

Landscape Stability through Analysis of Radioactive Disequilibria and Cosmogenic Nuclides (^{10}Be - ^{26}Al) in Weathering Profiles and River Sediments: The Case of the Strengbach Watershed

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Claude Allègre was one of the pioneers in using U-series isotopes for studying magmatic processes in the late 1960s. He quickly recognized the potential of these tools to estimate time constants of weathering processes when he involved his group in studying the world's major rivers in the early 1990s. His work certainly inspired several teams in France and elsewhere to explore these new directions. In Strasbourg we have developed the use of U-series isotopes for studying weathering in the late 1990s. We proposed a method, which has become the classical approach today, to reconstruct regolith production rates from U-Th-Ra disequilibria analysis along weathering profiles. Following these studies, and by focusing on the Strengbach catchment (France), we illustrated (1) how the morphological dynamics of landscapes could be modeled by combining radioactive disequilibria analysis with cosmogenic nuclides along the same weathering profiles, and (2) how detailed study of cosmogenic nuclides in river sediments allows us to reconstruct the dynamics of topographic instabilities observed in the field. These data allow us to discuss the stability of the Vosges relief over the last millions years: the results will be presented and summarized.