



SCIENCE AND
INDUSTRY
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STEM Community Partnerships Program

Blacktown local scenario

Heat Stress

The Blacktown 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. The need for cooling leads to greater energy consumption.

Western Sydney typically experiences 6 – 10°C higher temperatures during extreme events in the summer period compared to Sydney's Eastern Suburbs. Strategies undertaken for the future management of heat stress includes urban wetlands, increasing urban green infrastructure and tree canopies, 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.

Blacktown City Council is committed to working towards zero net emissions by 2040 to help reduce the rising daytime temperatures. In the meantime, Council is working with local organisations to trial the creation of 'heat refuges'. These refuges are air-conditioned venues that would become go-to places on high heat days for the local community to gather at, with toilets, comfortable seating and cold water nearby. During a heatwave, a community organisation would transport local residents to the venues.

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

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)



The Pulse (Western Sydney Health News), January 2019

Resources

CSIRO research

- Bushfire management, CSIRO <https://www.csiro.au/en/research/natural-disasters/bushfires>
- Smart Sensors to help Darwin residents manage smoke and heat, CSIRO <https://blog.csiro.au/darwin-smart-sensors/>
- Climate and Health cluster – article and website, CSIRO <https://research.csiro.au/climate/themes/clusters/csiro-climate-health-cluster/>

Reports

- Heat stress and heat related illness <https://www.betterhealth.vic.gov.au/health/healthyliving/heat-stress-and-heat-related-illness>
- Sydney Water Cooling Western Sydney https://www.sydneywater.com.au/web/groups/publicwebcontent/documents/document/zgrf/mtty4/~edisp/dd_168965.pdf

Articles and other resources

- NSW Government Planning System – thermal comfort <https://basix.nsw.gov.au/iframe/thermal-help.html>
- Refuges to provide shelter in Blacktown City during heatwaves, Blacktown City Council, February 2021 <https://www.blacktown.nsw.gov.au/News-Media/Refuges-to-provide-shelter-in-Blacktown-City-during-heatwaves>
- 'Heat refuges' may be one solution to Western Sydney's climate emergency, January 2021 <https://www.abc.net.au/news/2021-01-14/western-sydney-heat-refuge-strategy-needed-for-summer-heatwaves/13026882>
- Heatwaves may mean Sydney is too hot for people to live in 'within decades', ABC Science, 24 January 2021 <https://www.abc.net.au/news/science/2021-01-24/heatwaves-sydney-uninhabitable-climate-change-urban-planning/12993580>
- Pavement technology could cool cities from the ground up, AP News, October 2020 <https://apnews.com/article/virus-outbreak-technology-arizona-bdd2b997ebdf976c22090eaf5b32bcb7>
- Natural ways of cooling cities, Science Daily, 4 September 2019 <https://www.sciencedaily.com/releases/2019/09/190904165242.htm>
- City-cooling tech wins international award, Sustainability Matters, 24 September 2019 <https://www.sciencedaily.com/releases/2019/09/190904165242.htm>
- Cool Streets program <https://www.coolstreets.com.au/>

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