



Universität
Basel

Publication

Fallout Pb-210 as a soil and sediment tracer in catchment sediment budget investigations : a review

JournalItem (Reviews, Editorials, Rezensionen, Urteilsanmerkungen etc. in einer wissenschaftlichen Zeitschrift)

ID 2828902

Author(s) Mabit, L.; Benmansour, M.; Abril, J. M.; Walling, D. E.; Meusbürger, K.; Iurian, A. R.; Bernard, C.; Tarjan, S.; Owens, P. N.; Blake, W. H.; Alewell, C.

Author(s) at UniBasel [Alewell, Christine](#) ; [Di Bella, Katrin](#) ;

Year 2014

Title Fallout Pb-210 as a soil and sediment tracer in catchment sediment budget investigations : a review

Journal Earth-science reviews

Volume 138

Pages 335-351

Keywords (210)pb(ex), Soil and sediment tracing, Sediment dating, Soil redistribution

Increasing anthropogenic pressures coupled with climate change impacts on natural resources have promoted a quest for innovative tracing techniques for understanding soil redistribution processes and assessing the environmental status of soil resources. Among the different existing tracers, the fallout component of the radioisotope lead-210, also termed unsupported or excess lead-210 (Pb-210(ex)) when referring to its presence in soil or sediment, arguably offers the broadest potential for environmental applications, due to its origin and relatively long half-life. For more than five decades, Pb-210(ex) has been widely used for dating sediments, to investigate sedimentation processes and, since the 1990s, to provide information on the magnitude of soil and sediment redistribution. The aim of this review is to provide a comprehensive evaluation and discussion of the various applications of Pb-210(ex) as a tracer in terrestrial and aquatic environments, with particular emphasis on catchment sediment budget investigations. This paper summarizes the state-of-the-art related to the use of this tracer, the main assumptions, the requirements (including the need for accurate analytical measurements and for parallel validation), and the limitations which must be recognised when using this fallout radionuclide as a soil and sediment tracer. Lessons learned and current and future research needs in the environmental and radiochronological application of Pb-210(ex) are also presented and discussed. (C) 2014 Elsevier B.V. All rights reserved.

Publisher Elsevier

ISSN/ISBN 0012-8252

edoc-URL <http://edoc.unibas.ch/dok/A6337896>

Full Text on edoc No;

Digital Object Identifier DOI 10.1016/j.earscirev.2014.06.007

ISI-Number WOS:000345058600016

Document type (ISI) Review