

## Cooling Singapore 2.0

### *Developing solutions to address the urban heat challenge in Singapore*

Singapore has become warmer as a result of the Urban Heat Island (UHI) effect, exacerbated by greenhouse gas emissions that are driving global climate change. As a densely populated city state in the tropics, Singapore's population, economy, and ecosystems are vulnerable to the negative impacts of further temperature increase.

Tackling such a complex issue, with implications for planning, energy, transportation, building, and patterns of consumption, must be based upon sound scientific knowledge, in partnership with governmental and industry stakeholders.

The interdisciplinary [Cooling Singapore project](#) aims to mitigate the UHI effect by furthering the scientific knowledge required for climate-sensitive design of the urban environment. The team seeks not only to improve residents' comfort level outdoors, but ultimately, also to improve livability and well-being of residents, and sustainability of Singapore as a whole.

In the current phase, the team will develop an island-wide digital urban climate twin (DUCT) of Singapore by integrating relevant computational models (environmental, land surface, industrial, traffic, building energy) as well as regional and micro-scale climate models.

Building on work done in the earlier phase, the team will work closely with government agencies to explore heat effects of buildings, transport and industry. Finally, they will produce a set of climate-informed urban design guidelines based on research findings as a resource to planners and agencies.

The multi-institutional project is led by the Singapore-ETH Centre, in partnership with the Singapore Management University (SMU), Massachusetts MIT Alliance for Research and Technology (SMART), TUM-EPF-ATF (Established by

# Developing an Innovative Digital Urban Climate Twin

Singapore, India, Indonesia

The Twin is based on coupling several environment models that are tested and parametered with observed data to ensure that these are representative of Singapore's urban climate center.

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Computer model

Digital urban climat

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