

20th July 2021

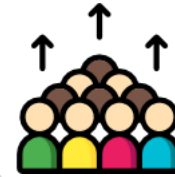
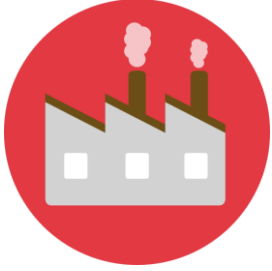
THE IMPORTANCE OF HIGH RESOLUTION CLIMATE DATA IN THE CONTEXT OF URBAN AREAS

FONDAZIONE EURO_MEDITERRANEAN CENTER ON CLIMATE CHANGE (CMCC)

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NEXUS BETWEEN CLIMATE CHANGE & URBAN AREAS



CLIMATE MODEL: FROM GLOBAL TO URBAN AND LOCAL SCALE

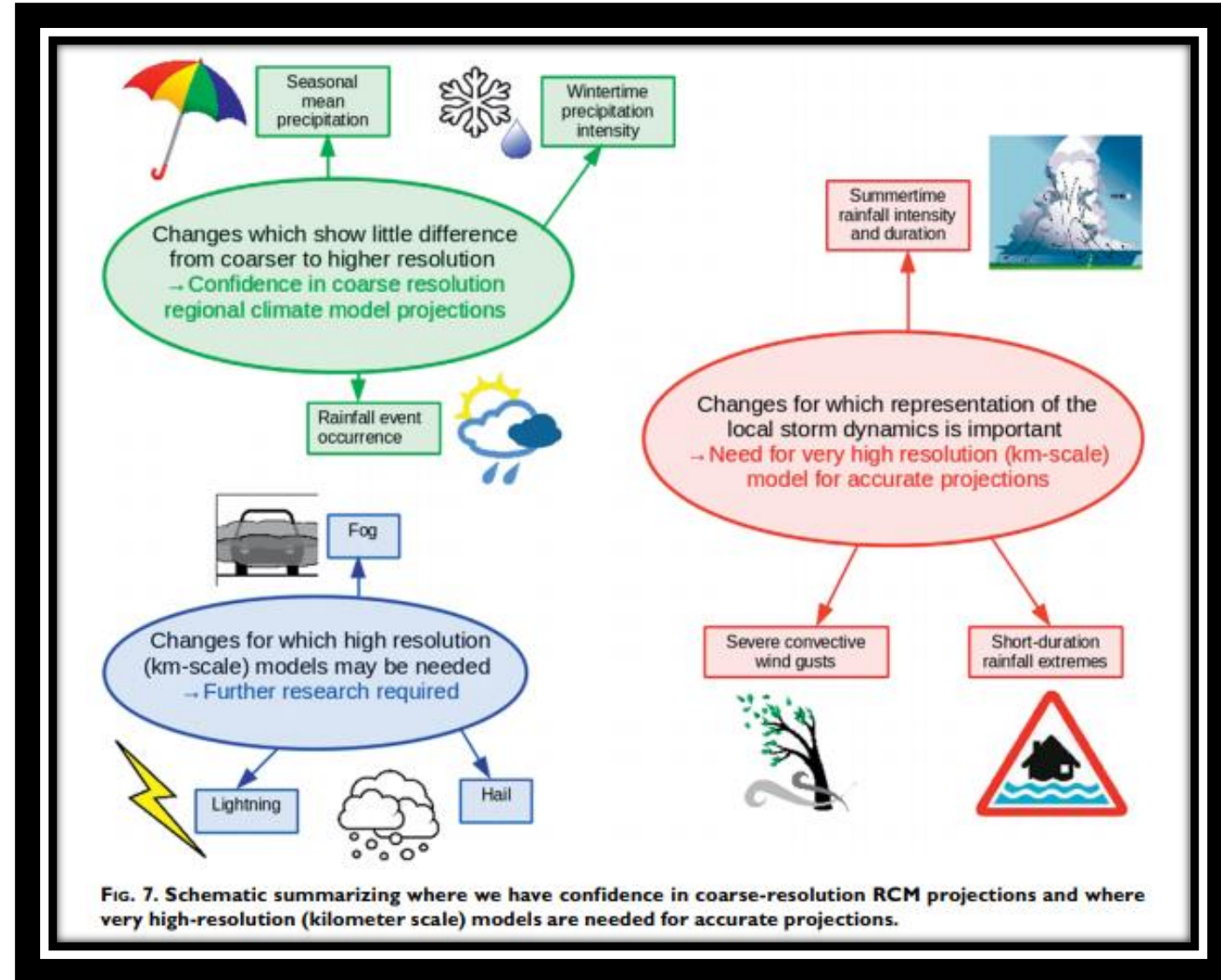
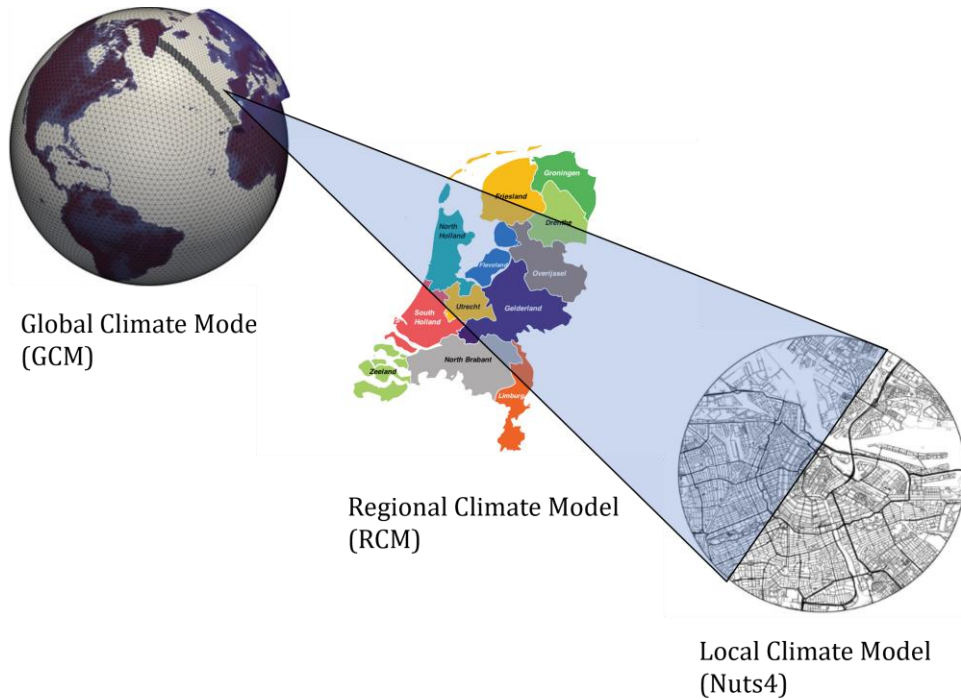
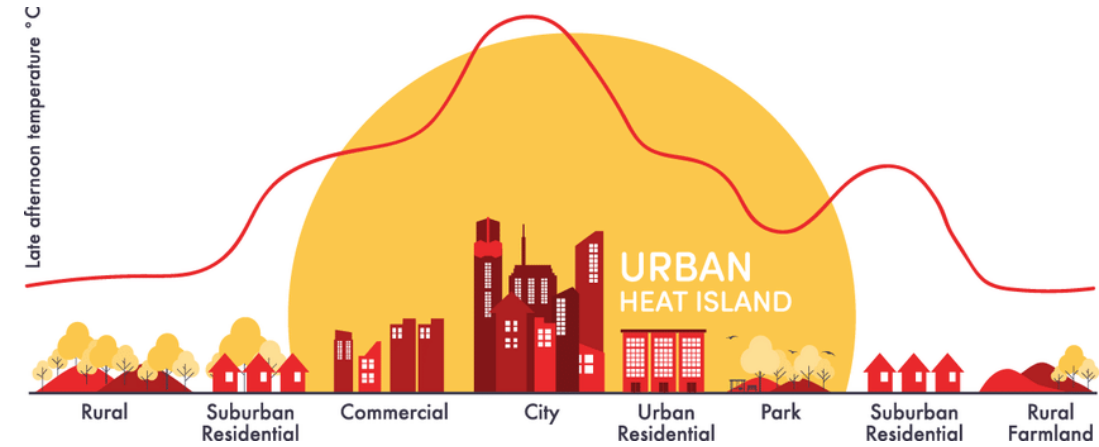


FIG. 7. Schematic summarizing where we have confidence in coarse-resolution RCM projections and where very high-resolution (kilometer scale) models are needed for accurate projections.

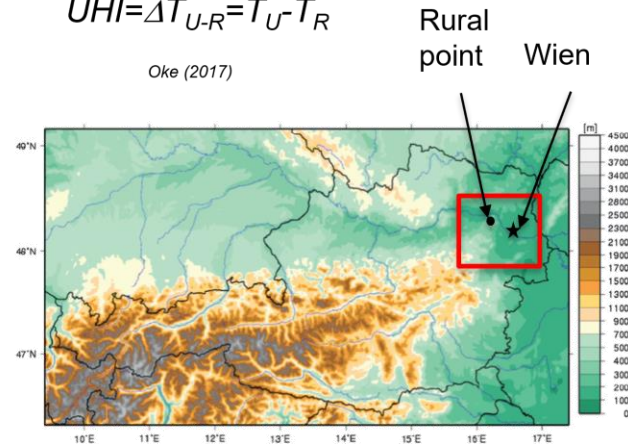
CLIMATE CHANGE IMPACTS on URBAN AREAS: HEAT WAVES



Urban heat island in Wien

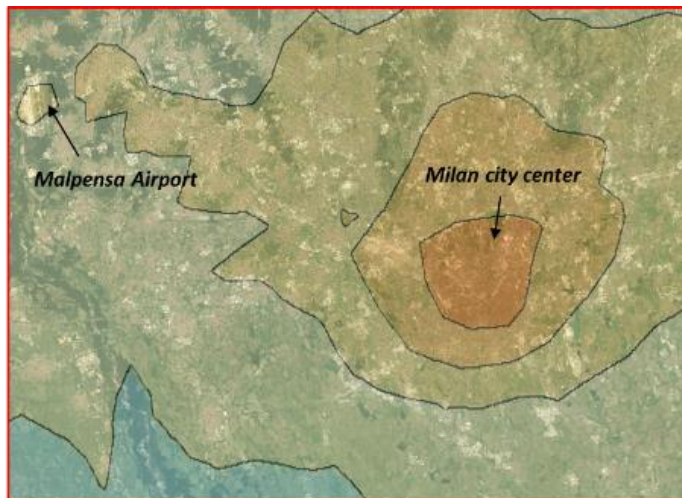
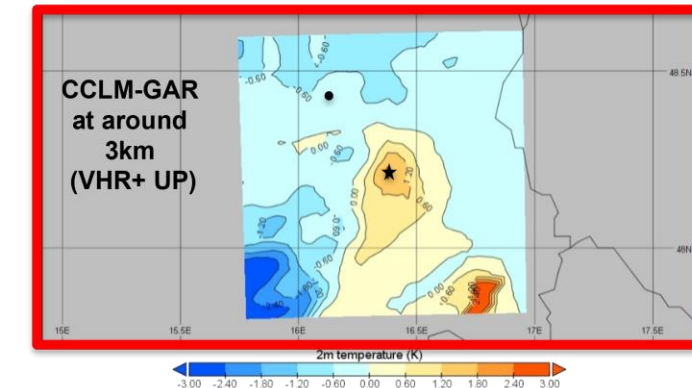
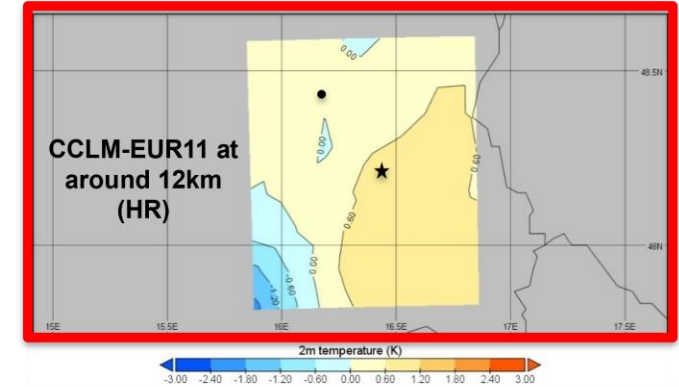
$$UHI = \Delta T_{U-R} = T_U - T_R$$

Oke (2017)

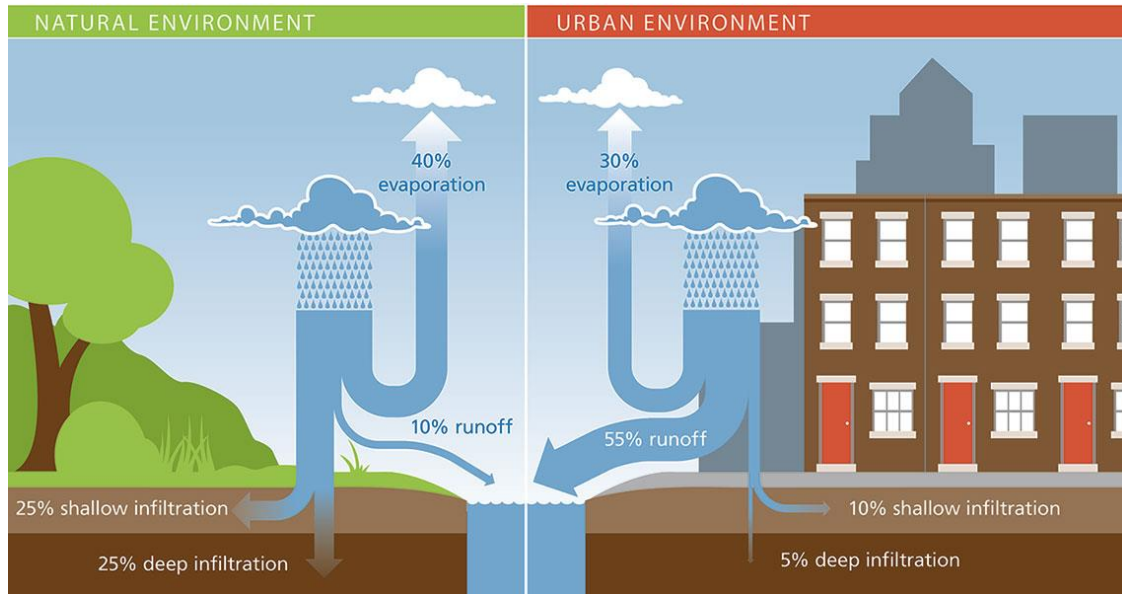


The UHI is only revealed by the VHR simulation while the HR one is not able to catch local dynamics due to the not inclusion of urban parameterization in the simulation and coarser resolution.

UHI in Wien on 12-02-2000 (night time 18:00-06:00)

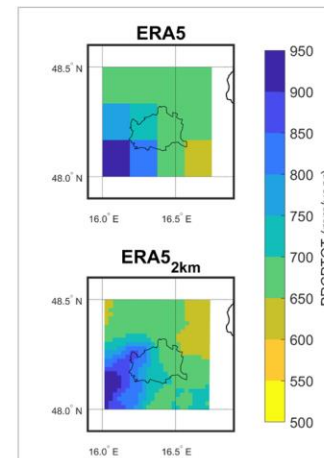


CLIMATE CHANGE IMPACTS on URBAN AREAS: FLOOD



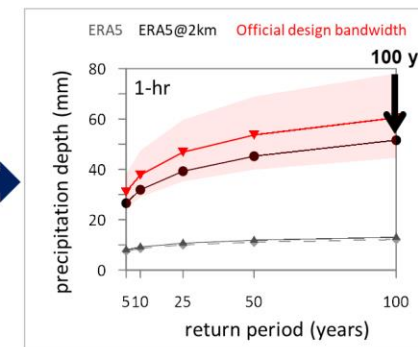
Evaluation of climate change risks is an important component of local adaptation decision-making

Step 1: ERA5 dynamically downscaled at 2 km



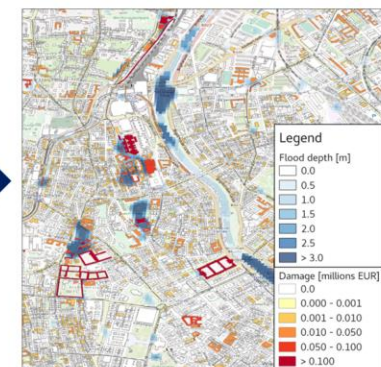
New ERA5@2km dataset over 1989-2018

Step 2: Intensity-Duration-Frequency curve at city scale



Official design bandwidth, <https://ehyd.gv.at/>

Step 3: Flood Risk Analysis

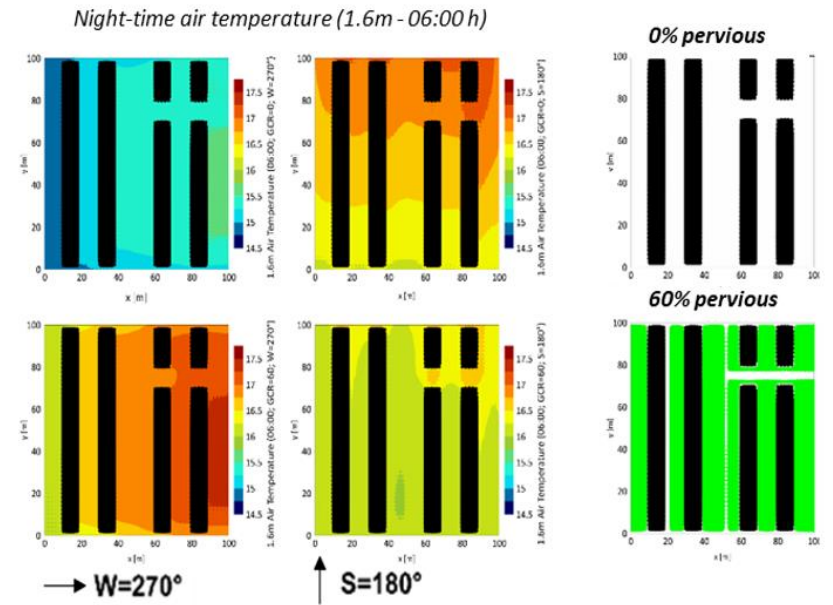
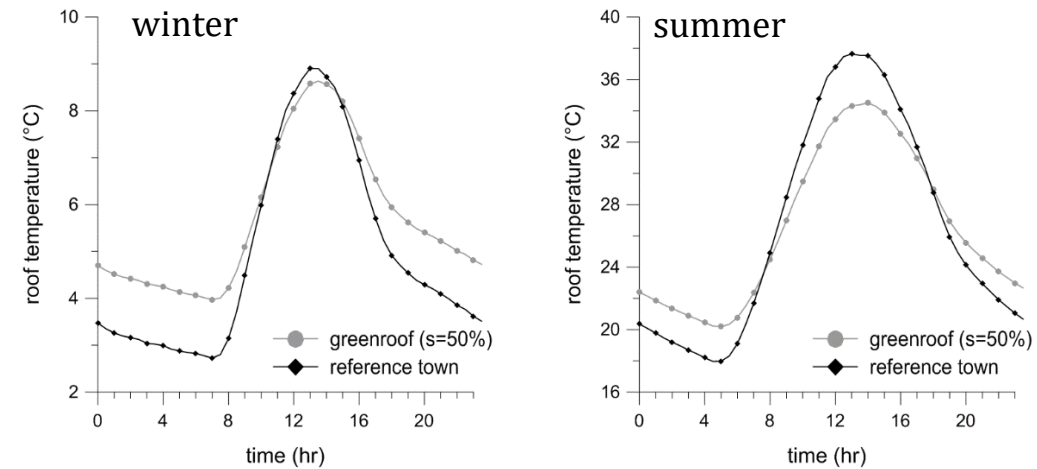


Flood depth and direct damages yielded for a precipitation depth with RP = 100 y (EU-DEM v1.1 as Digital Elevation Model)

SUPPORTING ADAPTATION OVER URBAN AREAS



Reference: <https://ramses-cities.eu/home/>



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QUESTIONS ?

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