



Global Conversation

Can big data save lives?
Protecting Hong Kong against
air pollution and extreme weather

Hong Kong Observatory
Monday 15 April 2019



Introduction

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University of Exeter

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Outline

- The role of big data in addressing environmental challenges
- Examples
 - Air pollution and health
 - Extreme weather events
- The future...
- Panel discussion: Q&A





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The role of big data in
addressing environmental
challenges



ENVIRONMENTAL CHALLENGES

The Telegraph
News | Science

News > Science
Climate change co malaria to Britain, Health fears

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News Opinion Sport
Environment ► Climate change Wildlife Energy Pollution

Air pollution Air pollution falling in London but millions still exposed

No breach of annual limits so far in 2019, after 2017's first breach within five days

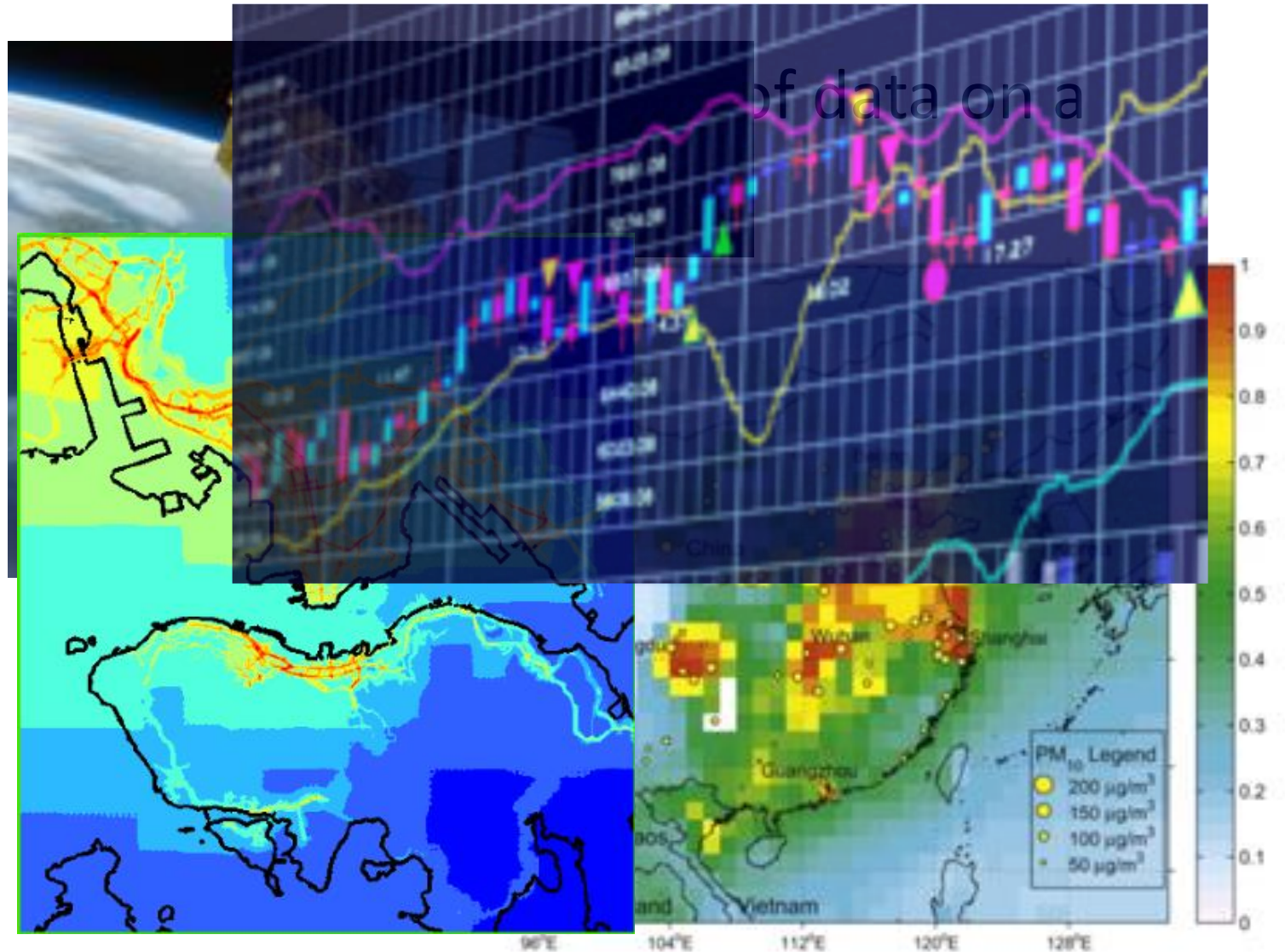
Damian Carrington
Environment editor
@dpcarrington
Mon 1 Apr 2019 14:06 BST

SEPTEMBER 16

SQUAWK BOX HK: RECOVERY & CLEAN-UP EFFORTS UNDERWAY

CNBC

AND BIG DATA





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Example: **Air pollution and
health**



AIR POLLUTION AND HEALTH

AIR POLLUTION – THE SILENT KILLER

Every year, around **7 MILLION DEATHS** are due to exposure from both outdoor and household air pollution.

Air pollution is a major environmental risk to health. By reducing air pollution levels, countries can reduce:



Stroke



Heart disease



Lung cancer, and both chronic and acute respiratory diseases, including asthma

REGIONAL ESTIMATES ACCORDING TO WHO REGIONAL GROUPINGS:



Over 2 million in South-East Asia Region

Over 2 million in Western Pacific Region

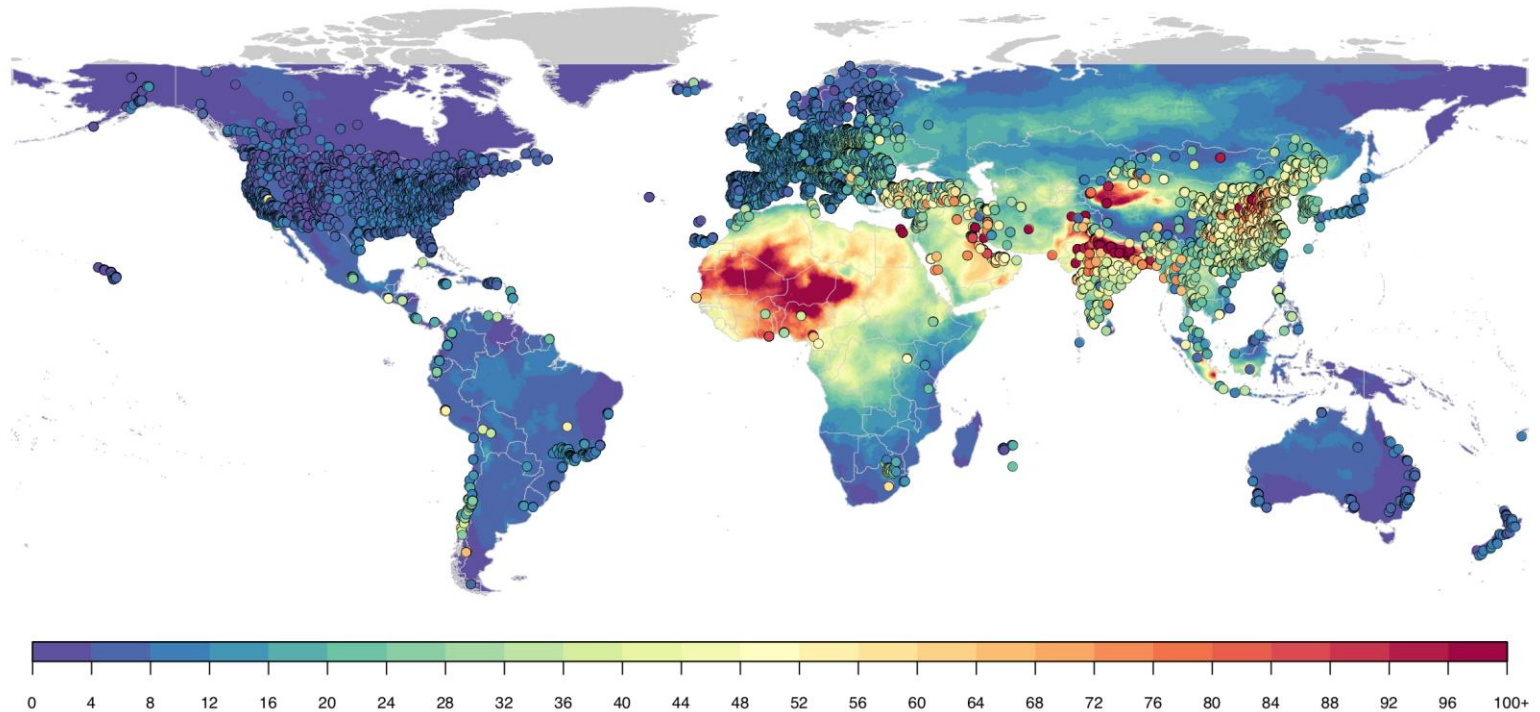
Nearly 1 million in Africa Region

About 500 000 deaths in Eastern Mediterranean Region

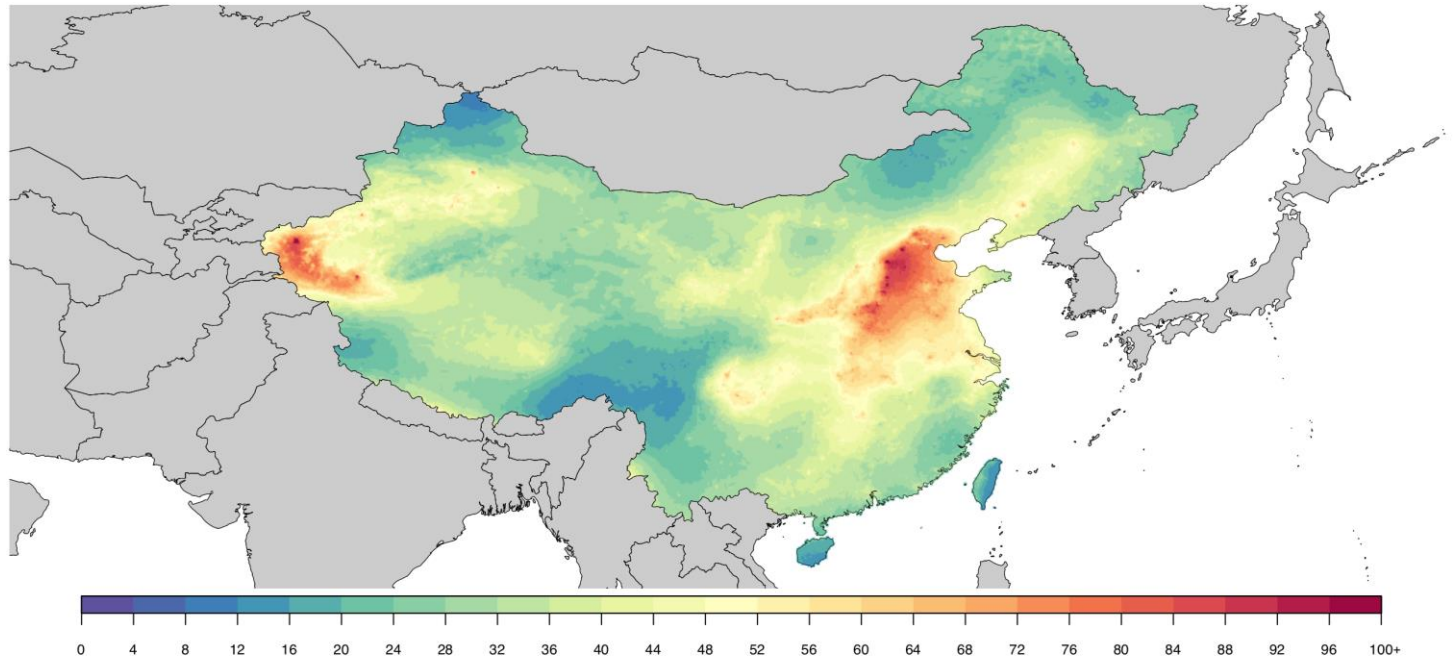
About 500 000 deaths in European Region

More than 300 000 in the Region of the Americas

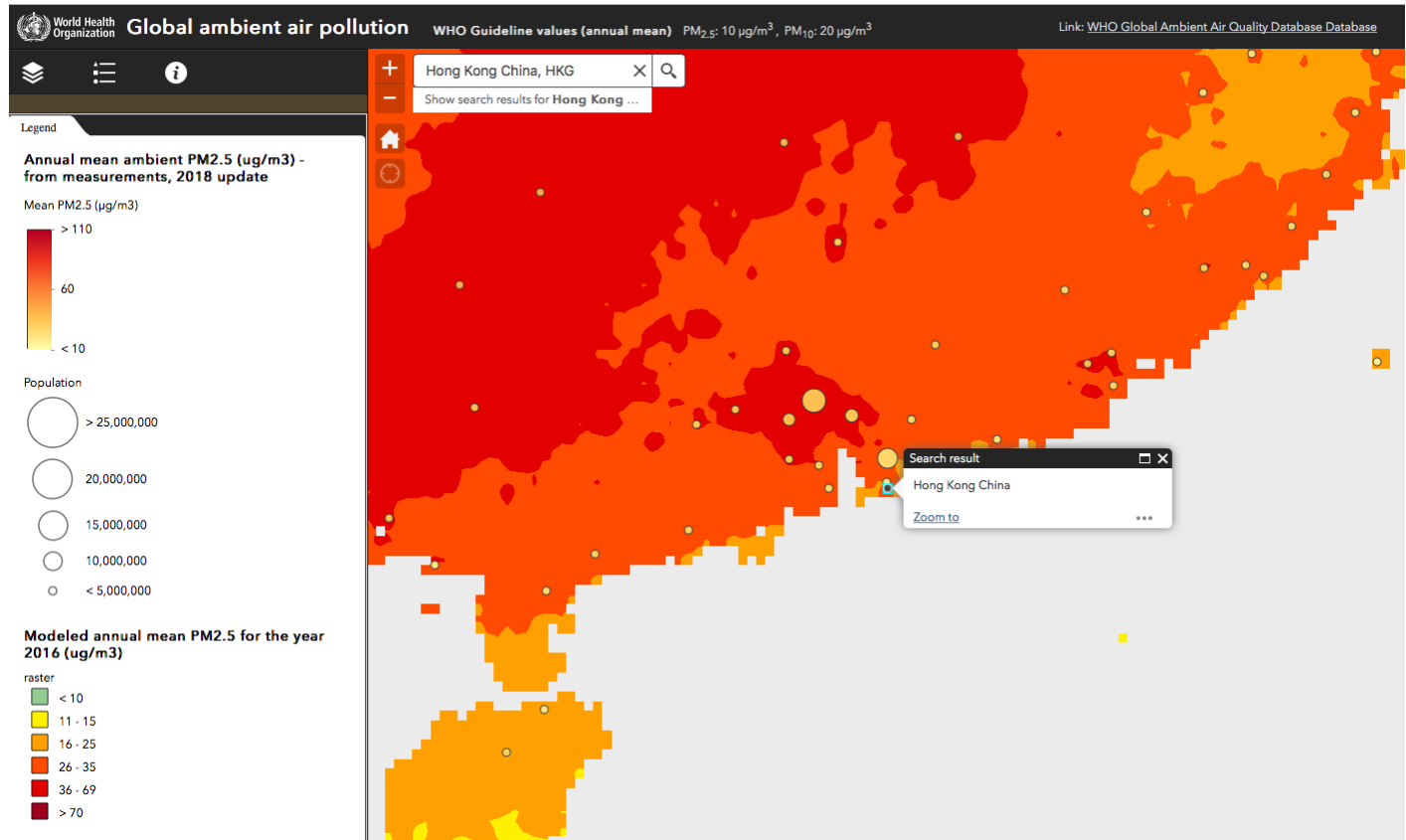
GLOBAL AIR POLLUTION



CHINA



HONG KONG



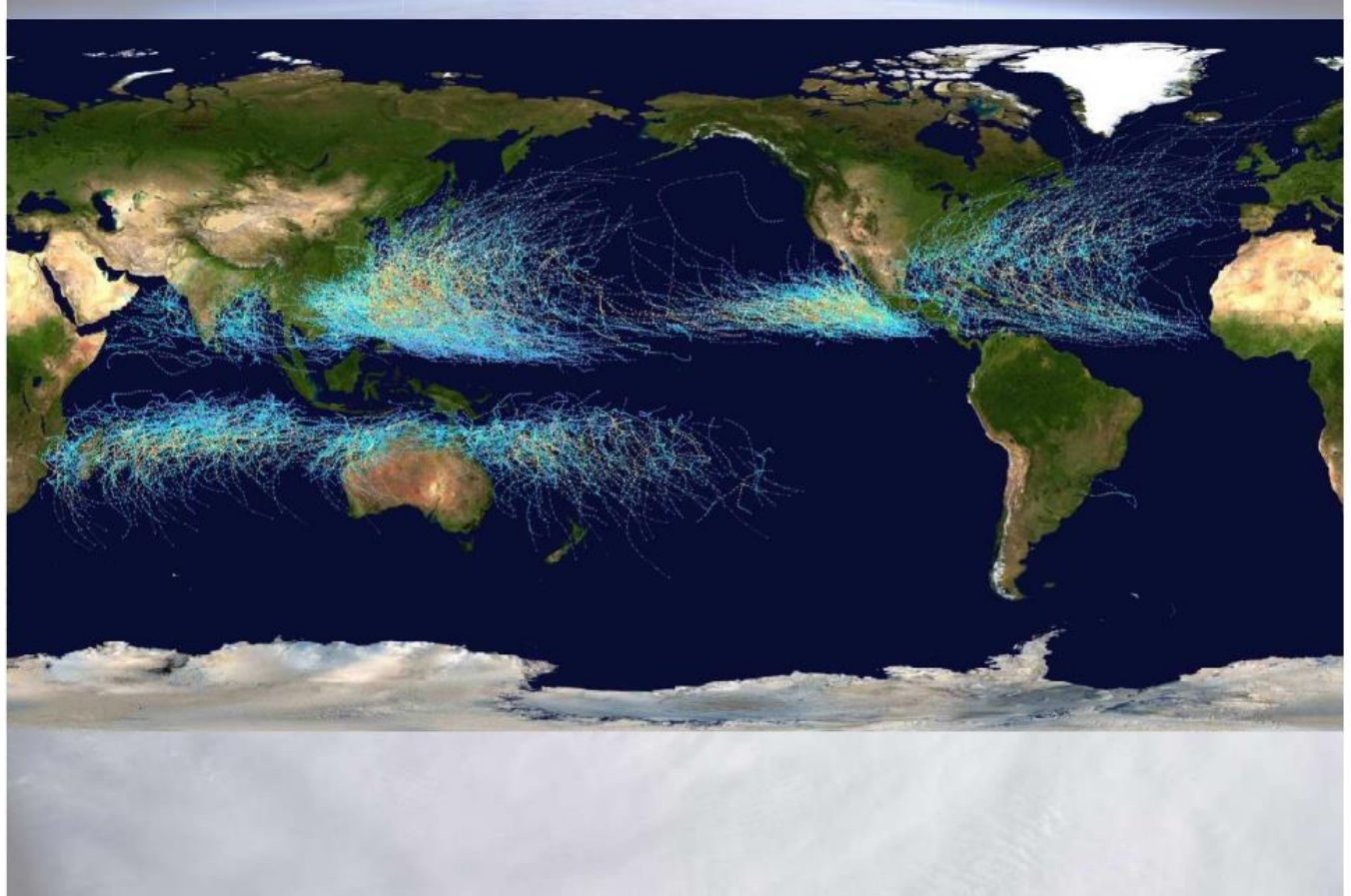


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Example: **Extreme weather
events**



TRACKS OF ALL TROPICAL CYCLONES, 1985-2005



SUPER TYPHOON MANGKHUT

16TH SEPT 2018

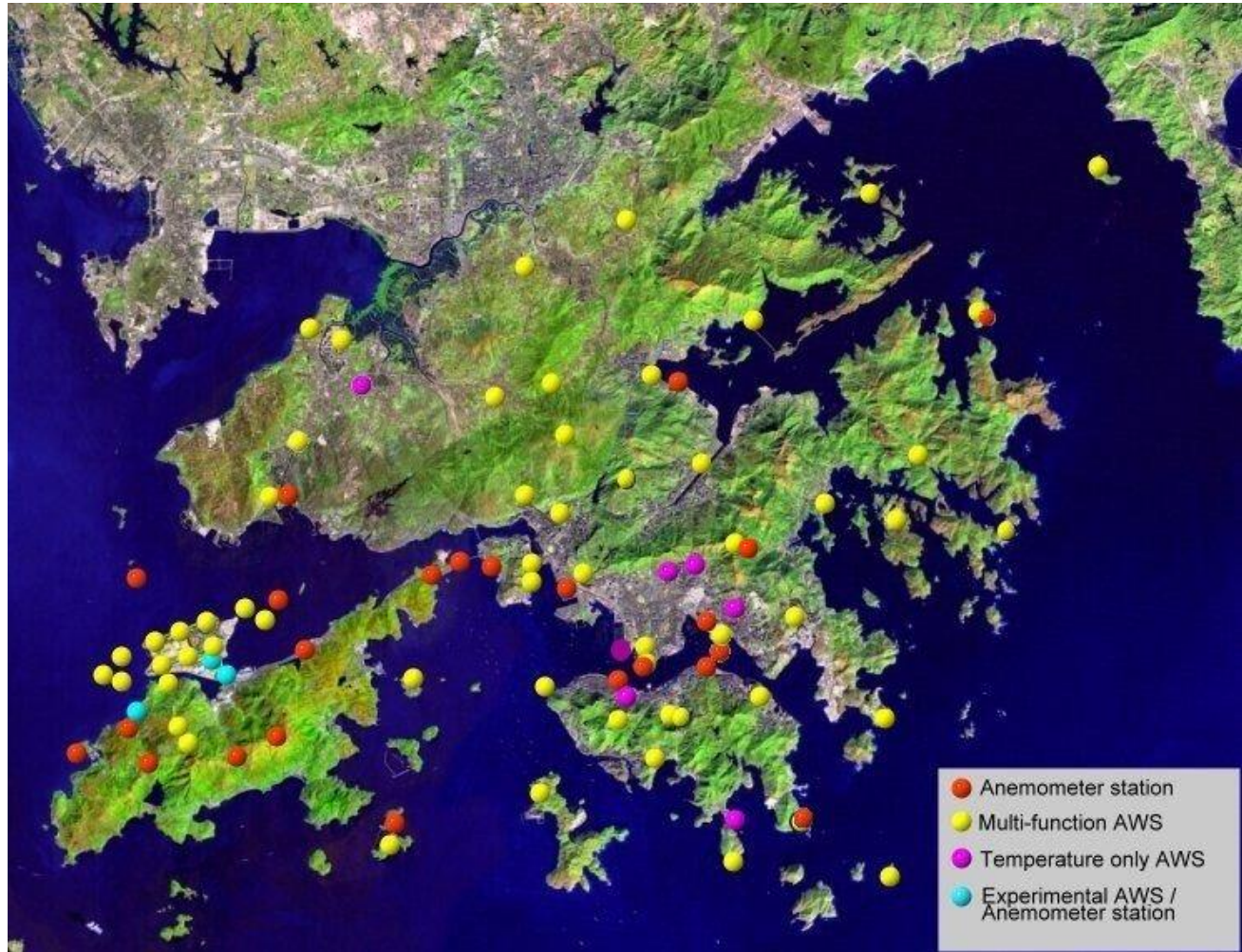


CLIMATE MONITORING IN HONG KONG

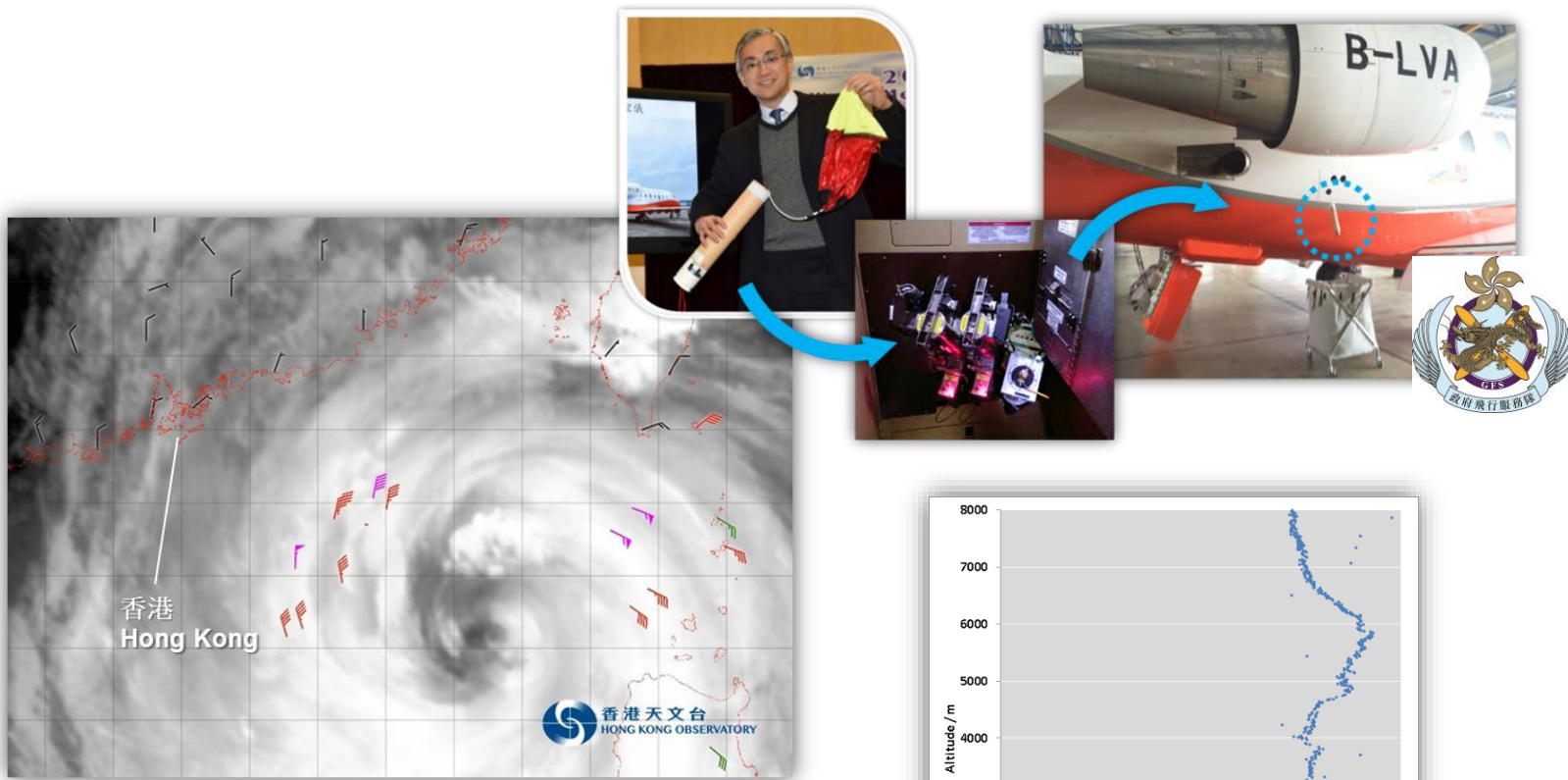
- Hong Kong Observatory Headquarters
 - Since 1884
- King's Park Meteorological Station
 - Since 1951



COVERAGE OF MONITORING NETWORK

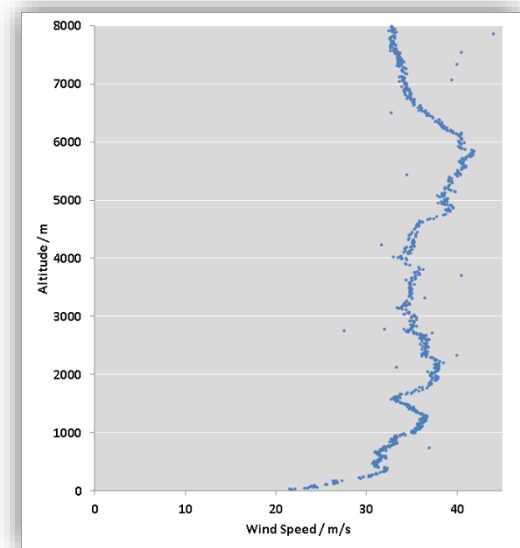


COLLECTING DATA USING AIRCRAFT DURING TROPICAL CYCLONES

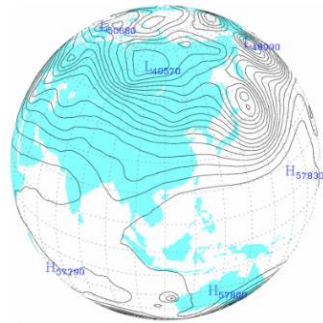


Super Typhoon Mangkhut (2018)

Vertical distribution of meteorological data collected by the Hong Kong Observatory during dropsonde missions over the South China Sea on 15 September 2018



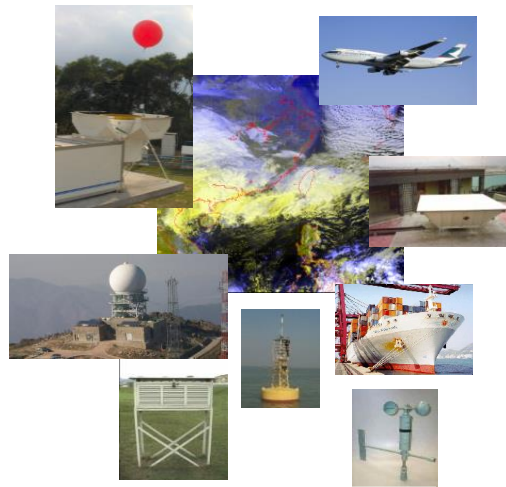
NUMERICAL WEATHER PREDICTION



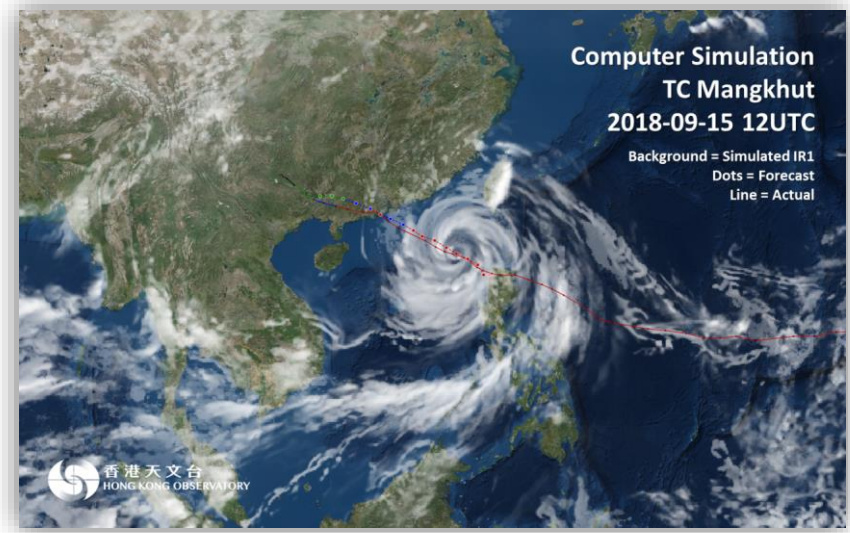
Boundary Conditions from
Global Atmospheric Models



High-Performance
Computers



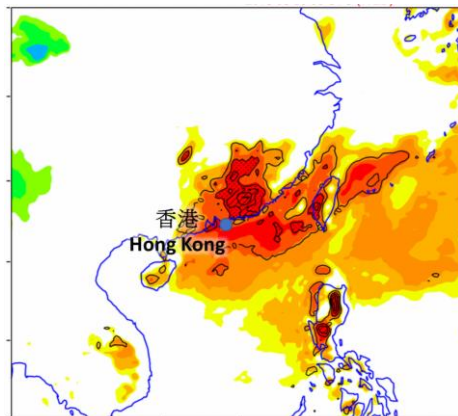
Global/Regional
Observation
Networks



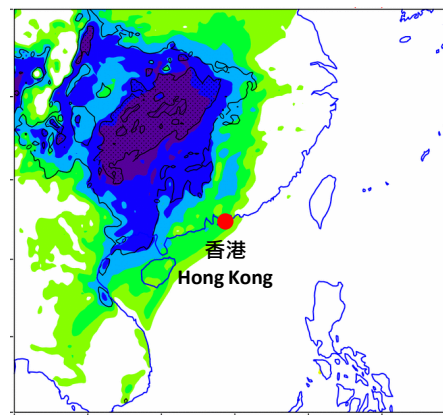
ENSEMBLE FORECASTS

Extreme Forecast Index for extreme temperatures

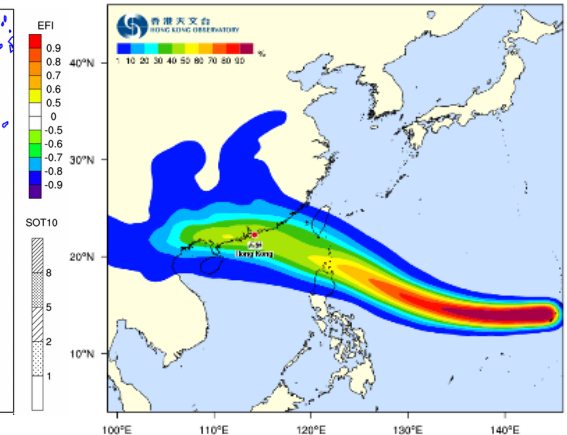
Tropical Cyclone Track
Probability Forecast



Forecast of extreme hot temperatures in southern China in late May 2018



Forecast of extreme low temperatures in central and southern parts of China in late December 2018



UNIVERSITY OF
EXETER

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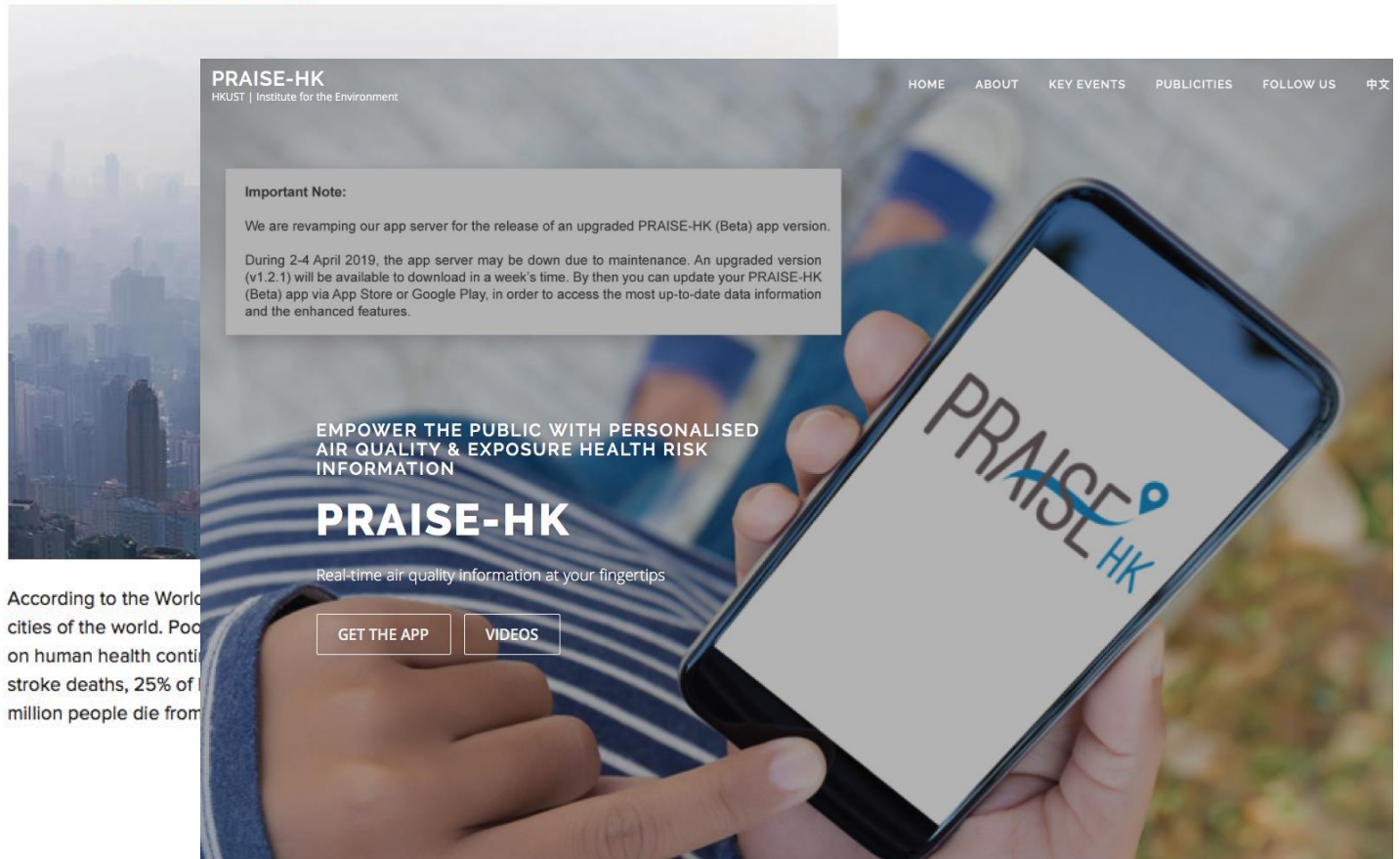
The future...



SOCIAL MEDIA AND SMART PHONES

The 6 Best Apps to Monitor Air Quality in Hong Kong

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PRAISE-HK
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Important Note:

We are revamping our app server for the release of an upgraded PRAISE-HK (Beta) app version.

During 2-4 April 2019, the app server may be down due to maintenance. An upgraded version (v1.2.1) will be available to download in a week's time. By then you can update your PRAISE-HK (Beta) app via App Store or Google Play, in order to access the most up-to-date data information and the enhanced features.

EMPOWER THE PUBLIC WITH PERSONALISED AIR QUALITY & EXPOSURE HEALTH RISK INFORMATION

PRAISE-HK

Real-time air quality information at your fingertips

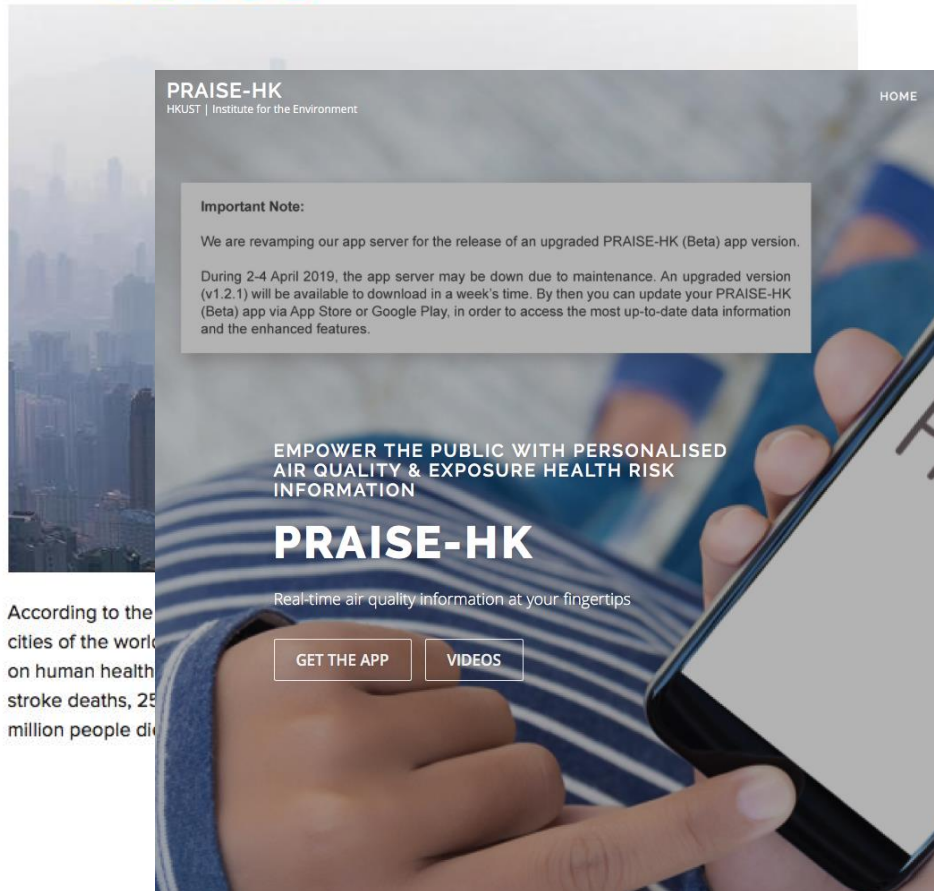
[GET THE APP](#) [VIDEOS](#)

According to the World Health Organization, air pollution is one of the leading causes of death in cities of the world. Poor air quality is a major risk factor for human health continuing to rise. In fact, air pollution is responsible for 25% of stroke deaths, 25% of heart disease deaths, and 25% of lung cancer deaths. In Hong Kong, 1 million people die from air pollution every year.

SOCIAL MEDIA AND SMART PHONES

The 6 Best Apps to Monitor Air Quality in Hong Kong

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HOME

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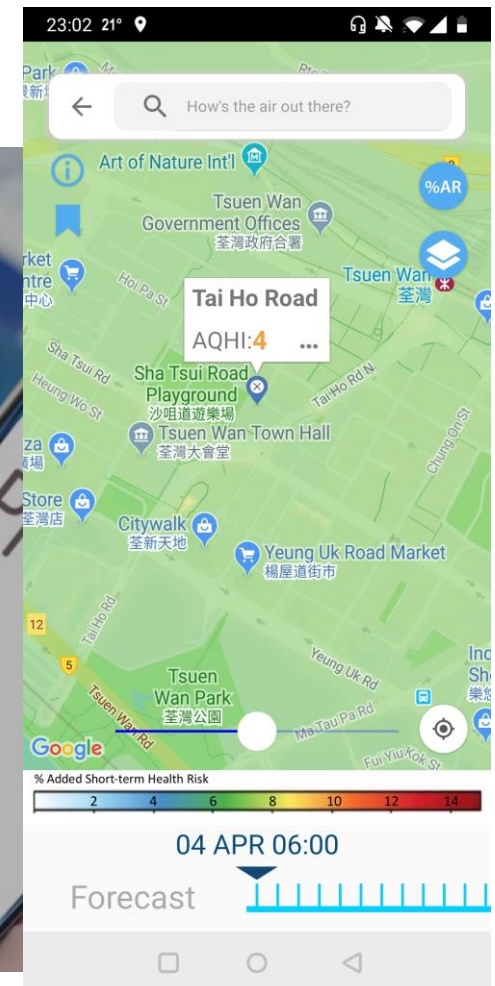
EMPOWER THE PUBLIC WITH PERSONALISED AIR QUALITY & EXPOSURE HEALTH RISK INFORMATION

PRAISE-HK

Real-time air quality information at your fingertips

GET THE APP VIDEOS

According to the cities of the world on human health stroke deaths, 25 million people die



SOCIAL MEDIA AND SMART PHONES

The image displays the Hong Kong Observatory's digital presence. On the left is the website's navigation menu, and on the right are two mobile app screens. The website header includes the logo and tagline 'Innovate with Science, Serve with Heart'. The navigation menu lists various services such as 'Home', 'Weather Note (Chinese)', 'Weather Forecast', and 'MyObservatory'. The mobile app screens show the 'MyObservatory' interface for Hong Kong, displaying the current time (06:02), temperature (20.6°C), humidity (88%), and a regional weather map with temperature data for various locations.

Navigation Menu (Left):

- Home
- What's new
- About us
- HKO Side Lights
- Our Services
- Visitors Figures
- Press releases
- Weather Note (Chinese)
- Weather Warning
- Local Weather
- Observations
- Weather Forecast
- Weather Monitoring Imagery
- Computer Forecast Products
- MyObservatory**
- Earth Weather
- Met on Map
- Tropical Cyclones
- Aviation Weather Services
- Marine Meteorological Services
- Weather Information for Sports
- Weather Information for Communities
- China Weather
- World Weather
- Climatological Information Services

Mobile App Screens (Right):

- MyObservatory (Top):** Shows the date (04 Apr 2019), time (06:02), location (Hong Kong), current temperature (20.6°C), humidity (88%), wind speed (13 km/h), and gust speed (24 km/h). It also displays an automatic forecast for the day.
- Regional Weather Map (Bottom):** A map of Hong Kong showing temperature data for various locations:

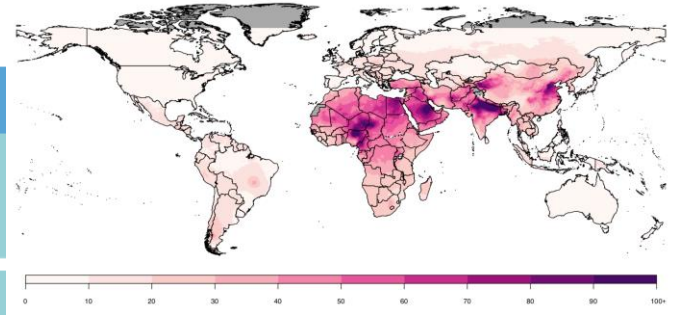
Location	Temperature (°C)
Country Park	16.0
San Po Tsai	20.1
Ngau Tau Kok	19.5
Kwun Tong	20.4
Central	20.4
Tsim Sha Tsui	20.6
Sai Wan	20.4
South Horizons	17.3
Repulse Bay	20.4
Tai Tam	20.6
Stanley	20.6

A CAUTIONARY TALE

Data Science
needs to be
with knowl
environmen

INTEL

DATA &





Global Conversation

So, can big data save lives?



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Director CM Shun

Hong Kong Observatory

Ted Hodgkinson

Willis Towers Watson

