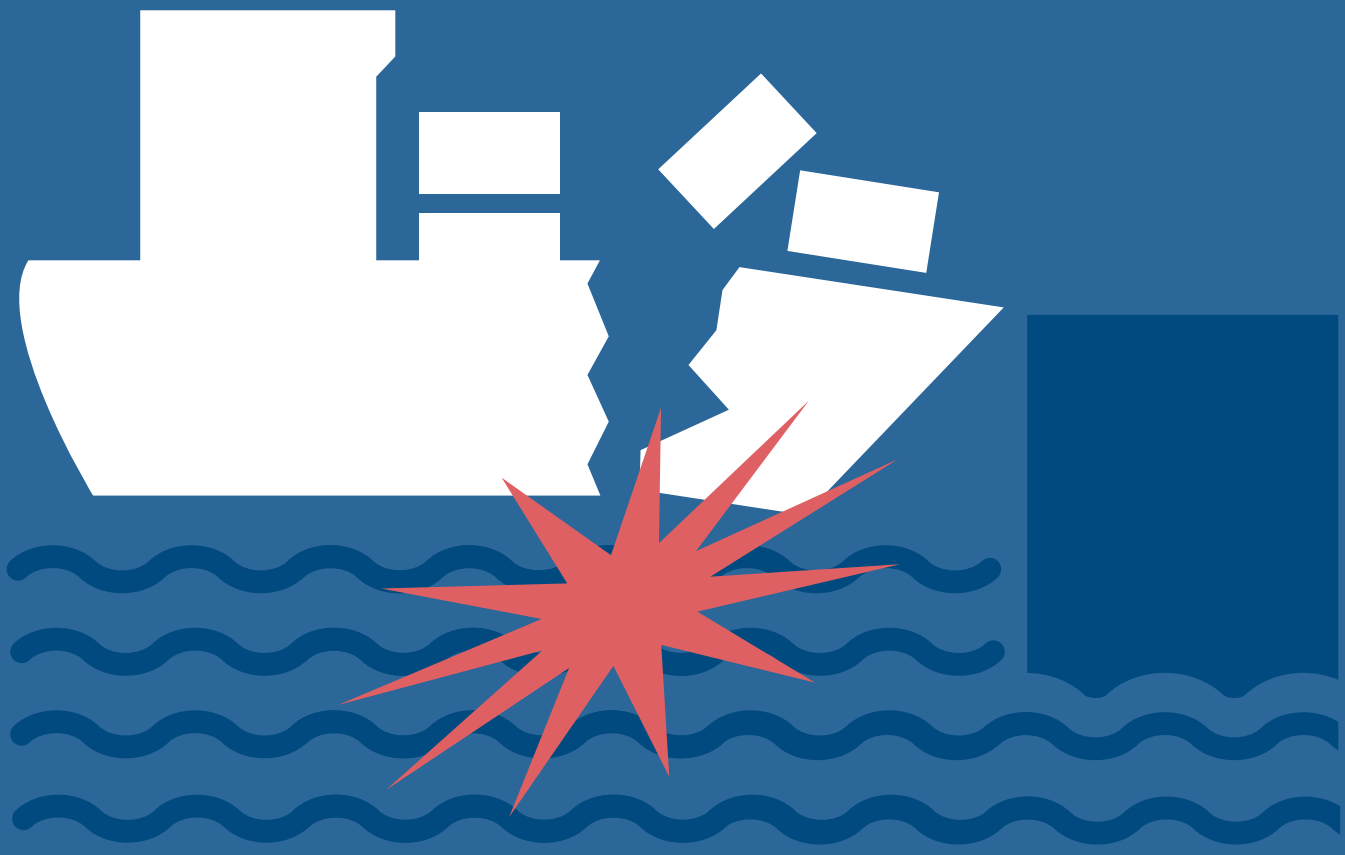
MARITIME

Shipping accidents in the Baltic Sea 2019

Baltic Marine Environment Protection Commission

Shipping



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Published by:

Helsinki Commission – HELCOM
Katajanokanlaituri 6 B
00160 Helsinki, Finland

www.helcom.fi

For bibliographic purposes this document should be cited as:
"HELCOM report on Shipping accidents in the Baltic Sea 2019. HELCOM (2021)"

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1. Introduction

Annual reports on shipping accidents in the Baltic Sea area have been compiled by HELCOM since 2000. According to an agreed procedure all accidents were reported irrespectively if there was pollution or not. This includes accidents which involved tanker ships over 150 gross tonnage (GT) and/or other ships over 400 GT, both in territorial seas or Exclusive Economic Zone (EEZ) of the HELCOM Contracting States. Accident types cover i.e. groundings, collisions (striking or being struck by another ship), contacts with fixed or floating objects, pollution accidents (e.g. during fuel transfer) and other types of accidents like fires and explosions, machinery damage and capsizing.

Since 2000, new reporting formats were adjusted to collect shipping accidents data from HELCOM Contracting parties. The first adjustment was taken into use in 2004, meaning that the data collected before 2004 is thus not fully comparable with the data collected in 2004 and subsequent years. In 2012 the HELCOM reporting format was again modified in order to harmonize with reporting formats for incidents of the International Maritime Organization (IMO) and the European Maritime Safety Agency (EMSA). Some further fine-tuning was also made to the reporting in 2013. The latest adjustment is from 2019: following the request from the Contracting Parties of the Helsinki Convention, the HELCOM Secretariat took contact with the European Maritime Safety Agency (EMSA) to obtain access to the European Marine Casualty Information Platform (EMCIP) database. This report and future HELCOM reports on shipping accidents will be compiled based on the data collected by EMSA and stored in the EMCIP database, as well as shipping accidents reported directly by Russia and based on the Guideline for filling-in the HELCOM Reporting Format on Shipping Accidents (cf. Annex 1). Although the HELCOM Secretariat is still collecting data of accidents occurring in Russian waters, no accidents were reported for 2019. It is important to take note of the reporting adjustments in the data collection process to avoid misunderstanding when comparing the historical data.

This report focuses on the shipping accidents data collected for the year 2019 as well as for the longer period since 2004[1]. This report has the same structure with updated figures from previous reports, such as the report published in 2018 on shipping accidents in the Baltic Sea Region from 2014 to 2017[2] and the report on shipping accidents in 2018[3].

The data used for this report is made available on the HELCOM Map and Data Portal. However, ship identification data is not made publicly available.

[1] A major revision of the shipping accidents database of Denmark, maintained by the Danish Maritime Agency, took place in 2013. Denmark has informed that the accidents data of the old database and of the new database can both be considered valid. However, due to the differences in the content and structure of the two databases, care should be taken when presenting regional information on accidents which include Danish data both from the old (before 2009) and new (after 2010) databases. For example, this is the case in the southwestern Baltic Sea, where the relative influence of data from Denmark to overall trends is higher. However, based on HELCOM Secretariat comparisons between regional datasets including either old or new Danish data for the years 2010-2012, the effect of the revision on regional trends can be considered minor Baltic wide, but also within all sub-regions.

[2] HELCOM 2018. Report on shipping accidents in the Baltic Sea from 2014 to 2017. Available at http://www.helcom.fi/Lists/Publications/Report%20on%20shipping%20accidents%20in%20the%20Baltic%20Sea%20from%202014%20to%202017.pdf

[3] HELCOM 2020. Report on shipping accidents in the Baltic Sea 2018. Available at https://helcom.fi/media/publications/Ship-accidents-in-the-Baltic-Sea-2018.pdf

2. Ship traffic in the Baltic Sea

To get a full picture of the shipping safety in the Baltic Sea, basic information on the intensity of shipping is of importance. IMO regulations (i.e. SOLAS) require Automatic Identification System (AIS) transponders to be fitted on board all ships of 300 GT and above engaged in international voyages, cargo ships of 500 GT and above not engaged in international voyages, as well as all IMO registered passenger ships irrespective of size. The AIS enables the identification of the name, position, course, speed, draught and ship types.

In the Baltic Sea area movements of ships are gathered in the regional HELCOM AIS network and database launched in 2005. The intensity of traffic based on the HELCOM AIS data is illustrated in Figure 1.

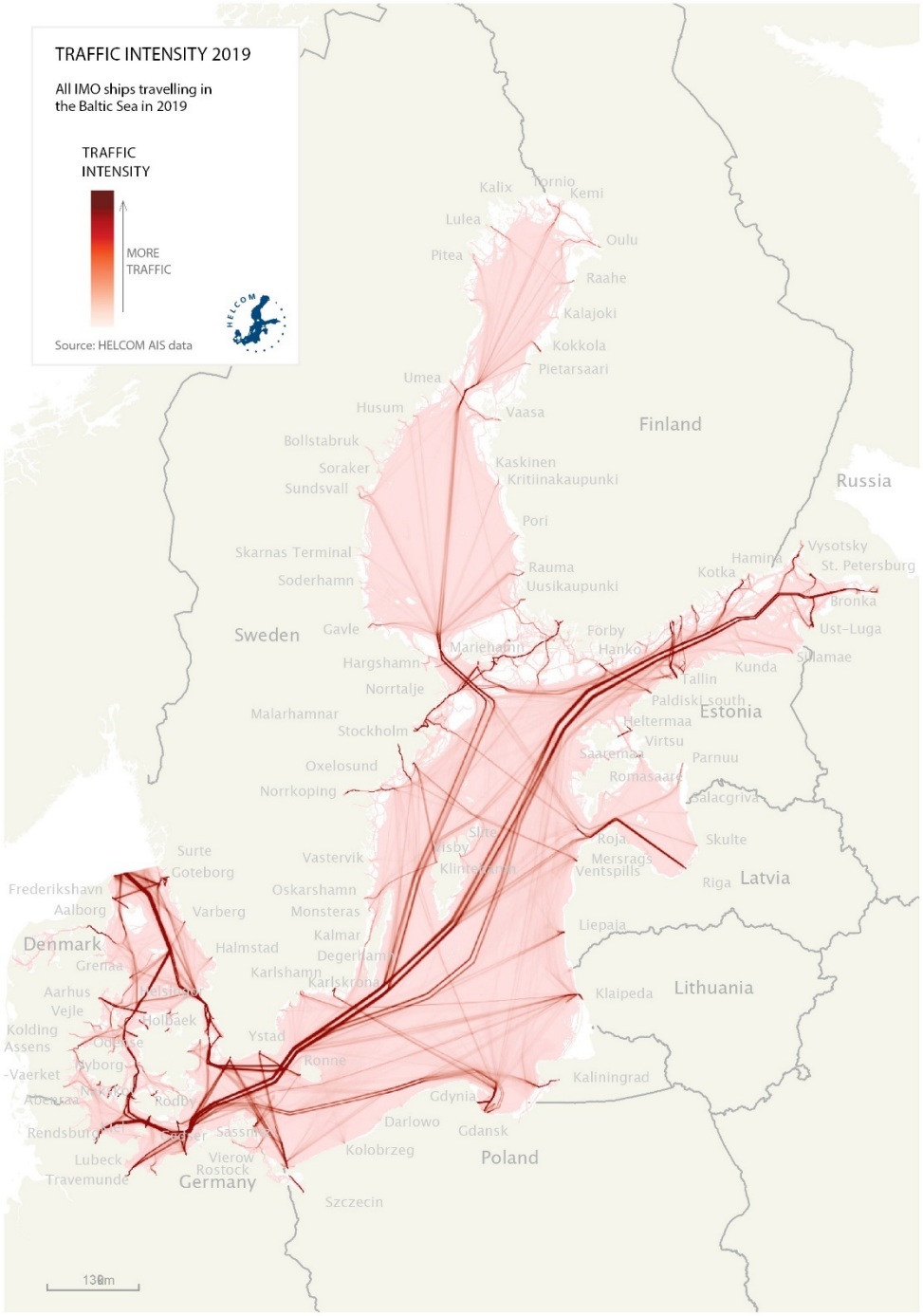

Figure 1. Traffic intensity in the Baltic Sea Region in 2019

The ship movements can also be illustrated by the number of ships crossing the pre-defined statistical lines as presented in Figure 2 (according to the ship types).

Line	Name of the location
1	Skaw
2	The Great Belt East Bridge
3	Sundet Syd
4	Langeland East
5	Kadet Fairway
6	North of Bornholm
7	South of Bornholm
8	West of Gotland
9	East of Gotland
10	Irbe Strait
11	Gulf of Finland
12	Åland West
13	Åland East
14	Bothnian Sea

Figure 2. Location of the predefined crossing lines.

The HELCOM Secretariat is producing the figures regarding the number of ships crossing predefined based on the HELCOM AIS data. More information and the scripts can be found on the HELCOM GitHub page (https://github.com/helcomsecretariat). The data is also available on the HELCOM Map and Data Service.

The Figures on the two next pages are illustrating the number of ships crossing each line.

Figure 3. Number of ships crossing predefined passage lines based HELCOM AIS data.

The results of analysing the HELCOM AIS highlighted that in 2019 the IMO-registered fleet was by far represented by cargo ships with more than 3800 ships operating in the Baltic Sea (about 45,4% of the total fleet). Tanker ships represented 23,5% of fleet with almost 2000 vessels. Passenger ships were equal to 5,2% of the fleet (445 vessels) but they were involved in almost half of the port visits in the Baltic Sea Region (48,5% with 174 329 visits[4]). This is mainly due to frequent connections between cities in the region (HELCOM, 2018)[5]. The dominance of the cargo ships in the Baltic Sea Region can also be represented with the distance sailed in the Baltic Sea area (cf. Figure 4 below).

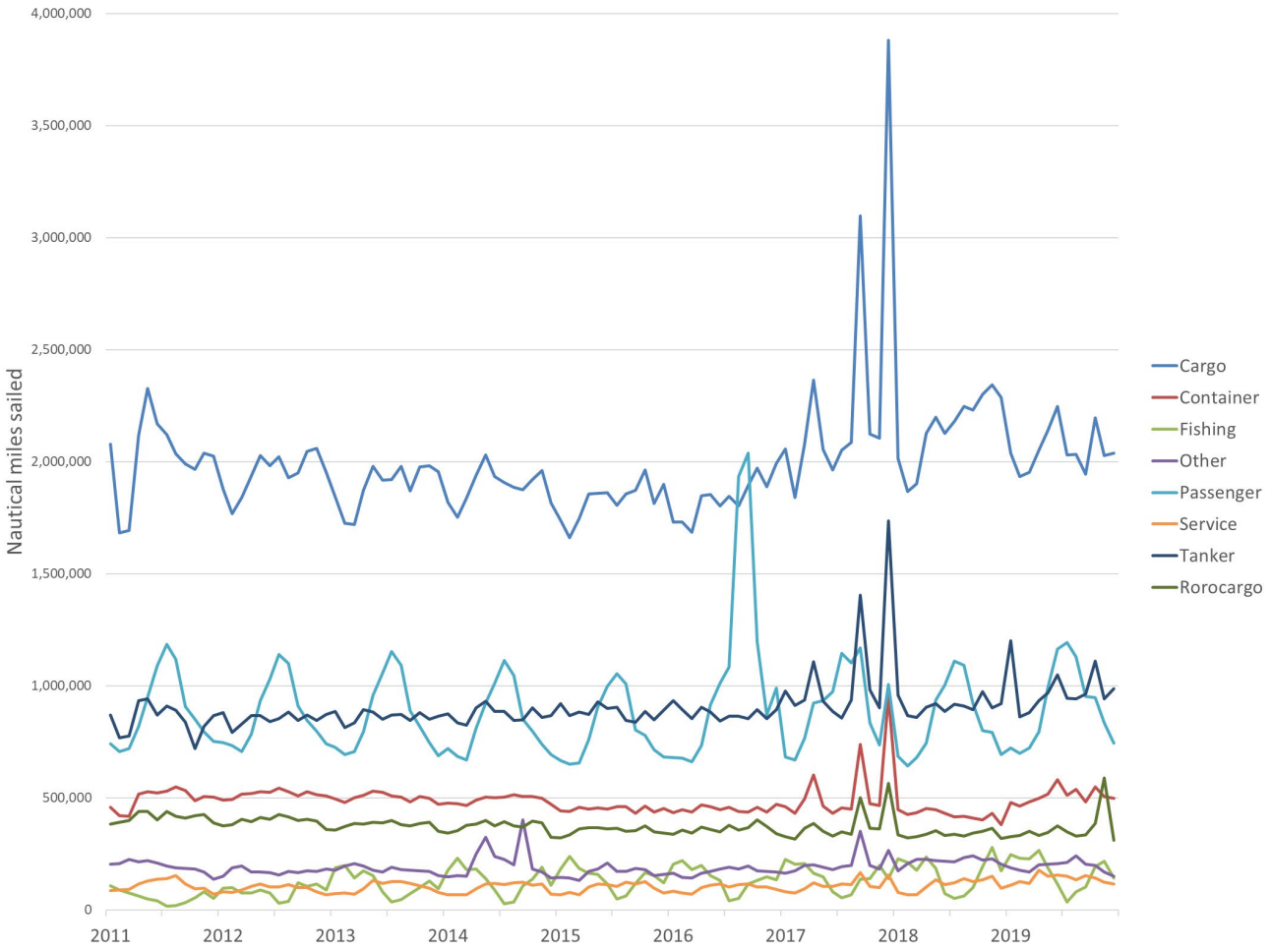

Figure 4. Distance sailed in the Baltic Sea per ship type. Monthly figures from July January 2011 to December 2019 based on HELCOM AIS data.

[4] A visit is defined as a stop in a port for at least 10 minutes (HELCOM, 2018)

[5] HELCOM 2018. HELCOM Assessment on maritime activities in the Baltic Sea 2018. Baltic Sea Environment Proceedings No.152. Helsinki Commission, Helsinki. 253pp. Available at http://helcom.fi/Lists/Publications/BSEP152.pdf

3. Overview of accidents in the Baltic Sea

A total of 233 validated shipping accidents happening in the Baltic Sea area were reported to the EMCIP database for EU Member States (cf. Figure 5 below). No accidents were reported by Russia. While being lower than number of accidents reported for 2018, this figure is anyway the second highest value collected since 2004. As it is not possible to establish whether all accidents were reported each year or not, it is difficult to establish the trend of the number of accidents in the Baltic Sea Area. However, it is important to note that all the accidents reported to the EMCIP database can contain information whether there was pollution or not based on these accidents (cf. Fig 5 below).

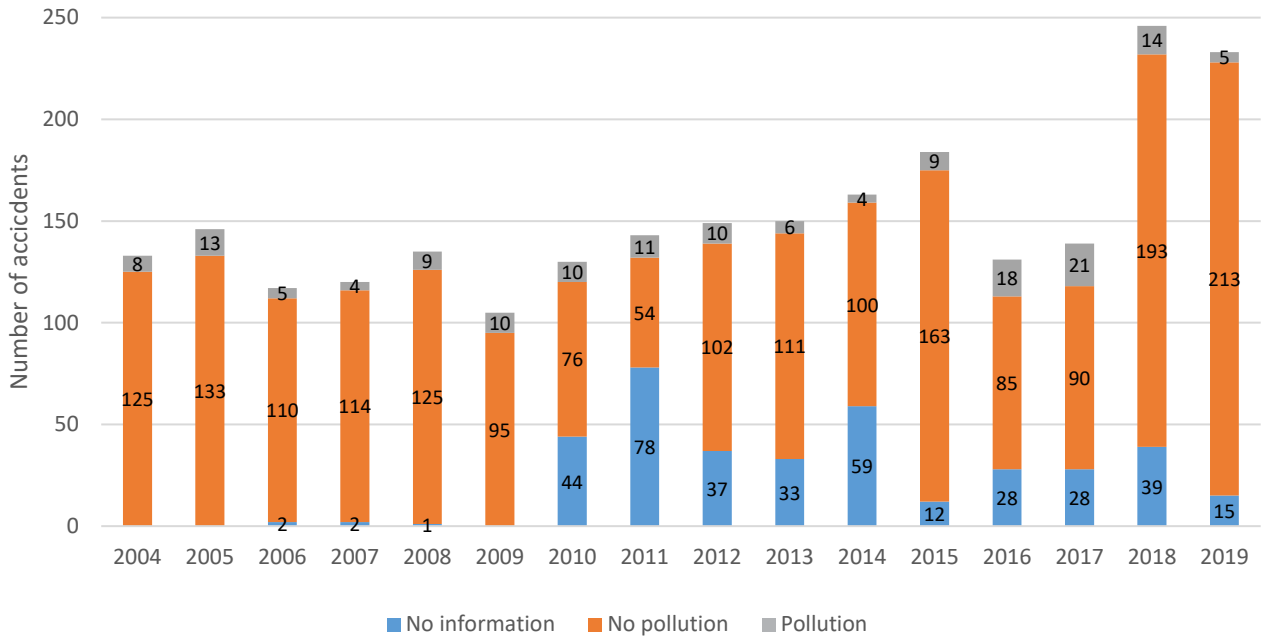

Figure 5. Number of reported accidents in the Baltic Sea

A detailed categorization of accidents location – open sea, port approach and port - was introduced for the reporting in 2012 and it is possible to also retrieve this information from the data provided by EMSA (cf. Figure 6 below). Almost half of the accidents in 2019 took place when the ships were approaching the ports or within the port area (45.5% with 106 accidents). Since 2016, the port approach and the open sea are the two areas where the number of accidents occurring has been increasing. In 2019, 47.2% of the reported accidents happened in the open sea. The spatial distribution of the reported accidents in 2019 is presented in Figure 7 next page.

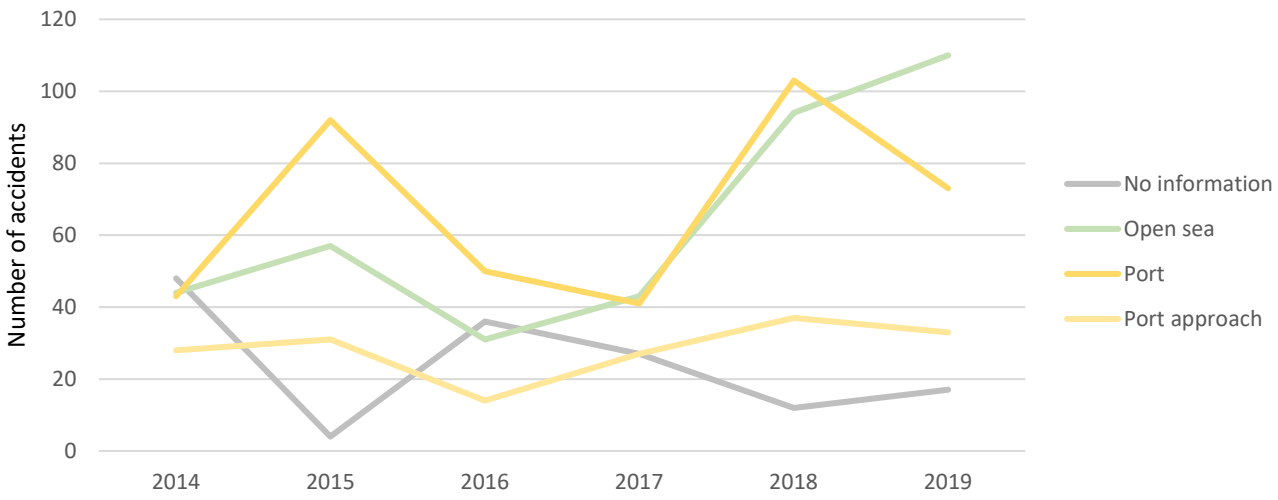

Figure 6. Location of the accidents or the period 2014 to 2019

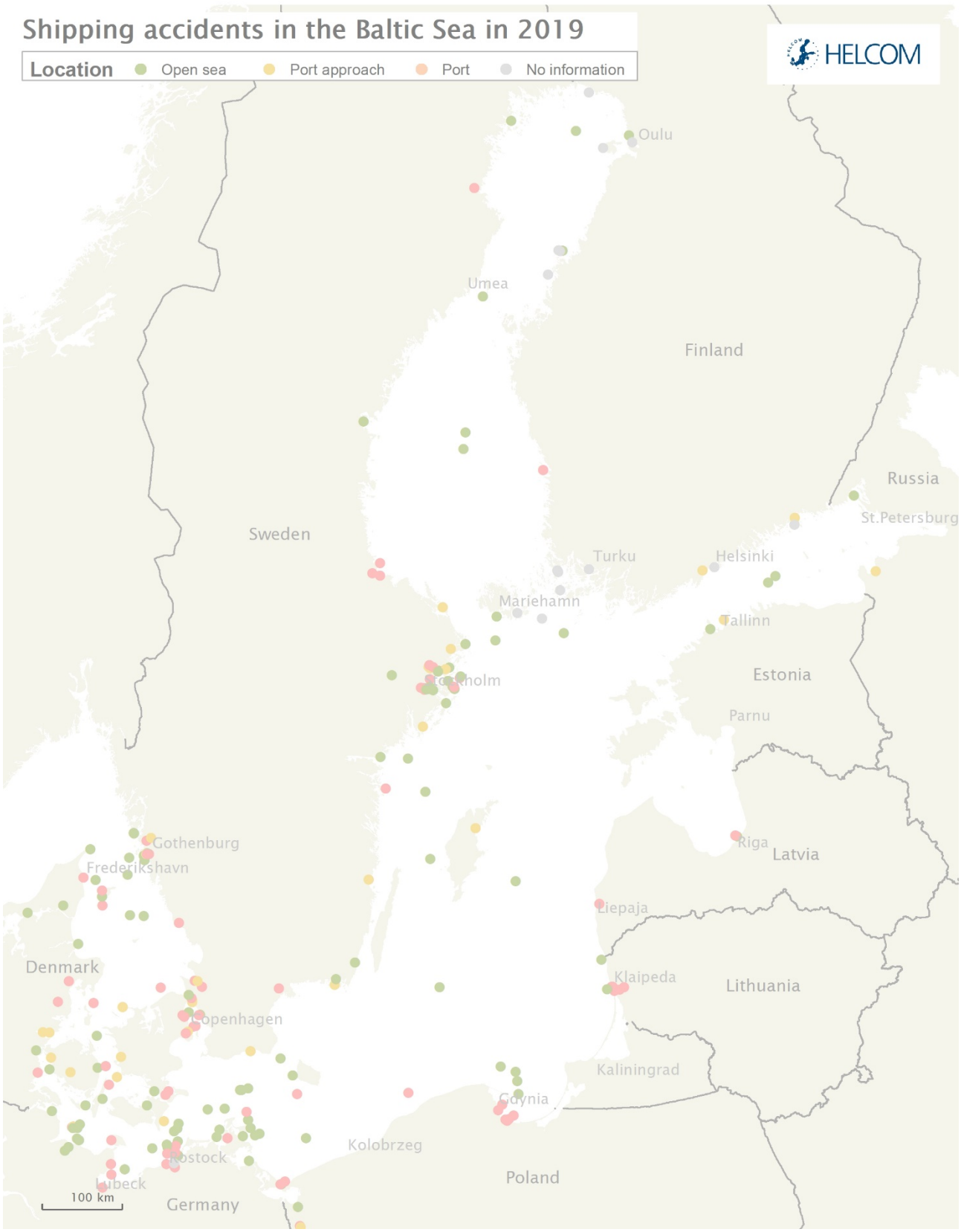

Figure 7. Locations of reported shipping accidents in the Baltic Sea in 2019.

4. Types of accidents

Due to modification of the reporting format in 2012, the category “contact”, as a type of accident, was included in the reporting, defined as striking any fixed or floating object other than ships or underwater objects (i.e. wrecks). In previous reports “collisions” accounted for both collisions with ships and objects. In order to retain comparability both “collision” and “contact” accidents will be referred to as “collisions” in following text. Such information on the types of accidents is also available in the data provided by EMSA as shown on the Figure 8 below.

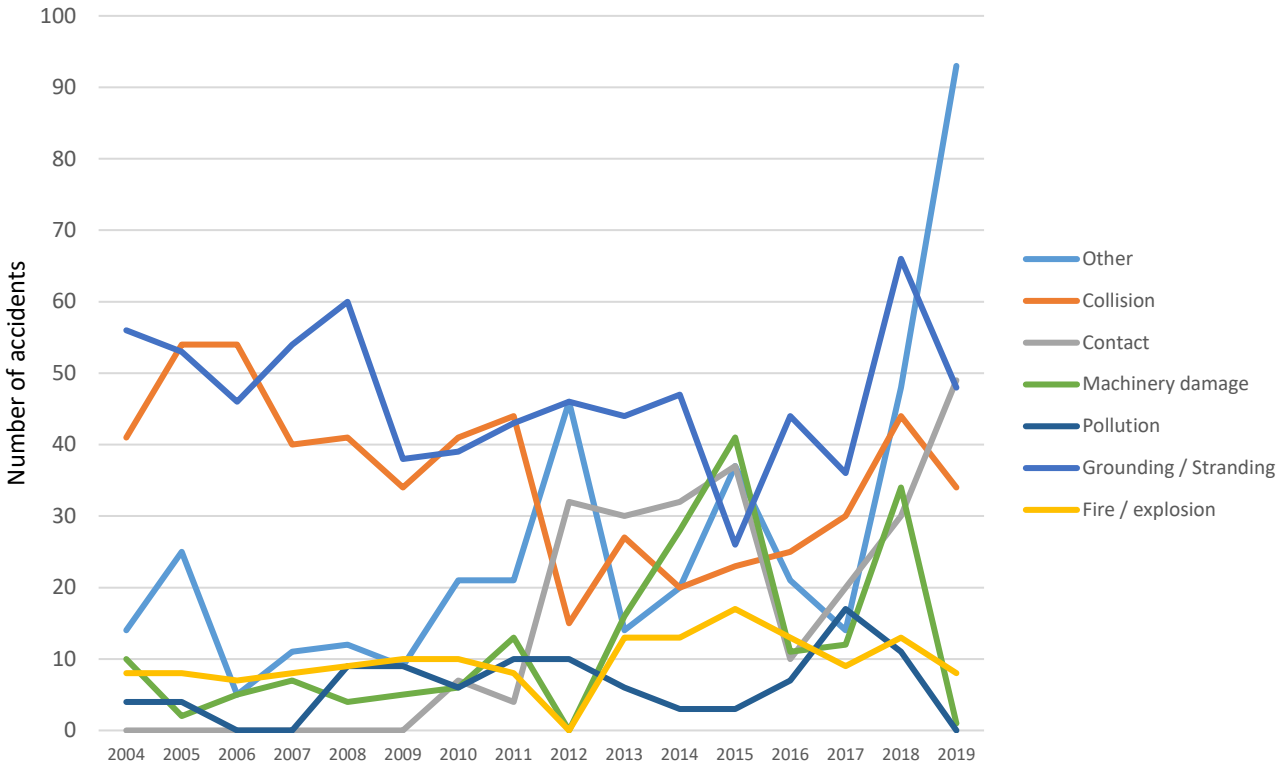

Figure 8. Types of accidents in the Baltic Sea

With a large increase from previous years, 39.9% of the accidents reported for 2019 were in the class “Other”, with a total of 93 accidents. This is most likely due to the completeness of the data collected by EMSA. The definitions for this class are listed in Table 1 below. Grounding / stranding and contact type accidents were the next most common types with 20.6% and 21.0% respectively. The spatial distribution of different types of reported accidents in the Baltic Sea area is presented in Figure 9 below.

Table 1. Definition of the accident type “other”

Other reason
Accidents with life-saving appliances
Capsizing/listing
Damage to ship or equipment
Door fault / fault in doorways
Flooding/Foundering
Physical damage
Related to the use of rescue equipment
Sunk
Technical failure
Tilt / crash
Hull failure/failure of watertight doors/ports etc.
Loss of control
Other reason

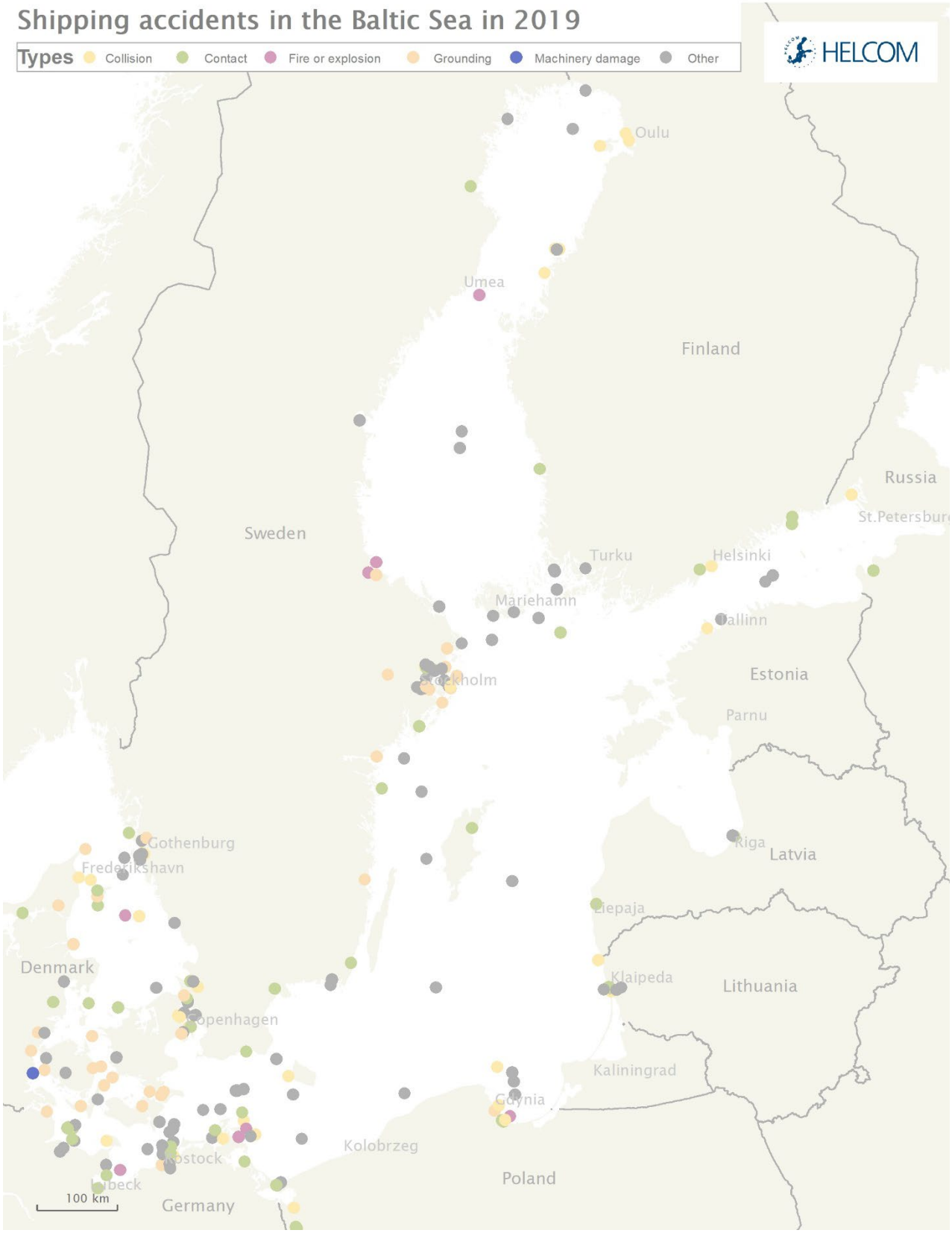

Figure 9. Types of shipping accidents in the Baltic Sea in 2019.

4.1. Collisions

In 2019, 83 collisions (collisions and contacts) were reported in the Baltic Sea area accounting for 35.6% of the total number of accidents. As for the past few years, most of the collisions happened around the port areas, when ships are approaching ports or even within these ports (50 events accounting for 60.2% of the collisions, cf. Figure 10). However, it seems that more accidents happened in the open sea in 2019 compared to 2018. Six collisions included no information as to the specific location of the accident.

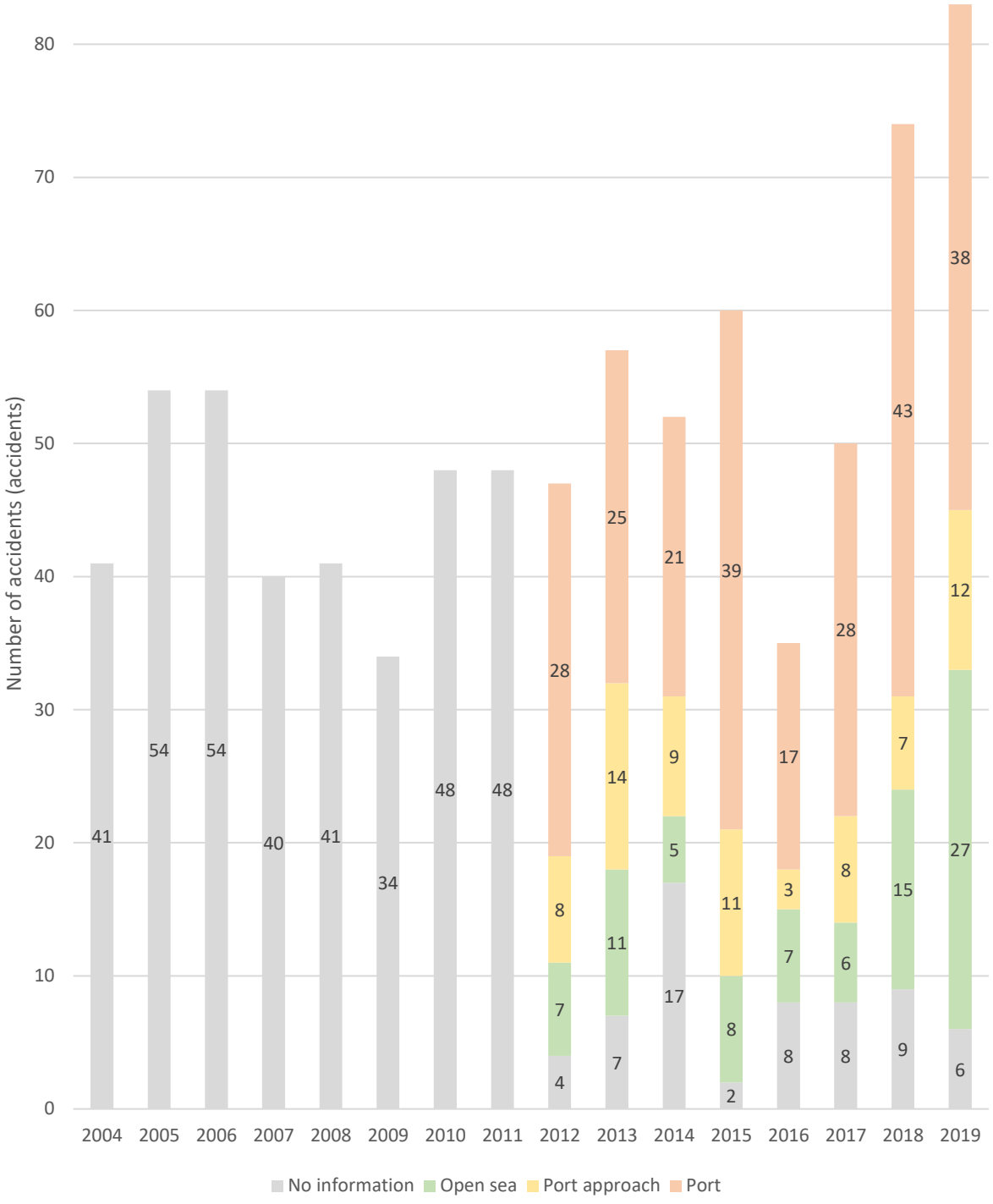

Figure 10. Location of ship collisions in the Baltic Sea between 2004 and 2019

Based on the information on shipping accidents collected by EMSA, it is possible to divide the collisions in different types. This information is shown in Figure 11 below with numbers of collisions per different types since 2004. The merging of some types of collisions was necessary to produce Figure 11: the detail of the collisions with vessel, with object and other reasons are available in Table 2 on the next page. As mentioned in the previous HELCOM reports in shipping accidents, the lack of information on the type of collision was decreasing in the reported accidents sent by the Contracting Parties since 2016. For 2019, collision accidents categorized as "contact" were the most common type. Note that the contact type accidents are not categorized further.

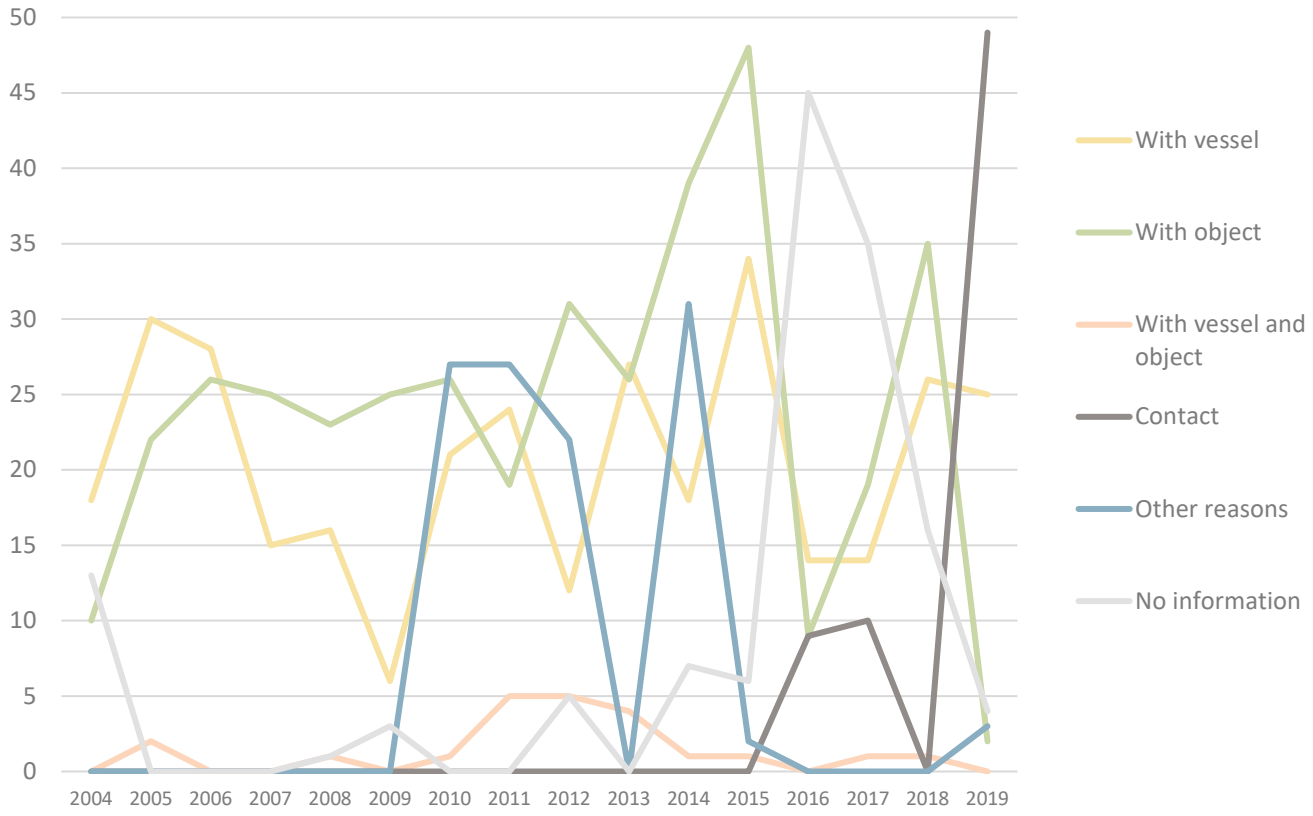

Figure 11. Types of collisions since 2004 reported in the Baltic Sea area

Table 2. Definition of the types of collisions

With vessel	With object	Other reasons
With another vessel	Buoy	Loss of containment
With multiple vessels	Dry dock	Loss of directional control
	Fixed object	On the fairway slope
	Object	other (unsealing the vessel's hull)
	Bridge	Ship not underway
	Pier, quay	Drift
	Sluice	Explosion
	Breakwater	Fire
	Berth	Flooding
		Loss of electrical power
		Loss of propulsion power
		Power

There was a large decrease in the proportion of collisions with no information for 2019 (9% for 4 events, cf. Figure 12). The spatial distribution of the reported collision and contact accidents in the Baltic Sea area is presented in Figure 13 (next page).

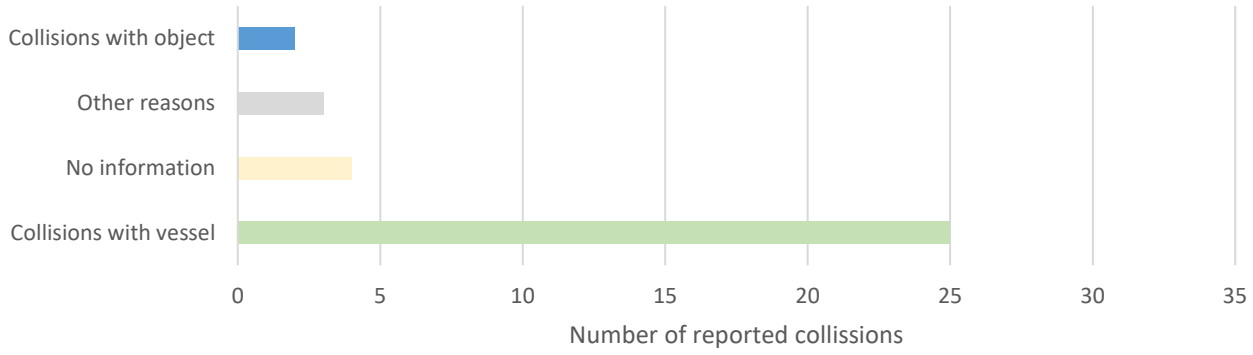

Figure 12. Types of collisions reported in 2019

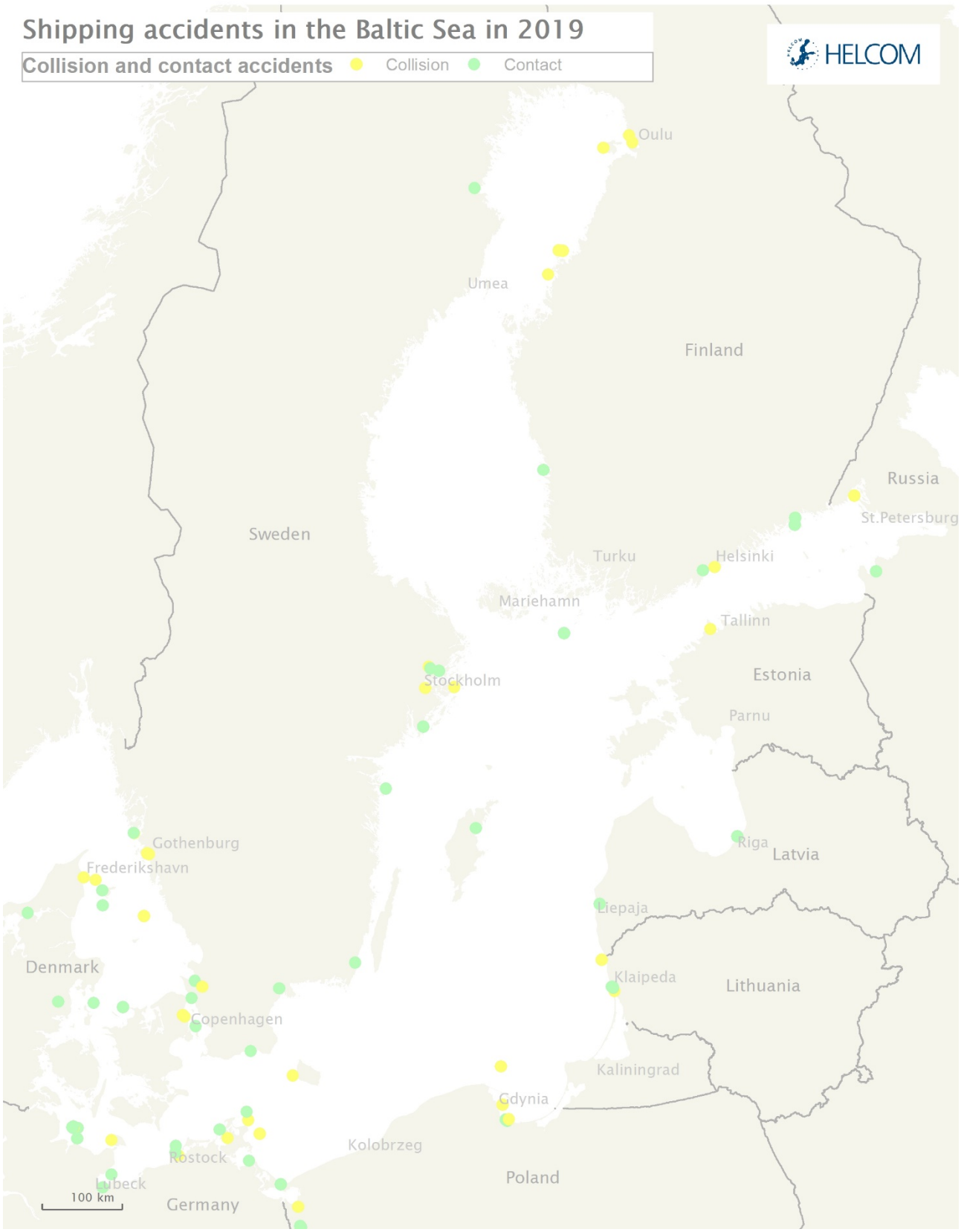

Figure 13. Collision and contact accidents in the Baltic Sea in 2019 (if no accidents are displayed in certain national waters, the reason can be either no accident occurrence during 2019, or lack of data).

4.2. Groundings

Groundings and strandings decreased from 2018, approximately matching the figure reported in 2017. A total of 48 groundings occurred in 2019, almost 37.5% of those took place when the ships were approaching the port or operating in the open sea (with 18 events) (cf. Fig. 14).

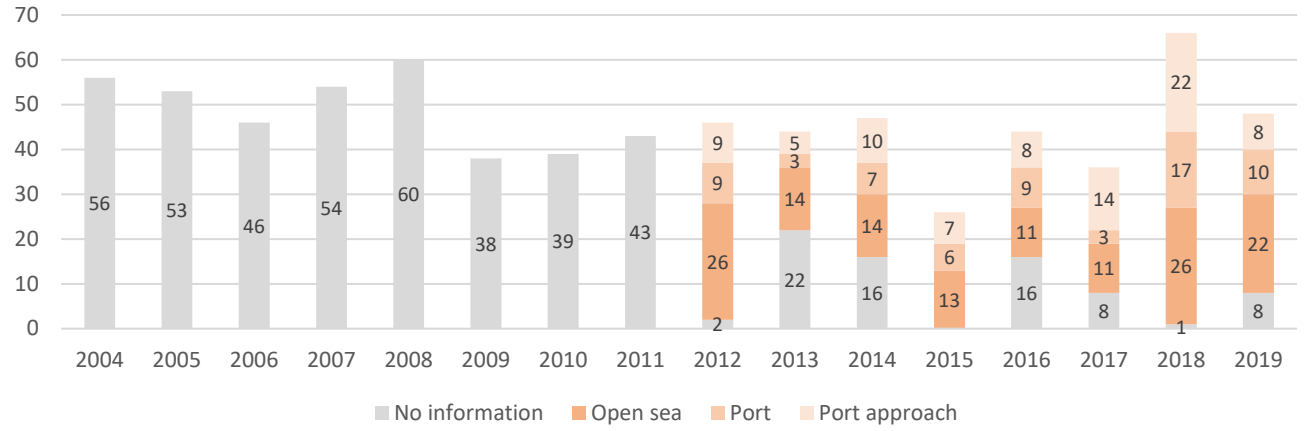

Figure 14. Location of the grounding accidents in the Baltic Sea between 2004 and 2019

Figure 15 below helps to compare the different location of grounding accidents in 2019.

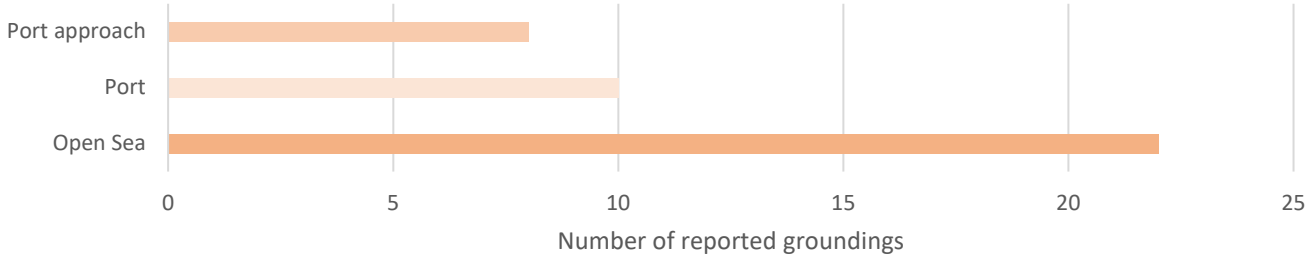

Figure 15. Location of the grounding accidents in 2019.

Figure 16 illustrates the presence or absence of a pilot on board vessels in cases of grounding accidents from 2014 to 2019. 78.7% of the grounding accidents occurred when no pilot was on board.

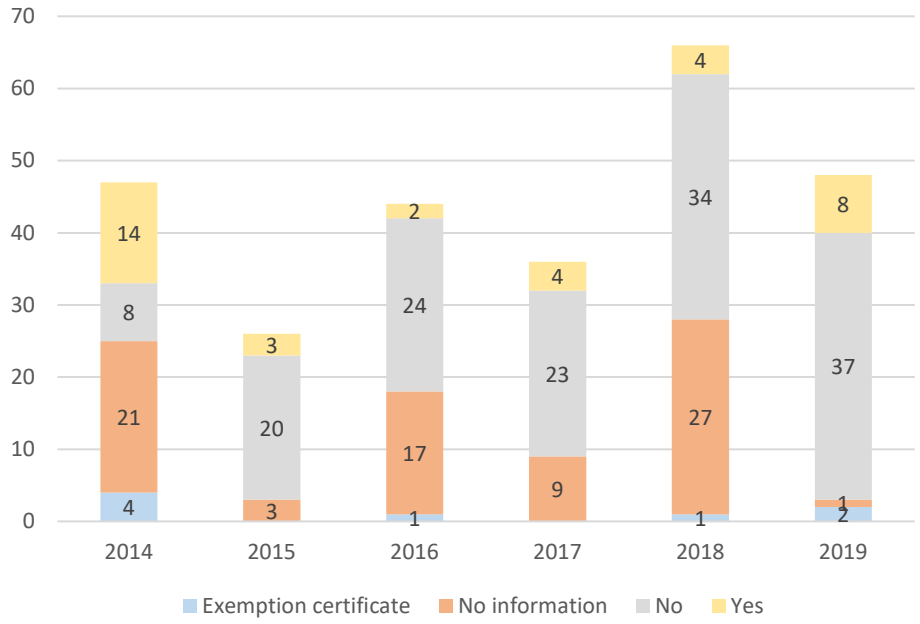

Figure 16. Presence, absence or exemption of pilots during groundings

As for the period 2014 – 2018, most of the reported groundings in 2019 occurred with vessels with a draught of less than 7 metres and for another large portion, there was no information reported on the draught (cf. Figure 17). It is important to note that small vessels are not covered by the IMO´s recommendations on the use of pilotage.

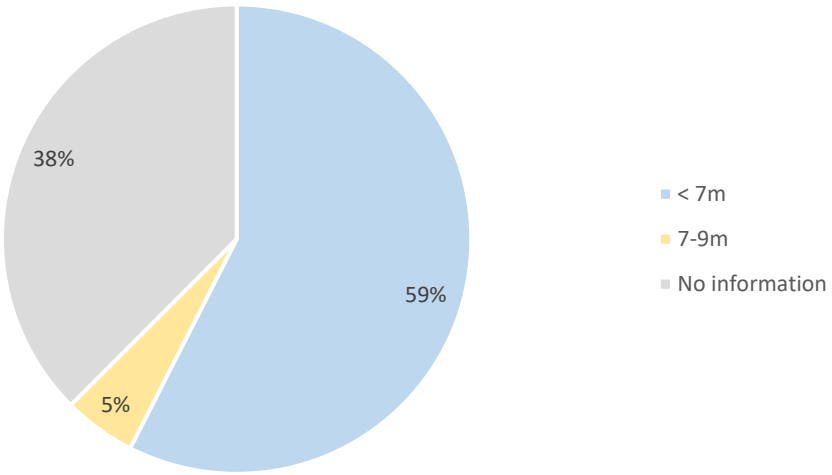

Figure 17. Percentage of grounding accidents reported in 2019 per draught categories

The spatial distribution of the reported collisions and contact accidents in the Baltic Sea area is presented in Figure 18 below.

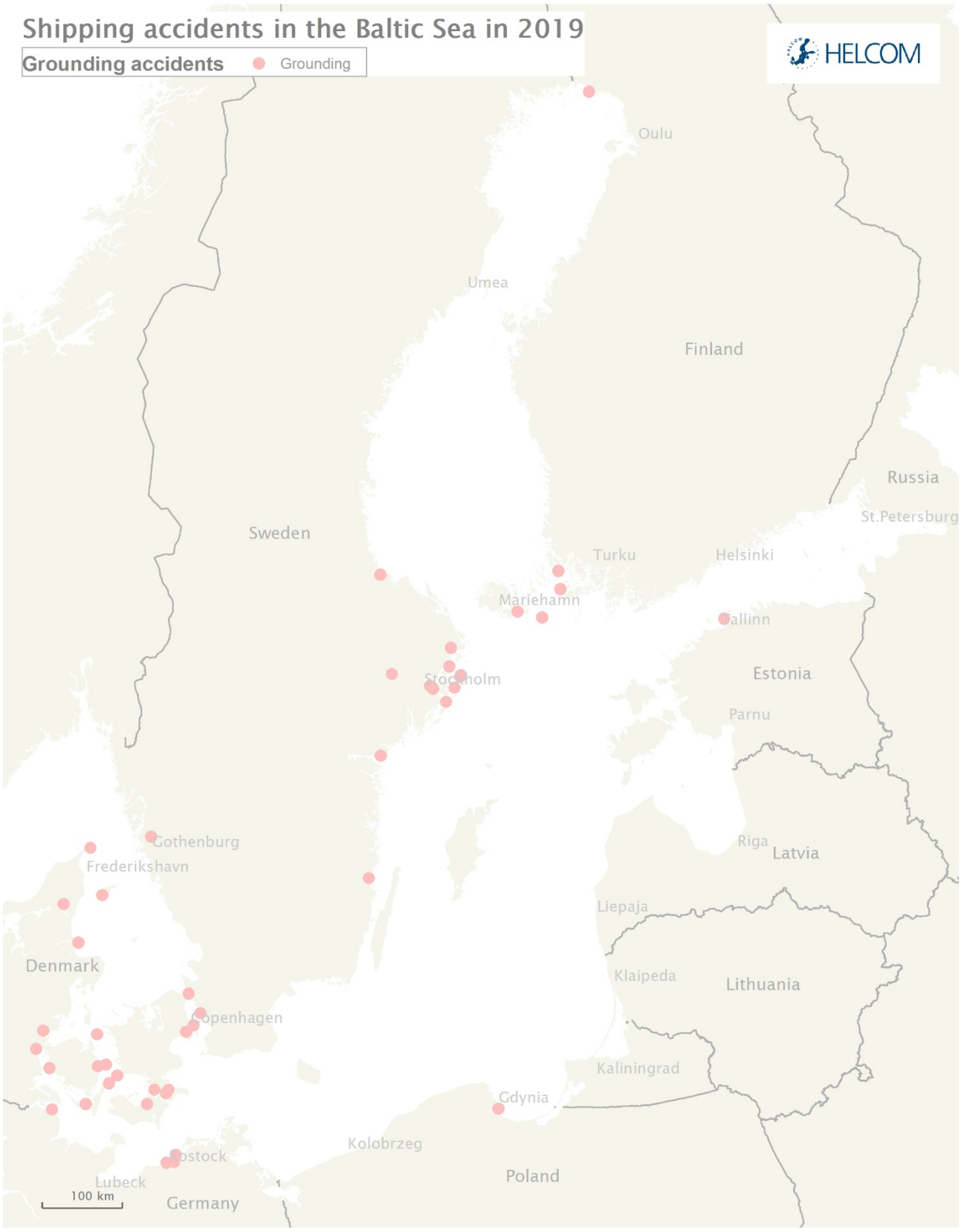

Figure 18. Grounding accidents in the Baltic Sea area in 2019 (if no accidents are displayed in certain national waters, the reason can be either no accident occurrence during 2019, or lack of data).

5. Types of vessels involved

Cargo vessels were the most common type of ships involved in accidents in 2019 accounting for 36.9% of all vessels with a total of 86 reports (cf. Figure 19). Passenger ships were involved in 33.5% of all the reported accidents with 78 reports. As was previously mentioned in this report (cf. Section 2 on ship traffic in the Baltic Sea), passenger and cargo vessels are known to be the ship types operating the most in the Baltic Sea area. The category ”other” including dredger and tug boats is accounting for 6.9% of the accidents. The rest of ship types such as tanker, service, container, roro cargo and fishing vessels are accounting for 47.6% of all the accidents reported for the year 2019.

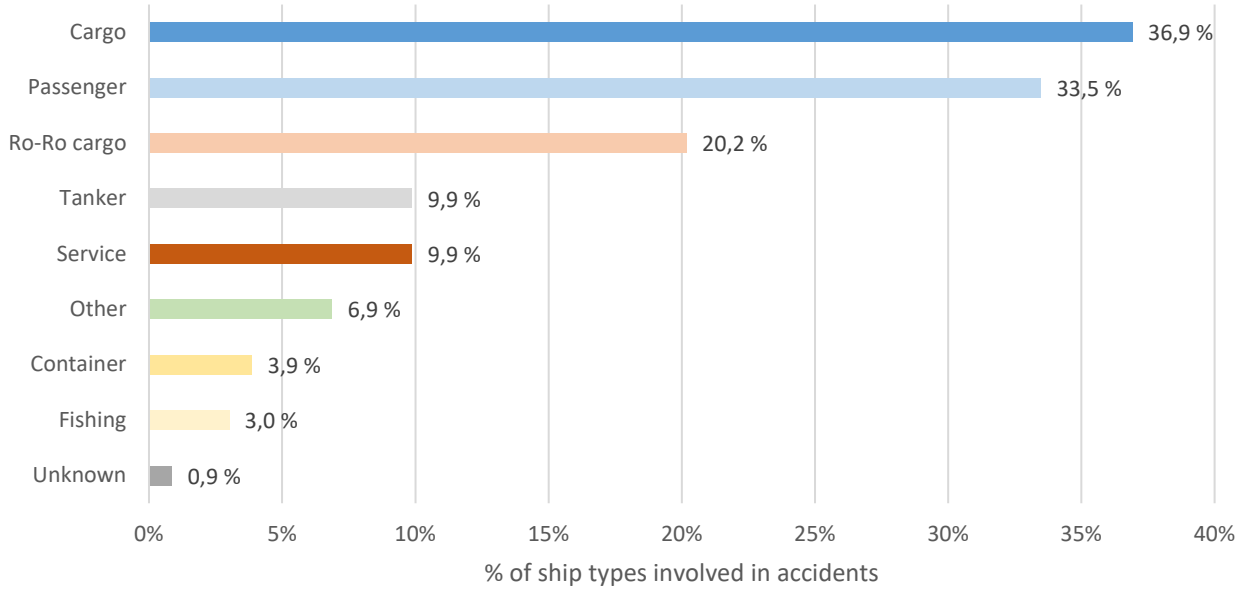

Figure 19. Proportion of ship types involved in accidents in 2019. The Figure includes all the types of accidents as well as the accidents involving several ships.

The spatial distribution of these accidents by ship types is presented on Figure 20 on the next page.

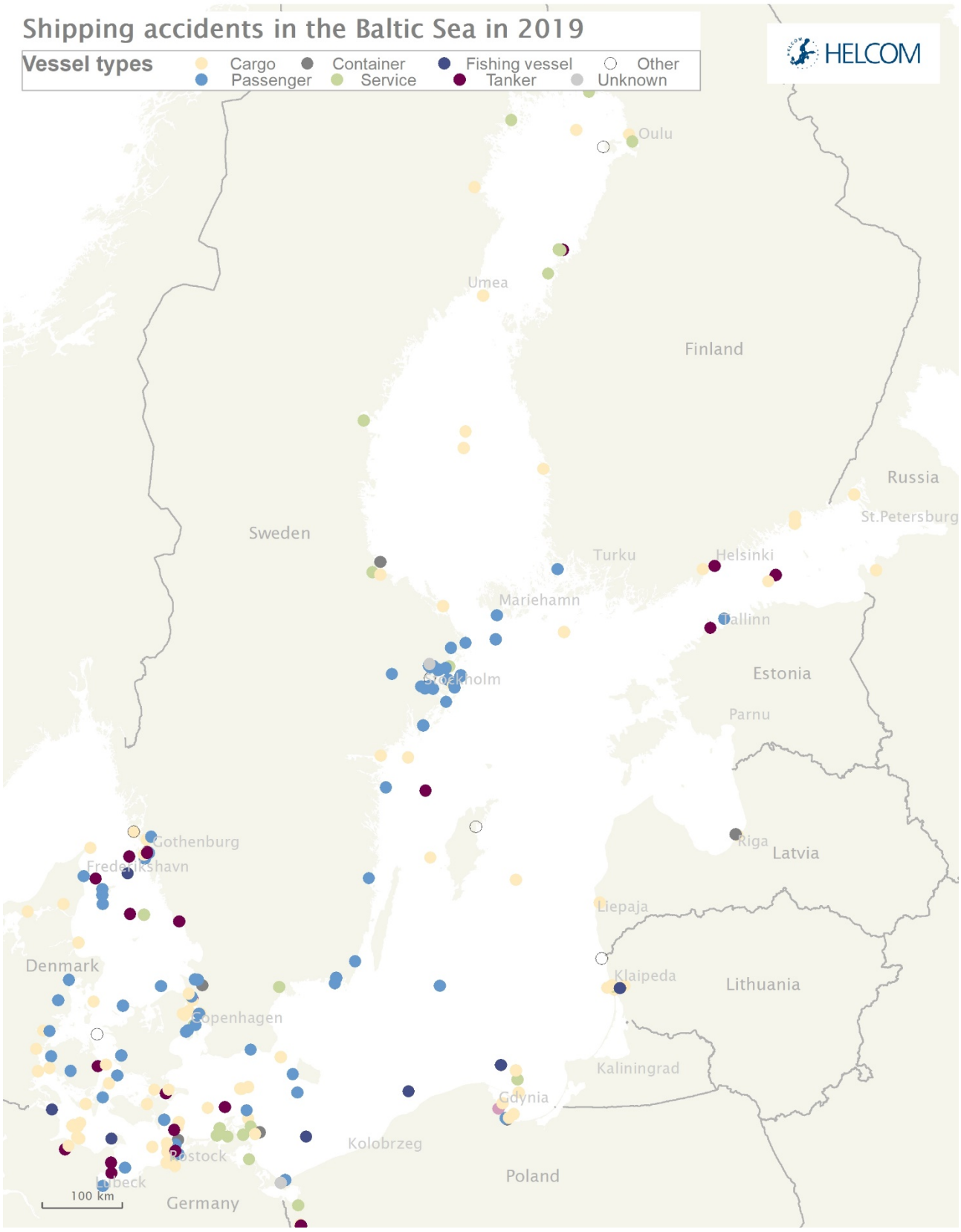

Figure 20. Reported shipping accidents by ship types in 2019.

6. Cause of accidents

The majority of the reported accidents did not include information on the cause of the accident (73% Figure 21). Technical failure and human element were of almost equal proportion, with 11% and 14% of causes of accidents respectively.

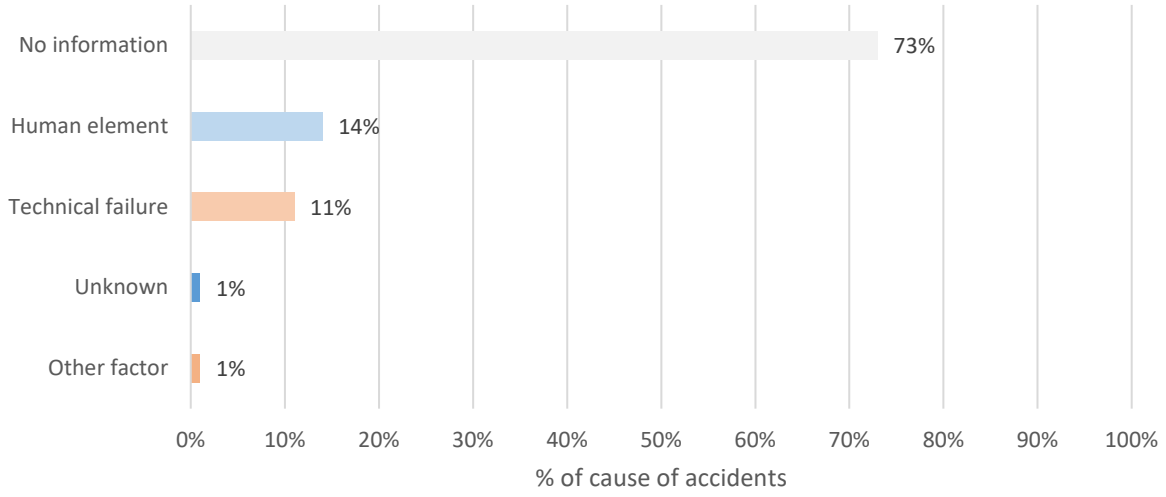

Figure 21. Proportion of cause of accidents reported in 2019

The spatial distribution of accidents with indication of the cause of the accidents for the period is presented in Figure 22.

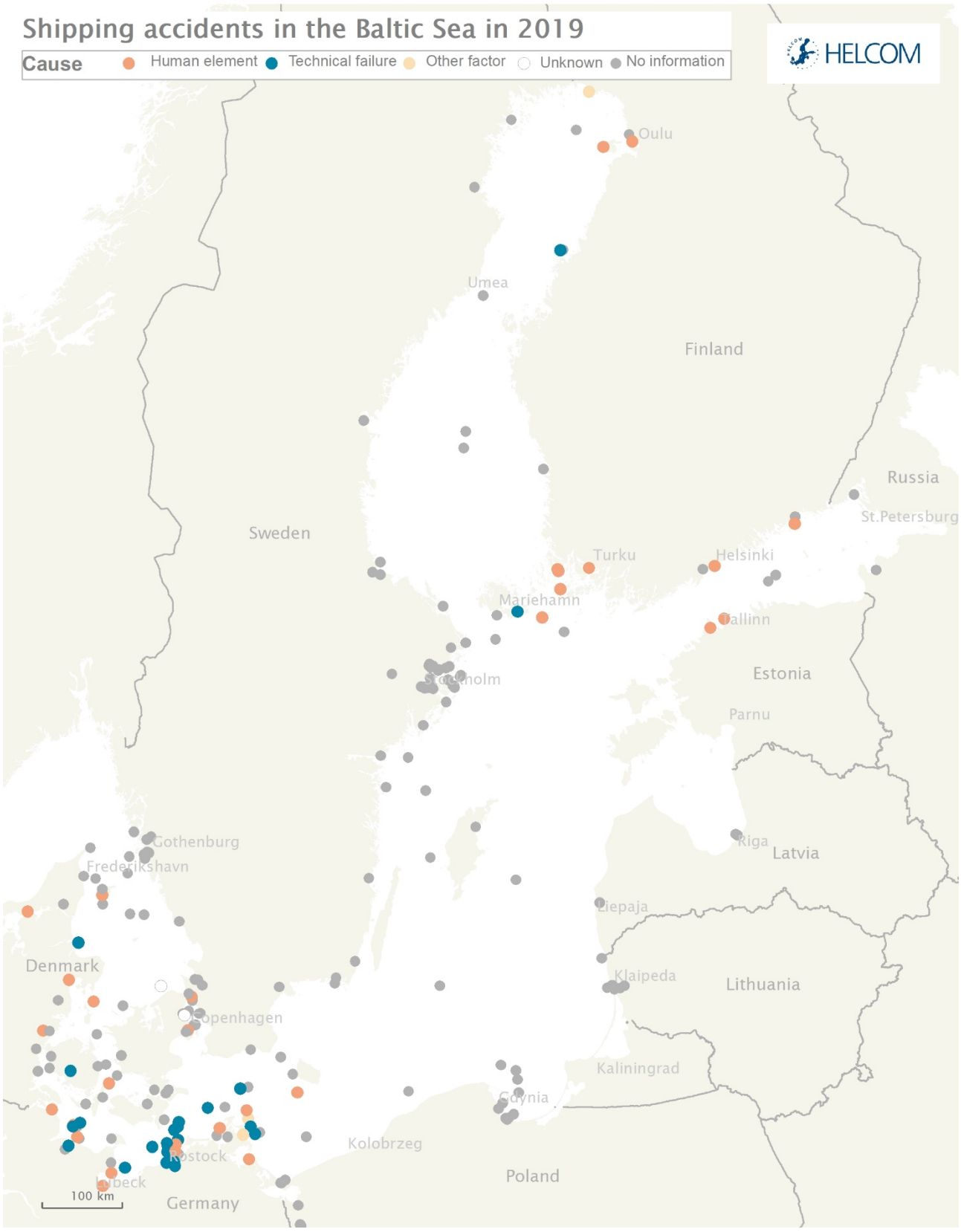

Figure 22. Cause of accidents in the Baltic Sea area in 2019.

7. Acccidents with pollution and response activities

7.1. Accidents with pollution

For each accident reported, the reporting bodies were asked to define if some the events generated pollution or not. According to the reported data, 2.1% (5 events) of the accidents ended up with some kind of pollution. Most of the accidents (213 events or 91.4%) did not cause pollution. The 6.9% (15 events) of accidents included no information on pollution. Due to the low number of pollution related accidents, no figures are presented (unlike previous reports).

The spatial distribution of the accidents resulting in pollution for the period is presented in Figure 23 (next page). Special characteristics such as low salinity, small water volume, restricted connection to the ocean, seasonality and the ice cover during winter make the Baltic Sea highly vulnerable to the effects of oil spills which makes swift response very important. Intensive regional cooperation in the field of response and preparedness to spills in the Baltic Sea has been carried out within HELCOM since the 1970s (HELCOM Response Working Group). Due to such cooperation efforts the oil recovery rate in the Baltic Sea is generally much higher than the global average and, as proved by previous pollution accidents of regional importance, it can reach as much as 50 %.

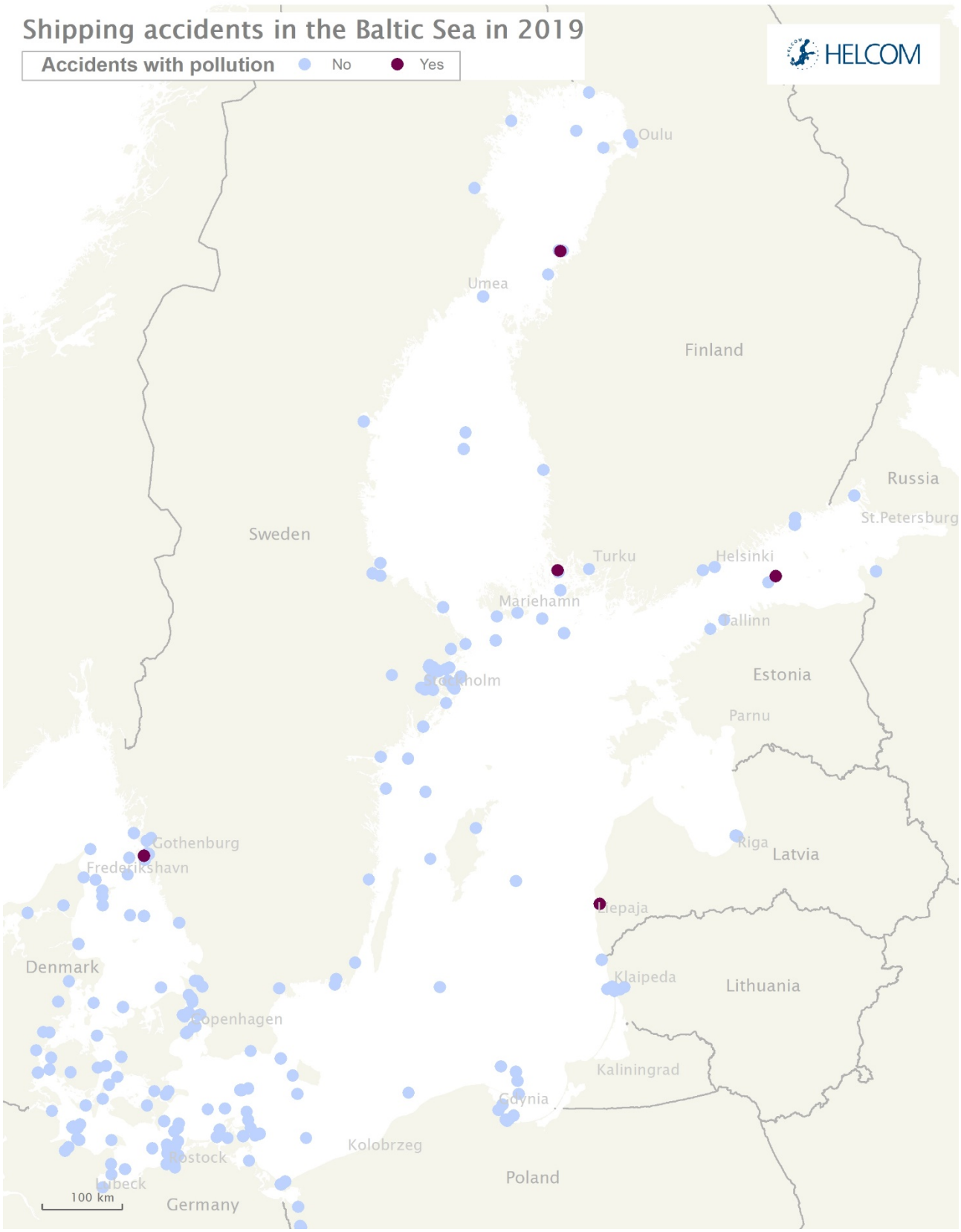

Figure 23. Shipping accidents with pollution in the Baltic Sea in 2019.

7.2. Response activities

Response activities in the Baltic Sea region have been reported by the Baltic Sea states following a request by the HELCOM Secretariat. All the Contracting Parties answered to the data request from the HELCOM Secretariat, the information is available in the table 3.

Table 3. Reported response activities in the Baltic Sea area in 2019

Country	Year	Date (dd.mm.yyyy)	Time (hh:mm)	Place	Latitude (DD)	Longitude (DD)	Source	Type of pollution	Amount of pollution (m3)	Amount recovered at sea (m3)	Amount recovered on shore (m3)	Polluted coastline (km)	Amount and state of affected wildlife	Affected species	Action taken for collection and/or treatment of wildlife	Recovery operation at sea (days)	Recovery operation on shore (days)	Responsible organization	Further details
Estonia	2019	17.3.2019		at sea	59° 25´	027° 45´	ship	fuel oil	0,2	0									
Estonia	2019	14.4.2019		at sea	59° 19´	023° 30´	ship	fuel oil	0,2	0									
Estonia	2019	20.4.2019		at sea	59° 50´	026° 04´	ship	crude oil	3	3						2		Police and Border Guard Board	
Estonia	2019	13.5.2019		at sea	59° 26´	024° 46´	ship	fuel oil	0,2	0									
Estonia	2019	10.7.2019		at sea	59° 54´	026° 03´	ship	fuel oil	0,3	0									
Estonia	2019	28.8.2019		at sea	59° 49´	025° 43´	ship	fuel oil	0,1	0									
Estonia	2019	4.9.2019		at sea	59° 25´	027° 44´	ship	fuel oil	0,1	0									
Estonia	2019	25.9.2019		at sea	59° 26´	024° 46´	ship	fuel oil	0,2	0									
Estonia	2019	28.9.2019		at sea	59° 30´	024° 37´	ship	fuel oil	0,1	0									
Finland	2019	20.6.2019	4:57	EEZ	59° 27'01 "N	020° 58' 39"E	ship	waste oil	39	8 (estimation)	0	0	none detected	n/a	n/a	2		Finnish Border Guard	Operational discharge

Annex 1

Guideline for filling-in the HELCOM Reporting Format on Shipping Accidents (as of September 2016).

All accidents including, but not limited to grounding, collision with other vessel or contact with fixed structures (offshore installations, wrecks, etc.), disabled vessel (e.g. machinery and/or structure failure), fire, explosions, etc., which took place in territorial seas or EEZ of the Contracting Party and involved any ships which are required to carry AIS should be reported to the HELCOM Secretariat using the agreed reporting format, irrespectively if there was pollution or not.

The reporting format is provided as an excel file and includes the following information entries. The predefined entries should be used:

Country	Country in whose water the accident took place	
Year	Year of accident	
Date (dd.mm.yyyy)		
Time (hh:mm)		
Latitude (DD)	Please provide latitude in decimal degrees, e.g. 57.123	
Longitude (DD)	Please provide longitude in decimal degrees, e.g. 18.456	
Location of accident	Fixed answers; please choose from: **"Port"**, **"Port approach"**, **"Open sea"** or **"n.i."** (no information available). The category "Open sea" covers all accidents at sea i.e. not defined as "Port" or "Port approach". Categories are used only for the purpose of statistics and are too be defined according to national practice of the reporting authority.	
Ship 1	Ship 1 name, ID, flag	
	Ship 1 AIS category	Fixed answers; please choose from: **"Tanker"**, **"Cargo"**, **"Passenger"** or **"Other".**
	Ship 1 type (detail)	Please, provide further details on type of ship, e.g. tanker (oil, chemical, gas tanker), cargo ship (general cargo, bulk carrier, etc) and other ships (icebreaker, tug boat, ro-ro, etc).
	Hull construction (tankers only)	Fixed answers; please choose from: **"Single, hull"**, **"Double hull"**, **"Double bottom"**, **"Double sides"**, **"Mid deck"** or **"Other"** .
	Size (gt)_ship1	
	Draught (m)_ship1	Fixed answers; please choose from**: "< 7m"**, **"7-9m"**, **"9-11m"**, **"11-13m"**, **"13-15m"**, **">15m"** or **"n.i."**.
Ship 2 (if relevant) *Fill this in only if accident involved two ships, e.g. in case of a collision*	Ship 2 name, ID, flag	
	Ship 2 AIS category	Fixed answers; please choose from: **"Tanker"**, **"Cargo"**, **"Passenger"** or **"Other".**
	Ship 2 type (detail)	Please, provide further details on type of e.g. tanker (oil, chemical, gas tanker), cargo ship (general cargo,

		bulk carrier) and other ships (icebreaker, tug boat, ro-ro etc).
	Hull construction (tankers only)	Fixed answers; please choose from: **"Single, hull"**, **"Double hull"**, **"Double bottom"**, **"Double sides"**, **"Mid deck"** or **"Other"** .
	Size (gt)_ship2	
	Draught (m)_ship2	Fixed answers; please choose from**: "< 7m"**, **"7-9m"**, **"9-11m"**, **"11-13m"**, **"13-15m"**, **">15m"** or **"n.i."**.
Type of cargo	If relevant, please specify amount and type of cargo, e.g. people (passengers and crew), oil, dangerous goods, harmful substances, bunker, ballast and empty, other.	
Type of accident	Fixed answers; please choose from: **"Collision"** (striking or being struck by another ship) **"Stranding/grounding"** (being aground, or hitting/touching shore or sea bottom or underwater objects (wrecks, etc.)) **"Contact"** (striking any fixed or floating object other than those included previously) **"Pollution"** (e.g. during fuel transfer) **"Fire or explosion"** **"Hull failure/ failure of watertight doors/ports etc."** **"Machinery damage"** **"Damages to ships or equipment"** **"Capsizing/listing"** **"Missing (assumed lost)"** **"Accidents with life-saving appliances"** **"Other"**	
Type of collision or contact*(collision and contact accidents only)*	Fixed answers; please choose from: **"With vessel"**, **"With vessel and object", "With object"** or **"n.i."**.	
Further details about accident	More detailed information, especially if "Other" was selected in the "Type of accident" column.	
Cause of accident	Fixed answers; please choose from: **"Human element"** (violations or error) **"Structural failure"** **"Technical failure"** (machinery/equipment incl. design errors) **"Cargo related"**	

	"External causes"(including environment, navigational infrastructure, criminal acts etc.) **"Unknown"**
Human element subcategories	Please provide further details if "Human element" was selected in the previous column. Fixed answers; please choose from: **"Violation"** (deliberate decision to act against a rule or plan) **"Slip"** (unintentional action where failure involves attention) **"Lapse"** (unintentional action where failure involves memory) **"Mistake"** (an intentional action where there is an error in the planning process; there is no deliberate decision to act against a rule or procedure):
Accident in ice conditions	Fixed answers, please choose from: **"Yes", "No"** or **"n.i.".**
Crew trained in ice navigation	Fixed answers, please choose from: **"Yes", "No"** or **"n.i.".**
Further details on cause of accident	Please, provide further details on cause e.g. hard winds, heavy waves, reduced visibility, etc.
Pilot on board	Fixed answers, please choose from: **"Yes"**, **"No"**, **"Exemption certificate"** or **"n.i."**.
Offence against rules or regulations	Please, specify e.g. use of pilot, routeing, weather restriction, deficiency of the ship, operation of the ship, COLREG, speed limits, max draft, others.
Damage	Please specify, e.g. lives (crew and passengers), total loss, leakage, others.
Need of assistance	Please specify, e.g. SAR, towing, lightering, salvage, others.
Pollution	Fixed answers; please choose from: **"Yes"**, **"No"** or **"n.i.**.
Amount of pollution (m^3)	
Amount of pollution (tonnes)	
Type of pollution	Please, specify e.g. crude oil, diesel fuel, other.
Consequences/response action	Please, specify e.g. consequences of pollution, response to contamination taken, amount of pollution recovered, etc.
Additional info	Any other relevant information, e.g. needed to evaluate the limitation of data, etc.