MULTITEMPORAL SENTINEL-1A SAR AND SENTINEL-2A MSI DATA FOR GLOBAL URBAN SERVICES

Cities

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<tr>
<td>Beijing, China</td>
<td>Mumbai, India</td>
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<td>Jakarta, Indonesia</td>
<td>New York, U.S.A.</td>
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<td>Lagos, Nigeria</td>
<td>Rio de Janeiro, Brazil</td>
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<tr>
<td>Mexico City, Mexico</td>
<td>Stockholm, Sweden</td>
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<td>Milan, Italy</td>
<td>Sydney, Australia</td>
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Users

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<tr>
<td>Stockholm County Administrative Board (Sweden)</td>
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<td>National Geomatics Center (China)</td>
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Partners

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With more than half of the world’s population now living in cities, and 2.5 billion more people expected to move into cities by 2050, urban areas pose significant challenges on the environment. Accurate and timely information on urban land cover and their changing patterns is of critical importance to support sustainable urban development. At present, the information urban planners and decision makers needed to support planning activities are either non-existent, dated or collected through time-consuming field survey or visual interpretation of aerial photographs. Through its synoptic view and the repeatability, satellite remote sensing can provide timely and accurate information necessary to map urban land cover and monitor urbanization trend. With the recent launch of Sentinel-1A/2A, high resolution SAR and optical data with global coverage and operational reliability become routinely available. They provide excellent opportunity to develop novel and automated methods and algorithms for operational urban services and products required by planners to support smart and sustainable urban development.

**BACKGROUND**

The overall objective of this research is to evaluate multitemporal Sentinel-1A SAR and Sentinel-2A MSI data for global urban services using innovative methods and algorithms, namely KTH-SEG, a novel object-based classification method for detailed urban land cover mapping, and KTH-Pavia Urban Extractor, a robust algorithm for urban extent extraction. Ten cities around the world in different geographical and environmental conditions are selected as study areas.

**OBJECTIVES**

This research and development is expected to produce a pilot global urban services demonstrator using multitemporal Sentinel-1A SAR and Sentinel-2A MSI data. The project will contribute to:

- better understanding of the urban products and services required by end users
- development of novel and robust methods and algorithms for improved urban services to planners to support smart and sustainable urban development
- better understanding of the capacity of Sentinel-1A SAR and Sentinel-2A optical data for detailed urban land cover mapping and urbanization monitoring
- the goals and activities of GEO SB-04 Global Urban Observation and Information Task and the UN post-2015 sustainable development goals.

**OUTCOMES**

The Data User Element (DUE) is a programmatic component of the Earth Observation Envelope Programme (EOEP), an optional programme of the European Space Agency, currently subscribed by 18 ESA Member States.

The DUE mission is to favour the establishment of a long-term relationship between the User communities and Earth Observation. It is a continuation on a larger scale of the Data User Programme.