THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY
HKUST JOCKEY CLUB INSTITUTE FOR ADVANCED STUDY
INSTITUTE FOR ADVANCED STUDY ATMOSPHERIC RESEARCH CENTER

DECEMBER 2025

NEWSLETTER

Hong Kong Selected as a Global Demonstration City for WMO Urban-PREDICT

Chosen from an initial pool of 14 leading global cities to advance next-generation urban weather prediction and early-warning science

Hong Kong's role in global urban climate resilience reached an important milestone in November 2025, when the World Meteorological Organization (WMO) selected the city as one of three Global Demonstration Cities under Urban-PREDICT, a flagship project of the World Weather Research Programme (WWRP) for 2025–2029.

The decision followed a rigorous international assessment involving an initial pool of 14 proposed cities, spanning diverse geographic, climatic, and institutional contexts. Selection reflects not only scientific capability, but a city's demonstrated capacity—and continuing commitment—to contribute knowledge, evidence, and learning that support informed decision-making on urban early warning and risk reduction.

Urban-PREDICT addresses a growing global challenge. As climate change intensifies, cities are increasingly exposed to extreme rainfall, flooding, heat stress, storm surge, and compound hazards. Many existing warning systems, however, were not designed for the spatial complexity and decision-making needs of dense urban environments. Urban-PREDICT responds by advancing ultra-high-resolution, urban-scale weather prediction, while working with cities to explore how such information can better inform early-warning practices and protective action.

"Hong Kong offers exceptional examples, both infrastructure and community-based, for how a dense coastal city can prepare for weather extremes."

– Urban-PREDICT Steering Group

Why Hong Kong?

Hong Kong was selected based on its strong scientific foundations, mature institutional coordination, and demonstrated operational preparedness, making it highly relevant to cities worldwide facing escalating weather risks.

Key strengths identified by the Urban-PREDICT Steering Group include:

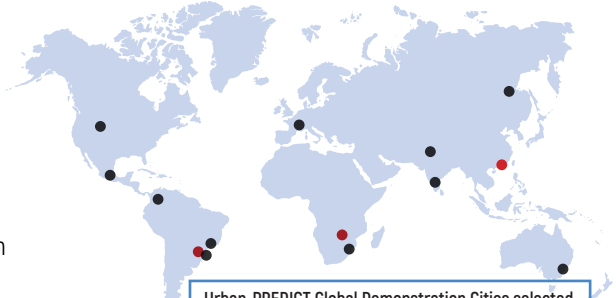
A complex tropical coastal hazard environment, exposed to interacting risks such as intense rainfall, flooding, heat stress, storm surge, and air-quality impacts

A highly compact, infrastructure-intensive urban form, requiring neighbourhood- and street-level weather information to inform operational and community decisions

Deep integration of science, governance, and operations, observed during workshops and field engagements, where weather information supports coordinated decision-making across agencies

Mature cross-sector collaboration, extending beyond government to include NGOs, community organisations, and the business and finance sectors, reflecting both the challenges and opportunities of managing urban weather risk

High transferability, as Hong Kong's dense, coastal context mirrors challenges faced by many rapidly urbanising cities across Asia and other tropical regions



Urban-PREDICT Global Demonstration Cities selected from an initial pool of 14 cities worldwide.

A Strategically Selected Reference Case

The three Global Demonstration Cities were deliberately chosen to reflect complementary urban contexts, enabling Urban-PREDICT to examine how its integrated framework functions across different governance and data environments. Hong Kong was identified as a city with rich observational and modelling capacity and highly coordinated institutional structures, providing a strong reference case for shared learning.

Insights generated through the Hong Kong case study will inform comparative analysis, synthesis, and global learning, and can be tested, refined, and adapted by other cities in ways that reflect local priorities and governance arrangements. .

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How Urban-PREDICT Works — From Prediction to Protection

Urban-PREDICT addresses a central challenge facing cities worldwide: how advances in urban-scale weather science can better inform early warnings and decisions that protect people, infrastructure, and livelihoods. Rather than focusing on forecast performance alone, the project integrates prediction science, governance understanding, communication, and community response within a single framework.

In Hong Kong, Urban-PREDICT operates as a case study and co-learning platform. Scientists work with government agencies, practitioners, and community partners to examine how weather information is produced, interpreted, and used in practice, and how future approaches might be strengthened. Urban-PREDICT contributes evidence, analysis, and learning to support informed decision-making, while recognising that decisions on implementation remain with local authorities.

Urban-PREDICT's Integrated WP1–WP4 Framework

WP1 – Contextualisation and governance pathways

Examines how weather-risk information flows across institutions and decision points, identifying opportunities to strengthen interfaces between science and action.

WP2 – Hazard-scale relevance and urban risk characterisation

Explores how urban hazards translate into impacts at different spatial and temporal scales, clarifying what information is most useful for specific decisions.

WP3 – AI-physics integrated urban weather prediction

Advances urban-scale prediction by combining physics-based models with AI approaches, assessed in terms of decision relevance, not technical performance alone.

WP4 – Vulnerability, communication, and community response

Examines how warnings are received and acted upon, working with NGOs and community partners to strengthen people-centred early warning.

Learn more from Urban-PREDICT Website: https://wwrp-urbanpredict.net/

Why This Case Study Matters

Urban-PREDICT is a co-learning process, not a mechanism for prescribing solutions. Hong Kong's rich data environment and mature institutional landscape allow scientists and practitioners to jointly explore what is feasible, useful, and context-appropriate, while generating insights relevant beyond the city.

Urban-PREDICT Steering Group

Prof. Fei Chen, The Hong Kong University of Science and Technology, Hong Kong, China (Co-Chair)

Prof. Soledad Garcia Ferrari, University of Edinburgh, United Kingdom (Co-Chair)

Dr. Lewis Blunn, Met Office, United Kingdom

Prof. Gabriela di Giulio, University of Sao Paulo, Brazil

Prof. Sara Harrison, GNS Science, New Zealand

Dr. Valéry Masson, Meteo-France, France

Dr. Negin Nazarian, University of New South Wales, Australia

Dr. Thara Prabhakaran, Indian Institute of Tropical Meteorology, India

Prof. Shouraseni Roy, University of Miami, USA

Dr. Andrea Laura Pineda Rojas, University of Buenos Aires, Argentina

Dr. Gilbert Siame, University of Zambia, Zambia

Dr. María Eugenia Ibarrarán Viniegra, IberoAmerican University Puebla, Mexico

Dr. Olga Wilhelmi, NSF NCAR, USA

Dr. Mariano Re, National Water Institute, University of Buenos Aires, Argentina

Dr. Shiguang Miao, Institute of Urban Meteorology, China (SSC Liaison)

Dr. Volker Lehmann, Deutscher Wetterdinst (DWD), Germany (SSC Liaison)

Dr. Siham Sbii, Morocco Met Service, Morocco (SSC Liaison)

Scientific Leadership, Global Coordination, and Regional Learning

Urban-PREDICT is implemented under WMO leadership as part of its international research activities. Within this framework, Hong Kong contributes through scientific leadership, coordination support, and regional learning, working alongside partners across WMO's global network.

Scientific Leadership within WWRP Urban-PREDICT

Urban-PREDICT is a flagship project of WWRP, guided by an international scientific Steering Group.

Prof. Fei Chen (HKUST) and **Prof. Soledad García Ferrari (University of Edinburgh)** serve as Co-Chairs, supporting the project's scientific direction, governance principles, and implementation strategy.

Co-Chairs of Urban-PREDICT (left: Prof. Fei Chen; right: Prof. Soledad Garcia Ferrari) supporting scientific direction under WMO's WWRP.

Professor Soledad Garcia Ferrari

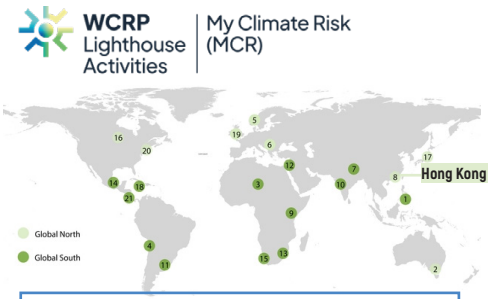
Co-Chair of WWRP Urban-PREDICT

Professionally qualified in Architecture and Urbanism in Uruguay, Soledad has extensive expertise in sustainable urban planning in Latin American cities, with a focus on community-empowerment, participatory and co-creation processes in the production and management of the built environment, towards increasing resilience and adaptation to climate change. She leads action research focused on community-led climate change-related risk management in Mexico, Colombia and Guatemala. She is currently working on the implementation of co-produced strategies for risk management, including mitigation and climate change adaptation actions in Medellin, incorporating naturebased solutions. In addition, Soledad is leading research with academics from Kyiv and Athens focused on postcrisis urban regeneration https://www. globalurbancollaborative.org. Soledad is Programme Director for the MSc Urban Strategies and Design. She is Co-Chair of the World Weather Research Programme - Urban Prediction Project and is UK representative for the International Committee for Integrated Research on Disaster Risk (IRDR) of the International Science Council (ISC).

Urban-PREDICT International Coordination Office (ICO) – Supporting Global Coordination

HKUST hosts the Urban-PREDICT International Coordination Office, established in partnership with WMO. The ICO supports global coordination, facilitating communication, meetings, documentation, and information exchange across the project's international network, while scientific leadership and decision-making remain embedded within WMO-led structures.

My Climate Risk Hub – Complementary Learning and Coordination under WCRP



The global network of My Climate Risk (MCR) regional hubs

Hong Kong also contributes to climate-risk learning under WCRP through the My Climate Risk (MCR) initiative. As a Regional Urban Hub for Southeast Asia, HKUST supports coordination, sharing of experience, and co-learning across cities and partners, recognising that weather extremes are a core component of climate risk.

Launch of the Urban-PREDICT International Coordination Office at HKUST in November 2025.

Linking Weather Prediction and Climate-Risk Practice

Urban-PREDICT and My Climate Risk operate under different WMO research programmes, but their objectives are complementary. Urban-PREDICT, under WWRP, advances understanding of urban-scale weather prediction and early warning. My Climate Risk, under WCRP, provides a platform for integrating weather-related risks into broader climate-risk and resilience thinking.

Through engagement in both streams, Hong Kong contributes to strengthening connections between weather prediction and climate-risk practice, supporting WMO's broader efforts to improve early warning and climate services for cities worldwide—while working collaboratively with international partners and respecting local governance contexts.

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From Observation to Shared Learning

Field engagements during the November 2025 Steering Group meeting allowed international experts to observe how urban weather risk is currently managed in practice—across infrastructure, emergency operations, and community preparedness.

What Was Observed

Visits to flood-mitigation infrastructure, flood-control centres, and discussions with the Hong Kong Red Cross illustrated how early warning functions as a chain, linking prediction, operational decisions, and community action. These engagements provided a basis for reflection and co-learning, not evaluation or prescription.

Why This Matters Globally

Hong Kong's experience offers insight into how integrated early-warning pathways function in a data-rich, highly coordinated urban environment, contributing to comparative learning across the Urban-PREDICT network.

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1. Flood-control / emergency operations centre: Operational decision-making informed by real-time weather information
2. Happy Valley stormwater storage facility: Large-scale flood-mitigation infrastructure supporting urban resilience
3. Hong Kong Red Cross engagement: Community-level preparedness and people-centred early warning

Looking Ahead: Sustaining Learning through Partnership and Local Support

As Urban-PREDICT moves into its implementation phase under WMO leadership, the focus will be on deepening learning within and across cities, strengthening synthesis activities, and supporting capacity-building efforts that connect science with practice.

While WMO provides international coordination and scientific guidance through its research programmes, the scope, depth, and continuity of local demonstration and learning activities depend critically on locally mobilised resources. In practice, sustained engagement with infrastructure operators, emergency managers, community organisations, and other stakeholders requires dedicated local support beyond what international coordination alone can provide.

In the current global context, local funding and partnership contributions—from government, research institutions, philanthropic organisations, industry, and community partners—play an increasingly important role in enabling cities to move from initial demonstration to sustained exchange, synthesis, and long-term capacity building.

For Hong Kong, locally supported investment will be essential to fully realise the city's potential contribution as a Global Demonstration City—ensuring that learning generated through Urban-PREDICT informs both global research objectives and ongoing local understanding of how urban early-warning systems can continue to evolve in response to changing risks.

"Philanthropic support can play a catalytic role in enabling Hong Kong's contribution to Urban-PREDICT, providing the flexibility and continuity needed to sustain deep engagement, cross-sector learning, and the translation of global coordination into lasting urban resilience impact."

– Urban-PREDICT Steering Group