contact: project.urclim@meteo.fr

WEBSITE

URCLIM

The news !

URCLIM newsletter | Issue 2| December 2018

Edito

Its been more than a year now since URCLIM started. Great work has been achieved. WP2 on Urban mapping is pretty much advanced, and the consortium will soon be able to implement Urban mapping into TEB model to evaluate the impact of climate. WP3 is already finished in 6 months, which truly is a big achievement. The consortium is now ready to tackle WP5 on scenarios identification. This first year was pretty busy but partners succeeding in working all together which is encouraging for the coming months.

Yours sincerely,

Upcoming project event(s)

SC #5: The fifth Steering Committee will be organized in January 2019. The date still has to be fixed.

Upcoming events and seminar

- Valéry Masson (URCLIM coordinator) will take part in the 2018 edition of PLEA, in Hong-Kong, 8-12 December 2018.

Members of the consortium on September, 25, 2018 at Météo-France, Toulouse for the Second General Assembly of the project @C.Ciais

URCLIM Second General Assembly

This year, the second General assembly of URCLIM project took place in Toulouse, France at Météo-France. It was a 2 days event organized on September 25-26 where members from all partner organizations joined. The first day was dedicated to discussions on the latest achievements. But also, to recap all that has been done since the project started. The second day was divided into two parts: break sessions were organized in the morning for partners to split in groups and discuss WP2 (Urban Planning) and, the other group WP3 (Methods for impacts assessment and uncertainty estimation). On the afternoon, trainings were organized. Jean-Christophe Calvet and Catherine Meurey (Météo-France) presented ECOCLIMAP SG and provided practical exercices. Then Bénédicte Bucher gave a talk on the Infolab webinar she organized earlier in September. It was decided during this event that the next General Assembly should be hold in Helsinki at the Finnish Meteorological Institute during Spring 2019.

Recruitment

IGN is recruiting a Postdoc « Climate & spatial data visualization »

IGN-France is offering an 18 months contract for a Postdoc on « Climate & spatial data visualization ». The Postdoc will join the GeoVIS Team at IGN-LaSTIG in Saint-Mandé (close to Paris. The Postdoc is expected to start in december 2018 or early 2019

For more details please visit our website or contact Sidonie Christophe

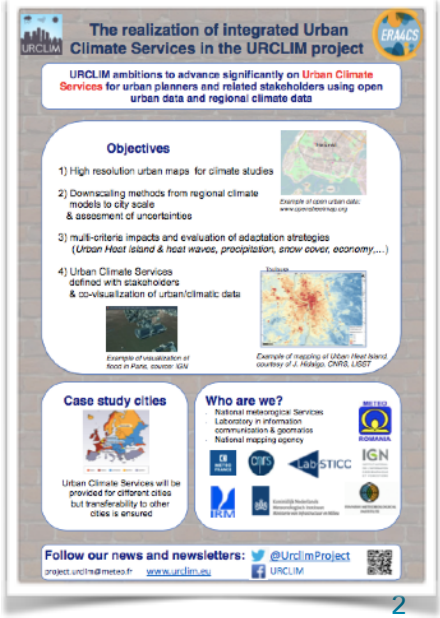
« Open source Geospatial Research & education Symposium 2018 », Lugano, Switzerland. 9-11 October 2018 - by J.Lao (Labsticc)

OGRS is a biennial meeting dedicated to sharing knowledge, solutions, methods, practices, ideas and trends in the field of geospatial information through the use of free and Open source software in both research and education.

Given that the aim of WP2 is to build an open urban mapping methodology by the use of Open geographic data, Lab-STICC team seized the opportunity to highlight its work to peers of the open Geographic Information Science community. Jonathan Lao presented the ongoing work of URCLIM WP2.2 by focusing the talk on the geoprocessing chain. The support of the talk is available on the HAL Open-access platform : https://halshs.archives-ouvertes.fr/halshs-01898612.

Climateurope festival, Belgrade, Serbia. 17-19 October 2018

A poster of URCLIM was presented by RMI during the Climateurope festival which took place in Belgrade in October.



Portraits of partners

Who is really working on the project ? Get to know two persons from URCLIM team!

This time, we are meeting Benjamin Le Roy, a PhD student at Météo-France and Liliana Vela, Senior Researcher at Meteo-Romania.

Benjamin Le Roy, Météo-France

1) Hello Benjamin, Could you tell us more about yourself ?

My name is Benjamin Le Roy and I'm currently a PhD student at Météo-France under the supervision of Aude Lemonsu in the *VILLE* team. I studied physical geography and it is how I developed an interest in climatology. During my masters' internships I had the chance to work on the use of satellite imagery for urban climate services, notably the estimation of the *Surface Urban Heat Island* phenomenon. These experiences sparked my interest in both urban climatology on the scientific side and also being able to work with stakeholders and decision makers on a more societal side.

2) What are you doing in the context of URCLIM project?

My PhD work meets with URCLIM topic, and can be divided in three main axes.

A first step, part of the *Methods for impact assessment* group, consists in the development of indicators specific to the urban climate. In my case, I study the potential of spatialized data on the city of Paris such as: infrared satellite imagery or weather stations interpolation for the surface and air *Urban Heat Island* effect and the use of radar analysis for the impact of the city on precipitation. We can then use these indicators to evaluate the ability of climate models to simulate the urban climate at different scales.

The second step of my thesis is to apply a statistical downscaling methodology based on weather types to regional climate models to simulate the urban climate under climate change with various models and scenarios. The goal is to be able to quantify the associated uncertainties.

Lastly, as part of the *Evaluation of strategies* group, I will use the indicators developed before to quantify the potential impacts of climate change on the urban climate under different urbanization scenarios, urban planning strategies.

3) What do you expect from URCLIM?

I hope that URCLIM project will be able to show the interest and possibilities of the urban climate study for urban planners, decision makers and stakeholders through the development of various tools ranging from high resolution urban maps to impact study methodologies. For me the final goal would be the implementation and the use of URCLIM results in urban planning.

Liliana Velea, Meteo-Romania

1) Hi Liliana, could you tell us more of your background ?

I am a senior researcher in the Climate Department at the National Meteorological Administration in Romania (MeteoRo) and my recent activity focused on studies relating climate changes and societal impacts, as well as on early-stage development of climate services and products.

2) In what consist your job regarding URCLIM?

My contribution to URCLIM project lays down on the analysis of thermal discomfort, risk assessment related to heat-wave events, urban climate change scenarios as basis for climate services.

3) Great ! And what do you think about the project's outcomes?

I think URCLIM has a huge potential to develop and deliver enhanced information needed to build up specific and efficient adaptation measures in urban areas. Given the impressive enthusiasm and passion for science of all colleagues involved in this project, I am confident that URCLIM will reach its objectives, making a significant contribution in this area.

Issue #2 article: LES modeling in Helsinki - by Antti Hellsten and Mona Kurppa (FMI)

Air quality in a city boulevard affected by surrounding buildings

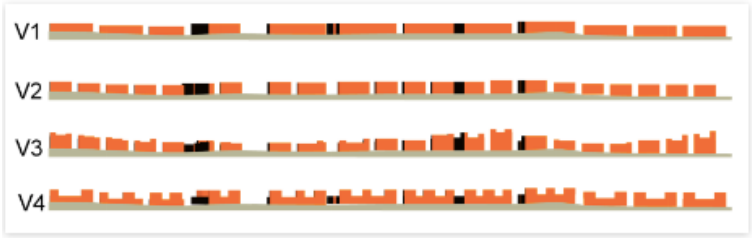
The Finnish Meteorological Institute and the University of Helsinki have used supercomputers to investigate what kinds of building block structures should be built along future city boulevards planned in Helsinki in order to limit the adverse effects of street traffic emissions on air quality as much as possible.

In this study we have demonstrated the utility of LES-modelling in computing urban concentrations at very high spatial resolutions, as required in URCLIM WP3. The demonstrated numerical methodology can be used to assess a wide range of future scenarios, including alterations to the urban boundary layer energy and momentum balance arising due to climate change or modifications to the urban plan.

The new Helsinki City master plan includes areas of new city development where the aim is to change the existing access routes inside the Ring Road I into urban boulevards lined with residential and commercial buildings. According to the study conducted by the Finnish Meteorological Institute and the University of Helsinki, the structure of the building blocks surrounding the boulevard streets has a significant impact on the air quality in the local streets. The study compared four different types of building blocks and one of the solutions proved to be clearly better than the others in this respect.

***Block models studied: V1 – V4**. In the top picture the colour indicates the height of the buildings and the ground. The darkest shade of green represents the maximum height. The picture below describes the cross sections of the building block models. The study indicated that block model V3 was best for overall ventilation and reducing street traffic induced air pollution both in the most commonly occurring weather conditions and most ventilation-inhibiting meteorological conditions.*

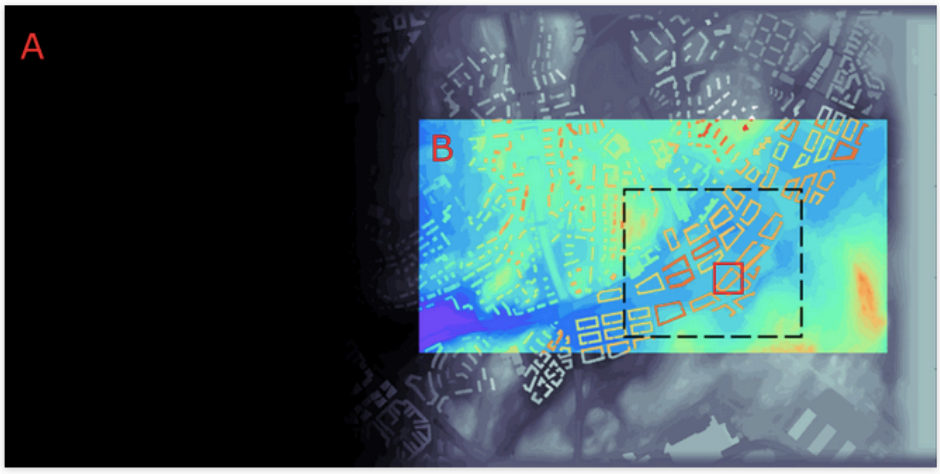
Project URCLIM is part of ERA4CS, an ERA-NET initiated by JPI Climate and is co-funded by the European Union (Grant 690462)



"The best solution in terms of air quality are building blocks of different heights, which contribute to the transfer of air pollution from the street level. In this solution, the short façades of the blocks face the boulevard and the height of the blocks varies gradually from one block to the other in the direction of the street," says Finnish Meteorological Institute researcher Antti Hellsten. More efficient ventilation reduces concentrations of harmful pollutants to which people are exposed at street level. According to the modelling this sort of construction method allows the air to flow providing good ventilation.

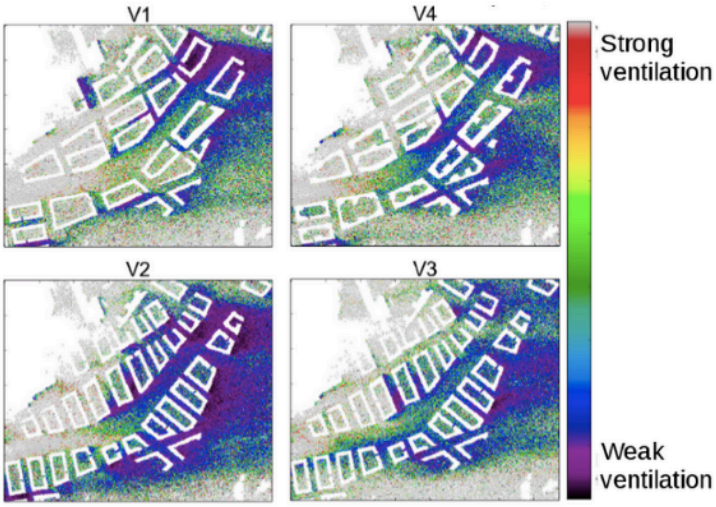
Supercomputers make exceptionally detailed dispersion modelling possible

Such detailed air pollution dispersion modelling in an urban environment has not been carried out anywhere else in the world. The area of study was focussed on four theoretical urban boulevard plans drawn up for the Hämeenlinnanväylä area. The simulations were made at the Finnish Meteorological Institute on a Cray XC30 supercomputer running four hundred computing processes in parallel. In the study the air flow and its entrained air pollutant concentrations were modelled using a self-nested large-eddy simulation model.



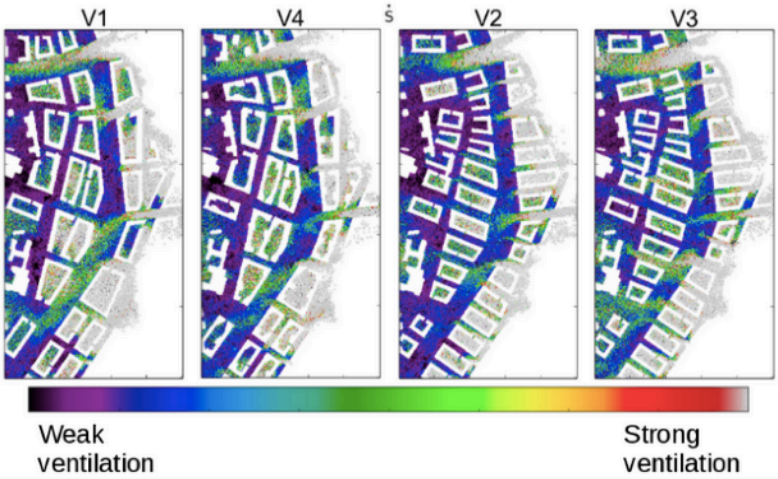
Increased resolution at the location of interest: A: Outer modelling domain comprising an area of 4 km x 2 km, with a resolution of 2 m. B: Inner modelling domain: area of 2 km x 1 km, described in the model at 1 m resolution

The study took into account not only the ground height and buildings but also the air braking effect of trees in the street and the surroundings, as well as the effect of the weather on the



ventilation. Both the weather conditions most common in the Helsinki region and the weather conditions expected to be the most ventilation inhibiting were included in the study scenarios (characterized by averaged wind direction, temperature near the ground surface, and the stratification of the atmosphere). Analysis of the model run results focused on pollutant concentration, vertical flux and ventilation efficiency.

Ventilation in common meteorological conditions: *average wind direction is from South-West, and ventilation is strongest at the South-West end of the studied boulevard in all building block configurations. Overall ventilation is the strongest with the V1 building block configuration and weakest in the V2 configuration. At the North end of the boulevard ventilation in the V1 configuration was weaker than in V4.The variation of ventilation of inner courts of the buildings was remarkably large.*



Ventilation-inhibiting meteorological conditions: *In this case clean air flows from the East and the side streets of the boulevard are efficiently ventilated, but the boulevard itself is not.*

The work was done in collaboration with the University of Helsinki's Research Division of Atmospheric Sciences, as well as the Helsinki Region Environmental Services Authority (HSY). The study was commissioned by the Helsinki City Planning Department. The study used methods developed for the Academy of Finland funded CityClim research project, as well as other methods.

Links

Link to the final project report: http://www.hel.fi/hel2/ksv/julkaisut/yos_2016-5.pdf

Link to an animation describing the wind field: https://youtu.be/hTi2HPikJvk

Link to an animation showing the migration of pollutant concentrations close to the street level: https://youtu.be/6HTeWcBy1Fw

Further information

Senior Research Scientist Antti Hellsten, Tel. 050 409 0477, antti.hellsten@fmi.fi

Researcher Mona Kurppa, Tel. 0400 991 944, mona.kurppa@helsinki.fi

Researcher Mikko Auvinen, Tel. 029 415 0714, mikko.auvinen@helsinki.fi

Project URCLIM is part of ERA4CS, an ERA-NET initiated by JPI Climate and is co-funded by the European Union (Grant 690462)