

# Successful testing of CRAB oil slicks detector on different types of oils

*Instrument*  
**CRAB oil slicks detector**

*Industry*  
**Environmental protection**

*Region*  
**Japan, Asia**

*Lumex Instruments CRAB oil slick sensor has proven to be remarkably effective in detecting oils that are difficult to detect with conventional techniques.*

## THE CHALLENGE

Getting into the water, oils of any nature (mineral, synthetic or vegetable) form thin films on the water surface. Oil spills and leakages extremely affect water eco-systems. They disrupt air-water gaseous exchange and pose a threat to both marine and freshwater biocenoses. Moreover, toxic aromatic hydrocarbons released into water cause serious effects on eco-systems, such as physiological and behavioral alterations in living beings.

Large-scale accidents that attract public attention make up a small part of water bodies pollution by oils. Most are continuous, less traceable leaks, drains, and releases from various industrial and urban sources.

This is why continuous and reliable detection of oil films on the water surface is essential. Commercial sensors use UV fluorescence, laser reflection, impedance or other methods. However, some types of oils are not detected by these conventional systems. A Lumex Instruments' customer in Japan complained that the optical sensor they used could not detect two types of technical oils to be monitored. They are ENEOS FBK 32 turbine oil and Shell Corena S2RJ32 air compressor oil. Samples of these oils were delivered to Lumex Instruments and tested using CRAB oil slicks detector.



## THE SOLUTION

CRAB sensor by Lumex Instruments is designed for continuous automatic oil-on-water monitoring. The principle of operation is remote optical sensing of the water surface with a laser beam. Oil slick detection is based on the difference of light reflection from the clean water surface and from oil films. Therefore, CRAB sensor detects any type of oil on the water surface, regardless of its nature, physical characteristics, and chemical composition.

The compact sensor can be installed at stationary points (bridges, waste water outlets, wells, etc.), floating vehicles\*, and buoys enabling continuous cost-effective monitoring of natural and technological water bodies. Statistical processing of signal excludes the influence of scattered solar radiation and enables measurement to be taken over ruffled water surface.

## THE RESULTS

Experiments have shown solid evidence that surface films formed by all customer's oil samples, including FBK 32 turbine oil and Shell Corena S2RJ32 air compressor oil, are easily detected by the CRAB oil slick sensor.



\* Ferri, G., Manzi, A., Fornai, F., Ciuchi, F., & Laschi, C. (2015). The HydroNet ASV, a Small-Sized Autonomous Catamaran for Real-Time Monitoring of Water Quality: From Design to Missions at Sea. *IEEE Journal of Oceanic Engineering*, 40(3), 710-726. doi:10.1109/JOE.2014.2359361.