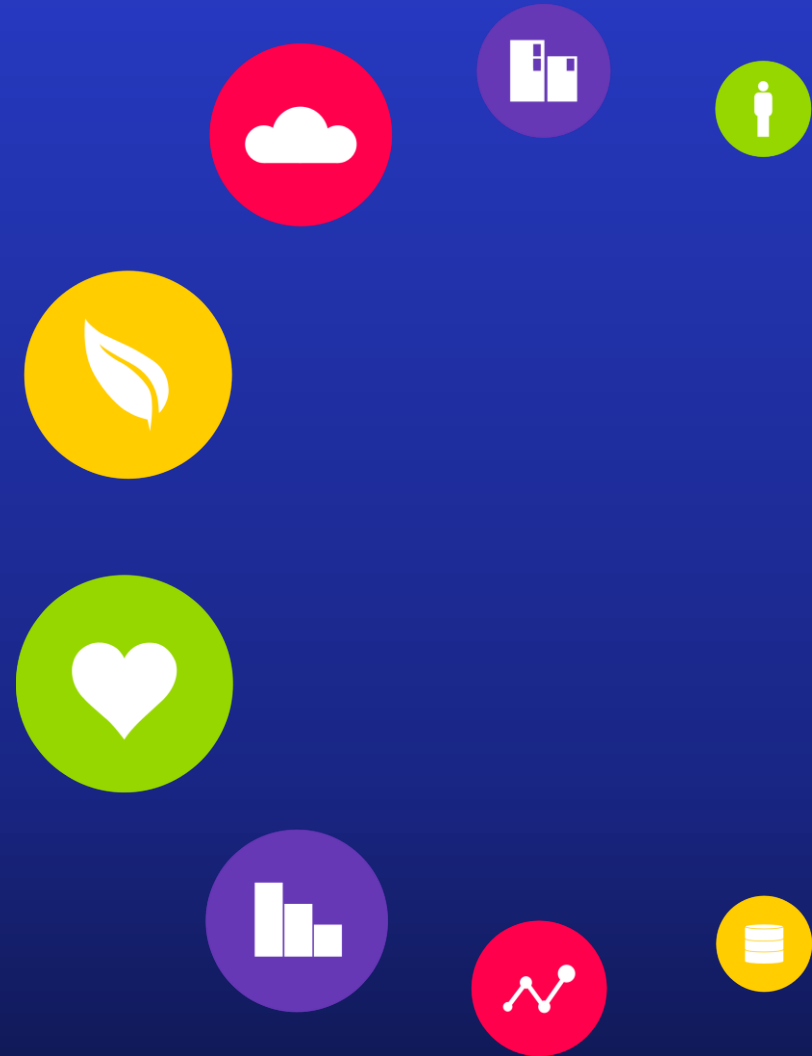
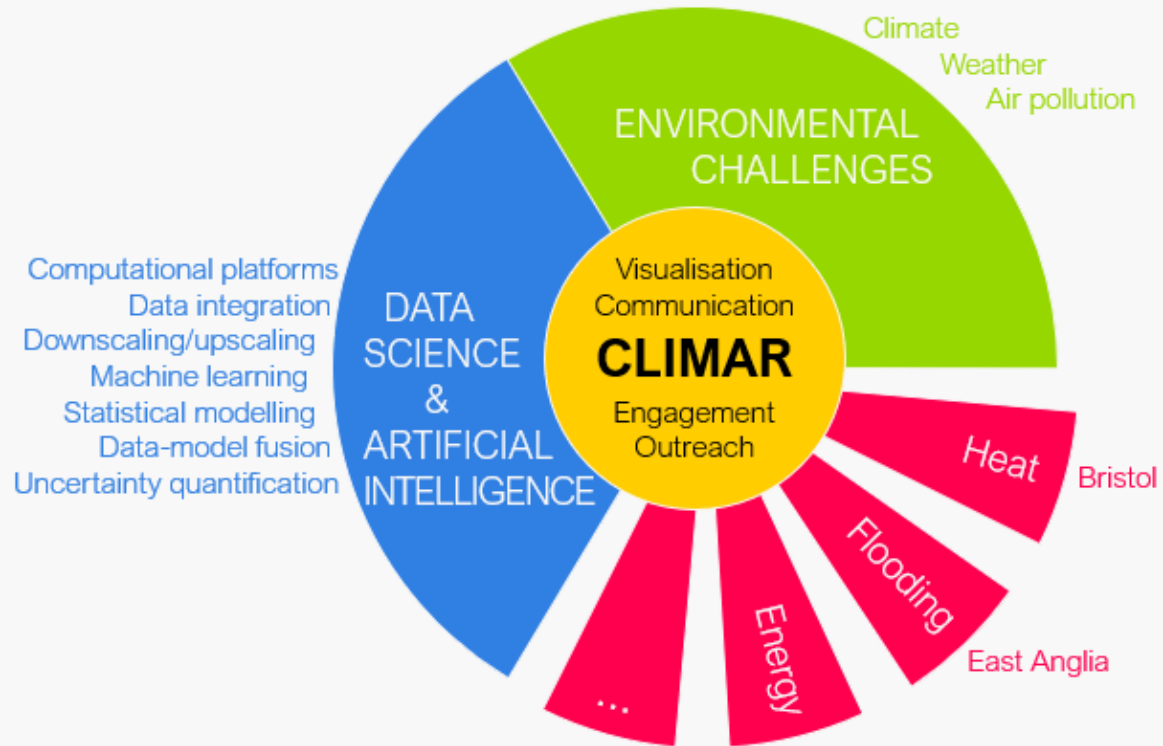


What is CLIMAR?

The team: J. Abrams, K. Donkers, T. Dunbar, D. Fekete, A. Ryan, J. Salter, M. Sanderson, C. Sheldon, F. Spooner, E. Vanvyve



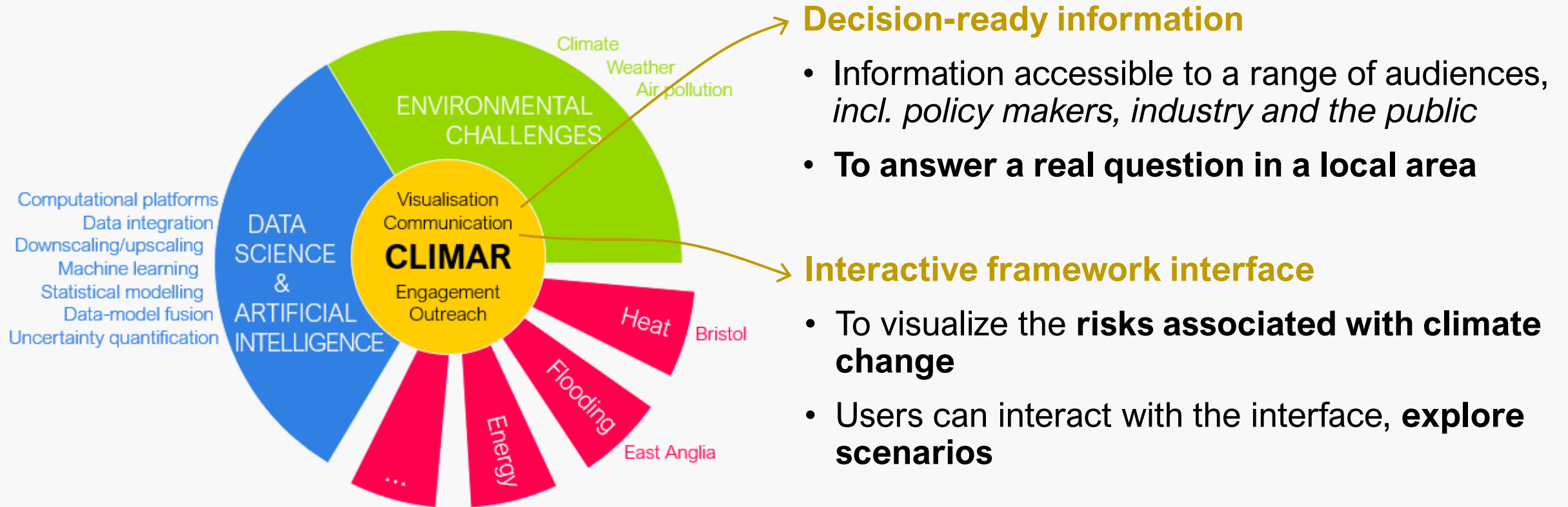
Climate Impacts, Mitigation, Adaptation & Resilience framework



We estimate quantify and visualise **risks** associated with **climate change** by using **data science** and **artificial intelligence** to integrate data on **hazard, exposure** and **vulnerability**.

[CLIMAR video on YouTube](#)

Climate Impacts, Mitigation, Adaptation & Resilience framework



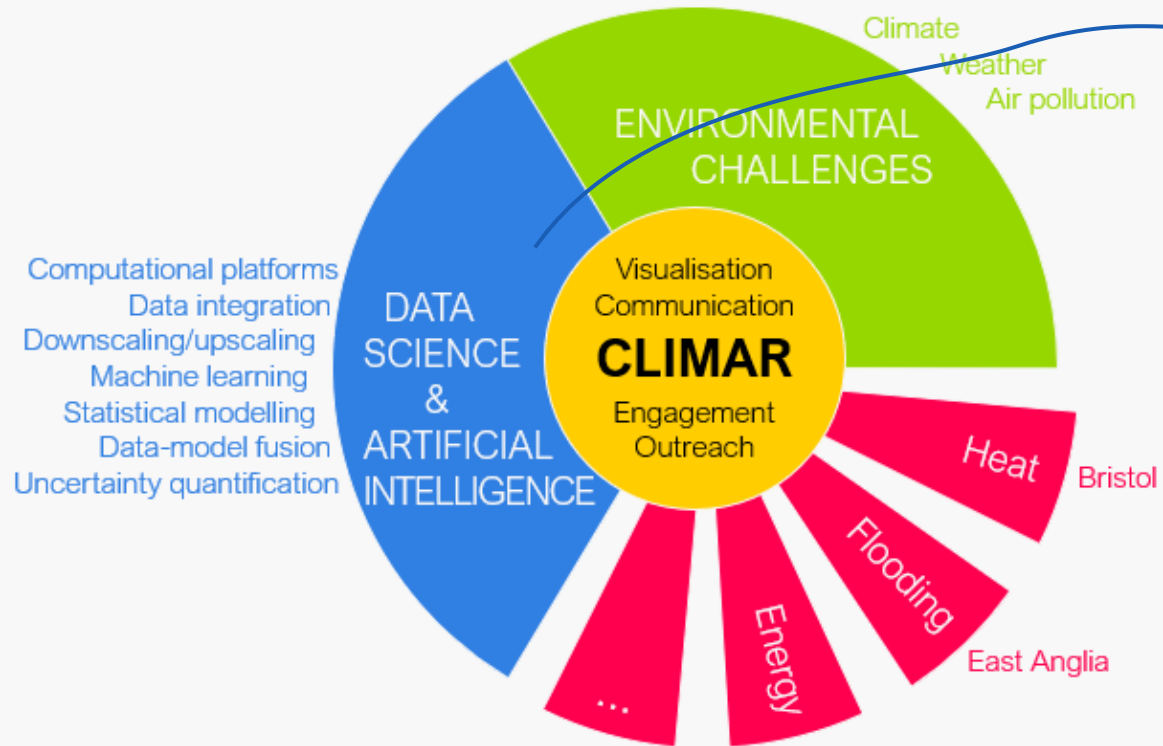
Decision-ready information

- Information accessible to a range of audiences, *incl. policy makers, industry and the public*
- **To answer a real question in a local area**

Interactive framework interface

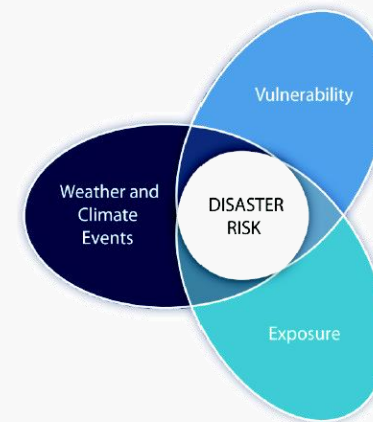
- To visualize the **risks associated with climate change**
- Users can interact with the interface, **explore scenarios**

Climate Impacts, Mitigation, Adaptation & Resilience framework



Leveraging data science and artificial intelligence

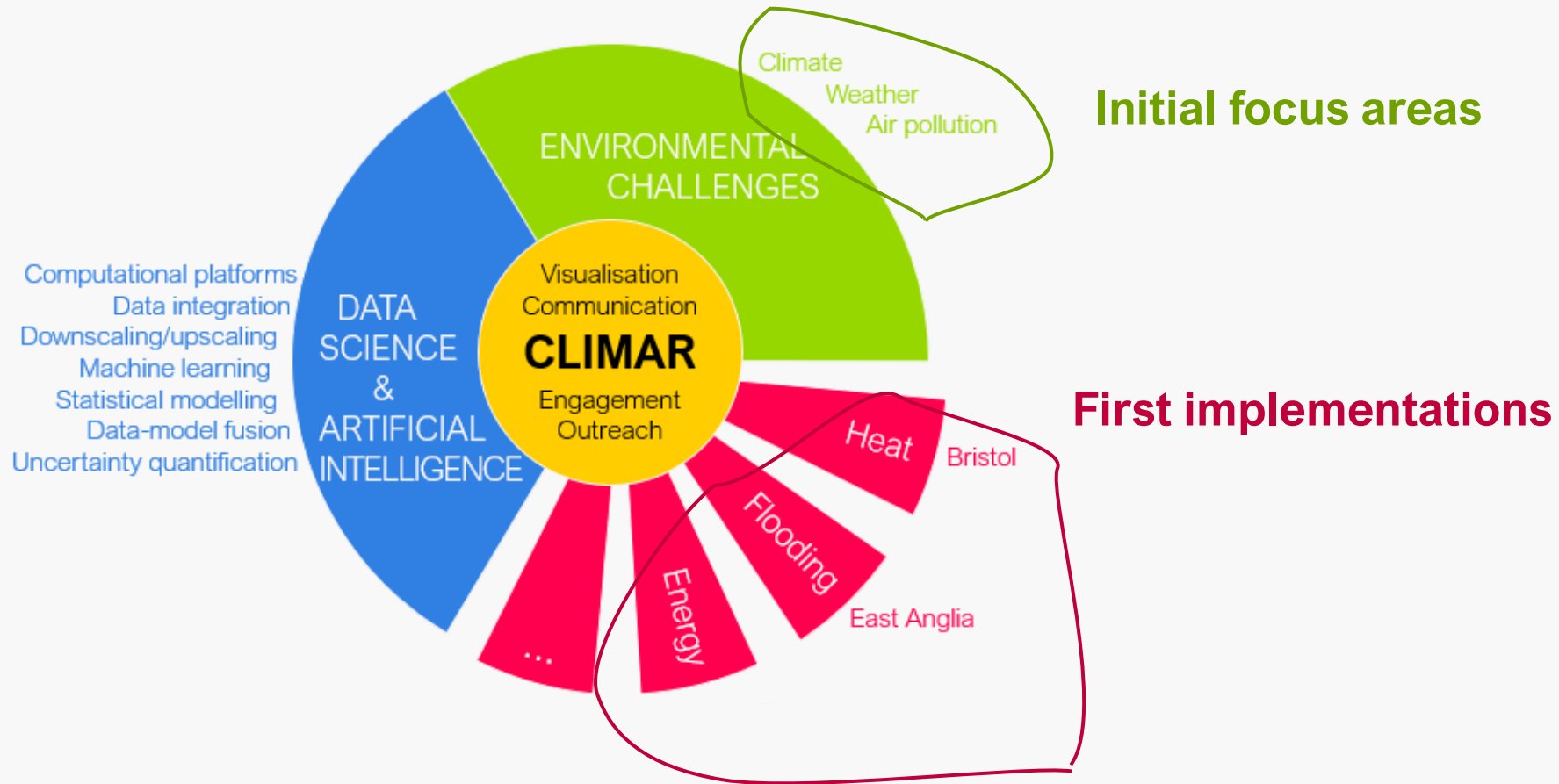
- Building an underlying **mathematical framework**
- Risk model combining environmental **hazard** with **vulnerability** and **exposure**



Climate risks are determined by how vulnerable we and our surroundings are when exposed to climate-related hazards

IPCC SREX report (Lavell et al., 2012)

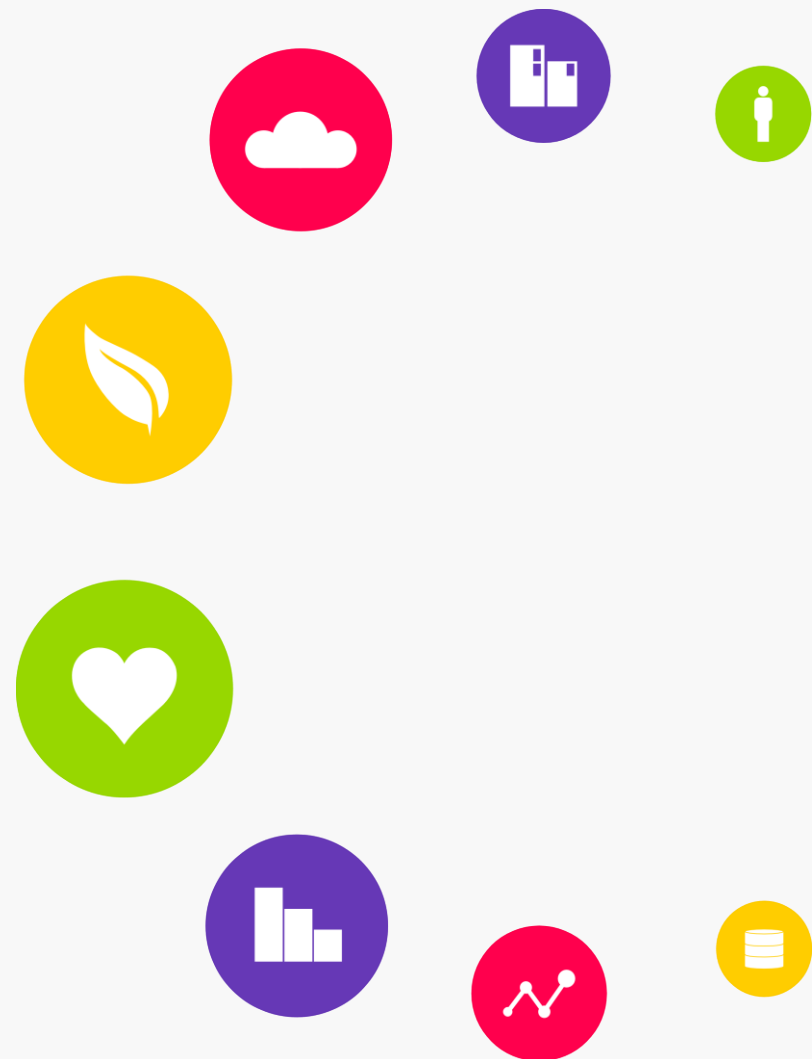
Climate Impacts, Mitigation, Adaptation & Resilience framework



Heat resilience in Bristol

Strategic Priorities Fund (SPF) – UKRI

Hazard	High temperature (UKCP18)
Exposure	Buildings (insulation properties)
Vulnerability	People (age)



CLIMAR for Bristol city council

Bristol city council aims to have its **estate climate resilient by 2030**.

Estates = built estate, roads, parks, agricultural lands, water bodies.

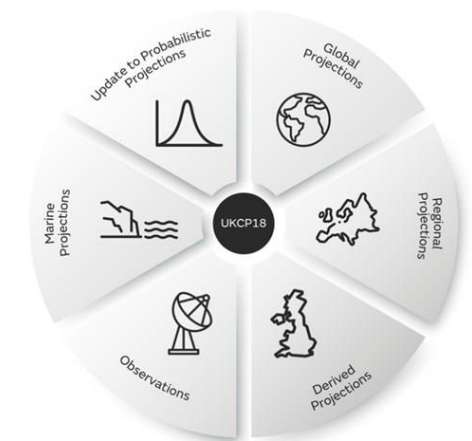
They are in the early stages of figuring out what this means and how to achieve climate resilience.

We have been building CLIMAR as a **risk-model prototype** that

- provides them with future scenarios of **how risk from extreme heat could change in the future** over Bristol,
- allows them to interact with the underlying data **to explore future scenarios** in relation to the impact of heat on people, factoring in building heat-related properties.



A strategy for a carbon neutral, climate resilient Bristol by 2030



UKCP18

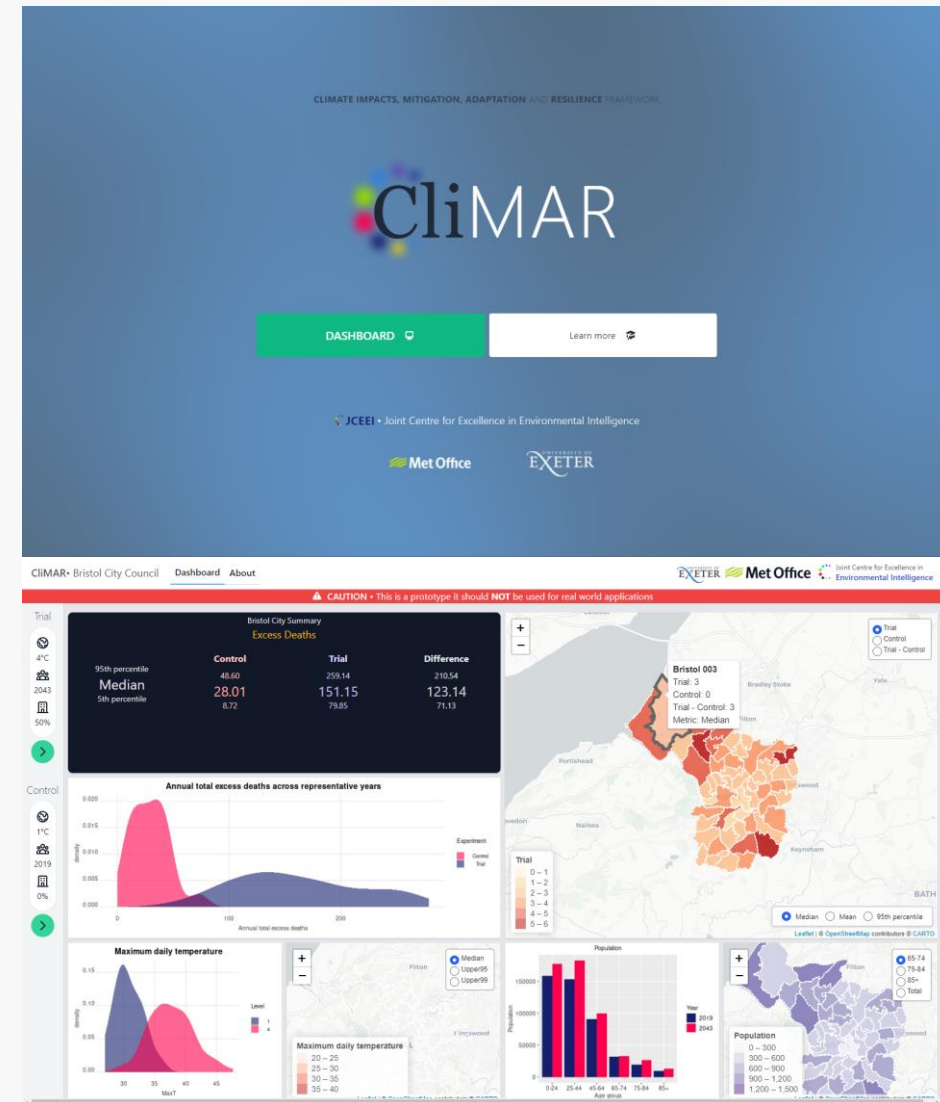
 Met Office

Latest state of prototype

Mathematical model calculates risk (**excess deaths**) from combining

- Heat hazard (**maximum daily temperature**)
- Population vulnerability (**age**, incl. future population)
- Exposure through **building properties**
 - Simple building-heat exposure relationship
 - Possibility to apply a single retrofitting intervention to poorly-insulated buildings and to scale it to represent the number of buildings concerned
 - Need more data to constraint relationship

Information aggregated to MSOA level / 2 and 4 °C global warming levels / UKCP18 2.2-km data, recalibrated (scaled distribution mapping), RCP8.5, 12 members / Population characteristics from SPENSER data (past) and ONS Bristol data (future) / Codebase in R and Python / User interface in Rshiny, hosted on Rshiny server / User testing with Bristol



ACCESS

[JCEEI.SHINYAPPS.IO/CLIMAR](https://jceei.shinyapps.io/climar)

