Geophysical Research Abstracts
Vol. 14, EGU2012-3063, 2012
EGU General Assembly 2012

Application possibilities of aerial and terrain data evaluation in particulate pollution effects

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Recently, remote sensing has become a widely used technology in order to acquire information about our environment. Data collected using remote sensing technology indispensible criteria to recognise and monitor environmental problems caused by contamination from various human activities. According to great technological change and development in the previous decade high spectral and geometric resolution sensors are more often used. The higher resolution technology allows getting more accurate and reliable results in the research processes of the environmental pollution impacts.

At University of Pannonia, Georgikon Faculty (Hungary) plant-soil-atmosphere system analyses are carried out for detecting the potential harmful effects of heavy metal pollution originated from vehicle industry. Related to this research at the Department of Meteorology and Water Management, black carbon and cadmium pollution effects are being analysed on maize crops. Testing area is situated at Agro-meteorological Research Station in Keszthely, where the first time in 2011 aerial imaging technology was used in parallel with field analyses. The experiment aims to analyses correlation of the field data with aerial data.

During aerial photography were taken in different spectral bands (Visible, Near Infrared, Far Infrared). High intensity, spectral and spatial resolution data was an important part of the multitemporal imagine sensing and evaluating technology, therefore original technical solutions were applied. These resolutions served accurate plot-level evaluation. Fractal structure and intensity measurement evaluation methods were applied to examine black carbon and cadmium polluted and control maize canopy after data pre-processing. Research also focused on the examination of potential negative or positive effects of irrigation so that differences between irrigated and non-irrigated maize was investigated. For the period of growing season of 2011 time-series analyses were carried out in various phonological phases of maize. Finally, valued aerial and terrain parameters – including e.g. micro-climatic conditions, relative humidity, albedo, etc. - were compared.

This article was made under the project TÁMOP-4.2.1/B-09/1/KONV-2010-0003 and TÁMOP-4.2.2/B-10/1-2010-0025. These projects are supported by the European Union and co-financed by the European Social Fund.