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Analyzing anthropogenic pressures in soils of agro-ecological protected coastal wetlands in L'Albufera de Valencia Natural Park, Spain

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Coastal wetlands, despite the importance of their environmental and ecological functions, are areas that suffer of great pressures. Most of them are produced by the rapid development of the surrounding artificial landscapes. Socio-economic factors such as population growth and urban-industrial surfaces expansion introduce pressures on the nearby environment affecting the quality of natural and agricultural landscapes.
The present research analyses interconnections among landscapes (urban, agricultural and natural) under the hypothesis that urban-artificial impacts could be detected on soils of an agro-ecological protected area, L'Albufera de Valencia, Natural Park, located in the vicinity or the urban area of the City of Valencia, Spain.
It has been developed based on Environmental Forensics criteria witch attend two types of anthropogenic pressures: (1) direct, due to artificialization of soil covers that produce anthropogenic soil sealing, and (2) indirect, which are related to water flows coming from urban populations throw artificial water networks (sewage and irrigation systems) and that ultimately will be identified by the presence of o emerging-pharmaceuticals contaminants in soils of the protected area. For the first case, soil sealing a methodology based on temporal comparison of two digital layers for the years 1991 and 2011 applying Geographical Information Systems and Landscapes Metrics were undertaken. To determine presence of emerging contaminants 15 soil samples within the Natural Park were analyzed applying liquid chromatography tandem mass spectrometry for the detection of 17 pharmaceutical compounds.
Results show that both processes are present in the Natural Park with a clear geographical pattern. Either soil sealing or detection of pharmaceuticals are more intensive in the northern part of the study area. This is related to population density (detection of pharmaceuticals) and land cover conversion from agricultural and natural surfaces to artificial ones (soil sealing). Presence of pharmaceutical in soils of the Natural Park may be explained because of the interconnectivity of urban sewage waters (that after treatment) are incorporated in the irrigation network. Soil sealing expansion is more acute in the 1 kilometer stripe inside the boundary of the protected area.

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