



# URBAN CLIMATE SERVICES REQUIREMENTS AND INSPIRE DATA ON-GOING WORK IN THE URCLIM PROJECT

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### Workshop Use of INSPIRE data

Warsaw, November 28th 2018



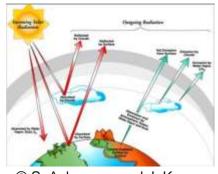








### CLIMATE SERVICES, WHAT ARE THEY?



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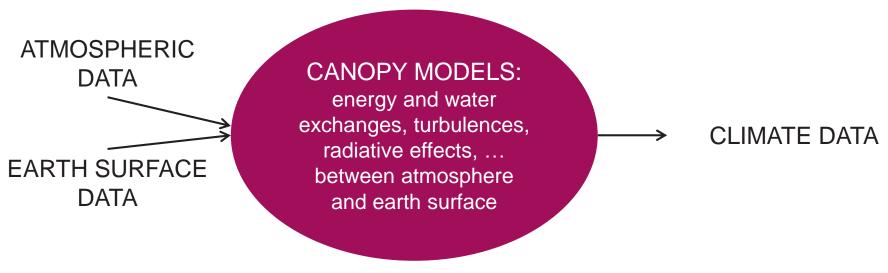
Need for knowledge related to global/meso/micro climate dynamics and to adaptation strategy efficiency,

...communicated through climate services in a way that it is scientifically sound and easily understood,

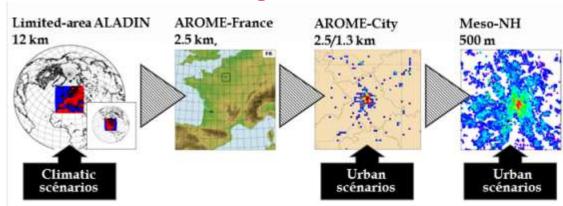
...for research, for operational decision-support, for public awareness.



### CANOPY MODELS AND DOWNSCALLING



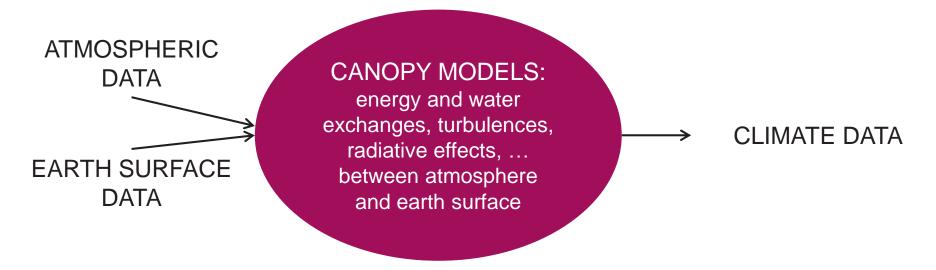
#### Global →regional →local







### CANOPY MODELS AND INTEROPERABILITY REQUIREMENTS

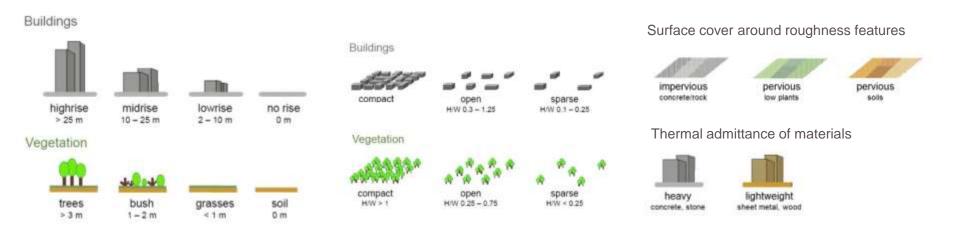


Need for comparable climate data across the world and across time (millesimal data)

### The climate community designs:

- reusable canopy modules,
- de facto standards for earth surface data (content and production process)

### A DE FACTO STANDARD FOR LOCAL EARTH SURFACE DATA: LOCAL CLIMATE ZONES (LCZ)

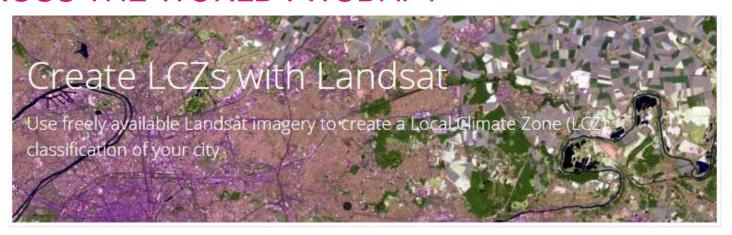


Stewart and Oke 2012: a defacto standard to depict earth surface in homogeneous components for many local canopy modules.

IGN

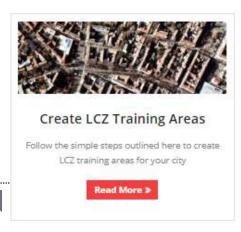
04/12/2018

# A PLATFORM ENSURING COLLABORATIVE AND HOMOGENEOUS ENOUGH PRODUCTION OF LCZ DATA ACROSS THE WORLD: WUDAPT



The World Urban Database and Access Portal Tools project is a community-based project to gather a census of cities around the world. Come join us!

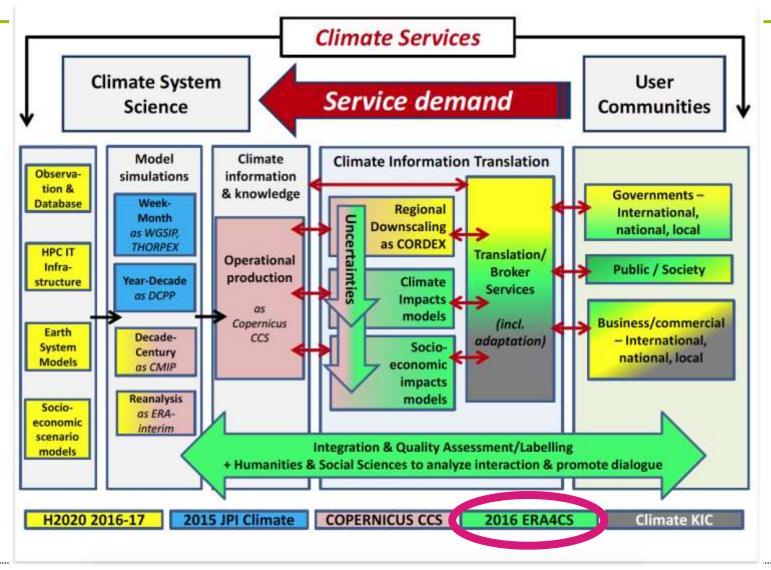








#### AN ERANET FOR R&D IN CLIMATE SERVICES : ERA4CS























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### URCLIM: URBAN CLIMATE SERVICES DESIGN

How cities interact with local meso climate flows to generate micro-climates (scale: the city block)?

How efficient are adaptation strategies currently adopted?



Titre de la présentation 04/12/2018

### URCLIM (2017-2020) AMBITION

To prove the concept of integrated Urban Climate Services (UCS) to model several phenomena related to micro-climates (urban heat islands, extreme precipitations, snow and ice events, air quality)



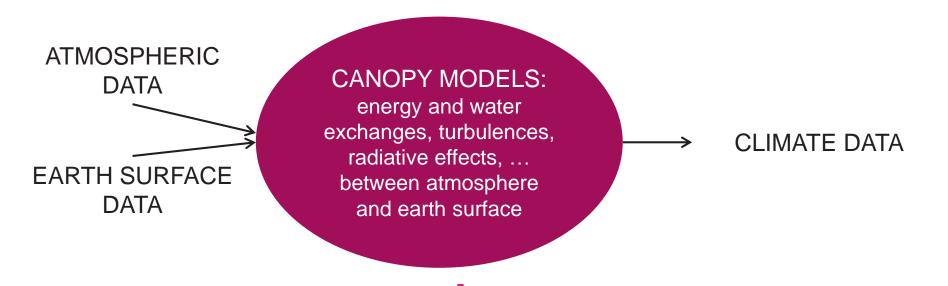
Thanks to downscalling methods and uncertainties assessment (down to a 100 meters grid, city block) and thanks to multi-criteria evaluation of adaptation strategies

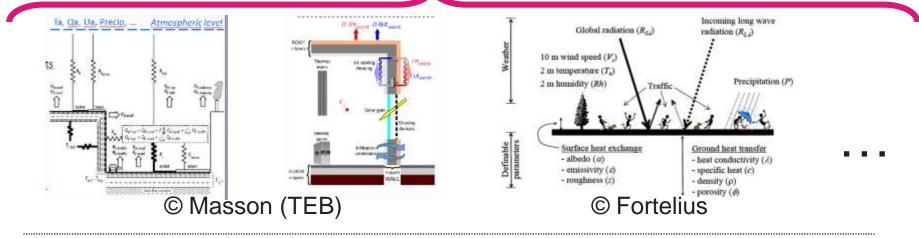
With reproducible enough methods across big cities in Europe (Toulouse, Ghent&Brussels, The Randstad, Helsinki, Bucarest) using open urban data to produce a specific urclim urban map as input to urban canopy models

Designing specific services –incl. co-visualisation- for decision support for urban planners and related stakeholders.

Titre de la présentation 04/12/2018

### LOCAL CANOPY MODULES USED IN URCLIM







### DESIGNING THE URCLIM URBAN MAP (~ URBAN LOCAL CLIMATE ZONES)

The URCLIM project wants to reuse a former result yielded by partners on France to include more morphological information and socio-economic elements

#### ... with INSPIRE-like data

Bocher, E., Petit, G., Bernard, J., Palominos, S.. A geoprocessing framework to compute urban indicators: The MApUCE tools chain. Urban Climate, Elsevier, 2018, 24, pp.153-174.

data set	Description
BD Topo@	Topographic data, in vector format, provided by the French National Geographical Institute (IGN) (see http://prof-sesionsels.ign.fr/bdtopo). The data are classified in ten topos. Each topic contains a set of layers distributed in a GIS the format. e.g. "IWILD- ING" thems includes undefined, industrial or remach- sible building layers.
Parcele	Cadastral parcels, in vector format, provided by ECN (see http://professionnels.igs.fr/ bdparcellaire)
Gridded population	This data set depicts the distribution of human popula- tion across the french territory. The data is distributed by the French National Institute for Statistics and Eco- comic Studies (INSEE) (see https://www.insee.fr/ sc/accustl)
IRIS contouring	The BBS contouring contains a set of polygons that rep- resents as area of 2,000 grouping inhabitants. The tue- dian area is about 749 ha, and maximal size is of 26,700 ha. This data set is provided by KIN.

Table 1. Jupan spatial data sets used by the MApUCE tool chain

data set	Description
Households survey	The french households survey is provided by the Na- tional Institute of Statistics and Economies and Stadies (DSSEE). This survey is linked to the BRS contouring thanks to a key index.

Table 2: Input statistical data set used by MAyUCE tool chain

Buildings: height, nb of levels, nb of inhabitants, floor\_area, volume, perimeter, convexhull, form factor, number of neighbor, walls area, ...

Spatial units (voronoi): vegetation area, roads area, roads length, sidewalkd length, hydrographic area, hydrographic length, nb inhabitant, nb households principal residence, nb households in collective housing

Municipalities: urban fabric typology (dominant in the municipality)



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	French National Geographical Institute (IGN) (see

Buildings: height, nb of levels, nb of inhabitants, floor\_area, volume, perimeter,

How to propose a method to yield such data, in a comparable form across space and time (in terms of data content but also production process)?

	bdparcellaire)
Gridded population	This data set depicts the distribution of human popula- tion across the french territory. The data is distributed by the French National Institute for Statistics and Eco- comic Studies (INSEE) (see <a href="https://www.insee.fr/&lt;br&gt;em/accusil">https://www.insee.fr/ em/accusil</a> ).
IRIS contouring	The IHIS contouring contains a set of polygons that rep- resents an area of 2,000 grouping inhabitants. The me- dian area is about 740 ha, and maximal size is of 26,700 ha. This data set is provided by IGN.

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area, roads length, sidewalkd length, hydrographic area, hydrographic length, nb inhabitant, nb households principal residence, nb households in collective housing

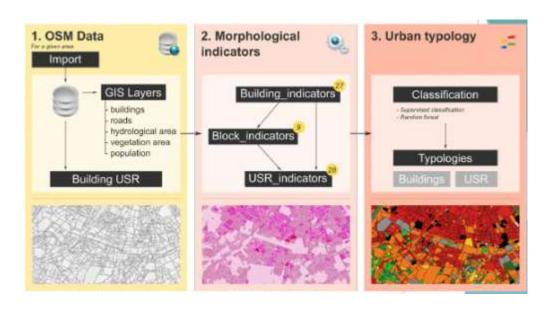
Municipalities: urban fabric typology (dominant in the municipality)



### APPROACH 1 : DESIGN A GENERIC PIPELINE BASED ON OPEN DATA

### Approach investigated by Bocher et al. 2018:

- Adapt the french MAPUCE model to OSM data,
- Design a WPS chain distributed on the cloud,
- Get volunteers to produce the data



Titre de la présentation 04/12/2018

# APPROACH 2 : DESIGN A COLLABORATIVE CATALOGUES OF « RECIPES », INCL. LINEAGE METADATA DOCUMENTATION

Adopt a brokering approach rather than single pipeline Inspired by current successful social platforms.





URCLIM infolab: a collaborative platform to exchange knowledge (recipes and clues) so that each partner can produce the data he needs based on 1) available reusable data on his specific city and 2) on the others experience







### URCLIM INFOLAB IMPLEMENTATION (ON-GOING), CONNECTED TO A EUROSDR PLATFORM

#### Why a EuroSDR platform?

- Share our learnings about user requirements,
- Use the network to help adapt a process description from one country to another
- Prototype the design of a technology neutral, scientifically sound, user legible, uncertainty anagement

framework Log in GM Read View source View history Search GeoMetaDahii ab Page Discussion Labs Infolab URCLIM " Georesources of potential interest to URCLIM collaboratively built list of data and software that can yield features of respect to URCLIM requirements Main page \* URCLIMinfoRequirements : description of climate change scientist need for geoinformation **URCLIM Infolab** Historical and Time \* Write a review to share your experience about using specific data or software. Stamped Data Infolab \* All georesources already referenced on the platform \* Reference a new georesource (data or software of potential interest) Upload He/image Special pages What is URCLIM? Recent changes URCLIM@ is a European project on Climate services for scientists and urban stakeholders which specifically addresses : m scaling and uncertainty management. URCLIM approach comprises the usage of precise spatial urban data (especially ope

legal data) in several steps briefly summarized herefater

source data and processing software

to improve the resolution of scientific simulation models by using more resolute input data. This is referred to in URCLIN
resolution urban map which can be either available directly in the required format for scientific models or can be derived.



#### CONCLUSION

Climate services: an important use case for INSPIRE data

OSM: a community of developers that contribute a lot to demonstrating the added value of structured data.

• We should collaborate based on our respective assets

### Reproducibility accross Europe:

- Obesign a process fed with ELF-ELS (on-going at IGN-F... we need help),
- Oculd ELS also mediate with a « non authoritative open data layer »?

Reproducibility accross time: sampling European 2000 years history for comparable facts = the futur great challenge? https://timemachine.eu/

23/11/2018





# THANK YOU FOR YOUR ATTENTION

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