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User
Uptake

Introduction of problem

Almost half of European population lives on coastal areas





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Introduction of problem

High impact on the natural evolution of coastline



Natural erosion of coastline become a problem



Impact on houses, economic activities and infrastructures





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Monitoring the changes

In order to understand the threats on coastal areas is important to monitor the evolution of urbanization in those areas

Use case 1:

The Italian Imperviousness layer at 5/10 m spatial resolution for monitoring changes in sensible zones

Use case 2:

Coastal anthropogenic pressure indicator for urban planner and coastal manager



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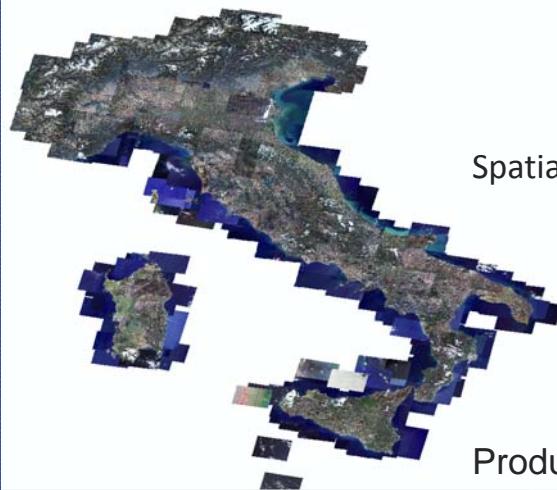
USE CASE 1



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Italian downstream at 5 / 10 m

A very high resolution Imperviousness layer was product for Italy (2012, 2015)



Spatial resolution of 5 m for 2012 and 10 m for 2015 (Sentinel-2 data used)

Product for Italian National Institute for Environmental Protection and Research



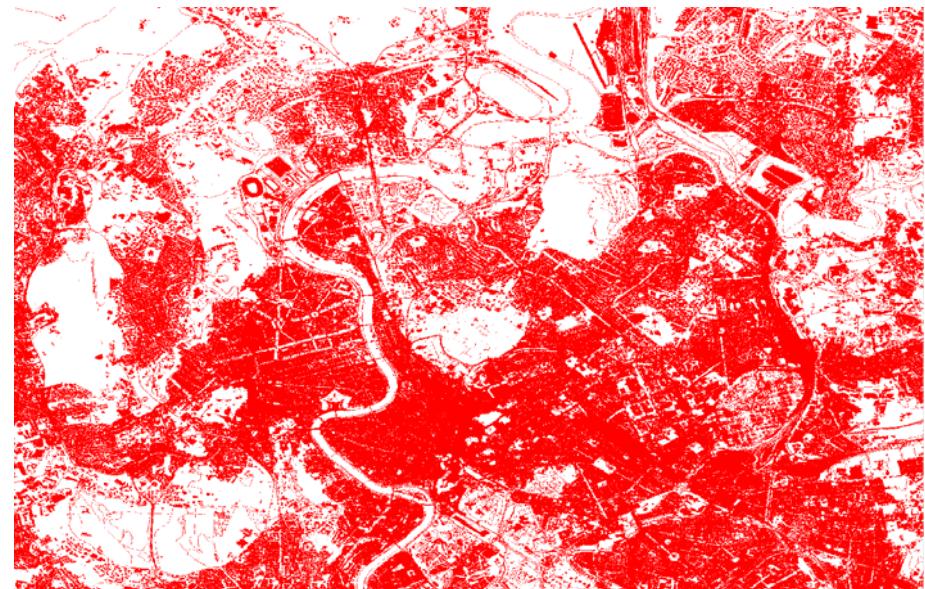
ISPRRA
Istituto Superiore per la Protezione
e la Ricerca Ambientale



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The Italian 5 m resolution imperviousness layer

With respect to the European scale (20 m), the better spatial resolution data allowed the classification of minor sealed soil elements (including small road and railway network)



Rome

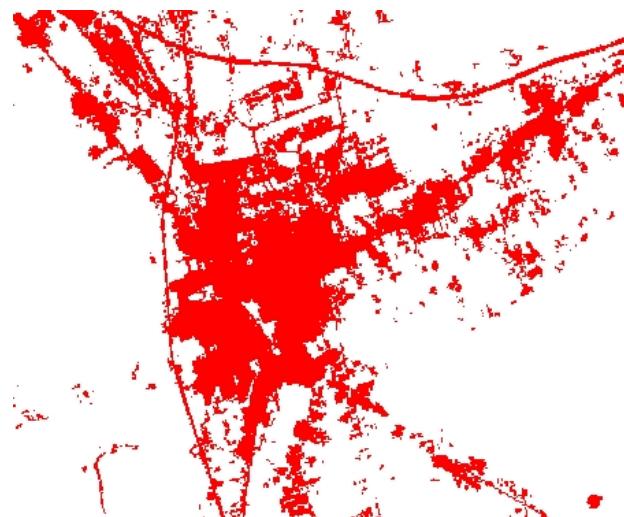
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European Commission

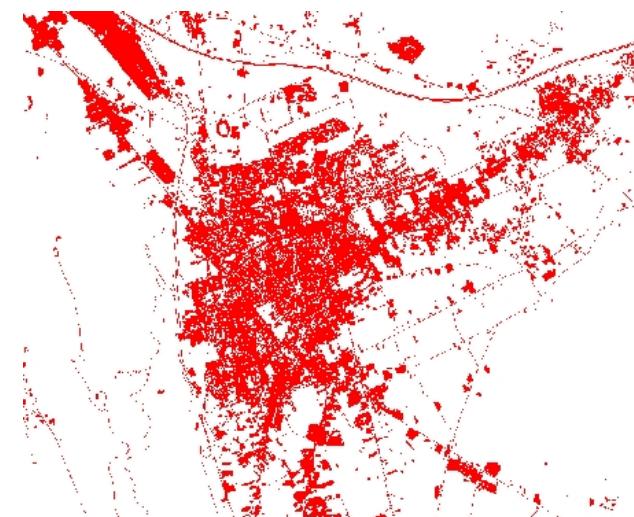


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Comparison HRL and 5 m layer



EEA imperviousness layer



5 m imperviousness layer

(the specifications are similar but not the same)

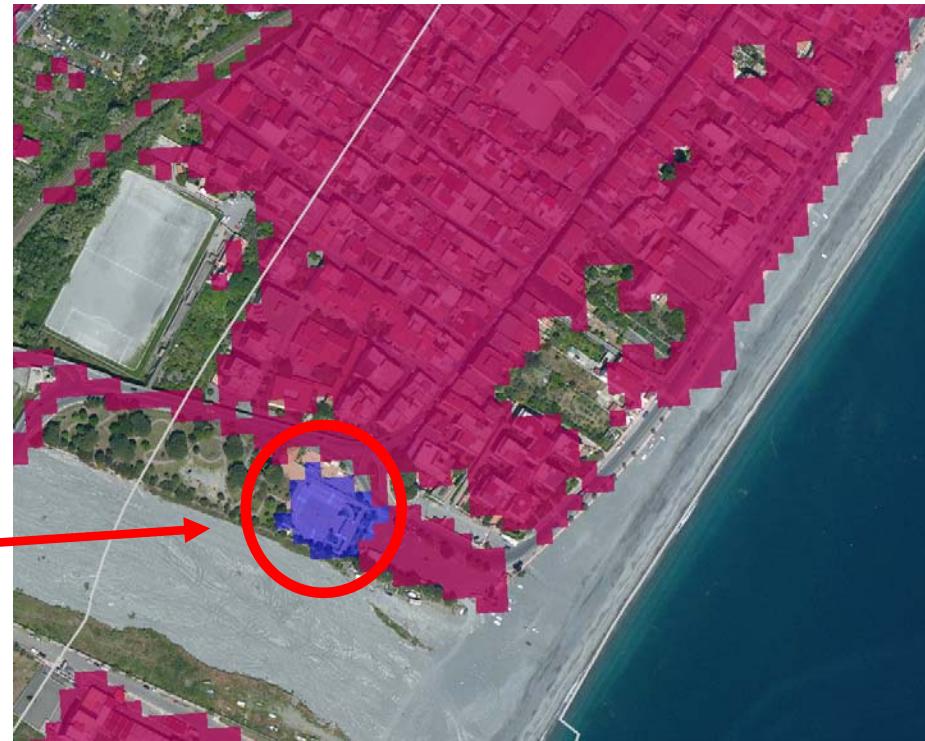


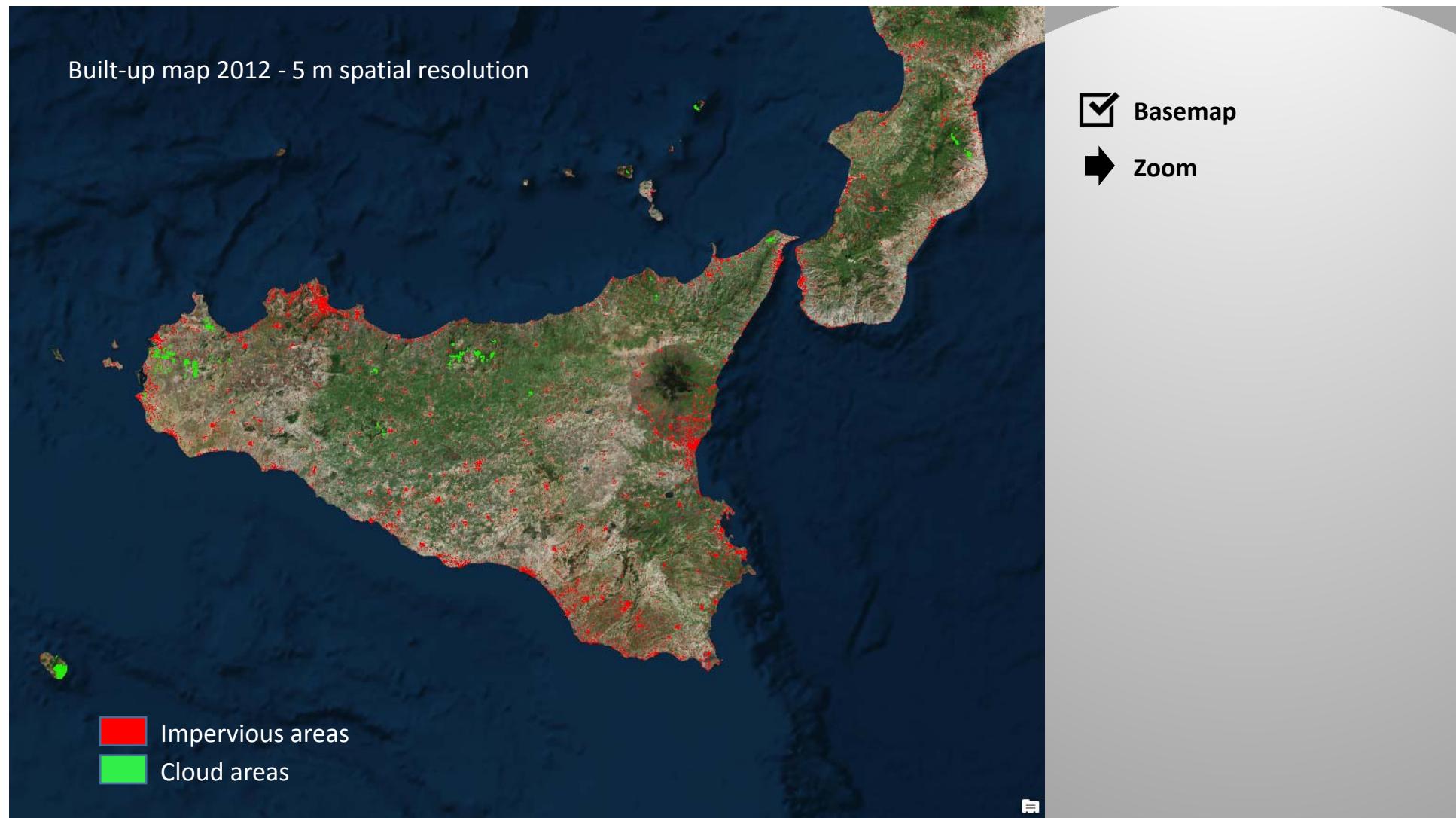
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Analysis of changes

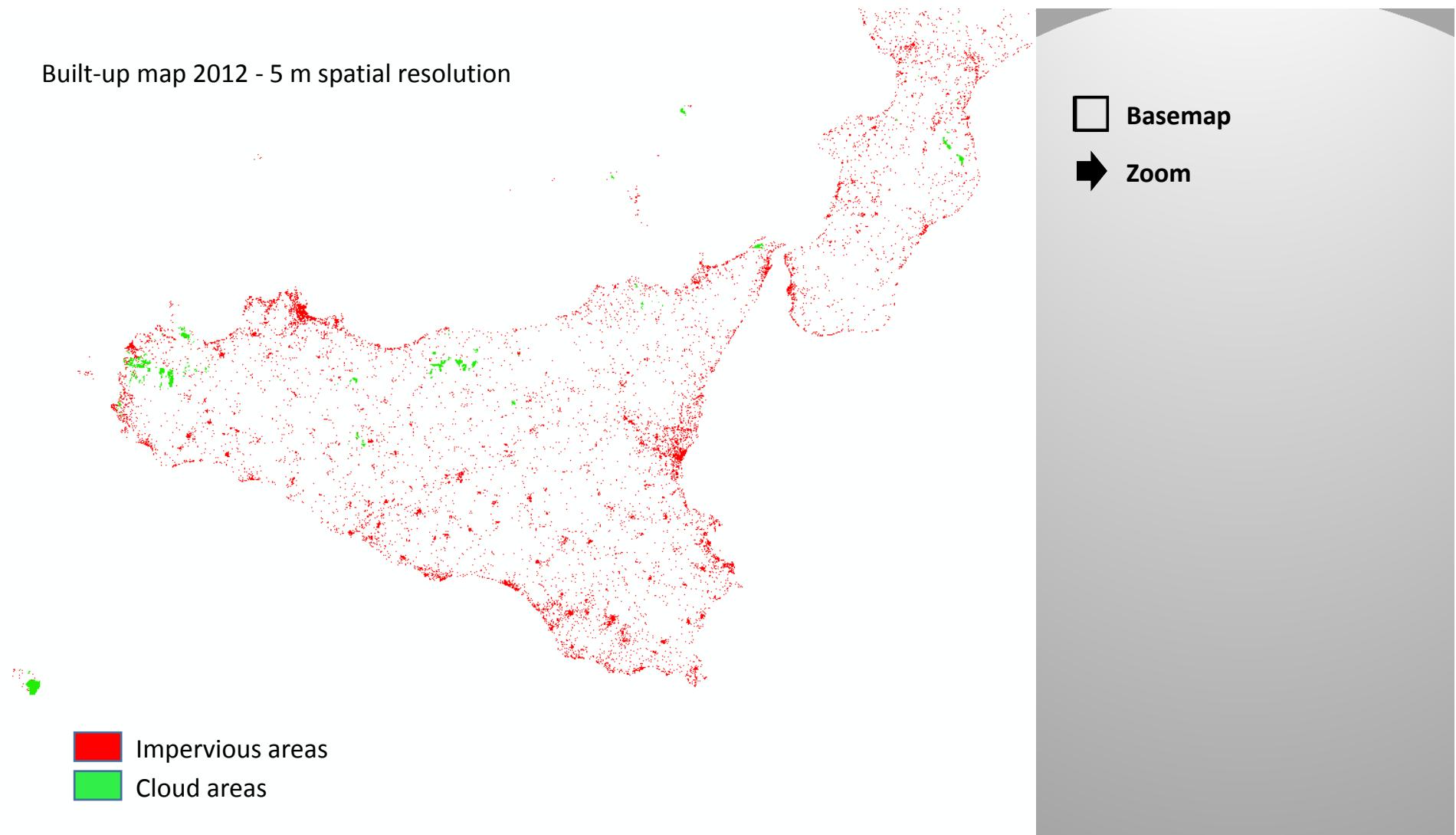
The changes on sensible coastal areas (300 m from coastline in Italy)

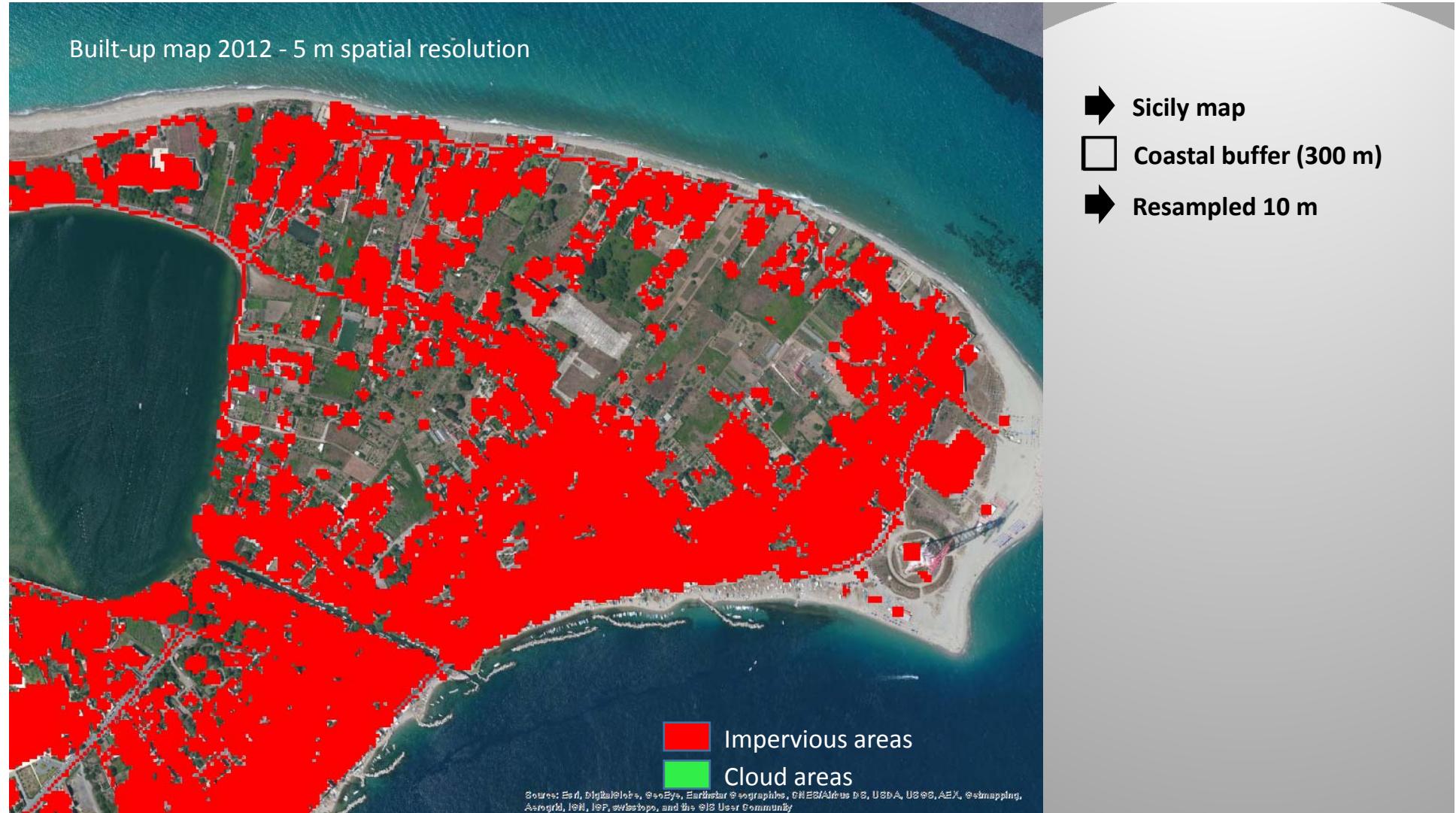
New impervious areas in sensible zone

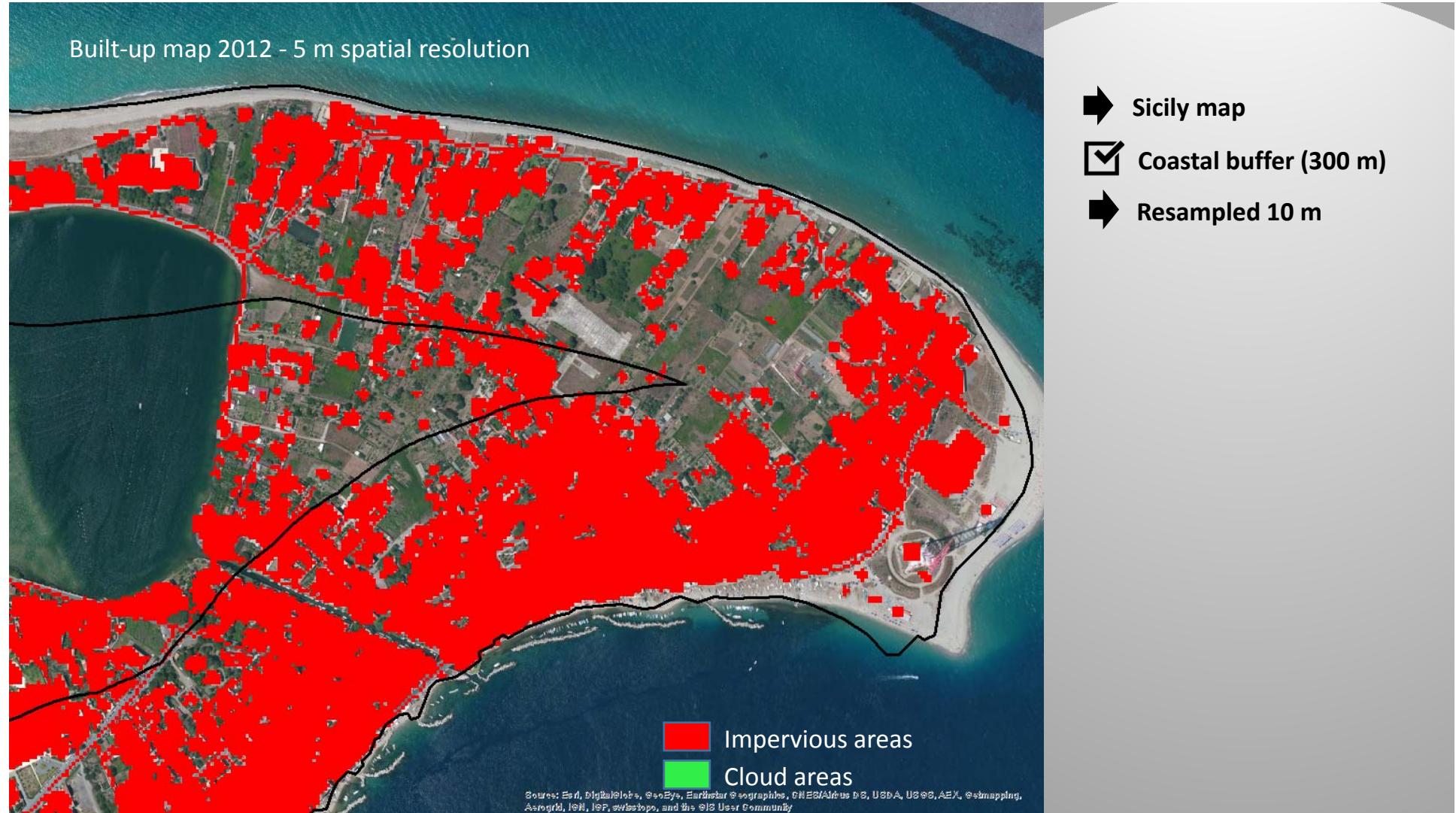


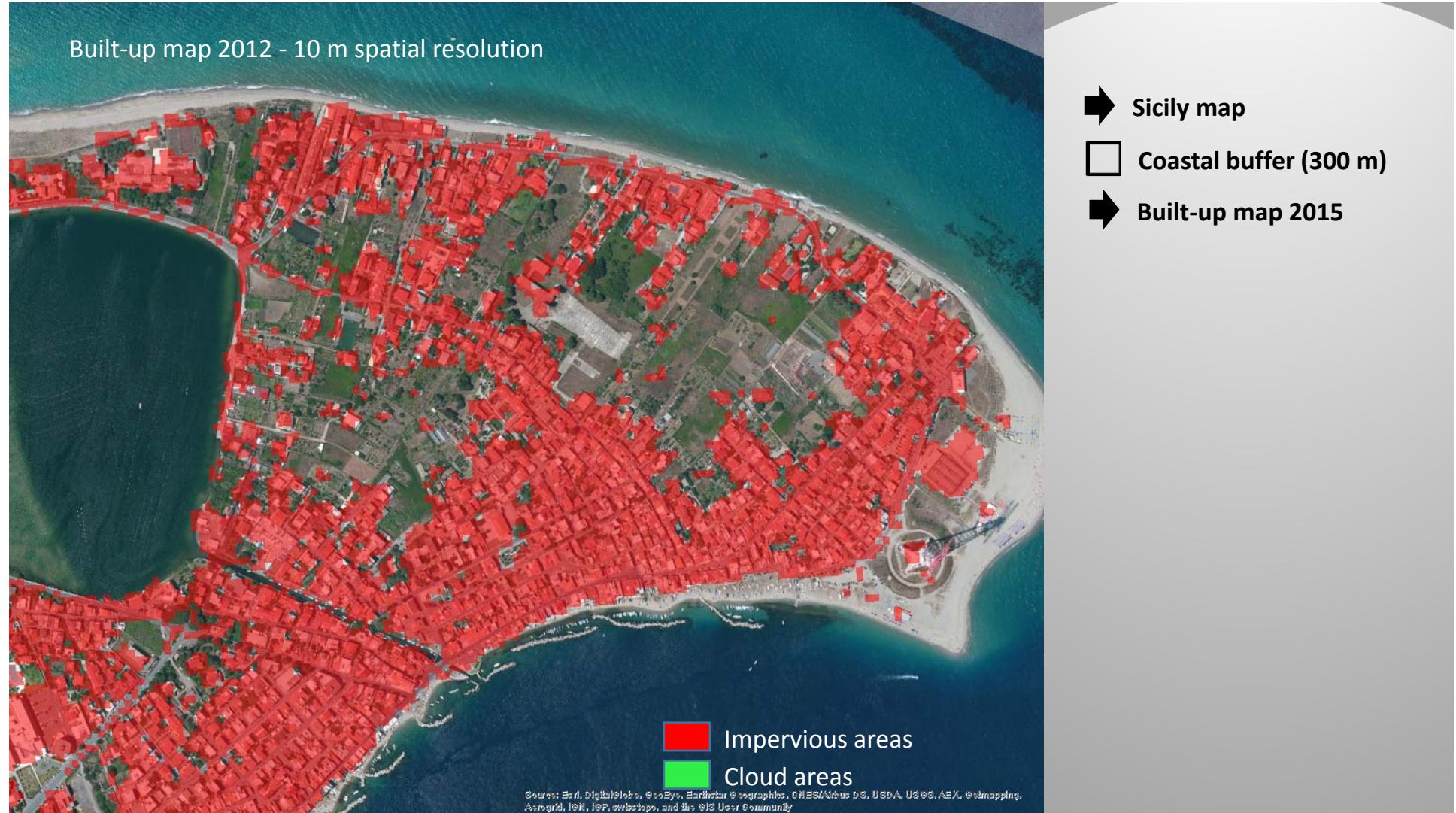


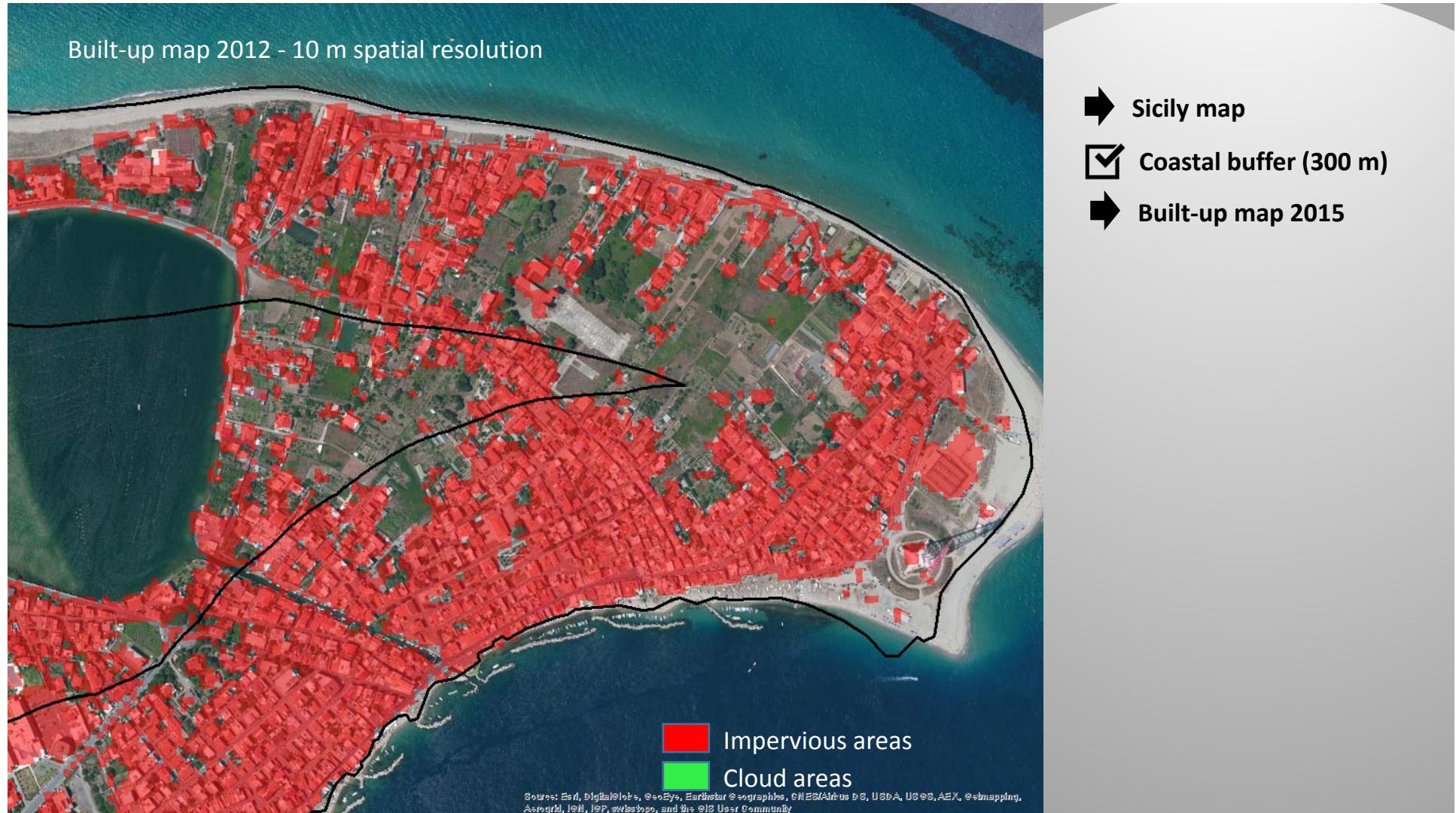
Built-up map 2012 - 5 m spatial resolution

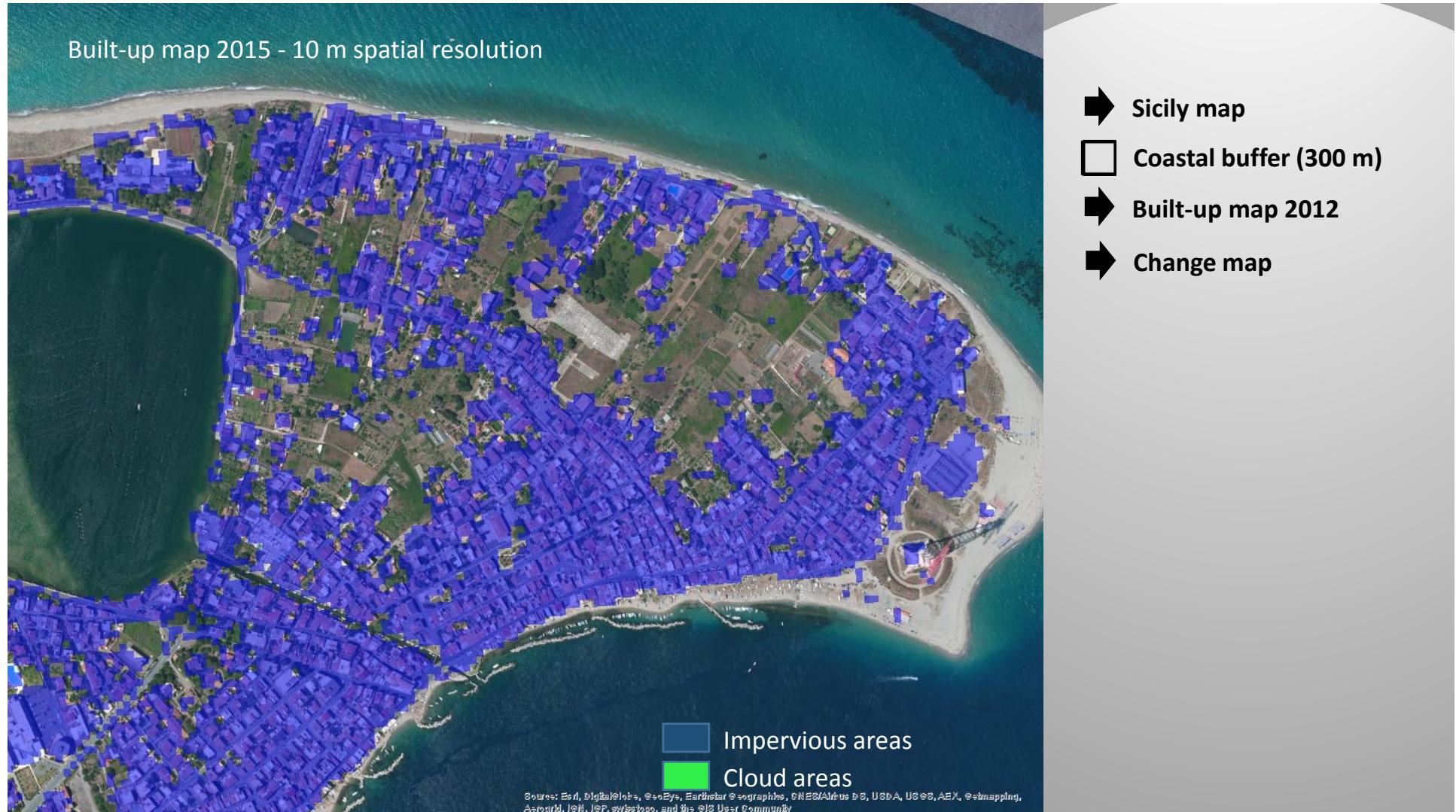


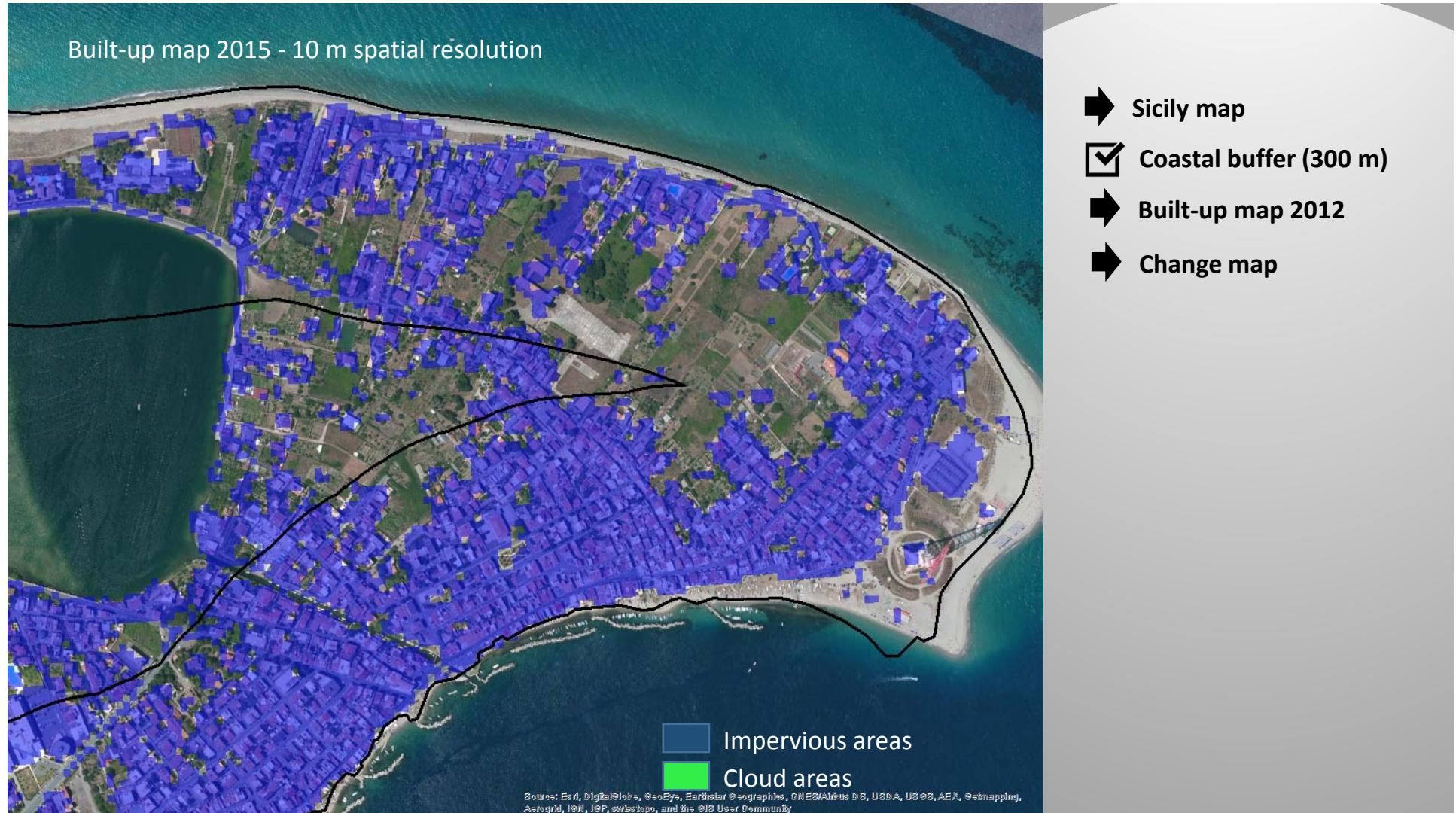


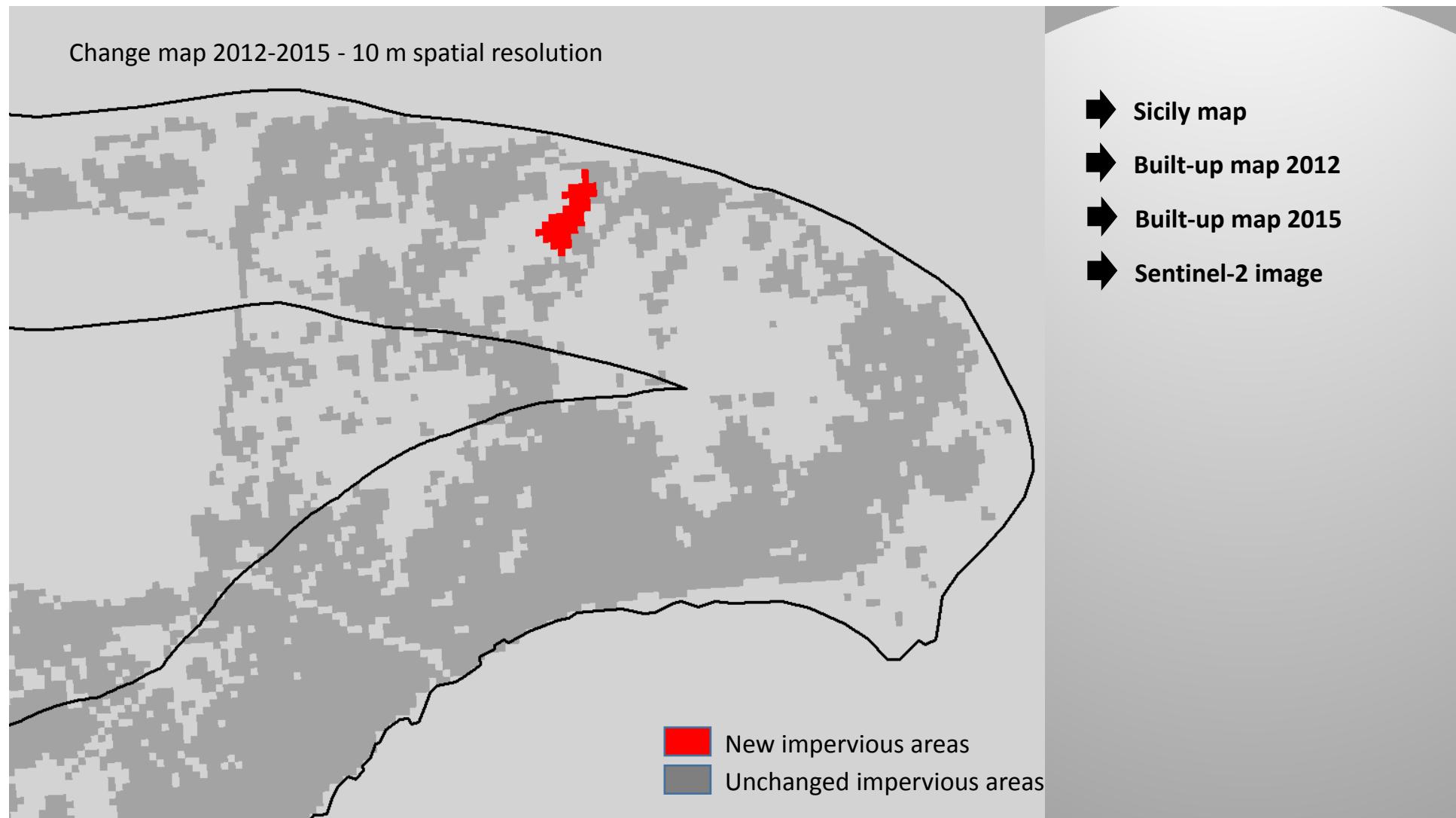




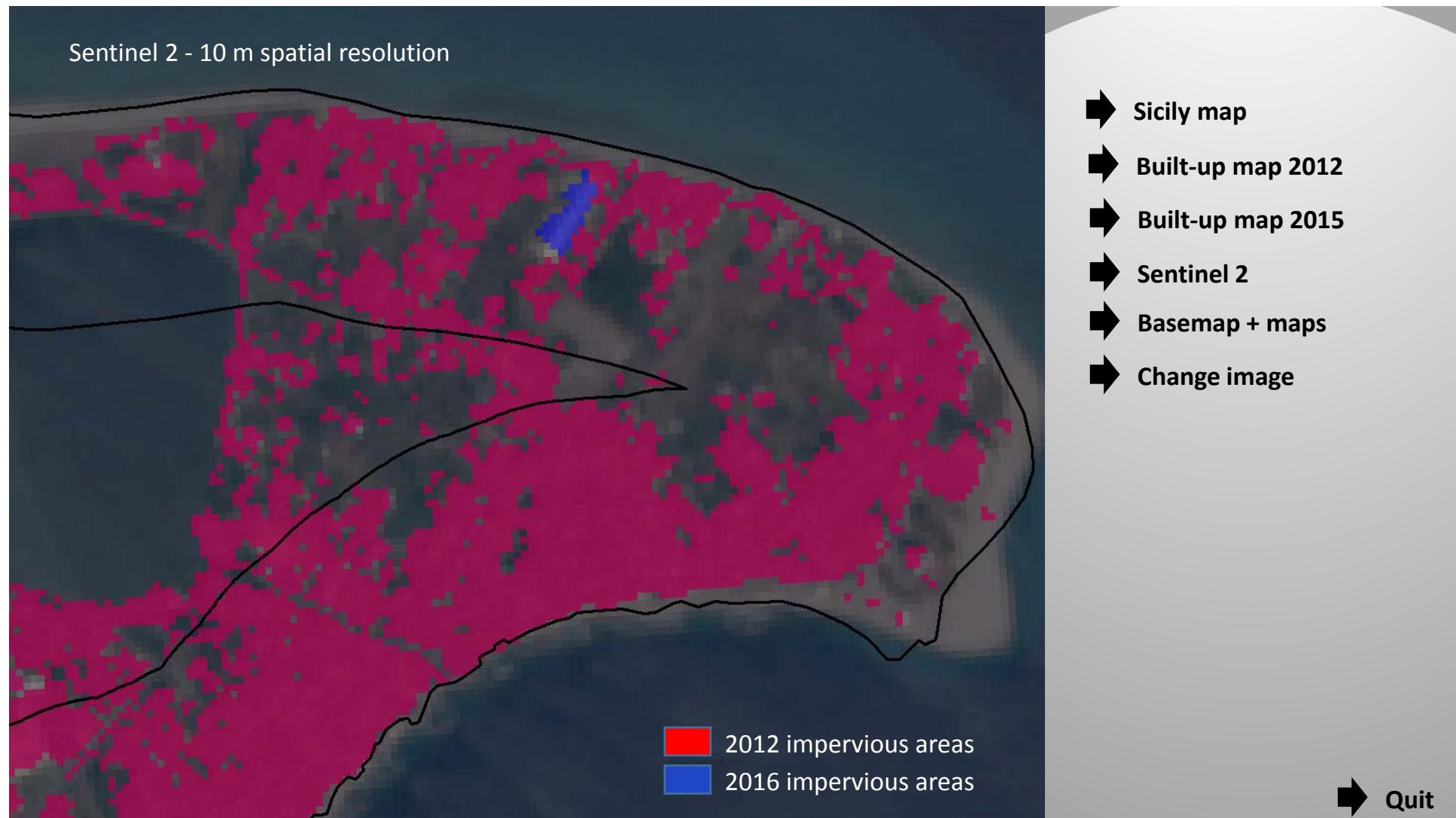














- Sicily map
- Built-up map 2012
- Built-up map 2015
- Sentinel 2
- Sentinel 2 + maps
- Change image

→ Quit



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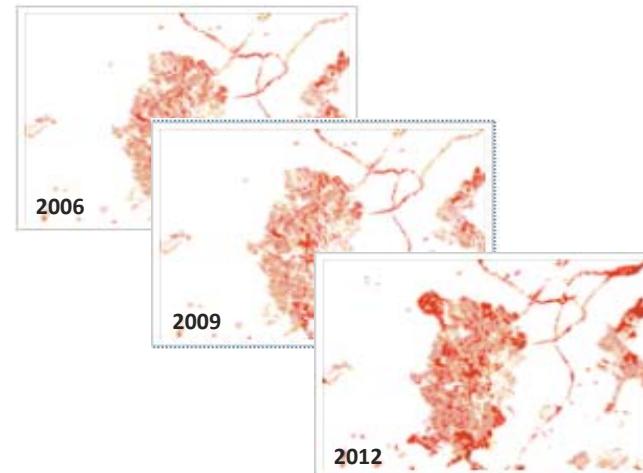
USE CASE 2



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Introduction of problem

Homogeneous time series of third part input data allow a consistent estimation of the human impacts through the years for an independent evaluation of them





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Introduction of use case

Coastal anthropogenic pressure indicator

Aim of indicator

- To quantify the urbanization on coastal areas
- It provides a measurement of the impact of the urbanization on coastal areas
- It provides information useful for urban planner and coastal manager



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Description

Coastal anthropogenic pressure indicator

3 buffer areas are defined from coastline

300 m

1 km

10 km





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Description

Coastal anthropogenic pressure indicator

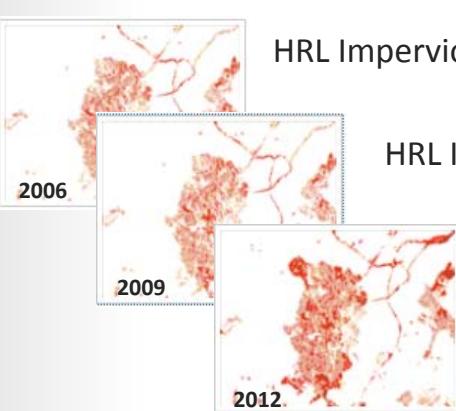
To compute the amount of impervious areas in these buffer zones for the entire region and for the administrative units (provinces)





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I n p u t D a t a



HRL Imperviousness Time series

Shapefile of administrative units





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Tool used

Any “good” GIS Software





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D e m o n s t r a t i o n

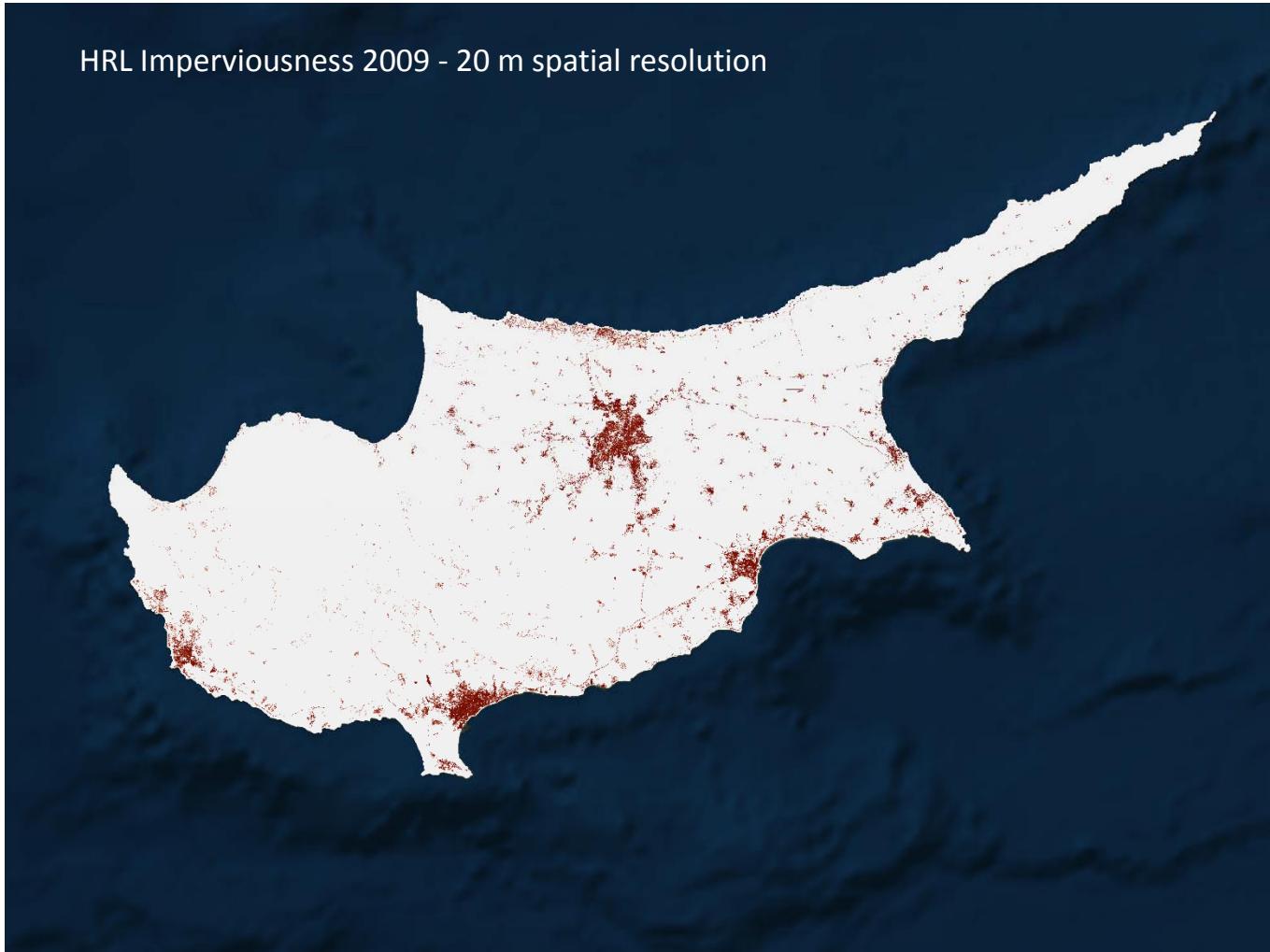
- Interactive ppt

HRL Imperviousness 2006 - 20 m spatial resolution

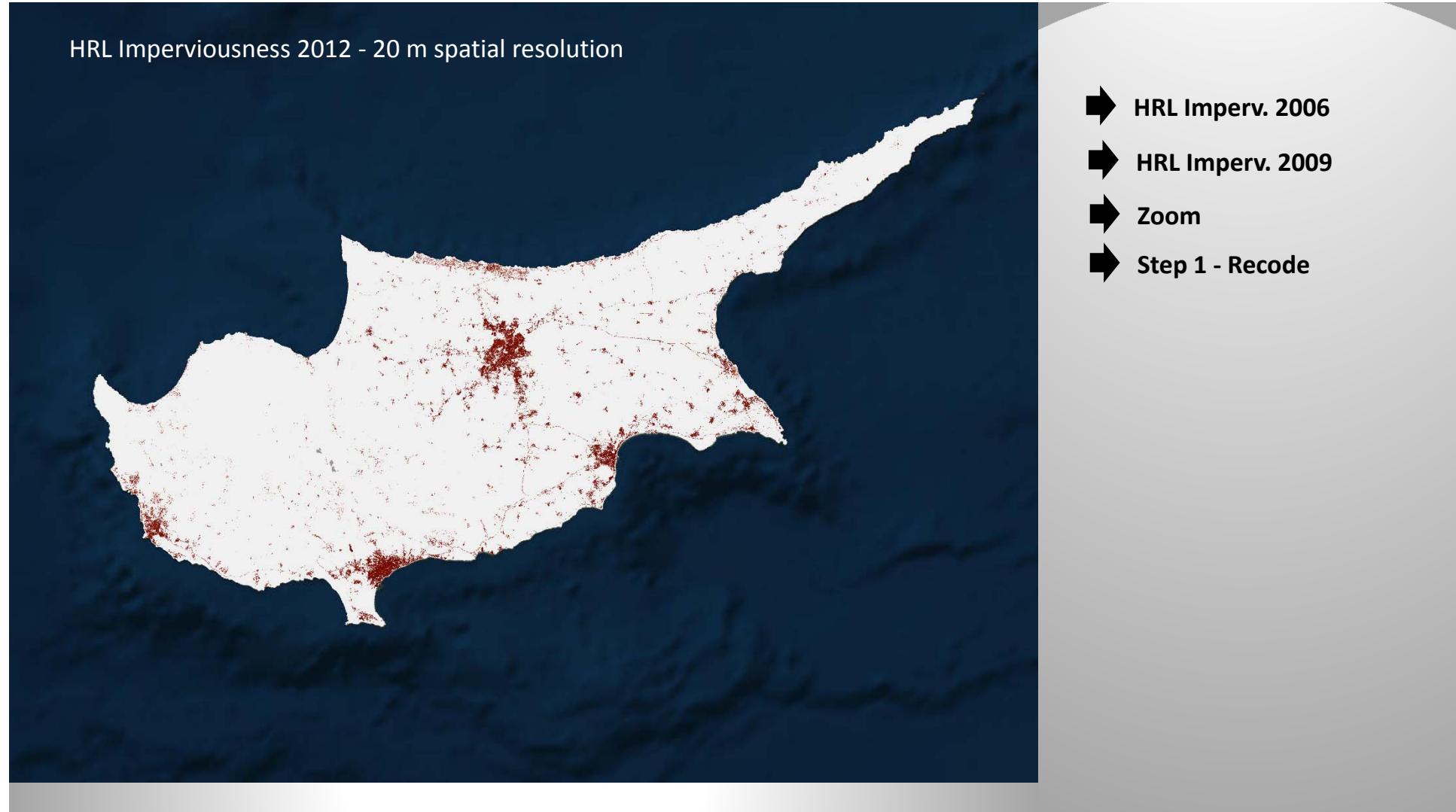


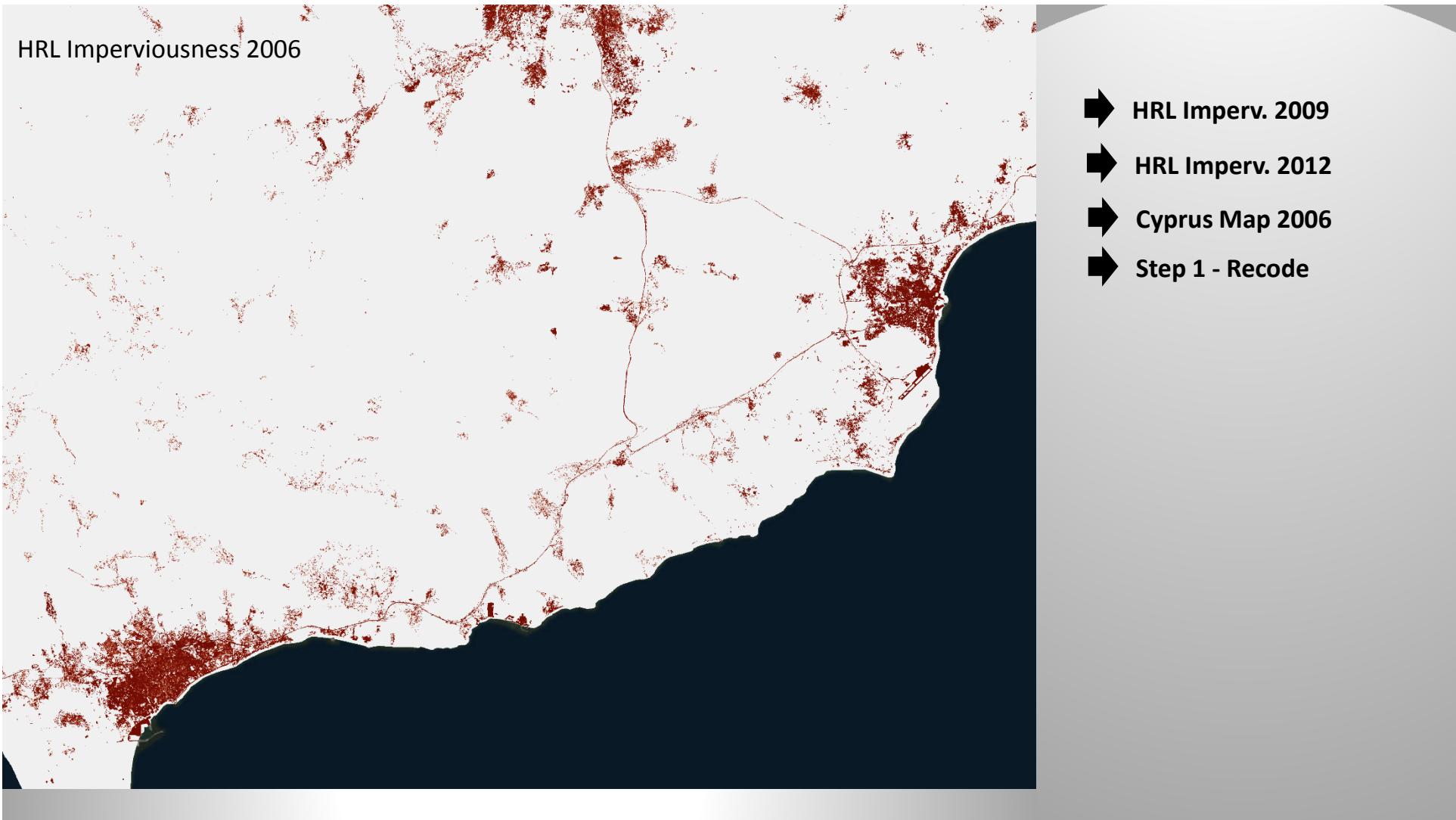
- ➡ HRL Imperv. 2009
- ➡ HRL Imperv. 2012
- ➡ Zoom
- ➡ Step 1 - Recode

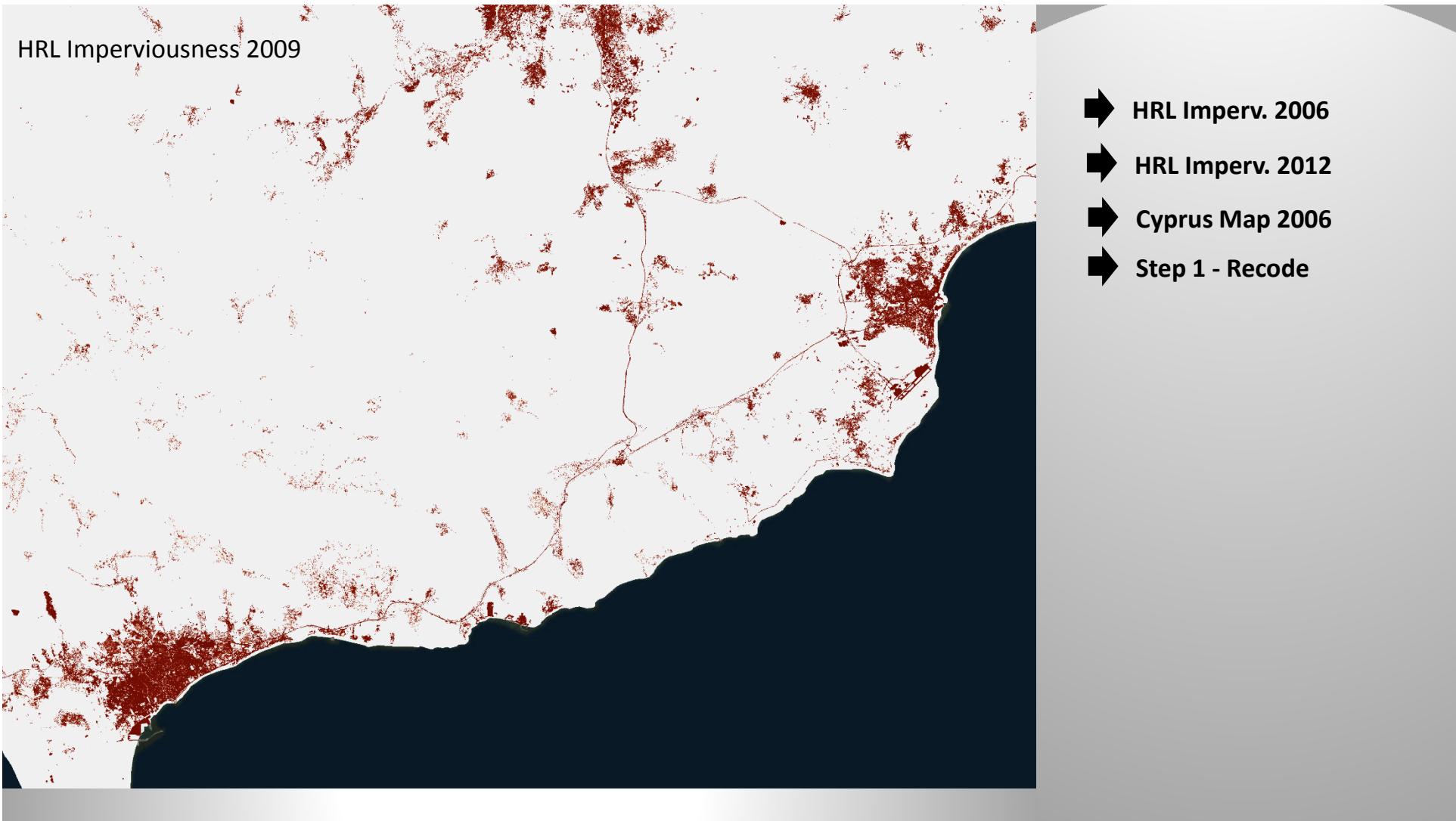
HRL Imperviousness 2009 - 20 m spatial resolution

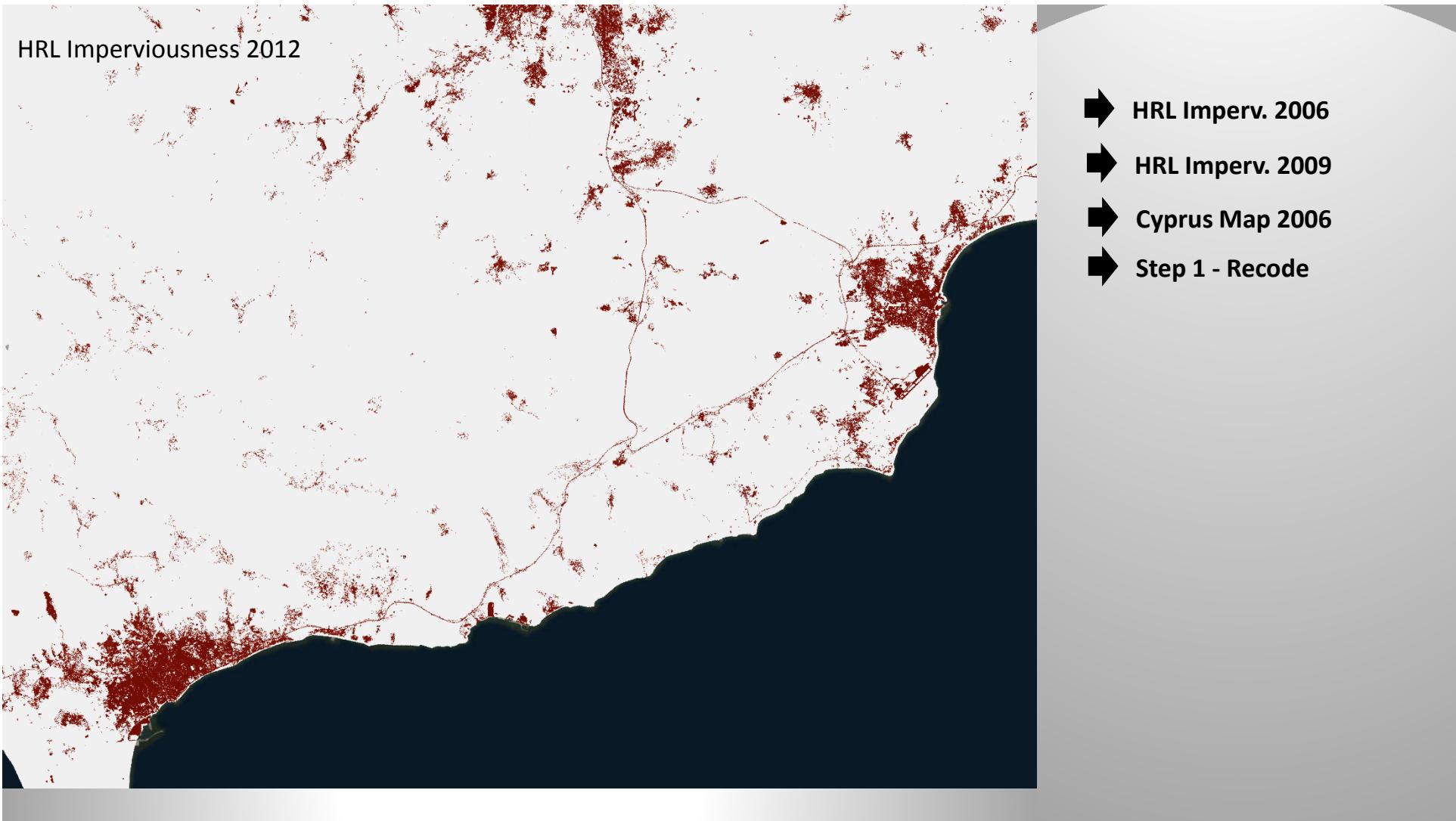


- ➡ HRL Imperv. 2006
- ➡ HRL Imperv. 2012
- ➡ Zoom
- ➡ Step 1 - Recode

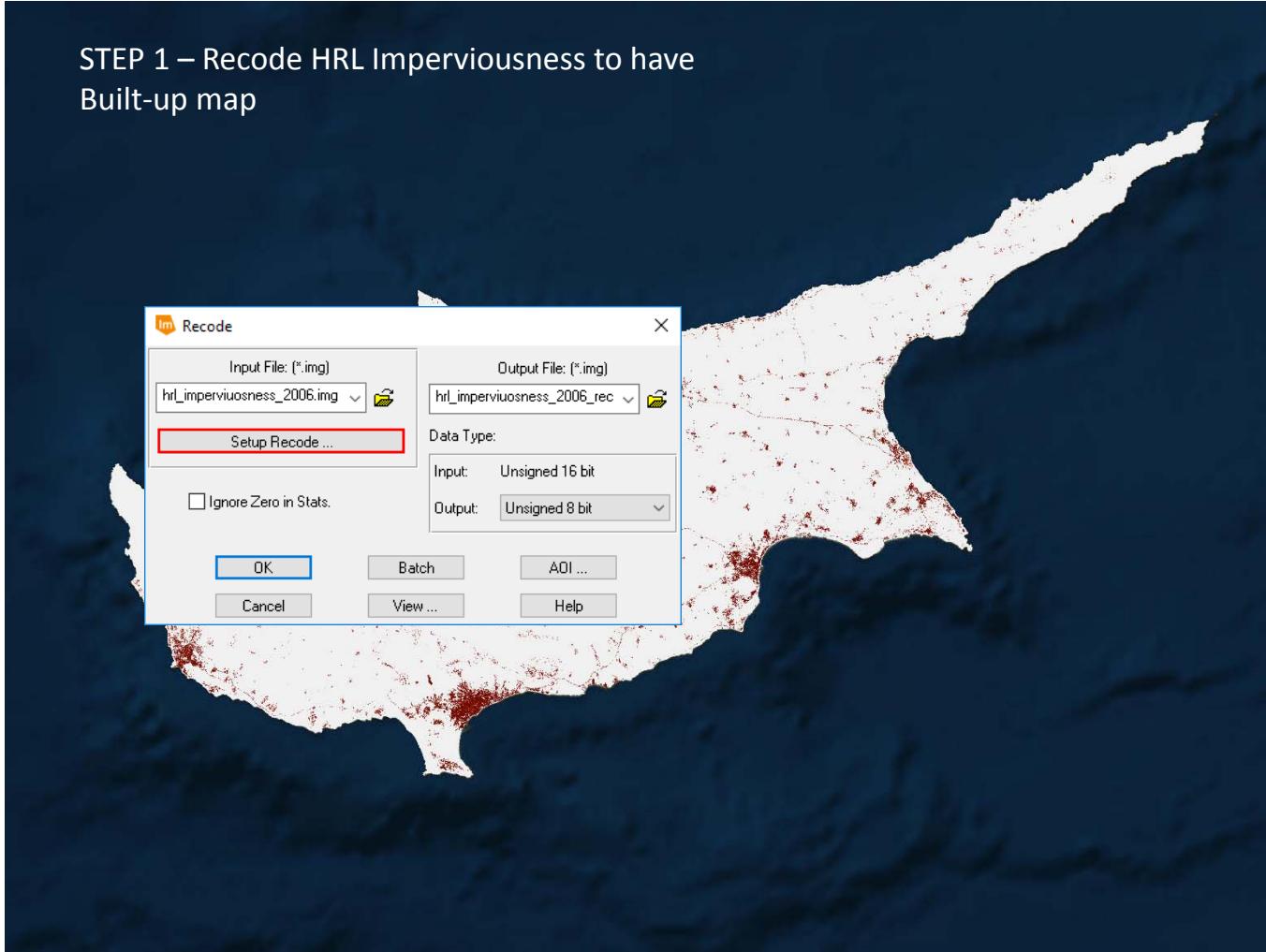




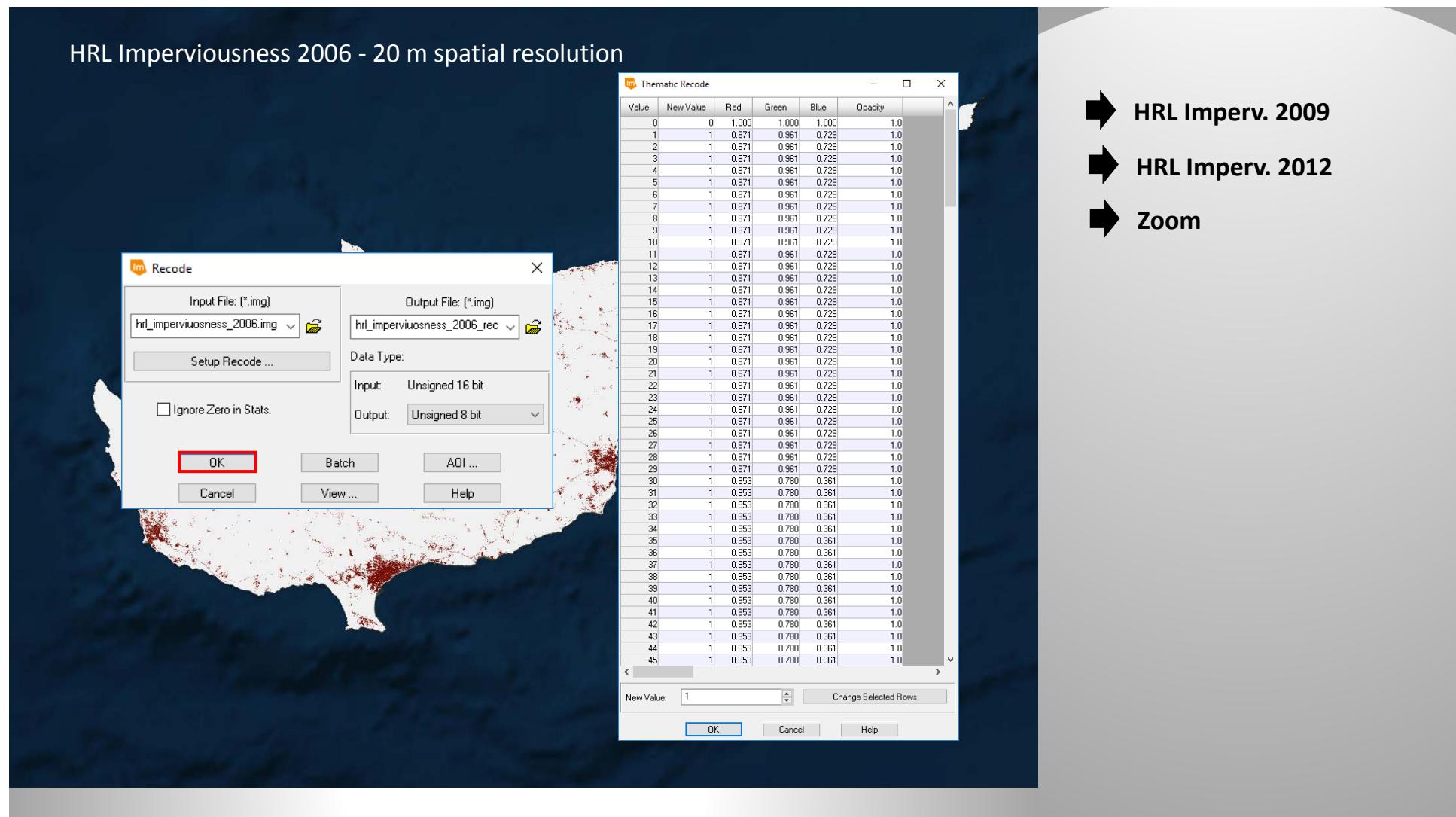




STEP 1 – Recode HRL Imperviousness to have
Built-up map



- HRL Imperv. 2009
- HRL Imperv. 2012
- Zoom



→ **HRL Imperv. 2009**

→ **HRL Imperv. 2012**

→ **Zoom**

Built-up map 2006



- ➡ Built-up map 2009
- ➡ Built-up map 2012
- ➡ Step 2

Built-up map 2009



- ➡ Built-up map 2006
- ➡ Built-up map 2012
- ➡ Step 2

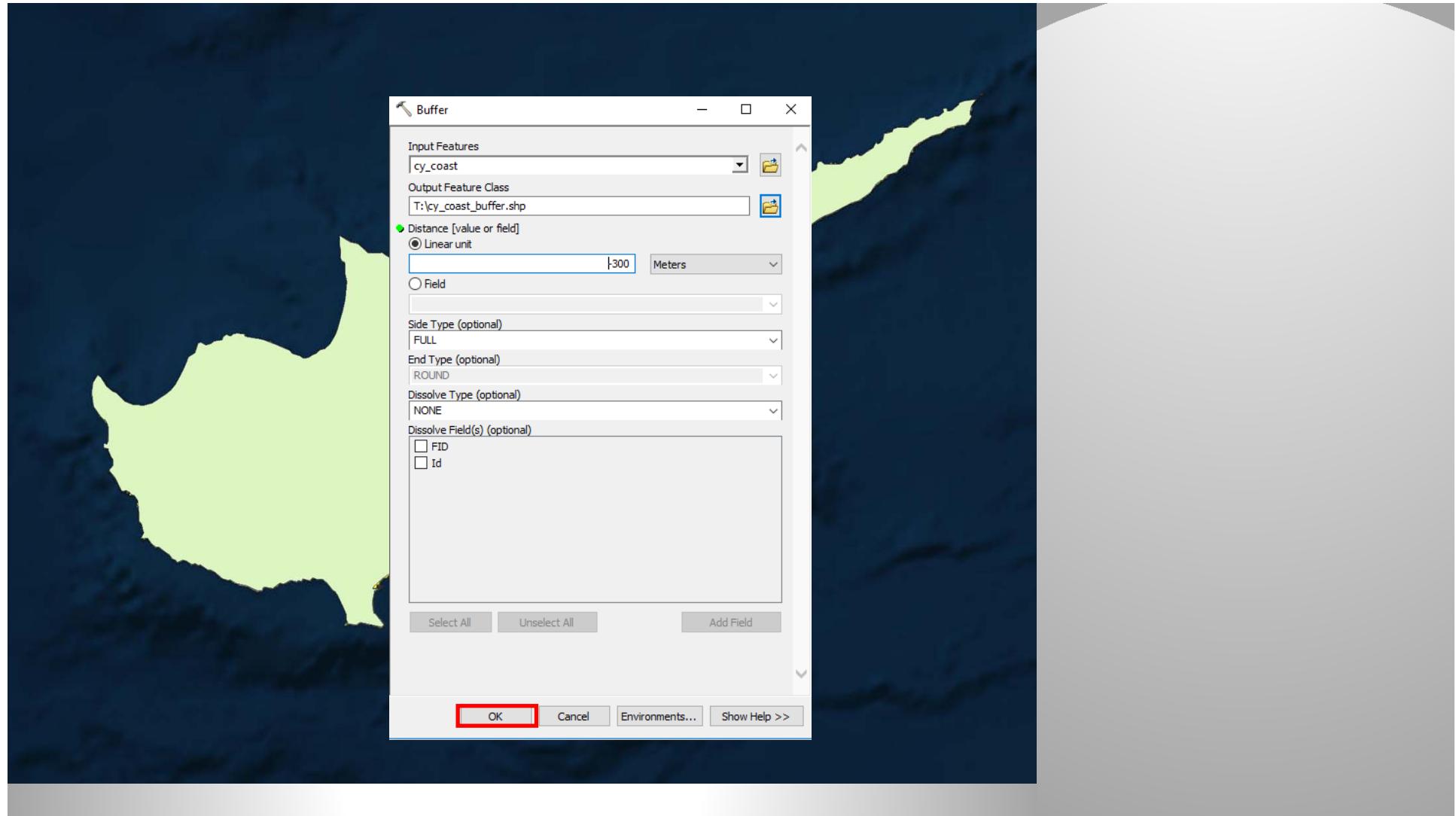
Built-up map 2012



- ➡ Built-up map 2006
- ➡ Built-up map 2009
- ➡ Step 2

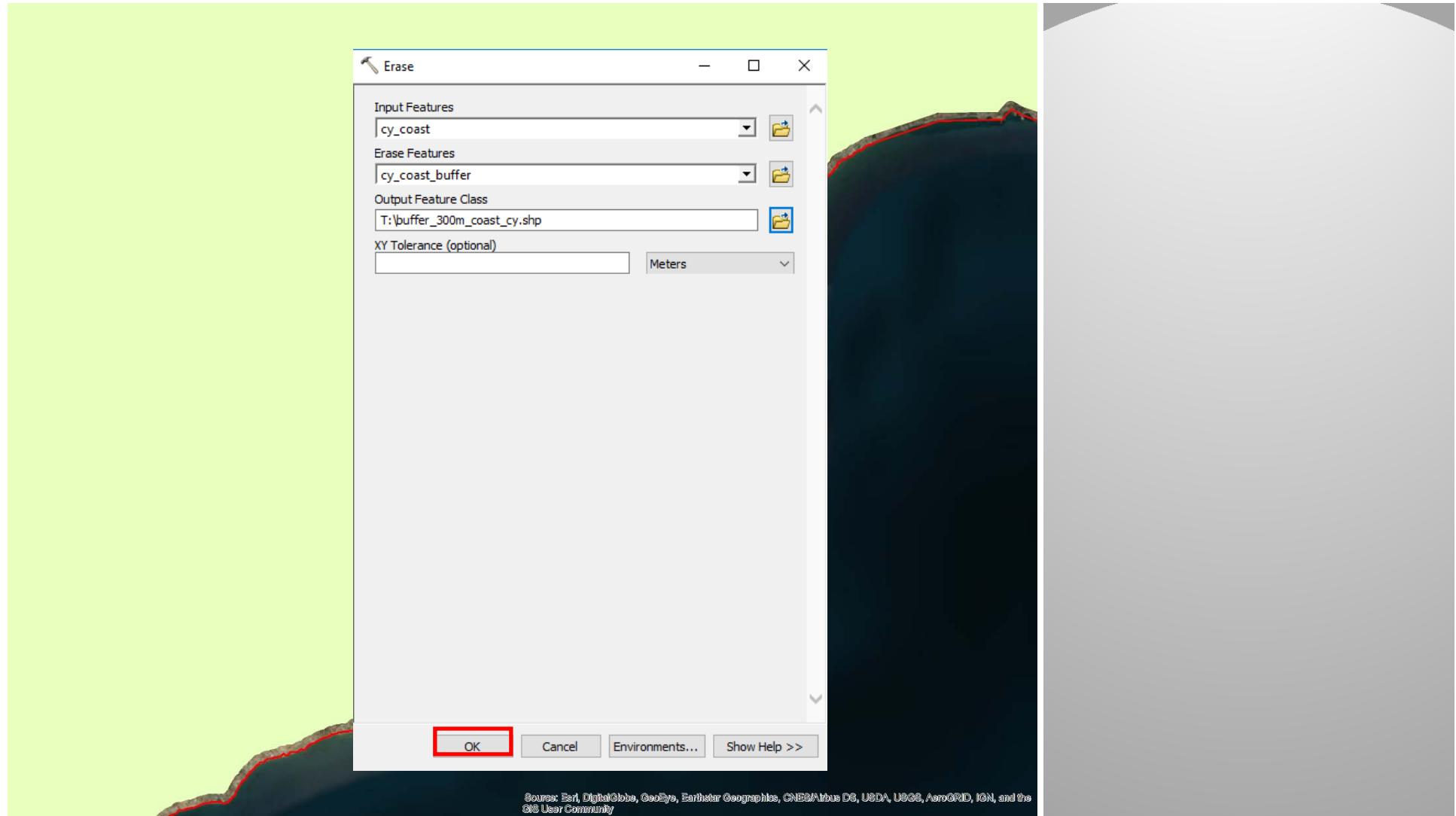
Shapefile region

→ Create buffer zones





Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the
GIS User Community





Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the
GIS User Community

- ➡ 1 km buffer
- ➡ 10 km buffer
- ➡ All buffers
- ➡ Step 3



- 300 m buffer
- 10 km buffer
- All buffers
- Step 3

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

- ➡ 300 m buffer
- ➡ 1 km buffer
- ➡ All buffers
- ➡ Step 3



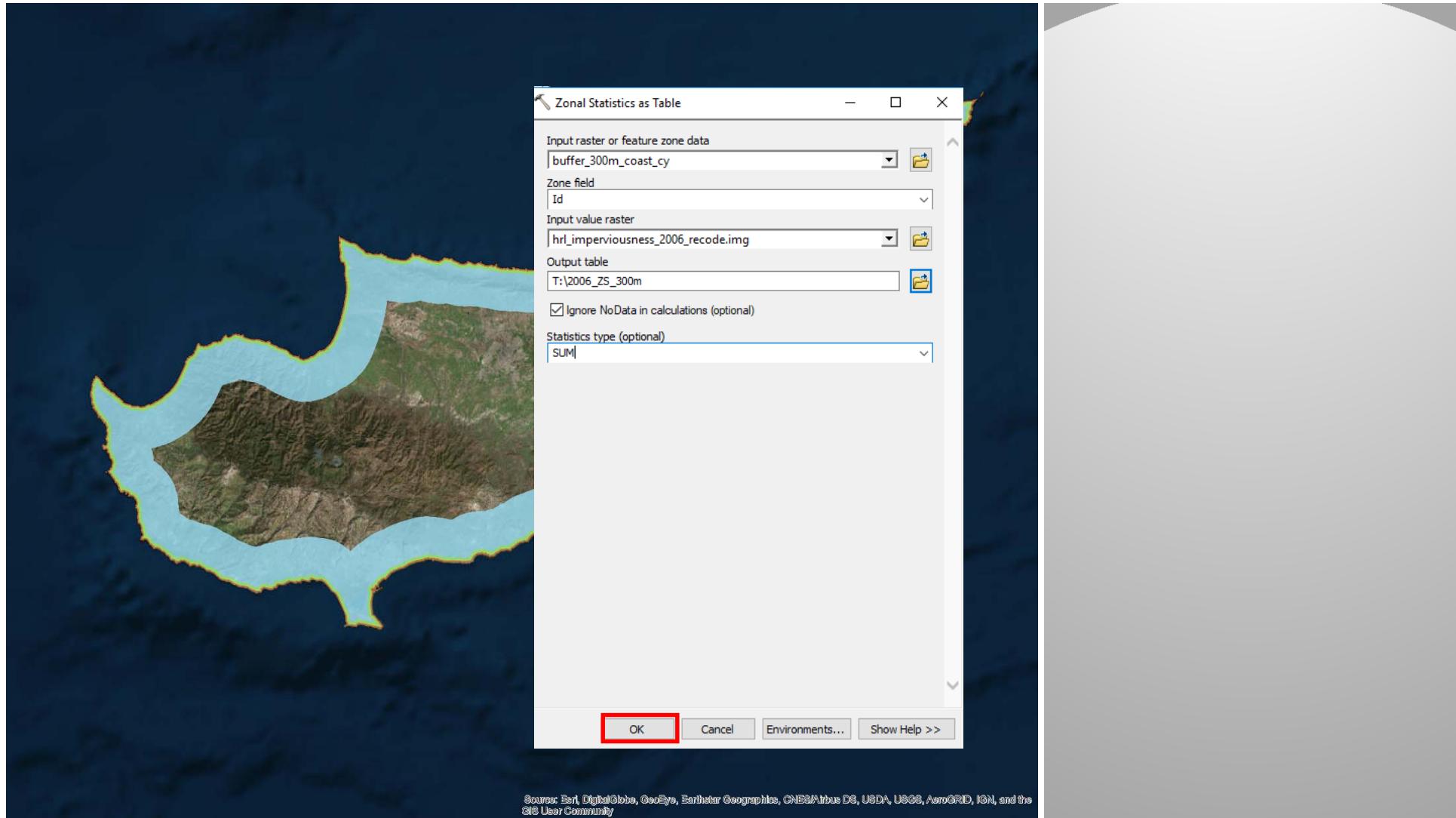
- 300 m buffer
- 1 km buffer
- 10 km buffer
- Step 3

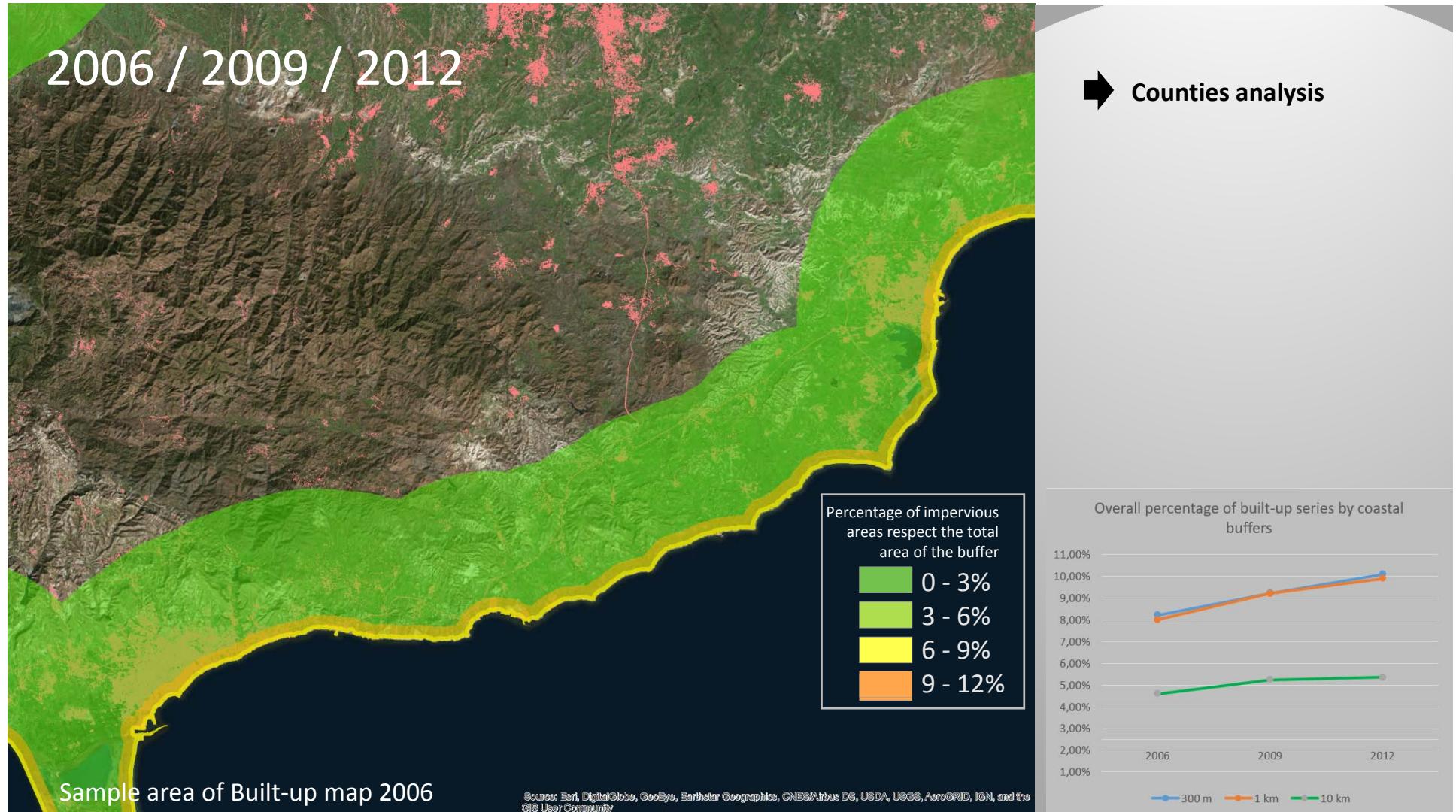
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

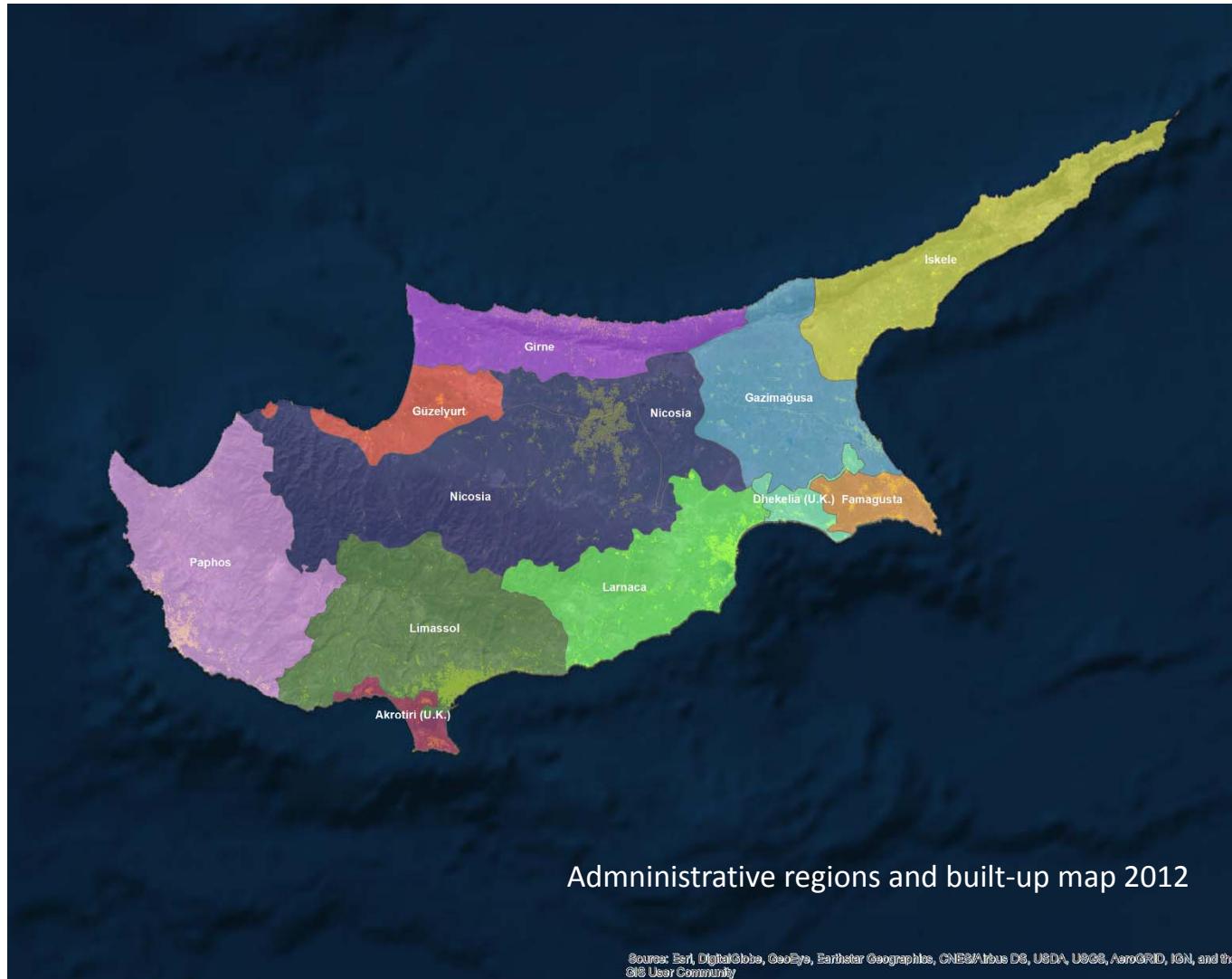


Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

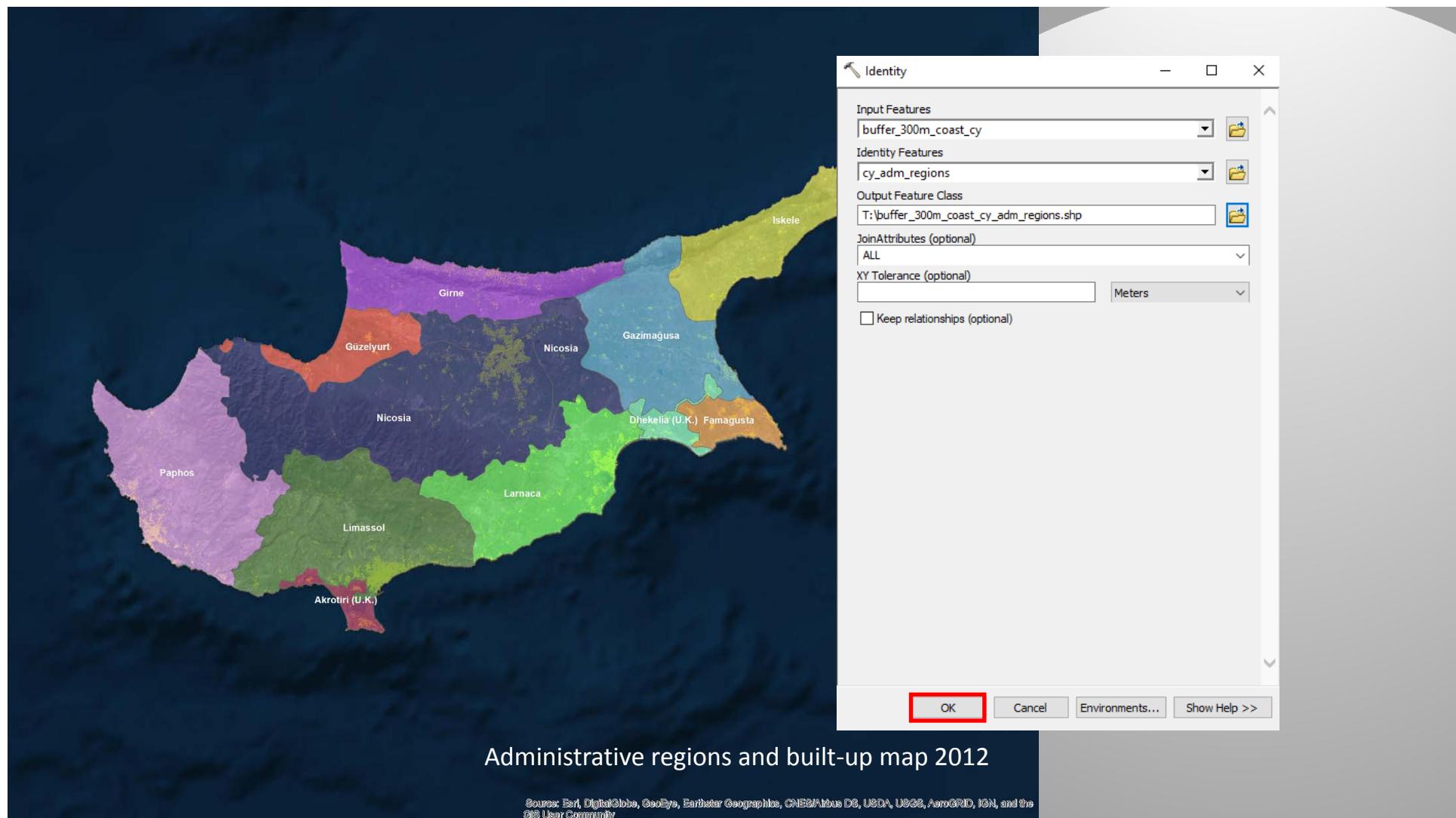
→ Zonal statistics

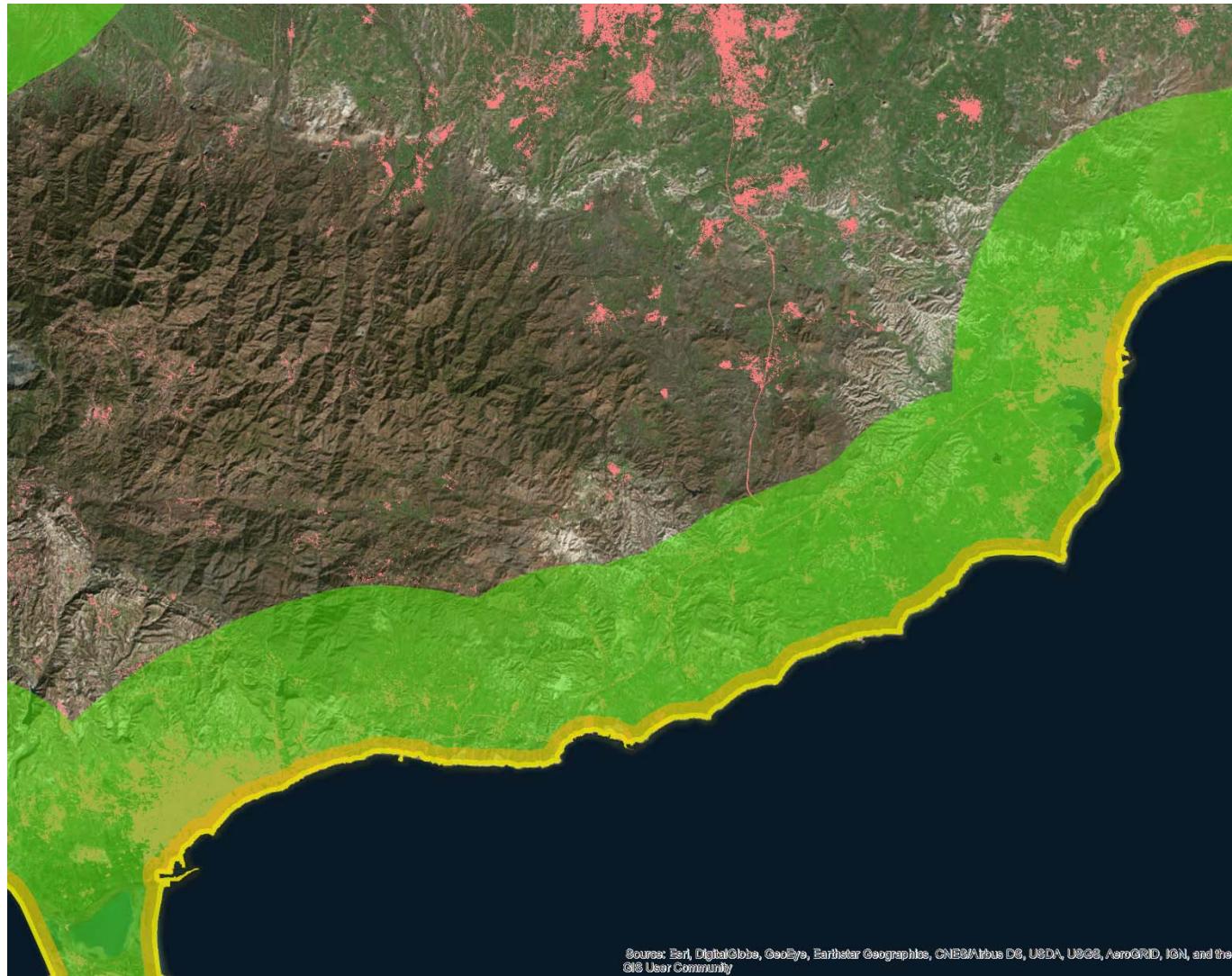






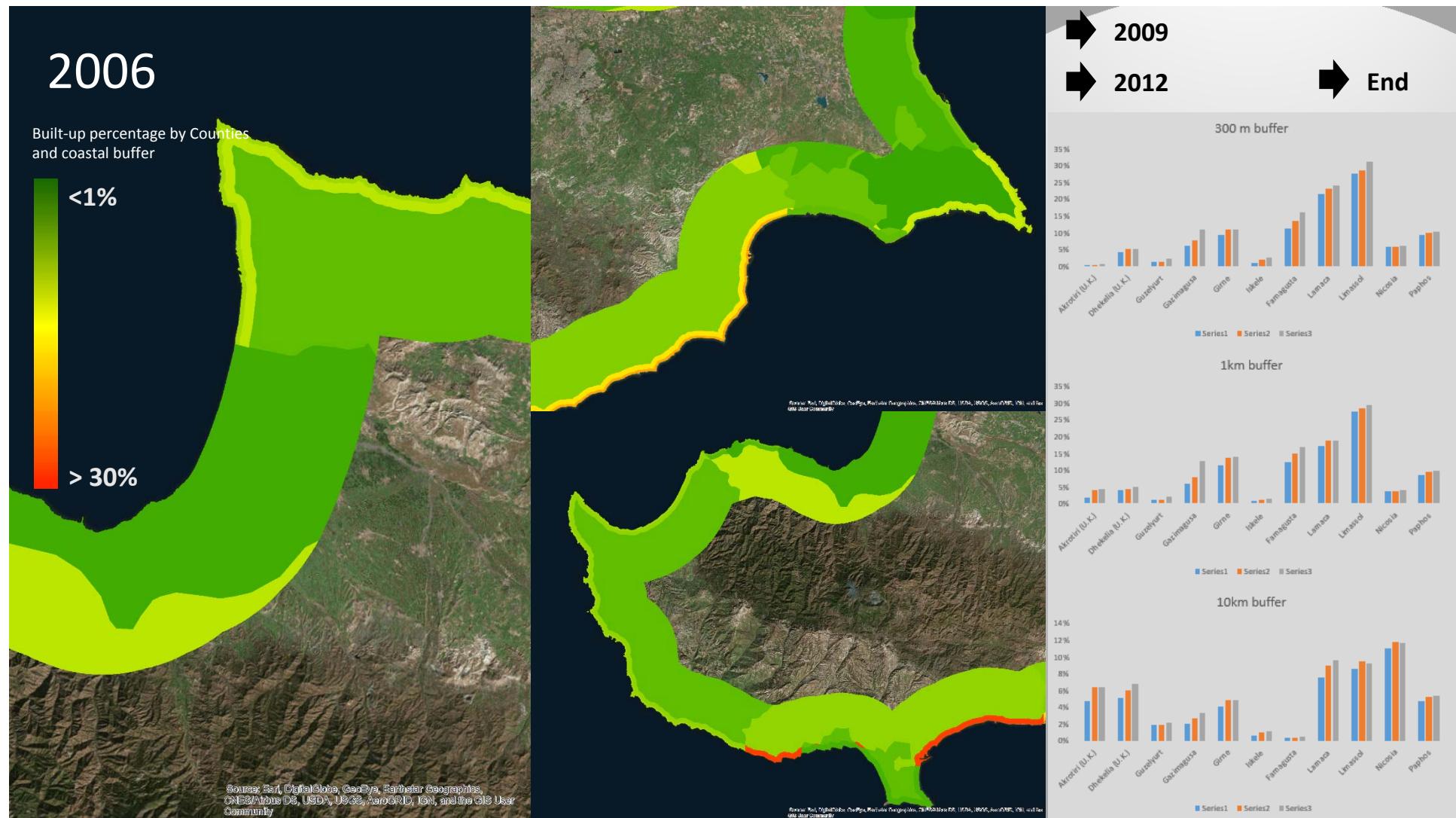
→ Create new buffers

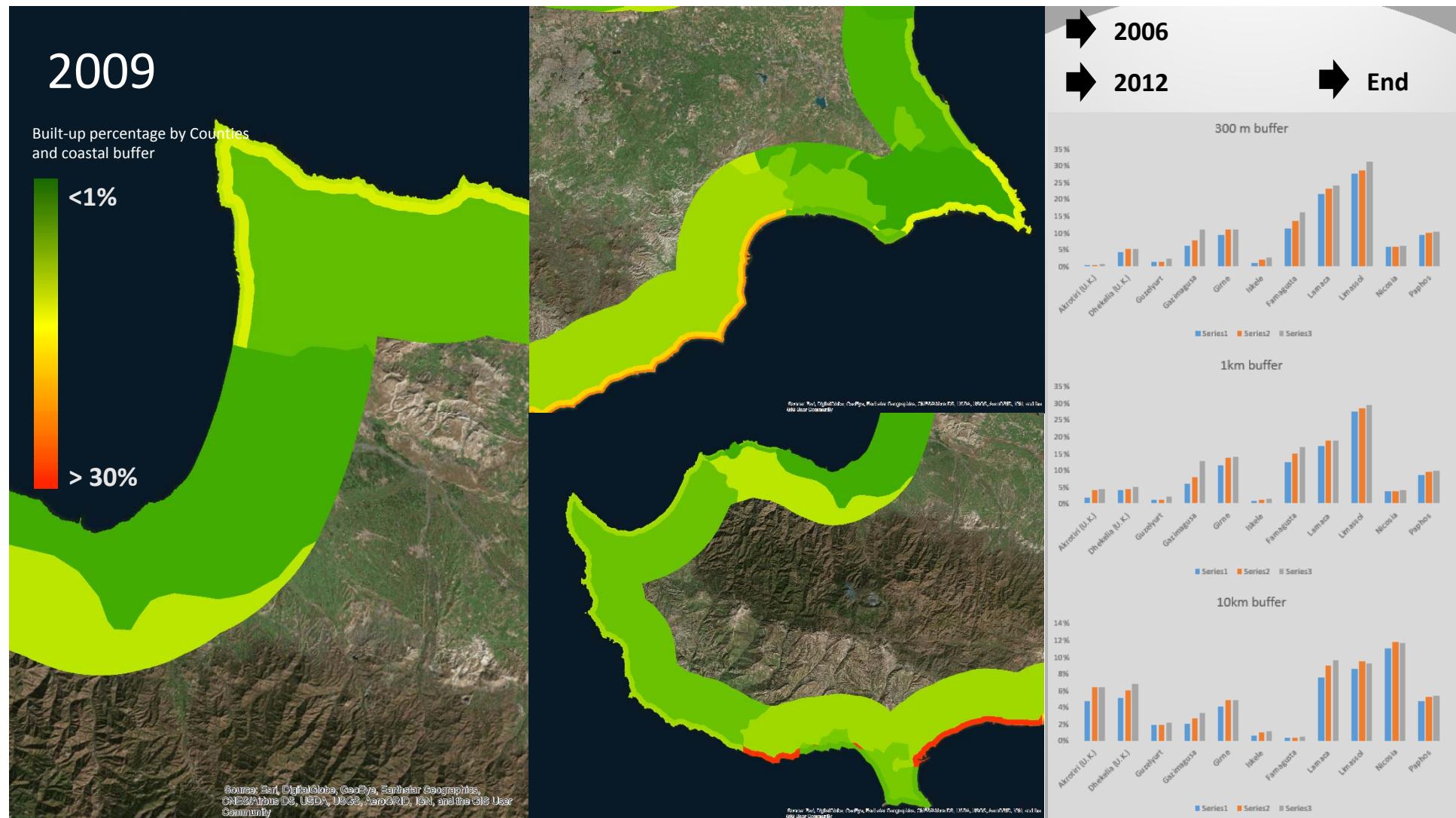


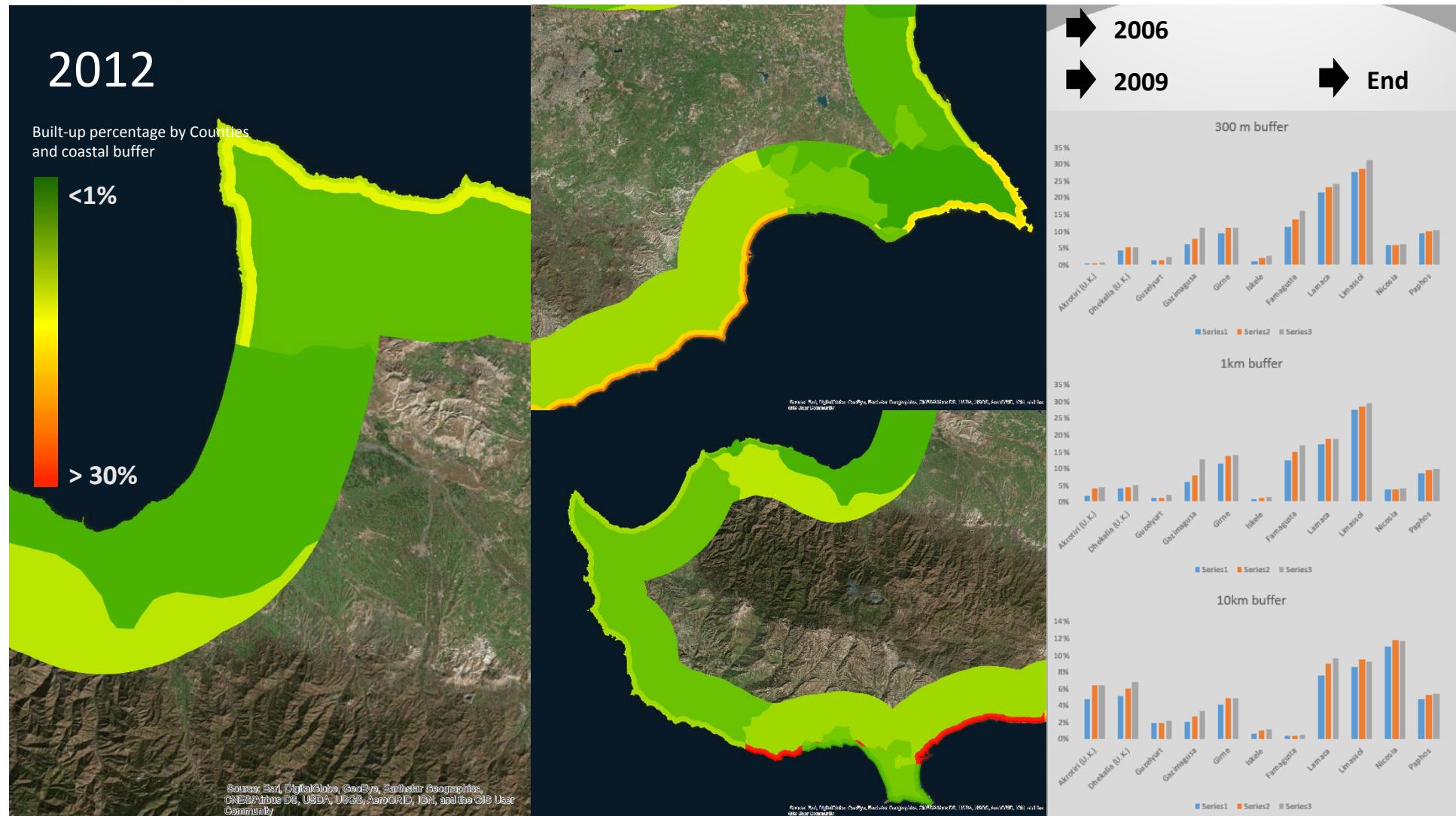


→ Analysis results

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the
GIS User Community









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Thank you