

WEATHER ON WINGS



Dial-a-Weather : 1878 200
Home page : <http://www.hko.gov.hk>, <http://www.weather.gov.hk>

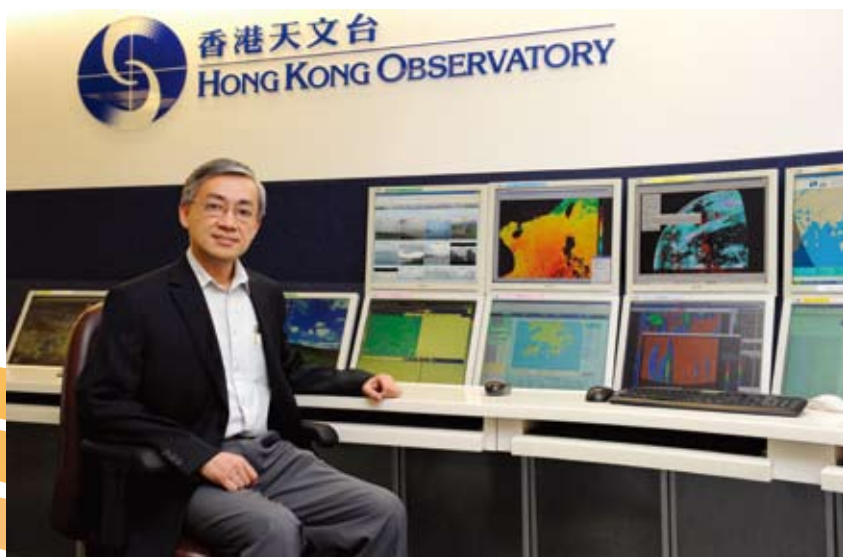


New Director, New Climate

Editorial Board

Mr SHUN Chi-ming was appointed as the Director of the Hong Kong Observatory on 14 April 2011. He is the youngest ethnic Chinese to hold the position so far. Mr SHUN joined the Observatory in February 1986 as Scientific Officer. He was promoted to Senior Scientific Officer in charge of aviation weather services in April 1998 and then to Assistant Director in December 2008. Mr SHUN was elected President of the Commission for Aeronautical Meteorology (CAeM) of the World Meteorological Organization (WMO) in February 2010, serving the public and the aviation communities with his experience and expertise. This is the highest position in the WMO that an official of the Observatory has taken up in its history.

Mr SHUN strongly believes that the Observatory needs to be proactive in developing new weather services, to meet the future challenges and the ever-increasing expectations from the public. In his first article for the "Observatory's Blog", he mentioned, "In the weather business, we will need to be proactive in weather monitoring, in disaster prevention and mitigation, and in public education. In management of the organization, we will need to upgrade ourselves, to embrace change, and to try our best to fulfill the needs of the society. In today's rapidly changing environment, where there are challenges, there are also opportunities. In developing meteorological services, if we count on science and innovation, taking serve-the-society as our goal, recognizing the right direction and trend, be energized and versatile, we would be able to reach out and communicate effectively, seize the opportunities and achieve the desired goals."



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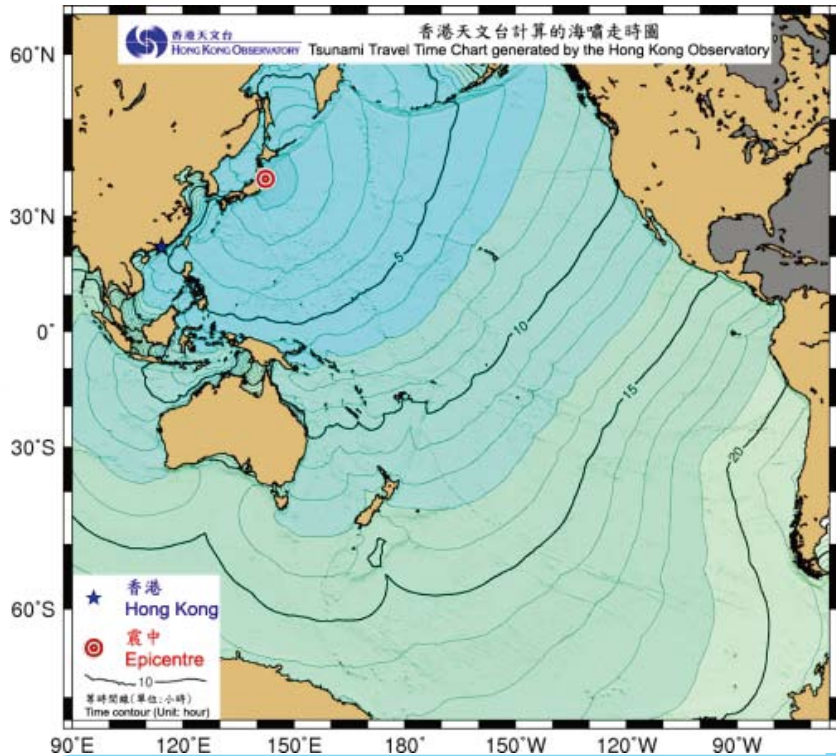
Mega Earthquake over North-eastern Japan Generated Severe Tsunami

NG Moon-chiu

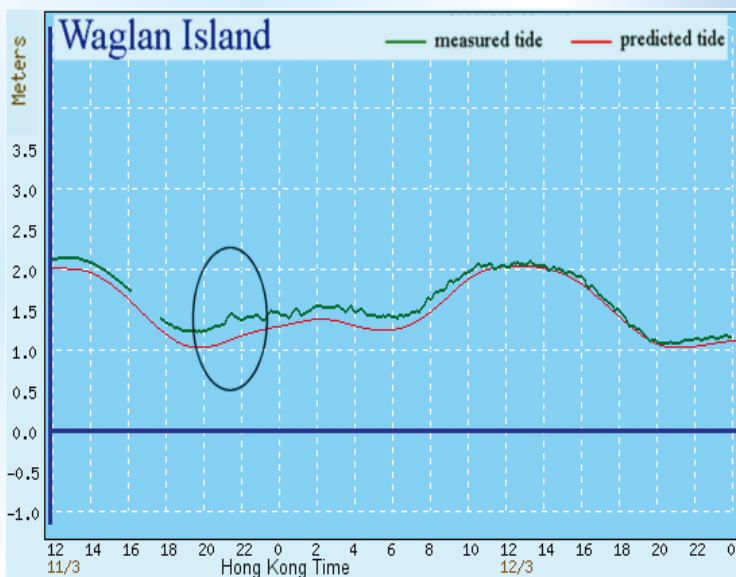
On 11 March 2011, a magnitude 9.0 mega earthquake occurred at the seas east of Japan and generated a severe tsunami which caused serious casualties and property damages along the north-eastern coast of Honshu. Previous serious tsunamis causing calamity to the region included the Meiji Sanriku tsunami in 1896 and the Showa Sanriku tsunami in 1933. The tsunami also caused damage to Japan's Fukushima Daiichi nuclear power plant, leading to the leakage of radioactive materials that attracted worldwide attention.

Apart from causing serious damage in Japan, the tsunami propagated to far places across the Pacific Ocean reaching the west coast of the United States and Hawaii. In Hong Kong, due to blocking effect of Taiwan Island and Luzon Island, only a small amount of tsunami energy could enter the South China Sea from the Pacific. The maximum tsunami height recorded by tide gauges in Hong Kong was 0.2 m only, far below the normal tidal variation of around 1 m. The tsunami did not have significant influence on Hong Kong.

For information on tsunami, please refer to the publication "Tsunami, The Great Waves". (http://ioc3.unesco.org/itic/files.php?action=viewfile&fid=808&fc at_id=137)



A magnitude 9.0 earthquake occurred in Japan at around 1:47 p.m. Hong Kong time on 11 March. The tsunami it generated traversed the Pacific and reached Waglan Island of Hong Kong at about 9:15 p.m.



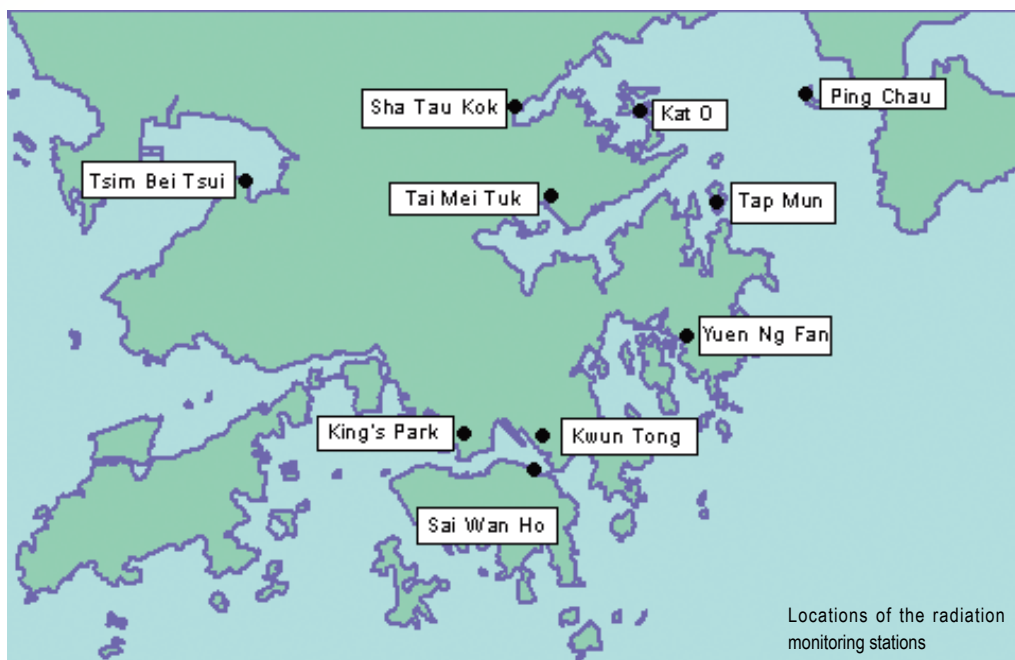
Tide data recorded at Waglan Island on 11 March. The black circle shows the first tsunami reached Waglan Island at around 9pm.

The Observatory Enhanced Radiation Monitoring

in Response to the Japan Nuclear Accident

LEUNG Wai-hung

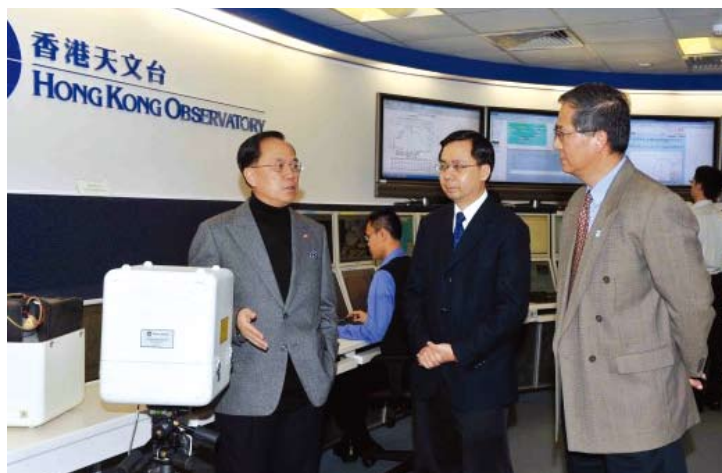
The Hong Kong Observatory (HKO) has been monitoring environmental radiation levels in Hong Kong since 1961. In response to the construction of nuclear power stations at Daya Bay, the HKO embarked on a comprehensive Environmental Radiation Monitoring Programme (ERMP) in 1983. Under the ERMP, the HKO monitors the gamma radiation levels in real-time from a network of ten radiation monitoring stations in Hong Kong; and collects samples of air, food, water, soil, etc., for the detection and analysis of radioactivity in these samples in the radiation laboratory.



In March 2011, the nuclear accident at Fukushima, Japan brought worldwide attention. Members of the public were concerned about its health effects in Hong Kong. To address these concerns, HKO swiftly stepped up the efforts in radiation monitoring and assessment. The monitoring results were promptly announced through press conferences and on the Observatory webpage. The additional work and enhanced services are summarized below:

- (1) making available on the HKO webpage hourly radiation levels at the ten stations in Hong Kong;
- (2) increasing the frequency of sample collection from the air samplers at King's Park and Yuen Ng Fan from once weekly to once daily so as to operate round-the-clock for radioactivity measurement, and reporting on the HKO website the latest measurement results of the concentrations of any radionuclide detected in the air samples;
- (3) carrying out an extra aerial radiation monitoring over Hong Kong using a Government Flying Service helicopter;
- (4) collecting and analyzing additional soil, rain and seawater samples;
- (5) estimating the trajectory of the air reaching Hong Kong, so as to help identify whether the origin is from Japan; and estimating the trajectory of air originating from Japan, so as to help people assess where the released radioactive materials would go.

For details on the environmental radiation levels in Hong Kong and the latest radiation measurement results, please refer to the Observatory's "Radiation Monitoring Special Webpage for Nuclear Accident": http://www.hko.gov.hk/radiation/ermp/rmn/applet/map/rmn_latest_link_e.htm.



Meeting the Media on 23 March

Editorial Board



Dr LEE (1st left) had a friendly chat with reporters

Every year, we celebrate the World Meteorological Day on 23 March. The theme for the World Meteorological Day this year is “Climate for you”. The Director of the Hong Kong Observatory, as in previous years, briefed the media on the Observatory's recent work and plans this year during the press conference.

Dr LEE Boon-ying, ex-Director of the Observatory, said that the recent severe earthquake and tsunamis in Japan attracted worldwide attention. Along with these came public concern, first on the possible local effects of the tsunami, then followed by anxiety of radiation from the damaged nuclear power plant at Fukushima. In this connection, the Observatory immediately stepped up its services to better inform the public, including the release of forecast track of air reaching Hong Kong in the next

three days as well as real-time radiation data at the 10 radiation monitoring stations in Hong Kong. The Observatory also participated in various special TV programmes on radiation monitoring, produced educational videos on the Observatory Youtube, Upper Albert Road Facebook and Roadshow and organised a public lecture on the effects of the nuclear accident on Hong Kong.

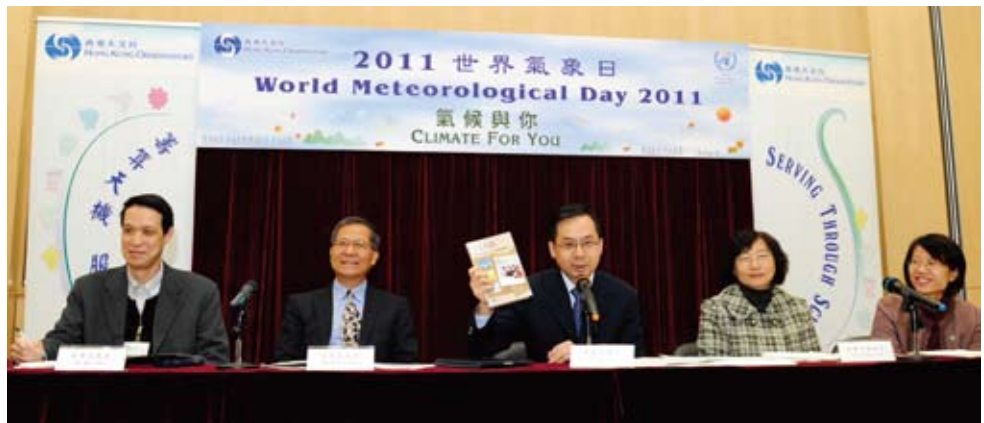
Dr LEE also announced the launch of several new services on the Internet and electronic social networks, including the revamped PDA version of the Observatory website with friendly displays and richer content, the Weibo website for dissemination of weather warnings and information to a wider audience, the circulation of messages about earthquakes of magnitude 6 or above through Twitter, and enhancing the ultraviolet (UV) webpage with real-time Ultraviolet-A measurements, together with advice on protection from the damaging effects of ultraviolet rays.

Reviewing the work of 2010 and looking ahead, he said that SWIRLS, a nowcasting system developed inhouse - which was used during the 2008 Beijing Olympics, the 2010 Shanghai EXPO and the Commonwealth Games in New Delhi - will be adapted to provide short-term forecasts to support the Universiade 2011 in Shenzhen later this year. Experiences gained in running SWIRLS in various setups are being channelled back for the further improvement of the system and the related services to better serve the public.

In 2010, the Observatory made significant strides in the provision of weather information on mobile devices. “MyObservatory”, enhanced in July last year provided easy access to weather products specific to the user's location and has become increasingly popular, with total visitor figures exceeding 400 million since its launch in early 2010. In order to reach a broader audience, plans are underway to further develop “MyObservatory” for use on other mobile platforms, in addition to the existing ones for iPhone, iPad and Android mobile.

Dr LEE also talked about the findings on extreme temperature projections for Hong Kong in the 21st century. The results suggest that there would be a significant increase in hot nights and very hot days, and a significant decrease in cold days.

In respect of this year's typhoon and rain season, he said that the current La Nina event, as established in December 2010, has peaked and is expected to weaken during the spring. On the basis of past climate and the latest climate forecasts, Hong Kong may start to experience tropical cyclones in June or earlier this year. For the year 2011, he expected that the number of tropical cyclones affecting Hong Kong will be normal to above normal and between 6 and 9. The annual rainfall is forecast to be near normal, between 2,100 and 2,700 mm. It is important that Hong Kong people should prepare for the rainy and typhoon seasons to mitigate loss and damage.



Dr LEE Boon-ying (centre) briefed the media on the Observatory's recent work during the press conference of World Meteorological Day

Hong Kong Observatory Open Day



People visiting the instruments on the lawn



Members of "Friends of the Observatory" photographed with the ex-Director.

Editorial Board

Every year in March, the Observatory organises an open day to celebrate World Meteorological Day on March 23. This year, the Observatory was open to the public on 26 and 27 March, with around 10,000 people of all ages visiting the Observatory Headquarters.

The open day's theme was "Climate for you" this year. Through words, pictures and exhibits, various topics, including climate, extreme weather, geophysical science, radiation monitoring and others, were introduced to the public. State-of-the-art equipment was also displayed. The game booths and science talks proved highly popular. Many visitors interviewed commented that Observatory staff were friendly and helpful, the exhibits were well presented and the games were fun for everyone.

Dr LEE Boon-ying, ex-Director, also autographed his new book "Director's Collectanea" during the open day. Many people welcomed this opportunity and posed for a picture with him. Apart from Observatory staff, some sixty members of "Friends of the Observatory" volunteered as guides and enjoyed a happy weekend with the visitors.

New Products & New Services

Launch of New Version 3.0 of "MyObservatory" for iPhone

LEUNG Yin-kong



Sample displays in the new version of "MyObservatory" (red circles indicate the newly added icons)

To further enhance the "MyObservatory" weather services for people on the move, the Observatory launched a new iPhone version of "MyObservatory" on 10 March. In addition to the weather services provided by the existing version, the new version 3.0 adds the special function of "weather warning push notification" service. Other newly provided weather information include rainfall distribution map, radar & lightning composite map, Observatory's blog, and

link to HKO's Twitter account.

The new version can be downloaded from the link: <http://itunes.apple.com/hk/app/myobservatory/id361319719?mt=8>

Got a Face-lift of the PDA Version of HKO Website

LEUNG Yin-kong

The Observatory launched a more user-friendly mobile version of the Observatory's website for people on the move on 23 March. The new version is a face-lift of the existing Personal Digital Assistant (PDA) version with better displays and navigation as well as richer contents. It contains an intelligent function that can re-scale automatically to fit the screen size of different mobile devices.

We can now readily use mobile phones to access the latest weather warnings and information from the new mobile website at <http://m.weather.gov.hk/report.htm>.



New mobile version of the Observatory's website

Launch of Observatory's "Weather Information for Fishermen" Website (Beta Version)

LEE Kwok-lun

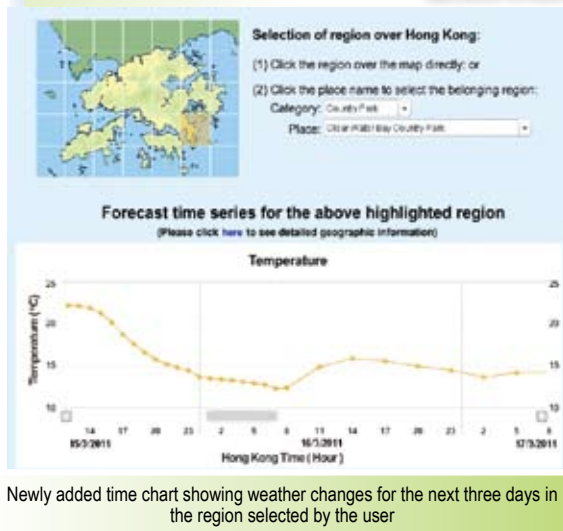
The Observatory continues to strive for better weather services for the fishermen. With effect from late December last year, fishermen can acquire the most updated and relevant weather information for their operations from the "Weather Information for Fishermen" website (<http://www.hko.gov.hk/fishermen/main.htm>).

The newly launched "Weather Information for Fishermen" website facilitates fishermen and members of the public to conveniently obtain the weather information for South China coastal waters, positions and track of tropical cyclone, latest weather photos, and other useful related links such as the websites of the Agricultural, Fisheries and Conservation Department and the Marine Department.

The website will assist fishermen to better understand the latest weather situation before operation at sea. Moreover, it also facilitates fishermen bodies to provide relevant weather information upon enquiries from individual fishermen. This development is expected to help enhance the safety and efficiency of fishing operations.

Observatory's Digital Regional Weather Forecast Extended to Three Days

LI Yuet-sim



The Observatory enhanced its Digital Weather Forecast webpage on 9 March by extending the regional weather forecast period from one day to three days. Time charts have also been added to show how the weather is expected to change in the next three days in the region selected by the user. This will help the public better plan their weather-sensitive activities and prepare for the changes in advance.

Another new feature of the webpage is that users can select time charts for any region, either through a map or by selecting place names, such as the name of a country park or tourist attraction. This gives users an at-a-glance knowledge of the weather forecast at their chosen location. In addition to the existing temperature and wind forecasts, the webpage includes a forecast of relative humidity. Furthermore, the update frequency has been increased from once to twice a day, so that the public can better appreciate the latest changes in weather conditions. The webpage can be accessed at www.hko.gov.hk/dfs/main/dfs_time_e.html.

Weather Information from Hong Kong Sea School Newly Added to Regional Weather Webpage

CHAN Siu-wai

Towards the end of 2010, real-time wind direction and wind speed information recorded at the Hong Kong Sea School, a member of the Community Weather Information Network (Co-WIN), was incorporated into the Regional Weather webpage of the Hong Kong Observatory. Weather information service for the southern district of Hong Kong Island was thereby further enhanced.

Hong Kong Sea School is located near the tourist area of Stanley. The offshore sea area, Tai Tam Bay, is a training centre and race venue for water sports. The weather information provided by the Hong Kong Sea School is therefore particularly useful for visiting tourists and water sport enthusiasts.

Wind direction and wind speed information recorded at the Hong Kong Sea School as shown on the Observatory's Regional Weather webpage



The Observatory Launch of the Sand and Dust Weather Information webpage

WONG Kwun-wah

In general, sandstorm/duststorm or sand/dust weather can be defined as an ensemble of particles of sand and dust which is energetically lifted to great heights by a strong or turbulent wind and brings visibility down. In East Asia, most sand and dust related weather originates in western China, northern China and Mongolia and occurs mainly in spring, typically between March and May. Dust plumes in northern China can be carried eastward by airstream to places such as Japan, Korea and the North Pacific.

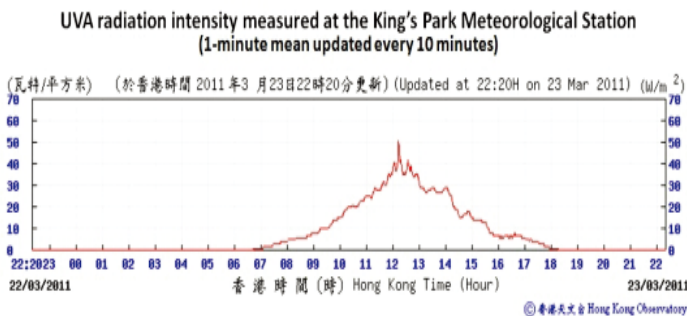
To understand the development and movement of the sand and dust weather, the Observatory launches the Sand and Dust Weather Information webpage. The webpage provides latest information and products for the monitoring of sand and dust weather. The webpage displays on a map the reports of sand and dust weather over East Asia in the past few days. It also provides satellite image products and forecast air trajectory information. Please visit the Sand and Dust Weather Information webpage at <http://www.weather.gov.hk/wxinfo/sanddust/sdawx.html>.



Sand and dust observation reports, yellow dot for sand/dust and red dot for sandstorm/duststorm. The figure (in blue circle) shows that sand and dust weather was affecting parts of northern China at 20HKT on 10 November 2010.

The Observatory Enhanced its Website with Ultraviolet-A (UVA) Radiation Information

YEUNG Hok-kee



Real-time UVA radiation data on the Observatory's webpage

health effect and sun protective measures, etc, are available on the webpage. Members of the public are welcome to visit the webpage at: www.weather.gov.hk/wxinfo/uvindex/english/uvatoday.htm.

UVA radiation is a major component of the solar radiation. Over-exposure to UVA radiation may cause wrinkling, aging and tanning of the skin, as well as potential development of skin cancer. As there is increasing concern about the health effect of UVA radiation, the Observatory has set up equipment to measure UVA radiation intensity at the King's Park Meteorological Station and has made available real-time UVA radiation data on its webpage since March 2011, so that the public can better appreciate the ultraviolet radiation in Hong Kong.

Apart from real-time UVA radiation data, relevant information including the characteristics of UVA radiation, its

The Observatory Delivered Weather News on Weibo

LEUNG Yin-kong

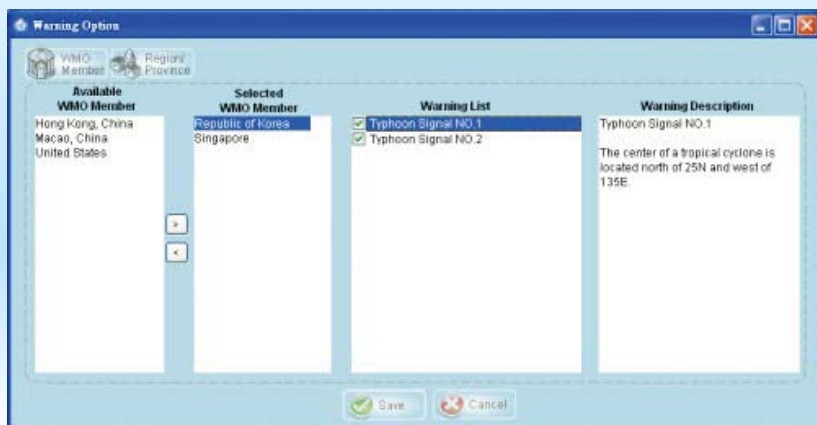
The Observatory delivers latest news and real-time weather warnings on Weibo website commencing 23 March. Following Twitter, the Observatory once again makes use of social networking website to disseminate latest weather information and warnings to a wider audience. On following "HongKongObservatory", the official weather accounts on Weibo, you will be kept posted with the latest weather news including the latest warnings in force. The official Weibo account of the Observatory is available at <http://t.sina.com.cn/observatoryhk>. The weather service on Weibo has become very popular and the number of followers has already exceeded 30,000.



New SWidget Service of Severe Weather Information Centre (SWIC) Gained Popularity

LEUNG Yin-kong

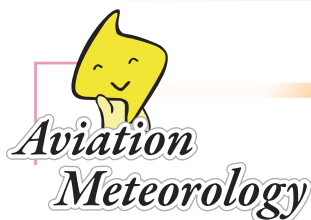
SWidget has become popular since its launch in June 2010 and the visit figures have exceeded 8 millions as at March 2011. SWidget is a software tool developed by the Observatory on behalf of the World Meteorological Organization for users of personal computers (PCs) to automatically retrieve official severe weather warning messages from the SWIC website. By indicating their choices under the screen of "Warning Option", users can obtain the selected warning information when warnings are issued. A dialogue box will pop up with audio alarm on the user's PC whenever there is a change of warning status. The SWidget software can be downloaded from the SWIC website at <http://severe.worldweather.org/swidget/swidget.html>.



"Warning Option" page of the SWidget user interface



Dialogue box showing a Typhoon Signal of Republic of Korea



Observatory Staff Wrote for ICAO

SONG Man-kuen, Sandy

Mr SHUN Chi-ming, the Director and I co-authored an article entitled New Meteorological Services Supporting Air Traffic Management which was recently published in the Asia-Pacific (APAC) Regional Report, a periodical of the International Civil Aviation Organization (ICAO). Mr Shun is also the President of the Commission for Aeronautical Meteorology (CAeM) of World Meteorological Organization (WMO), while I am a core member of the CAeM Expert Team on Meteorological Services in the Terminal Area.

The current issue of the ICAO APAC Regional Report is dedicated to the theme of Intensifying Asia-Pacific Collaboration to Address Efficiency and Safety. The above-mentioned article presents the new Meteorological Services in the Terminal Area (MSTA) initiative, which is being undertaken by WMO in close collaboration with ICAO, aims at providing meteorological services to support Air Traffic Management (ATM) for the wider terminal areas, especially those at busy airports, which are currently not covered by the standard meteorological services stipulated by ICAO.



The WMO CAeM is working closely with ICAO and the ATM community to define and map out the details of the new MSTA services in support of ATM with the aim that it will evolve into a more integrated and collaborative initiative. It is planned that a proposal of MSTA will be developed for consideration by a conjoint meeting of ICAO and WMO to be held in 2014. This conjoint meeting, held once every 12 years, will determine the future development of aviation meteorological services for the next decade or so.

The article is available from the ICAO website at: http://www.bangkok.icao.int/news/ICAO_APAC-Regional-Report.pdf

Reprint of the article can also be obtained at the Observatory's webpage: <http://www.hko.gov.hk/publica/reprint/r962.pdf>

Hong Kong Observatory Participated in HKIA Carbon Reduction Programme

YEUNG Kwok-chung, Daniel

The Observatory together with Airport Authority Hong Kong and around 40 different airport business partners participated in the "Hong Kong International Airport Carbon Reduction Programme" and pledged to reduce Hong Kong International Airport (HKIA) carbon emissions by 25% per workload unit by 2015. This marks not only the first voluntary, aviation sector-wide carbon reduction pledge in Hong Kong, but also the first airport in the world with that reduction pledge. Under this carbon reduction programme, the Observatory implemented a series of measures, such as using "Aviation Meteorological Information Dissemination System" website and electronic platform for disseminating aviation related meteorological information, so as to reduce paper usage.



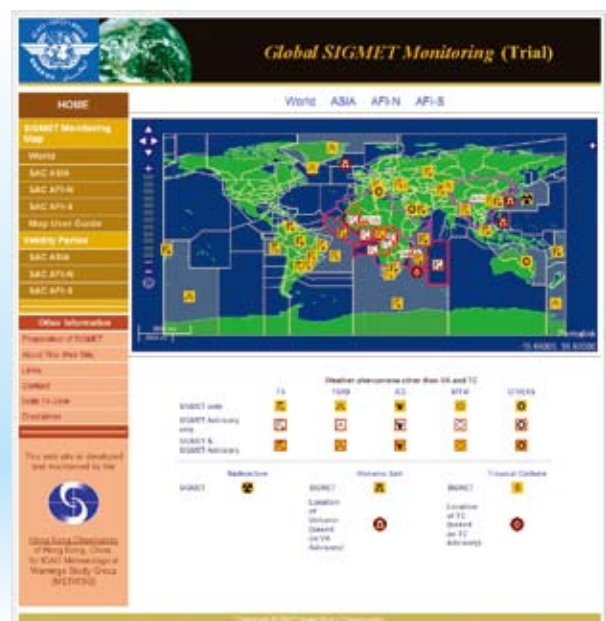
Hong Kong Observatory and other airport business partners attended the Carbon Reduction Pledging Ceremony organized by Airport Authority Hong Kong

The Observatory adheres to the environmental protection policy. Participating in HKIA Carbon Reduction Programmes aims to build towards a green airport, contribute to the protection of environment and establish a role model of environmental protection among meteorological community.

Trial Website "Global SIGMET Monitoring" for Aviation Sector

LI Luen-on

The Observatory has developed a trial "Global SIGMET Monitoring" website (<http://www.g-sigmatmon.weather.gov.hk>) for the International Civil Aviation Organization (ICAO). The website, launched in late March, is to facilitate ICAO and other related organizations to monitor the dissemination and exchange of real-time global en-route significant weather (SIGMET) information. The Observatory developed a SIGMET monitoring webpage for Asia-Pacific region in 2007. As the webpage was well received, the Observatory expanded the webpage to global coverage. Apart from SIGMET, users can also get information from Tropical Cyclone Advisory Centres, Volcanic Ash Advisory Centres and SIGMET Advisory Centres at a glance.



Meeting of Working Group on Aviation Meteorology in Pearl River Delta

CHAN Pak-wai



Miss Sharon LAU (3rd left, front row), Assistant Director, and Mr XU Jianliang (3rd right, front row), Deputy Head, Meteorology Division, Air Traffic Management Bureau of Civil Aviation Administration of China, photographed with participants.

The third meeting of the Working Group on Aviation Meteorology in Pearl River Delta was held in Guangzhou, China on 28 and 29 March. Meteorological personnel from the five major airports in Pearl River Delta had participated in the meeting. This was also the first time for Macao Meteorological and Geophysical Bureau to join the Working Group.

Following the previous meeting, the data link between the Observatory and Air Traffic Management Bureau of Middle-South China was established in late 2010. The present meeting discussed further strengthening of the collaboration, including weather briefing during inclement weather condition, as well as co-operation in such areas as numerical weather prediction, low-level windshear and the nowcasting of intense convective weather.

operation in such areas as numerical weather prediction, low-level windshear and the nowcasting of intense convective weather.

Participation in Plotting the Future Direction of Nowcasting in the World

LI Ping-wah



The author (2nd left, front row) worked together with other meteorology expert to plot the future direction of the nowcasting in the world at the Headquarters of the World Meteorological Organization

Dr LI Ping-wah, Scientific Officer, attended the meeting of the Working Group on Nowcasting Research under the World Meteorological Organization in Geneva, Switzerland, on 8 – 10 February 2011. The meeting discussed about the current state of nowcasting in the world, studied the relevant subjects and tabled the needs in nowcasting from the developing countries, and plotting the future direction of the Working Group. Apart from Hong Kong, the Working Group is composed of members of meteorology expert from the world, including China, USA, Canada, Australia, Germany, Austria and Brazil.

Promoting Applications of Satellite Products in Asia

SO Chi-kuen

The Observatory joined the first meeting of the Coordinating Group of the World Meteorological Organization Regional Association II Pilot Project held in Tokyo, Japan from 21 to 23 February. The objective of meeting was to promote the application and training in satellite data among the National Meteorological and Hydrological Services in Asia, in particularly those of the least developed countries, in support of their weather forecasting and warning services.

The Observatory as one of the members of the coordinating group actively participates in the pilot projects, promoting satellite data exchange, products development and applications to prevent and mitigate disasters due to severe weather.



Mr SO Chi Kuen, Scientific Officer (1st left, 2nd row), participated in the meeting of the Coordination Group

WOO Wang-chun

The Moon: *Near and Far*

The Moon goes around the Earth in an elliptic orbit, at a variable distance from the Earth. It appears bigger when it is closer to us and smaller when it is farther away.

The two photos of the Moon were taken 14 days apart, when the Moon was located around the apogee and perigee respectively.



(Courtesy of Hong Kong Space Museum)

The Running Man Nebula NGC 1977

The Running Man Nebula NGC 1977, located in the constellation of Orion, is so named because it looks like a man running in the midst of the cloud of gas. It is a reflection nebula that does not emit any visible light of its own. What we see is the dust illuminated by the light from nearby stars, like the fog around a street lamp.



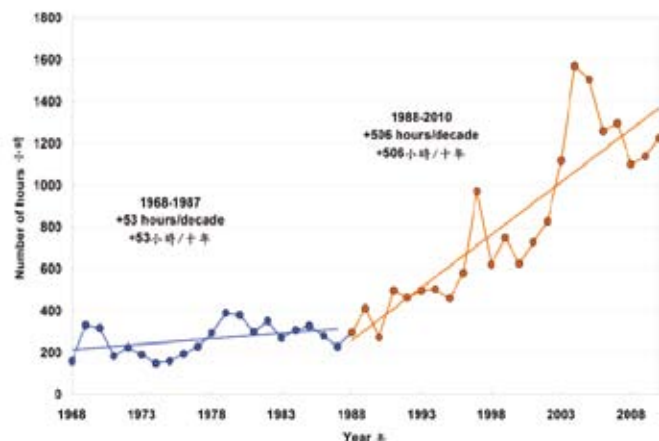
(Courtesy of Hong Kong Space Museum)

Long Term Trend of the Annual Number of Hours of Reduced Visibility in Hong Kong from 1968 to 2010

MOK Hing-yim

One visible aspect of climate change is the turbidity in the sky which more and more local people are concerned about. The suspended particulates of one kind or another in the atmosphere created by human activities in the city such as vehicular traffic, construction, fossil-fuel power generation, cooking and burning of vegetation, absorb and scatter the light, resulting in reduction of the visibility. As suspended particulates are carried and dispersed by the wind, reduced visibility is significantly influenced by meteorological factors such as wind direction, wind speed and atmospheric stability.

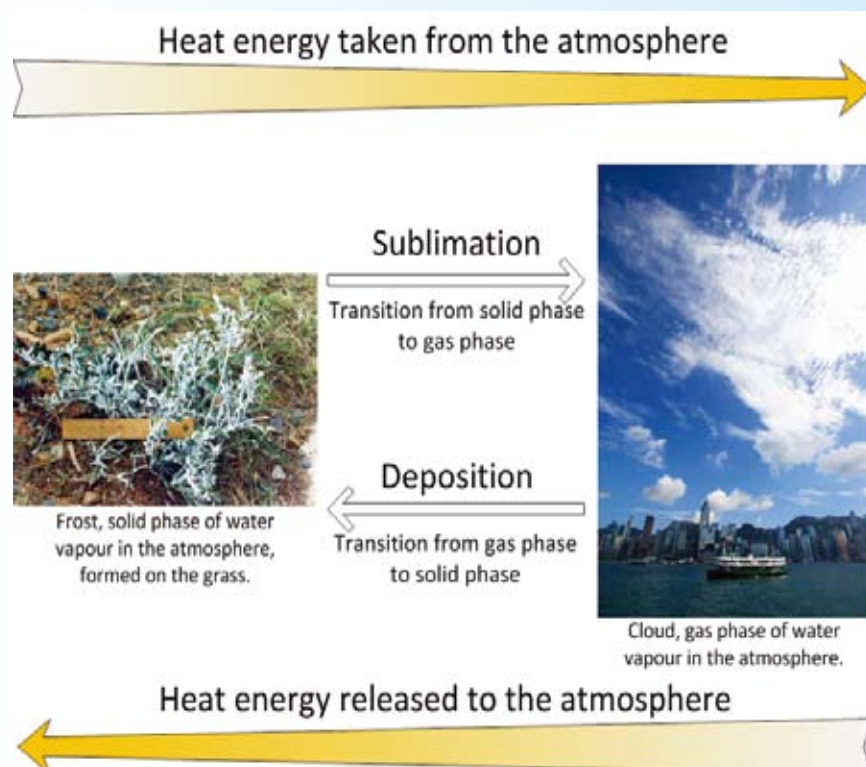
According to the visibility observations at the Hong Kong Observatory Headquarters, starting from 1968 to the late 1980s, there was no significant trend in the number of hours of reduced visibility (visibility below 8 km excluding cases of rain, fog and mist or associated with high relative humidity (95% or more)). But from the late 1980s to 2010, there has been a dramatic rise in the frequency of reduced visibility. There has been a generally improving trend since the peak in the mid-2000s. Nonetheless, the present level is still well above the 1,000-hour per year mark exceeded after 2002 and is many times the levels enjoyed prior to the late 1980s.



Annual total number of hours with visibility at the Hong Kong Observatory Headquarters below 8 km from 1968 to 2010 (relative humidity below 95% and not counting rain, mist or fog)

The Looks of Water in Four Seasons – *Winter*

PAN Chi-kin



Hong Kong is situated in the sub-tropical zone at the latitudes similar to those of Hawaii. However, the temperature variation of Hong Kong within a year is larger than that of Hawaii. In Hong Kong, the monthly mean temperature during summer is different from that in winter by more than 10°C. Located at the southeastern edge of the vast Asian continent, Hong Kong's weather conditions in winter are also quite different from other sub-tropical regions. In winter, cold air mass accumulates over the central and northern regions of the Asian continent such as Siberia. As the continent cools down more quickly than the ocean, winter monsoon

establishes itself, blowing from the land toward the sea, advecting the cold air from the northern region to the coastal areas and bringing cold weather to Hong Kong.

When the cold winter monsoon reaches Hong Kong, local temperature will drop significantly. Under certain weather conditions, frost may appear over rural areas and on high ground. Frost is a weather phenomenon which can be in general classified into three types: hoar frost (mainly caused by radiation cooling, also known as radiation frost), advection frost and rime. In Hong Kong, hoar frost occurs more frequently than the others. Let's focus on this type of frost here. In the early morning of cold season, the thin layer of white ice crystals appearing on the grass or soil might be hoar frost. The occurrence of hoar frost not only depends on weather conditions, but also the nature of the object surface. When the object is chilled by radiation cooling, the surface temperature will drop rapidly and the temperature of surrounding air close to the object will remain relatively high. The air will be chilled and simultaneously releases the excessive water vapour. When the temperature drops to 0°C or below, water vapor condenses through deposition directly on the surface as ice crystals, i.e. the hoar frost. Deposition, the direct formation of solid phase of the substance from its gas phase without going through the liquid phase, is a kind of latent heat release process. Frost is a common example of deposition.

In addition to temperature of the surrounding air and the object itself, the amount of cloud will inhibit radiation cooling. Under cloudy conditions, radiation cooling will be weaker and is not conducive to the formation of frost. Therefore, hoar frost occurs mostly under clear nights when radiation cooling is the strongest. Wind also plays an important role in the formation of frost. If the wind is light, the air slowly flows through the cool surface and at the same time brings abundant supply of moisture which are conducive to the formation of frost. On the contrary, under strong wind condition, the air flows rapidly without good contact with the surface. The air at low levels will also mix up and is not favourable to the drop of temperature, which in turn inhibit the formation of frost.

A cycle of four seasons passed. This is the last article of the series, I hope the readers can have a better understanding of the atmosphere and appreciate the changing weather in four seasons.

“Clouds in Hong Kong” Series - The Forms and Features of High Clouds

CHIU Hung-yu

High clouds are classified into cirrus, cirrocumulus and cirrostratus.

High clouds are often translucent (Fig.1). One of the main features is their resemblance of thin slices of white crystal-like glass that the cloud is mostly clear. In fact, high clouds are mainly aggregations of ice crystals, suspending at high altitudes in the sky. The degree of translucence depends on the quantity of ice crystals, denseness and thickness of the cloud.

While high clouds move along with the high altitude airstreams, their appearance is changeable. Sometimes, it is like flowers floating gracefully in the sky (Fig.2). Sometimes, the edge of high clouds is like waving silk ribbons or feathers exhibiting elegant and exquisite texture of filamentous lines (Fig.3). Sometimes, it is like thousands of pearls filling the sky (Fig.4 and Fig.5). Sometimes, it looks as if the sky is wearing a semitransparent veil, whitish, soft, smooth but blurred (Fig.6 and Fig.7). When the sun sets, the high clouds are rosy, gorgeous and pleasant in the dusk. High clouds often help to stage a picturesque, intriguing and romantic setting (Fig.8 and Fig.9).

Under suitable conditions, the refraction of sunlight through the hexagonal ice crystals of high clouds can produce atmospheric optical phenomena such as halo or sun dog (parhelion). For example, cirrostratus covering all or part of the sky can sometimes produce halo (Fig.6 and Fig.7). Also, dense cirrus patches can sometimes produce sun dog (Fig. 10, the original figure is shown on http://www.weather.gov.hk/education/edu06nature/ele_sundog0909_e.htm).



Fig.1 : Cirrus (Courtesy of Mr W.C. LI)



Fig.2 : Cirrus (Courtesy of Observatory colleague)



Fig.3 : Cirrus (Courtesy of Mr C.H. CHOW)



Fig.4 : Cirrocumulus (Courtesy of Observatory colleague)



Fig.5 : Cirrocumulus (Courtesy of Mr C.H. CHOW)



Fig.6 : Cirrostratus on an incomplete halo (Courtesy of Miss K.Y. SHUM)



Fig.7 : Cirrostratus on the Halo (Courtesy of Observatory colleague)



Fig.8 : Cirrus (Courtesy of Mr C.H. CHOW)



Fig.9 : Cirrus (Courtesy of Mr C.H. CHOW)



Fig.10 : "Sun dog" and dense cirrus patches (Courtesy of Mr CHAN Man-chun)

“Understanding Radiation” Series - What is radiation?

Editorial Board

All matters are made up of tiny units called atoms. As radiation is mainly released from atoms, the first step to understand radiation is to know more about their structure and properties. The following links contain useful material :

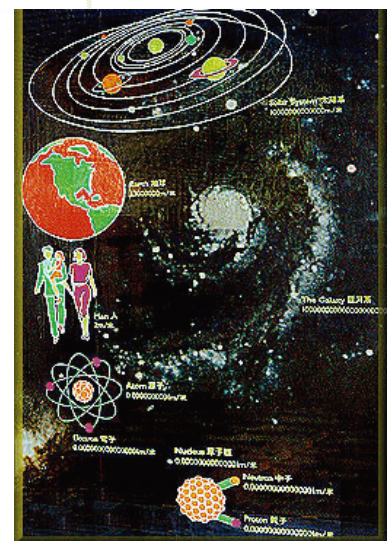
- Structure of an atom (<http://www.weather.gov.hk/education/dbcp/radiation/eng/r3.htm>)
- Unstable nuclei (<http://www.weather.gov.hk/education/dbcp/radiation/eng/r4.htm>)
- Decay (<http://www.weather.gov.hk/education/dbcp/radiation/eng/r5.htm>)

Radiation is everywhere in the universe. Since the inception of time, life on earth have been exposed to radiation in the natural environment.

Radiation embraces electromagnetic waves (such as light, radiowaves, x-rays, etc.), and particles (such as alpha (α) particles, beta (β) particles, etc.) emitted by radioactive materials as they decay.

Radiation can be classified as non-ionizing and ionizing. In general, the energy of the non-ionizing radiation (such as light and radiowaves) is low and not sufficient to change the chemical properties of a substance. On the other hand, ionizing radiation (such as α and β particles) has energy high enough to remove electrons from an atom to create an electrically charged ion. This ionization process often results in chemical changes in living tissues, which can lead to injury in the organism. Ionizing radiation is generally referred as harmful radiation.

Radiation cannot be heard, seen, smelt nor tasted. Most of it cannot be felt. However, with the use of instruments, it can be detected and measured.



Climate Change FAQ

KOK Mang-hin

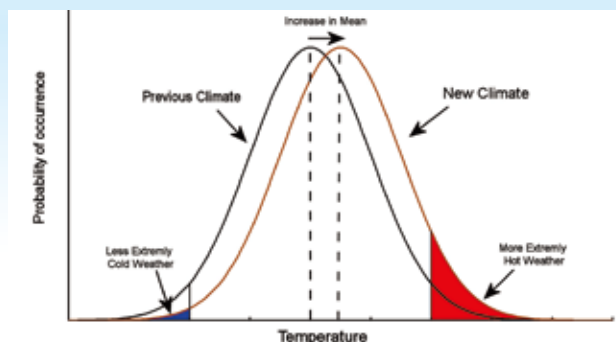
Through a question and answer approach, the Climate Change FAQs will explain some basic knowledge and facts of climate change in layman terms in order to enhance the public's understanding of the causes of climate change, its impacts and what we can do to mitigate its effects.

Q: Are extreme weather events becoming more frequent ?

A: An extreme weather event is an infrequent event. Climate change affects extreme weather by changing the mean of the distribution of climate elements. Even a relatively small shift in this mean of the distribution can result in substantial changes in the frequency of occurrence of extreme events. According to the Fourth Assessment Report of Intergovernmental Panel Climate Change (IPCC), observations over the past century show that in many places, hot days, hot nights and heat wave have become more frequent, while cold days, cold nights and frost have become rarer. Moreover, the frequency of heavy rain events has also increased over most land areas, but there were more intense and longer droughts over wider areas, particularly in the tropics and subtropics. In Hong Kong, it is observed that cold episodes have become rarer while very hot days and heavy rain events are becoming more frequent over the last 120 years or so.

Q: Can individual extreme events be explained by climate change?

A: It is not appropriate to determine whether an individual extreme event is due to climate change alone because extreme weather events are usually caused by a combination of factors and a wide range of extreme events is a normal occurrence even when there is no climate change. According to the Fourth Assessment Report of IPCC, the likelihood of some extreme events, such as heat waves and heavy precipitations, had increased due to climate change, and that the likelihood of others, such as cold spells and frost, had decreased.



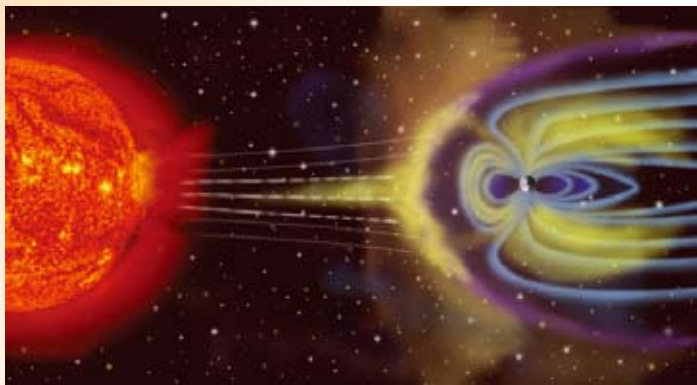
Taking temperature as an example, an increase in the mean can result in substantial changes in the frequency of extreme events

Tips on Geomagnetism

WOO Wang-chun

3. What effect does the Earth's geomagnetic field have on human beings and other life forms?

The Sun is continuously ejecting high energy charged particles (known as solar wind) which, if ever able to reach the Earth's surface directly, could harm human beings and other life forms on Earth. Fortunately, the Earth's geomagnetic field acts as a shield and protects life on Earth from solar winds. Besides, some animals, such as sea turtles and migratory birds, rely on the Earth's geomagnetic field for navigation.



The Earth's geomagnetic field shields the Earth from direct impact of the solar wind. (Courtesy of National Aeronautics and Space Administration)

4. What is the application of geomagnetic knowledge ?

The discovery of geomagnetism and the invention of compass enabled seafaring and paved the way for the Age of Exploration, causing tremendous impacts on trades, wars and cultural exchanges.

To date, compass is still a necessary tool for activities such as hiking, stargazing as well as marine and air navigation.



Commonly used pocket-sized compass

Meteorological Authorities of Guangdong, Hong Kong and Macao Enjoy Silver Jubilee and Launch Greater Pearl River Delta Weather Website

LEUNG Yin-kong

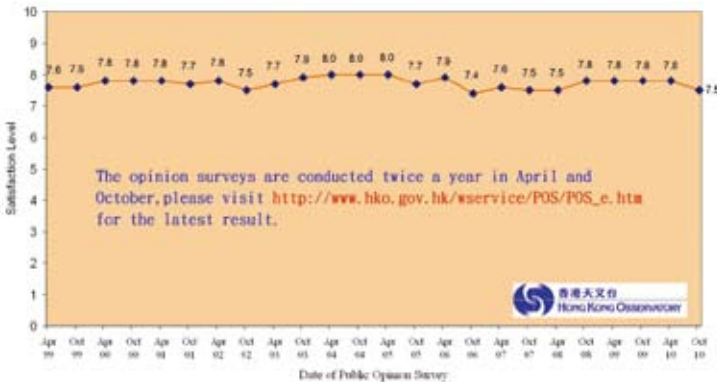
Meteorologists from Guangdong, Hong Kong and Macao met at the Observatory on 26 January for their annual meeting and meteorological technology seminar to discuss further co-operation and share research result. Significant achievements have been accomplished in the past 25 years through seamless co-operation among the three meteorological authorities. In addition to establishing automatic weather stations and a lightning location network, they have also developed the "Greater Pearl River Delta Weather Website" (<http://www.prdweather.net/index.htm>), which was launched on that day. The website, which integrates weather information from the three places into a one-stop portal, provides weather warnings and forecasts of the 11 cities in the region, boosting the local weather service and improving public safety.



Mr XU Yongke (left), Deputy Director of the Guangdong Meteorological Bureau, Dr FONG Soi-kun (right), Director of the Macao Meteorological and Geophysical Bureau, and Dr LEE Boon-ying (middle), Director of the Hong Kong Observatory, officiated the cake-cutting ceremony to celebrate silver jubilee of cooperation between meteorological authorities of Guangdong, Hong Kong and Macao

Results of public opinion survey, October 2010

Editorial Board



The Observatory commissions an independent consultant to conduct public opinion surveys twice a year to gauge the public perception of the accuracy of weather forecasts and warnings and the level of public satisfaction with its overall service. In the latest public survey conducted in October 2010, the overall satisfaction level with the Observatory's services had a mean score of 7.5 (out of 10), which is comparable to previous results. Regarding the tropical cyclone warning services, about 90% of the respondents considered the recent services better or about the same as before.

The Observatory Hosted the WMO/ESCAP Tropical Cyclone Best Track Consolidation Meeting

LUI Wing-hong

The Observatory hosted the Tropical Cyclone Best Track Consolidation Meeting convened by the United Nations Economic and Social Commission for Asia and the Pacific/World Meteorological Organization (ESCAP/WMO) Typhoon Committee during 13 and 14 December 2010. The aims of the meeting were to discuss techniques used in the analysis of tropical cyclone location and intensity and in determining tropical cyclone post-analysed best tracks. This would facilitate warning operation of tropical cyclone and the study of long-term trend in tropical cyclone characteristics in the region. Participants from the World Meteorological Organization, Typhoon Committee Secretariat, Shanghai Typhoon Institute of China Meteorological Administration, Joint Typhoon Warning Center of the US Armed Forces, Japan Meteorological Agency and the Hong Kong Observatory shared their experiences in the meeting.



Participants sharing their experiences at the Best Track Consolidation Meeting

The meeting concluded successfully with constructive recommendations to enhance the communication amongst the tropical cyclone warning centres within the region, strengthen the exchange of data and measures to further improve the determination of both the operational and post-analysed best tracks.

Visits • courses • talks • meeting



Mid December 2010 An invitation by Nanjing University of Information Science and Technology, Mr HUI Tai-wai (4th right, front row), Scientific Officer, delivered a training workshop on management and production of TV weather programmes.



6 January 2011 Ms WANG Gai-li, Associate Researcher of Chinese Academy of Meteorological Sciences, visited the Observatory and shared her views on skills of Remote Sensing and experience of Nowcasting with our colleagues.



22 December 2010 Mr JU Meng-jun (1st right), the president of Xinhua News Agency HKSAR Branch, led a three-member delegation to visit the Observatory. Ex-Director of the Observatory (1st left) briefed them on the history of the Observatory and the work of the Forecasting Office.



11 to 14 January 2011 A delegation of 6 members from the National Meteorological Center (NMC) visited the Observatory, and presented a briefing on the recent operational and research duties at NMC. This helped Observatory staff in understanding the work of NMC.



24 December 2010 A delegation of the Vietnam National Hydro-Meteorological Service (NHMS) visited the Observatory. Ex-Director (left) briefed them on the work of the Observatory.



14 January 2011 Messrs Sam Brand and Glenn Handlers, Meteorologists of the Naval Research Laboratory in Monterey, California, USA, shared their experience on the research of tropical cyclones.



19 January 2011 The ex-Director (2nd left) explained the weather forecasting operation to Professor Julia KING (2nd right), Vice-Chancellor of Aston University, United Kingdom.



8 February 2011 5 students from King's College were arranged to job-shadow with colleague mentors for a whole day. Apart from visiting various divisions, students had a chance to learn how to plot a weather map. Ex-director (middle) took this opportunity to share his views on selecting programmes in University and his life experience on working in the society. After the meeting, he presented certificates and encouraged them.



22 January 2011 A total of 24 members from the Nuclear Division of the Hong Kong Institution of Engineers visited the Observatory. They also attended a seminar on Climate Change delivered by a Scientific Officer.



11 and 18 February 2011 Mr Paul HO, Senior Experimental Officer, briefed members of the Hong Kong Air Cadet Corps Glider Aviator Training Course on aeronautical meteorology.



29 January 2011 "Wanchai Livelihood Place" invited Observatory staff and the docents of "Friends of the Observatory" to visit Wan Chai District and to exchange the experiences on guided tour.



12 February 2011 Mr KWAN Koon-wah and Mr POON Lai-shun, the voluntary docents of "Friends of the Observatory", gave a public talk on "Story of Waglan" to share their experience during the study trip in August 2010.



12 February 2011 Professor CHEN Yong-qin and nearly 80 students from Geography Department of Chinese University Hong Kong visited the Observatory.



23 February 2011 A delegation of 14 members from Wong Tai Sin District Council, headed by Mr LI Tak-hong (2nd right), the Chairman of the District Council, listening to the ex-Director briefing on the history of the Observatory.



12 February 2011 A group of more than 40 people from US Consulate visited the Observatory.



28 February to 4 March 2011 Mr Yoshiaki Sato (from left to right, front row) and Mr Syugo Hayashi from the Japan Meteorological Agency, and Mr James Wilson and Ms Rita Roberts from the National Centre for Atmospheric Research, United States, had in-depth discussion and exchanged views on "Workshop of Mesoscale Analysis".



15 February 2011 A delegation of 6 members from Yau Tsim Mong District Council, headed by Mr CHUNG Kong-mo (1st right), the Chairman of the District Council, visited the Observatory. The ex-Director (1st left) explained the operation on weather forecast to them.



12 March 2011 About 20 members of "Friends of the Observatory" visited the Seismograph Station of the Observatory.



18 February 2011 A "Teacher Orientation" was held by the Observatory. Mr SO Chi-kuen (front), Scientific Officer, explained on forecasting and application of weather radar.



30 March 2011 Director of Drainage Services, Mr CHAN Chi-chiu, JP (1st right), led a delegation of 10 members of directorates and engineers to visit the Observatory, was briefed on the works of climate change studies and rainfall nowcasting skills. Both sides also exchanged their views and experience on the works.



Best TV Weather Programme Presenters
4TH QUARTER, 2010
Ms SONG Man-kuen

Retirement
Dr LEE Boon-ying



Dr LEE Boon-ying (Left), ex-Director, received the souvenir from Mr SHUN Chi-ming (Middle), chairman and Mr LEE Lap-shun, vice-chairman of Hong Kong Observatory Staff Association.

Promotion

We cordially congratulate to all of you for the recognition of excellence in your performance.
 Wish you all the best at work and continue to strive for excellence in future.



Miss LAU Sum-yee (left) was promoted to Assistant Director on 28 December 2010.



Miss LEE Shuk-ming (left) was promoted to Senior Scientific Officer on 26 January 2011.



Mr SHAM Fu-cheung (right) was promoted to Chief Experimental Officer on 7 October 2010.



Mr CHAN Kin-yu (right) was promoted to Senior Experimental Officer on 28 December 2010.



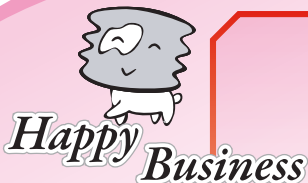
Ms LAU Siu-kuk (left) was promoted to Clerical Officer on 14 February 2011.

Observatory Staff and Friends of the Observatory Receiving Praise

Editorial Board

Staff of the Observatory and Friends of the Observatory who received words of thanks and commendation from the public or organizations during January to April 2011:

| | |
|---|---|
| Mr SHUN Chi-ming (Director) | Mr CHEUNG Sze-yuen (Experimental Officer) |
| Dr LEE Boon-ying (ex-Director) | Mr WONG Tak-kan (Experimental Officer) |
| Mr LEUNG Wing-mo (Assistant Director) | Mr LO Chi-hung (Scientific Assistant) |
| Mr LEE Tsz-cheung (Senior Scientific Officer) | Miss NG Yuk-yam (Assistant Clerical Officer) |
| Mr HUI Tai-wai (Scientific Officer) | Ms CHU Wan-ye (Clerical Assistant) |
| Mr LI Kin-wai (Chief Experimental Officer) | Mr LEUNG Man-kit (Friends of the Observatory) |



Being "Caring Organization" for the Sixth Consecutive Year

LEE Lap-chi

The Observatory has been awarded the "Caring Organisation" again under the "Caring Organisation Scheme 2010/11". This is the sixth consecutive year that the Observatory received the Award. The "Caring Organisation Scheme" is organised by the Hong Kong Council of Social Service, which aims to build a cohesive society by inspiring organisation social responsibility through caring for the community, caring for the employees and caring for the environment. The Observatory is awarded the "Caring Organisation" in recognition of its achievements in supporting and assisting the employee volunteering through the HKO Volunteers; encouraging donation in any format to social service bodies; offering employment and vocational training opportunities to the vulnerable; giving support to social enterprises; providing safe and healthy working environment to employees; nurturing a family-friendly environment for employees through a series of family-oriented policies and activities, and promoting awareness in environmental protection and actively participating in related initiatives.



HKO Website Wins Awards Again

LEUNG Yin-kong

The website of the Observatory won three awards recently: the Yahoo! BUZZ Award in the category of government department, the Ruby Award of the Web Care Award, and the Hong Kong top 10 ".hk" website with bronze prize for corporate group.

The website is tailored to users' needs. It provides not only one-stop webpage specialised for different user groups, but also provides personalised "MyObservatory" location-based weather and lightning location services. It also supports mobile Internet and links with major social networking websites. The visit rate has increased by about 30 times in the past decade and reached 4.9 millions a day in 2010.



Hong Kong Observatory Radiation Laboratory successfully passed the Second ISO 9001 Annual Surveillance Audit

LEE Shuk-ming

In order to enhance the management efficiency and quality of its radiation measurement work, the Hong Kong Observatory Radiation Laboratory at King's Park maintains a high standard of its radiation measurement services based on the International Organisation for Standardization ISO 9001:2008. Accreditation for the ISO 9001:2008 for its radiation measurement services from the international organization concerned was obtained in early 2009. The certification would be valid for 3 years (up to early 2012). During the period the certification body would conduct annual surveillance audit of the Radiation Laboratory to ascertain that its radiation measurement services meet the requirements for continuation of the ISO certification. Our quality radiation measurement services were once again recognized when the Radiation Laboratory successfully passed the second Annual Surveillance Audit on 28 January 2011. Our laboratory staff would face a bigger challenge in 2012 – ISO Re-certification Audit. We will, as always, strive to maintain and improve our quality radiation measurement services.



Director-General of Civil Aviation Speaking on Organization Management



Mr LO Shung-man, Director-General of Civil Aviation speaking in the management forum at the Observatory

CHIU Hung-yu

Mr LO Shung-man, Norman, AE, JP, Director-General of Civil Aviation, shared with Observatory colleagues on 17 February 2011 his management experience and insight on organization management in our monthly management forum.

With his wide range of professional knowledge and rich management experience in the aviation field, Mr LO drew an analogy between the power provided by the functioning components of an aircraft or vehicle and the management and driving force of an organization. The talk was very innovative and covered the hardware and software aspects of an organization. It provides a lot of new thinking on organization management for the Observatory.

Dr LEE Boon-ying (left), ex-Director, presenting a souvenir to Mr LO Shung-man



2010 Christmas Party

CHAN Wing-shan

The Christmas party of the Observatory was held on 24 December 2010. Many colleagues with their family members, and also retired colleagues came to join the party in that afternoon.

Before the party started, awards under the Departmental Commendation Letter Scheme and the Staff Suggestions Scheme were presented. Then the buffet lunch began. After enjoying the delicious food, the Staff Association has prepared some interesting games and many gifts. All were very happy. The finale was the big lucky draw with thousands of attractive prizes. The first prize this year – iPad was definitely the most wanted item for many colleagues.

Don't be disappointed if you cannot get a prize this year! For the next Christmas party, the winner for the first prize may be "you"!

HKO Planting Day 2011

LEE Lap-chi

One of our memorable annual events, the HKO Tree Planting Day 2011, was held on 2 April at our King's Park Meteorological Station. With endless blue sky and warmest sunshine, everybody was vibrant to plant different kinds of trees & flowers in the station, feeling the miracle of life and nature! Colleagues with their family enjoyed a healthy and meaningful "Green" family day. Although the planting activities were not easy, we all worked to sweat; however, when seeing the satisfied smile on everyone's faces, we all knew that the seed of happiness had been grown in our life! After the tree planting, we chit-chatted together while enjoying refreshments, it's really a pleasurable event. Some colleagues also attended the "Ping Shan, local culture bike tour", organized by the HKO Staff Association, to enjoy the sunshine.



Site Visit to Automatic Weather Station at Kadoorie Farm

LEE Lap-chi



The Observatory's new automatic weather station which located in the Kadoorie Farm has been officially operated. Earlier this year, led by Mr LEUNG Wing-Mo, Assistant Director, we visited the weather station to learn more about its operation. There are a variety of devices, supported by solar cells, are running round-the-clock to collect meteorological data. Those data will be transmitted to the Headquarters for analysis. Other than that, we also took this opportunity to come to a close contact with the nature – night safari, which was organized by mentors of the farm. We attempted to explore the nature after dark; we experienced the woods in the dark, breathed the smells of plants and animals, and listened to the howls of various animals. The wind came moaning through the trees, we saw boars hiding in the slope and also discovered a rare species of moth. Wow, night safari was really an unprecedented experience; all of us were eye-opening.

<Hong Kong Citizen Hong Kong Heart>

Volunteer Ambassador Program – A Visit to Home for the Elderly

CHOW Chi-Kin

The Observatory's volunteer group has supported for many years the <Hong Kong Citizen Hong Kong Heart>Volunteer Ambassador Program which is engineered by the Social Welfare Department. This year our first program is a visit to a home for the elderly at Chinese New Year to celebrate the festival with the elderly.

On 26 February, 15 volunteers went to the Choi Hung Elderly Service Centre to entertain the elderly there with lots of interesting programs, including singing, dancing, weather session introducing warnings issued by the Observatory and a quiz with prizes. The elderly danced and sang along with us. The atmosphere came to a new high, with everybody enjoying themselves.

All these would not have been possible without the general registry staff sacrificing their own time to hand-weave the woolen caps for the elderly, not to mention the contributions from the former Director and other colleagues. Thanks again for support from all colleagues!



Mailing Address

The Observatory Joins Charity Walks

CHOW Chi-Kin

The Observatory's volunteer group participated in two charity walks which were both held in early 2011.

The first one was the "River Walk" at Tai Tam Country Park organized by the Friends of the Earth on 2 January - a fund-raising campaign to promote water conservation in Dongjiang. Mr LEUNG Wing-Mo, Assistant Director, one of the officiating guests, explained to the participants the adverse impact on future water resources as a result of climate change, and urged everyone to be thrifty with the use of water.



Another event was the "Po Leung Kuk Chinese New Year Charity Walk cum Carnival" held on 13 February. The walk started at the Shatin Racecourse and we walked along Shing Mun River with the finishing point at Sha Tin Town Hall Plaza. The event provided a good opportunity for us to contribute towards the worthwhile cause of charity while celebrating the Chinese New Year together. Although the weather was cold and rainy that day, we all completed the journey happily with a caring heart.

And this charity walk has brought two awards for the Observatory: the "Merit Award for Outstanding Fund-raising Result" and the "Highest Donation Award (Individual)" won by Dr LEE Boon-ying, ex-Director.

