IR polarimeter improves detection of oil spills on water

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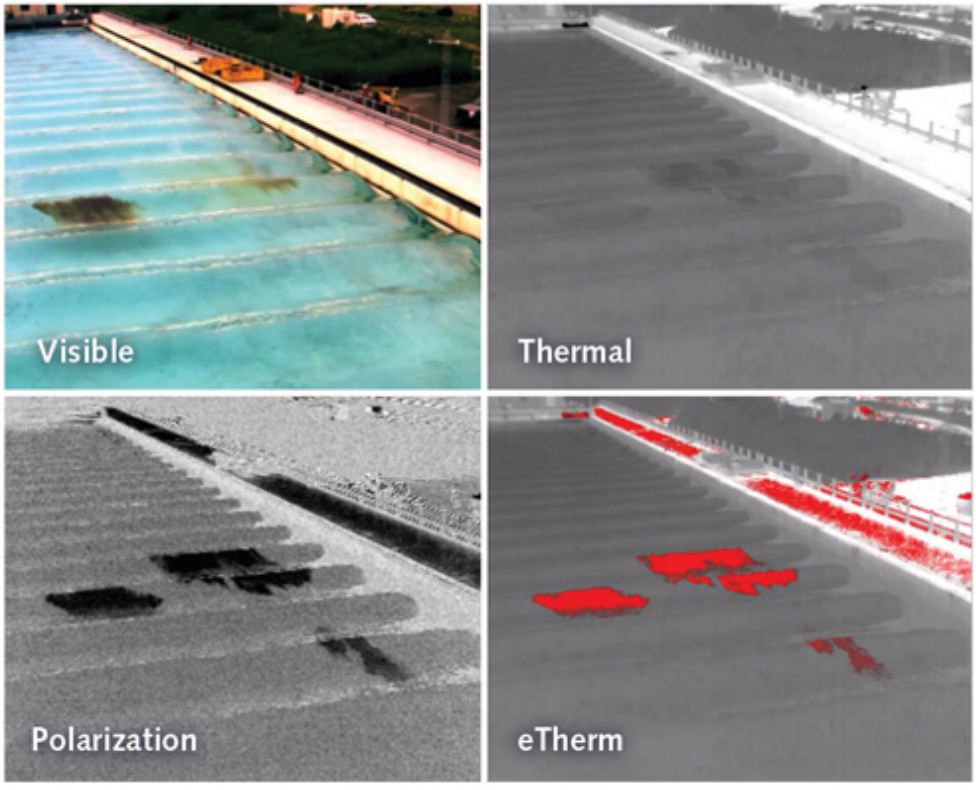
Beyond major oil spills such as the 2010 Deepwater Horizon incident in the Gulf of Mexico, smaller oil spills are reported frequently and cleanup efforts depend on tracking the oil, assuming it is present on the surface of the water. Because the small thermal contrast between oil and water makes standard infrared (IR) imaging difficult, scientists at Polaris Sensor Technologies (Huntsville, AL) have demonstrated that even without thermal contrast, oil on water can be distinguished by strong polarization effects, making discrimination possible using an IR polarimeter.



In the Pyxis long-wave infrared (LWIR) polarimetric instrument from Polaris, a microfilter array is mounted close to the microbolometer focal-plane array, allowing measurement of the thermal intensity of a scene as well as polarization magnitude and orientation. Because modern uncooled IR sensor arrays have low size, weight, and power and are based on emission characteristics of the signature, handheld use is possible, even at night. Operational tests at Ohmsett (the National Oil

Spill Response Research and Renewable Energy Test Facility in New Jersey) on various volumes/types of oil spills under different tidal actions confirmed efficacy of polarimetric discrimination of oil (even diesel oil) with thicknesses between 40 µm and 1 mm in flat or wavy water, with contrast 3 to 50 times better than standard visible or thermal imaging alone. Pyxis also offers a color-enhanced eTherm mode that fuses polarimetric and thermal data. *Reference: https://goo.gl/5J0Owt*.