

# If a major El Nino hits, how prepared is Singapore?



Singapore is knitting more greenery into its urban landscape to soften the urban heat island effect, a result of the night-time release of trapped heat from urban structures and roads. ST PHOTO: JOYCE FANG

## Individuals must learn how to deal with heat stress, and urban heat problem must be addressed

Shabana Begum

In the coming weeks, a national guide on preventing heat stress will be released to help people plan their activities and what to wear outdoors, and the protective actions to take to avoid heat injuries.

After three years of more than usual rainfall in the region, the forecast is for hotter and drier weather in South-east Asia and Australia.

There is up to an 80 per cent chance of the El Nino climate phenomenon occurring in the later part of 2023, the United Nations has forecast. The eastern tropical Pacific Ocean is heating up quickly, a clear sign El Nino is emerging.

"The odds of more extreme temperatures leading to heatwave conditions have been shortened because of El Nino. Maximum temperatures can exceed 35 deg C in Singapore, and El Nino will do us no favours in that," said associate professor of urban climate Winston Chow from Singapore Management University (SMU).

The possibility of a prolonged dry spell had led the Singapore Institute of International Affairs to issue a high risk alert for transboundary haze in late June.

Two severe haze episodes over the past decade, in 2013 and 2015, have been imprinted on people's minds.

And the return to hot weather is a worry for many – the country recently felt its highest temperature in 40 years when Ang Mo Kio recorded 37 deg C on May 13.

Professor Benjamin Horton, director of the Earth Observatory of Singapore at Nanyang Technological University, hopes the Republic will intensify efforts to protect people from rising temperatures, much like how it strove to keep people safe during the Covid-19 pandemic.

"Singapore had a fantastic action plan to keep people safe during the pandemic. All climate models project that the next five years can be really hot. What's Singapore's plan for this?" he said.

El Nino could stress Singapore's water resources. In 2016, water levels in Linggiu Reservoir, Singapore's main water source in Malay-

sia, plunged to a historic low of 20 per cent.

National water agency PUB said it will ramp up its production of desalinated water during dry months and also inject more Newater into the reservoirs to ensure that local water reserves remain at healthy levels.

With temperatures on the rise, people should learn to heat-proof themselves and recognise misconceptions related to hydration and cooling down, said Associate Professor Jason Lee, director of the Heat Resilience and Performance Centre at the National University of Singapore's Yong Loo Lin School of Medicine (NUS Medicine).

Aerobic fitness exercises, which

include running and cardio workouts, are known to be some of the most effective ways to raise resilience to heat, added Prof Lee.

Being aerobically fit improves the immune system and the body's thermal capacity to better deal with heat stress. At the same time, other solutions such as heat acclimatisation and proper fluid intake should also be practised, he added.

"Exercise is not only good for health. It's also good for heat-proofing one against a warming world," said Prof Lee, who is also from the NUS Medicine Human Potential Translational Research Programme.

While it is good advice to drink more fluids on hot days, Prof Lee

cautioned against relying solely on hydration. Too much fluid can lead to low blood sodium levels or water intoxication. When someone pauses work to drink, it is often the resting that contributes more to his recovery, he added.

Another common misconception is to avoid having a cold drink when one is feeling hot. Studies have shown that having a cold or frozen drink before starting work in warm and humid conditions can help to raise a worker's thermal capacity to deal with heat stress, said Prof Lee.

In addition to people protecting themselves, the problem of urban heat in Singapore – a result of the night-time release of trapped heat

from urban structures and roads – must also be addressed.

In an ongoing trial, a type of heat-reflective cooling paint that can reduce ambient temperatures by up to 2 deg C is being used on some 130 Housing Board blocks. The pilot, to be completed in 2024, will determine if it is beneficial to use such paint on building facades and pavements across the island.

Singapore is also knitting more greenery into its urban landscape to soften the urban heat island effect. Planting trees with large shade canopies can help to shield residents from the sweltering sun.

Green spaces such as Bishan-Ang Mo Kio Park can be about 1.5 deg C lower than their neighbouring urban areas. Sometimes, these cooler temperatures can extend beyond the park boundaries, a Cooling Singapore 2.0 research project co-led by SMU research assistants Yik Sin Kang and Graces Ching found.

While low wind speeds could limit the extent of cooling for nearby urban areas, other aspects such as size of the green space, the density of its greenery and if it is the monsoon season play a part too.

But solutions are not always straightforward, noted Prof Chow.

While air-conditioning provides much-needed respite, it cannot be the main solution since excess heat from the units and greenhouse gas emissions from coolants and energy consumed contribute to a warming world, said Prof Chow. Consumers can do their part by choosing energy-efficient air-conditioning systems.

Another research project under the multi-institutional Cooling Singapore 2.0 is studying how warmer temperatures might affect the ability of trees to provide shade and release water vapour into the air.

As for the haze, Prof Chow acknowledged that a lot of preparation has been done by Indonesia and plantation companies to make sure that the fire risk is low.

The upcoming El Nino could put the preparedness to the test, he said.

"The actions that have been taken will go a long way in lowering that fire risk. But if it's a strong El Nino with a drought lasting months and exhausts water storage and firefighting capacity, that will be a challenge.

"The climate aspects could totally overwhelm even the most efficient human adaptation approaches used," Prof Chow added.

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Visitors cooling off at a water park in 2022. With temperatures on the rise, people should learn to heat-proof themselves and recognise misconceptions related to hydration and cooling down, said one expert. ST PHOTO: LIM YAOHUI

### IMPACT OF EL NINO

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ASSOCIATE PROFESSOR OF URBAN CLIMATE WINSTON CHOW, from Singapore Management University.

### NEED FOR GAME PLAN

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PROFESSOR BENJAMIN HORTON, director of the Earth Observatory of Singapore at Nanyang Technological University.