



# Hong Kong Observatory 2010-2011

## INTRODUCTION

The Hong Kong Observatory's three main objectives are:

- (1) to provide weather services to meet the public's demand for short to medium range forecasts and warnings of hazardous weather and to provide forecasts for international aviation and shipping in accordance with the standards of international organizations;
- (2) to provide information on local environmental radiation levels and effects and to advise the Government on countermeasures that may be necessary during nuclear emergencies;
- (3) to maintain the Hong Kong time standard and to provide geophysical, oceanographic, astronomical and climatological information and consultative services to the public and private sectors.

During the financial year 2010-2011, the department's total expenditure was \$213.5 million and the total revenue was \$84.6 million. By the end of the financial year, there were altogether 289 civil servants and 21 contract staff working in the department.

The activities of the Observatory from April 2010 to March 2011 are highlighted in the following paragraphs.

## HIGHLIGHTS

The Observatory made significant strides in the provision of weather information on mobile devices, including the launch of "MyObservatory" on popular mobile platforms iPhone and Andriod, and the enhancement of the Observatory mobile website. These services provide easy access to weather products specific to the user's location and have proved to be very popular, with total visitor figures exceeding 500 million in 2010-2011.



Sample displays of "MyObservatory"

Triggered by the devastating earthquake and tsunami in March 2011, the nuclear accident at Fukushima, Japan, caused worldwide concerns. The Observatory cooperated with the Security Bureau and other departments and responded swiftly to strengthen the monitoring of radioactivity in air and other environmental samples. It also enhanced its information services to the public by organizing media briefings, producing information video on YouTube, as well as enriching its webpage with forecast tracks of air reaching Hong Kong, hourly radiation data at the ten monitoring stations in Hong Kong, and results of radioactivity measurements in environmental samples.



Mr. Leung Wing-mo, Assistant Director of the Hong Kong Observatory (first right), together with Mr. Lai Tung-kwok, Under Secretary for Security (fourth from right), and representatives from other departments delivered a series of press conference following the nuclear accident at Fukushima (Photo courtesy of Hong Kong Information Services Department)

The Observatory continued to take lead in the international effort under the auspices of the World Meteorological Organization (WMO) in the development and operation of the World Weather Information Service (WWIS) and the Severe Weather Information Centre (SWIC) websites, providing official weather information and warnings to the public worldwide. The WWIS reached a new height with the release of the Google-Earth version, registering around 149 million page visits in 2010-2011. The SWIC also reached an ever growing audience with the incorporation of world-wide gale information and its personal computer software tool called SWIdget, which automatically retrieves official weather warning messages from participating meteorological services and alerts the user.

The Observatory won a number of awards in 2010-2011, as follows:

- A Certificate of Merit in the 2010 Hong Kong Awards for Environmental Excellence (HKAEE) Sectoral Awards Scheme (Public Organizations and Utilities Sector);
- The CARE Scheme Civil Service Category Highest Per Capita Contribution Award under the “Community Chest Corporate and Employee Contribution Programme 2010/11”;
- The Yahoo! BUZZ Award 2010 in Government Department category, presented to the most searched websites by Internet users using Yahoo! Hong Kong's Search engine;
- The Hong Kong top 10 “.hk” website 2010 bronze prize for corporate group (with 100 or more employees), organised by the Hong Kong Internet Registration Corporation Limited;



Mr. Shun Chi-ming (middle), Assistant Director of the Hong Kong Observatory, and Mr. Leung Yin-kong, Acting Senior Scientific Officer (right), received the Hong Kong top 10 “.hk” website 2010 bronze prize for corporate group from the Government Chief Information Officer, Mr. Jeremy Godfrey (left)

- The Ruby Award of the “Web Care Award 2010” organized by the Internet Professional Association;
- The "Caring Organisation" under the "Caring Organisation Scheme 2010/11".

In the public opinion survey conducted in October 2010, the overall satisfaction level with the Observatory's services had a mean score of 7.5 (out of 10), comparable to previous years. Regarding tropical cyclone warning services, about 90% of the respondents considered the current services better or about the same as before.

## PUBLIC WEATHER FORECASTING AND WARNING SERVICES

### Public Weather Information Service

The Observatory website ([www.weather.gov.hk](http://www.weather.gov.hk) and [www.hko.gov.hk](http://www.hko.gov.hk)) continued to be very popular in 2010-2011 with the number of page views reaching 2.3 billion, a growth of more than 50% from last year.

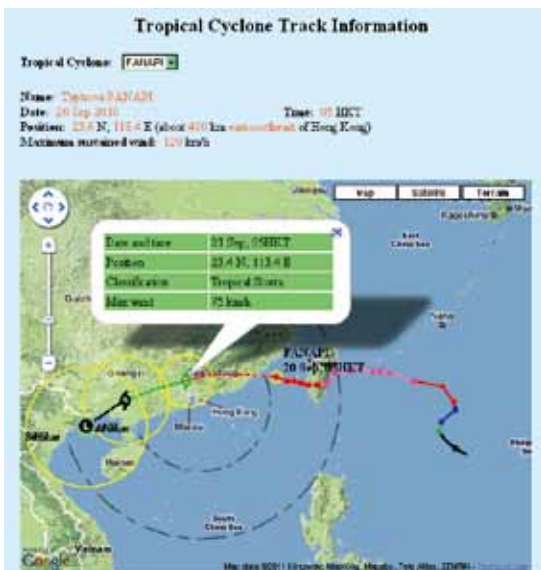
In 2010-2011, the Observatory further enhanced its website to include the following new services:

- Real-time measurements of direct and diffuse solar radiation, as well as ultraviolet-A radiation in Hong Kong, in addition to global solar radiation;
- Enrichment of the regional weather information service by the addition of real-time wind information from the Star Ferry wind station and Hong Kong Sea School, which is a member of “Community Weather Information Network” (Co-WIN); weather photos at Sha Lo Wan, Tolo Harbour and the eastern waters of Cheung Chau; temperature readings at the new automatic temperature station at Tsing Yi; and temperature and humidity readings at Tsuen Wan Shing Mun Valley. Exposure information of selected wind stations in Hong Kong were also provided for public reference;
- A new version of the “Rainfall Nowcast for the Pearl River Delta Region” webpage, enabling the public to view directly using a web browser the evolution within the next two hours of the forecast rainfall distribution over the Pearl River Delta region;



New “Rainfall Nowcast for the Pearl River Delta Region” webpage

- New satellite webpage to display the Japanese MTSAT-2 satellite imagery, replacing MTSAT-1 satellite imagery. The Observatory’s Personal Digital Assistant (PDA) webpage was enhanced with more satellite imagery, including images from the Chinese Fengyun-2D satellite and the MTSAT-2 satellite. The webpages on animation of satellite and radar imagery were enhanced to facilitate browsing on different PDA or mobile phones;
- A new tropical cyclone track information webpage based on a geographic information platform in addition to the traditional track map. Further enhancements included provision of distance and bearing relative to Hong Kong for a tropical cyclone within the area bounded by 10-30 degrees north and 105-125 degrees east, and provision of more frequent updates, at hourly interval, of the tropical cyclone track when the Standby Signal No. 1 is in force;



New tropical cyclone track information webpage

- New versions of “MyObservatory” for iPhone to provide more weather information such as 7-day weather forecast, tropical cyclone tracks, Observatory’s YouTube video and notification of weather warnings. “MyObservatory” was also launched on Android platform to provide personalized weather service. The PDA website got a face-lift with better displays and navigation as well as richer contents;
- The Greater Pearl River Delta Weather Website, integrating real-time weather warnings and forecasts from 11 cities in the region into a one-stop portal, especially for people crossing the boundary regularly for school and work;



A student (left) and the Vice-Principal of the Elegantia College (second from left) demonstrated the use of Greater Pearl River Delta Weather Website to cross-boundary students

- Latest news of the Observatory and real-time weather warnings on Twitter (<http://twitter.com/observatoryhk>) and Sina Weibo (<http://weibo.com/observatoryhk>);
- Enhanced Computer Forecast Weather Map providing more frequent updates of computer-generated prediction of the evolution of weather patterns over East Asia and the western North Pacific, with a new product on relative humidity information at ground level;
- Enhanced “Wind Forecast for Wind Surfers” webpage which was renamed as “Wind Forecast for Water Sport Activities”. The forecast period was lengthened from one day to three days. In addition to the daily update before daybreak, another update before noon was also introduced to provide the latest assessment of the daytime weather;
- A Sand and Dust Weather Information webpage providing latest information and products for the monitoring of sand and dust weather. The Observatory’s Daily Weather Chart was also enhanced

by adding information on mist, haze, sand/dust and sandstorm/duststorm;

- New Weather Information for Fishermen portal to facilitate fishermen to conveniently acquire relevant weather information for their operations;
- Enhanced Digital Weather Forecast webpage with the addition of relative humidity forecast and time charts of weather forecast for the location chosen by the user, and the extension of the forecast period from one day to three days.

The Observatory's Dial-a-Weather service (187 8200) handled a total of over 22.6 million calls in 2010-2011.

Professional meteorologists of the Observatory produced and hosted television weather programmes for major television channels in the morning and evening, while weather forecasters and Weather Service Officers of the Observatory provided the public with the latest weather situation through radio interviews. Videos on reviewing the weather of the week and interesting weather topics were produced in-house and posted on YouTube regularly. Starting from July 2010, Observatory's Scientific Officers started to give weekly briefing on the weather in Hong Kong and the Mainland in a Putonghua programme on RTHK Channel.



Scientific Officers of the Observatory who hosted the weather briefing in Putonghua

Following the 2008 Beijing Olympic Games, the Observatory rendered support to the "Shanghai World EXPO Nowcasting Service Demonstration Project", and the 19th Commonwealth Games in New Delhi, India. The Observatory's nowcasting system "SWIRLS" was deployed to Shanghai and New Delhi to provide forecast services on severe weather. A research paper was also published at a related symposium of the Indian Meteorological Society.



Mr. Yeung Hon-yin (rightmost, front row) of the Observatory introducing the "SWIRLS" forecast products provided by the Observatory for the Shanghai World EXPO to Ms. Haleh Kootval, chief of the Public Weather Services Division of WMO (middle, front row) at the Shanghai Meteorological Bureau

The Observatory provided specialized meteorological services and assistance in setting up a "Heat Stress Monitoring System" in support of the Equestrian Events during the 16th Guangzhou Asian Games. Weather forecasting support was also rendered to the Hong Kong Windsurfing Team during the Sailing Events via a dedicated webpage.



Mr. Lee Kwok-lun of the Observatory (front) discussing with the local forecasters about providing weather forecast for Equestrian Events at the Equestrian Meteorological Service Office in Conghua, Guangdong

#### Weather Services for other Government Departments and Special Clients

A total of 528 users from 60 government departments registered for the service of the Government Weather Information Server (GOWISE).

Alerts would be provided to relevant government departments to take timely precautions for some low-lying

areas vulnerable to flooding arising from storm surges during passages of tropical cyclones.

Specialized weather services were provided to utility companies, public transport operators, engineering contractors and information providers on a cost-recovery basis. A total of 106 clients subscribed to the Observatory's specialized services in 2010-2011, generating a revenue of about \$1.09 million.

### Observation Networks

The Observatory installed a new automatic temperature station at the Tsing Yi Sewage Treatment Plant on 23 August 2010 for trial operation. It was planned to replace the existing Tsing Yi temperature station located on the roof top of Ching Pak House, Cheung Ching Estate. Another new automatic weather station was installed at Shing Mun Valley Park in Tsuen Wan. It was put in trial operation on 7 December 2010. Powered by solar energy, the two new stations provided real-time weather information for the Tsing Yi and Tsuen Wan area to the public.

### Computer System

With the installation of a new computer system at the Observatory in early 2010, a high-resolution model suite started to provide the public with high spatial and temporal resolution weather forecasts. These enhancements were made possible through the operation of a new generation of numerical weather prediction models at the Observatory. The new suite of models offers a resolution down to 2 km, against a resolution of 20 km in the past, providing more details on weather systems affecting the territory. Making use of the high-resolution digital outputs of the models, more location-specific weather information could be provided to users and the public.

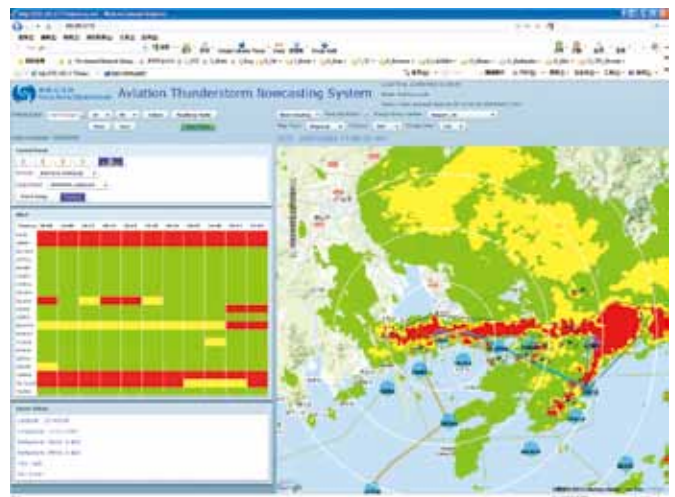
## **AVIATION WEATHER SERVICES**

Commencing June 2010, Observatory's Aviation Forecaster provided trial daily weather briefings to Air Traffic Control Watch Manager of the Civil Aviation Department on significant convection forecasts in support of their planning of air traffic flow management. In line with this new service, a tailor-made experimental product for "Significant Convection Monitoring and Forecast" was developed, providing significant convective weather observations and forecasts up to 12 hours ahead.



Observatory's Aviation Forecaster conducting weather briefing to the Civil Aviation Department

To better support air traffic management in Hong Kong, the Observatory developed an Airport Thunderstorm Nowcasting System to forecast the movement of thunderstorms within the Hong Kong Flight Information Region in order to allow air traffic controllers to better appreciate the latest weather conditions, with a view to enhancing aviation safety and reducing air traffic delays due to thunderstorms.



Thunderstorms forecast by the Airport Thunderstorm Nowcasting System on 28 July 2010 for the following hour

In 2010-2011, the Observatory's windshear and turbulence alerts for the Hong Kong International Airport (HKIA) maintained a success rate of about 92%. Some 161,000 flight documents were provided by the Observatory for aircraft departing HKIA, which was about 12 % higher than that of the previous year.

Following the original proposal by the ex-Director of the Hong Kong Observatory, Mr. Lam Chiu-ying and the coordination of Ms Jiao Mei-yan, Deputy Administrator of CMA, the Asia Aeronautical Meteorological Services Website was launched operationally in November 2010. The website provides, inter alia, flight documents and aviation related products. It was established and operated

by China Meteorological Administration (CMA) and Civil Aviation Administration of China (CAAC). Mr. Shun Chi-ming, Assistant Director of the Observatory, officiated at the operational launch ceremony of the website held in Beijing in November 2010 in the capacity of President of the WMO Commission for Aeronautical Meteorology (CAeM).



Mr. Shun Chi-ming (3rd left), Assistant Director of the Observatory, together with Mr. Jeremiah Lengoasa (middle), the Deputy Secretary-General of WMO, Mr. Xia Xing-hua (3rd right), Deputy Administrator of Civil Aviation Administration of China and Mr. Shen Xiao-nong (2nd left), Deputy Administrator of China Meteorological Administration, declared the Asia Aeronautical Meteorological Services Website operational

The Observatory has been providing aviation weather information through a web-based information delivery system dedicated for aviation users called the Aviation Meteorological Information Dissemination System (AMIDS). In 2010-2011, Observatory's aviation weather information was also made available on mobile platforms such as iPhone, Windows Mobile and Blackberry to enhance support to aviation users of the HKIA in making time-critical decisions related to weather. The total number of access to AMIDS exceeded 25 million, an increase of 25% over the previous year.



AMIDS mobile version on iPhone, Windows Mobile and Blackberry platforms (from left to right)

The Observatory launched the trial Global SIGMET Monitoring Website for ICAO in March 2011 to facilitate the real-time monitoring of SIGMET messages by ICAO and related parties.

To promote knowledge on aeronautical meteorology, the Observatory conducted a second online quiz on the subject in late 2010 attracting more than 6,000 participants.

In 2010-2011, the Observatory conducted two series of briefings on windshear for more than 100 representatives from airlines and air traffic controllers to introduce the latest developments of the Observatory's windshear and turbulence alerting services.

The Observatory continued to render full support to the "Dragonair Aviation Certificate Programme 2010" by providing basic training on aviation weather observation and forecasting, and allowing each participant to work at the Airport Meteorological Office to gain experience of the work of meteorological personnel. Sixteen cadets of the Hong Kong Air Cadet Corps joined the eight-month programme.

The Observatory continued the project to replace ageing equipment at HKIA in 2010-2011 and at the same time upgrade the meteorological facilities to meet the demand for higher quality aviation weather services.

## MARINE METEOROLOGICAL SERVICES

The Observatory established a Liaison Group for the Shipping Community in November 2010 with representatives from shipping companies, container terminal operators, the Hong Kong Pilots Association and the Marine Department. The group provided a forum for direct exchange of views among stakeholders and would facilitate the enhancement of weather services to better suit the needs of the local shipping community.



Dr. Lee Boon-ying, Director of the Hong Kong Observatory (middle), together with members of the Liaison Group for the Shipping Community

Staff of the Observatory visited Voluntary Observing Ships calling at Hong Kong and provided them with meteorological equipment and latest guidelines on making weather observations at sea. The Observatory managed a fleet of 54 voluntary observing ships by March 2011, an increase of about 15% from last year.

The Observatory operates a network of six tide gauges to measure water level and provide tidal prediction in Hong Kong. During the year, the Observatory enhanced its webpage to provide real-time tidal information of the Tai Miu Wan tide gauge station. During the trans-Pacific tsunami generated by the earthquake near the east coast of Japan on 11 March 2011, the maximum tsunami height recorded in Hong Kong was 0.2 m.

## RADIATION MONITORING AND ASSESSMENT

The Observatory operates the Environmental Radiation Monitoring Programme in Hong Kong. In 2010-2011, apart from the detection of minute amounts of radioiodine and radiocesium in air particulate samples from late March to mid April 2011 as a result of the Fukushima nuclear accident, measurement results in other months indicated no measurable increase in the ambient radiation levels in the local environment and artificial radioactivity in foodstuff consumed in Hong Kong, as compared with the respective levels before the operation of the nuclear power stations at Daya Bay and Ling Ao, Guangdong. The resulting radiation dose arising from the Fukushima accident was so low that there was practically no impact to public health in Hong Kong.

The 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. The Radiation Laboratory successfully passed the second Annual Surveillance Audit in January 2011.

## TIME STANDARD AND GEOPHYSICAL SERVICES

The Observatory maintains the Hong Kong Time Standard. Time checking services for the public are provided through the web clock, the network time service, the Dial-a-Weather system and local radio stations. In 2010-2011, the network time service registered over 1 billion hits, an increase of around 27% over the previous year. The "Palm Clock", a variant of the web clock, was launched to facilitate viewing of the Hong Kong Standard Time using mobile devices.



The Observatory's Palm Clock

The Observatory monitors local and distant earthquakes round-the-clock using seismic data from the local and overseas seismograph networks. The Observatory also monitors long term crustal movement in Hong Kong using two continuous GPS stations in Tate's Cairn and Shek Pik.

With the aim of providing early notification of the occurrence of strong earthquakes and locally felt earth tremors to the public, the Observatory launched a trial version of Quick Earthquake Messages on Twitter in March 2011.

In 2010-2011, the Observatory set up an educational webpage on geomagnetism and compiled an astronomical photo album on the web in cooperation with the Hong Kong Space Museum.

## CLIMATE SERVICES AND STUDIES

In 2010-2011, the Observatory entertained 1,312 written requests for meteorological and climatological data, generating a revenue of \$216,965. Observatory staff gave over 50 talks on climate change at the enthusiastic invitation of schools, universities, professional organizations and green groups. The Observatory also actively participated in campaigns organized by different conservation groups and stakeholders to promote the awareness of and actions to cope with climate change.

The Observatory re-computed the extreme temperature projections in Hong Kong in the 21st century using the daily model simulation data and more sophisticated statistical techniques. The results were made available in the Observatory's website and also published in a scientific journal.

In 2010-2011, the Observatory launched redesigned webpages on Climatological Information Service, Climate Change and Tropical Cyclones, providing more comprehensive information to the public with a more user friendly interface. The webpage on El Niño and

La Niña was enhanced to provide basic knowledge of the phenomena and their impacts on local climate. The Observatory also provided support to the production of Climate FAQ by Roadshow.



Redesigned Climatological Information Services webpage

With an aim to enhancing public awareness on climate change, the Environmental Campaign Committee, the Polar Museum Foundation, the Environmental Protection Department, the Observatory and the Hong Kong Science Museum jointly organized a series of public seminars and exhibitions in 2010-2011. The Observatory also conducted a public seminar on Volcanic Eruption and Climate Change in May 2010.

In 2010-2011, Observatory members took part in the "River Walk" organized by the Friends of the Earth to promote water conservation in Dongjiang and held the annual Tree Planting Day at King's Park. The Observatory also designated a Car-free Day and Departmental Lights-off Day every month.

## TRAINING

In 2010-2011, a total of 34 Observatory staff acquired professional training in mainland China and overseas institutions. The Observatory invited four overseas experts to share their expertise and experience with Observatory's staff during the workshop on mesoscale weather in February 2011.

Thirteen students from local universities joined the year-round as well as summer placement programmes of the Observatory in 2010-2011. They carried out research projects ranging from meteorological measurements, numerical weather prediction to nowcasting. The Observatory also held "Job Shadow Days" for 17 participating students from Shun Lee Catholic Secondary School and King's College.

In 2010-2011, the Observatory organized a seminar on lightning alert service with nearly 70 participants from property management companies as well as operators of swimming pools and outdoor facilities under the Leisure and Cultural Services Department. The Observatory also conducted a Weather Observation course for about 70 members of the public.



Mr. Leung Wing-mo, Assistant Director of the Observatory, welcomed the participants of the seminar on lightning alert service

The Observatory organized the course on "Automated Weather Station Network" in late 2010, as part of the Observatory's contribution to the WMO Voluntary Cooperation Programme (VCP). Eleven participants from Ecuador, Swaziland, Moldova, Belize, Lao PDR, Sri Lanka, Maldives, Indonesia, Samoa, Malaysia and Macao, China attended the course.



WMO VCP course participants visiting the Weather Radar Station and Automatic Weather Station at Tai Mo Shan

Two aviation safety inspectors on aeronautical meteorology of Nigerian Civil Aviation Authority were attached to the Observatory to study the installation, operation and maintenance of aerodrome meteorological observing system. Another two Korea Meteorological Administration staff visited the Observatory to better understand the experience in the installation, maintenance and application of Light Detection And Ranging system.

To promote science education, the Observatory continues to develop educational materials on meteorology, radiation and geophysics on its “Educational Resources” webpage. Dispatched in the form of “e-bulletin” to students, teachers and interested readers, they were very well received. In addition, the Observatory published over 50 technical reports or papers, including 26 in refereed journals in 2010-2011.

## OUTREACH AND PUBLICITY ACTIVITIES

The Observatory regularly organizes outreach activities for members of the public. In particular, the Open Day in March 2011 attracted around 10,000 visitors of all ages.



Hong Kong Observatory Open Day 2011

In 2010-2011, the Observatory Headquarters received over 4,900 members of the public visiting in groups. Observatory staff also gave talks on weather observation, forecasting and warnings, and on earthquake and tsunami to various organizations, including primary and secondary schools as well as universities.

The membership of the “Friends of the Observatory” (FoOb) continued to grow, exceeding 10,800 by March 2011. In addition to helping the Observatory in the annual Open Day and other exhibitions, volunteers of FoOb continued to contribute to various activities such as the guided tours of the Observatory, which entertained over 2,300 members of the public during weekends.

The Observatory and Department of Applied Physics of the Hong Kong Polytechnic University celebrated the third anniversary ceremony of “Community Weather Information Network” (Co-WIN), which included primary and secondary schools, an elderly centre, the Scout Association of Hong Kong and WWF-Hong Kong. An online Educational Resources platform of Co-WIN was also launched for exchange of knowledge and experience. By March 2011, there were altogether 95 members of the Co-WIN.



Guests and representatives of member organisations celebrating the third anniversary of Co-WIN

The “Science in the Public Service” Campaign, of which the Observatory was the co-ordinating department, organized a popular science lecture series from October 2010 to March 2011 at the Hong Kong Science Museum. The Campaign also organized a Student Project Competition which the champion team of the Primary School Category was interviewed in a TV programme. Moreover, the Observatory, together with seven partner government departments of the Campaign joined the “InnoCarnival 2010” organized by the Innovation & Technology Commission in November 2010 to showcase their scientific work at the Hong Kong Science Park.

At the invitation of the Hong Kong Award for Young People, the Observatory was appointed as their Honorary Adviser of the Expeditions Instructor Central Registration Scheme to provide expert advice on meteorology. Other outreach activities which the Observatory participated included “The Second Scout Met Day”, the “Mountaineering Safety Promotion Day”, and the “Safer Slopes Safer Living Fiesta 2010”.

The Observatory and the Senior Citizen Home Safety Association hosted the Warmth and Care in Wintry Weather press conference in December 2010, providing information on the location-based weather service and how senior citizens and those taking care of senior citizens can use the Observatory’s service to obtain real-time information on local weather and take appropriate measures when the temperature drops.

The Director’s Collectanea was published in February 2011. The Collectanea is a collection of blog messages written by the Director of the Hong Kong Observatory, Dr. Lee Boon-ying, during 2010-2011, in which he shared his thoughts and views on meteorology and other topics of interest.



Dr. Lee Boon-ying (centre), Director of the Hong Kong Observatory, at the “Director’s Collectanea” autographing session during the Observatory’s Open Day

## REGIONAL COOPERATION

The Observatory attended the biennial high-level meeting with a six-member delegation from the China Meteorological Administration at the Observatory in December 2010. The two sides reviewed the co-operation during the past two years and agreed on areas for future joint efforts.



Dr. Lee Boon-ying (rightmost), Director of the Hong Kong Observatory, welcomed the delegation of the China Meteorological Administration (CMA) headed by Mr. Shen Xiaonong (third from the left), Deputy Administrator, at the high-level meeting between the Observatory and CMA

The Observatory hosted the 16th Guangdong – Hong Kong – Macao (GHM) annual cooperation meeting and the 25th GHM Seminar on Meteorological Science and Technology in January 2011.

Five delegates from the Beijing Meteorological Bureau (BMB) and the Institute of Urban Meteorology (IUM) visited the Observatory during March - April 2010. Another seven delegates from the BMB visited the Observatory in October 2010. One visiting researcher from IUM and another from the Chinese Academy of

Meteorological Sciences were attached to the Observatory in December 2010 for training on nowcasting systems.

A five-member delegation from the China State Oceanic Administration visited the Observatory in November 2010 to discuss cooperation matters. Another delegation of six members from the National Meteorological Center visited the Observatory in January 2011 for sharing of knowledge and experience in aspects such as weather forecasting techniques, numerical weather prediction models and climate forecast.

A researcher from China National Meteorological Centre visited the Observatory from October to December 2010 to conduct a joint research project on tropical cyclones. The researcher studied the possible rainfall amount that would fall if Typhoon Morakot, which brought record-breaking rainfall to Taiwan in 2009, made a direct hit to Hong Kong.

A delegation including Deputy Director of the China Earthquake Administration, Director of the Earthquake Administration of Beijing Municipality, Director of the Earthquake Administration of Yunnan Province, and Director of the Earthquake Administration of Guangdong Province visited the Observatory in June 2010.

A delegation of the Air Traffic Management Bureau of Civil Aviation Administration of China (CAAC) visited the Observatory in November 2010 and attended the bi-annual senior meeting of CAAC and the Observatory. The meeting reviewed the collaboration between the two aviation meteorological services over the past two years, in particular, the Pearl River Delta Working Group and Meteorological Services for Terminal Area (MSTA) Working Group, and to set the direction for future cooperation.



Dr. Lee Boon-ying (center of first row), Director of the Hong Kong Observatory photographed with the delegation of the Air Traffic Management Bureau (ATMB) of CAAC led by Mr. Gao Yi, Deputy Director General of ATMB (second from the left) and staff of the Observatory

The Observatory attended the third meeting of the Working Group on Aviation Meteorology in Pearl River Delta in Guangzhou, China in March 2011, in which meteorological personnel from the five major airports in Pearl River Delta participated.

Other visits to the Observatory included a delegate led by the Director of the Macao Meteorological and Geophysical Bureau in May 2010 and a group of 12 delegates of the Nuclear Emergency Office of Zhuhai in September 2010.

## INTERNATIONAL COOPERATION

Seventeen staff members of the Observatory served as experts in various capacities in international organizations, including 35 positions in the World Meteorological Organization (WMO) and 6 positions in International Civil Aviation Organization (ICAO) during 2010-2011, in areas ranging from public weather services, disaster prevention to aviation meteorology and coordination of world weather websites. In particular, Dr. Cheng Choming of the Observatory was elected the vice-chairman of a sub-group of ICAO at its meeting held in Jakarta in July 2010, responsible for planning and implementation of communications, navigation, surveillance and meteorology for aviation in the Asia Pacific region.

Dr. Lee Boon-ying, Director of the Hong Kong Observatory, gave a lecture on the use of technology in service delivery and disaster risk reduction during the WMO "Symposium on Meteorological Service Delivery & Disaster Risk Reduction" in Shanghai and another lecture on early warning system at the Multi-hazard Early Warning Training Course held in the Nanjing University of Information Science & Technology in May 2010.



Dr. Lee Boon-ying, Director of the Hong Kong Observatory (first one on the right, front row) together with participants at Nanjing

Mr. Shun Chi-ming, Assistant Director of the Hong Kong Observatory, attended the 62nd Session of the Executive Council of WMO held in Geneva, Switzerland, in June 2010 in the capacity of President of the WMO CAeM.



Mr. Shun Chi-ming, Assistant Director of the Hong Kong Observatory (first row, third from the right) photographed with Michel Jarraud, Secretary General of WMO (first row, fifth from the left) and other participants attending the WMO Executive Council meeting at the WMO Headquarters

In 2010-2011, Mr. Lee Lap-shun of the Observatory gave a lecture on tropical cyclone forecasting in a training workshop held in Shanghai, with a view to enhancing the forecast services for the World Expo 2010. Mr. Yeung Hon-yin of the Observatory participated in the "Shanghai World EXPO Nowcasting Service Demonstration Project" of WMO and gave lectures on the "SWIRLS" nowcasting system which was developed in-house by the Observatory at the Shanghai Meteorological Bureau. Dr. Pan Chi-kin of the Observatory gave lectures on weather information services and the use of information technology in meteorology in a course organized by the WMO Regional Training Centre in Nanjing. Mr. Wong Wai-kin of the Observatory lectured on data assimilation technique in a training workshop on numerical weather prediction in the Thai Meteorological Department in Bangkok. Mr. Li Sun-wai of the Observatory delivered a series of lectures on public weather services in Tanzania of eastern Africa.

Moreover, Mr. Choy Boon-leung of the Observatory shared the Observatory's experience on participating in ICAO Universal Safety Oversight Audit Programme and the setting up of an ISO9000 certified quality management system on the provision of meteorological services for international air navigation with the Department of Meteorology and Air Navigation of Oman in Muscat.

Ms. Sandy Song and Mr. Shun Chi-ming of the Observatory co-authored an article entitled New Meteorological Services Supporting Air Traffic Management published in the Asia-Pacific (APAC) Regional Report, a periodical of the ICAO to highlight the progress and importance of MSTa in the development of new aviation meteorological services.

At the invitation of the World Bank, Mrs. Hilda Lam, Assistant Director of the Hong Kong Observatory, delivered a presentation on the early warning system in Hong Kong at the Asian Ministerial Conference on Disaster Risk Reduction Pre-Conference Workshop held in Incheon, Republic of Korea in October 2010.



Mrs. Hilda Lam, Assistant Director of the Hong Kong Observatory presenting the early warning system in Hong Kong at the Asian Ministerial Conference on Disaster Risk Reduction Pre-Conference Workshop

Mr. Chan Sai-tick of the Observatory, as a rapporteur of a group of international experts, compiled a report on “Operational Warning Strategies” and presented it at the 7th WMO International Workshop of Tropical Cyclones held in La Réunion, France in November 2010.

The Observatory hosted the Tropical Cyclone Best Track Consolidation Meeting convened by the ESCAP/WMO Typhoon Committee in 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.

## OUTLOOK FOR 2011-2012

In 2011-2012, the Observatory will continue to enrich the contents of its website in response to the evolving needs of the public and to further develop the delivery of weather services on mobile platforms. Added value services, with higher spatial and temporal resolution and tailored for different users will be pursued.

The Observatory will continue to enhance its weather service to the public, the aviation and marine community and to develop new products making use of up-to-date meteorological techniques and delivery channels.

The Observatory will plan the replacement of the aging Tate’s Cairn weather radar for monitoring severe weather.

The Observatory will continue to explore more weather observations over the south China coastal waters and the South China Sea through close cooperation with counterparts in China and other neighbouring countries. The availability of more observations can enhance the capability of weather forecasting, in particular for tropical cyclones.

The Observatory will continue to take forward the replacement and upgrading of the meteorological facilities for the airport to enhance the Observatory’s aviation weather services. This includes securing funding for constructing a station to house a new radar for windshear detection.

In the light of the experience gained during the Fukushima nuclear accident in Japan in March 2011, the Observatory will review and enhance its internal plan for nuclear emergency response. Radiation monitoring and assessment facilities will be improved to take advantage of technological advances. To prepare for the territory-wide Daya Bay Contingency Plan (DBCP) exercise scheduled in 2012, the Observatory will organise training on radiation monitoring and assessment, and conduct drills and exercises in conjunction with other government departments as well as the relevant Guangdong counterparts. Public education on radiation will also be strengthened.

The Observatory will participate in the Pacific-wide tsunami exercise organized by the Pacific Tsunami Warning and Mitigation System under the Intergovernmental Oceanographic Commission in November 2011. The Observatory will also promote public understanding of space weather and its effects, in view of the solar maximum in 2013.

The Observatory will continue to promote public awareness of, and preparedness for, natural disasters through various outreach activities and continuous development of educational resources. The Observatory will also continue to study as well as to promote public understanding of climate change in Hong Kong. Studies on the effect of weather on human health will also continue.