Indicators, datasets and mapping developed at national level by the Italian National System for Environmental Protection

Michele Munafò

Italian Institute for Environmental Protection and Research - ISPRA

ISPRA

The Italian Institute for Environmental Protection and Research is a public research body

- Responds to obligations set by the national law
- Receives general guidance from the Minister for Environment, Land and Sea

Unique peculiarity at EU level

- Operational mandate (AGENCY)
- Research legal framework (KNOWLEDGE CENTRE)

ISPRA

1200+ staff spread among eight sites all around Italy. Headquarters in Rome

Responsibility for environmental:

- Monitoring
- Assessment
- Reporting
- Prevention
- Control/Inspections
- Technical and scientific advice
- Information and communication
- Education and training

2017: A ‘NEW’ ISPRA

Following the entry into force of Law 132/16, since 14th January 2017, ISPRA coordinates the National System for Environmental Protection (SNPA)

19 Regional and 2 Province’s Environmental Protection Agencies, under the chairmanship of ISPRA

Duty to provide coordinated nation-wide essential levels of technical environmental performance

SNPA: Toward an Increased Level of Environmental Protection

HOW:

- Securing a minimum and uniform level of environmental protection throughout Italy
- Promoting homogeneity of behaviour within the National System for Environmental Protection
- Providing maps, data and indicators and developing the National Environmental Information System

National System for Environmental Protection (SNPA)

SOME FIGURES

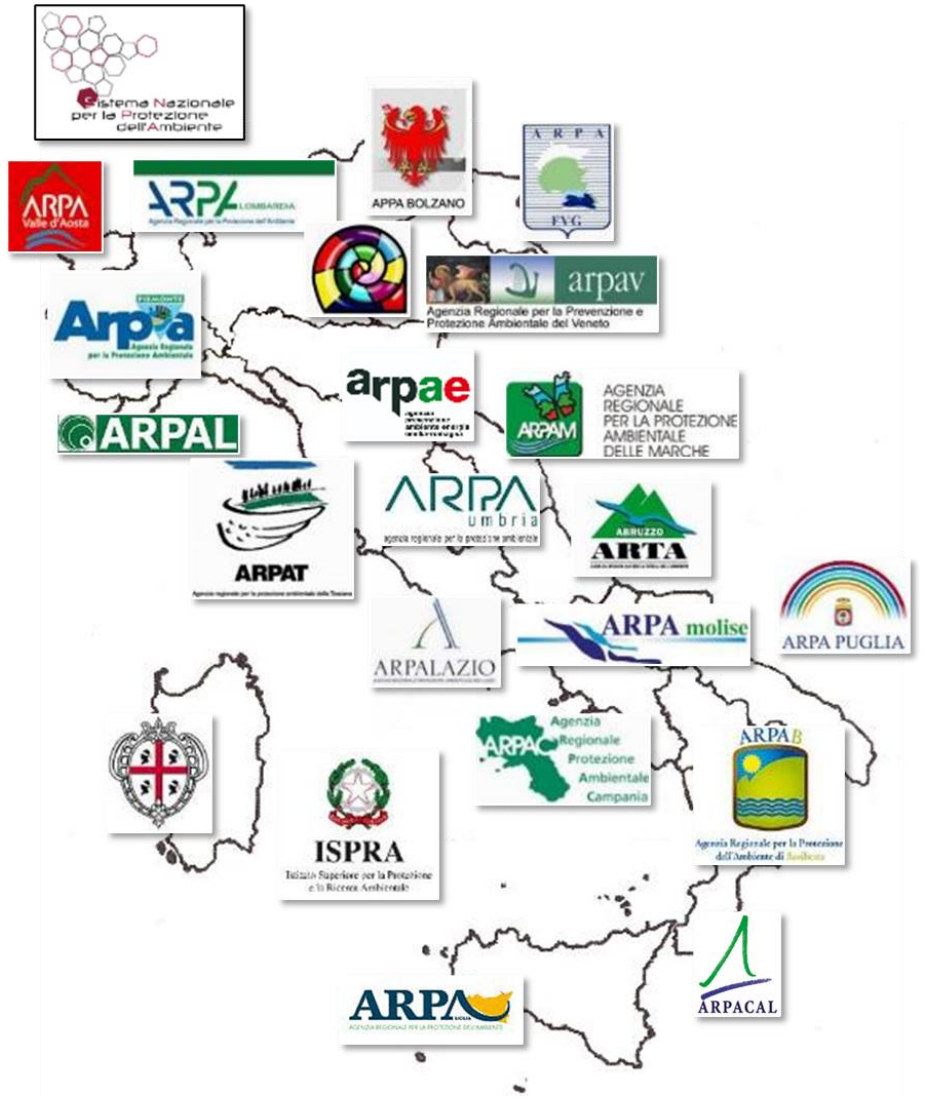
- Over 200 sites
- 10,000 operators
  - 1 operator every 6,000 inhabitants
  - 1 operator every 200 km^2
  - 44% inspections, controls and technical support
  - 21% labs activity
- 600,000 samples analyzed every year (twice the 2006 figures)
- 100,000 inspections and field controls
- 74,000 assessments and technical reports (+12% compared to 2006)

National System for Environmental Protection

SNPA is responsible for land take/consumption monitoring in Italy

SNPA data are the official reference data for public authorities in Italy and are part of the National Statistical System

ISPRA represents the Eionet National Focal Point and National Reference Centre (e.g. on land cover and land use), is the coordinating structure for INSPIRE implementation and is responsible for Land and Environmental Monitoring component in the National Copernicus User Forum



National System for Environmental Protection

Land take, land cover changes and ecosystem services Report is one of the main products of the System

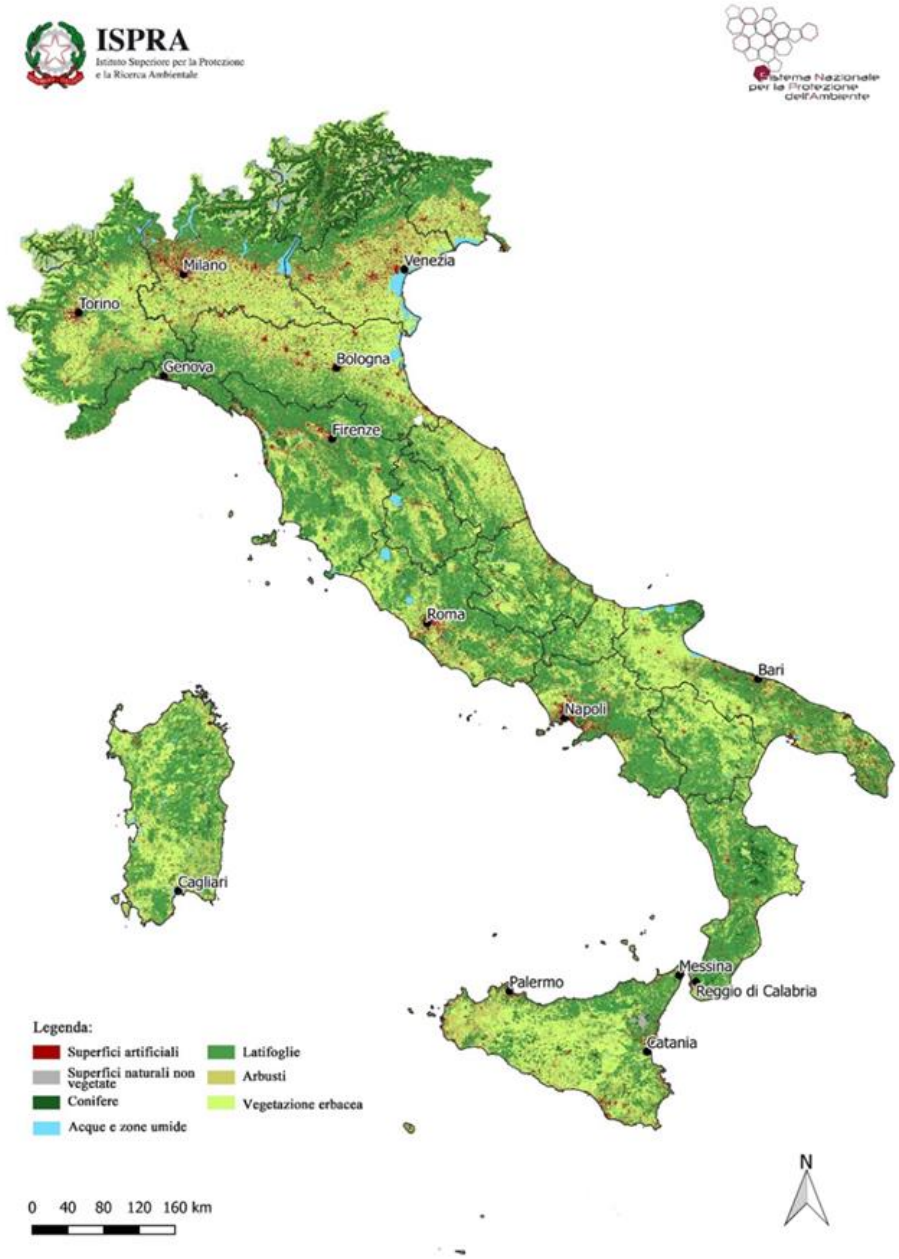
The annual Report provides maps, data and indicators to assess land condition and processes

Corine Land Cover (IV level)

- It is the national contribution to EU Corine Land Cover with a more detailed classification system
- Resolution and other specifications are derived from EU system (i.e. 1:100.000; MMU 5/25 ha)
- Data available for 1990, 2000, 2006, 2012, 2018
- Not suitable for analysis at local level

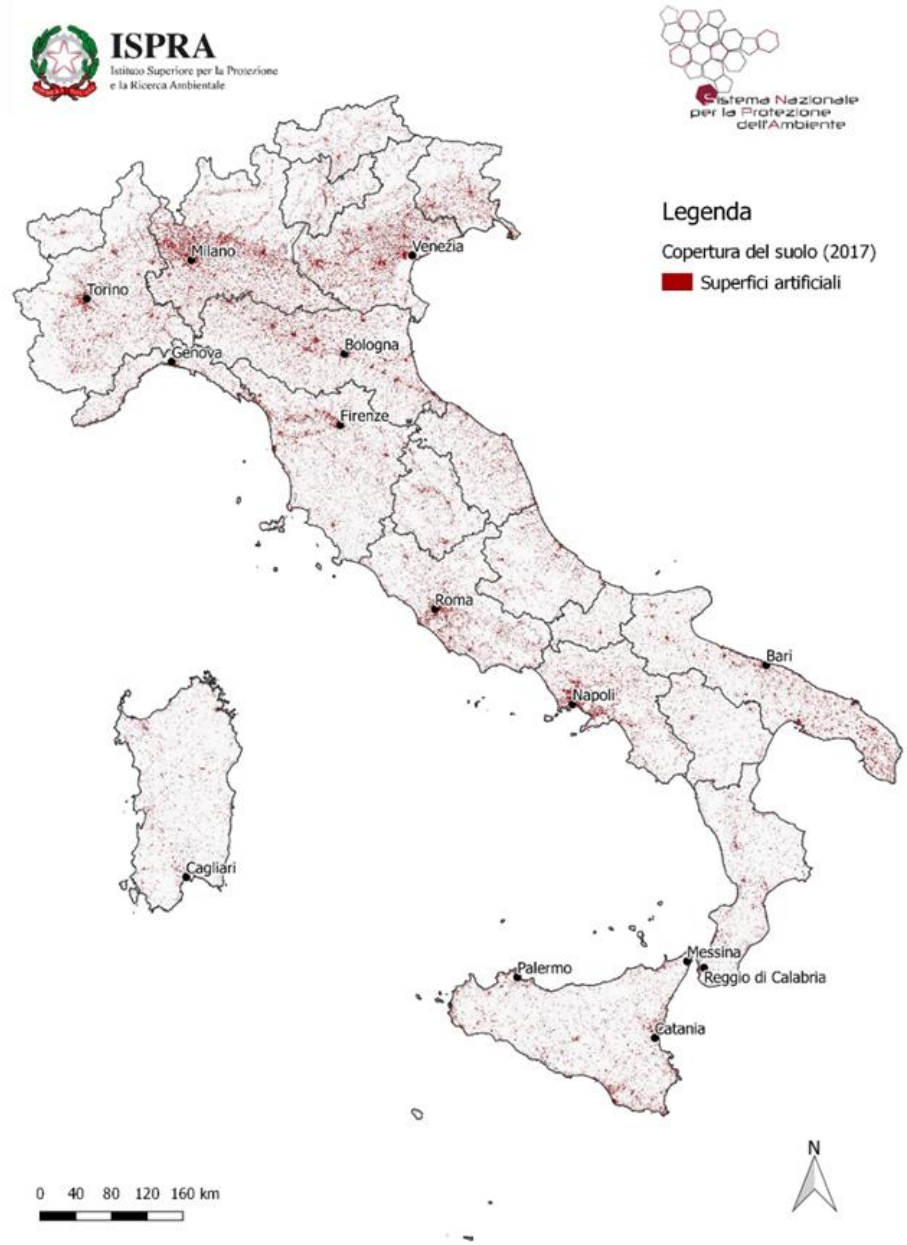
National Land Cover Map

- It is the national contribution to EU Corine Land Cover with a more detailed classification system
- It is based on the EAGLE specifications on land cover
- Derived from Sentinel 1 and Sentinel 2 semiautomatic classification
- 10 m resolution (MMU 100 m^2)
- Data available for 2018
- Possible use at local level



Land Take Maps

- It is the national map for land take monitoring
- It is based on the EAGLE specifications of artificial land cover
- Produced by manual photointerpretation at >1:5.000 scale (MMU 50 m^2)
- Resampled and delivered at 10 m resolution (MMU 100 m^2)
- Data available for 2006 (part.), 2012, 2015, 2016, 2017, 2018, 2019 (in production)
- Possible use at local level



FAQs Reference Manuals

1.1 Artificial Surfaces and Constructions

All surfaces where landscape has been changed by or is under influence of human construction activities by replacing natural surfaces with artificial abiotic 2D/3D constructions or artificial materials. Artificial parts of urban and suburban areas, where mankind has settled with permanent settlement infrastructures; also the settlement parts of rural areas. Sealed areas (buildings, other constructions and sealed flat surfaces) and non-sealed areas (no buildings, artificial and unsealed).

Note:
Urban greenery may be artificial and under human maintenance and form part of settlements, but after all it is vegetation and not to be placed here but under 2 Biotic Vegeta.

User corner

How to access our data

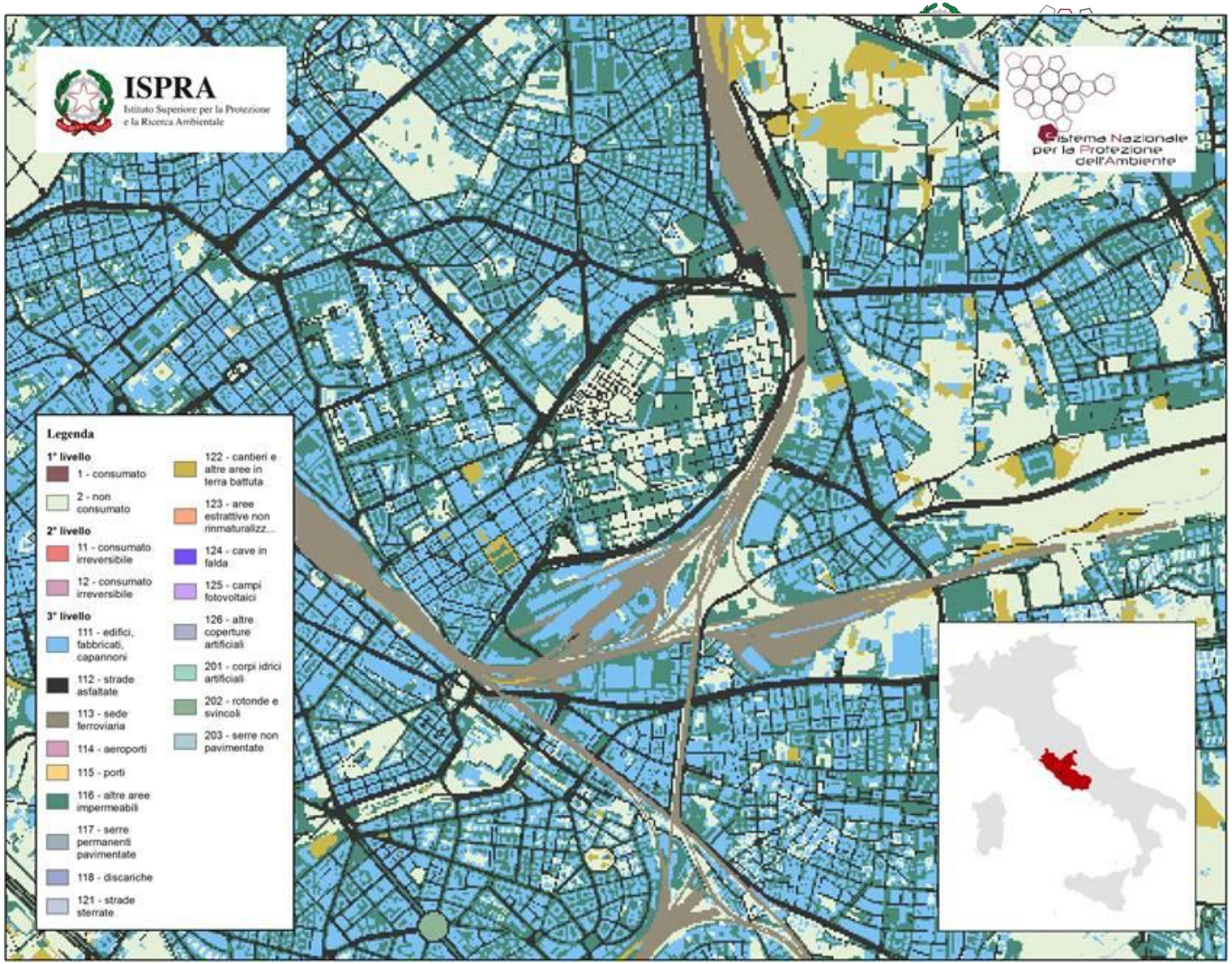
Technical library

Factsheets

Use cases

Land Take Maps

Every change is classified between artificial biophysical land cover of permanent type (buildings, paved roads and areas, railways, waste dumps and other permanent sealed surfaces) or reversible type (unpaved areas with soil compaction, permanent deposits of material, quarries, other artificial land cover).



Corine Land Cover

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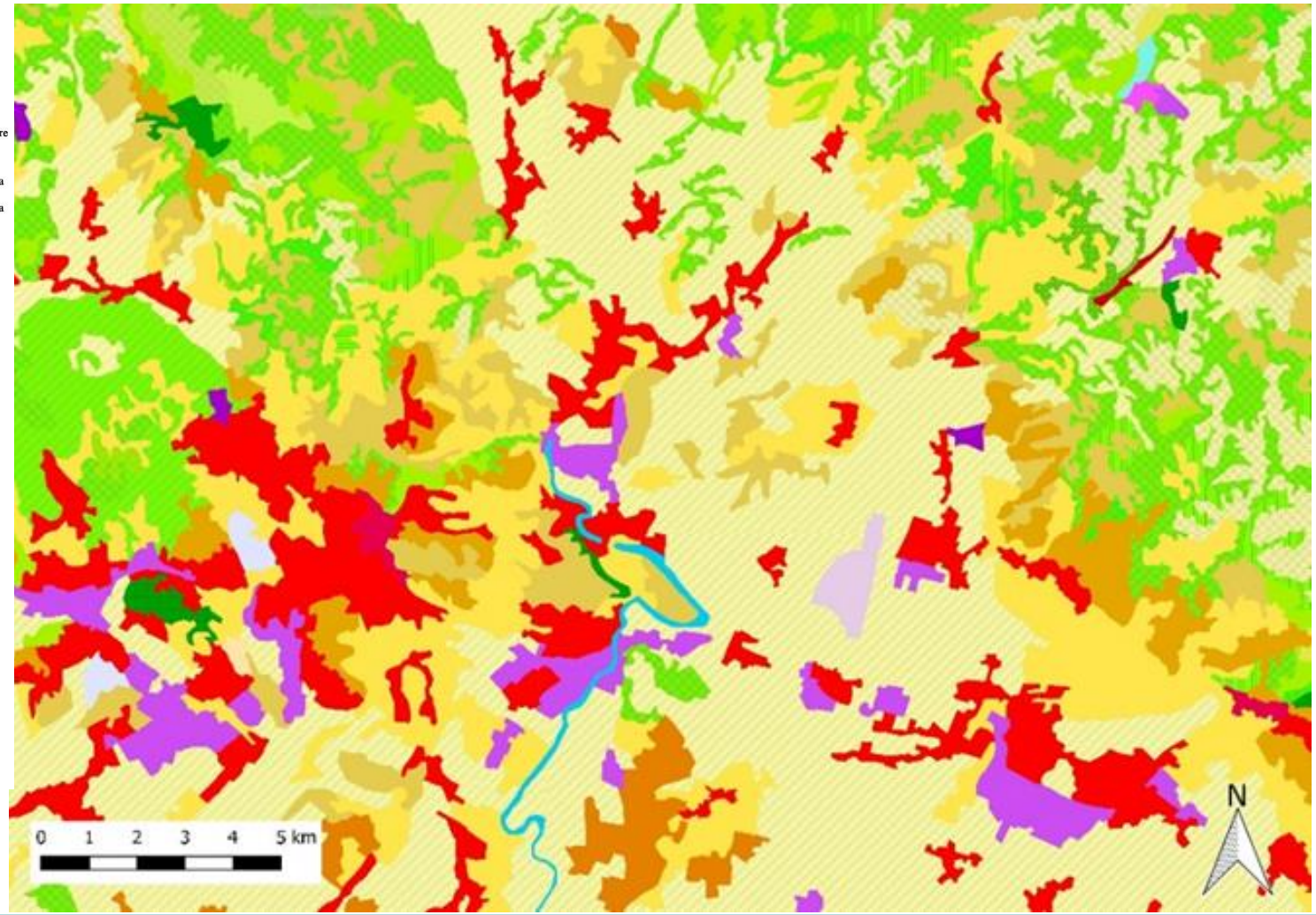
Sistema Nazionale per la Protezione dell'Ambiente

111- Zone residenziali a tessuto continuo
112- Zone residenziali a tessuto discontinuo e rado
121- Aree industriali, commerciali e dei servizi pubblici e privati
1211- Impianti fotovoltaici
122- Reti stradali, ferroviarie e infrastrutture tecniche
123- Aree portuali
124- Aeroporti
131- Aree estrattive
132- Discariche
133- Cantieri
141- Aree verdi urbane
142- Aree ricreative e sportive
211- Seminativi in aree non irrigue
2111- Colture intensive
2112- Colture estensive
212- Seminativi in aree irrigue
213- Risaie
221- Vigneti
222- Frutteti e frutti minori
223- Oliveti
224- Arboricoltura da legno
2241- Giovani impianti di arboricoltura da legno
231- Prati stabili
241- Colture temporanee associate a colture permanenti
242- Sistemi colturali e particellari complessi
243- Aree prevalentemente occupate da colture agrarie con presenza di spazi naturali importanti
244- Aree agroforestali
311- Boschi di latifoglie
3111- Boschi a prevalenza di querce e altre latifoglie sempreverdi
3112- Boschi a prevalenza di querce caducifoglie
3113- Boschi misti a prevalenza di altre latifoglie autoctone
3114- Boschi a prevalenza di castagno
3115- Boschi a prevalenza di faggio
3116- Boschi a prevalenza di igrofite
3117- Boschi ed ex-piantagioni a prevalenza di latifoglie esotiche
312- Boschi di conifere
3121- Boschi a prevalenza di pini mediterranei e
3122- Boschi a prevalenza di pini oro-mediterranei e montani
3123- Boschi a prevalenza di abeti
3124- Boschi a prevalenza di larice e/o pino
3125- Boschi ed ex-piantagioni a prevalenza di conifere
313- Boschi misti di conifere e latifoglie
3131- Boschi misti di conifere e latifoglie a prevalenza di latifoglie
3132- Boschi misti di conifere e latifoglie a prevalenza di conifere
321- Aree a pascolo naturale e praterie
3211- Praterie continue
3212- Praterie discontinue
322- Brughiere e cespuglieti
323- Aree a vegetazione sclerofilla
3231- Macchia alta
3232- Macchia bassa e garighe
324- Aree a vegetazione boschiva e arbustiva in evoluzione
3241- Tagliate di bosco ceduo
331- Spiagge, dune e sabbie
332- Rocce nude, falesie, rupi, affioramenti
333- Aree con vegetazione rada
334- Aree percorse da incendi
335- Ghiacciai e nevi perenni
411- Paludi interne
412- Torbiere
421- Paludi salmastre
422- Saline
511- Corsi d'acqua, canali e idrovie
512- Bacini d'acqua
521- Lagune
522- Estuari
523- Mari e oceani



Land take:

About 20 km²/ year

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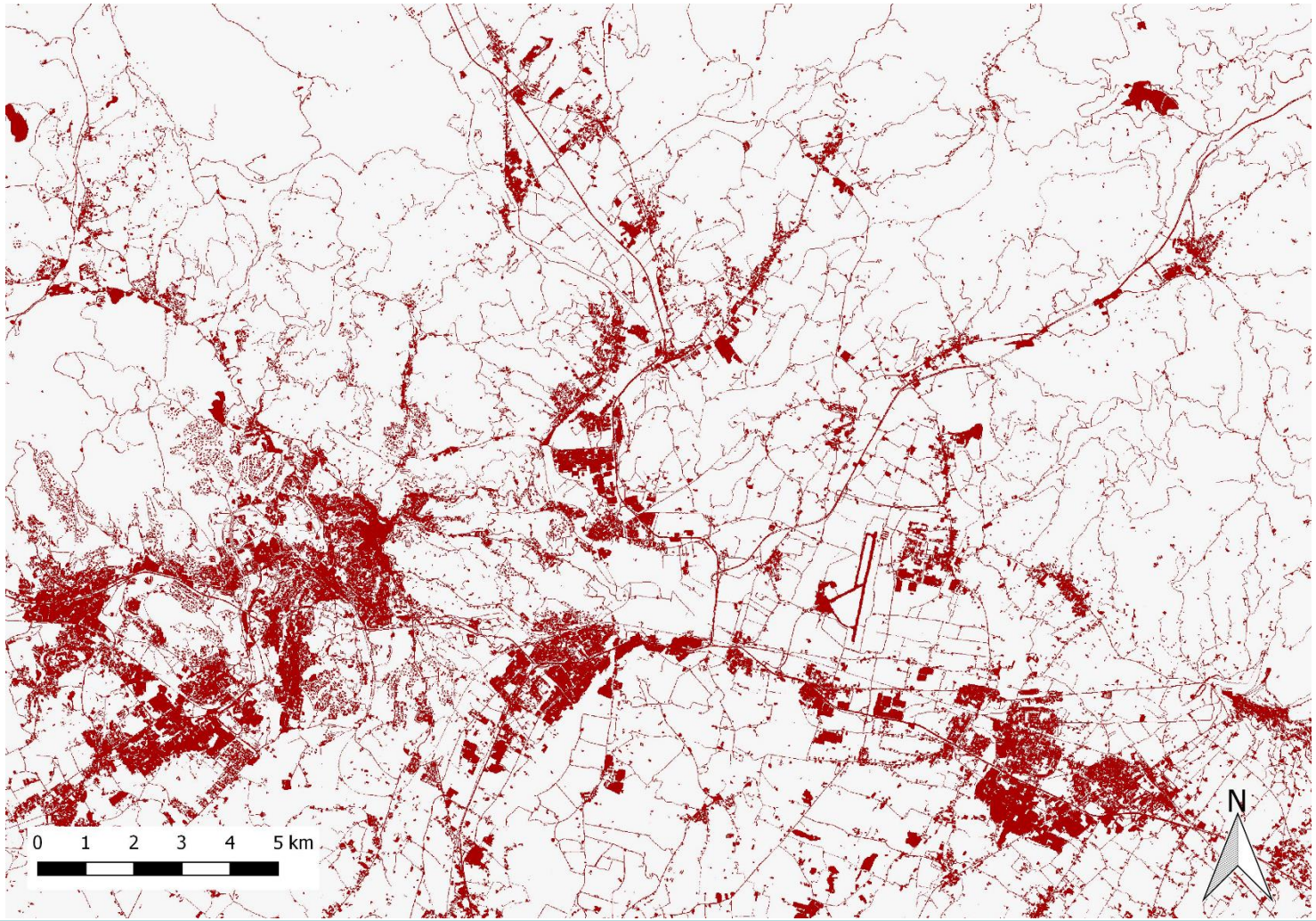
Land Take Maps

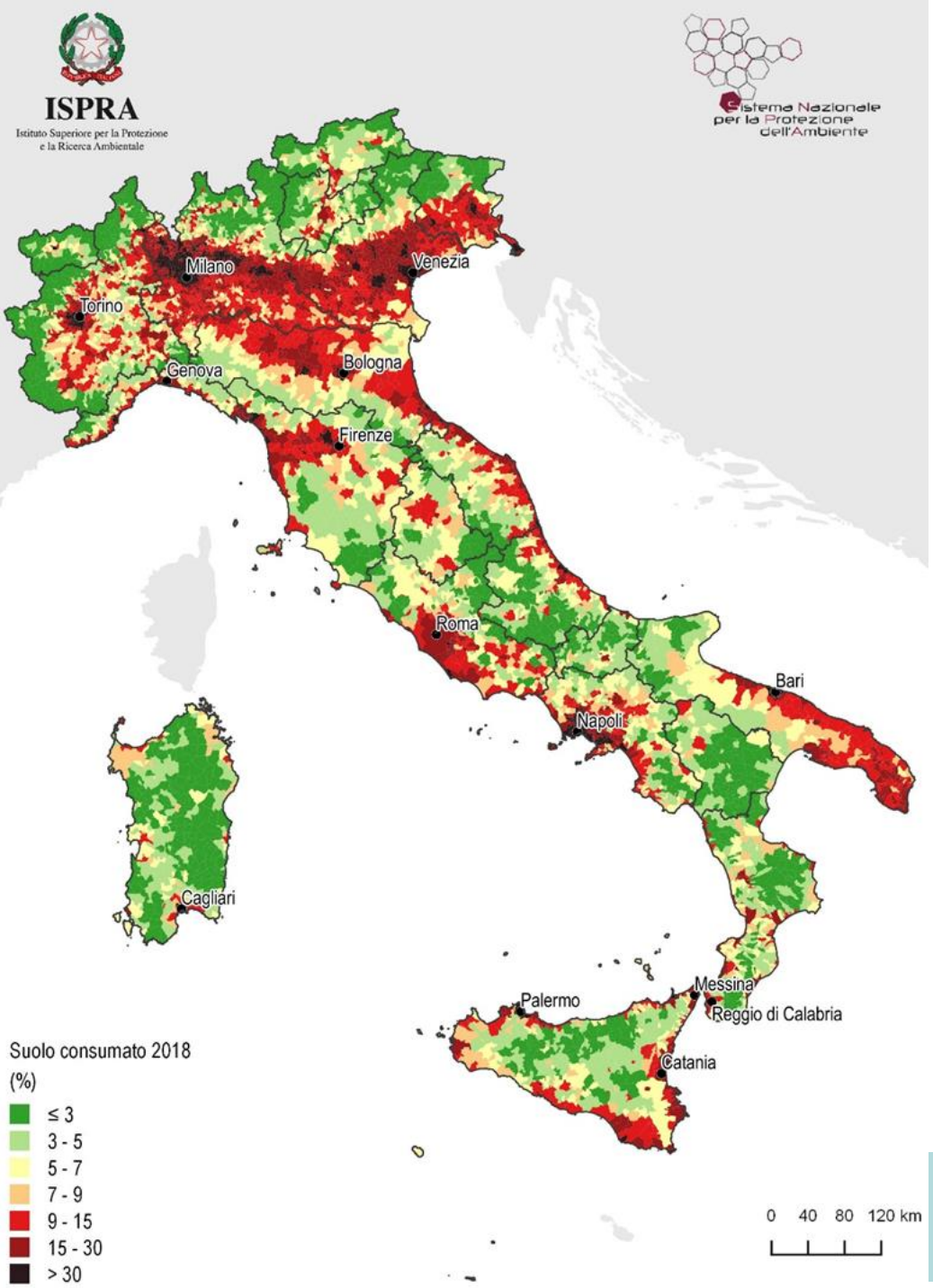


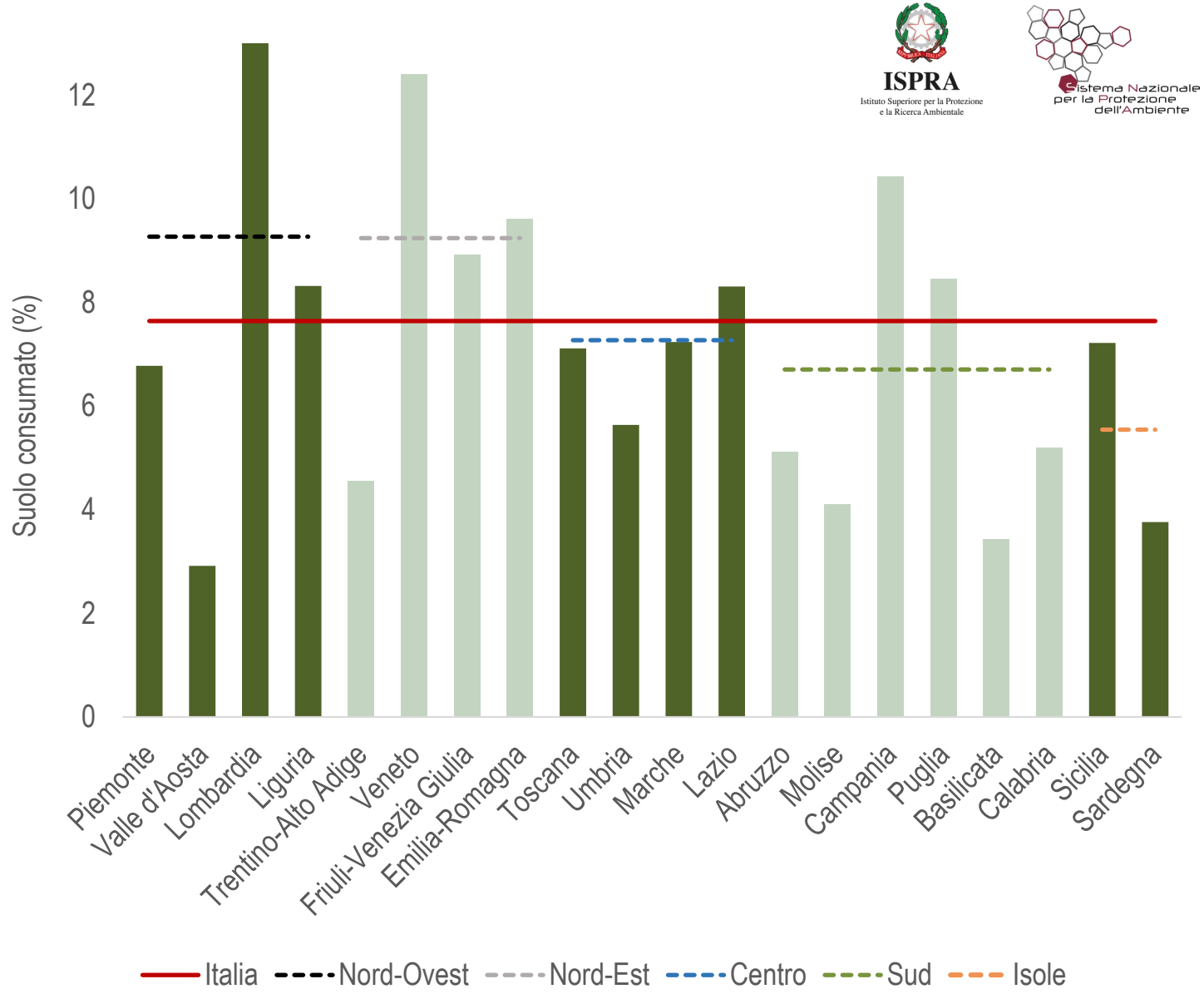
Land take:

About 50 km²/ year

Land Take Indicators

1. land_consumption
2. Not_land_consumption
3. Not_classified_soil
4. land_consumption_in_%
5. Not_land_consumption_in_%
6. Not_classified_soil_in_%
7. land_consumption_in_%_MN
8. Consumed_increase_[ha]
9. Consumed_density_[m2/ha]
10. Not_consumed_in_EUAP
11. Consumed_in_EUAP
12. Not_classified_in_EUAP
13. Not_land_consumption_in_150m_rivers
14. land_consumption_in_150m_rivers
15. Not_classified_soil_in_150m_rivers
16. land_consumption_in_150m_rivers_in_%
17. Not_land_consumption_out_of_150m_rivers_in_%
18. Not_land_consumption_in_300m_from_shoreline
19. Not_land_consumption_in_300-1000m_from_shoreline
20. Not_land_consumption_in_1000-10000m_from_shoreline
21. land_consumption_in_300m_from_shoreline
22. land_consumption_in_300-1000m_from_shoreline
23. land_consumption_in_1000-10000m_from_shoreline
24. land_consumption_out_of_10000m_from_shoreline
25. land_consumption_in_300m_from_shoreline_in_%
26. land_consumption_in_300-1000m_from_shoreline_in_%
27. land_consumption_in_1000-10000m_from_shoreline_in_%
28. land_consumption_out_of_10000m_from_shoreline_in_%
29. land_consumption_in_0-300m_a.s.l.
30. land_consumption_in_300-600m_a.s.l.
31. land_consumption_over_600m_a.s.l.
32. Not_land_consumption_in_0-300m_a.s.l.
33. Not_land_consumption_in_300-600m_a.s.l.
34. Npt_land_consumption_over_600m_a.s.l.
35. land_consumption_in_0-300m_a.s.l._in_%
36. land_consumption_in_300-600m_a.s.l._in_%
37. land_consumption_over_600m_a.s.l._in_%
38. land_consumption_in_0-10_%_slope
39. land_consumption_over_10_%_slope
40. Not_land_consumption_in_0-10_%_slope
41. Not_land_consumption_over_10_%_slope
42. land_consumption_in_0-10_%_slope_in_%
43. land_consumption_over_10_%_slope_in_%
44. land_consumption_in_flood_hazard_zones_(P1)
45. Not_land_consumption_in_flood_hazard_zones_(P1)
46. land_consumption_in_flood_hazard_zones_(P1)_in_%
47. land_consumption_in_flood_hazard_zones_(P2)
48. Not_land_consumption_in_flood_hazard_zones_(P2)
49. land_consumption_in_flood_hazard_zones_(P2)_in_%
50. land_consumption_in_flood_hazard_zones_(P3)
51. Not_land_consumption_in_flood_hazard_zones_(P3)
52. land_consumption_in_flood_hazard_zones_(P3)_in_%
53. land_consumption_in_landslide_hazard_zones_(P1)
54. land_consumption_in_landslide_hazard_zones_(P2)
55. land_consumption_in_landslide_hazard_zones_(P3)
56. land_consumption_in_landslide_hazard_zones_(P4)
57. land_consumption_in_landslide_hazard_zones_(P5)
58. Not_land_consumption_in_landslide_hazard_zones_(P1)
59. Not_land_consumption_in_landslide_hazard_zones_(P2)
60. Not_land_consumption_in_landslide_hazard_zones_(P3)
61. Not_land_consumption_in_landslide_hazard_zones_(P4)
62. Not_land_consumption_in_landslide_hazard_zones_(P5)
63. land_consumption_in_landslide_hazard_zones_(P1)_in_%
64. land_consumption_in_landslide_hazard_zones_(P2)_in_%
65. land_consumption_in_landslide_hazard_zones_(P3)_in_%
66. land_consumption_in_landslide_hazard_zones_(P4)_in_%
67. land_consumption_in_landslide_hazard_zones_(P5)_in_%
68. land_consumption_in_high_seismic_hazard_zones
69. land_consumption_in_very_high_seismic_hazard_zones
70. Not_land_consumption_in_high_seismic_hazard_zones
71. Not_land_consumption_in_very_high_seismic_hazard_zones
72. land_consumption_in_high_seismic_hazard_zones_in_%
73. land_consumption_in_very_high_seismic_hazard_zones_in_%
74. Surface_in_a_60m_buffer_of_land_consumption_area
75. Surface_not_in_a_60m_buffer_of_land_consumption_area
76. Surface_in_a_60m_buffer_of_land_consumption_area_in_%
77. Surface_in_a_100m_buffer_of_land_consumption_area
78. Surface_not_in_a_100m_buffer_of_land_consumption_area
79. Surface_in_a_100m_buffer_of_land_consumption_area_in_%
80. Surface_in_a_200m_buffer_of_land_consumption_area
81. Surface_not_in_a_200m_buffer_of_land_consumption_area
82. Surface_in_a_200m_buffer_of_land_consumption_area_in_%
83. Surface_of_Permanent_Water_Bodies
84. land_consumption_in_excluding_surface_of_Permanent_Water_Bodies_HRL_Copernicus_2012_in_%
85. Classification_of_municipalities_centrality_by__Dipartimento_per_lo_Sviluppo_e_la_Coesione_Economica
86. Classification_of_municipalities_elevation_by_ISTAT
87. TA
88. LCPI
89. Edclass
90. RMPS
91. DENSITY
92. Dispersion_index
93. Classes
94. Built-up_(20m)_area_in_rural_areas_in_%
95. Built-up_(20m)_area_in_urban_areas_in_%
96. Built-up_(5m)_area_in_rural_areas_in_%
97. Built-up_(5m)_area_in_urban_areas_in_%
98. Built-up_(5m)_area_in_rural_areas
99. Built-up_(5m)_area_in_low_density_urban_areas
100. Built-up_(5m)_area_in_compact_urban_areas
101. Urban_area
102. Rural_area_in_%
103. Low_density_urban_area_in_%
104. Compact_urban_area_in_%
105. Urban_area_in_%
106. PD
107. PLADJ
108. SHDI
109. MPA
110. MSI
111. CARB_E _min
112. CARB_E_max
113. HABITAT_E
114. PROD_AGR_E
115. PROD_LEGN_E
116. IMPOL_E_min
117. IMPOL_E_max
118. EROS_E_min
119. EROS_E_max
120. RM_E_min
121. RM_E_max
122. Tot_E_min
123. Tot_E_max
124. INF_E_min
125. INF_E_max
126. DEF_E_min
127. DEF_E_max
128. PUR_E_min
129. PUR_E_max
130. F_CAR_E_min
131. F_CAR_E_max
132. F_LEG_E
133. F_AGR_E
134. Consumed_in_protected_area
135. Not_consumed_in_protected_area
136. Degraded_area
137. Degraded_area_total
138. Ratio_land_consumption_population_2012_2018





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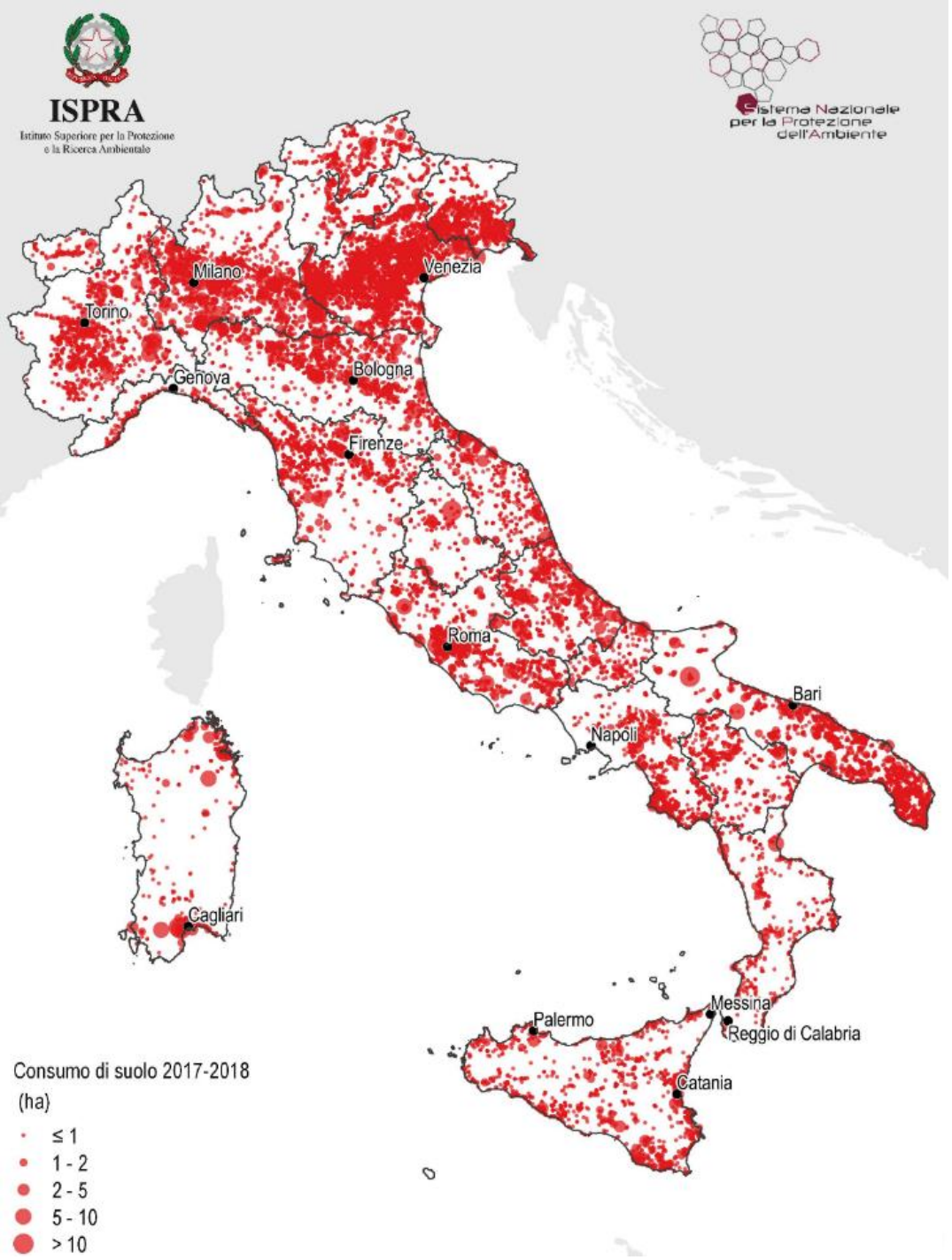


15% in central e semicentral urban areas

32% in peripheral and less dense urban areas

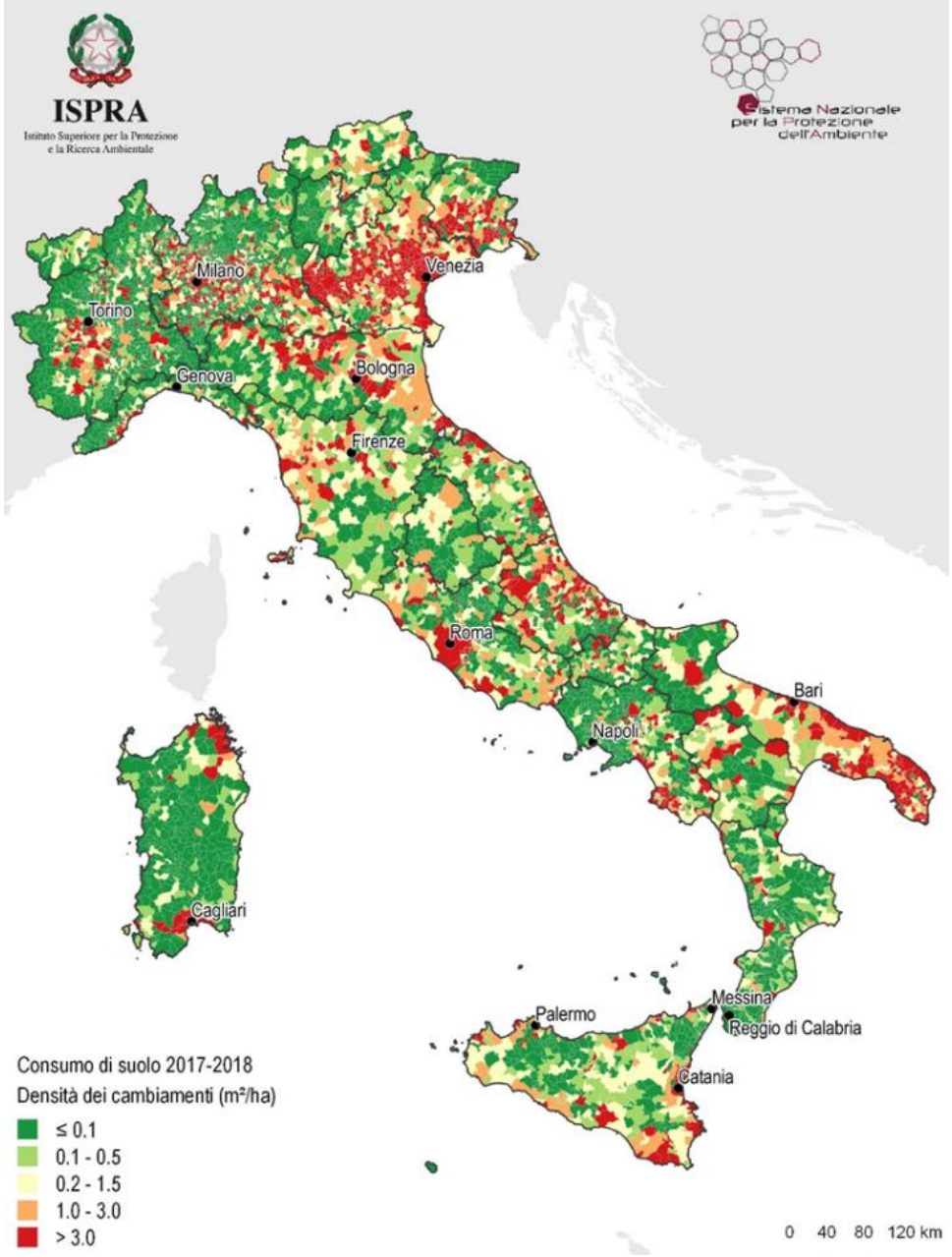
Main consump-tion typology Construction sites 2.846 ha

Land consumption

+50,9 km^2 (+0,22%) in a year

Almost 2 m^2 per second

+48,1 km^2 (net)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Sistema Nazionale per la Protezione dell'Ambiente
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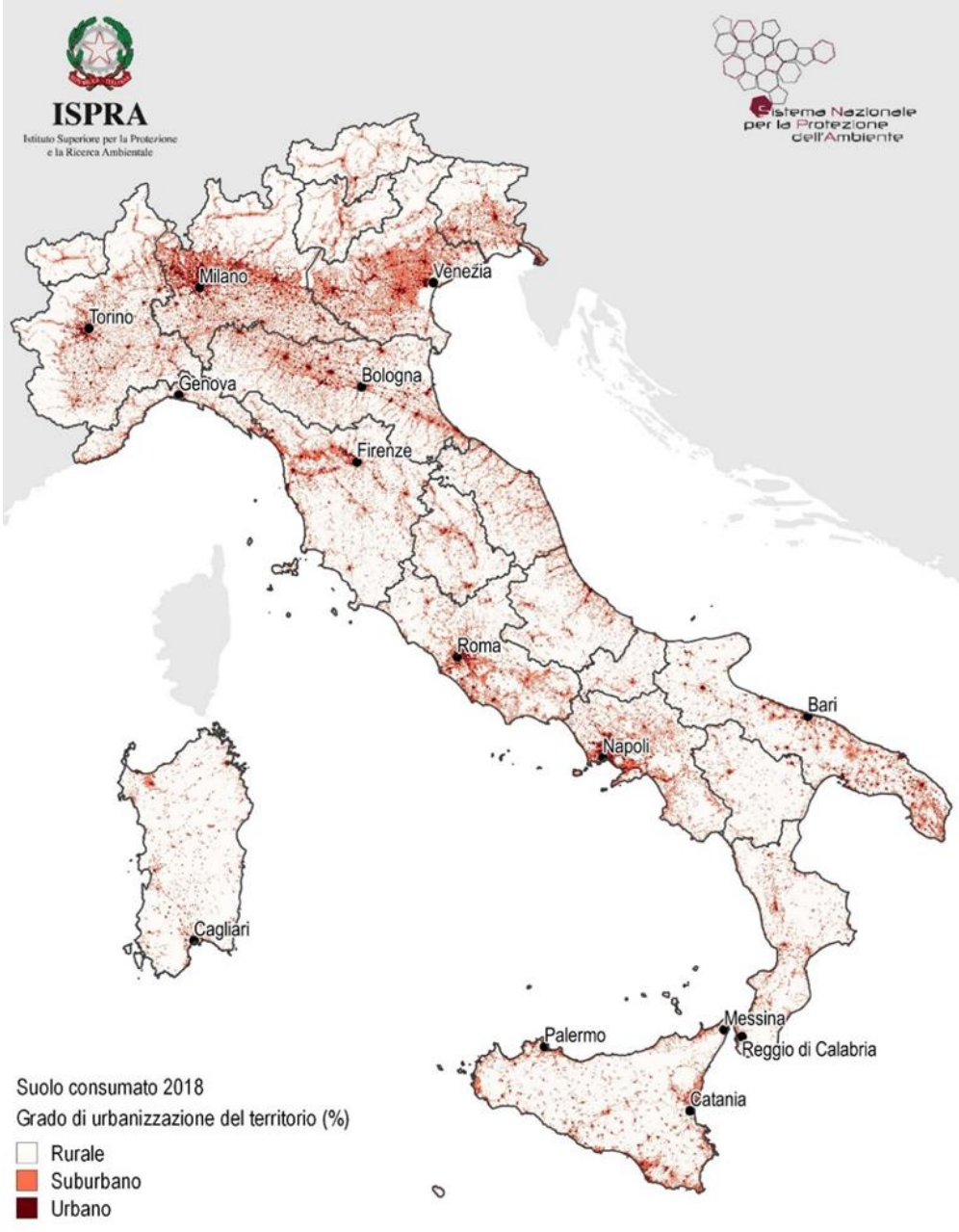
Venezia
Torino
Genova
Bologna
Firenze
Roma
Bari
Napoli
Cagliari
Palermo
Messina
Reggio di Calabria
Catania
Consumo di suolo 2017-2018
Densità dei cambiamenti (m²/ha)
≤ 0.1
0.1 - 0.5
0.2 - 1.5
1.0 - 3.0
> 3.0
0 40 80 120 km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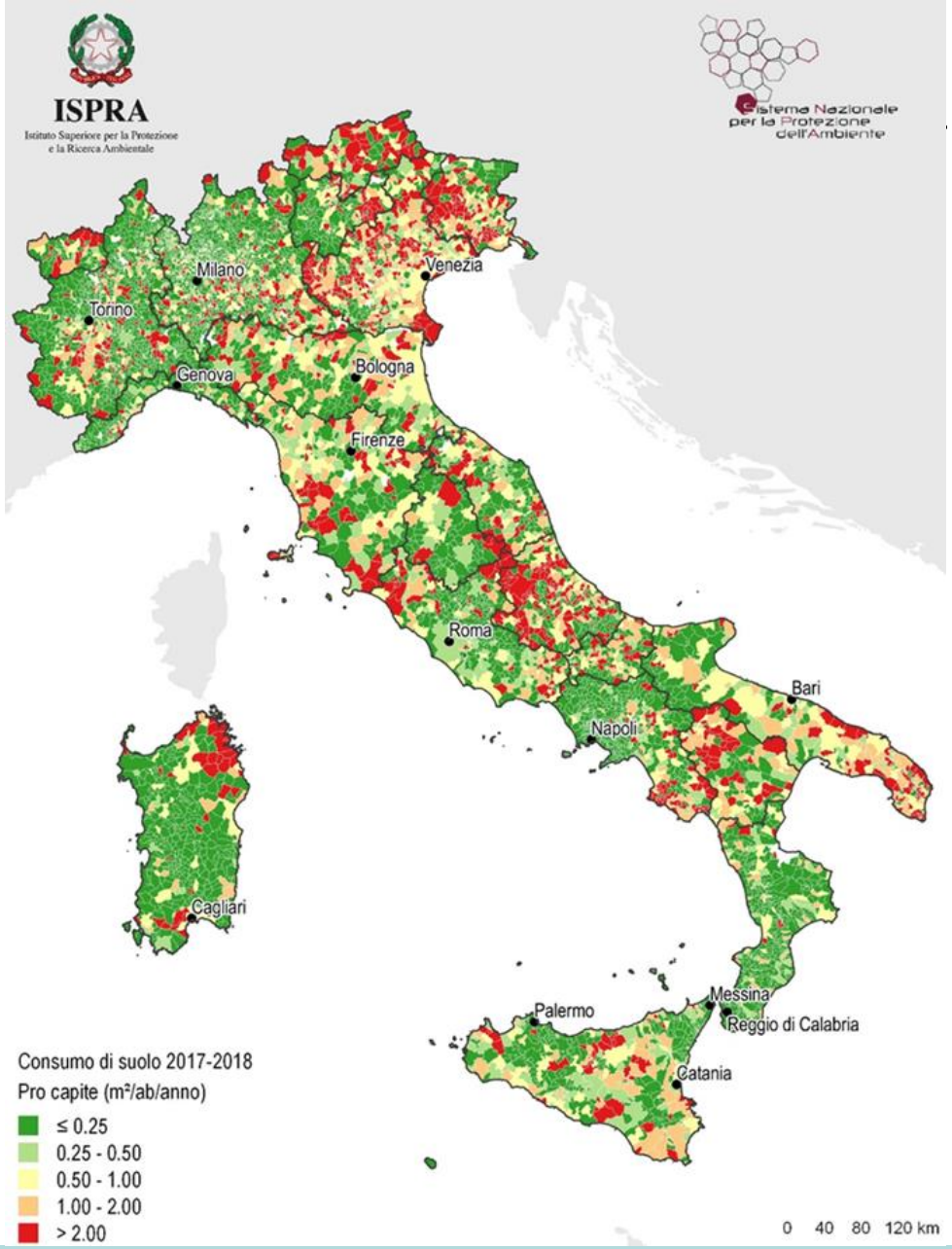
Catania
Suolo consumato 2018
Grado di urbanizzazione del territorio (%)
Rurale
Suburbano
Urbano

By 2030, enhance inclusive and sustainable urbanization and capacities for participatory, integrated and sustainable human settlement planning and management in all countries

INDICATORE: Ratio of land consumption rate to population growth rate, at comparable scale

$$LCRPGR = \left(\frac{ln\left(\frac{LC_{t+n}}{LC_t}\right)}{y}\right) \Big/ \left(\frac{ln\left(\frac{Pop_{t+n}}{Pop_t}\right)}{y}\right)$$



Land Take

(% in relation to the surface of the territory – 2018)

7,6 National Mean

11,0 Useful Land

10,5 Flood hazard(mean)

5,6 Landslide hazard(mean)

7,4 Earthquake hazard(high)

2,3 Protected Area

23,4 0-300m

19,7 300-1.000m

Coastal

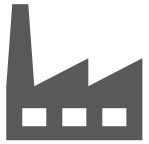
11,8 Plains

5,9 Hill

2,7 Mountain

75,4

28,9



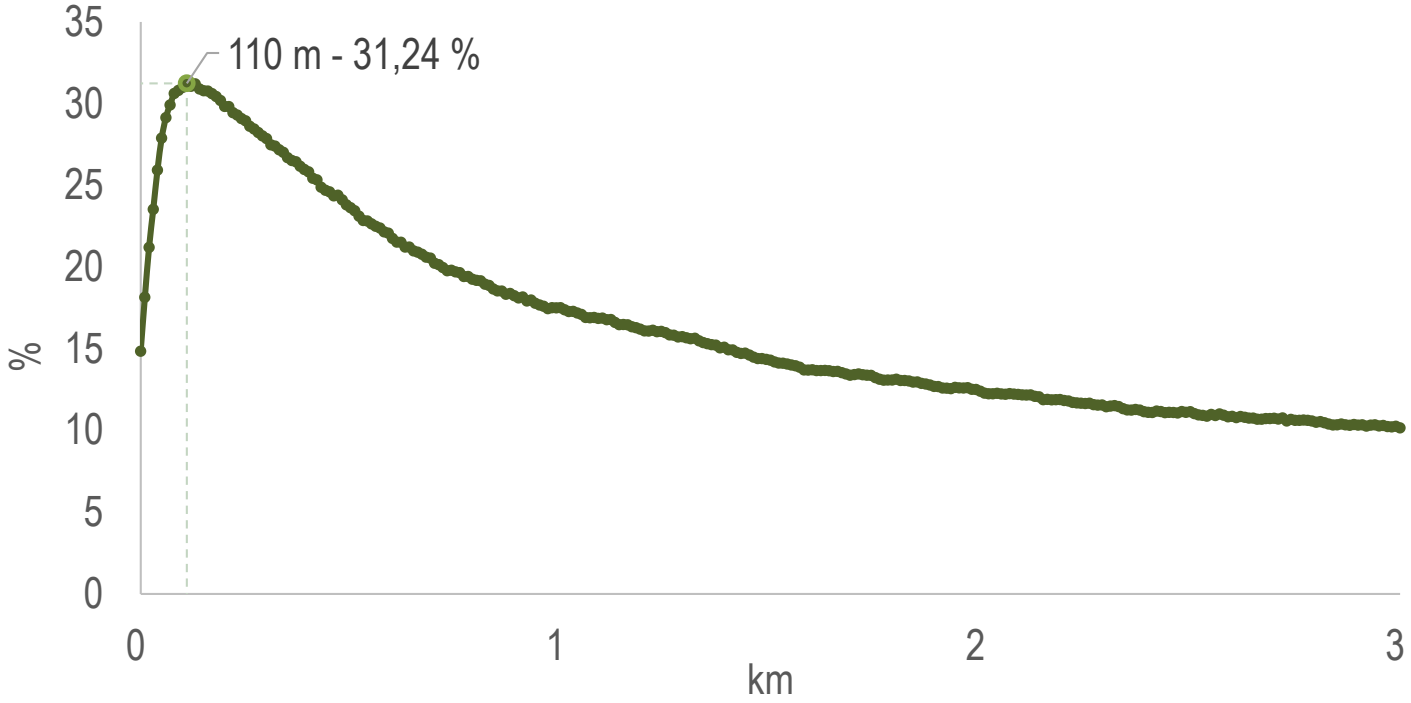
79,0

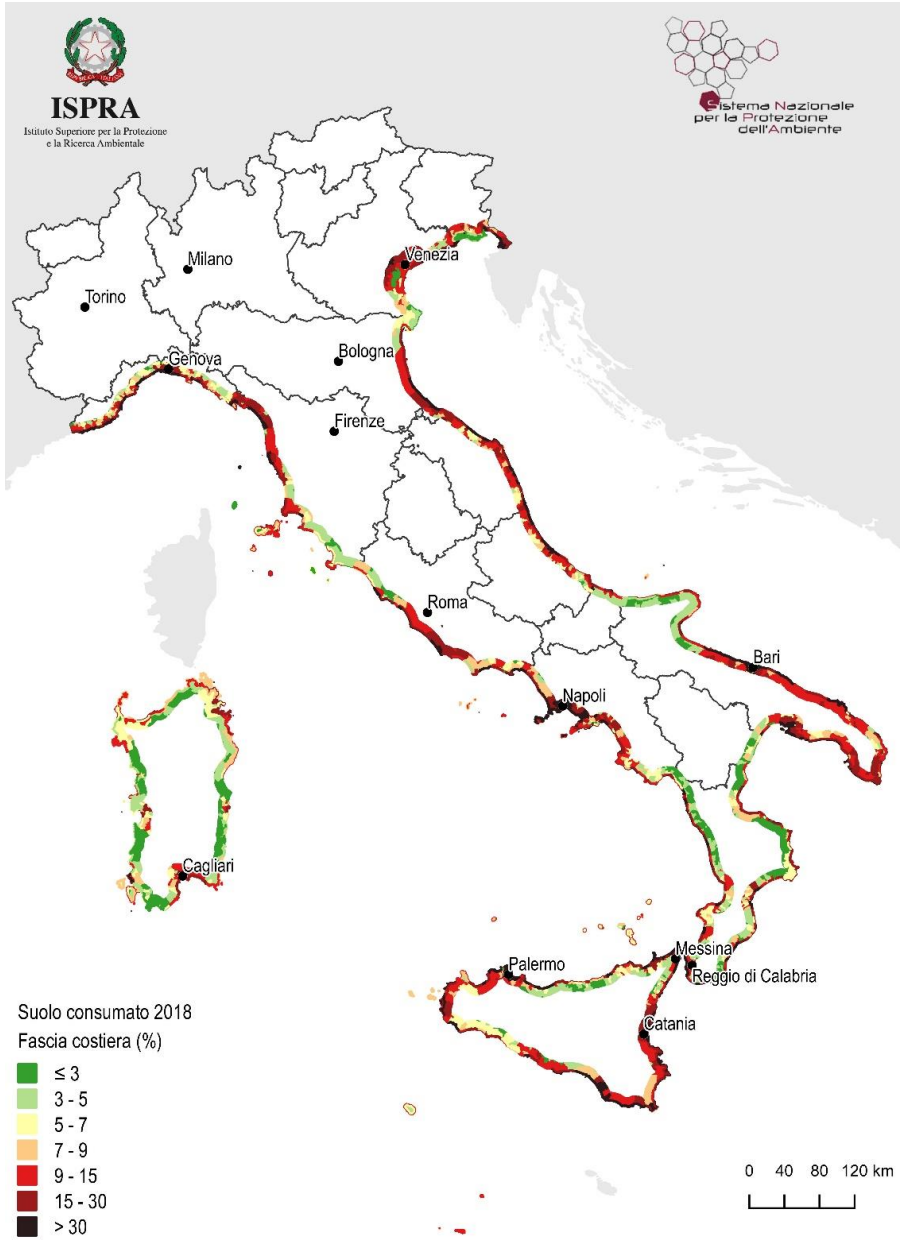
4,1

Land Take

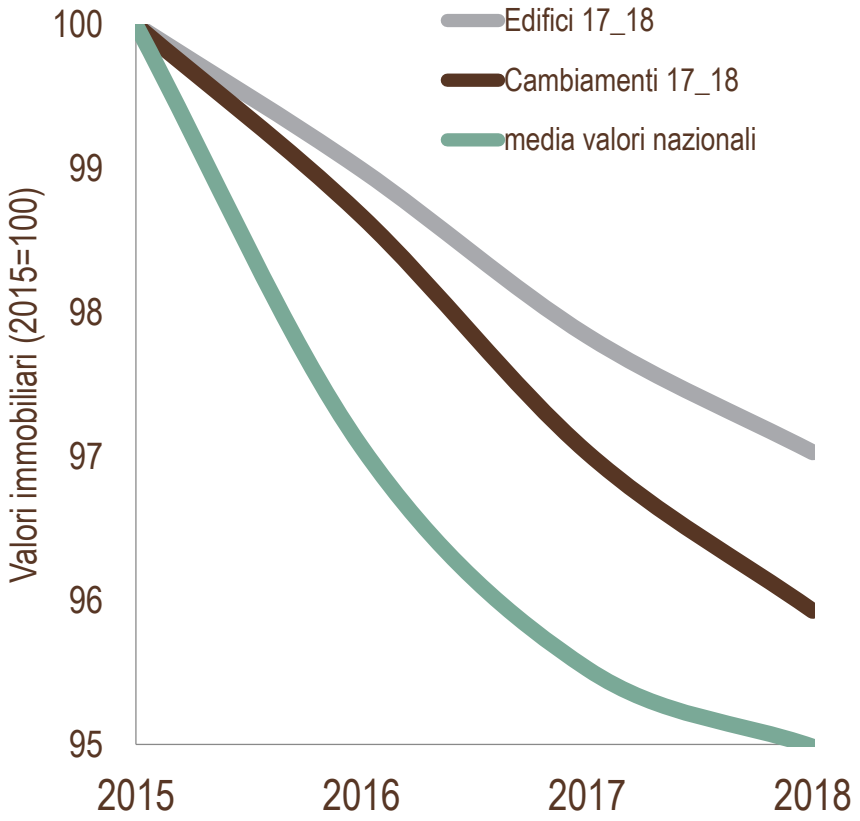
(% within 10 km from the coastline)

Land take in the coastal zone occurs with greater intensity at a national average distance of **110 m**, where the peak **of 31%** is reached.

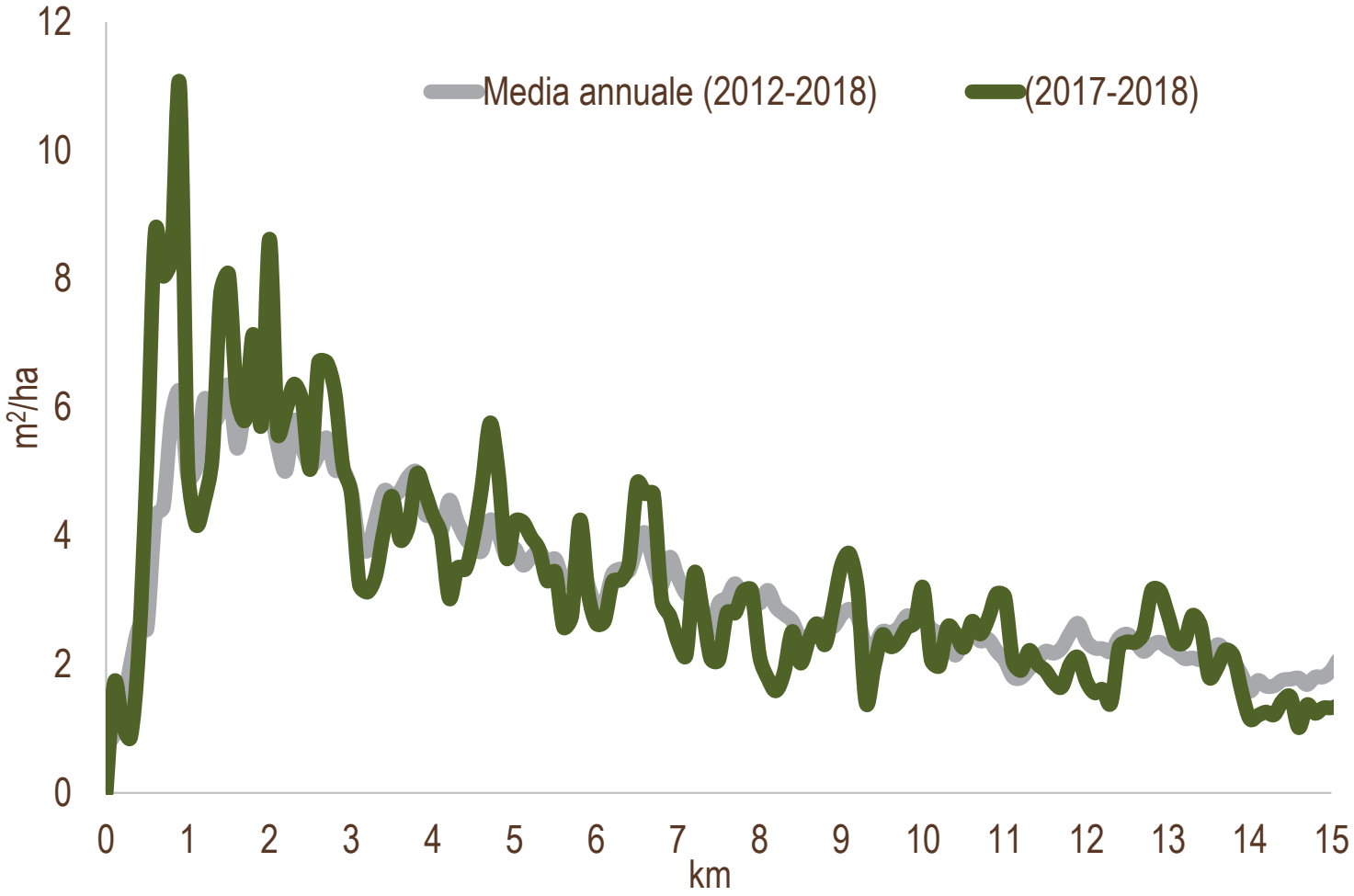




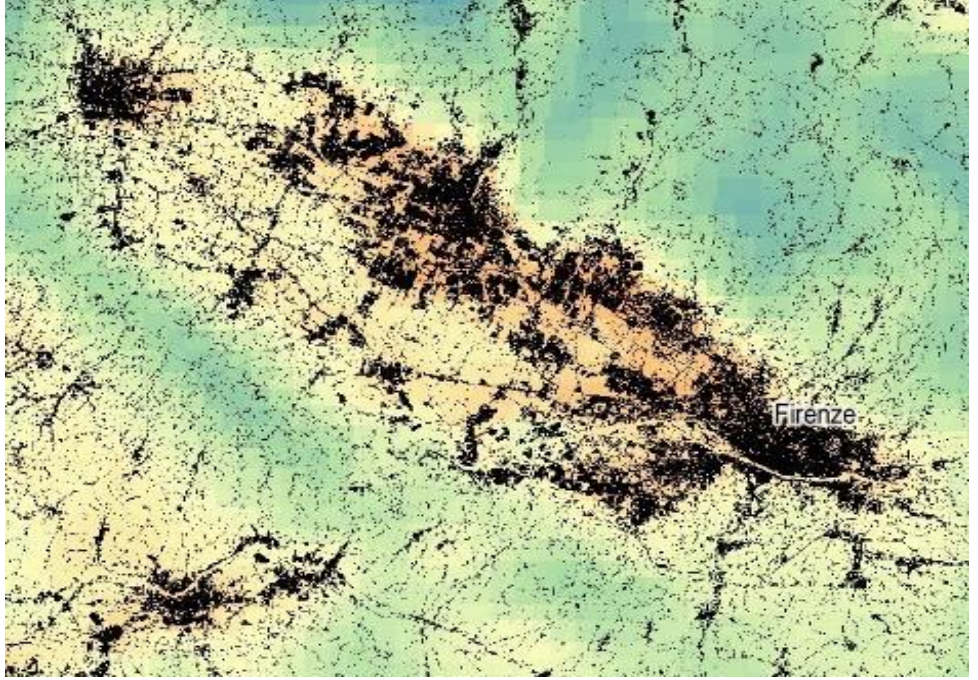
Land Take and Real Estate Value



Land Take and Distance from Urban Centre



Land Take Impact and Ecosystem Services Loss



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Urban Heat Inland

PPING

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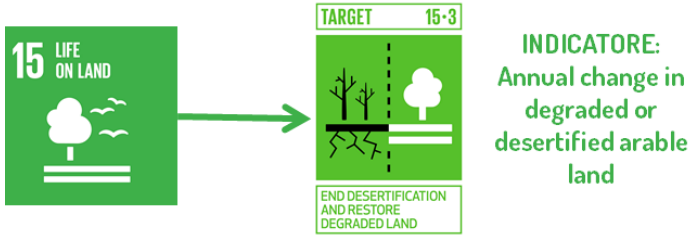
Land Degradation



INDICATORE: Annual change in degraded or desertified arable land

By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world

1. Land Cover Changes
2. Productivity
3. Soil organic carbon
4. Habitat quality
5. Soil erosion
6. Fragmentation
7. Burnt areas
8. Soil sealing

Il consumo di suolo in Italia

Sistema Nazionale per la Protezione dell'Ambiente Privacy Policy

Il suolo | Il monitoraggio | Lo stato in Italia | Indicatori | Mappe | Atlante Fotografico | Crediti

DICSIT - Database Indicatori Consumo di Suolo in Italia

Regioni

Regione: Lombardia 2018

Percentuale di suolo consumato* [%]

13,01%

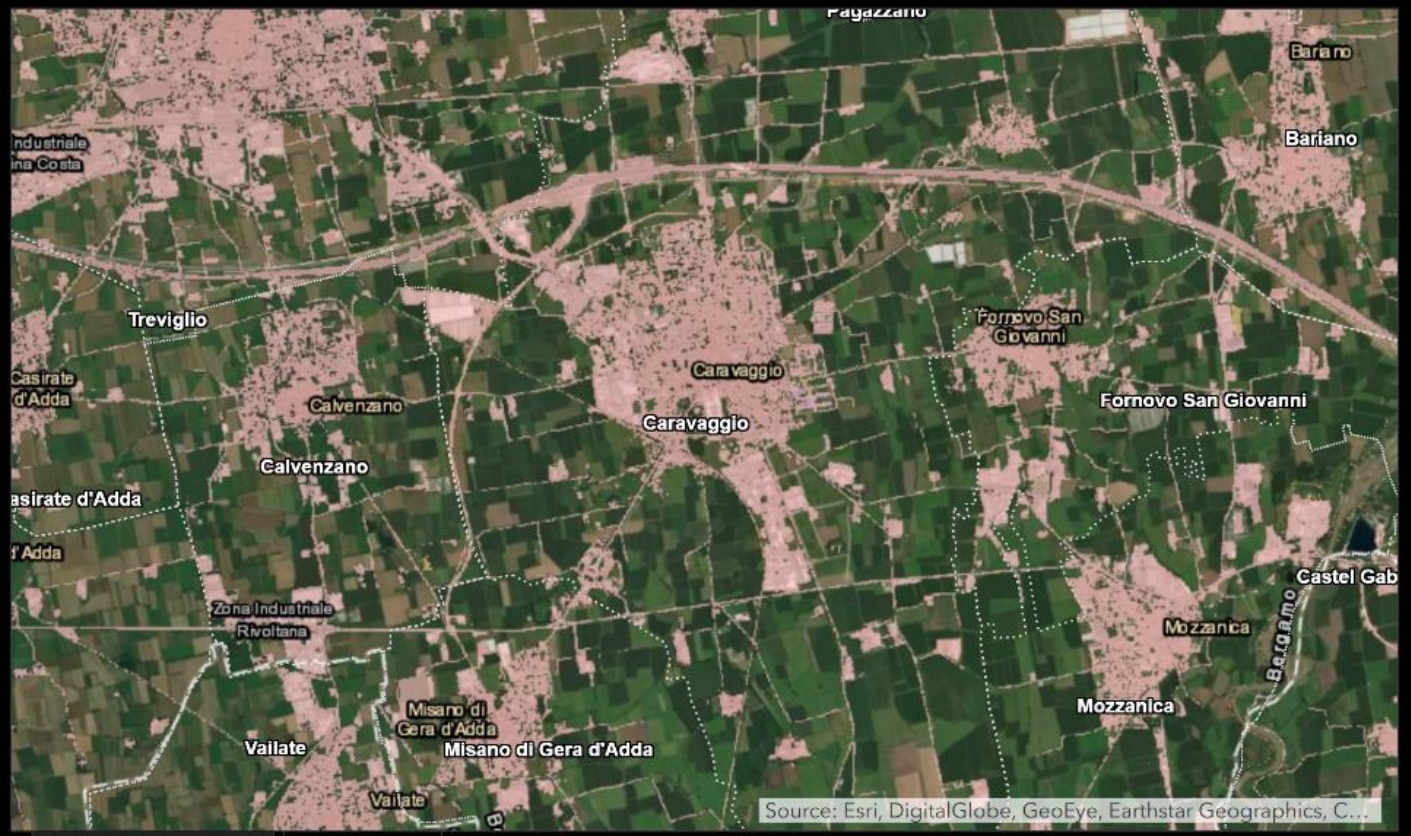
Superficie di suolo consumato* [ha]

310.641,72

Densità di consumo di suolo [m2] rispetto all'area totale [ha]

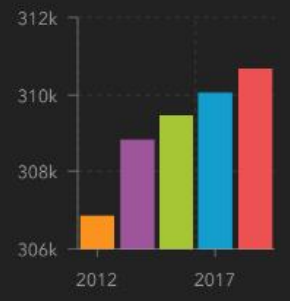
2,651

*Riferite alla superficie amministrativa e all'anno selezionati - 2012 n.d.

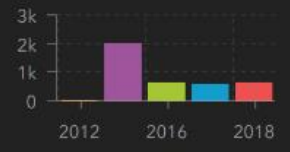


Mappa consumo 2018 | Cartogrammi

Superficie di suolo consumato [ha]**



Incremento per anno di suolo consumato rispetto al periodo precedente [ha]



**Riferito alla superficie amministrativa selezionata

Il valore di incremento del 2015 è riferito

REGIONI | COMUNI

UNDERSTANDING LAND TAKE

INDICATORS, DATASETS, MAPPING

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