

Emerging Semantic Web Technologies for EO Value-chains; Enabling Downstream Service Providers using Linked-Open Data (LOD)

15.11.2018 phi-week 2018



Why Linked Data?

The vision of linked data is to go from a Web of documents to a Web of data:

- Unlock data dormant in their silos
- Make it available on the Web
- Interlink it with other data

This is especially useful for Earth Observation data.

Semantic Web



About 602,000 results (0.36 seconds)

Sean Connery - Wikipedia

https://en.wikipedia.org/wiki/Sean_Connery

Sir Thomas Sean Connery is a retired Scottish actor and producer who has won an Academy Award, two BAFTA Awards (one of them being a BAFTA Academy ...

Sean Connery filmography · Diane Cleito · Fountainbridge · Sentinel Prime

Sean Connery - IMDb

www.imdb.com/name/nm0001251/

Sean Connery, Actor: Sir. Mr. Sean Connery is best known for portraying the character James Bond, starring in seven Bond films between 1962 and 1968.

Top stories



James Bond legend Sean Connery is 0087 as he strolls with stick in New York

Mirror · 1 day ago



Sir Sean Connery dresses down in polo and sweets in NYC

Daily Mail · 2 days ago



Sir Sean Connery, 87, swaps James Bond's suits for casual clobber as he takes a stroll...

The Sun · 1 day ago

➔ More for sean connery



Sean Connery

Actor

seanconnery.com

Sir Thomas Sean Connery is a retired Scottish actor and producer who has won an Academy Award, two BAFTA Awards and three Golden Globes. [Wikipedia](#)

Born: August 25, 1930 (age 87), Fountainbridge

Height: 1.89 m

Spouse: Micheline Roquebrune (m. 1970), Diane Cleito (m. 1962-1973)

Children: Jason Connery

Quotes

View 2+ more

Laughter kills fear, and without fear there can be no faith. For without fear of the devil there is no need for God.

There is nothing like a challenge to bring out the best in men.

I like women. I don't understand them, but I like them.

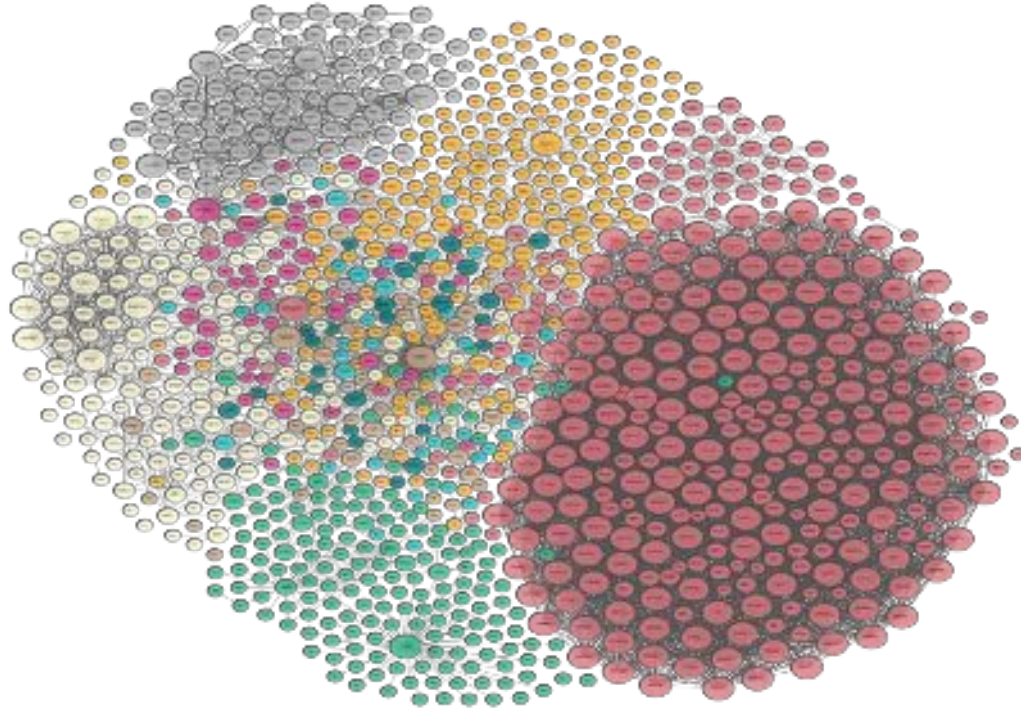
Movies

View 45+ more



Linked Open Data Cloud

Legend



Innovation

- Provision of Copernicus linked-open data (LOD) via online services
- Improved data access via a streaming data library (SDL)
- Tools for semantic linkage of Copernicus data with other societal or business information

GREEN UP YOUR LIFE

The designation “**Greenest capital**” is a sought-after trophy, but how to **establish** and **validate** such a claim?



[VIEW WINNING CITIES](#)



Use case: “*What is Europe's greenest capital?*”

Being ‘green’ brings many benefits for city marketing. Some of those benefits are listed below:

- Increase in **tourism**
- Positive **international media coverage** worth millions of euro
- Increase in **international profile**, networking and new alliances
- New **jobs** – *green capitals have successfully exported their green products, processes and services*
- More emphasis on **environmental projects** through sponsorship and grants
- **Momentum** to continue improving environmental sustainability
- Boost in **local pride** and feeling of belonging
- Enhancement of **culture and the arts**
- Green vegetation **reduces heat island-effects**

The designation of being the “**Greenest capital**” is therefore a sought-after ‘trophy’, **but how to validate such a claim?**

(e.g. a [Google](#) search for “What is Europe's greenest city?” shows a variety of claims)

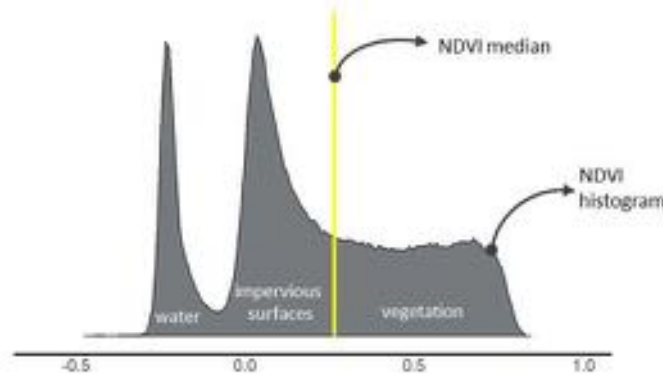


Use case: “What is Europe's greenest capital?”

The designation “**Greenest capital**” may be seen from Space, e.g. using Copernicus Land Monitoring, provided the question is rephrased as follows:

Question: Which capital in Europe offers the most green space for their inhabitants?

But: what defines the **city boundary** of a capital, and **what defines its greenness**?



Use case: “What is Europe's greenest capital?”

Definition:

greenness

Definitions of
greenness

1.

1 green color or pigment; resembling the color of growing grass

Synonyms: [green](#), [verdity](#)

Type: [show 11 types...](#)

Type of: [chromatic color](#), [chromatic colour](#), [spectral color](#), [spectral colour](#)

a color that has hue

2 the lush appearance of flourishing vegetation

Synonyms: [verdancy](#), [verdure](#)

Type of: [cornucopia](#), [profuseness](#), [profusion](#), [richness](#)
the property of being extremely abundant

[Add to List...](#) [Thesaurus](#) [Share it](#)

Word Family



Usage Examples

[All Sources](#) [Photos](#) [Audio/Video](#) [News](#)
[Business](#) [Sports](#) [Source Codes](#) [Technology](#)

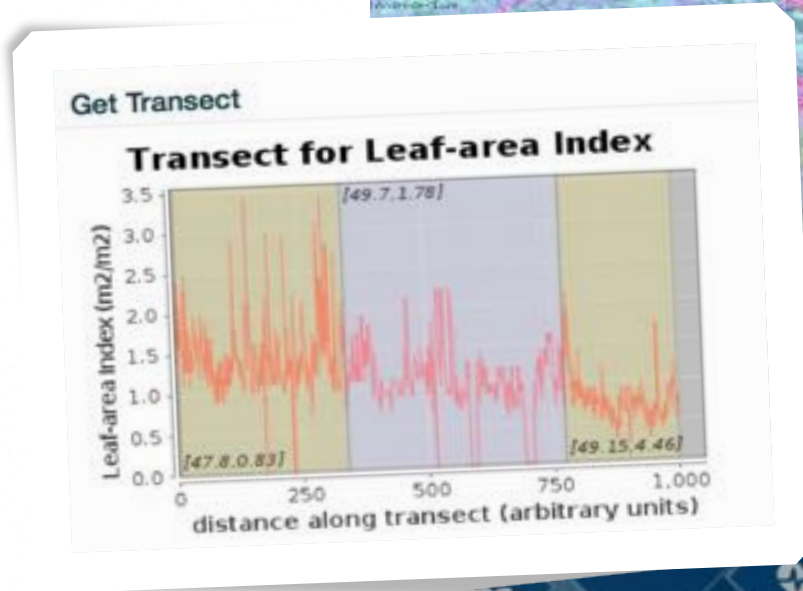
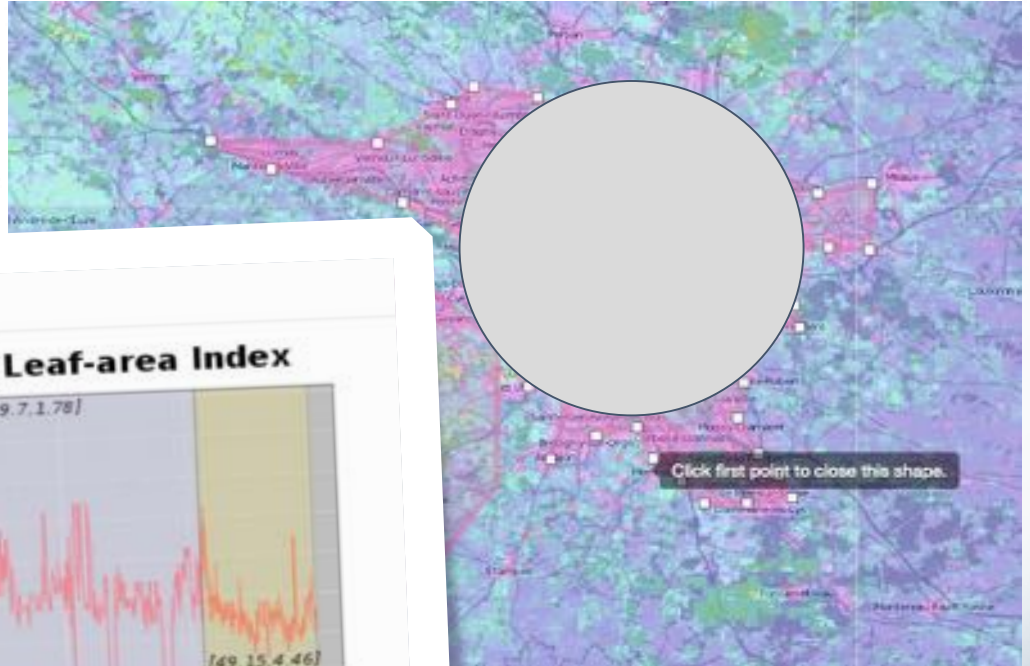
"Instead of giving someone a pill, we are giving them **greenness**," said Chris Chandler, director of urban conservation with The Nature Conservancy's Kentucky chapter.
Seattle Times, Oct 28, 2017

Dry vegetation and "very low **greenness**" will act as fuel for fires, the report warned.
BBC, Sep 5, 2017

Use case: “What is Europe’s greenest captial?”

before AppLab:

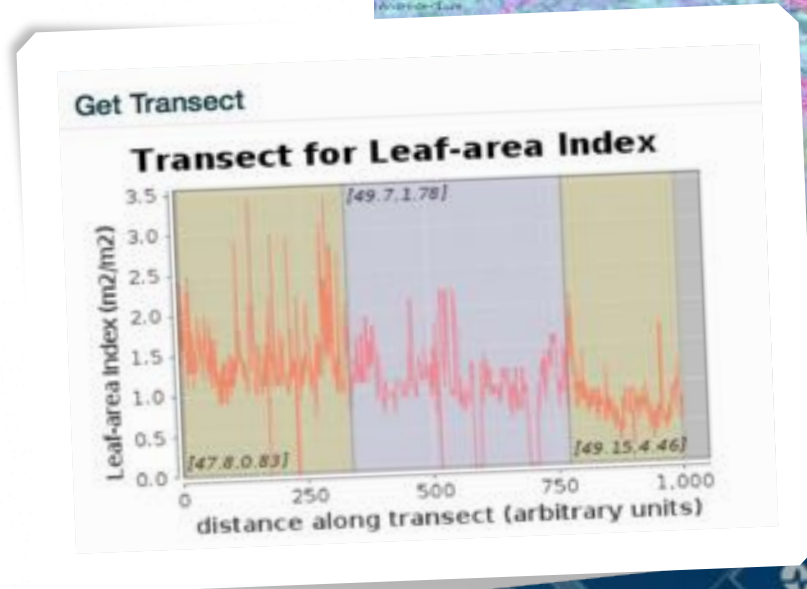
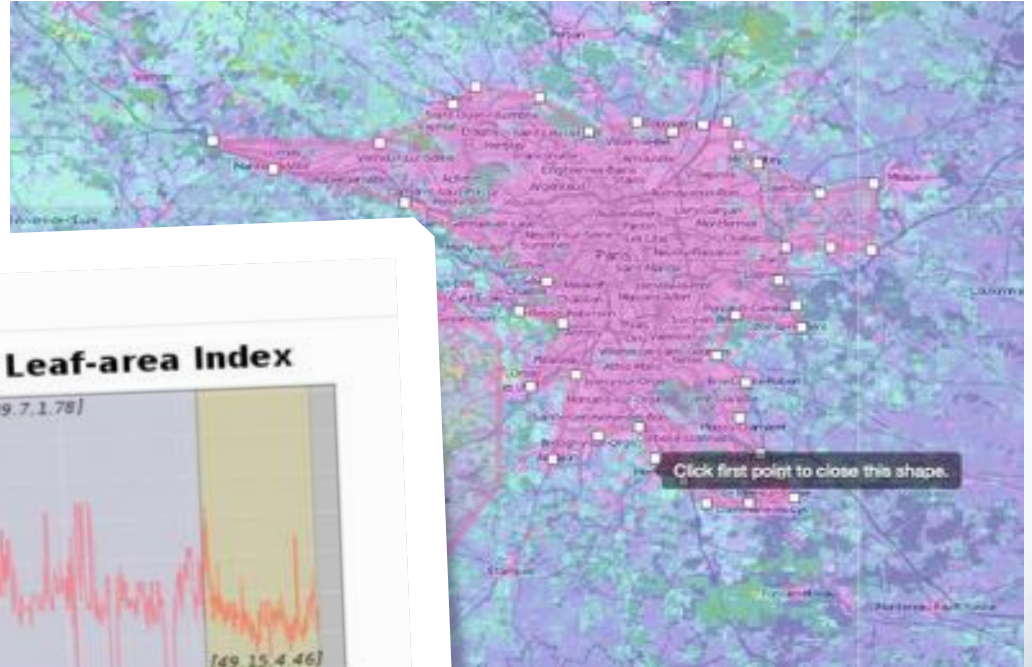
approximate city boundaries by drawing a buffer
around a **city centre** (lat,lon)



Use case: “What is Europe’s greenest captial?”

before AppLab:

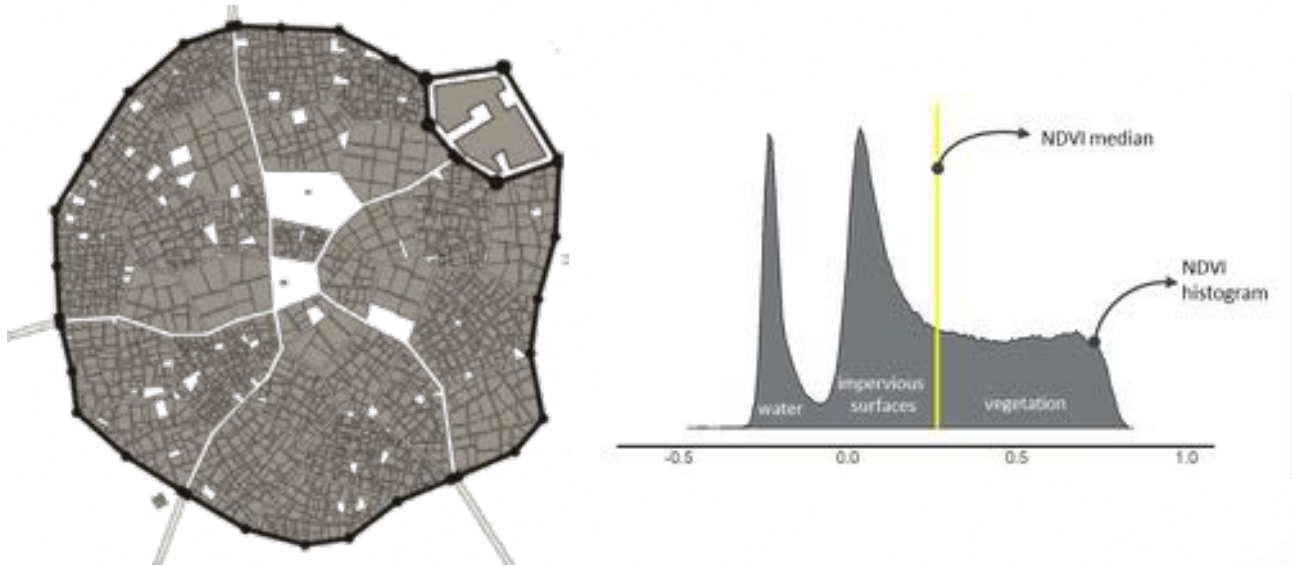
City boundaries by on-screen digitization



Use case: “*What is Europe’s greenest capital?*”

after AppLab:

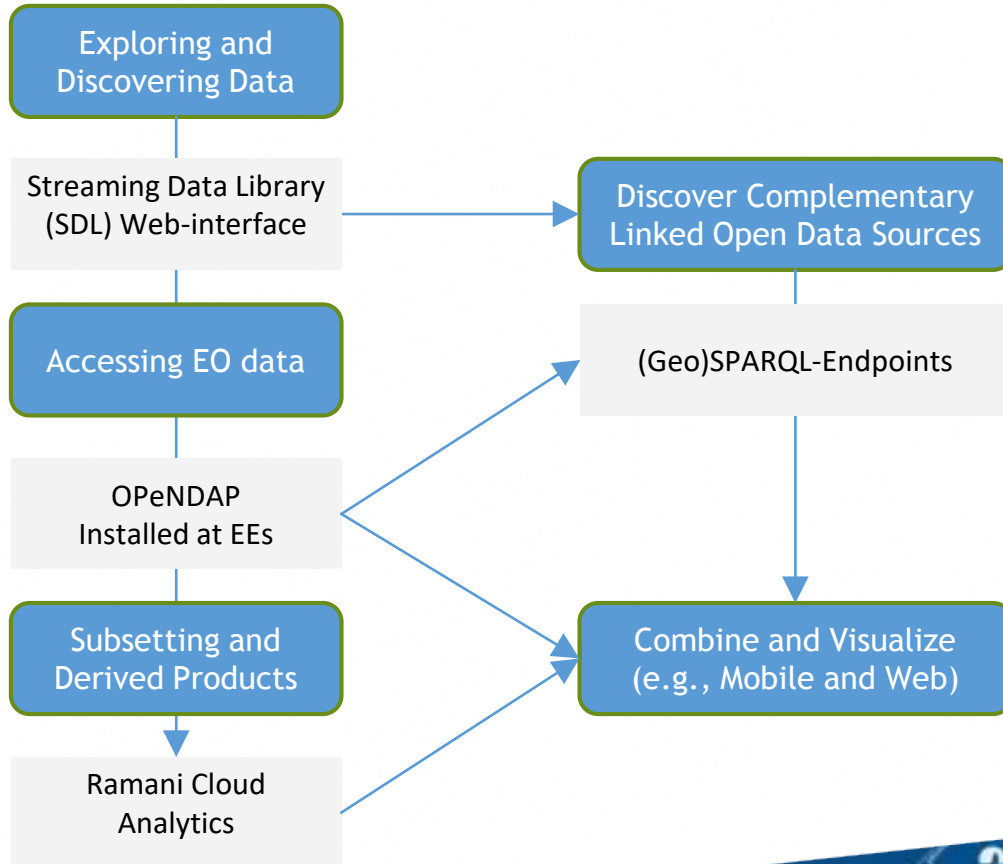
Obtain actual city boundaries from LOD (WP4), e.g. sourced from OSM offered as GeoTriples:



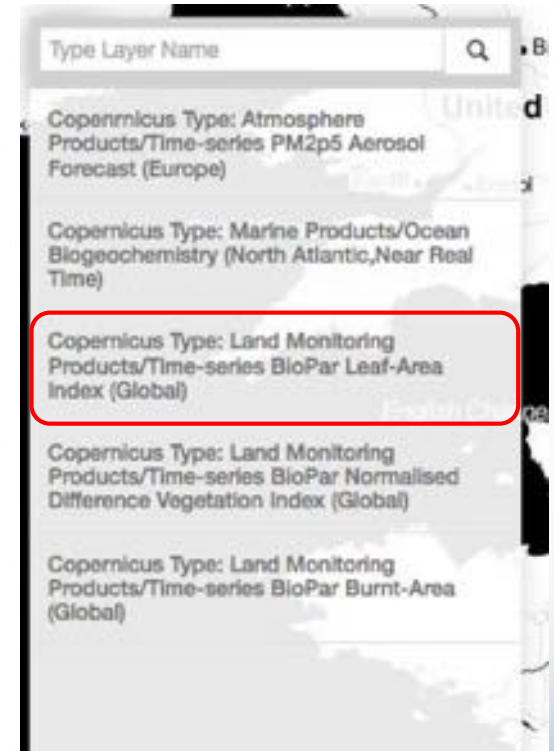
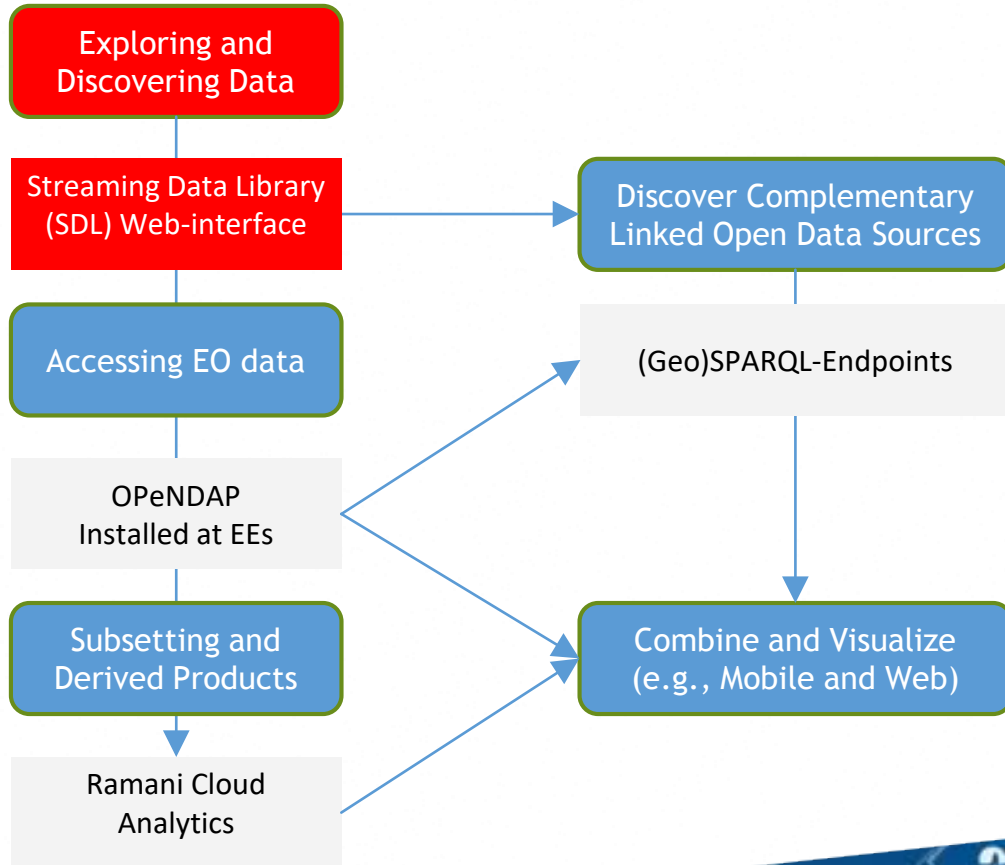
Exploring data, Adding
value, Publishing info



Earth Observation Linked Data Cycle



Earth Observation Linked Data Cycle

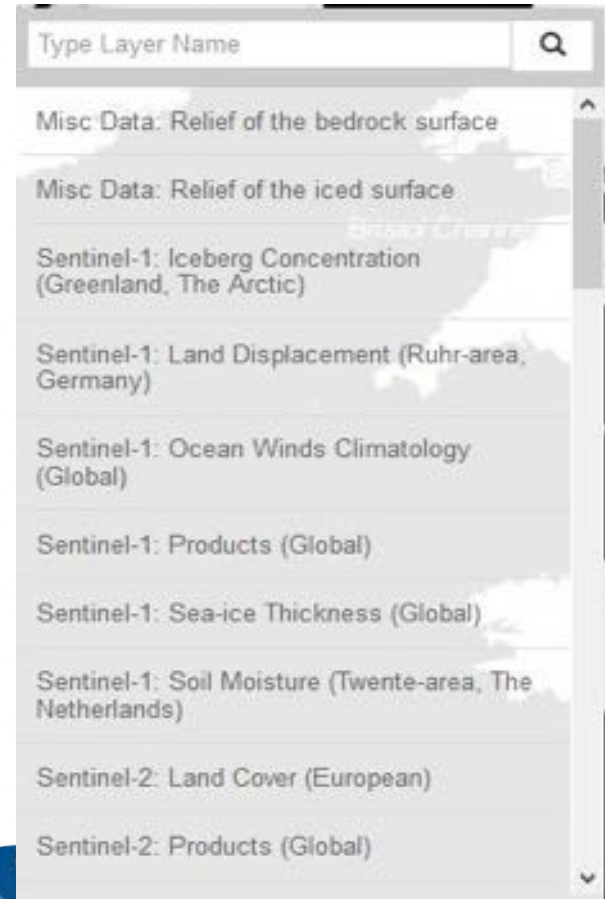


Results task 3.3: Web-interface

*Provide a web-interface;
discovery and exploration*

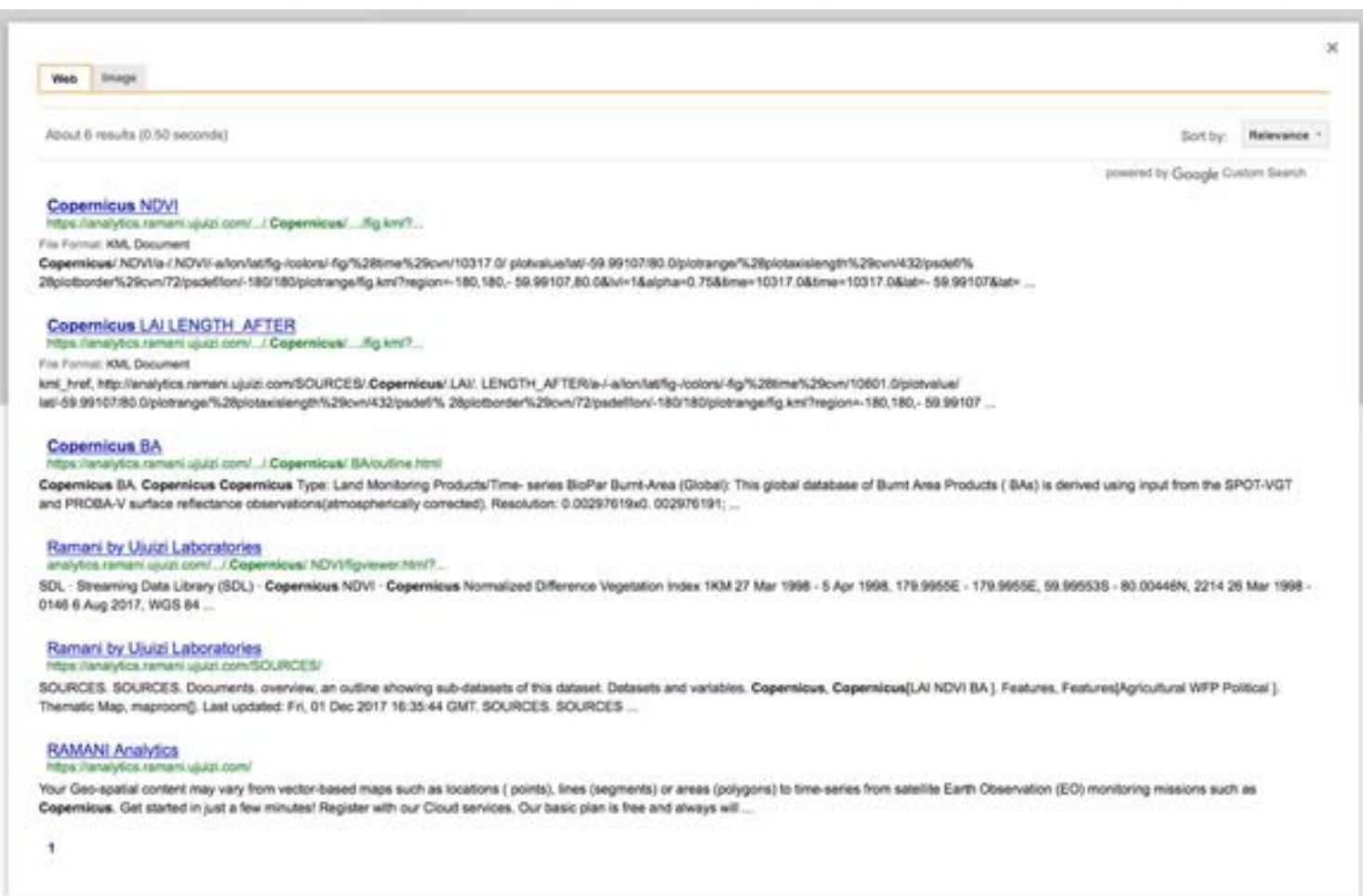
Web interface has been expanded to support a one-stop-shop:

- Supports discovery (text search) and exploration of datasets (map view)
- Provides basic filtering options
- Provides UI for SDK (scripting with functions, documentation) with illustrative example to facilitate downstream service provider to build their own add-ons (workflows).



Text

Pr
di



The screenshot shows a search engine interface with the following elements:

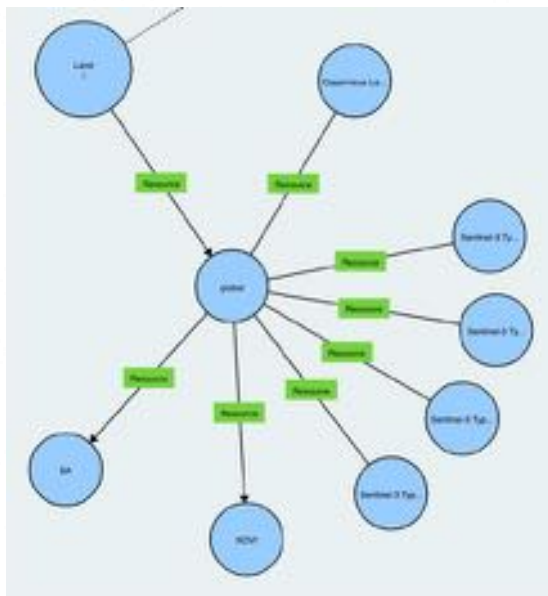
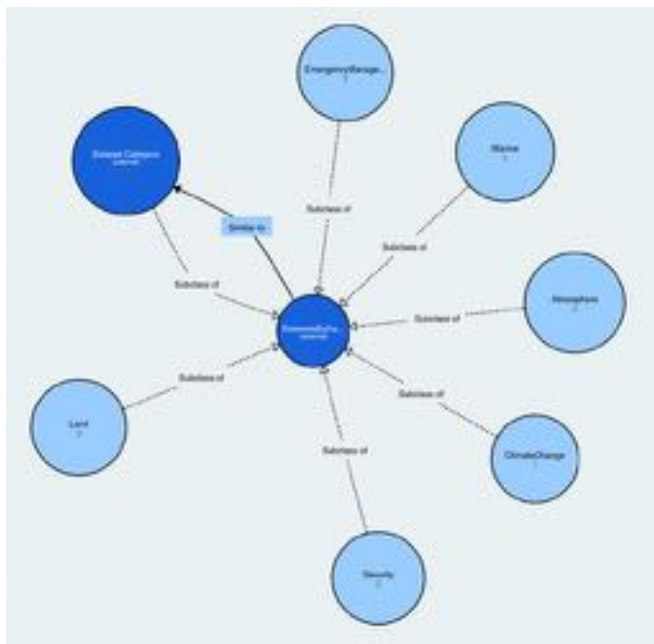
- Search tabs: **Web**, **Image**
- Search results: "About 6 results (0.90 seconds)"
- Sort by: **Relevance**
- Powered by: **Google Custom Search**
- Search results list:
 - Copernicus NDVI**
<https://analytics.ramani.ujuzi.com/.../Copernicus/.../fig/km?..>
File Format: KML, Document
Copernicus/ NDVI/a-f/NDVI/a-fon/lat/fig-icolon/fig-%28time%29cvn/10317.0/plotvalue/a-f-59.99107/80.0/plotrange/%28plotaxislength%29cvn/432/psdef/%28plotborder%29cvn/72/psdef/on/-180/180/plotrange/fig/km?region=-180,180,-59.99107,80.0&lv=1&alpha=0.75&time=10317.0&lat=-59.99107&lat=...
 - Copernicus LAI LENGTH_AFTER**
<https://analytics.ramani.ujuzi.com/.../Copernicus/.../fig/km?..>
File Format: KML, Document
kml_href, http://analytics.ramani.ujuzi.com/SOURCES/Copernicus/LAI: LENGTH_AFTER/a-f-a/on/lat/fig-icolon/fig-%28time%29cvn/10601.0/plotvalue/a-f-59.99107/80.0/plotrange/%28plotaxislength%29cvn/432/psdef/%28plotborder%29cvn/72/psdef/on/-180/180/plotrange/fig/km?region=-180,180,-59.99107...
 - Copernicus BA**
<https://analytics.ramani.ujuzi.com/.../Copernicus/BA/outline.html>
Copernicus BA, Copernicus Copernicus Type: Land Monitoring Products/Time-series BioPar Burnt-Area (Global); This global database of Burnt Area Products (BAs) is derived using input from the SPOT-VGT and PROBA-V surface reflectance observations(atmospherically corrected). Resolution: 0.00297619x0.002976191; ...
 - Ramani by Ujuzi Laboratories**
analytics.ramani.ujuzi.com/.../Copernicus/NDVI/figviewer.html?..
SDL - Streaming Data Library (SDL) - **Copernicus NDVI - Copernicus** Normalized Difference Vegetation Index 1KM 27 Mar 1998 - 5 Apr 1998, 179.9955E - 179.9955E, 59.99553S - 80.00446N, 2214 26 Mar 1998 - 0146 6 Aug 2017, WGS 84 ...
 - Ramani by Ujuzi Laboratories**
<https://analytics.ramani.ujuzi.com/SOURCES/>
SOURCES. SOURCES. Documents, overview, an outline showing sub-datasets of this dataset. Datasets and variables. **Copernicus, Copernicus**[LAI NDVI BA]. Features, Features[Agricultural WFP Political]. Thematic Map, maproom. Last updated: Fri, 01 Dec 2017 16:35:44 GMT, SOURCES. SOURCES ...
 - RAMANI Analytics**
<https://analytics.ramani.ujuzi.com/>
Your Geo-spatial content may vary from vector-based maps such as locations (points), lines (segments) or areas (polygons) to time-series from satellite Earth Observation (EO) monitoring missions such as **Copernicus**. Get started in just a few minutes! Register with our Cloud services. Our basic plan is free and always will ...



Getting started

Graphical data discovery

Provide a web-interface;
discovery and exploration



[Live view](#)

Copernicus/LAI LAI Data Files

This dataset has 3788 (1.4812193008 142.21575468) of data in it, which should give you a rough idea of the size of any file that you ask for.

Download Data To Specific Software

Python	The Postscript-based software on which the Streaming Data Library (SDL) is built.
QPT	Climate Predictability Tool More Information
Arvi	Interactive computer visualization and analysis software. More Information
GridGIS	Grid Analysis and Display System More Information
matlab	Data analysis and visualization software. More Information
RSL	NOAA Command Language More Information
GIS	A public domain software package for the display and analysis of satellite images, maps and associated databases, with an emphasis on early warning for food security. More Information

Other Available File Formats

Full Information Formats

These files contain all of the available metadata.

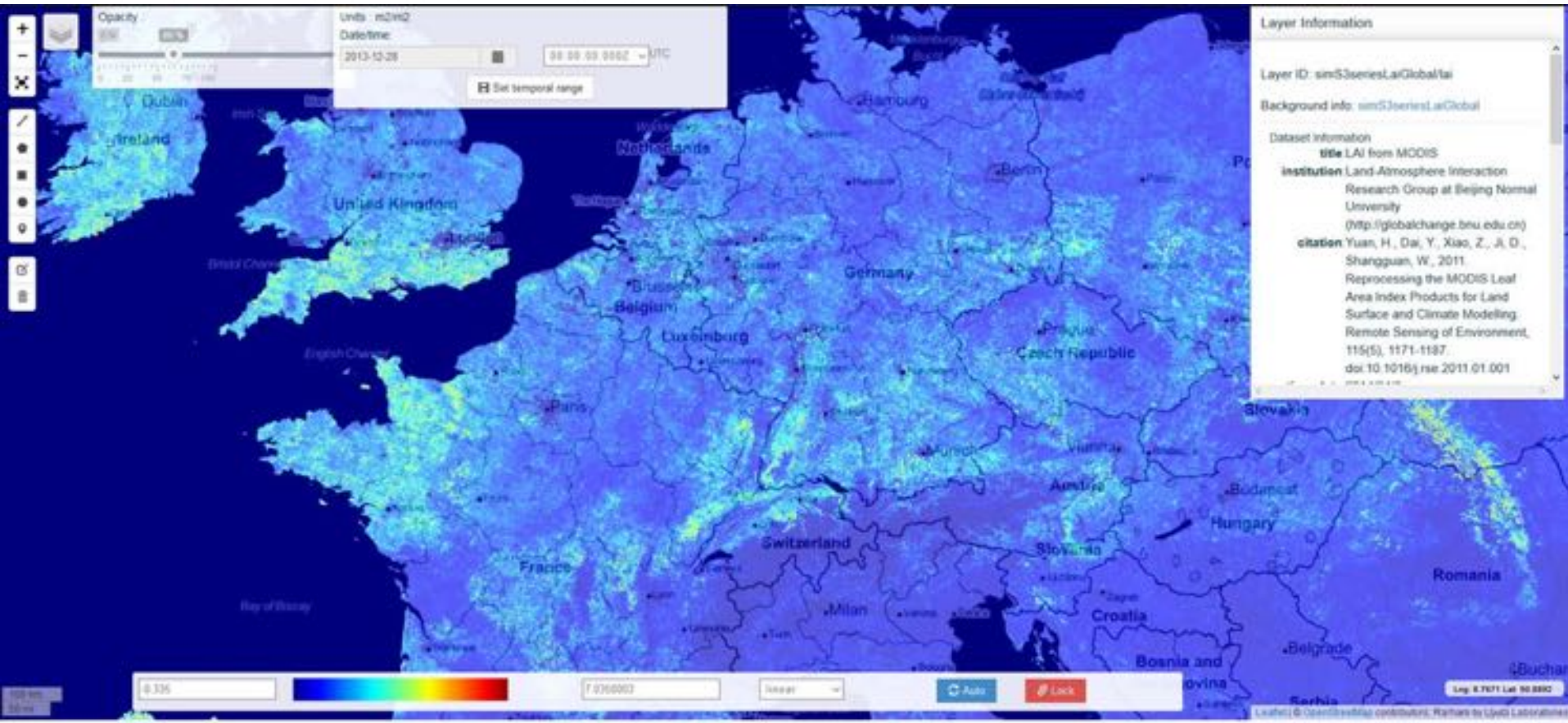
GDAL/GCP	A system which downloads data directly to software, such as Matlab, Ferret, GRADS, etc. Specific instructions are available in the table above. Note: GDAL/GCP was formerly known as GDOS (Distributed Geospatial Data System). More Information
netCDF (network common Data Form)	A commonly supported self-describing data format. More Information

Partial Information Formats

These files contain only some of the available metadata.

For the existing data format, the following information may be helpful: [Format 1](#), and the [data access kit](#), i.e. the data is already properly loaded. The existing [netcdf](#) files for missing data is [C-200000](#).

Web interface for visual discovery and exploration

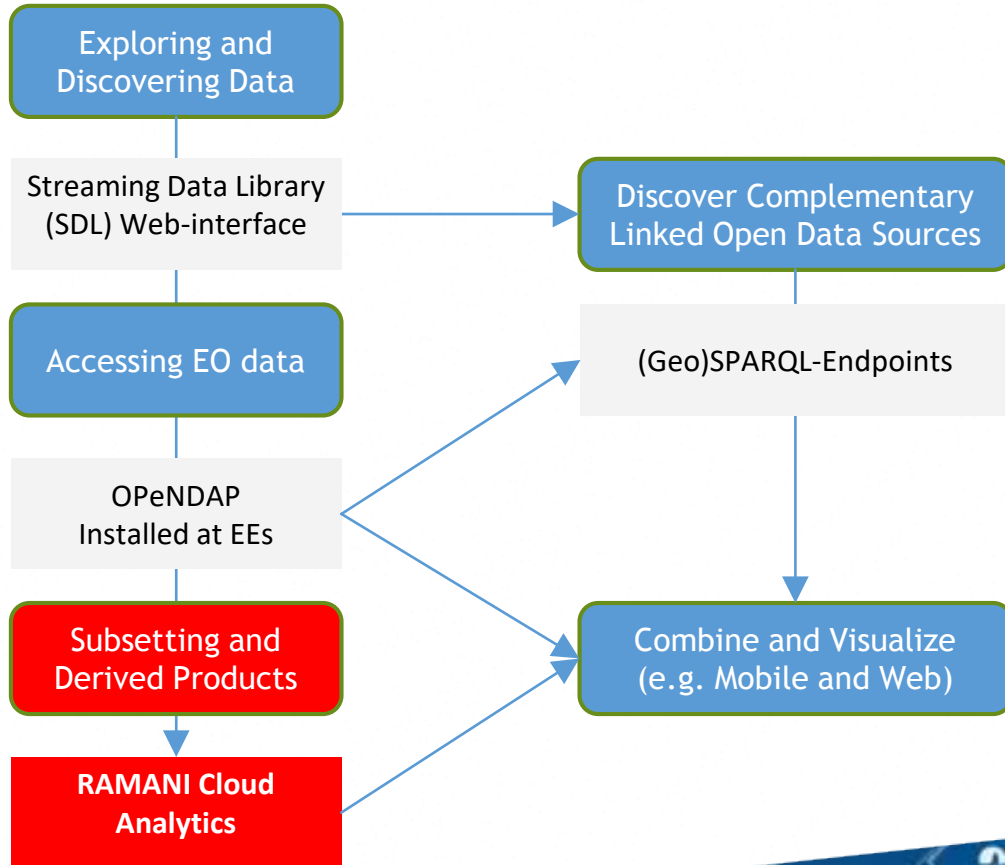


Data by Source ([Link](#))

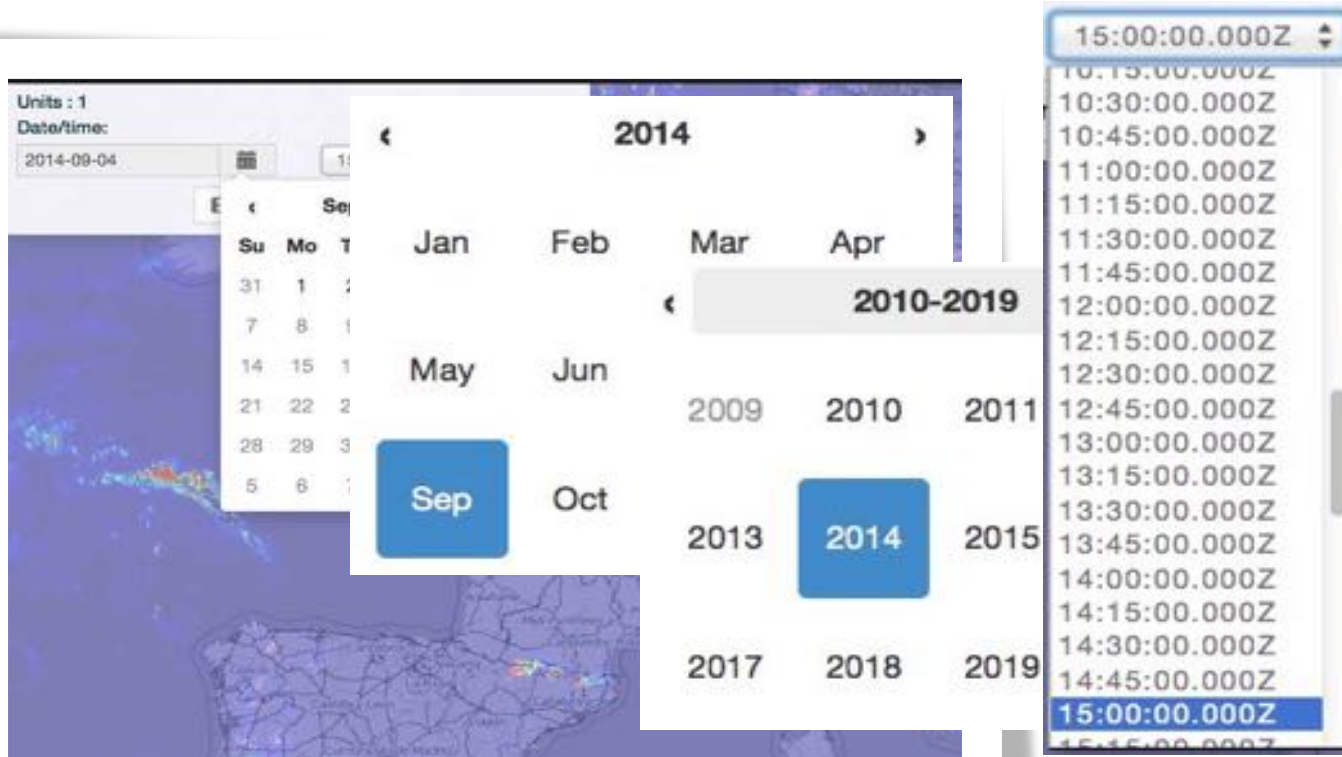
Datasets and variables

ANEEL	ANEEL: Agência Nacional de Energia Elétrica.
ARCTIC	ARCTIC: Oceanic station data for the Arctic Region.
Biosphere	Biosphere: Biosphere 2 Laboratory.
BRF	BRF: Black Rock Forest.
CAC	Climatological, smoothed, and raw sea surface temperature data for the tropical Pacific Ocean from the Analysis Center (now known as the Prediction Center).
CARDONE	ECMWF five day average wind stress; Cardone Level 2B data.
CAYAN	Heat flux and irradiance data analysis of COADS from Cayan of Scripps.
CDIAC	CDIAC: Carbon Dioxide Information Analysis Center.
CHRS	Wind stress calculated from EOF-filtered Serrain stress and various drag formulations for the tropical Atlantic.
CLIMAP	Modern and last glacial maximum (18 KBP) comparison of soil and vegetation characteristics from the World Data Center for Paleoclimatology.
CMA	CMA: China Meteorological Administration.
COADS	Comprehensive Ocean-Atmosphere Data Set: Trimmed monthly summaries.
Copernicus	Copernicus(Marine Land)
CORAL	CORAL: Isotope d18O data from coral colonies.
DASILVA	DASILVA: Atlas of Surface Marine Data 1994 from da Silva et. al.
EC9293	Zonal and meridional wind stress data
ECHAM	ECHAM surface stresses.
ECOSYSTEMS	ECOSYSTEMS: Vegetation and ecosystem data from the IIASA, GISS, and USGS.
ECP9293	Zonal and meridional wind stress data
ENSOFORECAST	Equatorial Pacific SST forecasts from the Lamont-Doherty Earth Observatory Group.

Earth Observation Linked Data Cycle



Get Metadata ([getMetadata](#)) from Ramani ([click for an example](#))



Subsetting by time and space

Description Views Data Filters **Data Selection** Data Files Data Tables Expert Mode

Data Selection

You can interactively pick out the data you would like with the [Data Viewer](#).
You can reduce the amount of data by restricting the range of the grids.

The current settings for the grids are:

- grid: /lon (degree_east) periodic (180W) to (179.9911E) by 0.008928572 N= 40320 pts :grid
- grid: /lat (degree_north) ordered (80N) to (59.99107S) by 0.008928572 N= 15680 pts :grid
- grid: /time (days since 1970-01-01 00:00:00) ordered [(5-14 Jan 1999) (0000 15 Jan 1999 - 1200 25 Jan 1999) (1200 25 Jan 1999 - 2400 4 Feb 1999) ... (1200 25 May 2018 - 1200 5 Jun 2018)] N= 699 pts :gnd

If this is what you want, choose

Stop Selecting

Setting Ranges

If you want to restrict the range along a grid, choose here.

name		range
lon	lon	180W to 179.9911E
lat	lat	80N to 59.99107S
time	time	5-14 Jan 1999 to 1200 25 May 2018 - 1200 5 Jun 2018
<input type="button" value="Restrict Ranges"/>		

Server-side Analytics

- App Lab [Analytics](#) (SDK for downstream service providers)
 - Broad range of analytics available
 - SDK for downstream service providers
 - Functions for supporting the use case:
 - Monthly average
 - Yearly anomalies
 - Spatial average
 - Temporal filter



SDL scripting language ([SDLS](#))

```
expert
```

OK

Test

Scripting

The SDL scripting language (SDLS), a PostScript-based language on which the Streaming Data Library (SDL) is based, facilitates the creation of user-tailored analyses and graphics from (geo-spatial) data. The SDL is designed to manipulate large datasets and model input/output. Given the proper commands in its command file, it can read data from its data catalog, a netCDF file, or a set of data directly embedded in-line with the script, and output the data, either by feeding it to a model, creating a new data file (or URI to this new data), or creating plots and other graphical or tabular representations of the data.

Read More

SDLS Usage

Data Selection

- Select a continuous time period

```
expert
SOURCES .M0AA .M0CF .ENC .OMB .OS0BAL .Keys_fmshd0ivi .weekly .ast
T (17 Nov 1983) (29 Dec 2001) RANGE
```

- Select a discontinuous time period

```
expert
SOURCES .M0AA .M0DC .DAILY .GLOBAL900 IN60 444940 VALUE .mean .temp
T (3-4 Sep 1995-1999) RANGE
```

Server-side Analytics

SDK for downstream service providers;
broad range of functions available

Function Index

2 `dateNahB`

: `built_filter`
`cc`
`crossman`
`Water_Balance`
`WDT`
`water`

A

`absrf`
`abs`
`absolute value value absolute value absolute abs`
`acosd`
`add`
`add_variable`
`addGRID`
`addGRIDlast`
`anomaly`; `anomalies`; `anomalies`; `wssp`; `yearly`
`anomalous`

Arithmetic Functions: Funciones Aritméticas:
Fonctions Arithmétiques: `abs`; `add`; `differences`
`dir`; `eexp`; `ln`; `log`; `mag`; `mod`; `mul`; `RESCALE`; `sqrt`
`sqrtage`; `sub`; `sum`

`asnd`
`atan2`
`atan2d`
`atanf`
`average`

Average: Promedio: Moyenne: `average`; `boxaverage`
`dkkadafaverage`; `monthlyaverage`; `monthlyMAVE`
`monthlyMAVE_SD`; `monthlymean`; `pentadaverage`

`geometrywedge`
`geometrysimplify`
`geometrytosimplify`
`geometrytosizes`
`geometryunion`
`geometrywithn`
`geomct`
`glinverse`
`GRID`

Grid Modification: Modificación de Retículas:
Modification des Grilles: GRID `regridAverage`
`removeGRID`; `renameGRID`; `replaceGRID`
`SAMPLE_MISSING`; `shrdata`; `shrdatashort`
`shrGRID`; `splitsreamgrid`; `unplitsreamgrid`
`zarpaintwidth`

`gridmatch`
`gridmatchnamed`
`groupgrid`
Growing Season: `onsetDate`

H

libfor
Health and Climate Functions: `k-means136`
`monthly3Q`; `monthlyepithresholds`; `monthlyMAVE`
`monthlyMAVE_SD`; `monthlyMAVEplus1p66SD`
`monthlyMAVEplus1SD`; `monthlyMAVEplus2SD`
`monthlymean`; `monthlymeanplus1SD`
`monthlymeanplus2SD`; `monthly9D`; `pentad3Q`
`pentadepithresholds`; `pentadMAVE`
`pentadMAVE_SD`; `pentadMAVEplus1p66SD`
`pentadMAVEplus1SD`; `pentadMAVEplus2SD`
`pentadmean`; `pentadmeanplus1SD`
`pentadmeanplus2SD`; `pentadSD`
`weeklyanomflr`; `weeklytopofsd`

`rankcorrel`
`ranked_prob_score`

Ranking Data: Orden de Datos: Rang de Données:
`datarank`

`ratiof`
`ratios`
`readgrb`
`readfreddo`
`rect`
`regridAverage`

Regridding: Regridado: Regriller: GRID
`regridAverage`; `regridLR`; `regridLinear`; `transit`
`weeklytomonthly`; `weeklytopentad`

`regridLi`
`regridLinear`
`removeGRID`
`removeVALUES`
`renameGRID`
`REORDER`
`replaceypersentile`
`replaceGRID`

`replaceNaN`
`RESCALE`
`rmcover`
`rmcover`

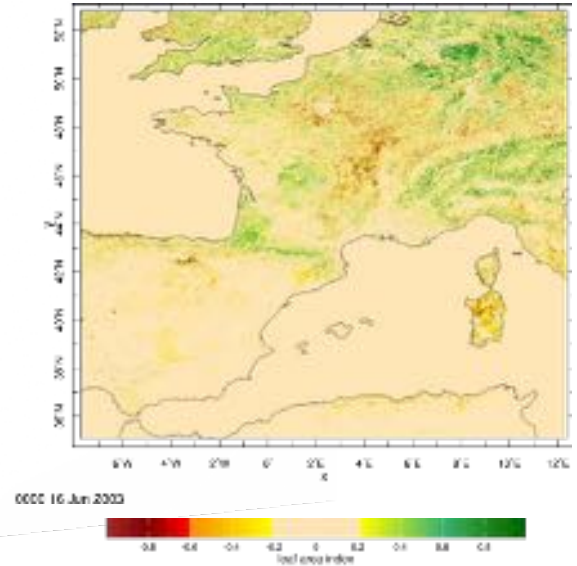
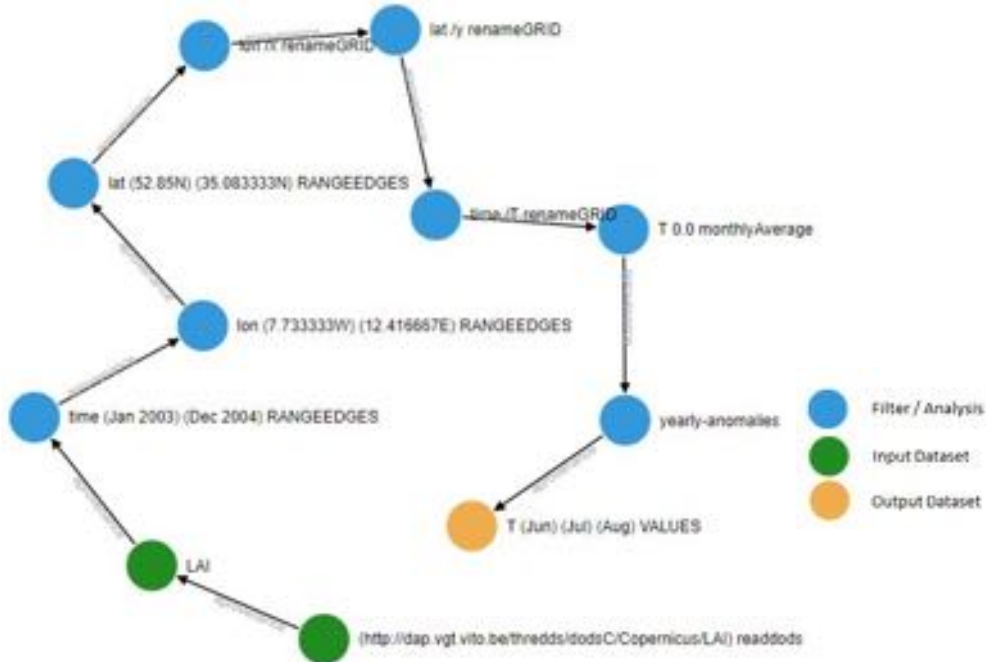
`root`; `mean square`; `media cuadrática`; `moyenne quadratique`; `rmcover`
`root`; `mean square anomaly`; `anomalía de media cuadrática`; `anomalie de la moyenne quadratique`; `rmcover`

`rotated EOFs`; `rotación de EOFs`; `rotacion des EOFs`; `rotmax`



Server-side Analytics

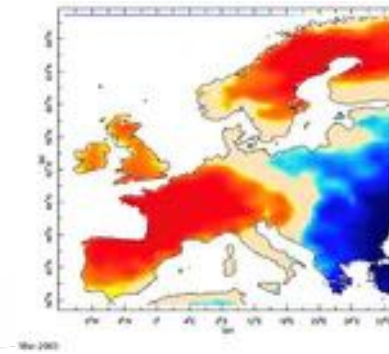
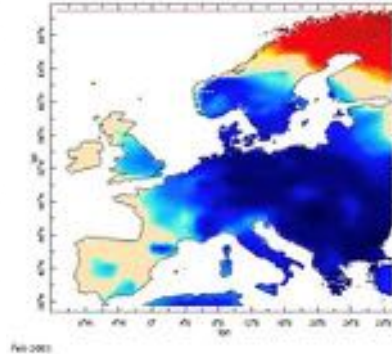
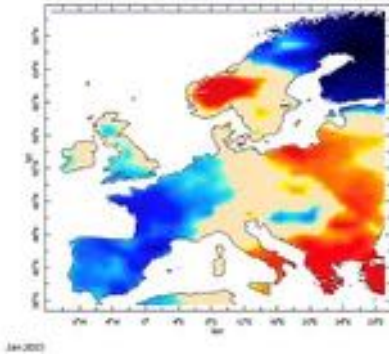
SDK for downstream service providers;
creating SDL add-ons using the visual model
builder



Server-side Analytics

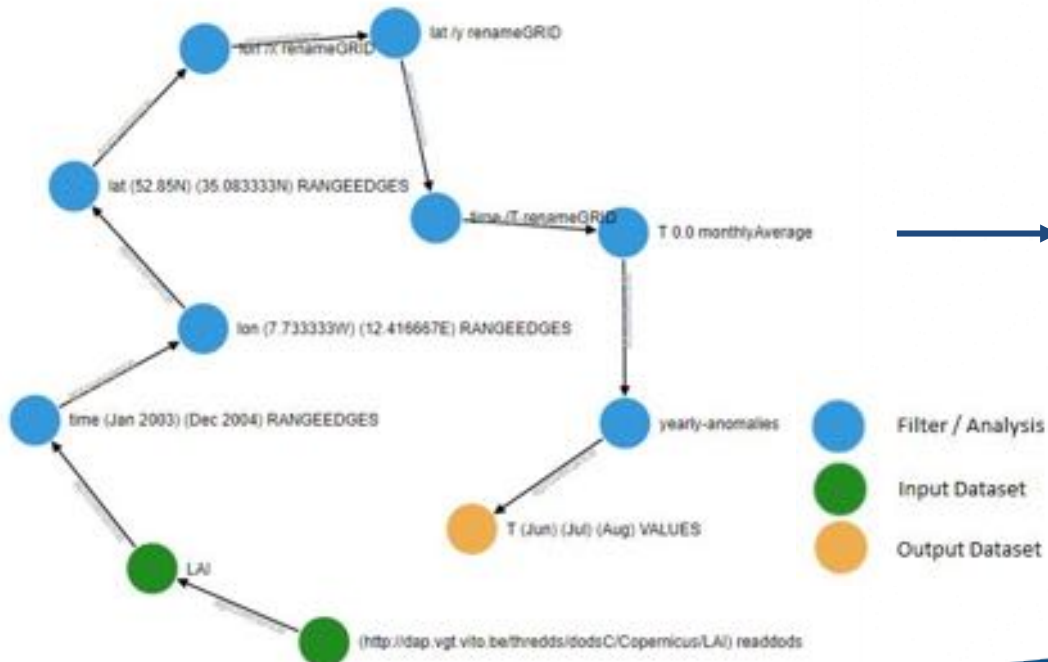
SDK for downstream service providers;
publishing added-value products generated
by a SDK add-on

Analytics e.g. to [reveal anomalies in Air temperature \(2m\)](#), sourced from the [ERAInterim reanalysis product](#), Copernicus [Climate Change service](#)

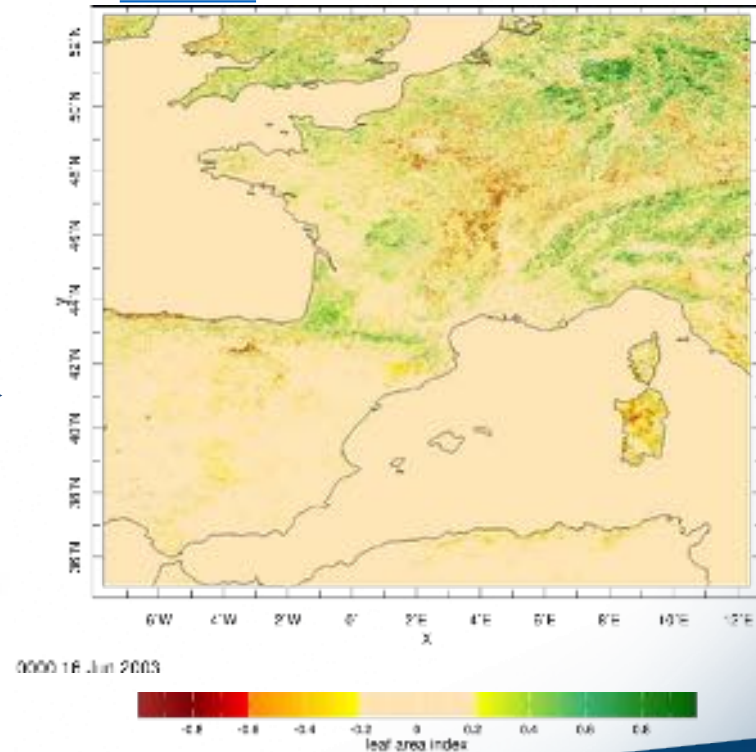


Greenest pixel in Europe

SDK for downstream service providers;
creating SDL add-ons using the visual model
builder



[Live View](#)



Greenest pixel in Europe; variance in time

SDK for downstream service providers;
creating SDL add-ons using the visual model
builder

Function Index

2 2xtoNaN8

: :butt_filter
:c
:crossman
:Water_Balance
:WCT
:weaver

A abrat
abs
absolute value: valor absoluto: valeur absolue: abs
acosd
add
add_variable
addGRID
addGRIDlast
anomaly: anomalias: anomalies: wasp yearly:
anomalies

Arithmetic Functions: Funciones Aritméticas:
Fonctions Arithmétiques: abs add differences
div sum to log max mod mul BERCA E sort

geometryoverlaps
geometrysimplify
geometrytoposimplify
geometrytouches
geometryunion
geometrywithin
georect
ginverse
GRID

Grid Modification: Modificación de Reticulas:
Modification des Grilles: GRID regridAverage
removeGRID renameGRID replaceGRID
SAMPLE_MISSING shiftdata shiftdatashort
shiftGRID splitstreamgrid unsplitstreamgrid
zeropointwidth
gridtomatch
gridtomatchnamed
grouptogrid
Growing Season: onsetDate

H hdnr
Health and Climate Functions: le-means136
monthGG monthuelthresholds monthAAAME

rankcorrelate
ranked_prob_score
Ranking Data: Orden de Datos: Rang de Données
dataRank
rasterize
rabs
readgrib
readthredds
rect
regridAverage
Regridding: Regrillado: Regriller: GRID
regridAverage regridLB regridLinear transit
weeklytomonthly weeklytopentad
regridLB
regridLinear
removeGRID
removeVALUES
renameGRID
REPROJECT
replacebypercentile
replaceGRID
replaceNaN



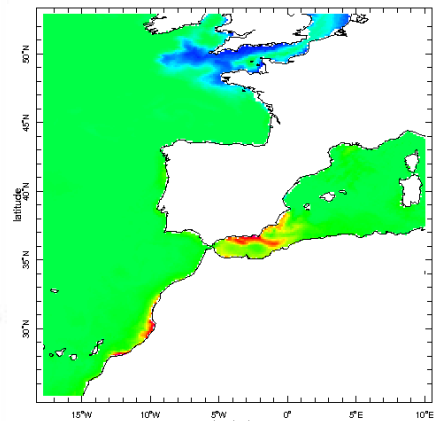
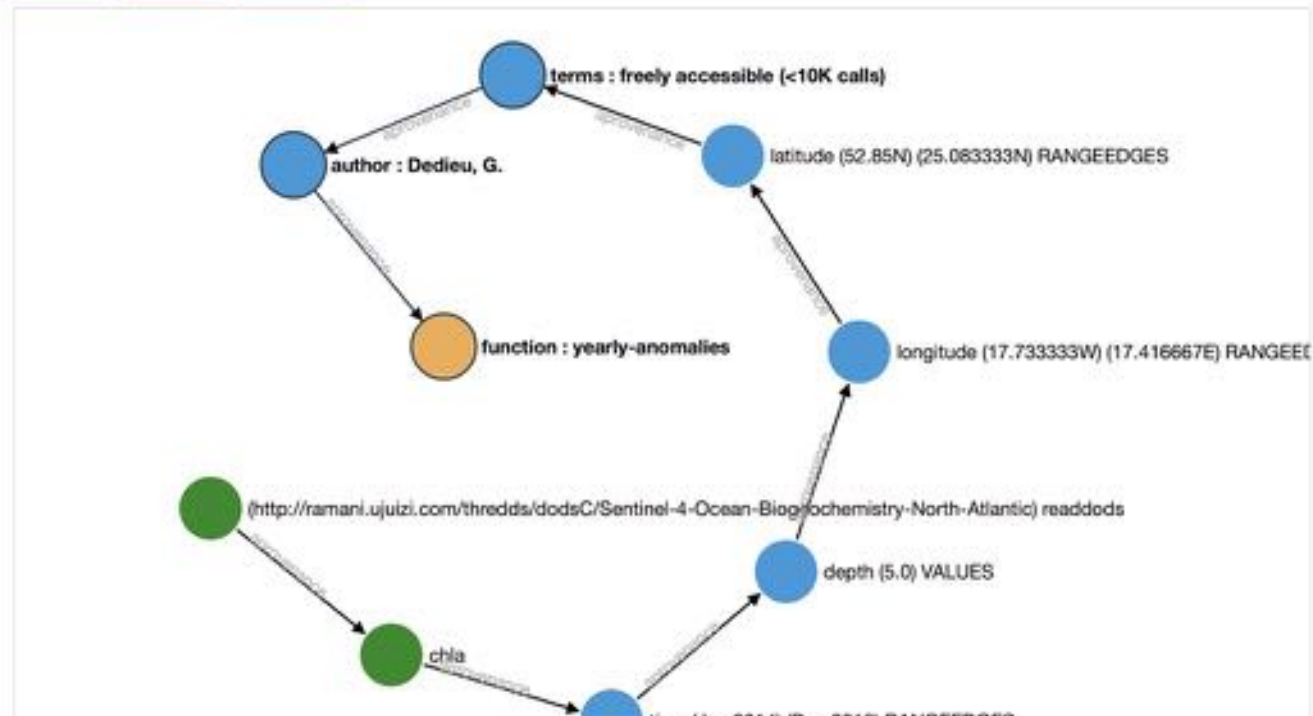
EO value-chains with micro-remittances on a blockchain

Description Views 3D View Data Filters Data Selection Data Files Data Tables Expert Mode

Get Shorten URL

Legend:

source function end point



5.0 meter Time Jan 2014

[depth](#)
[detrnd-bf](#)
Detrending: [Detección Tendencia:](#) [Détection Tendance:](#) [detrnd-bf](#)
[differences](#)
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Table Lookup: [Transitividad:](#) [Transitivité:](#) [BofA=C](#)
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[unitmatrix](#)
[units:](#) [unidades:](#) [unités:](#) [:o](#) [differential_mul](#)
[unitconvert](#)
[unsplitstreamgrid](#)

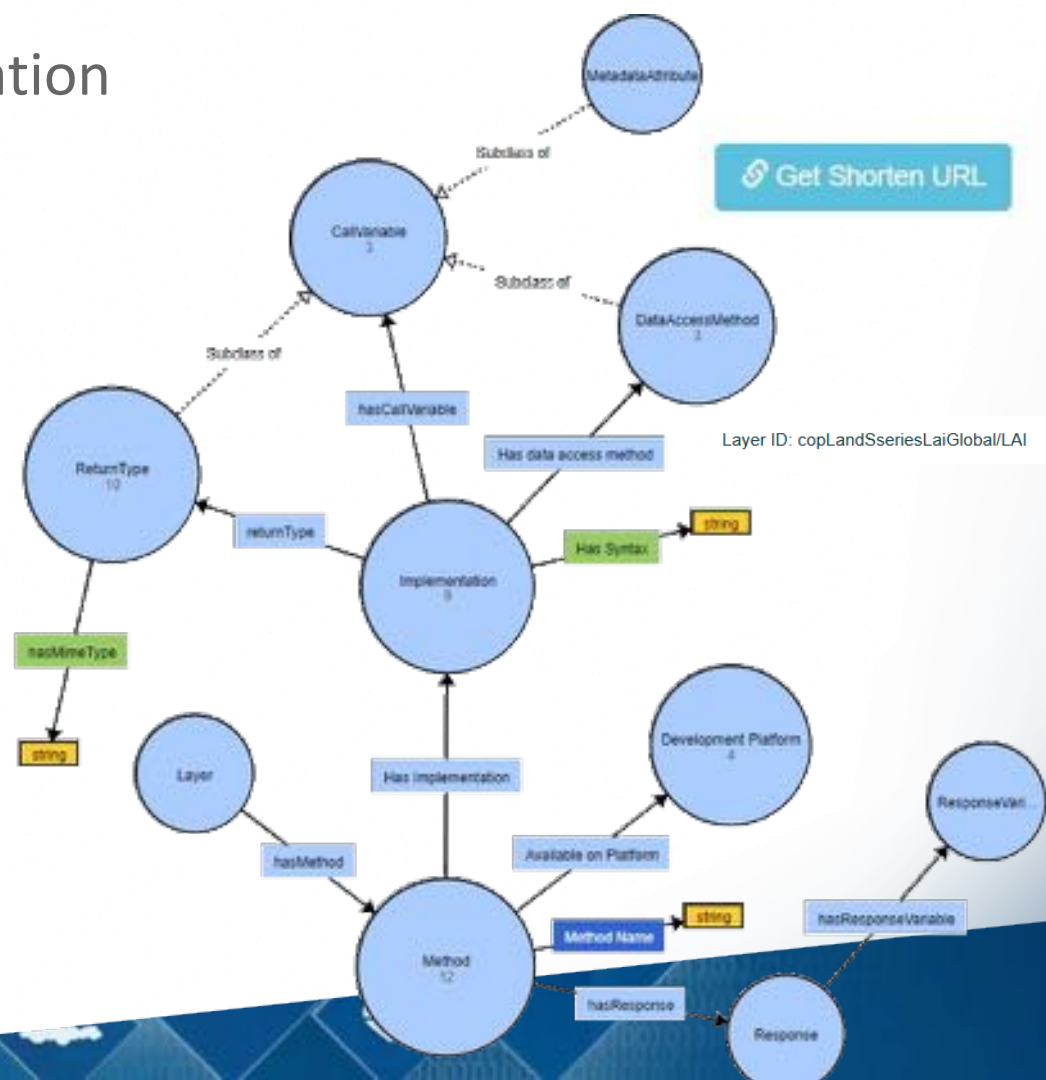
V

VALUES
[varimax](#)



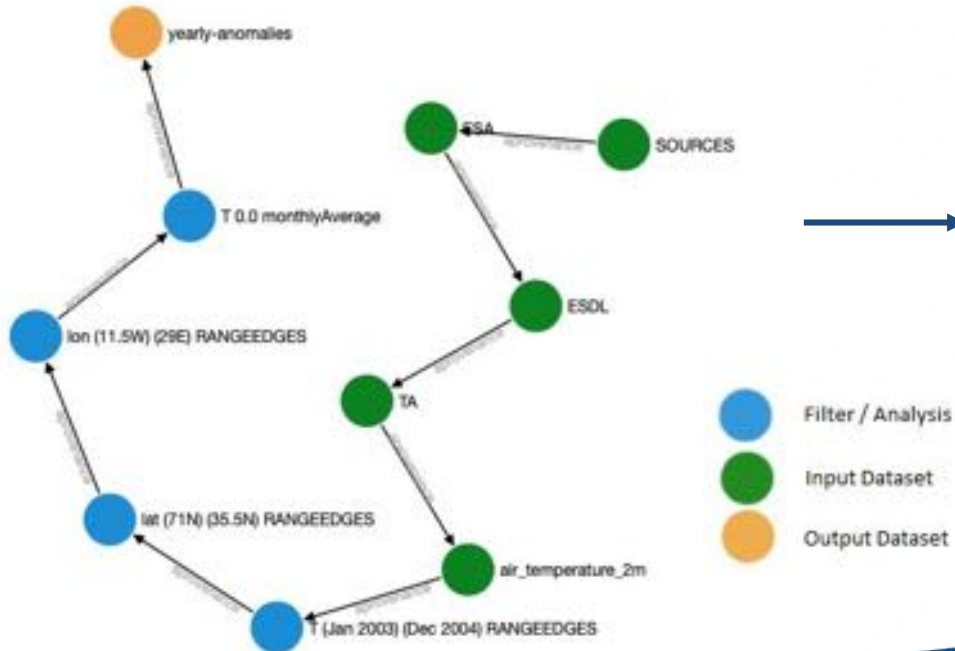
Consuming data in your application

- Use [API](#) to directly consume the data in your app
- Available for several development platforms
 - ◆ Android
 - ◆ Javascript
 - ◆ NodeJS
 - ◆ iOS
- Different data access methods
 - ◆ OPeNDAP link
 - ◆ LayerID
- Many different return types both text and images
- [Maps-API ontology](#) to make API logic explicit

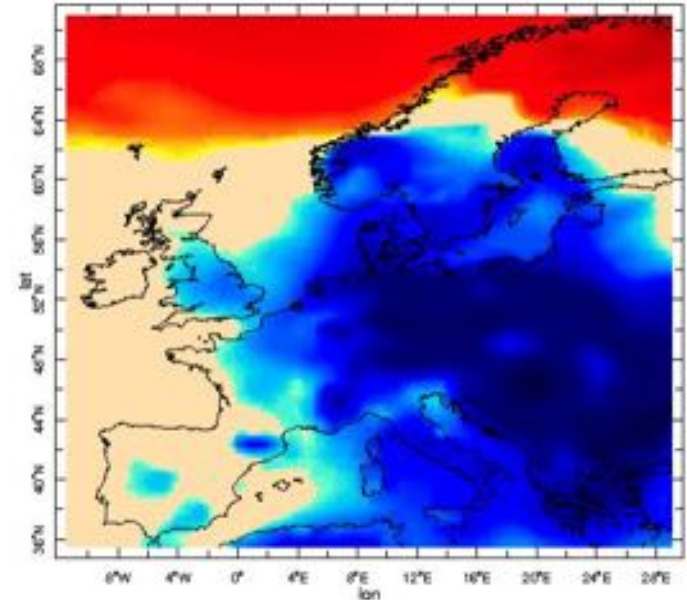


Air Temperature Anomalies

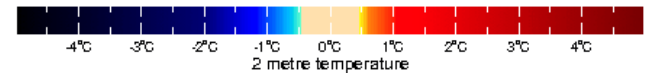
SDK for downstream service providers;
creating SDL add-ons using the visual model
builder



[Live View](#)



Feb 2003





What is next?

Build your App, expanding beyond urban 'greenness'...

Consider other relevant 'urban well-being' aspects. such as air quality from COPERNICUS Atmosphere (here rendered in an augmented reality-app).

Maps-API

On-screen demos with sample App to guide App-developers



Ramani Maps (Unreleased)
Ujjai Labs · Maps & Navigation
PEGI 3

- This app is in development. It may be unstable.
- This app is compatible with some of your devices.

Installed

3D BUILDING **OFFLINE MAP** **SATELLITE IMAGERY** **MAP (KML, HO...**

With the Ramani API Framework for Android, you can add map data to your application. The API automatically handles access to the map servers, returns tiled-map displays (retina optimized), and provides a variety of charts returned as PNG image or Scalable Vector Graphics (SVG) for further client-side interactions.

What is next?

Expand on this 'greenest capital' use case together with us by, for example:

- Rank-order Europe's capitals by 'greenness' (using other LOD, WP4), i.e. to arrive at a top-3 and a 'winner'.
- Expand beyond urban land-cover, for example by adding other relevant aspects to 'well-being' in cities (e.g. sustainability, air quality, micro-climate in relation to heat island-effects, demographics and heat-wave casualties) to allow for a more holistic approach in assessing who is the 'greenest capital' of Europe. We even support 'what-if' scenarios, e.g. [does rainfall in Paris change if the sea-surface or land-surface temperature elsewhere becomes warmer?](#)
- In competing for the trophy 'greenest capital of Europe', what infographic or media exposure works best for city marketing purposes? Imagineer new ways of giving this a spin.
- Explore within-city patterns, discover relationships *aka* correlations between datasets
- Explore what UX works best to market 'greenest capital of Europe' claims?

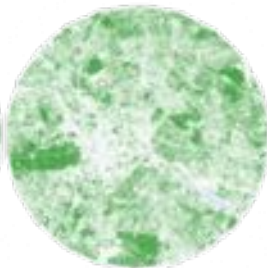


Fact-checking claims using triangulation

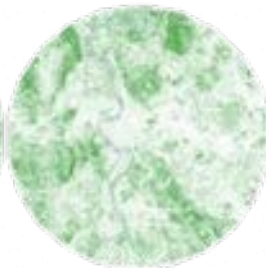
Greenest European metropolis - population above 2M, only considering 'greenness':



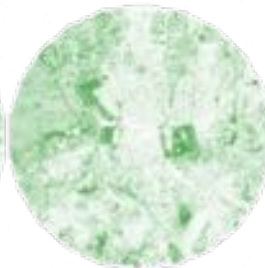
Kiev / Ukraine (NDVI 0.389)



Berlin / Germany (NDVI 0.246)



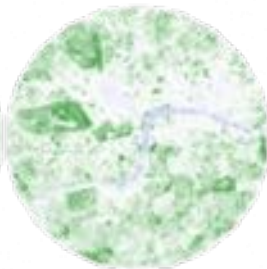
Rome / Italy (NDVI 0.27)



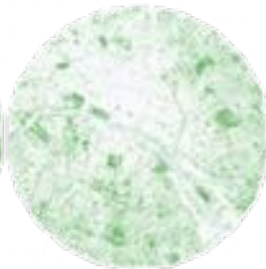
Madrid / Spain (NDVI 0.154)



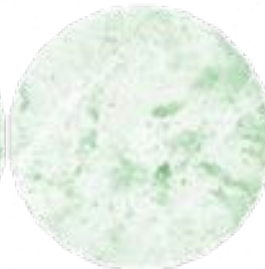
Amsterdam / Netherlands (NDVI 0.243)



London / United Kingdom (NDVI 0.135)



Paris / France (NDVI 0.119)



Athens / Greece (NDVI 0.088)

Fact?

The greenness was evaluated with the Normalized Difference Vegetation Index and allows comparison among the 43 analyzed capitals

<https://philippgaertner.github.io/2017/10/european-capital-greenness-evaluation/>

Validate any claims of greenest capital or city by allowing search engines to find your fact-checks (e.g. using schema.org's reviewClaims type, as part of the JSON-LD-snippet created by AppLab's semantically enriched MAProom, for validating claims by other journalists/websites for being 'greenest')

Peer-reviewing claims “*Europe's greenest capital?*”...

who validates or reviews claims (i.e. being the ‘greenest’ capital)?



Enn Rajasaar · 14 days ago

Bullshit. Weather conditions may be very different. You can't just base your investigation in pixel-to-pixel analysis.

^ | v · Reply · Share ·



Diego-Xavier Garcia Martens → Enn Rajasaar · 14 days ago

I agree the study is a bit too general and seems to privilege public greenery seen by satellite and apparently street view through color algorithms. While cities with urban typologies like Brussels have private gardens for each house in every block and because of it and the forests in the south the city has around 50% of it's surface made up of various greenery and also making it the 9th capital in europe in terms of biodiversity so the low score is criminally misleading...

^ | v · Reply · Share ·



Thomas Dissaux → Diego-Xavier Garcia Martens · 8 days ago

Agreed ! Waaaay too general ! Glad I'm not the only one who got surprised by Brussels score. Also all the cities are studied in a 5 miles radius so what about bigger cities and what about cities which are organised along a river and other urban configuration. The pictures are nice but the ranking is like you said "criminally misleading" since it might end up on social platform as "general knowledge".

^ | v · Reply · Share ·

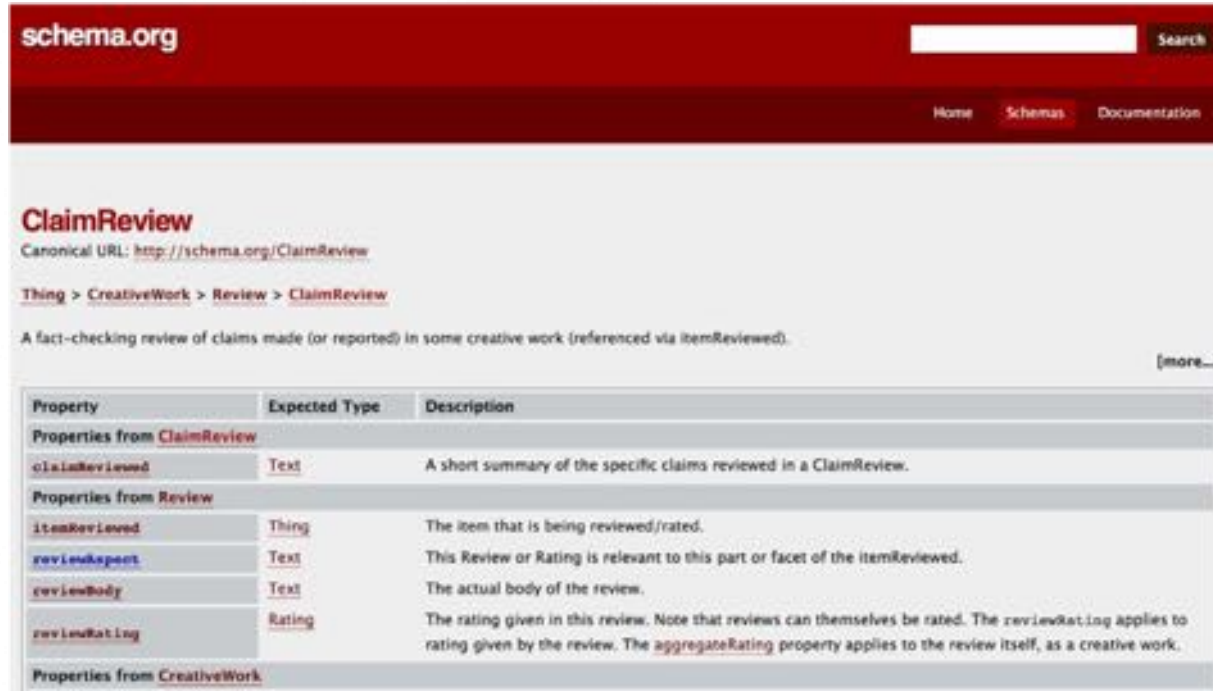
Or fiction...

Here ‘Greenness’ as key KPI, and the methods used to calculate this, are disputed by others and even deemed as “criminally misleading”.

But who establishes the ‘truth’?

Example: facilitating robust peer-review workflows

how can one review such claims (i.e. who is the 'greenest capital 2018')?



The screenshot shows the schema.org website for the **ClaimReview** class. The page title is "ClaimReview" and the canonical URL is <http://schema.org/ClaimReview>. The breadcrumb trail is "Thing > CreativeWork > Review > ClaimReview". The description is "A fact-checking review of claims made (or reported) in some creative work (referenced via itemReviewed)." There is a "[more...]" link. Below the description is a table with three columns: Property, Expected Type, and Description.

Property	Expected Type	Description
Properties from ClaimReview		
claimReviewed	Text	A short summary of the specific claims reviewed in a ClaimReview.
Properties from Review		
itemReviewed	Thing	The item that is being reviewed/rated.
reviewAspect	Text	This Review or Rating is relevant to this part or facet of the itemReviewed.
reviewBody	Text	The actual body of the review.
reviewRating	Rating	The rating given in this review. Note that reviews can themselves be rated. The <code>reviewRating</code> applies to rating given by the review. The <code>aggregateRating</code> property applies to the review itself, as a creative work.
Properties from CreativeWork		

Semantics WCS 3.0

A web of documents is not enough, a web of data helps to triangulate the 'truth'!



APP
LAB

Working with Semantic Web Technologies



Benefits of Linked Data Technologies

Approach without Copernicus App Lab Tools

- Download all datasets from their respective repositories
- Understand the data
- Make conversions to comply with standards
- Align data from different datasets to be able to combine the information (interlinking process)
- Store the transformed data using a new model
- Consume data
- Analyse data
- Visualisation

Approach with OPeNDAP only

- View metadata to understand the data
- Consume data
- Make conversions to comply with standards
- Align data from different datasets to be able to combine the information (interlinking process)
- Analyse data
- Visualisation

Approach with all Copernicus App Lab Tools

- View metadata to understand the data
- Consume data
- Analyse data
- Visualisation



Building Apps with Linked Data

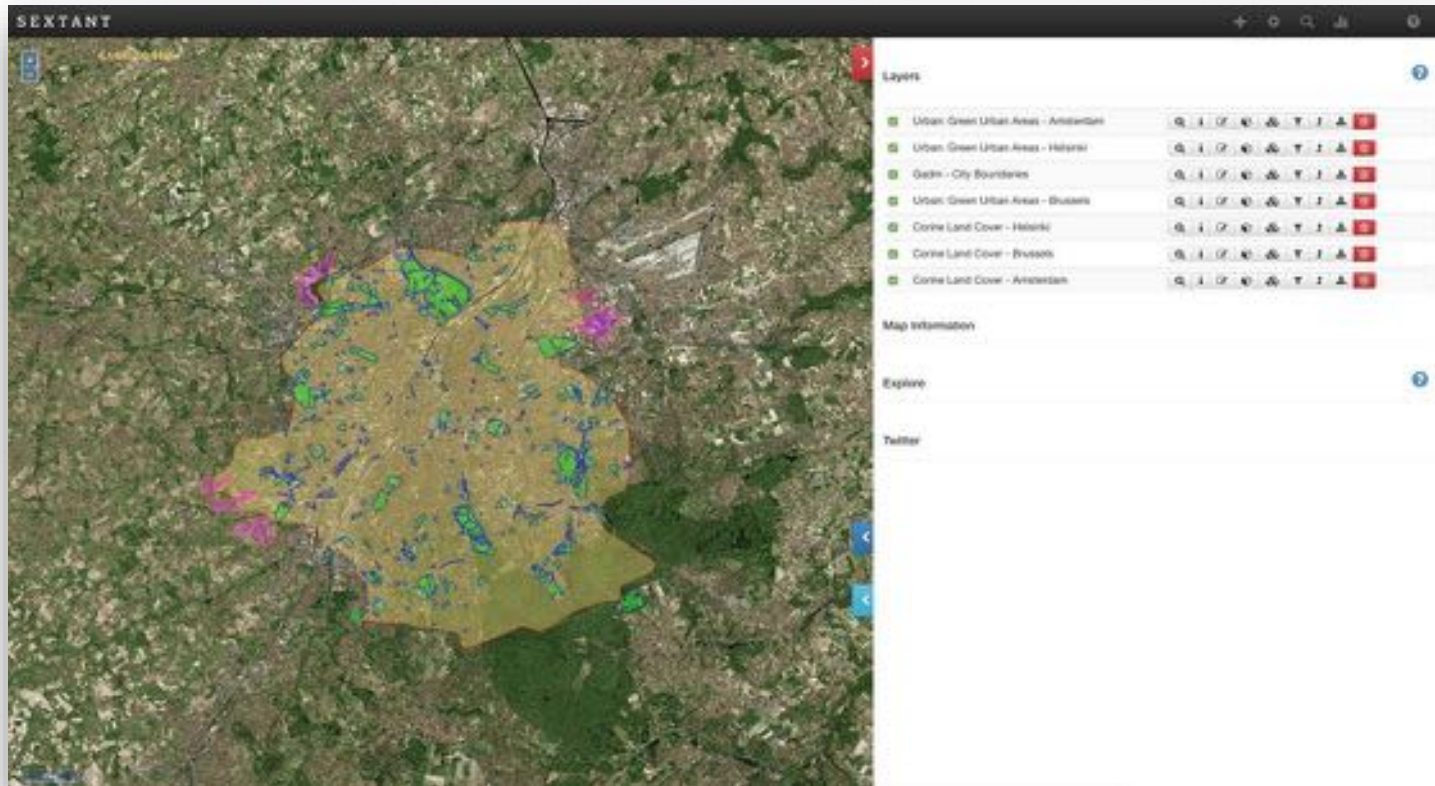
Linked Data applications have three main parts:

- Consume Linked Data
- Analyse Linked Data
- Application User Interface

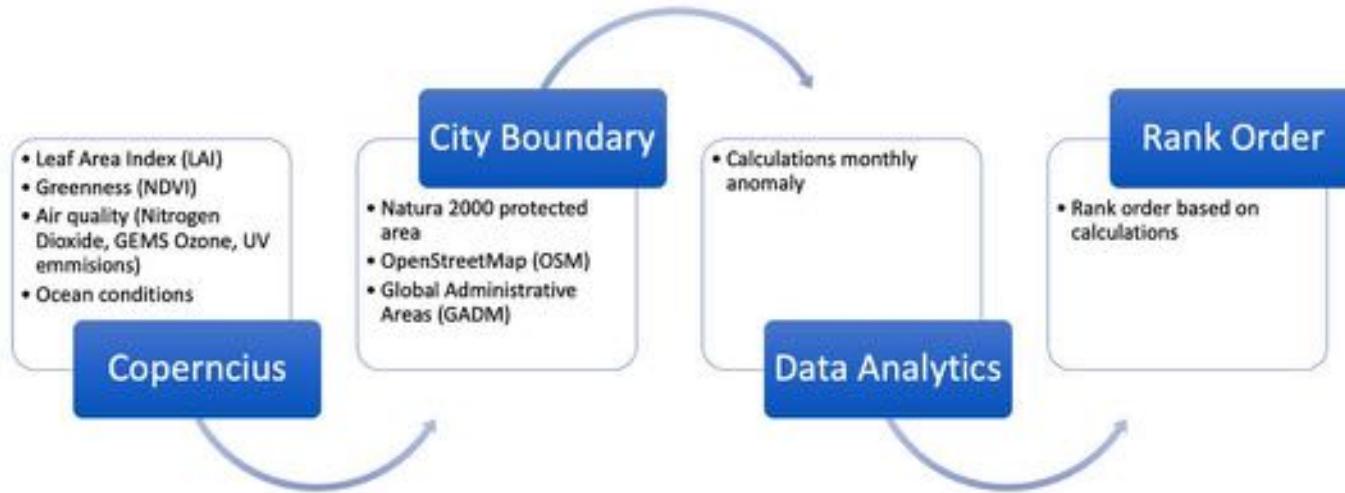
Consume Linked Data using HTTP requests

- GET request with a query parameter:
 - query : SPARQL query string (url encoded)
- Use Accept header according to the required results format:
 - application/sparql-results+xml (XML)
 - application/sparql-results+json (JSON)
 - text/tab-separated-values (TSV)
 - text/html (HTML table)
 - application/json OR application/geojson (GeoJSON)
 - application/kml (KML)

Explore within-city patterns, e.g. parks vs. urban greenness (Amsterdam, Paris, Helsinki, Brussel)



Explore within-city patterns, e.g. parks vs. urban greenness (Amsterdam, Paris, Helsinki, Brussel)



Query Example - “Greenness within Paris”

```
SELECT ?w1 (ceil(avg(?lai)) as ?meanLAI) ?name
```

```
WHERE {
```

```
  ?s lai:lai ?lai .
```

```
  ?s geo:hasGeometry ?geo .
```

```
  ?s lai:observationTime ?t .
```

```
  ?geo geo:asWKT ?w .
```

```
  ?adm a gadm:AdministrativeUnit .
```

```
  ?adm gadm:hasName ?name .
```

```
  ?adm geo:hasGeometry ?geo1 .
```

```
  ?geo1 geo:asWKT ?w1 .
```

```
  ?adm gadm:belongsToAdm2 ?adm2 .
```

```
  ?adm2 gadm:hasName "Paris" .
```

```
  FILTER (geof:sfIntersects(?w,?w1))
```

```
}
```

```
GROUP BY ?w1 ?meanLAI ?name
```

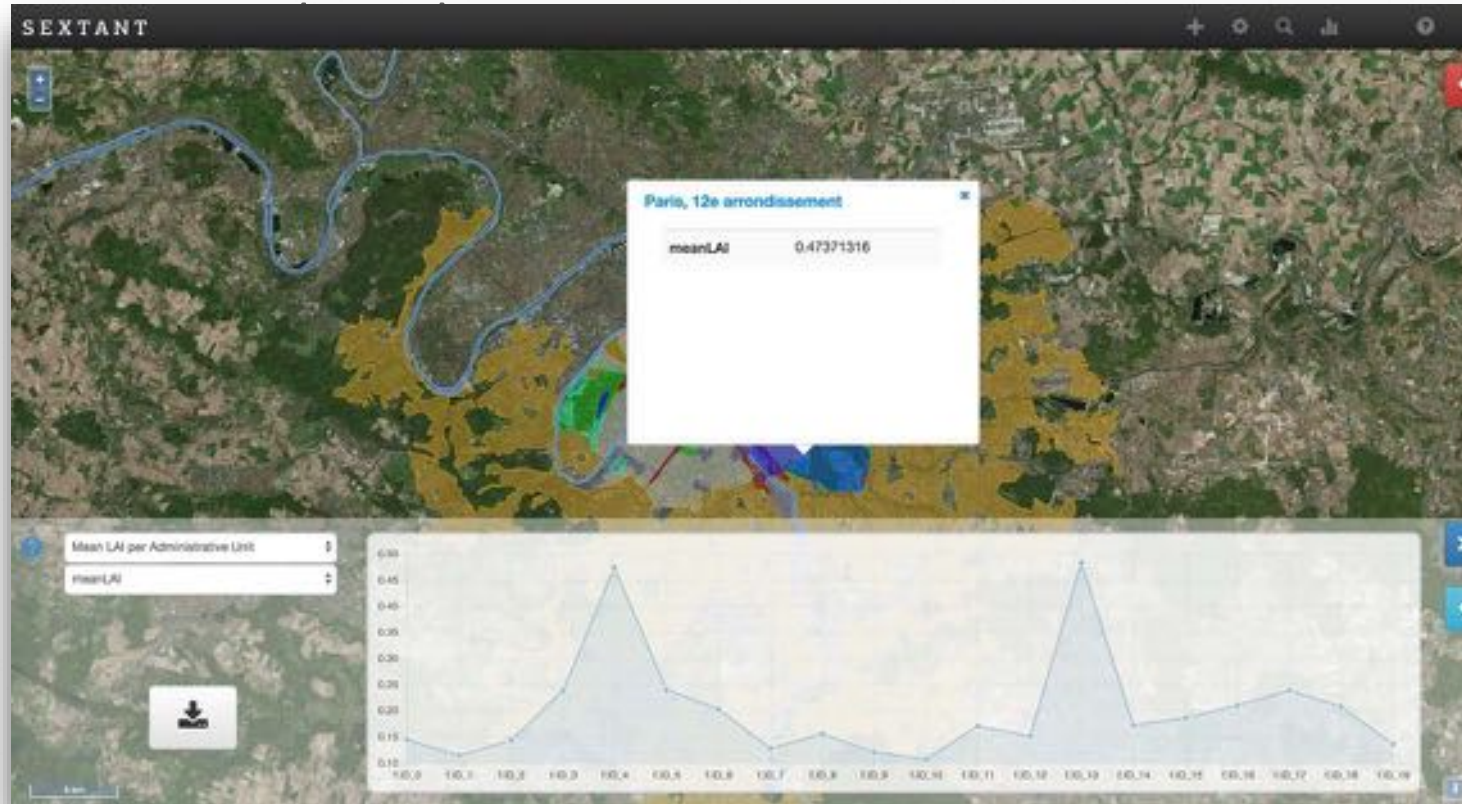
Select LAI values, their geometries and valid time.

Select Administrative Units

Filter Administrative Units that belong to Paris

Filter LAI values that are inside Paris

Examine within-city patterns, e.g. CLC vs. temporal urban



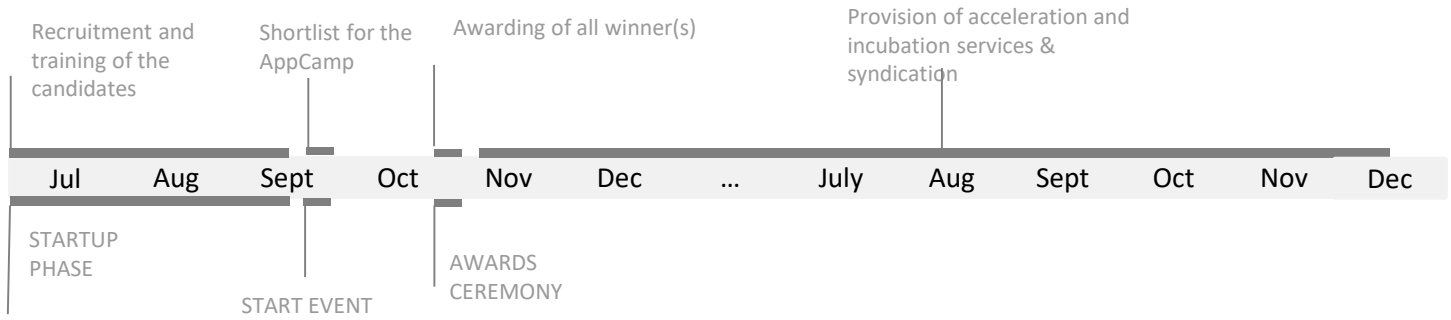
Launched in
2014

> 550
Participants

41.241
Hours of
Coding

> 70
Apps
developed

Example timeline of an typical event and RAMANI's role



RAMANI is

NEWS

ITC'S FIRST SPIN-OFF RAMANI FACILITATES PUBLIC USE OF EARTH OBSERVATION DATA

- 3 locations worldwide
- 6 FTE with a combined +35 year experience in Web 3.0 technology and Geospatial data



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I: [Resume](#)

