City of Unley Heat Island Modelling & Opportunities
What is the WSC Toolkit?

A numerical tool that support the strategic planning and conceptual design of stormwater management by:

- Quantifying the multiple benefits, including
  - Stormwater treatment & harvesting
  - Urban stream health
  - Local microclimate
- Understanding future rainfall variability and its applications for urban water management
- Evaluating the overall performance of potential green infrastructure scenarios
Overall concept

Drivers
- Climate change (present & future), etc.
- Hydrology & Ecology
- Urban Microclimate

Responses (modules in WSC Toolkit)
- Treatment and Harvesting Performance
- Stream Hydrology and Water Quality
- Stream Erosion and Minor Flooding
- Microclimate – Extreme Heat
- Microclimate – Average summer temperature

Consolidation
- Feed key performance indicators (KPIs)

Aspects of a Water Sensitive City
- Restrictions
- Stream Health
- Amenity
- Microclimate
- Flooding

Communication outcomes...

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Overall concept

Communication outcomes...

...allows well-informed collaborative decision-making by providing assessment of various aspects of different options...
Case Study: City of Unley

Quantifying the urban microclimate benefits associated with green infrastructure interventions

- Area ~14 km²
- Predominantly residential
1. Showgrounds
2. Residential
3. Residential (dense tree)
4. Commercial (Unley Rd)
Leader Street WSUD upgrade to an active living street

How do these WSUD interventions improve the microclimate?
Land surface temperature (LST) reductions

• Immediately after upgrade: 40% (0.8 ha) of the site will experience LST reductions of up to 3 °C.

• After tree establishment: 35% area will have 0-3 °C LST reduction; 15% area will have 3-6 °C.

- Up to 6 °C LST reduction (mainly in the inter-sections) can provide considerable cooling benefit to people utilising this street.
Opportunities to extend this work

• Refinement of Current Case Study:
  – New microclimate module – comparative case study
  – Comparison with City of Unley’s independent assessment
  – Detailed CRC Report and Publication on collaboration

• Exploration of other case studies:
  – Green Hills Project
  – Adelaide Airport