

WEATHER ON WINGS

January 2006



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HONG KONG OBSERVATORY

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Message from the Editors:

Starting from this issue, *Weather on Wings* will merge with the *Newsletter for the Friends of the Observatory* 「談天說地」 and the *Newsletter for Hong Kong Voluntary Observing Ships* to form a single newsletter. We hope that this will provide the readers with a more comprehensive report of the services provided by the Observatory and its latest development.



Headline

A Most Meaningful Christmas Present - Civil Service Outstanding Service Award

WONG Yang-tze, LEUNG Wing-mo

In the Civil Service Award Scheme in 2005, the Hong Kong Observatory won the top honour in the Departmental Award for Service Enhancement in the small department (less than 1000 staff) category. The Observatory's Electronic Maintenance Team (Radiation) also won a merit award under the Innovation/Application of Technology category.

To compete for the Departmental Award for Service Enhancement the Observatory put together a team consisting of representatives from the Scientific Assistant and Scientific Officer grades to make presentations to the adjudication panel. The team focused on the new services introduced by the Observatory in recent years, with particular emphasis on the Observatory's effort in enhancing the content of services and the means of delivery, and in promoting its public image.

For the Innovation/Application of Technology Award, colleagues of the Electronic Maintenance Team explained their work in setting up an automatic upper-air sounding system, designing a next-generation radiological monitoring system for fresh water, as well as enhancing efficiency through



The Observatory's Director (3rd right, front) and staff sharing the excitement of being the crowned champion with the Secretary for Civil Service, Mr Joseph Wong (4th right, front)

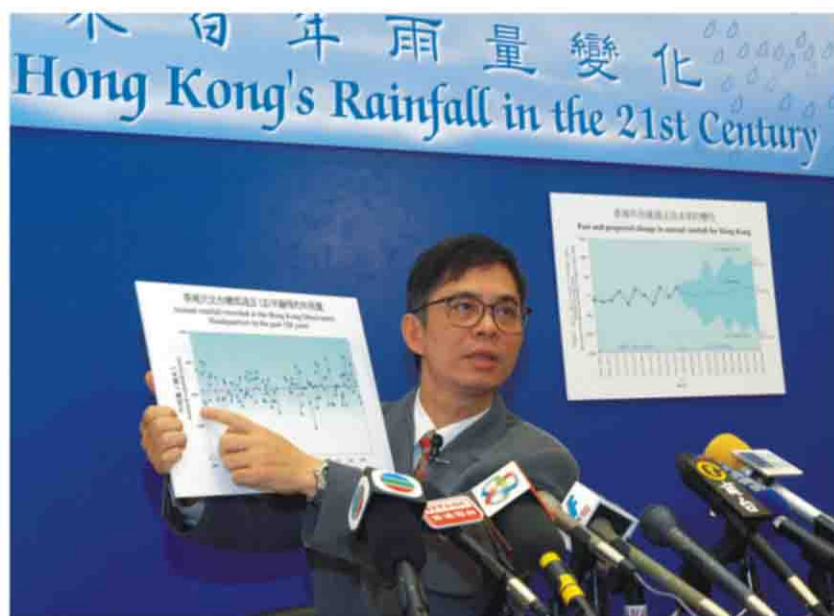
application of new technologies such as mobile telephony, global positioning system (GPS) and geographical information system (GIS).

During the adjudication for the departmental award, professional consultants visited the Observatory to examine different facets of its work, while an adjudication panel interviewed the Observatory's representatives. The adjudication panel was impressed by the accomplishments of the Observatory and the enthusiasm of the Observatory's representatives, and the Observatory emerged as the champion.

One of the team members, Mr Wat Kam-sing, remarked after the prize presentation ceremony, "What really counts in the competition for the Departmental Service Enhancement Award is actual achievement. The fact that we won the award is a reflection of our care for the public, and our initiative and effort to improve our service. This award is not only a recognition of the importance of our work, but also gives fresh impetus for us to excel."

Projected Rainfall in Hong Kong in the 21st Century - More Extremes

LEUNG Yin-kong



Acting Director of the Hong Kong Observatory, Mr YEUNG Kai-hing announced the results of a recent study on the projected change in Hong Kong's rainfall in the 21st century

Global warming has become a hot topic recently. It induces changes in the atmospheric circulation and gives rise to more extreme weather events, which in turn affect the ecological environment.

Rainfall is an important weather element. The long-term change in rainfall is a key consideration in planning for disaster mitigation and water resource management. In view of this, the Observatory carried out a study on the projected changes in Hong Kong's rainfall in the 21st century and announced the results through the media in August 2005. The study made use of the results of simulations of the future climate by supercomputers at major climate centres in the world. Combined with the observed rainfall in Hong Kong, southern China and central China, a projection of the rainfall in Hong Kong was made using the technique of statistical downscaling.

Results of the study revealed that the annual rainfall in Hong Kong would increase at a rate of

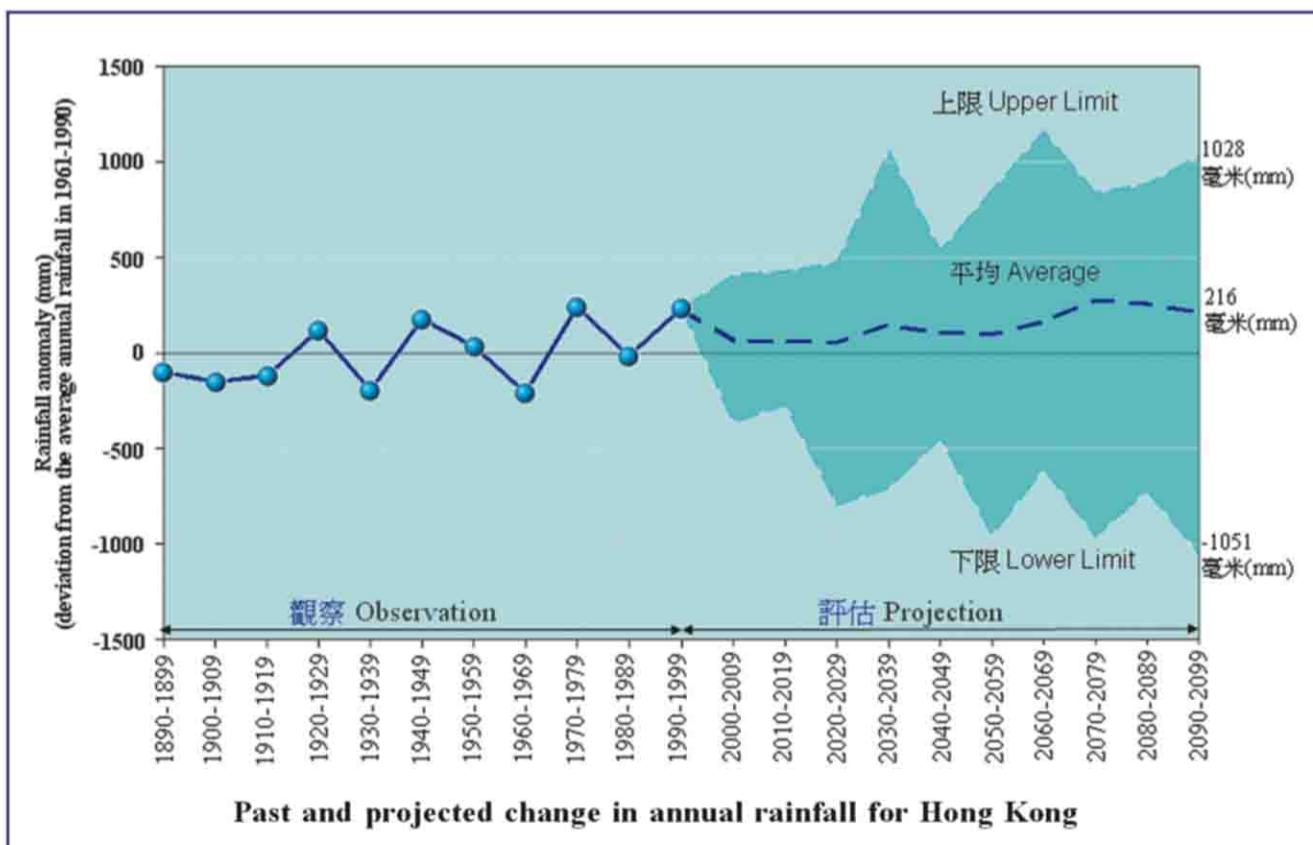
about 1% per decade in the 21st century, about the same rate as in the past 120 years. In the last 10 years of this century, the average annual rainfall at the Hong Kong Observatory Headquarters would be about 2430 mm, or 216 mm more than the climatological normal.

The year-to-year variability in Hong Kong's rainfall would also increase in the 21st century. In the past 120 years, the highest annual rainfall recorded at the Hong Kong Observatory Headquarters was 3343 mm. In the 21st century, it is expected that there would be 6 years with annual rainfall exceeding this value. In this century, we also expect to see 3 years with annual rainfall less than 901 mm, the lowest annual rainfall on record. The highest annual rainfall of 3343 mm was recorded in 1997, a year in which Hong Kong was plagued by severe flooding and numerous landslides triggered by rainstorms, and the Red and Black rainstorm warnings were issued on many occasions. The lowest annual rainfall of 901 mm was recorded in 1963. Water was rationed that year, and supplied to the public only once every four days. The classic

scene of people queuing for water and the yell to people living downstairs to turn off the water taps is vivid memory of those who lived through that difficult year.

The number of days with heavy rain would also increase. Towards the end of this century, the number of days in a year with heavy rain is likely to increase to 6.5, from 5.5 in the latter part of the last century.

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Development of Tsunami Warning Systems

WONG Wing-tak



Delegates from the State Oceanic Administration Mr. Wei WU and Prof. Xuejia SONG, and from the Hong Kong Observatory Dr. W T Wong, at the 20th Session of the International Coordination Group for the Tsunami Warning System for the Pacific (ICG/ITSU-XX)

On 26 December 2004, a major earthquake of magnitude 9 in the Indian Ocean off the west coast of northern Sumatra generated a huge tsunami that affected coastal communities around the Indian Ocean, killing more than 200,000 people. To some countries, it was the deadliest natural disaster in modern time.

After the disaster, many countries called for the establishment of a tsunami early warning system for the Indian Ocean. The Tsunami Warning System for the Pacific that has been in existence for forty years aptly serves as a model. The Intergovernmental Oceanographic Commission (IOC) under the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the World Meteorological Organization (WMO) jointly organized expert missions to the Indian Ocean countries and proposed plans to enhance their disaster reduction capabilities. Mr. K H Yeung, Assistant Director of the Hong Kong Observatory, represented WMO in the mission to Myanmar and Pakistan in June 2005.

After extensive discussions among relevant countries, IOC decided on 30 June 2005 to establish the Indian Ocean Tsunami Warning and Mitigation System. IOC further decided to set up tsunami warning systems for the Northeast Atlantic, the Mediterranean, and the Caribbean Seas. A global tsunami warning system is also in the pipeline.

Tsunami is a high-impact but low-probability hazard. To sustain an effective and reliable detection and warning system for a hazard that seldom occurs is difficult. In this regard, the WMO Global Telecommunication System (GTS) used by meteorological services worldwide for daily exchange of meteorological data was appropriately chosen to be the backbone for exchange of tsunami information. It is also more effective to put tsunami under the same integrated warning and mitigation

system that serve other natural hazards such as typhoons.

The 2nd Session of the Joint WMO/IOC Technical Commission on Oceanography and Marine Meteorology (JCOMM) held in Halifax, Canada in September 2005 expressed its support to the tsunami warning systems in different ocean and sea basins. JCOMM is also planning to set up mechanism to pass tsunami information to ships at seas under the Global Maritime Distress and Safety System (GMDSS).

The 20th Session of the International Coordination Group for the Tsunami Warning System for the Pacific (ICG/ITSU) was held in Chile in October 2005. The China delegation comprises experts from the State Oceanic Administration, the China Earthquake Administration and the Hong Kong Observatory. To emphasize the mitigation aspect, ICG adopted a new name "the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS)". In addition to coordinating development of the tsunami warning system, promoting public awareness and preparedness will also be a major task of the group.

Hong Kong's World-Renowned Aviation Weather Services

CHOY Boon-leung

58 aviation weather experts from 37 countries/territories in the Asia Pacific region participated in an international seminar hosted by the Hong Kong Observatory on 22-25 November 2005. Organized by the World Meteorological Organization (WMO) in collaboration with the International Civil Aviation Organization (ICAO), the Seminar on Quality Management in the Provision of Meteorological Services to Aviation was held to assist countries in Asia and the southwest Pacific to set up a quality management system for their aviation weather service.



Aviation meteorological experts exchanging views with Mr B L Choy (1st left), Scientific Officer of the Observatory during their visit to the Airport Meteorological Office

This was the first WMO seminar held in this part of the world on quality management of aviation weather services. The 4-day seminar featured expert presentations as well as experience-sharing sessions. Mr S T Chan and Miss S Y Lau of the Observatory were among the lecturers at the seminar.

Speaking at the reception to welcome the overseas participants, the Permanent Secretary for Economic Development and Labour (Economic Development) Ms Sandra Lee said, "The Hong Kong International Airport is the world's No. 1 cargo airport and it has also been rated the best airport by passengers. In seamless cooperation, the Hong Kong Observatory and the Civil Aviation Department work very hard to ensure the safe and smooth operation of aircraft at the Hong Kong International Airport in all weather conditions. Quality weather service for aviation calls for team work at international level. By hosting this seminar, the Observatory is doing a great job to foster international cooperation in assuring the quality of aviation weather service in the region."



Ms Sandra Lee and Mr C Y Lam talked to aviation experts

Mr M Waikai from the Cook Islands said, "I thank the Observatory for organizing the seminar, and showing us what an excellent aviation weather service is like." He further remarked, "The seminar highlights the benefits and challenges of setting up quality management systems in countries with different economic and technological capability. It is a great forum for exchanging experience and it enables the participants to identify the best possible way to implement quality management system in their countries."

In January 2006, a campaign titled "Science in the Public Service" which was initiated by the Hong Kong Observatory and co-organised by 30 departments of the Hong Kong SAR Government commenced. This campaign aims to present to the public the scientific work of government departments and to showcase the applications of science in our daily life.

Lasting one year, the campaign will feature a series of activities including a joint exhibition, public lectures, visits, an essay competition, a symposium, roving exhibitions, talks at schools and an awards presentation ceremony as the end-of-campaign event in late 2006.

The joint exhibition will be held at the Exhibition Galleries, G/F, the Hong Kong Central Library at Causeway Bay from 13-17 January 2006. Participating departments will bring out the theme message of "Science in the Public Service" through a variety of exhibits and interactive displays. The aim is to inform the public about how science and technology are applied in providing public services. The exhibition will also be an excellent source of information for those interested in joining the essay competition which will begin immediately after the launch of the campaign. Members of the public are also invited to attend a series of lectures at the Lecture Theatre of the Central Library on 14 and 15 January 2006. Details of the campaign can be found at the following website <http://www.science.gov.hk>.

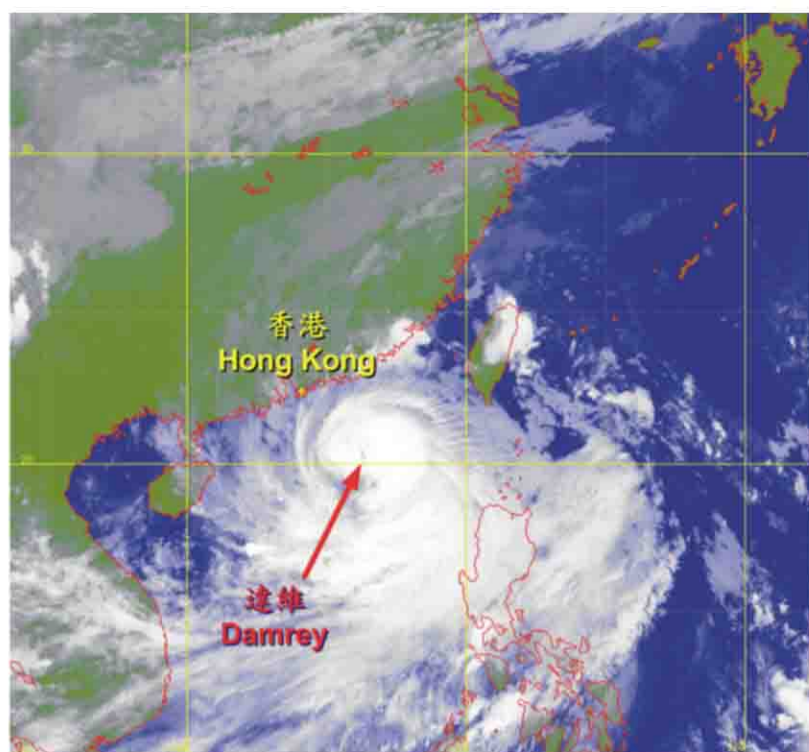


Real-time Imageries from the Japanese MTSAT-1R Satellite

SO Chi-kuen

From July 2005, members of the public can look at real-time imageries from the Multi-functional Transport Satellite-1R (MTSAT-1R) through the Hong Kong Observatory's website. MTSAT-1R is a new-generation satellite of the Japan Meteorological Agency (JMA).

MTSAT-1R was launched in February 2005 to replace the Geostationary Operational Environmental Satellite-9 (GOES-9) which was jointly operated by Japan and USA. After a series of tests, MTSAT-1R was put into operations in late June. This satellite is located some 36,000 kilometres above the Equator at 140°E, where JMA's former satellite Geostationary Meteorological Satellite-5 (GMS-5) once operate. At this position, the satellite is stationary relative to the Earth, enabling it to take cloudy imageries of the same area of the globe round-the-clock.



Infra-red imagery of MTSAT on 23 September 2005, showing Tropical Storm Damrey over the northern part of the South China Sea

In addition to taking images in the visible spectrum, MTSAT-IR can also take pictures in four different infra-red (IR) frequencies, one more than GMS-5. This extra IR imagery enables the detection of low clouds and fog as well as determination of the sea surface temperature. The resolutions of the MTSAT-IR imagery are 1 and 4 kilometres for the visible and infra-red channels respectively, higher than those of GMS-5. It can therefore reveal more detailed structures of cloud systems.

MTSAT-IR covers Asia, the western Pacific, Australia and part of the Indian Ocean. It provides cloud imageries of the northern hemisphere at half-hourly intervals. This enables weather forecasters to monitor the development of hazardous weather systems such as tropical cyclones and rainstorms closely.

The Observatory's website provides animation of MTSAT-IR imageries to show the movement of clouds. Aviation users can make use of the Observatory's Aviation Meteorological Information Dissemination System (AMIDS) to obtain cloud imageries from this satellite to assess the en-route weather conditions.

Green Island Automatic Weather Station Goes Green

KWOK Yuen-ha

Situated at the western edge of the Victoria Harbour, Green Island was a Tropical Cyclone and Monsoon Warning Signal Station from the early 20th century to the 1990s to serve vessels going in and out of the harbour. The Marine Department started collecting wind data on the island in the mid-20th Century. In 1989, the Observatory established an automatic weather station on the island to replace manual measurements. Data have since been transmitted to the Observatory's Headquarters automatically. Currently, wind information from Green Island is broadcast by radio stations during weekends and on public holidays for the benefit of water sports enthusiasts.

The Observatory has been using solar energy to power automatic weather stations since 1980s. For some stations, the wind serves as a supplementary energy source in the past few years to ensure a stable supply of electricity to the station in cloudy or overcast weather. The Green Island Automatic Weather Station, powered by both solar and wind energy, is the first of its kind in the Victoria Harbour. It is a testimony to the Observatory's endeavour to conservation through application of green technology.



Mr Edwin Ginn, Senior Scientific Officer of the Observatory, introduced to the media the application of renewable energy at the Green Island automatic weather station

Supporting Zhang Jian in his Feat to Swim Across Lingding Yang

LAM Ching-chi

The Observatory provided special weather forecasts in September 2005 to the Chinese athlete, Mr. Zhang Jian, in his feat to swim across the Lingding Yang from Hong Kong to Macao.

September is usually the peak of the tropical cyclone season in Hong Kong. The swim was originally scheduled to take place in the Mid-Autumn Festival on 18 September, but had to be postponed because of the approach of Tropical Storm Vicente. It was re-scheduled to 22 September, the only window before another tropical cyclone Damrey would bring deteriorating weather to the Pearl River Estuary. The journey started off on the morning of 22 September from Tai O in Lantau Island and ended at Coloane Island in Macao. The weather was fine with light to moderate northerly winds, and the sea surface temperature was about 28 degrees Celsius – quite an ideal condition for the cross-channel swimming. The swim was completed in about eleven hours, some three to four hours shorter than planned.

The Organizing Committee of the event thanked the Observatory for providing reliable and professional weather services, which they considered were very important to the success of Mr Zhang's endeavour.

