APP4SEA

Report on existing oil spill response infrastructure, June 2020

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APP4SEA

ARCTIC PREPAREDNESS PLATFORM

FOR OIL SPILL AND OTHER ENVIRONMENTAL ACCIDENTS

Oil Spill Response Infrastructure in the NPA region

Project report

Niko Hänninen, Adeleye Adetunji, Victor Pavlov

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Northern Periphery and Arctic Programme 2014–2020

EUROPEAN UNION

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APP4SEA

The 21st century brought unprecedented interest in the Arctic resources, turning the region from the world's unknown periphery into the center of global attention.

Within the next 50 years, local coastal communities, their habitual environment and traditional lifestyle is expected to undergo severe changes, caused by climatic perturbations, petroleum industrial intervention and increased shipping presence.

The APP4SEA project, financed by the Northern Periphery and Arctic Programme will contribute to environmental protection of the Arctic waters and saving the habitual lifestyle of the local communities. It will improve oil spill preparedness of local authorities and public awareness about potential oil tanker accidents at sea.

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Summary

This report provides a brief representation of the response arrangements, policies and oil spill response (OSR) infrastructure in the Northern Periphery and Arctic (NPA) Programme region. NPA Programme is an ERDF Interreg VB funding instrument, which covers northern parts of Europe, all the way from the Nordic Countries to the British Isles, and north of it to Iceland and Greenland. This study has been conducted as part of the Arctic Preparedness Platform for Oil Spill and other Environmental Accidents (APP4SEA) project. The report includes information about oil spill response in the individual partner countries, which are included in the NPA region. The report outlines the responsible national authorities in these countries, response arrangements & policies and OSR equipment. The sea areas included in the programme region span from North Atlantic in west to Baltic Sea in the east and from Barents Sea in north to North Sea in the south. Figure 1 below describes roughly the sea areas, where OSR actions would be carried out by NPA countries in case of oil spills. The main focus of the report is to improve the preparedness level of oil spill response in these waters by increasing knowledge about the existing OSR infrastructure.

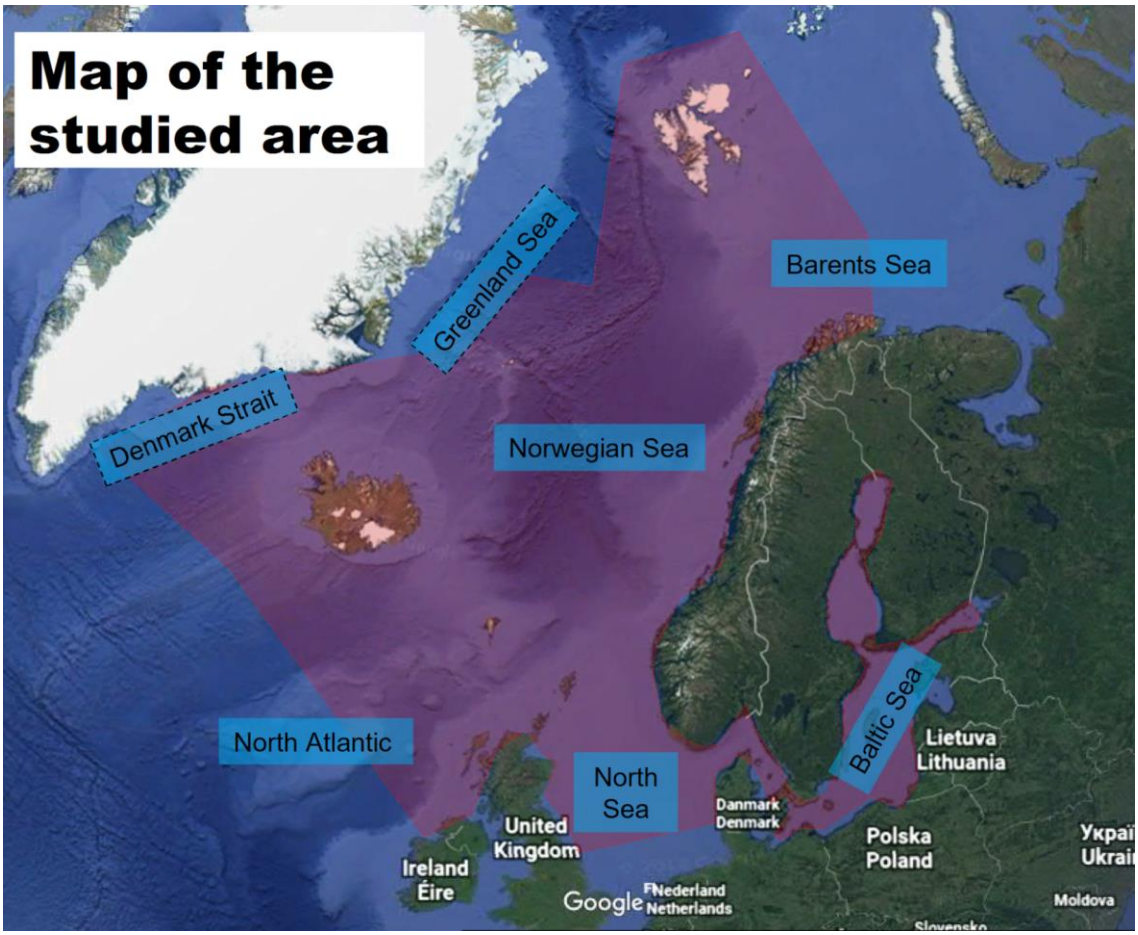


Fig. 1. Marine study area of APP4SEA project

Introduction

Our societies rely heavily on oil in its various forms, despite the calls to change our behaviour and habits. The use of petroleum products is very strategic for us, as it serves numerous needs: it keeps the world in motion as a transportation fuel, it provides heat and energy for homes and industries, and it is the key material in manufacturing of plastics and some fertilizers. But as long as we depend on oil and continue to extract, transport, store and use it, we must accept that in some stage of that process, an oil spill can happen. A spill, that can be detrimental both to existence of life and to environmental quality. These impacts can be immediate or long-term depending on the magnitude of the spill, and they can be caused by human error, equipment failure or by forces of nature, etc. About 2 billion metric tons of crude oil is transported seaborne annually, which gives some indication about the extent of the scale of things, whereas the total production of crude oil reaches 4.5 billion metric tons (figures from 2018). The total amount of oil, which travels on water, is much higher. Refined oils are transported by tankers, too and there is countless of ships of all sizes, all the way from huge cruise liners to the smallest engine driven boats, which all can cause an oil spill, if the hull of the vessel is broken or if oil is released in other way to water from the vessel. The marine ecosystem is always the first casualty of this event followed by human inhabitants, and the environment in general.

Acknowledging this risk and preparing for it is therefore important. Oil spill response plans are needed in order that we are ready, if an oil spill happens. Contingency plans must be at hand in the case of oil spill, which includes right measures to contain the spill, remove it from water and the clean-up the polluted areas, if the spill reaches shores. The first mentioned activities require rapid response, as the window of opportunity is short. If the worst fears materialise and despite rapid deployment of counter measures the spill reaches shoreline, the clean up operation can take years to complete.

In the NPA region, there are several hotspots of oil transports besides normal maritime traffic, cargo ships, passenger ferries and fishing fleets, which can cause oil spills. North Sea has been for the past 50 years an important oil extraction area. In the UK, the production of crude oil and NGL production has concentrated on the Scottish waters, which have provided since 1998 over 90 % of annual UK production. In 2018 oil and gas production in Scottish waters reached 89 million cubic meters equivalent of oil (Sm3), of which crude oil covered 58 million Sm3. There is a vast network of oil pipelines, which connect most of the platforms to dry land, but part of the crude oil is also shipped from the extraction sites. There are several oil terminals, for instance Flotta in the Orkneys or Sullom Voe in the Shetlands, which operate as a staging area, from where oil is shipped to oil refineries in

other parts of the world. In the business year 2017–2018, 8.7 million sm3 of crude oil passed through Flotta oil terminal, of which a third was ship-to-ship oil transfers involving 65 oil tankers.

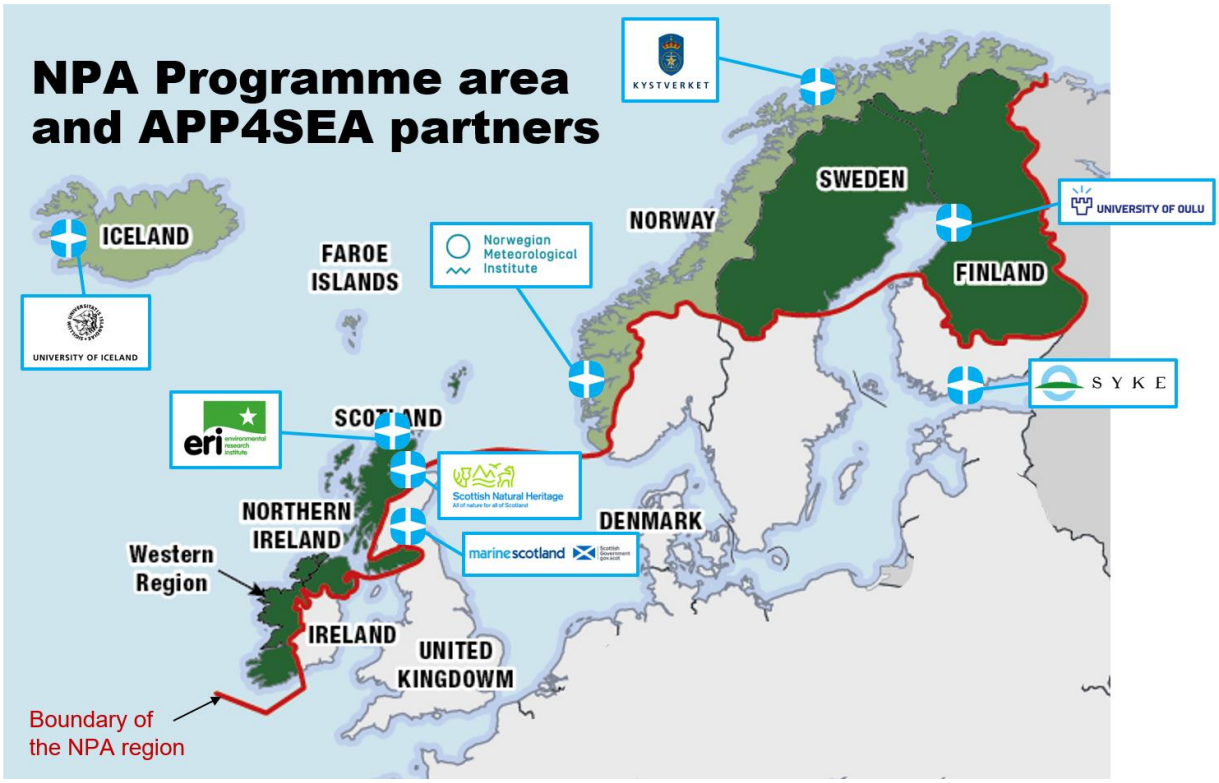
In the Norwegian waters, oil and gas production is still concentrated to the North Sea fields. Close to 81 percent of total production takes still place in this area, whereas extraction sites in the Norwegian sea amount to 18 percent. The remaining part – just a bit over one percent – is produced in the Barents Sea according to figures from 2019. The total production amounted on that year to 214 million Sm3, 13 million Sm3 less than in the previous year. In 2018 Norwegian crude oil production was 86 million Sm3 – almost as large as the whole Scottish oil and gas production was altogether.

Baltic Sea is also important route for transports of Russian crude oil. The narrow Gulf of Finland between Finland and Estonia sees a lot of tanker traffic to and from the Russian oil terminals, which are situated at the end of the gulf. There might be up to 20 tankers sailing on this sea area on a day. On severe winters, there can be also ice coverage in the Gulf of Finland, which increases the risk of oil spills. The Gulf of Finland is one of the most heavily trafficked sea areas, and besides the east and west bound tanker and transport shipping, there is a lot of passenger traffic between Helsinki and Tallinn. Big passenger ferries, each carrying up to several thousand of passengers and staff, cover this short sea trip multiple times a day. Should the paths of an oil tanker and a passenger ferry cross and lead to an accident, this could create the nightmare scenario for the rescue services: thousands of people and even hundred thousand tons of oil afloat.

Both North Sea and the Baltic Sea are very heavily trafficked seas, but as they are also key transportation routes for oil tankers, the risk of oil spill is high in these seas. The risks are also increasing in the high north, as human activity is growing there due to global warming. Gas and oil extraction, fishing, tourism and cargo transportations via the northern sea route each add to the risks of oil spills in the Arctic waters. But how have the coastal states of the NPA region prepared for these? This report will clarify, which authorities are is in charge for oil spill response in each country. The report also summarises the response policies and arrangements and how they differ between countries, and what kind of OSR infrastructure and equipment do the governmental organisations and private companies have.

This work has been done as part of the Arctic Preparedness Platform for Oil Spill and other Environmental Accidents (APP4SEA) project financed by the Northern Periphery and Arctic Programme (NPA) during 2014-2020. NPA is a European Regional Development Funding instrument and it involves remote communities of Northern Europe and aims to facilitate its sustainable development with related social, economic and environmental benefits. Figure 2 shows the partners and the four countries which are represented in the project by them. The partnership consists of University of Oulu & Finnish Environment Institute (Oulu & Helsinki, Finland); Norwegian Meteorological Institute & Norwegian Coastal Administration (Bergen & Tromso, Norway); University of Iceland (Reykjavik, Iceland); North Highland College, Scottish Natural Heritage & Marine Scotland (Thurso, Inverness, & Aberdeen, Scotland). The lead partner is the University of Oulu (Finland).

Figure 2 - NPA programme area and APP4SEA project partners



Response arrangements by country

Finland

The response in Finland is coordinated by the Finnish Border Guard at national level and by the regional emergency services at the regional level. The Finnish Border Guard is the government agency responsible for maintaining and operating national oil spill response equipment. The Border Guard provides necessary technical assistance when needed. At the local level, a local Response Commander will lead oil spill response actions for 'local scale' incidents. In case of bigger incidents, neighbouring municipalities and state authorities, through the Regional Environment Centres, can also be called upon. Polluter-pays principle is applied. When the polluter cannot be identified, the costs will be covered by the national oil pollution compensation fund.

Response policy: Helsinki convention, which restricts the use of chemicals, is followed. Dispersants are not used, mechanical recovery is employed. Finnish Coast Guard can carry out OSR operations in icy conditions.

Iceland

The response in Iceland is coordinated by the Environmental Agency of Iceland (EAI). EAI's responsible for spills in coastal zones and in open water of Iceland. The national response organisation includes besides EAI, Coast Guard and Maritime Administration in accordance with the National Contingency Plan. The level of EAI's involvement depends on the scale of the spill: harbour masters and the municipalities are in control of smaller spills.

Response policies: EAI aims to recover the oil as close to the source as possible. Physical removal is to be employed primarily and supplemented only by chemical dispersion. This is to be applied with care, if physical removal is not possible. Oil companies operating in Iceland are expected to maintain certain level of OSR equipment so that they can take care of possible spillages during their operations.

Norway

Norwegian Coastal Administration Agency (NCA), operating under the Ministry of Transport and Communications, is the responsible organisation in Norway. The emergency response department located in Horten coordinates the response efforts with with regional offices in Bergen and Tromso.

NCA is responsible for preventing and identifying acute pollution. It must ensure that necessary measures are to be taken by the responsible polluter or local municipality. There are 27 oil spill response depots along the coastline and the national contingency plans cover private, municipal and governmental contingency areas. In addition, there are contingency plans for 32 intermunicipal preparedness areas, with their own approved contingency plans. These municipal areas also have an obligation to help the government in the event of a major oil pollution event.

Response policy: The goal in Norway is to recover the oil as close to the source as possible. Physical removal is supplemented with chemical dispersion when physical removal is not possible. The use of dispersants must be approved by the Climate and Pollution Agency (Klif), under the Ministry of Environment.

Governmental organisations are well equipped to deal with oil spills. NCA has specialised recovery vessels and 9 Coast Guard vessels are also equipped with booms and skimmers. Since the oil production sector is significant in Norway, there is also vast private OSR equipment and stockpiles. These assets are coordinated by NOFO – Norwegian Clean Seas Association for Operating Companies.

Sweden

The response in Sweden is coordinated by the Swedish Coast Guard (SCG) under the ministry of Defence. It operates 26 stations along the coastlines. Municipalities have responsibilities for shorelines, municipal harbours and private harbours, which are supported by the Swedish Civil Contingencies Agency (MSB). MSB offers training to municipalities and has also depots with response equipment t on the Swedish coastline, which can be utilised in regional oil spills.

Response Policy: Sweden enforces the Helsinki convention and uses mechanical recovery methods. Dispersants or sinking agents are not used.

Greenland and Faroe Islands

Greenland and Faroe Islands, which are both autonomous territories within the Kingdom of Denmark, have their own OSR arrangements. These differ from those applied in Denmark and the local governments coordinate OSR actions. However, Danish assets can be utilised in an oil spill incident, if the scale of the incident requires this.

In Greenland the national oil spill response company, Greenland Oil Spill Response A/S (GOSR), holds a stockpile of response equipment. Greenland's fire and rescue services hold both offshore and shoreline equipment and have the capability for handling smaller coastline oil spills. Additional support in terms of personnel and equipment could be provided by the local municipalities.

In the Faeroes The Faroese Main Road Authority, the Environment Agency and the Faroes Islands Fisheries Inspection agency are the main actors together with the municipalities in case of an oil spill. The lightweight equipment, that they have in their depots, is only suitable for oil spills close to the shore.

United Kingdom

In the UK the responsible agency for recovery is the Maritime and Coastguard Agency (MCA) under the department of transport. The UK adopts a tiered approach to oil spill response which includes the following 3 tiers: Tier 1 is at the local level, and in the harbour authority to provide support for oil spills. Tier 2 is beyond one local authority and oil response recovery effort may involve deploying national pollution response resources. Tier 3 arrangement is determined by the MCA. The agents saddled with the responsibility for clean-ups include harbour authority, local authority, property owners and the MCA.

Response policy: Marine Response Centre (MRC) offers advice and decisions on the types of response, assessment and monitoring, dispersant spraying operations, mechanical recovery operations and cargo transfer operations. The use of dispersants is the main tool for oil response. However, the use of dispersants and other oil treatment is subject to strict control. As the UK is an oil producer, there is also significant private oil spill response assets, but there is no similar coordinating organisation for these actions as there is in Norway. There are also private companies, for instance Oil Spill Limited, which have significant assets in the UK, but actually operate worldwide.

Ireland

The responsible authority for organising and directing oil spill response in Ireland is the Irish Coast Guard (IRCG). IRCG operates under the department of transport. It coordinates the activities of all other oil spill response agencies such as Marine Pollution Response Team (MPRT), the local authorities, Harbour authorities and the Office of Public Works.

Response Policy: Mechanical recovery is priority, but dispersants may be considered if untreated oil is going to reach the shore. Only dispersants approved by the UK are considered for use.

OSR infrastructures

Finland, Sweden and Norway – large fleets capable of mechanical recovery

Both Sweden and Finland operate in the Baltic Sea, where OSR activities are regulated by the Helsinki Convention (HELCOM), which forbids use of dispersants in this sea. The shallowness of the sea and the vulnerable ecological state of the sea area has led to these regulations, which means that potential oil spills must subject to mechanical recovery. The Finnish Border Guard has purpose-built pollution recovery vessels in their fleet, as does the Swedish Coast Guard, but in addition to this they have patrol boats, which are capable of OSR operations.

The Swedish fleet consists only of vessels operated by the Coast Guard (KBV-series), whereas in Finland the governmental response fleet includes also some vessels of the Finnish Navy and coastal ferries. However, the number of these chartered vessels has decreased significantly recently. In 2019, when the overall OSR coordination responsibility was transferred from Finnish Environment Institute to the Finnish Border Guard, this had impacts on the scale of the Finnish OSR fleet. The Border Guard did not renew the contract for OSR vessels operated by Meritaito Ltd, which included shallow draught vessels, capable of working in coastal waters.

Meritaito Ltd is a subsidiary of Arctia Ltd, which is the government owned company in charge of the Finnish ice breakers, and some of the icebreakers can be equipped OSR tools and operated in OSR response in wintertime. The port of Kemi, which is situated in the bottom of the Bay of Bothia, has also a specifically designed harbour tug/ice breaker, which has OSR equipment on board.

The governmental OSR fleet in Norway consists of vessels operated by Norwegian Coastal Authority (OV-series), Norwegian Coast Guard (KV-series) and chartered vessels. In addition to this, the oil companies have large fleets that serve the production in the oil fields etc., which can be harnessed with OSR equipment. The companies have formed and association (NOFO) for this and pooled their resources together. Some of the vessels have been placed to the immediate response fleet, whereas some others form a stand-by fleet and the rest are in reserve and can be called up to OSR duties with

a longer delay. These are also capable of chemical OSR operations, as the use of dispersants is allowed in the Norwegian waters, unlike in the Baltic Sea.

NOFO has depots and storages along the Norwegian coastline with the focus to the oil production areas, whereas NCA's depots cover the Norwegian Coast more evenly. In Sweden the Coast Guard maintains national depots, which are supplemented by depots of the Swedish Civil Contingencies Agency (MSB) that are utilised in smaller regional and local oil spills. As in Sweden, in Finland the Border Guard's depots are mostly located at coast guard stations. In addition to this, the 22 Finnish regional rescue departments maintain their own small OSR depots, which are used to contain small, local oil spills. In Norway the 32 regional, intermunicipal preparedness regions have their own OSR depots.

Besides the vessels and depots, Finnish Border Guard, Swedish Coast Guard and Norwegian Coastal Authority have aerial assets, which can be used to detect oil spills and assist in OSR operations. Finland has operated since 1995 two twin-engined Dornier Do 228 aircraft, which are approaching the end of their service life. Decisions about their replacements are expected to be done in 2021 or 2022. Swedish Coast Guard has operated three Bombardier Dash 8 aircraft since 2008, which are among the most advanced maritime surveillance aircraft. Norwegian Coastal Authority has chartered two smaller Beech King Air series aircraft from Sundt Air company, which provide NCA with aerial environmental surveillance capability. Also, Iceland has one Dash 8 aircraft, which is operated by the Icelandic Coast Guard. The main seaborne asset of the Icelandic Coast Guard is the patrol vessel C/S TFIA (THOR), which is also equipped to act as OSR vessel. The ship's design is concurrent to that of KV Harstad of the Norwegian Coast Guard, which is also part of the Norwegian OSR vessel fleet.

United Kingdom and Ireland – coping with smaller governmental OSR assets

The preparedness infrastructure of the Republic of Ireland and the United Kingdom differs significantly from those of Finland, Sweden and Norway. Since the British Isles are surrounded by bigger water bodies than the Baltic Sea, the OSR methods in use rely heavier on chemical response, the use of dispersants. These can be dispersed from air or from vessels on sea, whereas mechanical recovery relies solely on boots on the ground – so to say – on ships carrying skimmers, brushes and booms. The governmental OSR assets in the UK are thus quite limited when compared to the Nordic ones. The Maritime and Coastguard Agency (MCA) has one vessel – anchor handling tug supply vessel – that is

operating in the Northern Scottish waters, from Western Islands to Shetlands. MCA has contracted also two Beechcraft King Air series aircraft – like those used by NCA – from 2Excel Aviation for aerial verification. In addition to this, the MCA has several depots with equipment and dispersant storages across the UK.

Further south on the east coast of Scotland is Aberdeen, which is the offshore capital and main service point for the oil and gas fields located in the Scottish waters in the North Sea. As in Norway, mostof the vessels operated by the oil companies can be turned into oil spill response vessels. There is not, however, similar kind of cooperation between the oil companies as there is in Norway through NOFO. In addition to this, there is several companies, which are providing services for both oil companies and the MCA. Oil Spill Limited operates two Boeing 727 aircraft that have been modified for aerial dispersant application, which are based in Doncaster, South Yorkshire. These aircraft have a long range and can operate worldwide. The United Kingdom Continental Shelf Dispersant Stockpile (UKDS) maintains dispersant storages for Oil Spill Response Ltd in Inverness and in the Shetland Islands, so that the aircraft can be sent to operate from these airfields, which can be closer to the potential oil spill sites.

In Ireland, there is not either formal governmental OSR fleet. The Irish Coast Guard (IRCG) is the national organisation in charge of oil spill response in the Irish waters, but it does not have its own patrol vessel fleet, which could be used as OSR vessels. IRCG has 50% share ownership of spill response vessels with the Shannon Estuary Anti-Pollution Team (SEA-PT), a private company, but these are suitable for close-to-shore operations only. IRCG maintains national stockpile of OSR equipment, which is divided into three locations across the country: to Dublin (principal depot), Killybegs in the north west and Castletownbere in south west. IRCG has also contractual arrangements to secure additional assistance, technical support and advice in case such is needed. In this sense IRCG relies more on external assets, as those of European Maritime Safety Agency (EMSA), which has one standby Oil Spill Response Vessel (OSRV) based in Cobh, south west of the country.

EMSA – European Maritime Safety Agency

European Maritime Safety Agency has a fleet of 17 standby oil spill response vessels around the Europe. At least one of these is based now in Cobh Ireland, and couple ones were based earlier on in the UK as well, but these have been relocated to other North Sea ports after the UK left European Union. There is also one vessel based in Malmö, Sweden. These vessels have been contracted from commercial operators and have been adapted for oil spill response operations. They are on stand-by, meaning if their assistance is needed, they will cease their other activities and are able to sail for the

spill site in less than 24 hours. EMSA also has a couple of equipment depots and one dispersant depot in these regions. The member states request assistance via Emergency Response Coordination Center and have operational control of the vessel during the incident.

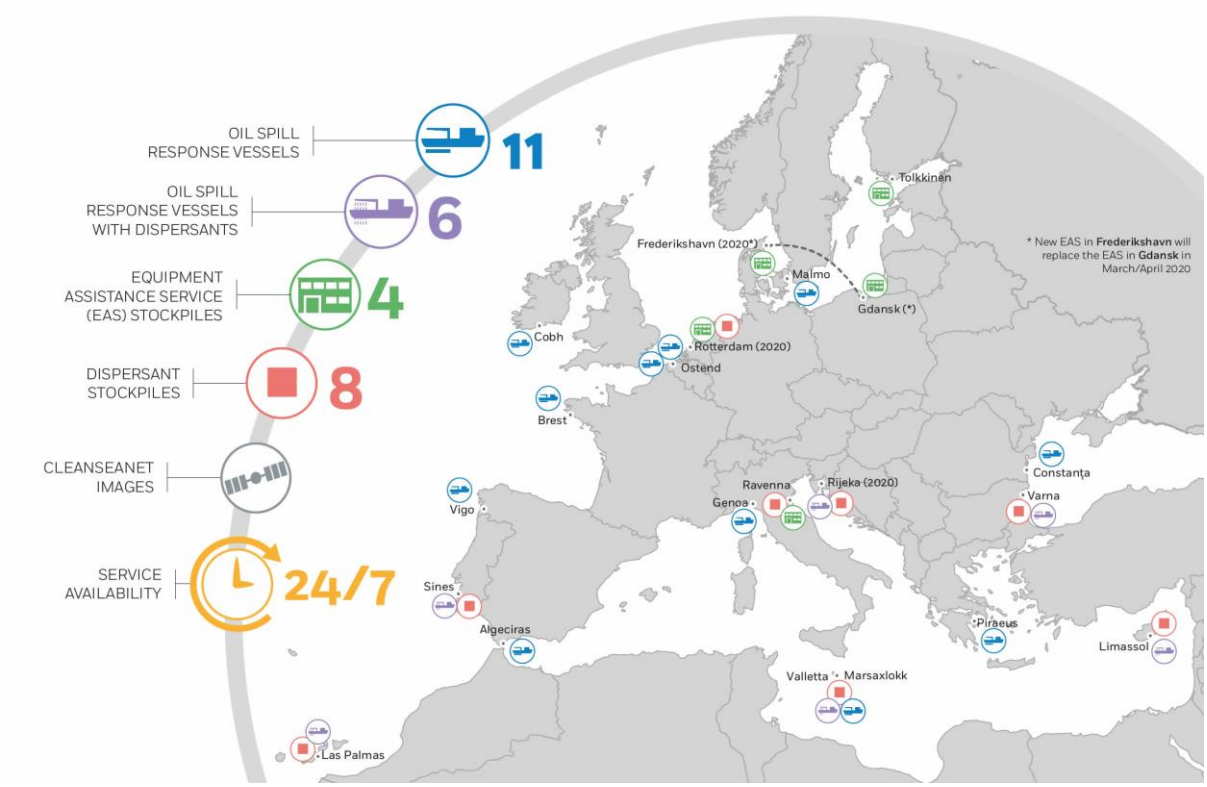


Figure 3. Plan for EMSA's Operational Oil Pollution Response Services by mid-2020

EMSA's OSR support to the EU member countries goes beyond the OSRV fleet and depots. Utilising the Copernicus Maritime Surveillance service, CleanSeaNet provides satellite-based oil spill and vessel detection service for the EU member countries. CleanSeaNet's almost real time service is important for rapid response. Individual countries have surveillance aircraft, but the range of the surveillance aircraft's own equipment is limited, so the satellite detection system significantly boosts the oil spill detection capacity of national authorities. In many cases an oil spill is first detected by the satellites, after which an aircraft or vessel is sent to the scene to confirm the sighting. That is, if the spill originates for instance from a vessel, which has not reported it to the authorities, or the spill has not been detected otherwise.

During the first 10 years in operation, 2007–2017, close to 24 000 possible spills were detected by CleanSeaNet in European waters. As surveillance has increased, the number of intentional and unreported oil spills has decreased. The number of potential spills halved during this first decade of operation. Similar trend has been observed in the Baltic Sea as well. Aerial surveillance of oil spills was

started there in 1989, when as many as close to 800 spills in a year were recorded. 30 years later, in 2018, only 62 were recorded, and in the previous year only 56 spills were recorded.

Conclusion

This report has studied the similarities and differences in the oil spill response infrastructure in the NPA countries. There are distinctive differences in these approaches, partly due to the preferred OSR methods and technologies, partly due to the significance of oil industry and vastness of these transports, which are carried out in these areas. Ireland and Iceland, whose waters are not a scene for active oil extraction nor crude oil transports, manage with less resources than for instance Finland and Sweden. They have to be prepared for oil spills in the Baltic Sea, where successful OSR operations require a lot of "Boots on the ground", vessels capable of mechanical oil recovery. The large scale of oil extraction in the UK and Norwegian waters require that the oil companies are prepared to act in case of oil spills. Since Norwegian authorities also prioritise mechanical recovery, at least close to coastal areas, a substantial governmental OSRV fleet is being operated. In the UK the use of dispersants seems to be the primary OSR method to be used in case of oil spills, why there is no need to maintain large a fleet as in Nordic Countries.

This baseline report has been utilised in making of the "Oil spill response sites, Vessels and Airplanes" layer of the APP4SEA smart map, which is available at www.app4sea.com. This layer gives more detailed description about the individual OSR vessels and aircraft – technical specifications, OSR equipment, home base, etc. – and the depots storing OSR equipment in the NPA countries by governmental and other organisations. However, this layer is only indicative, as some of the information is prone to changes.

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Contact:
Niko Hänninen
Water, Energy and Environmental Engineering Research Unit
University of Oulu
OULU
FINLAND
Tel: +358 40 704 5512
niko.hanninen@oulu.fi
http://app4sea.interreg-npa.eu

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