

Extended geological thematic data for managing geological and mining hazards

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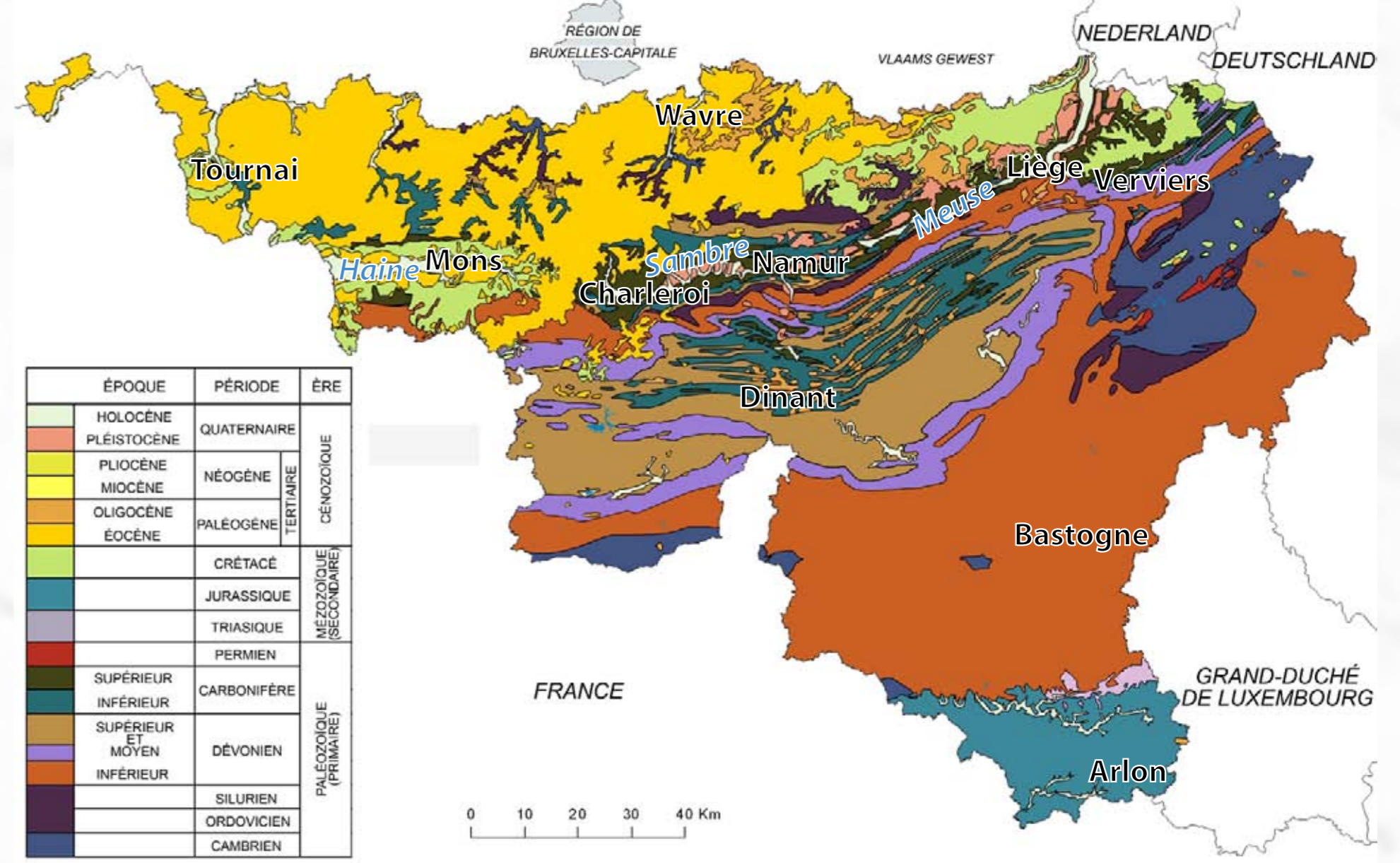
Context

The geology of Wallonia, despite its small superfcy (**16.844 km²**), is quite complex, including formations from late Cambrian to Carboniferous, some Triassic and Jurassic deposits, and a cover of Upper Cretaceous, Eocen and Miocen tabular deposits in the northern part. It is also mostly covered with Holocen deposits, often quite thick. The Paleozoic bed-rock is intensively folded and faulted, as a consequence of orogenies. So, Wallonia shows a great diversity of geological environments. Those fields are occupied by a population density of about 204 inhabitants/km² (to 1.000 along Haine-Sambre-Meuse rivers). To meet notably land planning and urbanistic needs, a working scale of 1/10.000 for the new Geological Map of Wallonia has been chosen (1/25.000 for the published maps). This scale is also appropriate to cartography other thematic items related with geology to generate a full performant tool that suits the demands of the users (geological, geomorphological, geotechnical and old exploitations items).

Underground & Geology

Generalities

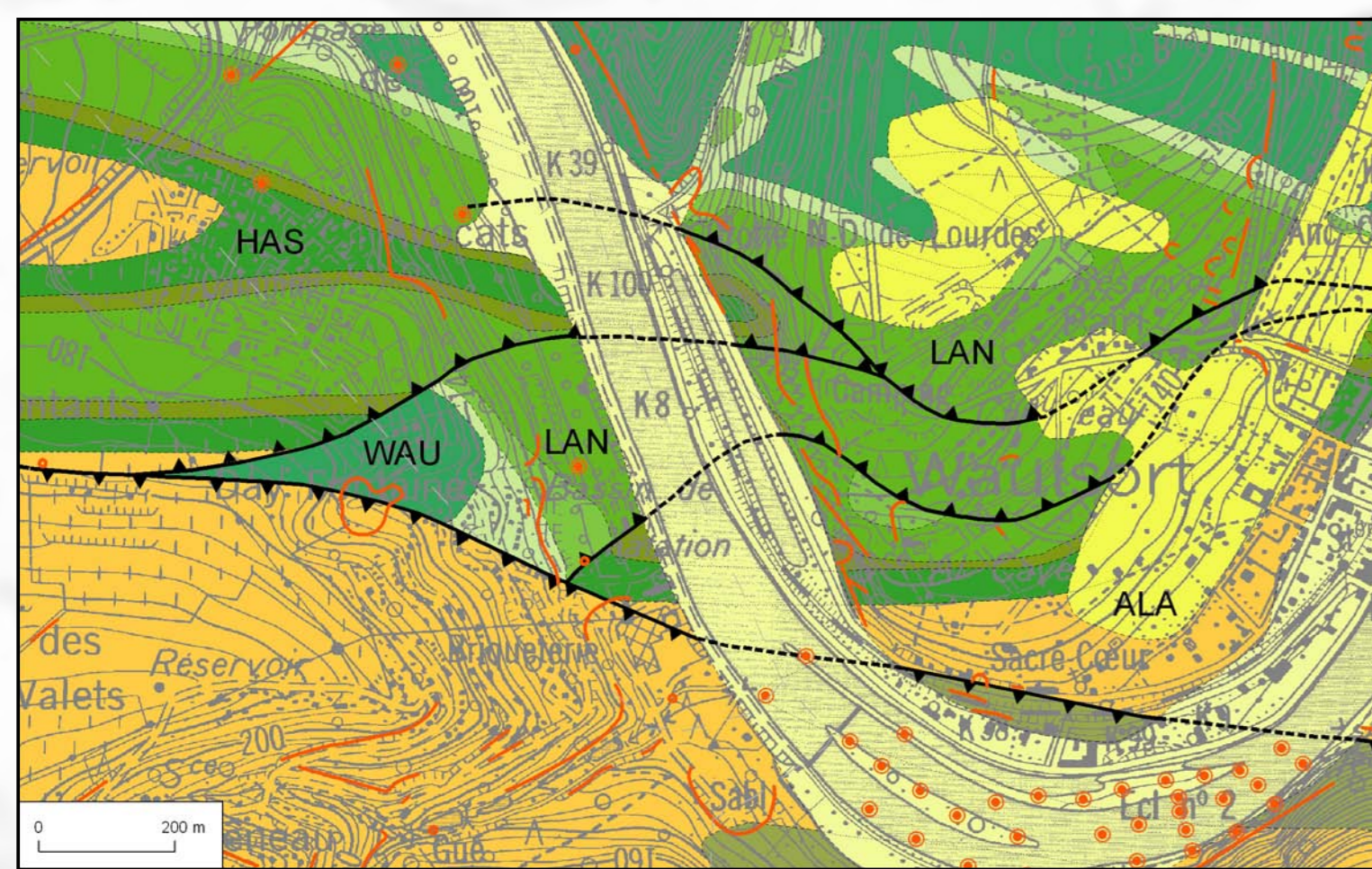
- Website – <http://geologie.wallonie.be>
- Geological Map (1/10.000)
- Start : 1990
- End of mapping : 2018 – End of publication : 2024
- Paper support
- WebGIS platform – <http://carto1.wallonie.be/geologie>
- Thematic items (1/1.000 – 1/40.000)
- Start : 1994
- End : 2014
- WebGIS platform – <http://carto1.wallonie.be/soussol>



Synthetic geological map of Wallonia

Outcrops and borings of the Geological Map of Wallonia

In order to draw the Geological Map of Wallonia, ten geologists of several institutions (UCL, ULg, ULB, UMONS, FUNDP and SGB) are collecting new field data and are reviewing the SGB archives. More than **110.000** outcrops and borings (**60.000** descriptions) are now recorded in a new database, for 92 maps on 142. The next step is to include about 200.000 descriptions of old points from archives and the future data, to update the geological map.



Outcrops and borings of the Geological Map of Wallonia



Geological items

Some others geological items have been gathered and localised, on the basis of mine files and maps and scientific and historic descriptions :

- metallic ore deposits, by UMONS (**1.200** objects – scale between 1/1.000 and 1/40.000);
 - iron ore deposits and layers, by ULg (**3.300** objects – scale between 1/1.000 and 1/40.000);
- Geochemical data, collected on the field, are also available (about **9.900** spots).



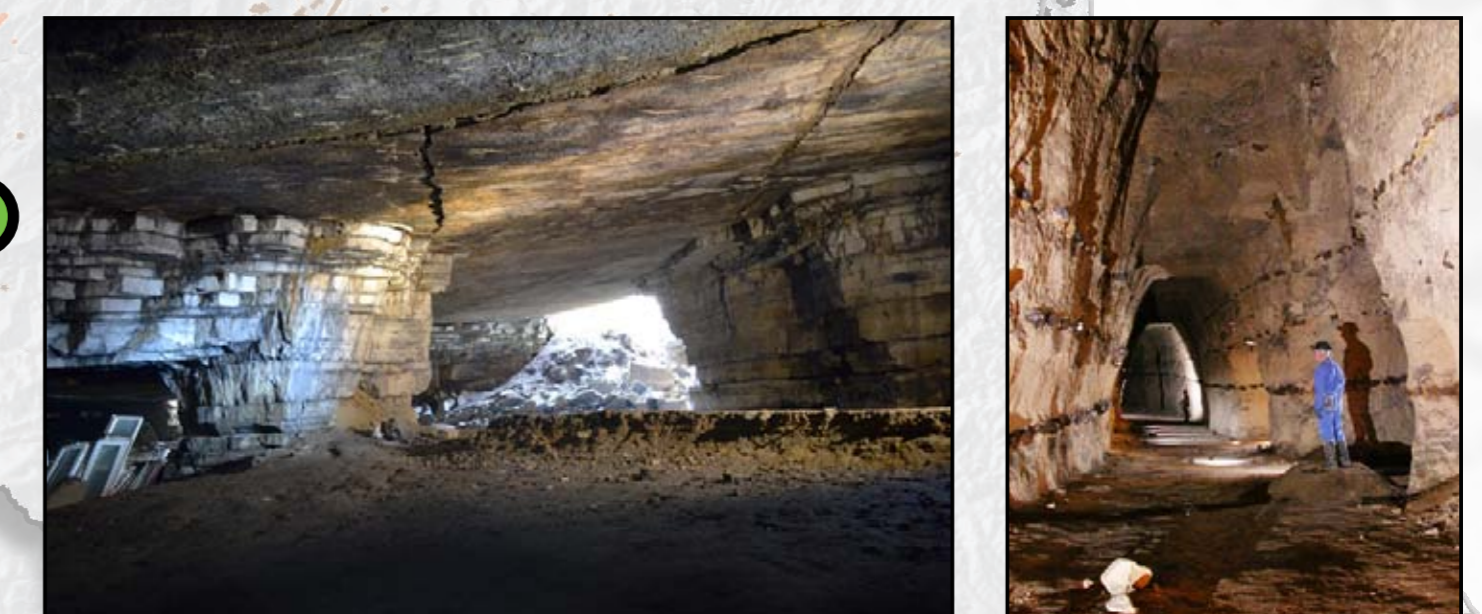
Geomorphological items

The Thematic application is aimed not only to show the objects and their localisation, but also to inform about the administrative requirements for construction or industry, linked to these objects.

Three items and their relative requirements are showed on the Thematics WebGIS service :

- the Atlas of Walloon Karst (**8.000** objects);
- landslides in the western and eastern parts;
- zones of falling rocks.

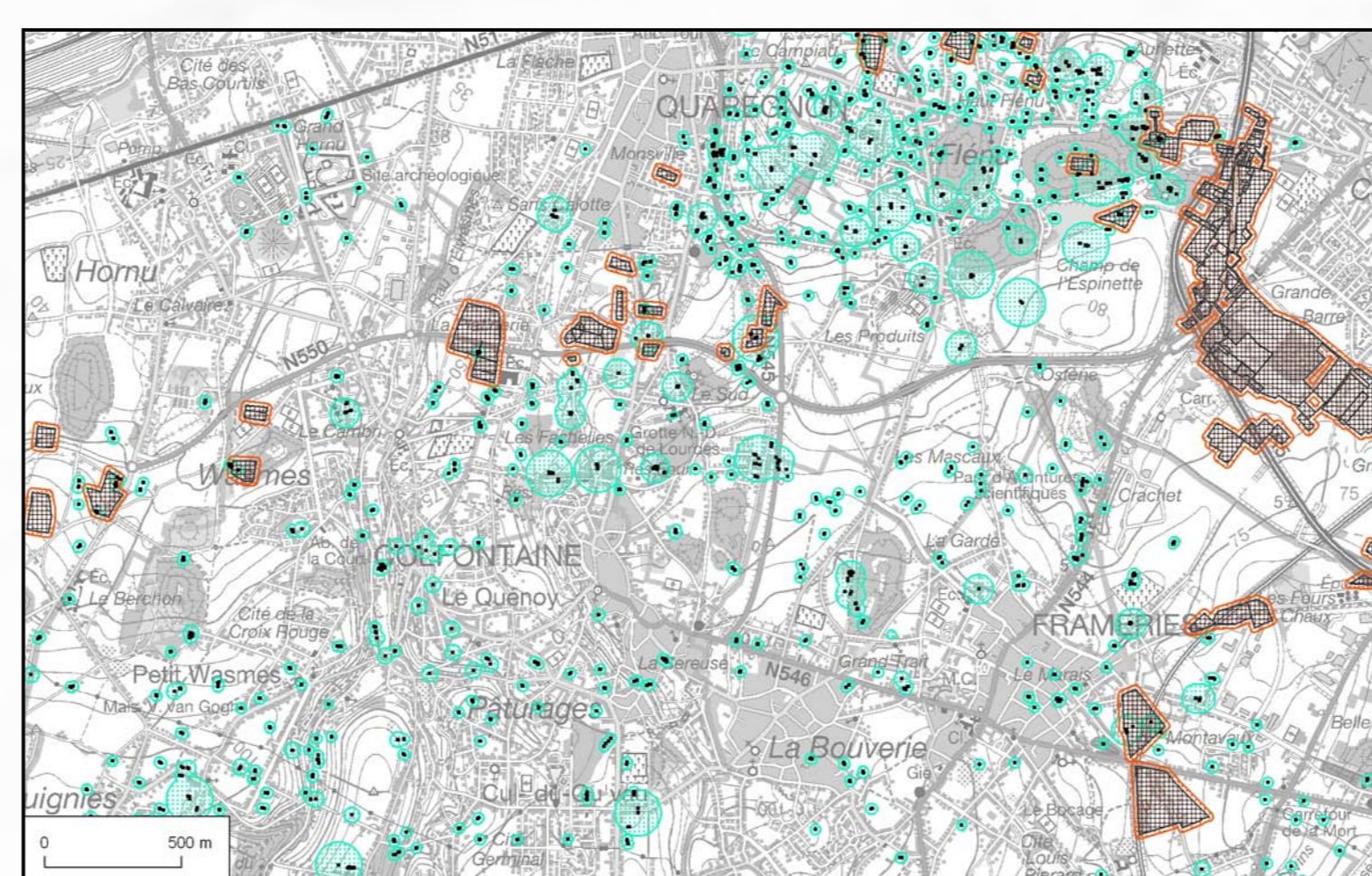
The two last thematics have been collected by ULg, on an initiative of DGO4. The Atlas of Walloon Karst is based on an initiative of DGO3, and done by the CWPSS, in collaboration with DGO4. The scale of these items is 1/10.000.



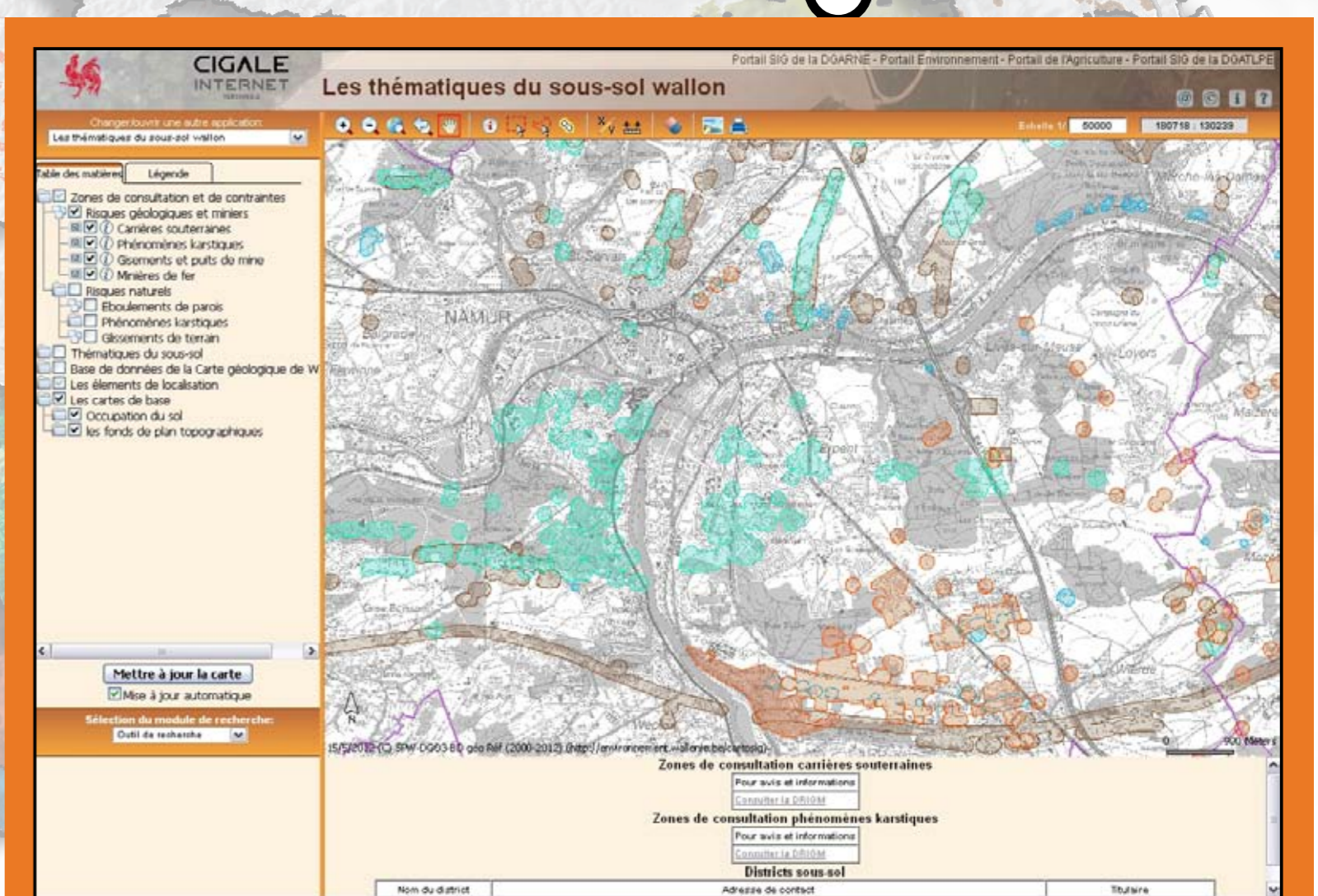
Mines and ancient exploitations items

Wallonia has a 8 centuries old mining (coal, zinc, lead, pyrite and iron) and quarrying history, on various rocks and ores, with a noticeably development of underground works. The gathering of data has begun in 1997, for the prevention of mining hazards. It was quickly completed by the collect of data on non strict "mines" items. The work is to be achieved in 2014. These items comprise :

- mining concessions (kept or created after 1793) : **354** - scale 1/10.000;
- mine shafts or gallery exits : **12.000** (30.000 occurrences) – average scale : 1/2.500;
- mine drainage galleries – average scale 1/10.000;
- underground exploitations of coal – scale 1/10.000;
- maps of past soil subsidence (coal mines);
- underground quarries : **5.000** based on cadastral plots, and less than **300** with plans – scale 1/1.000 to 1/5.000;
- iron ore exploitations (mostly superficial) : more than **2.000** – about 1.500 – scale 1/1.000 to 1/40.000;
- collieries slag heaps : more than **800**;
- zones of recommended consultation of the Direction of Industrial, Geological and Mining Hazards, because of the presence of underground exploitations;
- zones of administrative and geotechnical requirements linked to mine works *sensu stricto*.



Buffer incorporating the risk and uncertainty factors around mine shafts and underground quarries near Mons



Present WebGIS application to consult Thematic items

Perspectives

A "Certificate of Underground State" will be developed in order to integrate all these data in a document to join to application forms for permits or real estate transactions. It will also serve data on seismicity and radon hazards.

Acronyms

CWPESS : Commission Wallonne d'Etude et de Protection des Sites Souterrains
DGO3 : Direction générale opérationnelle Agriculture, Ressources naturelles et Environnement
DGO4 : Direction générale opérationnelle Aménagement du territoire, Logement, Patrimoine et Energie
FUNDP : Facultés Universitaires Notre-Dame de la Paix de Namur
SGL : Service Géologique de Belgique
UCL : Université catholique de Louvain
ULB : Université libre de Bruxelles
ULg : Université de Liège
UMons : Université de Mons



Wallonie