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3D geological modeling of the superficial formations, practical applications

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The interest in surface formations or "regoliths" is generating a growing demand, not only in terms of geological knowledge (cartography, lithology, origin, properties, geological connections) but also in terms of issues for the territories (planning, risks, resources management) and therefore economic interests.
In 2009, the BRGM carried out a first survey of the knowledge of the Regolith in France, at a scale of 1: 1 000 000, both for allochthonous deposits (continental deposits linked to the transport process) and for land. autochthonous deposits (weathering patterns). This work, continued since 2013, highlighted a strong heterogeneity in the quality of available geological information and targets the work to be done, especially in the field.
Geometric modeling of the geological units constituting the Regolith is an essential tool to advance the knowledge of the spatial distribution of formations. The application of this tool, closely associated with known geological knowledge, constitutes a first approach and a guide for the development of a potential acquisition strategy on the field.
The methodology implemented in the framework of the modeling of allochthonous and autochthonous regolith formations, carried out under GDM-Multilayer, at the level of each department area, then assembled at the scale of a region (from available geological maps data and drilling data from the Underground Data Bank, BRGM).
This work was done initially at the scale of the Brittany region and it aims to expand to the entire Armorican basement (Fig. 1). Interpolated data maps (roof and thickness) also highlight over- or under-valued results in certain geographic areas, which raises questions about both the relevance of the model input data and the need for local control in the field.
The results make it possible to propose new products in terms of tracks for predictive geosciences, such as lithological map and to offer support for over fields of geosciences (hydrogeological units for example).
http://www.brgm.fr/content/regolithe-geologie-tres-proche-sous-sol-amenagement

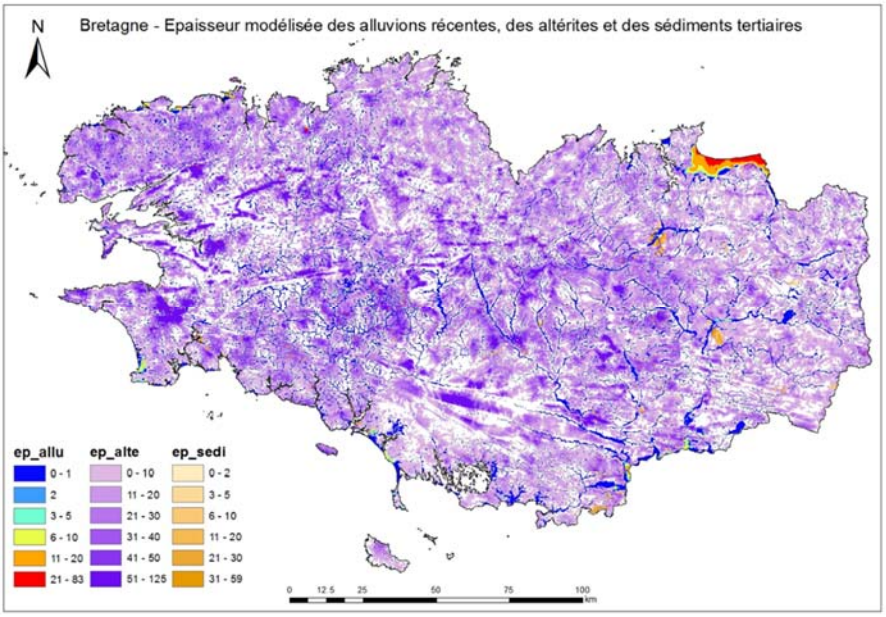

Fig. 1 Modelled thickness of recent alluvium, autochthonous surface formations and tertiary sedimentary deposits, Brittany, France.