

Publication**Plutonium aided reconstruction of caesium atmospheric fallout in European topsoils****JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)****ID** 4612322**Author(s)** Meusburger, Katrin; Evrard, Olivier; Alewell, Christine; Borrelli, Pasquale; Cinelli, Giorgia; Ketterer, Michael; Mabit, Lionel; Panagos, Panos; van Oost, Kristof; Ballabio, Cristiano**Author(s) at UniBasel** [Alewell, Christine](#) ; [Borrelli, Pasquale](#) ;**Year** 2020**Title** Plutonium aided reconstruction of caesium atmospheric fallout in European topsoils**Journal** Scientific Reports**Volume** 10**Number** 1**Pages / Article-Number** 11858**Mesh terms** Science & TechnologyMultidisciplinary SciencesScience & Technology - Other Topics

Global nuclear weapon testing and the Chernobyl accident have released large amounts of radionuclides into the environment. However, to date, the spatial patterns of these fallout sources remain poorly constrained. Fallout radionuclides (Cs-137, Pu-239, Pu-240) were measured in soil samples (n=160) collected at flat, undisturbed grasslands in Western Europe in the framework of a harmonised European soil survey. We show that both fallout sources left a specific radionuclide imprint in European soils. Accordingly, we used plutonium to quantify contributions of global versus Chernobyl fallout to Cs-137 found in European soils. Spatial prediction models allowed for a first assessment of the global versus Chernobyl fallout pattern across national boundaries. Understanding the magnitude of these fallout sources is crucial not only to establish a baseline in case of future radionuclide fallout but also to define a baseline for geomorphological reconstructions of soil redistribution due to soil erosion processes.

Publisher Nature Publishing Group**ISSN/ISBN** 2045-2322**edoc-URL** <https://edoc.unibas.ch/80590/>**Full Text on edoc** No;**Digital Object Identifier DOI** 10.1038/s41598-020-68736-2**PubMed ID** <http://www.ncbi.nlm.nih.gov/pubmed/32678221>**ISI-Number** 000550057200171**Document type (ISI)** Journal Article