



SCIENCE AND  
INDUSTRY  
ENDOWMENT  
FUND



# Generation STEM Community Partnerships Program

## Campbelltown local scenario

### Heat Stress

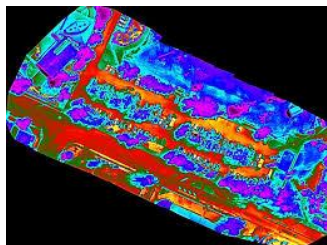
The Campbelltown area is vulnerable to heat stress. Heat stress occurs when your body cannot maintain a healthy temperature (37°C). Babies, young children, the elderly and people with some health conditions or on some medications may be a higher risk. Heat stress results in more deaths in Australia than bush fires and is displayed with pale skins, excess or no sweating and dark urine. Heat stress may lead to a medical emergency such as heat stroke which is fatal in 80% of cases.<sup>1</sup>

Western Sydney typically experiences 6 – 10°C higher temperatures during extreme events in the summer period compared to Sydney's Eastern Suburbs. The need for cooling leads to greater energy consumption.

Strategies undertaken for the future management of heat stress includes urban wetlands, urban greenery and the use of cool materials in community spaces (they have high reflectivity and emissivity value). Urban wetlands i.e. natural water bodies, evaporation technologies, pools, ponds and fountains can be used to decrease the ambient temperature. Urban greenery not only can assist in decreasing the ambient temperature but can mask urban noise, filter pollutants, prevent erosion and stabilise ground soils. Another strategy for urban cooling is using cool materials on vertical surfaces of buildings.

The design of buildings, construction and insulation and the use of skylights, glazing and shading also impacts the way temperature is experienced by locals and their use of energy consuming appliances.

How your Council tackles the complexity of this issue will impacts you now and future generations.



*Photos courtesy of smooth<sup>3</sup>, Sydney Water Colling WesternSydney<sup>4</sup>, The Australian<sup>5</sup>*

1. <https://www.betterhealth.vic.gov.au/health/healthyliving/heat-stress-and-heat-related-illness>

### Your task

Your task is to use the information above, and resources provided below as a start to identify a local problem and design a STEM-focussed solution.

(Question, Design, Explore, Communicate)

## Resources

### CSIRO research

- Home monitoring of health: <https://www.csiro.au/en/research/health-medical/diagnostics/home-monitoring>
- Bushfire management: <https://www.csiro.au/en/research/natural-disasters/bushfires>

### Reports

- Sydney Water Cooling Western<sup>4</sup>:  
[https://www.sydneywater.com.au/web/groups/publicwebcontent/documents/document/zgrf/mty4/~edisp/d\\_d\\_168965.pdf](https://www.sydneywater.com.au/web/groups/publicwebcontent/documents/document/zgrf/mty4/~edisp/d_d_168965.pdf)
- Australian Institute of Health and Welfare, Older Australia at a glance:  
<https://www.aihw.gov.au/reports/older-people/older-australia-at-a-glance/contents/demographics-of-older-australians/australia-s-changing-age-and-gender-profile>
- Australian Government, Productivity Commission, 17 June 2014, An Ageing Australia: Preparing for the Future:  
<http://www.pc.gov.au/research/completed/ageing-australia>
- NSW Aging Strategy 2016-2020, Family and Community Services, accessed 13/11/17:  
[https://www.facs.nsw.gov.au/\\_data/assets/pdf\\_file/0005/382829/NSW\\_Ageing\\_Strategy\\_2016-2020.pdf](https://www.facs.nsw.gov.au/_data/assets/pdf_file/0005/382829/NSW_Ageing_Strategy_2016-2020.pdf)

### Articles

- The Age, Dr Rebecca Valenzuela, March 25 2015, The economics of an ageing population:  
<http://www.theage.com.au/national/education/the-economics-of-an-ageing-population-20150316-1m0g4a.html>  
The Sydney Morning Herald article: <https://www.smh.com.au/opinion/australia-at-24-million-high-points-and-hazards-in-the-demographic-data-20160212-gmszk2.html>
- Heat stress and heat related illness: <https://www.betterhealth.vic.gov.au/health/healthyliving/heat-stress-and-heat-related-illness>  
NSW Planning System – thermal comfort: <https://www.basix.nsw.gov.au/iframe/basix-help-notes/thermal.html>
- Tips for keeping cool:  
[https://www.westernsydney.edu.au/newscentre/news\\_centre/more\\_news\\_stories/6\\_tips\\_for\\_keeping\\_cool\\_this\\_summer](https://www.westernsydney.edu.au/newscentre/news_centre/more_news_stories/6_tips_for_keeping_cool_this_summer)
- Smooth, September 21, 2017<sup>3</sup> <https://www.smooth.com.au/latest/nsw-faces-first-ever-40-degree-september-day>
- The Australian, January 9, 2019<sup>5</sup>: <https://www.theaustralian.com.au/news/nation/bats-drop-dead-in-scorching-heat/news-story/789216383260eb3c51bae57bc104b736>