



An open-source, object-based, unsupervised change detection tool for urban expansion monitoring



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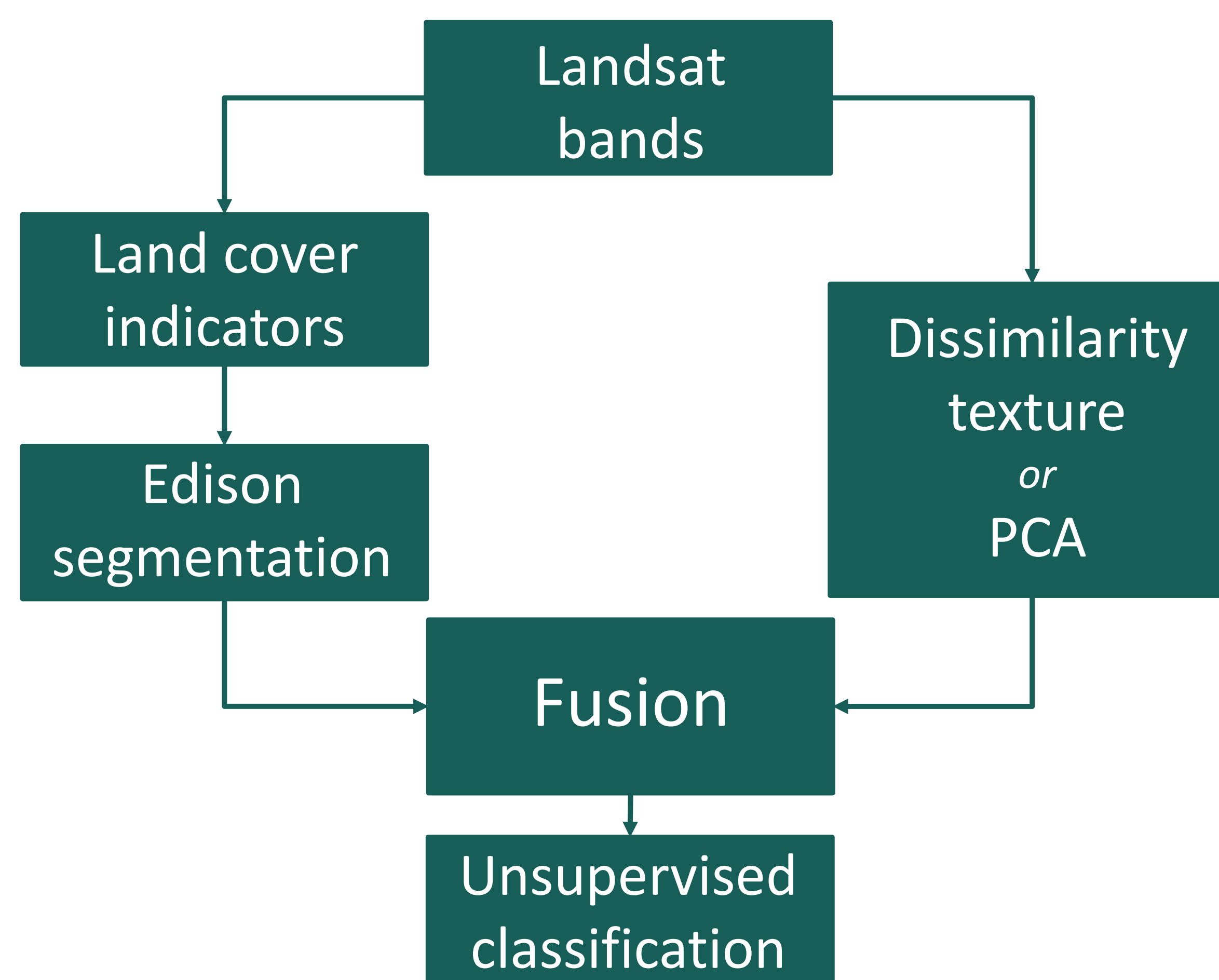
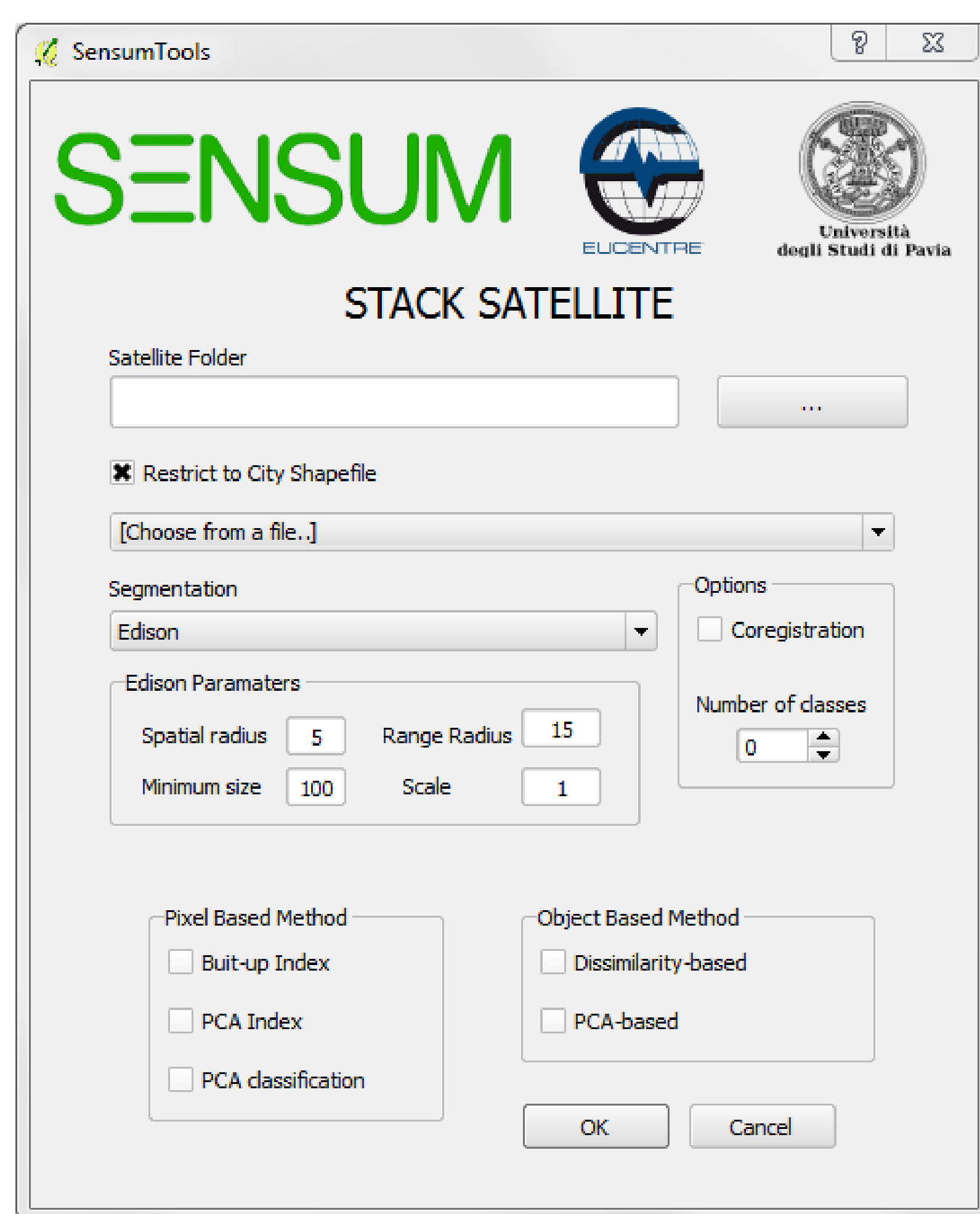
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Introduction

Satellite Earth Observation systems grant acquisition repeatability, a feature which can be very important in the context of a typical application, i.e. tracking the evolution of urban areas. With this goal in mind, a new, open-source technique has been developed in a framework of vulnerability estimation, monitoring and forecasting. The technique, developed in the context of some EU FP7 projects [1-3], relies on object-based change detection and post-adjustment of results based on common-sense rules. The developed technique does take advantage of a wide time span. Long timespans are also involved when dealing with “Big Heritage Data” [4] to reconstruct historical development in the addressed area.

Stack Satellite

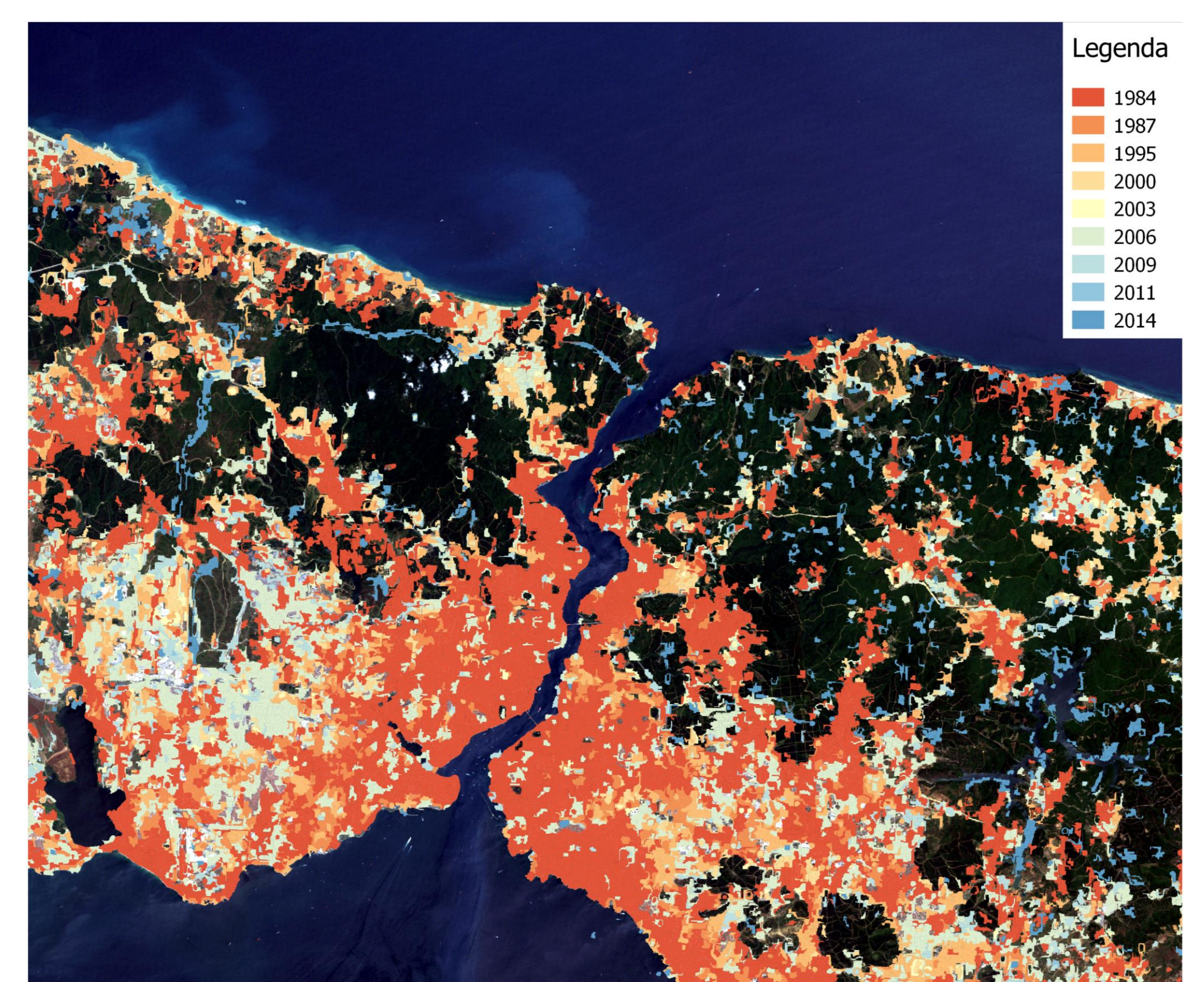
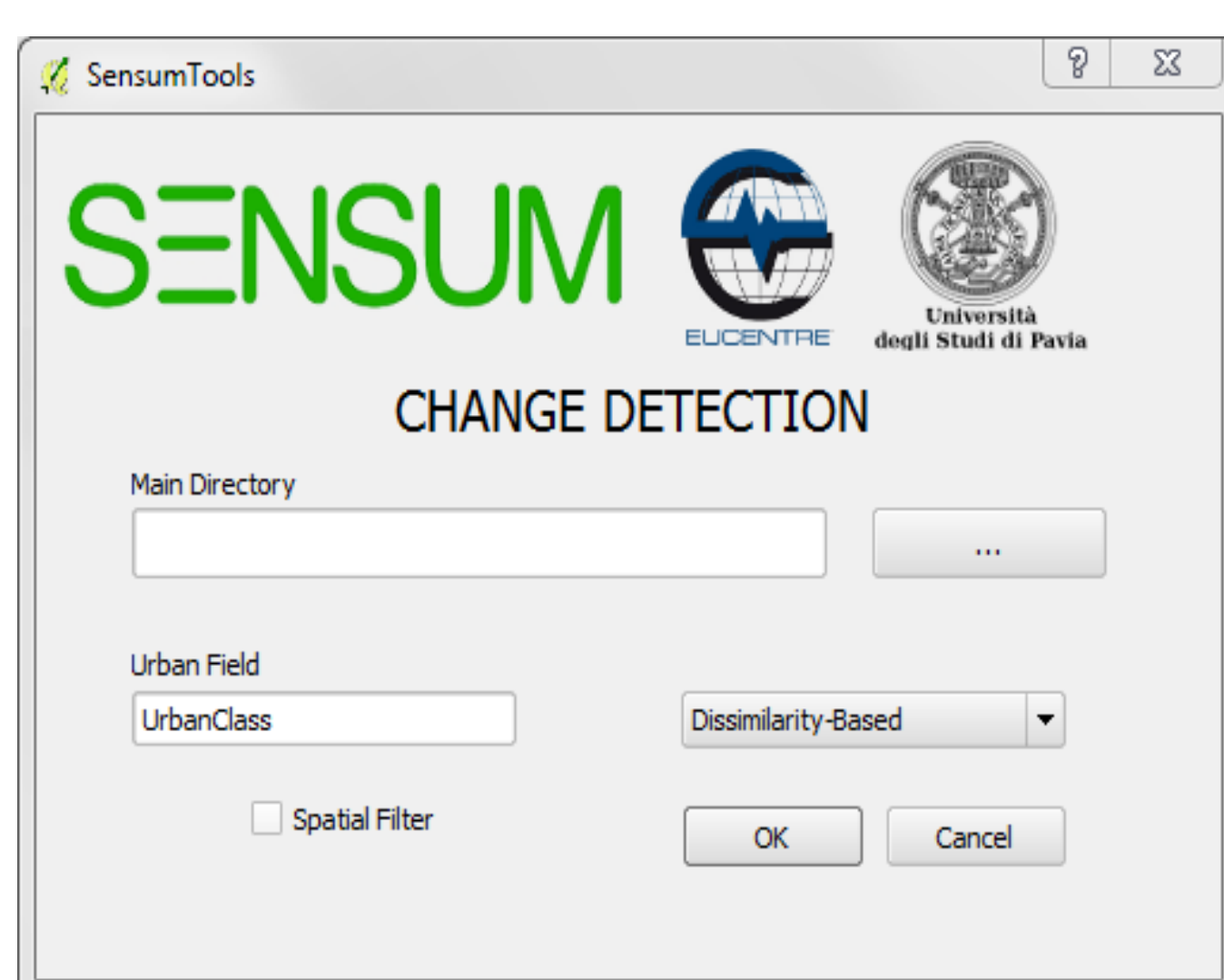
Built-Up area extraction from Landsat imagery. It includes the so-called hybrid-based techniques because it fuses pixel- and object-based procedures.



Example of extraction over Kampala, Uganda (2010).

Chg Unsupervised Change Detection

Unsupervised change detection technique based on the capability to process a series of Landsat images over a given time span. User input is limited to the election of the class or classes related to built-up areas generated by the **stack satellite** tool.



Example of extraction over Istanbul, Turkey (1984-2014).

References

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- [4] D. De Vecchi, M. Harb, F. Dell'Acqua: "Refining registration of large, multi-temporal stacks of medium-resolution images: a novel, automated approach for 'Big Heritage Data'". Proc. of BiDS 2014, October 2014, Frascati, Italy.
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- [6] D. De Vecchi, M. Harb, F. Dell'Acqua: "A PCA-based approach for built-up area extraction from LANDSAT 5, 7 and 8 datasets". Proc. of IGARSS 2015, July 2015, Milan, Italy.
- [7] D. De Vecchi, D. A. Galeazzo, M. Harb, F. Dell'Acqua: "Unsupervised Change Detection for urban expansion monitoring: an object-based approach". Proc. of IGARSS 2015, July 2015, Milan, Italy.

Try It!



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SENSUM

<http://www.sensum-project.eu/>



MARSITE

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RASOR

<http://www.rasor-project.eu/>



GPL

Free Software

Free as in Freedom