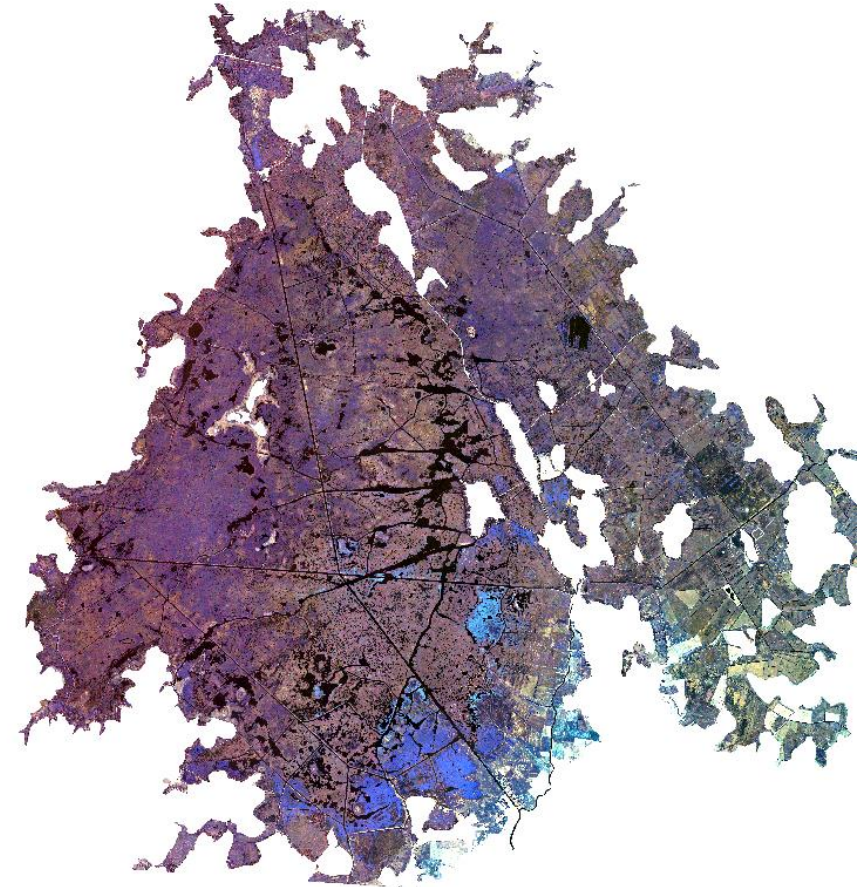


Remote sensing for mapping Natura 2000 habitats in the Brière marshes (France, Loire-Atlantique) : setting up a long-term monitoring strategy to understand changes

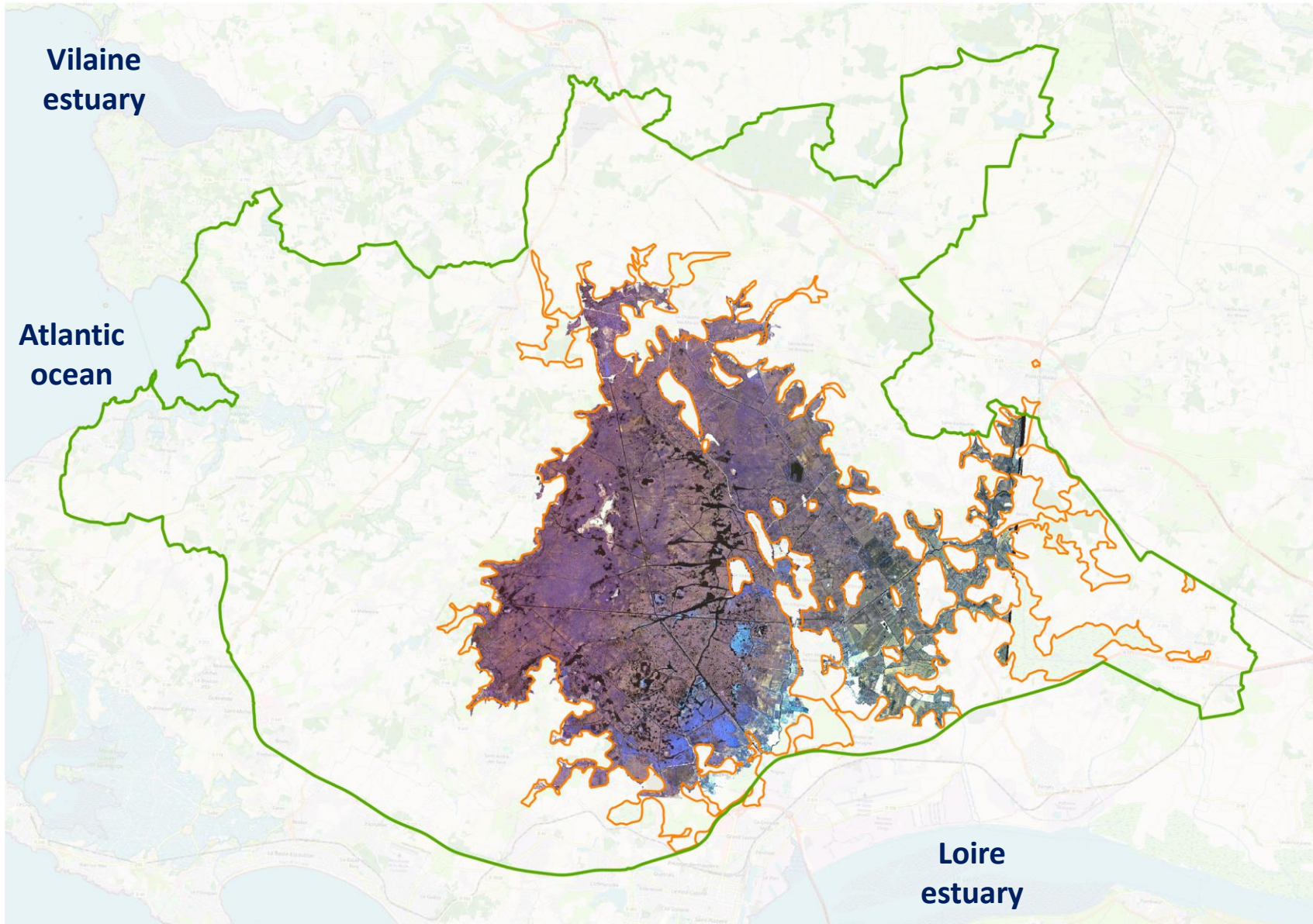
PhD student : Thomas LAFITTE
LETG, UMR 6554, Nantes University



CE PROJET EST COFINANCÉ PAR
LE FONDS EUROPÉEN DE DÉVELOPPEMENT RÉGIONAL



Study area

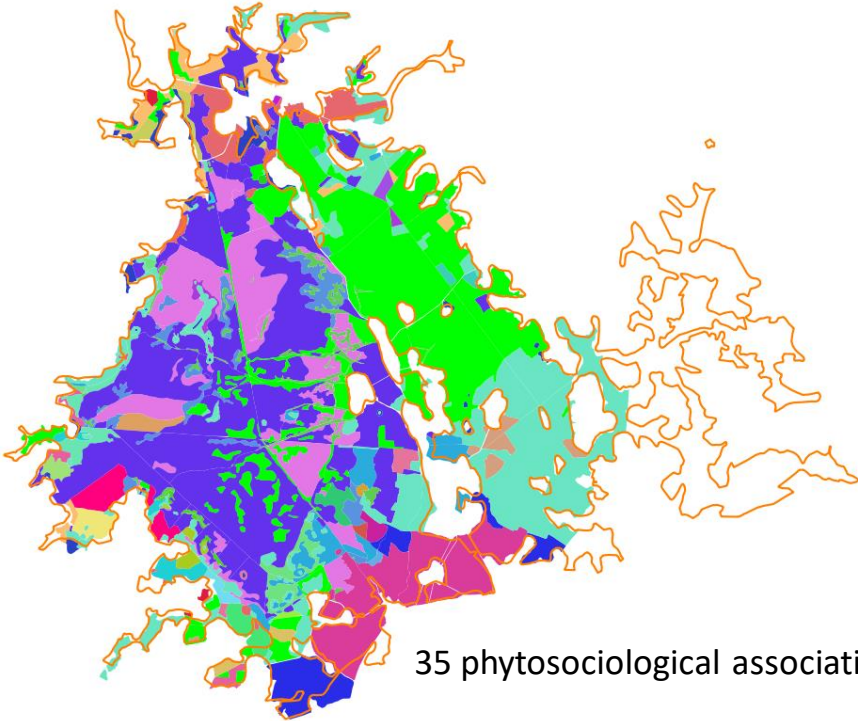


-  Regional natural park of Brière
-  Natura 2000 sector

Initial available data

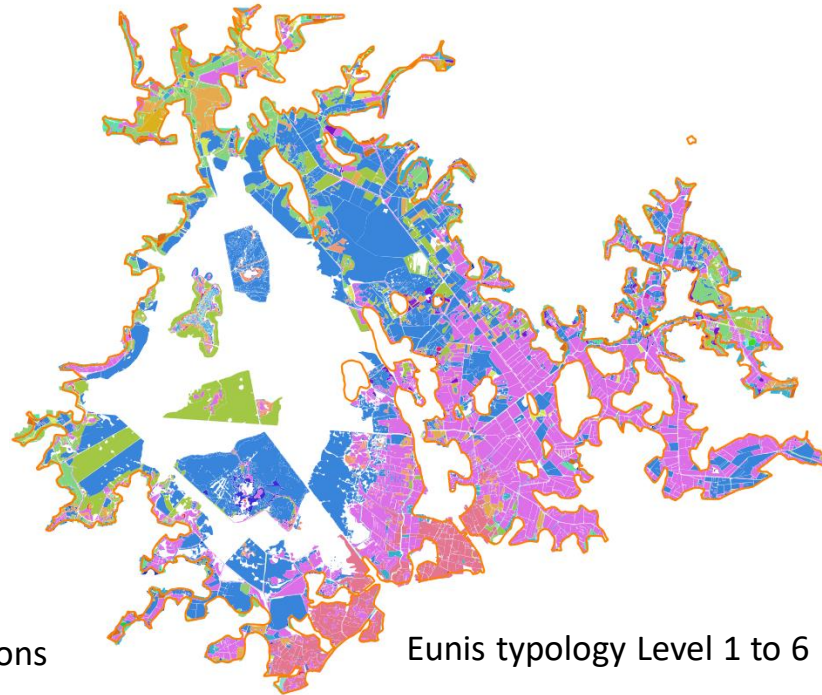
First plant communities map

(made in 1980)



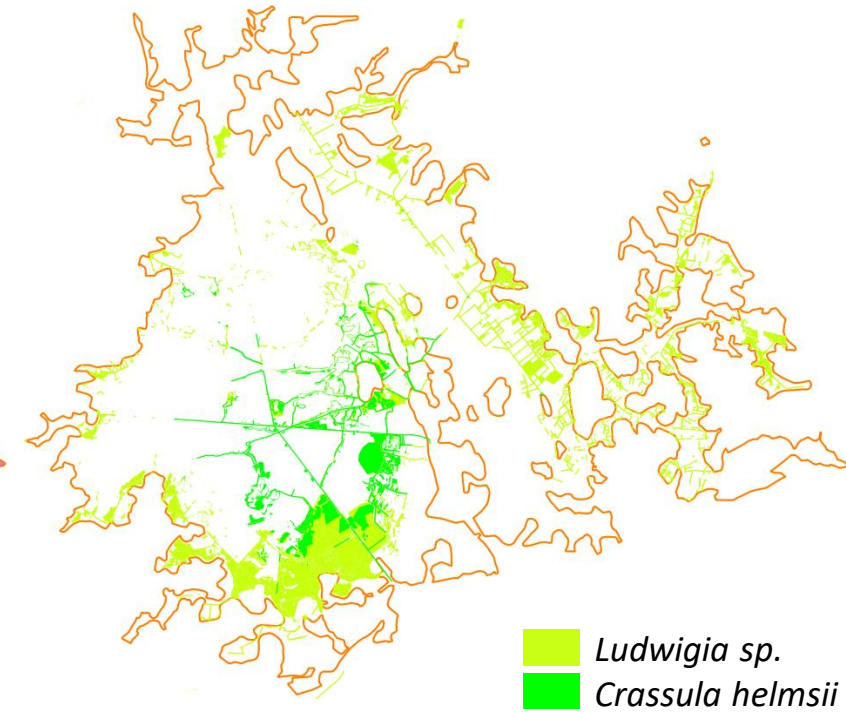
Natura 2000 map

(made between 2018 and 2020)



Invasive alien species map

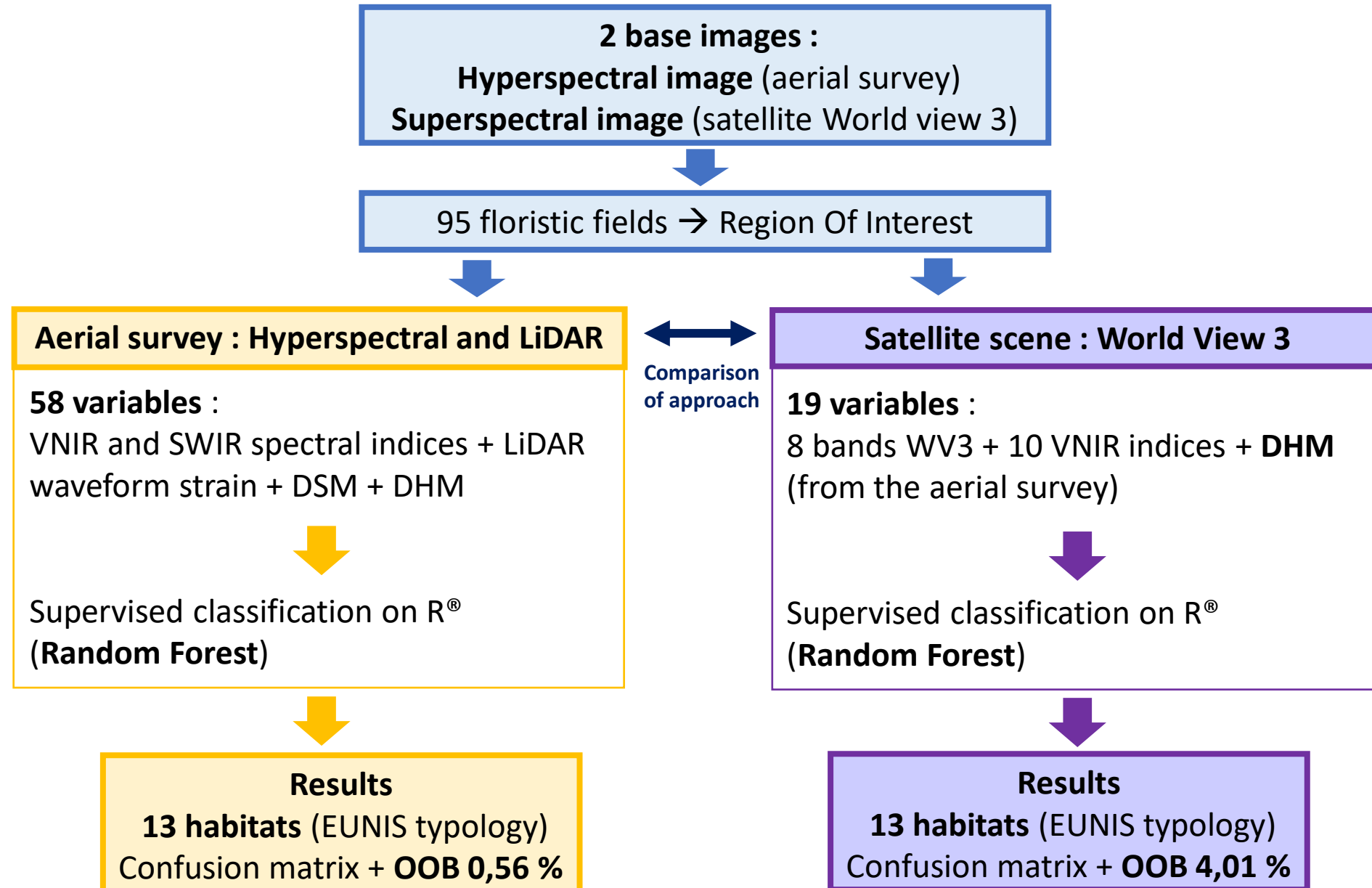
(updated each year by field surveys)



Hard access to the
extensive areas



Method : mapping the distribution of plant communities



Method : mapping trees and invasive alien species

Invasive alien species :



Ludwigia sp.



Crassula helmsii

Trees and woods :



Salix sp.



Satellite scene : World View 3

19 variables :

8 bands WV3 + 10 indices + DHM (from the airborne LiDAR)



Supervised classification on R[®]
(Random Forest)



Results

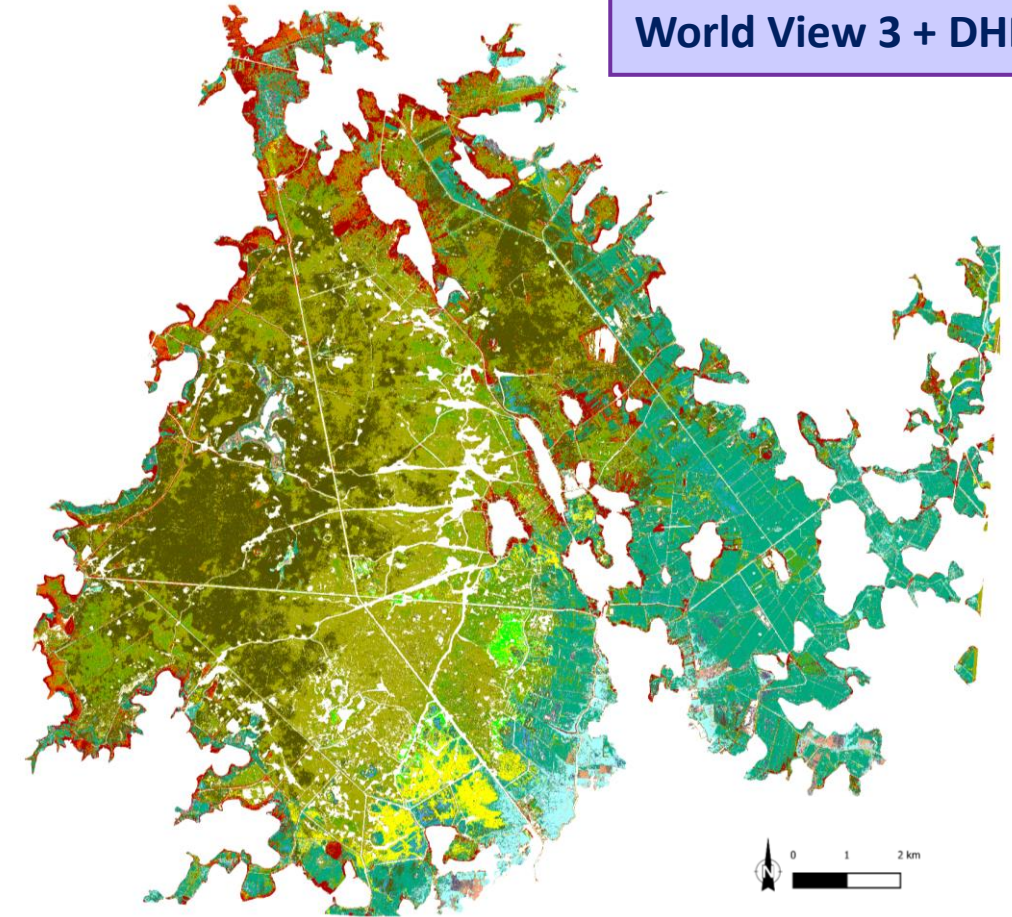
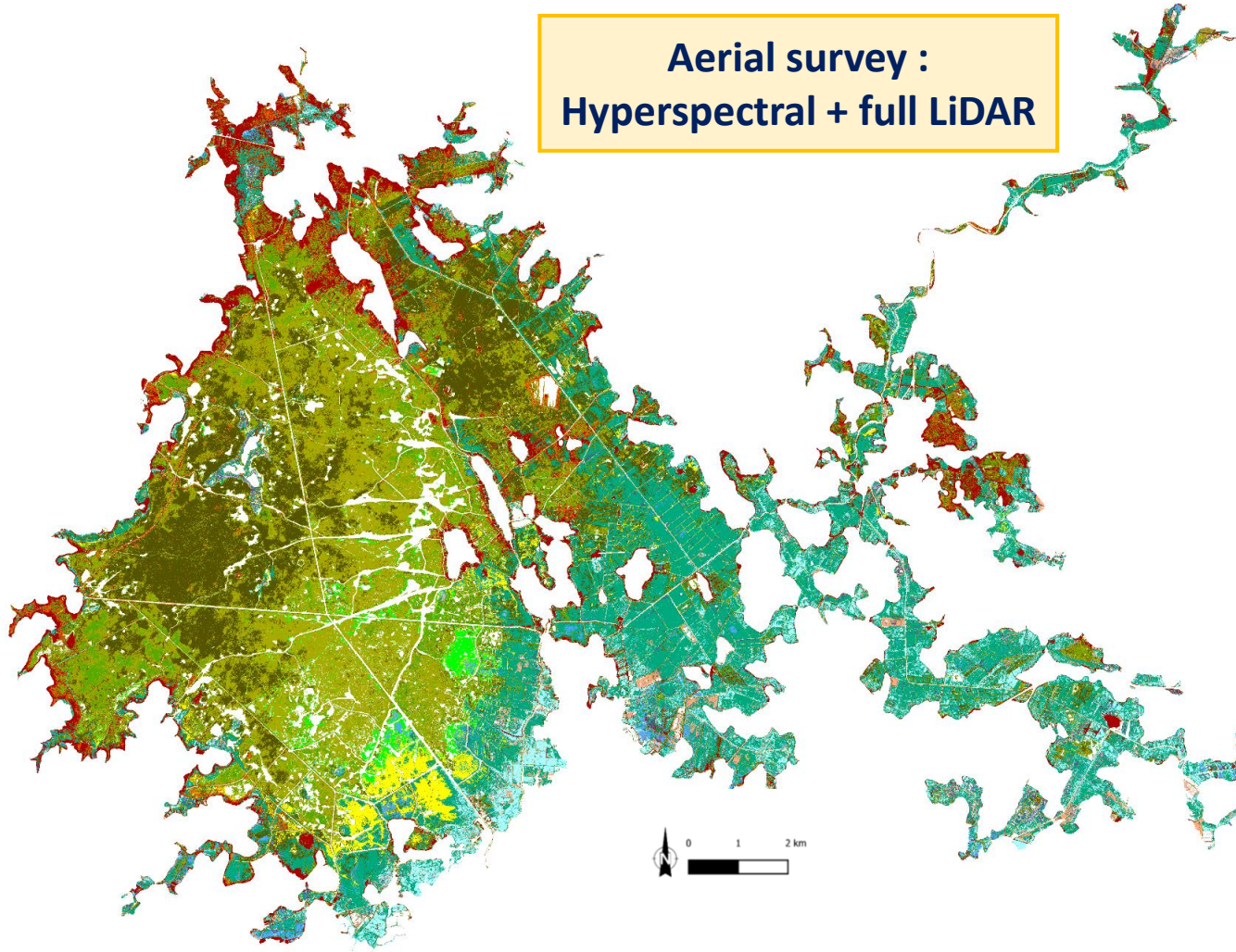
13 habitats (EUNIS typology)
Confusion matrix + OOB 4,01 %



Results : complete mapping according to EUNIS typology

Aerial survey :
Hyperspectral + full LiDAR

Satellite scene :
World View 3 + DHM



- EUNIS level 4** ▶
- A2.52 - Upper saltmarshes
 - C3.21 - Common reed ([Phragmites]) beds
 - C3.26 - Reed canary-grass ([Phalaris]) beds
 - C3.41 - Euro-Siberian perennial amphibious communities
 - D5.21 - Beds of large [Carex] species
 - E1.7 - Closed non-Mediterranean dry acid and neutral grassland

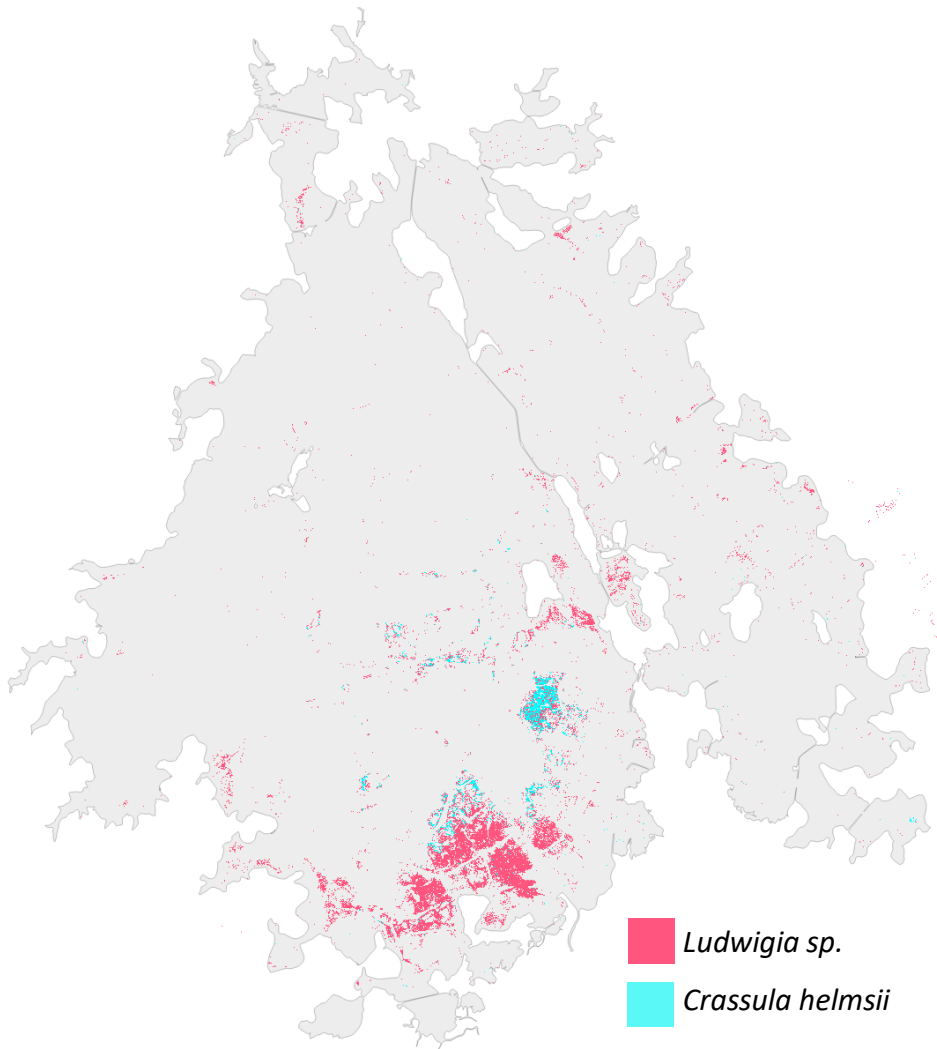
- E3.41 - Atlantic and sub-Atlantic humid meadows
- E3.44 - Flood swards and related communities
- E3.51 - Purple moorgrass ([Molinia]) meadows
- F9. 2 - Willow carr and fen scrub
- G1. 81 - Atlantic pedunculate oak - birch woods

Others ▶

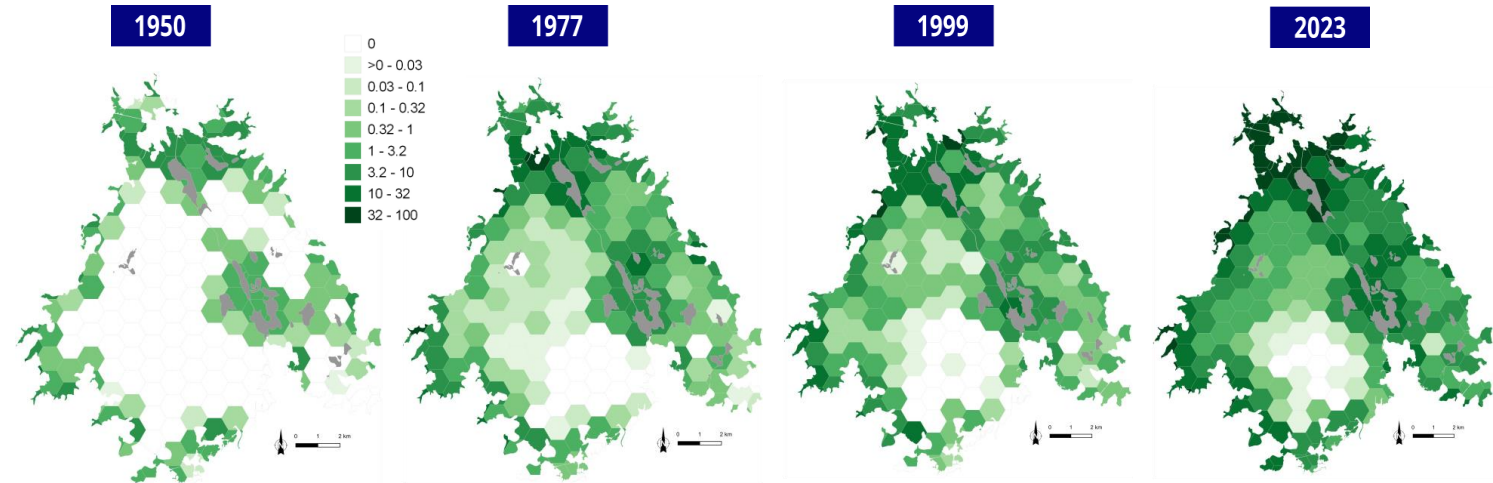
- *Ludwigia sp.*
- *Crassula helmsii*

Results : mapping trees and invasive alien species

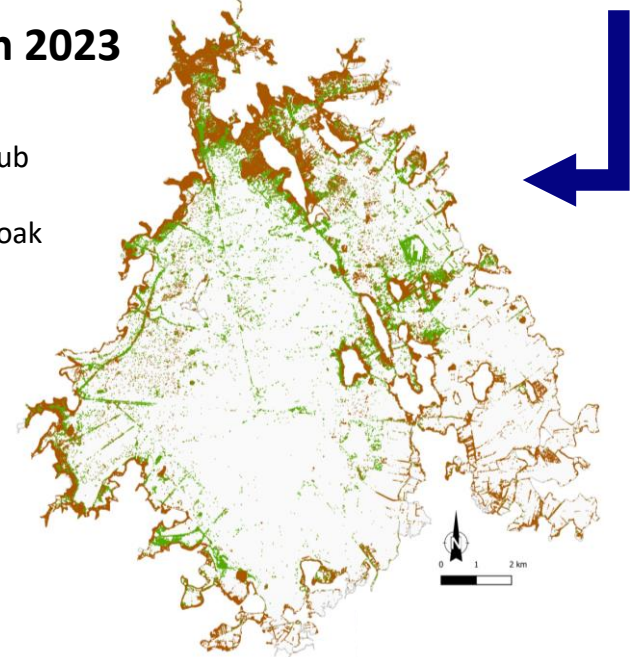
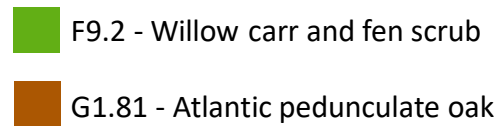
► Detection of 2 invasive alien species in 2023



► Percentage of trees occupation evolution from 1950 to 2023



► Two trees species distribution in 2023

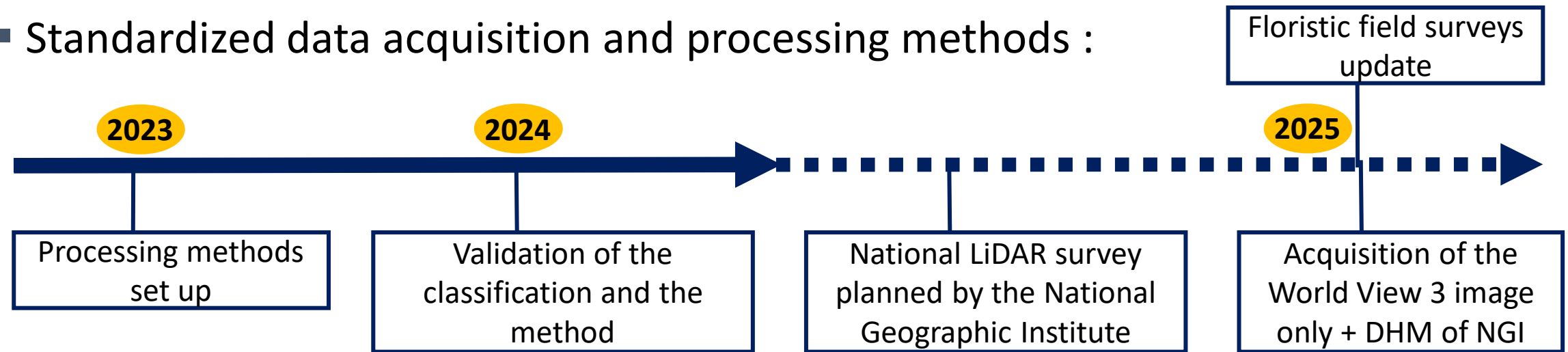


Conclusions and perspectives

- Complete mapping, according to the Eunis typology

- Including classic communities + exotic species

- Standardized data acquisition and processing methods :



- Long-term changes monitoring

- Assess the quality of the biodiversity and the resilience of plant formations

Thank you for your attention



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