Bonn Agreement
Accord de Bonn

Bonn Agreement Aerial Surveillance Programme

2021 Annual Report on Aerial Surveillance

Introduction

1. The ten countries (Belgium, Denmark, France, Germany, Ireland, Netherlands, Norway, Spain, Sweden and United Kingdom) bordering the Greater North Sea and its wider approaches work together within the Bonn Agreement to undertake aerial surveillance using specially equipped aircraft and specialised personnel to detect spills of oil, litter, garbage and other harmful substances and enforce international environmental regulations. They are further supported by the European Union through the European Maritime Safety Agency (EMSA) using the CleanSeaNetwork of satellite surveillance and Remote Piloted Aircraft Systems (RPAS)[1].

2. The North West European Waters – the main part of which is formed by the North Sea – have been declared a Special Area by the International Maritime Organization for the purpose of MARPOL Annex I (Oil). This took effect on 1 August 1999, from which date the discharge of all oily wastes at sea in the Special Area is prohibited. MARPOL Annex II regulates noxious liquid substances in bulk. MARPOL Annex V on the Prevention of Pollution by Garbage from Ships went into force on 31 December 1988, and the North Sea is one of the Special Areas established under this Annex. MARPOL Annex I, II and V monitoring and enforcement is included in the Bonn Agreement surveillance activities.

3. This report demonstrates the effectiveness of cooperation in aerial surveillance among North Sea countries and their collective effort to detect marine pollution. It presents the results of aerial surveillance operations undertaken during 2021 as a collective effort under the Bonn Agreement. In addition to national flights carried out under the Bonn Agreement in their own parts of the maritime area and other aerial surveillance undertaken for national purposes, the Bonn Agreement countries also coordinate flights of the following types:

a. *Tour d'Horizon* (TdH) flights - monthly flights carried out by countries in turn to survey the offshore area of the North Sea where offshore oil and gas activities take place;

b. *Coordinated Extended Pollution Control Operations* (CEPCO), where some neighbouring countries cooperate to survey intensively an area with high traffic density during a relatively short period (e.g. 24 hours). Contracting Parties may also decide to organise a so called "Super CEPCO" where Bonn Agreement Contracting Parties, often together with countries from neighbouring regions, cooperate in the surveillance of a specific area over a period of up to 10 days.

4.

5. For most of the detections observed/confirmed as oil slicks or other substances, the source of the slick (i.e. the polluter) has not been identified. Most visible slicks, however, come from shipping and

[1] At the time of this report RPAS are primarily used for Annex VI surveillance which is not currently within the scope of this report.

offshore installations. Except for oil spills originating from ships, it can often not be determined in the field whether a spill detection was the result of an illegal or a legally permitted discharge from a ship or offshore installation.

6. The marine pollution monitoring results however give a good idea of the order of magnitude of ship-source pollution and pollution from offshore oil & gas installations, and trends therein, in the Bonn Agreement region.

7. A summary report on the EU-EMSA CleanSeaNet Service that supports Bonn Agreement Contracting Parties with satellite images is at Annex I. The report presents CleanSeaNet data for the North Sea for the period 1 January 2021 – 31 December 2021.

8. This annual Surveillance report includes estimates of the total amounts of oil discharged based on the aerial surveillance data. These oil volume estimates have been obtained by means of a simple addition of the estimated (minimum)[2] volumes of the various mineral oil slicks detected/observed at the sea surface for a given year, per type of flight and per country. These estimates use the Bonn Agreement Colour Code until 2003 and from 2004 use its replacement, the more scientifically underpinned Bonn Agreement Oil Appearance Code (BAOAC), as the standard oil volume estimation method. The use of the BAOAC (just like the older Bonn Agreement colour code) results in a best estimate of the amount of oil detected on the sea surface within a reliable order of magnitude. It leads to a minimum and maximum estimated quantity, which basically reflects the respective use of the minimum and maximum oil layer thicknesses defined for each oil appearance. More detailed information on the BAOAC, the oil slick appearances and the use of the code can be found in the Bonn Agreement Aerial Operations Handbook and the BAOAC Photo Atlas[3].

9. As aerial and satellite surveillance do not provide continuous coverage of the Bonn Agreement region, it can be concluded that there is the potential for other incidents of oil in the sea not being detected over the course of any one year. Moreover, oil slicks (or other forms of pollution) are often detected with no known source, and already weathered to a certain degree. In case of oil this means that the amount estimated may be less than originally discharged. The Contracting Parties to the Bonn Agreement therefore consider the aerial and satellite surveillance data currently available to be too sparse and too diverse to allow for a reliable overall annual estimation of oil inputs in the entire Bonn Agreement area and that such estimates should be interpreted as indicative only.

10. This report compiles all the surveillance undertaken for Bonn Agreement purposes. These tables are based on data related to the number of flight hours, the number of spills and pollution detections, and, in case of oil spills, their estimated volume. The format of the report's tables 1 – 4 was modified in 2000, 2003, 2013, 2014 and 2019. The 2000 to 2002 data reflects the relation of the observation with SLAR coverage through the concept of 'BA flight hour' (i.e. one hour of airborne remote sensing over the sea at a standardised speed of 335 km per hour). As a result of this revision of the reporting format in 2000, the flight hour data up to 1999 are absolute numbers and from 2000 to 2002 the flight hour data are standardised on SLAR-coverage, i.e. corrected for relative aircraft speed. For the countries for which the average aircraft speed is significantly different from the standard speed (e.g. Belgium and UK) the data up to 1999 and from 2000 will not be comparable. As a result of a new revision of the reporting format in 2003, from 2003 onwards, the data are again absolute numbers. In the 2008 reporting round a draft revised reporting format has been used which was then harmonised with the Helsinki Commission. In 2013 the format was updated to include data on confirmed detections/observations of “other substances” and “unknowns”, as Contracting Parties had identified increasing numbers of these types of spills and agreed to

[2] As agreed within the Bonn Agreement, the minimum oil volumes should preferably be used for enforcement and statistical purposes, whereas the maximum oil volumes should preferably be used in the context of oil pollution response.
[3] https://www.bonnagreement.org/publications

collect this data for the 2012 report. In 2019 the format was updated to further include the diversification of detection categories and a shift from mainly ship-source oil pollution and an increase in 'other substances', a decrease in illegal discharges of oil while permitted discharges from offshore installations remain high and a diversification in surveillance platforms. To accurately portray permitted discharges the "Type of Polluter" field has been altered to "Polluter/source". The format further includes (Super)CEPCO for countries to report their detections to the organising Contracting Party. 2020 is the first year to utilise the new Reporting Format agreed by Bonn and HELCOM in 2019 and includes additional categories for Litter, Garbage and Objects.

Summary

11. Data for the 2021 report was received from Belgium, Denmark, France, Germany, Ireland, Netherlands, Norway, Spain, Sweden and United Kingdom with additional satellite surveillance from EMSA's CleanSeaNet. 3983 hours of national and regional flights (Tour d'Horizon) were performed, down from 2020 (4235) with several Contracting Parties cancelling flights due to the Covid-19 pandemic. A SuperCEPCO was organised by Norway in was performed in 2021. In addition to their crewed flights, France also flew 288 hours of drone flights during daylight hours. This marks the first time drone flights have been included in Bonn Agreement Aerial Surveillance statistics.

12. All flights combined, the overall totals for 2021 are as follows: 386 detections were made, 105 of these were confirmed as mineral oil (55 were from offshore platforms, 47 from ships and the remaining 277 from other or unknown sources). 171 detections were confirmed as 'Other substances', 70 were Unknown. Three Object detections were made consisting of containers and timber cargo lost overboard. 16 detection of Garbage and 20 Litter detections, mostly plastic.

13. The total number detections was 15% lower in 2021 than 2020 (386 vs 453). This can be seen across most categories with Oil detections -37% (105 vs 164), Litter detections -51% (20 vs 41), Unknown detections -45% (71 vs 129). Other detections increased by 47% (172 vs 117). The reason for the decline is not known but a 5% decline in flight hours compared to 2020 (4225 hours) may partly explain the decrease.

14. Compared to 2019, 2020 saw a large increase in the number of detected Mineral Oil Slick without an estimated volume but this was not seen in 2021 and all slicks had an estimate size.

15. EMSA's CleanSeaNet made 1218 detections. Of these 59 were confirmed to be mineral oil, 86 Other Substances, 35 Unknown and 28 Natural Phenomena. 823 instances were either not checked (267) or there was no feedback provided (556). Following the withdrawal of the United Kingdom from the European Union. As such 341 of the 556 detections not checked were within the UK area where no feedback is provided. Norway and, for the first time the United Kingdom, submitted 1894 additional national satellite detections and these are included in Table 5.

National Flights

Flight effort

16. The data presented in Table 1 relates to national flights conducted in 2021 with a total of 3912 hours flight time. As in 2020 the Netherlands flew the majority of these, conducting 1500 hours (1292 in 2020). The total number of flight hours (national and regional) from 1990 – 2021 is shown in figure 1.

Country	No. of flight hours		
	Daylight	Darkness	Total
Belgium	148:35	19:20	167:55
Denmark	253:00	16:56	269:56
France	90:00	10:00	100:00
Germany	136:18	189:00	325:18
Ireland	677:30	0:00	677:31
Netherlands	829:35	671:10	1500:45
Norway	340:33	6:30	347:03
Spain	336:00	25:00	361:00
Sweden	155:43	7:34	163:17
UK	301:27	0:00	301:27
Total	**2967:14**	**945:30**	**3912:45**

Table 1. National flight hours for 2021.

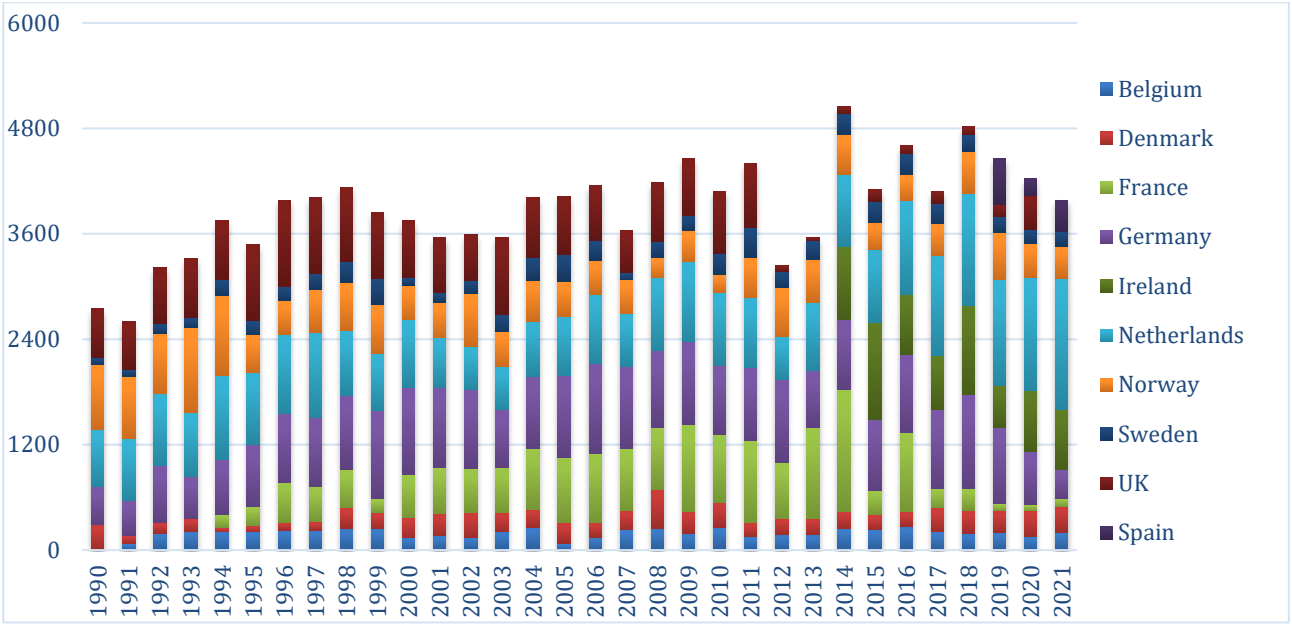

Figure 1. Number of flight hours per Contracting Party 1990-2020.

Oil Detections

17. In 2021 Contracting Parties observed 72 mineral oil detections during National Flights in the Bonn Agreement area (table 2).

Country	No. of flight hours			No. of detections inside national EEZ			Detections confirmed / observed as mineral oil spills			No. of polluters (mineral oil)				Estimated volume (m^3)
	Daylight	Darkness	Total	Dayllight	Darkness	Total	Daylight	Darkness	Total	Rigs	Ships	Other	Unknown	
Belgium	148:35	19:20	167:55	4	2	6	0	0	0	0	0	0	0	0.000
Denmark	253:00	16:56	269:56	27	4	31	17	0	17	3	0	0	14	1.871
France	90:00	10:00	100:00	8	1	9	4	1	5	0	0	2	3	2.170
Germany	136:18	189:00	325:18	22	11	33	6	0	6	0	0	0	6	0.682
Ireland	677:30	0:00	677:31	1	0	1	1	0	1	0	1	0	0	0.006
Netherlands	829:35	671:10	1500:45	168	19	187	6	0	6	0	1	0	5	0.339
Norway	340:33	6:30	347:03	2	0	2	2	0	2	0	1	1	0	0.033
Spain	336:00	25:00	361:00	39	2	41	9	1	10	0	9	0	1	53.656
Sweden	155:43	7:34	163:17	12	2	14	7	0	7	0	1	0	6	0.079
UK	301:27	0:00	301:27	26	0	26	18	0	18	16	0	1	1	1.443
Total	**2967:14**	**945:30**	**3912:45**	**309**	**41**	**350**	**70**	**2**	**72**	**19**	**13**	**4**	**36**	**60.28**

Table 2 Detections of mineral oil slicks in 2021

18. Volumes of oil slicks detected during National flights were estimated (as outlined in table 3). Figure 2 shows the percentage of oil detections subdivided into different size categories. Compared to 2020 there was a large increase in the total volume of oil detections from 11.11m^3 to 60.28m^3. Two category 4 detections (35.4 m^3 and 14.3m^3) were reported by Spain. No spills over 100m^3 were observed.

Country	Not quantified	Category 1: <0,1m³	Category 2: 0,1-1 m³	Category 3: 1–10 m³	Category 4: 10–100 m³	Category 5: >100m³	Number of Oil Slicks	Number of quantified Slicks	% of total count
Belgium	0	0	0	0	0	0	0	0	**0.00**
Denmark	0	11	6	0	0	0	17	17	**23.61**
France	0	4	0	1	0	0	5	5	**6.94**
Germany	0	5	1	0	0	0	6	6	**8.33**
Ireland	0	1	0	0	0	0	1	1	**1.00**
Netherlands	0	5	1	0	0	0	6	6	**8.33**
Norway	0	2	0	0	0	0	2	2	**2.78**
Spain	0	2	4	2	2	0	10	10	**13.89**
Sweden	0	7	0	0	0	0	7	7	**9.72**
UK	0	14	4	0	0	0	18	18	**25.00**
Total	**0**	**51**	**16**	**3**	**2**	**0**	**72**	**72**	**100**
count	**0.00**	**70.83**	**22.22**	**4.17**	**2.78**	**0.00**	**100.00**		

Table 3. Estimated sizes of detected mineral oil slicks

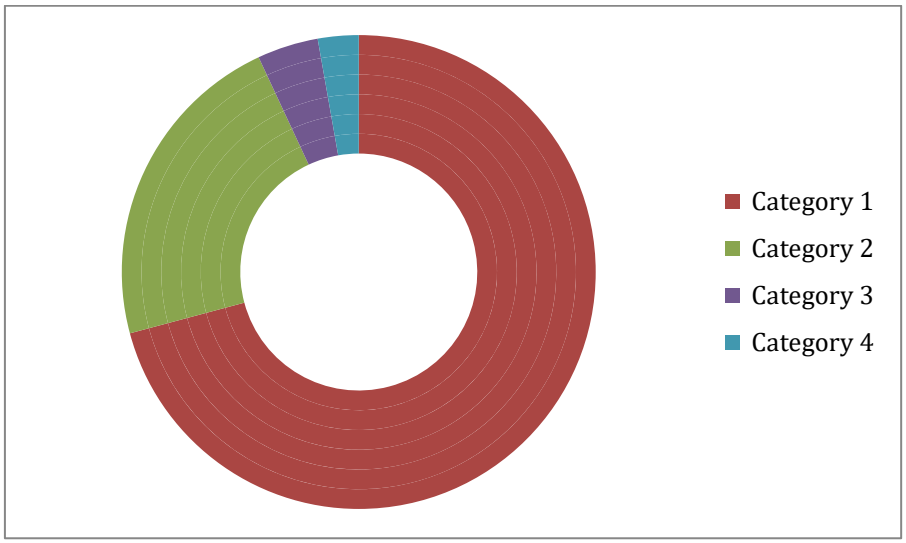

Figure 2: Percentage of national mineral oil slick detections in size categories observed in the Bonn Agreement area.

19. The location of these detections and their estimated size can be seen in figure 3, the decreasing trend in the number of detections of confirmed mineral oil since 1990 can be seen in figure 4.

20. A small increase in detections is seen since 2017 but it is too early to say if this is a future trend or an anomaly. In 2020 the increase can be partially attributed to Norway and the UK with the UK reporting a greater number of detections from offshore installations than in previous years. In 2021 the numbers are again decreasing to a similar level as 2017.

21. The ratio of flight hours to oil detections during this time is shown in figure 5. Since 2015 the ratio has remained stable between 0.2 and 0.3 oil detections per hour of flight time.

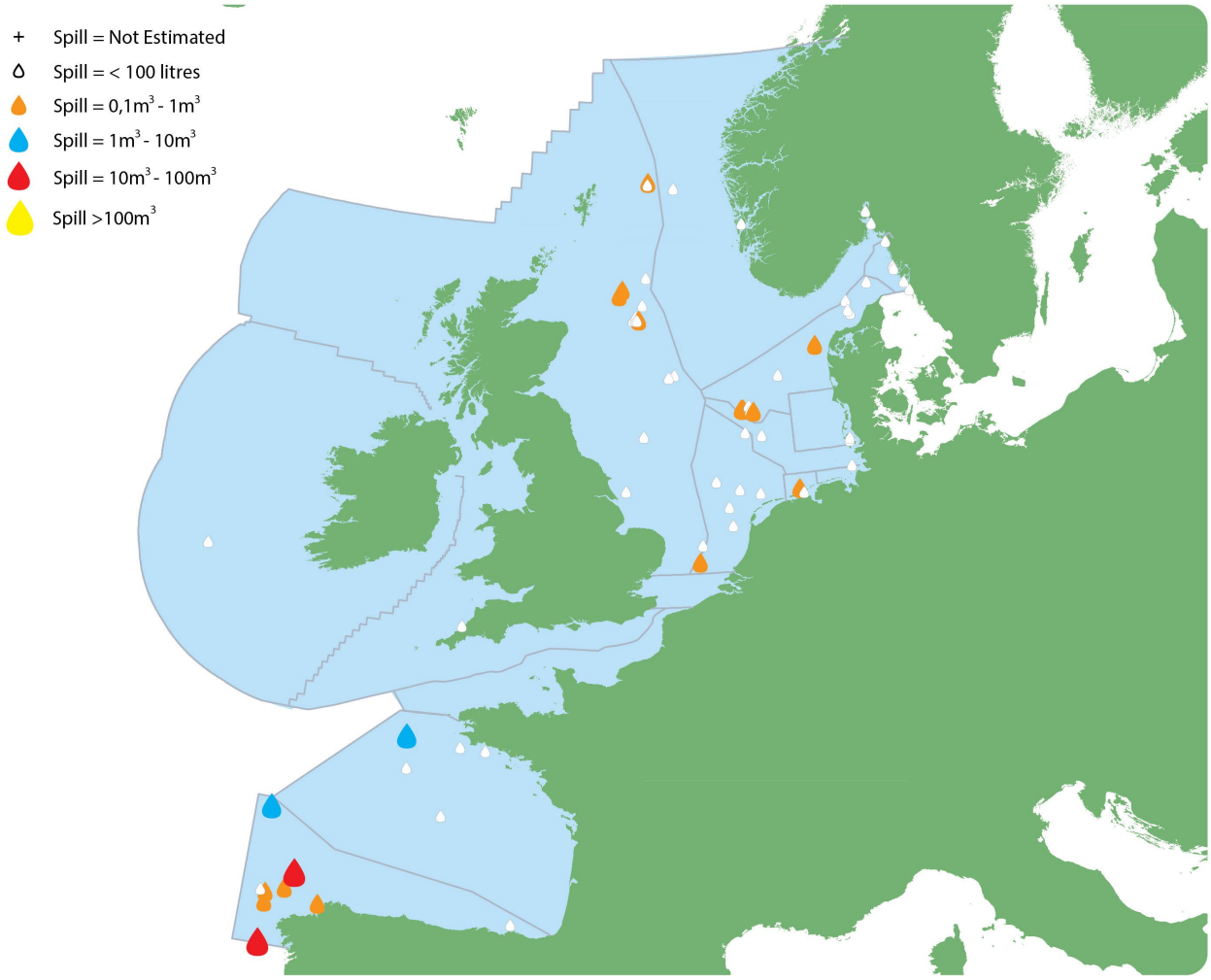

Figure 3. Location and size estimate of oil slicks.

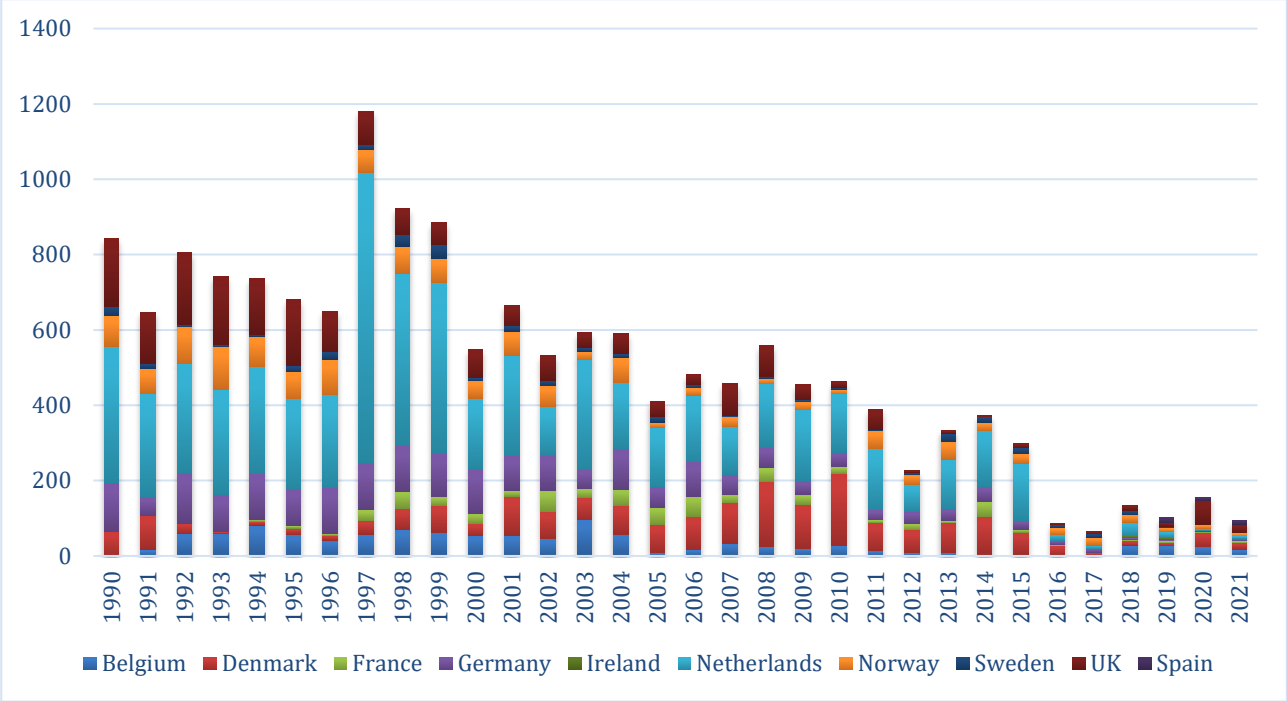

Figure 4. Number of oil slicks observed during national flights 1990 – 2021

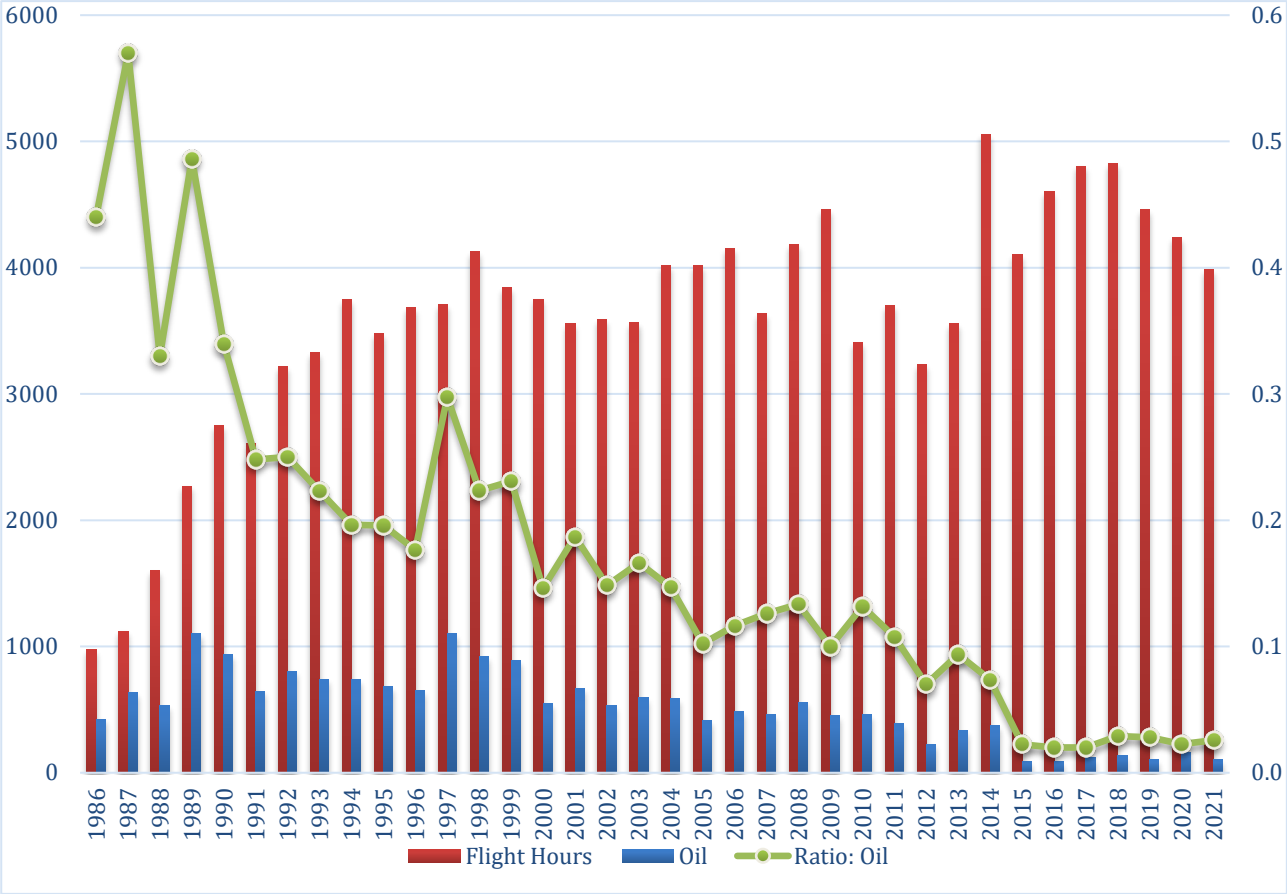

Figure 5. Ratio of flight hours: oil detections from 1986 to 2021.

Other Substances, Unknown Detections, Garbage, Litter and Objects.

22. Detections of other substances (including HNS) and unknown detections made during National Flights have also been reported as part of the annual aerial surveillance reporting (table 4). This has been included as national evidence and has pointed to an increase in spills of Other Substances and therefore it was agreed that this should be tracked at a regional level. In 2021 there were 171 detections of Other Substances during national flights, an increase compared to 115 in 2020, and 71 detections of Unknown Detections compared to 72 in 2020. In 2020 (floating) Objects, Litter and Garbage were added to the reporting format. 19 Object/Garbage detections and 20 litter detections were observed in 2021. As in 2020 all but one Litter detections were submitted by Spain, the remaining one from the Netherlands. The location and types of detections are shown in figure 5. Figure 6 shows the trend in detections with an overall decline in Oil and Unknown detections but an increase in all other detections fir 2021 compared to 2020. Number of detections per type and contracting party are shown in figure 7.

Country	Detections confirmed/observed as other substances	No. of polluters (other substances)				Litter detections	No. of polluters (Litter)	Object/ Garbage detections	No. of polluters (Object)	No. of polluters (Object)	No. of polluters (Garbage)	Unknown detections	No. of polluters (unknown detections)			
		Rigs	Ships	Other	Unknown		Unknown		Ships	Other	Ships		Rigs	Ships	Other	Unknown
Belgium	4	0	0	0	4	0	0	0	0	0	0	2	0	0	0	2
Denmark	1	0	0	0	1	0	0	0	0	0	0	13	1	0	0	12
France	4	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0
Germany	5	0	0	0	5	0	0	2	0	2	0	20	0	0	0	20
Ireland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Netherlands	150	0	20	0	130	1	1	11	0	1	0	19	0	0	0	19
Norway	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spain	0	0	0	0	0	19	19	6	0	0	6	6	0	5	0	1
Sweden	7	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0
UK	0	0	0	0	0	0	0	0	0	0	0	8	0	1	0	7
Total	**171**	**1**	**21**	**0**	**149**	**20**	**20**	**19**	**0**	**3**	**6**	**68**	**1**	**6**	**0**	**61**

Table 4. Other and unknown substances, Litter, Garbage and Object detections.

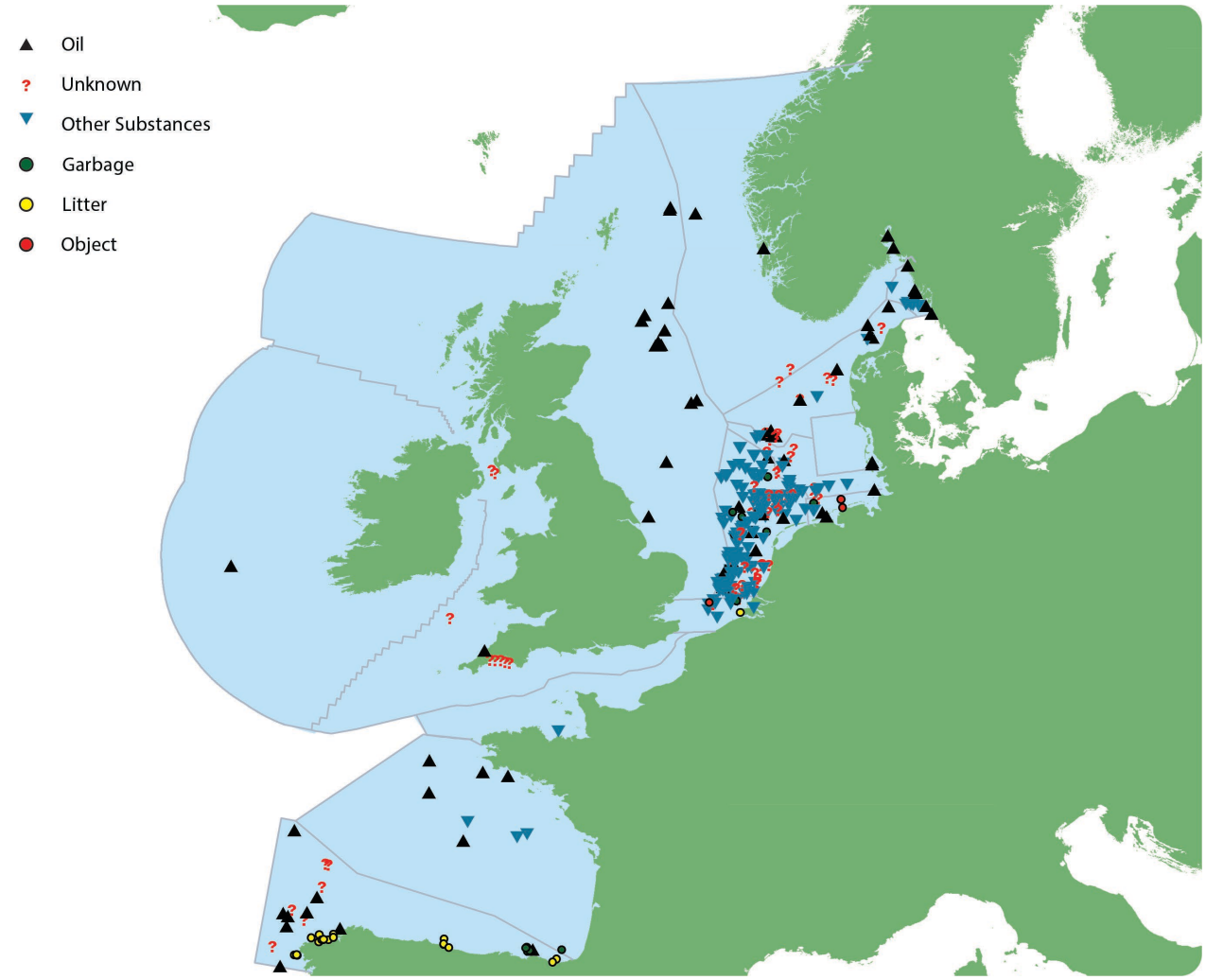

Figure 5. Location and type of detections

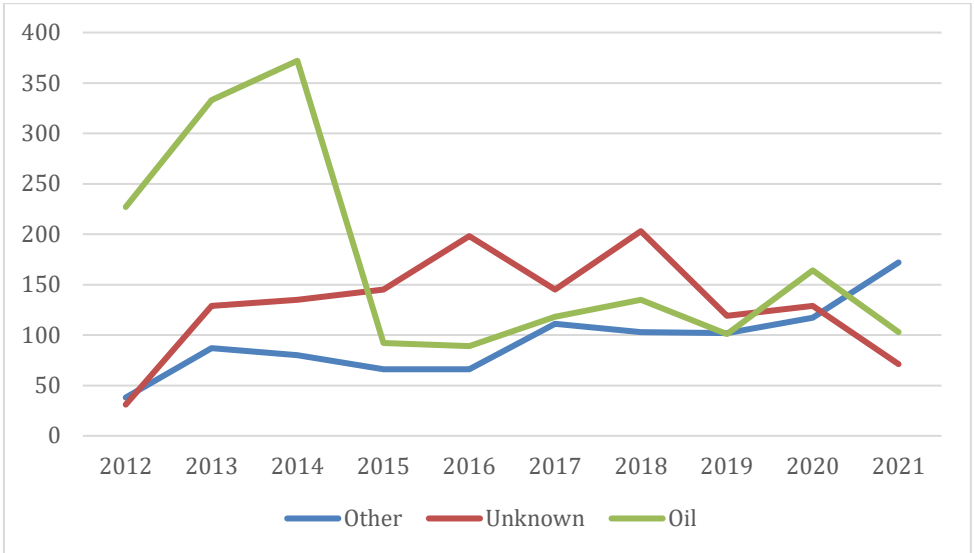

Figure 6. Detections of Other Substances, Unknown Detections and Mineral oil from 2012 – 2021.

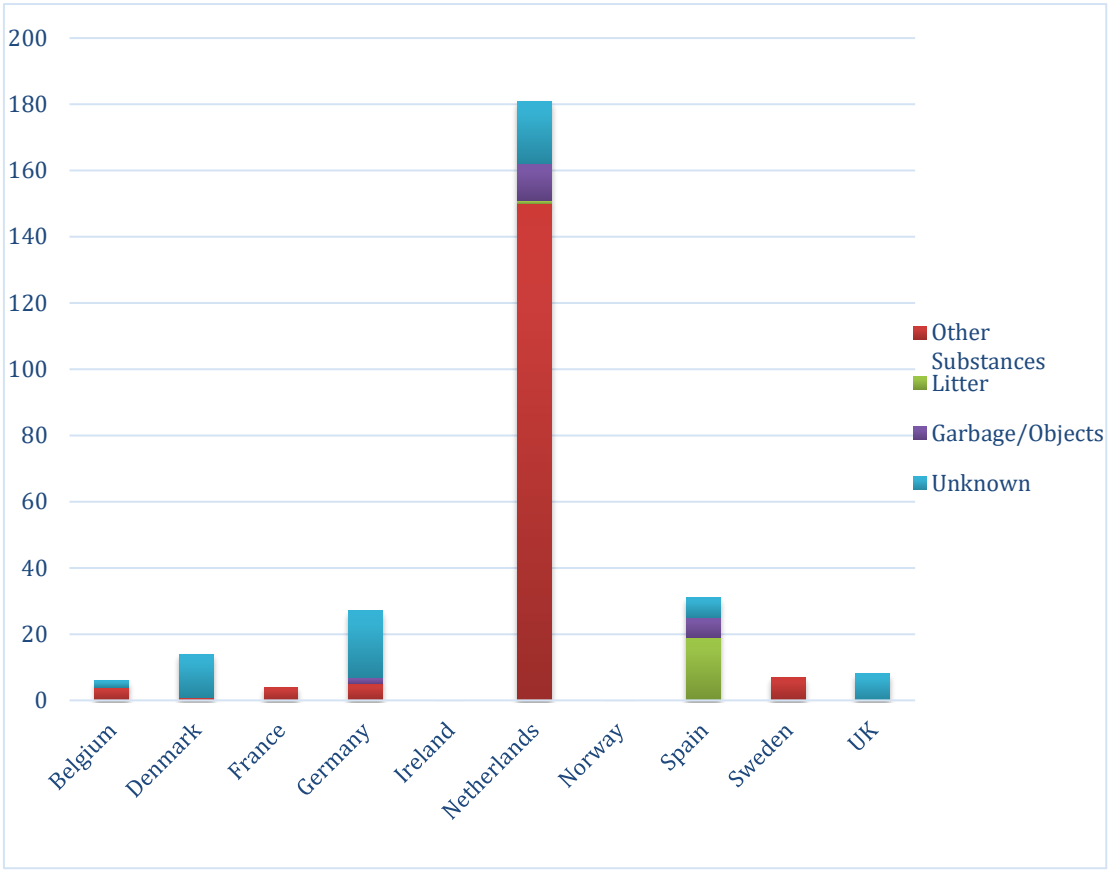

Figure 7. Detections other than mineral oil in 2021

Satellite Detections

Country	Satellite detections							
	Detected	Confirmed mineral oil	Confirmed other substances	Confirmed "unknown" spills	Confirmed natural phenomena	Nothing found	Not checked	No feedback
Belgium	11	0	2	1	0	2	6	0
Denmark	144	25	21	0	9	39	48	2
France	128	4	4	2	7	45	36	30
Germany	50	2	6	5	2	21	11	3
Ireland	80	1	2	4	5	16	31	21
Netherlands	183	5	32	12	3	43	66	22
Norway	278	120	20	1	0	7	9	106
Spain	68	3	1	6	1	2	31	24
Sweden	15	0	3	0	1	2	2	7
UK	2155	1115	76	9	9	230	27	341
Total	**3112**	**1275**	**167**	**40**	**37**	**407**	**267**	**556**

Table 5. National and CleanSeaNet detections during 2021. Satellite detections are not always confirmed by aircraft.

23. In total 3112 satellite detections were made by CleanSeaNet and national detections from Norway and the United Kingdom. Of these 1275 were confirmed as mineral oil (table 5) and this is a large increase from 272 in 2020. This can be attributed to the UK submitting National Satellite data and increasing their coverage in 2021. For full satellite details see Annex I

24. Satellite detections are increasingly used in combination with airborne surveillance but not all detections are confirmed via a visual verification. In particular discharges from offshore installations are confirmed via the operator of the platform. Figure 8 shows the verification effort of CleanSeaNet detections by Contracting Parties.

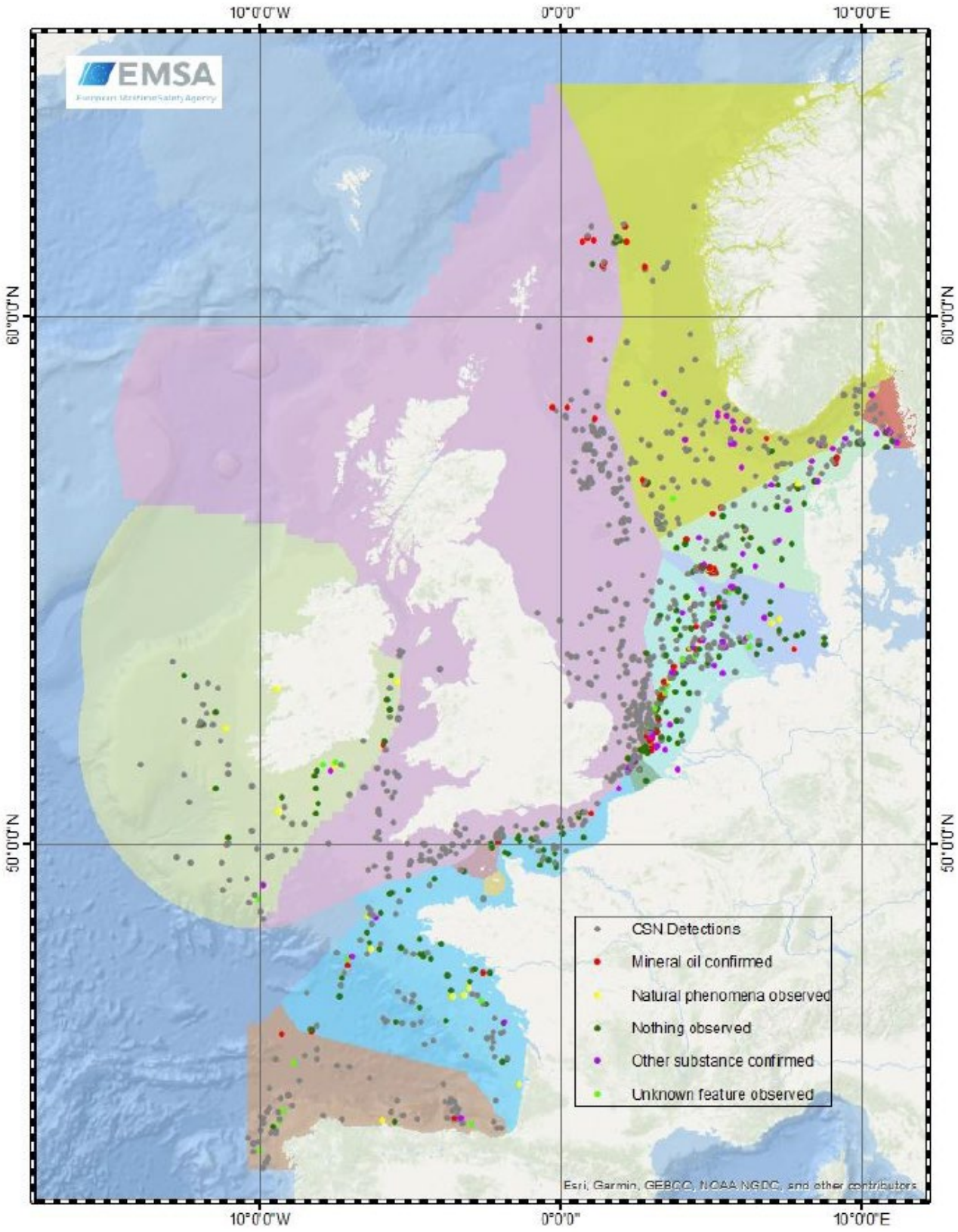

Figure 8. Spatial distribution of verified detections in 2021.

25. Long term trends of satellite detections are shown in figure 9. Satellite detections which were not checked are not available before 2017. From the available data there are no clear trends and this figure will continue to be updated in coming years.

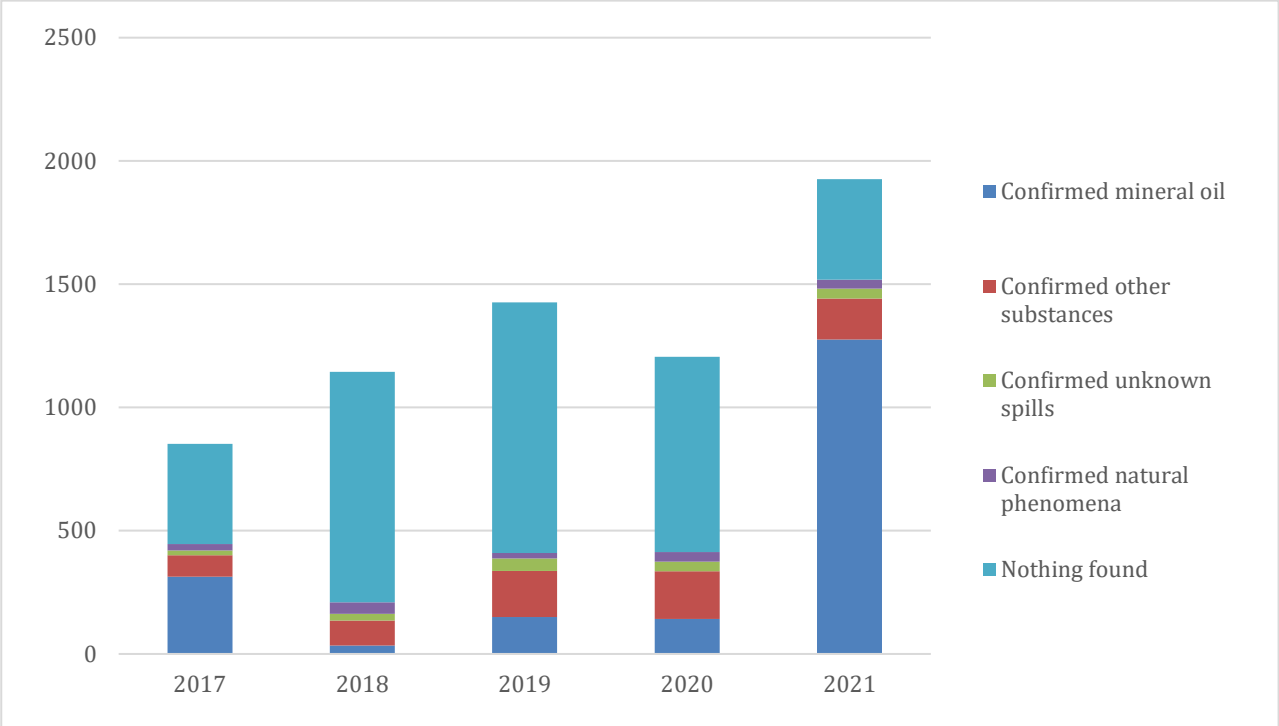

Figure 9. Types of satellite detections 2017 – 2021

Regional Flights

26. In 2021 Tour d'Horizon flights were carried out by Belgium, Denmark, Norway, Sweden and the United Kingdom. Germany and the Netherlands were unable to complete their missions due to technical issues. In total 61:47 flight hours were carried out with a total of 35 detections, 32 of these confirmed as mineral oil. Table 6a and 6b show an overview of the number and size of detections. For full details see the 2020 Tour d'Horizon report. Figure 10 shows locations of the TdH detections and figure 11 shows flight hours and detections from 1999 to 2021. It confirms the previously reported lack of trends (due to strong annual fluctuations) in annual TdH detections since 1999. This seems contrary to, for example, the significantly decreasing trend in oil pollution from ships. But it should be nuanced that such a comparison is difficult to make, since most TdH detections are assessed to be permitted OIW discharges, whilst oil spills detected in the wake of a ship are generally the result of an illegal discharge (violation of MARPOL Annex I discharge standards).

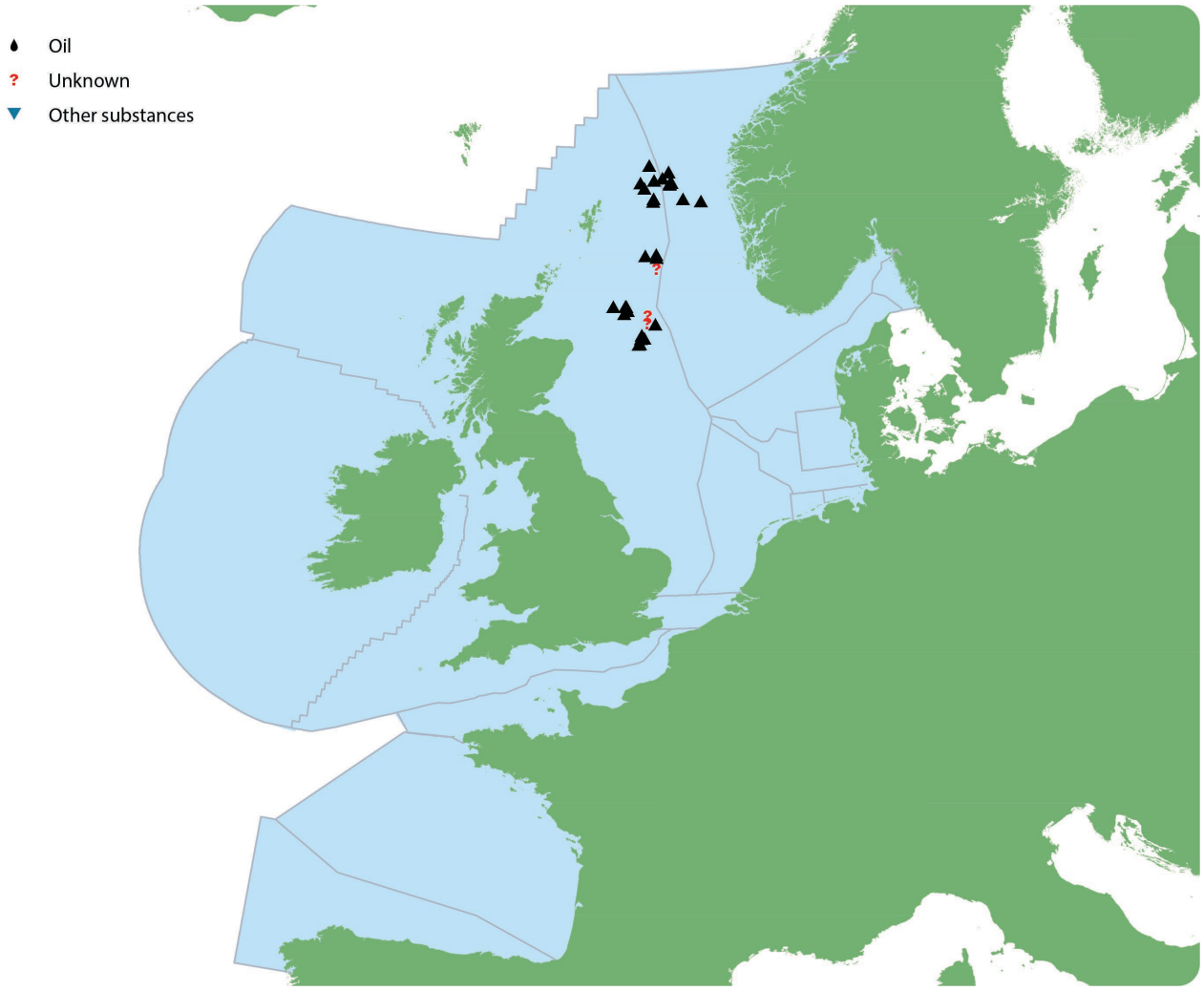

Figure 10. Location of Tour d'Horizon detections.

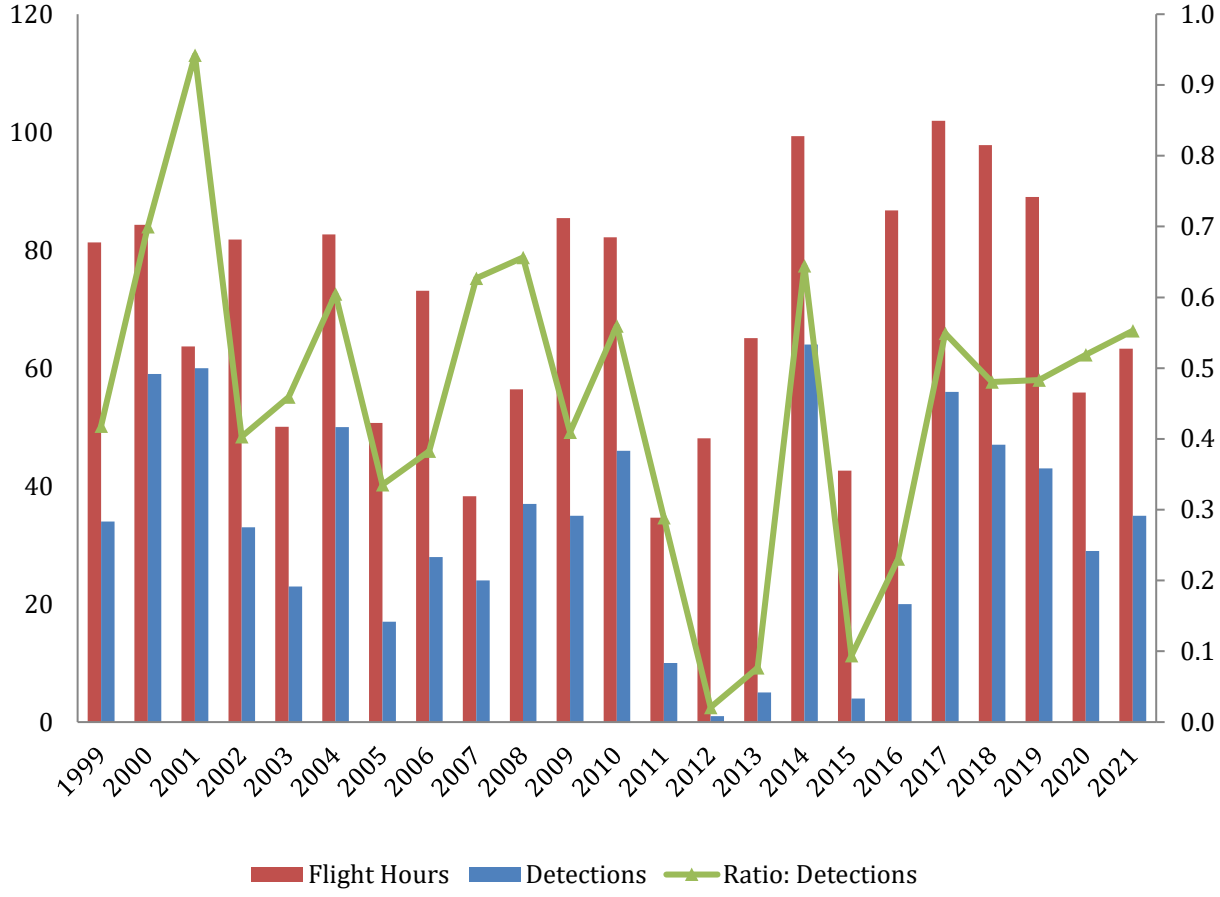

Figure 11. Tour d'Horizon flight hours and oil detections from offshore installations.

Country	No. of flights	No. of flight hours			No. of detections in TdH area			Detections confirmed / observed as mineral oil spills			No. of polluters (mineral oil)				Estimated min volume (m^3)	Estimated max volume (m^3)
		Daylight	Darkness	Total	Daylight	Darkness	Total	Daylight	Darkness	Total	Rigs	Ships	Other	Unknown		
Belgium	5	19:30	0:00	19:30	20	0	20	18	0	18	17	0	0	1	3.70	27.82
Denmark	3	9:34	1:13	10:47	0	0	0	0	0	0	0	0	0	0	0.00	0.00
France	0	0:00	0:00	0:00	0	0	0	0	0	0	0	0	0	0	0.00	0.00
Germany	0	0:00	0:00	0:00	0	0	0	0	0	0	0	0	0	0	0.00	0.00
Ireland	0	0:00	0:00	0:00	0	0	0	0	0	0	0	0	0	0	0.00	0.00
Netherlands	0	0:00	0:00	0:00	0	0	0	0	0	0	0	0	0	0	0.00	0.00
Norway	2	9:20	0:00	9:20	5	0	5	5	0	5	5	0	0	0	0.04	0.54
Spain	0	0:00	0:00	0:00	0	0	0	0	0	0	0	0	0	0	0.00	0.00
Sweden	2	13:01	0:00	13:01	3	0	3	2	0	2	2	0	0	0	20.61	111.00
UK	3	10:40	0:00	10:40	7	0	7	7	0	7	7	0	0	0	1.95	15.53
Total	**15**	**51:25**	**1:13**	**63:18**	**35**	**0**	**35**	**32**	**0**	**32**	**31**	**0**	**0**	**1**	**26.30**	**154.89**

Table 6a. Detections of mineral oil during Tour d'Horizon flights in 2021

Country	No. of flights	No. of flight hours			Detections confirmed/observed as other substances	No. of polluters (other substances)				Unknown detections	No. of polluters (unknown detections)			
		Daylight	Darkness	Total		Rigs	Ships	Other	Unknown		Rigs	Ships	Other	Unknown
Belgium	5	19:30	0:00	19:30	0	0	0	0	0	2	2	0	0	0
Denmark	3	9:34	1:13	10:47	0	0	0	0	0	0	0	0	0	0
France	0	0:00	0:00	0:00	0	0	0	0	0	0	0	0	0	0
Germany	0	0:00	0:00	0:00	0	0	0	0	0	0	0	0	0	0
Ireland	0	0:00	0:00	0:00	0	0	0	0	0	0	0	0	0	0
Netherlands	0	0:00	0:00	0:00	0	0	0	0	0	0	0	0	0	0
Norway	2	9:20	0:00	9:20	0	0	0	0	0	0	0	0	0	0
Spain	0	0:00	0:00	0:00	0	0	0	0	0	0	0	0	0	0
Sweden	2	13:01	0:00	13:01	0	0	0	0	0	1	1	0	0	0
UK	3	10:40	0:00	10:40	0	0	0	0	0	0	0	0	0	0
Total	**15**	**51:25**	**1:13**	**63:18**	**0**	**0**	**0**	**0**	**0**	**3**	**3**	**0**	**0**	**0**

Table 6b. Detections of Other Substances and Unknown Detections during Tour d'Horizon flights in 2021

27. A SuperCEPCO was organised by Norway. Full details are in Annex II.

Annex I

European Maritime Safety Agency
Ref. Ares(2022)1891790 - 15/03/2022

CleanSeaNet Statistics
Bonn Agreement

Reporting Period: 01/01/2021 – 31/12/2021

Date: 22 March 2022

EMSA

EMSA
European Maritime Safety Agency

Table of Contents

1. Introduction

This document presents the CleanSeaNet service (CSN) statistics for the Bonn Agreement region[1] for the reference period between 1st of January 2021 and 31st December 2021. Specifically, this report summarizes:

- CSN service deliveries.
- CSN possible oil spills detection.
- Coastal States verification activities in the scope of CSN.

In 2021, the CSN service was provided using images from Sentinel-1 (S1), RADARSAT-2 (RS2) and TerraSAR-X/PAZ1 (TSX/PAZ1) missions. During this period, CSN delivered a total of 1604 Earth Observation (EO) services to the Bonn Agreement Contracting Parties in the region. Figure 1 shows the monthly distribution of services.

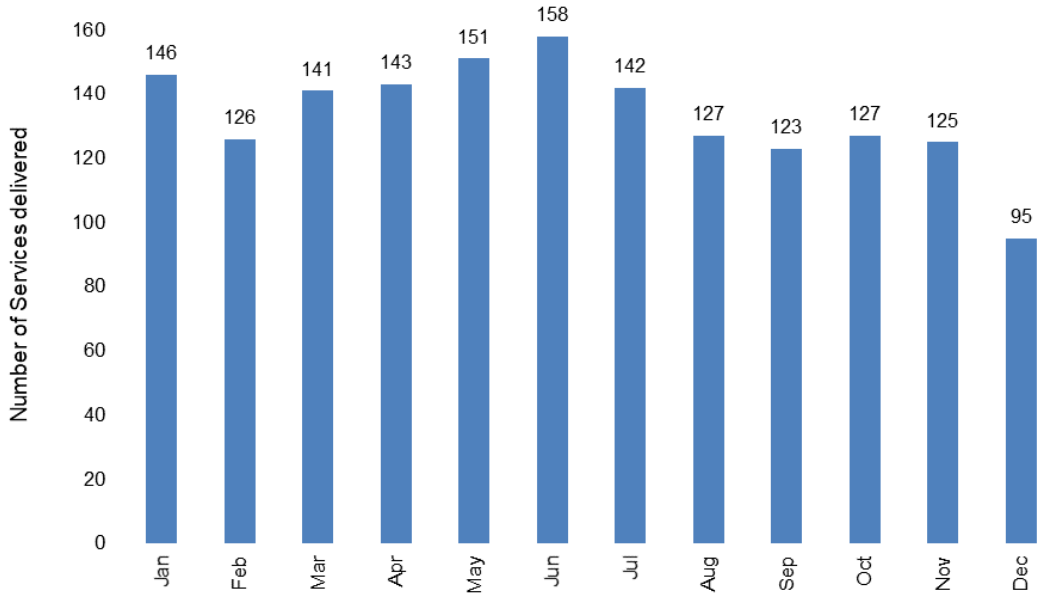

Figure 1 - CleanSeaNet delivered services for the Bonn Agreement region in 2021

2. CleanSeaNet Detections

CleanSeaNet detections consist in possible oil spills detected in satellite imagery. The likelihood of a certain detection being an oil spill is indicated by two classification levels: Classification A and B. In 2021 the likelihood of the CleanSeaNet detections were:

- **Class A** - higher confidence level that a certain feature is mineral oil
- **Class B** - lower confidence level that a certain feature is mineral oil

The confidence level being higher (Class A) or lower (Class B), CSN detections always represent "possible"

[1] An updated version of the Bonn Agreement area, in shape file format, was received by EMSA, in early 2021, with the enlargement of the geographical scope of the Bonn Agreement by incorporating the Bay of Biscay area.

oil spills, until these are verified on site. In 2021, 1218 detections were reported: 716 Class A (58.8%), 502 Class B (41.2%). Figure 2 shows the monthly distribution of CSN detections classified as A and B.

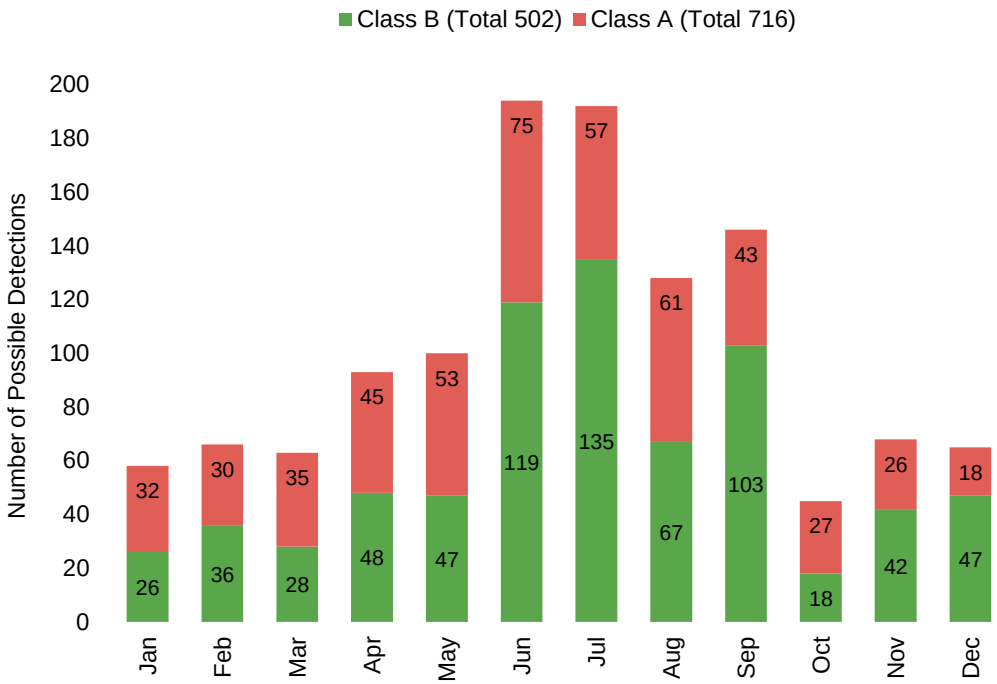

Figure 2 - Monthly distribution of class A and B detections, for the Bonn Agreement region in 2021

Figure 3 provides a distribution map of the possible oil spills detections within the Bonn Agreement region:

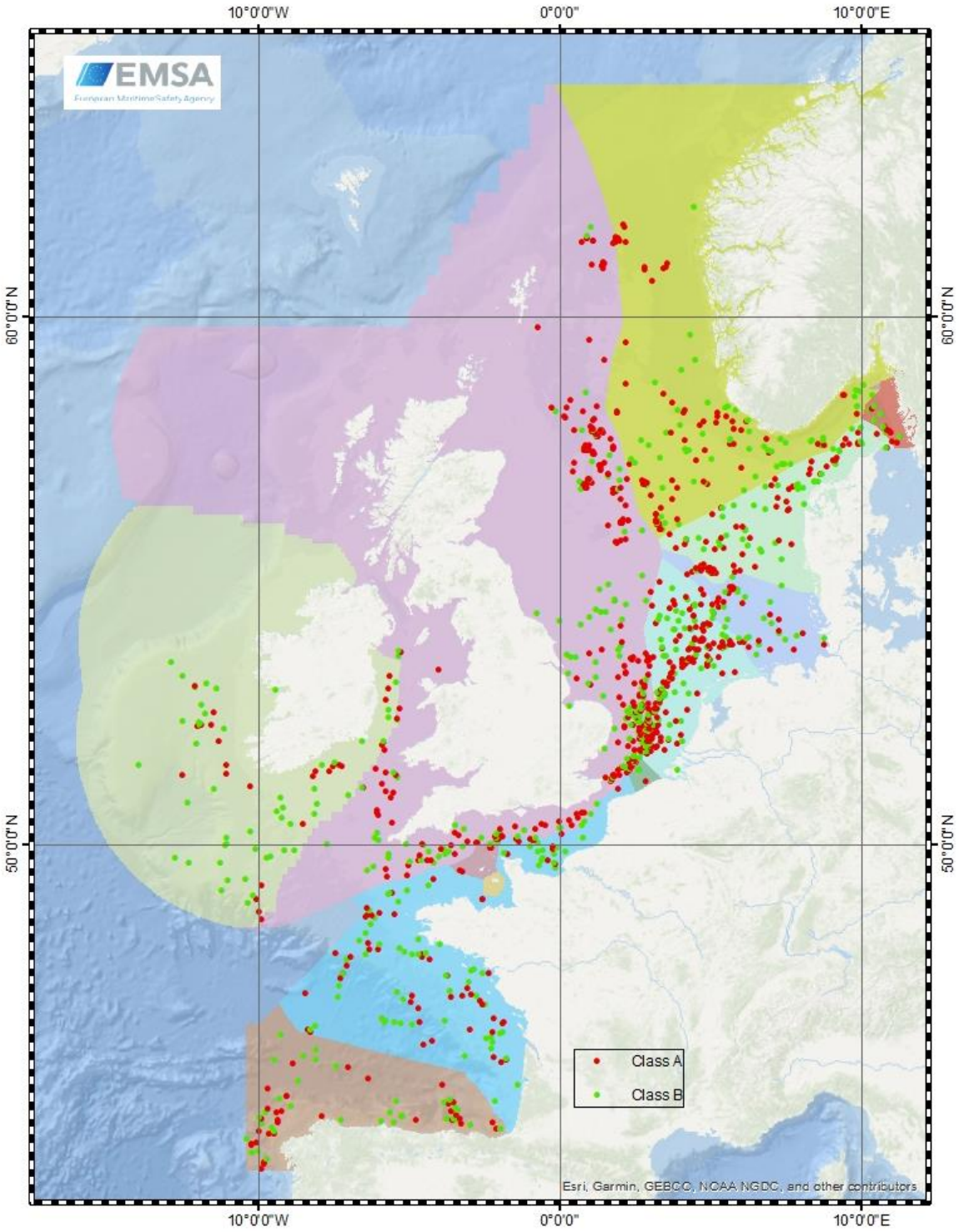

Figure 3 – Geographical distribution of class A and B detections, for the Bonn Agreement region in 2021

3. Verification activities

This section presents analysis of the information regarding verification activities concerning the CSN detected possible oil spills and reported to EMSA via the SafeSeaNet Ecosystem Graphical User Interface (SEG).

Only one feedback is counted per oil spill (designated priority feedback) and by default it will be the first feedback submitted.

The resulting feedback of these verifications may vary significantly depending on several factors, namely the size of the spill (i.e. small spills can evaporate/dissipate in a short period of time), type of substance, weather conditions, timeliness of verification (i.e. the longer the verification takes from the acquisition, the lower the probability that the spill is confirmed).

During the reporting period, out of the 1218 CSN detections, 395 (32%) were verified on-site by the coastal countries. In 267 (22%) detections the feedback was provided as “reason for no verification” and “No feedback provided” corresponds to 556 (46%) of the detections, as displayed in Figure 4.

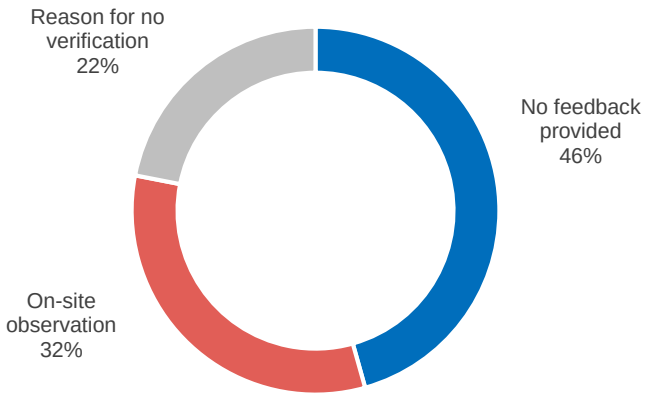

Figure 4 - CSN detection feedback distribution for the Bonn Agreement region, in 2021

Due to the withdrawal of the United Kingdom (UK) from the European Union, the CSN service ceased the provision of services to the UK on 31/12/2020. In Figure 4, the “No feedback provided “includes the possible detected oil spills within the UK area for which there is no feedback provided, representing 341 (61%) out of 556 cases of the no feedback cases.

The reasons for not performing verifications, corresponding to 22% of the total CSN detections (Figure 4), are further detailed in Figure 5. The main reason for no verification was due to “no assets availability” corresponding to 55.8%.

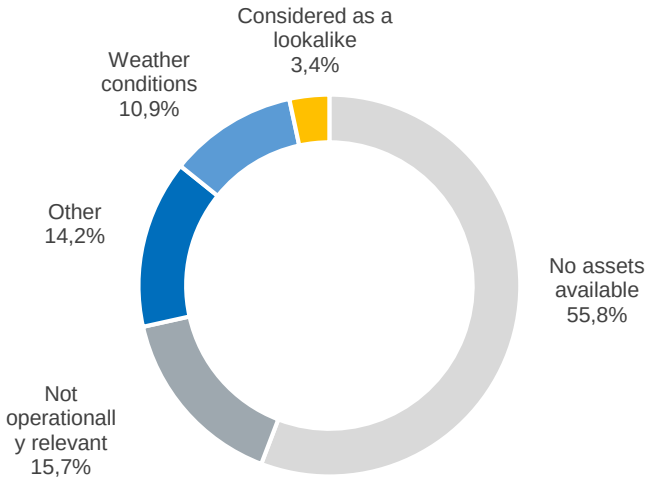

Figure 5 - Reasons for non-performance of on-site verifications in the Bonn Agreement region during 2021

During the reporting period, out of the 1218 detections, 395 (32%) were checked by the Coastal States (Figure 6):

- 59 (15%) were confirmed as being “Mineral oil confirmed”
- 86 (22%) were reported as “other substance”2
- 35 (9%) were reported as “unknown feature”
- 28 (7%) were reported as “natural phenomena”.
- 187 (47%) were reported as “nothing observed”

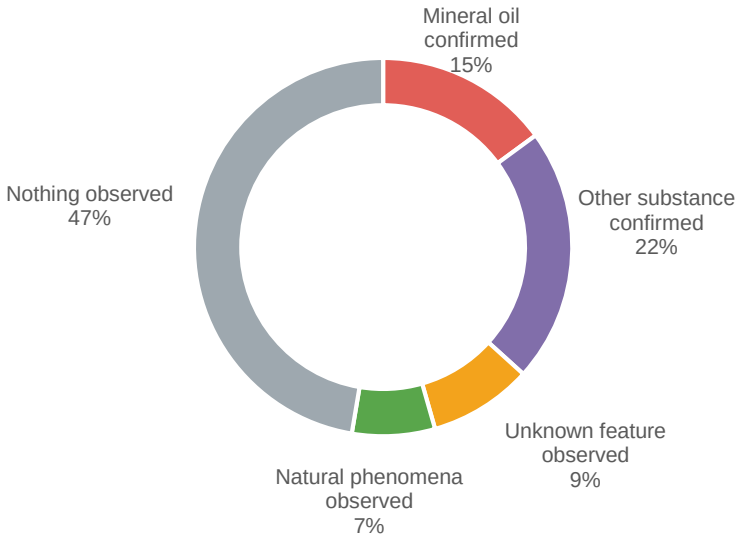

Figure 6 - On-site Observation feedback provided in the Bonn Agreement region, in 2021

[2] Other substance can be: Chemical oil, Vegetable oil, Fish oil, Sewage, Garbage or Unknown substance.

The total number of feedback reports for “Nothing Observed” can be the result of several factors, namely, type of substance, weather conditions and timeliness of verification (i.e., longer the verification takes from the acquisition, the lower the probability that the spill is confirmed).

The total number of feedback reports for “other substance confirmed” was 86 from which 49% of the occurrences are observations of vegetable oil and fish oil (Figure 7).

The “natural phenomena observed” is presented 28 times in feedback reports for which the main identifiable contributor was the Algae observations, with 32% of the cases (Figure 8).

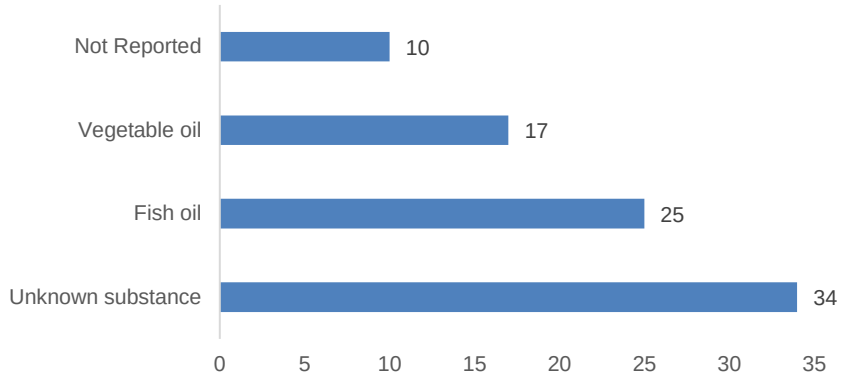

Figure 7 - Sub-type results of observation on-site for “other substance confirmed”, 2021

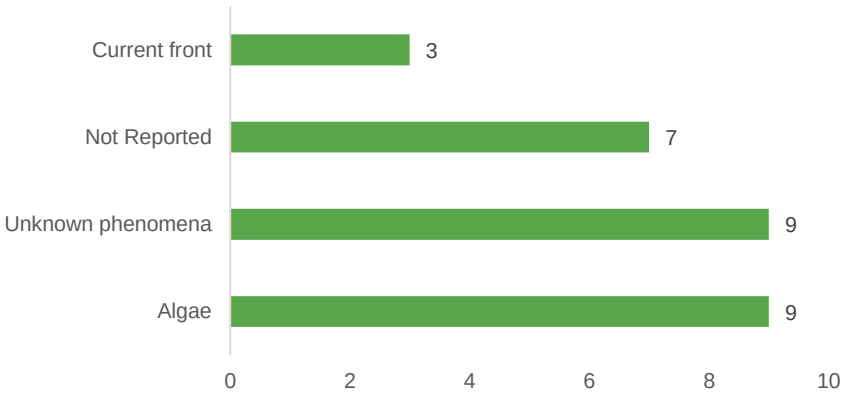

Figure 8 - Sub-type results of observation on-site for “natural phenomena observed”, 2021

Figure 9 shows the spatial distribution of CSN detections and verification activities carried out by the Coastal States in the Bonn Agreement region.

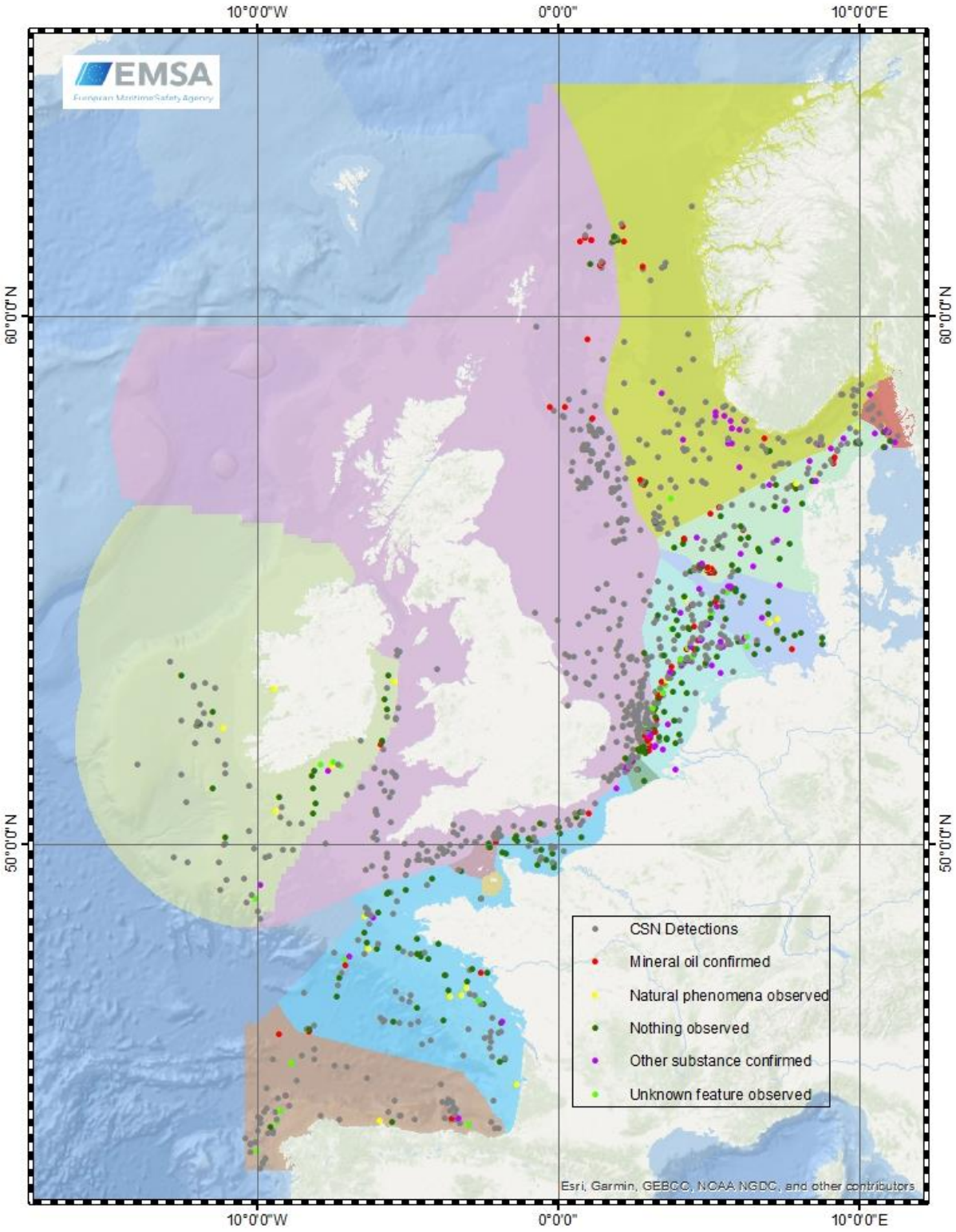

Figure 9 – Geographical distribution of CSN detections and the verification activities carried out by the Coastal States in the Bonn Agreement region in 2021

Table 1 shows the total number of detections of each Bonn Agreement coastal country area during 2021 and the on-site verification results.

Table 1 - Total of detections per Bonn Agreement coastal State's area and feedback provided, 2021

Country Waters	On-site observations						No on-site observation		No feedback provided		Total of Detections
	Mineral oil	Natural phenomena	Nothing observed	Other substance	Unknown feature observed	Total %	Reason for no verification	Total %	No Feedback Provided	Total %	
Belgium	0	0	2	2	1	45%	6	55%	0	0%	11
Denmark	25	9	39	21	0	65%	48	33%	2	1%	144
France	4	7	45	4	2	48%	36	28%	30	23%	128
Germany	2	2	21	6	5	72%	11	22%	3	6%	50
Ireland	1	5	16	2	4	35%	31	39%	21	26%	80
Norway	6	0	7	14	1	20%	9	6%	106	74%	143
Spain	3	1	2	1	6	19%	31	46%	24	35%	68
Sweden	0	1	2	3	0	40%	2	13%	7	47%	15
The Netherlands	5	3	43	32	12	52%	66	36%	22	12%	183
United Kingdom[3]	13	0	10	1	4	7%	27	7%	341	86%	396
Grand Total	**59**	**28**	**187**	**86**	**35**	**32%**	**267**	**22%**	**556**	**46%**	**1218**

[3] The United Kingdom is no longer a user of CleanSeaNet and therefore did not provide any feedback to CSN detections in UK Waters.

It should be noted that, in Table 1, CSN detections are assigned to countries based on national areas communicated to EMSA by the Bonn Agreement secretariat in February 2021. The centre position of the spill is used to decide to which country's area CSN detection belongs.

It should also be noted that CSN alert areas[4] defined by each country can be different from the Exclusive Economic Zone areas used as defined in the referenced Bonn Agreement area. In addition, a CSN alert report is generated each time a spill contour polygon intersects a CSN alert area and different CSN alert areas might overlap each other. Thereupon, the number of detections per country in this report and the number of CSN oil spill notifications alerts for the same country are different. Moreover, due to the overlapping of the CSN Alert areas of two different Member States, an oil spill can trigger two CSN Alerts, but it will be reported once in the Bonn Agreement statistics according to the centre position of the spill.

4. TdH and CEPCO operations' feedback

This section covers the verification activities on the CSN detected possible oil spills under the scope of the operations Tour d' Horizon (TdH) and the Co-ordinated Extended Pollution Control Operations (CEPCO)[5].

Table 2 shows the verification results of the TdH mission that took place between 5 and 9 July 2021, in the Bonn Agreement region. EMSA provided 10 EO products to support this operation, besides the imagery that was already planned under the CSN routine planning for July. The data in this table refers to the verification results submitted to EMSA which had the operation TdH identified in the comments section of the feedback window in SEG. Out of 20 feedbacks, 2 were assigned with a low priority and thus not considered as reference for reporting.

Table 2 - Verification results per country of the oil spill centre, operation TdH July 2021.

Country	Satellite detections checked by coastal States	
	Mineral oil confirmed	Nothing observed
Norway	3	2
United Kingdom	12	1

In June 2021, EMSA provided an additional 10 EO products to support the TdH mission that took place between 1 and 4 June 2021 in the Bonn Agreement region, besides the imagery that was already planned under the CSN routine planning for June. A total of 53 possible oil spills were detected in these images. There was a total of 11 feedbacks provided but none of the feedbacks included the TdH in the comments feedback, thereupon not considered as reference for reporting.

[4] CSN Alert areas define the area where coastal States want to be alerted for CleanSeaNet detected oil spills or Clean Sea reports. The definition of alert areas is strictly operational, without any legal bearing or link with formal maritime boundaries.
[5] As requested by the working group on Operational, Technical and Scientific Questions Concerning Counter Pollution Activities (OTSOPA) in May 2020. A Tour d' Horizon (TdH) is a Bonn Agreement regional mission type, consisting in periodic aerial surveillance of the offshore oil and gas installations in the central North Sea for oil pollution detection. A Co-ordinated Extended Pollution Control Operations (CEPCO) is an intensive pollution control operation in a specific high-risk area (e.g.: maritime area with dense shipping traffic) performed over a period of 24 hours. Operations lasting more than 24 hours are called SuperCEPCO.

A SuperCEPCO operation took place between 21 and 23 of September 2021 in the Bonn Agreement region. A total of four EO products were delivered to support the operation and one possible oil spill was detected. In terms of feedback with SuperCEPCO reference, Norway submitted feedback with on-site observation (“unknown feature observed”). However, this feedback was assigned with low priority as it was reported after another feedback submission on the same oil spill by Denmark.

European Maritime Safety Agency
Praça Europa 4
1249-206 Lisbon, Portugal
Tel +351 21 1209 200
Fax +351 21 1209 210
emsa.europa.eu

Annex II

KYSTVERKET

SuperCEPCO Skagerrak 2021

Norway, Sweden and Denmark

Report: March 2022

Content

Summary

The Super CEPCO 2021 was conducted according to the plan in week 38 2021. The planning and execution of the campaign was a joint effort by Norway, Sweden and Denmark. The planning was led by Norway and the goal was to monitor the shipping activity in Skagerrak. The base for the operation was Oslo Airport Gardermoen, Norway. In total were 15 of 16 planned missions executed during Tuesday to Friday week 38.

We did not have any big problems in planning or conducting the campaign, even though the Covid19 pandemic was a highly insecure element to be accounted for.

The campaign logged a total flight time of 33:48 hours over sea. 4 observations that most likely was related to shipping activities was recorded and reported to the competent authority in Norway, Sweden and Denmark.

There were 2 observations in Danish waters, 1 in Swedish waters, and 1 in Norwegian waters where 2 of the observations was unknown substance. One observation properly veg/fish oil (No colors) and one observation most likely mineral oil.

1. Background

In Bonn Contracting parties meeting in 2020, it was agreed that Norway would facilitate and organize a SuperCEPCO in 2021. Sweden and Denmark supported Norway in planning and conducting the SuperCEPCO 2021 operations in the Skagerrak area.

2. Planning

In the Bonn Contracting parties meeting in 2020, it was agreed that Norway would facilitate and organize a SuperCEPCO in 2021. Sweden and Denmark supported Norway in the planning and the execution of the campaign.
In January 2021, the Norwegian Coastal Administration (NCA) decided to go start the planning and Sweden and Denmark were invited to join the planning and to support the operations.

A planning team was established and manned by the following people:

- Ove Njøten, Norwegian Coastal Administration – Team Leader
- Jan Pedersen Norwegian Coastal Administration – Team member
- Thomas Bark, Swedish Coast Guard – Team member and focal point for Sweden
- Simon Rewers Hansen, Danish Defense- Team member and focal point for Denmark

Planning meetings were only held on digital platforms (Teams) due to the Covid19 and the restrictions throughout the planning of the operation.

The SuperCEPCO was planned to be operated from Oslo Airport Gardermoen week 38. This is also where the NCA surveillance aircraft contractor Sundt Air is situated. Sundt Air Executive Handling, a handling agent, is situated at the GA terminal. They gave the operation access to an operation office, briefing room and handling services for the participating aircraft.

A dedicated e-mail address was set up for the planning (supercepco@kystverket.no)

2.1 Invitation

The first planning meeting was held on teams on the 3rd of May 2021. In this meeting an invitation to the Bonn agreement CP and HELCOM CP were finalized and an invitation was submitted on the 5th of May via the Bonn Agreement Secretariat.
Sign up deadline was set to 1st of July, but it was postponed to 15thof July due to feedback from some of the invited parties. Information about aircraft and crew info was also received as part of the sign-up.

The following parties was signed up by the 15th of July:

- Norway
- Sweden
- Denmark
- Estonia
- The Netherlands
- Belgium
- United Kingdom
- Ireland
- France

2.2 EMSA support

A request for support by EMSA CleanSeaNet was sent on 25thon June, holding information on the operation area and operation start time and duration. A schedule and a satellite footprint file of ordered scenes were received on 15th of July and planned into the operation.

2.3 Diplomatic Clearance

To achieve Diplomatic Clearance for Norway and Denmark, each participating country made its own applications.

For Sweden, The Swedish representative in the planning team requested all information from participating parties and made a “bulk” application for the operation. This is not a practice that is recommended due to long response time from the participating countries. It created too much of a workload on the coordinating resource. The Danish and Norwegian approach seems therefore to be better.

One important finding was that the flight route and flight schedule should be ready for all invited parties at an early stage. This information is used for the application of diplomatic clearance and should be available for participants 2-3 months before the start of the operation.

2.4 Other regulations

In Norwegian territory waters (12 nautical miles), recording of remote sensing data, as video, infrared, photo, radar, and other sensors needs permission from the Norwegian National Security Authority. As the operation was planned within Norwegian territory waters, it was considered to support Norwegian pollution authorities. Because of this the Norwegian planning team applied for all participants pre-flight and followed up post-flight to National Security Authority.

2.5 Covid-19

The Covid-19 situation was a factor to consider in the planning of the campaign. As the rules changed during the planning period, we set a go/no go for the operation close up to the start of the operation. The two main things we as planners needed to consider were “Entry to Norway” and “duty to quarantine” on arrival. Participants also needed to consider national rules when returning after the operation.

Entry to Norway (Covid 19).
As all Bonn/Helcom CP was invited to Norway by NCA as a National authority, all participants were permitted to enter Norway for the scheduled SuperCEPCO.

Quarantine rules did apply on arrival. For planning purposes, we sent a mail to all participants requesting to categorize their crew in how many A, B, and C they had. By having this we were able to plan for the arrival of all participants.

The three categories where (By 1.September 2021)
A People who are fully vaccinated or who have recovered from Covid-19 in the past 6 months, and can document this with a verifiable Covid-19 certificate that is connected to the EUDCC gateway, will be able to enter Norway freely, regardless of which country they are travelling from.

These people are exempt from the duty to quarantine, testing prior to arrival, testing at the border, and the requirement of entry registration.

B Flight crew that ***are not*** fully vaccinated or who have recovered from Covid-19 in the past 6 months, will be able to enter with no quarantine after a negative Covid-19 test organized on arrival to Norway. *If some of the crew were in this category, Norway arranged for testing at arrival.*

C Participant (Observer or other that is not considered crew) that are not in the category A or B above, duty to quarantine. There was an exemption from travel quarantine for people who have only visited areas/countries with a low rate of infection in the EEA/Schengen area and the UK (‘green’ areas/countries, i.e. countries with fewer than 25 cases per 100 000 inhabitants during the past 2 weeks and fewer than 4% positive tests).

Based on the information above, the arrival to the operation went very smoothly. The national and regional rules were also part of the written communication and the in brief at arrival day.

3. Operations

The area of the operation is showed in Figure 1.

The flight route was coordinated with ATC in advance for the operation. ATC in Norway, Sweden, and Demark “approved” the agreed routing.

This made it easy for both participants and involved ATC’s during the operations.

Participants in the operation were:

- Norway
- Sweden
- Denmark
- Estonia
- Belgium
- Ireland

An operation briefing was conducted Monday afternoon. In addition to the administrative procedures, NOTAM representatives briefed the operational procedures for the operation area.

A SuperCEPCO office was established at the GA terminal at OSLO airport, supporting the operation. This was manned when operations were ongoing.

Covid related issues were also dealt with at the Supercepco office, where covid self-tests were available for flights crew.

The operation started Tuesday 21st September at 07:00 UTC and the last flight was planned for Thursday 23rd September at 19:00UTC. The operation followed the flight schedule shown in Figure 2 and Figure 3

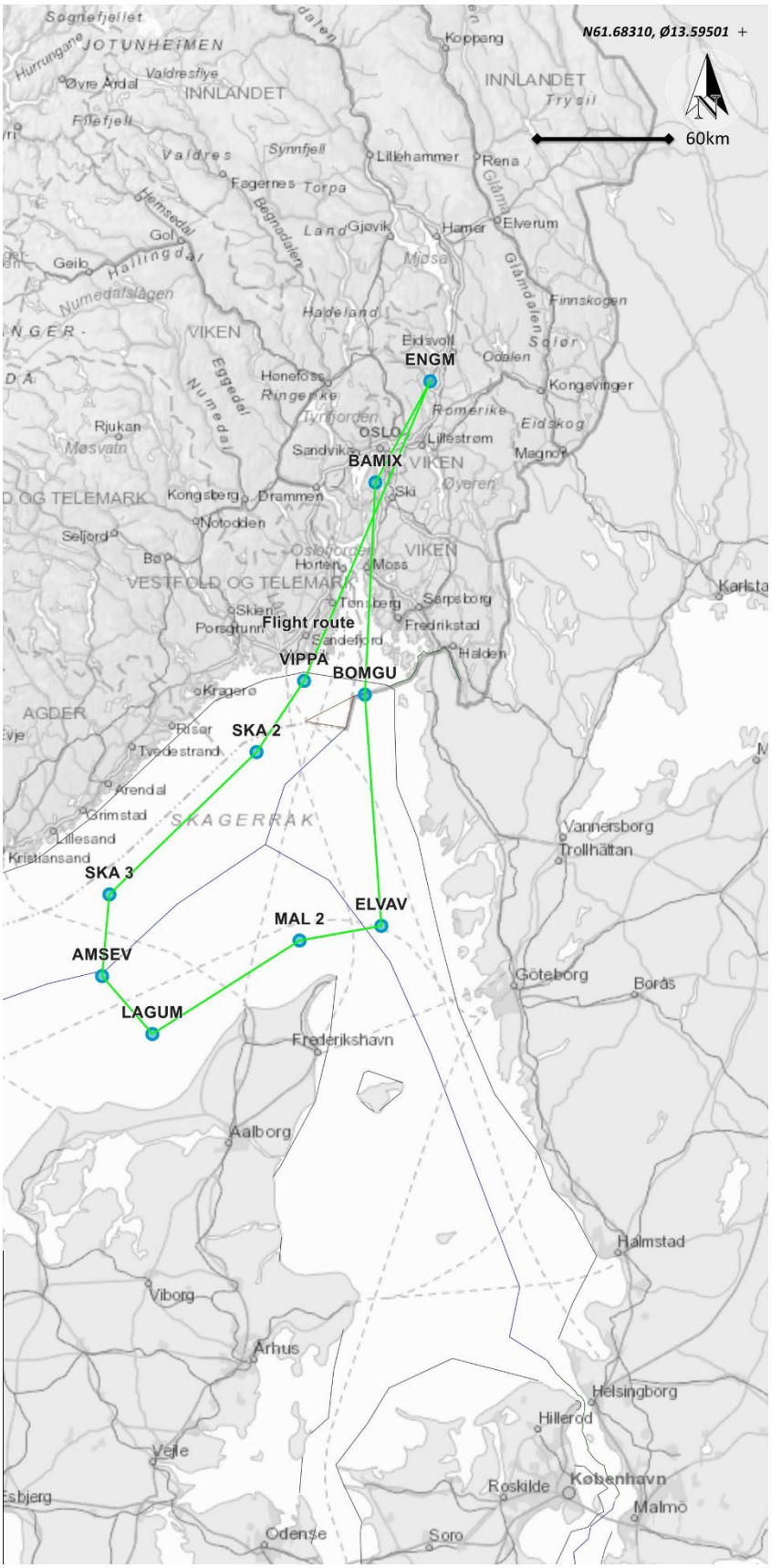

Figure 1 Flight route SuperCEPCO 2021

	Departure time UTC		
	1. flight	2. flight	3.flight
Norway	**22/9/2021 05:00:00**	**22/9/2021 22:00:00**	**24/9/2021 08:00:00**
Denmark	**21/9/2021 10:00:00**	**22/9/2021 13:00:00**	**24/9/2021 05:00:00**
Sweden	**21/9/2021 19:00:00**	**22/9/2021 16:00:00**	**23/9/2021 10:00:00**
Belgium	**21/9/2021 13:00:00**	**22/9/2021 19:00:00**	
Netherlands	**21/9/2021 16:00:00**	**22/9/2021 22:00:00**	CANCELLED
France	**21/9/2021 22:00:00**	**23/9/2021 10:00:00**	CANCELLED
Estonia	**22/9/2021 01:00:00**	**23/9/2021 07:00:00**	
United Kingdom	**22/9/2021 10:00:00**	**23/9/2021 04:00:00**	CANCELLED
Ireland	**21/9/2021 07:00:00**	**22/9/2021 07:00:00**	

Figure 2 SuperCEPCO Operation flights

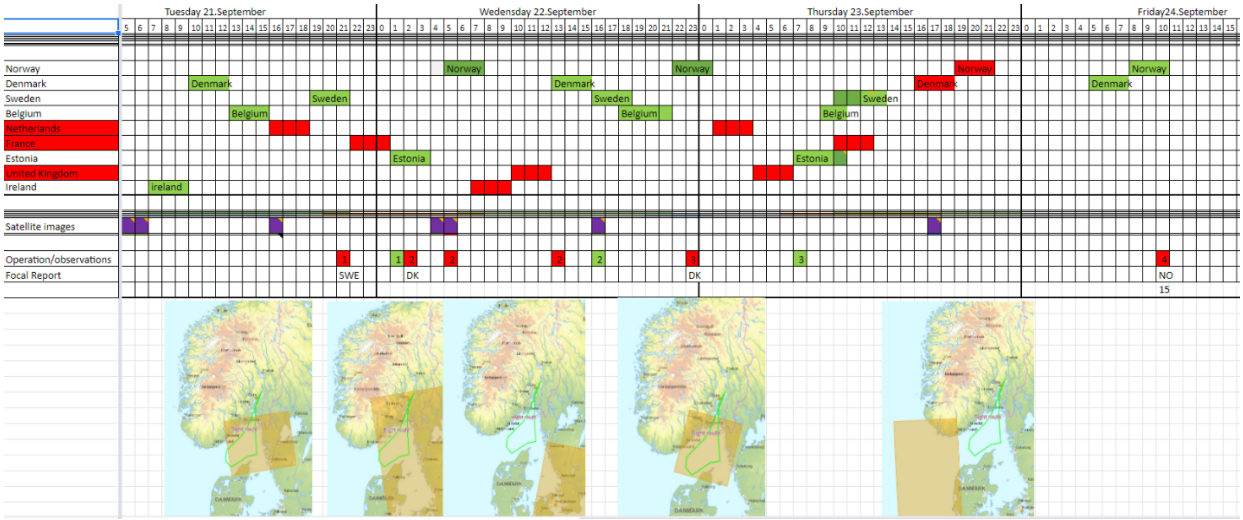

Figure 3 Operation Timeline with missions, time and cover of satellite images, and findings. The findings in red show detected spills (4 spills, with some repeating reports of the same spill), and green where the spill is no longer detected.

4. Results

The planned Flight schedule included 21 missions. Due to cancellations from the United Kingdom, The Netherlands, and France, the revised flight schedule included 16 missions.

15 shipping of the 16 planned missions were conducted (1 canceled due to technical issues). The operation was also postponed into Friday 24th September, as we got a very high wind period on Thursday 23rd September.

During the operations, we had 4 observations, that most likely relate to shipping activities.

There were 2 observations in Danish waters, 1 in Swedish waters, and 1 in Norwegian waters. Two of the observations was of unknown substance, one most likely veg/fish oil (No colors) and one most likely mineral oil. No vessels had a direct connection to any of the observations when overflown.

Total flight time over sea was 33:48.

5. Conclusion and recommendations

The operation was a success in terms of performance and professionalism from all participants. All data was reported to the SuperCEPCO office, and from there forwarded to National authorities. The hosting of the SuperCEPCO was also a success due to very good involvement from Sweden and Denmark both in planning and operation. We had also very good support from our surveillance contractor Sundt Air, with supporting personnel and facilities at the GA terminal on Oslo Airport.

We also received EMSA support during the operation. All images were used in the operation. One lesson learned is that “oil spill alerts” were both reported to national authorities and SuperCEPCO operations. As the day to day, national CleanSeaNet focal point can be a national body outside the setup of a SuperCEPCO, it created some confusion.

One recommendation here is that these CleanSeaNet focal points must be identified and informed of the operation, and also contacted during operation. This to avoid confusion on follow up, as a satellites image can cover areas and report spills way out of the SuperCEPCO operation area.

We also considered, due to requests, the possibility to implement sulfur sniffing and the use of oil sampling buoys. This was not implemented in this Supercepco, but could probably be implemented in future operations. Here one needs to consider national regulations in the operating area, where operational procedures need to be evaluated and approved for such an operation. This will involve national aviation authorities in the early planning of such events.

One recommendation is to let the resource, who on a daily basis would receive the oil spill reports, man the 24/7 operations center in order to facilitate and strengthen an already existing routine.