Bilan des travaux phytosociologiques et présentation des cartes des systèmes de végétation des îles Éparses (Europa, Juan de Nova, Les Glorieuses & Tromelin)

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Siège des TAAF, Saint-Pierre, 19 & 20 février 2020

Conservatoire Botanique National MASCARIN

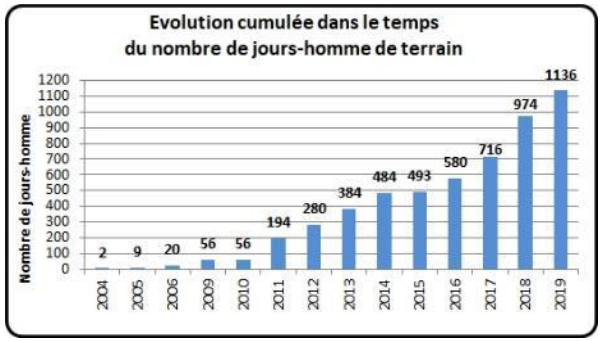
Conservatoire Botanique de ILES EPARSES MASCARIN

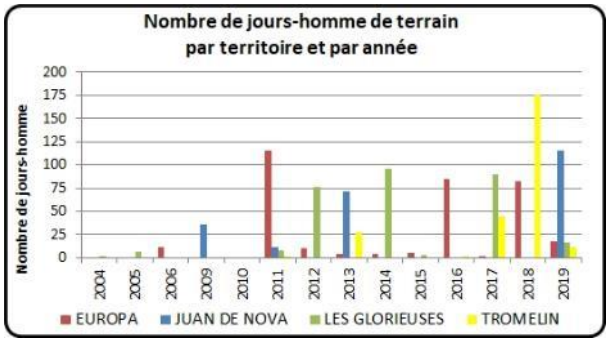
IGN INSTITUT NATIONAL DE L'INFORMATION GÉOGRAPHIQUE ET FORESTIÈRE

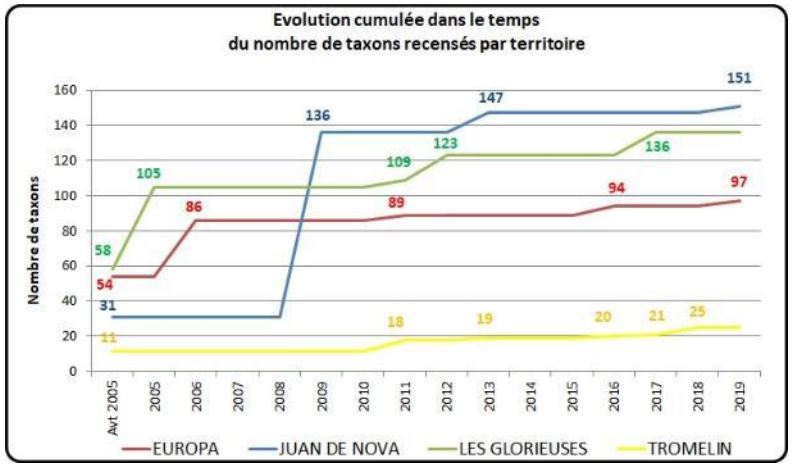
Liberté • Égalité • Fraternité
RÉPUBLIQUE FRANÇAISE
TERRES AUSTRALES ET ANTARCTIQUES FRANÇAISES

Préambule

- Missions terrain (2004 – 2019) :
  - 39 missions
  - 1136 jours-hommes
  - 17 personnels CBNM

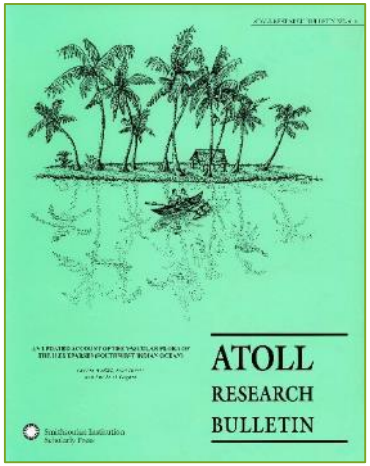






- Bilan floristique actualisé

- Publication de référence



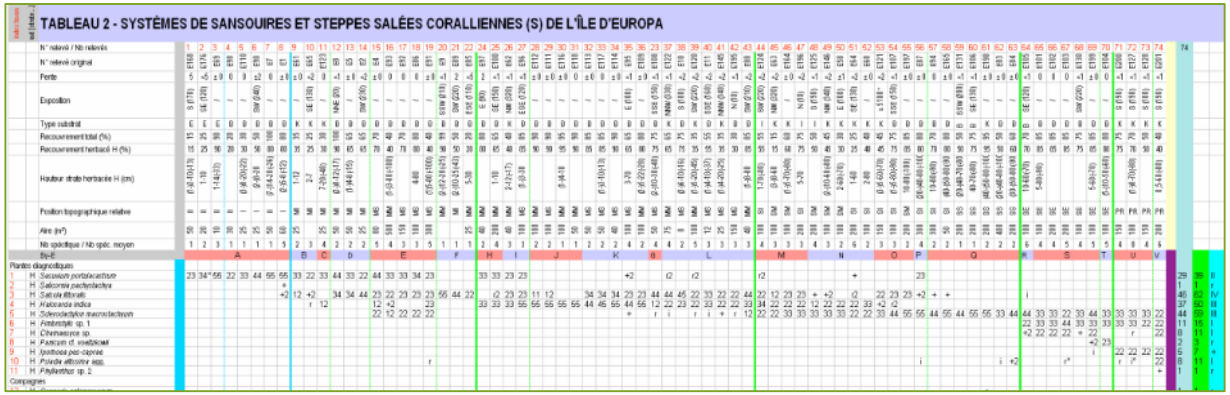
BOULLET V., HIVERT J. & GIGORD L., 2018. An Updated Account of the Vascular Flora of the Iles Eparses (Southwest Indian Ocean). Atoll Research Bulletin. 1-64. 10.5479/si.0077-5630.614.

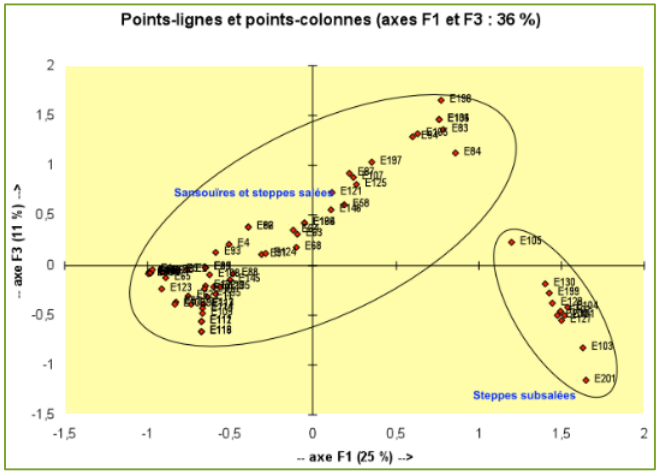
Travaux phytosociologiques

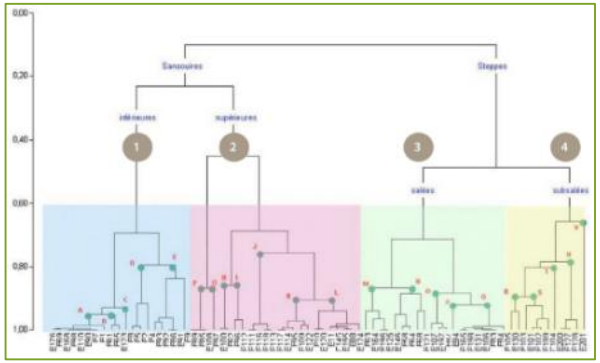
- Relevés de terrain (2004 – 2019) :
  - 10 missions
  - 129 jours-hommes

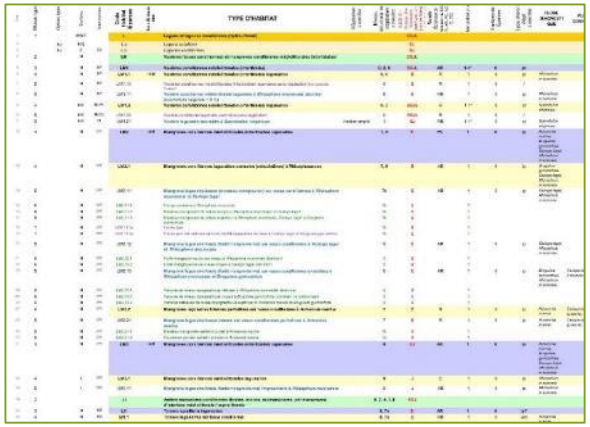
BILAN DES RELEVÉS PHYTOSOCIOLOGIQUES (2004 - 2019)	Nb de relevé	Nb de transect
EUROPA	529	90
JUAN DE NOVA	595	101
LES GLORIEUSES	510	95
TROMELIN	103	4
ÎLES ÉPARSES	**1737**	**290**

- Saisie et analyse des données :
  - Classification et ordination
  - AFC





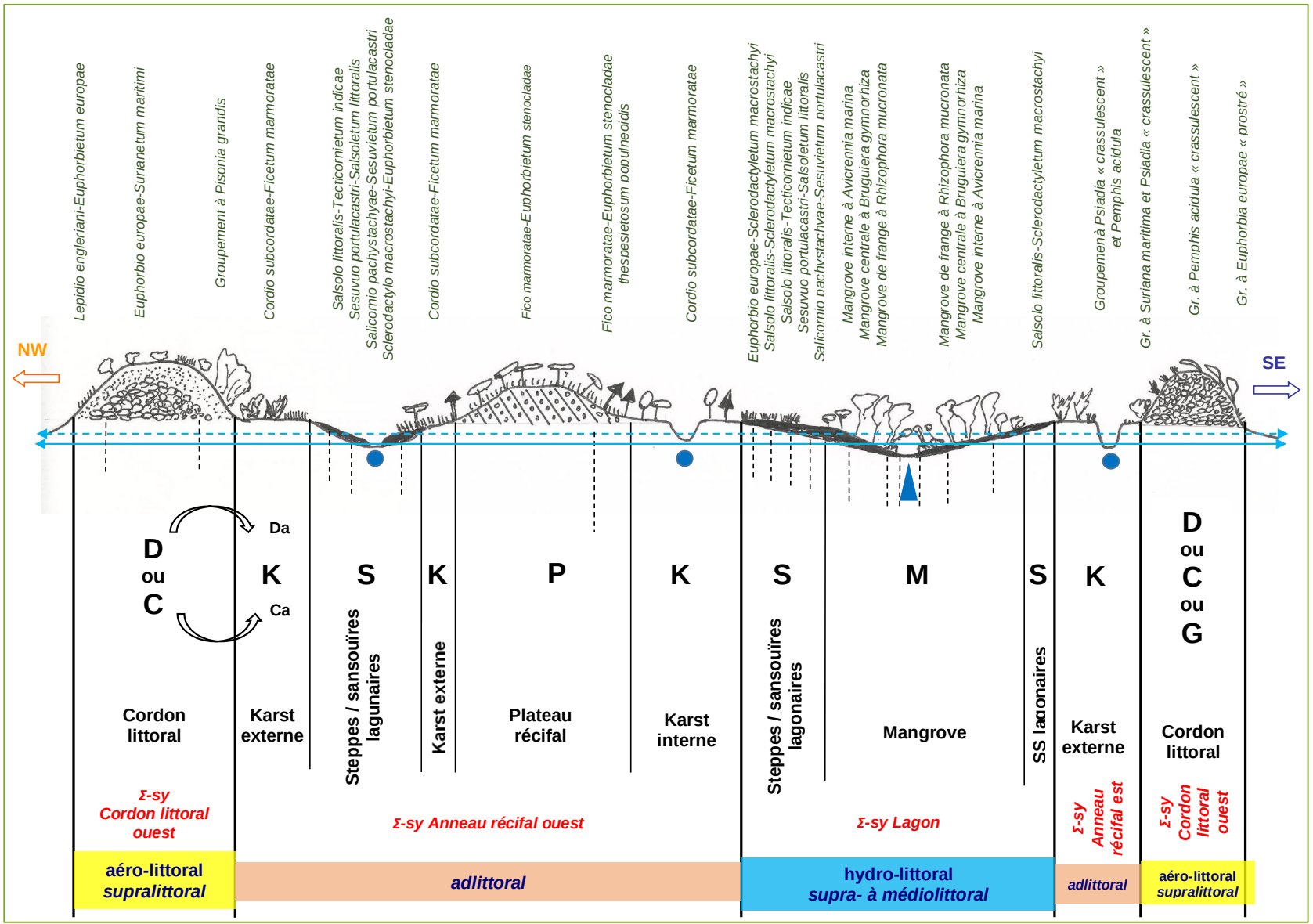




- Classification ascendante hiérarchique
- Typologie d'habitats terrestres et littoraux (pro parte) des îles Éparses

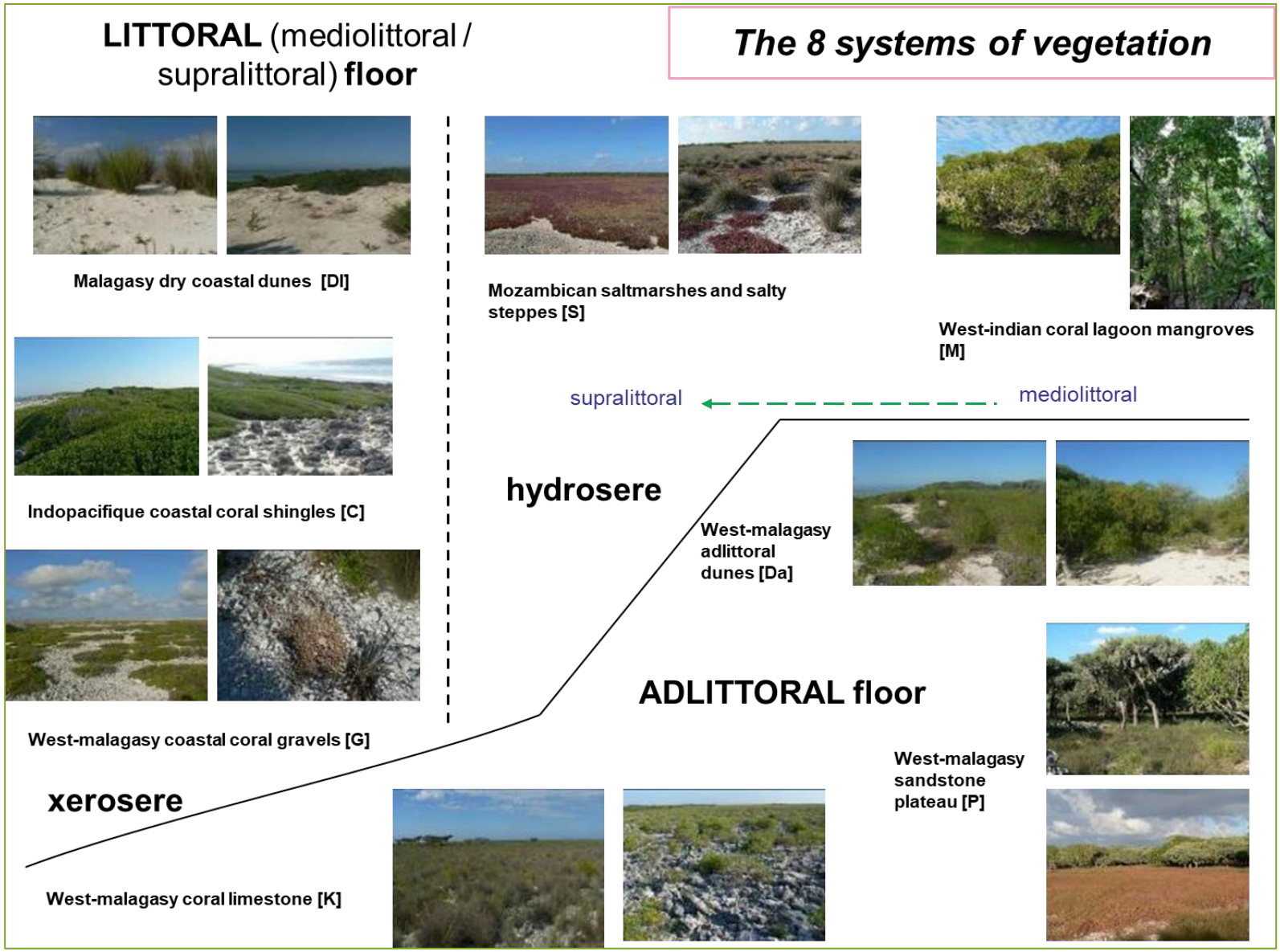
Travaux phytosociologiques

- Notions de ‘série’ et de ‘système’



Travaux phytosociologiques

- Notions de ‘série’ et de ‘système’



Travaux phytosociologiques

The 8 systems of vegetation

LITTORAL (mediolittoral / supralittoral) **floor**


Malagasy dry coastal dunes [Dl]


Indopacifique coastal coral shingles [C]


West-malagasy coastal coral gravels [G]


Mozambican saltmarshes and salty steppes [S]


West-indian coral lagoon mangroves [M]

supralittoral ← mediolittoral

hydrosere


West-malagasy adlittoral dunes [Da]

ADLITTORAL floor

West-malagasy sandstone plateau [P]

xerosere


West-malagasy coral limestone [K]

Méthodes | Europa | Juan de Nova | Les Glorieuses | Tromelin

Travaux phytosociologiques

salinity gradient

Sesuvium portulacastrum **mediolittoral saltmarsh**

Sesuvium portulacastrum - Salsola littoralis **very lower supralittoral saltmarsh**

Salsola littoralis - Halosarcia indica **lower supralittoral saltmarsh**

Salsola littoralis - Sclerodactylon macrostachyum **middle supralittoral steppe / saltmarsh**

Sclerodactylon macrostachyum upper supralittoral subsalty steppes

< 1 m

médiolittoral

lower

supralittoral

upper

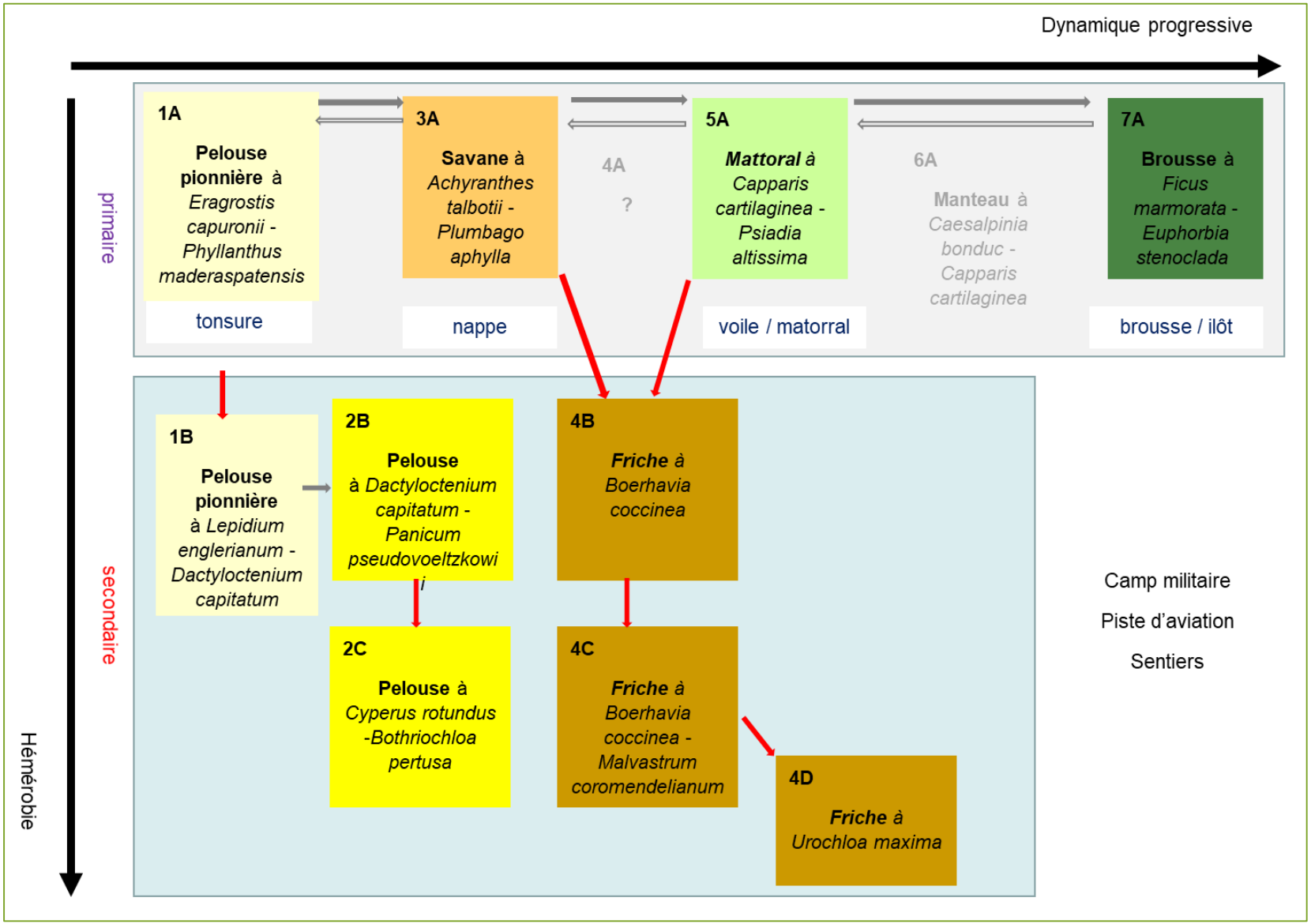
topographic gradient

serie 1 | serie 2 | serie 3 | serie 4 | series 5-6

Topographic and salinity gradient of saltmarshes ans salty steppes system

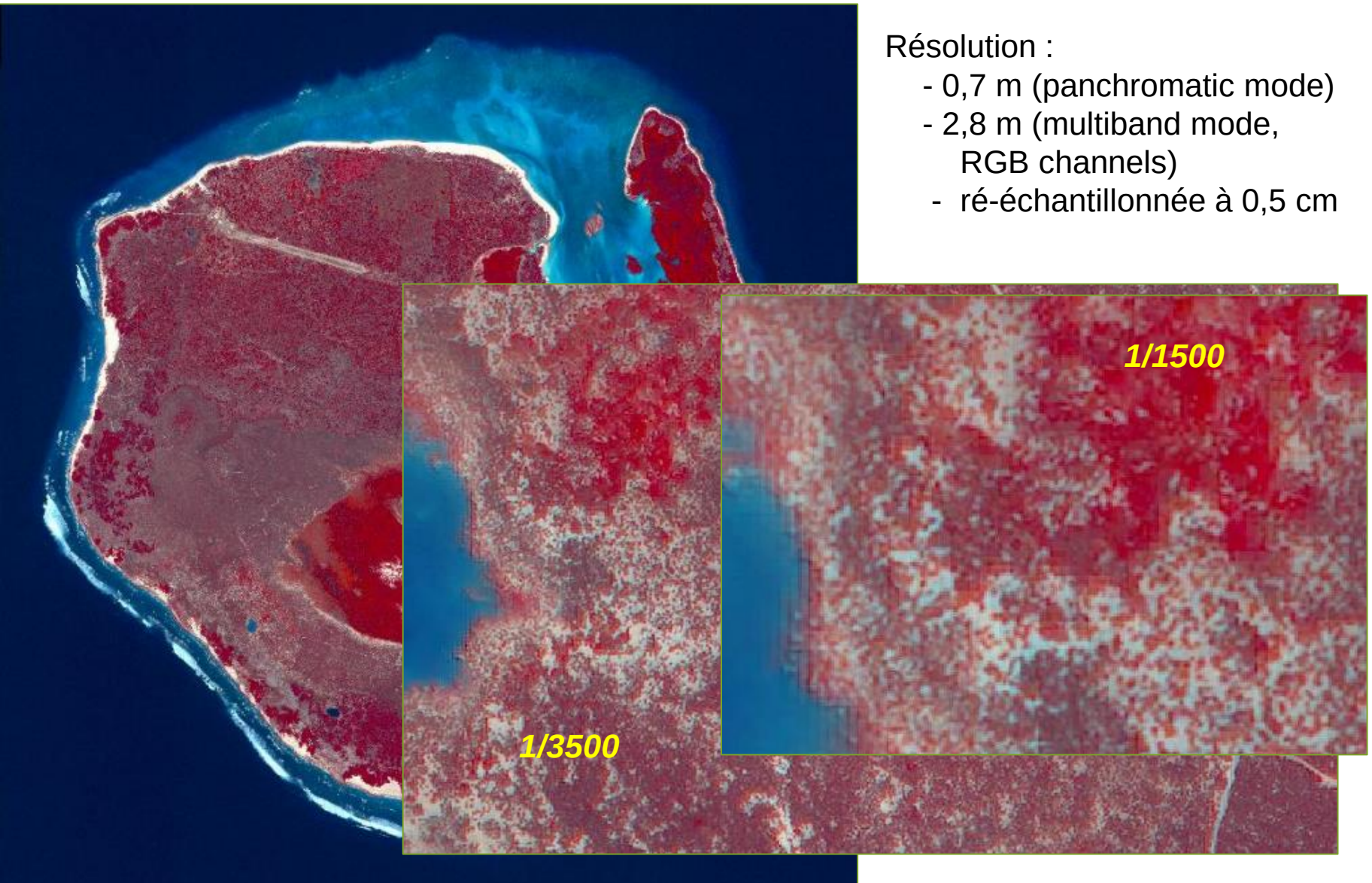
Travaux phytosociologiques

➢ Notion de 'dynamique'



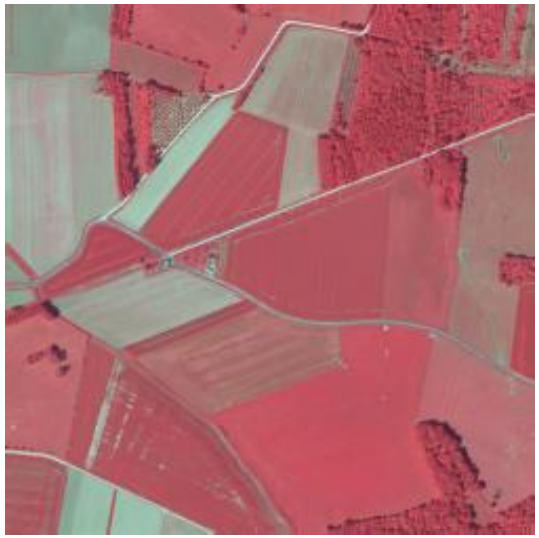
Segmentation (L. Commagnac & G. Liegard ; IGN)

- Image satellite Pleiade (29/07/2013, CNES (2013) Distribution AIRBUS DS)



Résolution :
- 0,7 m (panchromatic mode)
- 2,8 m (multiband mode, RGB channels)
- ré-échantillonnée à 0,5 cm

HOW DOES THE SEGMENTATION SOFTWARE WORK ?



False color IRG image (Infrared displayed as red, red displayed as green, green displayed as blue)

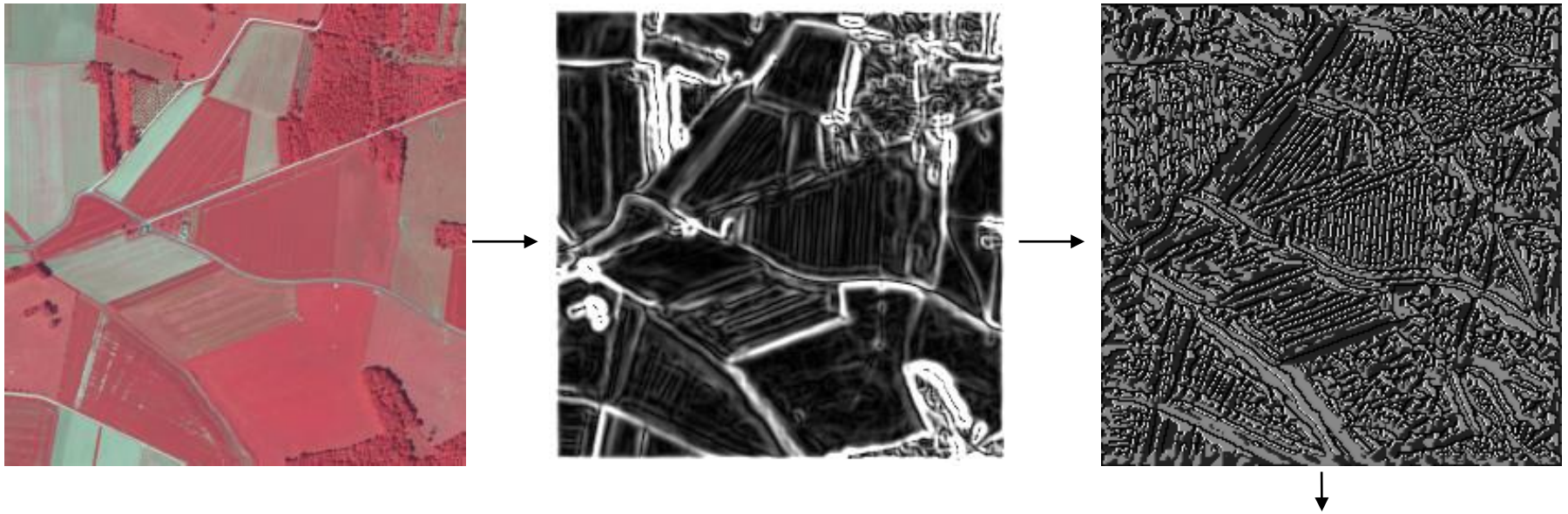
Grayscale gradient magnitude image (image band with maximum change (slope) is retained)

Watershed transformation: the image is treated like a topographic map, with the brightness of each point representing its height. The algorithm simulates the flooding of the image

Pyram ➔ see Guigues, L., Cocquerez, J.P., and Le Men, H. (2006). Scale-Sets Image Analysis. *Int. J. Comput. Vis.* 68, 289–317

Image segmentation by « Pyram » developed by IGN for CarHAB (french national program of habitat's mapping)

HOW DOES THE SEGMENTATION SOFTWARE WORK ?

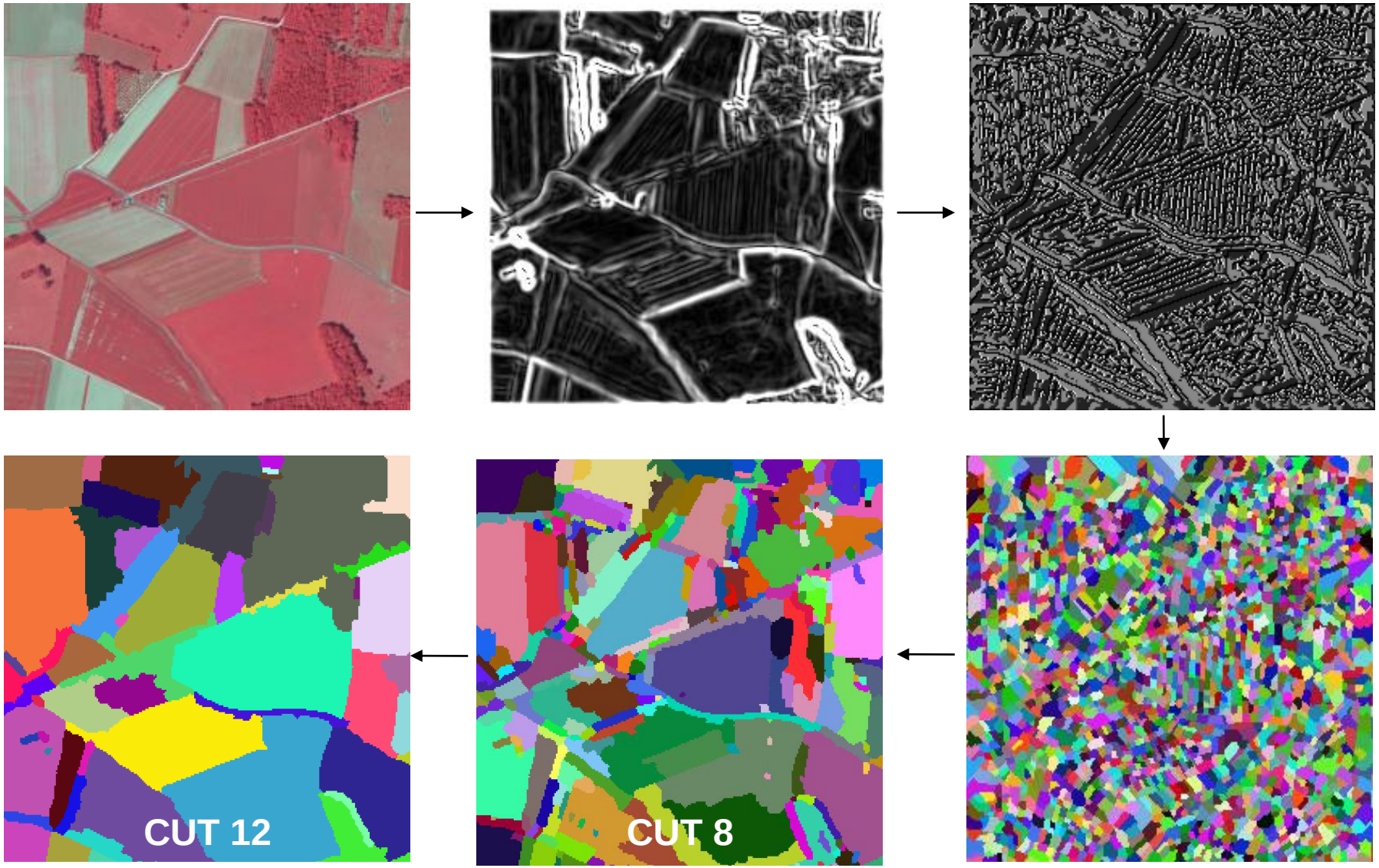


This leads to an over-segmented image to which a “scale climbing” algorithm is applied to produce a pyramid of images, where regions are merged with varying intensity.

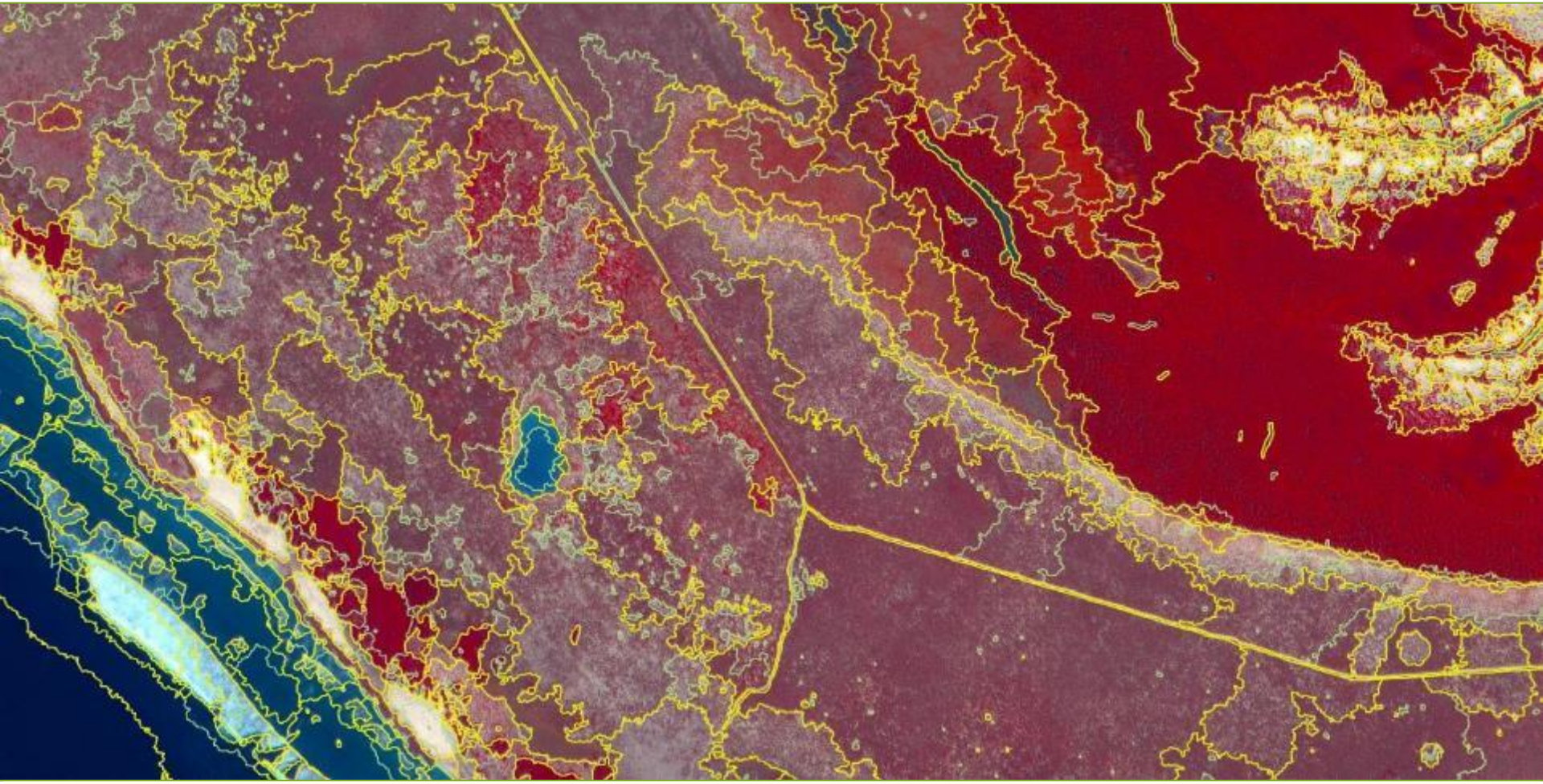
In order to find the regions to merge, for each small region and for all its neighbours, a degree of similarity is computed (based on colors) as well as a value of complexity of the polygon resulting from the merging of candidate regions.

It is then possible to choose the desired merge level (cut) in the pyramid that best fit the intended use.

HOW DOES THE SEGMENTATION SOFTWARE WORK ?



Segmentation at low level cut (C12) shows a good match with the series of vegetation, but less with elementary units of vegetation, because polygons most often correspond to dynamic mosaics of vegetation.
More detailled level cut (C8) appears sometimes complementary, but usually most irrelevant.



Purpose of mapping was a map of series and gesoseries (systems) of vegetation.
For this purpose, several types of vegetation are easily identifiable by photo-interpretation. Also each unambiguous C12 (or C8) polygon was directly informed by photo-interpretation in terms of series and systems.
All other polygons and system boundaries have been field verified and system boundaries modified as necessary.

Segmentation and pre-map of Europa at low level cup (C1) and more fine level (C2)