

**Speech by Mr C Y Lam, Director of the Hong Kong Observatory**  
**18 March 2009**

World Meteorological Day takes place on 23 March each year. The theme this year is “Weather, Climate and the Air We Breathe”.

Plants and animals including human beings share one treasure in common. It is the air we breathe, that is, the atmosphere in which we experience weather and climate. The theme of the World Meteorological Day this year reminds us that air is not to be taken for granted. If we mishandle it, weather and climate would change. The consequences could be serious, impacting on the survival of numerous species including human beings.

I have a piece of good news to announce as the World Meteorological Day approaches. On 23 March, a new German version will be added to the website on official weather forecasts of cities worldwide, developed and operated by the Hong Kong Observatory on behalf of the World Meteorological Organization. The website won the prestigious Stockholm award last year. It currently has versions in six languages viz. Chinese, English, Arabic, French, Portuguese and Spanish. The addition of the German version reflects the recognition given to the website by the international meteorological community.

I would now like to take this opportunity to report on various developments in the Hong Kong Observatory. First, let me introduce my assistant directors. They are:

- (1) Dr MC Wong, responsible for climate and geophysical matters,
- (2) Dr BY Lee, responsible for instruments and radiation monitoring,
- (3) Mr HG Wai, responsible for public weather service,
- (4) Mr CM Shun, responsible for aviation weather service.

In the past year, meteorological work in support of the Beijing 2008 Olympics was the most memorable. The Observatory’s nowcasting system deployed to Beijing performed extremely well. Indeed, in a number of aspects it did better than other systems deployed to Beijing by advanced countries at the same time. After the Olympics, we have channeled the capability of the system to support Hong Kong’s own public weather service. During the rain season this year, you may visit the Observatory’s website to find out the predicted rainfall pattern in the Pearl River estuary two hours ahead. But I hasten to emphasize that the intensity and movement of rain areas do change quickly and significantly. So you should treat the predicted

pattern as a general indication and avoid expecting it to be absolutely accurate in all aspects.

The hit rate of the Observatory's website last year reached 1.4 billion page hits, number one among government departments. In response to the keen support of people, we added a number of new services last year, including regional temperature forecasts and the world's first lightning alerting service for user-specified locations. We shall add more services this year.

Under the "One District One Station" scheme, we established automatic weather stations in Kowloon City and Wanchai Districts. The next one in Wong Tai Sin District will come on steam soon. Furthermore, there was a major breakthrough in the Hong Kong Community Weather Information Network (HKCoWIN) which is jointly established by the Observatory, Hong Kong Polytechnic University and Joint School Meteorological Association. It has started delivering information on ultraviolet indices in several areas in Hong Kong. We hope to see more schools and community organizations joining this collective community effort to build a weather information network.

A less conspicuous activity last year was the installation of a weather buoy in Tai Tam Bay, the venue of the East Asian Games, in support of preparations for the game. This year, we shall maintain close communication with the organizers and supply essential meteorological services covering the various game venues including Tai Tam Bay.

In reviewing our operations during the tropical cyclone season last year, we recognized that the arrangements to disseminate information on storm surge could be further improved. Starting this year, SMS calls will be made to alert representatives of Tai O residents and colleagues in relevant government departments, to alert them of storm surges whenever necessary. Furthermore, in order to prompt people to be extra vigilant in the case of stronger typhoons, we have decided to divide the current category "Typhoon" into three categories viz. "Typhoon", "Severe Typhoon" and "Super Typhoon". The technical data are given in Appendix 1. I must emphasize: any category of "Typhoon" would suffice to require the issuance of the number 10 signal and the full range of precautionary measures should always be activated.

Looking ahead, on the basis of observed data and computer computations, we expect that the number of tropical cyclones affecting Hong Kong in 2009 will be near normal, that is, about 5 to 6. The annual rainfall is expected to be below normal. Please see

## Appendix 2.

Regarding climate, we announced our projections of the temperature in Hong Kong in the 21<sup>st</sup> century. I shall explain below our work related to rainfall projections. It is based on the data of the latest global climate assessment given in the Fourth Assessment Report, issued by the UN Intergovernmental Panel on Climate Change in 2007. The projections of Hong Kong's rainfall in the 21<sup>st</sup> century by the Observatory are as follows:

- (1) The average annual rainfall will increase during the latter half of this century;
- (2) The number of extremely wet and extremely dry years will increase;
- (3) The average annual number of days with hourly rainfall exceeding 30mm at the end of this century will be more than that at the end of last century.

Please see Appendix 3 for details.

Finally, I would request you to help me publicize the following information. The Hong Kong Observatory will be open for visits by the public this Saturday and Sunday, that is, 21<sup>st</sup> and 22<sup>nd</sup> March. All are welcome.

Let me stop here. You are welcome to ask questions. I and my assistant directors will try our best to respond. Thank you.

**Classification of Tropical Cyclones**

<b>Tropical cyclone</b>	<b>Maximum sustained wind speed near the centre (km/h)</b>
Tropical Depression	<63
Tropical Storm	63 – 87
Severe Tropical Storm	88 – 117
Typhoon	118 – 149
Severe Typhoon *	150 – 184
Super Typhoon *	185 or above

\* New categories starting 2009

**Annual Outlook for 2009**

<b>Annual rainfall in Hong Kong</b>	<b>Below normal</b> (less than 2140 mm)
<b>Number of tropical cyclones coming within 500 km of Hong Kong</b>	<b>Near normal</b> (5 to 6)

## **Summary of Updated Projections for Rainfall in the 21<sup>st</sup> Century by the Hong Kong Observatory**

In the light of the latest global projections in the Fourth Assessment Report (AR4) of the Intergovernmental Panel on Climate Change (IPCC) published in 2007, the Hong Kong Observatory has updated its projections for the rainfall in Hong Kong in the 21<sup>st</sup> century. This is a follow-up to the initial study carried out in 2005, based on the projections presented in the Third Assessment Report (TAR) of IPCC.

The computations are based on projected global scenarios of economic and social development, which would result in different amounts of greenhouse gases being emitted into the atmosphere. Information on the data used and the scenarios adopted by IPCC are given in Annex 1.

The updated rainfall projection results for Hong Kong in the 21<sup>st</sup> century are summarized below:

### ■ **Increase in annual rainfall**

*The average annual rainfall of Hong Kong will increase during the latter half of the 21<sup>st</sup> century.*

It is anticipated that by the last decade of the 21<sup>st</sup> century, that is, during the decade 2090-2099, the average annual rainfall at the Hong Kong Observatory Headquarters (HKOHq) would be about **2572 mm**, or **248 mm (i.e. +11%)** above the average of 2324 mm for the last two decades of the 20<sup>th</sup> century (1980-1999). Please see the attached figure.

### ■ **More extremely wet and dry years**

*The number of extremely wet years (annual rainfall at HKOHq above 3187 mm) and extremely dry years (annual rainfall at HKOHq below 1282 mm) will increase.*

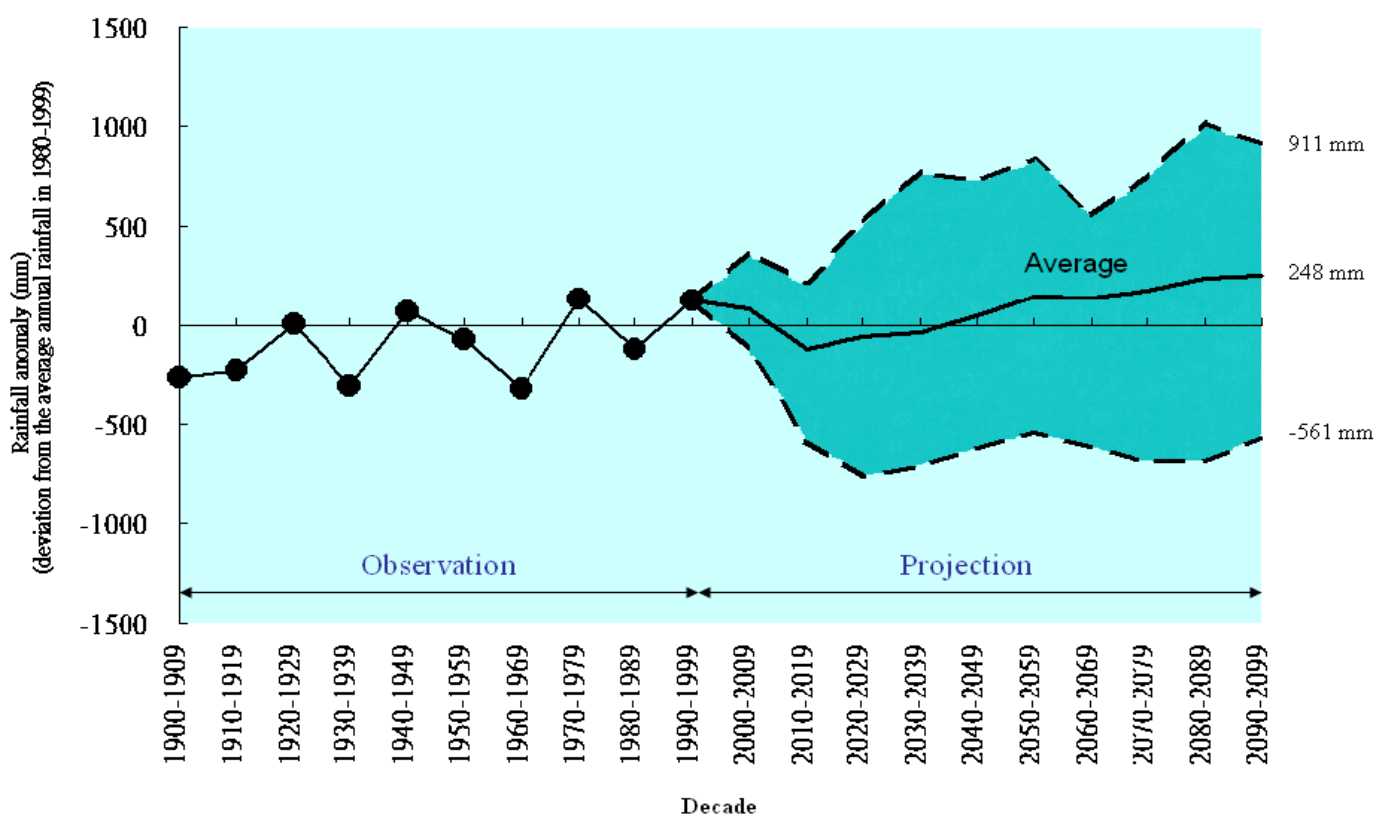
The number of extremely wet years will increase significantly from 3 during the period 1885-2008 to **10** in the 21<sup>st</sup> century and the corresponding figure for extremely dry year is also expected to increase from 2 to **4**.

■ **More heavy rain days**

During the last 30 years of this century, that is 2070-2099, the average number of days in a year with hourly rainfall at HKOHq exceeding 30 mm would be about **6.5 days**, about 1 day more than the 1980-1999 average of 5.8 days.

The increase in average annual rainfall, number of heavy rain days, and year-to-year rainfall variability in Hong Kong in the 21st century as depicted in this projection are consistent with the previous results based on TAR. A scientific paper discussing the revised projections in detail is available online at <http://www.weather.gov.hk/publica/reprint/r798.pdf>.

**Past and projected change in annual rainfall for Hong Kong**



## IPCC Greenhouse Gas Emission Scenarios

In order to make a projection of the future climate, it is necessary to develop scenarios regarding the emission of greenhouse gases into the atmosphere. Future greenhouse gas emissions are dependent on many factors such as population growth, socio-economical development, technological advancement, etc. In the Fourth Assessment Report (AR4) of the Intergovernmental Panel on Climate Change (IPCC), six emission scenarios for greenhouse gases are employed. The six scenarios in order of descending greenhouse gas emission are: A1FI, A2, A1B, B2, A1T and B1. For IPCC AR4, model projection data is available for the A2, A1B and B1 scenarios and all available data is used in the latest projection of rainfall for Hong Kong in the 21<sup>st</sup> century.

Detailed descriptions of these emission scenarios are available at the IPCC website: <http://www.ipcc.ch/pdf/special-reports/spm/sres-en.pdf>. The scenarios as portrayed in the website are outlined below:

- The **A1** storyline and scenario family describes a future world of very rapid economic growth, global population that peaks in mid-century and declines thereafter, and the rapid introduction of new and more efficient technologies. Major underlying themes are convergence among regions, capacity building, and increased cultural and social interactions, with a substantial reduction in regional differences in per capita income. The A1 scenario family develops into three groups that describe alternative directions of technological change in the energy system. The three A1 groups are distinguished by their technological emphasis: fossil intensive (**A1FI**), non-fossil energy sources (**A1T**), or a balance across all sources (**A1B**) (where balanced is defined as not relying too heavily on one particular energy source, on the assumption that similar improvement rates apply to all energy supply and end use technologies).
- The **A2** storyline and scenario family describes a very heterogeneous world. The underlying theme is self-reliance and preservation of local identities. Fertility patterns across regions converge very slowly, which results in continuously increasing global population. Economic



development is primarily regionally oriented and per capita economic growth and technological change are more fragmented and slower than in other storylines.

- The **B1** storyline and scenario family describes a convergent world with the same global population that peaks in mid century and declines thereafter, as in the A1 storyline, but with rapid changes in economic structures toward a service and information economy, with reductions in material intensity, and the introduction of clean and resource-efficient technologies. The emphasis is on global solutions to economic, social, and environmental sustainability, including improved equity, but without additional climate initiatives.
- The **B2** storyline and scenario family describes a world in which the emphasis is on local solutions to economic, social, and environmental sustainability. It is a world with continuously increasing global population at a rate lower than A2, intermediate levels of economic development, and less rapid and more diverse technological change than in the B1 and A1 storylines. While the scenario is also oriented toward environmental protection and social equity, it focuses on local and regional levels.