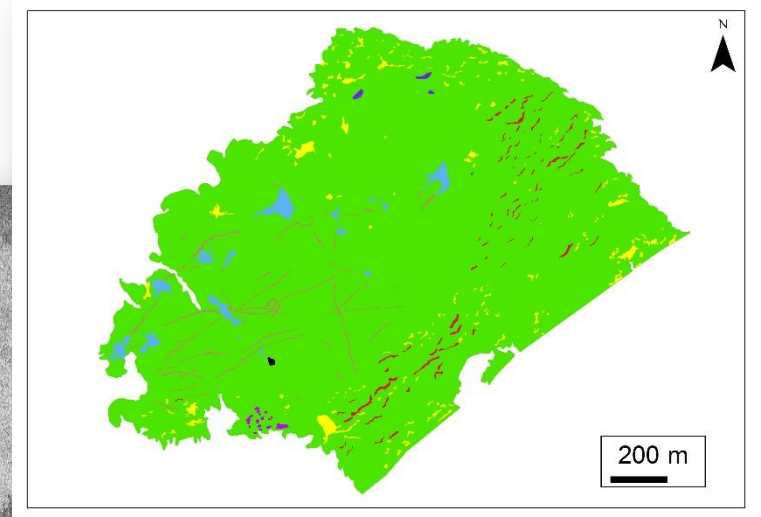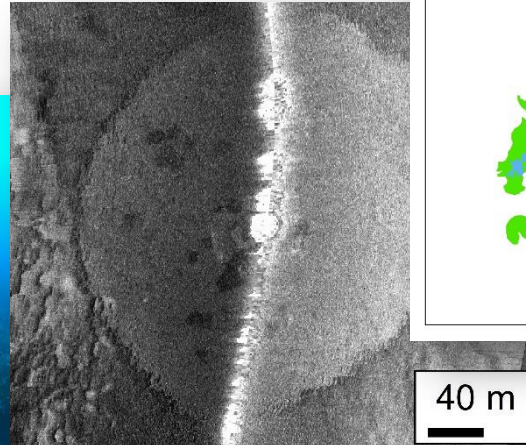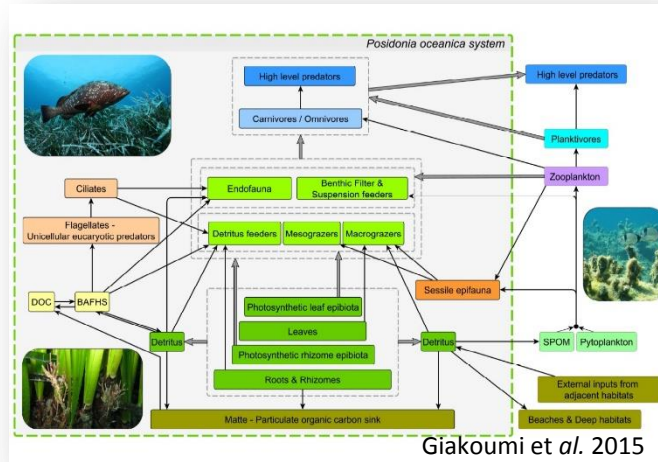# Patch types in *Posidonia oceanica* meadows around Corsica
How can we use them in seascape ecology?

Sardinia, Italy - May 2015

Arnaud Abadie, Marina Bonacorsi, Sylvie Gobert, Pierre Lejeune, Gérard Pergent, Christine Pergent-Martini

Giakoumi et *al.* 2015

Assessment of conservation state for managing purpose
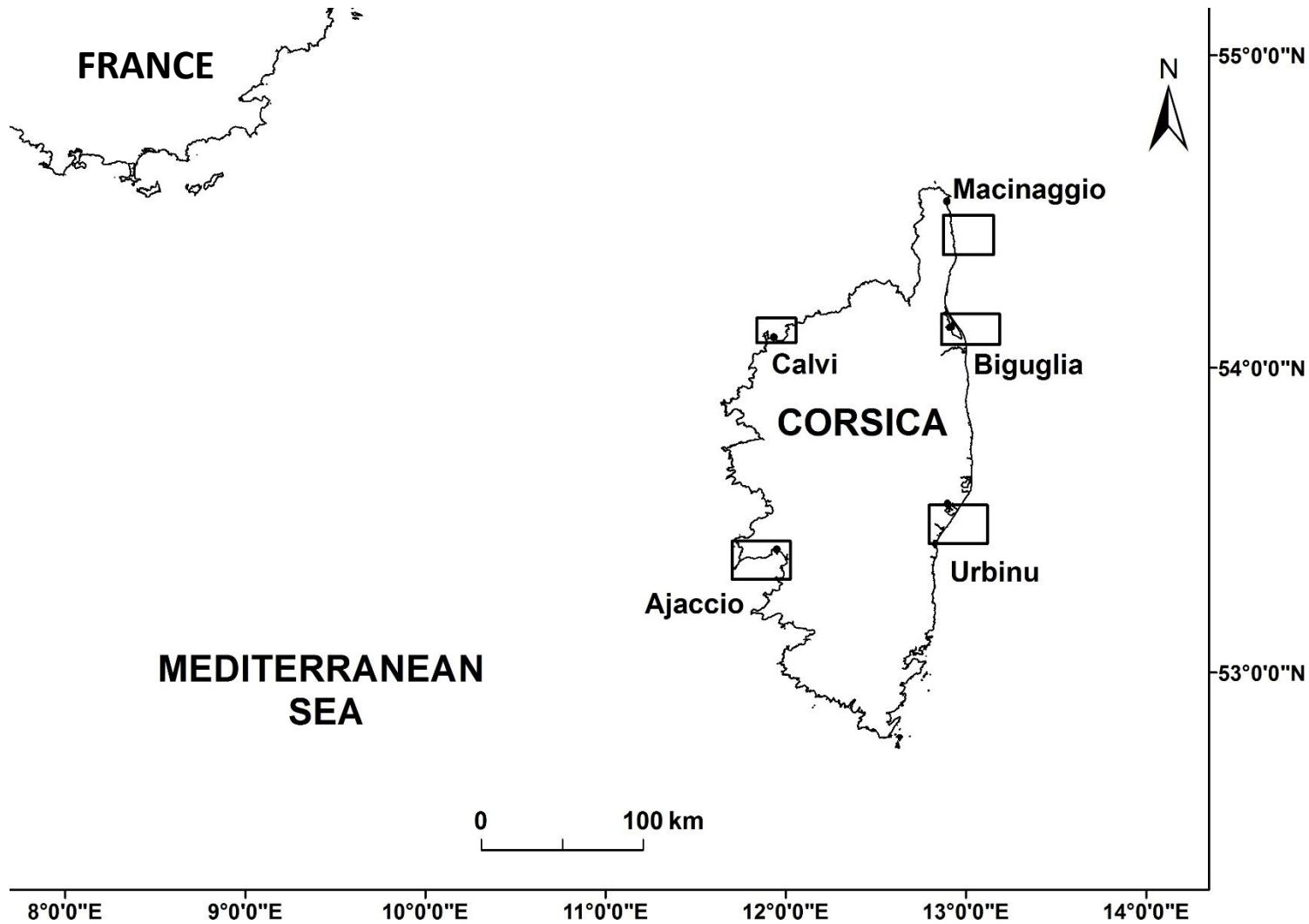
Whole ecosystem functioning

Meadows structure

Large scale studies of *Posidonia oceanica* meadows functioning => **seascape ecology**
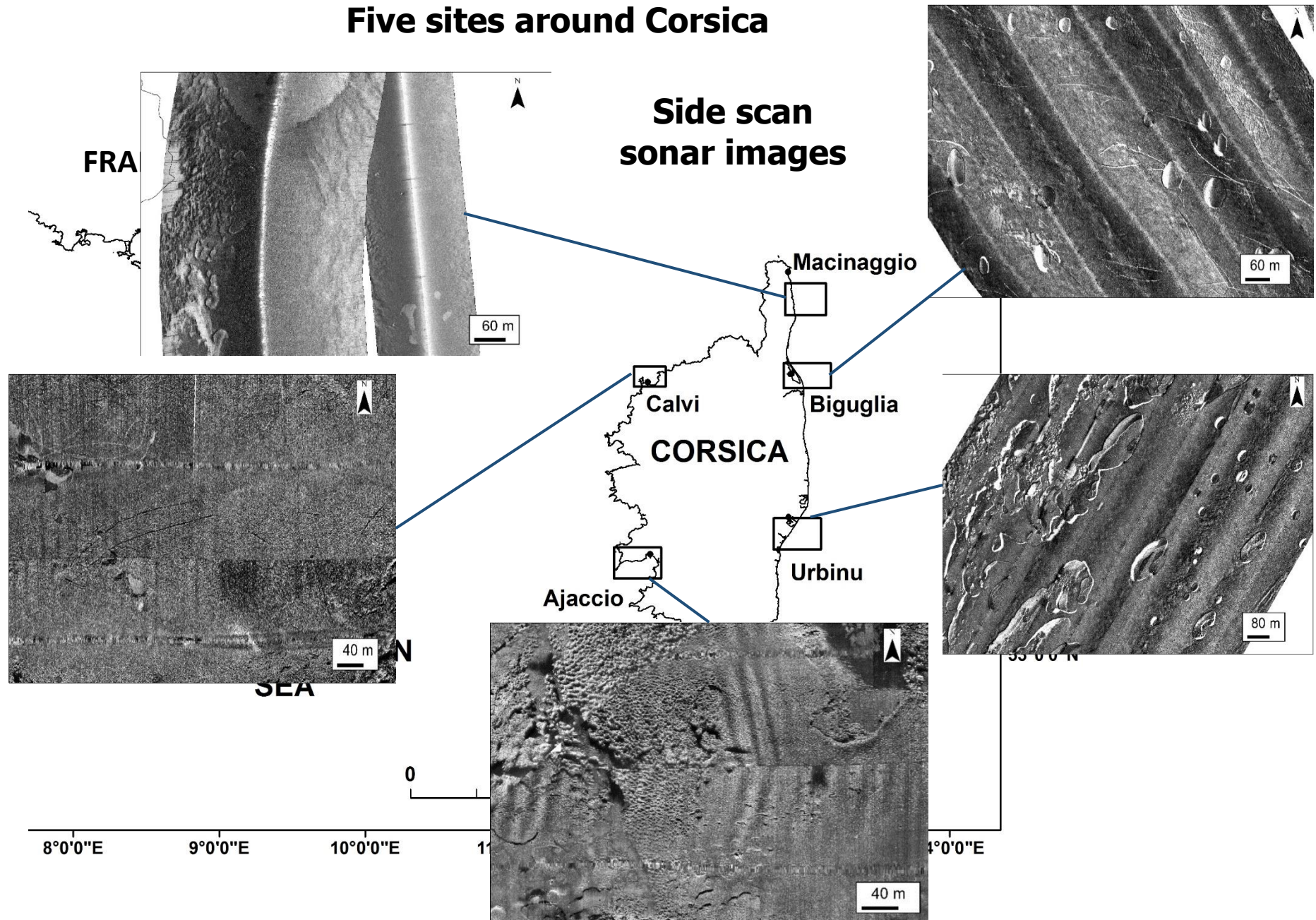
Five sites around Corsica

Five sites around Corsica

Side scan sonar images
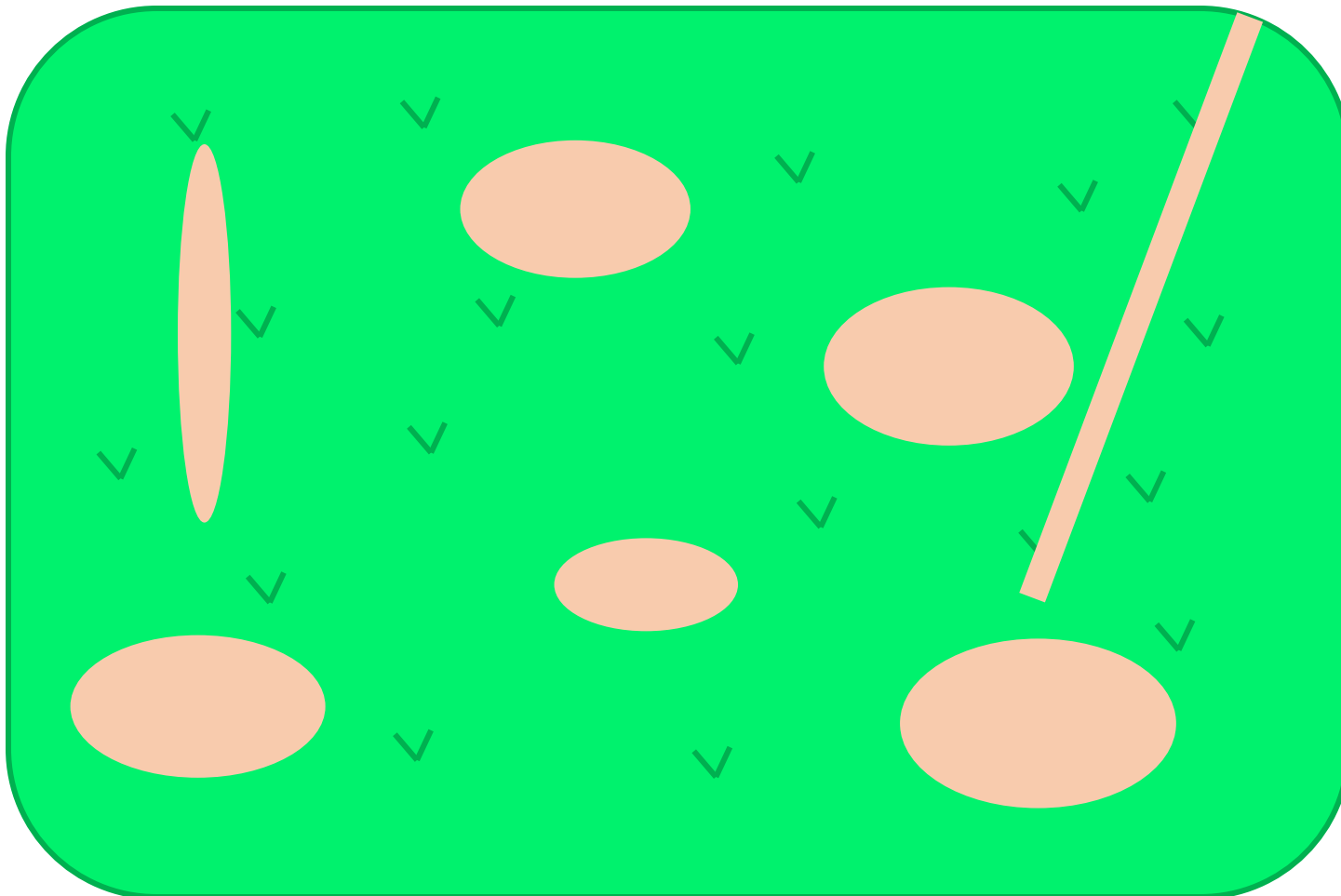
Continuous meadow

Meadow matrix

No patches

No natural or anthropogenic impact

Heterogeneous meadow

Multiple patches of different sizes and shapes forming various habitats

Heterogeneous meadow

Multiple patches of different origins:
natural
vs
anthropogenic
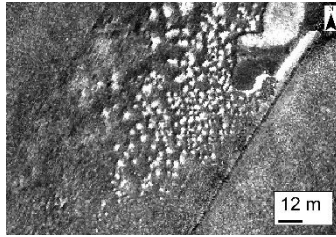
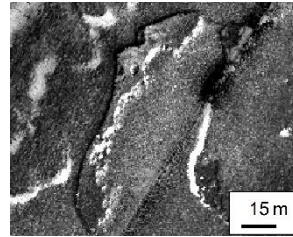# Heterogeneous meadow

Multiple patches of various types
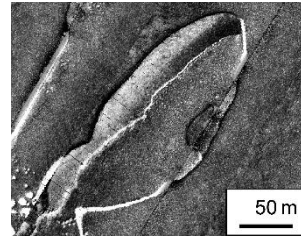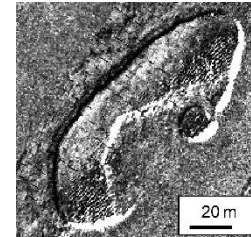
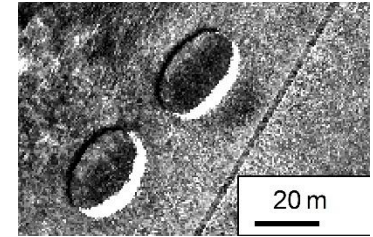# 11 types (or classes) of patch identified

5 natural

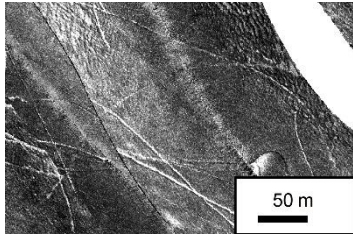Small sand patch   Sand corridor   Large sand patch   Colonized patch   Ovoid patch
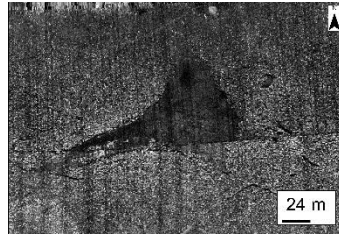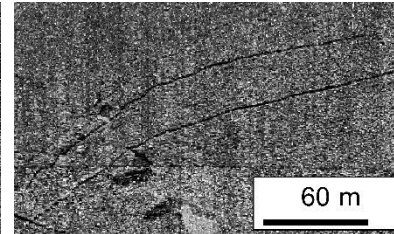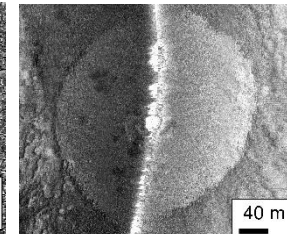
5 anthropogenic

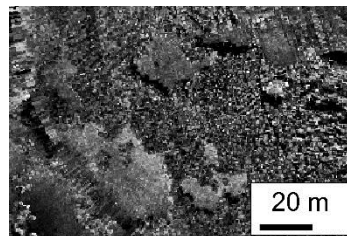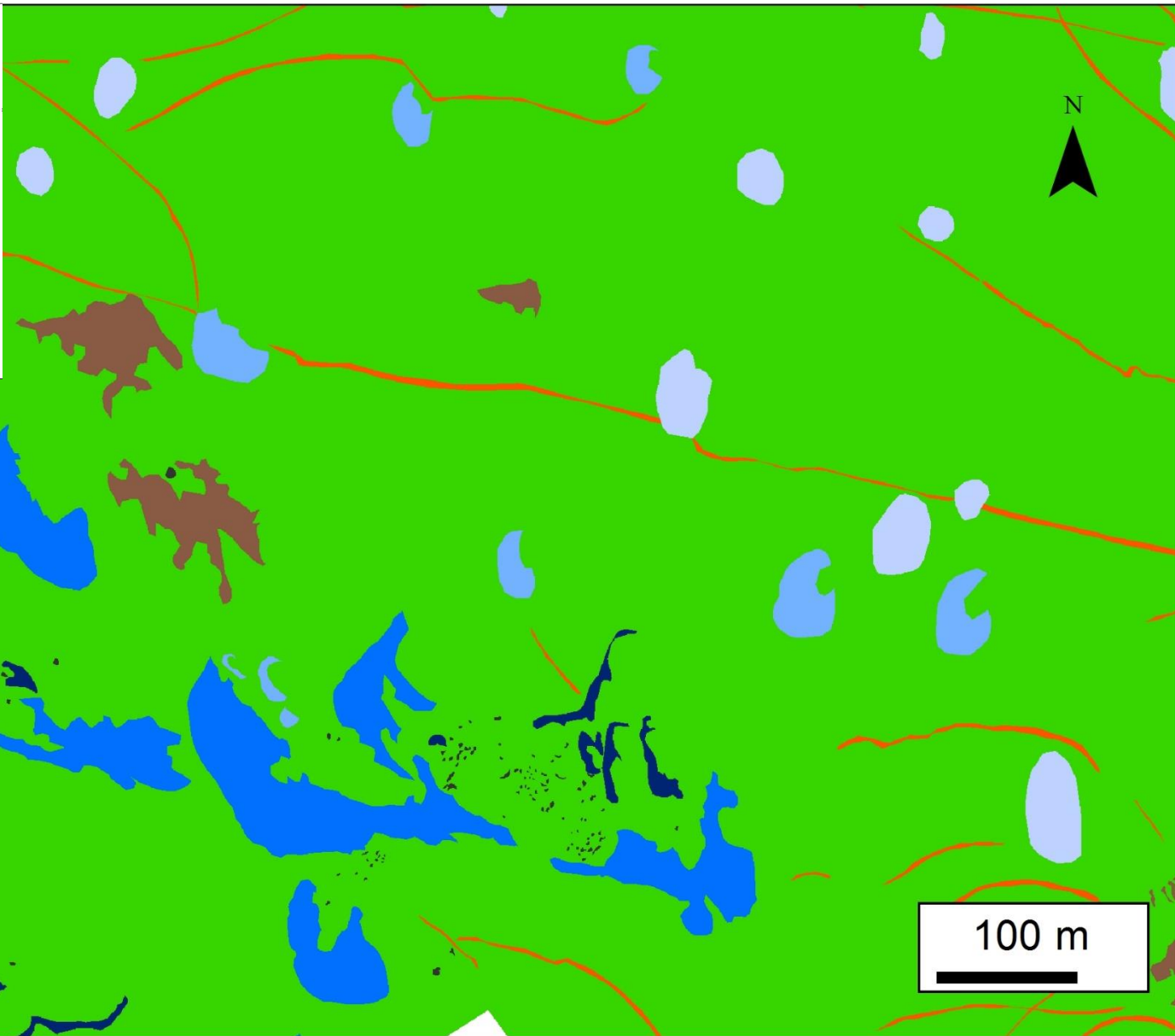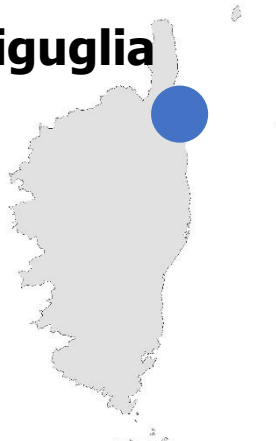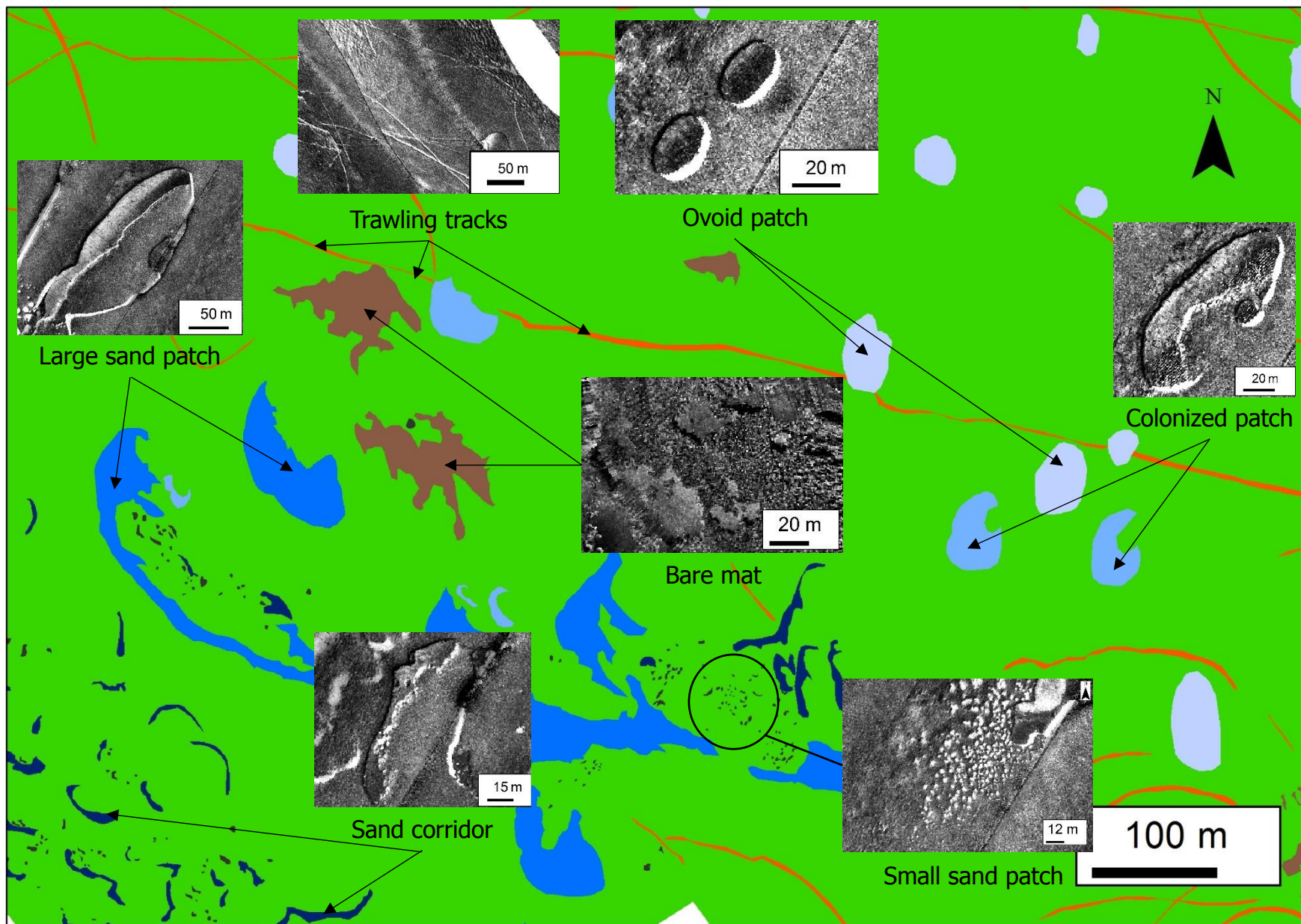Trawling tracks   Anchoring patch   Anchoring track   Bomb impact   Fish farm patch
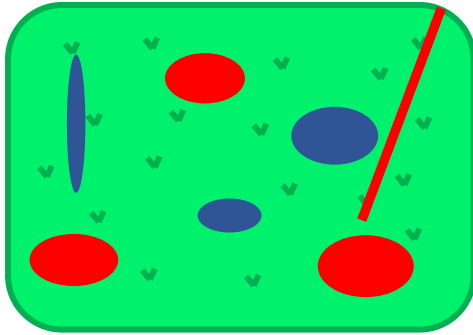
1 can be of both origins

Bare mat

Biguglia

100 m

Trawling tracks

Ovoid patch

Large sand patch

Colonized patch

Bare mat

Sand corridor

Small sand patch

50 m

20 m

50 m

20 m

20 m

15 m

12 m

100 m

N

Seascape analysis

natural vs anthropogenic

A simple area index

$$PaSI = \frac{S_{NP}}{S_{NP} + S_{AP}}$$

S_{NP}: surface of natural patches
S_{AP}: surface of anthropogenic patches

PaSI Value	Description	Color	Site
0.801 - 1	High natural influence on the meadow patchiness	Blue	Urbinu
0.601 - 0.800	Major natural influence on the meadow patchiness	Green	
0.401 - 0.600	Moderate anthropogenic influence on the meadow patchiness	Yellow	Ajaccio, South Macinaggio, Biguglia
0.201 - 0.400	Major anthropogenic influence on the meadow patchiness	Orange	Calvi
0 - 0.200	High anthropogenic influence on the meadow patchiness	Red	

Seascape analysis

patch **types**
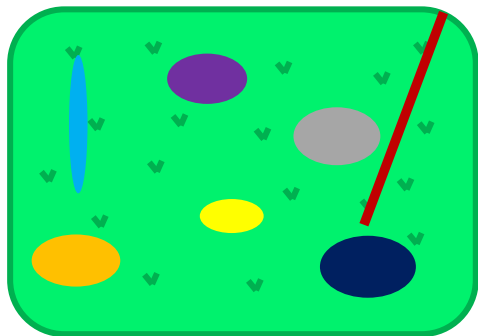
Several patch classes discriminated by their **characteristics**
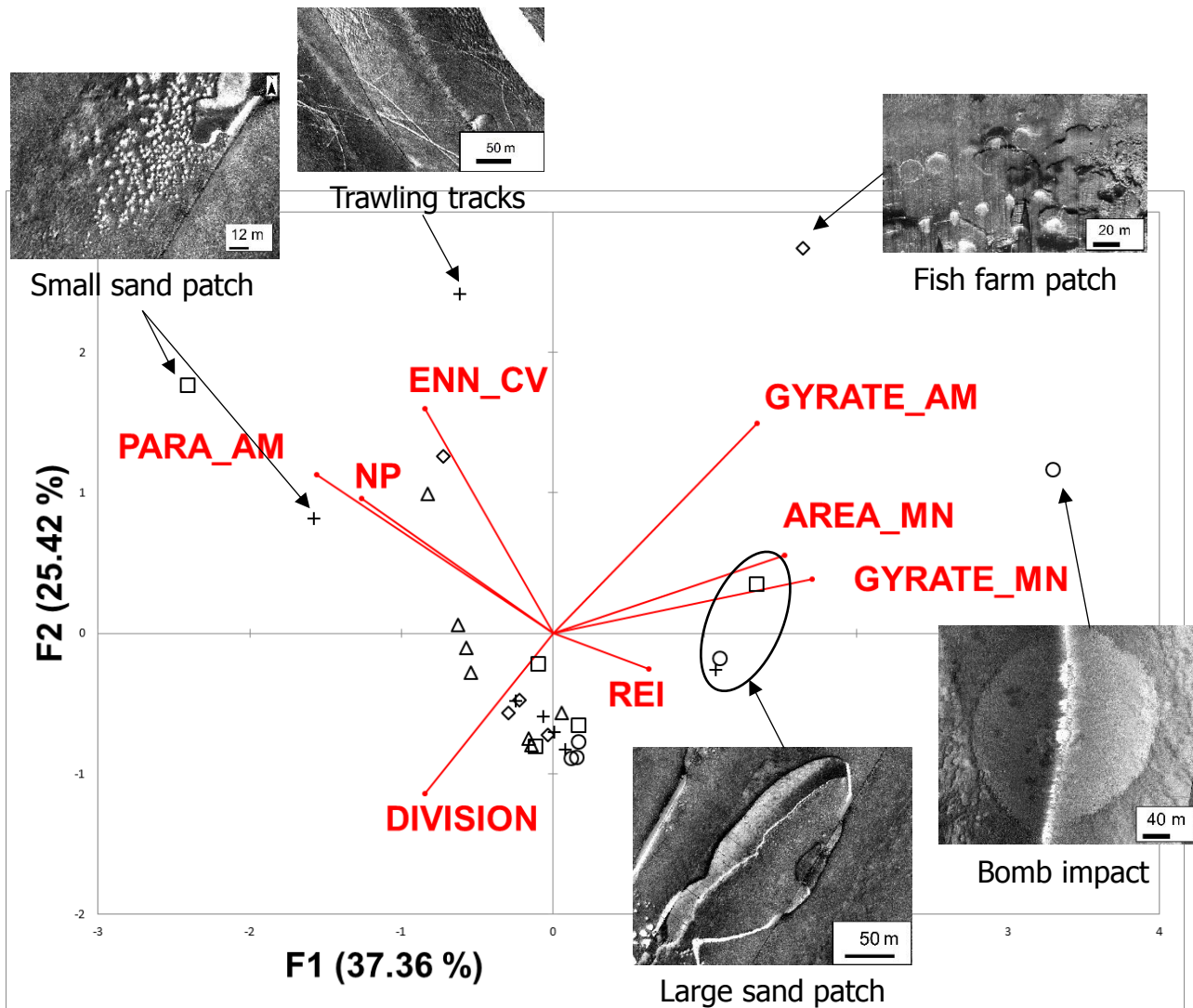
Seven landscape metrics + a water movement index (REI) used at patch class level

Trawling tracks

Fish farm patch

Small sand patch

ENN_CV

GYRATE_AM

PARA_AM

NP

AREA_MN

GYRATE_MN

REI

F2 (25.42 %)

DIVISION

Bomb impact
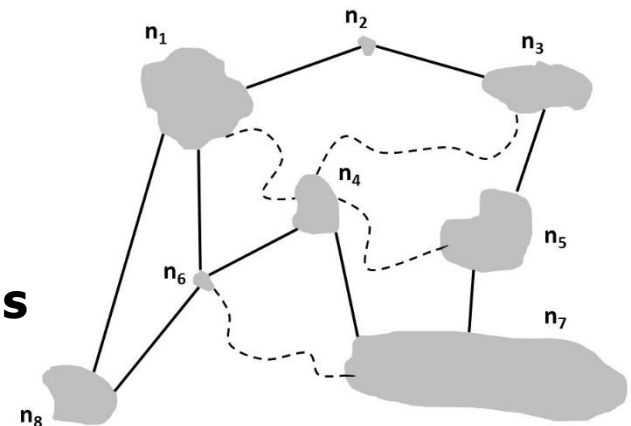
Large sand patch

F1 (37.36 %)

<u>Take-home message</u>

- **11 patch classes** recognizable with sonar images

- *P. oceanica* seascapes **structured by natural and anthropogenic patches**

- **A great potential use of patch classes characteristics to compute new conservation indices**

<u>Going further</u>

- **Combine structure and function at large scale**

- **3D maps and analyses of seascapes**

- **Use of the most recent landscape ecology tools (e.g. landscape graphs)**

Thanks for your attention!