



CRC for  
Water Sensitive Cities



4th water sensitive cities conference



Australian Government  
Department of Industry and Science

**Business**  
Cooperative Research  
Centres Programme

# Scenario Tool

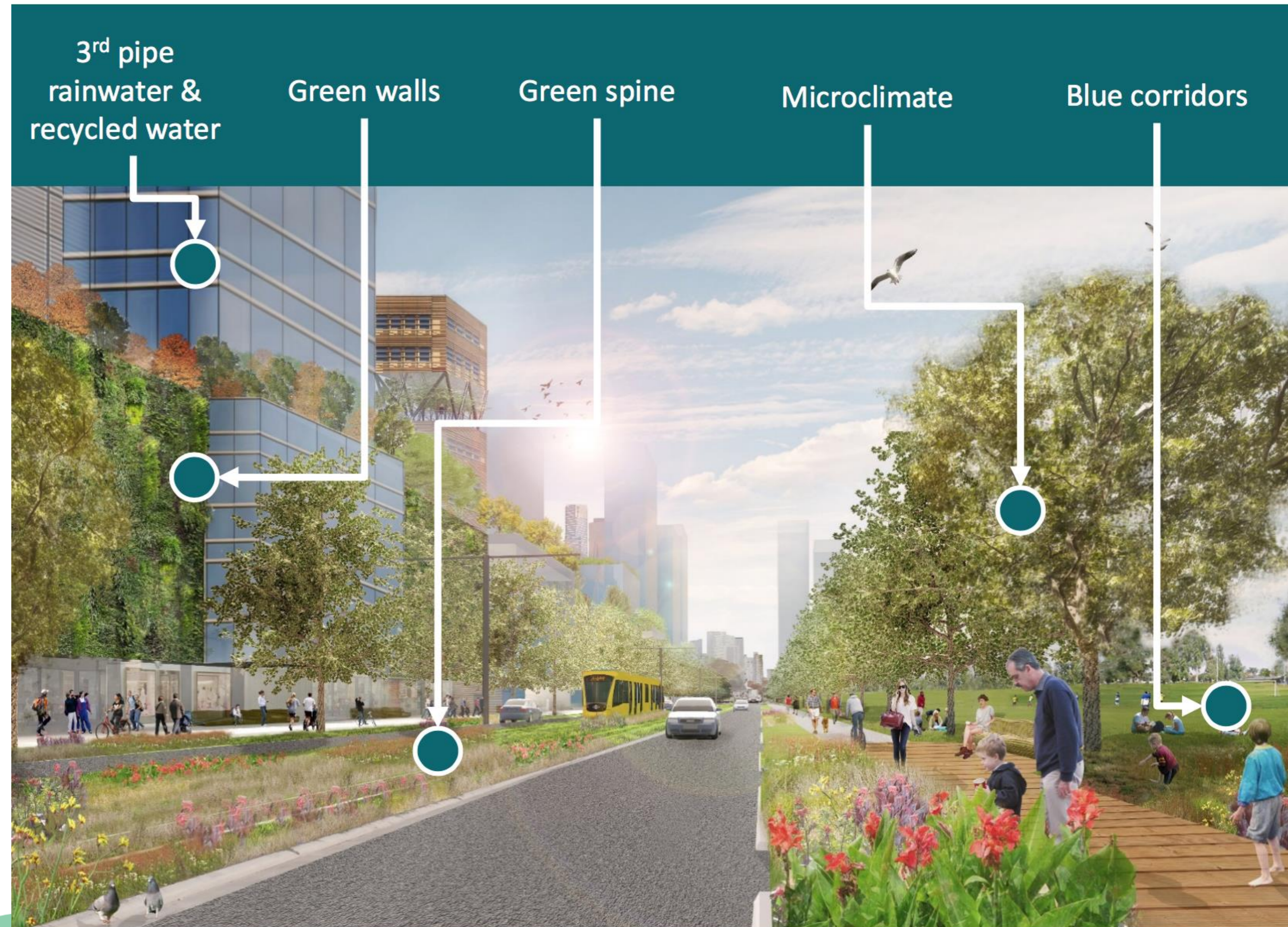
Dr Christian Urich  
Monash University

26-28 March 2019



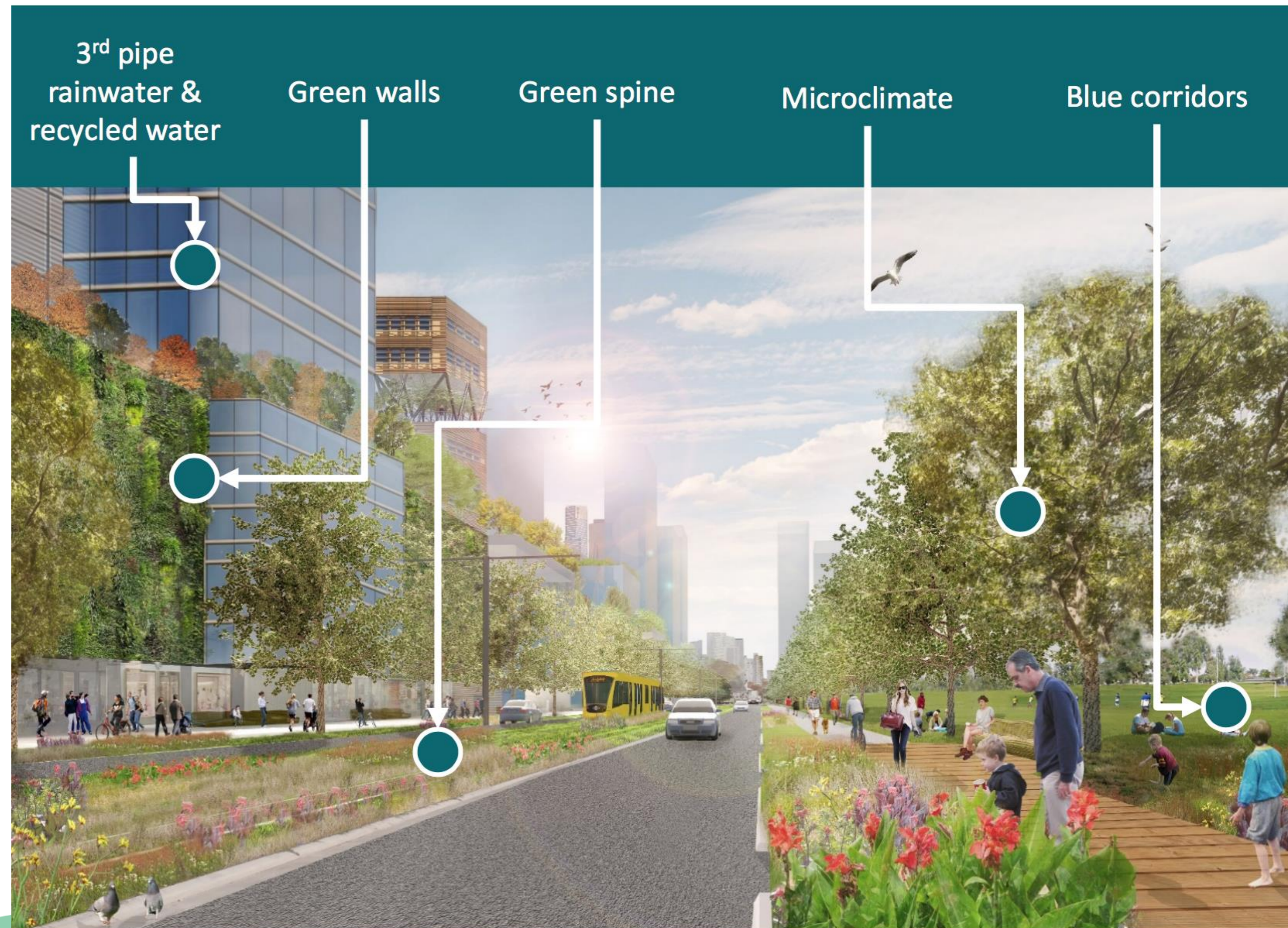
# Water Sensitive Cities Scenario Tool

Evaluating concept designs and technology/policy



# Water Sensitive Cities Scenario Tool

- ✓ Assesses multiple benefits of green infrastructure solutions
- ✓ Supports scenario planning and testing
- ✓ Supports collaborative planning and decision-making
- ✓ Provide the basis for robust water sensitive policies and business cases
- ✓ Integrates and bridges the gap between existing data and modelling tools across spatial scales



# Digital Twin

## Base Data

- Urban Form



# Digital Twin

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- Urban Form
- **Elevation and soil data**



# Digital Twin

## Base Data

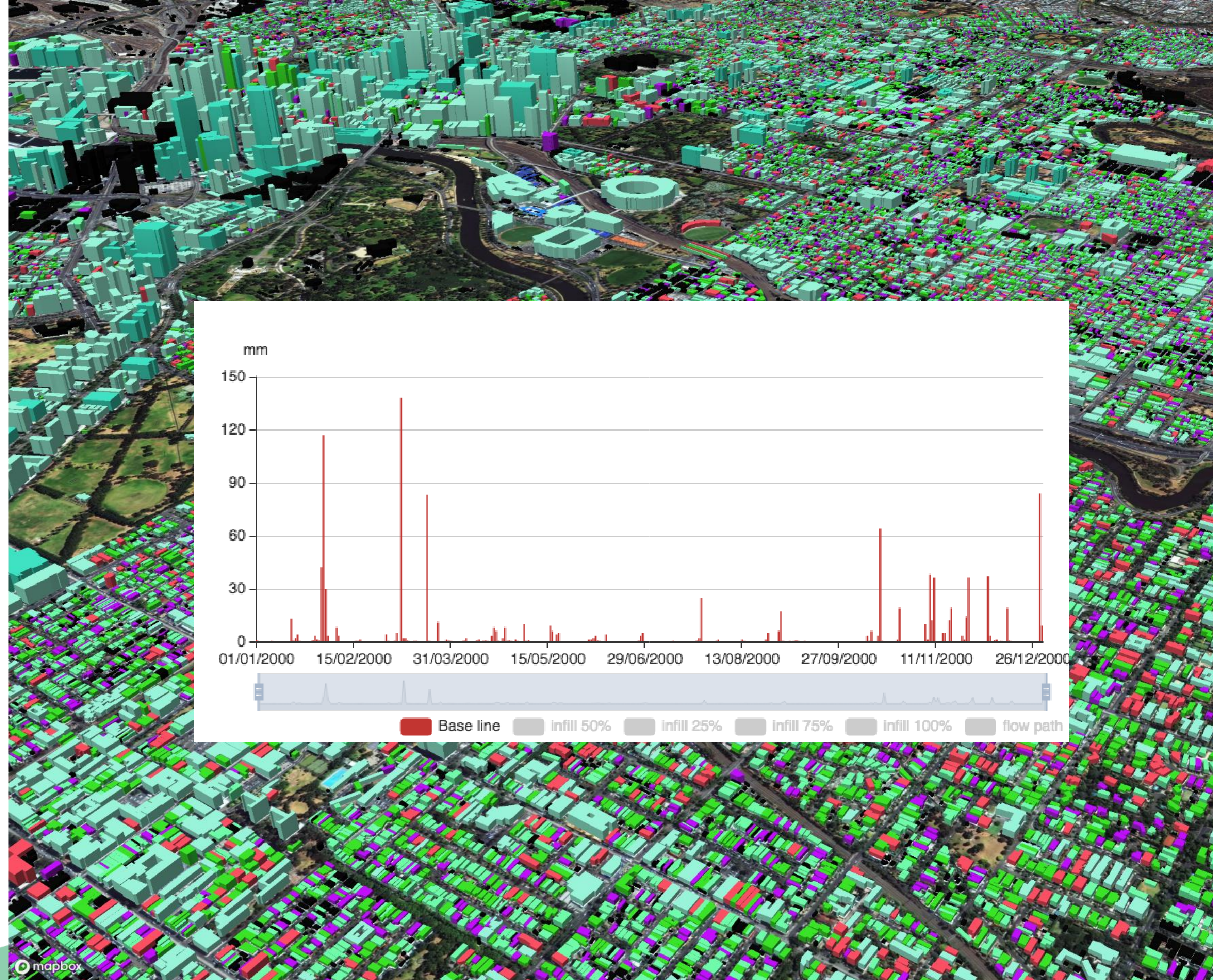
- Urban Form
- Elevation and soil data
- **Socio – demographic data**



# Digital Twin

## Base Data

- Urban Form
- Elevation and soil data
- Socio – demographic data
- **Climate data**



# Digital Twin

## Base Data

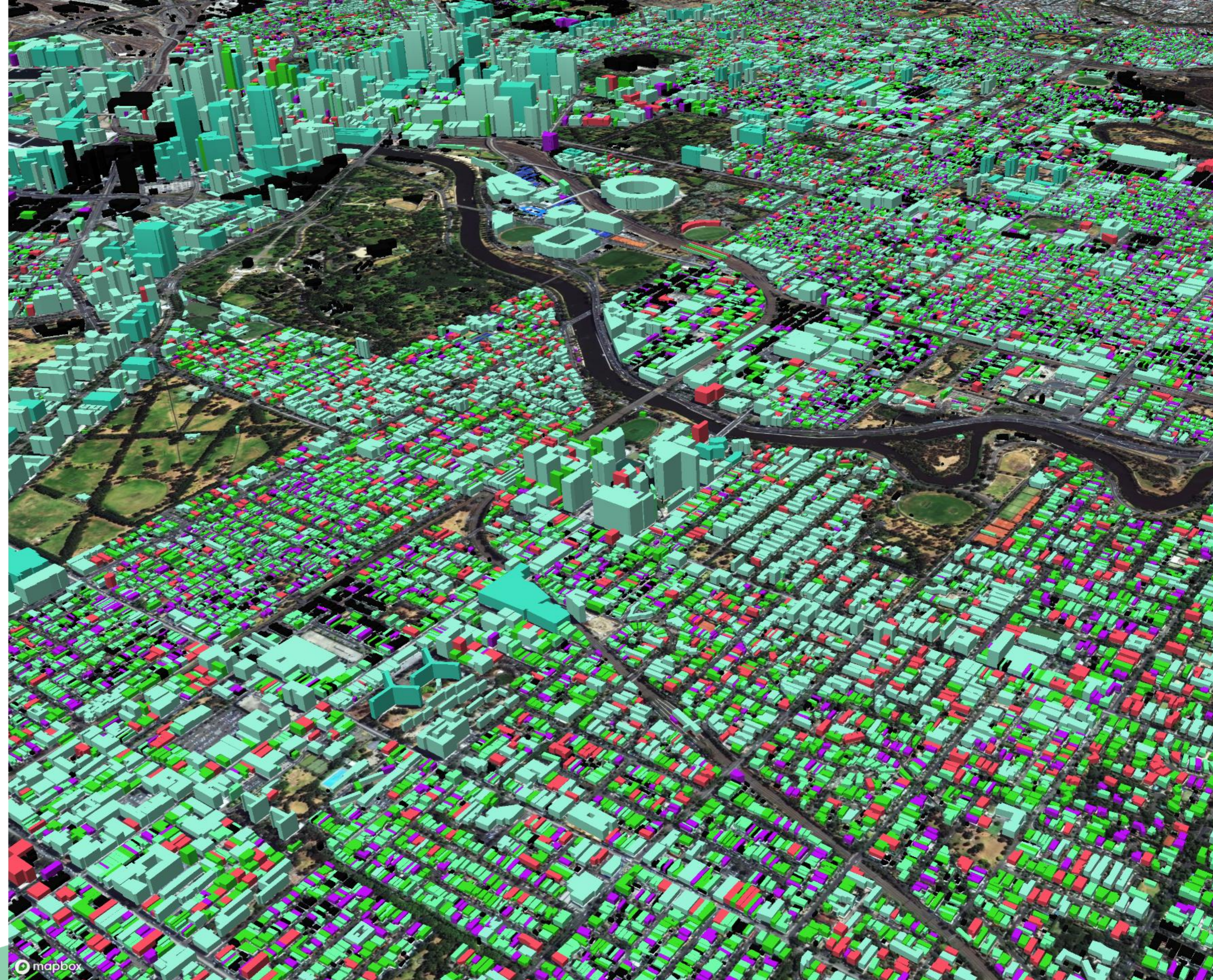
- Urban Form
- Elevation and soil data
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- **Climate data**

## CRCWSC Data

- Heat vulnerability mapping
- Future climate data
- Design typologies

## Own Data

- Land use zoning
- Asset data
- ...





# Digital Twin

- Melbourne
- Adelaide
- Brisbane
- Perth
- Sydney

The screenshot shows a web-based interface for setting up a digital twin project. The background is a satellite map of Melbourne, Australia. Three main panels are overlaid on the map:

- Project Setup** (dark teal panel):
  - Name**: A text input field with a cursor.
  - Region**: A dropdown menu currently showing "Melbourne".
  - upload custom data**
  - NEXT** button
- Overview** (light grey panel):
  - Text: "The region is set up for greater Melbourne. Data provided by Geoscape for research propose only."
  - Data** section with a list:
    - SA1 census (ABS, 2011)
    - Building footprints (Geoscape, 2018)
    - Parcel Map Polygons (Department of Environment, Land, Water & Planning, 2018)
    - Landcover (Geoscape, 2018)
    - 24h rainfall data (BOM, 2018)
    - Evaporation data (BOM, 2018)
    - Digital Elevation Model (DEM) of Australia derived from LIDAR 5 Metre Grid (Geoscience Australia, 2018)
- Data Sources** (yellow panel):
  - Text: "If you are building your own project and are looking for access to GIS and land cover data, these are some of the websites we visit for setting up a project. This is not an exhaustive list and we'll be adding to this list as we go. So please reach out if you're able to contribute data or know where to access publicly available data."
  - Text: "NOTE: All geojson file need to be set to WGS84 coordinate system, and land cover file need to be in tiff format."
  - List:
    - [Government Boundaries \(search your own\)](#)
  - DISMISS** button



# Models

## Urban Development

- Greenfield and Infill



# Digital Twin - Models

## Urban Development

- Greenfield and Infill
- Urban Form Typologies



Existing



BAU



WSUD Typology I



# Digital Twin - Models

## Urban Development

- Greenfield and Infill
- Urban Form Typologies

## Infrastructure Placement

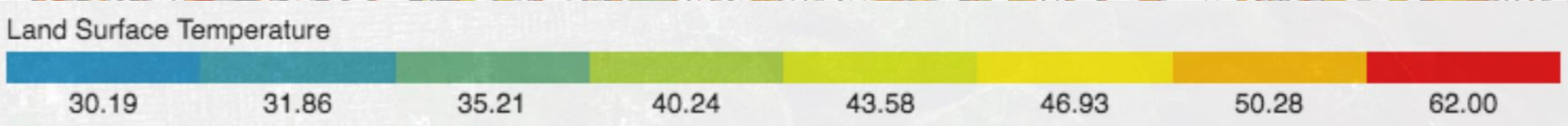
- Green Technologies
- Trees



# Digital Twin - Models

## Performance Assessment

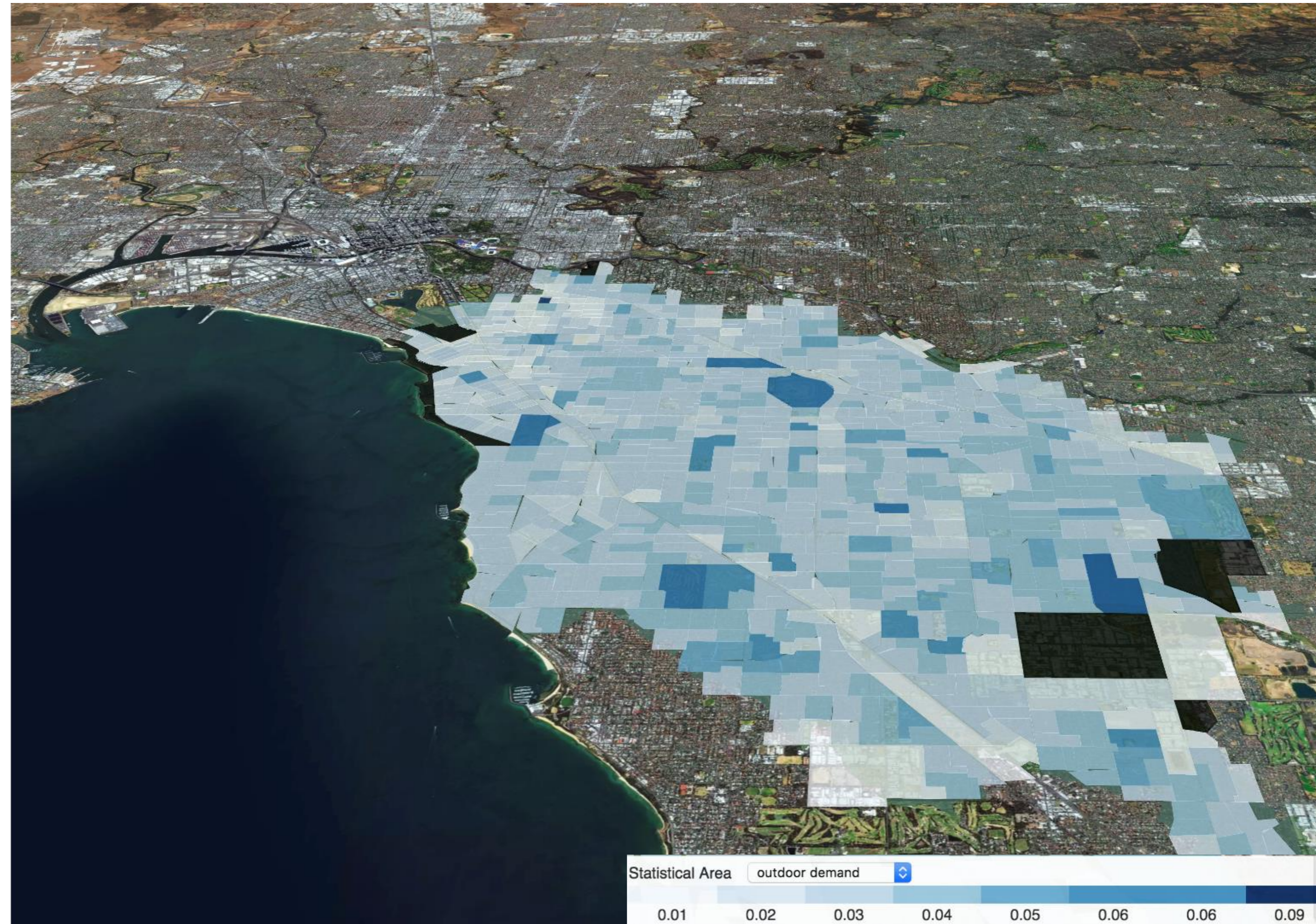
- Heat Island Effect
  - Land Surface Temperature
  - Air Temperature (TARGET)
  - Thermal Comfort



# Digital Twin - Models

## Performance Assessment

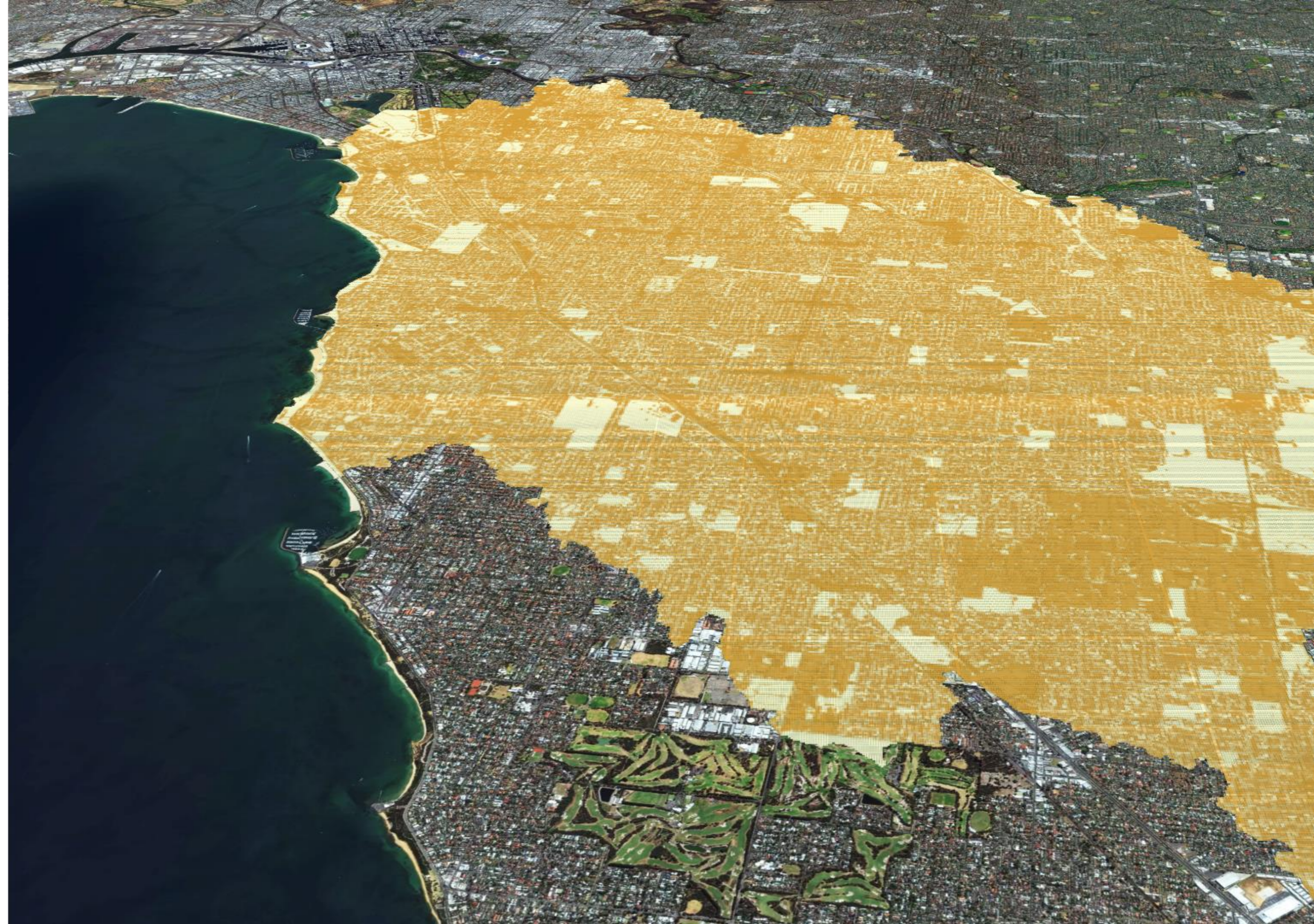
- Heat Island Effect
  - Land Surface Temperature
  - Air Temperature (TARGET)
  - Thermal Comfort
- Urban Water Cycle
- Urban Metabolism



# Digital Twin - Models

## Performance Assessment

- Heat Island Effect
  - Land Surface Temperature
  - Air Temperature (TARGET)
  - Thermal Comfort
- Urban Water Cycle
- Urban Metabolism
- Storm Water Treatment and Harvesting



# Digital Twin - Models

## Performance Assessment

- Heat Island Effect
  - Land Surface Temperature
  - Air Temperature (TARGET)
  - Thermal Comfort
- Urban Water Cycle
- Urban Metabolism
- Storm Water Treatment and Harvesting
- Flooding





# Analytics

## Scenario Analysis

**example 1**

Base line

3D

Compare

LAYERS PINNED

- Building
- Land Cover
- Tree Canopy
- Tree Stem
- Flow Path
- Statistical Area

Building none

### Scenarios

+

- Base line  
Scenario is complete i
- RWHT  
Scenario is complete i
- Infill  
Scenario is complete i

### Demographic

Parameter	Population
Base line	1180.00
RWHT	1180.00
Infill	1587.00

### Households

Category	Base line	RWHT	Infill
1	110	110	150
2	240	240	350
3	360	360	480
4	450	450	580

# Analytics

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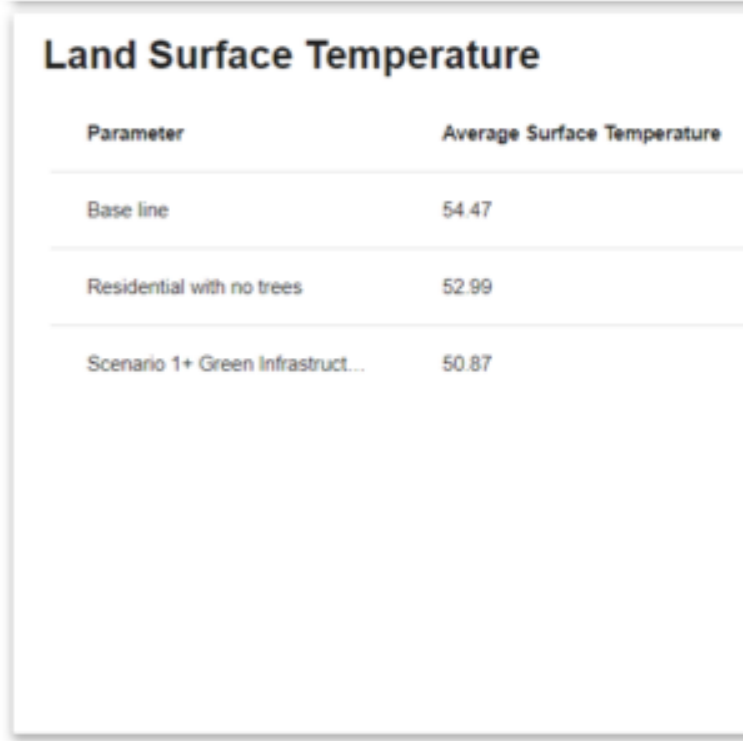
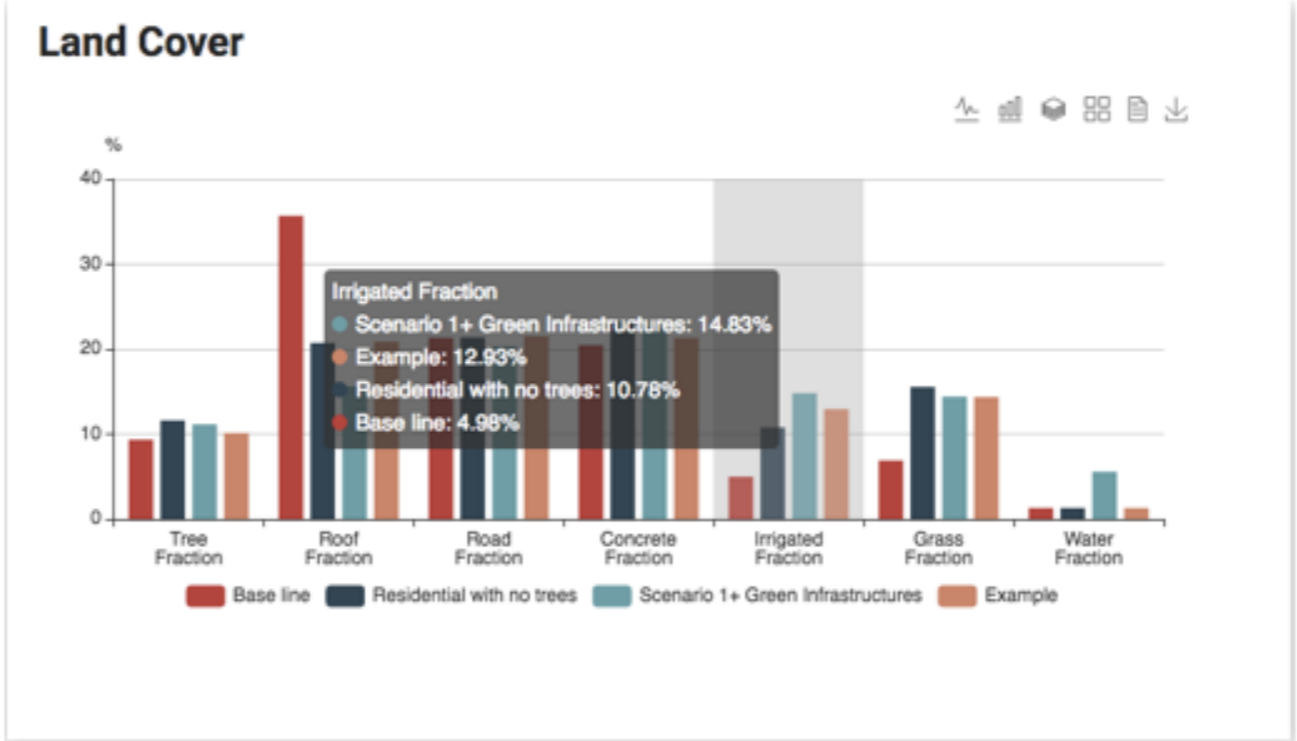
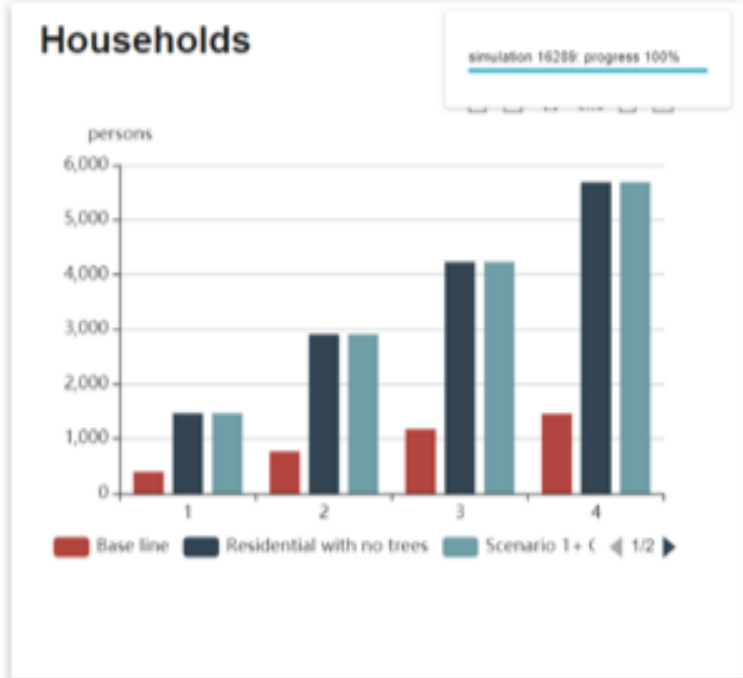
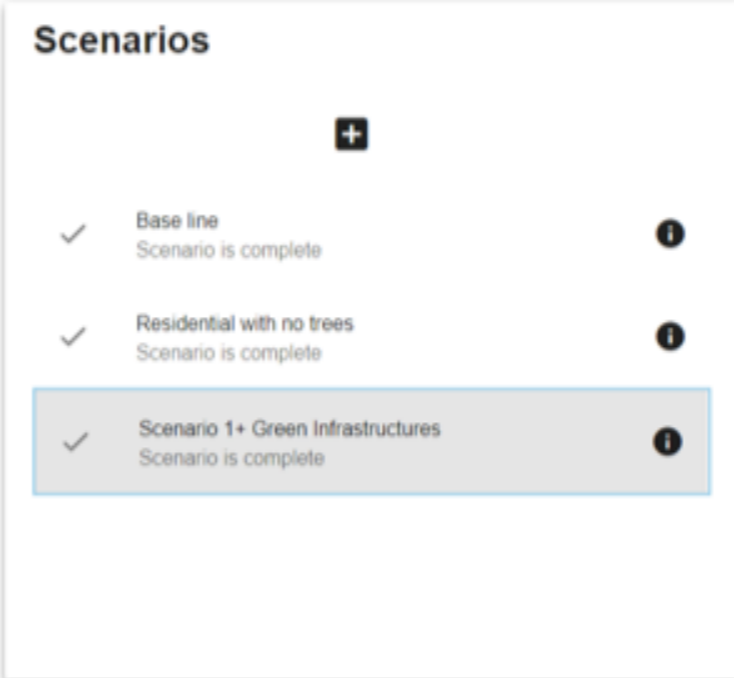
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# Analytics

- Scenario planning and testing
- Diagnostic tools



# Collaboration

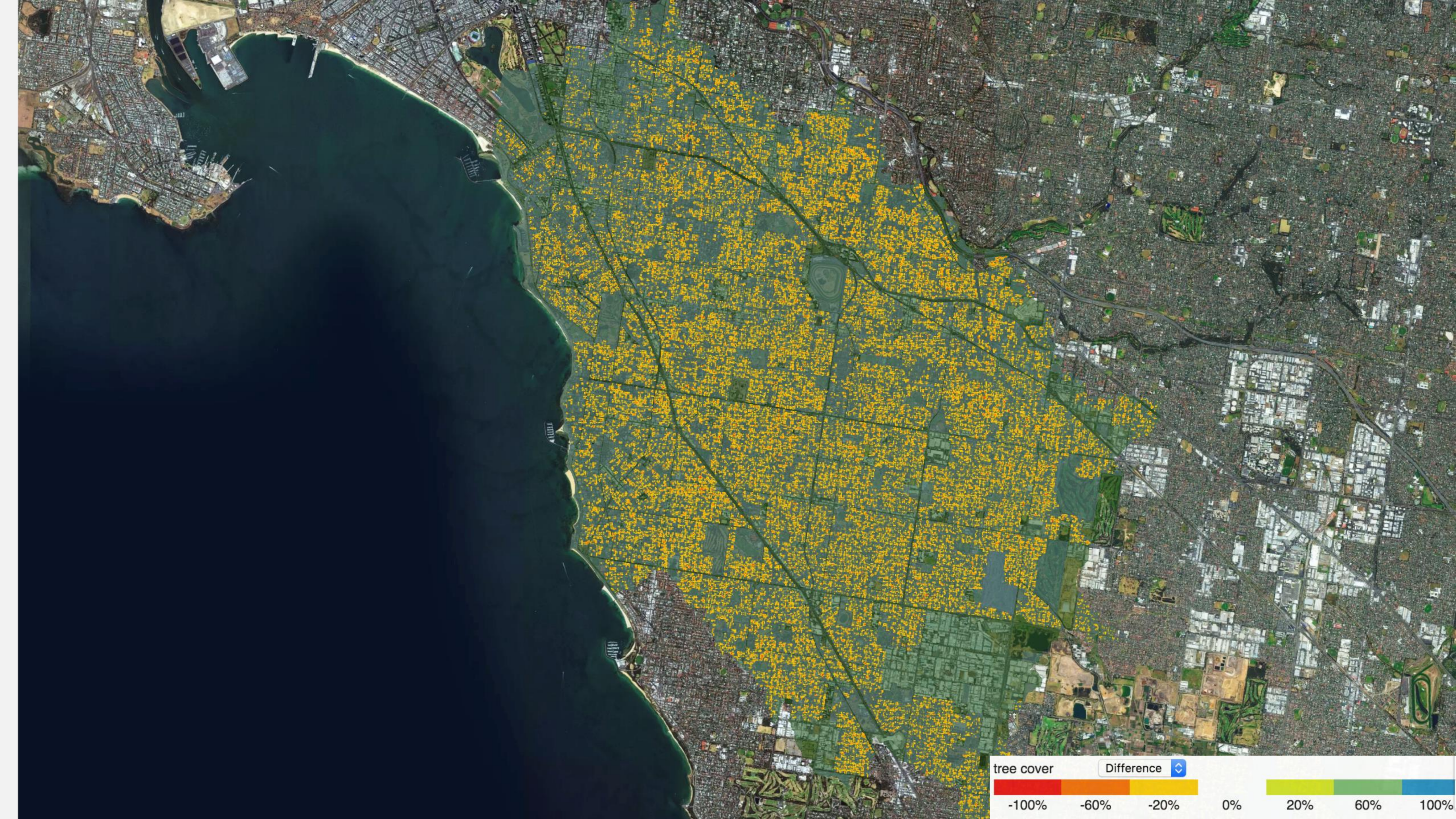
- Collaborative planning and decision-making
- Easy to use and accessible interface



# Collaboration

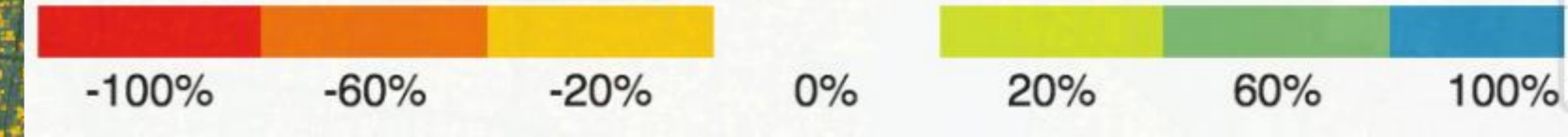
- Collaborative planning and decision-making
- Easy to use and accessible interface
- Visualisations

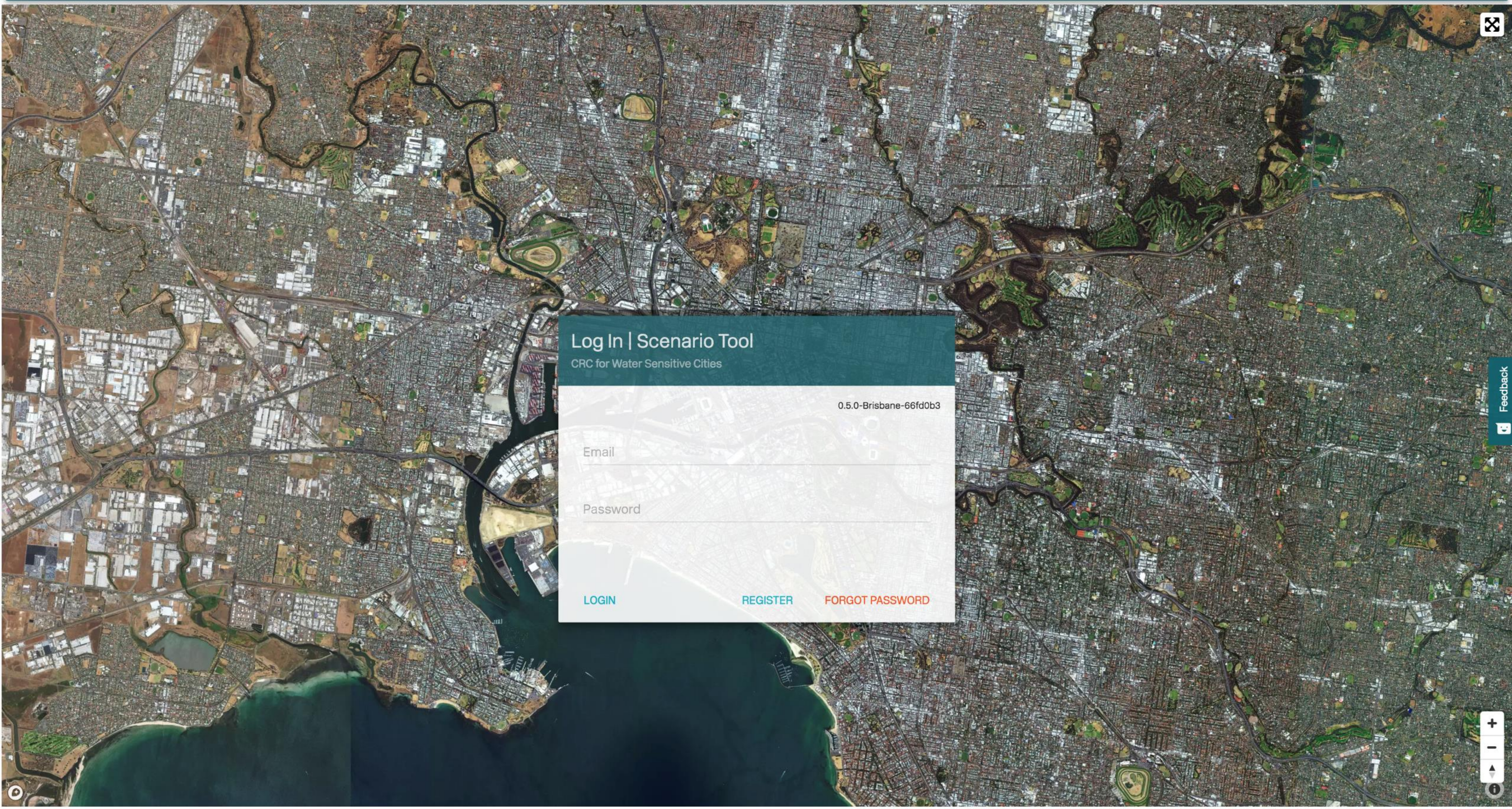




tree cover

Difference





**Log In | Scenario Tool**  
CRC for Water Sensitive Cities

0.5.0-Brisbane-66fd0b3

Email

Password

[LOGIN](#) [REGISTER](#) [FORGOT PASSWORD](#)



Feedback

