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09-136 - USE OF RS/GIS TECHNOLOGY FOR MAPPING OF COASTLINE DYNAMICS AND FIRE TRACES IN THE UKRAINE

Y.Gazyetov^a, T. Pavlik^a, V. Medinets^a, E. Cherkez^a, O. Buniak^a and A. Damalas^b

^aOdessa National I. I. Mechnikov University, Ukraine. E-mail: gazetov@gmail.com

^bDepartment of Civil Engineering and Geomatics, Cyprus University of Technology, Cyprus.

E-mail: drandreasdamalas@cytanet.com.cy

KEYWORDS: Remote Sensing (RS), Black Sea Coastline, Fire Traces, Dniester Delta

ABSTRACT: Results of space multispectral images (LandSat and Quickbird) and ArcGIS using for monitoring of Environmental changes (like coastlines mapping) and hazardous events (like fire traces) in Ukraine in the framework of some National projects and the FP7 PERSEUS project are presented. Odessa National I.I. Mechnikov University case studies of coastline long-term dynamics in the North-Western Black Sea (NWBS) for 1983-2013, as well as annual fire traces mapping in the Lower Dniester Delta in 2007-2013 are described. Assessment of the long-term coastline dynamics caused by abrasion and accumulation processes in the NWBS under the influence of natural and anthropogenic factors for the past 30 years is discussed. It is shown that that processes intensity could be various in different NWBS areas depending on geological structure and lithological composition of the exposed material on coastal cliffs; on intensity and direction of waves and currents; composition, direction and rate of sediments flow; and human activities. It has been concluded that maximal coastline changes took place in river deltas (the Danube, the Dniester, the Dnieper): in 1983-2013 more than 16 sq. km. growth of land was observed and decrease of dry land in other parts made about 5 sq. km. Second case study presented the results of digitizing of fire traces in the Dniester river delta using Landsat images and ArcGIS. It was shown that every year from 1000 up to 5000 ha (4-20 % of the Dniester delta square) could be covered with fire traces. Annual fire traces monitoring is also enabling us to locate the places in which fires occur year by year. Future possible application of RS/GIS for other environmental tasks in the Black Sea region has been discussed, especially for the deltaic areas and in the area of the city of Odessa, where natural and anthropogenic impact is very strong.

09-146 - REMOTE MONITORING AS A TOOL IN CONDITION ASSESSMENT OF A HIGHWAY BRIDGE

E. A. Tantele^a, R. A. Votsis^a, T. Onoufriou^a, M. Milis^b and G. Kareklas^c

^aDepartment of Civil Engineering and Geomatics, Cyprus University of Technology, Cyprus.

E-mail: elia.tantele@cut.ac.cy

^bSignalGenerix LTD, Cyprus. E-mail: marios.milis@signalgenerix.com

^cPublic Work Department, Ministry of Communications and Works, Cyprus.

E-mail: gkareklas@pwd.mcw.gov.cy

KEYWORDS: Remote Monitoring, Wireless Sensor Networks, Structural Condition, Strain Measurements, RC Bridge

ABSTRACT: The deterioration of civil infrastructure and their subsequent maintenance is a significant problem for the responsible managing authorities. The ideal scenario is to detect deterioration and/or structural problems at early stages so that the maintenance cost is kept low and the safety of the infrastructure remains undisputed. The current inspection regimes implemented mostly via visual inspection are planned at specific intervals but are not always executed on time due to shortcomings in expert personnel and finance. However the introduction of technological advances in the assessment of infrastructures provides the tools to alleviate this problem. This study describes the assessment of a highway RC bridge's structural condition using remote structural health monitoring. A monitoring plan is implemented focusing on strain measurements; as strain is a parameter influenced by the environmental conditions supplementary data are provided from temperature and wind sensors. The data are acquired using wireless sensor nodes deployed at specific locations and then transmitted them to a base station installed at the bridge. This WSN application enables the transfer of the raw data from the field to the office for processing and evaluation. The processed data are then used to assess the condition of the bridge. This case study, which is part of an undergoing RPF research project, illustrates that remote monitoring can alleviate the problem of missing structural inspections. Additionally, shows its potential to be the main part of a fully automated smart procedure of obtaining structural data, processed them and trigger the alarm when certain conditions are met.