

# 해양사고에 의한 유출유 모니터링 사례 소개와 향후 방향

† 양찬수

† 한국해양과학기술원

Case Study of Oil Spill Monitoring Caused by Maritime Casualties Using Satellite Data in 2014

† Chan-Su Yang

† Korea Institute of Ocean Science & Technology (KIOST), Korea

**요약** : 우리나라에서 해양오염사고는 일반적으로 선박에 의한 유출유에 기인한다. 2014년 1월 31일 여수에서 그리고 2월 15일 부산에서 해양오염사고가 발생하였다. 일반적으로 해상에서의 기름 배출 감시 및 유출유 모니터링에는 합성개구레이더가 이용되고 있다. 따라서 2013년 발사된 다목적실용위성-5호(KOMPSAT-5)가 정상 운영되는 시점에서는 그 활용성이 기대된다. 지난 오염사고 당시에는 다목적실용위성-3호 등 고해상도 광학위성이 관측되었다. 본 발표에서는 유출유의 광학적 특성을 기반으로 한 해석을 수행하고, 유출 해역 산정을 이루어졌다. 마지막으로 우리나라의 해양오염 감시와 대응을 위한 원격탐사기술의 역할과 방향에 대한 설명을 하고자 한다.

**핵심용어** : 해양사고, 유출유 모니터링

**Abstract** : Most of marine pollution have been occurred by oil spill accidents resulted from ship accidents in South Korea. This year there were two large oil spill accidents: the Yeosu Oil Spill Accident (2014.01.31.(Fri.) 09:35 LT) and the Captain Vangelis L. Oil Spill Accident (2014.02.15.(Sat.) 14:00 LT). In general, Synthetic Aperture Radar (SAR) is used in monitoring and detection of oil dumping and spilled oils by accident at sea. Therefore it is expected that KOMPSAT-5, launched successfully last year, will take part in that mission during a normal operation mode. After the two accidents, high spatial resolution optical satellite data including KOMPSAT-3 were acquired February 2 and 14, 2014. In this presentation, we analyzed optical properties of spilled oils from optical satellite imagery to estimate the spilled area and the volume at each region. Finally, a satellite application planning for ocean surveillance in South Korea will be presented.

**Key words** :Maritime Casualties, Oil Spill Monitoring

## 1. Introduction

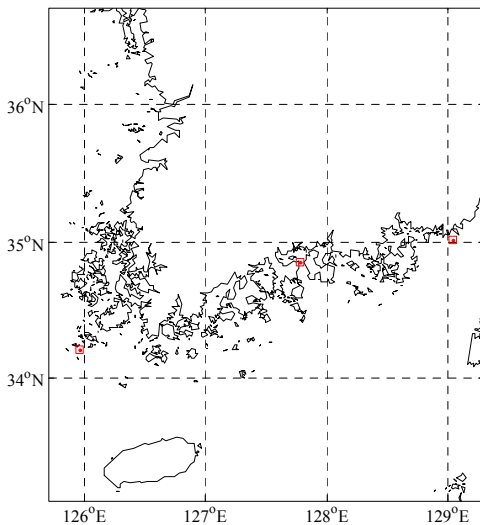


Fig. 1 Major oil spill accidents occurred in 2014 in South Korea

Oil spills (it means the release of a liquid petroleum hydrocarbon into the marine environment) in coastal areas affect the ecological system, fisheries, and the economy. Apart from forecasting the oil slick movement, remote sensing using airborne and spaceborne sensors is the most efficient technique for monitoring oil slicks on a regional, as well as global scale, and much effort has been made for accurate detection, identification and classification of oil-covered surfaces.

From Hebei Spirit incident occurred in Taean coastal area on December 7, 2007, two large oil spill accidents were occurred in 2014: 1) the Yeosu Oil Spill Accident (2014.01.31.(Fri.) 09:35 LT) and 2) the Captain Vangelis L. Oil Spill Accident (2014.02.15.(Sat.) 14:00 LT). In addition, capsizing of the ferry Sewol resulted in a leak of loaded fuel oil from April 16, 2014.

In general, Synthetic Aperture Radar (SAR) is used in monitoring and detection of oil dumping and spilled oils by

accident at sea. Therefore it is expected that KOMPSAT-5, launched successfully last year, will take part in that mission during a normal operation mode. After the two accidents, high spatial resolution optical satellite data including KOMPSAT-3 were acquired February 2 and 14, 2014.

## 2. Summary

In this presentation, we analyzed optical properties of spilled oils from optical satellite imagery to estimate the spilled area and the volume at each region. Finally, a satellite application planning for ocean surveillance in South Korea will be presented.

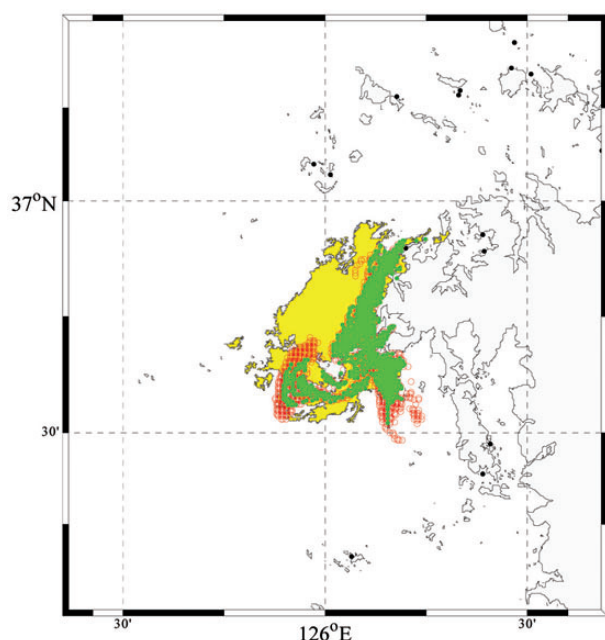


Fig. 2 Comparison of SAR-based oil spills (areas in yellow) and both cases (Case 1: green, Case 2: red) of the tracer experiment on 11th December 2007. (Courtesy of Yang et. al., 2009)

## References

- [1] Kim T-H, Yang C-S, Oh J-H, Ouchi K (2014) Analysis of the Contribution of Wind Drift Factor to Oil Slick Movement under Strong Tidal Condition: Hebei Spirit Oil Spill Case. PLoS ONE 9(1): e87393. doi:10.1371/journal.pone.0087393
- [2] Yang CS, Kim D, Oh JH (2009) Study on

improvement of oil spill prediction using satellite data and oil-spill model: Hebei Spirit Oil Spill. Kor J Remote Sens 25 (5): 435.444 (in Korean).