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Is Space R&D Truly Fostering A Better World For Our Future? (2)

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SPATIOTEMPORAL INVESTIGATIONS OF OIL GROUND SPILLS AND MODIS FIRE PRODUCTS IN NEAR REAL-TIME

Abstract

Ten thousand ground-based oil spill events were recorded for the Niger Delta of Nigeria in the period from 2007 – 2015. These oil spill events are recorded by the National Oil Spill Detection and Response Agency (NOSDRA) (see www.oilspillmonitor.ng). Spills from oil facilities (i.e. flowlines, oil wells, flow stations, and pipelines) are caused by operational error, equipment failure and by acts of deliberate sabotage or illicit tapping of oil pipelines. The latter two causes of oil spills are often accompanied by explosions and fires. Although the NOSDRA oil spill reports are plagued with several irregularities from the Joint Investigation Visits by the joint task force who visit spill sites, our approach in this study automated the filtering process of the raw database to include key parameters and pruning of spill events to 386 of the largest spills by volume. This study aims to identify whether accidental or deliberate oil fires may be sufficiently large to be detected by 250 m MODIS fire products. Examining the MODIS record (i.e. 85129 active fire products) vis-à-vis the Nigerian spill database of the largest spills by volume suggests that ground spill events and MODIS active fires are spatiotemporally correlated. By varying the distance between the two geolocations (i.e. distance is less than 1 km) and accommodating 3 days for spill events and MODIS events, the number of spatiotemporal correlated events can be increased. We demonstrate that some events are detected by MODIS. Additional remote sensing evidence includes burnt vegetation, as well as oil spill leaks. The ultimate goal of this work is to develop a near real-time warning system which identifies oil spill fires from MODIS fire products and provides warning signal for oil seepage and fire events.