

## 3D geological modeling of the superficial formations, practical applications

Anne Bialkowski, Bruno Tourlière, Bernard Bourguine, Caroline Ricordel-Prognon, Frederic Lacquement, Robert Wyna

### ► To cite this version:

Anne Bialkowski, Bruno Tourlière, Bernard Bourguine, Caroline Ricordel-Prognon, Frederic Lacquement, et al.. 3D geological modeling of the superficial formations, practical applications. 4th meeting of the European 3D GeoModelling Community, Feb 2018, Orleans, France. 2018. hal-01707777

HAL Id: hal-01707777

<https://hal-brgm.archives-ouvertes.fr/hal-01707777>

Submitted on 13 Feb 2018

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

### 3D geological modeling of the superficial formations, practical applications

Anne Bialkowski<sup>1</sup>, Bruno Tourlière<sup>1</sup>, Bernard Bourguine<sup>1</sup>, Caroline Prognon-Ricordel<sup>1</sup>, Frédéric Lacquement<sup>1</sup>, Robert Wyns<sup>1</sup>

<sup>1</sup> BRGM, Georesources Division, 3 avenue C. Guillemin, BO 36009, 45060 Orléans Cedex2, France

a.bialkowski@brgm.fr

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>

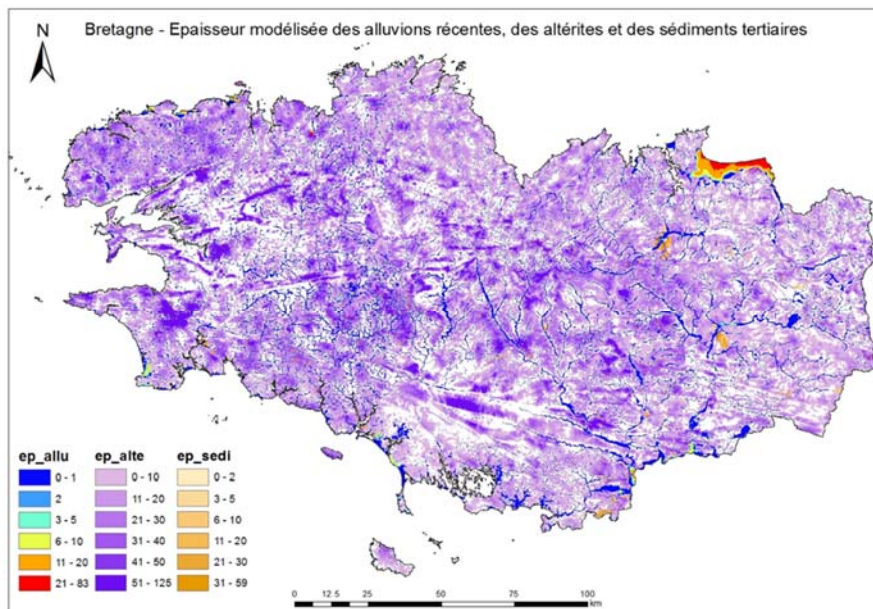


Fig. 1 Modelled thickness of recent alluvium, autochthonous surface formations and tertiary sedimentary deposits, Brittany, France.