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Flood risk assessment of land pollution hotspots

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Among the risks caused by extreme events, the potential spread of pollutants stored in land hotspots due to floods is an aspect that has been rarely examined with a risk-based approach. In this contribution, an attempt to estimate pollution risks related to flood events of land pollution hotspots was carried out. Flood risk has been defined as the combination of river flood hazard, hotspots exposure and vulnerability to contamination of the area, i.e. the expected severity of the environmental impacts. The assessment was performed on a geographical basis, using geo-referenced open data, available from databases of land management institutions, authorities and agencies. The list of land pollution hotspots included landfills and other waste handling facilities (e.g., temporary storage, treatment and recycling sites), municipal wastewater treatment plants, liquid waste treatment facilities and contaminated sites. The assessment was carried out by combining geo-referenced data of pollution hotspots with flood hazard maps. We derived maps of land pollution risk based on geographical and geological properties and source characteristics available from environmental authorities. These included information about soil particle size, soil hydraulic conductivity, terrain slope, type of stored pollutants, the type of facility, capacity, size of the area, land use, etc. The analysis was carried out at catchment scale. The case study of the Arno river basin in Tuscany (central Italy) is presented.