Rijkswaterstaat
Ministry of Infrastructure and Water Management

RWS Information

Paraffin on the Dutch Coast

Colofon

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Samenvatting

Op de Nederlandse stranden wordt regelmatig paraffine gevonden. Dit heeft een negatieve economische impact (schoonmaken stranden) en kan schadelijk zijn voor (zee) dieren. In 2016 en 2017 spraken verschillende politieke partijen dan ook hun bezorgdheid uit over de grote paraffine incidenten die deze jaren plaatsvonden.

De "Samenwerkingsregeling Bestrijding Kustverontreiniging RWS-diensten" beschrijft het Rijkswaterstaat (RWS) beleid over het verwijderen van paraffine van stranden. Rijkswaterstaat ruimt de paraffine op wanneer er grote hoeveelheden aangespoeld zijn op het strand. In het RWS-laboratorium worden analyses gedaan om de precieze samenstelling van de stof te bepalen conform CEN/TR 15522-2: Oil spill identification – Waterborne petroleum and petroleum resolution analysis.

De hoeveelheden paraffine die aanspoelen verschillen per jaar. Gemiddeld verwijdert Rijkswaterstaat 10-50 m^3 paraffine per jaar met een extreme waarde van meer dan 100 m^3 in 2017 en verschillende jaren met geen paraffine. De twee recente incidenten (2017) laten zien dat grote aanspoelingen nog steeds een probleem zijn.

Gemiddeld geeft de overheid €148.000 per jaar uit (2007-2017) om de stranden schoon te maken van paraffine en de paraffine te laten verwerken.

Vanaf 2001 wordt de aanwezigheid van paraffine (onder de categorie "verontreinigende stoffen") genoteerd tijdens de OSPAR 100m Beach Litter Monitoring surveys. Er is een ruwe schatting gemaakt die laat zien dat er vanaf 2009 een toename is van "paraffine – of wasachtige chemicaliën" op stranden in Nederland en Duitsland.

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In Europa bevinden veel bedrijven die paraffine in hun producten verwerken zich in de Hamburg-Le Havre zone: de kustlijn met de belangrijkste zeehavens van Noordwest Europa.

Nederland behoort met een exportwaarde van 66 miljoen dollar en een importwaarde van 68 miljoen dollar in 2016 tot de top 10 van de wereld van exporteurs en importeurs van paraffine. Rotterdam is de belangrijkste Nederlandse doorvoerhaven.

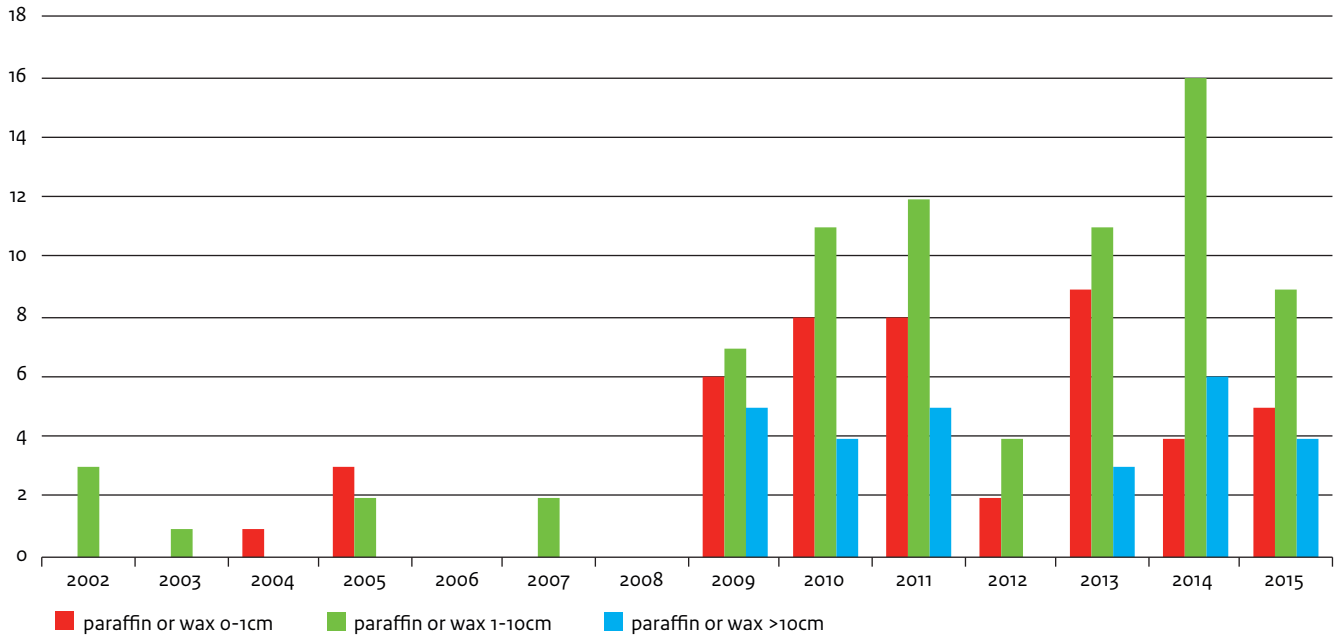
Nederland en Duitsland zijn niet de enige landen die te maken hebben met paraffineverontreiniging: Denemarken, Frankrijk, Noorwegen, Italië, Zweden, Portugal en het Verenigd Koninkrijk rapporteren ook allemaal incidenten met paraffineverontreiniging.

Paraffine wordt vervoerd als vloeibare stof in verwarmde tanks. Schepen die paraffine vervoeren lozen bepaalde hoeveelheden op zee door het wassen van tanks. Dit wassen van tanks is onder bepaalde voorschriften legaal volgens de huidige wetgeving. Dit heeft als resultaat dat resten paraffine worden geloosd op zee. De voorschriften zijn beschreven in Regulation 13, Annex II van de MARPOL Convention van de International Maritime Organization (IMO).

Incidenteel spoelen er grote hoeveelheden paraffine aan op het strand. Dit kan duiden op een overschrijding van de wettelijk toegestane hoeveelheden die geloosd mogen worden op grond van deze voorschriften. Er wordt aangenomen dat de tanks niet altijd zo volledig mogelijk in de havens zijn leeggepompt voordat ze op zee worden schoongemaakt en/of dat residuen van paraffine in leidingen achterblijven en niet volgens de regels worden verwerkt.

Handhaving is niet eenduidig (lucht surveillance, mede door middel van gebruik van satelliet beelden). Eén van de problemen die handhaving lastig maakt is het ontbreken van unieke registratie van paraffine in SafeSeaNet.

Nederland is één van de landen in Noordwest Europa die een voorstel heeft ingediend bij de IMO voor het aanpassen van MARPOL Annex II. Het voorstel eist dat tanks waarin stoffen met een hoge viscositeit en/of persistent floaters zoals paraffine worden vervoerd, worden voorgewassen nadat ze zo volledig mogelijk zijn leeggepompt. Dit waswater moet worden afgegeven bij de havenontvangst-faciliteiten. Om de zaak te versnellen heeft Nederland een informatiedocument ingediend bij de IMO waarin ze



Grafiek 1: Het aantal surveys per jaar waarin paraffine en wax is aangetroffen op OSPAR stranden in Duitsland en Nederland (waar stranden ononderbroken zijn gemonitord sinds 2002).

vraagt om een versnelde regionale invoering van de wijziging van Annex II voor de Noordzee regio. Tijdens de bijeenkomst van de IMO Sub-Committee on Pollution Prevention and Response in februari 2018 is hierover een wijzigingsvoorstel overeengekomen. Het voorstel gaat over een grotere regio dan het originele Nederlandse voorstel: de voorschriften zouden van toepassing zijn in Noord West Europese Wateren, de Baltische zee, de Westerse wateren en Noorse wateren noord van 62° N. Het wijzigingsvoorstel zal voor goedkeuring en daaropvolgend aanneming worden ingediend bij MEPC 73 in oktober 2018.

Omdat aanpassing van internationale wetgeving lang kan duren heeft Nederland de eerste stappen ondernomen om de industrie te betrekken bij het zoeken naar oplossingen: in oktober 2017 hebben Haven autoriteiten, rederijen/terminals en het Ministerie van Infrastructuur en Waterstaat mogelijke oplossingen voor paraffineverontreiniging besproken vooruitlopend op de wijziging van MARPOL Annex II. Eén van de voorstellen betreft het vrijwillig afgeven van het eerste waswater vooruitlopend op de aanpassing van MARPOL Annex II. Op 7 mei 2018 hebben de deelnemende partijen en de minister de afspraken ondertekend.

Uit vele onderzoeken blijkt dat duurzaamheid labels en incentive programma's de marktvraag naar verduurzaming van een sector kan aandrijven. Er zijn tientallen lopende initiatieven zoals de Clean Shipping Index, Green Award en Environmental Ship Index voor de Noordzee regio. Deze initiatieven maken het mogelijk voor reders en zee verladers om koploper te worden en om zichzelf te onderscheiden op het gebied van duurzaamheid.

Andere mogelijkheden die overwogen kunnen worden om het lozen van paraffine in het mariene milieu te voorkomen zijn economische stimulansen en de markt betrekken bij het vinden van oplossingen. Een goed praktijk voorbeeld hiervan is het bedrijf Sasol Wax in Hamburg dat een schoonmaakinstallatie heeft geplaatst in de haven. Rederijen die aan dit bedrijf leveren zijn contractueel verplicht de tanks van hun schip in de haven te wassen. Het is nog rendabel ook, want de was resten worden op die manier teruggewonnen.

Omdat paraffineverontreiniging een grensoverschrijdend probleem is, zou ook een internationale Green Deal overwogen kunnen worden voor alle betrokkenen, waaronder grote havens.

Executive Summary

Paraffin is found on the Dutch coastline on a regular basis. This has a negative economic impact (beach cleaning) and can cause harm to (marine) animals. In 2016 en 2017 several political parties raised their concern after major paraffin incidents that occurred in these years.

The "Samenwerkingsregeling Bestrijding Kustverontreiniging RWS-diensten" (SBK; Cooperation Agreement Clean-up Coastal Pollution) defines the Rijkswaterstaat policy to remove paraffin from beaches. Rijkswaterstaat cleans up major paraffin occurrences on beaches. In order to determine the exact composition, analysis is done at the RWS-laboratory conform CEN/TR 15522-2: Oil spill identification – Waterborne petroleum and petroleum resolution analysis.

The amounts of paraffin that wash ashore vary in years. Approximately between 10-50 m3 of paraffin is removed by Rijkswaterstaat every year with an extreme value of more than 100 m3 in 2017 and various years with zero m3. The two recent incidents in 2017 show that major incidents are still a problem.

On average over €148.000 per year (2007-2017) is spent by the national government to clean the beaches from paraffin and dispose of it properly.

Since 2001 the presence of paraffin (under the category "pollutants") has been recorded at the OSPAR 100 m Beach Litter Monitoring survey sites. A rough assessment was made showing an increase of "paraffin – or wax-like chemicals" since 2009 for beaches in the Netherlands and Germany.

In Europe many companies that use paraffin in their products are located within the Hamburg-Le Havre Zone; the coastline with the most important seaports of Northwestern Europe. The Netherlands is one of the top 10 exporters and importers of paraffin in the world with a export value of 66 million dollars and an import value of 68 million dollars in 2016. Rotterdam is the most important transit port for paraffin in the Netherlands.

The Netherlands and Germany are not the only countries experiencing paraffin pollution: Denmark, France, Norway, Italy, Sweden, Portugal and the UK, all report incidents with paraffin pollution.

Paraffin is transported as a liquid in heated tanks. Residues are sometimes discharged at sea through tank washing by tankers transporting paraffin. This tank washing is legal under current legislation, under specific restrictions, resulting in paraffin being discharged at sea. The regulations are specified under Regulation 13 of Annex II to the MARPOL Convention of the of the International Maritime Organization (IMO).

Incidentally large amounts of paraffin end up on the shore. This suggests that discharges are exceeding the amount that is permitted. It is assumed that the tanks are not always properly stripped (cleaned) in the ports before the tanks are washed and the waste water is discharged at sea and/or that residues of paraffin waxes remaining in the pipes are not properly being dealt with.

Enforcement is difficult (using air surveillance in combination with satellite images).
Lack of unique registration of paraffin in SafeSeaNet is one of the issues that makes enforcement difficult.

The Netherlands is one of several North West European countries that have submitted a proposal to the IMO for amending Regulation 13 of MARPOL Annex II. The proposal demands that tanks in which high viscosity substances and/or persistent floaters like paraffin are transported, after efficient stripping, are prewashed and this residue must be delivered at a Port Reception Facility.
To speed things up the Netherlands have submitted an information paper to the IMO, pleading for an accelerated regional introduction of the amendment by IMO for the North Sea region. At the meeting of the IMO Sub-Committee on Pollution Prevention and Response in February 2018 the Sub-Committee agreed on draft amendments to MARPOL Annex II covering a larger region than the original Dutch proposal: the requirements would be applied in North West European waters; the Baltic Sea area; the Western European water; and Norwegian waters North of 62° N. The draft amendments will be forwarded to MEPC 73 in October 2018 for approval and subsequent adoption.

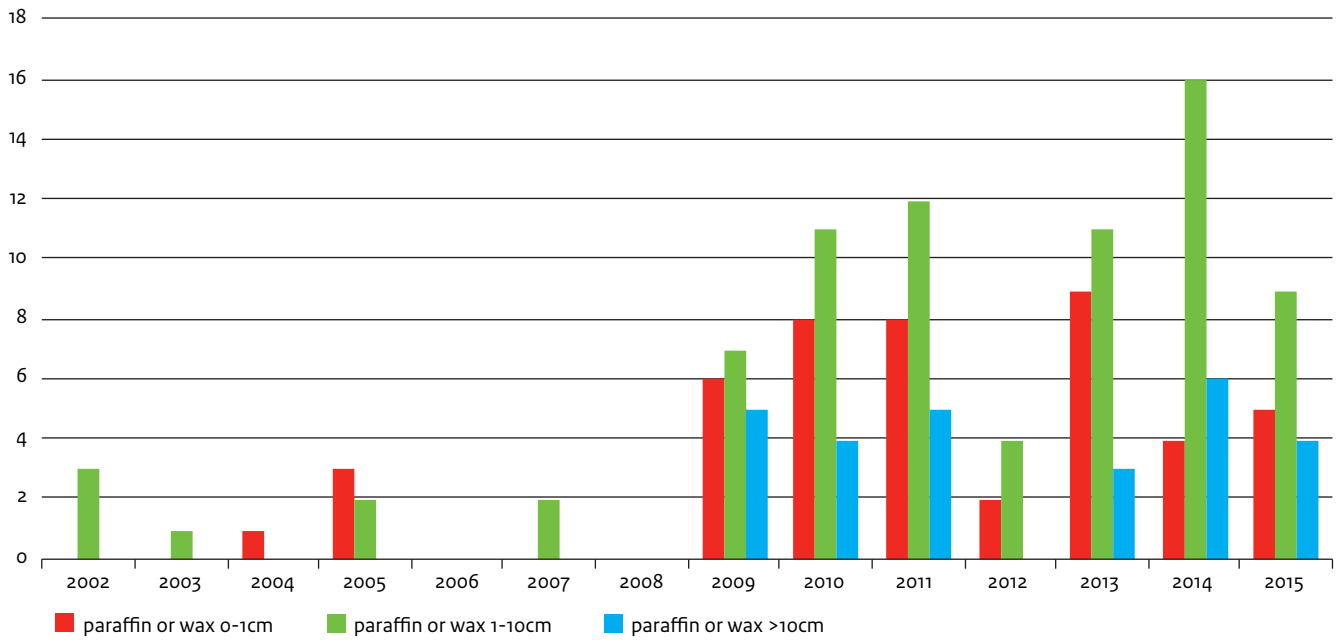


Figure 1: The total number of surveys per year with records of paraffin and wax on OSPAR beaches in Germany and The Netherlands (where beaches have been monitored continuously since 2002).

Because amending international legislation can take a long time the Netherlands have taken the first steps to involve the industry in looking for solutions: in October 2017 port authorities, terminals/ shippers and the Ministry of Infrastructure and Environment have been discussing possible solutions for paraffin pollution in anticipation of an amendment of Regulation 13 of MARPOL Annex II. One of the actions proposed is delivering the first washing water to the PRF on a voluntary basis. On May 7th 2018, participating parties and the minister signed the agreement.

Many studies point out that labels for sustainability and incentive programs can stimulate the market demand for a more sustainable sector. There are several active initiatives such as: Clean Shipping Index, Green Award and Environmental Ship Index. These initiatives make it possible for ship-owners and shippers to become frontrunners and distinguish themselves in the field of sustainability.

Additional measures to prevent paraffin being discharged into the marine environment that could be considered are economic incentives and getting the market involved in finding solutions. A good practical example is the Company Sasol Wax in Hamburg which has installed a cleaning installation in the harbor. Shipping companies delivering to Sasol Wax are obliged by contract to wash their ships in the harbor. It is a profitable initiative as the residue is reprocessed.

As paraffin pollution is a border-crossing issue also an international green deal might be considered for all those involved, including major harbors.

Content

Introduction

Paraffin is omnipresent in our everyday lives: it is used in waxes covering cheeses, in chewing gum, in skincare products, candles, and so forth (35).

In Europe many companies that use paraffin in their products are located within the so called Hamburg-Le Havre Zone, the coastline with the most important seaports of Western Europe. The Netherlands is one of the top 10 exporters and importers of paraffin in the world with a export value of 66 million dollars and an import value of 68 million dollars in 2016. Rotterdam, Moerdijk, Amsterdam and Zaandam are known to have terminals for processing and storing paraffin, Rotterdam being the most important transit port for paraffin in the Netherlands. In 2016 twenty ships unloaded paraffin in Rotterdam and Moerdijk. In Amsterdam one ship transporting paraffin called at the Port of Amsterdam (34).

Paraffin is found on the Dutch coastline on a regular basis. Small quantities can be discharged at sea through tank washing of tankers transporting paraffin. This tank washing is restricted to certain regulations, but it is not illegal. However, incidentally large amounts of paraffin are found on beaches. This suggests that discharges are exceeding the amount that is permitted. This could be the result of tanks not being (properly) cleaned according to the regulations. It is also possible that residues of paraffin waxes remaining in the pipes are not properly being dealt with (12).

Figure 2: Paraffin floating on seawater after discharging (photo by Dutch Coastguard).

Paraffin on beaches has a negative economic impact and may cause (limited) harm to (marine) animals.

In 2016 the Dutch NGO's North Sea Foundation and KIMO Netherlands/Belgium asked Rijkswaterstaat (Department of Public Works and Water) about the amounts of paraffin washed ashore on beaches and cost for cleaning the beaches. During the research period additional related national and international developments became apparent and even parliamentary questions were asked.

This study presents an overview of the amounts and clean-up costs of paraffin occurrence on Dutch beaches as well as an overview of recent policy developments. It also presents proposals for next steps.

Chapter 1 gives an overview of amounts of paraffin on the Dutch coast and clean-up costs involved. It also focuses on harm aspects of paraffin.

Chapter 2 presents policies and regulations with focus on enforcement, including current developments.

Chapter 3 presents an overview of present initiatives and potential measures.

1 Description of the paraffin issue

There are several sources that provide an insight into the amount of paraffin washed ashore on Dutch beaches. Rijkswaterstaat registers data on the amount of paraffin that is cleaned from beaches and the cost involved. Also KIMO Netherlands/ Belgium has conducted a survey on this topic. At international level OSPAR Contracting Parties have been collecting data on the occurrence of paraffin on marine litter monitoring beaches. Furthermore there is information on Northern Fulmars ingesting paraffin.

1.1 Rijkswaterstaat

The "Samenwerkingsregeling Bestrijding Kustverontreiniging RWS-diensten" (SBK; Cooperation Agreement Clean-up Coastal Pollution) defines the Rijkswaterstaat policy to remove paraffin (and other substances like oil) from beaches. Rijkswaterstaat cleans up major occurrences on beaches. Figure 3 presents the amounts removed from Dutch beaches between 1995 and 2017 by Rijkswaterstaat.

The amounts are a mixture of paraffin and sand and occasionally other litter. Therefore this data should be considered only as an estimate. Approximately 10-50 m3 of paraffin is removed every year with an extreme value of more than 100 m3 in 2017 and various years with zero m3.

When paraffin is removed from the beaches special Beach Cleaners are operated and a mixture of sand and waste including paraffin is collected. It is very difficult to estimate the exact volume of paraffin removed. One has to measure the length and width of the total pollution on the coastline. Then one takes one square meter and collects all the paraffin in that square meter and multiplies the outcome with the total length and width of a slick. The overall outcome is not very accurate. Volume data presented should be looked at remembering this explanation (1).

Costs for cleaning vary depending on the amount of paraffin and the area. Recently (2017) two major cleaning actions costed 400.000 and 412.000 euros. But it has also happened that annual costs were around 10.000 euros.

Information about the location of the incidents and the costs involved for removing and disposing of paraffin from the beaches is stored in a central database (SAP). Figure 4 below shows an overview of incidents and their cleanup cost since 2007.

The annual average costs from 2007-2017 thus amount to approximately € 148.000). This only includes the cleaning of beaches and disposal of paraffin. Actual costs are much higher. They should include the costs for analysis and of man-hours of all the people involved in an incident: Coastguard, Security region (Veiligheidsregio), KLPD (maritime police), local police, Inspectorate, Crisis-coordination, Provincial Authorities, Waterboards, Council, various divisions of Rijkswaterstaat (including laboratory) (2). Also not included are costs made by municipalities.

1.1.1 Identification

The substances found on the beaches are often difficult to identify on sight. When clean-ups are carried out under the SBK, samples are taken for identifying the type of pollution. Analyzing is done at the RWS-laboratory conform CEN/TR 15522-2: Oil spill identification – Waterborne petroleum and petroleum resolution analysis (6). Paraffin from different producers differ in composition. The different properties of paraffin can be used to identify the different types of paraffin. The Rijkswaterstaat laboratory has been researching the possibilities of fingerprinting paraffin (=identifying the different types of paraffin) (CEN/TR 15522-2) for identification of perpetrators (6).

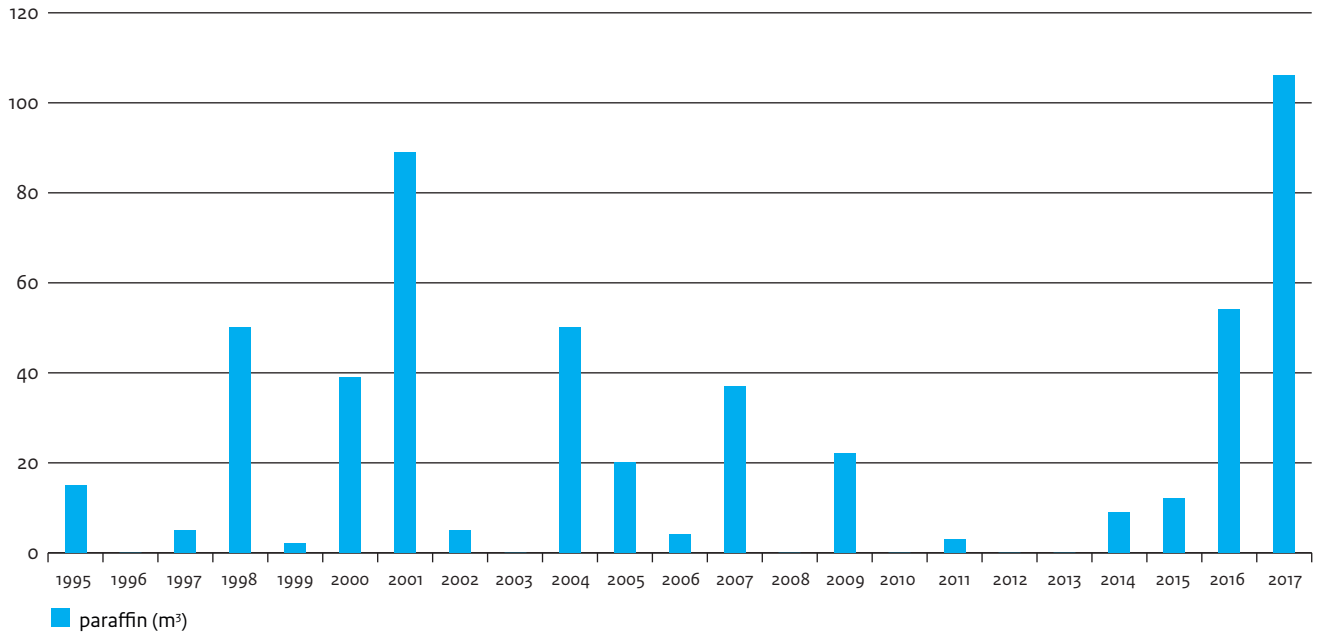


Figure 3: amount of paraffin removed from Dutch beaches between 1995-2017 by Rijkswaterstaat (m3) (1).*

Object Presented in	Total EURO
** WBS S.001232.0025 NZ 20070626 Paraffin NH & TEXEL	67422
** WBS S.001232.0030 NZ 20070713 Paraffin NH	94859
** WBS S.001232.0031 NZ 20070913 Paraffin Ameland & Terschel	23675
** WBS S.001232.0039 NZ 20090720 Paraffin NH	4631
** WBS S.001232.0046 NZ 20110727 Paraffin Friese Kwelders	22896
** WBS S.001232.0047 NZ 20110729 Paraffin Hoek van Holland	5683
** WBS S.001232.0049 NZ 20111212 Paraffin Hoek van Holland	30220
** WBS S.001232.0061 ZD 20141007 Paraffin Goeree en Schouwen	70371
** WBS S.001232.0066 ZD 20151120 Paraffin Noordwijk – IJmuiden	97514
** WBS S.001232.0074 ZD 20160705 paraffin Noordwijk/Zandvoort	12096
** WBS S.001232.0076 ZD 20163105 paraffin Vrouwenpolder	28506
** WBS S.001232.0077 ZD 20160306 paraffin Schierm/Rottum	347621
** WBS S.001232.0070 NZ 20160226 opruimen Paraffine	3902
Incident 1 2017 not yet registered in SAP	3385
Incident 2 2017 not yet registered in SAP	400000
Incident 3 2017 not yet registered in SAP	420000
Total	**1632781**

Figure 4: Overview of costs made by Rijkswaterstaat for removing and disposing paraffin from Dutch beaches 2007-2017 (SAP Registration).

During the Beach Cleanup Tour 2017, where volunteers removed 15000 kg of litter along the whole Dutch coast, the North Sea Foundation has collected samples of different types of paraffin/wax-like pollution. The objective was to get a better understanding of the composition of paraffin/wax-like materials that wash up on our beaches. This assignment was commissioned by Rijkswaterstaat and samples have been analyzed by the Rijkswaterstaat-laboratory. A total of 63 samples were analyzed:

- In 54 of the 63 samples, "pure" paraffin was found;
- In 6 samples, "non-pure" paraffin was found. These samples were mixed with other substances (2 samples) and unknown substances (4 samples) [1]

A different product was found for the remaining 3 samples:

- Fatty acids (possibly palm oil, coconut oil or sunflower oil);
- Policosanol (vegetable wax);
- Weathered fuel oil

Figure 5: Results analyzing wax-samples collected on Dutch beaches (34).

1.2 KIMO Netherlands/Belgium

When paraffin is not cleaned up by Rijkswaterstaat it is left to the municipality whether they clean their beaches or not. However, this is not compulsory. Depending on the season and the amount of paraffin, a municipality may decide to clean their beaches. During tourist season the paraffin is usually removed for obvious reasons. The paraffin is disposed of but not analyzed. During winter and/or on remote beaches municipalities tend to leave the paraffin on the beach.

KIMO Netherlands/Belgium has recently conducted a survey amongst its members on this topic (3). The outcome varies between the different municipalities. Most municipalities do not keep a record with specific data on the amount of paraffin on their beaches or of the costs involved as it is cleaned up with other litter. Some municipalities mention that small amounts wash ashore on their beach every year. In other municipalities it is an incident that does not occur every year and a few mention that no paraffin washes ashore on their beaches at all.

1.3 OSPAR and MSFD

OSPAR is a Regional Sea Convention, consisting of 15 Contracting Parties and the European Union, protecting the North East Atlantic Ocean, including the Greater North Sea.

OSPAR uses beach litter data as well as plastics in stomachs of northern Fulmars as common indicators to monitor and assess the marine litter situation. OSPAR Contracting Parties that are also EU Member States use these common indicators also to fulfill the obligation under the EU Marine Strategy Framework Directive (MSFD, Descriptor D10 – marine litter). The EU Marine Strategy Framework Directive (MSFD) demands that EU Member States use Regional Sea Conventions for regional coordination and for obtaining regional coherency.

Since 2001 the presence of "pollutants" has been recorded at the OSPAR 100 m Beach Litter Monitoring surveys sites. The pollutants are recorded in two categories i.e. "paraffin – or wax-like chemicals" and "other" category. The frequency, i.e. the estimated number of pieces of pollutant per meter of strandline, is recorded for three size classes (Table 1).

Presence of other pollutants		
Pollutant	**Size of pieces or lumps (estimates)**	**Frequency (estimated number per metre of standline)**
Paraffin or wax pieces	*Size range*	
108	0 - 1 cm	
109	1 - 10 cm	
110	> 10 cm	
Other (please specify in other item box)*		
111		

Table 1: example of survey form for registration of presence paraffin (pollutants) (29).

The Environmental Impact of Human Activities Committee of OSPAR in 2016 requested the Intersessional Correspondence Group on Marine Litter (ICG-ML) to assess the beach litter monitoring database on presence of paraffin items and to determine if there is a cause for concern that should be brought to the attention of the IMO. KIMO international, Observer in ICG ML, has further asked KIMO member municipalities to collect additional data on paraffin (4).

At ICG-ML (2) 2016 Germany and the OSPAR secretariat presented the document 16/05/01: "Recording the presence of "pollutants" on OSPAR Beach Litter Survey beaches". The data showed an increase of "paraffin – or wax-like chemicals" since 2009 (fig. 6 and 7).

[1] For this research it was also checked what the added products to paraffin were. This was done by comparing the properties of the added substances to information available at the Rijkswaterstaat lab. If no information was available, the added product is labeled as unknown.

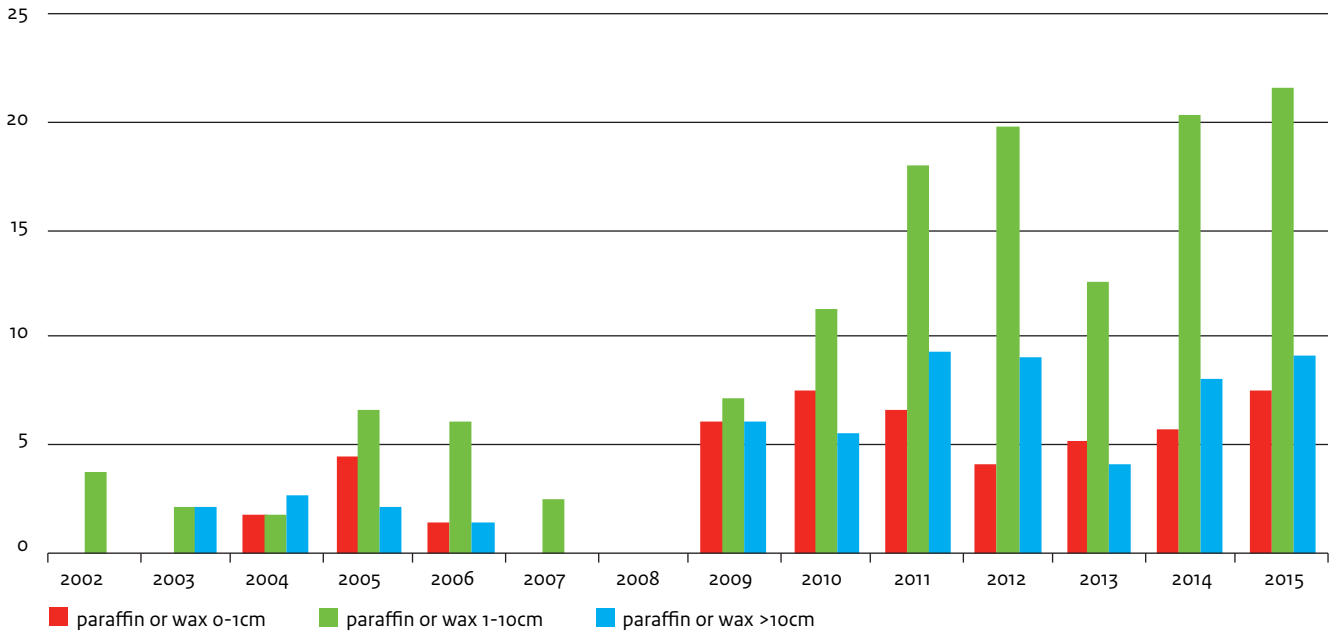


*Figure 6: Percentage of surveys per year with records of paraffin and wax on all OSPAR beaches (*Summary records IC-ML (2) 2016 16/13/01).*

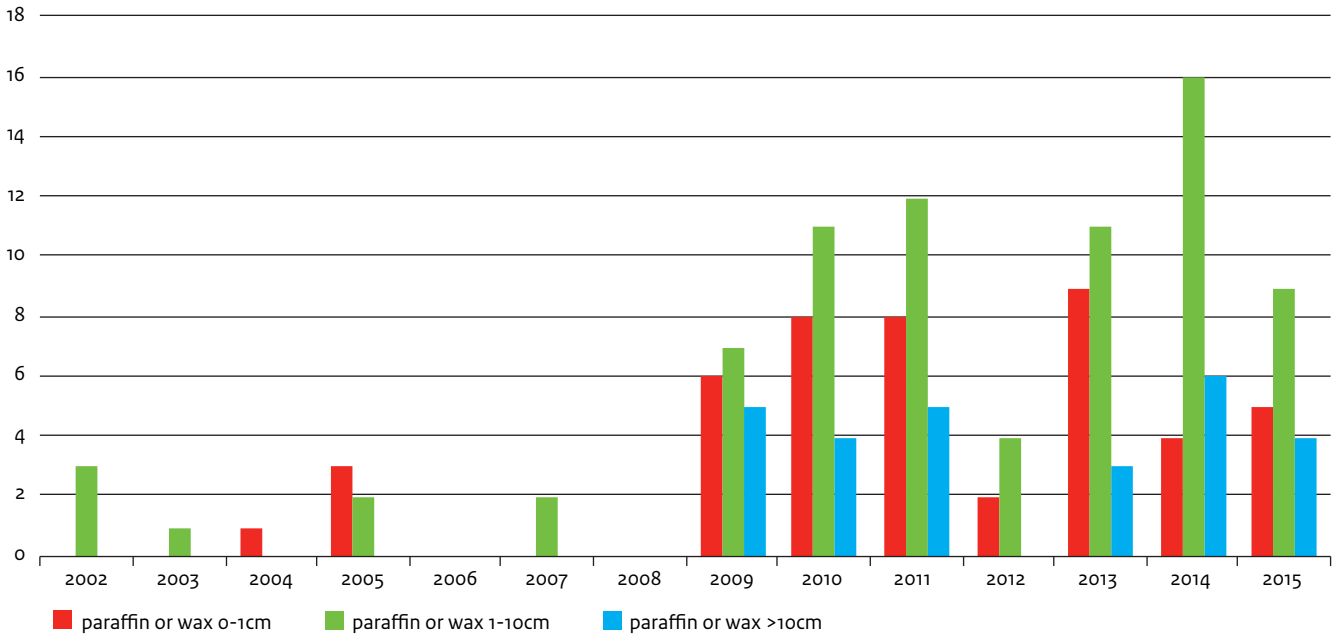


*Figure 7: The total number of surveys per year with records of paraffin and wax on OSPAR beaches in Germany and The Netherlands (where beaches have been assessed continuously since 2002) (*Summary records IC-ML (2) 2016 16/13/01).*

On the southern part of the North Sea incidents of mostly paraffin-like substances were in fact paraffin and there appeared to be a problem due to tank washings. Germany highlighted that although this was a rough assessment the data was valuable. The reliability of the data could be improved by including an analysis of samples to identify sources (4). The majority of the data concerns small pieces of paraffin (<=10 cm) and the amounts vary per survey but are usually small.

Figure 8: Small pieces of paraffin found on Dutch beach during monitoring (Photo by North Sea Foundation, 2017).

It is important to note that "paraffin & wax" is not always paraffin and that a number of other paraffin-like substances are also involved in the pollution of beaches (4). The ICG-Marine Litter group decided to monitor paraffin + wax as one type of pollution because it is very difficult to distinguish between paraffin and other wax-like materials on sight. However, a request to make an overview of analysis done by the Rijkswaterstaat laboratory (CIV) on all pollution related incidents on the Dutch coastline in 2015 and 2016 shows that nearly all incidents concerned paraffin: seven incidents of which five concerned paraffin only, one incident concerned paraffin and olefin and one concerned concentrated fuel oil (6). Similar results were found by a special assignment that was conducted by the North Sea Foundation in 2017. Samples from paraffin-like substances on Dutch beaches were collected and analyzed. Of the 63 samples that were taken, 59 concerned paraffin (see fig. 5).
The Netherlands is not the only country experiencing paraffin pollution. The UK, Norway, Germany, Denmark, France, Italy, Portugal and Sweden all report incidents with paraffin pollution (1,12,15,31).

OSPAR and EU Member States can collect additional data to the OSPAR monitoring on beaches from all participating countries on the amounts washed ashore and the costs that are involved with removing paraffin from the beaches. This information combined can then be used as a signal to the industry, transporters and harbors about the extent of the problem.

The MSFD D10 Marine Litter Descriptor specifies a compulsory beach litter monitoring of chemicals: paraffin, wax, oil and tar (14). At the moment OSPAR beach litter monitoring includes "paraffin - wax" resulting in a combination of data that is difficult to interpret. At EIHA 2017 Contracting Parties concluded that they like ICG-ML to further consider how to include paraffin in the marine litter monitoring programs and the Beach Litter Monitoring Guidelines (see also 2.1.2).

1.3.1 Northern Fulmar

The abundance of plastics in the stomachs of Northern Fulmars is used as a Common Indicator by OSPAR Contracting Parties to monitor the presence of floating marine litter and ingested litter in the North Sea. The indicator is now also used as an indicator to determine Good Environmental Status in the European Marine Strategy Framework Directive. Analysis of the stomach contents of dead Northern Fulmars washed up on German North Sea beaches showed paraffin–like substances in the stomachs of around 20% of the birds investigated (7).

1.4 Harm

Besides a negative economic impact due to cleaning beaches and potential loss of income when tourist numbers are decreasing there is also possible harm for (sea)animals. Dogs and birds are known to eat paraffin.
Furthermore, people have been collecting paraffin on beaches for making candles. Paraffin can however be polluted with chemicals that could have an effect on human health (7).

"Discharging paraffin in the marine environment has disastrous consequences for the bird-population", says biologist and researcher Jan Andries van Franeker. He often found paraffin in bird's stomachs. "The birds think the white lumps are food" (9). However, it is difficult to provide firm evidence for casual links between ingested debris and mortality. Therefore solid proof that ingested debris was the direct and sole cause is rare (10), although after a paraffin incident at the Dutch coast in 2017 van Franeker points out that in a few cases the lump of paraffin in the stomachs of a Northern Fulmar were so big they obviously were the cause of death (11).

The chemical properties of paraffin mean that the risk of paraffin sticking to the plumage of birds causing it to become matted is very low at temperatures experienced in North and Baltic Sea waters (7).

At present there is no comprehensive scientific research known on the extent of the consequences of paraffin for animals at population level.

1.5 Conclusion and next steps

1.5.1 National

The amounts of paraffin that wash ashore on Dutch beaches vary in years. Approximately between 10-50 m3 of paraffin is removed every year with an extreme value of more than 100 m3 in 2017 and various

years with zero m3. Two recent incidents (2017) show that major occurrences are still a problem.

On average over € 148.000 per year (2007-2017) is spent by the national government to clean the beaches from paraffin and dispose of it properly. Costs for two recent events (2017) were approximately € 400 k each. This is not taking into consideration the costs for all the people involved nor the costs made by local municipalities.

Two separate researches whereby samples were taken from the Dutch beaches and analyzed, show that most wax-like materials that wash up on shore are paraffin.
Paraffin causes economic and ecological harm. It could be interesting to analyze the wax-like materials found in the stomachs of Northern Fulmars and to see whether the majority of this is also paraffin or whether other materials are more prominent. As the Fulmar forages at sea only this could lead to additional information.
Rijkswaterstaat collects data about clean-up costs in a central databases (SAP). Unfortunately a change in recording the cost-data in a different program in 2006 has led to a loss of information. It is important to realize the value of long term data. The introduction of new databases/tools should always guarantee compatible data collection. Collecting data on the amount of paraffin that washes ashore and the costs that are involved is very valuable for underlining the necessity of taking measures and for assessing the effectiveness of present regulations and future measures. Furthermore, the data can be used to persuade the industry concerned not to wait for additional legislation but to be part of the solution. This will be further discussed in chapter 3.

From 2018 Rijkswaterstaat extends their data recording by registering all reports of paraffin incidents including those where no clean up action is required. This will give a better insight in the issue.

1.5.2 International

1.5.2.1 OSPAR and MSFD

The Netherlands is not the only country experiencing paraffin pollution. The UK, Norway, Germany, Denmark, France, Italy, Portugal and Sweden all report incidents with paraffin pollution (1,12,15,31).

OSPAR and MSFD can collect additional data to the OSPAR monitoring on beaches from all participating countries on the amounts washed ashore and the costs that are involved with removing paraffin from the beaches. This information combined can then be used as a signal to the industry, transporters and harbors about the extent of the problem.

The MSFD D10 Marine Litter Descriptor specifies a compulsory beach litter monitoring of chemicals: paraffin, wax, oil and tar (14). At the moment OSPAR beach litter monitoring includes “paraffin & wax” resulting in a combination of data that is difficult to interpret. At EIHA 2017 Contracting Parties concluded that they like ICG-ML to further consider how to include paraffin in the marine litter monitoring programs and the Beach Litter Monitoring Guidelines (see also 2.1.2).

As it is not possible to distinguish between paraffin and similar substances like olefins (see 2.3) on sight, classification is the only option: the category “paraffin and wax” of the OSPAR beach litter monitoring guidelines could be replaced by: paraffin/olefins and vegetable oils/fats. Olefins are also classified under the same MARPOL Annex II category as paraffin (see chapter 2) so combining the two does not present a problem. It is however very difficult for surveyors to distinguishing between paraffin/olefins and vegetable oils/fats on sight. Analysis can provide a solution but costs involved are high.

Though there is limited scientific information available about the ecological harm of paraffin in the marine environment it is known that seabirds (fulmar) eat this substance and that it is harmful to individual birds.

The Northern Fulmar research already has data on paraffin. As this data also includes “sure cause of death by eating paraffin” it may be possible to quantify harm and threat of paraffin to individual birds and at population level. As this is one of the most difficult aspects of marine litter it might be worth investigating.

2 Policies and regulations

Paraffin is transported in ships (bulk carriers) as a liquid in heated tanks. The (empty) tanks in which paraffin was transported are washed with water. The wash water containing cargo residues may be discharged at sea under certain conditions (such as distance from shore, speed, water depth etc.) thus releasing paraffin into the marine environment (16). This cleaning may be carried out after leaving the port of unloading (30).

This tank washing is not illegal, but is restricted to certain regulations. In contact with cooler waters, paraffin solidifies and floats. Usually only small pieces of paraffin are found at beaches. However, incidentally larger amounts of paraffin end up on the shore suggesting that quantities are discharged into the marine environment that might exceed the maximum amount that is permitted under these regulations. It is assumed that the tanks and pipes are not always properly prior to discharge overboard into the sea (12). Blocks of paraffin from clogged pipes have been found at beaches (30). Enforcement is difficult.

Recently, political parties (D66, Groen Links, Partij voor de Dieren) have been asking attention for paraffin pollution after major incidents on the Dutch coast in 2016 and 2017.

2.1 Policies and regulations

2.1.1 National

Paraffin is being dealt with by various policies and regulations. Nationally, the Samenwerkingsregeling Bestrijding Kustverontreiniging RWS-diensten (SBK; Cooperation Agreement Clean-up Coastal Pollution, 2007) is a governmental instrument for coordinating (a.o.) clean-ups for oil and paraffin pollution on Dutch beaches. When the amount of oil on the beach is more than 5m3, the SBK comes into force and Rijkswaterstaat will clean the beach. For paraffin there is no set amount agreed for when the SBK (paragraph 1.7, "pollution by a different substance") comes into force. This is decided on site. So whether Rijkswaterstaat removes and properly disposes of the paraffin varies per incident (1).

Figure 9: Clean up action RWS at beach of Zandvoort (photo by RWS).

When it is decided that the amount of paraffin on the beach is too little for the SBK, there is no legal instrument that can be applied. It is up to the local municipalities whether paraffin is removed from the beaches or not (see 1.2).

2.1.2 International

Paraffin pollution is a cross-border issue and international cooperation is crucial. Internationally, the International Maritime Organization (IMO) is the main policy body. Discharges of wash water with cargo residues at sea are permitted under certain conditions and depending on the categorization of the substance[2].

Substances are divided into categories X, Y, Z and other substances according to the level of threat they pose to the marine environment:

Category X	Major hazard – prohibition of discharge into the environment
Category Y	Hazard – limitation on quality and quantity of discharge into the environment
Category Z	Minor hazard – less stringent restrictions on quality and quantity of discharge
Other substances	Considered to present no harm to marine resources and human health

Paraffin is classified under category Y.

Preconditions under which discharge of paraffin into the sea can take place include (17):

- Tanks stripped as efficient as possible;
- Proceeding en-route at 7 knots;
- At least 12 miles from land;
- Depth of at least 25m;
- Discharge below waterline;
- If the substance discharged is insufficiently heated and is at a temperature too close to its melting temperature (12,30).

A new ship (constructed after the 1st of January 2007) is allowed a maximum of 75 liters per tank paraffin residual product in its tanks and pipes. For existing ships (constructed before the 1st of January 2007) the amount is 100 – 150 liters per tank. A ship can have up to several dozen tanks (30). If the unloading procedure goes badly and the quantities exceed the amounts mentioned above, the tanks must be prewashed and the residues must be delivered at a Port Waste Reception Facility (30). The amounts of paraffin found at beaches imply that this may not always be the case and that a multiple of this legally permitted amount remains in tanks and/or pipes after delivering of the paraffin after which the tanks are washed at sea (12).

When paraffin (category Y) is delivered, it is registered in the Cargo Record Book that the ship is unloaded in agreement with the P&A manual, thus in conformity with the requirements of Regulation 13 of Annex II stating that all tanks should be stripped as efficient as possible. This is not supervised by the government as is mandatory for category X substances. However, companies can request an empty tank certificate. These are provided by surveyors which should indicate that the tanks were indeed stripped as much as possible, although it seems that pipes are not always covered by the certificate (12,32). At the moment it is not clear whether this is due to different companies carrying out the inspection or whether the company requesting the certificate can ask for specifications.

Only for the Antarctic region a complete ban on the discharge of hazardous substances exists (Paragraph 8 Regulation 13 of Annex II to the MARPOL Convention). No other regions are listed as special areas for discharge restrictions, therefor there is no general ban on the discharge of paraffin and similar products in the North and Baltic Seas (7).

In the Netherlands MARPOL legislation has been incorporated into: Wet voorkoming Verontreiniging door Schepen en Besluit Voorkoming verontreiniging door Schepen (06/04/87 nl).

Once paraffin has been discharged at sea enforcement is difficult:

1. Enforcement is carried out air surveillance, supported by satellite imagery
2. It is not always clear whether the amount of paraffin that is allowed to be discharged at sea legally has been exceeded (1);
3. High traffic intensity in large parts of the OSPAR area makes it almost impossible to identify a perpetrator (30, 31);
4. For different types of cargo there is the obligation to register in SafeSeaNet. However paraffin does not have a unique code and all sorts of descriptions can be used for registration making it difficult to recover data (2) (see EMSA below);
5. Linking paraffin to a perpetrator is almost impossible unless details and/or samples of the paraffin transported are available.

A few other international organizations as well as the implementation of the EU Marine Strategy Framework Directive are important to mention:

BONN Agreement: Different North Sea countries that have signed the Bonn Agreement are working together on combating the North Sea pollution, including paraffin. Rijkswaterstaat and BSH Germany are both lead countries for OSINet, the Bonn Agreement oil spill identification network of experts (13). A database is being constructed: by exchanging and combining information more insight is gained into which types of paraffin are transported (6). This can contribute to identifying perpetrators (see also 2.1.2).

EMSA: the European Maritime Safety Agency (EMSA) is a European Union agency that is charged amongst others with reducing the risk of maritime accidents and marine pollution from ships. EMSA's CleanSeaNet collect/processes satellite imageries that Member Status can use for enforcement purposes. SafeSeaNet is a vessel traffic monitoring and information system of EMSA. It can be used for marine environment protection.

Marine Strategy Framework Directive (MSFD): the main goal of the MSFD is to achieve Good Environmental Status of EU marine waters by 2020. Descriptor 10 ("Properties and quantities of marine litter do not cause harm to the coastal and marine environment")

[2] Full text available at *www.marpoltraining.com*

concerns the reduction of marine litter pollution. The new Commission Decision for the Marine Strategy Framework Directive (EU 2017/848; May 2017) mentions 'chemicals' as one of the D10/ marine litter categories that should be monitored, chemicals referring to paraffin, wax, oil and tar (18).

OSPAR, also coordinating MSFD issues for their EU Member States, is already working on this issue of paraffin pollution. By collecting data on presence and impact of paraffin, OSPAR can add increasing pressure at IMO for amending Regulation 13 of MARPOL Annex II (see 2.2.2). Currently, the OSPAR Guideline for Monitoring Marine Litter is being revised. One of the discussions is to improve monitoring paraffin.

2.2 Developments

2.2.1 National

In 2016 twenty ships have delivered wax and paraffin in the Ports of Rotterdam and Moerdijk. Twelve of these ships washed their tanks and delivered the residue to a reception facility. It is not yet known whether these tanks delivered their first washing on a voluntary basis or because they didn't meet the criteria for tank washing at sea. The other eight ships washed their tanks (legally) at sea (19). These numbers suggest that capacity of the Port Reception Facilities is not the problem.

In this same year a governmental multi-disciplinary Working Group on Paraffin was initiated. The objective is to work towards solutions on national and international level for paraffin washing ashore (5). Several political parties raised their concern on the major paraffin incidents that occurred in 2016 and 2017:

- "De Partij voor de Dieren" in Rotterdam asked several questions to the Mayor and Aldermen about tank washing after several incidents where large amounts of paraffin washed ashore. They requested an investigation and pleaded for action to diminish such discharges. They stated that the municipality as major shareholder in the Port should install a cleaning installation in the harbor which should be free of use and be paid by increasing the harbor fee for ships concerned (20).
- "D66" and "PVDA" have put forward a motion in Parliament in which the proposal to IMO (see 2.2.2) is considered a good but also very time consuming step forward and that in the meantime everything should be done to come to quicker prohibition of tank washing at sea. The government is requested to investigate whether a European prohibition is possible(. This motion was adopted in the House of Representatives (21).
- More concern came from "GroenLinks" after at least three more incidents after the motion of "D66" and "PVDA" in February 2017. Several parliamentary questions were raised (a.o.) as to how the minister is going to speed up a regional prohibition on tank washing.
- The minister responded that the Netherlands has put forward a proposal to IMO for an accelerated regional introduction of the amendment by IMO, e.g. for the North Sea by which the first washing water of tanks will have to be discharged to a reception facility (see 2.2.2). Until this comes into force the minister will, together with ports and purchasers, explore possibilities to take effective and efficient measures to make the discharging of washing water at a reception facility more attractive (23).

On May 7th 2018 participating parties and the minister signed an agreement: port authorities and terminals/shippers agreed, in anticipation of an amendment of Regulation 13 of MARPOL Annex II, on a voluntary delivering of the first washing water to the PRF.

2.2.2 International

Currently a discussion is ongoing in the IMO to strengthen the discharge rules for certain liquid chemicals, in particular the 'high-viscosity and persistent floating products' like paraffin and vegetable oils.

The Netherlands is one of several North West European Countries that have submitted a proposal for amending Regulation 13 of Annex II to the MARPOL Convention to the IMO. The proposal demands that tanks in which high viscosity substances and/or persistent floaters were transported, after efficient stripping, are prewashed and this residue must be delivered at a Port Reception Facility (PRF). The remaining seawater (with some last residual remains) can be discharged overboard according to the current regulations. The proposal does not include a request for reclassification of the category Y to the stricter category X (22).

The obligation to deliver the first washing water at a PRF is currently opposed within the IMO by paraffin producing countries. Arguments that are mentioned are a) pollution by paraffin is seen as a regional problem and b) worldwide there are not enough Port Reception Facilities (PRF) or the capacity of these Port Reception Facilities is not sufficient. In IMO the IPTA (International Parcel Tanker Association) noted that also in NW Europe there is one harbor where certain substances cannot be delivered and they would have to continue to an alternative harbor. However, this seems to be an exception (22).

To speed up the international prohibition of discharging these products into the North Sea area, the Netherlands have submitted an information paper to the IMO Sub-Committee on Pollution Prevention and Response (PPR). The paper pleads for an accelerated regional introduction of the amendment by IMO, e.g. in the North Sea. In October 2017 the IMO Working Group drafted a text on basis of the Dutch proposal for the IMO Sub-Committee on PPR meeting in February 2018 (22).

The Sub-Committee then agreed draft amendments to MARPOL Annex II to strengthen discharge requirements for tank washings containing high-viscosity, solidifying and persistent floating products (such as certain vegetable oils), in specified sea areas. The new requirements would cover persistent floating substances with a high viscosity and/or a melting point greater than or equal to 0°C. Under the new requirements, a chemical tanker that would unload

a cargo of such a substance would have to carry out a prewash of its tanks and the residue/water mixture generated during the prewash would have to be discharged to a reception facility at the port of unloading. The new requirements cover a larger area then the original Dutch proposal: it is proposed that the requirements would be applied in North West European waters; the Baltic Sea area; the Western European waters; and Norwegian waters north of 62° N. The draft amendments will be forwarded to MEPC 73 in October 2018 for approval and subsequent adoption (33).

Denmark, Germany and the Netherlands have been working together for 40 years to protect the Waddenzee. In May 2018 a minister from each country has signed the "Verklaring van Leeuwarden" (Declaration of Leeuwarden) a declaration to protect the Waddenzee. One of the new topics that will included in the agreement for the next four years is paraffin.
The following text is included in the Declaration: "note the ongoing discussions in the framework of the International Maritime Organization (IMO) on a possible mandatory prewash of cargo tanks having contained paraffins, whereby the prewash residue shall be discharged into a port reception facility" (8).
The European Commission closely follows the discussion in the IMO and in principle supports any initiatives on the topic for finding a solution for the matter in the context of the MARPOL Convention. The Commission will consider putting forward a proposal for EU legislation to address the issue of pollution from paraffin discharges if there is no sufficient progress at international IMO level.

The discussion on paraffin is also ongoing within the North Sea Network of prosecutors. Persecution of incidents with paraffin are expected to be a topic at the upcoming discussion on the strategic issues for the BONN Agreement (1).

The governmental multi-disciplinary Working Group on Paraffin has brought forward another issue which they will discuss in EMSA: the IBC Code (International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk) lists chemicals and their hazards and gives both the ship type required to carry that product as well as the environmental hazard rating. EMSA should work towards appointing a unique SafeSeaNet code for all (paraffin) substances on the IBC list. This way the list of possible perpetrators can be narrowed down increasing the possibility to match litter samples from beaches to a ship (2,5,12).

2.3 Paraffin versus other high viscosity substances and/or persistent floaters

Crude oil is the most important source for paraffin waxes. Paraffin waxes are a byproduct from the production of lubrication oils which form the major part of the motor oil used in cars. The so-called Group I base oils are produced by solvent refining, a simple and low-cost refining process, which is also the source for slack wax. In the meantime, the market demands more and more Group II base oils. These are manufactured by hydrocracking the paraffin components, leaving a better product at similar costs. However, no slack waxes become available from Group II abase oil production (25).

Paul Kienhuis of the RWS-laboratory: "Although no longer used for primary illumination, candles are currently the fastest growing segment of the wax market. The production of paraffin is declining. I assume paraffin will stay on the market as product because of its many applications. Partly paraffin will be replaced by other products like poly alpha olefins which we already come across at the beaches on a regular basis. Thereby the problem of persistent floaters remains".

2.4 Conclusions and next steps

Current legislation (Regulation 13 of Annex II to the MARPOL Convention) allows for legal discharge of paraffin through tank washing at sea. However, it also fosters discharge whereby more paraffin might be washed out of the tanks and pipes than allowed. This is reflected in some recent incidents whereby large amounts of paraffin were washed up on the shore.
Strengthening Regulation 13 of MARPOL Annex II is the key to reduce paraffin pollution. An accelerated regional introduction of the proposal to IMO for the North Sea area should speed up the process.
Approval and subsequent adoption of the draft amendments at MEPC 73 in October 2018 should result in a diminishing pollution of paraffin.

Because changing international regulation takes a long time the Netherlands have taken the first steps to involve the industry in finding solutions: May 7th 2018, several parties have signed an agreement to deliver first washing water to the PRF on a voluntary basis. Further more the government is looking into the technical and financial possibilities of recovering paraffin from this washing water.

There seems to be no practical issue that prevents ships delivering first tank washing residues to reception facilities in Rotterdam. This most likely is true for all major European harbors, which gives the industry the opportunity to get involved in contributing to solutions as will be discussed in Chapter 3.

The requirement for a mandatory prewash will not prevent small discharges of the residual solidified products, as the amount of residue after the prewash is depending on the prewash conditions (for example duration and water temperature). Additional agreements between port authorities on the prewash conditions may be necessary to ensure maximum discharge of cargo residues to the Port Reception Facilities (22).

Al these initiatives will, however, not diminish illegal discharges. So apart from working towards a mandatory prewash, enforcement remains indispensable.

The governmental multi-disciplinary Working Group on Paraffin will discuss the issue of appointing an unique SafeSeaNet code for all (paraffin) substances on the IBC list at EMSA. This can enhance the chance of finding possible perpetrators (2,5,12).

In 2017 Paul Kienhuis (RWS-laboratory, published a scientific article on a comparison between paraffin spills and cargo reference samples (matching). This publication should lead to international support which could lead to the method to be approved as evidence for identifying the perpetrator (6).[3]

There is no known requirement that a ship transporting paraffin should have a reference sample on board of the paraffin cargo it is transporting (12). This could be a measure that would facilitate identifying the perpetrator. Making this mandatory would require global legal action which is not easy to achieve, especially not in the near future. Other possibilities are for example a voluntary agreement with the industry or making a mandatory sample part of a economic example.

Besides tackling discharges, a decline of paraffin pollution in the marine environment in time could also be partly the result of a decline of paraffin production and therefor a decline in paraffin transport. However, substitutes of paraffin like olefins are likely to increase as a pollutant in the marine environment. The growing market for candles is likely to lead to more pollution incidents. This emphasizes the importance of the IMO proposal.

Knowledge on the changes in the paraffin production industry is vital to assess any changes in pollution discharges of the substances concerned. This should be mapped and regularly updated. Cooperation from the industry is indispensable. Furthermore, substances that are already replacing paraffin as a product or will so in future, should be (if not already) included in the IMO proposal for amending MARPOL Annex II demanding that tanks in which high viscosity substances and/or persistent floaters were transported are prewashed and this residue must be delivered at the Port Reception Facilities.

All wax–like substances collected under SBK are already analyzed at the Rijkswaterstaat-laboratory and this will continue in the future. This gives the opportunity to compare the amount of different waxes that have washed ashore in time and to assess which other high viscosity substances and/or persistent floaters that are known to replace paraffin as a product are washed ashore, like olefins. It also alerts us when new unknown substances are found, for instance future products that will replace paraffin. The results can be used for examining whether these substances are covered by the new requirements for amending MARPOL Annex II.

[3] Paul. G. M. Kienhuis et al. , 2017 Paraffin Wax Spill Identification by GC-FID and GC-MS, Elsevier special issue on: Oil Spill Environmental Forensics Case Studies, DOI:

3 Initiatives and alternative potential measures

Changing rules and regulations through IMO plays an important role in reducing paraffin discharge in the marine environment. It is, however, a difficult process achieving a more stringent policy for discharge rules for certain liquid chemicals, in particular the 'high-viscosity and persistent floating products' like paraffin and vegetable oils may take years. There are other possibilities that can be considered alongside aiming for amending regulations like economic incentives and getting the market involved in finding solutions.

3.1 Economic incentives

Many studies point out that labels for environmental sustainability and incentive programs can stimulate the market demand for a more sustainable sector. A report from Clean Baltic Sea Shipping (2013) shows that there are 50 different initiatives around the Baltic Sea that have been developed to 1) assessing the environmental performances of ships to apply port fee differentiation 2) financial support for shipping companies to be able to invest in sustainable technologies on board and 3) assessing the environmental performance of ships by means of eco-labelling. There are also dozens of active initiatives such as The Clean Shipping Index, Green Award and Environmental Ship index for the North Sea region. These initiatives make it possible for ship-owners and sea shippers to distinguish themselves in the field of sustainability. Environmental performance can be measured and environmental impact is made visible. Ship owners and shippers with good environmental performances can be rewarded by getting discount on port fees and/or tax or a better starting position when contracts are tendered (26).

3.1.1 Conclusion and next steps

There are already many initiatives available that could be a valuable asset in reducing paraffin pollution. The Clean Shipping Index has discussed including "delivery of first washing of tanks after paraffin transport at Port" as a possible criteria. At the moment there are too many unknown factors such as whether harbors have sufficient capacity. It will be considered again at the CSI criteria review in 2018. Other initiatives could also be considered.

3.2 Market based solutions

An approach that has proven successful in mitigating marine litter entering the marine environment is involving the sector responsible for polluting. Two examples are: "Fishing for Litter" and "Green Deals". These instruments have contributed to cleaner oceans by change from within the industry by communication and awareness. This approach can also prove to be useful for the paraffin problem. The available data can help the industry to understand the problem and persuade them to get involved in finding solutions.

A promising example of an initiative from the sector that can contribute to reducing paraffin pollution comes from the Company Sasol Wax in Hamburg. This company washes the tanks of every ship delivering paraffin slack wax (a basic product for paraffin and wax). The company, a leading specialist and producer of a comprehensive range of mineral oil-based and synthetic paraffin waxes, petroleum jellies and liquid paraffin, has installed a cleaning installation in the harbor. Shipping companies delivering to Sasol Wax are obliged by contract to wash their ships in the harbor. It is a profitable initiative as the residue is reprocessed (27).

By unloading paraffin there is no supervision by the government to ensure that tanks are stripped as efficient as possible. However, companies can request that such an inspection is carried out. Prior to the IMO proposal coming into force, this could already contribute to mitigating disposal of paraffin when tank washing at sea.

3.3 Conclusion and next steps

While working towards a compulsory pre-tank washing for paraffin and similar substances for cargo ships through IMO, communication with and awareness of the paraffin problem by the industry concerned may contribute to solutions in shorter but lasting terms. Data on paraffin pollution on all levels plays an important part in this.

The national Working Group on Paraffin has suggested to start a communication strategy, informing producers, transporters, and buyers about the problem of paraffin in the marine environment. Sasol Wax's installation, a voluntary sample of the cargo on board and the request for an empty tank certificate are three examples that could be presented to the industry.

As paraffin pollution is a border-crossing issue, an international green deal might also be considered for all those involved, including major harbors.

4 References

1. Personal communication Sjon Huisman, Ministerie van Infrastructuur en Waterstaat, DG Rijkswaterstaat, RWS Zee en Delta, Dir. Netwerk Management, District Zuid.

2. Personal communication Jan Kool, Ministerie van Infrastructuur en Waterstaat, DG Rijkswaterstaat, RWS Corporate Dienst

3. Personal communication Lars Hopman, KIMO Netherlands Belgium, 2017

4. OSPAR Summary records ICG-ML (2) 2016 16/13/01)

5. Personal communication Jean Groels. Ministerie van Infrastructuur en Waterstaat, RWS Zee en Delta, Dir. Netwerk Management, District Zuid.

6. Personal communication Paul Kienhuis, Ministerie van Infrastructuur en Waterstaat, DG Rijkswaterstaat, RWS Centrale Informatievoorziening, Dir. Inwinning en Gegevensanalyse, Afd. Laboratorium

7. Independent Environmental Group of Experts "Consequences of Pollution Incidents"(UEG. 22 July, 2014 Pollution of the North and Baltic Seas with Paraffin.

8. Personal communication Floris van Bentum. Ministerie van Infrastructuur en Waterstaat, RWS Noord-Nederland, Dir. Netwerk Ontwikkeling, Afd. Netwerkontwikkeling en Visie.

9. Reddingsbrigade Bloemendaal (2015): www.reddingsbrigade-bloemendaal.nl/nieuws/Paraffine-op-het-strand.html

10. Werner, S et al. (2016) Harm caused by Marine Litter. MSFD GES TG Marine Litter – Thematic report; JRC Technical report; EUR 28317 EN; doi:10.2788/690366

11. Nederlands Dagblad, (7th August 2017): https://www.nd.nl/.../nederland/oppassen-voor-brokjes-paraffine-op-het-strand.

12. Personal communication Ron Faber, Netherlands National Police, Maritime Police

13. Rijkswatertstaat Minsterie van Infrastructuur en Waterstaat: http://www.4.goteborg.se/

14. EUR-Lex Access to European Union Law (2017): Commission Decision (EU) 2017/848, May 2017

15. OSPAR Commission (2017): OSPAR Agenda Item 3 Feedback from EIHA 2017 ICG-ML(1) 17/03/01).

16. IAEA International Atomic Energy Agency: https://www.iaea.org/newscenter/news/forensic-tools-to-track-the-sources-of-paraffin-in-the-marine-environment

17. Orzan Congres: www.orzancongres.com/administracion/upload

18. EUR-Lex Access to European Union Law: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32017D0848&from=EN.

19. Personal communication Coen Peelen, Ministerie van Infrastructuur en Waterstaat, DG Luchtvaart en Maritiem. Dir. Maritieme Zaken, Afd. Zeehavens

20. Partij voor de dieren, gemeenteraads fractie Rotterdam (2016) https://rotterdam.partijvoordedieren.nl/news/zeezwaaien.

21. https://www.noordzee.nl/scheepvaart-in-de-tweede-kamer/

22. Personal communication Heddy Lindeijer, Ministerie van Infrastructuur en Waterstaat, Beleid, DG Milieu en Internationaal, Dir.Veiligheid en Risico's, Cluster B

23. Overheid.nl (2017) https://zoek.officielebekendmakingen.nl/ah-tk-20162017-2635.html.

24. Personal communication Charlotte Mogensen, OSPAR Deputy Secretary

25. Stepanski (2014) Oil and Gas Crystallization of paraffin wax Wax deoiling technology for the future_STR_2014_1_12_15

26. Stichting de Noordzee (2017) https://www.noordzee.nl/de-scheepsbel-luidt-voor-schone-scheepvaart/ 29th September 2016

27. Stichting de Noordzee (2009) https://www.noordzee.nl/opnieuw-vervuiling-door-paraffine-op-de-nederlandse-kust

28. Kustdienst Nederland en Europa (2011) https://www.facebook.com/KustnieuwsNL/posts/1026759350783639

29. OSPAR Commission (2010) Guideline for Monitoring Marine Litter on the Beaches in the OSPAR Area. Agreement number 2010-02. ISBN 903639739

30. Sea-Mer Asso (2017) Industrial paraffin-wax strandings on the Eastern coast of the Channel. Contexts and stakes. Sea-Mer-Asso, October 27, 2017, http://sea-mer.org

31. Personal communication Michiel Visser. Ministerie van Infrastructuur en Waterstaat, DG Rijkswaterstaat, RWS Zee en Delta, Dir. Netwerk Management, District Zuid

32. Personal communication Dennis Brinkman. Ministerie van Infrastructuur en Waterstaat, Inspectie Leefomgeving en Transport, Scheepvaart, Handhaving Zeevaart.

33. IMO (2018) http://www.imo.org/en/MediaCentre/MeetingSummaries/PPR/Pages/PPR-5th-Session.aspx

34. Boonstra, M. et.al. (2018). Analyse van paraffine monsters verzameld op de Nederlandse kust, Draft report; The North Sea Foundation

35. www.wikipedia.org /wiki/Paraffine

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