



Soil hydrologic characterization for modeling large scale soil remediation protocols

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In Campania Region (Italy), the Ministry of Environment identified a National Interest Priority Sites (NIPS) with a surface of about 200,000 ha, characterized by different levels and sources of pollution. This area, called Litorale Domitio-Agro Aversano includes some polluted agricultural land, belonging to more than 61 municipalities in the Naples and Caserta provinces. In this area, a high level spotted soil contamination is moreover due to the legal and outlaw industrial and municipal wastes dumping, with hazardous consequences also on the quality of the water table. The EU-Life+ project ECOREMED (Implementation of eco-compatible protocols for agricultural soil remediation in Litorale Domizio-Agro Aversano NIPS) has the major aim of defining an operating protocol for agriculture-based bioremediation of contaminated agricultural soils, also including the use of crops extracting pollutants to be used as biomasses for renewable energy production.

In the framework of this project, soil hydrologic characterization plays a key role and modeling water flow and solute transport has two main challenging points on which we focus on. A first question is related to the fate of contaminants infiltrated from stormwater runoff and the potential for groundwater contamination. Another question is the quantification of fluxes and spatial extent of root water uptake by the plant species employed to extract pollutants in the uppermost soil horizons. Given the high variability of spatial distribution of pollutants, we use soil characterization at different scales, from field scale when facing root water uptake process, to regional scale when simulating interaction between soil hydrology and groundwater fluxes.