from the 2009–2018 average of 51. The majority of accidents aboard ship occurred on cargo vessels (38%) and fishing vessels (37%).

## Casualties (tables 1, 6 and 7)

In 2019, 17 marine fatalities were reported, down from the 22 fatalities reported in 2018, but above the annual average of 15.2 in the 2009–2018 time period. Of these 17 fatalities, 4 were the result of 3 shipping accidents, while the remaining 13 fatalities resulted from 10 accidents aboard ship (Figure 2).

Of note, none of the 4 shipping accident fatalities in 2019 involved a commercial fishing vessel, although 8 of the 13 fatalities that ensued from accidents aboard ship did occur aboard commercial fishing vessels.

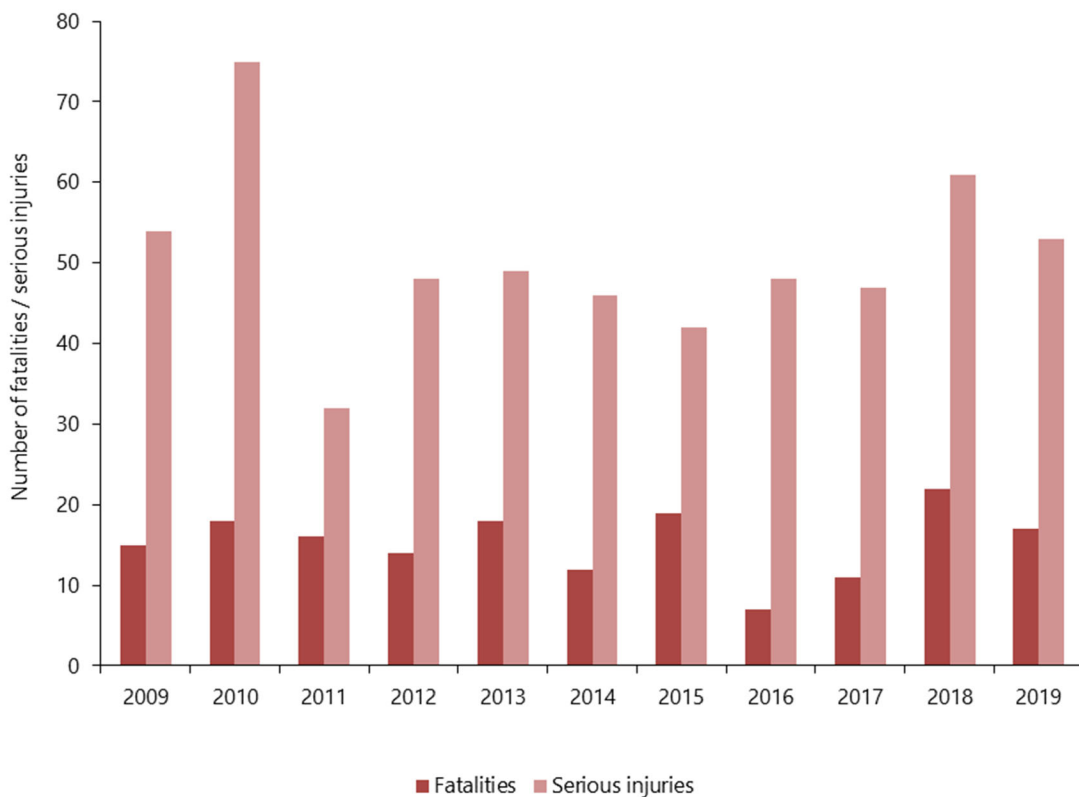
<sup>1</sup> See the Definitions section.

The total of 8 fishing vessel fatalities in 2019 was below the annual average of 10.2 in the 2009–2018 time period.

However, 3 additional fishing-related fatalities resulted from two shipping accidents, and 1 additional fishing-related fatality resulted from an accident aboard ship (the 3 accidents involved vessels that were not commercial fishing vessels). Therefore, 12 of the 17 marine fatalities in 2019 were fishing-related. The data indicate that more needs to be done to improve safety in the commercial fishing industry.

Serious injuries in 2019 totalled 53, down from 61 in 2018 and similar to the annual average of 50 from 2009 to 2018. Forty-three of the 53 serious injuries (81%) resulted from accidents aboard ship, and the remaining 10 resulted from shipping accidents.

**Figure 2. Marine fatalities and serious injuries, 2009 to 2019**

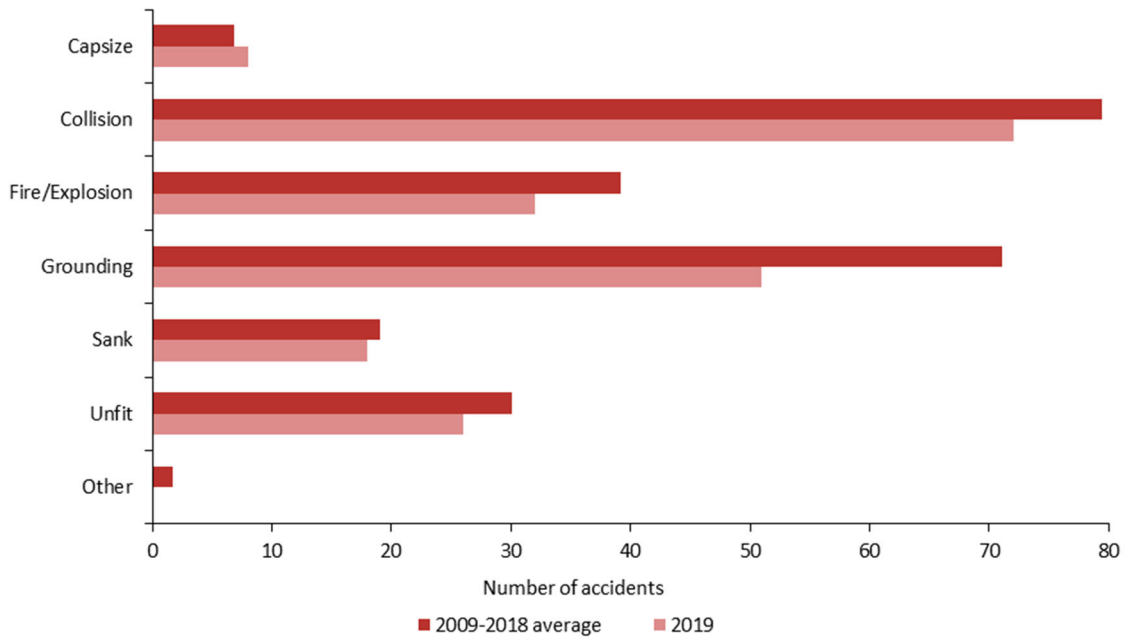


## Shipping accidents

### Type of accident (Table 1)

As illustrated in Figure 3, the most frequent types of shipping accidents in 2019 were collision (35%), grounding (25%), and fire/explosion (15%). The total number of collisions (72) was 9% less than the 10-year (2009–2018) average of 79, the number of groundings (51) was 28% below the 10-year average of 71, and the number of fire/explosion accidents (32) was 18% below the 10-year average of 39.

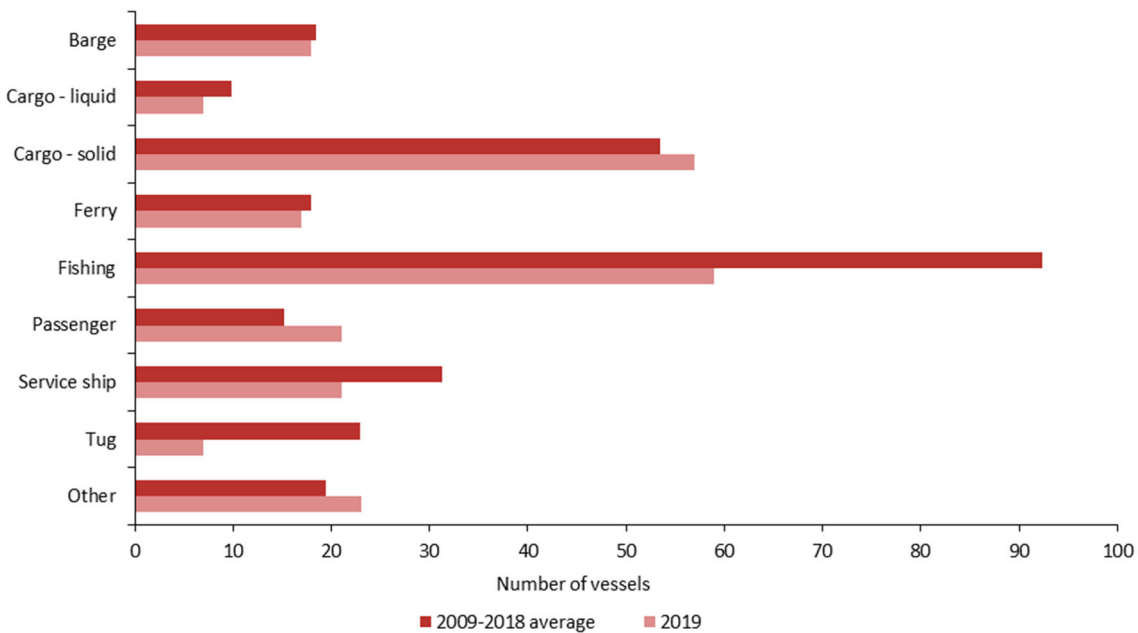
Figure 3. Shipping accidents, by accident type, 2009–2018 average and 2019



#### Type of vessel (Table 1)

Fifty-nine fishing vessels were involved in shipping accidents, down from 74 in 2018, and down from the 2009–2018 average of 92 (Figure 4). Fishing vessels represented slightly over one-quarter (26%) of all vessels involved in shipping accidents.

Figure 4. Shipping accidents, by vessel type, 2009–2018 average and 2019



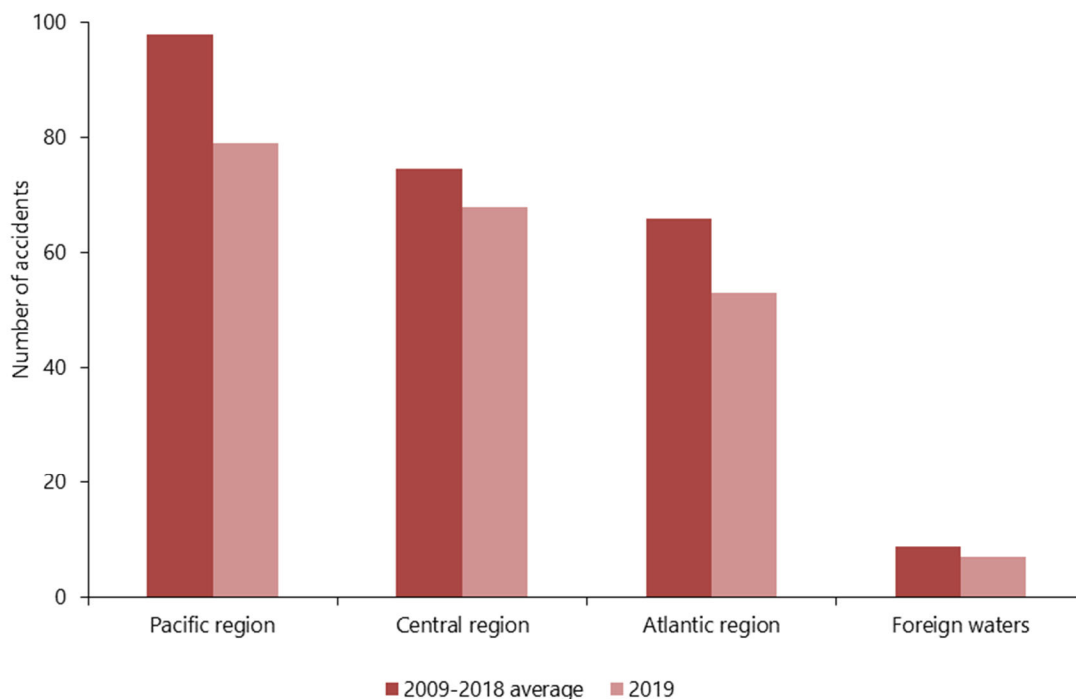


## Geographical region (Table 2)

In 2019, 38% of shipping accidents occurred in the Pacific region, 33% in the Central region, and 26% in the Atlantic region. The remaining 3% of shipping accidents were in foreign waters.<sup>2</sup> In the Pacific region in 2019, shipping accidents were 19% below the 2009–2018 average, in the Central region shipping accidents were 9% below the 2009–2018 average, and in the Atlantic region shipping accidents were 20% below the 2009–2018 average (Figure 5).

Thirty-five fishing vessels were involved in shipping accidents in the Atlantic region, which is below the 2009–2018 average of 47 fishing vessels. Twenty-three fishing vessels were involved in shipping accidents in the Pacific region, below the 2009–2018 average of 36 fishing vessels (Table 2).

Figure 5. Shipping accidents, by geographical region, 2009–2018 average and 2019



## Vessel flag (tables 1, 3, and 4)

In 2019, 79% of the 230 vessels involved in shipping accidents reported to the TSB were Canadian-flag vessels. Of these Canadian-flag vessels, 49% were commercial non-fishing vessels and 35% were fishing vessels; the remaining 16% were non-commercial vessels, pleasure craft or service vessels.

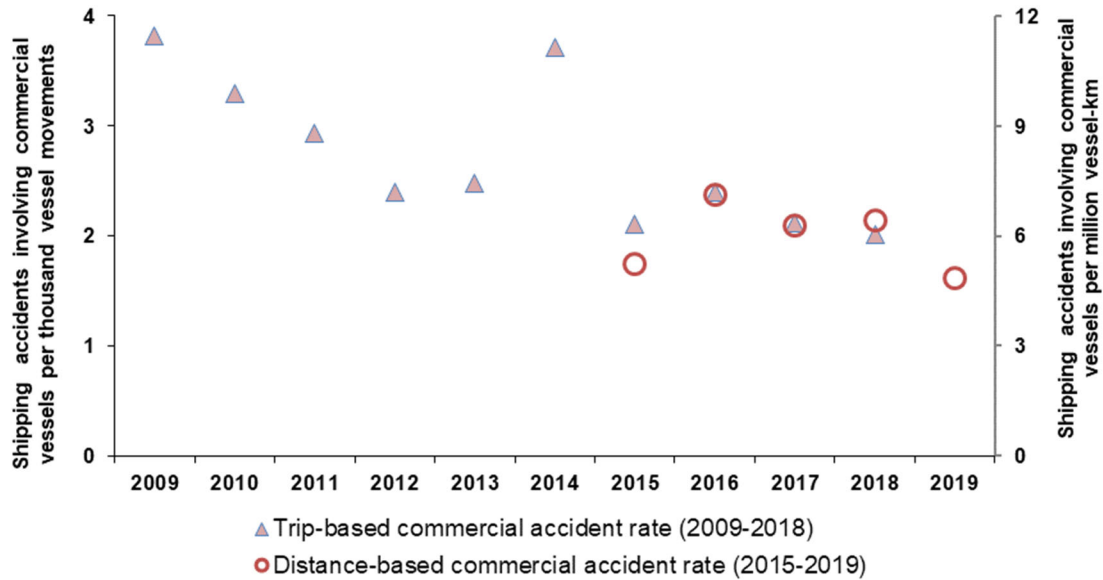
According to information provided by Transport Canada, marine activity for Canadian commercial non-fishing vessels over 15 gross tons (GT) (excluding passenger vessels and cruise ships) was 14 185 thousand commercial vessel-km in 2019, which is 12% above the 2015–2018 average.<sup>3</sup> This yields a rate of

<sup>2</sup> See the Definitions section.

<sup>3</sup> Transport Canada has updated its methodology for measuring commercial activity. Beginning from 2015, TC combines terrestrial automatic identification system (AIS) data from the Canadian Coast Guard and satellite AIS

4.9 shipping accidents per million commercial vessel-km in 2019, lower than the prior 4-year average of 6.3. (Note that a 5-year series is too short to test for trends.)

Figure 6. Shipping accident rates for Canadian-flag commercial non-fishing vessels, 2009 to 2019



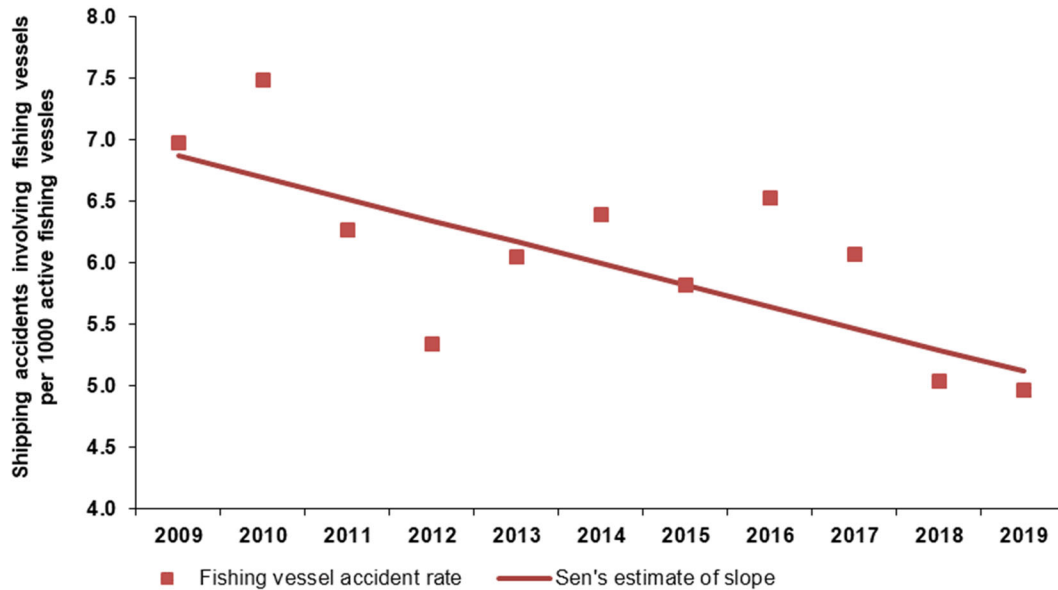
According to the Department of Fisheries and Oceans (DFO), there were an estimated 12 102 active fishing vessels in Canada in 2019. The shipping accident rate for Canadian fishing vessels (Figure 7) was 5.0 shipping accidents per 1000 active fishing vessels in 2019, which is essentially unchanged from 2018. The 2019 rate is 20% below the prior 10-year average.

Kendall's tau-b correlation and Sen's estimate of slope were used to quantify the trend in the fishing vessel accident rate shown in Figure 7. Kendall's tau-b ( $\tau_b$ ) correlation coefficient is a nonparametric measure of the strength and direction of association that exists between two variables. Kendall's  $\tau_b$  was calculated on the 11-year series of accident rate values by year from 2009 to 2019. There was a moderately strong, negative correlation that indicates a downward trend in the Canadian fishing vessel shipping accident rate over the period ( $\tau_b = 0.491$ ,  $p = 0.036$ ). Sen's estimate of slope, the amount of downward rate change per year, was  $-0.175$  accidents per thousand Canadian-flag fishing vessels.

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data from the Government of Canada Satellite AIS provider, to yield a comprehensive and detailed distance-based metric of commercial marine activity in Canadian waters. However, vessel movements are no longer captured.

Figure 7. Shipping accident rate for Canadian-flag fishing vessels, 2009 to 2019



For Canadian-flag fishing vessels, the most frequently reported shipping accident types in 2019 were groundings (46%), fire/explosions (18%), collisions (12%), and sinkings (12%). Canadian-flag commercial non-fishing vessels were most often involved in collisions (51%), fire/explosion accidents (16%), or groundings (16%).

In 2019, 49 foreign-flag vessels were involved in shipping accidents in Canadian waters, 45 of which were commercial non-fishing vessels. According to information provided by Transport Canada, marine activity for foreign commercial non-fishing vessels was 20 465 commercial vessel-km in 2019, above the 2015–2018 average of 19 071 thousand vessel-km. This yields an accident rate of 2.0 shipping accidents involving commercial foreign-flag vessels per million commercial vessel-km, above the 2015-2018 average of 1.6.

**Vessels lost (tables 1 and 5)**

In 2019, 8 vessels were reported lost, down from 14 in 2018 and down from the 2009–2018 average of 20. Five of the 8 vessels lost in 2019 were fishing vessels. Six of the 8 vessels lost were less than 15 GT. In the past 10 years (2010 to 2019), fishing vessels under 60 GT have accounted for more than two thirds of Canadian vessels lost (tables 1 and 5).

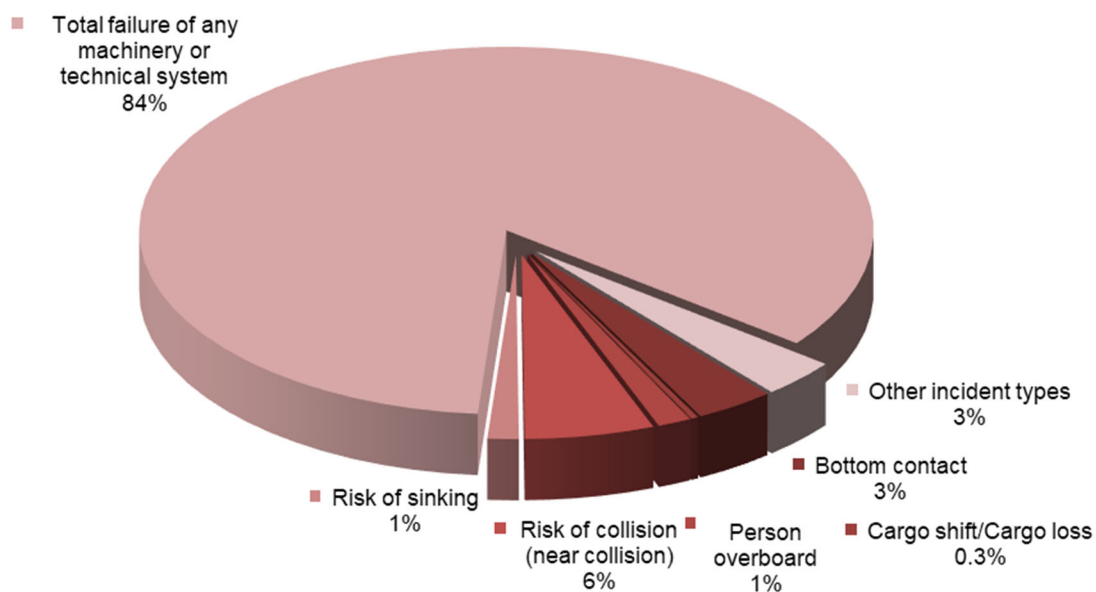
# Incidents

## Overview of incidents

In 2019, 947 marine incidents were reported to the TSB, comparable to the total of 931 in 2018, and above the annual 10-year (2009–2018) average of 573.<sup>4</sup> Incidents in the Atlantic region represented 44% of all marine incidents, followed by 30% in the Central region, and 25% in the Pacific region. The remaining 2% of reported incidents occurred in foreign waters (Table 2).

The majority (84%) of reportable incidents involved the total failure of any machinery or technical system (Figure 8).<sup>5</sup> The largest proportion of these incidents (47%) occurred in the Atlantic region, while the greatest proportion of incidents involving risk of collision (45%) occurred in the Central region (data not shown). The types of vessel most often involved in total failure of any machinery or technical systems incidents in 2019 were fishing vessels (54%) and solid-cargo vessels (23%) (data not shown).

Figure 8. Marine incidents, by type, 2019



<sup>4</sup> In 2014, the TSB issued new regulations that changed reporting requirements for some types of incidents, leading to an increase in incidents since that time.

<sup>5</sup> The 2014 changes in reporting requirements applied to those involving a total failure of any machinery or technical system, leading to an increase in incidents of this category since then.

# Data tables

Table 1. Marine occurrences, by types, vessels, and losses involved, 2009 to 2019

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
<b>Accidents</b>	<b>358</b>	<b>336</b>	<b>295</b>	<b>268</b>	<b>299</b>	<b>301</b>	<b>248</b>	<b>307</b>	<b>279</b>	<b>289</b>	<b>267</b>
Shipping accidents by type	301	273	254	216	238	249	213	264	233	232	207
Capsize	9	8	2	6	8	3	10	7	5	10	8
Collision	81	64	87	78	79	88	57	89	89	82	72
Fire/Explosion	50	53	50	34	31	29	33	44	33	35	32
Grounding	110	102	73	69	62	61	59	65	52	58	51
Sank	20	20	10	10	14	26	16	26	22	26	18
Sustains damage render unseaworthy / unfit for purpose	29	24	28	16	43	41	36	32	31	21	26
Other shipping accident types	2	2	4	3	1	1	2	1	1	0	0
Accidents aboard ship	57	63	41	52	61	52	35	43	46	57	60
<b>Vessels involved in shipping accidents by type of vessel</b>	<b>337</b>	<b>295</b>	<b>294</b>	<b>241</b>	<b>275</b>	<b>281</b>	<b>240</b>	<b>310</b>	<b>268</b>	<b>267</b>	<b>230</b>
Barge	28	17	20	6	19	12	10	24	20	29	18
Cargo - liquid	11	12	10	6	7	14	12	7	10	9	7
Cargo - solid	63	61	57	63	60	68	37	40	39	47	57
Ferry	26	19	23	18	13	20	18	20	12	10	17
Fishing	117	111	99	82	88	92	81	91	88	74	59
Passenger	17	14	16	15	15	13	17	15	15	15	21
Service ship	38	29	25	20	36	21	29	50	38	27	21
Tug	19	18	24	26	25	22	19	26	25	25	7
Other vessel types	18	14	20	5	12	19	17	37	21	31	23
<b>Vessels involved in shipping accidents by vessel flag</b>	<b>337</b>	<b>295</b>	<b>294</b>	<b>241</b>	<b>275</b>	<b>281</b>	<b>240</b>	<b>310</b>	<b>268</b>	<b>267</b>	<b>230</b>
Canadian non-fishing vessels	166	137	152	111	147	144	127	184	148	157	124
Canadian fishing vessels	114	109	95	78	86	92	80	90	84	69	57
Foreign vessels	57	49	47	52	42	45	33	36	36	41	49
<b>Vessels lost by gross tonnage</b>	<b>26</b>	<b>27</b>	<b>22</b>	<b>23</b>	<b>20</b>	<b>20</b>	<b>23</b>	<b>17</b>	<b>12</b>	<b>14</b>	<b>8</b>
1600 gross tons and over	3	0	0	0	0	0	0	0	0	1	0
150 to 1599 gross tons	0	0	0	1	1	1	2	1	0	0	0
60 to 149 gross tons	4	4	2	3	4	4	6	4	2	4	1
15 to 59 gross tons	6	10	9	8	6	4	6	2	2	2	1
Less than 15 gross tons	7	8	10	9	6	8	8	6	5	6	6
Unknown tonnage	6	5	1	2	3	3	1	4	3	1	0
<b>Fatalities</b>	<b>15</b>	<b>18</b>	<b>16</b>	<b>14</b>	<b>18</b>	<b>12</b>	<b>19</b>	<b>7</b>	<b>11</b>	<b>22</b>	<b>17</b>
Shipping accidents	7	11	3	5	10	4	13	6	4	14	4
Accidents aboard ship	8	7	13	9	8	8	6	1	7	8	13
<b>Serious injuries</b>	<b>54</b>	<b>75</b>	<b>32</b>	<b>48</b>	<b>49</b>	<b>46</b>	<b>42</b>	<b>48</b>	<b>47</b>	<b>61</b>	<b>53</b>
Shipping accidents	5	5	2	6	0	1	12	5	7	8	10
Accidents aboard ship	49	70	30	42	49	45	30	43	40	53	43
<b>Occurrences with a dangerous good release*</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>7</b>	<b>7</b>	<b>8</b>	<b>2</b>
<b>Reportable incidents by type</b>	<b>249</b>	<b>224</b>	<b>216</b>	<b>270</b>	<b>734</b>	<b>747</b>	<b>707</b>	<b>768</b>	<b>885</b>	<b>931</b>	<b>947</b>
Bottom contact	14	13	14	21	19	24	36	24	42	35	33
Cargo shift/Cargo loss	6	3	2	5	2	1	4	4	6	7	3
Person overboard	7	9	4	5	10	7	13	10	10	11	14
Risk of collision (near collision)	28	33	38	37	63	35	31	45	52	67	54
Risk of sinking	33	24	24	25	26	0	10	20	15	34	13
Total failure of any machinery or technical system**	150	135	120	156	603	676	589	637	719	732	798
Other incident types	11	7	14	21	11	4	24	28	41	45	32

Data extracted 19 February 2020

New TSB regulations came into effect on 1 July 2014, changing some reporting requirements.

\* Under new reporting requirements the release of dangerous goods has been harmonized with Part 8 of the Transportation of Dangerous Goods Regulations. Detailed data was not collected prior to 1 July 2014.

\*\* New regulations clarify the reporting requirements for a total failure of any machinery or technical system.

Table 2. Details of occurrences, losses and vessels involved, by region, 2009 to 2019

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
<b>Pacific region</b>											
Shipping accidents	106	87	88	76	88	95	90	138	111	101	79
Accidents aboard ship	22	15	11	18	21	23	13	19	8	12	15
Vessels involved in shipping accidents	120	94	103	87	107	108	106	164	130	119	90
Barge/Tug	26	19	25	18	28	23	23	39	34	37	16
Cargo / Tanker	13	5	5	12	8	15	6	14	9	8	13
Ferry/Passenger	15	8	13	10	10	10	15	17	12	13	16
Fishing	44	43	38	29	30	36	33	43	35	30	23
Other vessel types	22	19	22	18	31	24	29	51	40	31	22
Vessels lost	8	6	3	6	3	9	12	9	9	3	2
Fatalities	6	6	6	4	2	5	12	0	6	7	8
Reportable incidents	115	113	102	118	150	149	260	290	283	253	233
<b>Central region</b>											
Shipping accidents	105	98	81	74	73	74	64	56	59	63	68
Accidents aboard ship	18	31	16	19	25	17	10	11	16	21	19
Vessels involved in shipping accidents	119	106	95	79	85	85	71	65	66	71	75
Barge/Tug	17	11	12	9	14	8	6	9	7	8	7
Cargo / Tanker	52	55	46	46	40	55	35	24	26	35	38
Ferry/Passenger	11	18	14	14	13	14	13	9	11	10	17
Fishing	17	10	11	6	7	3	6	5	14	8	1
Other vessel types	22	12	12	4	11	5	11	18	8	10	12
Vessels lost	5	2	2	1	4	2	2	1	0	2	0
Fatalities	3	3	1	3	5	2	2	0	3	1	3
Reportable incidents	82	67	74	107	149	137	116	126	203	274	284
<b>Atlantic region</b>											
Shipping accidents	86	79	78	56	62	72	54	63	57	53	53
Accidents aboard ship	16	13	14	14	12	12	12	13	18	22	22
Vessels involved in shipping accidents	94	85	88	64	67	80	57	72	64	61	58
Barge/Tug	4	4	6	5	2	3	0	1	1	5	2
Cargo / Tanker	6	5	11	3	6	6	2	3	11	4	6
Ferry/Passenger	17	7	12	9	4	9	7	9	4	2	5
Fishing	56	58	50	45	49	52	42	43	38	34	35
Other vessel types	11	11	9	2	6	10	6	16	10	16	10
Vessels lost	12	18	17	15	12	9	9	7	3	9	6
Fatalities	6	8	9	6	11	5	5	7	2	13	6
Reportable incidents	44	38	36	40	429	450	319	338	385	392	412
<b>Foreign waters</b>											
Shipping accidents	4	9	7	10	15	8	5	7	6	15	7
Accidents aboard ship	1	4	0	1	3	0	0	0	4	2	4
Vessels involved in shipping accidents	4	10	8	11	16	8	6	9	8	16	7
Barge/Tug	0	1	1	0	0	0	0	1	3	4	0
Cargo / Tanker	3	8	5	8	13	6	6	6	3	9	7
Ferry/Passenger	0	0	0	0	1	0	0	0	0	0	0
Fishing	0	0	0	2	2	1	0	0	1	2	0
Other vessel types	1	1	2	1	0	1	0	2	1	1	0
Vessels lost	1	1	0	1	1	0	0	0	0	0	0
Fatalities	0	1	0	1	0	0	0	0	0	1	0
Reportable incidents	8	6	4	5	6	11	12	14	14	12	18

Data extracted 19 February 2020

New TSB regulations came into effect on 1 July 2014, changing some reporting requirements.

**Table 3. Canadian-flag vessels involved in shipping accidents, by vessel category and type of accident (including commercial accident rates), 2009 to 2019**

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
<b>Canadian-flag vessels involved</b>	<b>280</b>	<b>246</b>	<b>246</b>	<b>189</b>	<b>230</b>	<b>225</b>	<b>192</b>	<b>242</b>	<b>210</b>	<b>194</b>	<b>163</b>
Commercial vessels	113	98	109	88	101	107	83	100	90	100	80
Capsize	4	5	1	2	0	0	3	2	1	2	1
Collision	41	34	55	45	45	53	34	48	44	49	41
Fire/Explosion	12	13	18	9	12	12	11	14	7	14	13
Grounding	34	31	17	22	28	16	14	21	19	16	13
Sank	12	5	3	1	3	6	10	5	5	5	3
Sustains damage render unseaworthy/unfit for purpose	10	10	15	9	13	20	11	10	14	14	9
Other shipping accident types	0	0	0	0	0	0	0	0	0	0	0
Commercial movements (a)	24 871	25 539	28 269	28 800	29 000	23 185	30 956	35 478	38 366	43 353	n/a
Commercial accident rate (b)	3.8	3.3	2.9	2.4	2.5	3.7	2.1	2.4	2.1	2.0	n/a
Commercial vessel-km (thousands) (c)	n/a	n/a	n/a	n/a	n/a	n/a	12 403	11 955	12 905	13 569	14 185
Commercial accidents per million vessel-km (d)	n/a	n/a	n/a	n/a	n/a	n/a	5.2	7.1	6.3	6.4	4.9
Fishing vessels	114	109	95	78	86	91	78	88	80	67	57
Capsize	3	1	1	3	6	1	5	3	2	4	1
Collision	14	10	16	12	12	15	4	12	19	12	7
Fire/Explosion	27	28	24	19	12	9	14	16	15	6	10
Grounding	56	50	43	33	30	32	33	31	27	33	26
Sank	6	14	6	9	9	19	9	16	8	8	7
Sustains damage render unseaworthy/unfit for purpose	7	4	1	0	16	14	11	9	8	4	6
Other shipping accident types	1	2	4	2	1	1	2	1	1	0	0
Active fishing vessels (e)	15 050	14 167	14 217	13 871	13 719	13 623	13 242	13 478	13 196	13 114	12 102
Fishing vessel accident rate (f)	7.0	7.5	6.3	5.3	6.1	6.4	5.8	6.5	6.1	5.0	5.0
Other vessels	53	39	42	23	43	27	31	54	40	27	26
Capsize	2	2	0	1	1	0	1	1	1	1	1
Collision	25	20	24	10	24	14	15	25	24	14	12
Fire/Explosion	7	6	6	4	3	7	3	14	4	10	2
Grounding	15	8	7	5	10	3	8	7	2	1	3
Sank	2	1	1	0	2	1	0	3	6	1	5
Sustains damage render unseaworthy/unfit for purpose	1	2	4	3	3	2	4	4	3	0	3
Other shipping accident types	1	0	0	0	0	0	0	0	0	0	0

Data extracted 19 February 2020

a Vessel movement data from Transport Canada (TC).

b The commercial accident rate is the number of shipping accidents involving Canadian-flag commercial vessels of 15 gross tons or more (excluding passenger vessels and fishing vessels) per 1 000 vessel movements (to 2018).

c Based on data from TC, who has updated its methodology for measuring commercial activity. Beginning from 2015, TC combines terrestrial automatic identification system (AIS) data from the Canadian Coast Guard and satellite AIS data from the Government of Canada Satellite AIS provider to calculate a distance-based metric of Canadian-flag commercial marine activity in Canadian waters. Vessel movements are no longer captured.

d The commercial accident rate is the number of shipping accidents involving Canadian-flag commercial vessels of 15 gross tons or more (excluding passenger vessels and fishing vessels) per million vessel-kilometres.

e Active fishing vessels are commercial fishing vessels landing a catch (Source: DFO).

f The fishing vessel accident rate is the number of shipping accidents involving Canadian-flag commercial fishing vessels of 15 gross tons or more per 1 000 active fishing vessels.

**Table 4. Foreign-flag vessels involved in shipping accidents, by vessel category and type of accident (including commercial accident rates), 2009 to 2019**

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
<b>Foreign-flag vessels involved</b>	<b>57</b>	<b>49</b>	<b>47</b>	<b>52</b>	<b>42</b>	<b>45</b>	<b>33</b>	<b>36</b>	<b>36</b>	<b>41</b>	<b>49</b>
Commercial vessels	51	43	40	46	38	41	30	32	31	31	45
Capsize	0	0	0	0	0	0	0	0	0	0	0
Collision	26	17	23	28	19	29	11	17	19	23	25
Fire/Explosion	3	5	3	3	5	0	5	0	3	3	6
Grounding	8	13	6	10	2	7	4	8	3	2	6
Sank	0	0	0	0	1	0	0	1	0	0	0
Sustains damage render unseaworthy/ unfit for purpose	14	8	8	5	11	5	10	6	6	3	8
Other shipping accident types	0	0	0	0	0	0	0	0	0	0	0
Commercial movements (a)	23 720	26 029	25 669	26 300	26 600	17 635	18 940	21 657	24 728	27 787	na
Commercial accident rate (b)	1.9	1.5	1.4	1.6	1.4	2.4	1.4	1.3	1.4	1.1	na
Commercial vessel-km (thousands) (c)	na	na	na	na	na	na	19 151	16 814	19 554	20 766	20 465
Accidents per million vessel-kms (d)	na	na	na	na	na	na	1.4	1.7	1.8	1.4	2.0
Fishing vessels	3	2	4	4	2	0	1	1	4	5	2
Capsize	0	0	0	0	0	0	0	0	0	0	0
Collision	0	0	1	2	2	0	0	0	2	1	0
Fire/Explosion	0	0	0	0	0	0	0	0	1	1	1
Grounding	3	2	3	1	0	0	1	1	1	2	1
Sank	0	0	0	0	0	0	0	0	0	1	0
Sustains damage render unseaworthy/ unfit for purpose	0	0	0	0	0	0	0	0	0	0	0
Other shipping accident types	0	0	0	1	0	0	0	0	0	0	0
Other vessels	3	4	3	2	2	4	2	3	1	5	2
Capsize	0	0	0	0	0	1	1	0	0	1	0
Collision	2	3	3	1	2	1	1	2	0	2	2
Fire/Explosion	1	1	0	0	0	0	0	0	1	1	0
Grounding	0	0	0	1	0	2	0	1	0	0	0
Sank	0	0	0	0	0	0	0	0	0	0	0
Sustains damage render unseaworthy/ Uunfit for purpose	0	0	0	0	0	0	0	0	0	1	0
Other shipping accident types	0	0	0	0	0	0	0	0	0	0	0

Data extracted 19 February 2020

- a Vessel movement data from Transport Canada (TC).
- b The commercial accident rate is the number of shipping accidents involving foreign-flag commercial vessels of 15 gross tons or more (excluding passenger vessels and fishing vessels) per 1000 vessel movements (to 2018).
- c Based on data from TC, who has updated its methodology for measuring commercial activity. Beginning from 2015, TC combines terrestrial automatic identification system (AIS) data from the Canadian Coast Guard and satellite AIS data from the Government of Canada Satellite AIS provider to calculate a distance-based metric of foreign-flag commercial marine activity in Canadian waters. Vessel movements are no longer captured.
- d The commercial accident rate is the number of shipping accidents involving foreign-flag commercial vessels of 15 gross tons or more (excluding passenger vessels and fishing vessels) per million vessel-kilometres.



Table 5. Vessels lost, by vessel category and age, 2009 to 2019

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
<b>All vessels</b>	<b>26</b>	<b>27</b>	<b>22</b>	<b>23</b>	<b>20</b>	<b>20</b>	<b>23</b>	<b>17</b>	<b>12</b>	<b>14</b>	<b>8</b>
0-4 years	0	1	0	1	0	0	1	0	0	0	1
5-9 years	2	5	1	1	1	0	0	0	0	1	0
10-14 years	4	1	1	2	3	0	2	0	0	2	0
15-19 years	0	2	3	5	2	2	1	3	1	1	1
20-24 years	4	6	4	3	2	1	1	0	0	1	1
25-29 years	2	2	4	3	2	5	5	1	0	3	0
30+ years	7	4	7	5	5	4	10	5	6	3	1
Unknown	7	6	2	3	5	8	3	8	5	3	4
<b>Commercial vessels</b>	<b>9</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>8</b>	<b>4</b>	<b>2</b>	<b>3</b>	<b>0</b>
0-4 years	0	0	0	0	0	0	0	0	0	0	0
5-9 years	0	0	0	0	0	0	0	0	0	1	0
10-14 years	1	0	0	0	0	0	0	0	0	0	0
15-19 years	0	0	0	0	0	0	0	1	0	0	0
20-24 years	0	0	0	0	0	0	1	0	0	0	0
25-29 years	0	0	0	0	0	1	2	0	0	0	0
30+ years	4	0	1	1	1	1	4	2	1	1	0
Unknown	4	1	0	0	0	0	1	1	1	1	0
<b>Fishing vessels</b>	<b>14</b>	<b>23</b>	<b>21</b>	<b>22</b>	<b>17</b>	<b>17</b>	<b>15</b>	<b>12</b>	<b>7</b>	<b>11</b>	<b>5</b>
0-4 years	0	1	0	1	0	0	1	0	0	0	0
5-9 years	2	5	1	1	1	0	0	0	0	0	0
10-14 years	3	1	1	2	3	0	2	0	0	2	0
15-19 years	0	2	3	5	2	2	1	2	1	1	1
20-24 years	4	6	4	3	2	1	0	0	0	1	1
25-29 years	2	1	4	3	2	4	3	1	0	3	0
30+ years	3	4	6	4	2	3	6	3	5	2	0
Unknown	0	3	2	3	5	7	2	6	1	2	3
<b>Other vessels</b>	<b>3</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>3</b>	<b>0</b>	<b>3</b>
0-4 years	0	0	0	0	0	0	0	0	0	0	1
5-9 years	0	0	0	0	0	0	0	0	0	0	0
10-14 years	0	0	0	0	0	0	0	0	0	0	0
15-19 years	0	0	0	0	0	0	0	0	0	0	0
20-24 years	0	0	0	0	0	0	0	0	0	0	0
25-29 years	0	1	0	0	0	0	0	0	0	0	0
30+ years	0	0	0	0	2	0	0	0	0	0	1
Unknown	3	2	0	0	0	1	0	1	3	0	1

Data extracted 19 February 2020

Table 6. Accidents, fatalities and serious injuries, by accident type, 2009 to 2019

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
<b>Shipping accidents with fatalities or serious injuries</b>	<b>9</b>	<b>7</b>	<b>4</b>	<b>7</b>	<b>4</b>	<b>4</b>	<b>7</b>	<b>5</b>	<b>8</b>	<b>12</b>	<b>7</b>
Capsize	1	1	0	3	2	0	2	1	1	5	2
Collision	4	3	1	1	0	1	2	2	4	1	1
Fire/Explosion	0	0	2	3	1	0	1	1	1	1	1
Grounding	1	0	1	0	1	0	1	0	0	3	1
Sank	3	1	0	0	0	3	1	1	2	2	2
Sustains damage render unseaworthy/unfit for purpose	0	0	0	0	0	0	0	0	0	0	0
Other shipping accident types	0	2	0	0	0	0	0	0	0	0	0
<b>Shipping accidents fatalities (a)</b>	<b>7</b>	<b>11</b>	<b>3</b>	<b>5</b>	<b>10</b>	<b>4</b>	<b>13</b>	<b>6</b>	<b>4</b>	<b>14</b>	<b>4</b>
Capsize	2	4	0	3	6	0	9	2	1	7	3
Collision	0	0	1	1	0	0	1	0	0	2	0
Fire/Explosion	0	0	1	1	1	0	0	0	0	0	0
Grounding	1	0	1	0	3	0	0	0	0	1	0
Sank	4	1	0	0	0	4	3	4	3	4	1
Sustains damage render unseaworthy/unfit for purpose	0	0	0	0	0	0	0	0	0	0	0
Other shipping accident types	0	6	0	0	0	0	0	0	0	0	0
<b>Shipping accidents serious injuries</b>	<b>5</b>	<b>5</b>	<b>2</b>	<b>6</b>	<b>0</b>	<b>1</b>	<b>12</b>	<b>5</b>	<b>7</b>	<b>8</b>	<b>10</b>
Capsize	0	0	0	3	0	0	0	0	0	1	0
Collision	5	5	1	0	0	1	9	4	6	0	4
Fire/Explosion	0	0	1	3	0	0	1	1	1	5	1
Grounding	0	0	0	0	0	0	2	0	0	2	4
Sank	0	0	0	0	0	0	0	0	0	0	1
Sustains damage render unseaworthy/unfit for purpose	0	0	0	0	0	0	0	0	0	0	0
Other shipping accident types	0	0	0	0	0	0	0	0	0	0	0
<b>Accidents aboard ship</b>	<b>57</b>	<b>63</b>	<b>41</b>	<b>52</b>	<b>61</b>	<b>52</b>	<b>35</b>	<b>43</b>	<b>46</b>	<b>57</b>	<b>60</b>
<b>Accidents aboard ship fatalities (a)</b>	<b>8</b>	<b>7</b>	<b>13</b>	<b>9</b>	<b>8</b>	<b>8</b>	<b>6</b>	<b>1</b>	<b>7</b>	<b>8</b>	<b>13</b>
Boarding, being on board, falling overboard from the ship	6	4	13	3	3	5	6	0	5	5	12
In contact with any part of the ship or its contents	2	3	0	6	5	3	0	1	2	3	1
<b>Accidents aboard ship serious injuries</b>	<b>49</b>	<b>70</b>	<b>30</b>	<b>42</b>	<b>49</b>	<b>45</b>	<b>30</b>	<b>43</b>	<b>40</b>	<b>53</b>	<b>43</b>
Boarding, being on board, falling overboard from the ship	4	2	3	2	6	10	5	4	6	7	2
In contact with any part of the ship or its contents	45	68	27	40	43	35	25	39	34	46	41

Data extracted 19 February 2020

a. Fatalities includes missing persons.

Table 7. Vessels, fatalities and serious injuries, by vessel type, 2009 to 2019

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
<b>Vessels involved in shipping accidents with fatalities or serious injuries</b>	<b>9</b>	<b>7</b>	<b>4</b>	<b>7</b>	<b>4</b>	<b>4</b>	<b>7</b>	<b>5</b>	<b>8</b>	<b>12</b>	<b>7</b>
Barge/Tug	0	0	0	2	0	0	0	0	0	1	0
Cargo	0	0	0	0	0	1	0	0	1	1	0
Ferry/Passenger	1	1	0	0	0	0	2	2	2	1	0
Fishing	5	4	3	4	4	3	3	2	3	8	2
Other	3	2	1	1	0	0	2	1	2	1	5
<b>Shipping accident fatalities (a)</b>	<b>7</b>	<b>11</b>	<b>3</b>	<b>5</b>	<b>10</b>	<b>4</b>	<b>13</b>	<b>6</b>	<b>4</b>	<b>14</b>	<b>4</b>
Barge/Tug	0	0	0	1	0	0	0	0	0	0	0
Cargo	0	0	0	0	0	2	0	0	0	0	0
Ferry/Passenger	0	4	0	0	0	0	6	0	2	1	0
Fishing	7	7	2	2	10	2	6	6	1	13	0
Other	0	0	1	2	0	0	1	0	1	0	4
<b>Shipping accident serious injuries</b>	<b>5</b>	<b>5</b>	<b>2</b>	<b>6</b>	<b>0</b>	<b>1</b>	<b>12</b>	<b>5</b>	<b>7</b>	<b>8</b>	<b>10</b>
Barge/Tug	0	0	0	1	0	0	0	0	0	1	0
Cargo	0	0	0	0	0	0	0	0	1	5	0
Ferry/Passenger	1	0	0	0	0	0	2	4	2	0	0
Fishing	0	1	1	3	0	1	1	0	3	1	2
Other	4	4	1	2	0	0	9	1	1	1	8
<b>Vessels involved in accidents aboard ship</b>	<b>58</b>	<b>64</b>	<b>41</b>	<b>53</b>	<b>61</b>	<b>52</b>	<b>35</b>	<b>43</b>	<b>46</b>	<b>58</b>	<b>60</b>
Barge/Tug	6	5	4	1	3	4	0	4	2	3	5
Cargo	16	22	13	23	17	21	5	12	18	22	23
Ferry/Passenger	8	8	6	3	7	5	8	5	5	8	7
Fishing	20	17	17	21	25	18	21	18	15	21	22
Other	8	12	1	5	9	4	1	4	6	4	3
<b>Accident aboard ship fatalities (a)</b>	<b>8</b>	<b>7</b>	<b>13</b>	<b>9</b>	<b>8</b>	<b>8</b>	<b>6</b>	<b>1</b>	<b>7</b>	<b>8</b>	<b>12</b>
Barge/Tug	1	0	1	0	1	0	0	0	0	0	0
Cargo	0	1	1	2	2	1	0	0	2	2	2
Ferry/Passenger	1	2	1	1	0	0	1	0	2	0	1
Fishing	4	4	10	6	5	6	5	0	2	4	8
Other	2	0	0	0	0	1	0	1	1	2	1
<b>Accident aboard ship serious injuries</b>	<b>49</b>	<b>70</b>	<b>30</b>	<b>42</b>	<b>49</b>	<b>42</b>	<b>30</b>	<b>42</b>	<b>40</b>	<b>53</b>	<b>43</b>
Barge/Tug	4	5	3	0	2	4	0	4	3	2	4
Cargo	16	36	12	21	12	18	5	12	15	21	15
Ferry/Passenger	6	5	6	2	7	5	7	5	4	10	6
Fishing	16	13	8	15	19	12	17	18	13	17	17
Other	7	11	1	4	9	3	1	3	5	3	1

Data extracted 19 February 2020

a. Fatalities includes missing persons.

## Definitions

The following definitions apply to marine transportation occurrences that are required to be reported pursuant to the *Canadian Transportation Accident Investigation and Safety Board Act* and the TSB Regulations.

### Marine occurrence

- any accident or incident associated with the operation of a ship
- any situation or condition that the Board has reasonable grounds to believe could, if left unattended, induce an accident or incident described above.

### Marine accident

An accident resulting directly from the operation of a ship other than a pleasure craft, where

#### Accident aboard ship

- a person is killed or sustains a serious injury as a result of
  - boarding, being on board or falling overboard from the ship, or
  - coming into direct contact with any part of the ship or its contents;

#### Shipping accident

- the ship
  - sinks, founders or capsizes,
  - is involved in a collision (includes strikings and contacts),
  - sustains a fire or an explosion,
  - goes aground, or
  - sustains damage that affects its seaworthiness or renders it unfit for its purpose,
  - is missing or abandoned;

### Marine incident

- a person falls overboard from the ship, or
- the ship
  - makes unforeseen contact with the bottom without going aground,
  - fouls a utility cable or pipe, or an underwater pipeline,
  - is involved in a risk of a collision,
  - sustains a total failure of
    - the navigation equipment if the failure poses a threat to the safety of any person, property or the environment,
  - the main or auxiliary machinery, or

- the propulsion, steering, or deck machinery if the failure poses a threat to the safety of any person, property or the environment;
- all or part of the ship's cargo shifts or falls overboard, or
- is anchored, grounded or beached to avoid an occurrence,
- a crew member whose duties are directly related to the safe operation of the ship is unable to perform their duties as a result of a physical incapacitation which poses a threat to the safety of persons, property or the environment;
- there is an accidental release on board or from the ship consisting of a quantity of dangerous goods or an emission of radiation that is greater than the quantity or emission levels specified in Part 8 of the Transportation of Dangerous Goods Regulations.

### **Serious injury**

- (a) a fracture of any bone, except simple fractures of fingers, toes or the nose;
- (b) lacerations that cause severe hemorrhage or nerve, muscle or tendon damage;
- (c) an injury to an internal organ;
- (d) second or third degree burns, or any burns affecting more than 5% of the body surface;
- (e) a verified exposure to infectious substances or injurious radiation; or
- (f) an injury that is likely to require hospitalization.

### **Vessels covered**

This report covers commercial vessels that include all vessels either registered or licensed to operate commercially. Pleasure craft occurrences are not normally included unless they also involved a commercial vessel.

#### **Vessel categories**

- Commercial Vessels: include cargo vessels, ferries, passenger vessels, tugs and barges
- Fishing Vessels: include vessels involved in commercial fishing
- Other Vessels: include research vessels, oil exploration, exploitation and support vessels, government vessels and pleasure craft

### **Miscellaneous**

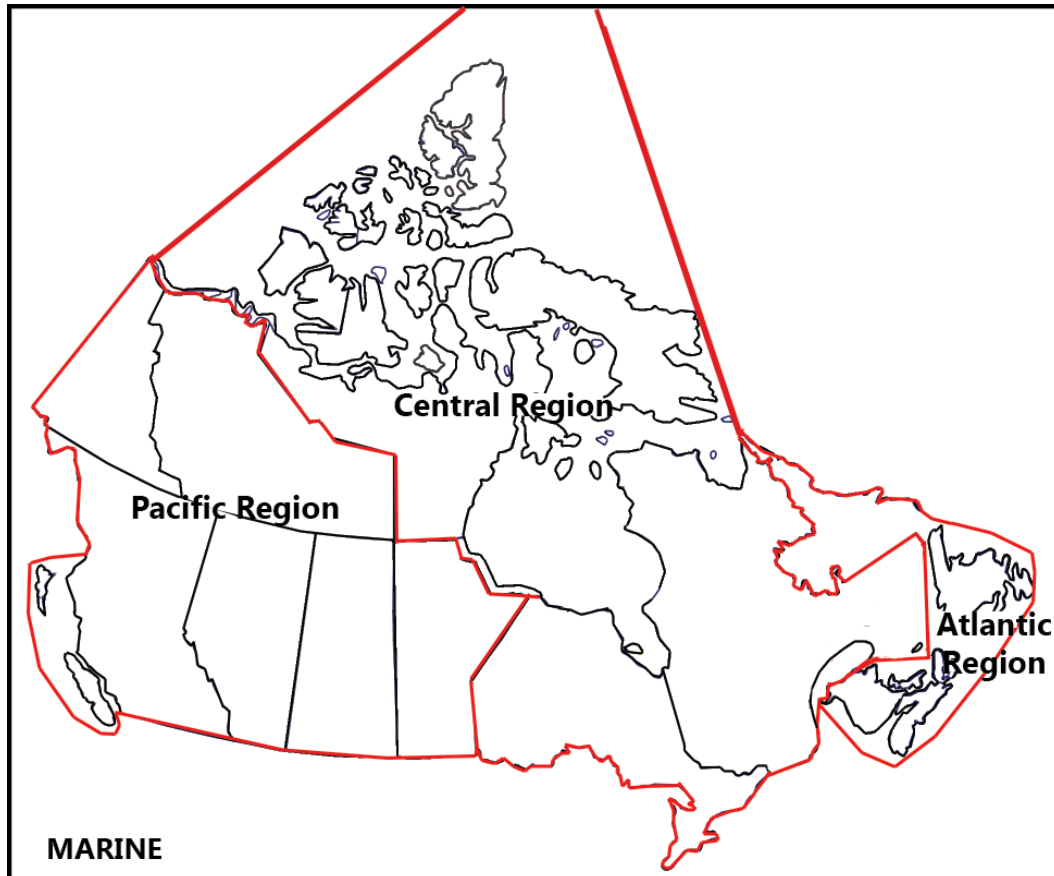
#### **Gross tons (GT)**

A measure of vessel capacity in cubic feet of the spaces within the hull, and of enclosed spaces above deck available for cargo, stores, fuel, passengers and crew, with certain exclusions. One hundred cubic feet is equivalent to one gross ton.

## Movement

A vessel's travel segment between ports or a length of 1 km or more within a port harbor, with at least one port being a domestic port.

## TSB regional offices' areas of responsibility



Pacific Region's area of responsibility consists of the provinces of British Columbia, Alberta, Saskatchewan, and Manitoba, the Yukon and the Northwest Territories south of the 70th parallel, as well as the waters adjacent to these provinces and territories.

Central Region's area of responsibility consists of the provinces of Ontario and Quebec (including the Magdalen Islands), the territory of Nunavut, and the Northwest Territories north of the 70th parallel, as well as James Bay, Hudson Bay, the St. Lawrence Seaway, and the Great Lakes waterways up to the Canada–U.S. border.

Atlantic Region's area of responsibility consists of the provinces of New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland and Labrador, as well as the waters adjacent to these provinces.