

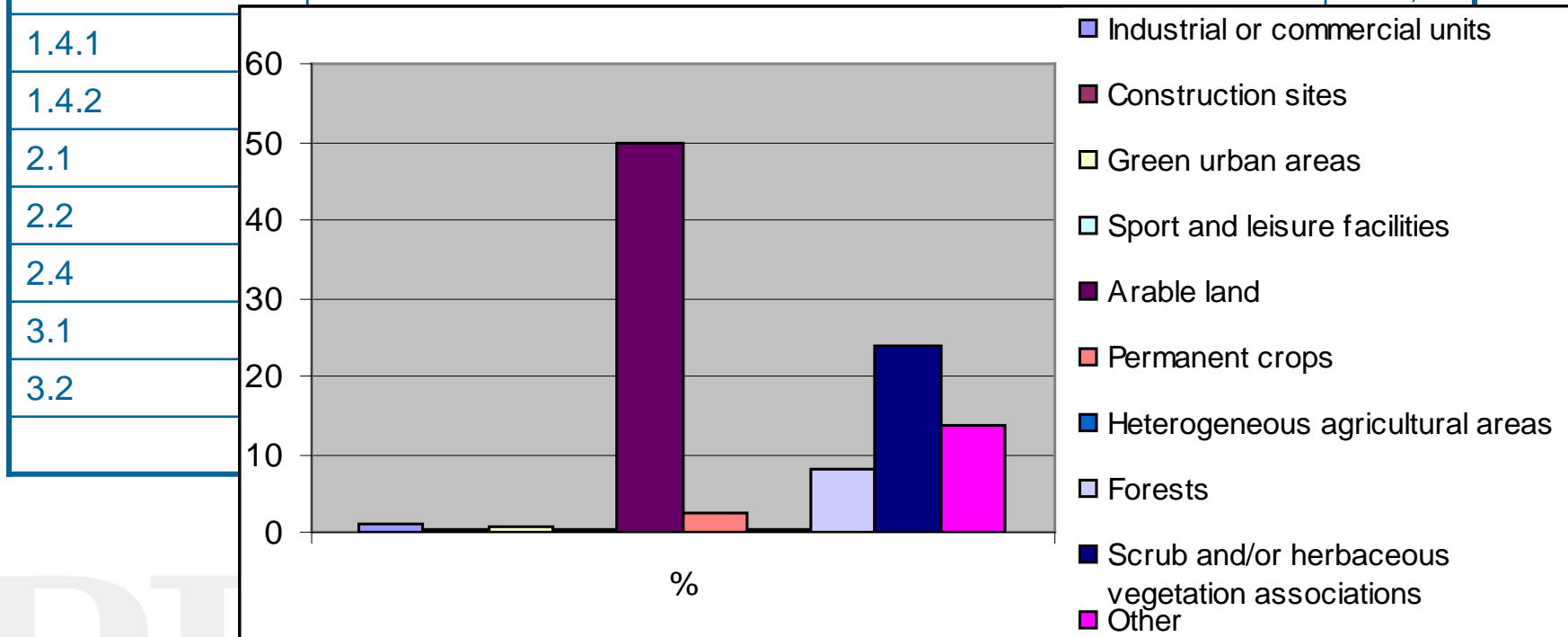
VHR Thematic Maps from Aerospace for Regional and Provincial Urban Planning

Massimo Zotti

Soil loss index

Which **soil type** has been lost in the urban sprawl?

Land use 2006	Class description	%
1.2.1	Industrial or commercial units	0,89
1.3.3	Construction sites	0,41



About Planetek Italia

Massimo Zotti

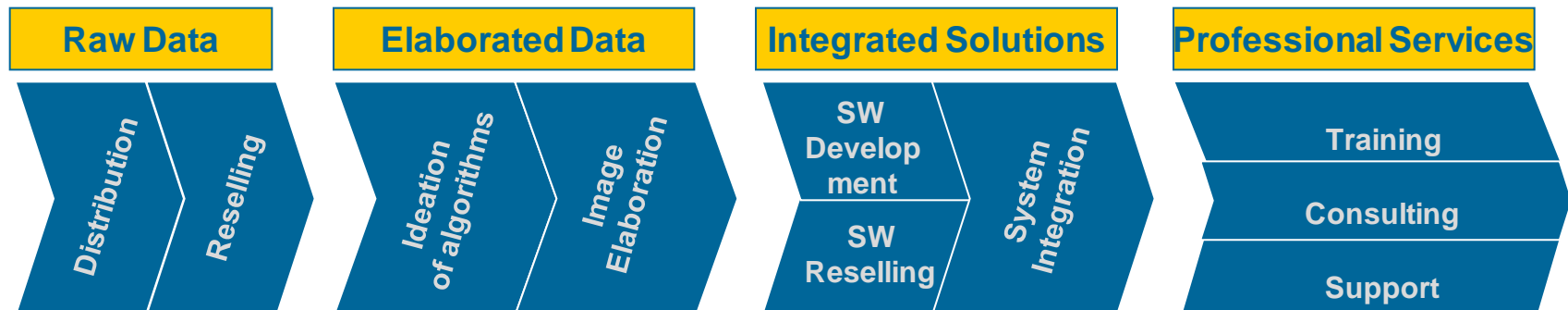


Company profile

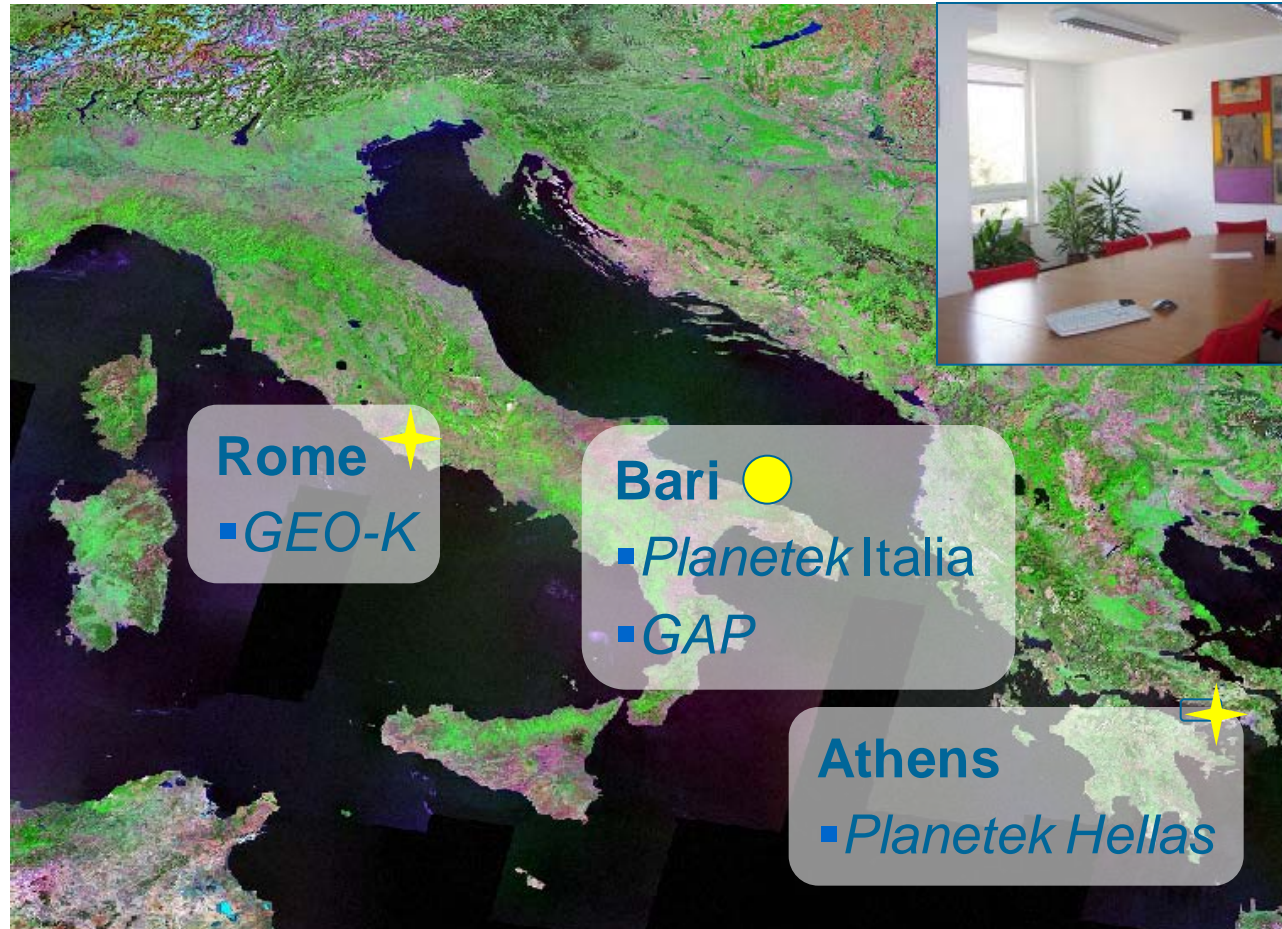


- **Name:** Planetek Italia S.r.l.
- **Industry sector:** Geomatics specialized in Earth Observation and design & development of Spatial Data Infrastructures (SDI)
- **Target Customers:** Central and local public administrations, research agencies, private industries
- **Property:** SME, four founding associates
- **Group:** Planetek Italia S.r.l. controls Geo-K S.r.l. (Italy) and Planetek Hellas E.p.e. (Greece), minority associate of Geophysical Applications Processing S.r.l. (Italy)
- **Economy:** triennium 2007-2009 value of the production circa 15 M€
- **Uman resources:** 43 employees with medium age of 32 years (85% graduates), mostly involved in R&D activities
- **Reference Customers:** ASI, ESA, UE, MATT, ISPRA, ENEA, Regione Sardegna, Calabria, Puglia, Lombardia, Emilia Romagna, Lazio, numerous provinces, townships and other hundreds of administrations, Infoterra, Telespazio, E-geos, ThalesAlenia Space
- **Principal collaborations:** AIT, AMFM, AIPAS, Consorzio SUD Space, Distretto Aereospazio Puglia, UniBA, PoliBA

VALUE CHAIN



Planetek Italia Group



Experience in GMES

GMES Urban Service

Users: Prov. di Treviso, Prov. di Foggia e Comune di Bari

GSE Land

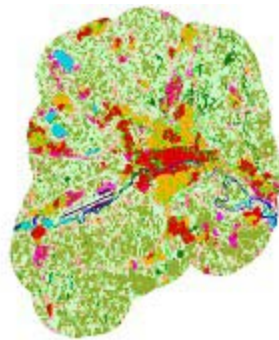
Users: Regione Veneto, Patti territoriali

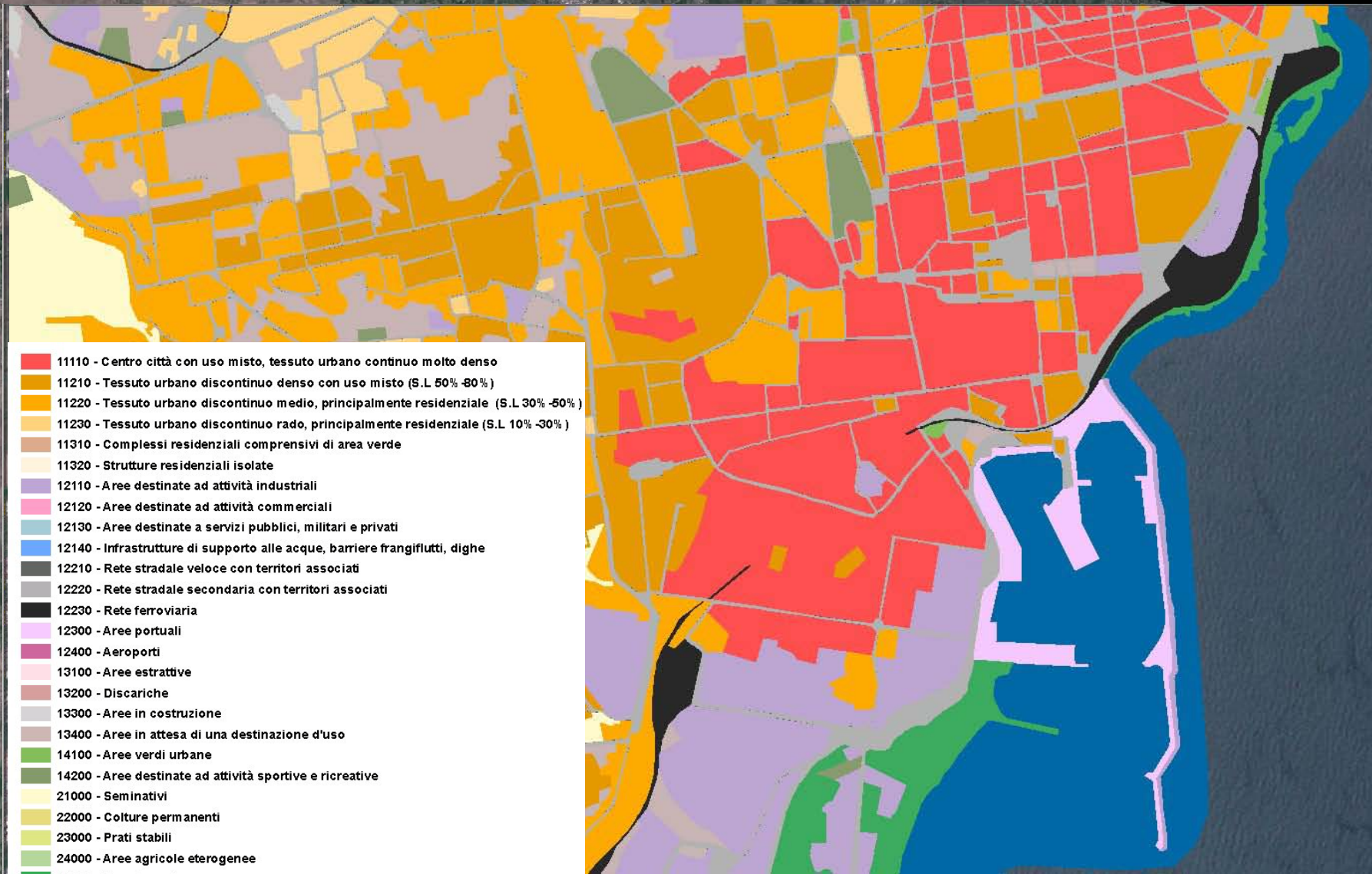
GMES Forest

Users: Ministero de Medio Ambiente (E)

Land Use Maps

- Level 3
- 1.1.1 Continuous urban fabric
- 1.1.1.1 Residential continuous dense urban fabric
- 1.1.1.2 Residential continuous medium dense urban fabric
- 1.1.2 Discontinuous urban fabric
- 1.1.2.1 Residential discontinuous urban fabric
- 1.1.2.2 Residential discontinuous urban fabric
- 1.2 Industrial, commercial and transport units (1.3 Mine, dump and construction sites
- 1.4 Artificial non agricultural vegetated areas
- 1.4.1 Green urban areas
- 1.4.2 Sport and pleasure facilities
- 2.1 Arable land
- 2.3 Pastures / 3.2 Shrub and/or herbaceous vegetation association
- 3.1 Forest
- 5 Water bodies
- 5.1.1 Water courses
- 5.1.2 Water bodies





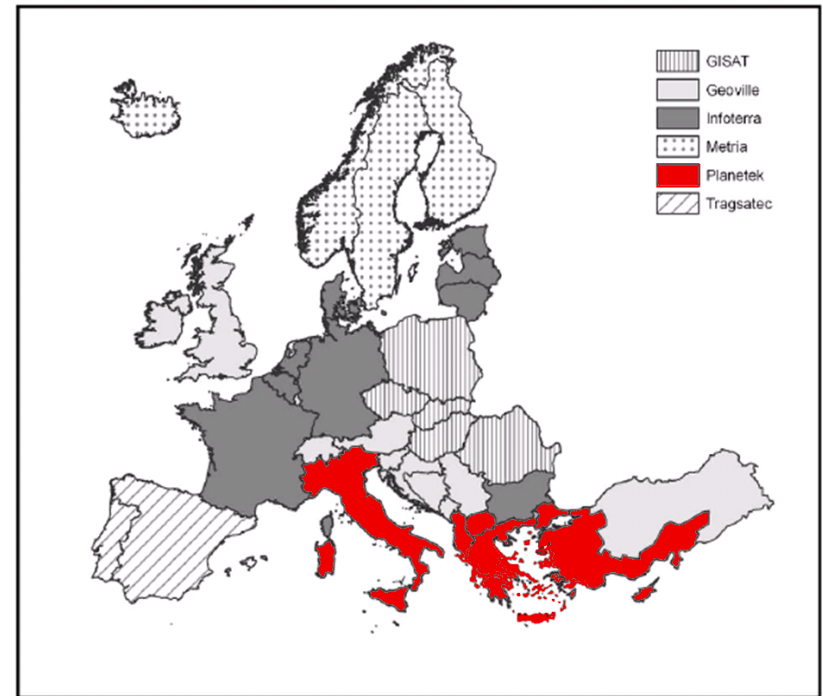
- 11110 - Centro città con uso misto, tessuto urbano continuo molto denso
- 11210 - Tessuto urbano discontinuo denso con uso misto (S.L. 50% -80%)
- 11220 - Tessuto urbano discontinuo medio, principalmente residenziale (S.L. 30% -50%)
- 11230 - Tessuto urbano discontinuo rado, principalmente residenziale (S.L. 10% -30%)
- 11310 - Complessi residenziali comprensivi di area verde
- 11320 - Strutture residenziali isolate
- 12110 - Aree destinate ad attività industriali
- 12120 - Aree destinate ad attività commerciali
- 12130 - Aree destinate a servizi pubblici, militari e privati
- 12140 - Infrastrutture di supporto alle acque, barriere frangiflutti, dighe
- 12210 - Rete stradale veloce con territori associati
- 12220 - Rete stradale secondaria con territori associati
- 12230 - Rete ferroviaria
- 12300 - Aree portuali
- 12400 - Aeroporti
- 13100 - Aree estrattive
- 13200 - Discariche
- 13300 - Aree in costruzione
- 13400 - Aree in attesa di una destinazione d'uso
- 14100 - Aree verdi urbane
- 14200 - Aree destinate ad attività sportive e ricreative
- 21000 - Seminativi
- 22000 - Colture permanenti
- 23000 - Prati stabili
- 24000 - Aree agricole eterogenee
- 31000 - Aree boscate
- 32000 - Aree caratterizzate da vegetazione arbustiva e erbacea
- 33000 - Aree aperte con vegetazione rada o assente
- 41000 - Aree umide interne
- 42000 - Aree umide costiere
- 51000 - Acque interne
- 52000 - Acque marittime



Soil Sealing Maps



2012 Land monitoring services:
high resolution land cover
characteristics of 5 main land cover types



Soil Loss Analysis

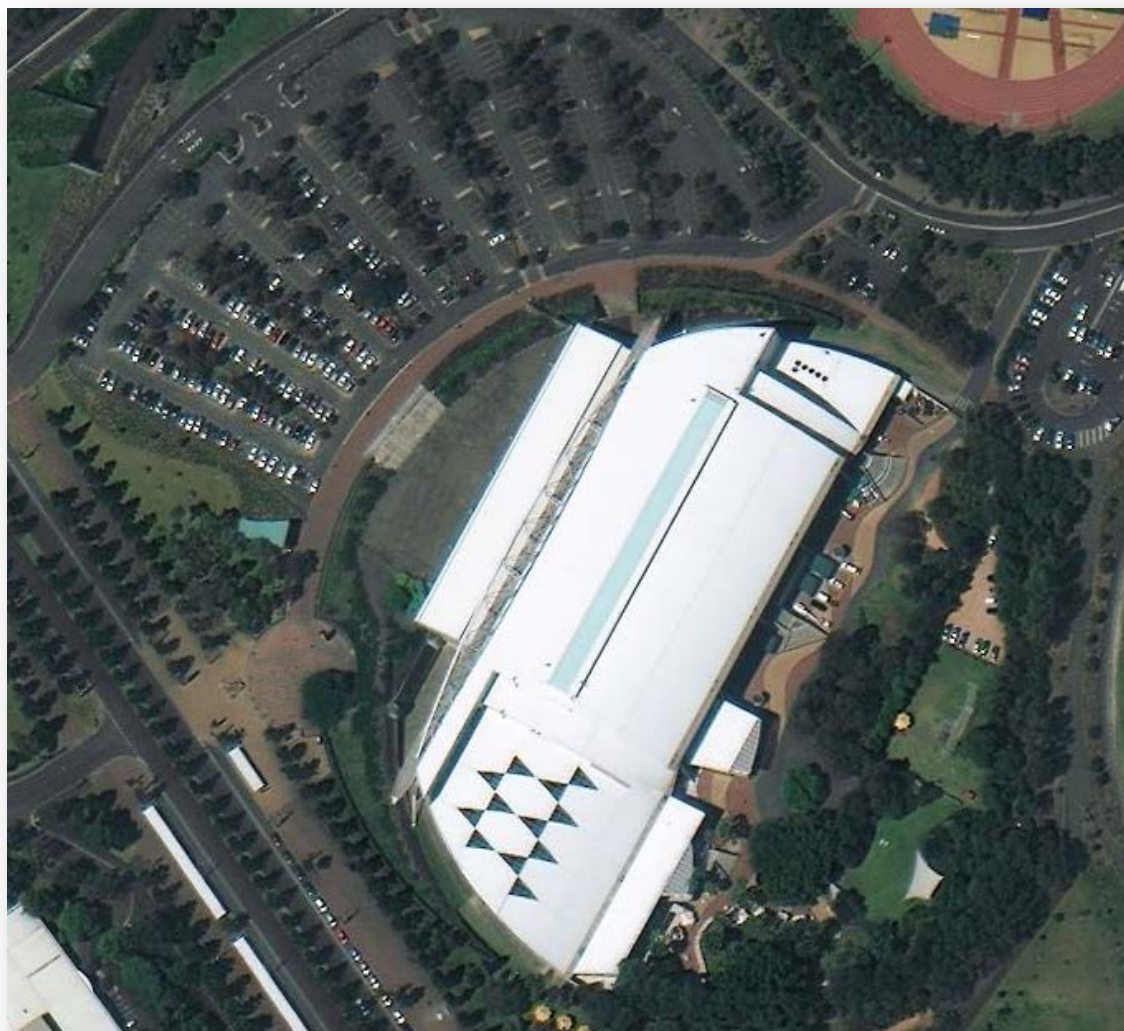
Massimo Zotti



Use of multispectral data



WorldView-2



Spectral Bands	Spatial Resolution
0.45 - 0.90 (Pan)	0.46 m
0.40 - 0.45 (coastal)	1.84 m
0.45 - 0.51 (blu)	1.84 m
0.51 - 0.58 (green)	1.84 m
0.585 - 0.625 (yellow)	1.84 m
0.63 - 0.69 (red)	1.84 m
0.705 - 0.745 (Red-Edge)	1.84 m
0.77 - 0.895 (NIR1)	1.84 m
0.860 - 1.04 (NIR2)	1.84 m



**WorldView-2
First Images**

4 band 2m Image

November 23, 2009

Aitutaki Lagoon

Coastal Areas Analysis



**WorldView-2
First Images**

4 band 2m Image

November 23, 2009

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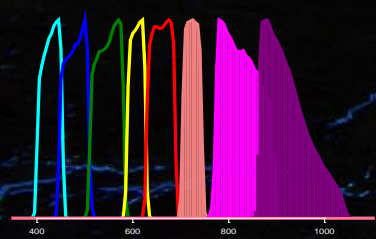
WorldView-2
First Images
RE, NIR1, NIR2
2m Image
November 23, 2009

Aitutaki Lagoon

**Rifrazione delle onde e
vegetazione acquatica
sommersa**



**barriere
lineari**



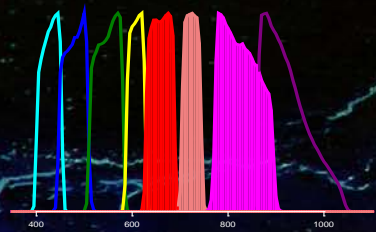
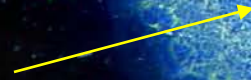
**WorldView-2
First Images**

R, RE, NIR1
2m Image

November 23, 2009

Aitutaki Lagoon

**Vegetazione aquatica
sommersa**



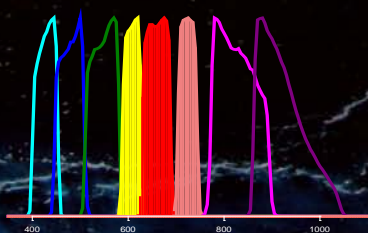
**WorldView-2
First Images**

Y, R, RE
2m Image

November 23, 2009

Aitutaki Lagoon

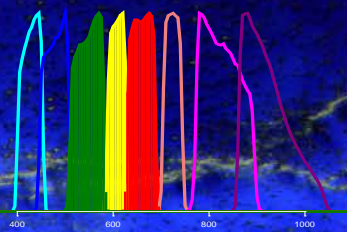
**Vegetazione aquatica
sommersa**



WorldView-2 First Images

G, Y, R
2m Image
November 23, 2009

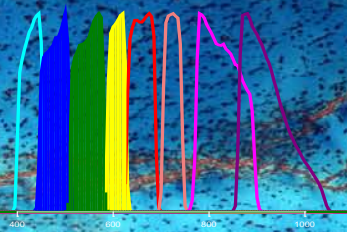
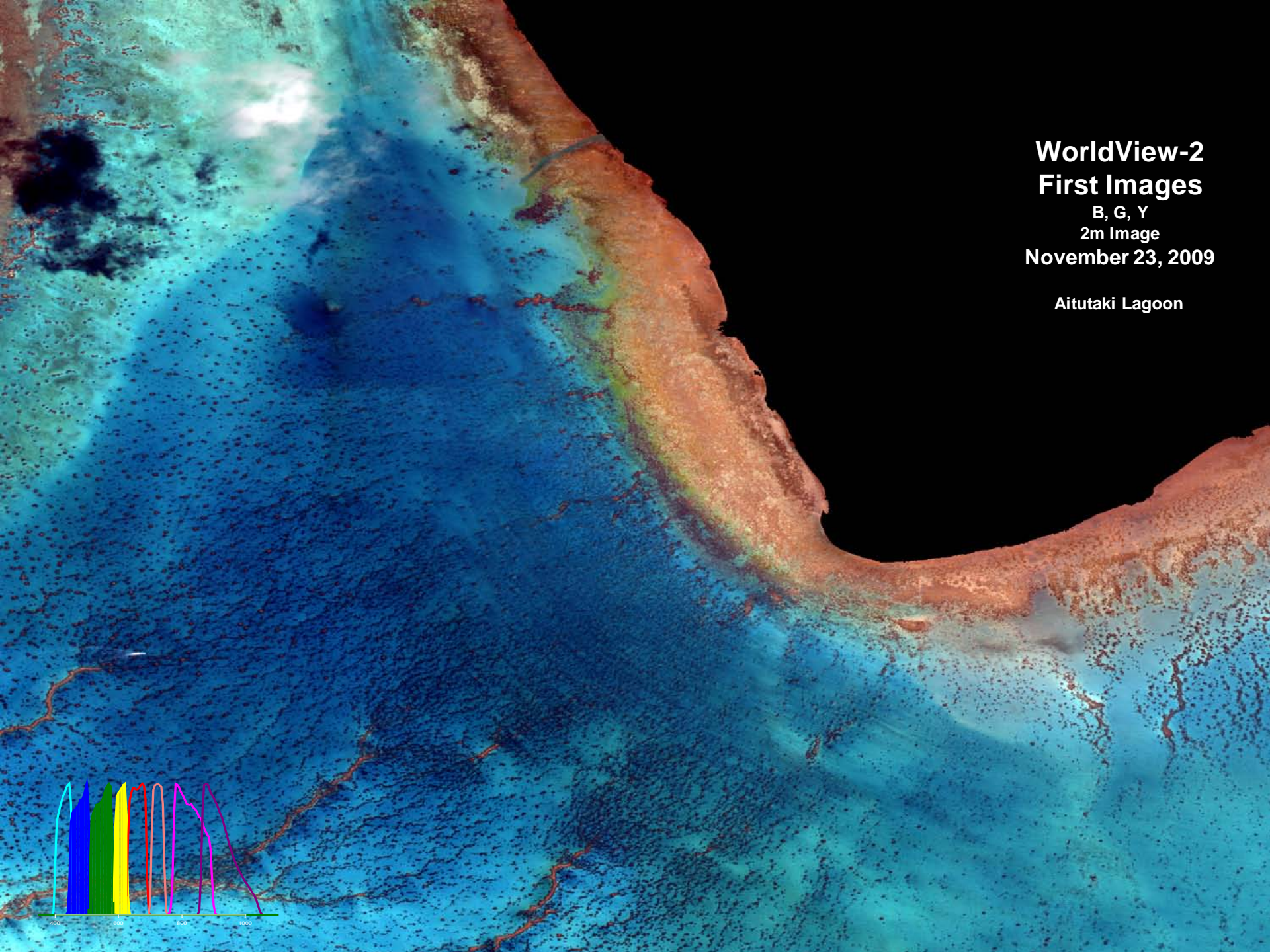
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WorldView-2 First Images

B, G, Y
2m Image
November 23, 2009

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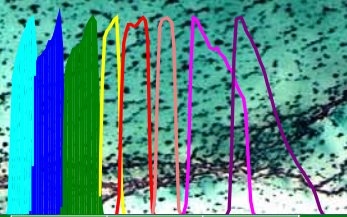
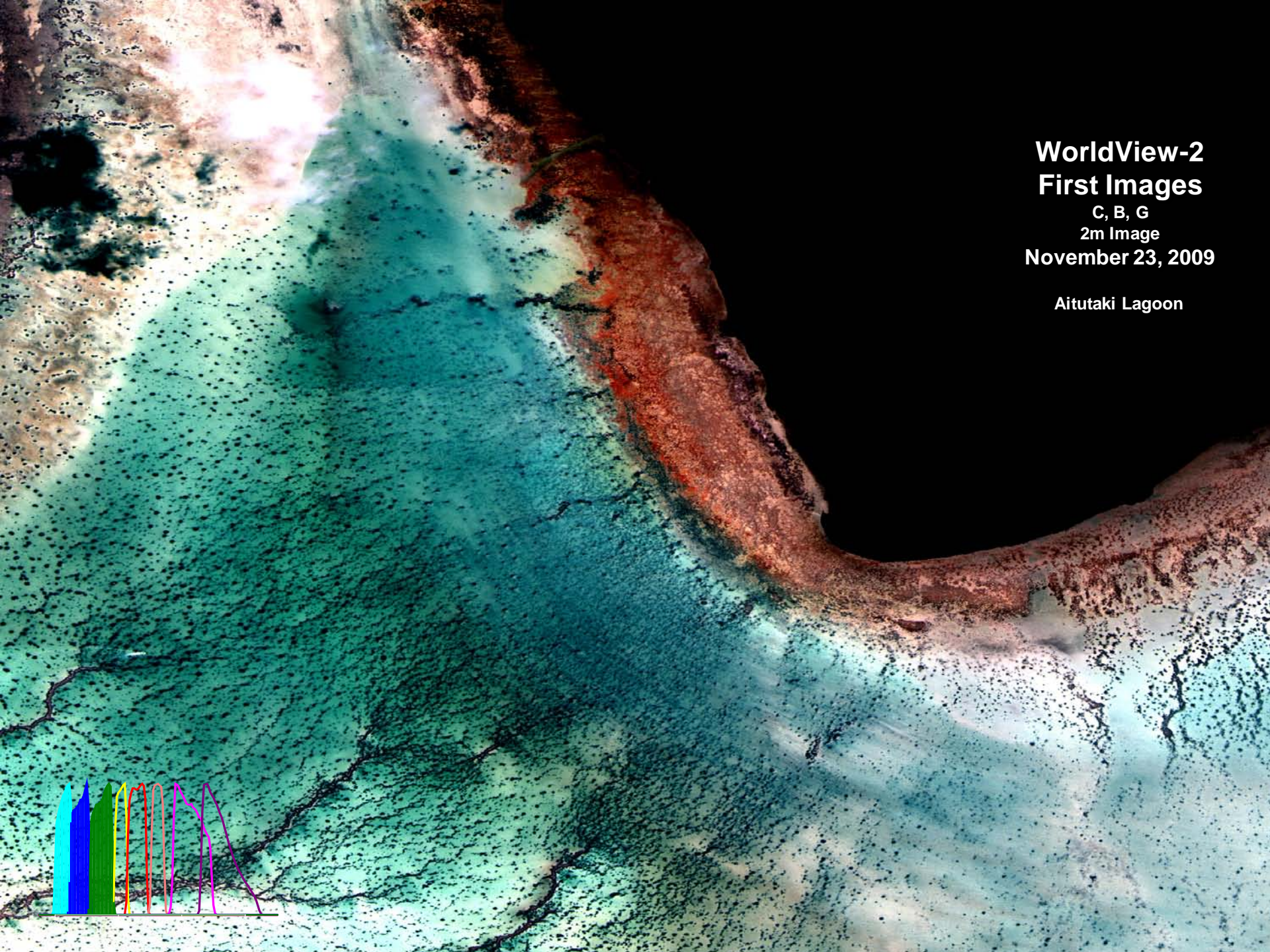


WorldView-2 First Images

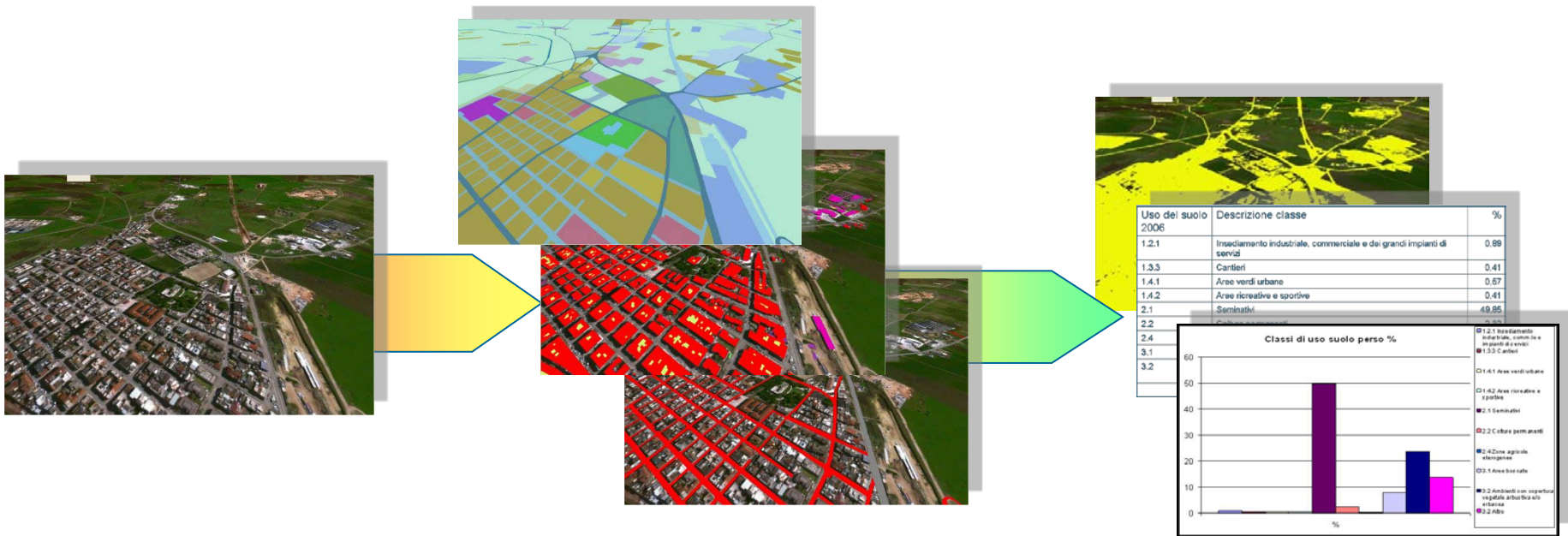
C, B, G
2m Image

November 23, 2009

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Data / Information / Knowledge



Data

- Satellite orthoimages
- Vector maps
- DTM

Information

- Transport network
- Buildings
- Land use
- Soil sealing

Knowledge

- Indicators

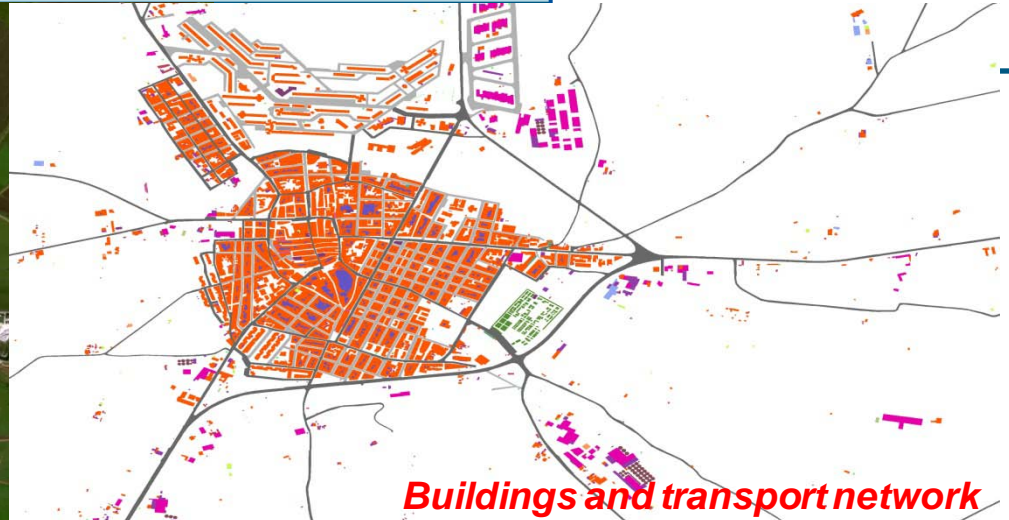
Multi-level Geospatial Data



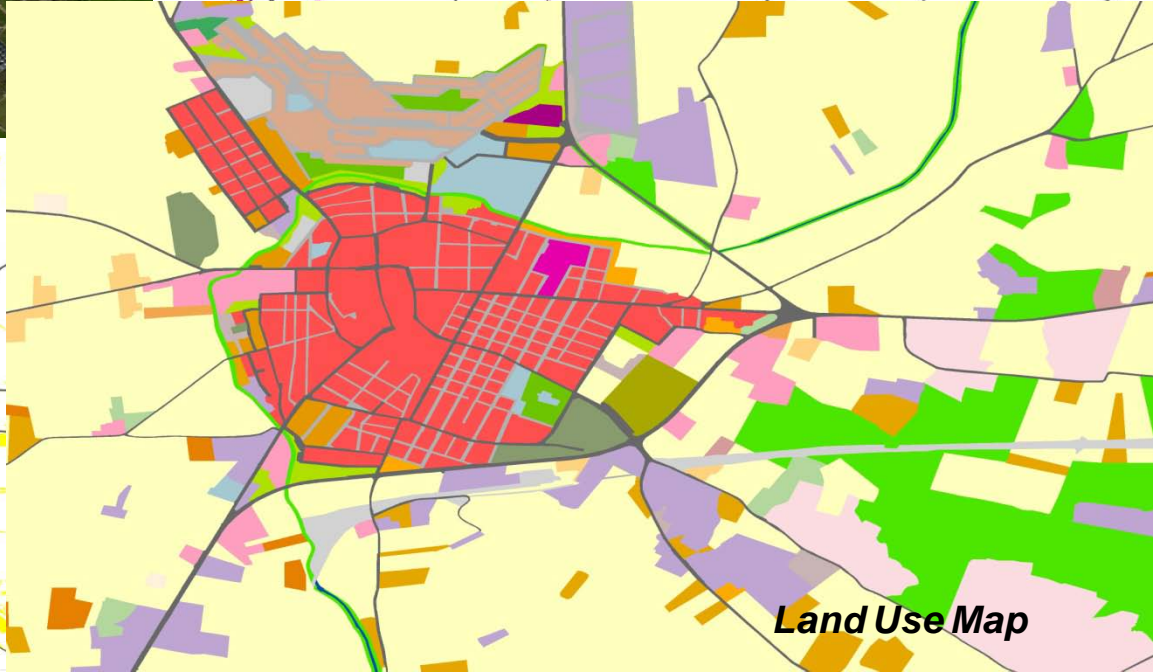
Informative level	Description	File format
Level 0	Orthoimage. Is the basis for all the updating activities	TIFF, ECW Metadata ISO 19115
Level 1 (Land Use)	Land use map with a legend of 43 classes compliant with the European CORINE Land Cover nomenclature system	SHP, GDB Metadata ISO 19115 Statistics Report
Level 2 (Transport Infrastructures)	Roadway and Railway Layer	
Level 3 (Buildings)	Buildings Layer classified on the basis of their use	
Level 4 (SoilSealing)	SoilSealing Layer. Binary raster map of the sealed areas	TIFF, ECW Metadata ISO 19115
Auxiliary levels	Available ancillary data (i.e. CTR, historical LCM, DTM, etc.)	SHP/GDB Metadata ISO 19115 Statistics Report



Multi-level Geospatial Data



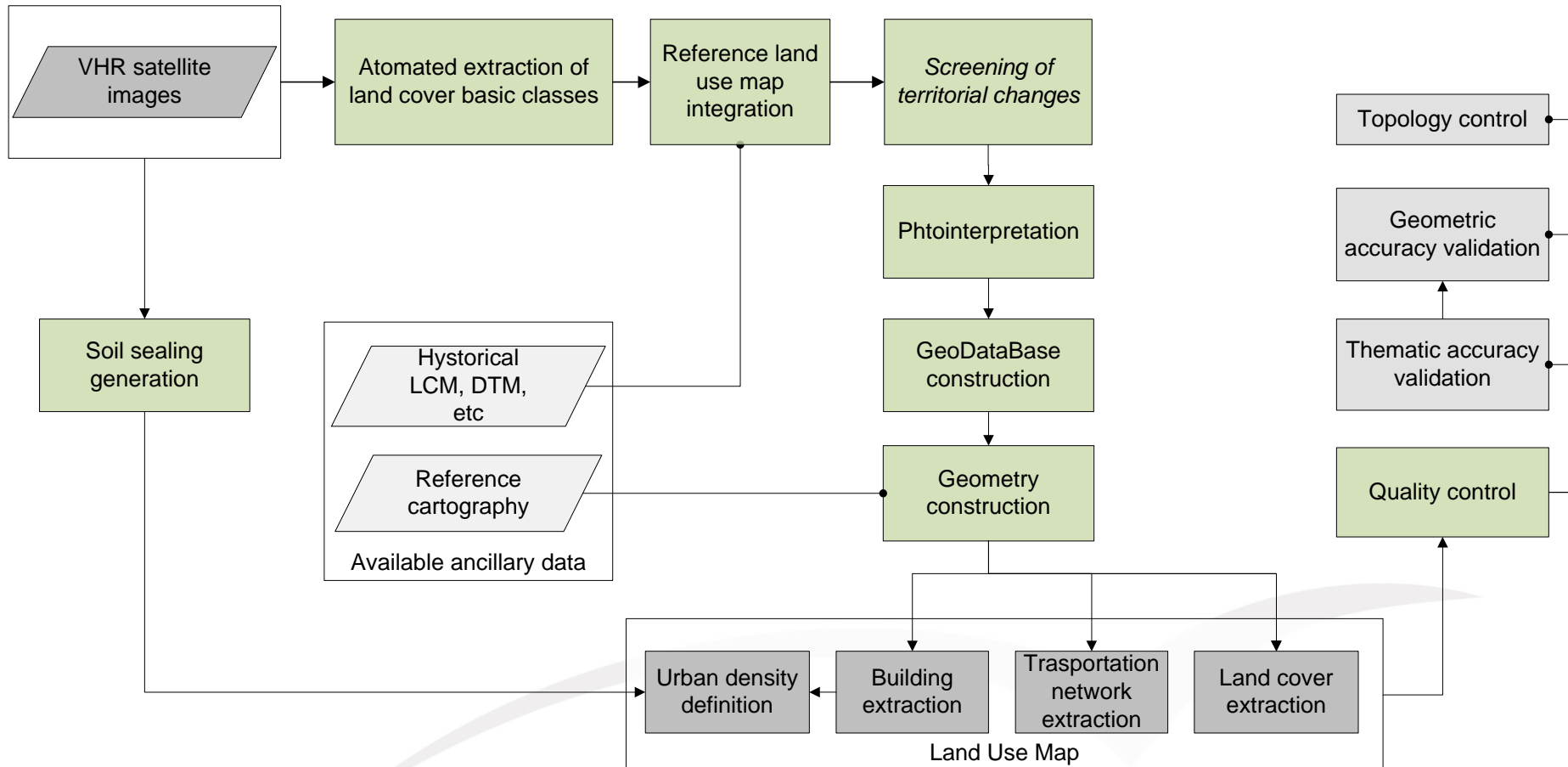
Buildings and transport network



Transport network and soil sealing areas

Land Use Map

Workflow

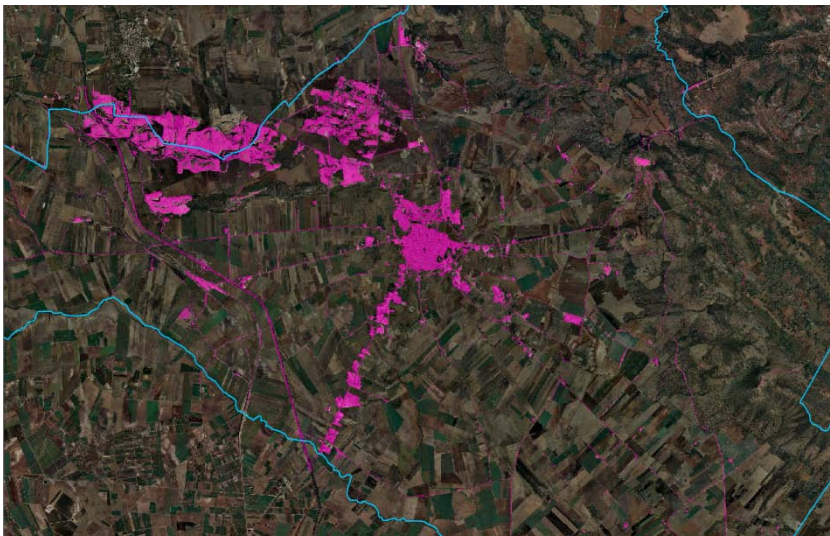


SEA Indicators

Indicator	Description
<u>Soil loss</u>	Measures the soil loss incidence due to urban sprawl and transport infrastructure construction
<u>Land use</u>	Measures the surface size of the principal land use types (artificial, agricultural, forest, etc.)
<u>Landscape fragmentation</u>	Measures the medium size of natural areas that are not interrupted by transport infrastructures
<u>Landscape diversity</u>	Measures the diversity of the landscape that is very important from the perceptive point of view
<u>others</u>	specific indicators can be derived by the intersection with other ancillary information

Soil loss index (Apricena)

Soil Sealing map **2006**



Soil Sealing map **2010**



Urban areas percentage
with respect to the Municipality
area = **4.6 %**

Urban areas percentage
with respect to the Municipality
area = **4.7 %**

Soil loss index (Apricena)

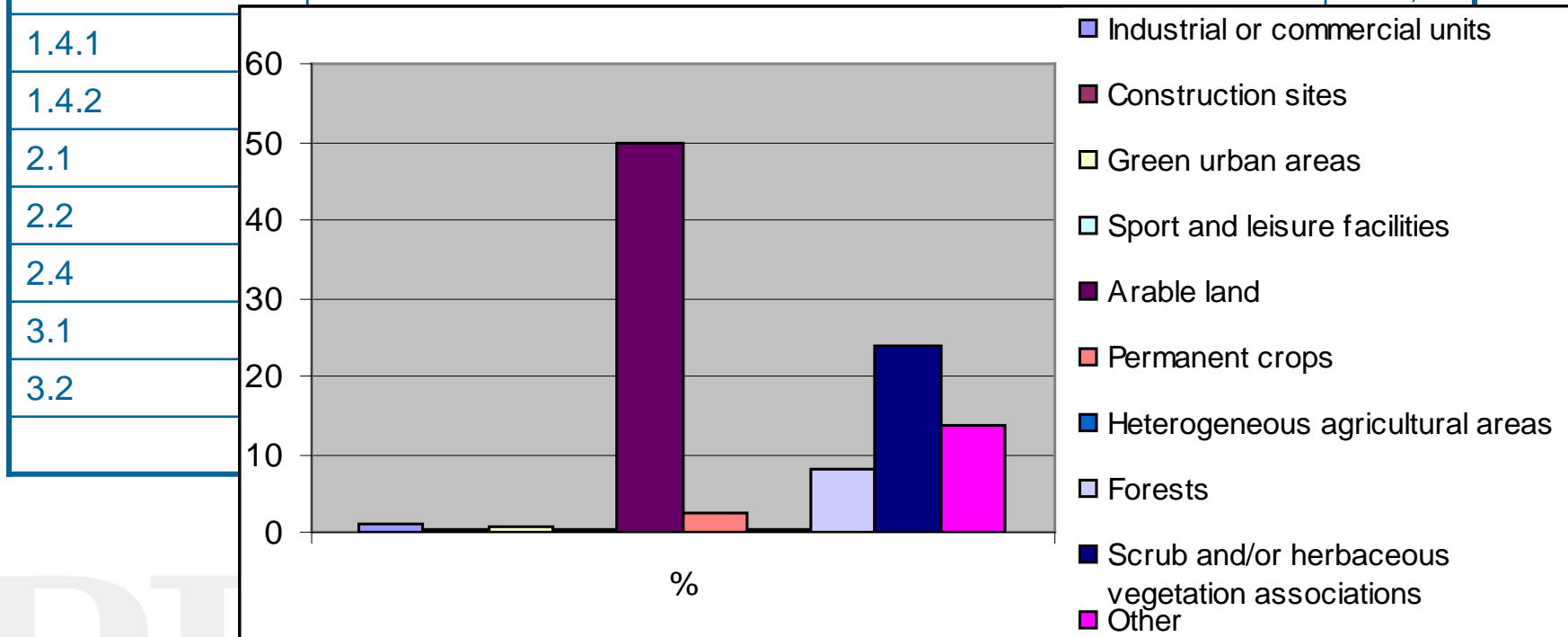


- Urban sprawl with respect to the Municipality area: 0.16% = 29 ha
- Urban sprawl with respect to the built-up areas 2006: 3.7 %

Soil loss index

Which **soil type** has been lost in the urban sprawl?

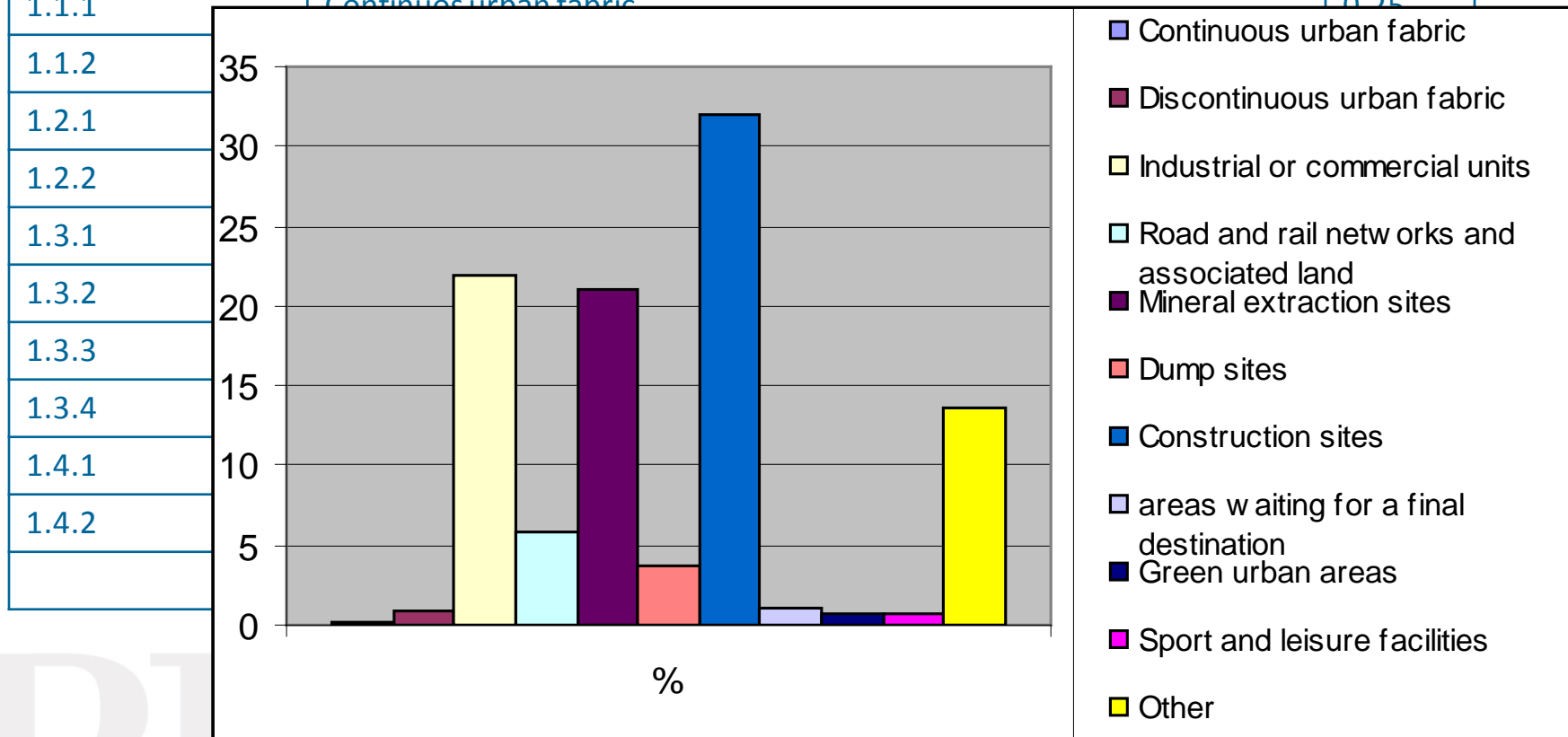
Land use 2006	Class description	%
1.2.1	Industrial or commercial units	0,89
1.3.3	Construction sites	0,41



Soil loss index

What the soil lost in 2006 become in 2010?

Land use 2006	Class description	%
1.1.1	Continuous urban fabric	0.25



Conclusions

- **Temporal Optimization** for the plan arrangement
- **Landscape understanding** improved by the production of objective indicators
- **SEA monitoring**
- Stakeholder involvement guarantees **transparency** of the planning process
- Operative and diffuse use of **EO products** for the modern urban planning process

**Thank you for your
attention!**

Massimo Zotti

Planetek Italia s.r.l.

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A large, faint, light grey watermark of the Planetek logo is visible at the bottom of the page. It consists of the word "PLANETEK" in a serif font, with a stylized bird-like graphic above the letters "A" and "L".

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