

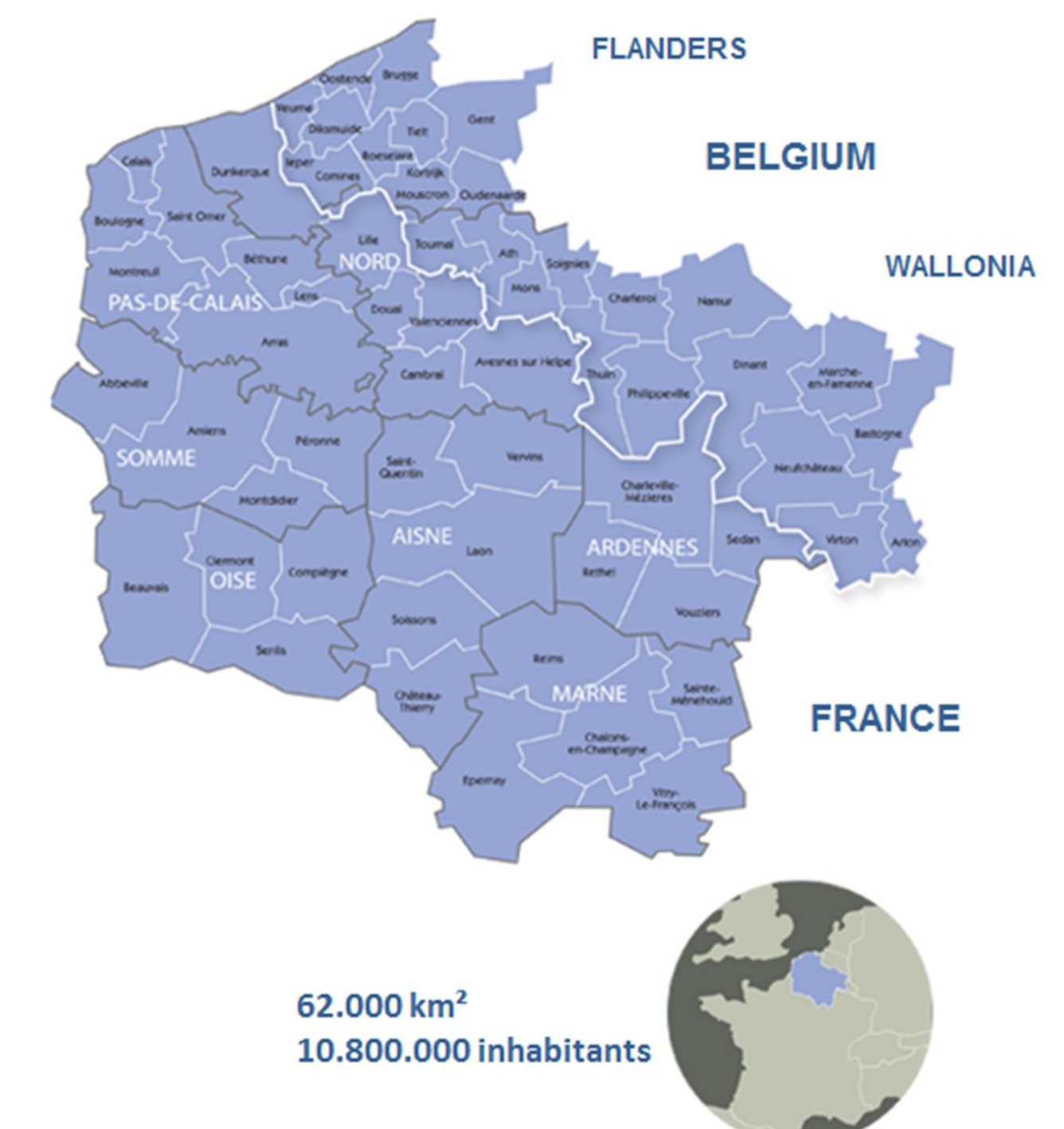
Reuse of sediments in landscape development: ecotoxicological monitoring of a mound (part of the VALSE project)

Florian Liénard¹ and Laurence Haouche¹
¹ISSEP, Institut Scientifique de Service Public

The VALSE project

Can dredged materials be recovered through landscaping?

➔ *Monitoring of a mound made with unpolluted sediments*



Monitoring methodology

Field surveys

Soil macro-invertebrates

Flora

Laboratory testing

Determination of potential nitrification

Eisenia fetida reproduction test

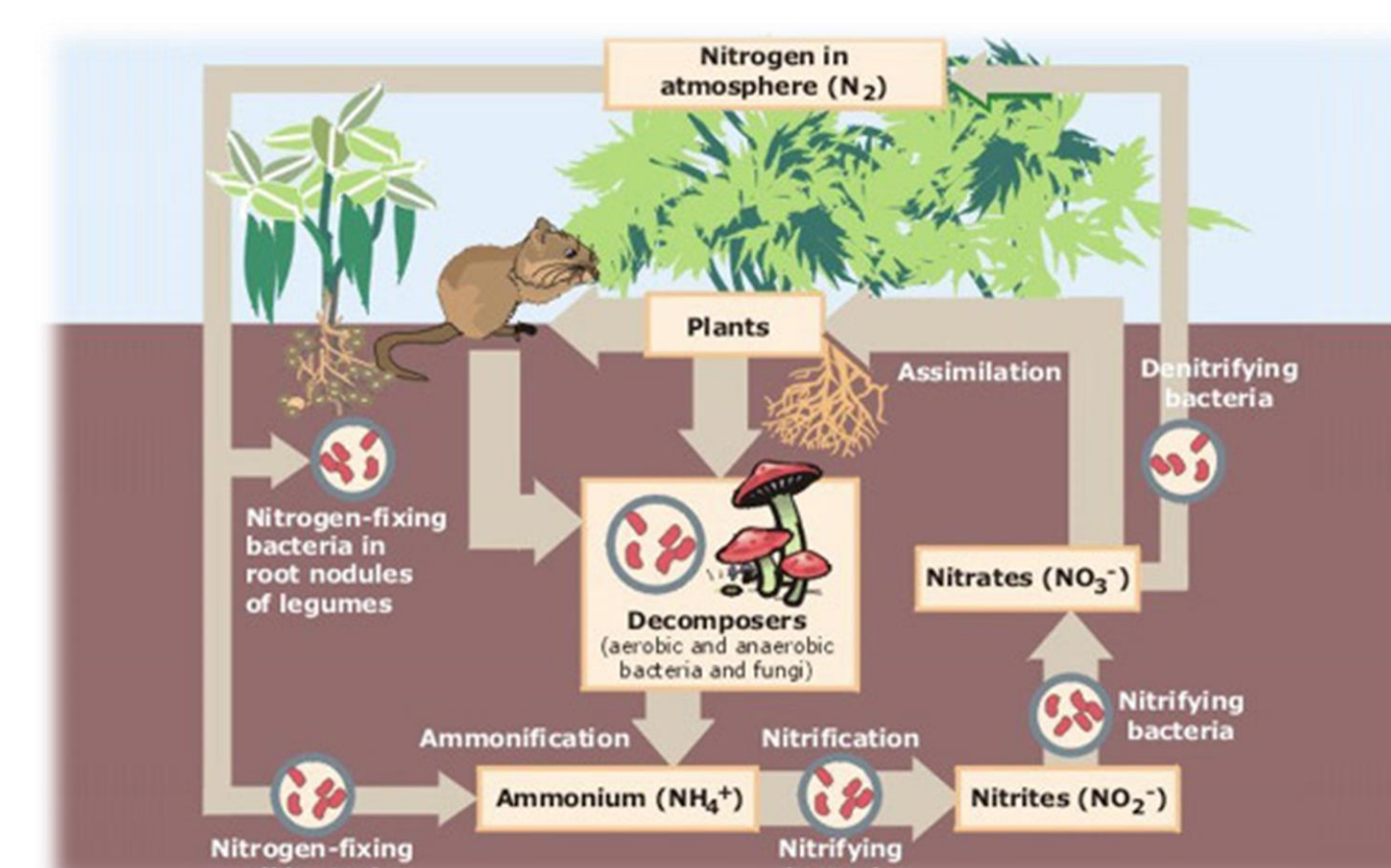
Sorensen-Dice index:

$$Q_s = \frac{2C}{(A + B)}$$

A = total number of taxa for site A

B = total number of taxa for site B

C = number of taxa that both sites have in common



Redworm
E. fetida

Results & Discussion

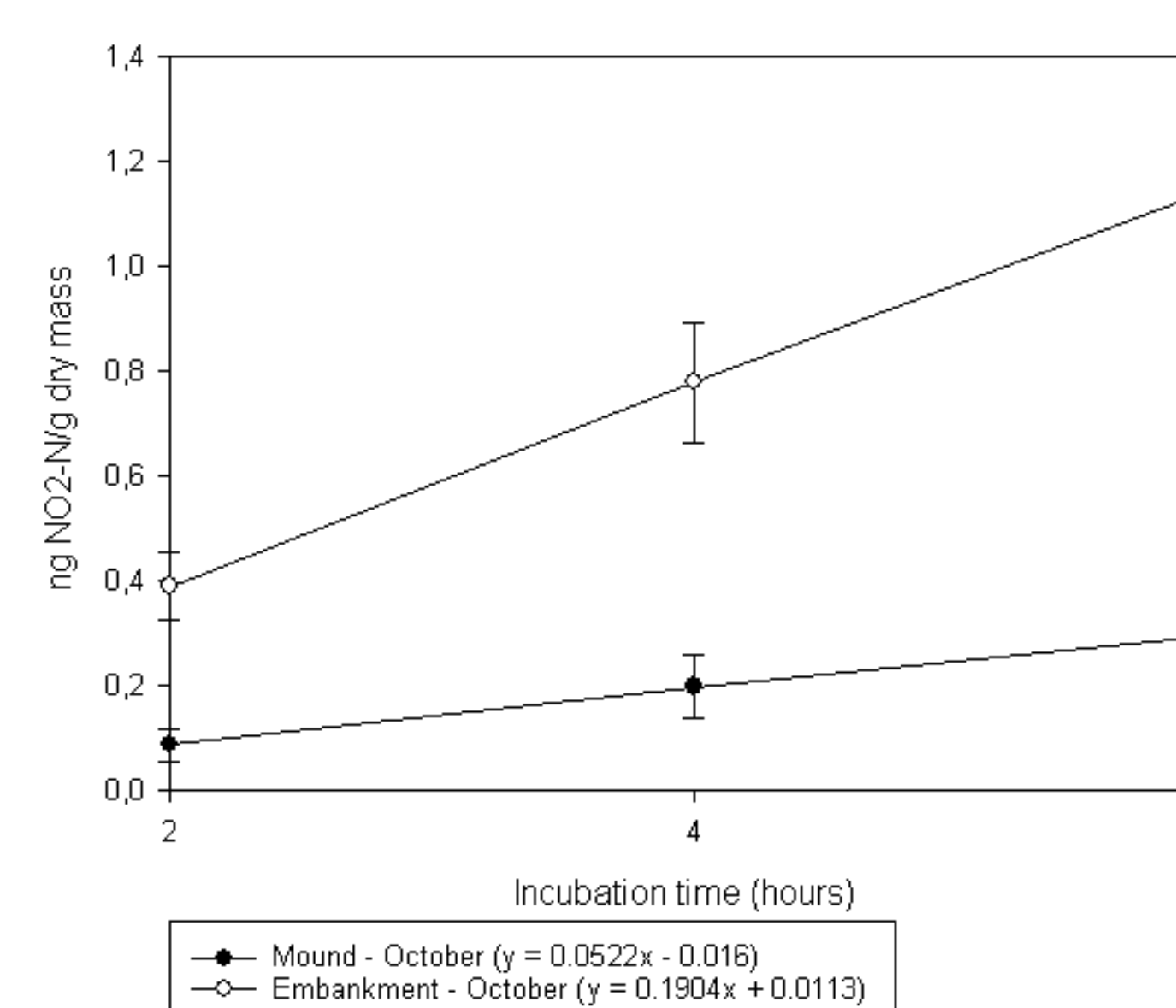
Fauna & flora survey

Similarity indexes	
Macro-arthropod communities	
Sites comparison	Qs
M (2017) - E (2018)	0,09
M (2018) - E (2018)	0,17
M (2017) - DS (2018)	0,26
M (2018) - DS (2018)	0,36
E (2018) - DS (2018)	0,08
Vegetal communities	
Sites comparison	Qs
M (2017) - RS (2018)	0,66
M (2018) - RS (2018)	0,63

M - 2017		
Family	Number of species	%
Asteraceae	8	17,78
Poaceae	6	13,33
Fabaceae	5	11,11
Polygonaceae	4	8,89
Other (17 families)	22	48,89
Total (21 families)	45	100,00
M - 2018		
Family	Number of species	%
Asteraceae	9	18,75
Poaceae	7	14,58
Fabaceae	4	8,33
Apiaceae	4	8,33
Other (19 families)	24	50,00
Total (23 families)	48	100,00
RS - 2018		
Family	Number of species	%
Asteraceae	6	17,65
Poaceae	6	17,65
Fabaceae	5	14,71
Other (13 families)	17	50,00
Total (16 families)	34	100,00

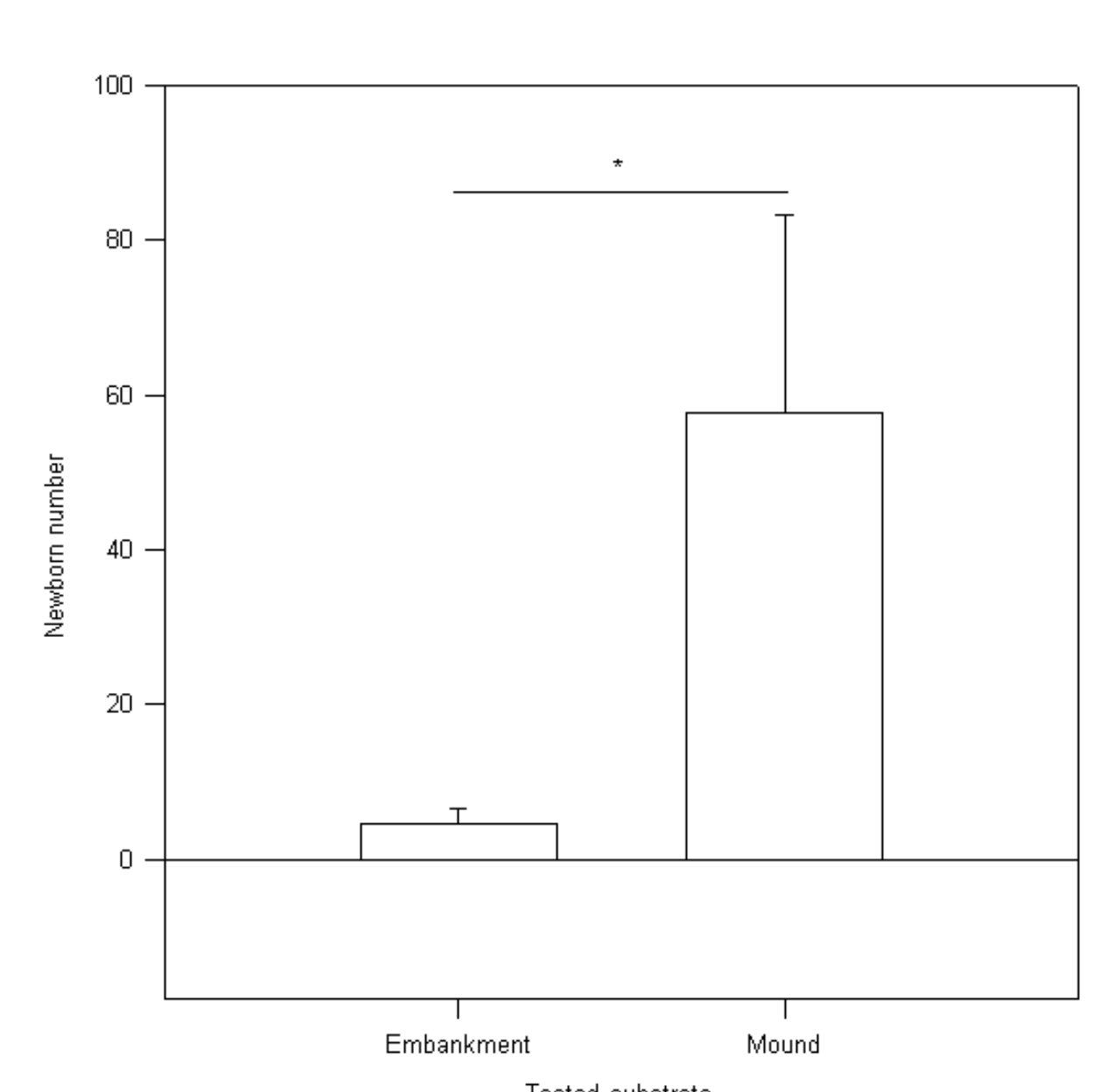
Determination of potential nitrification

Nitrification of tested substrates over time (October 2017)



E. Fetida reproduction test

Number of newborns by substrate (May 2018)



- Dissimilarity between the fauna of all studied sites because the Sorensen-Dice index is low ($Q_s = 0,36$ maximum) ; mound and disposal site are the most similar biotopes
- Mound and roadside flora are similar
- Vegetation related to environments neglected by anthropic activities on the mound and the roadside
- Mound, roadside and disposal site support nitrophilous plants

- Higher nitrification rate in embankment soil than in sediments from the mound
- Higher reproduction rate in sediments than in embankment soil
- Mound do not seem deficient in assimilable nitrogen (presence of nitrophilous plants)
- Sediments from the mound enhance reproduction rate

Conclusions

Monitored parameters show a good integration of the mound in the surrounding environment.

Sediment-based landscaping does not appear to represent an issue for the local fauna and flora nor soil biological processes.