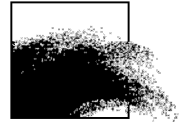


ROYAL BELGIAN INSTITUTE OF NATURAL SCIENCES

MANAGEMENT UNIT OF THE NORTH SEA
MATHEMATICAL MODELS (MUMM)

SECTION 15
MARINE ECOSYSTEM MANAGEMENT



ACTIVITY REPORT 2011

Of the Belgian North Sea Aerial Survey Programme

Report MUMM - G. de Montpellier, J.P. Vogt, W. Van Roy and R. Schallier

Activity report aerial surveillance 2011

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MUMM
100 Gulledelle
B-1200 Brussels
Belgium

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(0.) Introduction

MUMM's observation aircraft has flown **273h20** in 2011. This lower number of flight hours compared to 2010 (331h), is mainly because of a long aircraft unavailability in the second semester due to the complete renewal of the instrumentation. However the continuation of the program over the year has been secured by the use of a spare observation aircraft, in accordance with the terms of the maintenance agreement (a Partenavia P68 aircraft, for ca. 38h flight hours in total of which 30h 'on task' above the sea). Moreover, in autumn 2011 the DG Environment (FPS Health, Food Chain Safety and Environment) allowed MUMM operators to join them on board of their helicopter (NHV heli) for a series of additional surveillance flights over the Belgian marine areas.

In 2011, **155h35** flight hours were dedicated to regular surveillance and control flights over the sea (of which 110h50 specifically for pollution control flights in the Belgian surveillance area being the Belgian marine areas and surrounding waters in an area that is called the Bonn Agreement quadripartite zone of joint responsibility, 39h30 of fishery control flights; and 5h15 for the surveillance of marine activities that require an environmental permit). Furthermore, the aircraft has flown **1h45** in the context of national (Belgian Coastguard) and multinational (Bonn Agreement) pollution response exercises, whereas **33h40** flight hours were dedicated to the monitoring of marine mammals at sea and **7h20** to the monitoring of seals in the Scheldt estuary. Finally, **10h50** was spent on flight training for pilots, and **64h10** on transit between the airport and the North Sea ('off task' time).

The different observation and surveillance tasks of the aircraft can be subdivided in the following categories (each of which is being further addressed below):

1. Routine pollution control flights;
2. 'On call' flights organised during an incident or following an alarm;
3. Fishery control flights;
4. Specific national missions in the framework of the Belgian Coast Guard;
5. International exercises in the framework of the Bonn Agreement;
6. Scientific observations and monitoring at sea and in the Scheldt estuary;
7. Follow-up of activities at sea that fall under an environmental permit regime.

1. Routine pollution control flights

In 2011, MUMM devoted 110h50 to its main mission, which is to perform regular pollution control flights (of which 30 min. 'On Call' – see §2.), mainly in search of illegal operational discharges from ships at sea in the Belgian surveillance area, being the Bonn Agreement "Quadripartite Zone of Joint Responsibility", which in fact corresponds to the Belgian marine areas and surrounding waters.

25 discharges have been detected in that sea area: 11 operational oil slicks, 2 accidental oil

slicks following an incident involving a fishing vessel (Z700 – see §2.), 1 –probably illegal-chemical discharge, 8 unidentified slicks (of which 2 were only detected by radar in poor visibility conditions, and 6 were of unknown origin, but probably consisted of chemicals or vegetable oil) and 3 legal discharges (among which 2 vegetable oil slicks and 1 fish oil slick).

The link between an illegal pollution and its polluter was established 2 times. The first case consists of a probably illegal chemical slick (MARPOL Annex II, Cat.Y discharge) that was discharged by a Maltese tanker and detected in British waters. The details of this observation were immediately reported to the British authorities for further action (MUMM received no feedback to date). The second case concerns an oil slick discharged by a Belgian fishing vessel in Belgian waters. In this case the MUMM operator drafted an official statement that was sent to the competent Prosecutor’s office in Belgium (Kortrijk).

This low number of oil slicks and rate of ships caught red-handed confirms the trend of the years 2000: the low frequency of observation of oil spills at sea remains stable, and this also for 2011 (see Fig.1). However, this environmental problem clearly remains relevant and therefore needs continued enforcement effort in the field.

Finally, during transit, take off and landing procedures, 7 oil slicks have been observed in the port of Antwerp. This information was immediately transmitted to the Maritime Police for further follow-up.

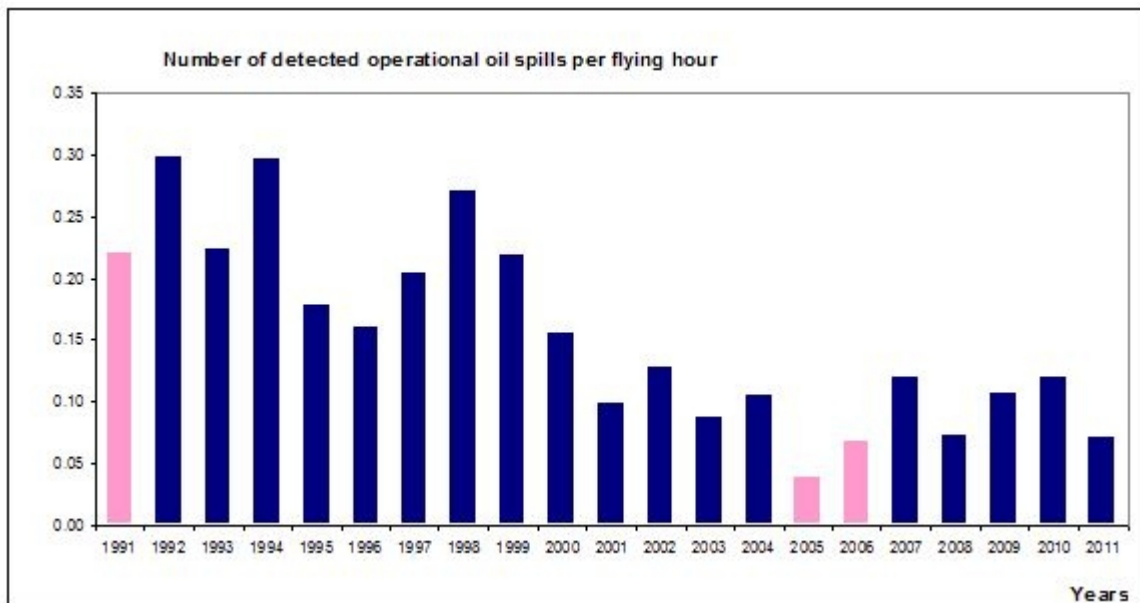


Figure 1: Frequency of operational oil slicks detected per flying hour (Belgian North Sea Aerial Survey programme). 1991, 2005 and 2006 are transition years (programme start-up phase in 1991, and transfer and conversion of remote sensing aircraft in 2005 and 2006).

2. European system of satellite alerts

EMSA (European Maritime Safety Agency) provides satellite images containing possible

detections of pollution at sea to the various EU Coastal States. These satellite images are first analysed by a service provider (CLS, for the North Sea), followed by a report sent after each analysis to a Member State concerned. All these data are collected on an internet site managed by EMSA, and are visualized by means of a GIS viewer used in CleanSeaNet.

In 2011, 18 detection alerts of possible pollution detections have been received for the "Quadripartite Zone of Joint Responsibility", of which 7 detections were located in Belgian waters. For those located in Belgian waters, MUMM operators on board of the surveillance aircraft have been able to verify and confirm 2 of these satellite detections¹: (1) one satellite image was able to confirm an oil slick that was observed only shortly before in the wake of a vessel caught red-handed in Belgian waters (see §1.; as such the satellite image has strengthened the pieces of evidence attached to the Official Statement); and (2) the second detection that could be verified on site with the aircraft seemed to consist of a polluting substance of unknown type and origin.

2. "On call" flights

On 21 April 2011, a special "On call" flight of 30 minutes was organized following an incident involving a Belgian fishing vessel, the Z700, which took place at sea the day before. This vessel sank between the sandbanks 'Thornton' and 'Akkaert' on April 20th; the next day the aircraft spotted two oil spills in that area. The volume of the first oil spill was estimated between 0.14 m³ and 1.89 m³ and of the second one between 0.04 m³ and 0.54m³.

3. Fishery control flights

The fishery control flights are executed on behalf of and in cooperation with the Fishery Inspection Service (DZV) of the Flemish Region. In total 39h30 were performed in 2011 for the purpose of controlling the fishery activities at sea, in particular with respect to the access limitations in force for fishery vessels in shallow coastal waters (3 nautical miles limit) and the territorial sea (12 nautical miles limit). These control flights were performed not only during the day (21 flights) but also frequently during the night (18 flights). In addition, three of these flights were international control missions, as part of the "JDP's" (Joint Deployment Plans), joint control operations coordinated by the European Fisheries Control Agency (EFCA). During these international fishery control operations, the controllers operate outside of their normal area of intervention, controlling activities in neighbouring countries' waters (France and Netherlands in our case). Some other fishing flights were finally carried out as part of nationally coordinated coast guard operations at sea, known under the code 'OPERA' (see § 4).

In 2011, 311 fishing vessels were observed and identified during these flights, and their

¹ Two other satellite detections situated in British and Dutch waters of the quadripartite zone of joint responsibility have been validated in the field during flights performed with the DG Environment helicopter. The first consisted of oil pollution, the second was a pollution of unknown type and origin.

positions and activities noted. The fishery inspectors observed one infringement: in April 2011, a fishing vessel with an engine power of over 221kW was found fishing within the 12 nautical mile zone, which is an exclusion zone for this type of ship. The other observations provide interesting information that can be used for at-sea control by patrol vessels or for the verification of the vessels' positions mentioned in their logbooks or derived from the VMS satellite system. It

also gives the authorities a clearer picture of the fishing activity in our sector.

4. Specific national missions in the framework of the Belgian Coast Guard

3. Participation in the OPERA operations

OPERA operations are organized by the Belgian Maritime Security Centre (MIK), and allow the coordination of several available resources in the Belgian Coast Guard in order to perform an intensified, joint surveillance and control operation in the Belgian marine areas. During one week, the available units (at or above the sea) of the Maritime Police, the Navy, customs, the Fishery inspection service, DG Environment and MUMM take turns and coordinate their enforcement actions in order to identify all offenders who do not respect the rules in force at sea.

MUMM's surveillance aircraft contributed to these campaigns in May 2011 with two specific OPERA control flights. A MUMM operator and a fishery inspector were on board of the aircraft for both of these flights.. All observations collected during these reconnaissance flights over the sea area covered by the operation were systematically reported to the MIK.

4. Participation in the "On Scene Commander" exercise

On 8 June 2011, the aircraft participated in an "On Scene Commander" (OSC) coordination exercise at sea. In this exercise, organized by the MIK in the framework of the national North Sea contingency plan, the aircraft was tasked to test the 'air-sea' communication and coordination with the OSC on board of the Belgian Navy vessel 'A963 Stern'.

5. International missions in the framework of Bonn Agreement

Aerial surveillance of the North Sea is coordinated at international level in the framework of the Bonn Agreement. Each country organizes its own national aerial surveillance program. In addition however, international operations, missions or joint trainings are also planned on a yearly basis.

Unfortunately, due to the extended project of the complete replacement of the instrumentation on board of the aircraft, MUMM could not perform a "Tour d'Horizon" mission in 2011 in the Bonn Agreement framework. MUMM has nevertheless been able to take part in two international exercises: the 'ORSEC POLMAR Manche 2011' marine

pollution response exercise, organized by the French authorities, and the 'POLEX EMSA-NL-BE' exercise organized by the Netherlands.

5. *Participation in the "ORSEC POLMAR Channel 2011" exercise*

On 31 May 2011, MUMM's surveillance aircraft took part in the French exercise "ORSEC POLMAR Channel 2011". This is an annual accidental marine pollution response exercise organised by the French Maritime Prefecture of the Channel and the North Sea. This year's exercise took place off Dunkirk. Conducting at-sea response exercises is considered very useful in many ways because it enables the effective deployment of various aerial and seaborne resources from various governmental agencies and also - if brought to the international level - the mobilisation of response means of other European partners. It is also valuable in order to test the response organization, communication and control units, and improve them if necessary. Apart from the numerous French vessels involved (*BSAD Argonaute, VB Puissant, BSR Elan, PSP Flamand*), other vessels that took part in the exercise were the Belgian Navy vessel *A963 Stern*, the German specialised response vessel *Neuwerk*, and the *Sara*, a vessel chartered by EMSA (European Maritime Safety Agency).

The mission of the Belgian surveillance aircraft consisted in locating the simulated oil slicks (made of coloured rice husk) as fast as possible and in evaluating their dimensions, in order to transmit the coordinates to the participating oil combating vessels and to guide them in their response operations using mechanical recovery systems. Owing to the aerial support of MUMM's surveillance aircraft and of two French helicopters, a complete picture of the pollution was rapidly obtained by the seaborne means and the coordination of the different units was a success. And this despite the adverse weather conditions (wind speed and sea state) that were dispersing the rice husk floating at the sea surface too quickly.

6. *Participation in the "POLEX EMSA-NL-BE" exercise*

On 3 October 2011, the aircraft performed one flight within the framework of the pollution response exercise POLEX EMSA-NL-BE, coordinated by the Netherlands and organised in front of the Scheldt river mouth. The point of attention here was to mobilize response means chartered by EMSA and to test their deployment in coordination with pollution response means from Belgium and the Netherlands. The different response vessels that took part in this exercise were the *Frans Naerebout* and the *Rio* (NL), the *Zeehond* and *Zeetijger* (BE), and the *3000 DC Vlaanderen*, a Dutch dredger chartered by EMSA which also discharged an oily non-toxic substance 'Radiagreen' in order to simulate an oil pollution at sea.

The main mission for MUMM's aircraft was to guide the response vessels to the simulated slick. To that purpose, useful information on the position of the simulated slick was communicated via VHF marine radio to the two tugs *Zeehond* and *Zeetijger*. The surveillance aircraft successfully guided these response vessels, allowing them to correctly encircle the simulated slick.

6. Scientific observations

7. *Monitoring of marine mammals at sea*

Aerial monitoring of marine mammals through "distance sampling" is an excellent method to determine their number and density in a predetermined sea area, and offers many advantages in comparison to other observation platforms like vessels. The most common marine mammal in the Belgian marine waters, the harbour porpoise, after decades of absence since the late 1990s, reappears again in the southern North Sea, including the Belgian waters. The monitoring carried out in 2011 was held as part of the study of the effects of construction of and operations in offshore wind farms, particularly in studying the effects of pile driving on the Thornton bank in April 2011. A greater effort was made to determine the number and density of these animals before the start of the pile driving, and during pile driving operations, in order to verify the impact of site operations on marine mammals present in our waters. In 2011, a total of 33h40 was devoted to this monitoring. This monitoring effort allowed us to observe a total of 1017 porpoises, and also one gray seal, one harbour seal, three seals of which the species could not be identified, and 12 white-beaked dolphins. These observations should allow MUMM to make an estimate of the total number of marine mammals for the entire Belgian marine areas.

8. *Monitoring of seals in the Scheldt estuary*

During every transit flight from the airbase (located in Antwerp) to the sea, the aircraft flies over the Westerscheldt estuary (Dutch area). In this part of the Dutch territory, a small seal colony has persisted since the 90s. Over the last years, this Westerscheldt colony seems to be expanding, despite the increasing pressure of maritime traffic in this area. The use of this estuarine habitat by these marine mammals, and the factors that influence their numbers and distribution, remain poorly known. Owing to the regular passage of our aircraft over this area, it is an excellent observation platform of opportunity: The high number of transit flights has the advantage that the inter-annual variability of the seals can be monitored. Therefore, MUMM recently started performing regular counts of seals in the Westerscheldt, and this in close contact and collaboration with the Dutch scientific institutes (Rijkswaterstaat-Waterdienst and IMARES), since the information collected from our aircraft can be useful for determining and fine-tuning the necessary management measures.

In 2011, 27 transit flights were used (for a total of 7h20 flight hours) for systematic counts of the common seal and the grey seal in the Westerscheldt. In total ca. 1460 animals were observed, of which 928 harbour seals and 12 young (in July and August), 83 grey seals and 437 seals of which the species could not unfortunately be identified.-

9. *Remarkable observations of natural phenomena*

If during routine surveillance flights remarkable natural phenomena are being observed, MUMM will report them and a description will be given. In 2011, no unusual natural

phenomena such as plankton blooms were observed, unlike 2010. This is probably because the spring and summer 2011 were not as hot as in 2010.

7. Surveillance of activities at sea that fall under an environmental permit regime

10. Follow-up of the activities of the installation and exploitation of wind farms

In the framework of the follow-up of the construction and exploitation phases of wind farms on the Bligh bank (BELWIND) and the Thornton bank (C-POWER), the aircraft regularly surveys the area, amongst others to report on progress to the authorities and to verify the compliance with the environmental permit conditions. In 2011, 24 observations were recorded during routine surveillance flights in the Belgian area related to ongoing activities in wind farms. These observations were systematically reported to MUMM and other Coast Guard Partners via the dedicated Coast Guard Centre (MIK).

11. Follow-up of aquaculture activities and surveillance of experimental fishery zones

Aquaculture projects (mussel culture, another type of economic activity falling under the Belgian environmental permit regime) and experimental fishery activities have also been controlled on a regular basis during observation flights, with the aim to verify the permit conditions and aspects related to safety. The structures that were placed and anchored in the designated aquaculture and experimental fishery areas, have been regularly overflowed in 2011 in order to determine their number, place, and overall condition, and relevant findings were systematically reported to MUMM and other involved Coast Guard Partners. In the course of 2011 however, most of these activities in the three zones (D1, D2, D3) have come to an end.

12. Follow-up of sand and gravel extraction activities

Finally, the aircraft is also used to exercise control on the sand and gravel extractions in Belgian waters. Every extraction vessel that has received an environmental permit is equipped with an automatic registration system, a so-called 'black box'. This black box registers *inter alia* the date, time, position, speed, status of the pumps of the extraction vessel, etc. MUMM is responsible for the technical management and the control of the black box system on behalf of the FPS Economy. By reporting sand and gravel extraction activities observed at sea, the aircraft delivers interesting additional information for the validation of the black box data. In 2011 the aircraft internally reported 14 observations made at sea with regard to sand and gravel extraction activities.

COLOPHON

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If you have any questions or wish to receive additional copies of this document, please contact:

MUMM
Royal Belgian Institute of Natural Sciences
100 Gulledele
B-1200 Brussels
Belgium
Phone: +32 2 773 2111
Fax: +32 2 773 2112
<http://www.mumm.ac.be/>

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