

→ BALTIC FROM SPACE WORKSHOP

29–31 March 2017 | Helsinki, Finland



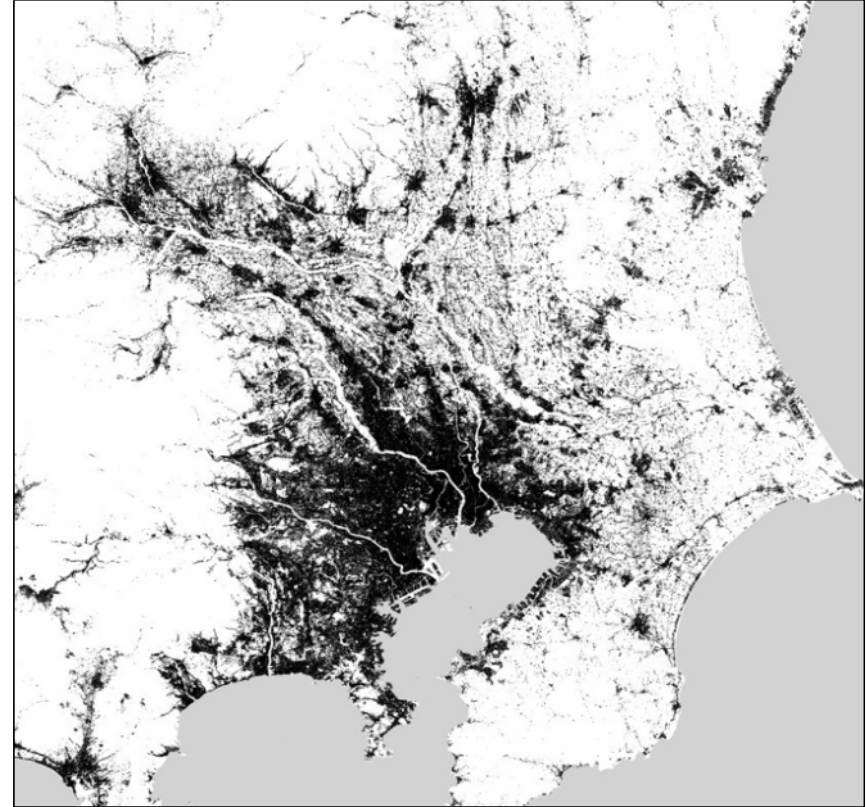
The Urban TEP

Martin Böttcher, Brockmann Consult GmbH

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



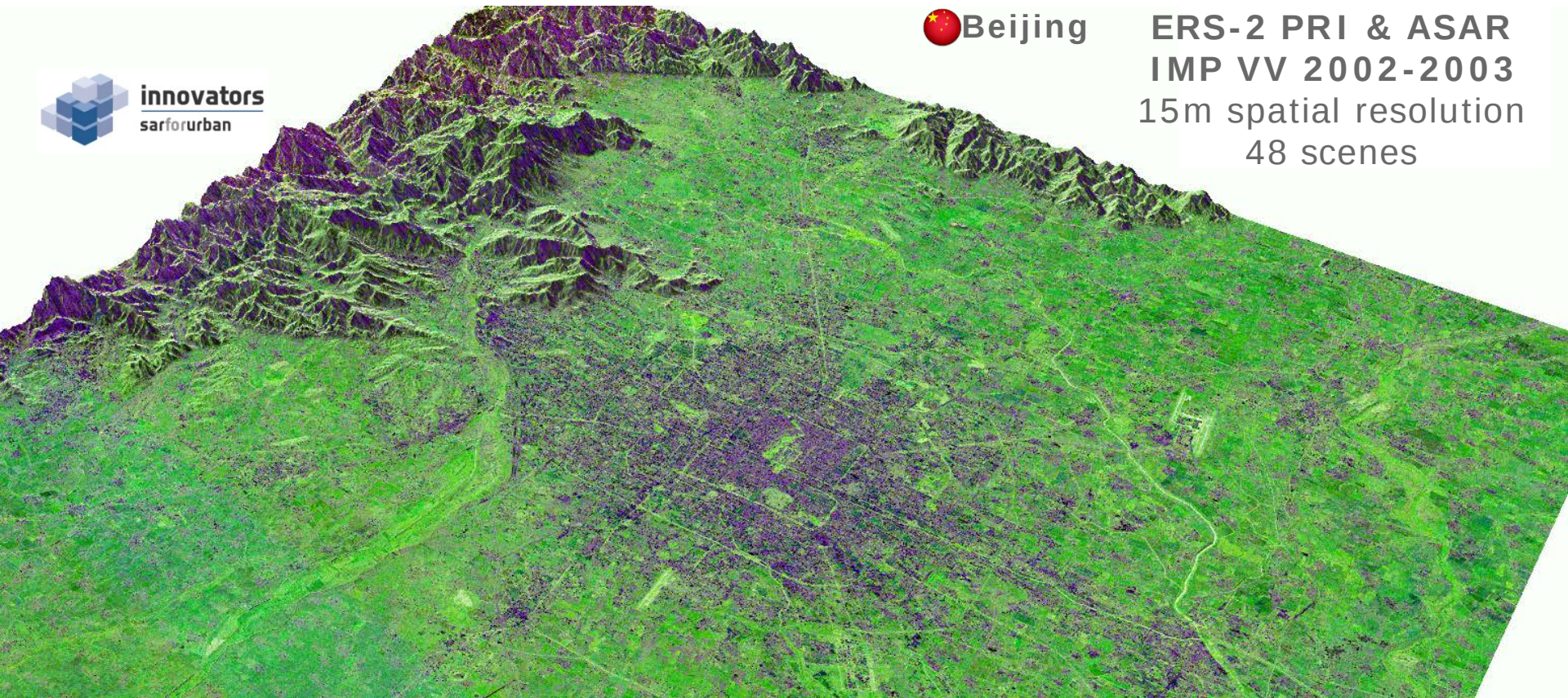
Global binary raster mask showing
location of human settlements (12m/75m)



Urban growth



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

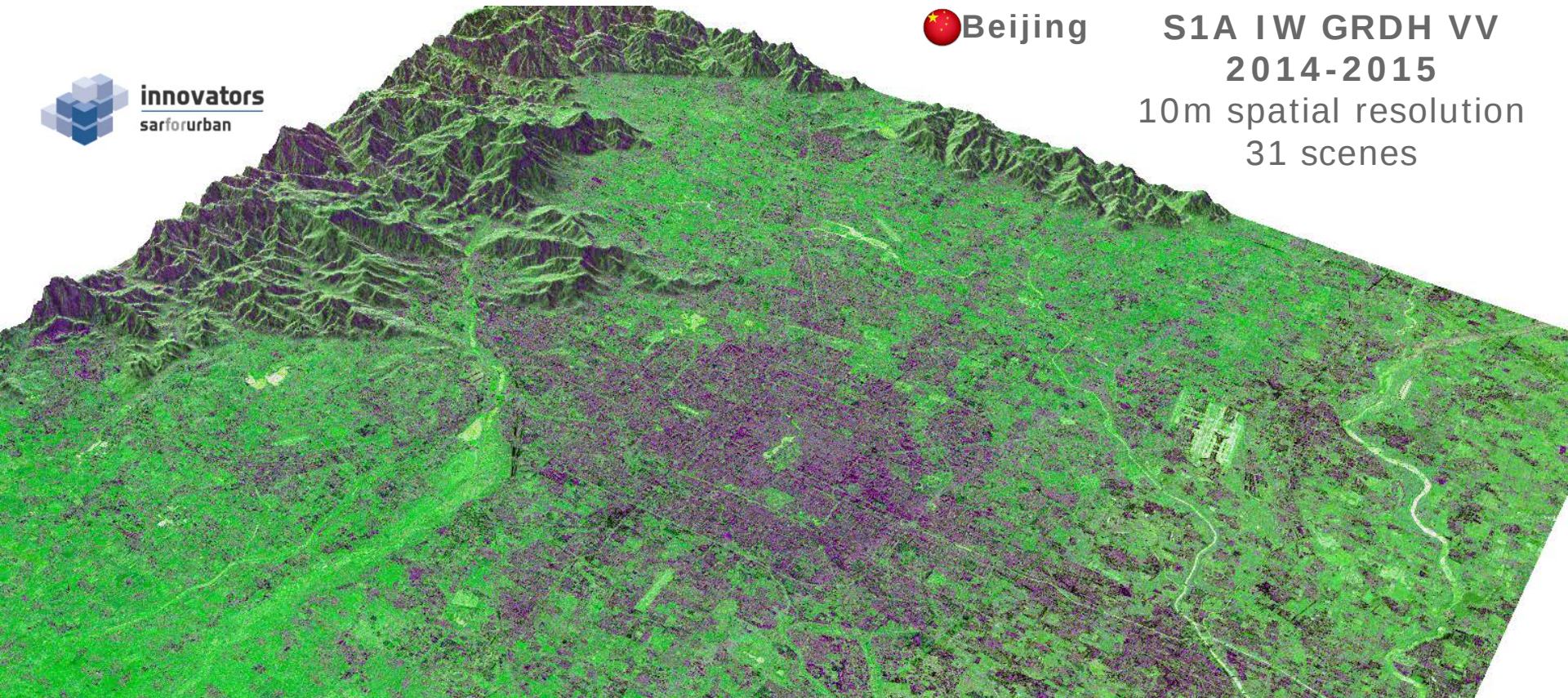


Urban growth

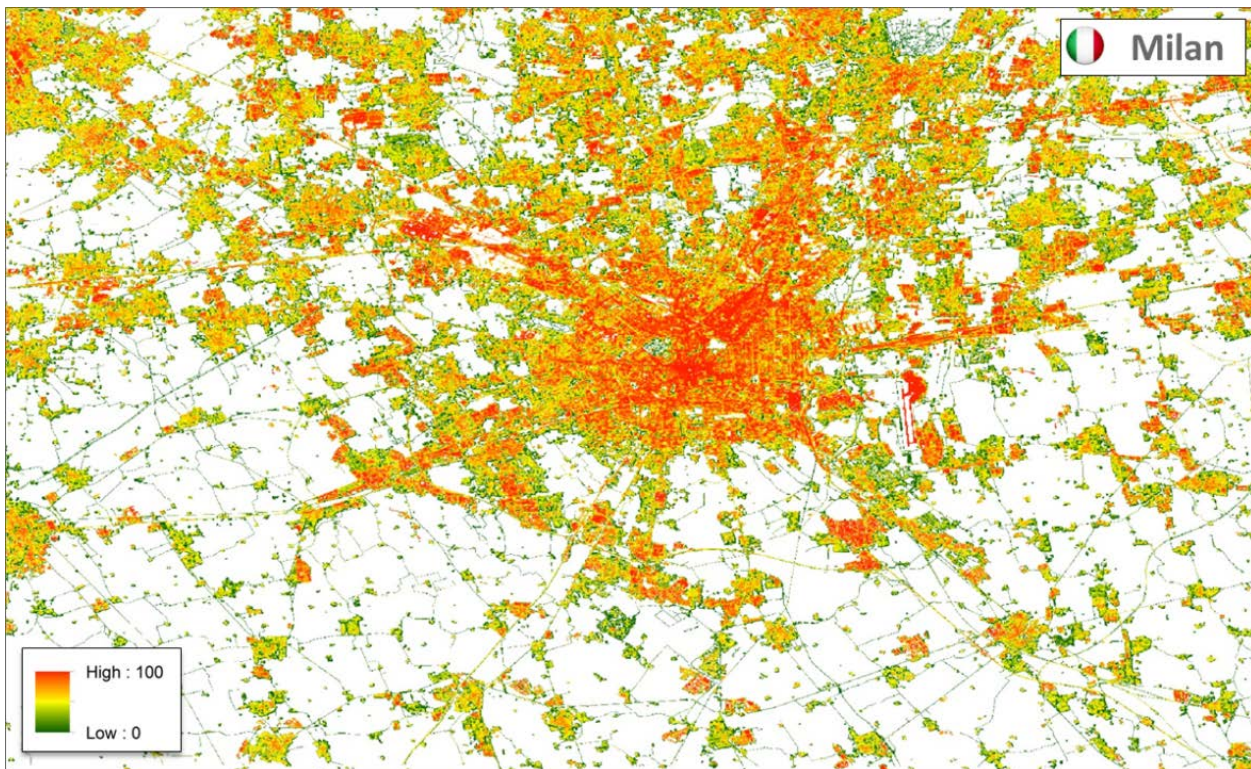
BeijingS1A IW GRDH VV
2014-2015

10m spatial resolution

31 scenes



Imperviousness

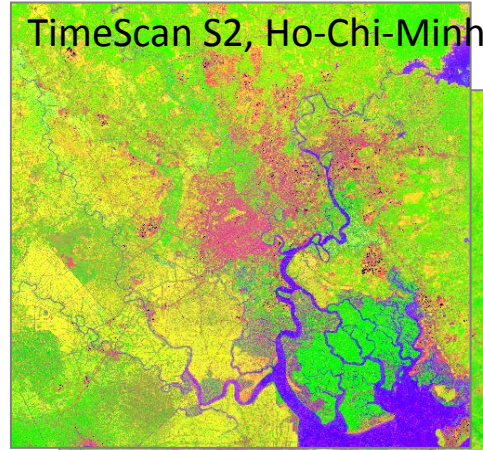


Imperviousness - Combination of GUF and vegetation information

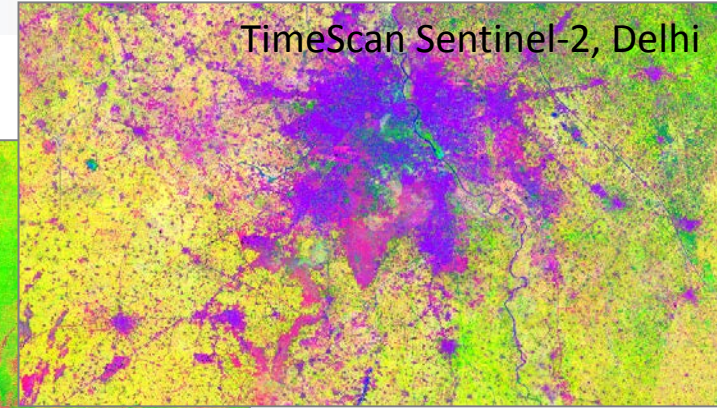
TimeScan S1 and S2



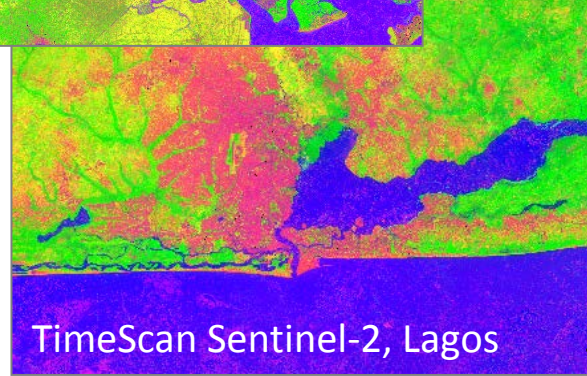
TimeScan Sentinel-1



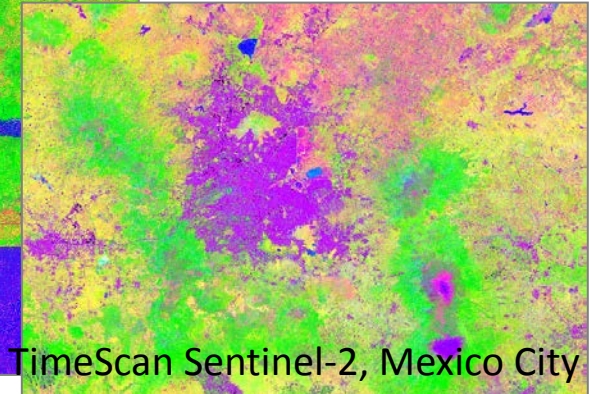
TimeScan S2, Ho-Chi-Minh



TimeScan Sentinel-2, Delhi

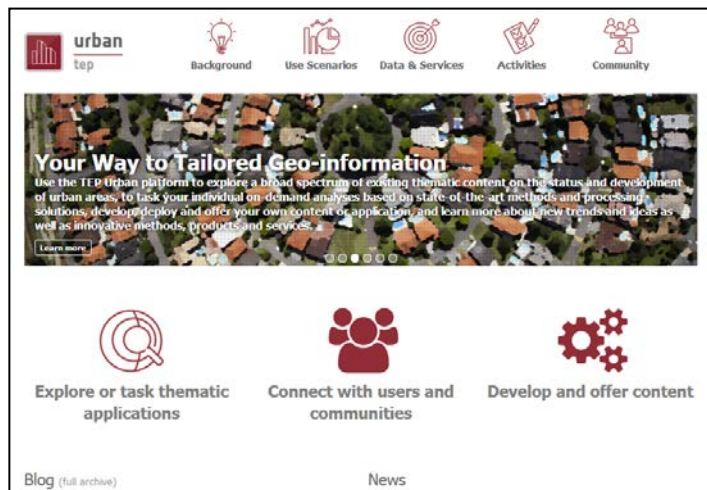


TimeScan Sentinel-2, Lagos



TimeScan Sentinel-2, Mexico City

Urban TEP elements



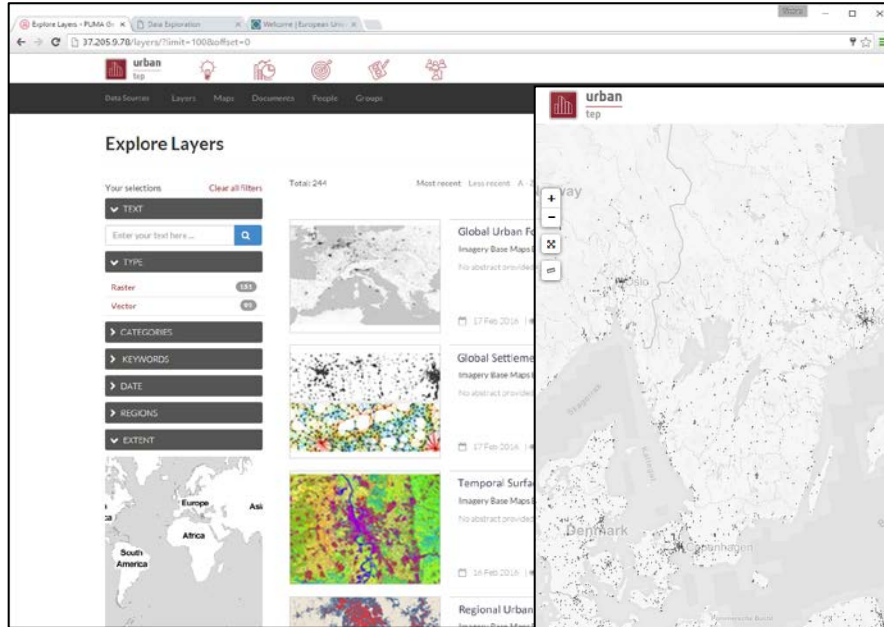
Visualisation
& Analysis

gateway to ...

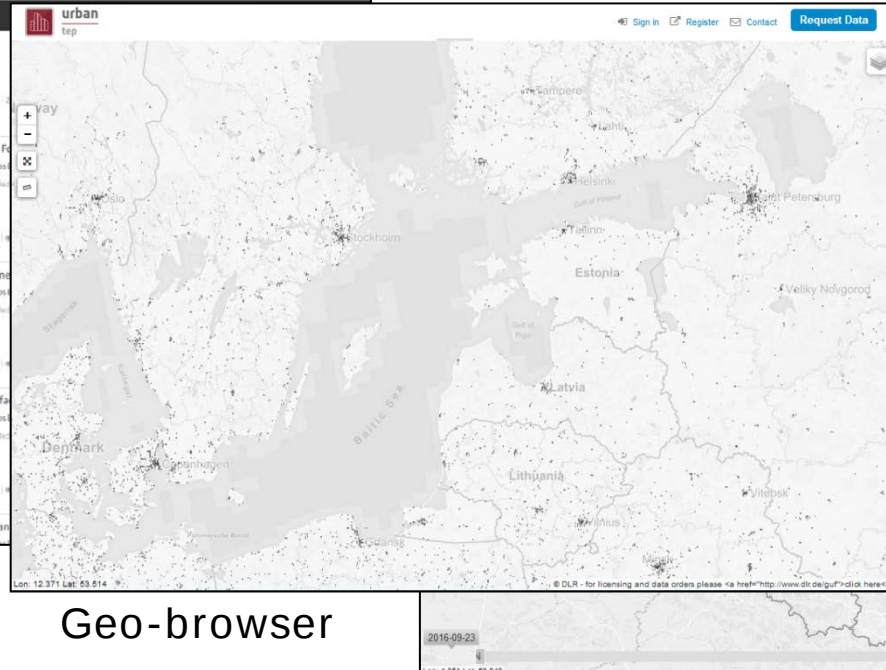
Urban TEP
Processing
Centres

Urban TEP portal + gateway

Portal functions

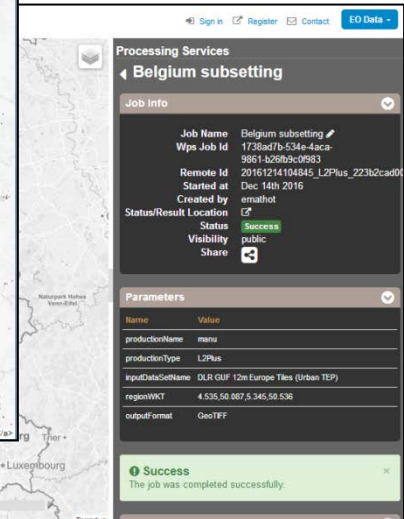


Datasets and services

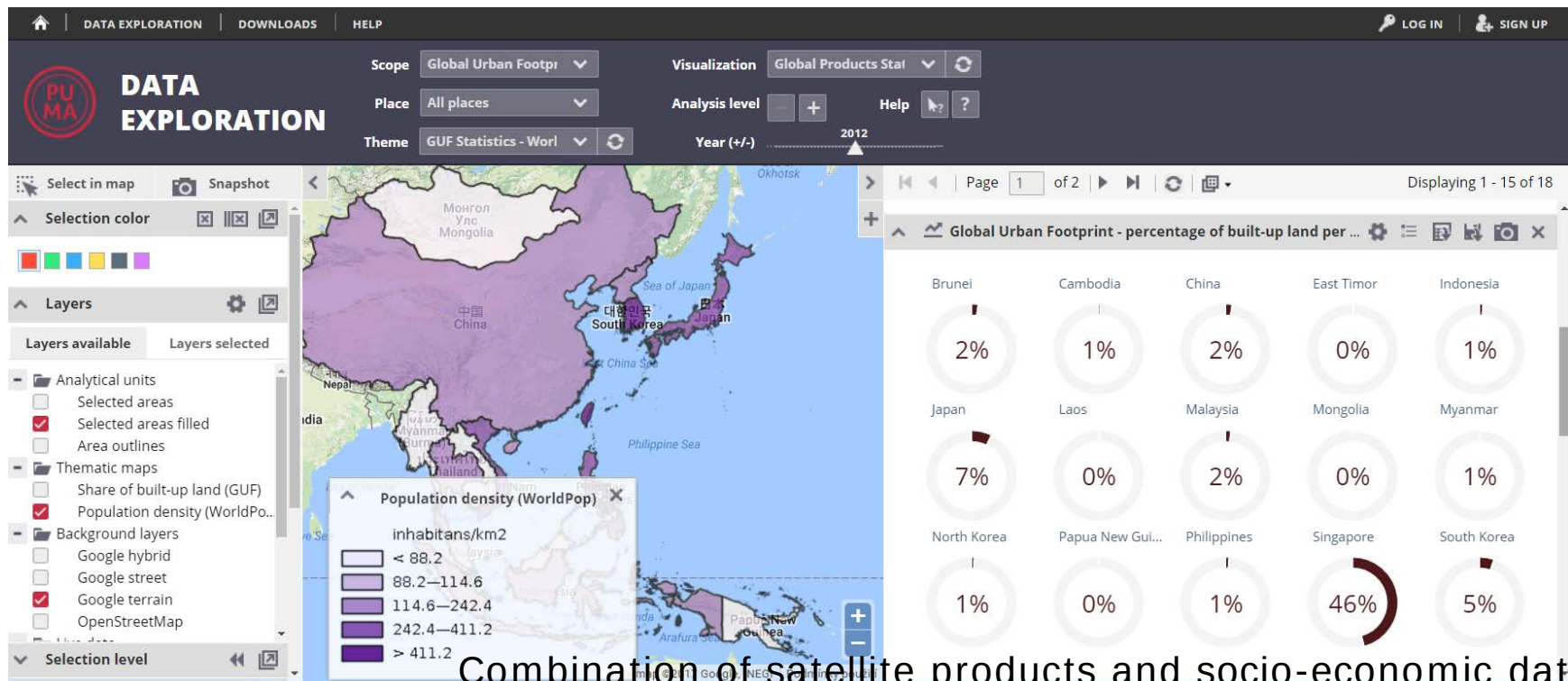


Geo-browser

Processing request forms and result access



Analysis and visualisation



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

Processing request form



The screenshot displays the Urban TEP web interface. On the left, a map shows a satellite image of a landscape with a river and a pink dashed rectangular selection box. The map includes a search bar, a 'spatial' filter, and a vertical toolbar with icons for zooming, panning, and other map functions. At the bottom of the map, a timeline slider is visible with dates '2016-09-23' and '2016-09-24'. On the right, the 'Processing Services' panel is open, showing the 'TemporalStatistics' service. The panel includes a job title 'Test of index generation', a 'productionName' field, a 'maxCloudCover' field set to '25.0', an 'inputDataSet' dropdown menu set to 'Landsat_8_Level_1', and fields for 'minDate' and 'maxDate'. A tooltip for the 'minDate' field indicates the format 'YYYY-MM-DD'. The 'regionWkt' field is also present. The top right of the interface shows the user 'martin.boettcher.bc' and an 'EO Data' button.

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

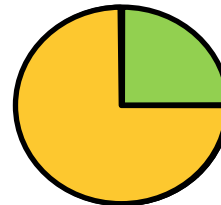
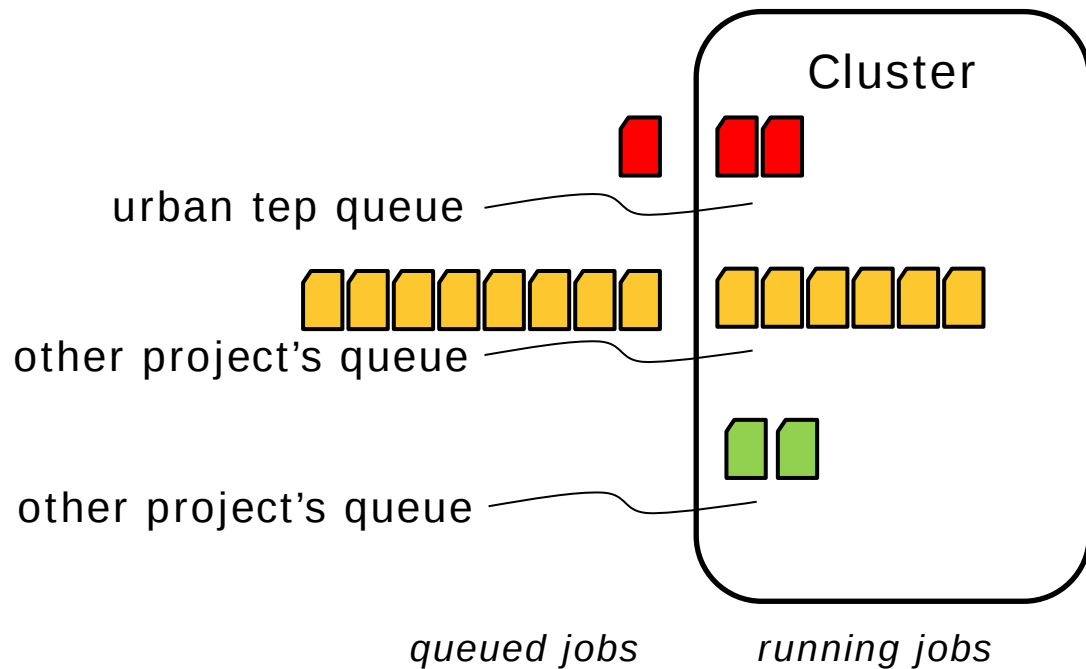
Systematic or on-demand processing

- 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

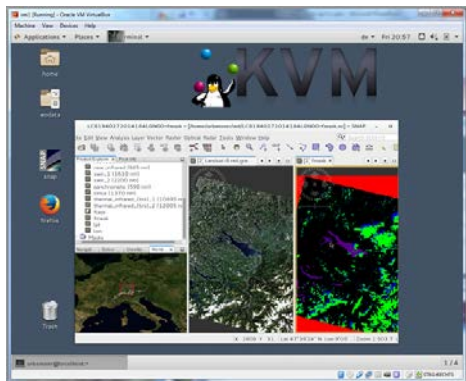
IT4Innovations	Brockmann Consult	DLR
cluster (Salomon HPC)	cluster (Calvalus/Hadoop) YARN scheduler	virtualised env. (GeoFarm) + cluster (Calvalus/Hadoop)
Landsat data access	Sentinel-2 (urban areas, Africa), OLCI, MERIS	Sentinel-1
Geoserver WPS + own backend implementation	Calvalus WPS + Urban TEP config+extension	-
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



dynamic adaptation
of share to demand
within configured limits

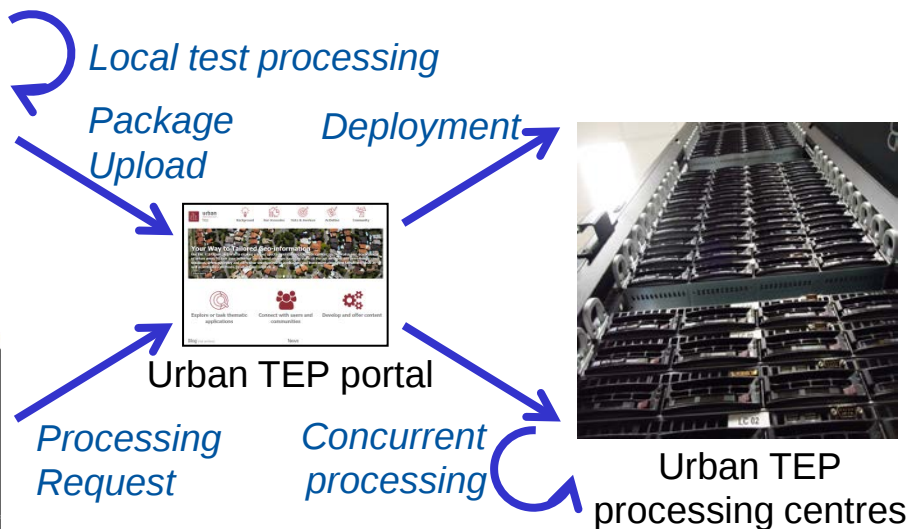
Processor development model



VM for download



Browser for request submission



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

