

→ BALTIC FROM SPACE WORKSHOP

29–31 March 2017 | Helsinki, Finland



The Urban TEP

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IT4I



- Which data products does it provide?
- What is the Urban TEP?
- What is an Urban TEP processing centre?

Global Urban Footprint

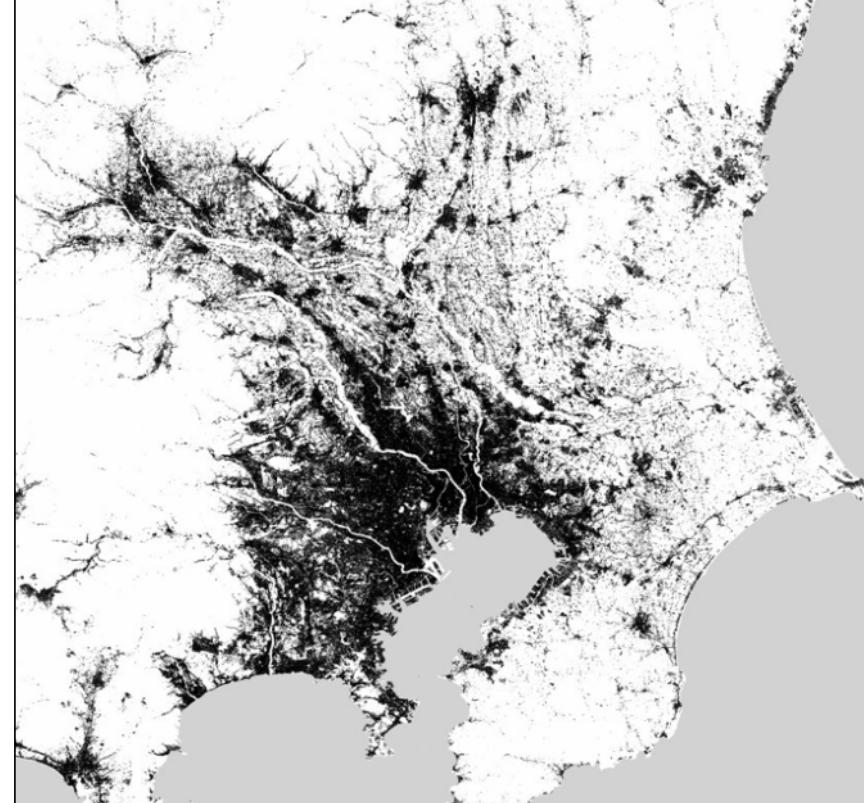


Urban Footprint

GOF



Global binary raster mask showing
location of human settlements (12m/75m)

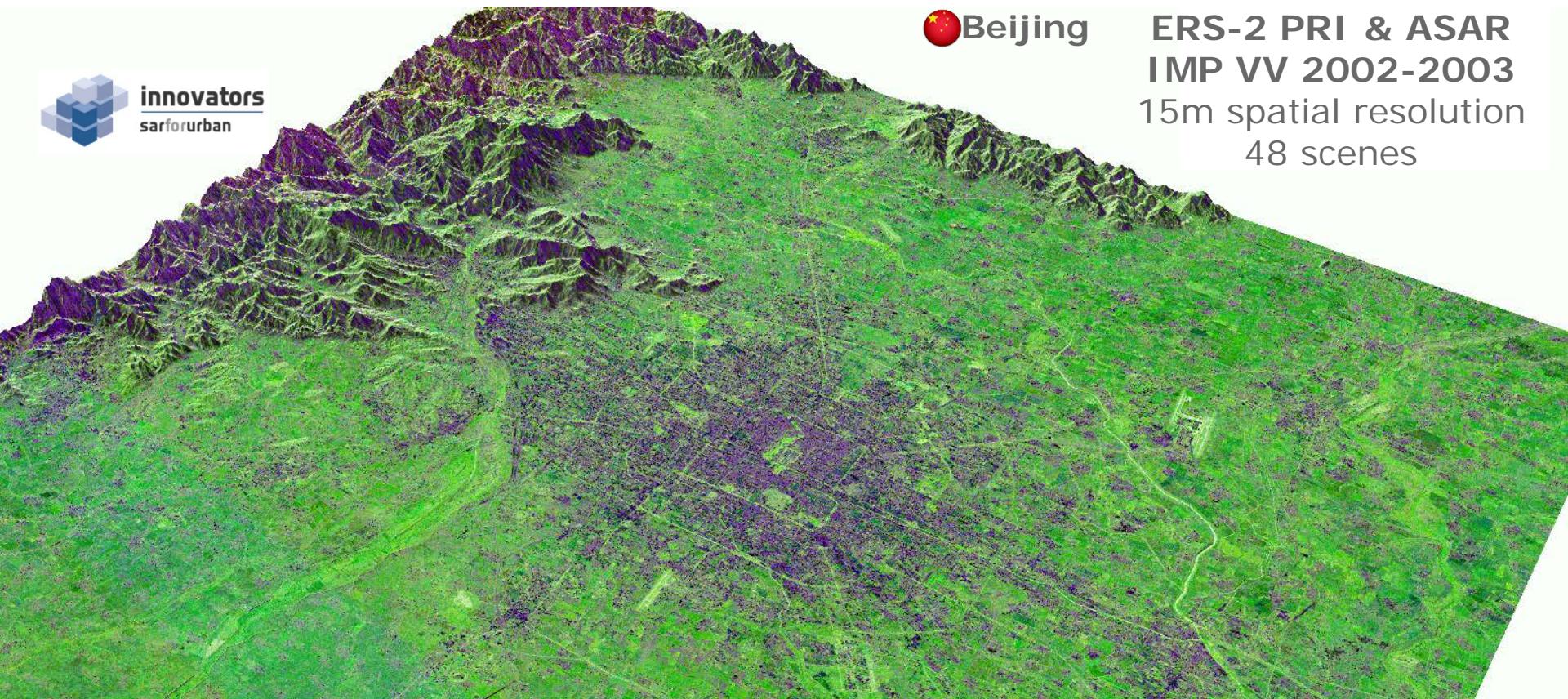


Urban growth



Beijing

ERS-2 PRI & ASAR
IMP VV 2002-2003
15m spatial resolution
48 scenes





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Urban growth



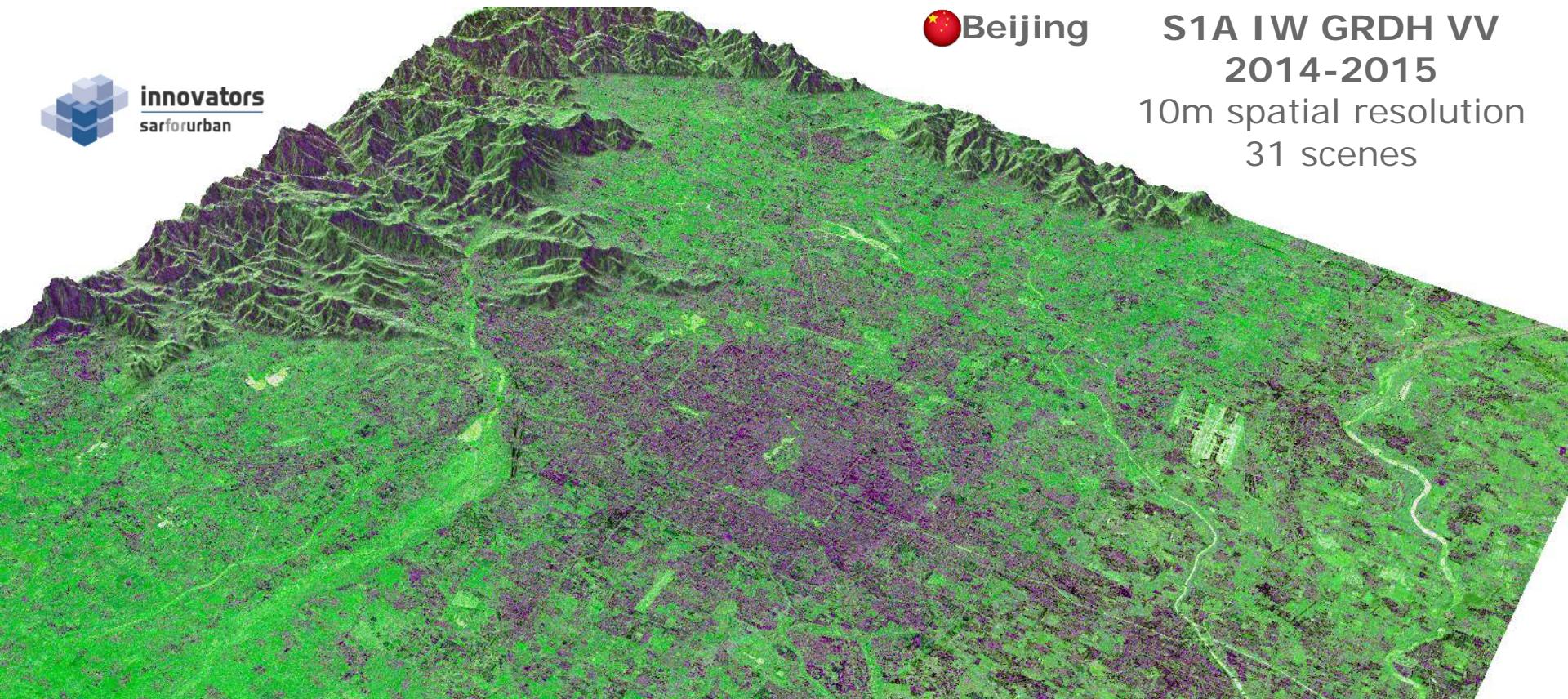
Beijing

S1A IW GRDH VV

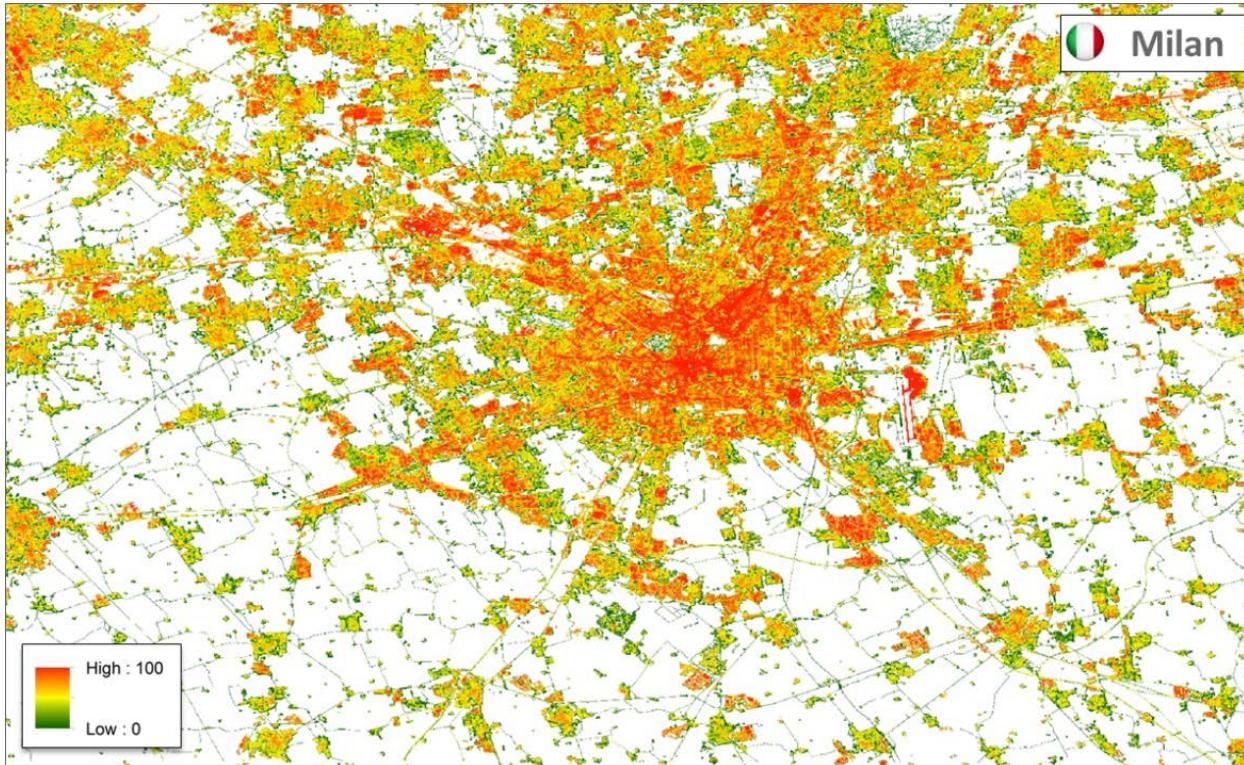
2014-2015

10m spatial resolution

31 scenes



Imperviousness

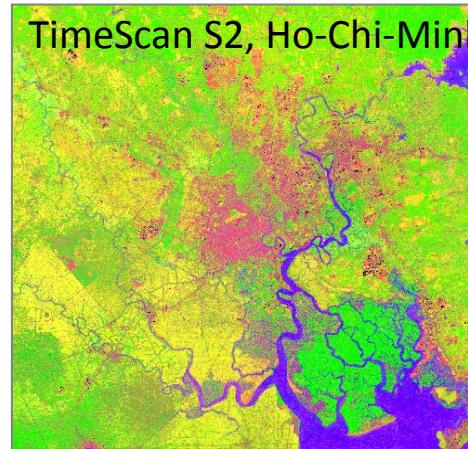


Imperviousness - Combination of GUF and vegetation information

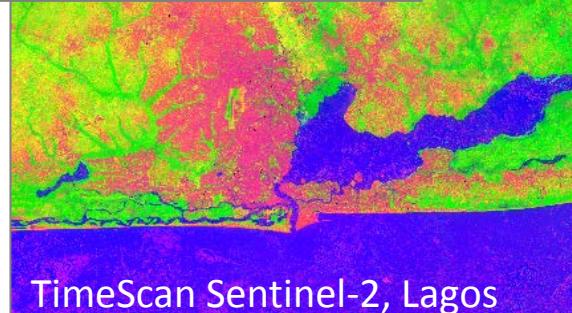
TimeScan S1 and S2



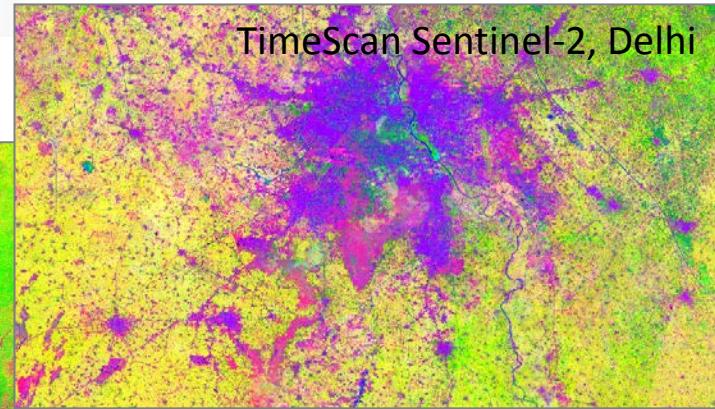
TimeScan Sentinel-1



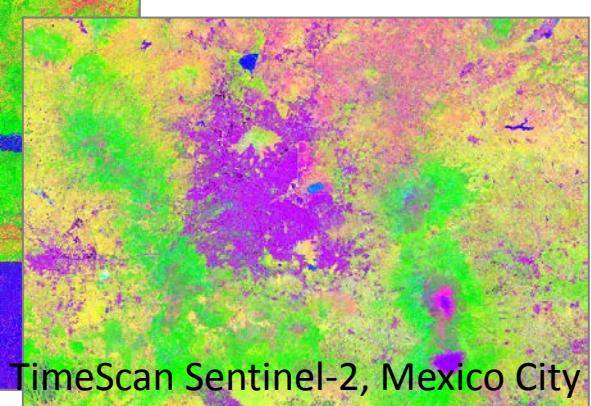
TimeScan S2, Ho-Chi-Minh



TimeScan Sentinel-2, Lagos

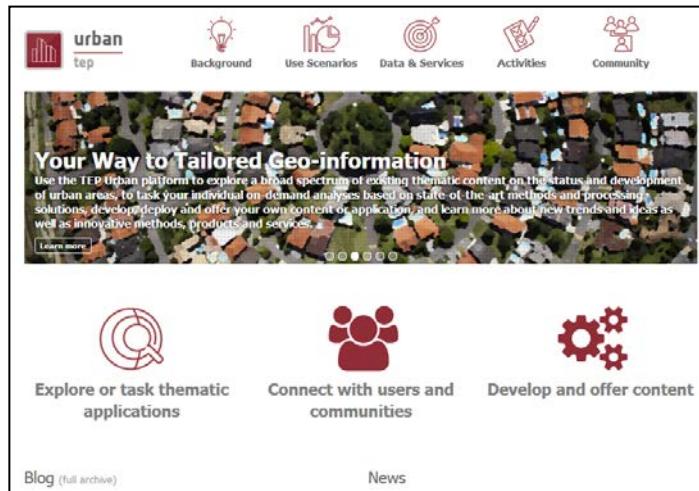


TimeScan Sentinel-2, Delhi



TimeScan Sentinel-2, Mexico City

Urban TEP elements



The screenshot shows the homepage of the Urban TEP portal. At the top, there's a navigation bar with icons for 'Background', 'Use Scenarios', 'Data & Services', 'Activities', and 'Community'. Below this is a large image of a residential area with the text 'Your Way to Tailored Geo-information'. A descriptive paragraph explains the platform's purpose: 'Use the TEP Urban platform to explore a broad spectrum of existing thematic content on the status and development of urban areas, to task your individual on-demand analyses based on state-of-the-art methods and processing solutions, develop, deploy and offer your own content or application and learn more about new trends and ideas as well as innovative methods, products and services.' A 'Learn more' button is at the bottom. At the bottom of the page are three sections: 'Explore or task thematic applications' (with a magnifying glass icon), 'Connect with users and communities' (with a people icon), and 'Develop and offer content' (with a gears icon). There are also links for 'Blog (full archive)' and 'News'.

Visualisation
& Analysis

gateway to ...

Urban TEP
Processing
Centres

Urban TEP portal + gateway

Portal functions



Datasets and services

Geo-browser

Processing request forms and result access

Processing Services

Belgium subsetting

Job Info

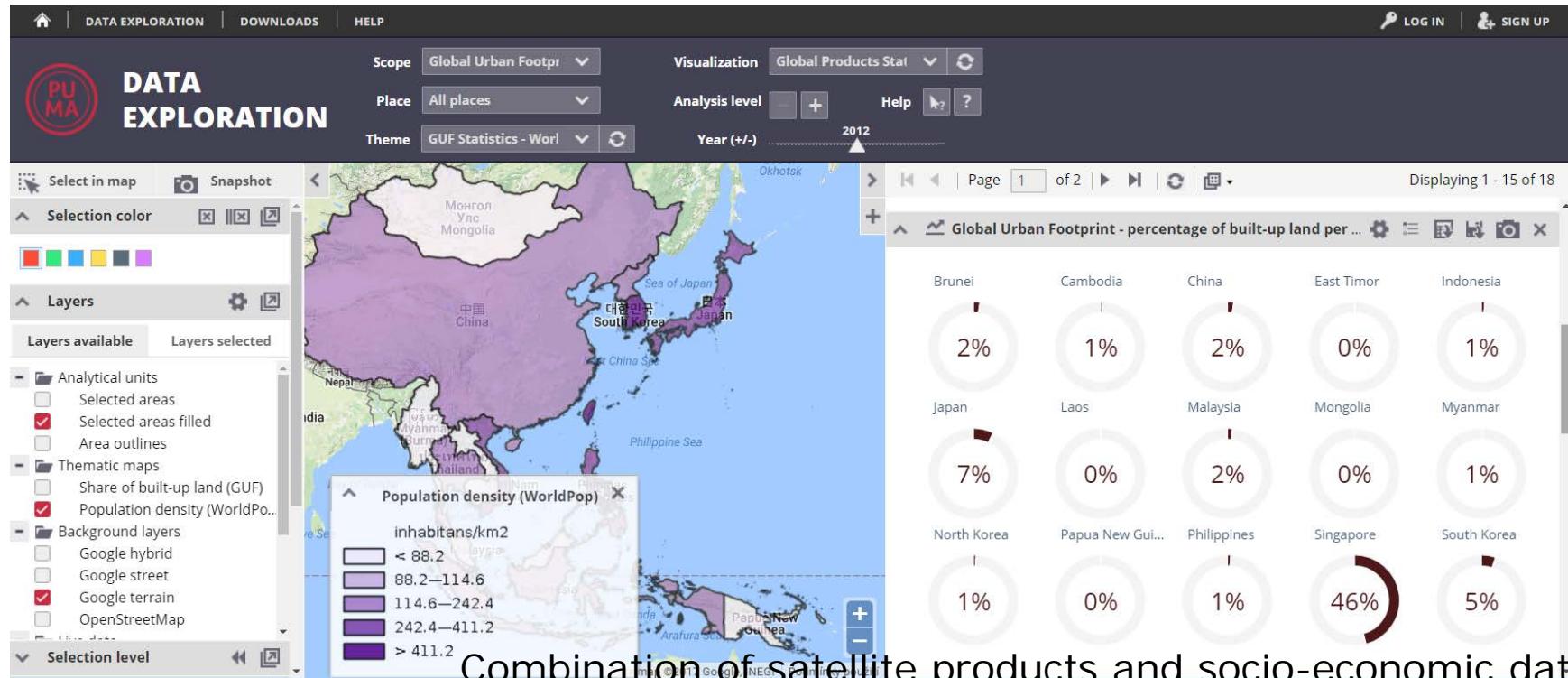
Job Name	Belgium subsetting
Wps Job Id	1738ad7b-534e-4aca-9861-a26fb9c0f983
Remote Id	20161214104845_L2Plus_223b2cad0f
Started at	Dec 14th 2016
Created by	emathot
Status/Result Location	Status Success Visibility public Share

Parameters

Name	Value
productionName	manu
productionType	L2Plus
inputDataSetName	DLR GUF 12m Europe Tiles (Urban TEP)
regionWKT	4 535.0 0.0875 345.50 536
outputFormat	GeoTiff

Success
The job was completed successfully.

Analysis and visualisation



Combination of satellite products and socio-economic data
Derivation of new criteria



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Processing request form

The screenshot shows the urban tep Processing Services interface. On the left is a satellite map of a rural area with a river and fields. A pink dashed rectangle highlights a specific region. To the right of the map is a processing request form for "TemporalStatistics".

Processing Services

TemporalStatistics
id: d90ac5c7-5984-4e33-8f72-f57cd3c1772
publisher: IT4I

Temporal Statistics

Job title: Test of index generation

productionName: Test of index generation

maxCloudCover: 25.0

inputDataSet: Landsat_8_Level_1

minDate: The desired start date of the products in the format YYYY-MM-DD
2016-09-23

maxDate: 2016-09-24

regionWkt

regionBB

Map controls on the left include: search bar (Search Terms, spatial), zoom (+ -), location (home, location, wkt), and coordinate display (lon: 21.327 | lat: 59.805).

Urban TEP is ...

- attractive high-quality datasets ...
... that meet space, time and feature dimensions of the domain
- the capability to generate them
- the facilities ...
... to access and use them,
... to generate more of them

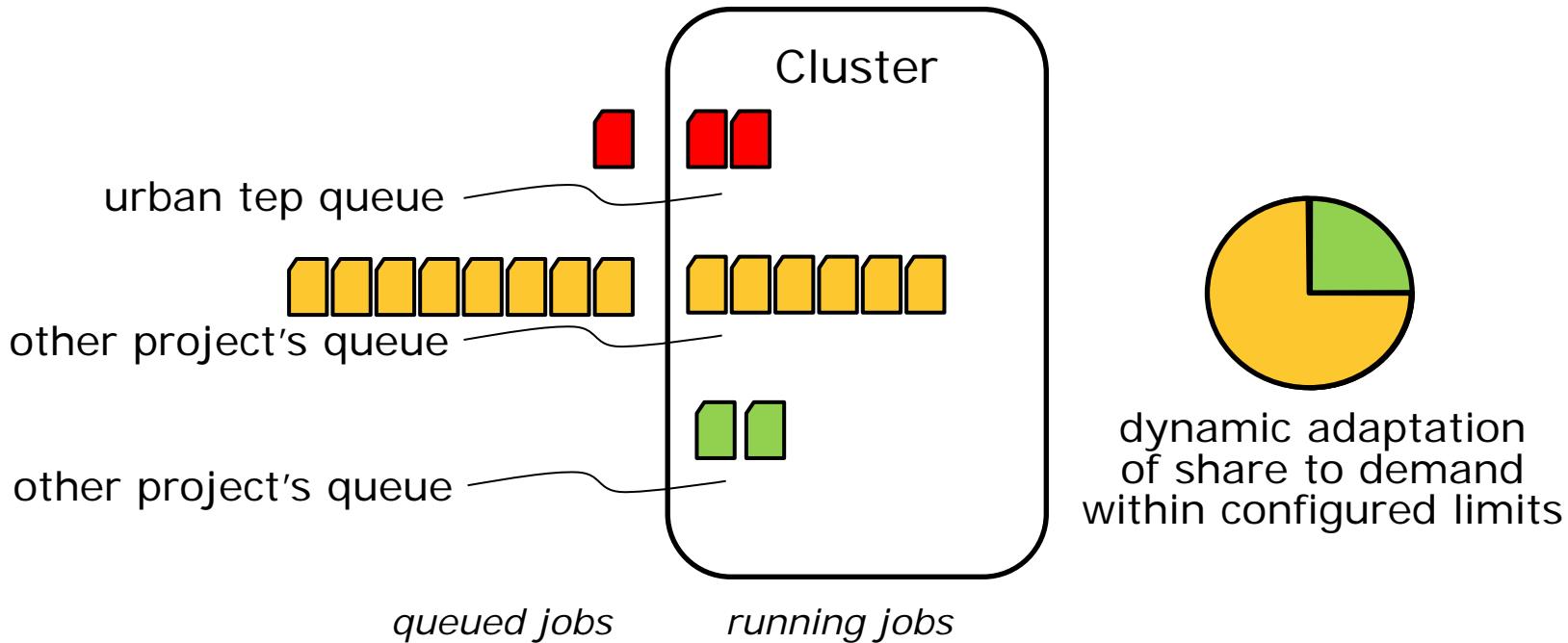
Systematic or on-demand processing

- Datasets may be pre-generated, providing access to them as **product**
 - for long-running processes
 - for global datasets with high complexity/information reduction
 - in order to be able to visualise them
 - Example: GUF
- Datasets may be processed on-demand, providing a **service** instead
 - for short-running processes
 - for selected areas
 - in case of user-defined parameterisation
 - to avoid storage of large output datasets
 - Example: Sentinel-2 timescan service (unless generated systematically)

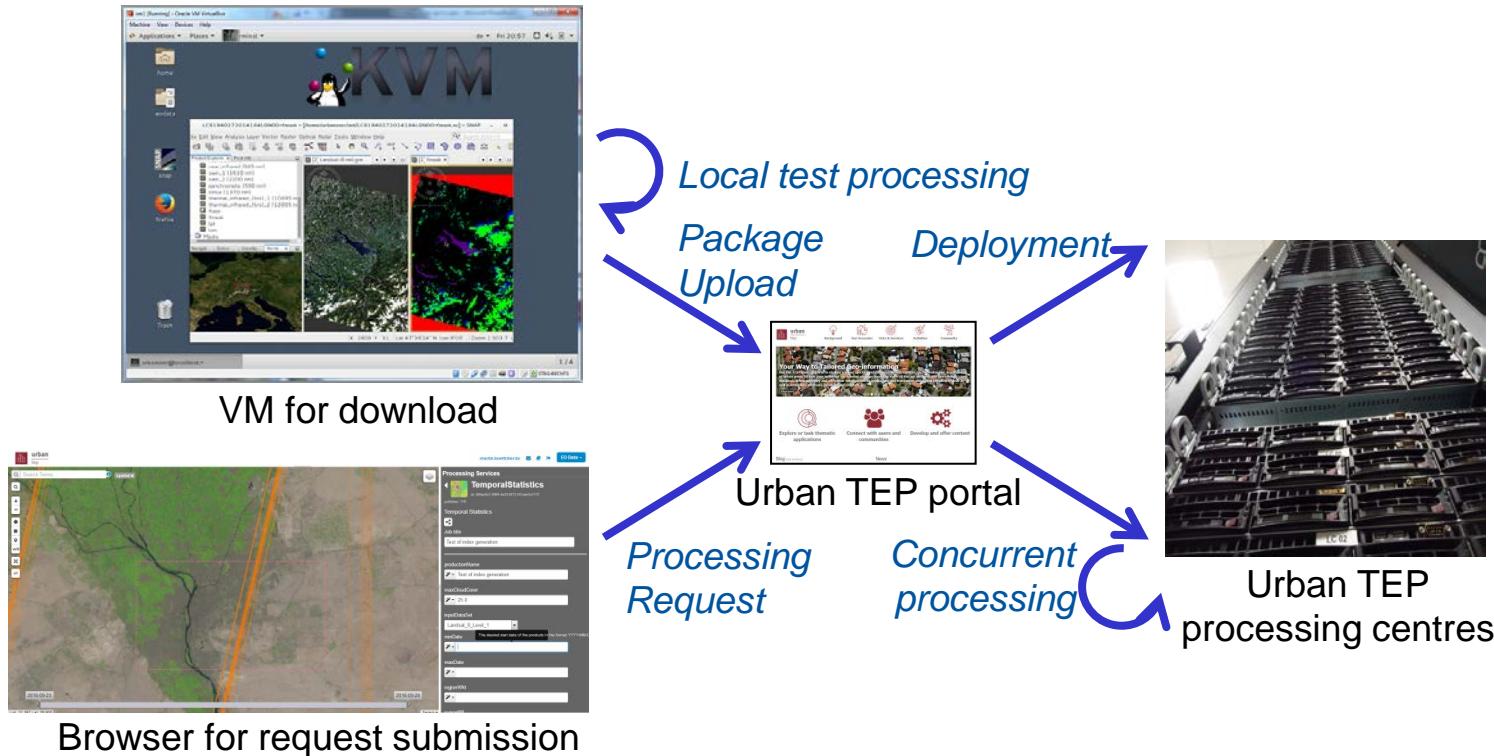
Urban TEP processing centres

IT4Innovations	Brockmann Consult	DLR
cluster (Salomon HPC)	cluster (Calvalus/Hadoop) YARN scheduler	virtualised env. (GeoFarm) +cluster(Calvalus/Hadoop)
Landsat data access	Sentinel-2 (urban areas, Africa), OLCI, MERIS	Sentinel-1
Geoserver WPS + own backend implementation	Calvalus WPS + Urban TEP config+extension	-
Geoserver WMS	Geoserver WMS	-
large-scale global Landsat timescan processing	GUF subsetting, Sentinel-2 timescan processing	GUF and thematic Urban datasets
fast internet access, HPC. host of portal and analysis/visualisation	distributed data-local processing and concurrent aggregation	systematic generation of datasets

Dynamic resource allocation in clusters



Processor development model



An Urban-TEP processing centre is ...

- Provision of (Earth observation) input datasets
- Thematic data processors
- Data processing resources and functions
- Interfaces
 - OGC Web Processing Service (ifc. to portal)
 - Online access to datasets and results
 - Web Mapping Service (to serve geo-browser)
 - Data processor upload and deployment
 - Docker, SNAP
- Truster of the portal (for user authentication)
- Else: Use of solutions provided by the respective processing centre

