

Annual report 2021 for Flagship Pilot Study URB-RCC

Status and progress during the year including scientific highlights, end to end perspective and participants engaged in the project

- FPS URB-RCC was accepted by CORDEX-SAT ~February 2021
- The official start of the FPS was on 01 May 2021

Phase 1 of FPS URB-RCC milestones:

1) Created a Table with an overview of the partners and models, including detailed information about the urban schemes used/under development, model specifics, available observations for evaluation, and land surface input data.

2) Defined up to 10 scientific questions that could be answered with available data sets (e.g. CORDEX-CORE, EUCP/FPS CP, EURO-CORDEX). Started the data analysis of available simulations.

3) First draft of Protocol was developed for coordinated simulations by the protocol WG, and discussed during the 2nd FPS meeting.

4) City selection criteria were defined and potential candidate cities were discussed, as an input to the city selection table – which will be used to define the city(ies) for the coordinated simulations.

Participants:

Currently ~30 institutions involved (2/3 European), and 80 individuals signed up for the activity.

The FPS science advisory board recommended further partners from China and South-Africa, to mitigate the European bias. Fudan University (China), and the Institute of Urban Meteorology (IUM) CMA (China), Univ. Pretoria (S-Africa), and Ouranos (Canada) have confirmed to be partners of the project.

The FPS remains open for additional partners (particularly outside of EU-domain). Suggestions/support by CORDEX-SAT would be welcomed.

Summary of each workshop/activity held during the year

Title, date, short description, location, website, links	Responsible person/-s	Funder
<p>URB-RCC Kick-off workshop, virtual, 19-21 May 2021</p> <p><i>Over 50 participants from across the globe participated in the three-day event. The workshop was focused on getting to know the partners, sharing the science conducted within the different groups, and primarily discussed the initial steps of the first phase of the project. The latter aims to 1) gain an overview on the different urban parameterizations, models, and urban studies from the different partners; 2) conduct research on urban areas under climate change using existing simulations, primarily stemming from the CORDEX activities, and; 3) to draft a protocol for the coordinated simulations.</i></p>	<p>Tomas Halenka Gaby Langendijk</p>	<p>none</p>
<p>Protocol WG meeting (2x) 28 Oct 2021 11am-12.30pm 16 Dec 2021 2-3pm</p> <p><i>Drafting the first version of the protocol for coordinated simulations.</i></p>	<p>Eleni Katragkou, Bert v. Schaeybroeck, Mat Lipson, Miguel Nogueira, Pedro Soares, Tomas Halenka, Gaby Langendijk</p>	<p>None</p>
<p>2nd FPS meeting 2nd FPS URB-RCC meeting 13 & 14 January, virtual</p> <p><i>The second FPS URB-RCC meeting brought together the project partners to discuss the first draft of the coordinated experiment protocol, and the city selection criteria for the coordinated experiment. Furthermore, various science topics relevant to the main aims of the FPS were discussed that will be analysed based on existing data in the coming period.</i></p>	<p>Tomas Halenka Gaby Langendijk</p>	<p>None</p>

Publications

As the FPS project only started in May 2021, we provide a list of activity relevant papers of partners' teams from last two years. These publications did not originate directly from the FPS.

Title, journal and link to publication	Author/-s	Date
<p>A statistical-dynamical methodology to downscale regional climate projections to urban scale, J Appl Meteorol Climatol, 59(6), 1109-1123.</p>	<p>Duchêne, F., Van Schaeybroeck, B., Caluwaerts, S., De Troch, R., Hamdi, R., Termonia, P</p>	<p>2020</p>
<p>The "urban meteorology island": a multi-model ensemble analysis. ATMOSPHERIC CHEMISTRY AND PHYSICS, 20, 23, 15061-15077, 10.5194/acp-20-15061-2020, https://acp.copernicus.org/preprints/acp-2020-433/acp-2020-433.pdf</p>	<p>Karlicky, J, Huszar, P, Novakova, T, Belda, M, Svabik, F, Doubalova, J, Halenka, T,</p>	<p>2020</p>
<p>Validation of the PALM model system 6.0 in a real urban environment: a case study in Dejvice, Prague, the Czech Republic, GEOSCIENTIFIC MODEL DEVELOPMENT, 14, 8, 4797-4842, 10.5194/gmd-14-4797-2021,</p>	<p>Resler, J, Eben, K, Geletic, J, Krc, P, Rosecky, M, Suhring, M, Belda, M, Fuka, V, Halenka, T, Huszar, P, Karlicky, J, Benesova, N,</p>	<p>2021</p>

https://gmd.copernicus.org/preprints/gmd-2020-175/gmd-2020-175.pdf	Doubalova, J, Honzakova, K, Keder, J, Napravnikova, S, Vlcek, O	
An integrated approach to project the future urban climate response: Changes to Lisbon's urban heat island and temperature extremes. Urban Climate, 34, 100683.	Nogueira, M., Lima, D. C., & Soares, P. M.	2020
Impact of urban imperviousness on boundary layer meteorology and air chemistry on a regional scale. Meteorologische Zeitschrift, pp.349-367.	Fallmann, J., Barra, M., Kumar, V. and Tost, H.	2021
Resolving the influence of local flows on urban heat amplification during heatwaves. Environmental Research Letters. IOP Publishing, 16(6): 064066.	Hirsch AL, Evans JP, Thomas C, Conroy B, Hart MA, Lipson M, Ertler W.	2021
Added value of convection-permitting simulations for understanding future urban humidity extremes: case studies for Berlin and its surroundings. Weather and Climate Extremes, 33, 100367.	Langendijk, G. S., Rechid, D., Sieck, K., & Jacob, D.	2021
A statistical–dynamical downscaling methodology for the urban heat island applied to the EURO-CORDEX ensemble. Climate Dynamics, 1-22.	Le Roy, B., Lemonsu, A., & Schoetter, R.	2021
Impact of Urban Canopy Parameters on a Megacity's Modelled Thermal Environment. Atmosphere, 11(12), 1349.	Varentsov, M., Samsonov, T., & Demuzere, M.	2020

Planned activities for next year

- 1). Data analysis of available datasets (papers development), support preliminary answers to science questions of FPS (Phase 1B).
- 2). City selection for coordinated simulations (Phase 1C)
- 3). Protocol development & finalisation (Phase 1C)
- 4). 3rd FPS meeting (Sept/Oct) – probably virtual
- 5). Test experiments (possibly also start of 2023)

Additional relevant information

- Website created: https://ms.hereon.de/cordex_fps_urban/index.php.en
- FPS Mailing list & Wiki page (internal communication) started
- Presented FPS at: EGU/AGU/EMS/AMS
- Outreach to urban climate community, incl. IAUC newsletter publication: <http://www.urban-climate.org/wp-content/uploads/newsletter/IAUC080.pdf>
- Connection to LUCAS & CP FPS established
- Connection with HorizonEU project FOCl (accepted Jan. 2022)

- Connection to 2nd HorizonEU submitted proposal (Feb. 2022)

Contact person/-s

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If more space is needed just add rows in the table.

The report is due the 15th of February each year and should be sent to ipoc@cordex.org.