

EMSA CLEANSEANET System in its Practical Implementation

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Abstract: The paper deals with the collaboration of EMSA CLEANSEANET System and MRCC (Maritime Rescue Coordination Centre) Georgia. MRCC Georgia is regularly provided by data to avoid the responsibility region pollution as well as to rapidly react to the existed facts of illegal discharges.

The European Maritime Safety Agency (EMSA) is tasked to contribute to the enhancement of the overall maritime safety system within the European Union. One of its goals is to reduce the risk of marine pollution and to assist sea using satellite monitoring

To develop a common sustainable European system, EMSA transfers expertise from regions with experience in satellite surveillance to regions with no operational experience in this field.

The EMSA satellite service offers extensive surveillance of European waters for oil spills by using radar images acquired by Synthetic Aperture Radar (SAR) sensors on polar orbiting satellites. SAR sensors have the capability to detect oil slicks on the sea surface in darkness as well as daylight hours and to see through clouds.

The service provides a range of information including:

1. Oil spill alerts to Member States and rapid delivery of all available satellite images over the area of interest,
2. Slick position/extent/pattern/shape,
3. Assimilated meteorological wind and wave data,
4. Local wind and wave data derived from the SAR image.

The practical implementation of the EMSA CLEANSEANET-MRCC Georgia partnership is presented in the case study concerning with the illegal discharges in MRCC Georgia responsibility region.

1. INTRODUCTION

The European Maritime Safety Agency (EMSA) is tasked to contribute to the enhancement of the overall maritime safety system within the European Union. One of its goals is to reduce the risk of marine pollution and to assist Member States in tracing illegal discharges at sea using satellite monitoring.

The European Directive 2005/35/EC of the European Parliament and of the Council on ship-source pollution and on the introduction of penalties for infringements, which entered into force in September 2005, elaborated the Agency’s task with respect to supporting Member States activities in the field of monitoring marine oil spills. Specifically the Directive requires the Agency to “work with the Member States in developing technical solutions and providing technical assistance in relation to the implementation of this Directive, in actions such as tracing discharges by satellite monitoring and surveillance”.

Accordingly, EMSA has developed the CLEANSEANET service, a satellite based monitoring system for marine oil spill detection and surveillance in European waters. The service provides a range of detailed information including oil spill alerts to Member States, rapid delivery of available satellite images and oil slick position.

Coastal States have defined the areas to be monitored by the CleanSeaNet service, together with the required number of satellite scenes. The basis of the definitions has been the knowledge of the national hot spots, i.e. areas where the illegal oil discharges are known to take place, areas of high traffic density etc.

The satellite images are downloaded using antennae in Norway, Italy and Portugal (from 2008 onwards). The data is processed and analyzed to detect possible oil slicks. An alert report is produced for every planned image to inform the Coastal States on the results of the analysis, i.e. whether possible oil slicks are detected or not. In case slicks are detected, the affected Coastal State immediately receives an alert to enable the Coastal State to take quick actions in order to verify and quantify the slick and to identify the potential source. The complete process, from satellite overpass to the alert, takes a maximum of 30 minutes (See Fig.1.).

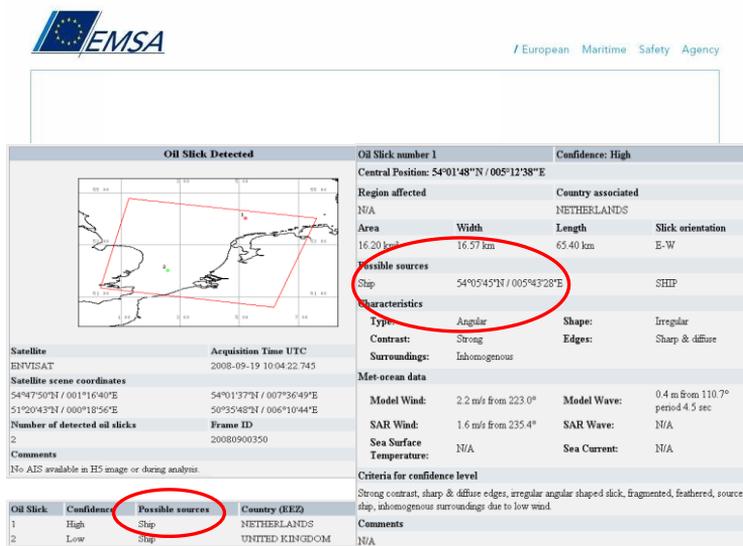


Figure 1. E-mail alert report.

This article contains information about this service CleanSeaNet, to identify and satellite monitoring of oil spills and transfer this information to the national MRSS for rapid response in areas of their responsibility.

2. PRACTICAL USE OF EMSA CLEANSEANET IN MRCC GEORGIA

Alert e-mail will be sent for to MRCC in case if oil slick is located in responsibility zone of MRCC Georgia. MRCC will call the alert contact point if potential oil spill is detected in the national alert zone. A short description of the detection will be provided. Alert image and further e-mail (“Oil Service Desk”) consists of (See Fig.2.):

- Position of the possible oil pollution,
- Date and time of observation,
- Estimated size of the polluted area,
- Wind speed and direction,
- Polluter category e.g. Ship, platform, industry,
- If available, the name of the platform or the geographical name in the case of release from onshore sites,
- Probability level (low, medium or high).

After receiving Alert e-mail from CleanSeaNet when a potential source detected in satellite images MRCC should identify a vessel which is potentially contaminant. Further rapid action is essential to ensure that at the time to identify sites of pollution and the vessel. Need to use all available means (AIS, VTS, RADAR) to identify and track suspected pollutant - in this case, if the potential polluter is a ship). If a potential source of the ship, which was determined by its delay in the sea to investigate, and if it fails to send a request to port State control to be checked at the next port of call. Proofs sent via e-mail at the next port of call. If the ship continues on his way, messages are transmitted MRCCs neighboring countries

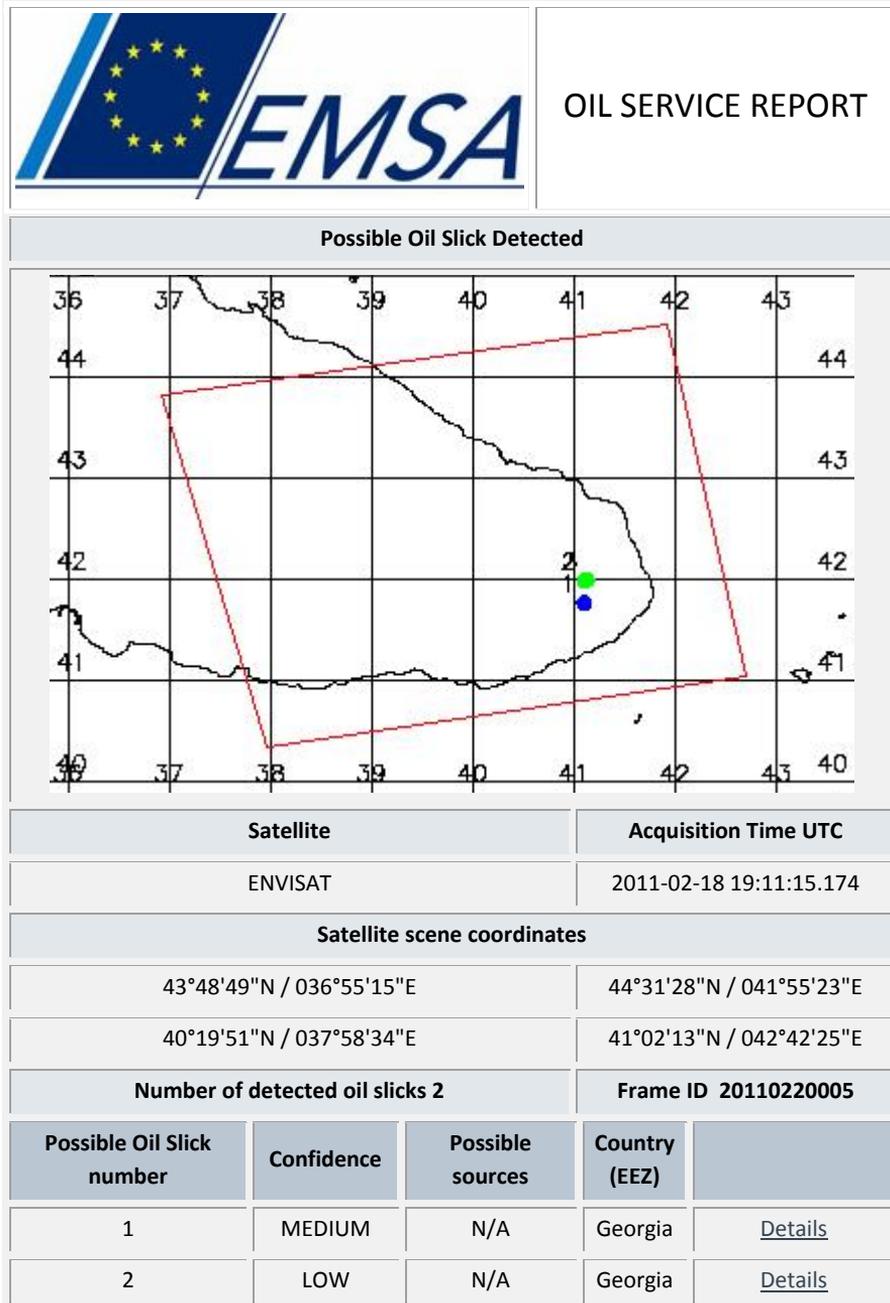


Figure 2. A concrete example of the report oil slick in the area of responsibility MRCC.

Possible Oil Slick number 1		Confidence: MEDIUM	
Central Position: 41°45'49"N / 041°06'01"E			
Region affected		Country associated	
Georgia		Georgia	
Area	Width	Length	Slick orientation
1.92 km ²	0.41 km	4.67 km	E-W
Possible sources			AIS MMSI
Characteristics			
Type:	Tail	Shape:	Irregular
Contrast:	Medium	Edges:	Sharp and Diffuse
Surroundings:	Homogenous		
Met-ocean data:			
Model Wind:	1.6 m/s from 88.7°	Model Wave:	0.2 m towards 49.9°
SAR Wind:	7.7 m/s from 99.8°	SAR Swell:	0.1 m towards 260.0°
Sea Surface Temperature:	N/A	Sea Current:	N/A
Criteria for confidence level			
Medium contrast, sharp and diffuse edges, irregular tail shaped slick, source: N/A, homogenous surrounding.			

Figure 2. continued. A concrete example of the report oil slick in the area of responsibility MRCC.

Possible Oil Slick number 2		Confidence: LOW	
Central Position: 41°59'10"N / 041°06'18"E			
Region affected		Country associated	
Georgia		Georgia	
Area	Width	Length	Slick orientation
1.68 km ²	0.49 km	3.46 km	S-N
Possible sources			AIS MMSI
Characteristics			

Type:	Linear	Shape:	Irregular
Contrast:	Weak	Edges:	Sharp and Diffuse
Surroundings:	Homogenous		
Met-ocean data:			
Model Wind:	2.2 m/s from 81.4°	Model Wave:	0.2 m towards 63.0°
SAR Wind:	7.9 m/s from 102.0°	SAR Swell:	0.1 m towards 210.0°
Sea Surface Temperature:	N/A	Sea Current:	N/A
Criteria for confidence level			
Weak contrast, sharp and diffuse edges, irregular linear shaped slick, source: N/A, homogenous surrounding.			

Figure 2 continued. A concrete example of the report oil slick in the area of responsibility MRCC.

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3. CONCLUSIONS

How to use the system CLEANSEANET shows that:

- EMSA played an operational role in monitoring marine oil spill and detection in Europe.
- Ensures fast and efficient delivery of all relevant satellite imagery and information products.
- In the event of a major oil spill disaster in European seas and adjacent waters, EMSA will act as a focal point with its own resources, to quickly download information to ground stations in Europe for further processing and analysis.
- Coastal States will more quickly locate oil spills and will take the agreed timetable for satellite monitoring of the planning of national or regional measures.

REFERENCES

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