Home The Society Members Commissions Documents Publications Education Calendar Links News

Publications
Archives
Volumes
Full Text Search
Title and Author Search
Annals
ISPRS Journal
ISPRS Journal Geo-Info
ISPRS eBulletin
ISPRS Highlights
Book Series
Brochure
ISPRS Profile
Annual Reports
Related Publications
Booklet

Volume XXXIX-B7

TESTING THE GENERALIZATION EFFICIENCY OF OIL SLICK CLASSIFICATION ALGORITHM USING MULTIPLE SAR DATA FOR DEEPWATER HORIZON OIL SPILL

C. Ozkan[1], B. Osmanoglu[2], F. Sunar[3], G. Staples[4], K. Kalkan[3], and F. Balık Sanlı[5]

[1] Erciyes University, Engineering Faculty, Geodesy and Photogrammetry Engineering Dept., 38039 Kayseri, Turkey
[2] University of Alaska - Fairbanks, P.O. Box 757320, Fairbanks AK 99775
[3] Istanbul Technical University, Civil Engineering Faculty, Geomatics Engineering Dept., 34469 Maslak Istanbul, Turkey
[4] MDA,13800 Commerce Parkway, Richmond, V7S 1L5, Canada
[5] Yıldız Technical University, Civil Engineering Faculty, Geodesy and Photogrammetry Engineering Dept., Davutpasa Campus, 34220 Esenler, Istanbul, Turkey

Abstract. Marine oil spills due to releases of crude oil from tankers, offshore platforms, drilling rigs and wells, etc. are seriously affecting the fragile marine and coastal ecosystem and cause political and environmental concern. A catastrophic explosion and subsequent fire in the Deepwater Horizon oil platform caused the platform to burn and sink, and oil leaked continuously between April 20th and July 15th of 2010, releasing about 780,000 m^3 of crude oil into the Gulf of Mexico. Today, space-borne SAR sensors are extensively used for the detection of oil spills in the marine environment, as they are independent from sun light, not affected by cloudiness, and more cost-effective than air patrolling due to covering large areas. In this study, generalization extent of an object based classification algorithm was tested for oil spill detection using multiple SAR imagery data. Among many geometrical, physical and textural features, some more distinctive ones were selected to distinguish oil and look alike objects from each others. The tested classifier was constructed from a Multilayer Perception Artificial Neural Network trained by ABC, LM and BP optimization algorithms. The training data to train the classifier were constituted from SAR data consisting of oil spill originated from Lebanon in 2007. The classifier was then applied to the Deepwater Horizon oil spill data in the Gulf of Mexico on RADARSAT-2 and ALOS PALSAR images to demonstrate the generalization efficiency of oil slick classification algorithm.

Conference Paper (PDF, 905 KB)

Bibtex   EndNote   Reference Manager   XML