# Modelling heat risks in **London** and **Barcelona**

ISGlobal
Barcelona Institute for Global Health

**Dr. Vijendra Ingole**
Program of Climate and Health - ISGlobal

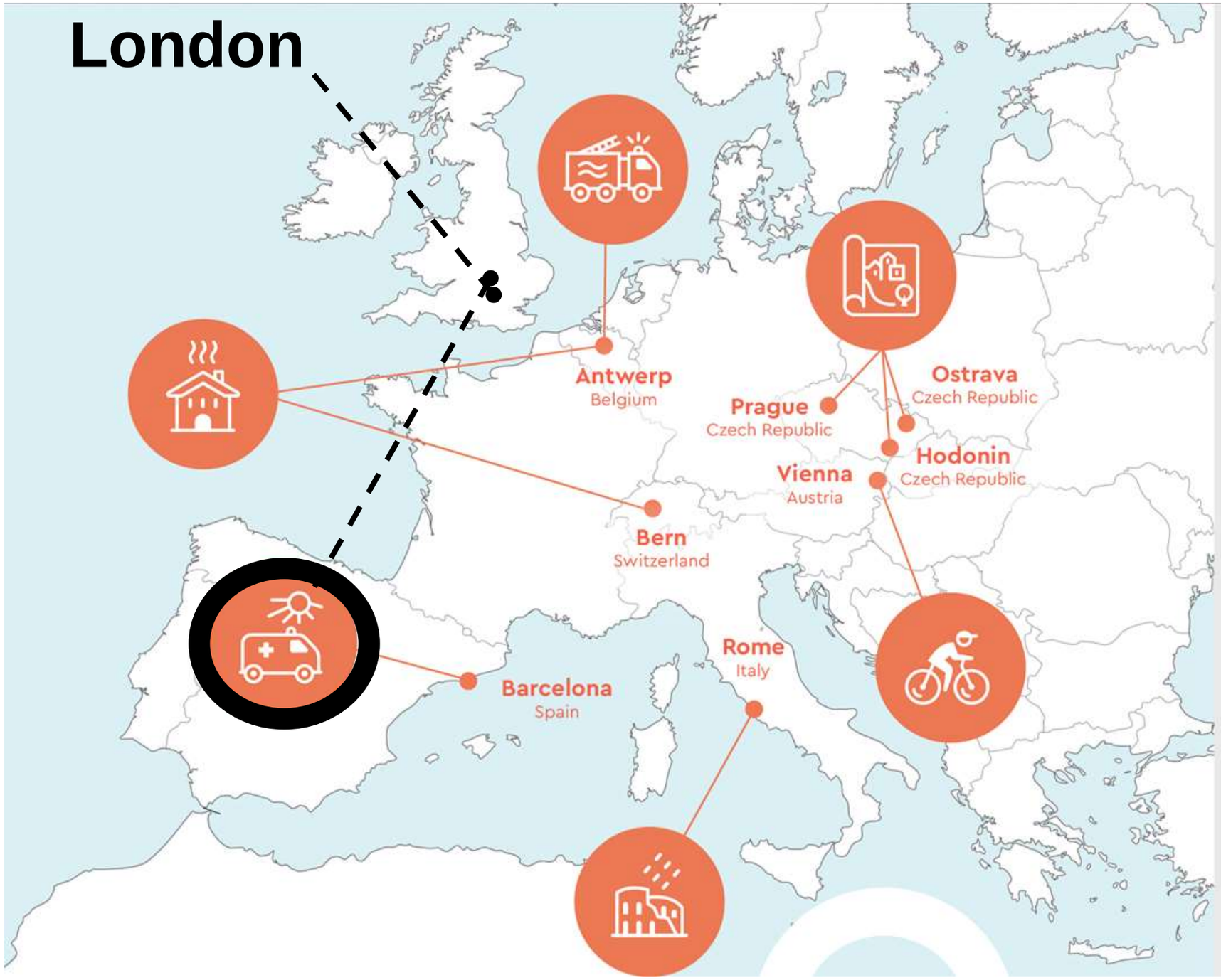
In collaboration with **Peninah Murage and Shakoor Hajat** (LSHTM), **Dirk Lauwaet and Filip Lefebre** (VITO), **Joan Ballester** and Anna Deluca Silberberg (ISGlobal), Marc Marí and Marcos Quijal (ASPB), Christophe Sarran (MetOffice)

# Climate Services for Health

Climate -fit.city | Experience the benefits of climate services

European Commission

## *Health* Service



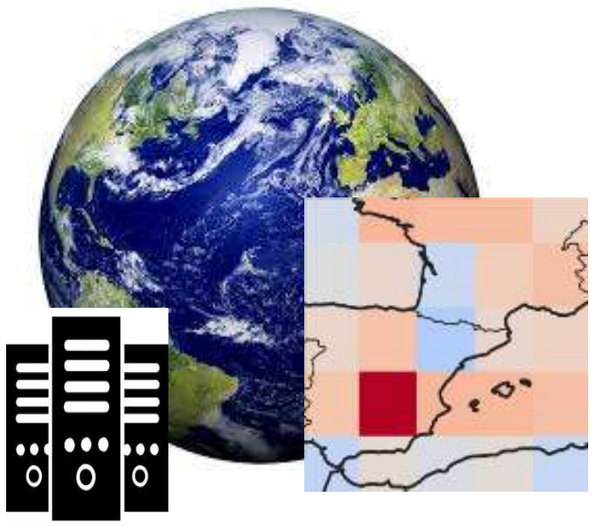

- Active mobility
- Building energy
- Cultural heritage
- Emergency planning
- **Health**
- Urban planning

Climate-fit.city is developed as part of the PUCS project, which has received funding from the European Union's H2020 Research and Innovation Programme under Grant Agreement No. 73004

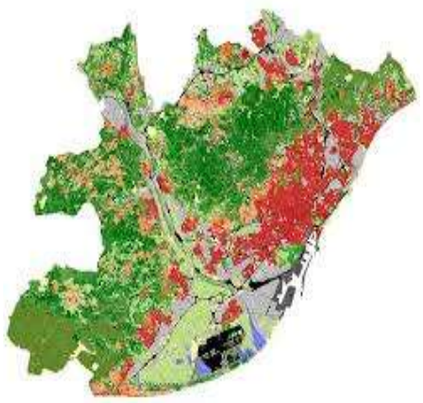
https://londonheat.shinyapps.io/climate-fit-city/

# Urban Climate Models

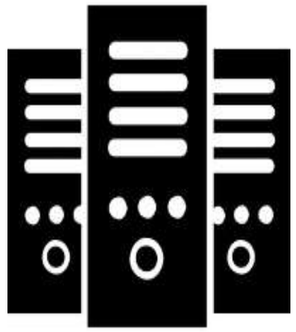
**Large-scale Climate information (80x80km/30x30km)**

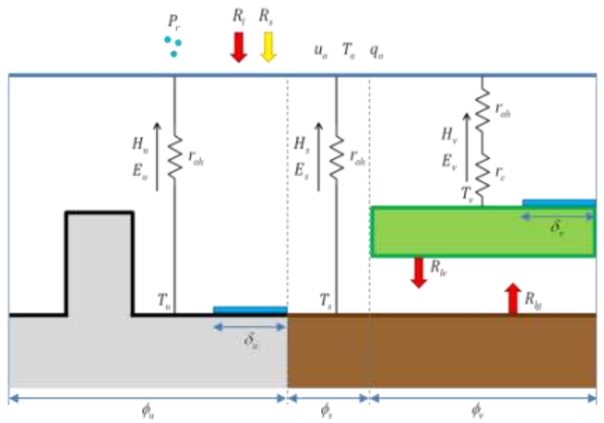


**Land Use Information < 100m**



**Climate Urban Modelling**



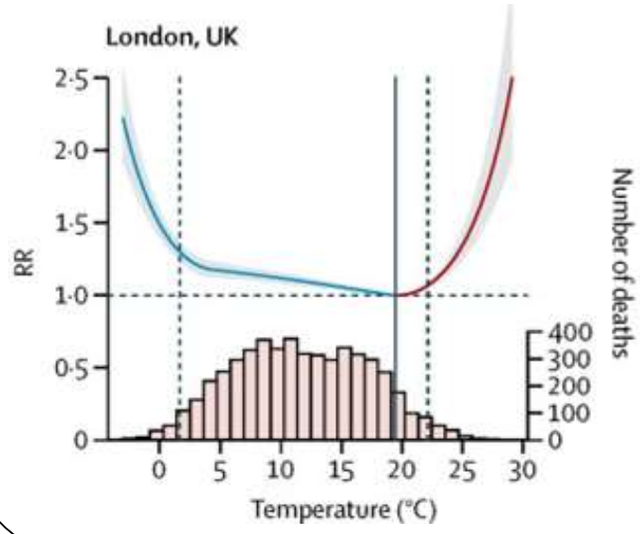


Our Maths and Physics best knowledge modelling 3 lower km of the atmosphere *boundary layer + surface scheme with urban physics*

vito

**Temperature and other variables at city scale**

**Health Impact Models**




Gasparrini et al. 2015, The Lancet.

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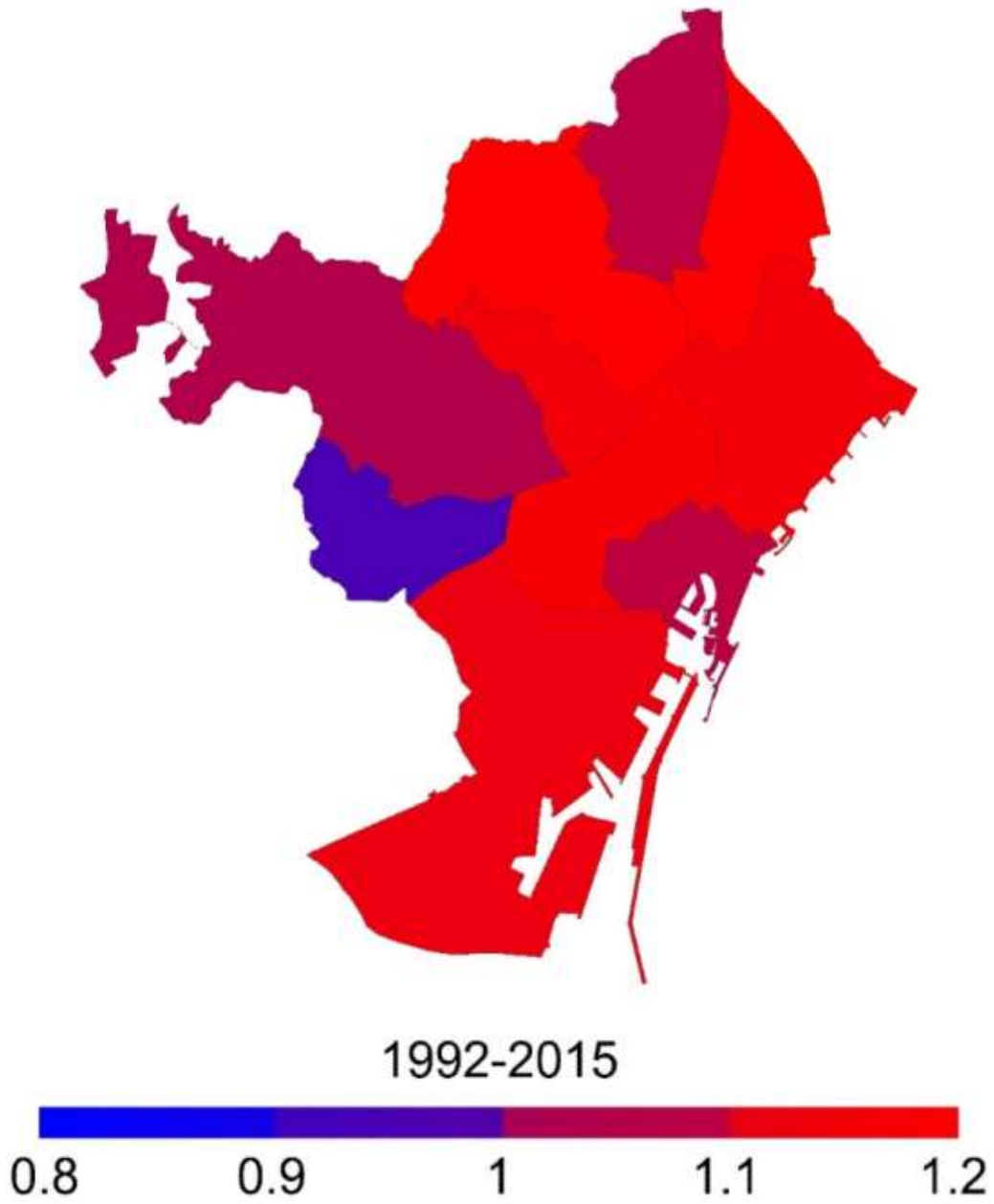
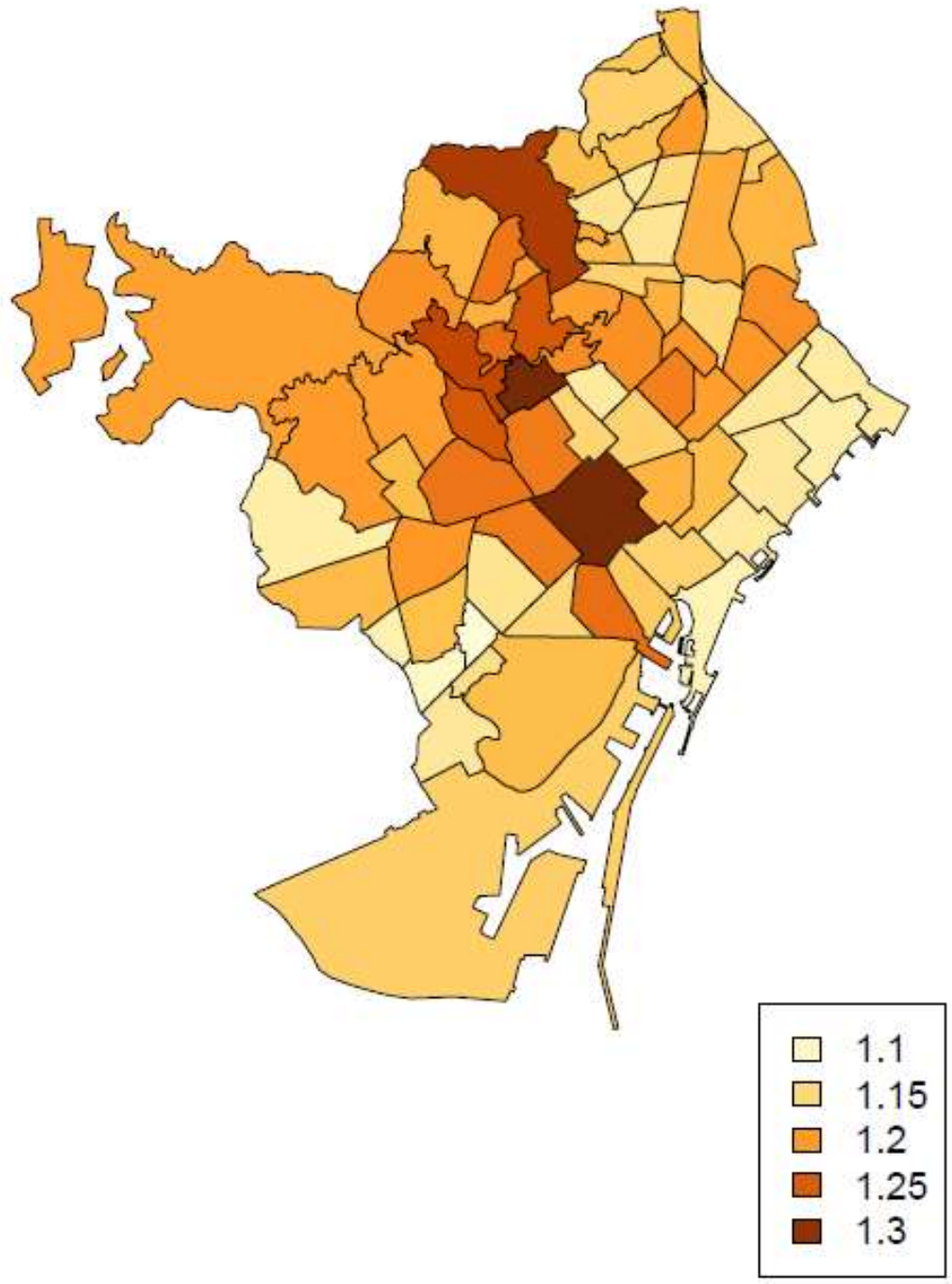
# *Spatial Variability in heat-related mortality in Barcelona*




District level




Neighbourhood level

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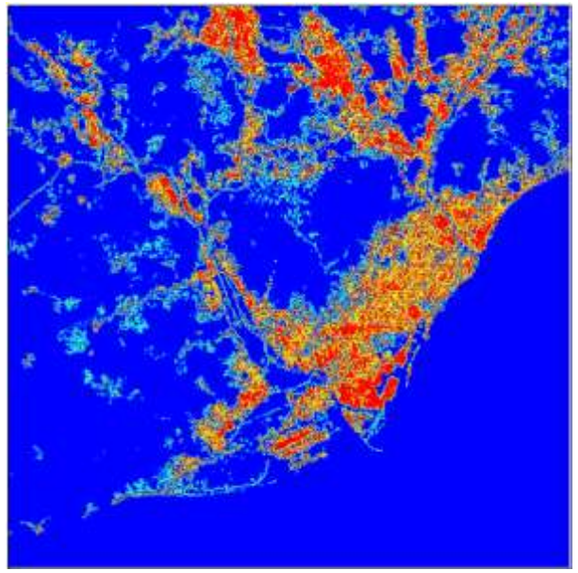
# Barcelona

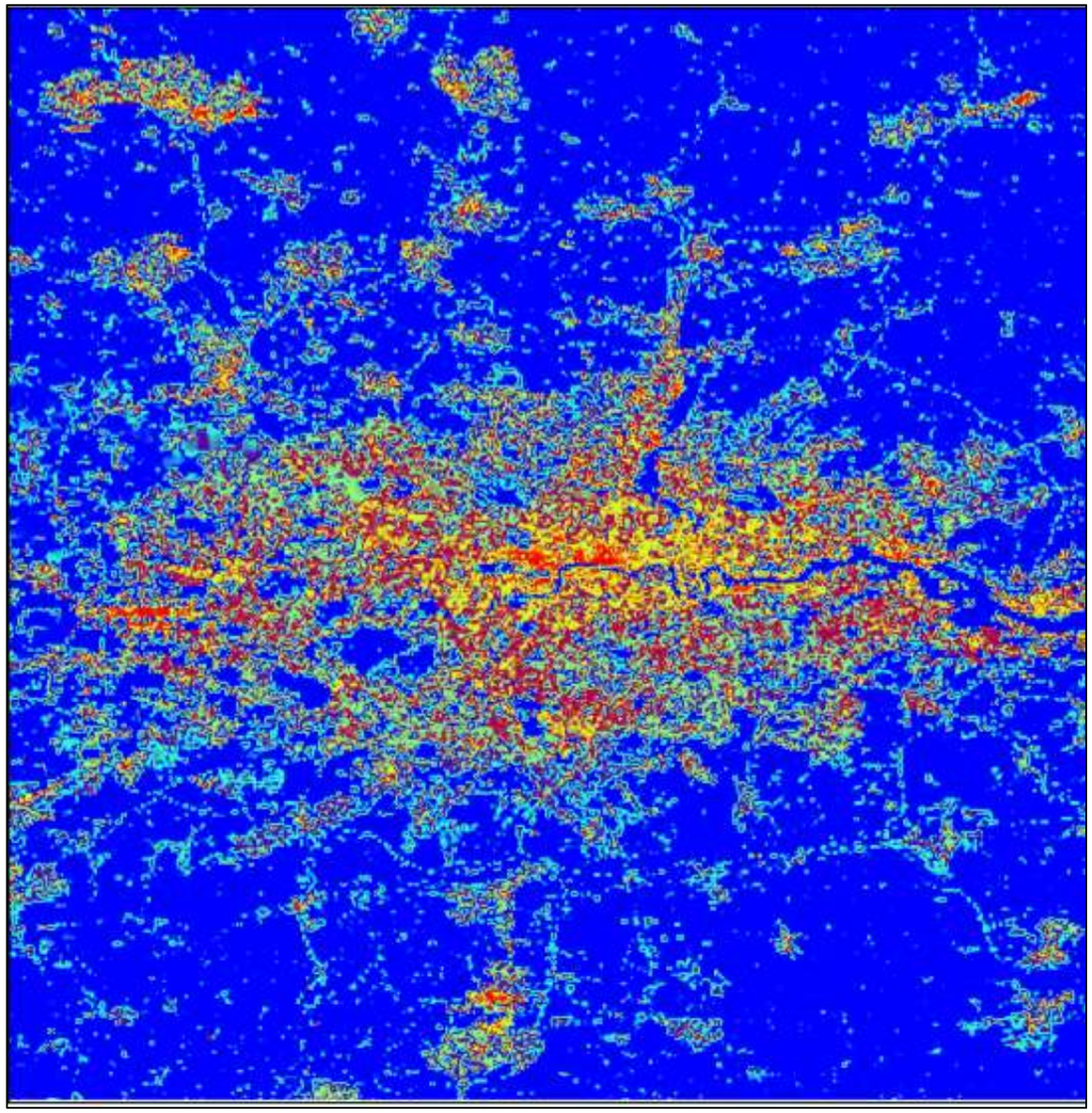
# London

***Example of surface data used for the simulation***

*Soil sealing fraction of grid cell (%)*



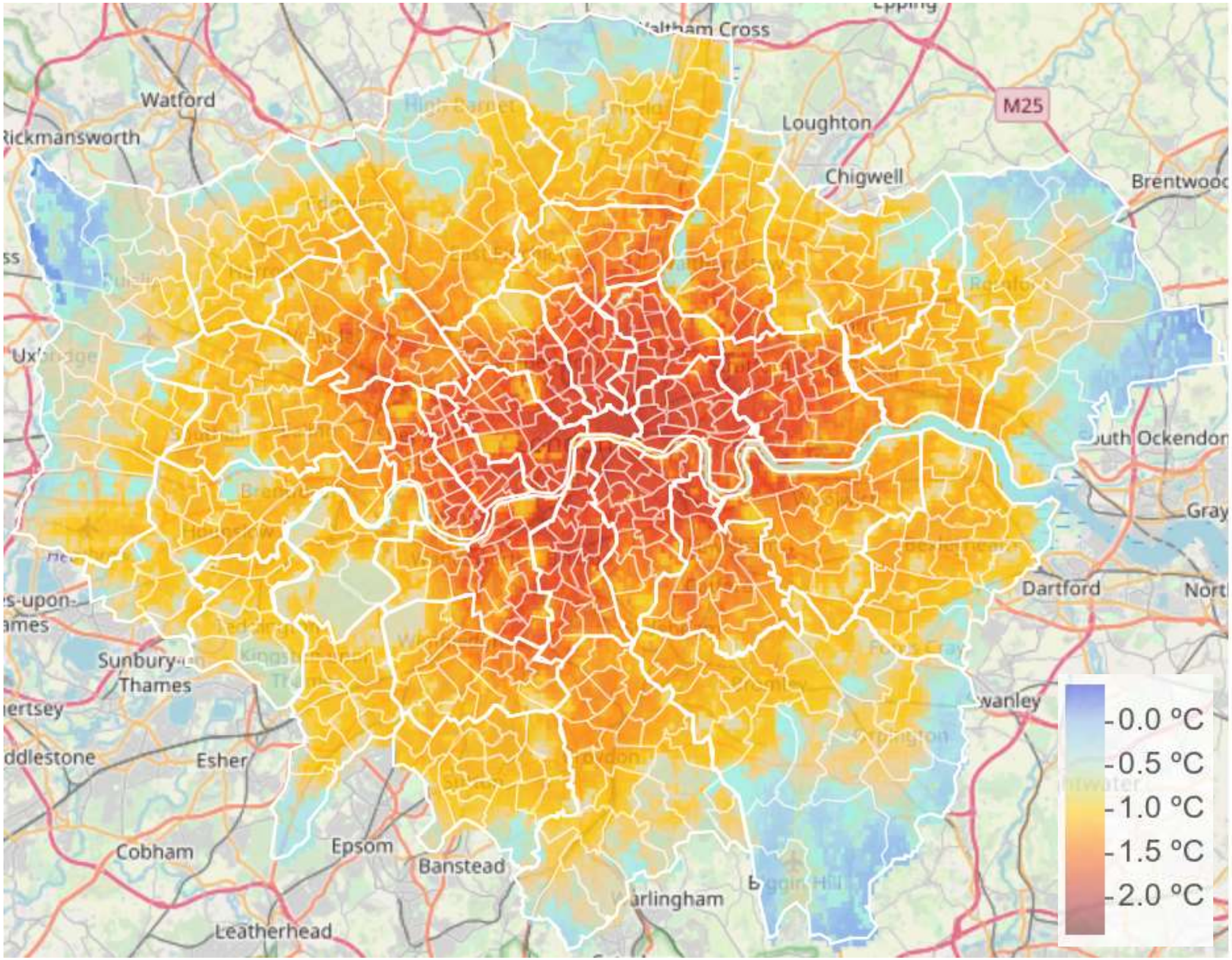
Resolution: **100x100m**, hourly
Domain size: 40x40km in total
Variables: temperature, humidity



Resolution: **250x250m**, hourly
Domain size: ~90x90km in total
Variables: temperature, humidity

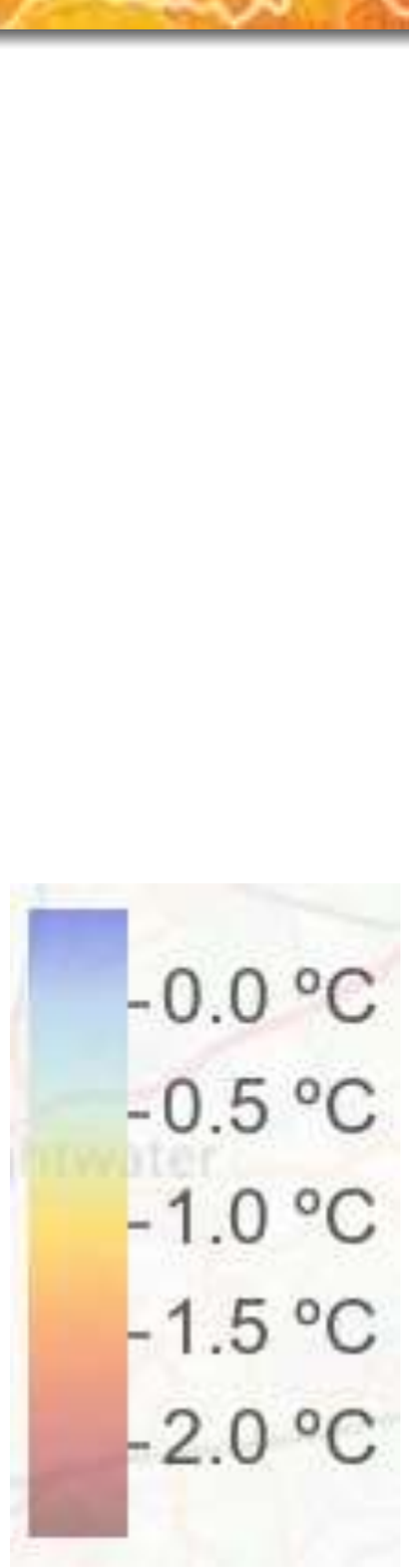
Periods: **last 30 years reanalysis plus RCP 4.5 and RCP8.5 2011-2100**

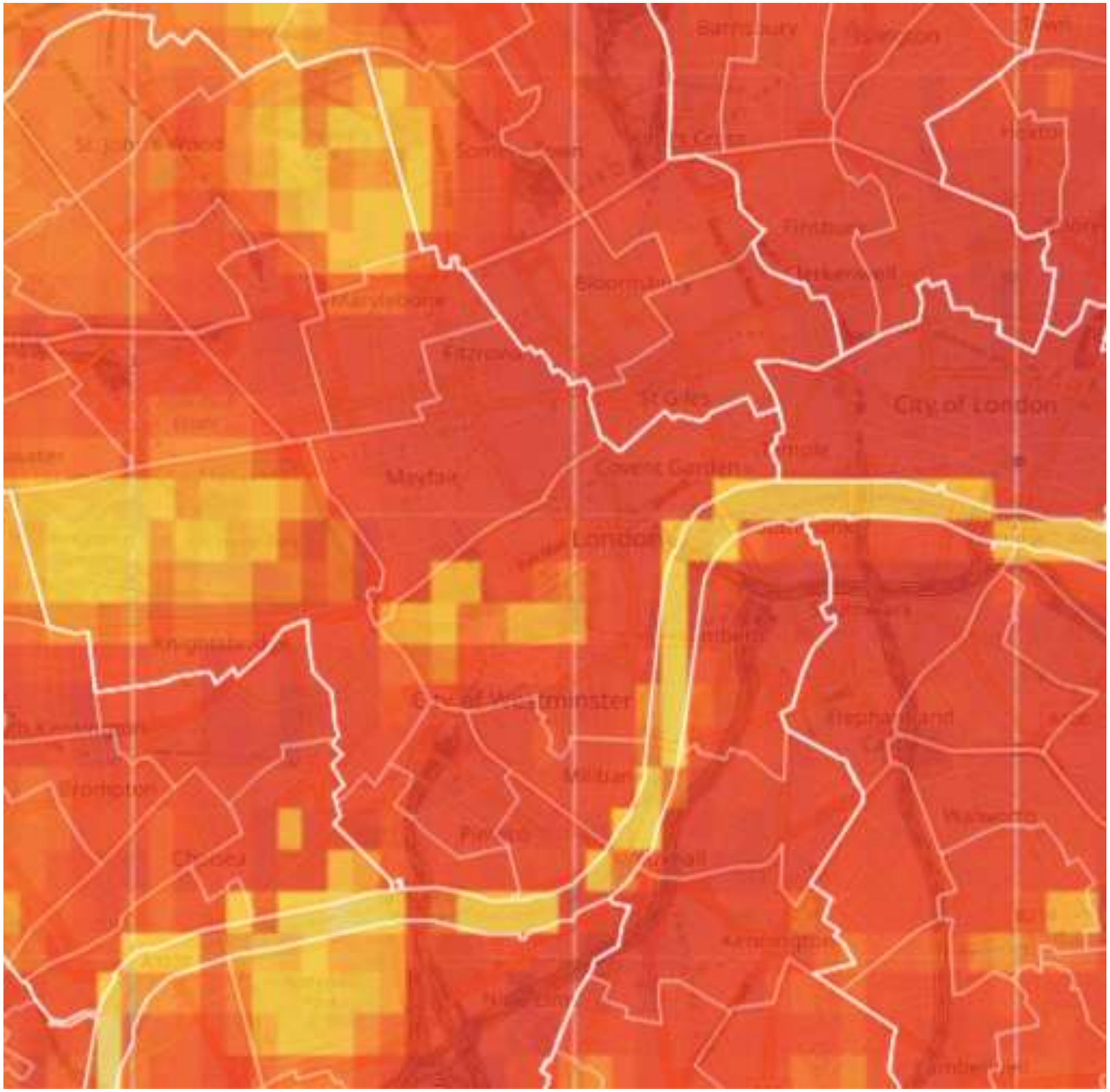
# London *Urban Heat Island Effect, 30 year average*




https://londonheat.shinyapps.io/climate-fit-city/

# London *Urban Heat Island Effect, 30 year average*

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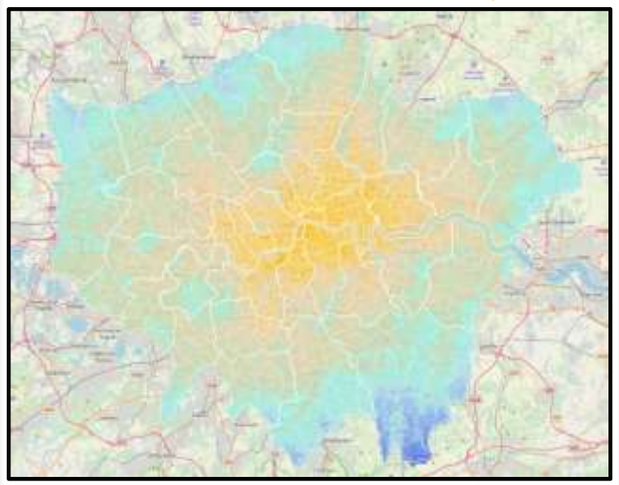
# London

## *Projected Future:*

**+2.4ºC** at the end of the century

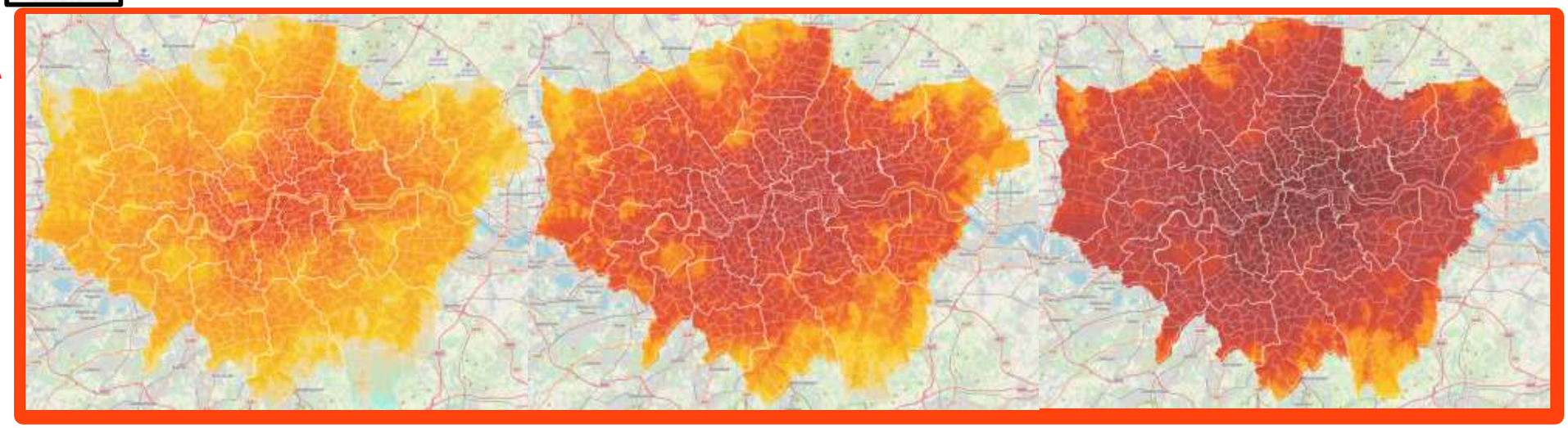
2011-2040 | 2041-2070 | 2071-2100

1988-2017




**+3.5ºC** at the end of the century

2011-2040 | 2041-2070 | 2071-2100



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# Health Impacts: Heat Risks

Combining climate information and **georeferenced mortality data.**

LONDON SCHOOL of HYGIENE &TROPICAL MEDICINE

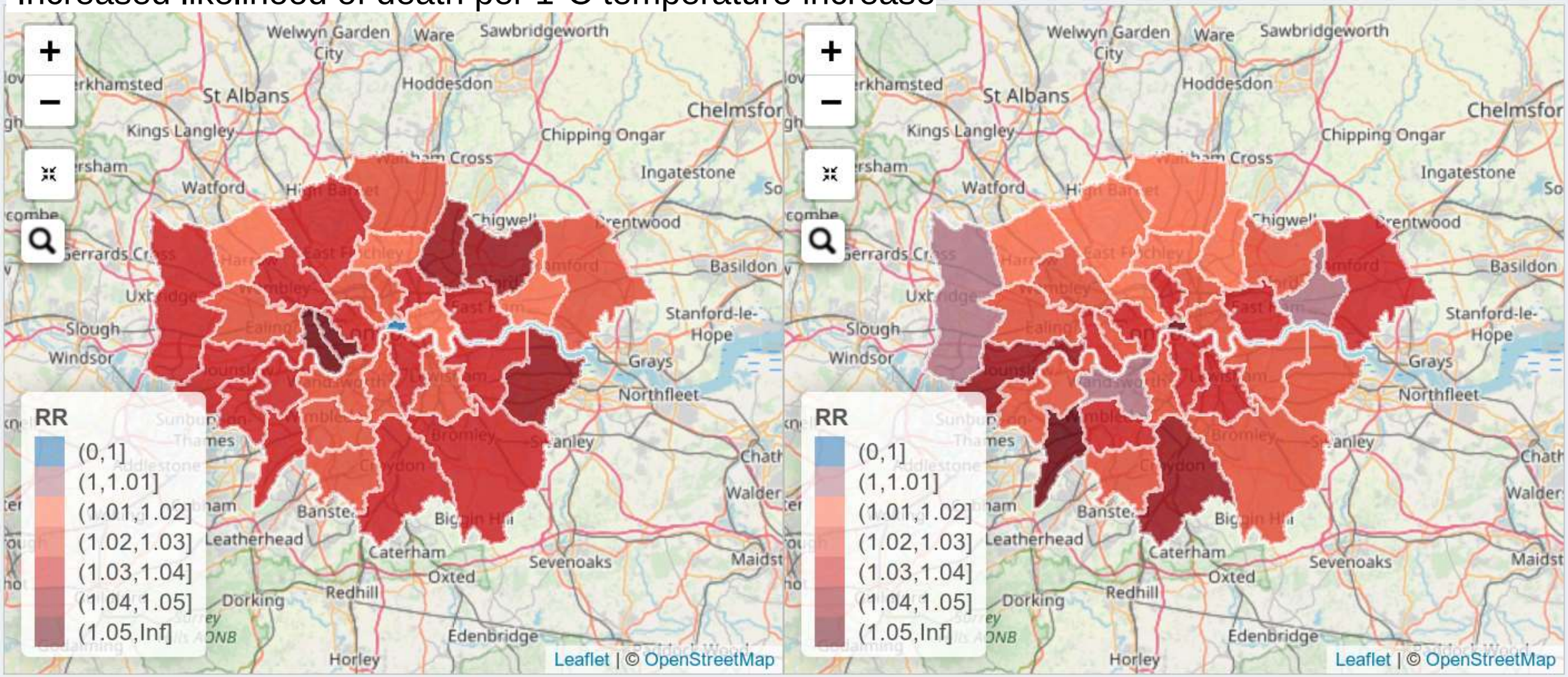
**Population Group**

Female by Borough

**Population Group**

Male by Borough

Increased likelihood of death per 1ºC temperature increase




*Which areas and population groups of the city are at higher risk?*

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# Growing list of indicators and periods available

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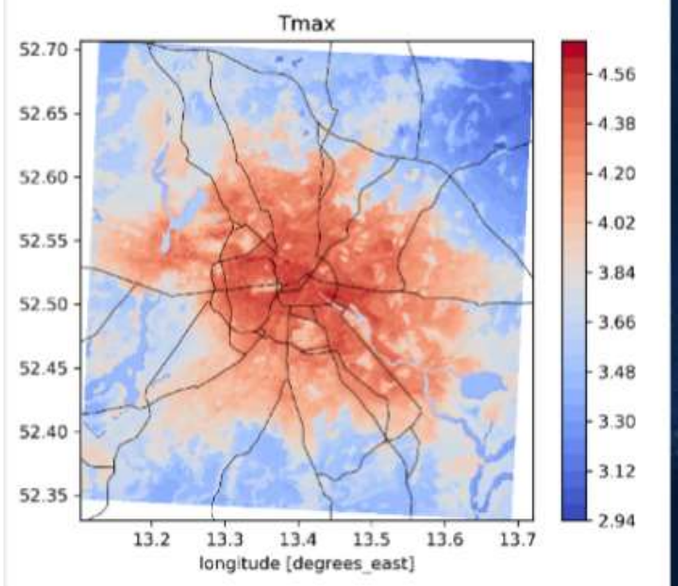
# Other Cities Being Simulated by VITO

***In the UK: Leeds, Newcastle, Edinburgh, Glasgow and Birmingham***

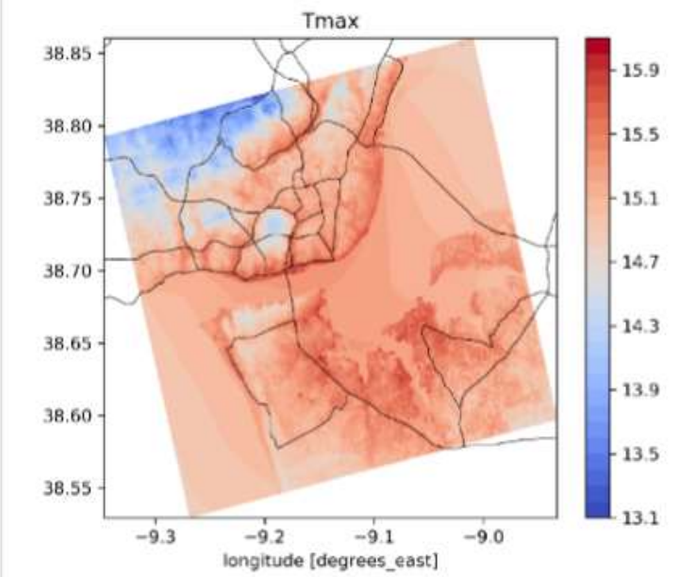
Climate Change

**Urban simulations for 100 cities**

Berlin winter



Lisbon winter




**100 m spatial resolution (hourly values, ERA5, 10-yr period 2008-2017)**

ECMWF Copernicus Europe's eyes on Earth European Commission

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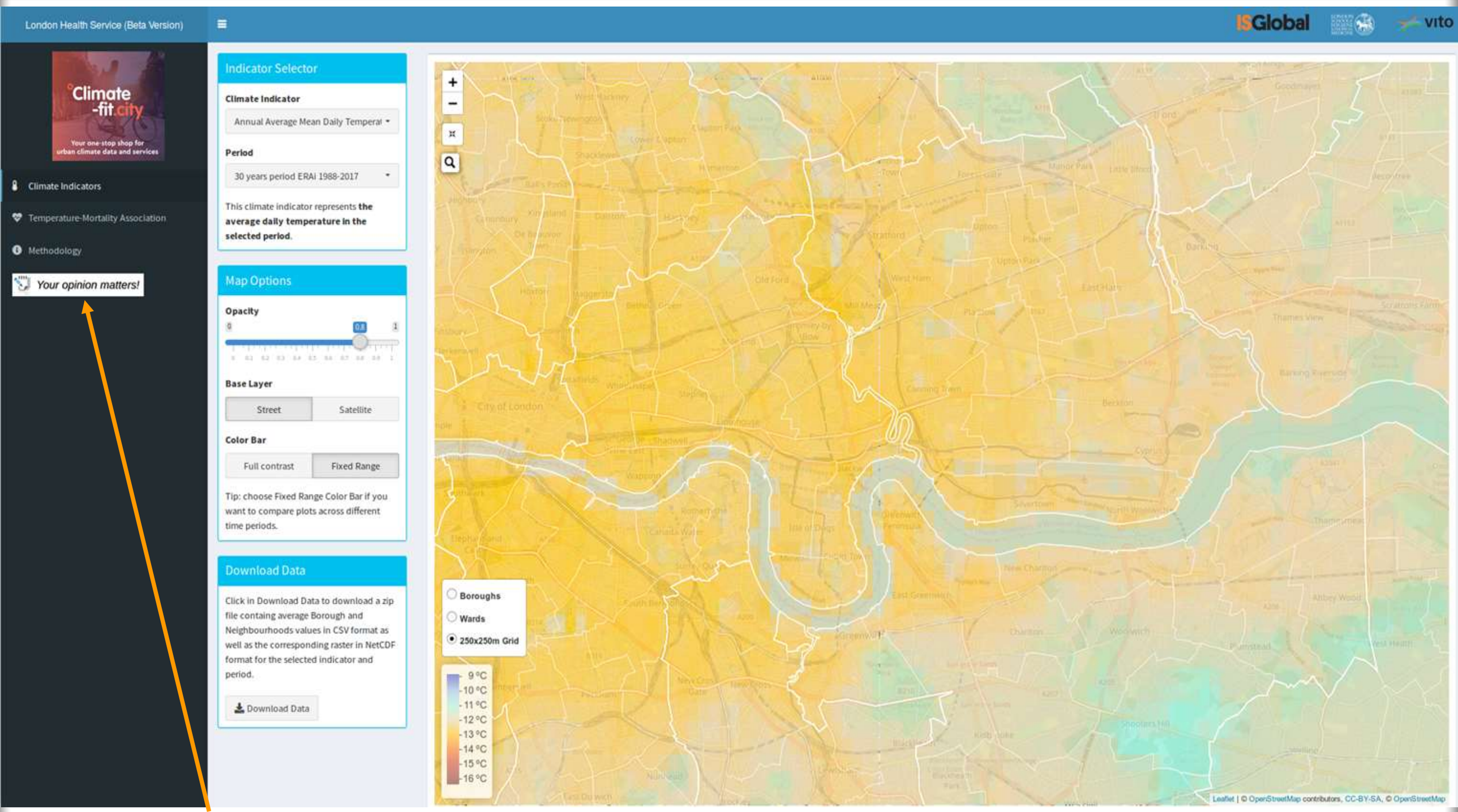
# Climate information and Raw Data Release Plan




*Your opinion matters!*

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# Thank you!

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# For a fit-for-purpose service

Your opinion matters!

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