Geophysical Research Abstracts
Vol. 19, EGU2017-18564, 2017
EGU General Assembly 2017

Impact of recent land use and climate changes on sediment and pollutant redistribution in small catchments within the Seim River Basin (Kursk Region, European Russia)

Vladimir Belyaev, Nadezda Ivanova, Maxim Ivanov, Valery Bondarev, Nikolay Lugovoy, Elena Aseeva, and Alisa Malyutina

Lomonosov Moscow State University, Faculty of Geography, Laboratory of Soil Erosion and Fluvial Processes, Moscow, Russian Federation (vladimir.r.belyaev@gmail.com)

It is widely accepted that changes of land use or climatic conditions can exert profound impacts on river basin sediment budgets and associated particle-bound pollutant redistribution patterns at different temporal and spatial scales. It can be especially difficult to distinguish relative importance of particular factors when the changes occur more or less within the same time frame. Such situation is typical for most parts of the agricultural belt of Russia, as period of economic downfall associated with collapse of the former Soviet Union and later gradual recovery practically coincides with period of the most significant climate changes observed in the late 20th – early 21st Centuries. Therefore it seems interesting and important to consider possible changes of fluvial systems responses within the period from 1980s to the present under different spatial scales. Here we plan to present results of the almost 10-year period of investigations of sediment and associated pollutant redistribution spatial and temporal patterns in several small catchments within the Seim River Basin (Kursk Region, European Russia). Studies dealt with small catchments and small river basins in scales from 1-2 km2 to ~200 km2 located in different parts of the main basin. Works carried out included detailed geomorphic surveys, soil and sediment sections and cores description and sampling in different locations (undisturbed, erosion, transit, deposition), remote sensing data and morphometric analysis, soil erosion modeling. Integration of the results allowed constructing sediment budgets, in most cases, for two time intervals (approximately – pre-1986 and post-1986, as the Chernobyl-derived 137Cs has been an important time mark at all the case study sites). It has been found out that combination of several major tendencies including abandonment and recultivation of arable fields, notable decrease of winter-frozen topsoil layer thickness and increase of heavy summer rainstorms magnitude and frequency are responsible for the observed variability of sediment and associated contaminant redistribution patterns.