Planbureau voor de Leefomgeving

Sustainable Urbanization and land-use in European Regions

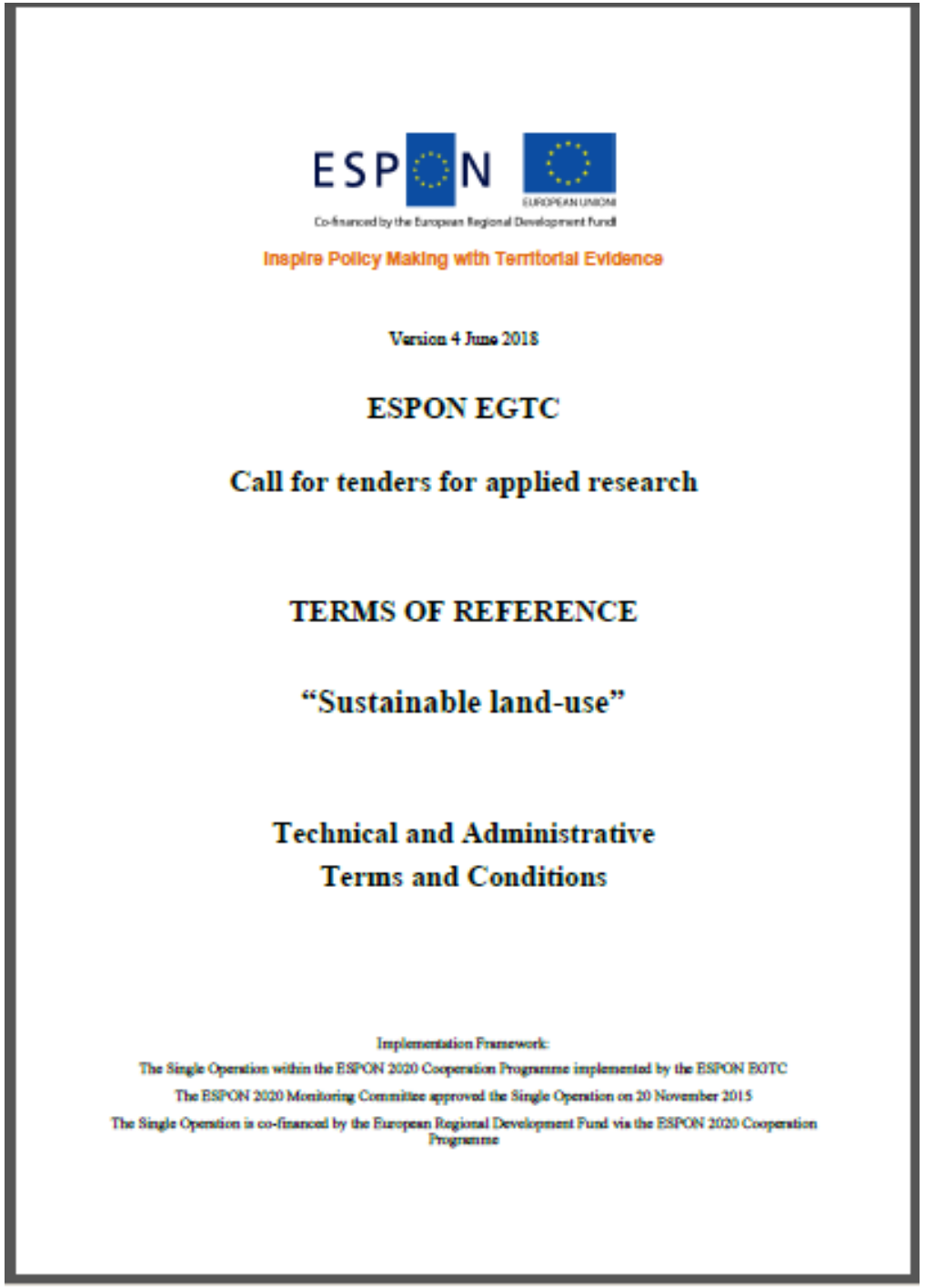
Past, present and future developments

ESPON Peer Learning Workshop on Housing and Multi-locationality, 17 March 2022

David Evers

ESPON call

“The service shall provide evidence, recommendations and measures on how sustainable land use can be promoted and how **land-take** and **urban sprawl** can be avoided, reduced and compensated in Europe, its cities and regions”


ESPON

Co-financed by the European Regional Development Fund

Inspire Policy Making with Territorial Evidence

Version 4 June 2018

ESPON EGTC

Call for tenders for applied research

TERMS OF REFERENCE

“Sustainable land-use”

Technical and Administrative
Terms and Conditions

Implementation Framework:
The Single Operation within the ESPON 2020 Cooperation Programme implemented by the ESPON EGTC
The ESPON 2020 Monitoring Committee approved the Single Operation on 20 November 2015
The Single Operation is co-financed by the European Regional Development Fund via the ESPON 2020 Cooperation Programme

SUPER tender

- Sustainable Urbanization and land-use Practices in European Regions

- New terminology
  - Land take => urbanization
  - Urban sprawl => urban form
  - Sustainability => balance of 3 Ps

https://www.espon.eu/super


ESPON

Project Proposal

To carry out the

ESPON Applied Research Project

"sustainable land-use"

SUPER

Sustainable Urbanization and land-use Practices

in European Regions

Application Form

Part B - TECHNICAL PROPOSAL outline

3 August 2018

PBL Netherlands Environmental Assessment Agency

Bundesinstitut für Bau-, Stadt- und Raumforschung

POLITECNICO DI TORINO

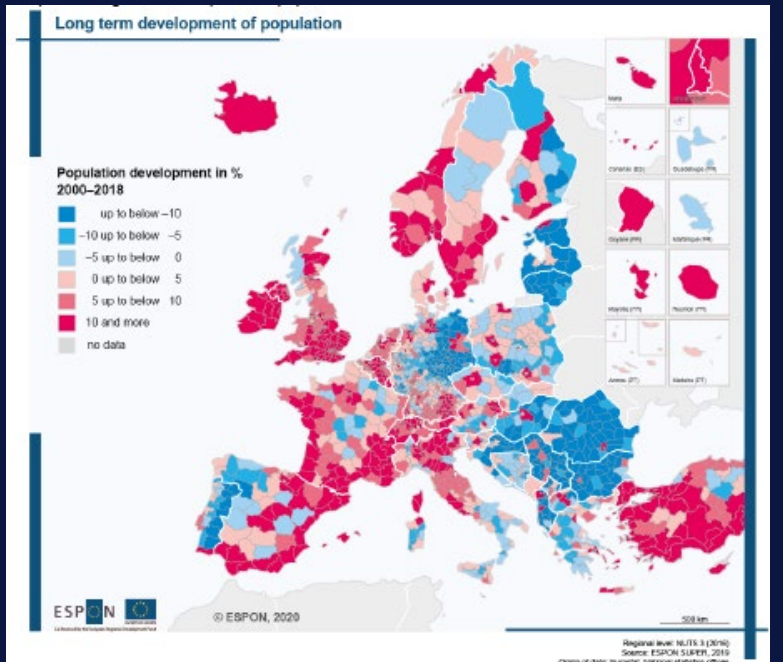
ÖIR

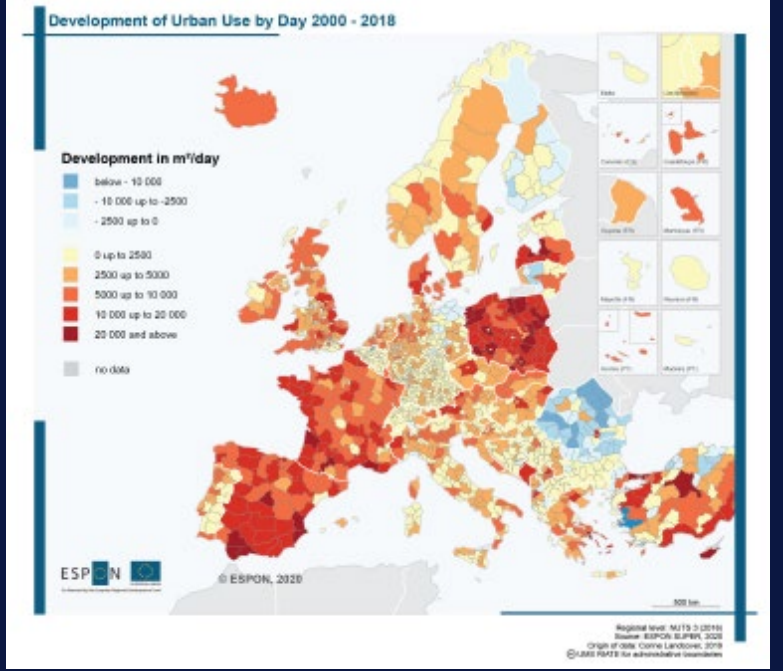
URBANEX

EUROREG

1

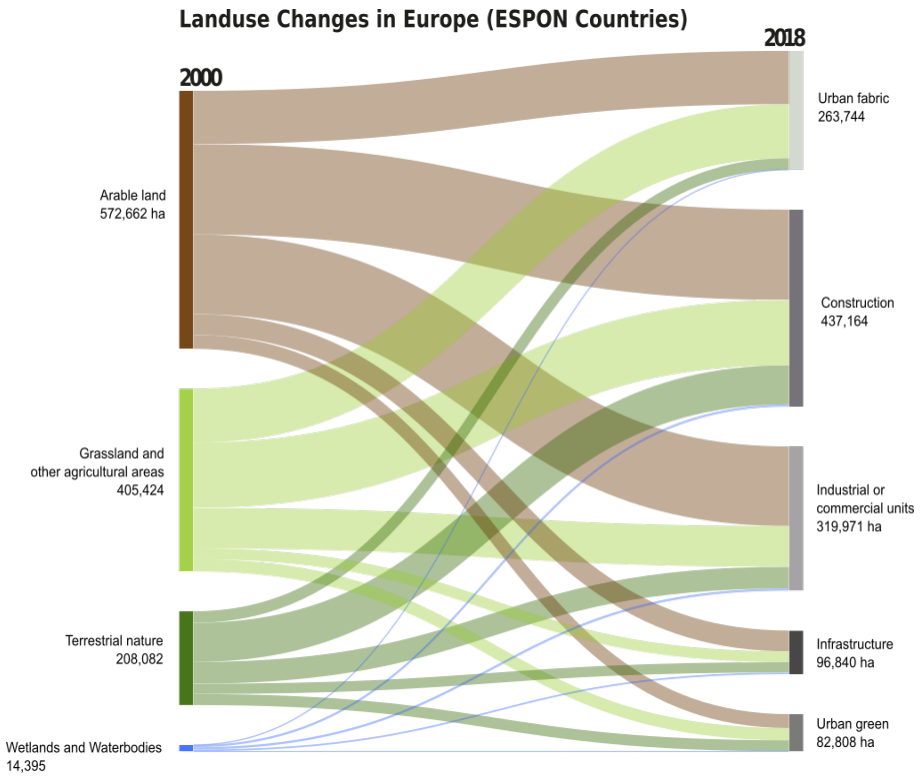
Evidence on urbanization and land-use developments in Europe: past and future

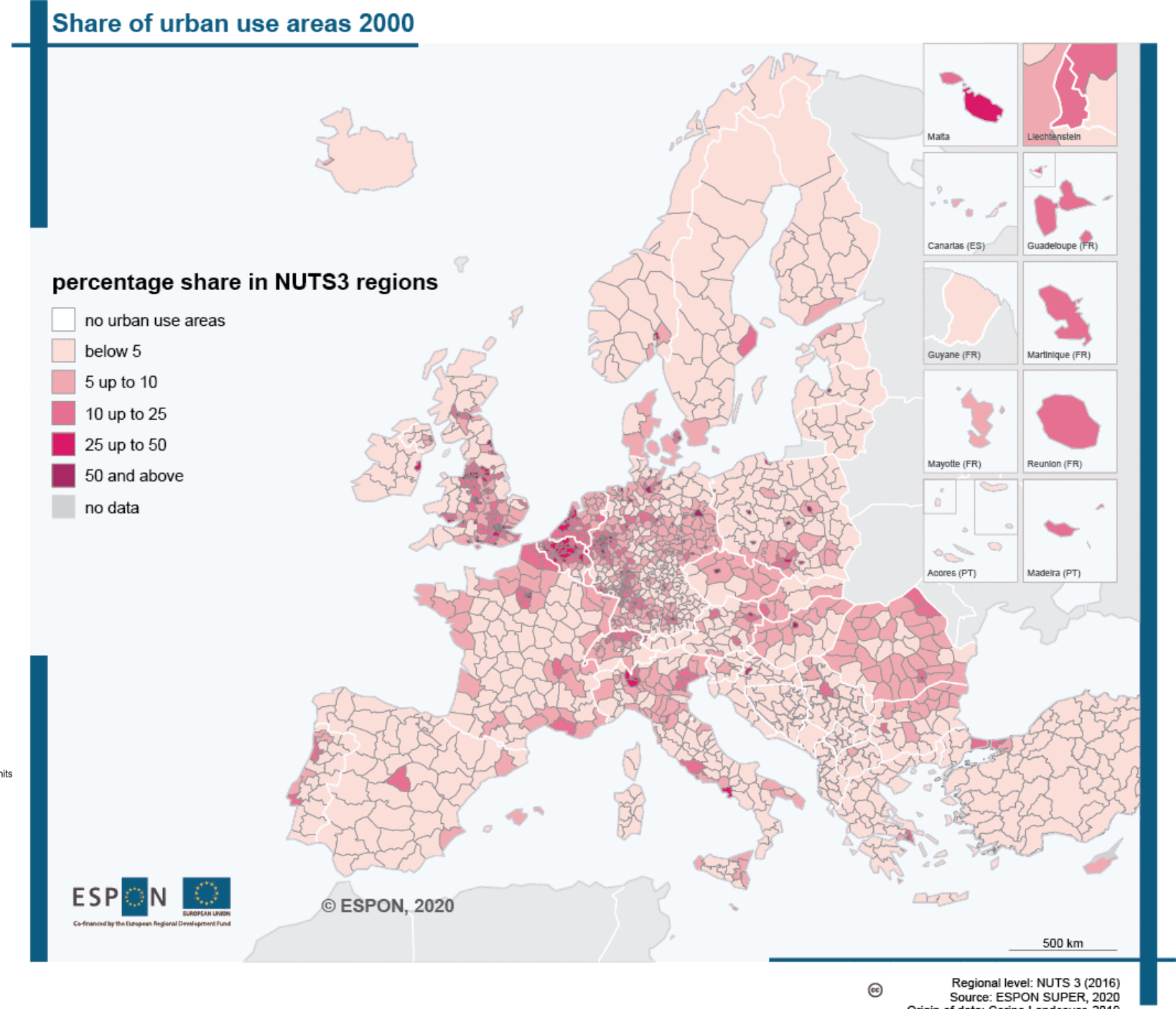




Between 2000-2018, about 1.17 million hectares of land was converted into urban use.

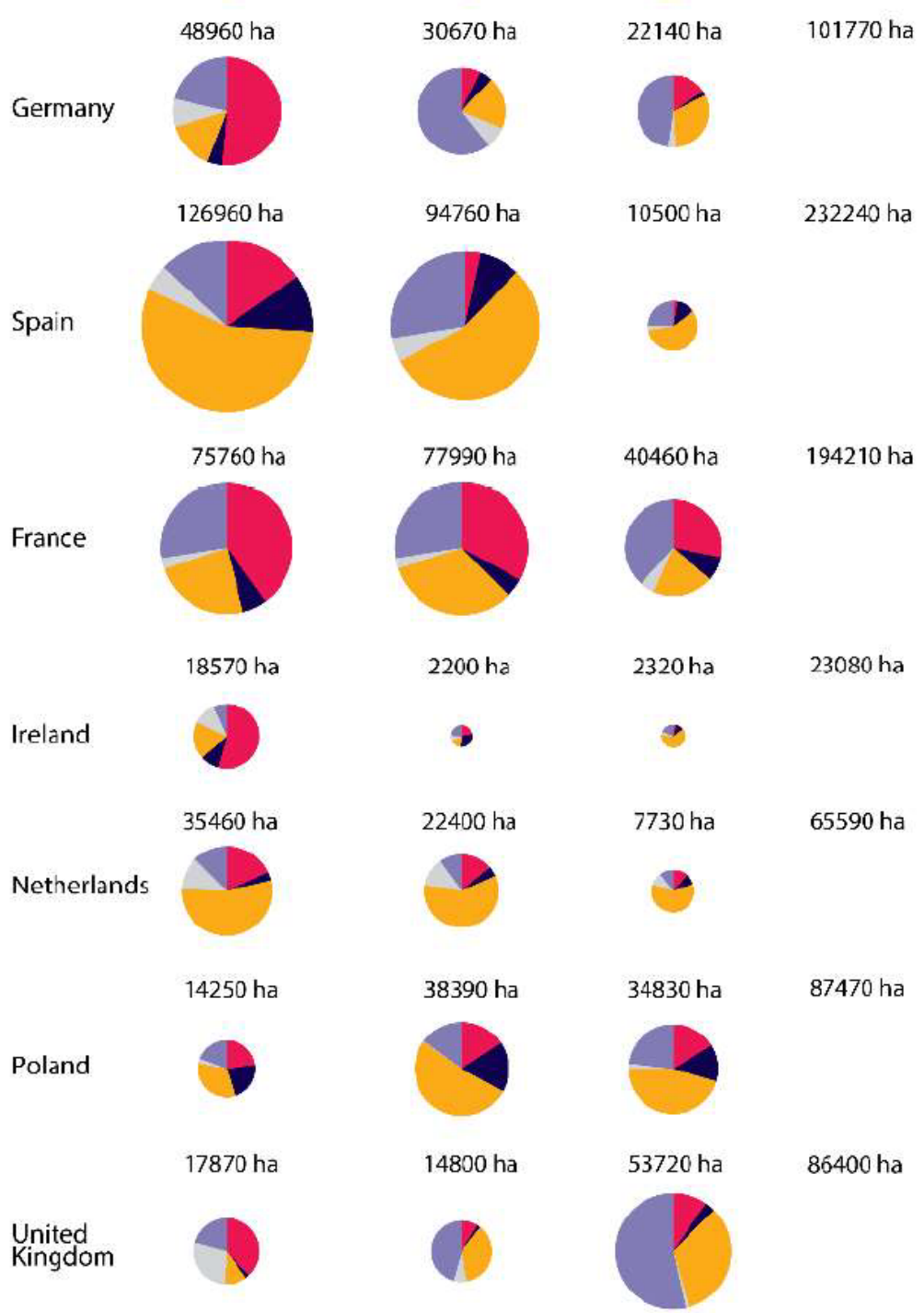
This is approximately 250 football fields per day (>0)





National differences

- Big builders = big countries: ES (construction sites), D, F (primarily housing)
- Declining rates: ES, F, NL (urban green), IE
- Increasing rates: PL (infra and construction sites), UK (urban green => industrial)

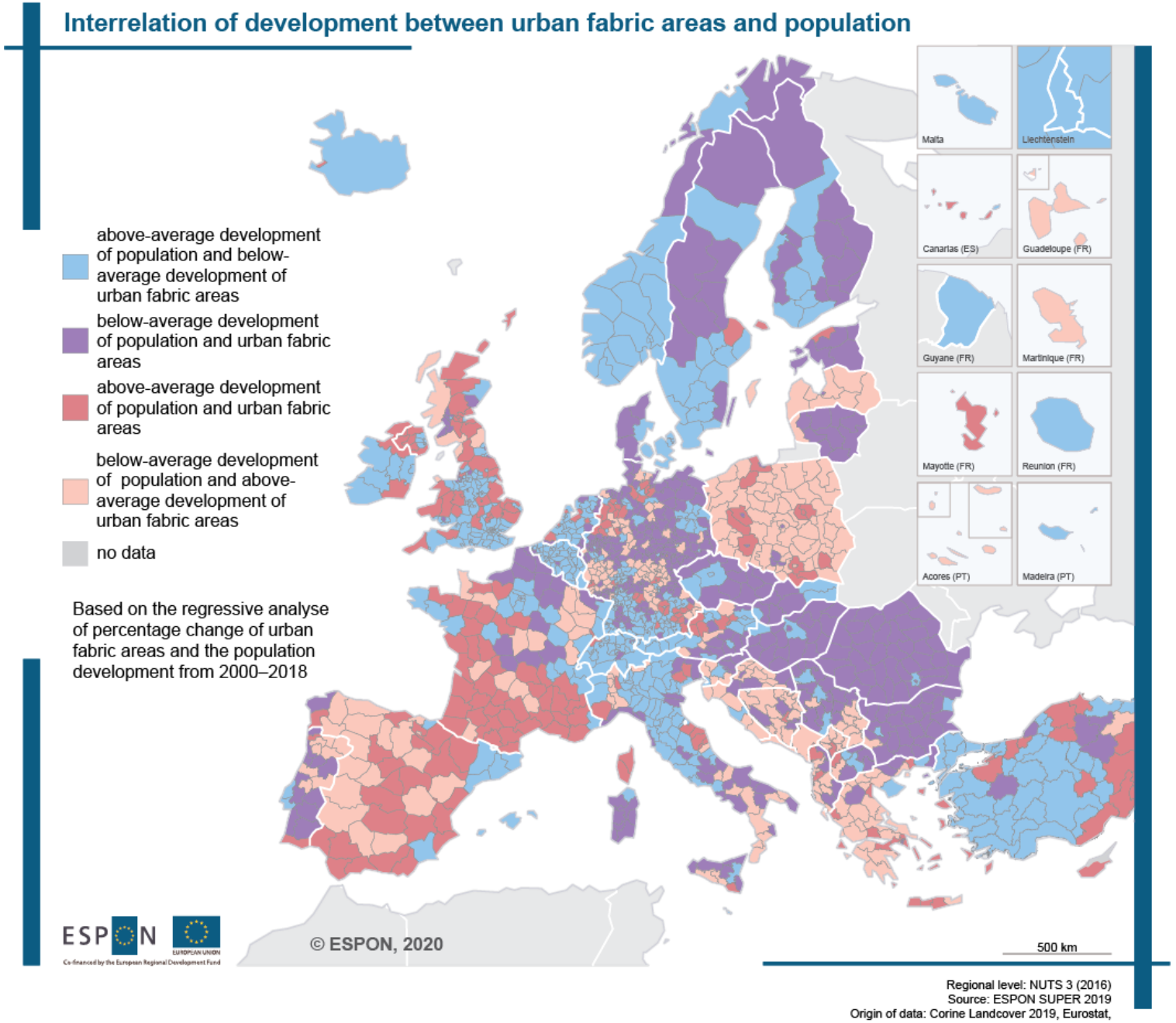


Change from non urban use to:

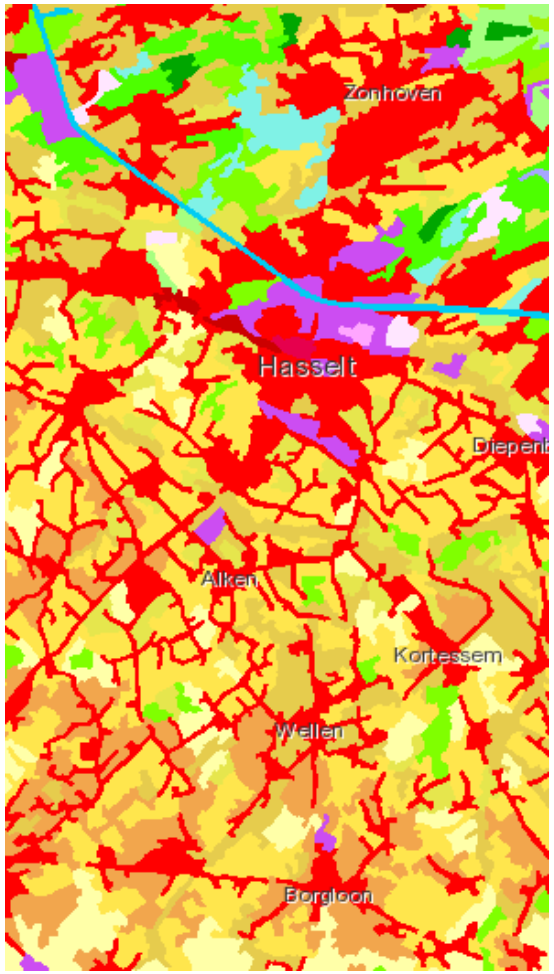
- Urban fabric
- Urban - Industrial
- Construction sites
- Urban infrastructure
- Urban green

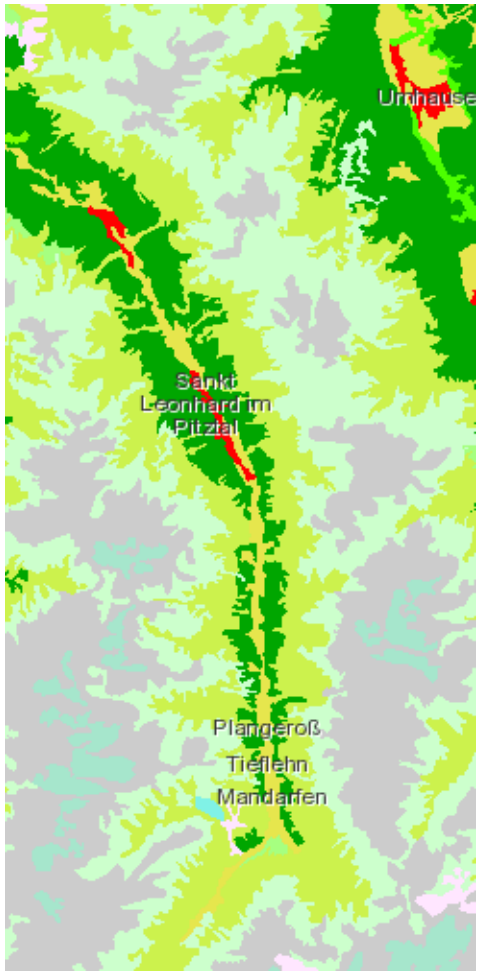
Relative growth

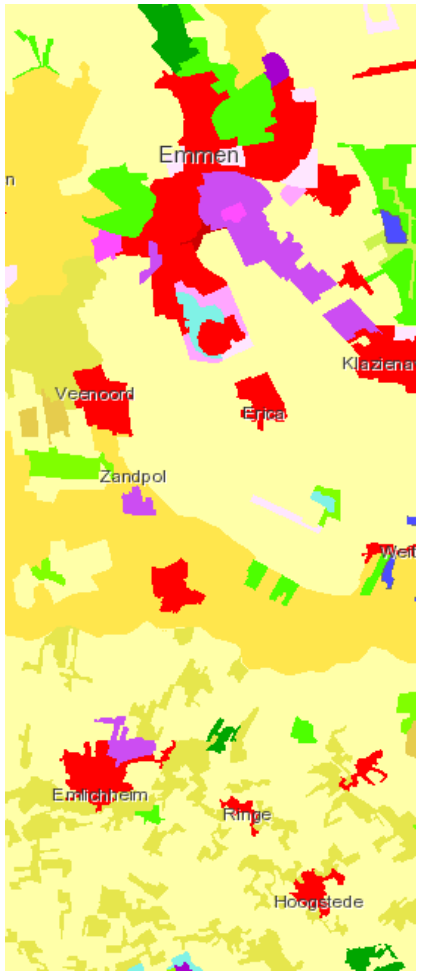
- Overall, land is being converted to urban (8x more than back) and population is growing, so benchmarking is a good tool.
- **Light red**: urban growth outstrips population growth
- **Light blue**: relatively compact development vis-à-vis European average

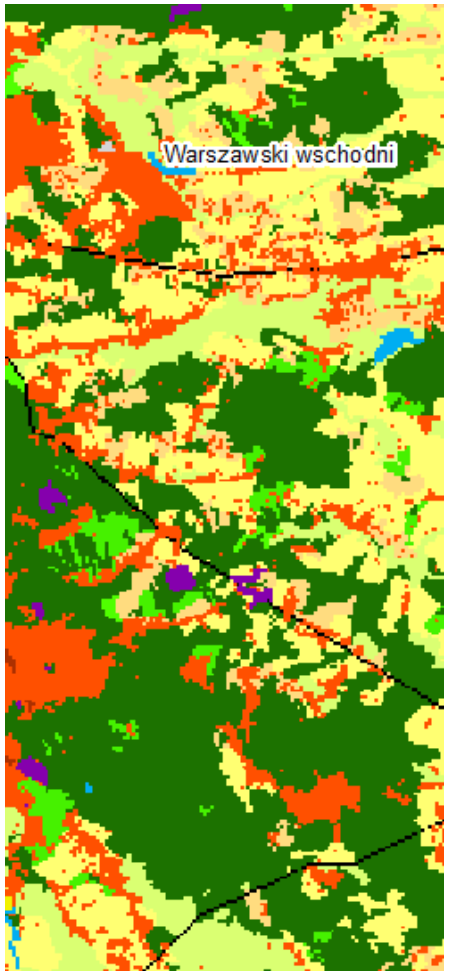


Urban form: easy to see, hard to measure

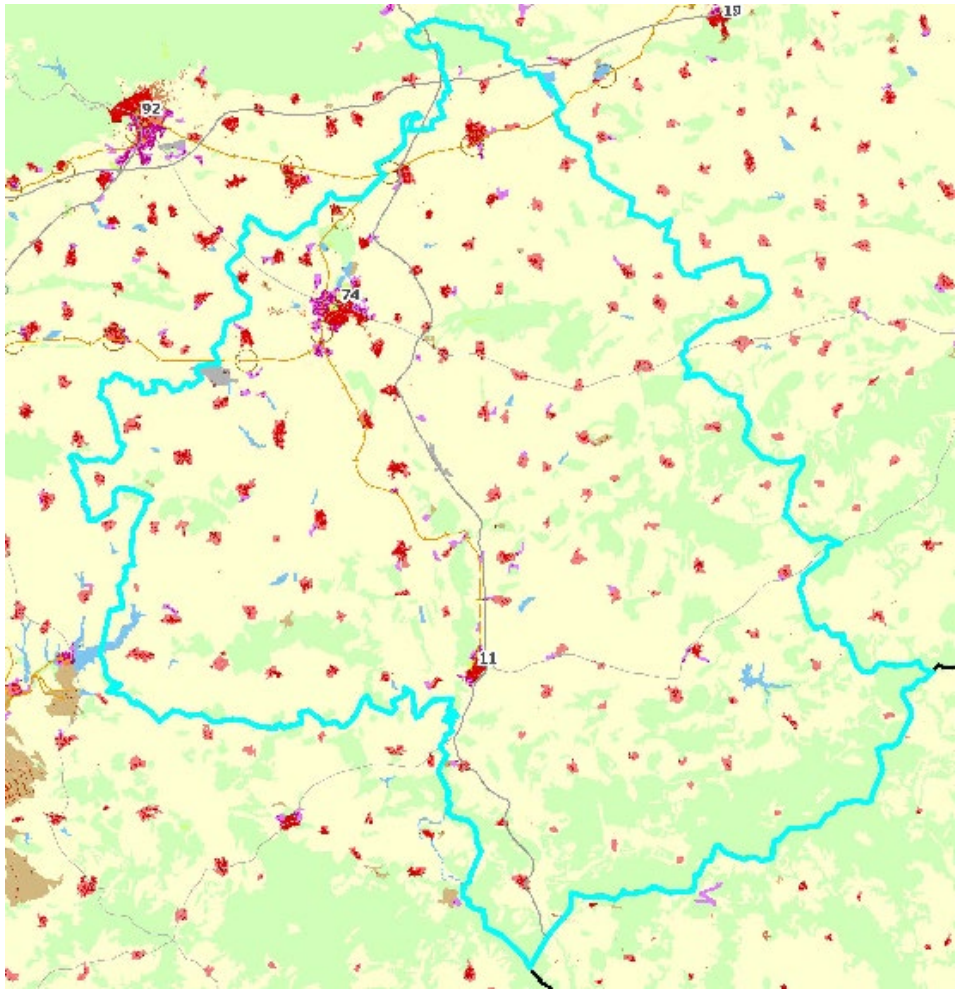


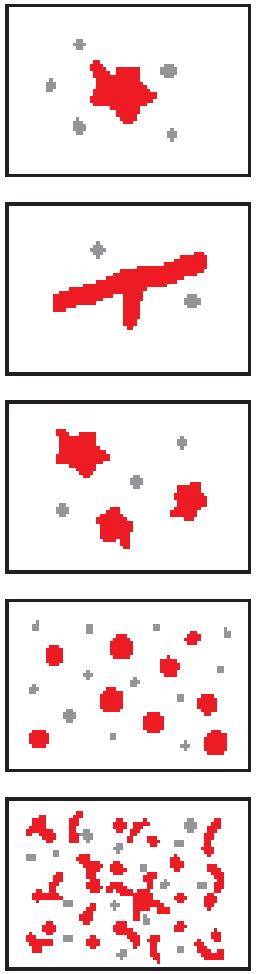


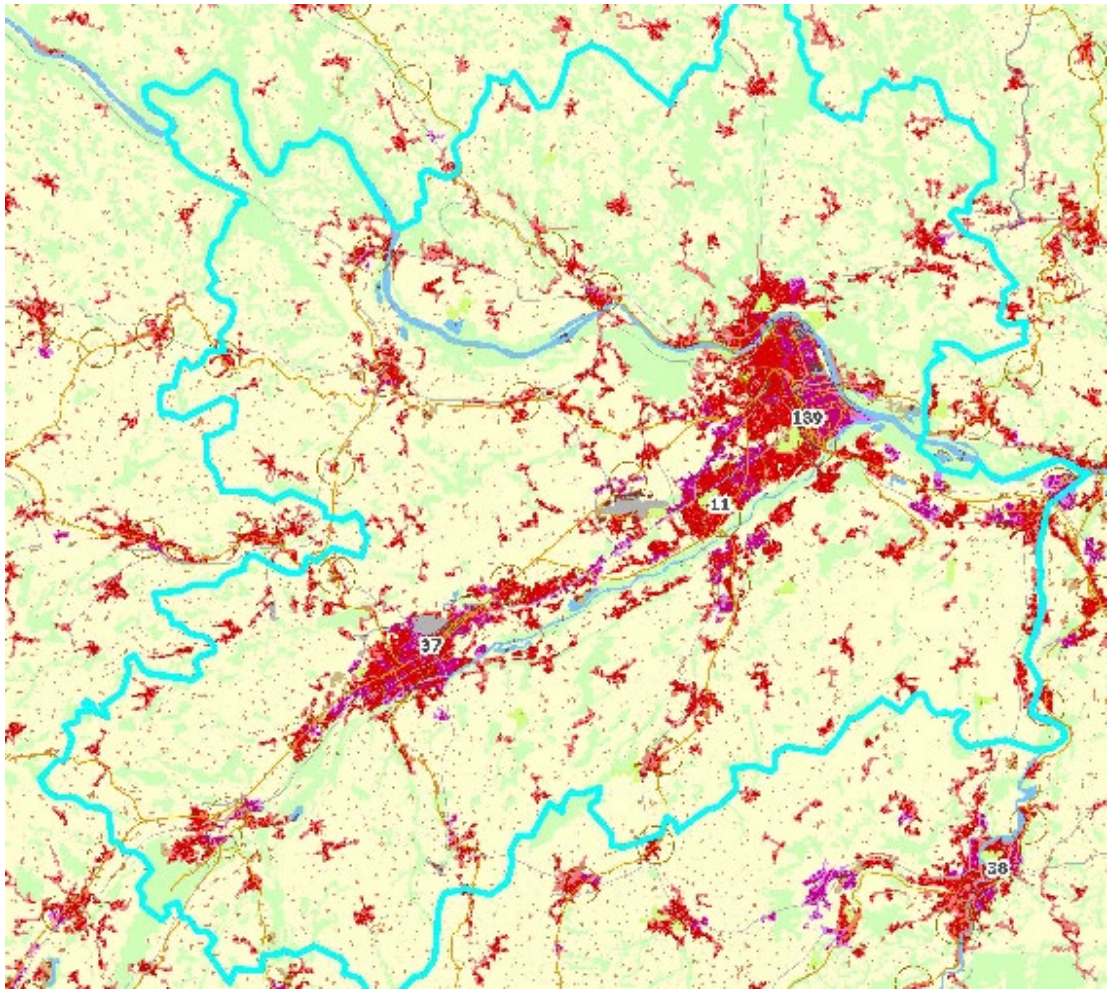




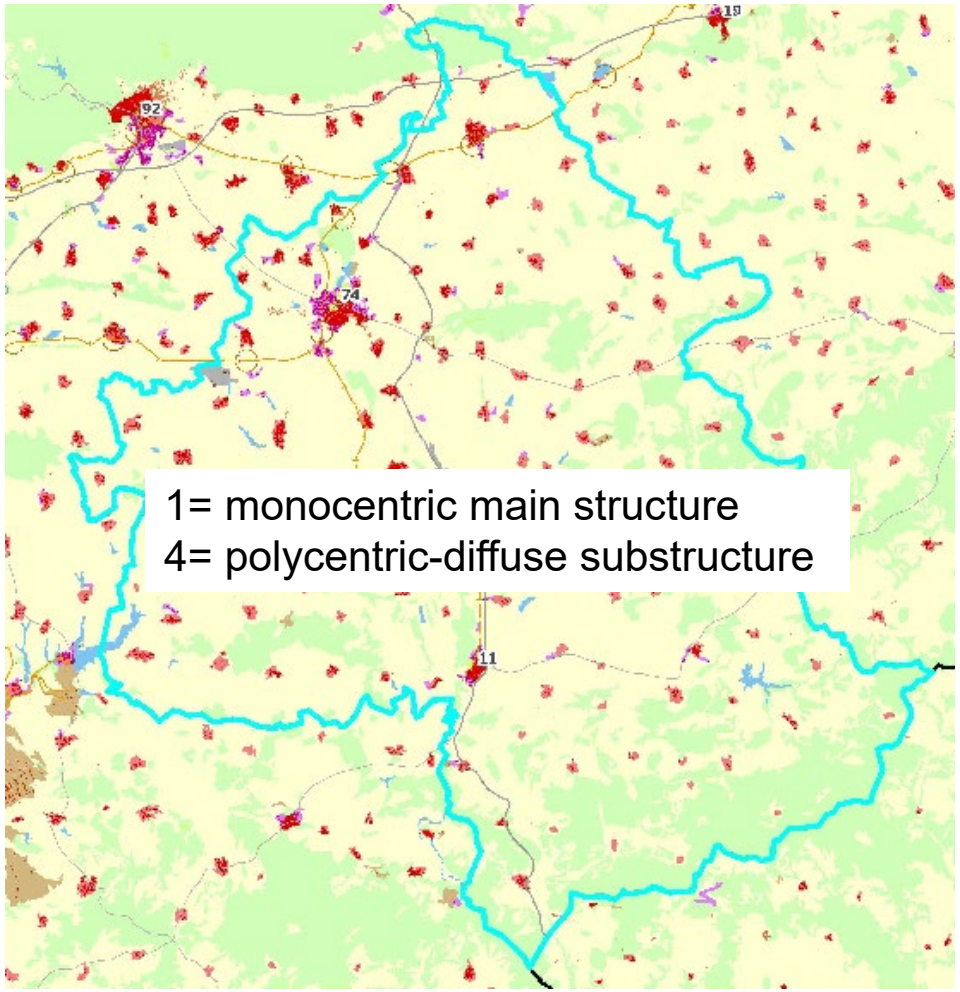
Morphological analysis

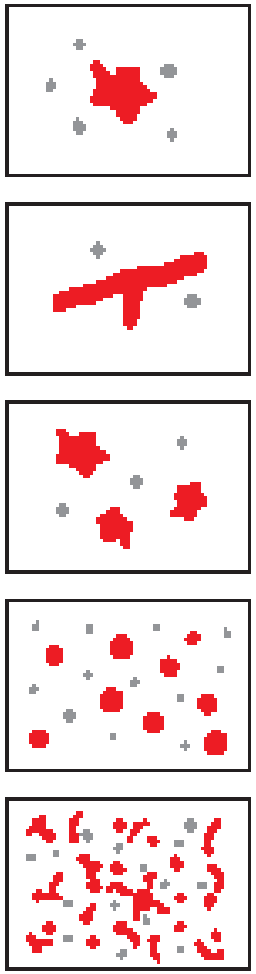


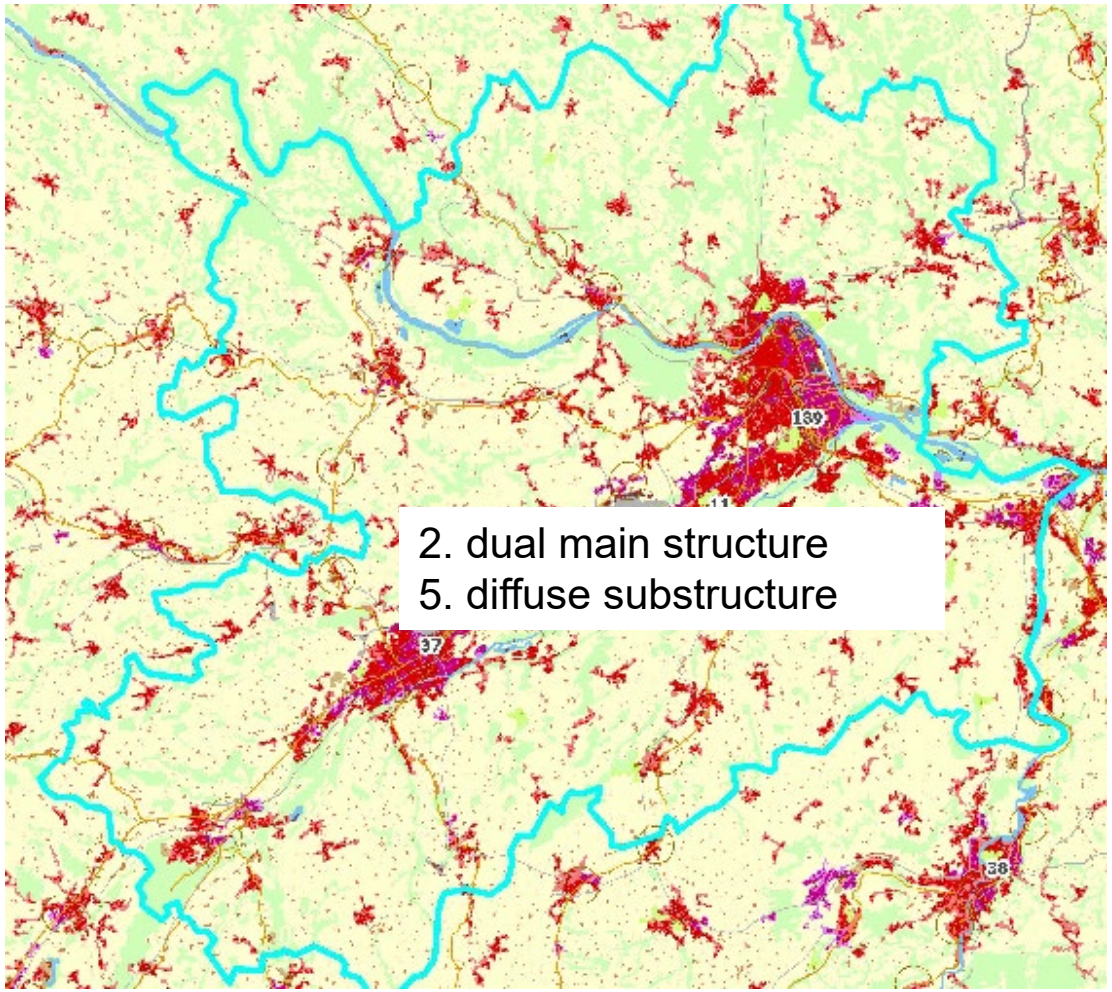




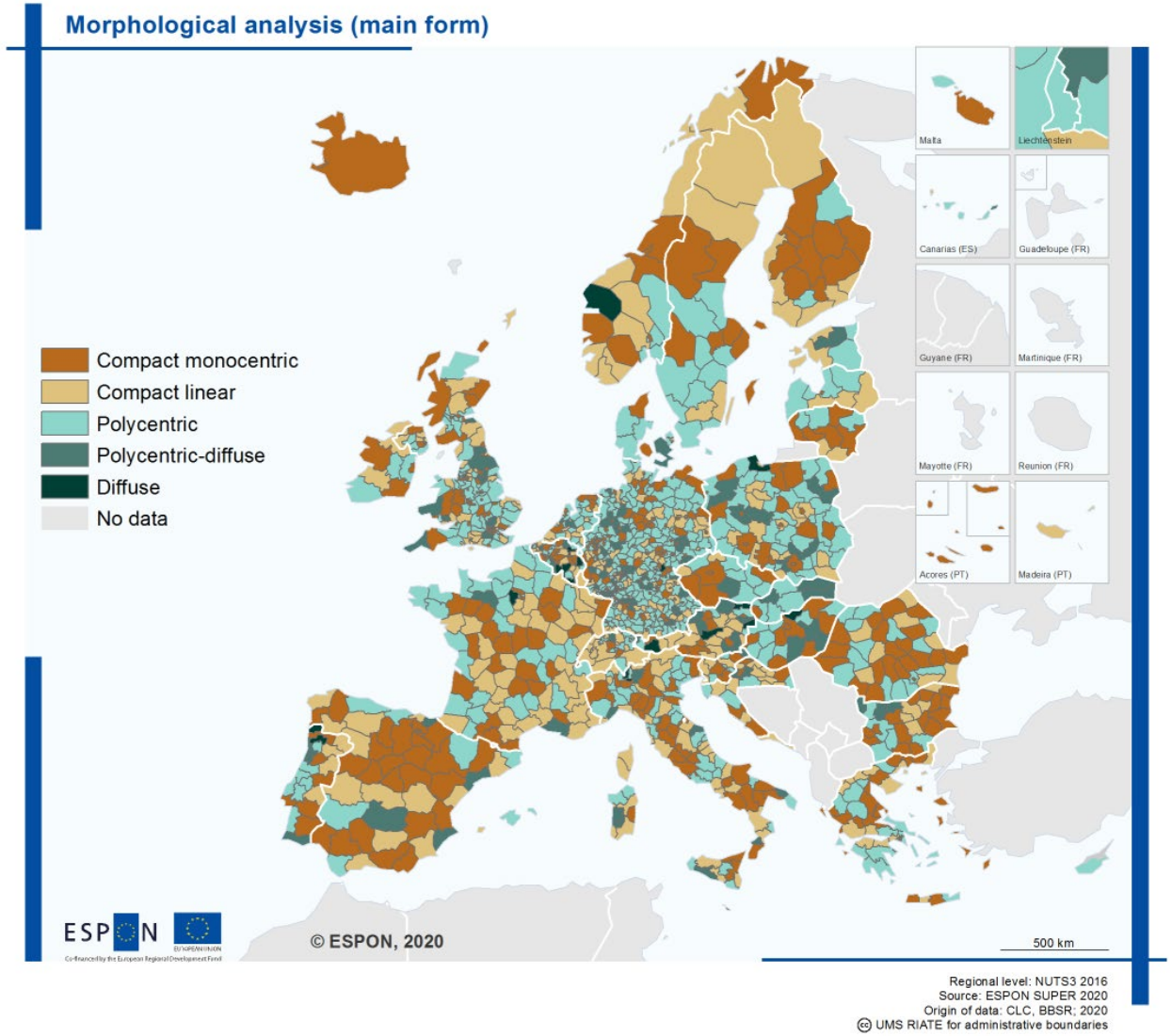
Morphological analysis

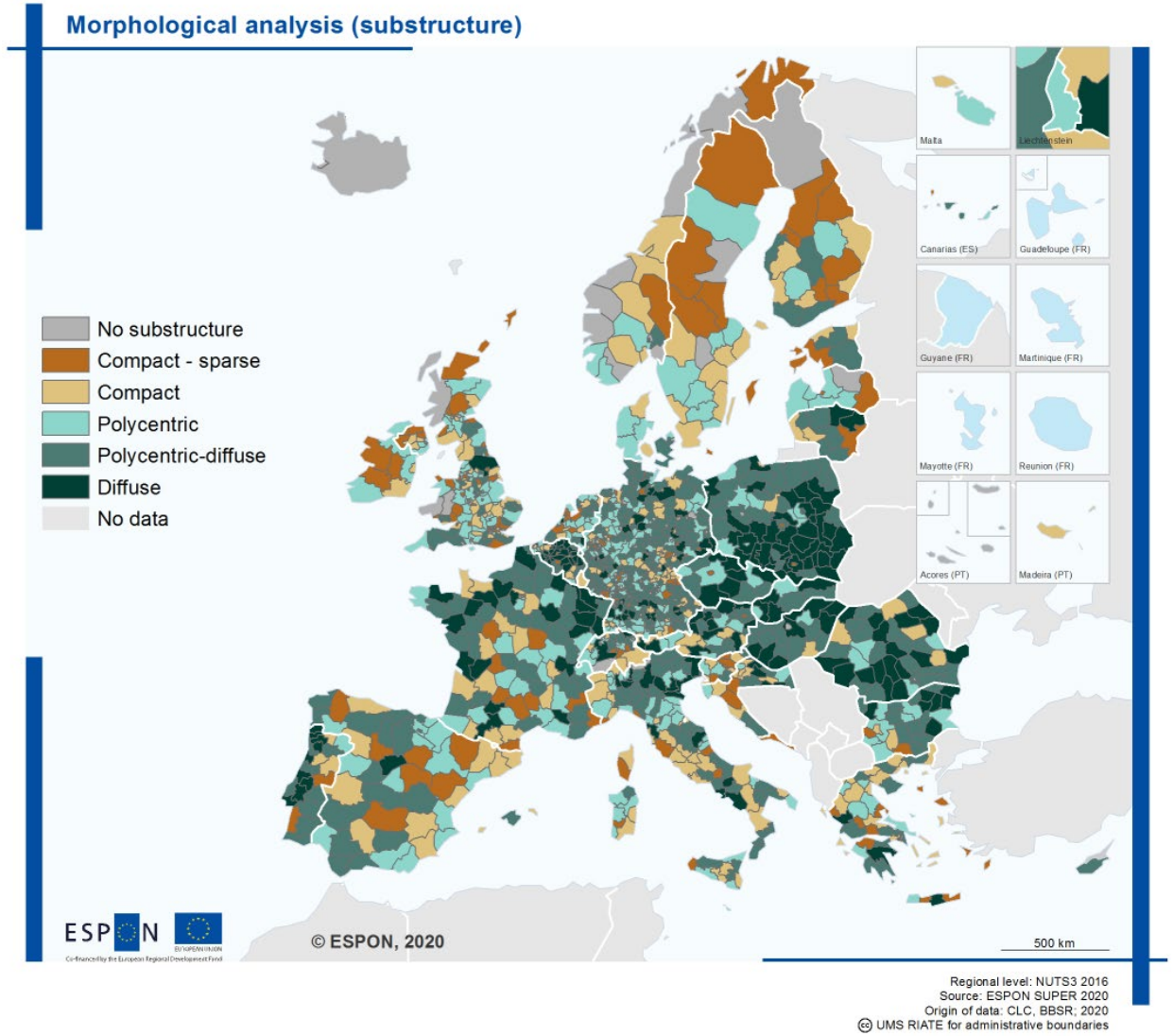




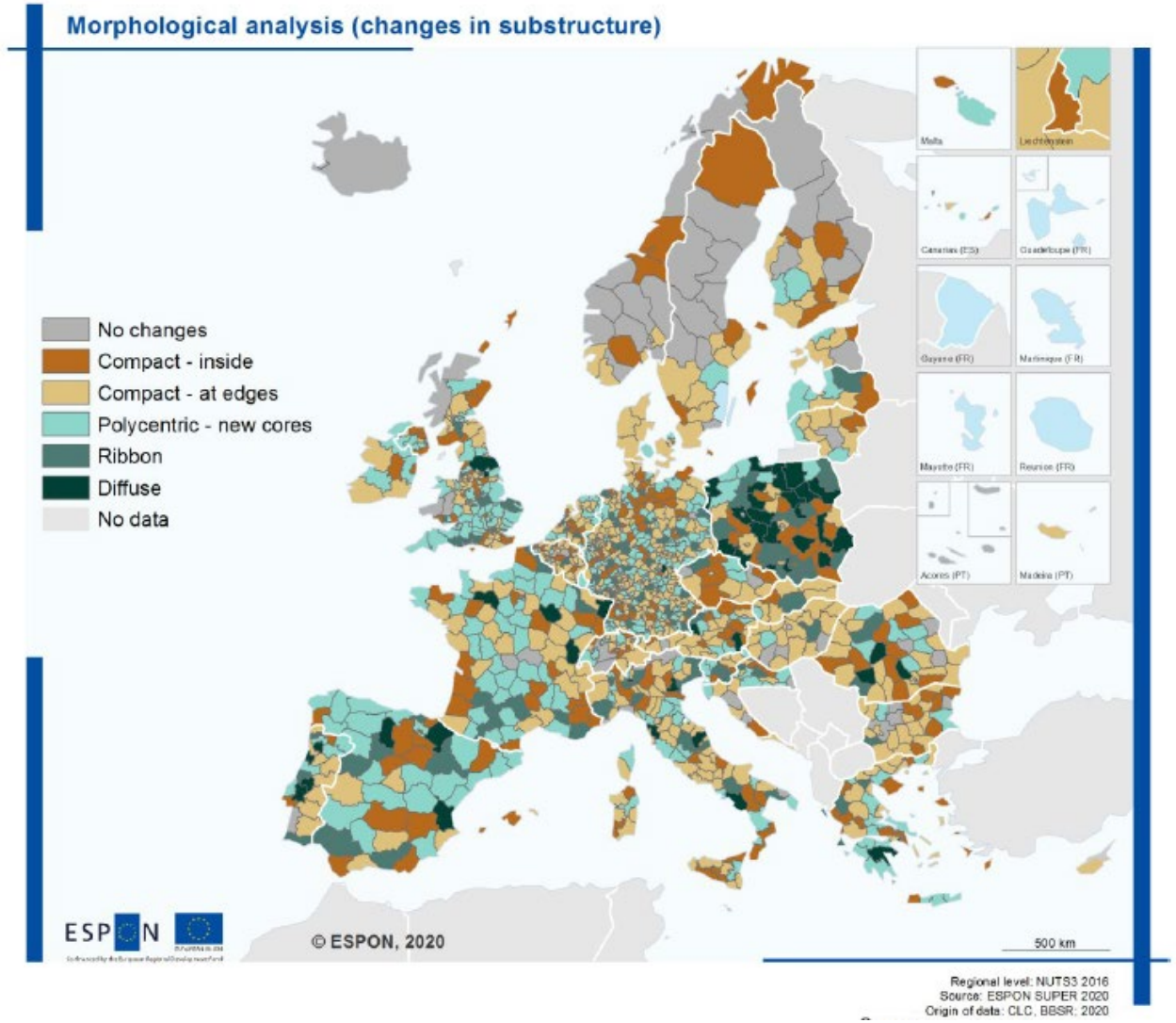


- Polycentric regions most frequent structure in Europe
- Substructure diffuse development around all kinds of main structures





Substructure development



Three modes of urbanisation

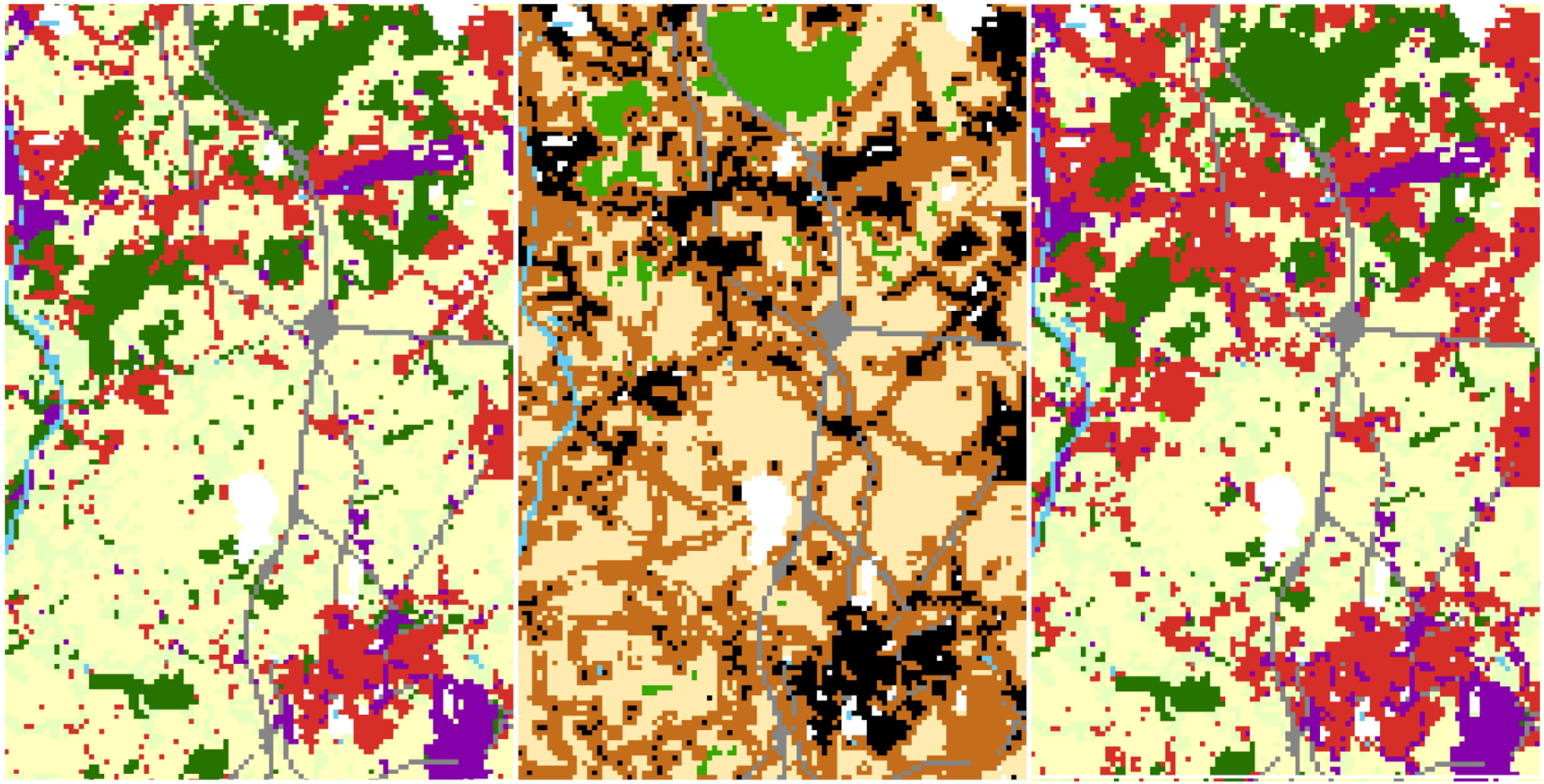
- **Compact / containment**
  - High-density compact cities
  - Growth boundaries, infill & brownfield redevelopment
- **Polycentric / clustered**
  - Medium-density, clustered, polycentric urban structure
  - Planned new towns, TOD, some new urbanist designs
- **Diffuse / scattered**
  - Low-density, scattered/discontinuous, car-oriented
  - Organic growth, single-family zoning

Scenarios are covid-proof

- **Compact / containment**
  - People need human contact, cycling/walking popular
- **Polycentric / clustered**
  - Community is important, access to open space and facilities
- **Diffuse / scattered**
  - Desire for large homes and gardens, car popular

Source: http://www.urbanisticainformazioni.it/IMG/pdf/ui289si_sessione_06.pdf

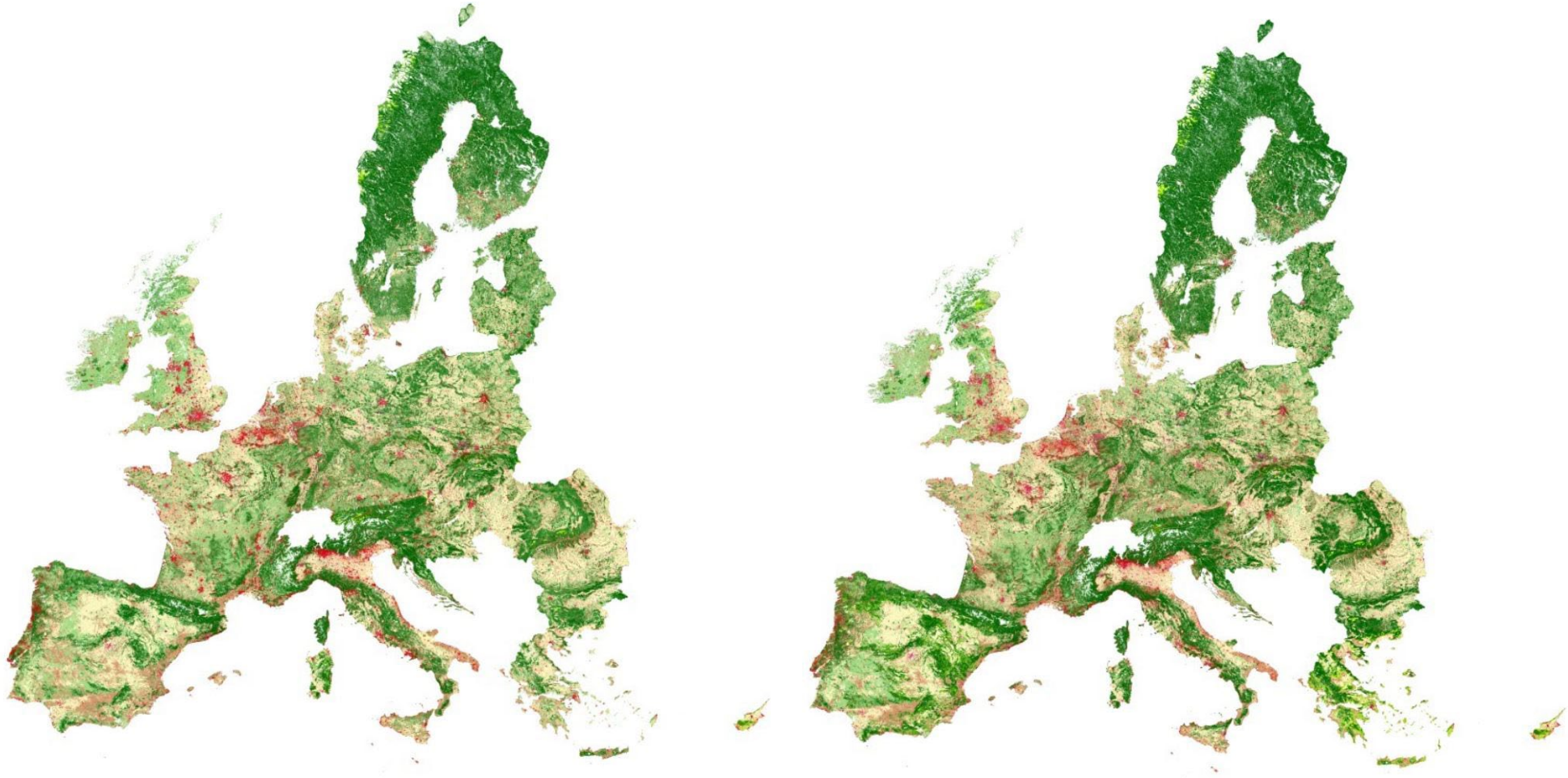
Modelling land-use change



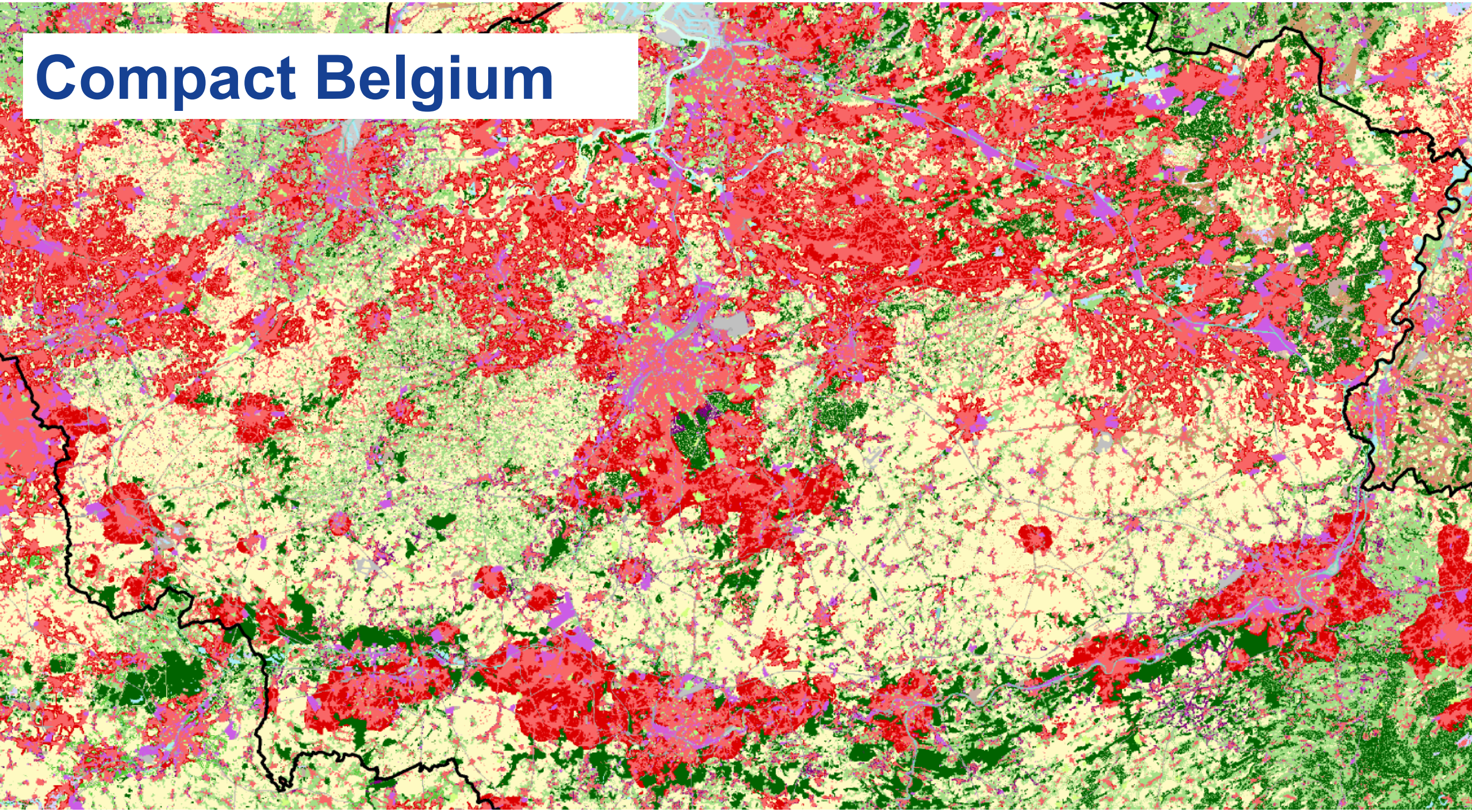
Luisetta works on five year intervals, consecutively changing land use.

It reallocates according to expected demand at Nuts2 level and local suitability (near roads, existing urban area, water)

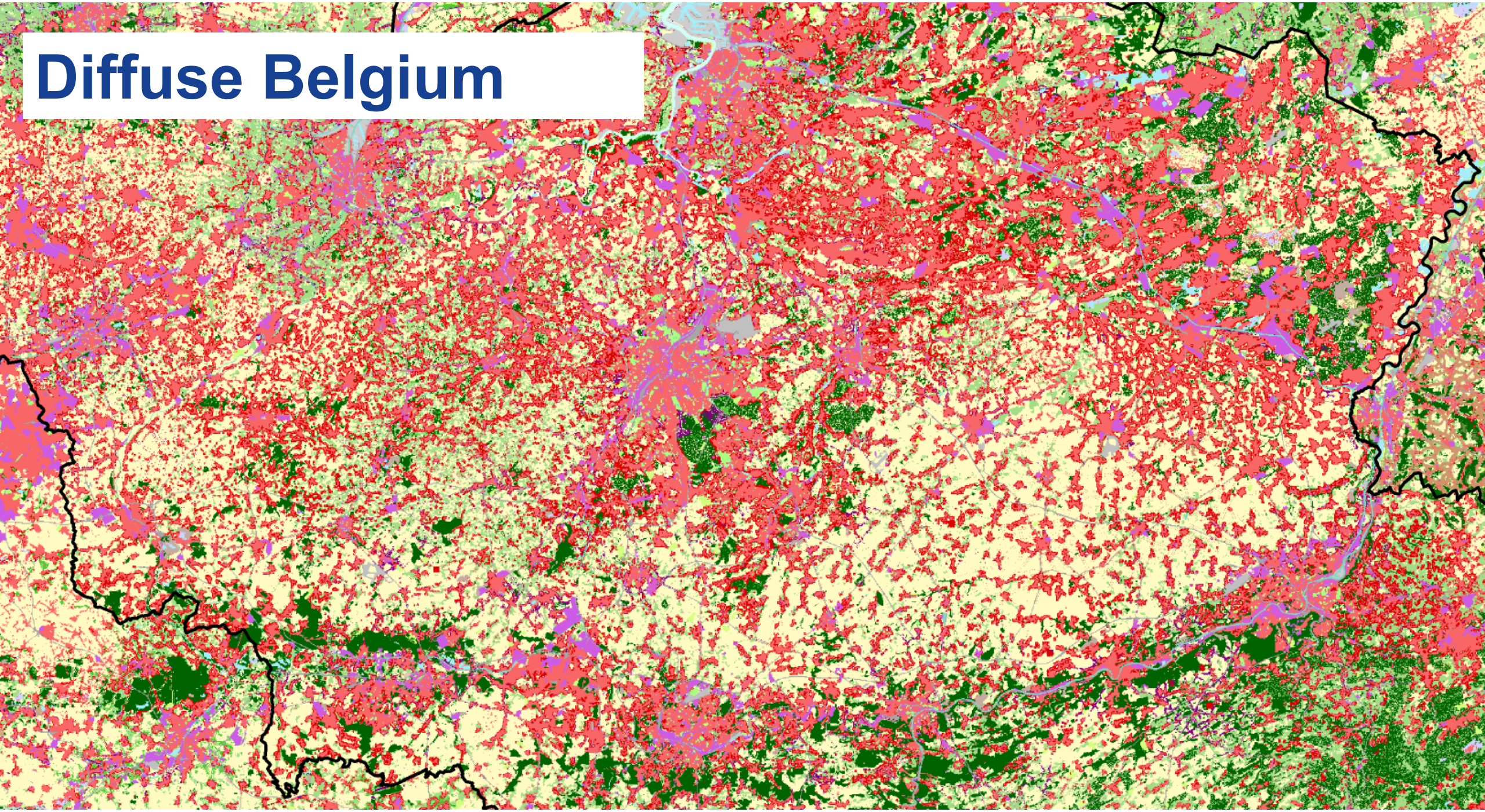
Model results: compact vs diffuse



Compact Belgium



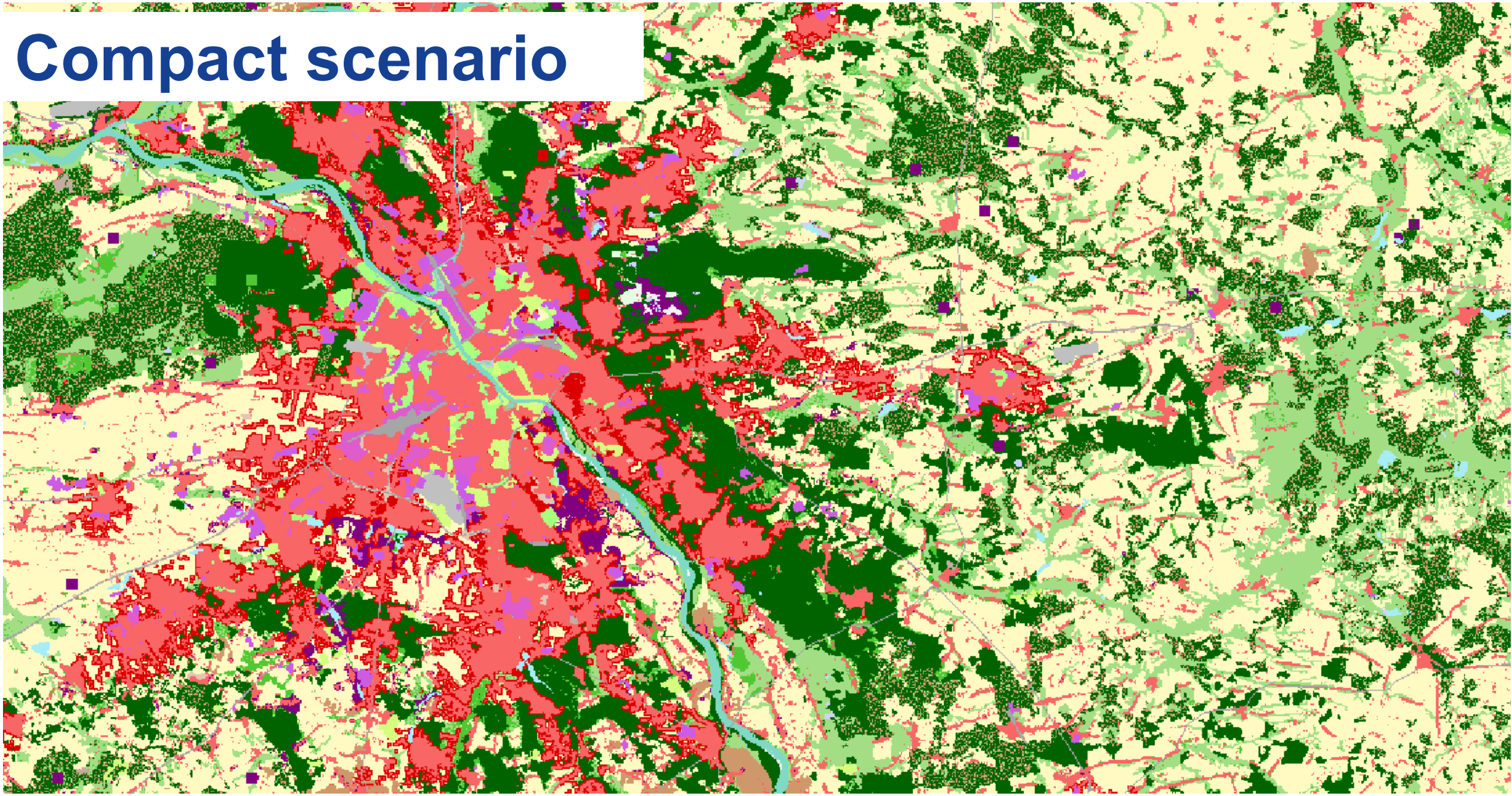
Diffuse Belgium



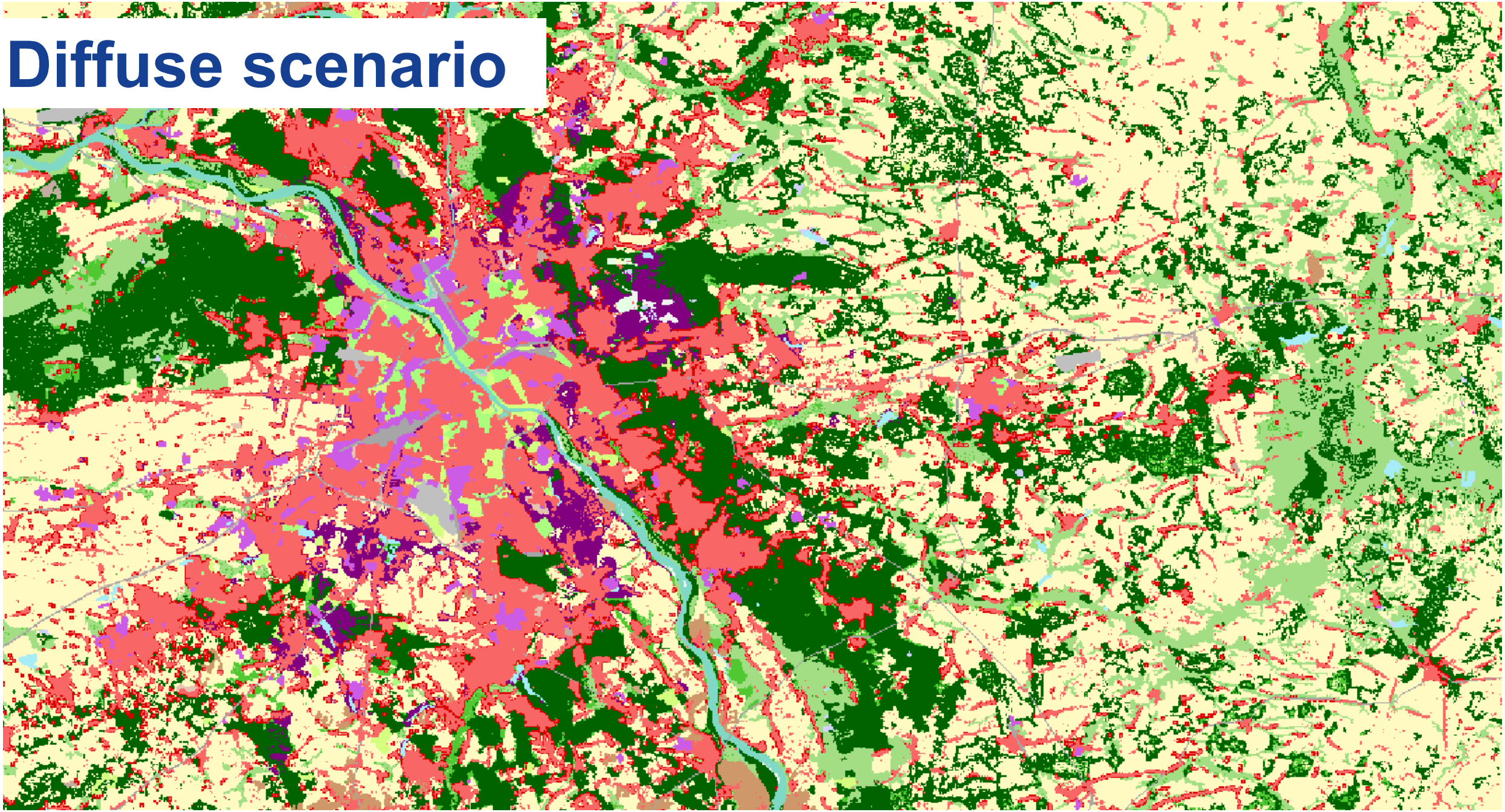
Compact Germany

Diffuse Germany

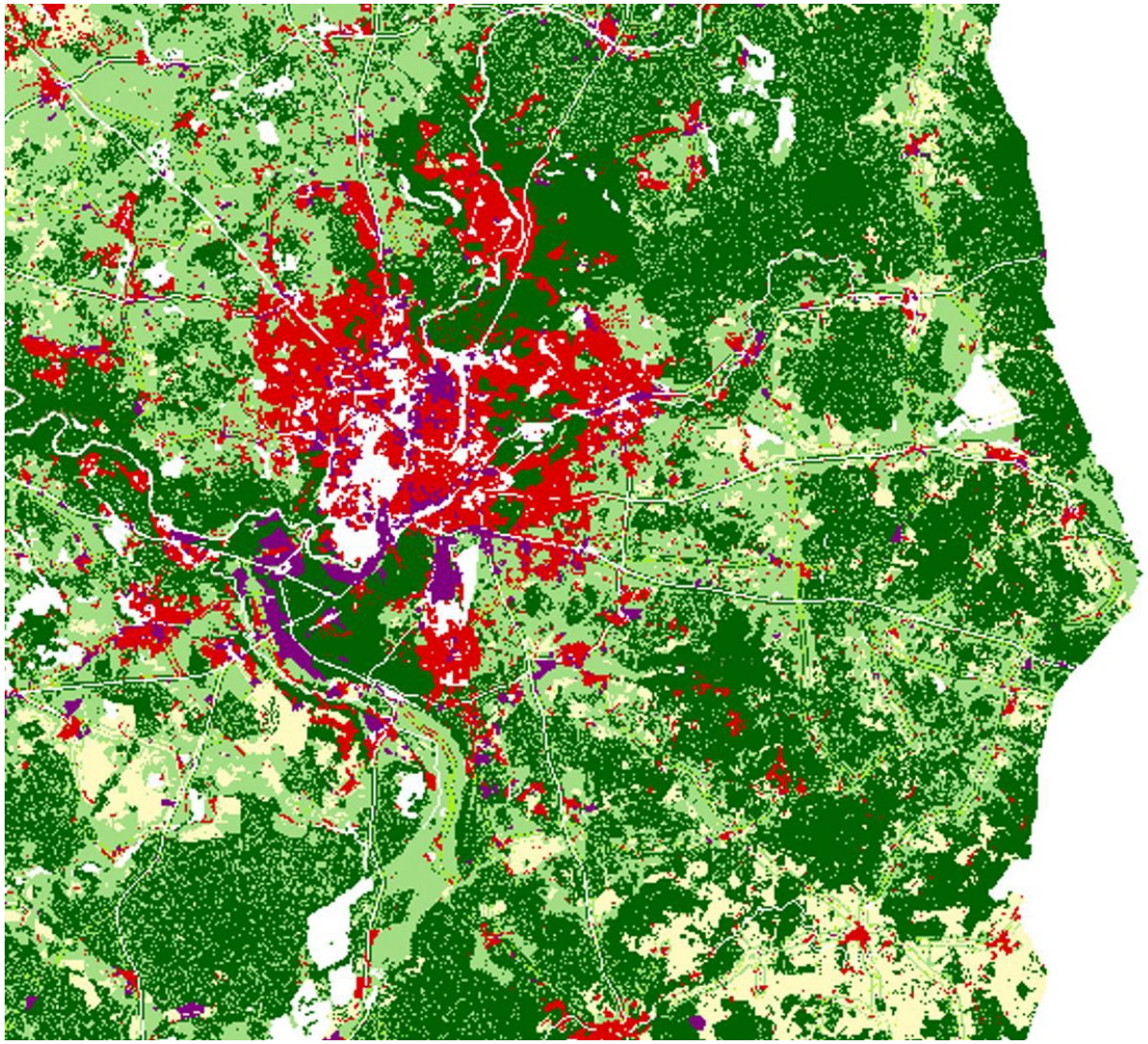
Compact scenario

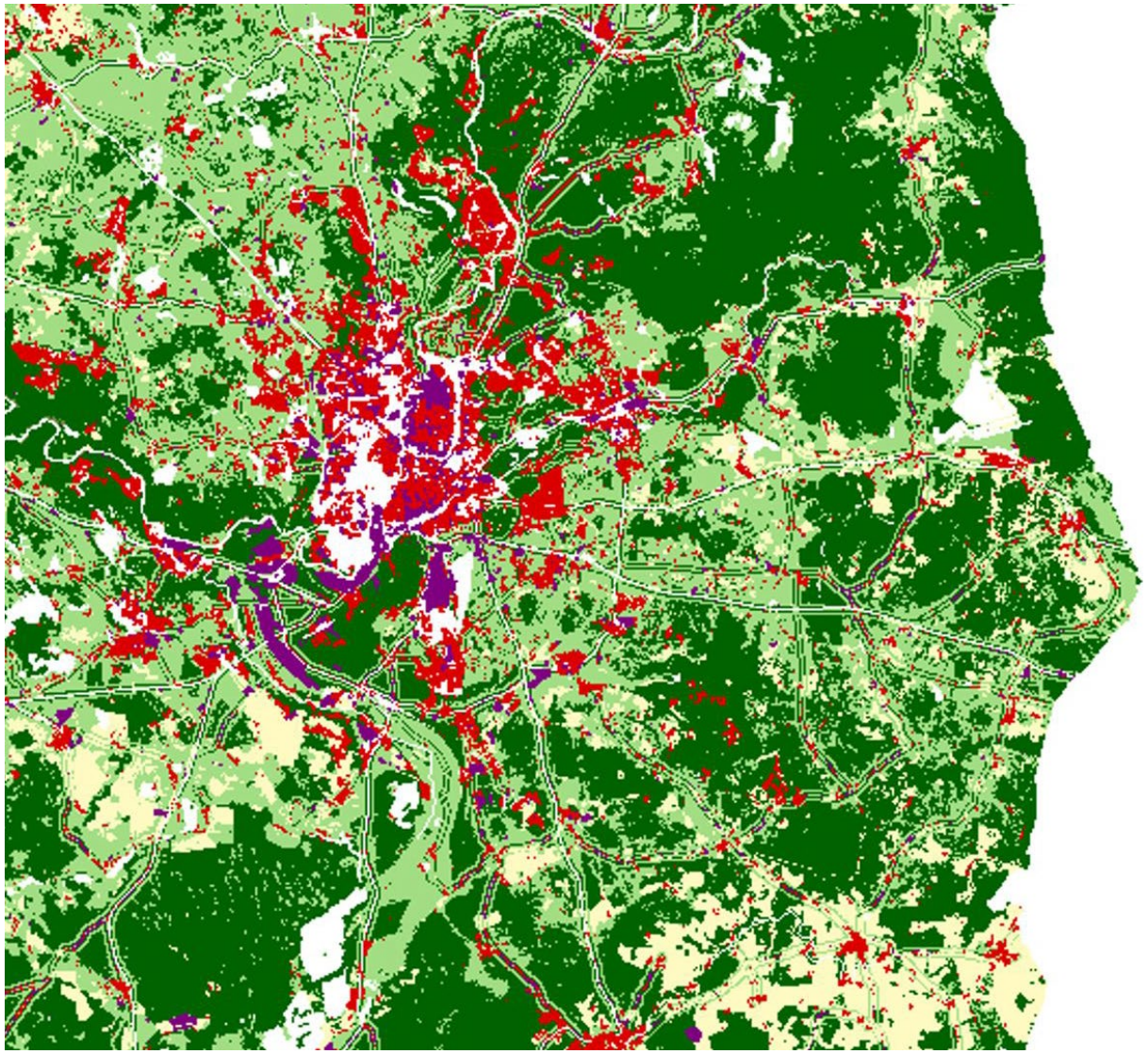


Diffuse scenario

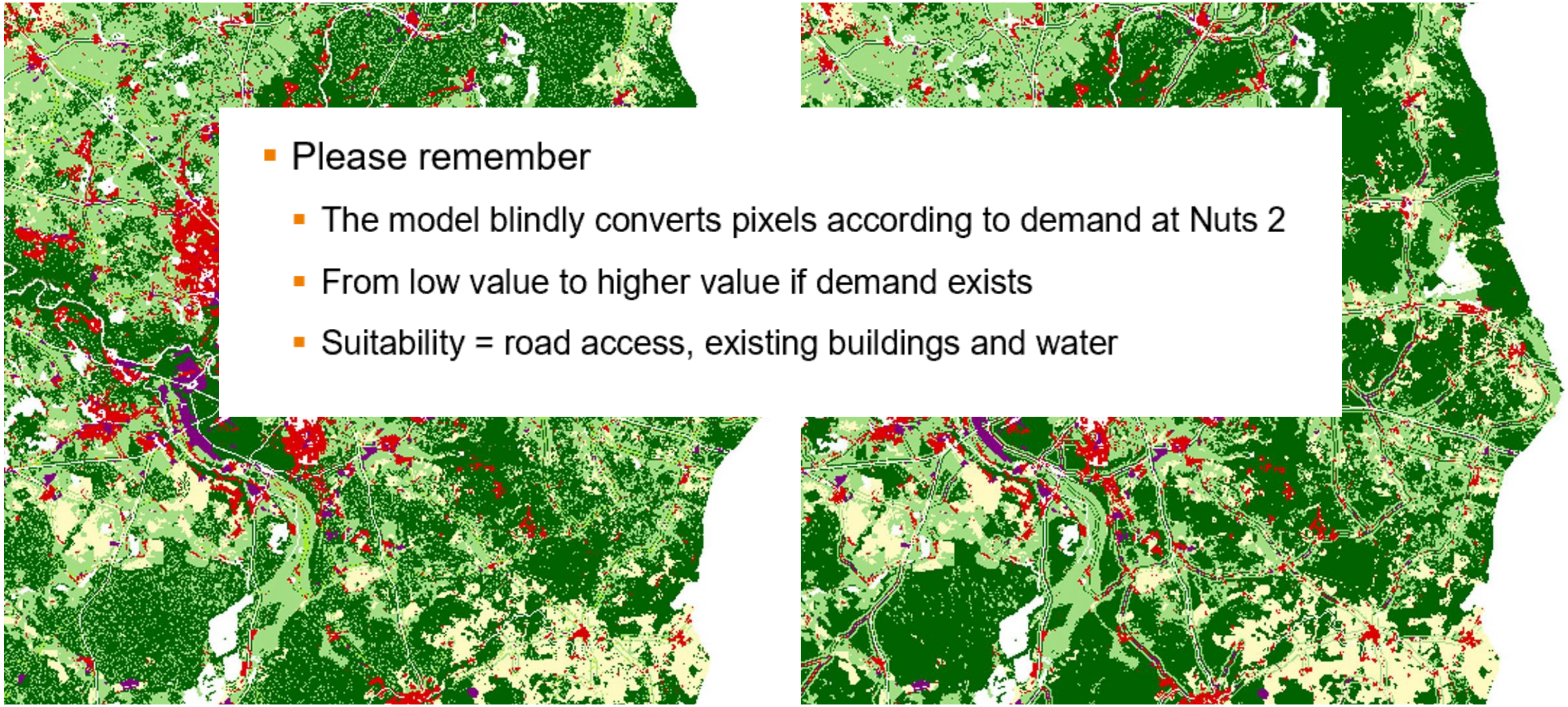


Compact vs diffuse in Vilnius



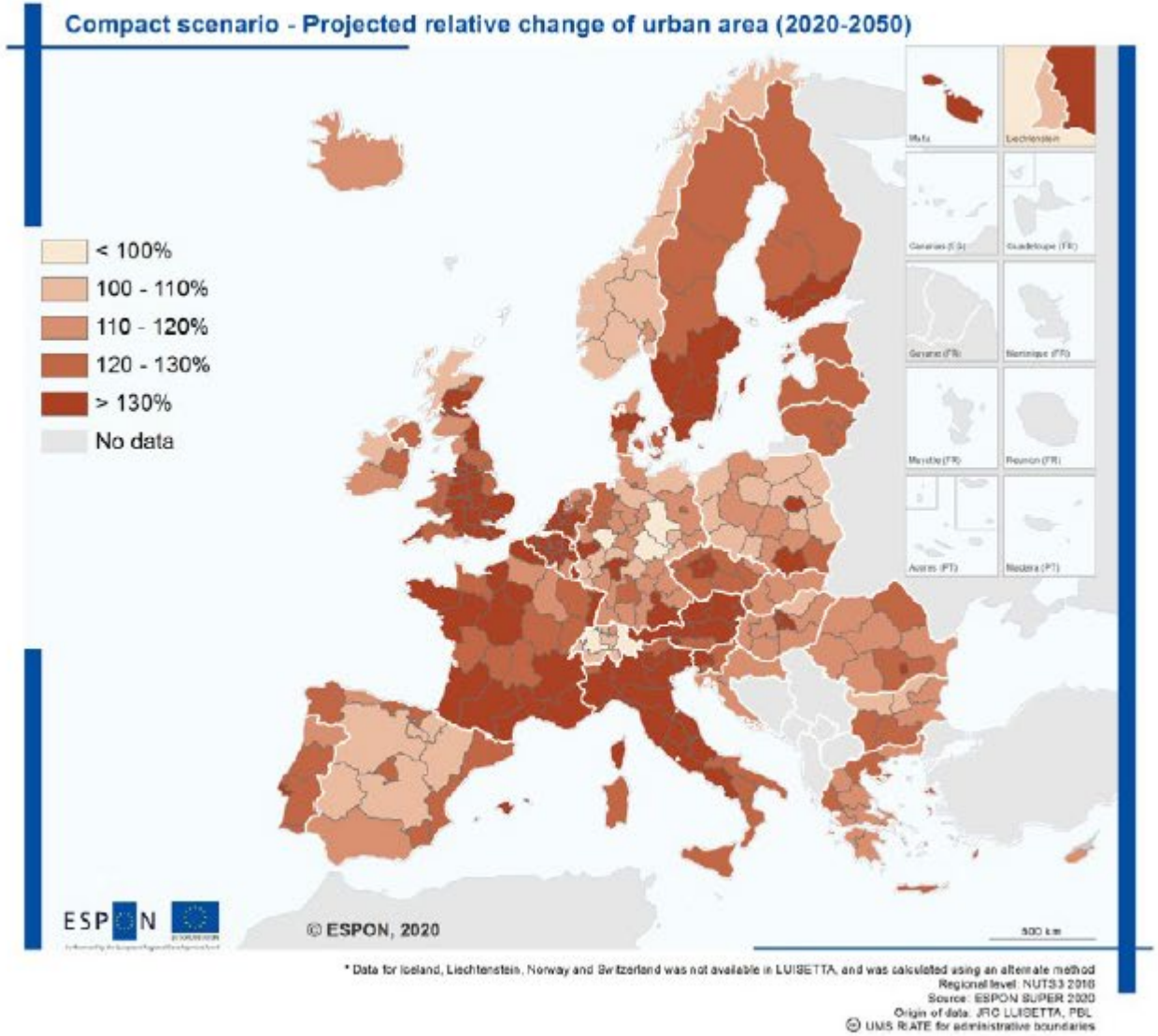


Compact vs diffuse in Vilnius

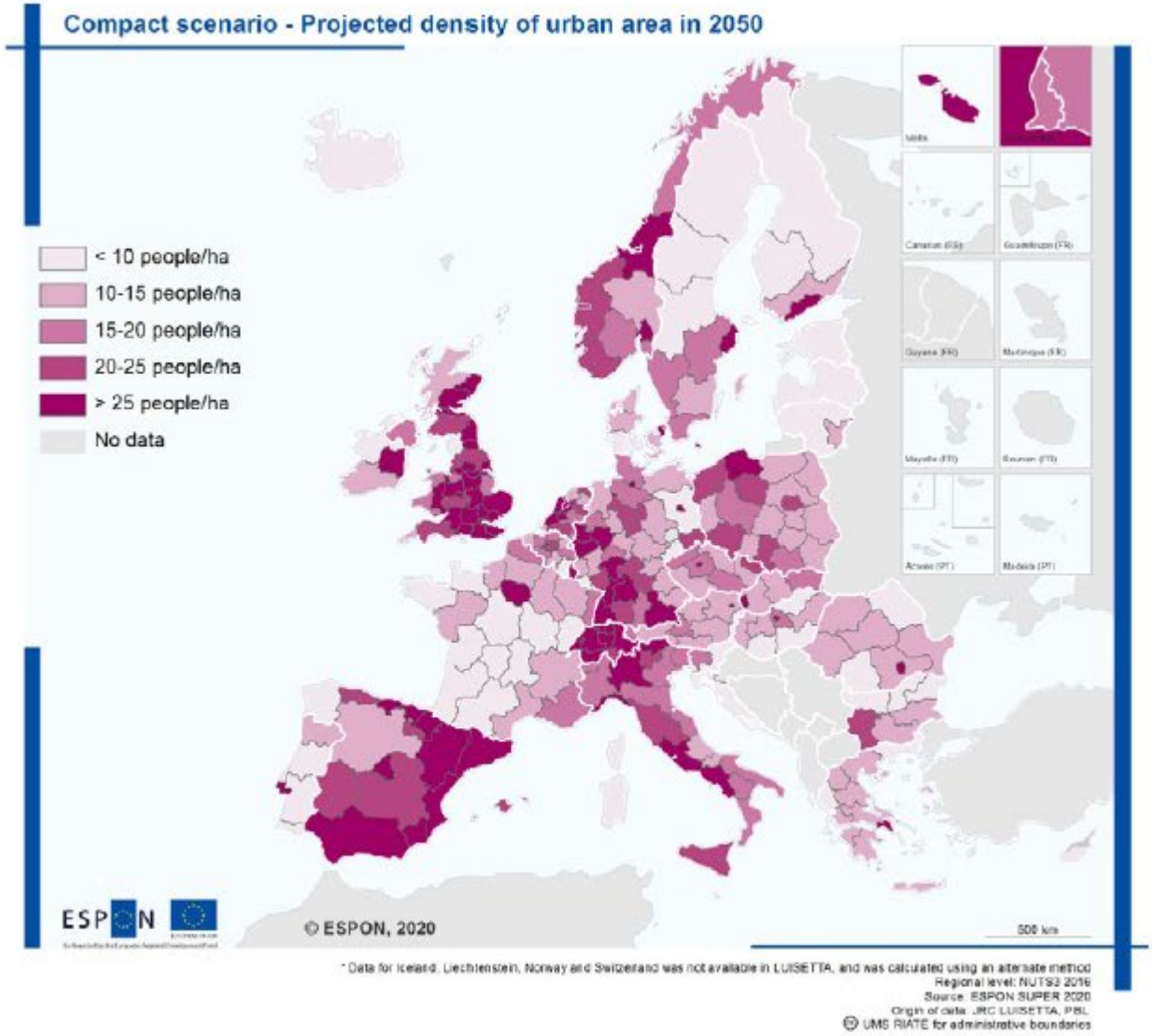


- Please remember
  - The model blindly converts pixels according to demand at Nuts 2
  - From low value to higher value if demand exists
  - Suitability = road access, existing buildings and water

Urban growth



Population density



	Compact	Polycentric	Diffuse
Economic sustainability			
GDP, wealth	+/–*	++	+
Public finance	+ +	+	–
Jobs	+ +	++	+/ –
Accessibility	+/–	++	+/–
Business areas	++	++	+/–
Housing demand / new construction	–	+	+
Transportation costs	+/–	+	– –
Energy consumption	+	+	– –
Ecological sustainability			
Reducing mobility (by car)	+ +	+ +	– –
Reducing pollution, including CO2	+ +	+	– –
Green urban areas	–	+	–/+
Biodiversity	+/–	+/–	––
Land consumption	+	+	– –
Natural hazards – risk and vulnerability	–	+	+/–
Climate change adaptation/mitigation	+/–	+	+/–
Consumption of resources	+/–	+	–
Space for future renewable energy	+/–	+/–	+/–
Space for future water retention	+	+	+
Space for future circular economy	+	+	–
Social sustainability			
Health	+/–	+/–	+/–
Affordable housing	+/–	+/–	+ +
Equity/inclusion	+/–	+	– –
Public and recreational space	+/–	+	+/–
Variety (high–rise, suburban, etc)	+	+	+
Mixed–use areas	+	++	–
Satisfaction with home environment	+/–	+	+

* For the sake of readability, findings are presented in a synthetic way, omitting the references and averaging out the weights for each indicator (+/– usually means conflicting findings between studies).

Conclusion: learn from past and future

- **Urban form matters for sustainability**
  - Some regions inherited certain forms, hard to change
  - Still some developments perceptible in 2000-2018 period
  - Scenarios allow for a political discussion on desired developments

- **Assessing urbanization modes**
  - Which (types of) areas are (not) urbanized in each scenario?
  - How did the urban structure change as a whole?
  - How will that impact car use, public services, future development sites?
  - The various trade-offs imply a *political* decision, not a technical one!

ESPON EUROPEAN UNION

Co-financed by the European Regional Development Fund

Inspire Policy Making with Territorial Evidence

// Thank you

David Evers, PBL (Netherlands)