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Faculty of Natural Sciences, Constantine the Philosopher University in Nitra (UKF Nitra)
Horticulture and Landscape engineering Faculty, Slovak University of Agriculture in Nitra (FZKI SPU Nitra)

Abstracts

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Mgr. Michaela Kalivodová
Mgr. Ivan Laco

message of the article is that while scientific methods increasingly point to the risks of current human development towards its possible self-destruction, the policy response remains delayed and rather on a declarative basis. Of the three spatial levels monitored, the greatest progress could be pronounced in case of the European Union whose environmental policy is very progressive - but it is confronted with shortages on fulfilling the global commitments and, at least for some countries, with insufficient and delayed response at national level. Finally, the basic principles and tools needed for ensuring an adequate and balanced development of human society are discussed. The common premise for effective solutions is that social and economic development needs to be seen as an integrated issue including environmental implications. At the same time, addressing global and regional environmental threats belongs to the one of the key factors of further reasonable (ideally sustainable?) human development.
Keywords: *environment, global megatrends, scenarios, environmental policy*

Urban geosystems mapping and analysis for urban landscape functions assessment

Merekalova[1] K., Kharitonova[1] T., Batalova[1] V., Moiseev[1] A., Khoroshavin[2] V., Marinskikh[2] D.

[1] *Lomonosov Moscow State University, Moscow, Russia*
[2] *University of Tyumen, Tyumen, Russia*
merekalova@yandex.ru

The spatial analysis for ecosystem services assessment, land management and improvement is primary based on search and selection of spatial homogeneities which may be uniform or present a peculiar pattern of heterogeneous land cover types. Urban morphology pattern imposed on land relief and geology forms urban landscape which should be studied by all research methods used in geography. Urban geographical system is

characterized by certain type of landform, sediments and urban morphology and is a unit of urban landscapes mapping. The mapping of city of Tyumen (Siberia, Russia) was performed using field survey data (150 sites), highresolution aerial images, multispectral Landsat images and Sentinel-1 radar images. Tyumen is situated on a series of highly waterlogged floodplains and terraces of river Tura. The urban tissue consists of wooden 1-2-floor housing, brick and panel 3-5-floor buildings, new multistory buildings, parks, industrial zones and open spaces. We studied the effect of urban geosystems pattern on some regulating (local climate and air quality regulation) and cultural (aesthetic and recreational value) landscape functions. We calculated land surface temperatures based on Landsat 8 TIRS data for different seasons of the year and linked them to urban landscapes composition. For assessing air pollution in the city we selected snow samples from undisturbed surfaces at all sites of field observation on a significance distance from the roads. The known dimensions of snow cores enable us to calculate average inflow of air dust and pollutants per square meter. Preliminary analysis showed that snow pollution is a result of multiple basic factors – relief, density of trees and the area of green zones, landscape neighborhood, – and temporarily factors, such as construction. Analysis of urban landscape metrics helped us to reveal the optimal composition of urban geosystems, including needed industrial zones, for better ecological, aesthetical and comfortable environment in the city.

Keywords: *urban geosystem, landscape pattern, landscape functions, LST, air quality*