

BeBrit Extreme Heat Risk Project City Case Study

"Cool City" action in Guangzhou, China

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Introduction

Guangzhou, a rapidly urbanizing megacity in South China, is situated in a subtropical monsoon climate and faces significant climate challenges, including rising temperatures, frequent heatwaves, and intensified urban heat island effect. These factors have increased the city's vulnerability to extreme heat, posing risks to public health and urban development. In response, Guangzhou has launched the "Cool City" initiative to reduce heat risks and enhance urban resilience through sustainable cooling solutions and adaptation strategies.

Key Strategies

•Policy Integration

City level

Guangdong's 14th Five-Year Plan (2022)

Guangzhou Territorial Spatial Master Plan (2018-2035)

- To enhance real-time thermal health monitoring
- To expand urban wetlands, green spaces, and water bodies
- To mitigate the urban heat island effect

- To establish six urban ventilation corridors

District level

Identify the thermal vulnerabilities of Guangzhou's sub-districts and implement tailored planning, design recommendations, and urban cooling measures

•Nature-Based Solutions (NBS)

- Developed nine major ecological zones, Create 5,000 km of ecological corridors. Maintain six key ecological cores as citywide cold and oxygen sources.

Block level

Guidelines for the Design of Sustainable Urban Cooling Neighborhoods

•Sponge City Projects

•Heat Alert Systems

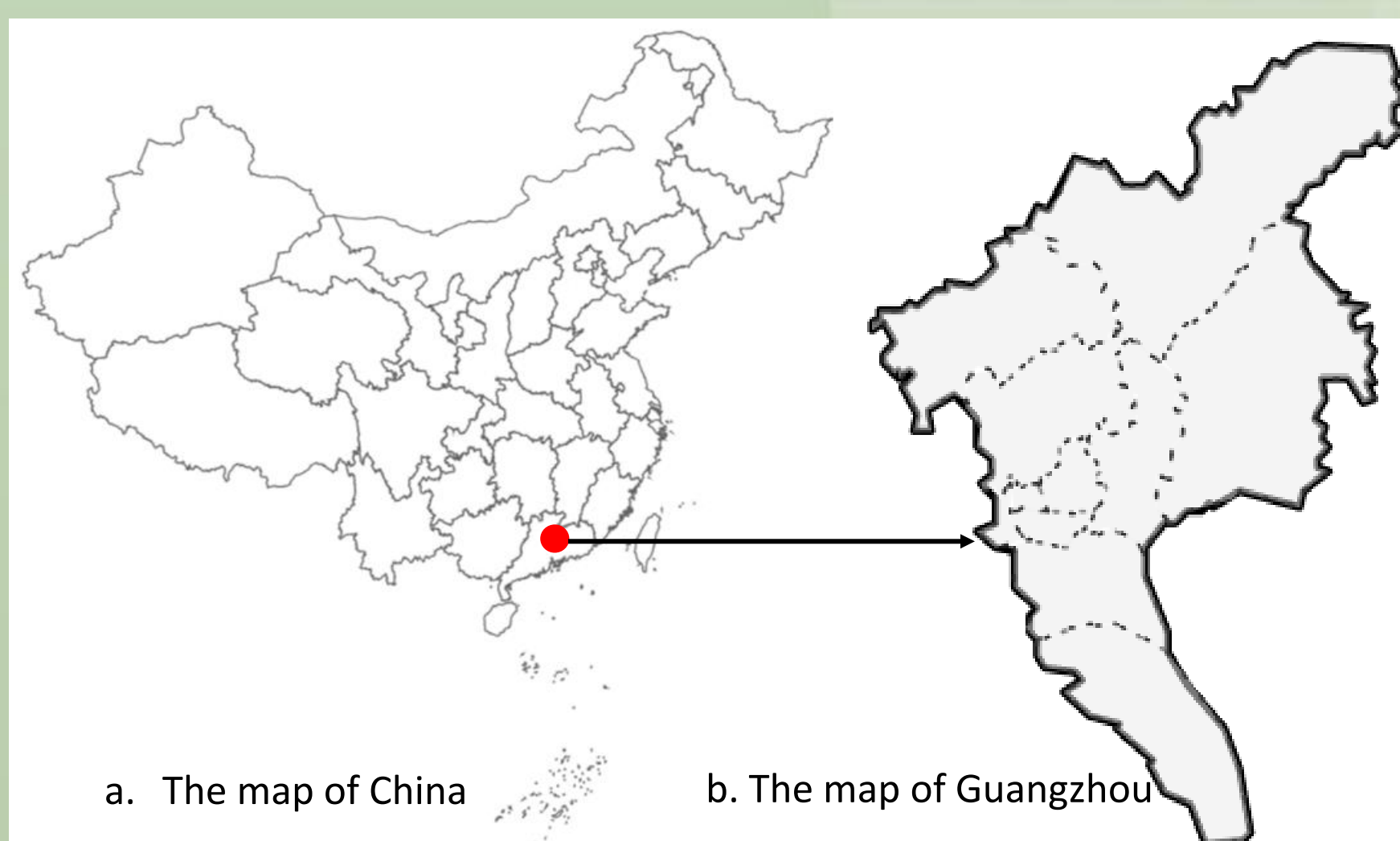


Fig. 1. Study area

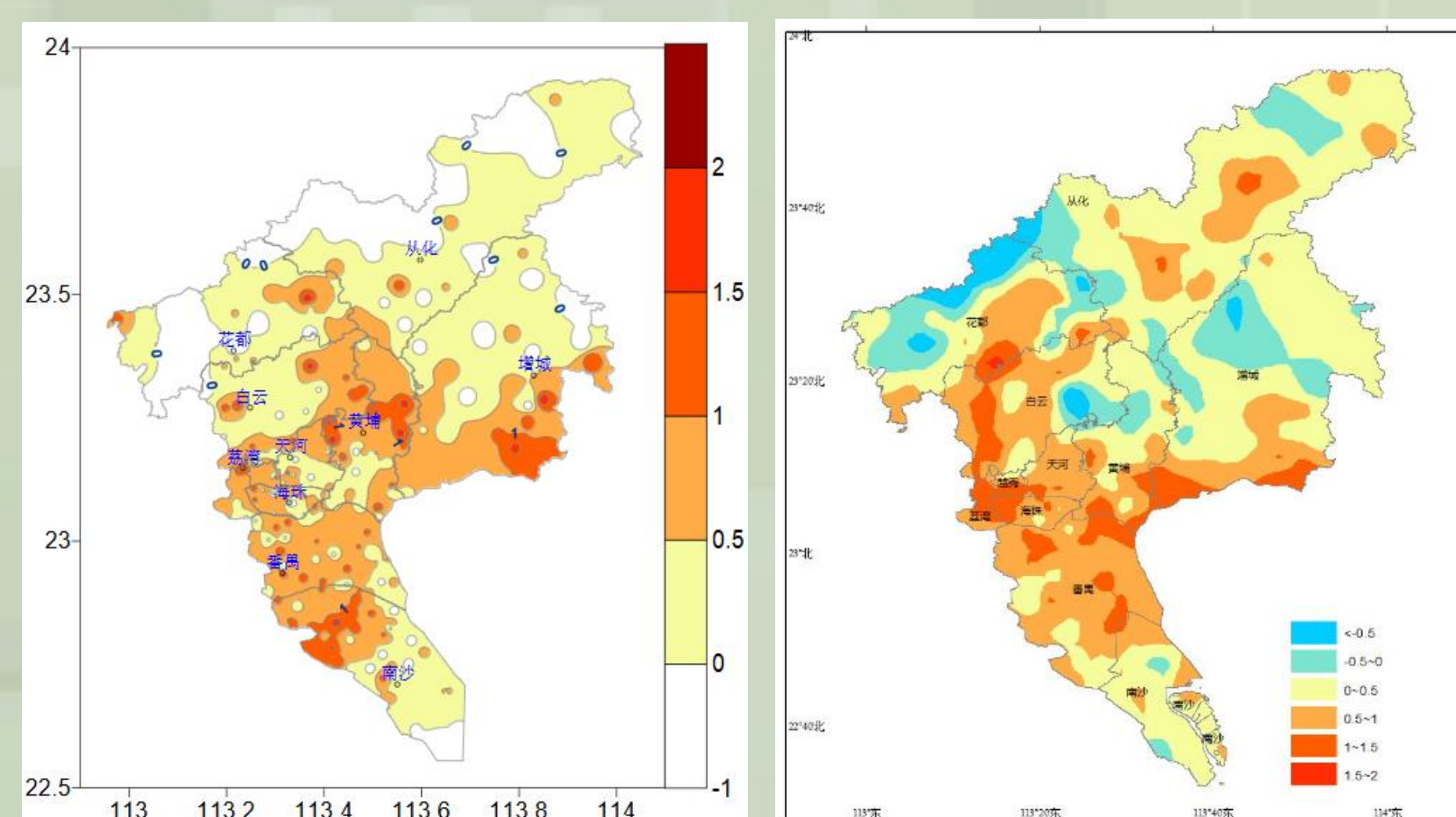


Fig. 2 and 3. Heat island intensity of maximum summer temperature in Guangzhou in 2020 and 2023

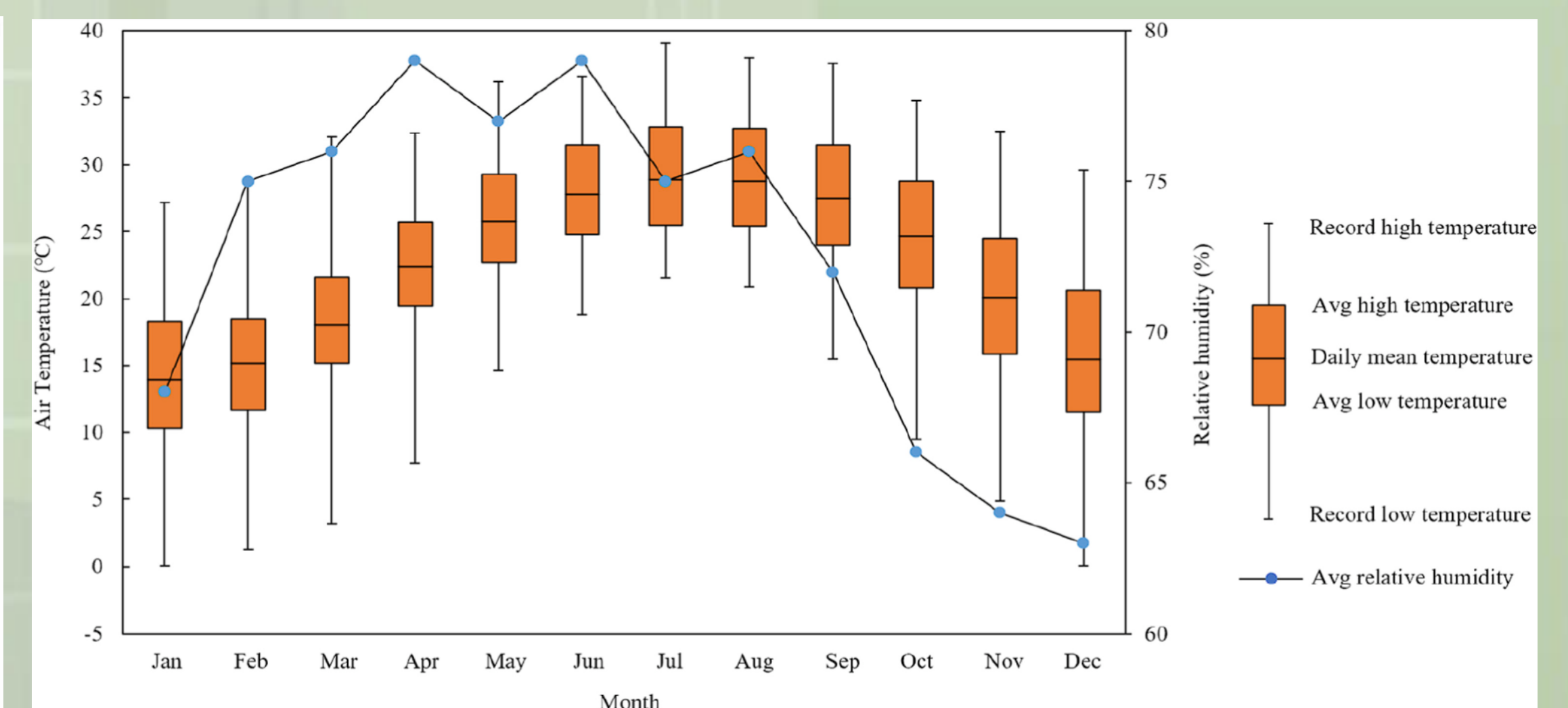
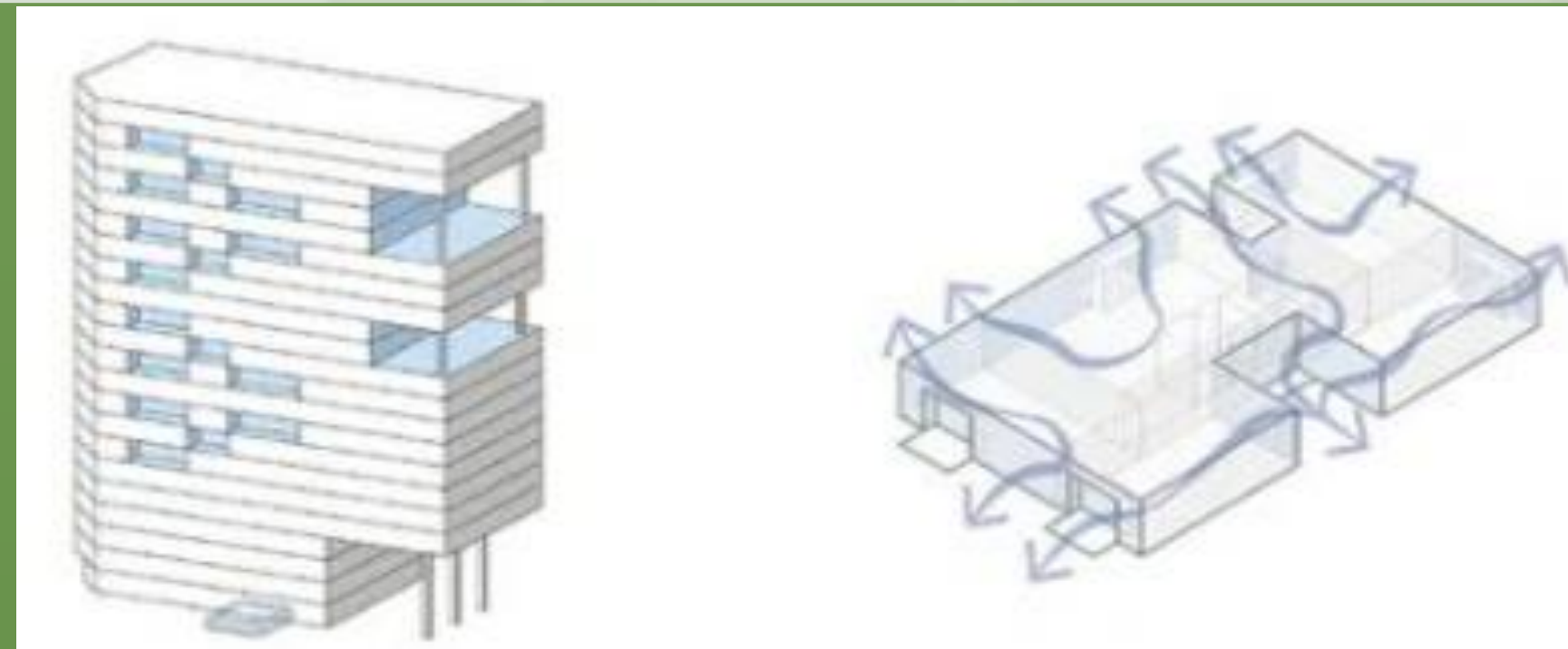


Fig. 4. The air temperature and relative humidity in Guangzhou (1981–2010 normal values, 1951–2010 extremes values)

Examples of City Actions

•**Yongqing Fang Project:** Cooling materials are used and the layout of the building is changed to allow ventilation



Building overhead for passive ventilation

•**Zhongxing Knowledge City Project:** Widespread use of green roofs, green walls, permeable paving, building layouts to suit wind and ventilation needs, cooling pavements, new buildings with green and energy-efficient designs, and centralized district cooling technology



Using building shading

•**Haizhu Wetland Project**



3D greening

Challenges and Lessons Learned

•**Urban Ventilation Corridors:** Proposed corridors and natural cold sources show cooling potential but require further validation and refinement.

•**Green Buildings & Sponge Cities:** Adoption is slow due to insufficient incentives and legislation.

•**Sustainable Cooling:** Concept is emerging but lacks a solid technical framework.

•**Heat Risk Assessment:** A comprehensive system and post-heatwave review process are still needed.

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