

Regional Advisory Panel Meeting Western Region

Meeting No. 40	Meeting Minutes	9.00am - 11:00am
30/01/2020		Water Corporation

Attendees			
John Savell (Chair)	Dept. of Communities /CRCWSC EPRG	Emma Yuen	CRCWSC, Regional Manager
Greg Ryan	Development WA	Emma Monk	Dept. of Biodiversity, Conservation & Attractions
Ryan Hunter	Peet	Winsome MacLaurin	Dept. of Water & Environmental Regulation
Shelley Shepherd	New Water Ways Inc.	Antonietta Torre	Water Corporation
Scott Wills	Water Technology	Ryan Hunter	Peet
Tao Bourton	Yolk Property Group	Michelle Duke	Dept. of Communities
Ben Fumage	CRCWSC		
Apologies			
Barry Ball	CRCWSC	Loretta van Gasselt	Dept. of Planning, Lands & Heritage
Ajay Shah	KBR	Nick Deeks	GHD
Neil Burbridge	City of Armadale	Max Hipkins	Consultant
Mike Mouritz	CRCWSC Board		

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1.	Welcome and apologies The Chair welcomed Scott Wills and Michelle Duke Mike Mouritz, Neil Burbridge, Loretta van Gasselt were apologies
2.	Acceptance of previous minutes The minutes from the last RAP meeting were accepted.
3.	Actions from August minutes Outstanding actions to be addressed at next meeting.
	CRCWSC Updates
5.	Regional Manager Report The concept of Integrate case studies was communicated and WRAP were informed that WA is not currently to receive one from within CRCWSC budgets. There is the opportunity to fund these commercially. The WRAP were disappointed that other states would receive

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	<p>these and not WA which had good opportunities in Brabham, Subiaco, Knutsford, Canning etc.</p> <p>Products provided via the Institute need to consider groundwater for them to be useful to WA.</p> <p>The WRAP were asked if they wanted to meet the Texans. They are interested if they will share their case studies but are less interested if they are just collecting information from WA stakeholders. This way we can be more targeted in inviting the right people</p> <p>The WRAP were asked if there are priority conferences to target presentations. They suggested Liveable Cities on 22 June 2020 - currently calling for abstracts (due 6 March).</p> <p>The WRAP strongly agreed with the need to make CRCWC information more accessible and that the proposed landing page is important in achieving this. There was concern that an accessible webpage wasn't covered by CRC as part of the standard operating budget. There are currently no unallocated funds in the WA capacity building budget (NWW) and in any case the WRAP would not support use of the WA capacity building budget for this because it should come under the national budget. The WRAP may be willing to support use of left-over WRAP budget but would like to see this covered by a national budget first and the failing that, understand other priorities for the WRAP budget such as the transition strategy publication.</p> <p>Priority themes for WA are green infrastructure and/ public realm, Water sensitive development, operations and maintenance as the first priority. Secondary priorities are Alternative water supplies and benchmarking. Urban Metabolism should change the title to something readily understood by stakeholders.</p> <p>List of what would success looks like was tabled during the meeting.</p> <p>ACTION: EY to ask the Texans via Mike Mouritz if the planned meeting with WRAP is to collect information from WA stakeholders or to share information back from the researchers related to their international case studies. EY with the support of AT and GR will make a submission to the Liveable Cities Conference around using water for WSUD. EY to put together scope, list of priority topics, cost and approach for developing landing pages and then seek national CRC funding for landing pages. EY to report back out of session on how much of the CRCWSC WRAP budget is underspent and report back EY to circulate the success list and ALL to provide top 1-2 priorities from success list distributed in the meeting.</p>
	<p>Items for discussion</p>
<p>6.</p>	<p>Capacity Building</p> <p>Held session with Andre Taylor in November, Aquarevo breakfast in September and Nigel tapper videos on the website.</p> <p>Masterclasses are going forward but can no longer hold paid activities at Water Corporation venues. Helen Fordham will present on communications.</p> <p>Case studies being updated.</p> <p>Hydropolis will have expert panel presentation</p> <p>Requested suggestions on the Water Industry Night and agreed to consider IRP4 typologies.</p>

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	<p>ACTION: SS to provide flyer on masterclasses to WRAP ALL to consider submitting an abstract to Hydropolis</p>
7.	<p>TAPS2 and TAPS1 Recent TAPS Webinar was not easy to hear.</p> <p>Antonietta said it will be a stretch to get industry ready by June 2021 although the Scenario tool may use consultants. The TDF tool is highly valued by the WRAP</p> <p>ACTION: AT will follow up on TDF tools with Katie Hammer.</p>
8.	<p>IRP1</p> <p>The research team is developing reports on 10 principles for engaging communities in the transition to a WSC. Ideally this would have been case study based examples of learnings related to the principles rather than just high level principles.</p> <p>Regarding if hard copies of the two Perth IRP1 reports should be printed - Need to be clear on who the printed copies of the 'Vision and Transition Strategy for a Water Sensitive Greater Perth reports would be for. While the minister already has a copy, there might be value in LGAs/ Councillors or Senior Decision makers in government.</p> <p>Agreed to find out available money first and consider in context of other priorities such as the landing page before making a decision on allocating funding to printing.</p> <p>ACTION: Revisit funding for printing reports after budget for landing page is decided as this is higher priority.</p>
9.	<p>IRP2</p> <p>RENEW at Murdoch lacks the student resources to drive this.</p> <p>ACTION: Emma Yuen to follow up with Natasha from DWER and Tanith from Mandurah re. case studies applying the INFEWS tool. Antonietta Torre will check up with Water Corporation regarding interest in applying the INFEWS tool to Drainage for Liveability projects Emma Yuen to confirm Liz Petersen's role going forward and if this will include train the trainer.</p>
10. and 12.	<p>IRP3 and IRP5</p> <p>Both were discussed at the same time</p> <p>Note Greg Claydon is only involved in IRP5.</p> <p>Discussed the value in IRP3 presentations on the planning and governance report to Brabham board, and possibly WAPC and UDIA urban water committee. Briefing of EPRG to be held March 17. Should also brief WSTN and WRAP and perhaps have Chris Chesterfield video conference into April WSTN meeting.</p> <p>Discussed the value in IRP5 WSTN/WRAP meeting on 20 Feb. This should include WRAP, WSTN, IRP5 PSC and possibly DCBA team and other stakeholders who have</p>

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	<p>already meet with Greg Claydon. Ideally we would also include IRP3 so that the Planning report and Brabham case study could also be discussed, but IRP3 needs to first go through approvals first.</p> <p>Shelley offered to video the sessions.</p> <p>ACTION: EY, WM and AT to coordinate:</p> <ul style="list-style-type: none"> • IRP5 WSTN/WRAP meeting/ workshop on 20 Feb, • IRP3 governance and Brabham briefing of WSTN/ WRAP in March and or at the April WSTN meeting <p>SS and EY to investigate presentations on IRP3 the planning and governance report findings to Brabham board, and possibly WAPC and UDIA urban water committee.</p>
11.	<p>IRP4</p> <p>IRP4 research team coming late March to meet with the PSC in Perth around Knutsford stakeholders. The PSC are looking at ways to link with Design WA and other stakeholders.</p> <p>Discussed value in open seminar via water industry night and teamed with an industry speaker e.g. Matt Stack or Nic Brunsdon. Maybe St. Patrick's Day 17 March? Not school holidays.</p> <p>ACTION: SS to look into Typologies Water Industry night around end of March. GR and JS to set up meeting for DoC to understand the project better. GR to suggest industry night to the IRP4 team.</p>
13.	<p>WS Transition Network</p> <p>Next meeting of WSTN will be held on 14 Feb, but the waterwise showcase will now be later in year. The WSTN meeting venue has also changed and it is now at DPLH 140 William Street.</p> <p>Waterwise Perth Steering Committee will be held on 26 February and Mike Rowe would present at that meeting.</p>
4.	<p>Executive Update</p> <p>Concern was raised that the CRCWSC was not available for phone in considering the WSC Institute was on the agenda.</p> <p>Board signed off on scope for WSC Institute in September and will start off focussing on advisory services</p> <p>Ben Furmage provided an overview of what the institute could deliver.</p> <p>CRCWSC will not lead the CRC water security but will support its contribution to urban issues. They may consider leading a March 2021 circular economy CRC bid.</p> <p>Board and EPRG meeting on 25 February 2020 will seek to gain Essential Participant commitment to institute as Tier 1 or owner. Then the WSC Institute will prepare a prospectus and engage with partners more broadly.</p> <p>Ben and Tony will meet with WSTN on 14 February as well as individual meetings with partners. Originally discussed Tony and Ben meeting individually with DBCA but decided</p>

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	<p>better to wait until after core participants are bedded down.</p> <p>Ben clarified that governance will be similar to now, where there is an owner (performing a similar role as currently done by the commonwealth), but the owner of the institute might be a university who provide administration and in-kind support and maybe some funding. There will be a board elected by tier 1 members. Will work with WRAP or WSTN to get mainstreaming priorities. The next 6 months are to get critical mass and then 18 months to move forward.</p> <p>WRAP made comments/questions:</p> <ol style="list-style-type: none"> 1. Mainstreaming part and local industry involvement is important so how does WSC Institute maintain a WA focus and not become an eastern states focussed/driven body? 2. What will be the governance structure and how will it ensure industry voices are heard? 3. Ben said the money invested by state partners will come back to the state, but how will this happen and ensure investment addresses WA industry partners' priorities? 4. How does it link to WA NWW and how funding will be split? 5. How will it maintain legitimacy as we currently have in CRCWSC? 6. Need secure governance model as we also have the WSTN model? 7. Is an Institute the best approach to get transformative cities up? 8. What happens to WSC Institute funding if a broader 2021 bid gets up? 9. How will the membership tiers work? 10. How do we get to 1 July 2021 and ensure IRPs and TAPs are completed and what happens if they are not finished? 11. What happens to WRAP and RMs? 12. What are the priorities for WSC Institute? 13. Is it solid enough to get support from the universities? 14. How do we get a new projects up? 15. How is the WSC Institute run? 16. Will money that comes back to the states be dollar for dollar?
	Other business
15.	<p>Other Business</p> <p>None</p>
16.	<p>Close: The meeting closed at 11.00am.</p> <p>Next meeting: 9-11 Tuesday 31 March 2020 @ Development WA later changed to 24 March</p>

WESTERN Regional Advisory Panel

ACTIONS

Legend
Done
Not Done
Deferred
On Agenda

Actions	Description	Who	When
Actions from Meeting No. 40			
1.	EY to ask the Texans via Mike Mouritz if the planned meeting with WRAP is to collect information from WA stakeholders and or to share information back from the researchers related to their international case studies. If the later, then MM/EY to coordinate a WRAP session.	EY and MM	
2.	EY with the support of AT and GR will make a submission to liveable cities around using water for WSUD.	EY and AT and GR	
3.	CRCWSC to put together scope, list of priority topics, cost and approach for developing landing pages and then seek national CRC funding for landing pages.	EY	
4.	EY to report back out of session on how much of the CRCWSC WRAP budget is underspent and report back	EY	
5.	EY to circulate the success list and ALL to provide top 1-2 priorities from success list distributed in the meeting	EY	
6.	SS to provide flyer on masterclasses to WRAP	SS	
7.	ALL to consider submitting an abstract to Hydropolis	ALL	
8.	AT will follow up on TAP1/TDF tools with Katie Hammer.	AT	



Actions	Description	Who	When
9.	WRAP Chair and EO to revisit funding IRP1 reports after underspent budget for land page is decided as this is a higher priority.	MM and EY	
10.	Emma Yuen to follow up with Natasha from DWER and Tanith from Mandurah. Antonietta Torre will check up with DWER drainage for liveability for interest in using INFEWS	EY	
11.	Emma Yuen to confirm Liz Petersens role going forward and if this will include train the trainer.	EY	
12.	EY, WM and AT to coordinate IRP5 WSTN/WRAP meeting/ workshop on 20 Feb,	EY and WM AT	
13.	EY, WM and AT to coordinate IRP3 governance and Brabham briefing of WSTN/ WRAP in March and or at the April WSTN meeting	EY and WM AT	
14.	SS and EY to investigate presentations on IRP3 the planning and governance report finding to Brabham board, and possibly WAPC and UDIA urban water committee.	SS and EY	
15.	SS to look into Typologies Water Industry night around 23/24/25 March or 29, 30,31.	SS	
16.	GR and JS to set up meeting for DoC to understand the project better.	GR and JS	
17.	GR to suggest industry night to the IRP4 team.	GR	
18.	All will send Emma Yuen coffee orders via text 0448889318 one hour before the next RAP	WRAP	
Outstanding actions from previous meetings			
A.	GR and WRAP to explore opportunities for linking with planning processes including Design WA.	GR/ WRAP	
B.	GR/ MR to provide additional cost to include heat in Knutsford case study	MR	
C.	Abbie Rogers to investigate options for video recordings of the Expert sessions in the Ideas for Financing	AR	



Actions	Description	Who	When
D.	Emma Yuen and Abbie Rogers to discuss WA workshop opportunities Following Ideas for Financing workshop.	EY and AR	
E.	EY to circulate governance and Brabham reports from IRP3 once completed.	EY	
F.	future WRAP to discuss the mainstreaming workshop outputs.	EY	
G.	EY to circulate Sam Lemons IRP output list.	EY	

Western Region Manager Update

WRAP 24 March 2020

Activity title	Outcomes achieved	Items for RAP to note
CRCWSC executive	Tony's executive functions with both the CRCWSC and the Water Sensitive Cities Institute formally finished on Tuesday 25 February 2020. He is still with Water Sensitive cities but is now focusing on delivering projects, translating research into works on-ground, and developing business opportunities for the Institute. He will chair of the Water Sensitive Cities Think Tank, to challenge business-as-usual thinking about how we plan and develop our towns and cities, and advocating for WSC practices Tony Wong and Ben Furmage met with DWER, WC and Communities on February 13. Ben presented on the institute to the WSTN on Feb 14	
CRCWSC Board	Face to face Meeting was held February 25 with Board with a focus on the WSC Institute	
CRCWSC AC		
CRCWSC commercial	The CRCWSC are undertaking work with DFAT and ADD in Pakistan and China. CRC has been contracted to develop a smart platform prototype for slow movement system in Kunshan (City Explorer) Capetown is going to undertake an WSC Indexing workshop All travel domestic and international travel has been disrupted by the corona virus	
EPRG	Met February 25 with a focus on the WSC Institute.	
Research including Tranche 1 and Tranche 3	Research Leaders meeting held 18 and 19 February to discuss the potential Integrated Research Case Studies. Currently there are three potential sites, but it may be reduced to just one Salisbury which had already used most CRC tools already. The other potential sites were Townsville and Sunshine Coast as they had strong support from local groups able to drive them forward along with strong potential for local funding. CRC for Transformations in Mining Economies has been funded for 2020 Potential upcoming water CRCS are: <ul style="list-style-type: none"> • CRC for Water security: Griffith and UQ – possible 2020 • CRC circular economy – possible 2021 Our 2019 stakeholder annual report has been released and showed in 2019, the benefits of our research and adoption activities were independently valued at over \$600 million—a benefit cost ratio of 6, significantly more than forecast in 2012. Jenn Middleton from UWA was awarded the AWA WA student water prize for B2.23 “protection and restoration of urban freshwater ecosystems: informing management and planning”	See details on the WSC Institute are here https://watersensitivecities.org.au/content/our-water-sensitive-cities-institute-has-a-proposed-new-business-model-for-post-2021/?utm_medium=email&utm_campaign=Newsflash%20%20for%202020%20-%20181&utm_content=Newsflash%20%20for%202020%20-%20181+CID_c3eebadd04b45e44dcf491b5714b30f4&utm_source=Email%20marketing%20software&utm_term=Read%20feature%20article See the stakeholder report here https://watersensitivecities.org.au/content/stakeholder-annual-report-fy1819/
General operations and Regional Manager	Regional managers meeting January 21 and 22 in Brisbane discussed the WSC Institute. The business plan was circulated out of session March 9 The CRCWSC has a draft education and training strategy which should be linked with the work of the WSTN research subcommittee.	For decision: endorsement of the business plan For discussion: need to consider exit strategy for WRAP
Transition Network	WSTN held 14 February and discussed the WSC Institute and Max's experience from City of Nedlands.	
Adoption - WA Research and Adoption Plan	There is another tools and products Roadshow being planned for mid 2020, starting with the IRP4 tools March 31 followed by the TAPS in July. This may be delayed due to Corona We are required to undertake WRAP satisfaction surveys for our commonwealth reporting and will do this in-session using mentimeter. We had 4 people respond already which was the highest anywhere but the commonwealth needs more than 6 responses.	
Adoption - IRP1 Shelley	Final draft of the community engagement report which outlines ten principles for engaging communities in WSC transitions reviewed by PSC and with Briony in publication. Project team still to develop Guidance manual for enhanced envisioning process methodology (A4.2 deliverable) and the Technical report on comparative analysis of case study results. At previous WRAP we deferred the decision on printing 100 copies of the Transition strategy and Implementation Plan (at \$1397) until after website themed landing pages are finalized.	
IRP2 Emma	EOI for financial expert on Ideas for Financing was awarded to Martin van Bueren from Synergies who has produced a draft report and is revising it ahead of the Victorian workshop. Made formal approval of our variation, which created a budget line for Liz Petersens services. Her role is primarily to provide a peer review of Participants' INFFEWS applications. Once she has reviewed the BCA and provided feedback, she will write up that case study in a report (2-3 pages), which would include the processes they went through, the collaborations, the timelines, the overall result and anything else worth mentioning. We will offer this service for free to our Participants who complete an INFFEWS application over the next couple of months. She will not be available to train the trainer but she will, support the community of practice.	For information: Any Participant nearly ready with an INFFEWS application can receive support from Liz soon. See Subiaco Case Study report is now publicly available: https://watersensitivecities.org.au/content/subiaco-strategic-resource-precinct-case-study-non-market-valuation-of-recycled-water-final-report/ Also, the WP6 Economic value of urban heat mitigation Industry Note has been released, please forward this to your colleagues to support the widespread dissemination of the results: https://watersensitivecities.org.au/content/economic-value-of-urban-heat-island-uhi-mitigation-a-case-study/
IRP3 Shelley	Brabham case study is complete along with the Governance report and both reports are awaiting publication The IRP3 team is currently working on scoping the Melbourne based case study (Sunshine – infill development) Townsville case study is underway (greenfield development). Have started developing the Framework. Still not clear on what the outputs are going to be or who they will be for but expecting them to be brief and visual. Both case studies highlighted the difficulty in engaging with planners (CRCWC quote).	
IRP4 Greg	The original plan to hold an open workshop, charette and project steering committee meeting on March 31/ April 1 has been changed due to coronavirus to the following: The open panel session planned for the morning of March 31 at DPLH will go ahead with use of zoom for speakers from interstate. Marguerite and Geoffrey will be in attendance assuming that the health department doesn't limit public meetings	

Activity title	Outcomes achieved	Items for RAP to note
	<p>The charette in the afternoon, will probably be delayed for 3 months and will be held independently of the open session with a small select group of stakeholders.</p> <p>The Project steering committee on April 1 will be held using zoom to link face-face sessions in the separate states. This avoids air travel and uni policies.</p> <p>The afternoon Knustford meeting with DevelopmentWA will be go ahead as planned.</p> <p>Ant looked into a peer review of the Urban water mass balance model and applicability to Perth.</p>	
IRP5 Ant	<p>A first draft of guidance document has been drafted and socialized with stakeholders on 20 February. The project is on track, with the guidance document due for completion end of March 2020.</p> <p>Next step is commencing Work Package 2 – selecting the field validation sites, design the field validation program and developing the Sampling & Analysis Plan. However, funding is available to undertake the field validation for water balance (quantity) only, and not water quality or evapotranspiration of vegetation (a key component of the water balance that was identified as a knowledge gap by the Expert Panel).</p>	<p>For discussion – how to fund water balance (water quality or evapotranspiration of vegetation)? See article for further info https://watersensitivecities.org.au/content/irp5-is-kicking-goals/</p>
TAP1 - WSC index ant	<p>There have been some project delays due to change in staff and team member delayed due to travel restrictions (coronavirus).</p> <p>The modellers have been working on the Management Actions Module, which is being sent to Katie and Briony for feedback. After this, it will be ready for testing. The module will help share peer to peer learning data and share insights across the LGAs/cities that have undertaken benchmarking and action planning.</p> <p>The Transition Dynamics Framework (TDF) module is being finalized to go to alpha version. After this done it will be available to all partners.</p> <p>The CRCWSC is developing an online tool that relates to the WSC Index to the UN Sustainable Development Goals (SDGs). The tool will enable modelling of how actions impact the SDGs. This will be available soon.</p>	<p>For discussion: Let Antonietta know if you have any feedback on the Index tool, as there is opportunity to incorporate in the upgrade.</p>
TAP2 – scenario tool at planning scale Ant	<p>The TAP PSC Tele-meeting #13 was held on 20 Feb. The project is slightly behind schedule.</p> <p>The User acceptance testing (UAT) of the Scenario Tool started in January and closed for comments on 6 March. The team will now start reviewing comments and addressing key issues (to be completed by June 2020). Issues will be prioritised and resources assigned (may not be able to address all issues). Refinement of the Scenario Tool's water balance model was completed, and the updated capabilities will be made available to an external testing group next quarter.</p> <p>TARGET is now finalised and has been tested by the User Acceptance Test Group and Geoscape data for the built-up area of Australia was integrated into the model. Data for Perth is now available.</p> <p>Monthly training webinars are available</p> <p>In mid/late 2020 there will be a CRCWSC Tools information seminar involving a demo then a half day scenario tool and 1 day training.</p> <p>Note: that the water mass balance in the TAPs and in the IRP4 evaluation tool are different. IRP4 will focus more on the smaller scale and provide more details to feed into the IRP4 assessment framework. Whereas the Water Cycle component in the scenario tool will be looking into the temporary pattern as well and the interactions between centralised and decentralised supply options and hopefully a fit for purpose groundwater component.</p>	<p>For discussion: Let Antonietta know if there are any topics you would like Monthly training webinars to focus on.</p>
KAT – capacity building and community engagement Shelley	<p>We need to think about priority capacity building areas which may include both a) local adoption of IRPs, TAPs etc and b) national level communication such as the themed landing pages.</p> <p>There is no guarantee that the existing way of funding capacity building will continue next financial year.</p> <p>Events held or planned</p> <ul style="list-style-type: none"> • Waterwise Masterclasses booked and successful first class held on 19 Feb. Next one on Collaboration scheduled 25 March. Have arranged for each class to incorporate 2 experts to provide different perspectives. Places still available. • Water Industry Night 10 March – Greg Ingleton from SA Water, 65 rsvps • WSCSS IRP4 31 March at DPLH • Fact sheets nearly completed for review by WRAP – watch this space! • Workshop with Dept Finance and Dept Education held 21 Feb. Following up • Introductory WSUD training sessions 10 March and 7 April. 	<p>For discussion: what does WRAP think are the priorities for 2020/2021?</p>
WSTN Winsome	<p>Schedule of 2020 meetings set and a refresh for how we will manage meetings.</p>	<p>Outcomes of WSTN paper on resourcing research and adoption for waterwise outcomes submitted to Waterwise Steering Committee (26 Feb 2020).</p>
Opportunities – policy		
Opportunities - Projects		
Grants and Funding		
Analysis: Evaluation		
events	<p>Water events calendar has moved to the MS teams site.</p> <p>CRCWSC are a partner in the 15th IWA/IAHR International Conference on Urban Drainage, to be held in Melbourne 6–11 September 2020.</p>	
Media	<p>Greg Ingleton was on gardening Australia https://www.abc.net.au/gardening/factsheets/smart-watering/11966152 talking about the airport on 14 February.</p> <p>CRCWSC end-of-year video (Our year 2019 - Aspiring, innovating, delivering)</p> <p>New media coming up:</p> <ul style="list-style-type: none"> • Started work on a video about the Sponge City Brain • Started work on augmented reality products, to convey the intricacies of WSUD assets • videos planned around WSCI and circular economy video. • Producing a trailer to provide an overview of all the tools 	
Stakeholder engagement by Regional Manager	<p>Would like to “like” partner websites from the CRCWSC website send details through RM onto Lorena.</p> <p>I have attended/ met with:</p> <ul style="list-style-type: none"> • the AWA casual event at The Shoe • interview with Amanda Fencl • Canning – change your world conference 	<p>Attached: slides on heat impacts of living turf from last year</p>

Activity title	Outcomes achieved	Items for RAP to note
	<ul style="list-style-type: none"> • Jason Pitman – Perth NRM • Jade Mains WALGA • DLGSCI 	
Development sector engagement	UDIA water committee has revised their membership. New members include Nick Turner, Matt Craven – Kelly, Ben De Marchi, Kelly Lavell, Shane McSweeney, Darren Pesich, Scott Wills UDIA water committee have been engaged regarding IRP5 through Greg Claydon.	
Local Government sector engagement	<p>AWA mentoring event planned for 23rd of June, at The Shoe. There is the potential to include LGAs within this event. LGA participants would need to become a member of the AWA and pay a small event fee.</p> <p>The next WSC index workshops are City of Armadale on 11 March 2020 and Stirling 25 March.</p> <p>There will be a few hard copies of the business case available soon</p> <p>WALGA in conjunction with the Local Government Urban Forest Working Group will host Trees in a Liveable City: An Urban Forest Conference on Friday, 17 April in Perth. The conference will showcase achievements of the organisations involved in growing Perth's urban canopy, including best practice examples and latest research, to provide attendees with the knowledge needed to make positive change through their own roles, organisations and communities.</p>	See business case report on https://watersensitivecities.org.au/content/constructing-a-business-case-for-water-sensitive-investments-a-guideline-for-local-government-2/
Water utility engagement	<p>Water wise councils Platinum is coming up soon.</p> <p>The Water Corporation showcase has been delayed until later in the year.</p>	



Business Plan 2019/2020

Western Regional Advisory Panel
December 2018

CRCWSC and the WA context

In Western Australia, there are a wide range of stakeholders seeking to drive a Water Sensitive Agenda. While the Departments (DWER, DBCA and DPLH) and UWA have long been supporters of water science and policy, the engagement of a broader group of stakeholders through the CRCWSC has provided additional opportunities. The Water Corporation board has set ambitious targets, the state developers (Department of Communities and Development WA) are undertaking innovative developments in Brabham, Bentley, White Gum Valley and Knutsford> Meanwhile local governments are increasingly undertaking Water Sensitive Cities Index/ Transition Strategy workshops which lead on to actions incorporated into strategic plans and local sustainability strategies.

However, there are also long term trends towards smaller government, exacerbated in 2017 by high numbers of redundancies across state agencies. The impacts range from the ability of approval agencies to undertake approvals in a timely manner and the ability to engage in collaborative processes that have long term benefits across government. The shrinking public sector can make collaboration more difficult although our partners continue to support us through both the CRC Water Sensitive cities and the Water Sensitive Transition Network.

The local development sector has been subdued since 2014 which tends to dampen any appetite for risk through innovation. Ironically, timelines are not as critical during property slumps and innovation is best achieved at these times. Perth currently has low rates of infill, and compared to other capital cities has the highest proportion of residential completions from greenfield estates compared with apartments. Many of these new Greenfield developments are in areas without a groundwater licence for public open space irrigation and or experience high groundwater levels in the winter months. The 'easy' development sites close to the city have invariably been developed and Perth is left with these more challenging sites. However, these emerging problems for development have the potential to also open doors where water sensitive approaches are shown to be an answer to an existing problem.

The impacts of climate change have been evident for a number of decades in southwest WA which has seen the water sector take swift and decisive action through climate independent supplies such as desalination. Meanwhile momentum is gathering around protection of the urban tree canopy at the state level through DPLH while the LGAs are undertaking heat mapping and developing their own urban forest strategies. At the same time the health sector is poised to tackle the impacts on health in the wake of the Sustainable Health Review, and the Climate Health WA inquiry. The convergence of healthy communities under climate change and greening our suburbs has the potential to embed water sensitive practices across Perth.

About the Western Regional Advisory Panel

Regional Advisory Panels (RAPs) are a key component of the CRC for Water Sensitive Cities' (CRCWSC) management structure. These Panels enable state-level coordination of end-user priorities and involvement in CRCWSC research activities, as well as tailoring of capacity building activities.

The Western Regional Advisory Panel (WRAP) is composed of officers from government, councils, water utilities, developers, consulting organisations and capacity building organisations who are invested in transforming Perth into a water sensitive city. In early 2019, WRAP membership was opened up to all participants, including individual Local governments and SMEs, and key gaps in the development and planning sectors have been filled by non-participant stakeholders.

The purpose and role of the Regional Advisory Panel is outlined in its Terms of Reference which states it will act as an advocate and steering committee for CRCWSC programs to advance the transition to water sensitive cities and towns in their region. The WRAP is focussed on providing strategic guidance to the CRCWSC Regional Managers, Executive and Board to ensure that the CRCWSC program activities (eg Integrated Research Programs, Tools products and Capacity Building) address the priorities of regional CRCWSC Participants and stakeholders.

Meanwhile, the Water Sensitive Transition Network (WSTN) is identifying priority actions to help Perth transition to a water sensitive city whilst supporting key stakeholders in their organisational goals.

Current members of the WRAP can be found at <https://watersensitivecities.org.au/creating-wsc-australian-cities/wsc-wa/regional-advisory-panel-wa/>

The WRAP is connected to a network of other groups, both within and outside of the CRCWSC who are pursuing a water sensitive Perth. These groups are illustrated on the diagram below:

WA WSCs stakeholder groups

- State government committees:
~~Waterwise~~ Perth Steering Committees
- DGs group DWER, ~~DoC~~, DPLH, WC, LC & DLGSC
 - Working group
- Senior leaders – drainage leadership (DWER, WC)
 Joint Executive (DWER, WC)
- Other External committees:
 UDIA Urban water committee
- subcommittees on alternative supplies
 - subcommittees on approvals
 - ARR
- Swan NRM
 Sustainable Health Community of Practice
 Nature Link Perth
- New ~~Water~~ Ways Board – WA's capacity building program for water sensitive cities

Water Sensitive Transition Network WSTN

- WSTN leadership group
- WSTN subcommittee - Community Engagement & Communication
- WSTN subcommittee - Research
- WSTN subcommittee - Policy & Governance
- WSTN subcommittee - Technical Capacity and Partnerships

WA CRCWSC Committees

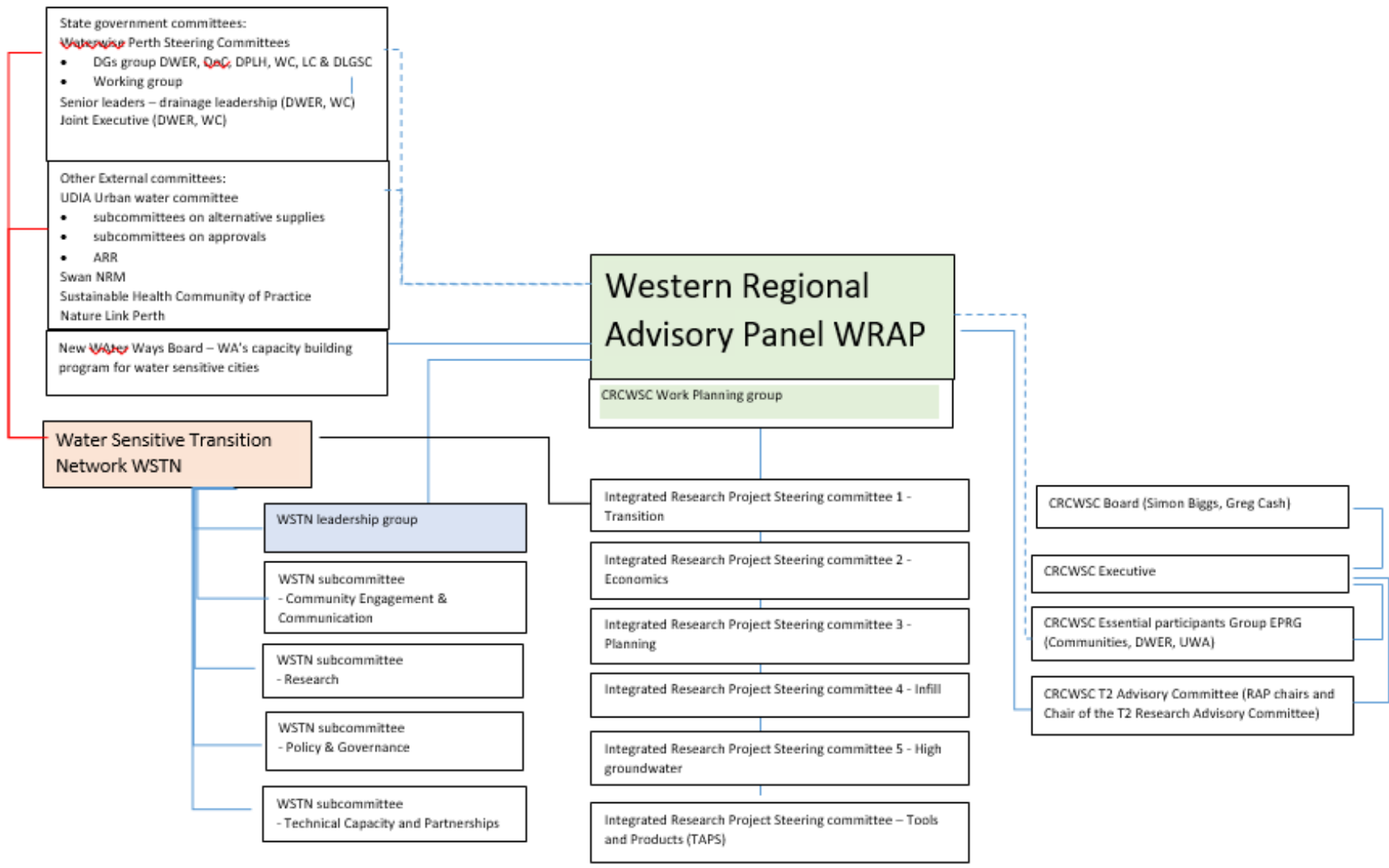
Western Regional Advisory Panel WRAP

CRCWSC Work Planning group

- Integrated Research Project Steering committee 1 - Transition
- Integrated Research Project Steering committee 2 - Economics
- Integrated Research Project Steering committee 3 - Planning
- Integrated Research Project Steering committee 4 - Infill
- Integrated Research Project Steering committee 5 - High groundwater
- Integrated Research Project Steering committee – Tools and Products (TAPS)

National CRCWSC committees

- CRCWSC Board (Simon Biggs, Greg Cash)
- CRCWSC Executive
- CRCWSC Essential participants Group EPRG (Communities, DWER, UWA)
- CRCWSC T2 Advisory Committee (RAP chairs and Chair of the T2 Research Advisory Committee)



Goal of this business plan

In 2019/20, the emphasis is on delivery of the five Integrated research programs (IRPs) and various Tools and Products (TAPs) including the Scenario planning tool, the city shaping platform, WSC Index, Transition Dynamics Framework (TDF), Synthesis workshops INFEWS economic tools, Infill framework and typologies catalogue.

This business plan is for the WRAP only and doesn't cover the Water Sensitive Transition Network. Key objectives for the WRAP include:

- improve translation and access to knowledge generated to date;
- improve pathways for the CRCWSC research to influence 'on-ground' projects;
- demonstrate end-user value from the investment in research;
- facilitate adoption of CRCWSC research and tools through the NWW program

Relationship to other plans

The Plan articulates what the partnership between the CRCWSC and its end-user organisations aspires to deliver in WA, provided adequate resources are identified. It achieves this by providing a set of outcomes (success measures) and outlining high-level actions that will deliver them. This plan will guide the efforts of the WRAP, which in turn provides advice to the CRCWSC on research and adoption.

The plan will be guided by National plans:

- CRCWSC Strategic and Operations Plans (released October 2019).
- Research and Adoption Portfolio Action Plan (2017-2021) - a national scale plan including actions and performance targets.
- key commonwealth milestones for the CRCWSC

The plan will be aligned with local plans:

- The WSTN's Perth Transition Strategy (Part A and B) and subcommittee priorities.
- New WaterWays local work programs (CRCWSC knowledge broker and capacity building activities in WA).

Resources available to deliver the business plan

The proposed activities of the CRCWSC in WA will be delivered through a mix of:

- CRCWSC Tranche 2 activities and services which include integrated research projects, tools and products, regional projects and the WA Transition Strategy and Implementation Plan;
- A CRCWSC budget for capacity building activities in the Western region;
- Commercial products including fee-for-service CRCWSC activities (e.g. “Ideas for” workshops, application of the Transition Dynamics Framework, WSC Index benchmarking workshops, etc.);
- CRCWSC staff including the WA Regional Manager;
- In-kind contributions and participation or partnerships with end-user organisations.

Integrated Research Projects and Regional Projects

The CRCWSC is delivering its 2016 - 2021 research program through 5 Integrated Research Projects (IRP1- IRP5) and a Tools and Products (TAPs) project. Each project has a Project Steering Committee comprised of CRCWSC member organisations. The Projects include a mix of case study projects nominated by the Regional Advisory Panels. WA case studies within the IRPs include:

- Perth Transition Strategy
- Belle View Estate wetlands
- Subiaco strategic resource precinct
- Knutsford Museum site
- Brabham development

- Ocean Reef Marina
- Queens Park Regional Open Space
- Various LGAs undertaking benchmarking or transition planning

In WA we also have at least 5 Regional Research Projects:

- REG 6-1 Eric Singleton Wetland Data Analysis
- REG6-2 Protection of urban waterways: Eric Singleton Wetland and Heron Park sediment discharge
- REG6-3 Green walls in Mediterranean climates: improved liveability and lower water and energy use
- REG6-4 Hydrological monitoring, water balance and hydrological performance Anvil way living stream and Wharf street wetlands
- REG6-6 Hydrological nutrient modelling of Swan Canning.

Capacity Building, Knowledge Brokering and Adoption Budget

Under the Knowledge and Translation (KATs) program there is financial support for participant states to undertake capacity building with their local stakeholders. The WRAP has engaged New WAtER Ways (NWW) to deliver capacity building and research adoption activities and products. NWW was formed in 2006 and incorporated in 2014 with the aim to build the water sensitive urban design capacity of government and industry. Activities are guided by the NWW Board agencies, who also contribute funding and in-kind resources. In the 2019/2020 Financial Year, the CRCWSC through the WRAP will provide \$40,000 to NWW to undertake additional capacity building on its behalf. There is no guarantee that the same amount will be available in 2020/21. The activities delivered by NWW on behalf of the CRCWSC are consistent with the *CRCWSC knowledge broker and capacity building activities in WA – update May 2019* and endorsed by the WRAP.

There is also funding at the national level for capacity building activities that are nationally relevant activities.

Targeted services such as the WSC Index and Research Synthesis projects

The CRCWSC offers a range of services to support the implementation of integrated water management. These services are offered to benefit individual organisations (whether CRCWSC members or external organisations) to draw upon the research and adoption activities developed within the CRCWSC. Examples of projects delivered to date include:

- **Benchmarking** - the water sensitivity of cities and municipalities using the WSC Index Tool;
- **Visioning and transition strategy** – creating stakeholder alignment and an implementation strategy around the agreed vision from the 'Shaping Perth as a water sensitive city' report (project A4.2), as well as facilitating local governments including City of Perth, and/or regional cities/towns through a transition planning process (IRP1);
- **Research Synthesis** projects – co-design, with researchers, water sensitive city designs and solutions for specific locations;
- **Investment Framework For Economics of Water-Sensitive Cities (INFEWS)** – non market valuation tool and the Cost Benefit Analysis tool
- **Demonstration projects** – e.g. Detailed case studies and short case studies published on the CRCWSC's website
- **Consulting projects** – for instance facilitating workshops, where CRCWSC may be the lead consultant or a sub-consultant.

The Regional Manager

The Regional Manager has been funded part-time (0.7 FTE ~ 15 days a month) until the end of the 2021 by the CRCWSC. The key activities of the WA Regional Manager include:

	Key activities	Percentage of time
1	Provide support to WRAP Chair and WRAP;	10%
2	Support the implementation of CRCWSC programs including IRP1, IRP2, IRP3, IRP4, IRP5, TAP platform, KAT, Ideas/Synthesis, CRC forums	50%
3	Support the IRP5 PSC and EP	10%
4	Influence through supporting NWW, WSTN, UDIA forums, and direct engagement with key sectors: development, Local Government, and Water Utilities	20%
5	Inform through presentations and engagement with stakeholders	10%

CRCWSC stakeholder engagement activities

Occasionally the CRCWSC undertakes targeted stakeholder engagement activities to advance the adoption of water sensitive cities. These are supported by CRCWSC staff including the Regional Manager, Adoption Manager, Chief Research Officer and CEO as well as support staff. Examples include:

- workshops with key stakeholder groups communicating the CRCWSC research, products, tools or services;
- preparing submissions on key issues on behalf of participants and key stakeholder organisations;
- leading round table discussions or workshops; and
- convening working groups on strategic issues.

Transition Network

The Water Sensitive Transition Network (WSTN) is a group of CRCWSC participants and non-CRCWSC participants who support the transition to a water sensitive city in greater Perth. Membership of this group is open to all CRCWSC participants in WA, as well as other engaged stakeholders not formally part of the CRCWSC.

The Western Region has developed a Transition Strategy through Integrated Research Project 1 with support of the Transition Network. The Transition Implementation plan has been finalised mid 2019 and outlines key actions the WSTN will move forward via the subcommittees related to Policy and Governance; Community Engagement and Communications; Technical Capacity and Partnerships; and Research.

Contributions by participants and partners

CRCWSC participants support the objectives of this business plan by attending WRAP, Essential Participants Reference Group (EPRG), CRCWSC Board and IRP Project Steering Committees, in addition to providing venues and cash contributions.

In addition, they continue to support and facilitate actions that support a water sensitive city at an organisation or sector level including:

- Department of Water and Environmental Regulation: Leading development of a water wise Perth strategy, supporting Waterwise Council Program (a joint initiative with Water Corporation) and supporting New WAtEr Ways
- Department of Communities (Housing): Undertaking water sensitive developments including Bentley greenwalls and Brabham urban development
- Development WA: Undertaking exemplar developments incorporating water sensitive principles, including Knutsford and Hamilton Hill urban developments
- Water Corporation: Implementing their water for life strategy and supporting their newly created Waterwise Cities team, implementing their Board's strategic objectives and supporting the Waterwise Council Program (a joint initiative with the DWER)
- Department of Biodiversity, Conservation and Attractions: Funding research around water in and around the Swan Canning catchment and supporting New WAtEr Ways.

The WRAP also partners with non-CRCWSC participants both directly and via the NWW board who actively support WSC principles, including:

- Department of Planning, Lands and Heritage: Incorporating of WSC principles into State Planning Policy 2.9 Water Resources, Design WA, etc, participation in CRCWSC processes and supporting New Water Ways
- Urban Development Institute of Australia (UDIA): Supporting engagement via the UDIA Urban Water Committee, which has identified Alternative water supplies and Smoothing Approvals as key issues.
- Western Australian Local Government Association (WALGA) and non-participant local governments: Providing access to their network of local governments to facilitate knowledge sharing and supporting New Water Ways.

Cash contributions from the CRCWSC

The table below provides the cash contributions made to the Western Region by the CRCWSC excluding research and centralised activities such as commercial, communications and operations.

Activity for	CRCWSC funding for WA in 2019/2020	CRCWSC funding for WA in 2020/2021
WRAP operations	\$10k	TBC
Regional Manager	\$90k	\$90k confirmed to June 2021
Capacity Building <ul style="list-style-type: none"> • New Waterways • National activities 	\$40k (WA only) tbc	May be allocated differently

What does success look like in 2021?

IRP5: Incorporate the interim guidance on high groundwater into relevant policy and practices

- Embed Expert Panel recommendations in DWER policy including:
- Water resource considerations when controlling groundwater levels in urban development.
- BUWM water monitoring guideline.
- Incorporated into the IPWEA (subdivision) guidelines.

IRP4: Apply the 'Infill Performance Evaluation Framework' and 'Infill Typology Catalogue' across the Industry in Perth

- Workshop with Design WA in early 2020 with IRP4 team
- Meeting and presentations with WRAP, WSTN, Dev WA, Communities, METRONET and other key stakeholders in March with IRP4 team.
- Establish an engagement process to encourage Development WA/ Communities to use the catalogue/ evaluation framework in future developments and link to waterwise Perth responsibilities

IRP4: Apply the Water Mass Balance in Perth

- The Water mass balance tool applied to a WA case study and validated by researchers or experts hence making it accessible for use by other practitioners.
- CRCWSC partners trial the water mass balance module within the Scenario planning tool.
- Inclusion of the water mass balance tool in other modelling applications

IRP3: Embed the learnings from the Brabham case study report in the planning system

- Share outcomes with project stakeholders (Department of Communities and Peet) and other stakeholders including Development WA and participants on WSTN. This will create a greater understanding of efficient approval processes and barriers to innovation in a way that facilitates buy-in for shared solutions.
- Targeted meetings with WAPC, DPLH, UDIA urban water committee and DWER potentially attended by Chris Chesterfield.

IRP2: facilitate awareness and use of the Investment Framework for Economics in CRCWSC participant processes:

- A meeting is coordinated with WA treasury, ERA, Infrastructure WA and public infrastructure assessment experts to pitch the value of including non-market values in business case guidelines and arguments are shared around why they should endorse INFEWS as a suitable tool for the calculation of non-market values.
- CRCWSC participants who deliver infrastructure (eg state developers, utilities, LGAs) consider non-market values and trial the INFEWS tool on key projects
- Developers are able to use the INFEWS tools in negotiations for a fair distribution of costs where future public water sensitive benefits are unable to be recouped through housing sales.
- Identify 1-2 additional case studies in WA using the INFEWS tool.

IRP1: Deliver the Perth Transition Strategy and roll out the process across WA

- The actions in the implementation plan (lead by the WSTN), are funded and implemented by relevant stakeholders.

- City of Perth's (CoP) Transition Strategy is incorporated into strategic water and land planning.
- City of Bayswater Transition Strategy is incorporated into strategic water and land planning.
- WA Regional towns understand the benefits of undertaking a transition strategy process.
- WaterWise Councils (WWC) support LGAs to undertake not just WSC Index workshops but other transition components including visioning, TDF, actions, implementation support and TAP1.
- Re-benchmark the greater Perth Metro every 5 years including in 2021 (Feb 2016).

All IRPs: Development of appropriate research outputs and tools, readily adopted across Industry

- Key stakeholders have engaged with, and provided feedback via Project Steering committees to ensure research and products are locally and industry relevant

- Key stakeholders understand the research outputs and are able to adopt the knowledge across Industry

Sustainable and widely used Capacity Building program

- WRAP, IRP PSC and NWW work together to prioritise high impact capacity building activities related to CRCWSC outputs and case studies. Current program includes:

- Show how WSUD achieves the outcomes/objectives of other agencies - series of fact sheets for transport, health, agriculture & tourism
- New fact sheets/case studies on CRCWSC outputs
- Inter/intra agency WSC workshop
- Delivery of Clearwater Masterclasses – adapt for WA with local case studies.
- The CRCWSC website on a platform that endures beyond 2021.
- The website is user friendly and uses themed landing pages to curate and prioritise key documents

TAP2: Support the trial of the Scenario Planning Tool with CRCWSC partners

- Maximise value from user acceptance testing by WRAP members by sharing learnings
- After release, Trial by participant organisations in relevant case studies.

Wide range of sponsors undertake Synthesis Projects across diverse issues and in diverse locations in WA

- New "Ideas for ..." workshops are undertaken in Perth and across WA.
- Other synthesis processes (ie excluding Ideas for workshops) have been trialled in WA.
- Stakeholders value, participate in, and sponsor synthesis processes delivered by the CRCWSC and or the WSC-Institute.

Diverse range of Case studies are accessed by practitioners and provide the knowledge and confidence to undertake water sensitive projects.

- Approach partners related to potential case studies (eg Brabham, Subiaco, Canning and Knutsford) who may be interested in commercially sponsoring an integrated case study.
- CRCWSC and other capacity building websites illustrating case studies are linked and complement each other.
- Case studies are easy to search for via the internet.
- WA relevant case studies support participants to undertake Water Sensitive Projects.

Test the Restore Tool and design guidelines in WA

- Promote use of the RESTORE tool in at least one case studies in WA.
- WA consultants interested in trialling the tool have been provided access

Post CRCWSC Governance

- There is a governance structure that supports WA post- CRCWSC in coordination and pooling of research funds.
- Sustainable funding or in-kind support for administration of the WSTN.
- Sustainable funding for a Regional Manager/Coordinator for Water Sensitive activities including WSTN.
- NWW and other stakeholder organisations have sustainable funding for capacity building activities.

(Note: high priorities in yellow)

List of Acronyms

AWA – Australian Water Association

CoI – Community of Interest

CoP – City of Perth

CRCWSC – Cooperative Research Centre for Water Sensitive Cities

DBCA – Department of Biodiversity, Conservation and Attractions

DoC – Department of Communities

DLGSCI – Department of Local Government Sport and Cultural Industries

DPLH – Department of Planning Lands and Heritage

DWER = Department of Water and Environmental Regulation

ERA – Economic Regulation Authority

EPRG – Essential Participants Reference Group

GWIG - Greywater and Wastewater Industry Group

INFEWS – Investment Framework For Economics of Water-Sensitive Cities

IPWEA – Public Works Engineers Australia

IRP – Integrated Research Project in Tranche 2

IWA – International Water Association

KATs – Knowledge and Translation

LGA – Local Government Authority

NWW – New WAter Ways (Shelley Shepherd)

PSC – project steering committee

RAP – Regional Advisory Panel

RESTORE – Optimising ecological gains to urban waterways by prioritising the natural ecosystem components for repair

REG – Regional project

RM – Regional Manager (Emma Yuen)

TAPS – Tools and products

TDF – Transition Dynamics Framework

TNSC-CB – Transition Network Subcommittee -Technical capacity and partnerships (Chair: Emma Monk)

TNSC-CCE – Transition Network Subcommittee - Community engagement and communications (Chair: Winsome Maclaurin)

TNSC-PG – Transition Network Subcommittee -policy and governance (Chair:Sergey Volotovskiy)

TNSC-R – Transition Network Subcommittee – research (Chair: Mike Mouritz)

UDIA – Urban Development Institute of Australia

UWA –University of WA

UAT - User acceptance testing

WALGA – Western Australian Local Government Association

WAPC – Western Australian Planning Commission

WC – Water Corporation

WRAP – Western Regional Advisory Panel

WSAA – Water Services Association of Australia

WSC – Water Sensitive Cities

WSCI – Water Sensitive Cities Institute

WSUD – Water Sensitive Urban Design

WSTN – Water Sensitive Transition Network

WWC - Waterwise Councils



Cooperative Research Centre for Water Sensitive Cities

 Level 1, 8 Scenic Boulevard
Monash University
Clayton VIC 3800

 info@crcwsc.org.au

 www.watersensitivecities.org.au



Growing cool cities – The role of irrigated green cover

Dr Mark Siebentritt
Seed Consulting Services

ADELAIDE – BRISBANE MELBOURNE
– PERTH - SYDNEY - BRISBANE

**Hort
Innovation**
Strategic levy investment

**TURF
FUND**

Conveying the
benefits of living turf -
Mitigation of the
urban heat island
effect

TU18000

**Hort
Innovation**
Strategic levy investment

**TURF
FUND**

- Hort Innovation is the grower-owned, not-for-profit research and development corporation for Australia's horticulture industry
- One of the nation's 15 Rural Research and Development Corporations tasked with investing horticulture levies and Australian Government contributions into initiatives to help the industry be as productive and profitable as possible.



What are the cooling benefits of irrigated green space, especially living turf, and how should this inform future decisions about how we cool, and grow, our cities?

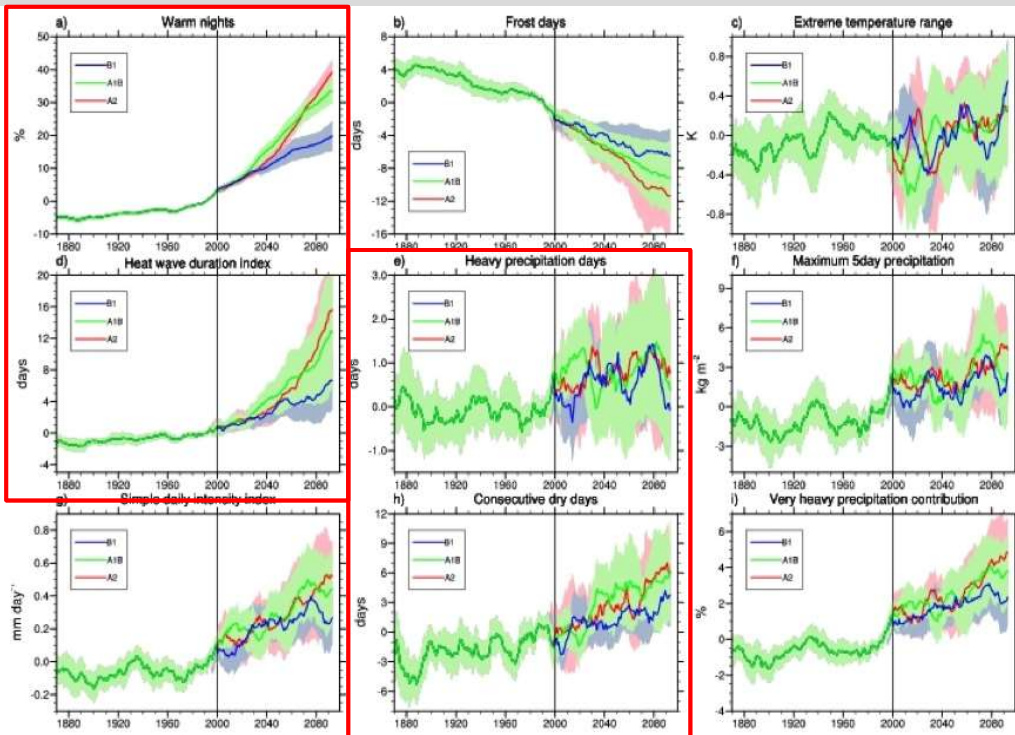
Overview

1. Why does urban heat (and cooling) matter?
2. What causes urban heat islands and how can irrigation help?
3. What is the impact of different land surface types on heating and cooling?
4. How could surface materials impact energy demand?
5. What does it mean for climate change?
6. Wrap up



Why does urban heat (and cooling) matter?

Australian Climate Stressors



Both Melbourne and Sydney, cities with 5 million+ populations, have recently recorded official temperatures > 47°C. Adelaide in 2019.

50°C + temperatures are projected for mid-Century and beyond for all of Australia's major cities

Time Series of Extremes for the Australian Region 1870-2099

Alexander and Arblaster, 2009



Why are heat islands important?

- Extreme heat kills more people than any other natural hazard.
 - 1 °C warming being linked to an increase of 2-5% in mortality
- Extreme heat impacts the community, environment, and economy
 - Unchecked, cities will be ***spending up to 10%*** of GDP to mitigate UHIs
 - The total economic cost to the community due to hot weather is estimated to be approximately \$1.8 billion in present value terms. Approximately one-third of these impacts are due to heatwaves. Of the total heat impact, the Urban Heat Island effect contributes approximately \$300 million in present value terms. (AECOM 2012)
- The accumulation of heat in urban areas can result in urban heat islands, which experience temperatures higher than the surrounding landscape
- Under climate change, the impact of higher temperatures will become more evident in these areas
- Decisions today matter

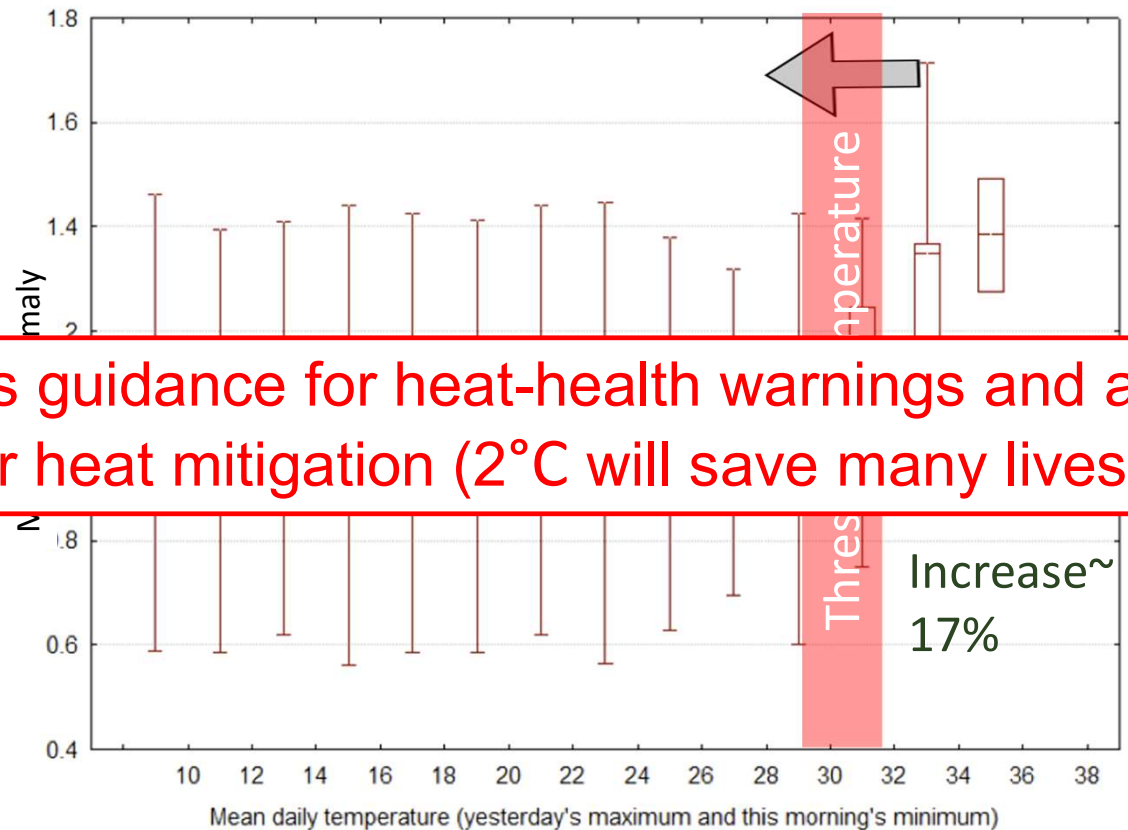
Improved public heat warnings and emergency services preparedness to save lives

Melbourne – Heat
Threshold for Excess
Deaths in > 64 year olds

$$MDT \text{ of } 30^{\circ}\text{C} = (40^{\circ}\text{C} + 20^{\circ}\text{C}) / 2$$

Provides guidance for heat-health warnings and a target for heat mitigation (2°C will save many lives)

Nicholls, Skinner,
Loughnan and Tapper,
2008





“While land surface temperature and air temperature are different, addressing high surface temperatures in cities is an appropriate target”

Norton, B. A. et al., 2015. Planning for cooler cities: A framework to prioritise green infrastructure to mitigate high temperatures in urban landscapes. *Landscape and Urban Planning*, Volume 134, pp. 127-138.





How do we measure heat?



What causes urban heat islands and hot spots and how can irrigation help?

Urban Heat Mapping Viewer

Find address or location...

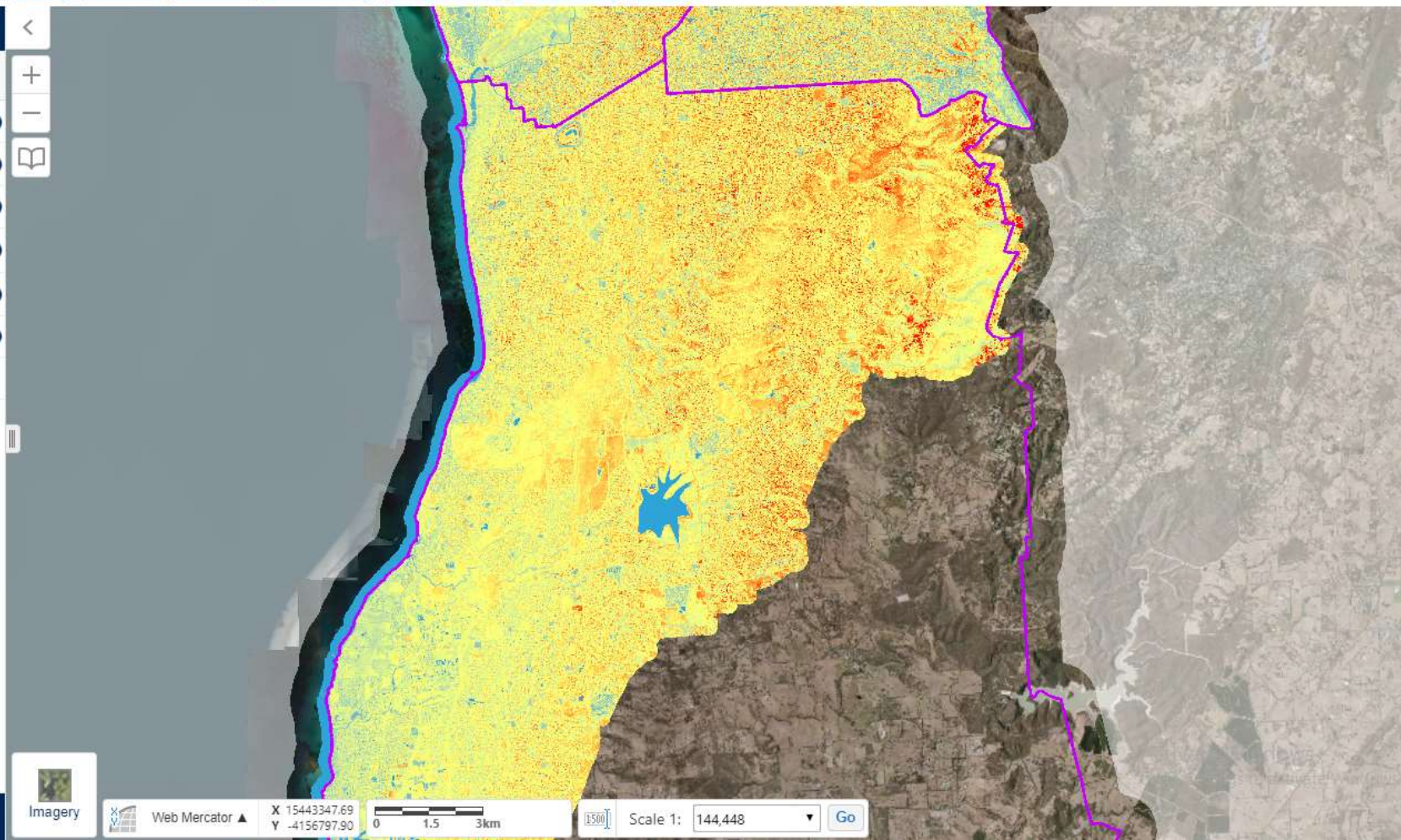
General Tools Measure Tools Draw Tools Find Tools

Full Extent Previous Extent Show Legend Identify Point Print Upload Data Zoom to XY Plot Coordinates Google Street View Share Map via Email Help

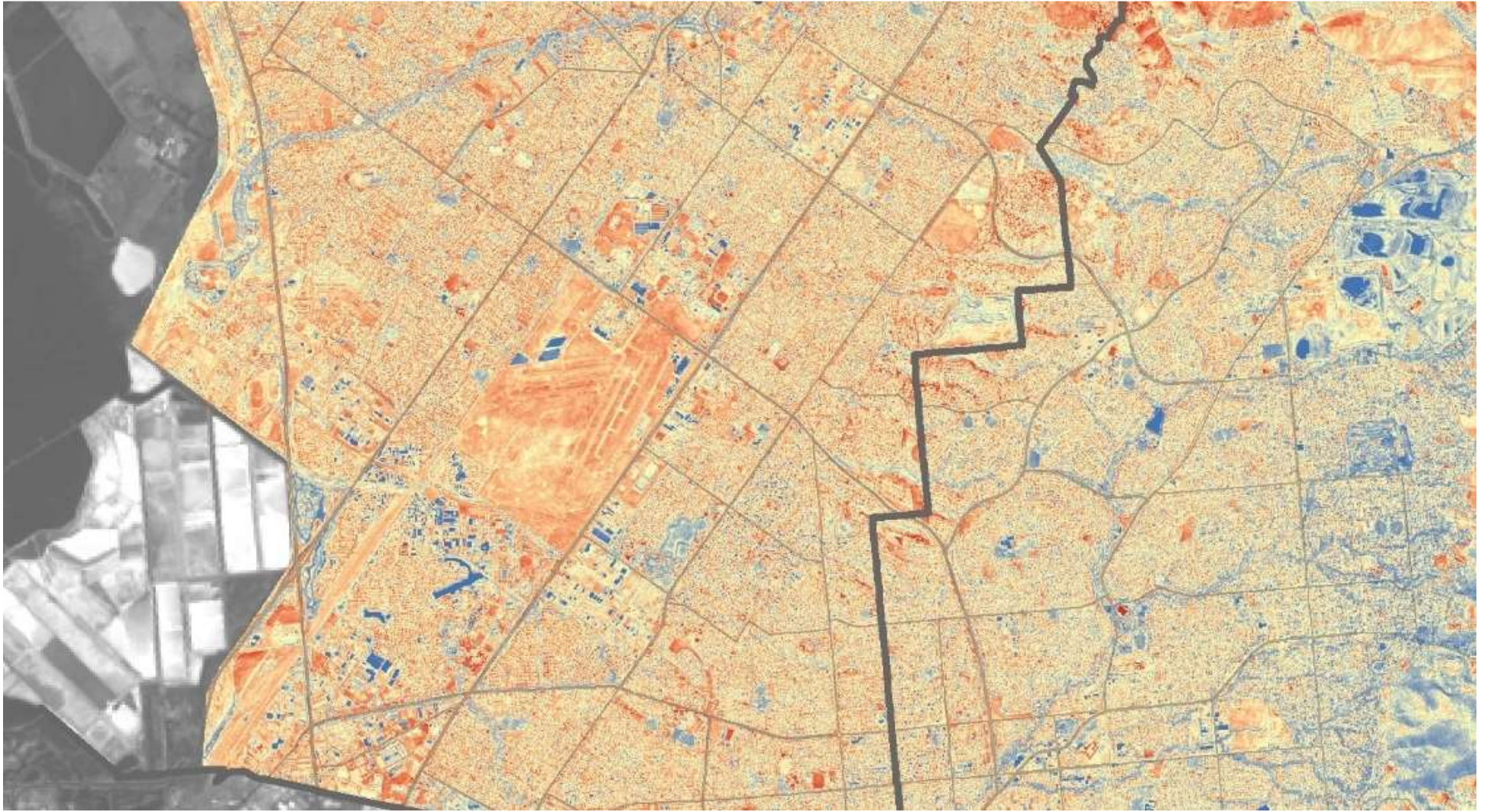
Layers

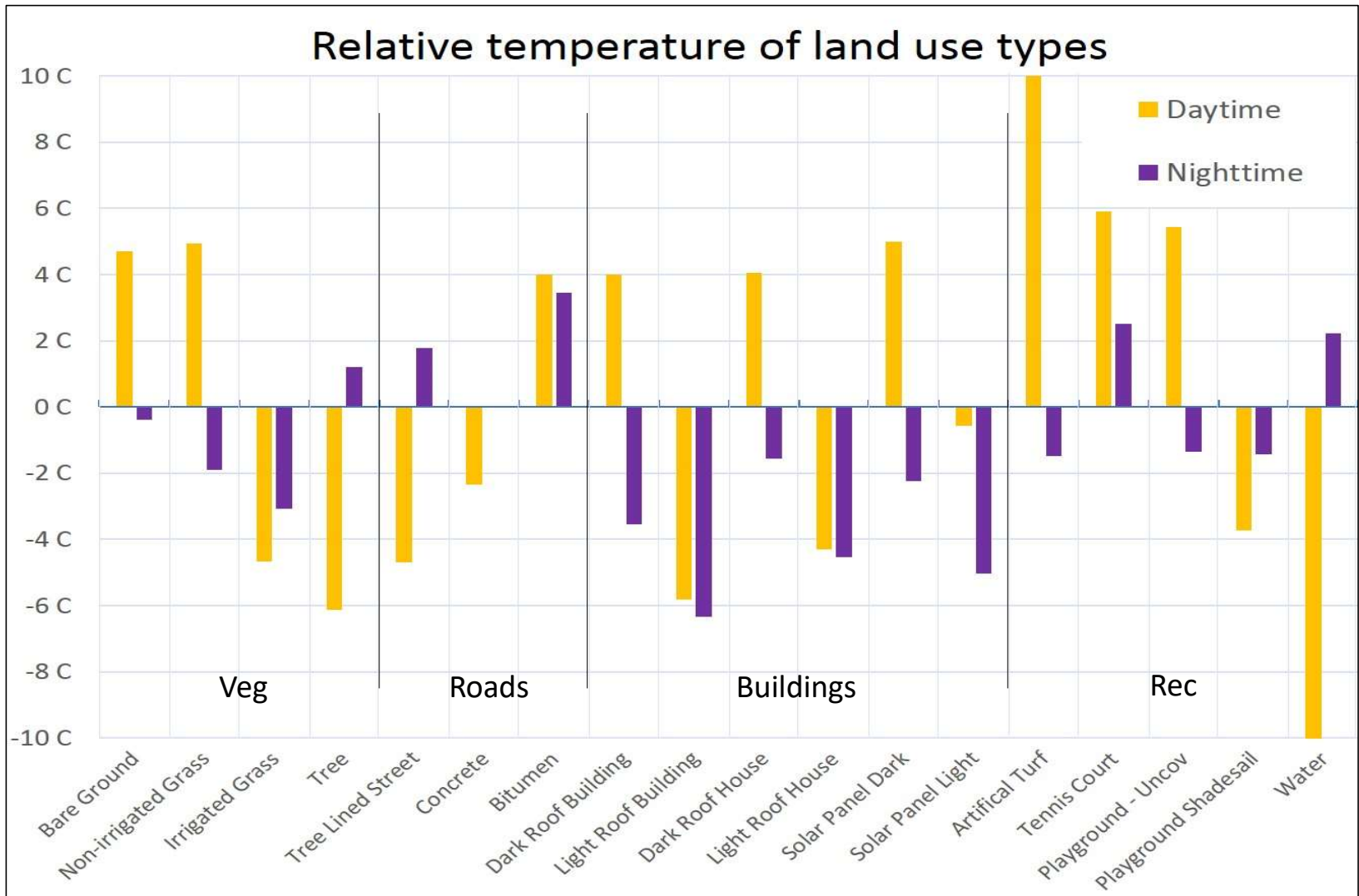
Search Layers... Search

- Administrative Boundaries
- Cadastral Information
- Adapt West Urban Heat data
- Resilient East & City of Salisbury Urban Heat Data
- Resilient South Urban Heat Data
- Land Use
- Overlays



Home Layers Imagery Web Mercator X 15443347.69 Y -4156797.90 0 1.5 3km 1500 Scale 1: 144,448 Go





Source: Seed Consulting Services, EnDev Geographic and Monash University, 2018. Collaborative Heat Mapping for Eastern and Northern Adelaide Report. Prepared for the City of Unley on behalf of the Eastern Region Alliance of Councils and the City of Salisbury.

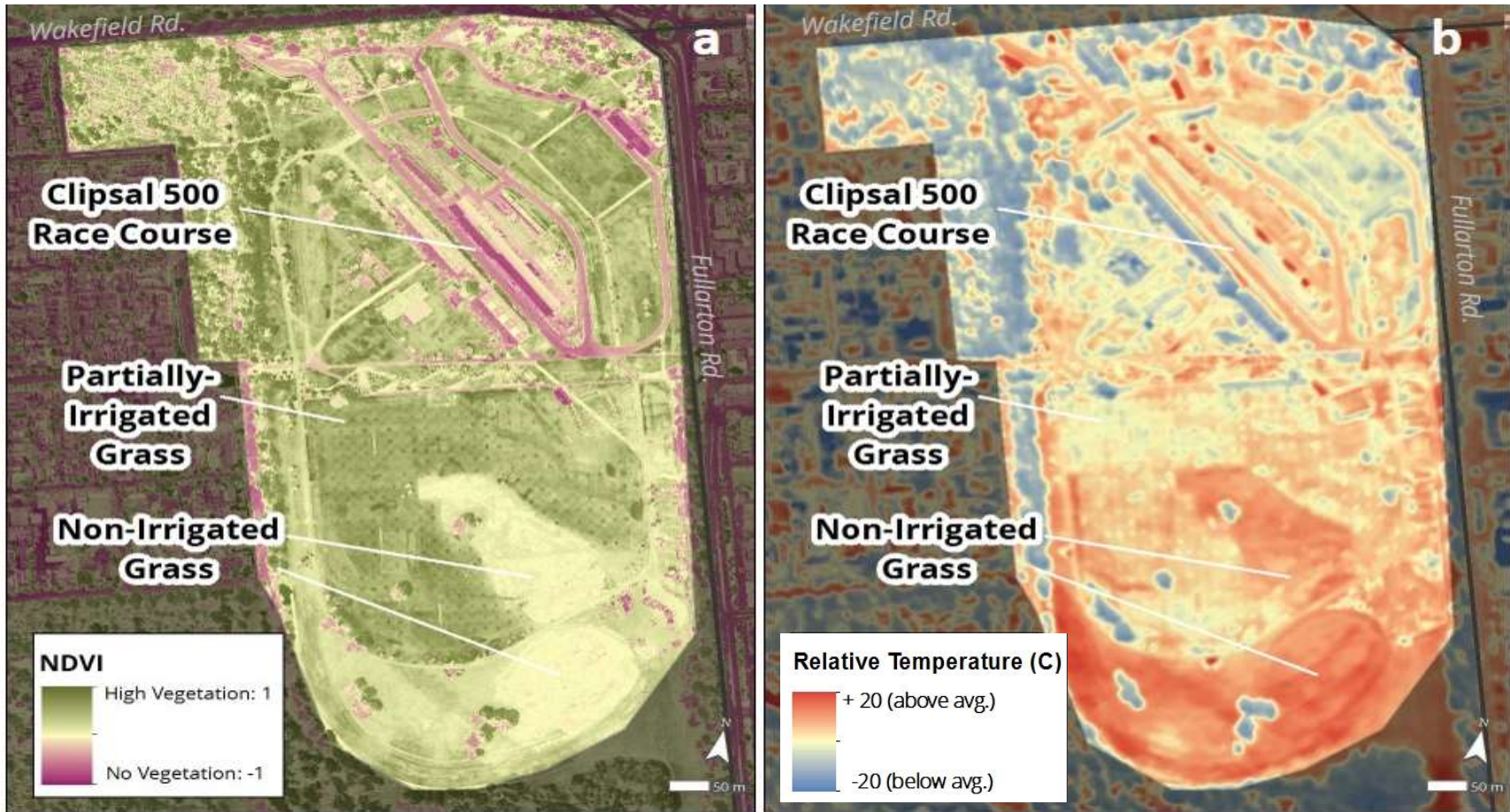


Source: Seed Consulting Services, Airborne Research Australia and EnDev Geographic, 2017. Western Adelaide Urban Heat Mapping Project Report. Prepared for the Cities of West Torrens, Charles Sturt and Port Adelaide Enfield, and the Adelaide Mount Lofty Ranges Natural Resources Management Board.

Irrigated grass versus non-irrigated grass (Adelaide Parklands)

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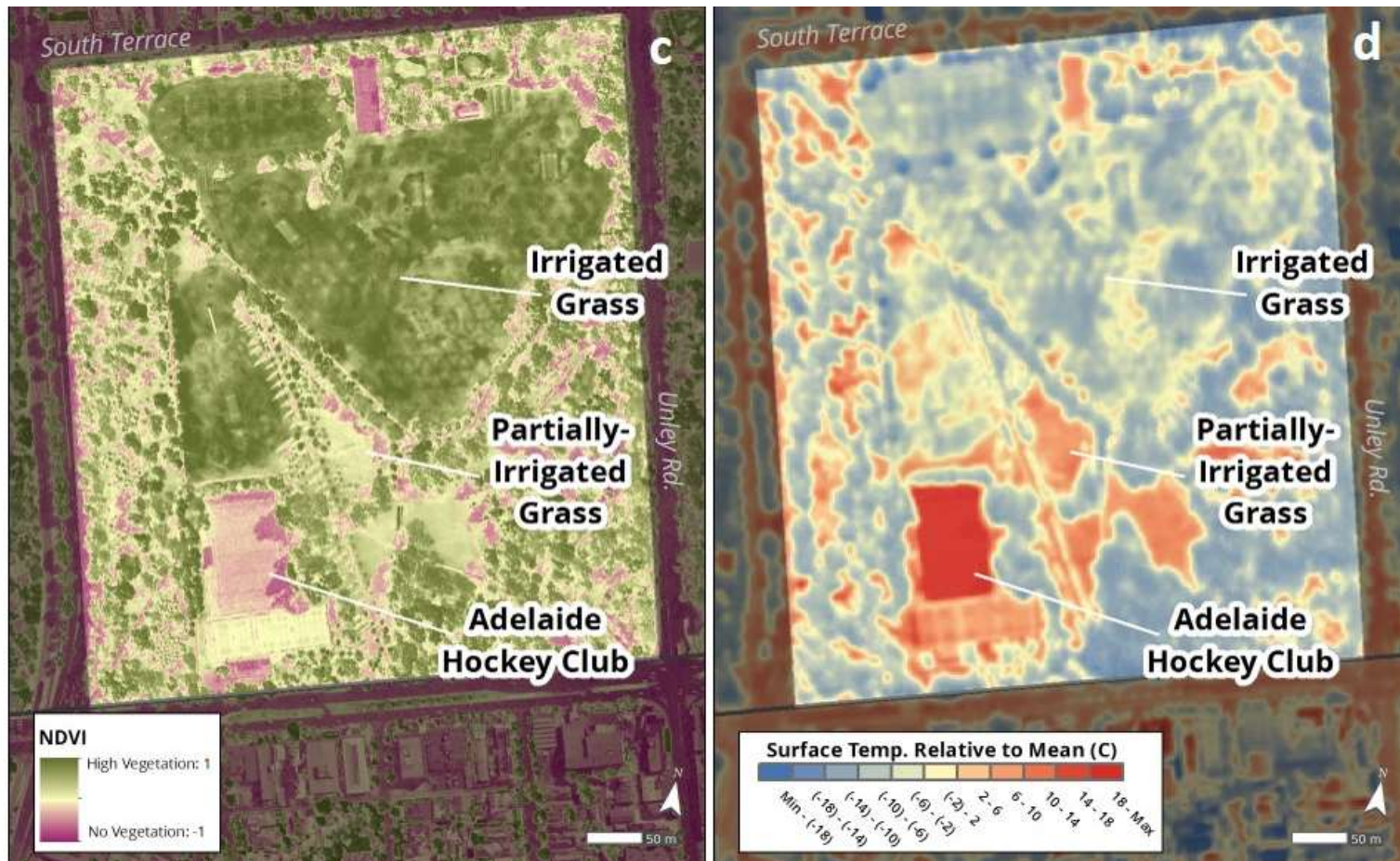
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Source: Seed Consulting Services, EnDev Geographic and Monash University, 2018. Collaborative Heat Mapping for Eastern and Northern Adelaide Report. Prepared for the City of Unley on behalf of the Eastern Region Alliance of Councils and the City of Salisbury.

Irrigated grass versus non-irrigated grass (Adelaide Parklands)

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Source: Seed Consulting Services, EnDev Geographic and Monash University, 2018. Collaborative Heat Mapping for Eastern and Northern Adelaide Report. Prepared for the City of Unley on behalf of the Eastern Region Alliance of Councils and the City of Salisbury.



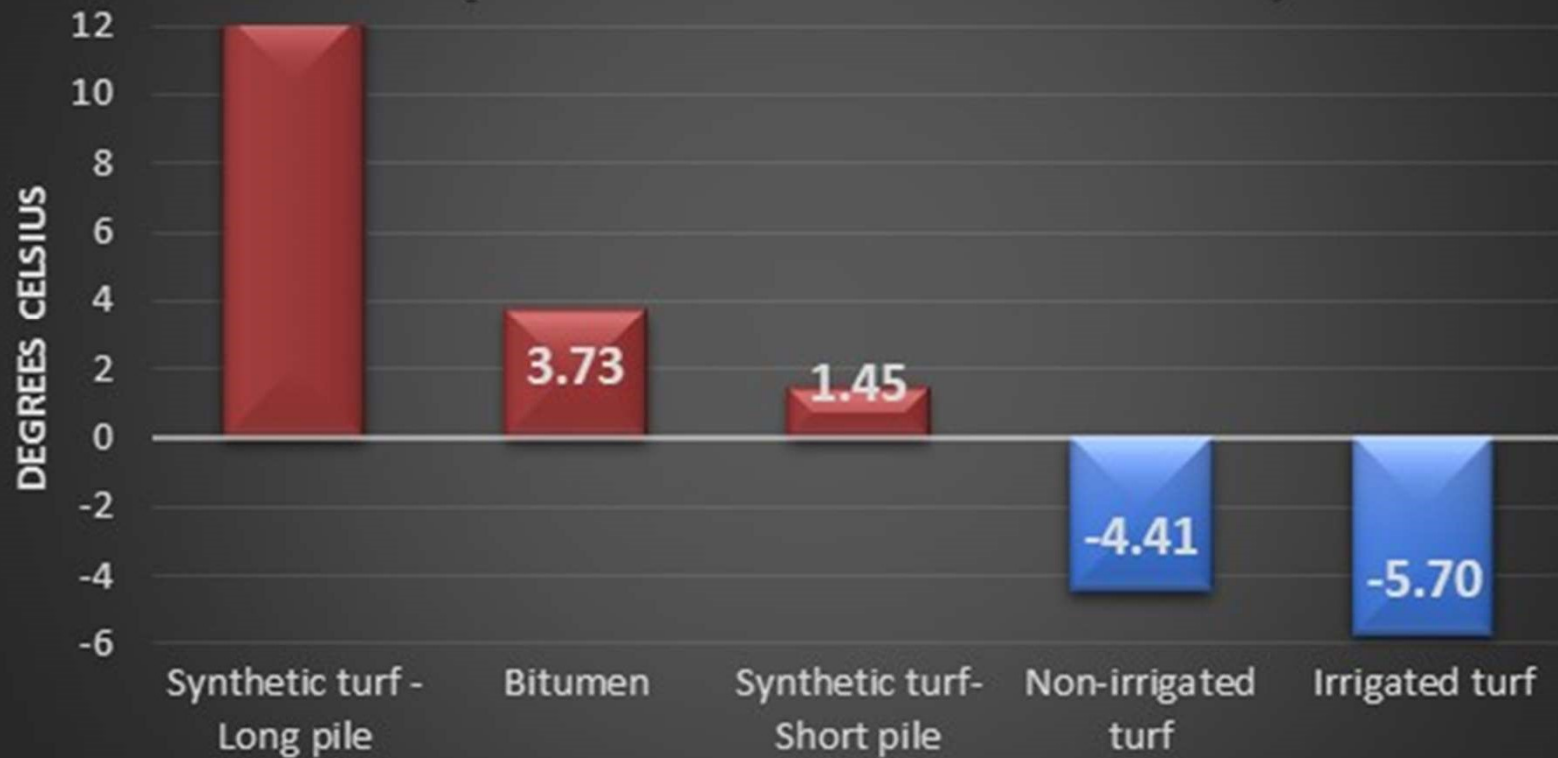
What is the impact of different land surface types on temperature?

Surface type	Description	Examples
Irrigated living turf	Areas of green healthy living turf with visual irrigation patterns	Golf courses, sports fields, reserves, gardens
Non-irrigated living turf	Areas of maintained vegetation with no evidence of irrigation	Reserves, sports fields surrounds, non-irrigated areas of golf courses
Synthetic turf – long pile	Large fields of synthetic turf playing surfaces	Hockey clubs, futsal fields
Synthetic turf – short pile	Thin synthetic turf coverings	Yardscapes, cricket nets
Bitumen	Dark hardscaped driving surfaces	Parking lots, roads

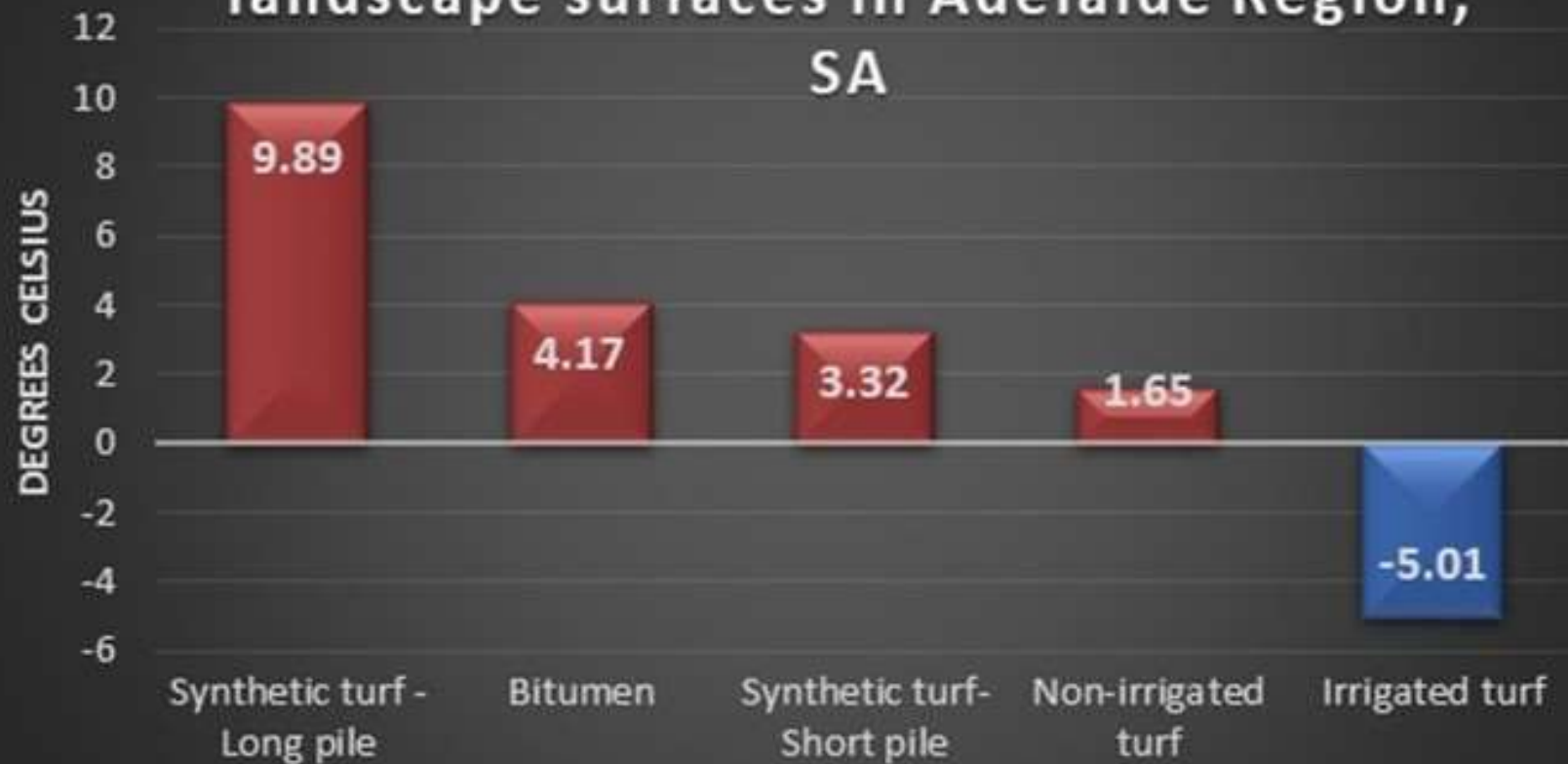
The warming and cooling influence of landscape surfaces in Parramatta, NSW



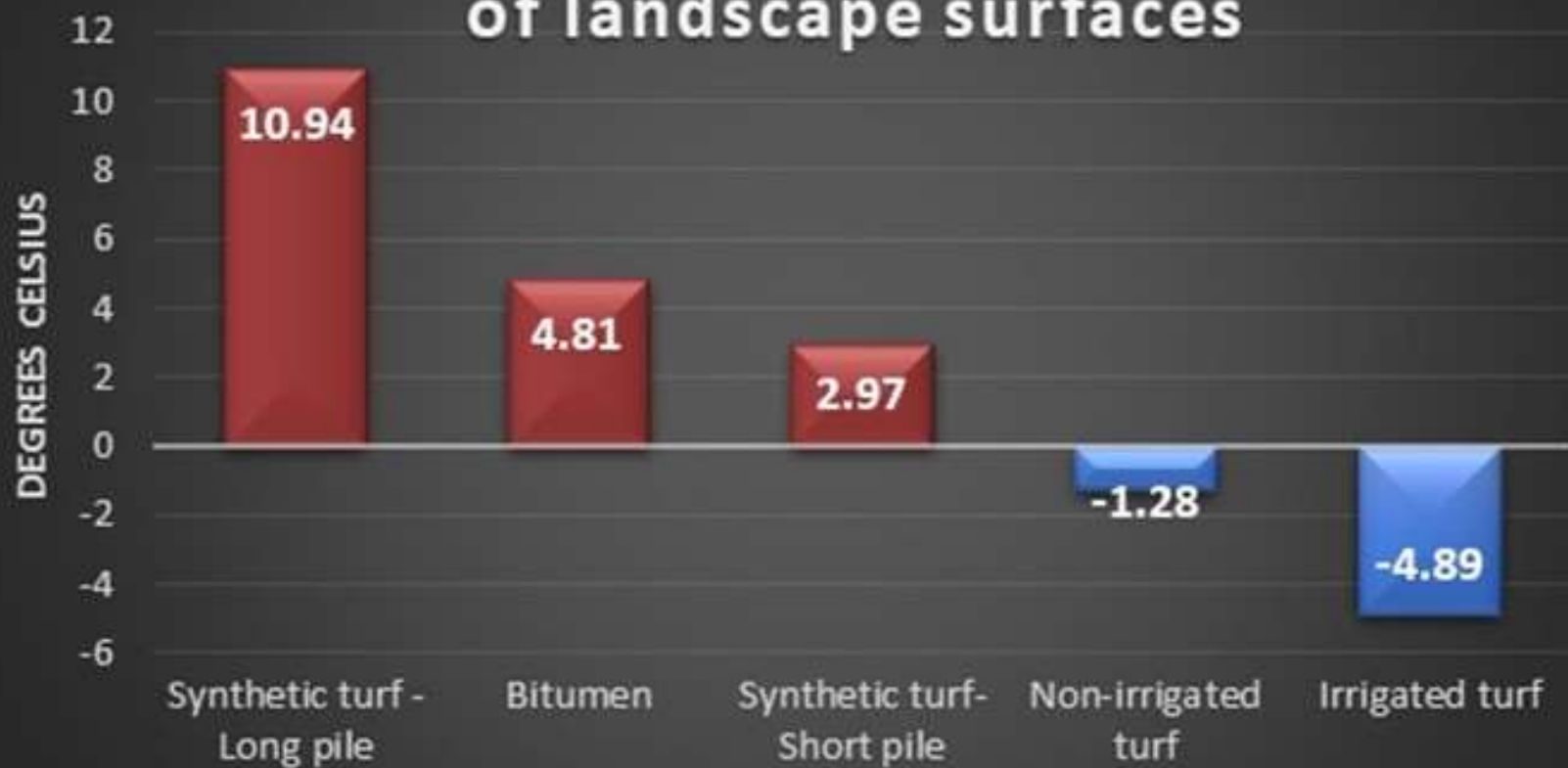
The warming and cooling influence of landscape surfaces in Melbourne, VIC

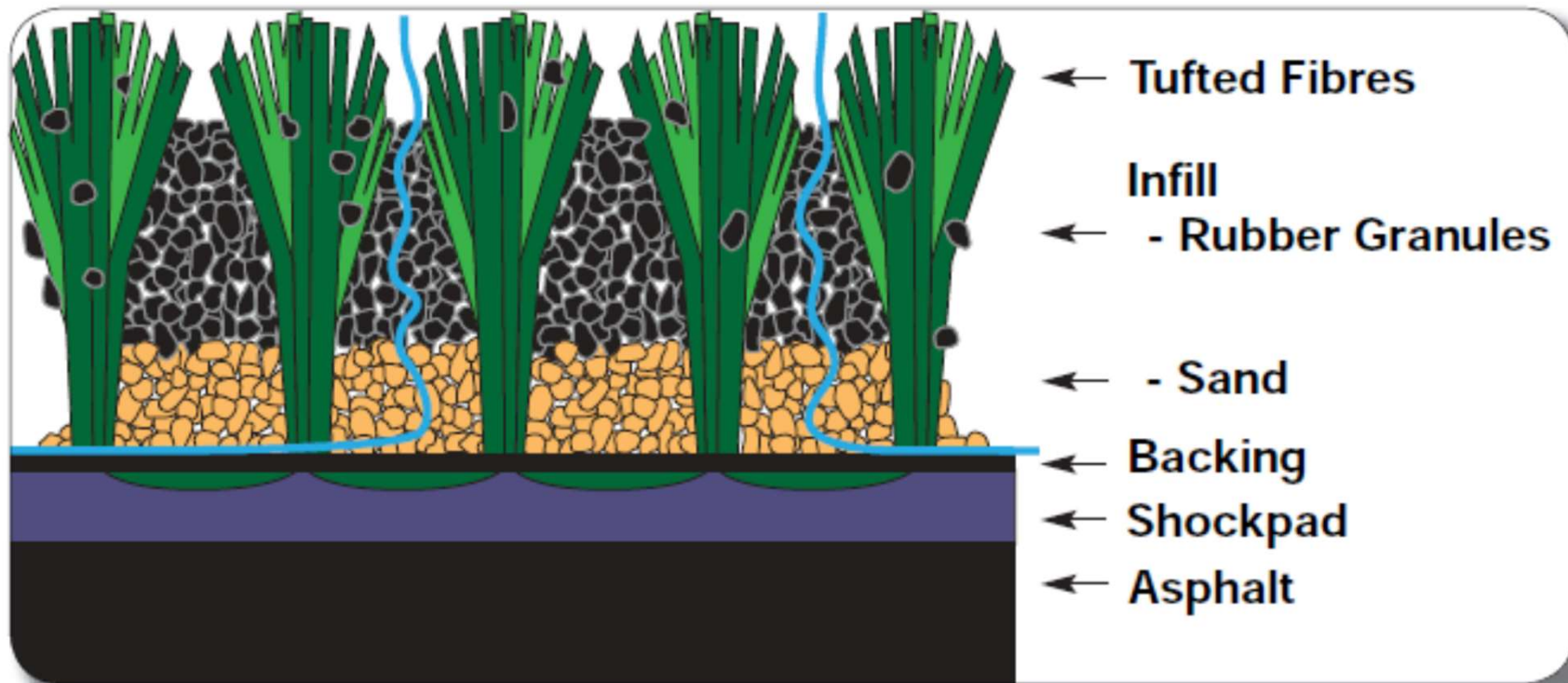


The warming and cooling influence of landscape surfaces in Adelaide Region, SA

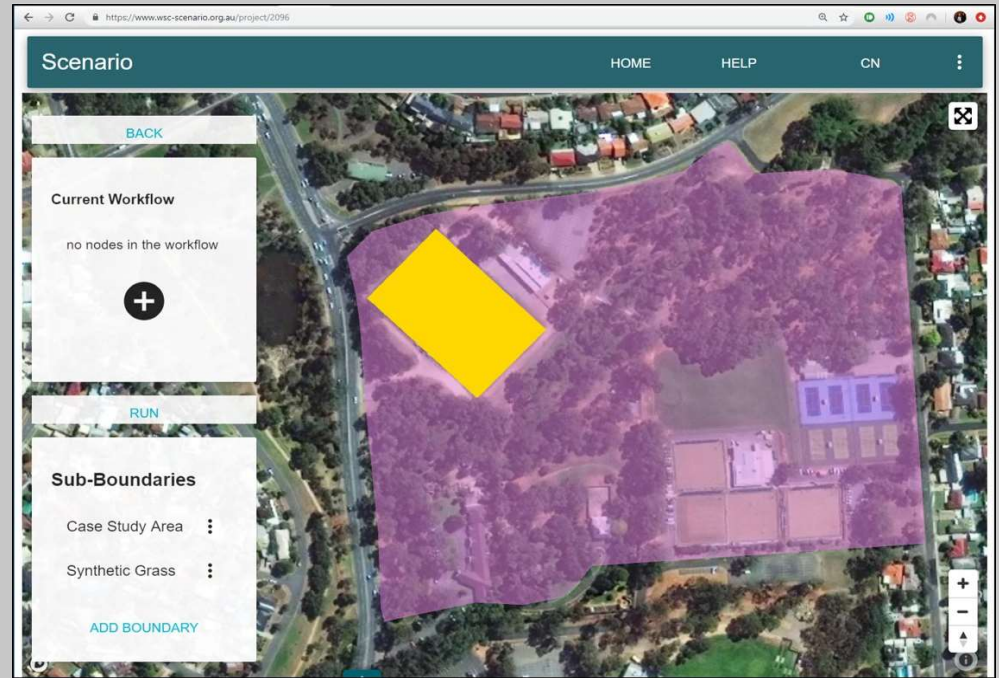
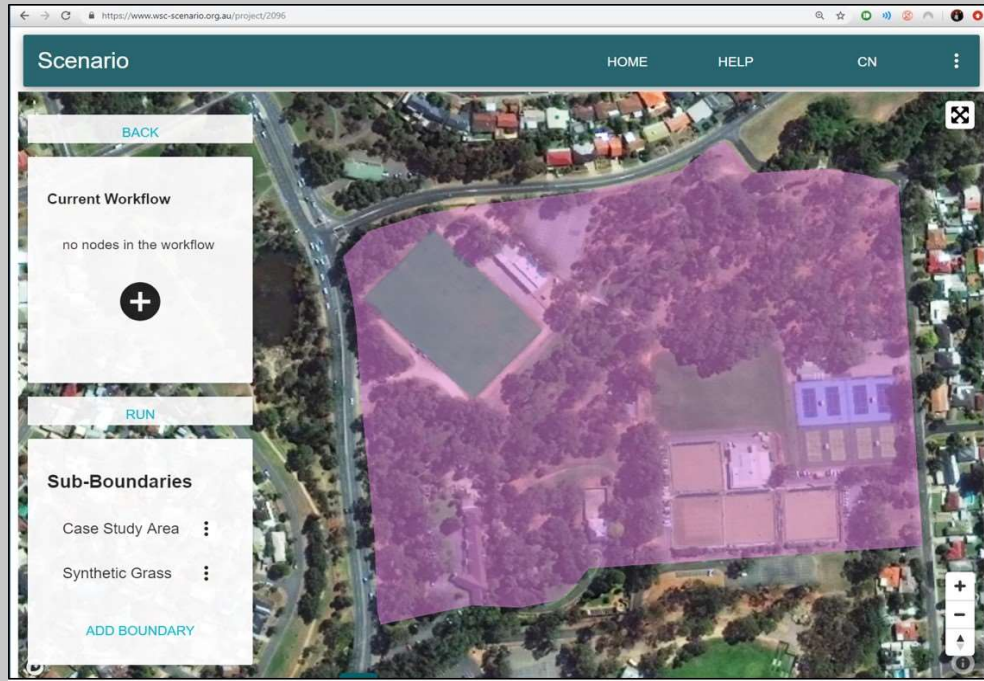


The warming and cooling influence of landscape surfaces





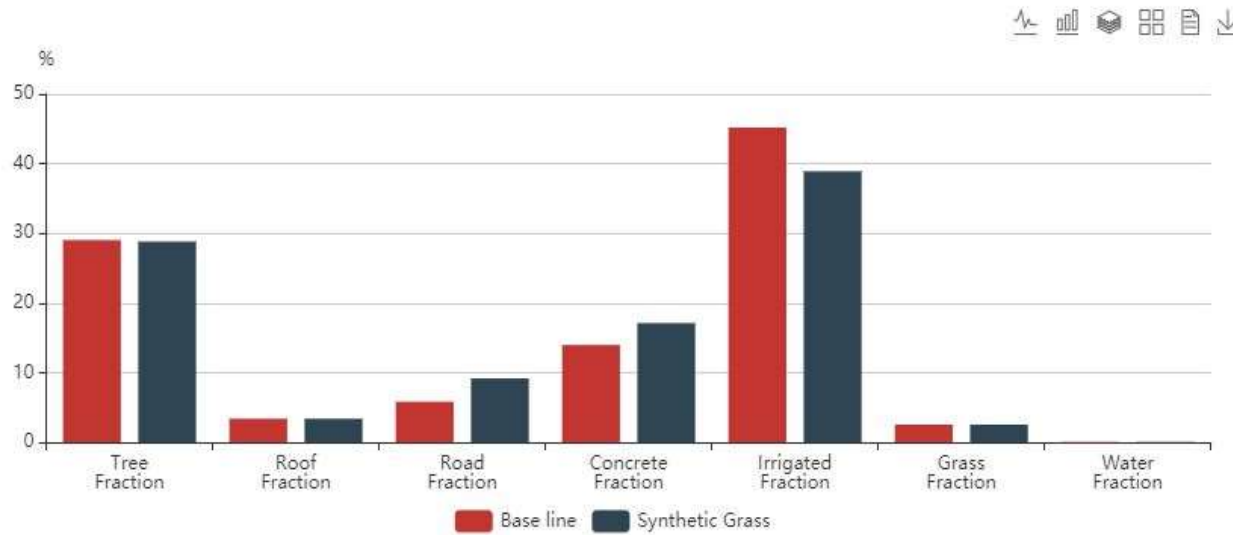
Short pile < 12 mm, medium pile 20-35 mm, long pile 35-60 mm



CRC for Water Sensitive Cities – Scenario Tool

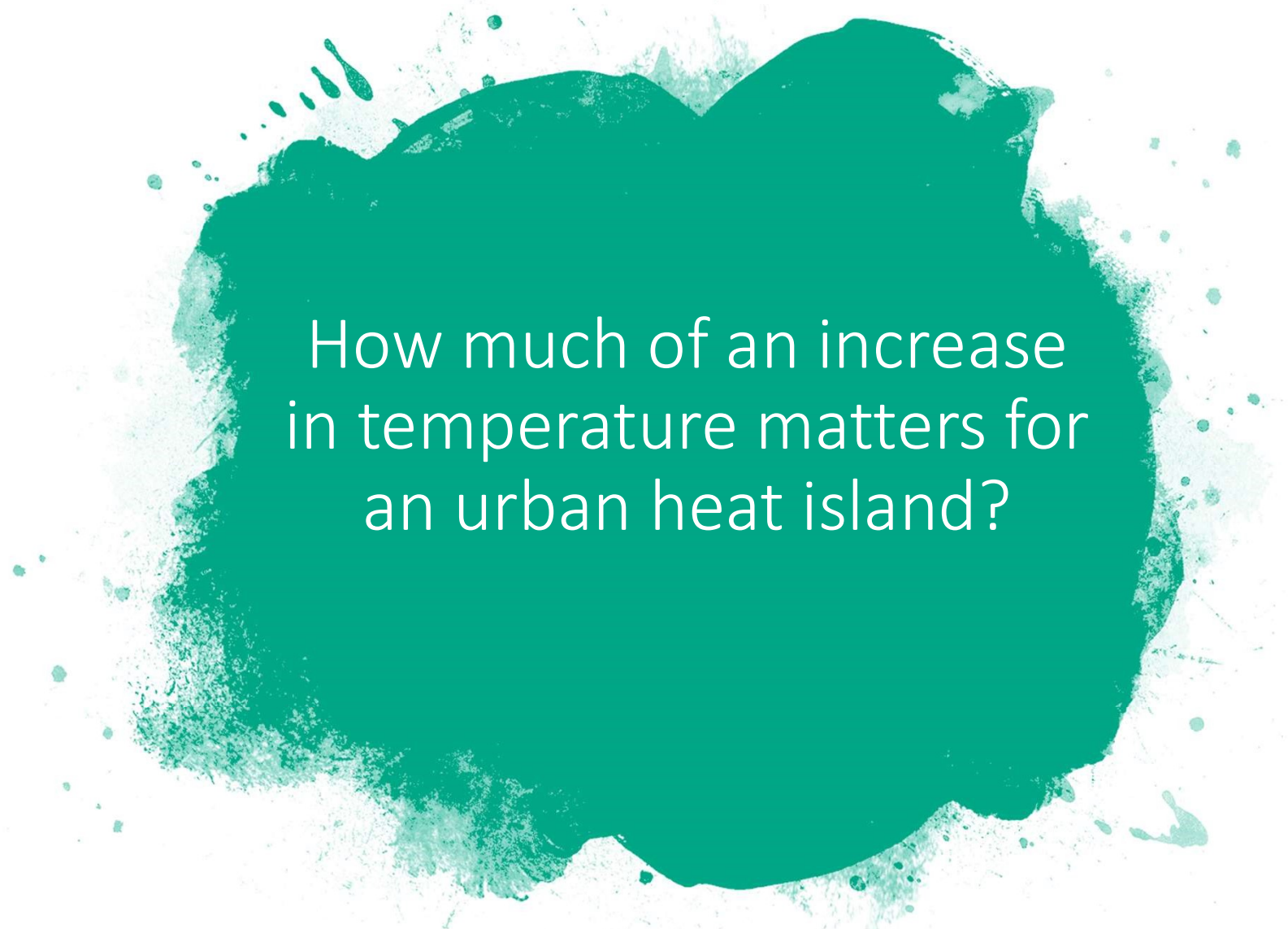
<https://watersensitivecities.org.au/solutions/water-sensitive-cities-scenario-tool/>

Land Cover



Land Surface Temperature

Scenario	Average Surface Temp... °C
Base line	41.99
Synthetic Grass	43.05



How much of an increase
in temperature matters for
an urban heat island?



Surface to air temperature



Playing court example from Parramatta, NSW (12 Feb 2019).



Synthetic turf example from Port Phillip, VIC (03 Feb 2019).



Non-irrigated natural turf example from Port Phillip, VIC (03 Feb 2019).



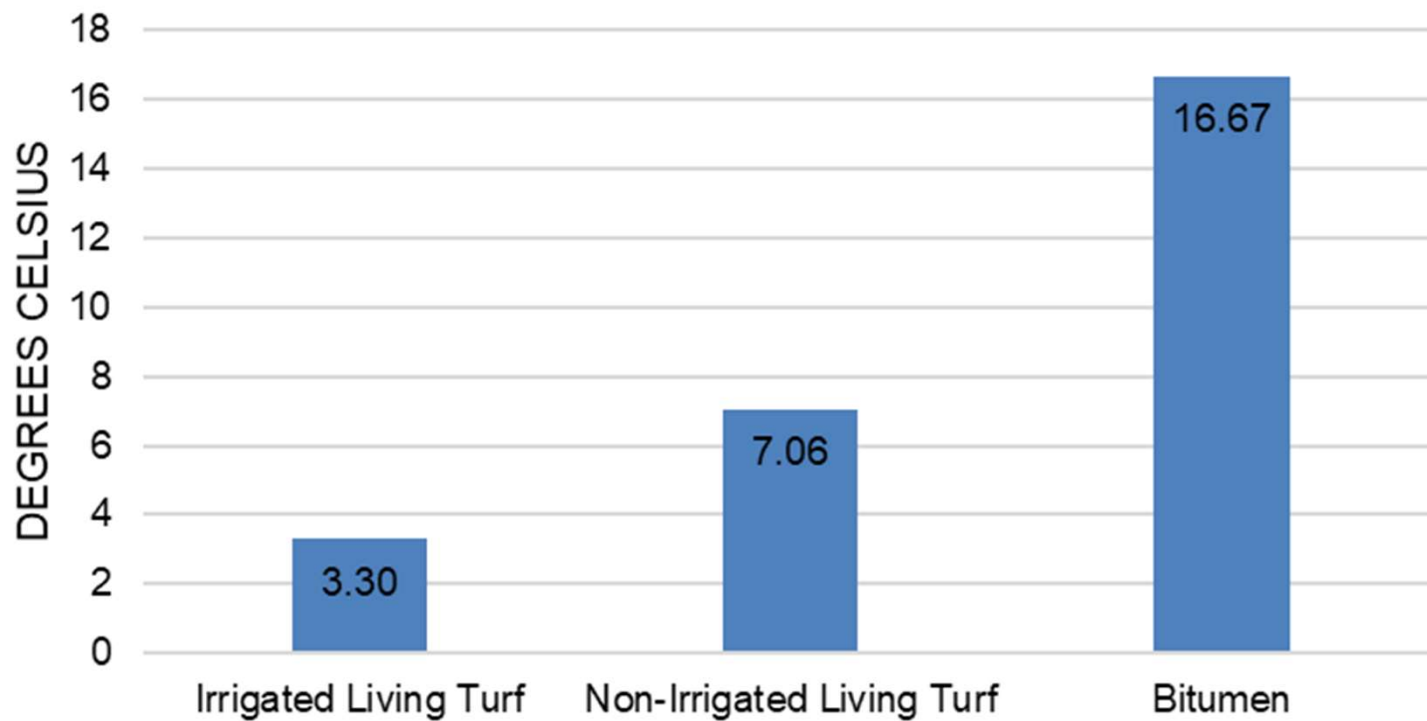
Bare ground example from Adelaide, SA (02 Feb 2019).

Surface to air temperature relationship

Air temperatures over the 15 transects showed an average maximum increase of 0.81 °C compared with nearby irrigated living turf

Average UTCI values were very consistent across the 15 transects ranging between 40 and 45 °C

Ground level air temperature warming compared to 1.2m level over varying surfaces





Thermal comfort and energy use simulations

	Normal Weather – Cooling Energy (kWh/m ²)	Shifted Weather – Cooling Energy (kWh/m ²)	% Increase in Cooling Energy
Sydney	18	30	51%
Adelaide	13	20	48%
Melbourne	6	10	72%

Annual cooling-only energy increase resulting from urban heat islands

	Normal Weather – Cooling Utility Cost (\$/m ²)	Shifted Weather – Cooling Utility Cost (\$/m ²)	% Increase in Cooling Utility Cost
Sydney	\$5.0	\$7.6	51%
Adelaide	\$5.1	\$7.5	48%
Melbourne	\$1.9	\$3.3	72%

Annual cooling-only energy cost increase resulting from urban heat islands



Climate change

City	Temperature Change (2090, RCP 8.5)	Precipitation Change (2090, RCP 8.5)	Solar Radiation Change (2090, RCP 8.5)
Adelaide	2.9 °C	-9 %	1.5 %
Brisbane	3.7 °C	-16 %	0.8 %
Melbourne	3.0 °C	-9 %	3.1 %
Perth	3.5 °C	-18 %	1.0 %
Sydney	3.7 °C	-3 %	1.3 %

Changing capital cities

What will climate change mean for UHIs?

Widespread warming of all surfaces is unlikely to change the number and size of urban heat islands.

What will change is the frequency and severity of extreme heat events, the impacts of which will be experienced to a much greater extent within urban heat islands.

While thermal response of many surfaces will be similar under a changing climate, some surfaces may have different thermal responses.

Thermal performance changes



- Non-irrigated grass
 - During wetter periods and in wetter climates, non-irrigated grass performs similarly to irrigated grass providing a cooling effect.
 - During drier periods and in drier climates its surface temperature is close to bitumen and provides a strong warming effect.
- Irrigated turf
 - Will become more important for cooling in the future
 - Will require greater irrigation to provide cooling benefits



Summary

So what do
the results
mean for:



Parks and reserves



Homes



Street verges

Summary



- Irrigated green space cools our cities
- Living turf is one of the coolest land surface types in our cities
- But, more green cover is being replaced with impervious surfaces
- The decisions we make today about how our cities are constructed influences how cool they will be now and in the future

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Strategic levy investment

**TURF
FUND**

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Provision of surface temperature data: New South Wales: City of Parramatta; Victoria: City of Port Phillip; South Australia: AdaptWest region councils (City of Port Adelaide Enfield, City of Charles Sturt, City of West Torrens), City of Salisbury and the Resilient East region councils (City of Adelaide, City of Burnside, City of Campbelltown, City of Norwood Payneham St Peters, City of Prospect, City of Tea Tree Gully, City of Unley, and Town of Walkerville).

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Thank you

For further
information please
contact:

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City of Armadale WSC Benchmarking Index workshop		11/03/2020 9:00 AM
IPWEA conference	The Esplanade, Fremantle	12/03/2020 12:00 AM
UDIA National Congress	Sydney	17/03/2020 12:00 AM
Water Industry Night	DPLH, L2, 140 William St	17/03/2020 5:00 PM
City of Stirling WSC Index benchmarking workshop		25/03/2020 12:00 AM
UWM Masterclass 2 - Collaboration	Water Corporation	25/03/2020 9:00 AM
Waterwise Councils Forum - learning from the leaders	Water Corporation	26/03/2020 9:00 AM
WSTN Research SC	Water Corporation	26/03/2020 1:00 PM
IRP4 team in town		30/03/2020 12:00 AM
Designing and Evaluating Water Sensitive Infill Developments; a showcase of CRCWSC IRP4	DPLH, 140 William St, L2 Exhibition Hall	31/03/2020 9:00 AM
Hydropolis	DWER	1/04/2020 12:00 AM
Asia Pacific Conference on Sustainable Development of Energy, Water and Environment Systems	Gold Coast	6/04/2020 12:00 AM
NWW Introductory WSUD training- session 2	Water Corporation	7/04/2020 9:00 AM
WSTN Tech Capacity & Partnerships Subcommittee	DBCA, Kensington	9/04/2020 10:00 AM
GOOD FRIDAY		10/04/2020 9:00 AM
EASTER MONDAY		13/04/2020 9:00 AM
ANZAC DAY		27/04/2020 9:00 AM
Water Sensitive Transition Network Meeting		28/04/2020 9:00 AM
UWM Masterclass 3 - Business cases	Water Corporation	29/04/2020 9:00 AM
Ozwater20 - Thirst for Action	Adelaide Convention Centre	5/05/2020 12:00 AM
WSTN Research SC meeting	Water Corporation	7/05/2020 10:00 AM
PIA National congress	Adelaide	13/05/2020 12:00 AM
UWM Masterclass 4 - Communication and influence	Water Corporation	27/05/2020 9:00 AM
Sustainability, Research and Innovation Conference	Brisbane	14/06/2020 12:00 AM
National Stormwater Conference	Crown Promenade Melbourne	17/06/2020 12:00 AM
WSTN Tech Capacity & Partnerships Subcommittee	DBCA, Kensington	25/06/2020 10:00 AM
WSTN Tech Capacity & Partnerships Subcommittee	DBCA, Kensington	3/09/2020 10:00 AM
15th IWA/IAHR International Conference on Urban Drainage	Melbourne Convention Centre	6/09/2020 12:00 AM
AILA "spectacle and collapse"	Perth WA	20/10/2020 12:00 AM
WSTN Tech Capacity & Partnerships Subcommittee	DBCA, Kensington	12/11/2020 10:00 AM