

# **Sourcing natural stone used in the architecture of stone-poor landscapes demonstrated for northern Belgium**

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**Session 4: Geology, Man and Society**

**04-4**

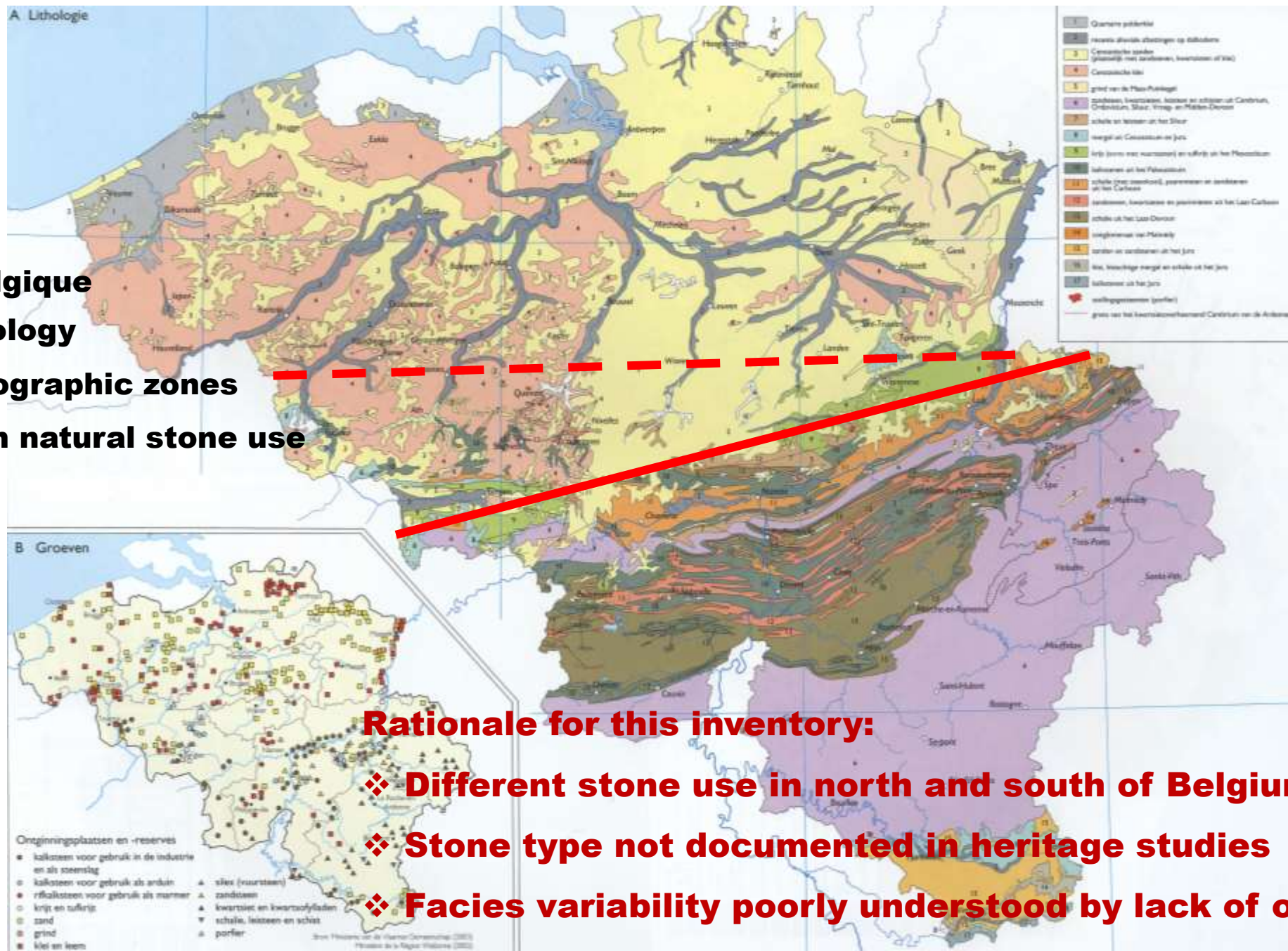




## Introduction to Natural stone

- nature product without physico-chemical transformation
- only mechanical treatment
- recyclable (at least the traditional stone uses)
- home-grown, linked to landscape (limited transport)
- ⇒ environmental-friendly
- durable but reacting to atmospheric conditions (patina)
- ⇒ supports authenticity, value of buildings





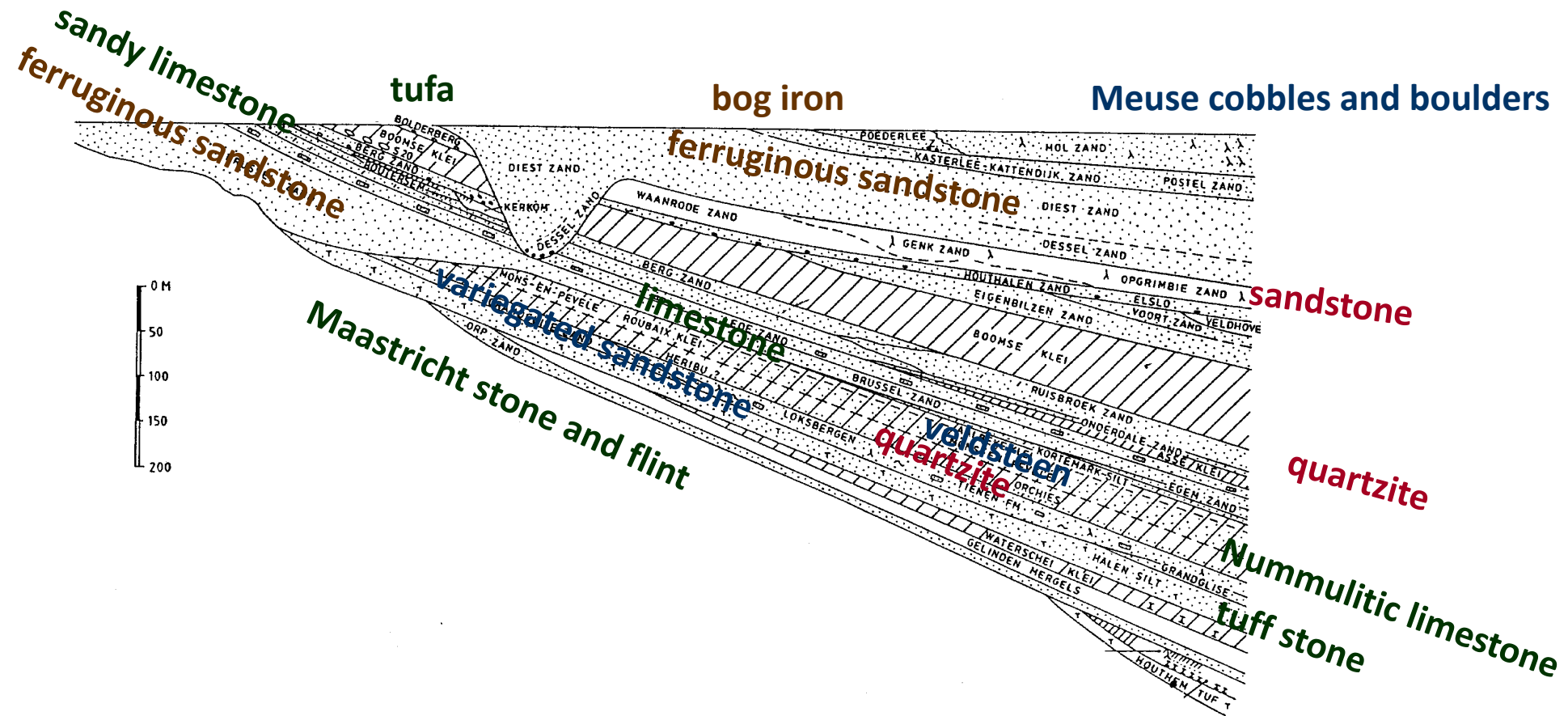
## NATURAL STONE USE

- ✓ **Distinction old - young**
  - ✓ **old and hard**
    - ⇒ **'bluestone'**
    - ⇒ **completely lithified (homogeneous)**
    - ⇒ **'Walloon'**
  - ✓ **young and soft**
    - ⇒ **'witsteen '**
    - ⇒ **limited lithification (random quality)**
    - ⇒ **'Flemish'**
- ✓ **Natural stone impact on cultural landscape**
  - diminishing from south to north**
  - also changing from east to west**
- ✓ **Evolution in time, from local to regional**



**Different application  
of 'bluestone' and 'white stone'**

**North – South traverse through Belgian Tertiary formations (after N. Vandenberghe)**  
**indicating stratigraphic position of natural stones**



**All stony materials occurring in the soil and subsoil  
have been used as building stone**



✓ **Overview of major 'witstenen' of local origin**

- **Maastricht**
- **Lincent**
- **Gobertange**
- **Brussels (Diegem)**
- **Lede**
- **Ypres**

✓ **Comparison quarry areas and use in buildings**

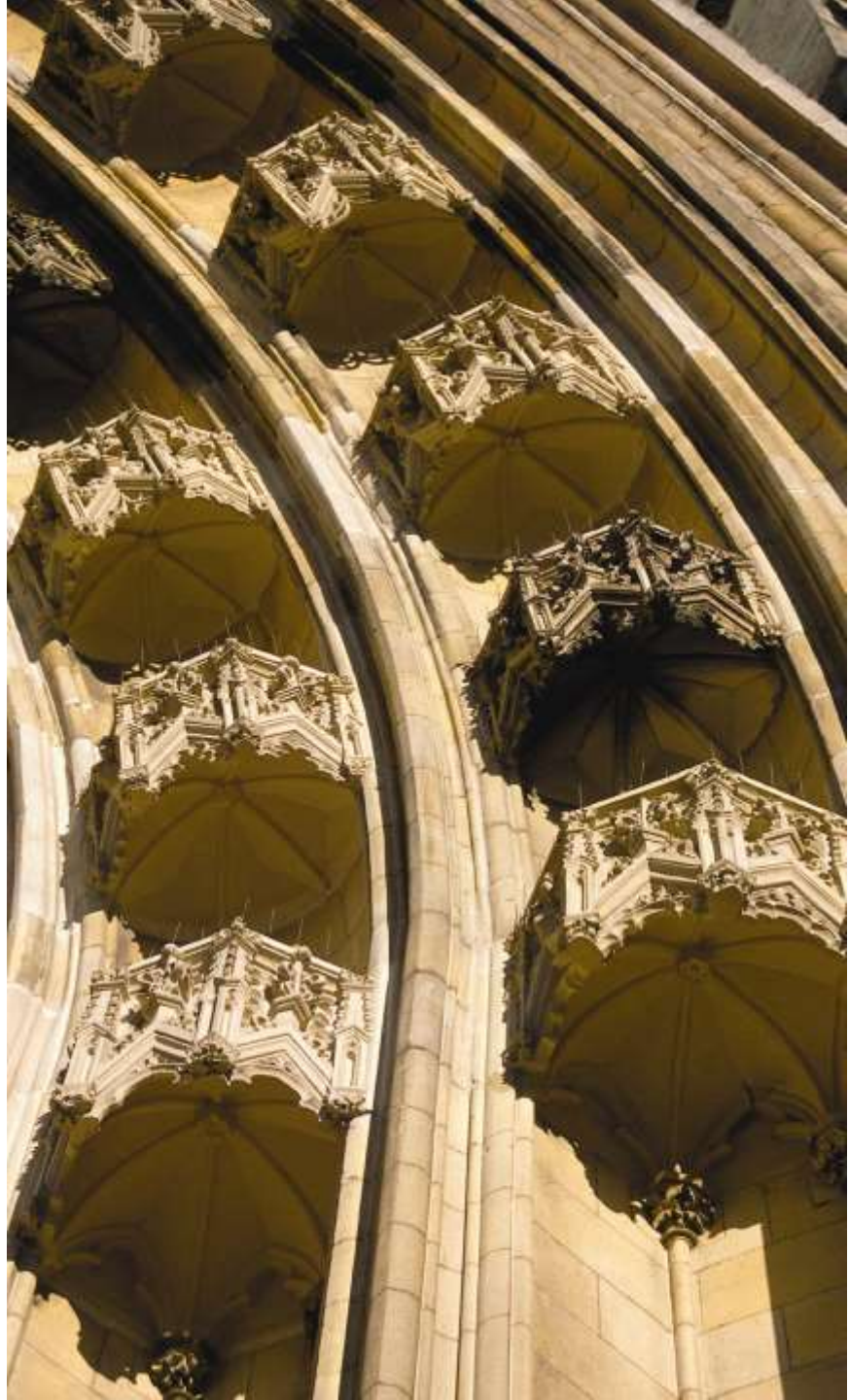
✓ **Data inventory and storage**

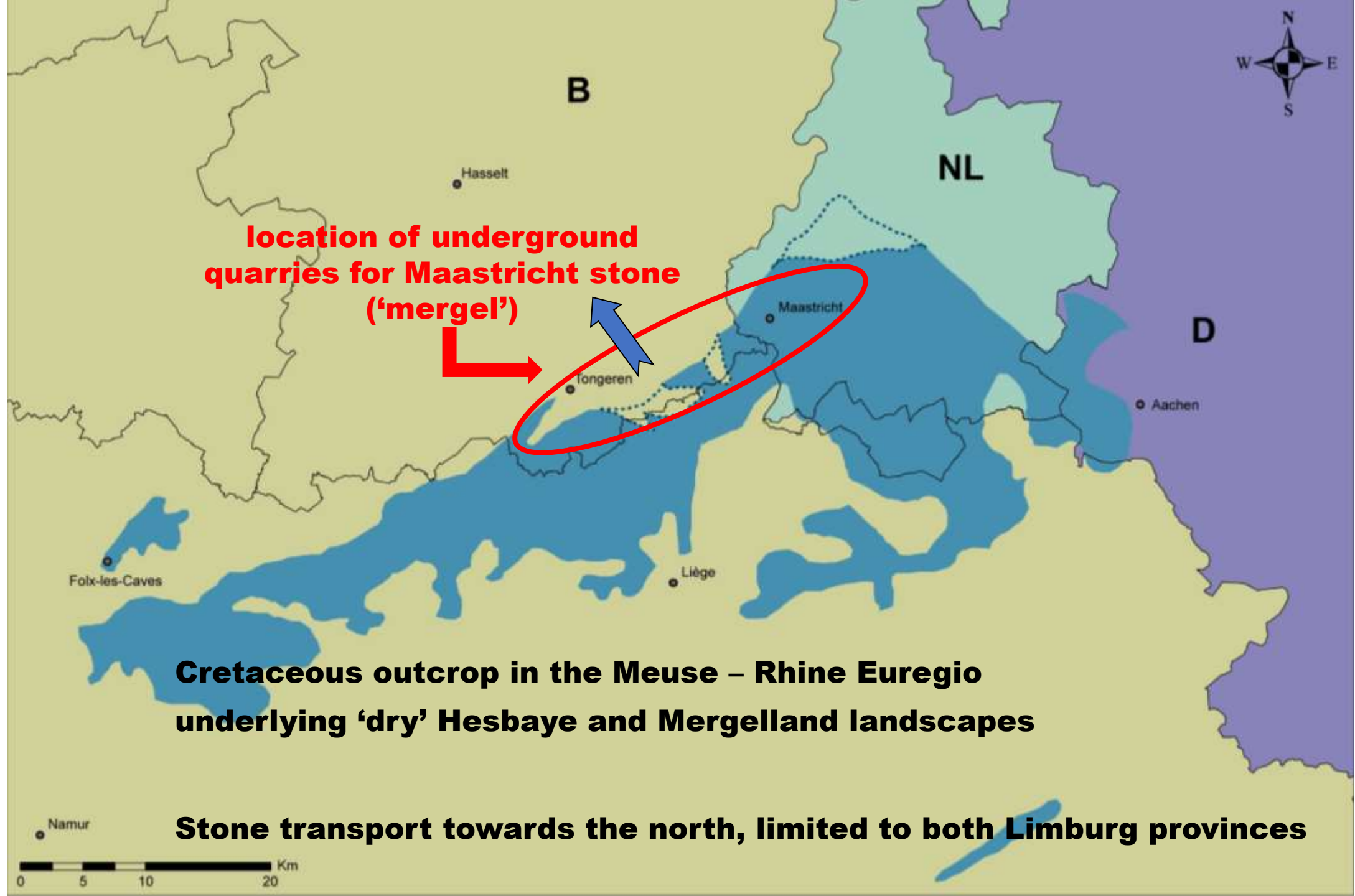




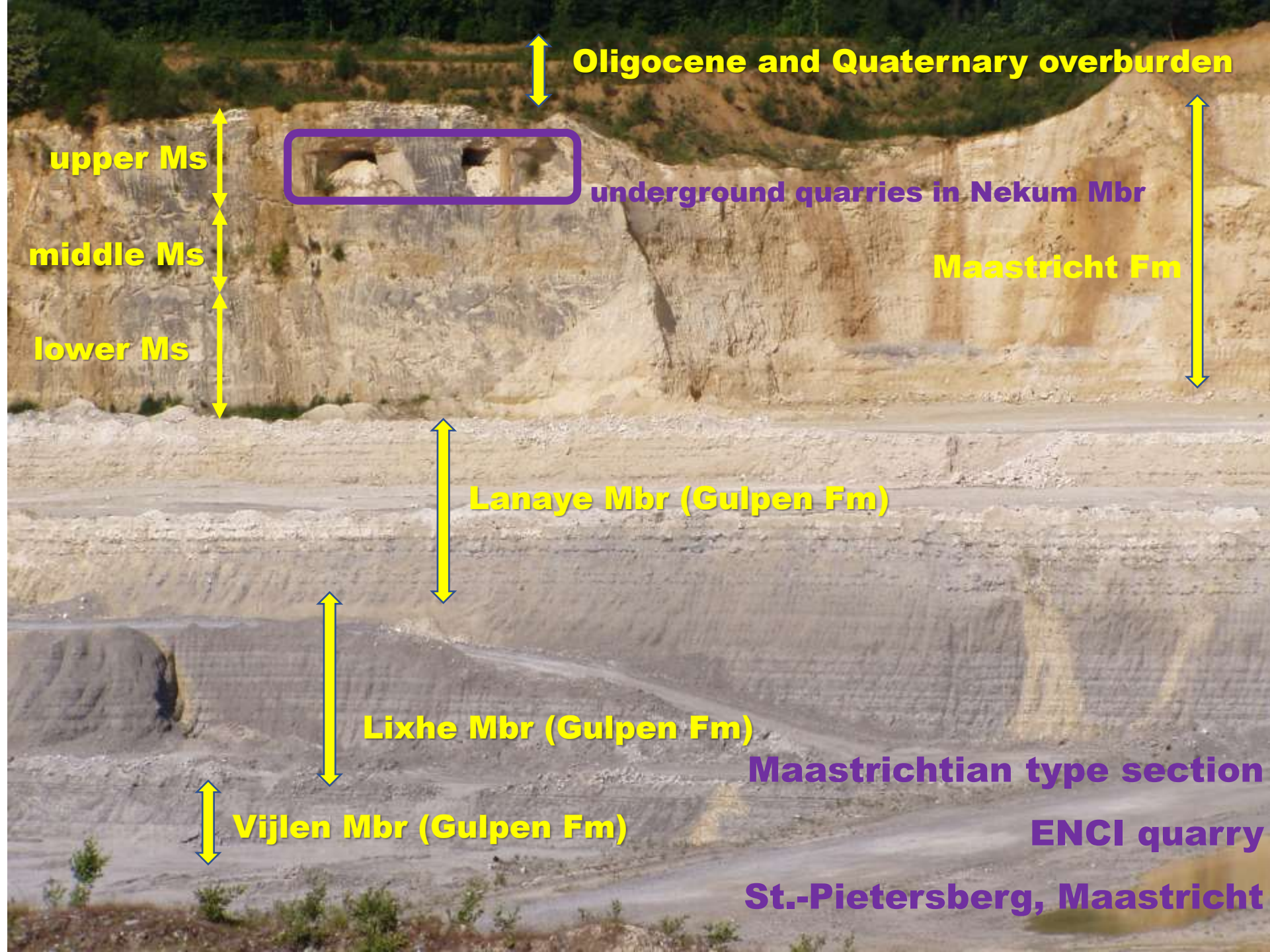


**Maastricht stone**  
**OLVrouwbasiliek Tongeren**



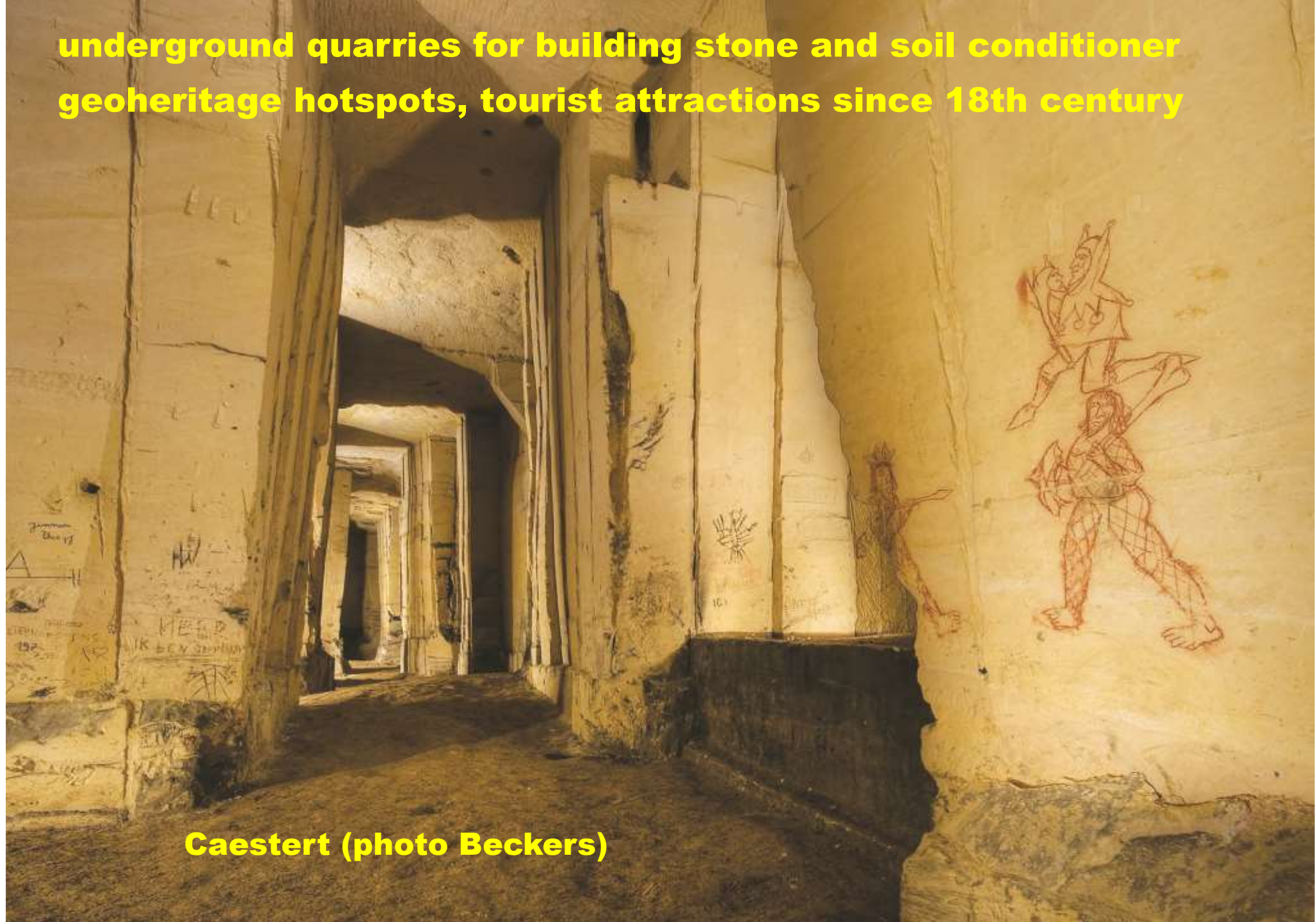








**underground quarries for building stone and soil conditioner  
geoheritage hotspots, tourist attractions since 18th century**



**Caestert (photo Beckers)**



## 4 exploitation levels

in different members of Maastricht Formation

**Serpulid bed in Sibbe stone (Valkenburg area)  
currently quarried variety from Emael Member**



**Hemipneustes echinoids  
from Nekum Member**





## **Linent stone**

**‘Landenian’ in border area between provinces of  
Flemish Brabant, Walloon Brabant, Liège, Limbourg  
Locally quarried and used in all these 4 provinces**



**Opheydissem**



**Linent tuffeau / Tienen quartzite  
St Gangulfus St.-Truiden**

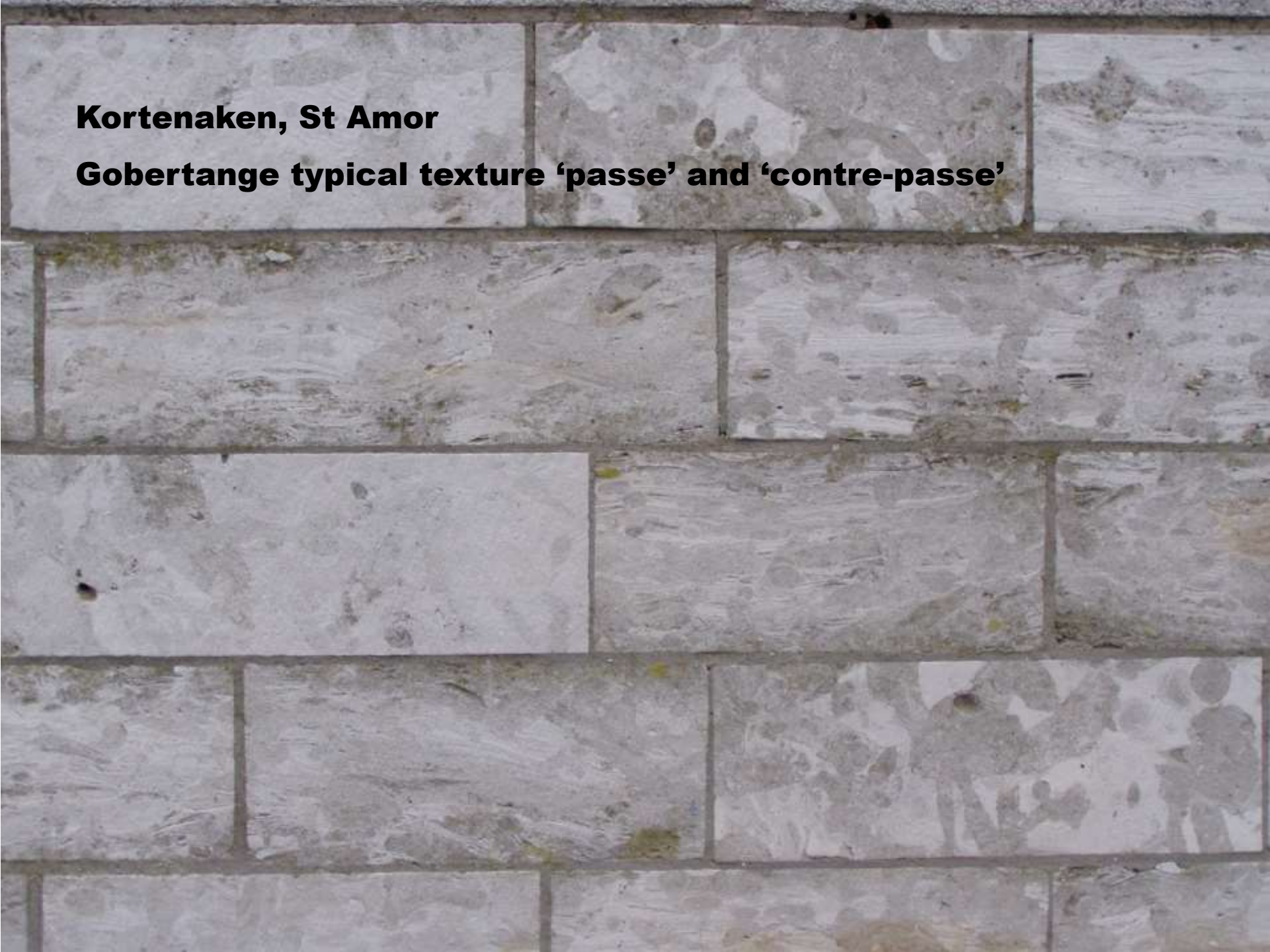


**City hall Dendermonde**  
**Reconstruction 1922**  
**predominantly Gobertange**

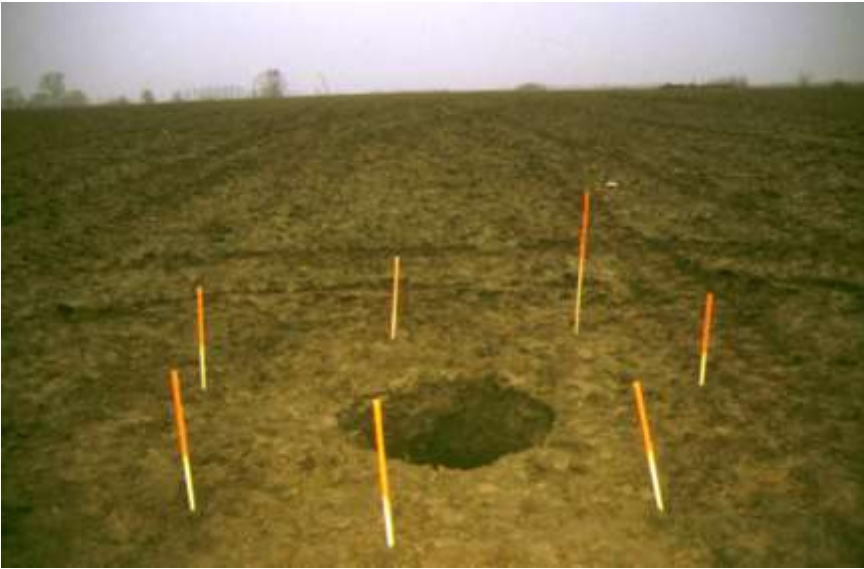


**Kortenaken, St Amor**

**Gobertange typical texture 'passe' and 'contre-passe'**







**traces of former exploitation  
Gobertange stone  
in wider area**



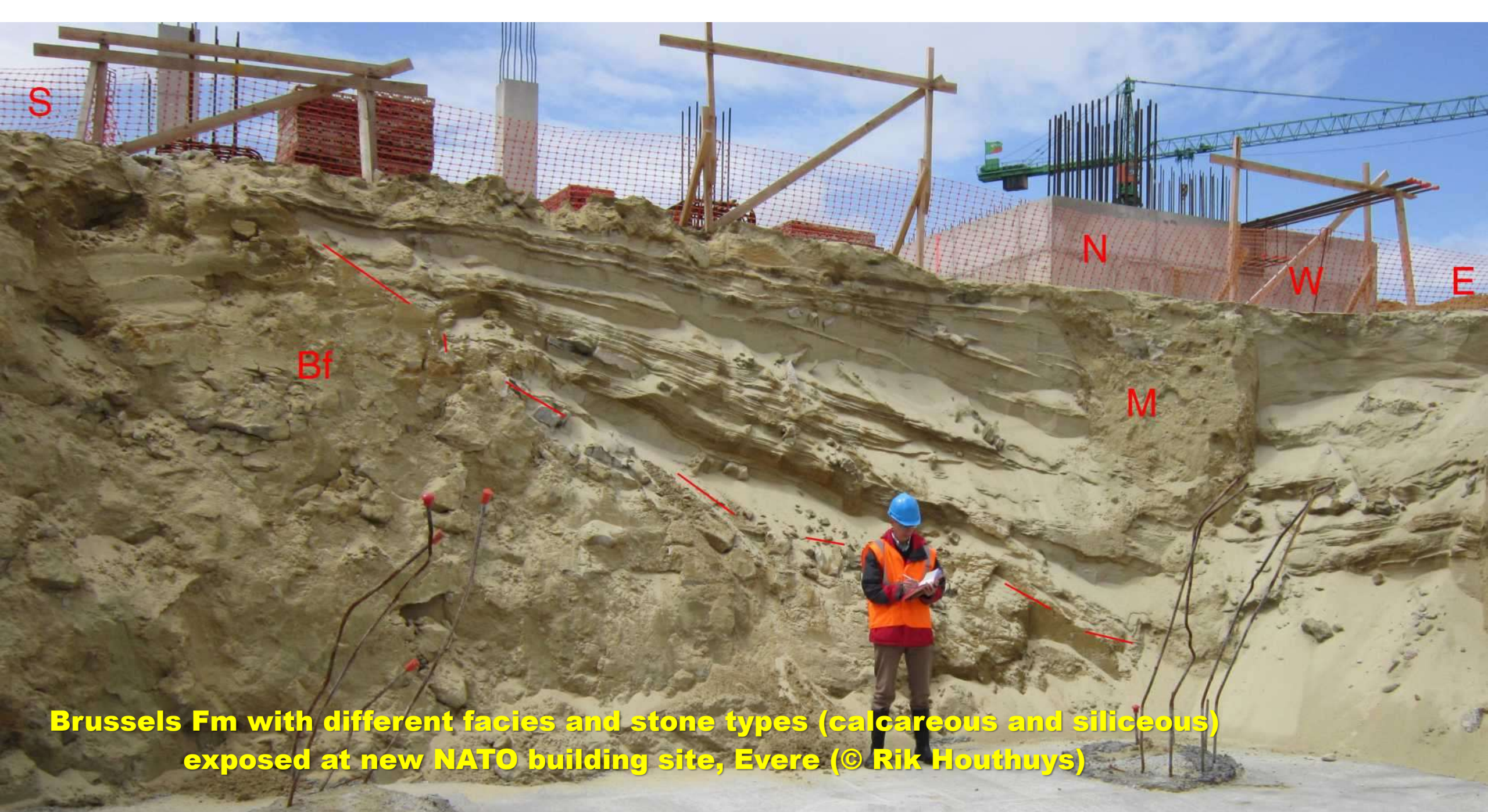
**collapse sinkhole Hoksem, anno 2000**





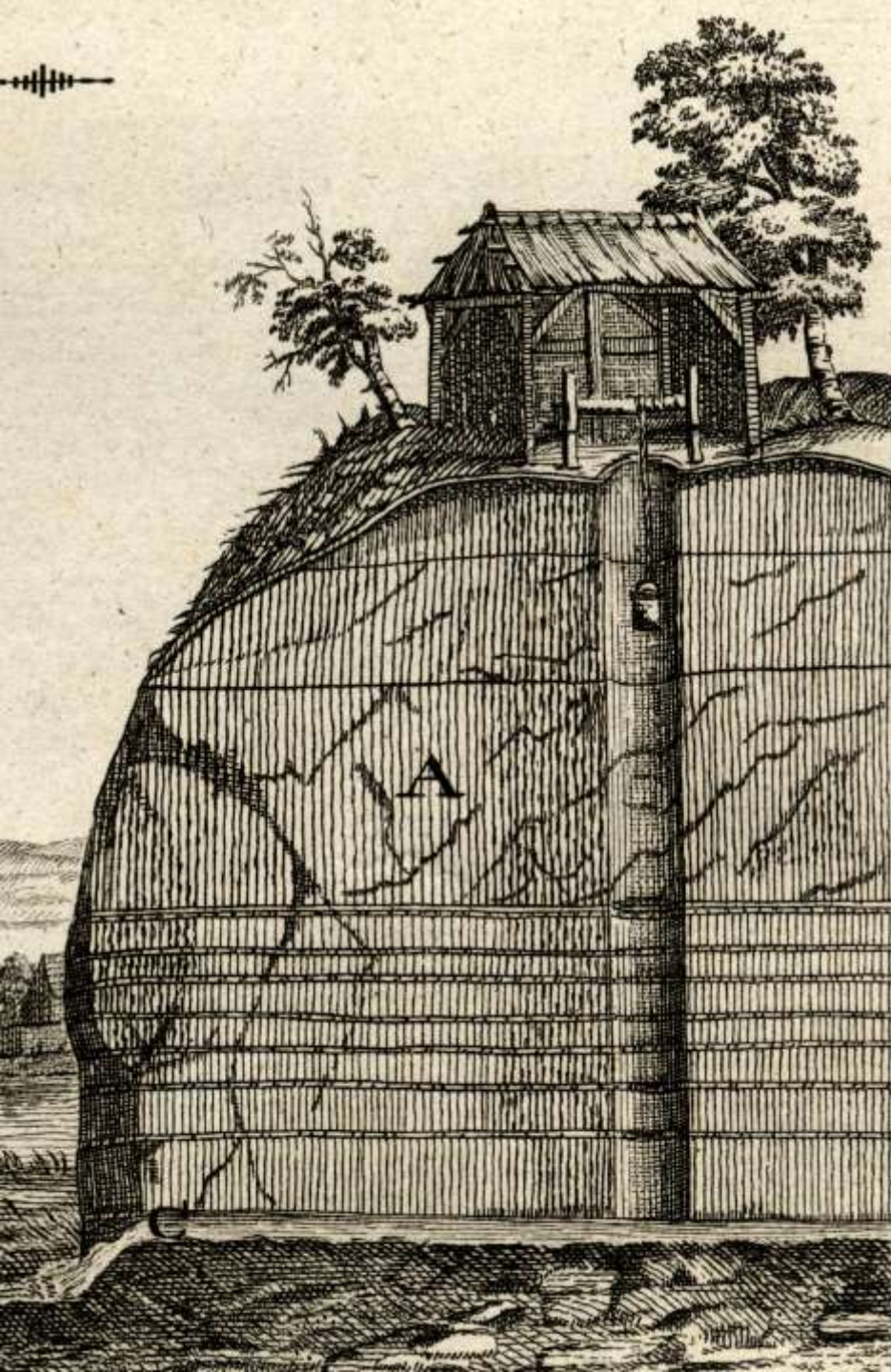
**Brussels stone in St.-Catharina Humelgem  
(Steenokkerzeel – Kortenberg plateau)  
major production centre Lede + Brussels stone**





**Brussels Fm with different facies and stone types (calcareous and siliceous)  
exposed at new NATO building site, Evere (© Rik Houthuys)**



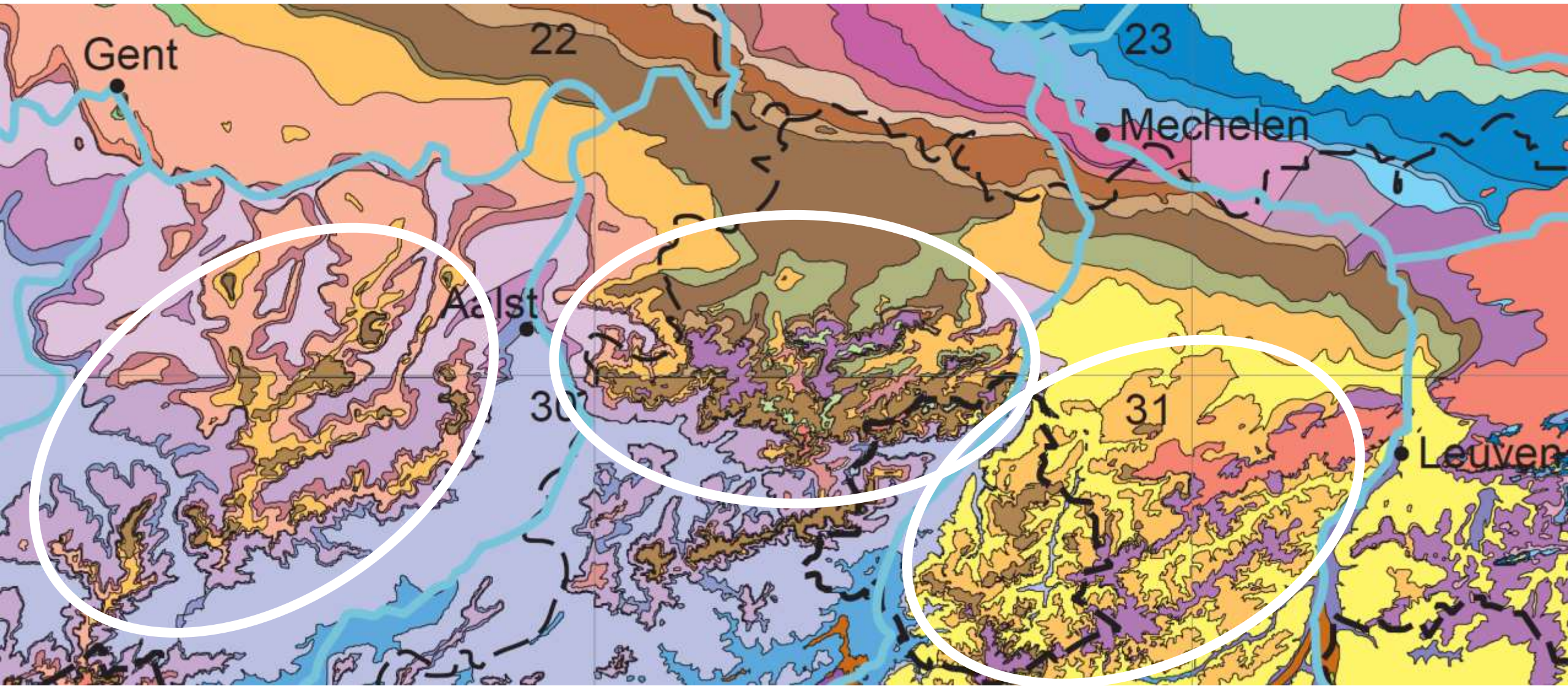


**Underground quarrying  
east of Brussels**  
**top bed = Lede Fm**  
**intermediate = Laeken**  
**lower beds = Brussels Fm**  
***Burtin, 1784***





**Lede stone outcrop areas, number one of Flemish stones, also in variety**



**Scheldt - Dender**

**Dender - Zenne**

**Zenne - Dijle**



**Balegem**



**Meldert bij Aalst**



**Nederokkerzeel**







**'Brabant Arduin' Lede stone**  
**St.-Gummarus, Lier**





**St.-Amandus Denderleeuw**

**Lede stone with coarse quartz, nummulites, serpula (image width 4 cm)**



**‘Veldkapellen’ in local Ypresian stone**



**Smeerebbe**



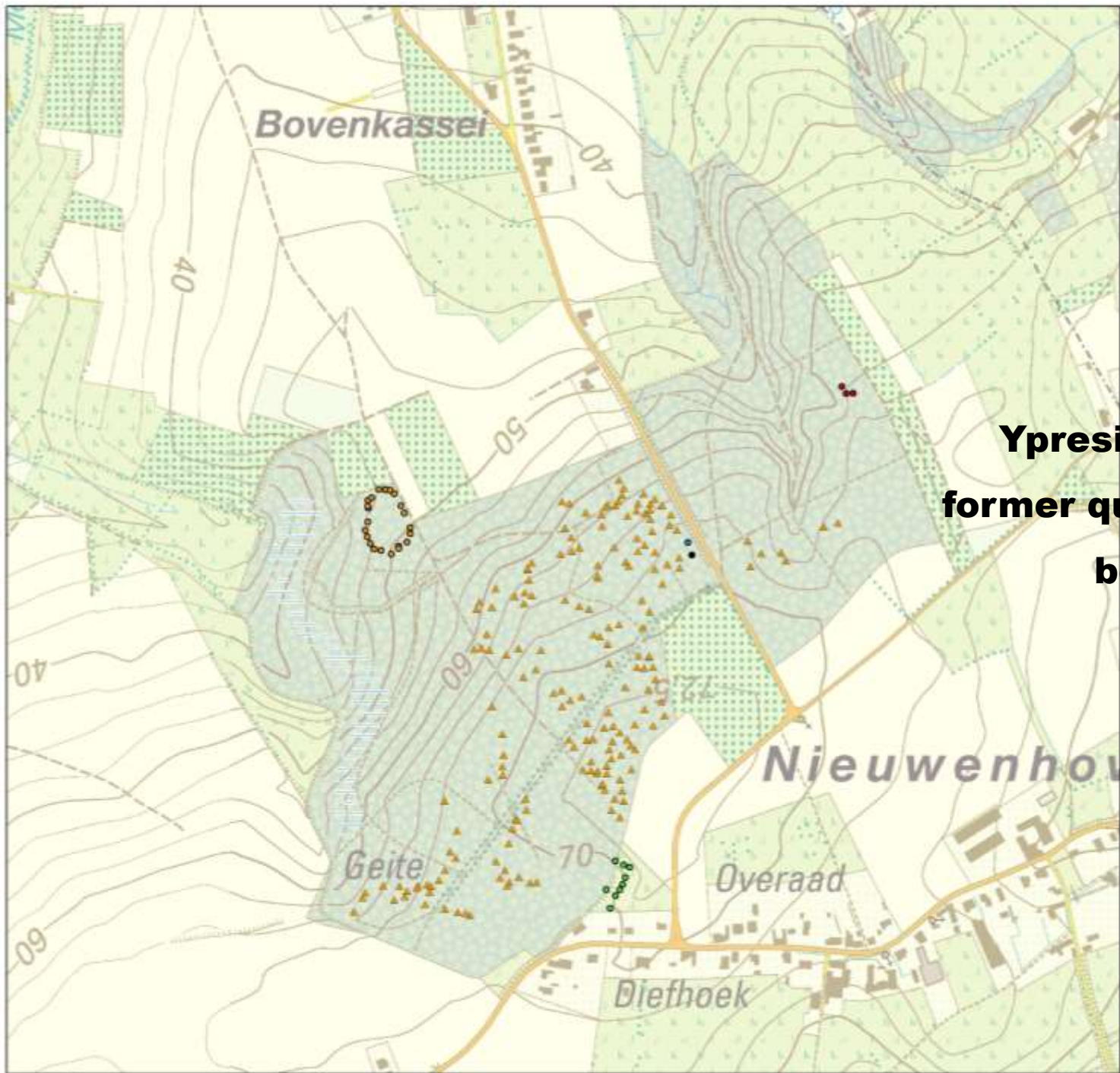
**Denderwindeke**





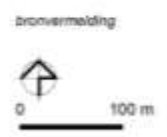
**Augustijnenkerk Antwerpen: Ypresian nummulitic stone**





- naam
- groeve
  - groeve2
  - groeveabdij
  - grovebk
  - grovebkas
  - put

**Ypresian stone does not come from Ypres  
former quarry area supposedly along Dender  
between Ninove and Geraardsbergen  
(‘Zandbergse steen’)**





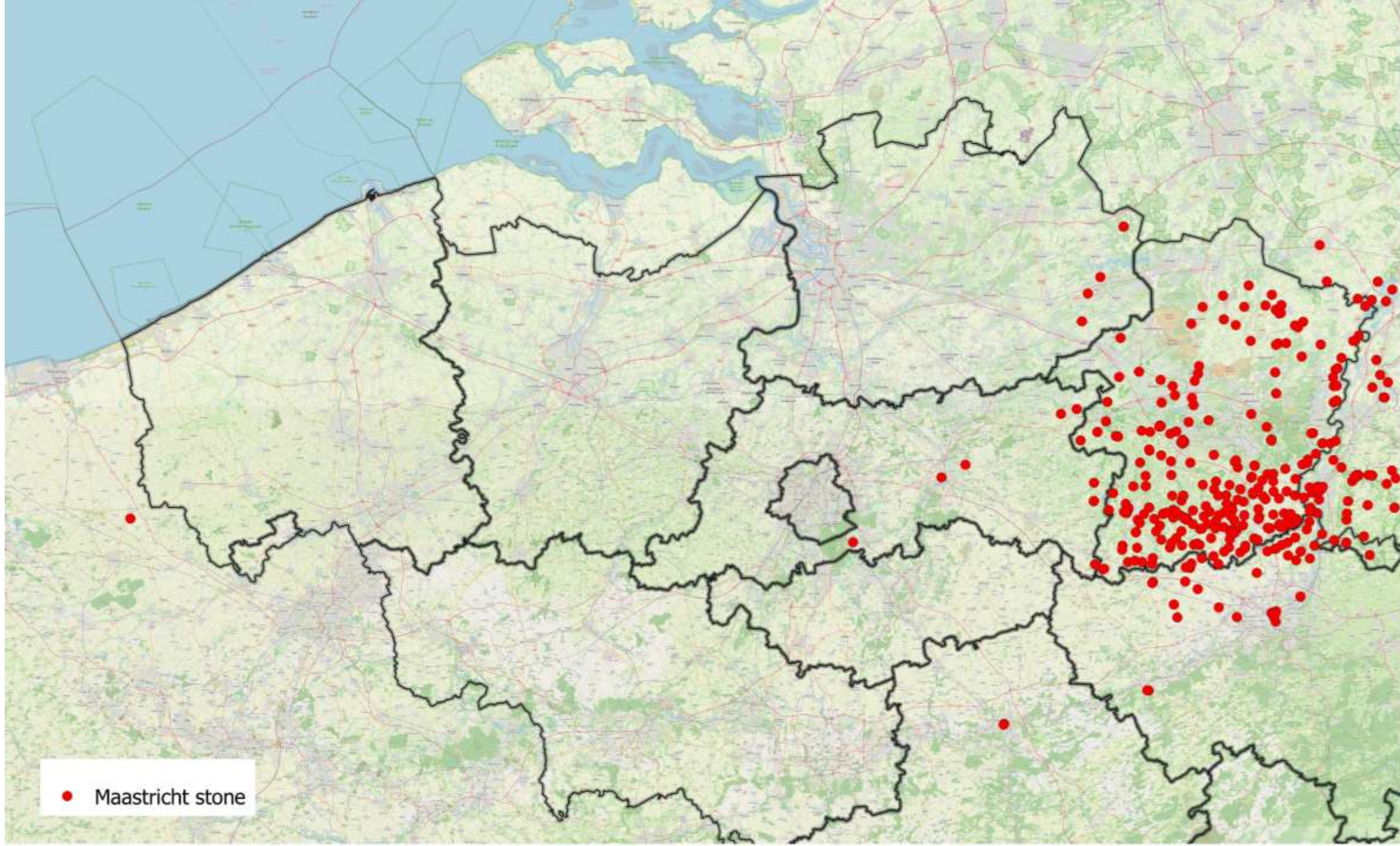


**No outcrop of precise locality known  
for extracting Ypresian stone**

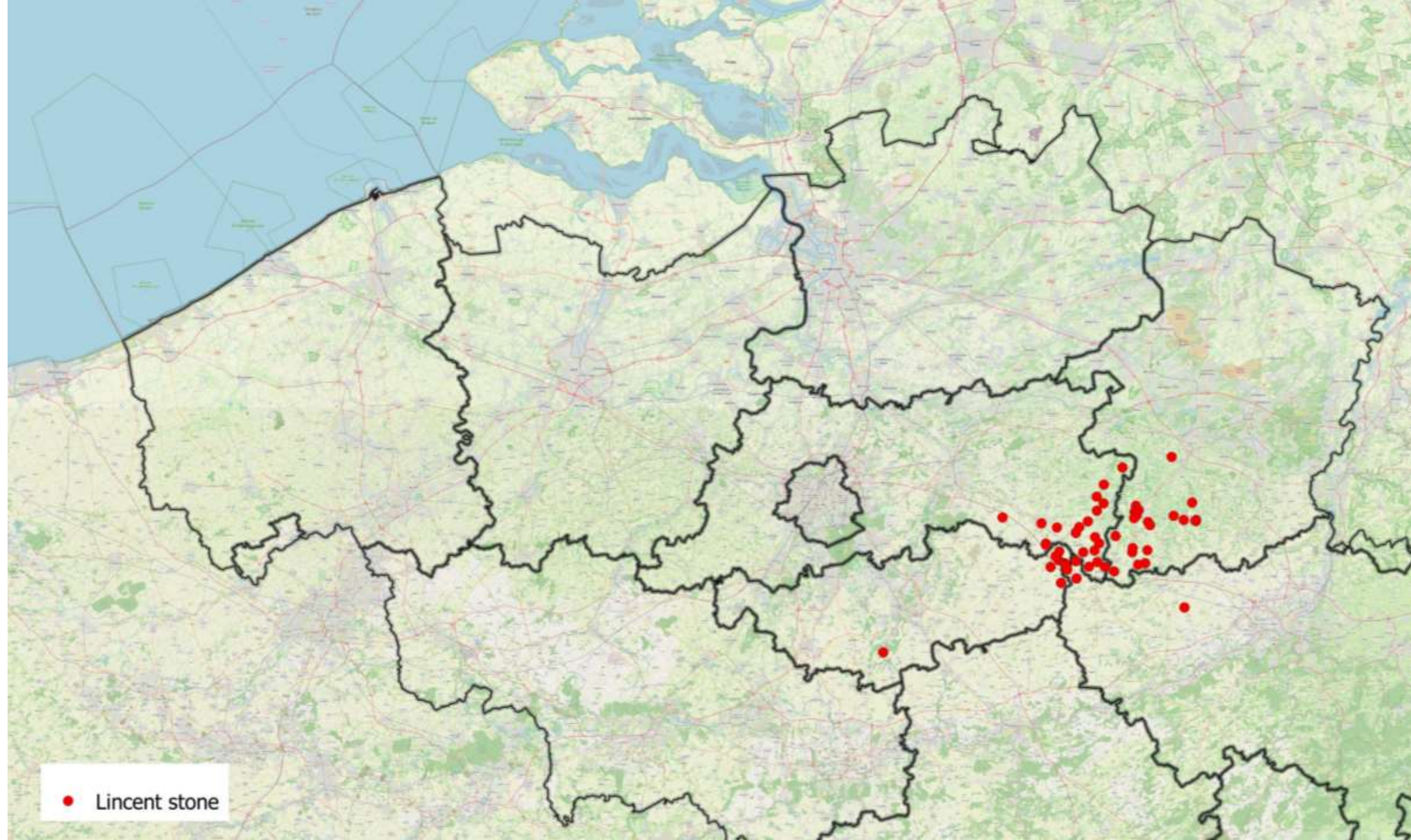
**Ghelamco borehole BH01 Heizel parking  
core 57,30 - 57,50 m**

**Fm Hyon, Mons-en-Pévèle Member, 'Vorst sand'  
with concentrations of large nummulites, but unlithified**





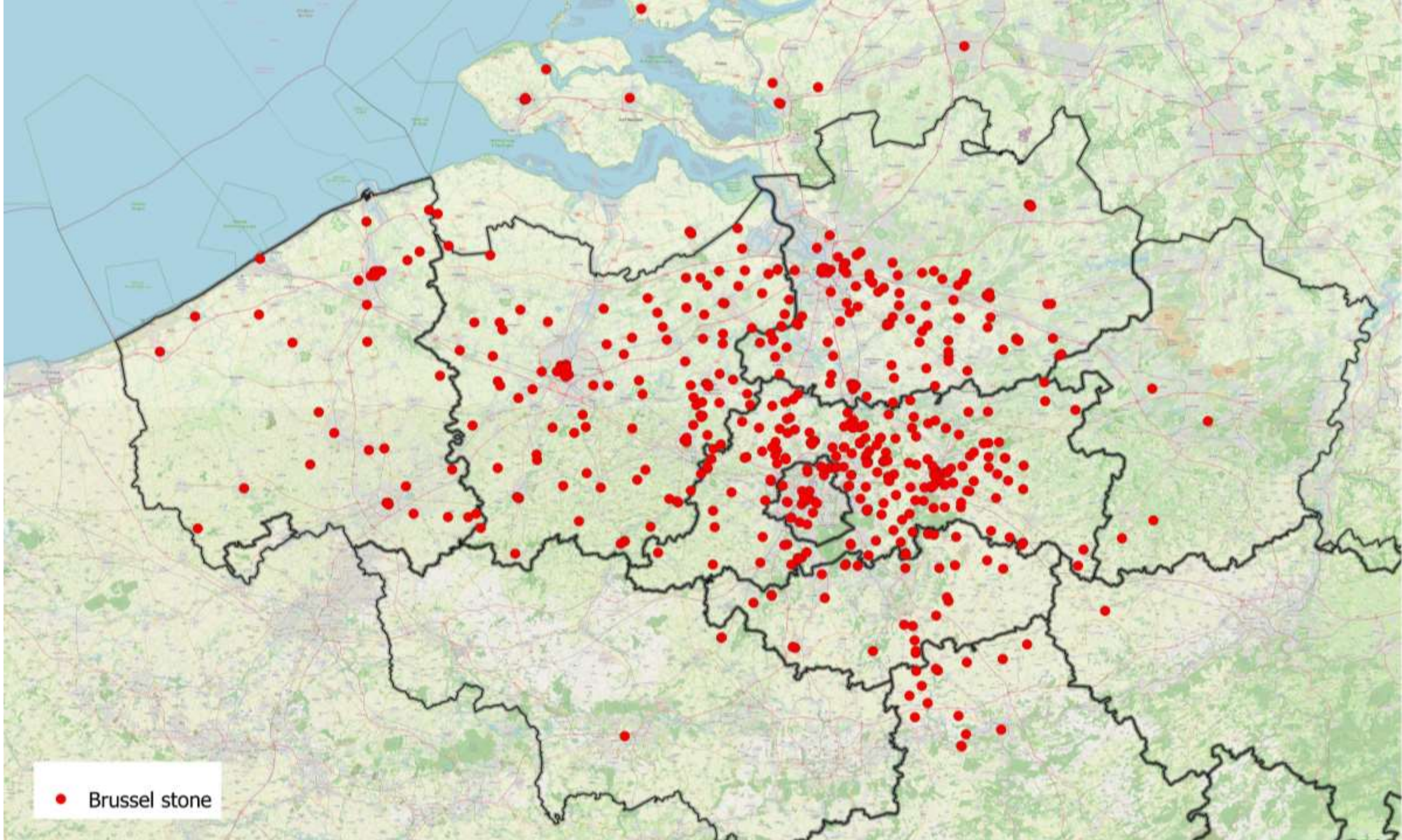










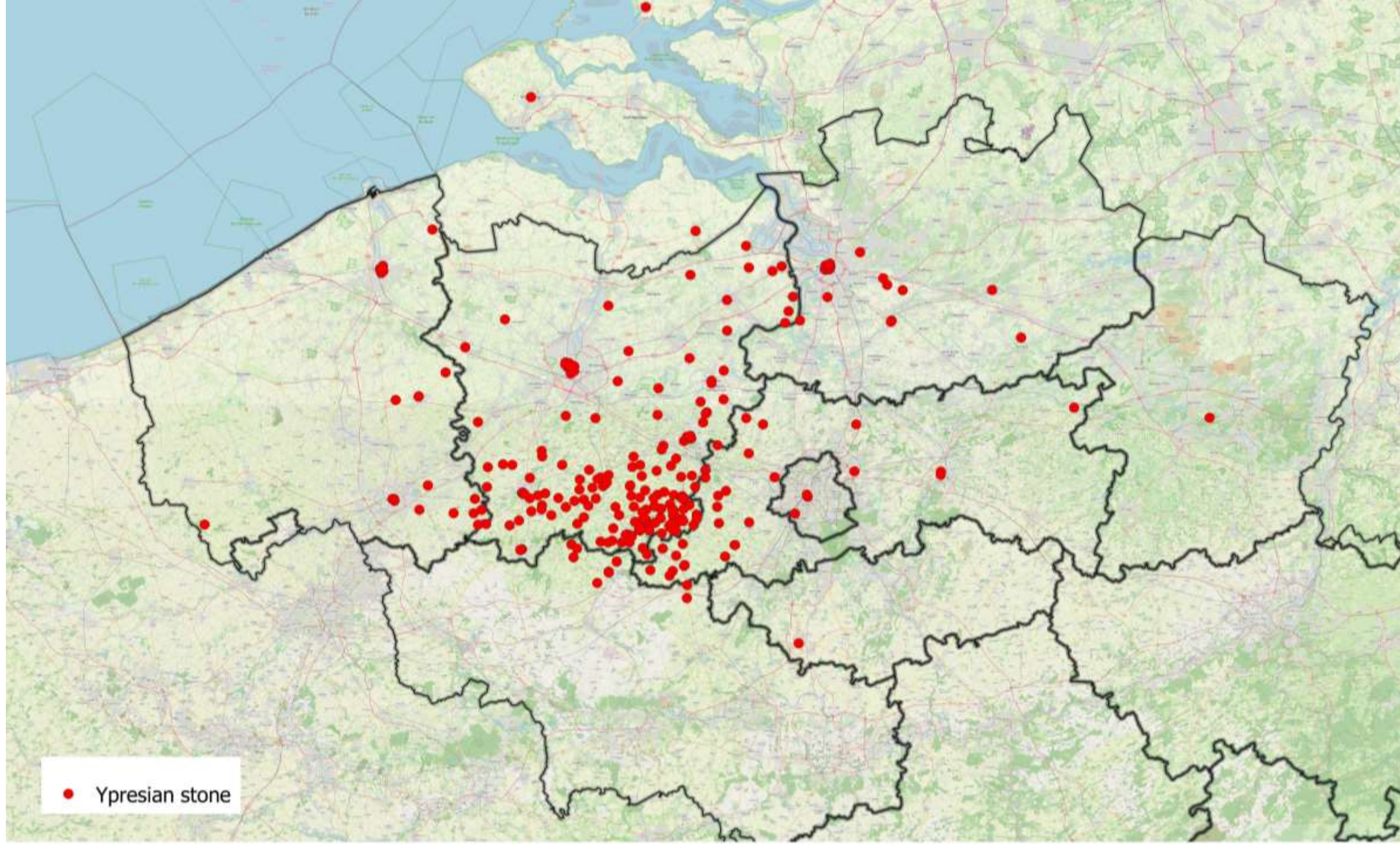






• Lede stone









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Range view

Range view 0 - 250

fusiegemeente, prov. of type (zie codelijst vb  
kerk)

☒ all items ☐ in current results

gemeente en/of naam monument

☒ all items ☐ in current results

bouwsteen

☒ all items ☐ in current results

**Where to find?**

**Monument database at Geological Survey of Belgium, a permanent work in progress**

**currently 22851 records (VLA 16382, BXL 1836) from 4714 sites, GIS linked**

**representative for Flemish region**

**partly on website**

**completed by stone collection, photo-library and bibliographic database**



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Range view

Range view 0 - 250

Search:

Current search

☒ Range view

☒ 0 - 250

☒ gemeente en/of naam monument

☒ museum ☒ tervuren

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fusiegemeente, prov. of type (zie codelijst vb kerk)

☒ all items

Search

☐ in current results

gemeente en/of naam monument

museum,tervuren

☐ all items

Search

☒ in current results

bouwsteen

☒ all items

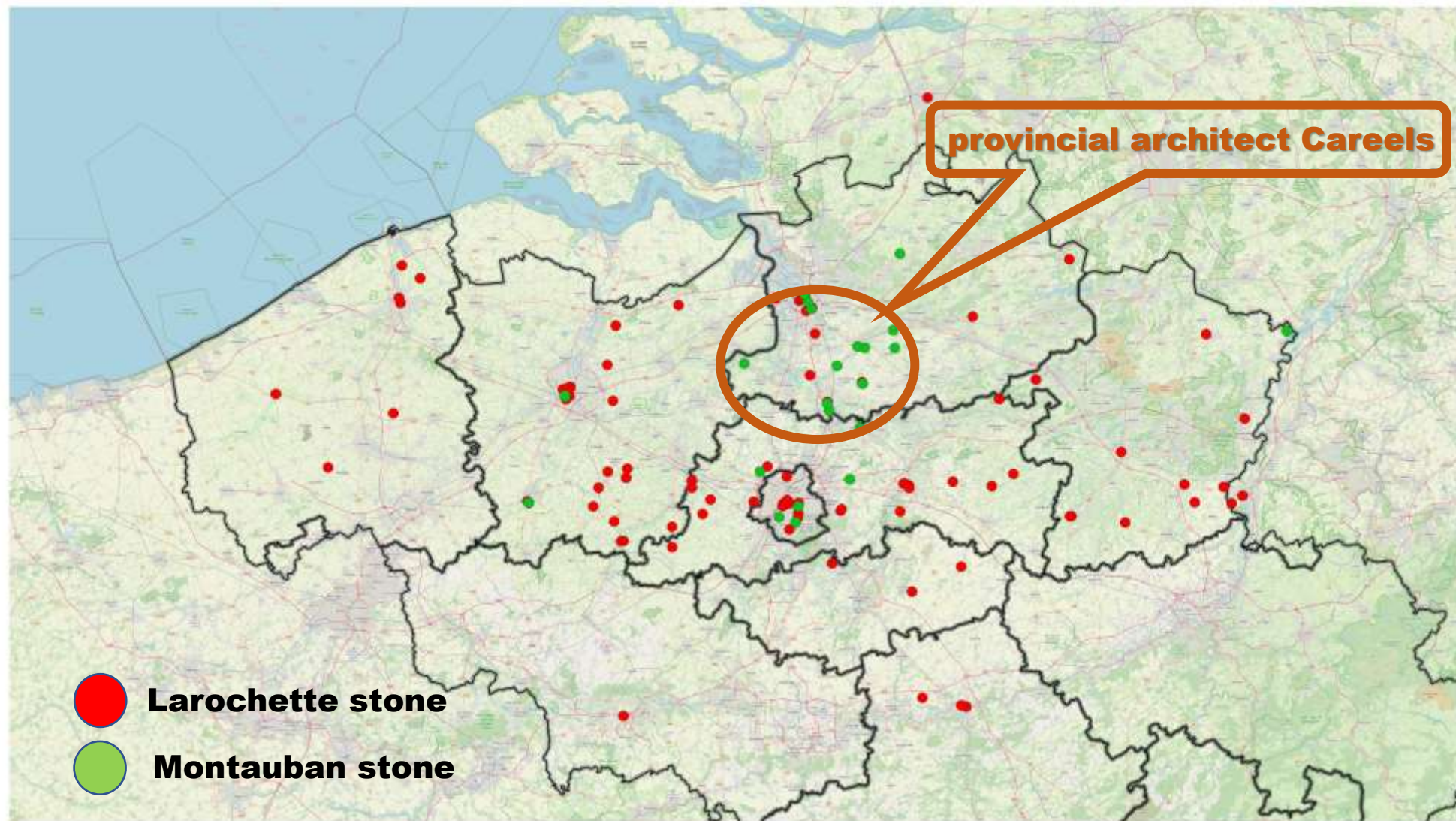
Search

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### Bibliography items

- ☐ Duser M., 2011. Tervuren, Koninklijk Museum voor Midden-Afrika marmer, Escalettes, vol. wanden inkomgalerij, 2 - opmerkelijk.
- ☐ Duser M., 2011. Tervuren, Koninklijk Museum voor Midden-Afrika marmer, Campan vert, vol. vloer inkomhal, 1 - beperkt.
- ☐ Duser M., 2011. Tervuren, Koninklijk Museum voor Midden-Afrika Grijs marmer, Grand Antique du Nord, vol. stroken op wanden inkomhal, 1 - beperkt.
- ☐ Duser M., 2011. Tervuren, Koninklijk Museum voor Midden-Afrika gele marmer, Lioz, vol. vloer inkomhal, 1 - beperkt.
- ☐ Duser M., 2011. Tervuren, Koninklijk Museum voor Midden-Afrika Rode marmer, Rouge royal, vol. inkomgalerij muur boven, 1 - beperkt.
- ☐ Duser M., 2011. Tervuren, Koninklijk Museum voor Midden-Afrika Rode marmer, Rouge incarnat, vol. vloer inkomgalerij, 1 - beperkt.
- ☐ Duser M., 2011. Tervuren, Koninklijk Museum voor Midden-Afrika Rode marmer, Rance, vol. wanden inkomhal, 2 - opmerkelijk.
- ☐ Duser M., 2014. Tervuren, Koninklijk Museum voor Midden-Afrika Rode marmer, vol. vloer CAPA gebouw, 4 - in deel volledig.
- ☐ Duser M., nn. Tervuren, Koninklijk Museum voor Midden-Afrika Luxemburgse zandsteen, vol. gehele gevels tot nok, dominant, 6 - volledig gebouw.
- ☐ Duser M., nn. Tervuren, Koninklijk Museum voor Midden-Afrika Euville, vol. raamdorpels en -ondermuur, 2 - opmerkelijk.
- ☐ Duser M., nn. Tervuren, Koninklijk Museum voor Midden-Afrika Petit Granit, vol. ondermuur, 3 - in hoeveelheid belangrijk.
- ☐ Duser M., 2013. Tervuren, Koninklijk Museum voor Midden-Afrika marbre du Boulonnais, Notre-Dame, vol. muurplaten onderaan, granietzuilvoeten, 2 - opmerkelijk.
- ☐ Duser M., 2013. Tervuren, Koninklijk Museum voor Midden-Afrika Larrys, vol. vloertegels inkomgang directiepaviljoen, 1 - beperkt.
- ☐ Duser M., 2013. Tervuren, Koninklijk Museum voor Midden-Afrika Comblanchien, vol. vloertegels inkomhal directiepaviljoen, 1 - beperkt.
- ☐ Duser M., 2012. Tervuren, Koninklijk Museum voor Midden-Afrika marmer, Brèche Médicis Calacatta, vol. wanden boutique, 1 - beperkt.
- ☐ Duser M., 2012. Tervuren, Koninklijk Museum voor Midden-Afrika Grijs marmer, Bardiglio capella, vol. vloer afw met carrara (zelden), 0 - zelden tot eenmalig.
- ☐ Duser M., 2012. Tervuren, Koninklijk Museum voor Midden-Afrika Luxemburgse zandsteen, Dillingen, vol. kroonlijst en dak, 2 - opmerkelijk.
- ☐ Duser M., 2012. Tervuren, Koninklijk Museum voor Midden-Afrika Graniet, ranite des Ballons = granit de Miellin, vol. zuilen binnenkoer, 2 - opmerkelijk.
- ☐ Duser M., 2012. Tervuren, Koninklijk Museum voor Midden-Afrika Wit marmer, Arabescato, vol. stroken ster inkomhal, restaurant, 1 - beperkt.





**Luxembourg stone**

- **no relation use – outcrop, but other connections**
- **restricted use in time (late 19th – early 20th century)**