



# DAFNI

## DAFNI Overview

*UKCRIC – All Hands Meeting – 13<sup>th</sup> April 2021*  
*Marion Samler, DAFNI Partnership Manager*



Science and  
Technology  
Facilities Council

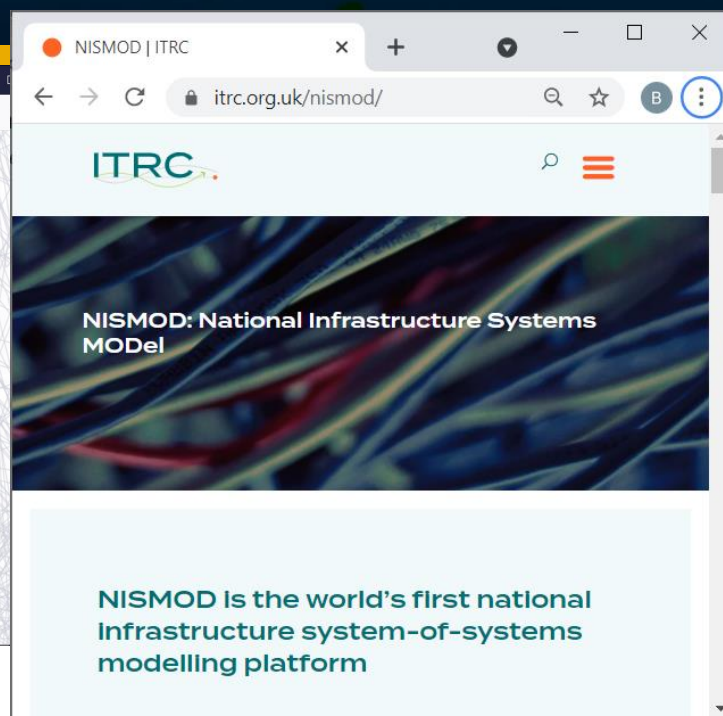
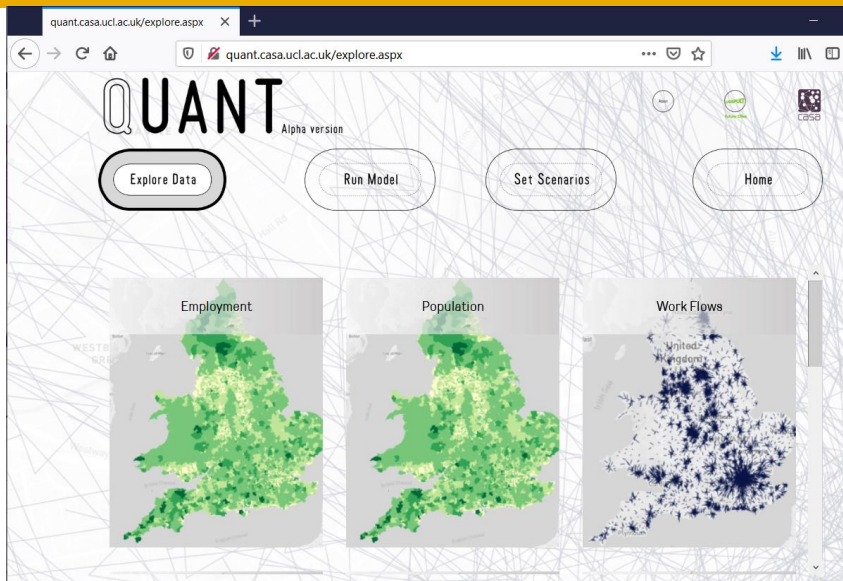


Engineering and  
Physical Sciences  
Research Council

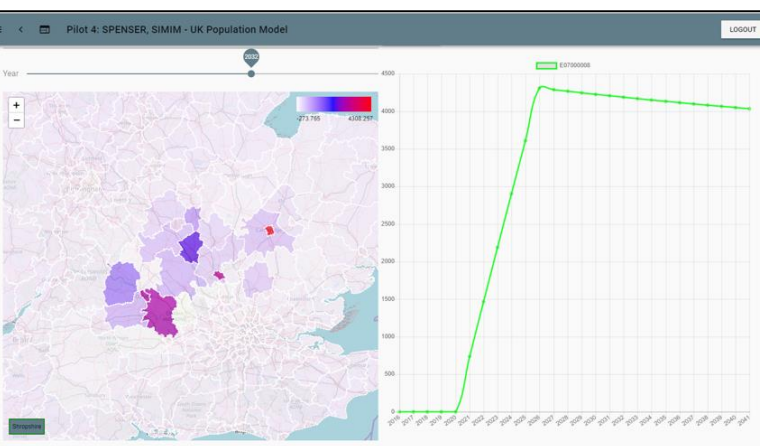
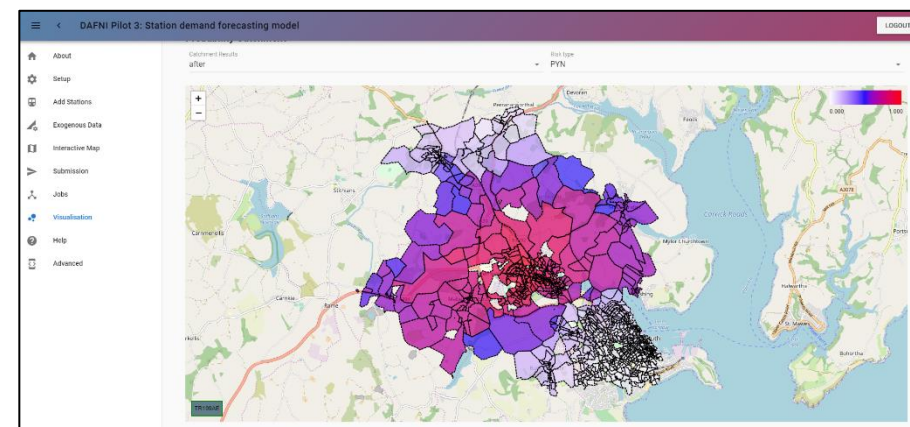


**UKCRIC**

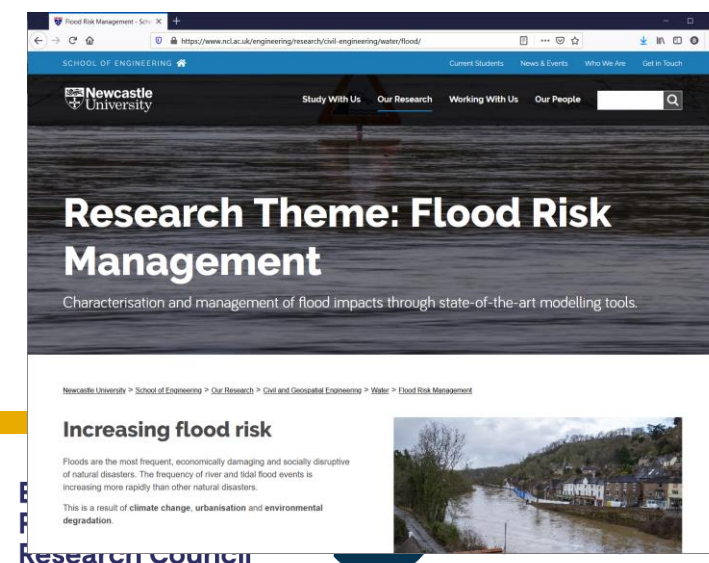




## Station demand model, University of Southampton



## SIMIM, University of Leeds

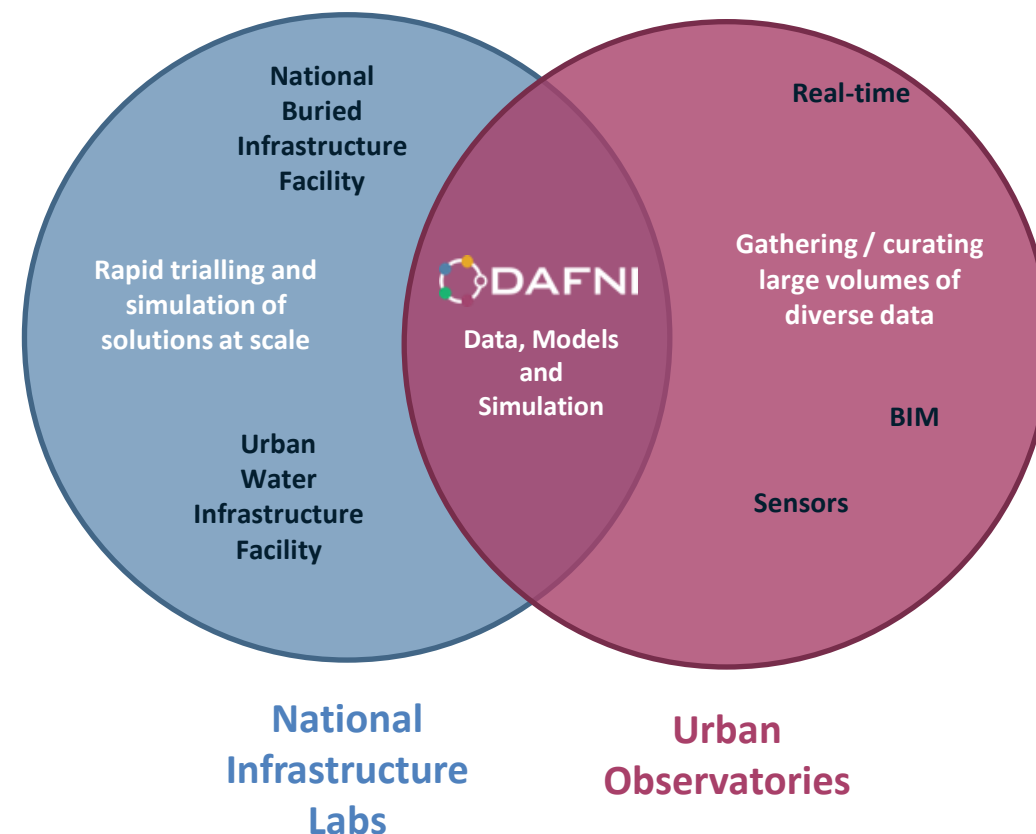


## Data and Analytics Facilities for National Infrastructure

Providing a computing platform for  
research into decision making for  
national infrastructure

£8M investment 2017-2021 under the UK Collaboratorium  
for Research on Infrastructure and Cities

Towards Partnerships between Academia, Government,  
Industry







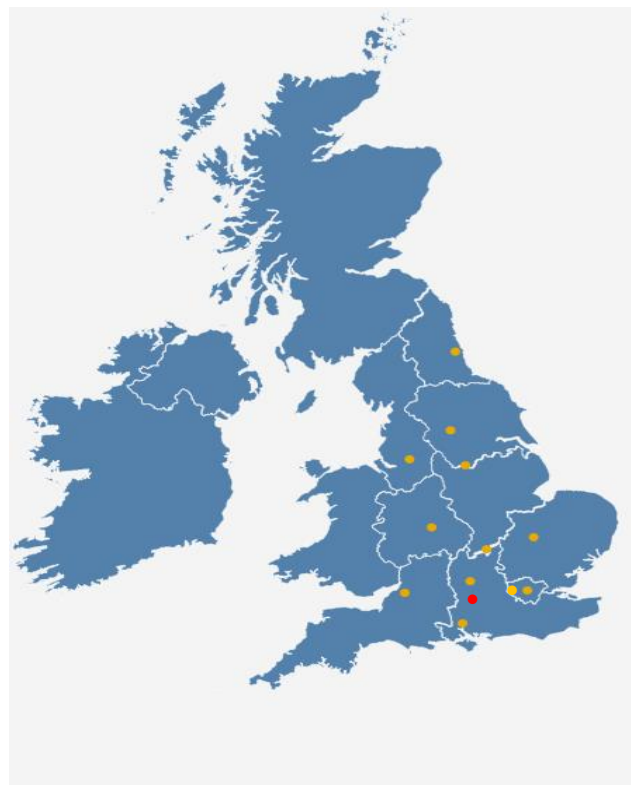
**Prof. Jim Hall**  
Uni. of Oxford



**Prof. Stephen Hallett**  
Cranfield Uni.



**Dr. Theo Tryfonas**  
Uni. of Bristol.



**Prof. Nigel Cassidy**  
Uni. of Birmingham



**Dr. Aruna Sivakumar**  
Imperial College



**Prof. Daniel Coca**  
Uni. of Sheffield



**Dr. Brian Matthews**  
STFC



**Dr. Nik Lomax**  
Uni. of Leeds



**Prof. Liz Varga**  
UCL



**Prof. Julien Harou**  
Uni. of Manchester



**Dr. Simon Blainey**  
Uni. of Southampton



**Dr. Luke Smith**  
Uni. of Newcastle



**Prof. Mike Batty**  
UCL

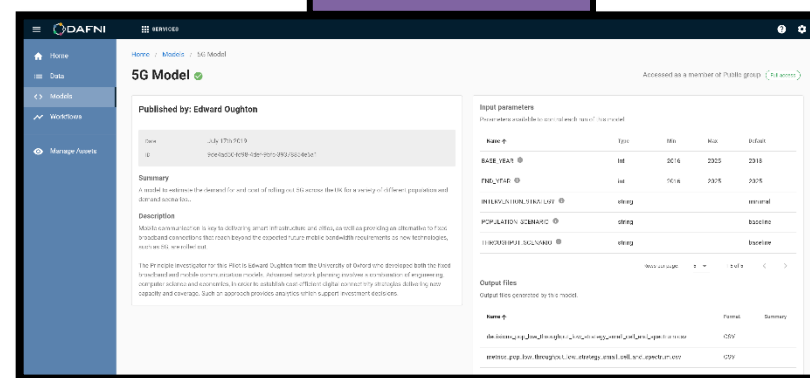


**Dr. Ruchi Choudhary**  
Uni. of Cambridge

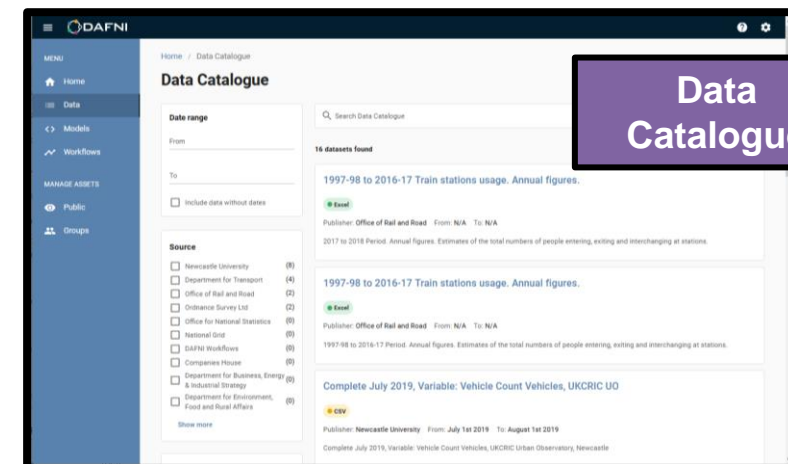
**A Partnership of 12 universities and + STFC as development and hosting partner**

- **A Place for sharing and combining data and models**
  - A hybrid high-performance computing platform
  - A secure repository for national infrastructure data and models
- **A Place to support collaborations and deploy applications**
  - A collaborative platform to research multi-system models of infrastructure
- **A Place as a legacy**
  - A place to make data and models available for the long-term

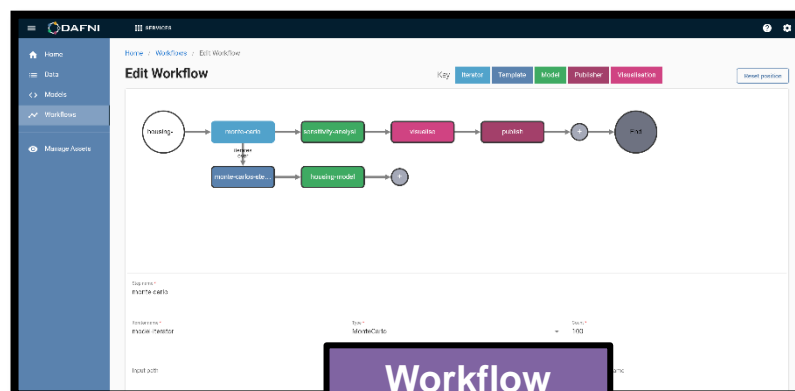
## Data



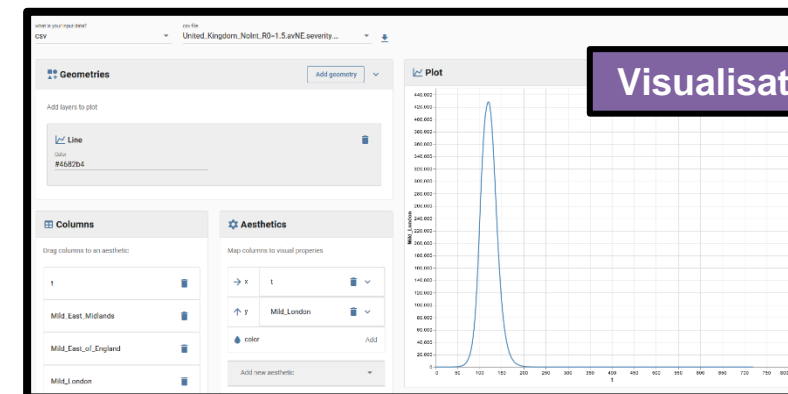
# Data Catalogue



## Models



## Visualisation

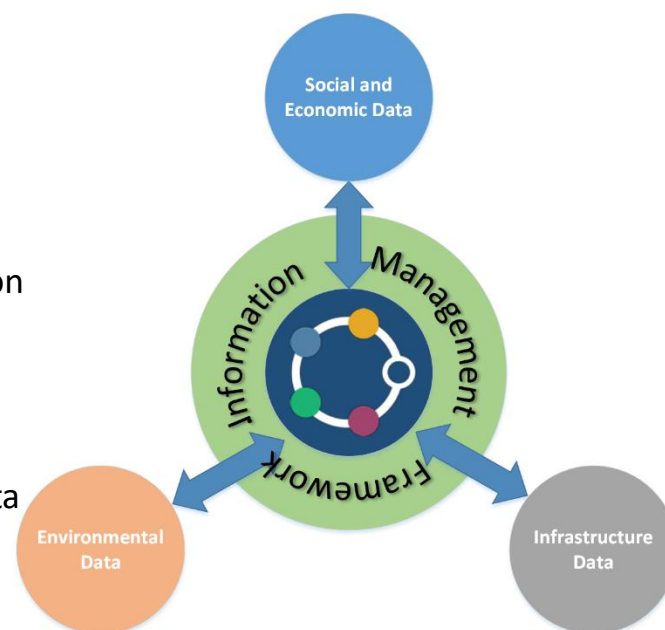




## A platform for integrating and combining data

The DAFNI NID provides

- A trusted secure space to hold share and access data
- A metadata framework for the data catalogue (DCAT2.0)
- Data management and modelling, Curation
- An information Management Framework
  - Extensible to sectors: water, energy, transport ...
  - Support an Ontological framework for data
- Adding dynamic and streaming data capability

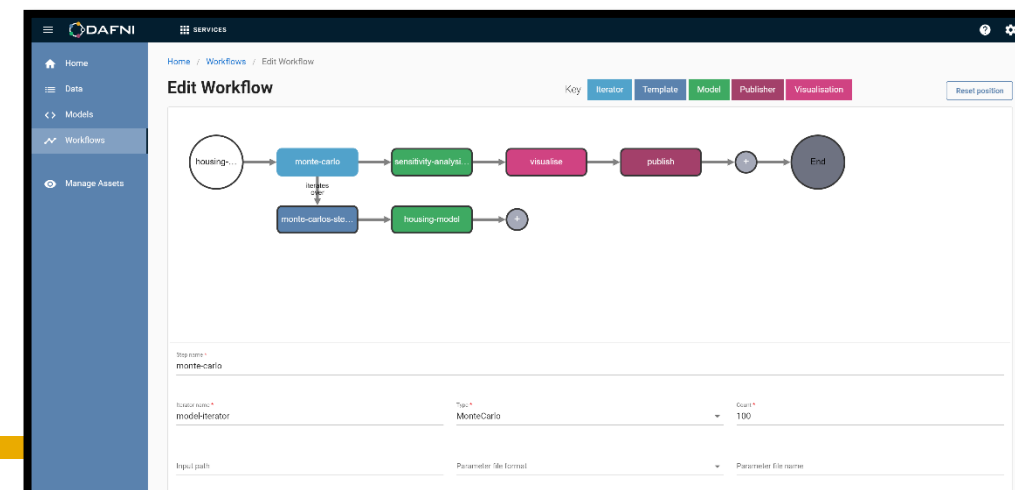


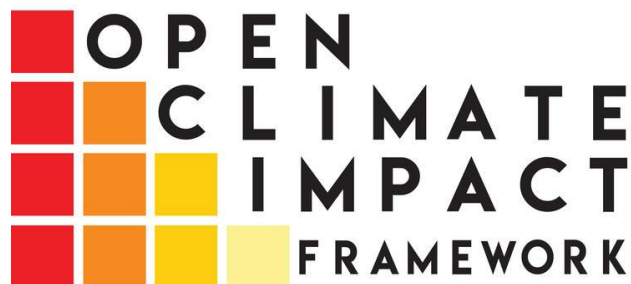
## Extending the capability

- FAIR: Open and Commercial Data
- Security IoT, distributed systems, ML

## The DAFNI NIMS:

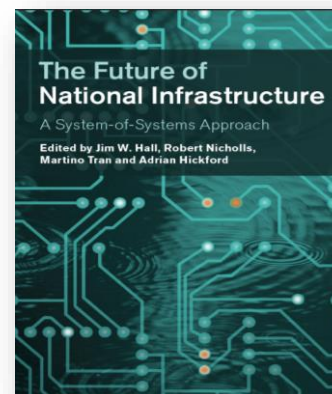
- Upload models from anywhere
  - Models “containerised” using Docker
  - Kubernetes workflow orchestration
  - Scale up models for more compute
- A repository of models
  - Harbor - a repository of Docker containers.
  - Sharing models
- Build Systems-of-Systems Models
  - Towards a Framework: Different scales, features





Modelling the  
impact of Climate  
Change

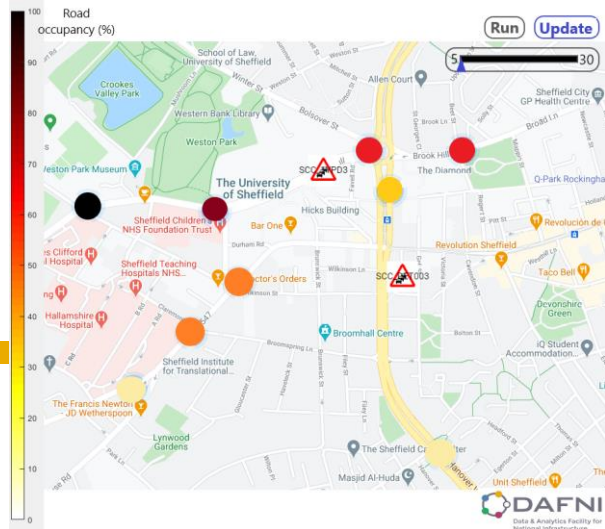
NISMOD has  
migrated to DAFNI



Green Finance: DAFNI part of a  
new £10M UK centre for climate  
and environmental risk for the  
financial industry.



Traffic Digital Twin in Sheffield



Digital Twin Urban Analytics -  
Towards A Flexible, Sustainable  
Urban Energy System





## DAFNI-ROSE

A grant under EPSRC's Resource-Only Strategic Equipment programme

July 2021-June 2023

- A production platform
  - With an enriched collection of data and models
- Developing the User Base
  - Research users
  - Working with CDTs for early careers researchers
- Looking towards further development:
  - Digital Twins:
  - Information Integration infrastructure
- Forming Multi-disciplinary partnerships
  - With academia, government and Industry

**Please talk to us!**

[info@dafni.ac.uk](mailto:info@dafni.ac.uk)

[www.dafni.ac.uk](http://www.dafni.ac.uk)



**Thank You**

*Dr Brian Matthews*  
*Brian.Matthews@stfc.ac.uk*  
[www.dafni.ac.uk](http://www.dafni.ac.uk)  
[info@dafni.ac.uk](mailto:info@dafni.ac.uk)



[www.dafni.ac.uk](http://www.dafni.ac.uk)

