

THE ESCAP / WMO

Typhoon Committee

NEWSLETTER

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THIRTIETH TYPHOON COMMITTEE SESSION

Hong Kong, China, Nov 25-Dec 1, 1997

TC Member-countries gird for entry of biggest El Niño event



Participants in the 30th Typhoon Committee Session in Hong Kong, China.

Asian weather experts gathered for the first time in Hong Kong when this former British colony hosted the thirtieth annual session of the ESCAP/WMO Typhoon Committee, held from November 25 to December 1, 1997.

The week-long meeting, attended by representatives from TC Members and other organizations, drew up measures on how to mitigate the worst effects of the biggest El Niño phenomenon in 15 years. The gathering also discussed the proposal for a new system of naming tropical cyclones in the region.

Opening the session, S.K. Ip, Secretary for Economic Services of the Government of Hong Kong Special Administrative Region, told the gathering that apart from the historic handover to China, 1997 also saw the wettest year ever recorded in Hong Kong but with good infrastructure and adequate emergency response, extensive casualties and damage had been avoided.

H. K. Lam, Director of the Hong Kong Observatory, in a message said that with thirty tropical cyclones on the average forming an-

nually over the western North Pacific and South China Sea, the Typhoon Committee, as a regional body has achieved remarkable progress in the promotion and coordination of international efforts to mitigate damages caused by typhoons.

Addressing the session, Eisa H. Al-Majed, Representative of the World Meteorological Organization (WMO), complimented the Committee for thirty years of hard work since its establishment which had been rewarded by significant achievements. Nevertheless, he said there was a need for more effective warnings with increased reliability and lead time, to allow for improved response by the public so as to reduce further the loss of life and property. He added that closer interaction between the National Meteorological and Hydrological Services (NMHSs) and the national agencies concerned with disaster prevention and preparedness was an area that needed to be further strengthened.

The session, noting with concern the abnormal weather patterns and characteristics of typhoons in 1997 as ominous signs of the arrival of the El Niño event, urged the Members to strengthen their capabilities to advise their government on national and regional climate impacts associated with the phenomenon. The session agreed that the experiences of the Members in relation to the El Niño be pooled in a comprehensive information campaign using fast telecommunication facilities.

The Members of the Committee were also urged to step up their efforts in studying short-term climatic fluctuations associated with El Niño and in enhancing their capabilities and coordination in respect to the forecasts and warnings of related disastrous weather conditions. The Members cited the need to

conduct statistical studies to evaluate the impact of El Niño in both meteorological and human-related terms, and to learn from case studies of past El Niño events particularly with regard to the response of governments and the community.

The meeting also discussed the proposal of giving Asian names to Asian typhoons under a proposal to end the use of American or European names and give the storms a more Asian identity when they hit the Asia-Pacific region. The Committee's TRCG (Typhoon Research Coordinating Group) was tasked to work out details of the scheme in consultation with members so that a list of recommended names could be presented in the next session of the Committee.

The session requested the member-countries to provide tropical cyclone passage report through the Typhoon Committee Secretariat (TCS) a day after cyclone passage for distribution to other members. Likewise, it endorsed the request of the WMO Executive Council for the Tropical Cyclone RSMC's to supply the first level basic information covering the tropical cyclone's present and forecast movement and intensity to the international media, where a clearly defined source of reliable information was needed, and for the centres to establish Internet access.

As this developed, Viet Nam requested for experts assistance from other members to help improve their national Hydrological Service under the programme of Technical Cooperation among Developing Countries (TCDC). The member-countries were also urged to establish a homepage of their national hydrological services similar to the homepages of the NMHSs of some TC members.

Meanwhile, the Korea Meteorological Administration (KMA) announced that it's extending assistance to the development programmes of other members through the utilization of the overseas-aid program organized by the Korea International Cooperation Agency (KOICA). The KOICA carries out a survey for implementation of aid projects annually through Korea's diplomatic offices abroad. The KMA advised those interested to get in touch with the Korean Embassy in their country.

The session noted WMO's approval of the regional project-proposal *Integrated System for the Mitigation of Typhoon, Flood and Environmental Disasters in the Western North Pacific Area* with the active participation of the Economic and Social Commission for Asia and the Pacific (ESCAP). It also noted the *International Training Course on Satellite Meteorology* set for September-October 1998 in Nanjing, China.

The Members agreed to support the South China Sea Monsoon Experiment (SCSMEX), the field phase of which is scheduled to take place in 1998. In line with this activity, the Republic of Korea reported it would undertake an intensive Korea Monsoon Experiment in association with SCSMEX during the same period.

The session gave its nod to the holding of a special annual session to commemorate the year 2000. A hitch developed, though, when no member offered to host the next session of the Committee. It seemed that none of the Members, except for the Republic of Korea which will host the session in 1999, were too keen on making a commitment at a time when they were weathering a financial crisis in the region.

ESCAP/WMO Typhoon Committee Natural Disaster Prevention Award

Lam wins '97 award from Committee's Foundation



Dr. H.K. Lam holds the Typhoon Committee Natural Disaster Prevention Award for 1997 presented by TCS Coordinator Roman Kintanar.



Honorable Mention citation for the 1997 TC prize was given to Bernard Lam Moon-tim.



Awardees Lam and Moon-tim pose with (from left) Eisa H. Al-Majed, WMO Representative; Guangchang Shi, ESCAP Representative; S.K. Ip, JP, Secretary for Economic Services of the HK Special Administrative Region; Roman Kintanar, TCS Coordinator and TCFI Chairman and Prof. Ng Ching-fai.

H. K. Lam, Director of the Hong Kong Observatory, was named winner of the 1997 Typhoon Committee Natural Disaster Prevention Award. Lam received the award in ceremonies held during the opening of the 30th Session of the Typhoon Committee in Hong Kong, China.

Lam won the \$3,000 cash award and plaque that accompany the prize. He was the eighth recipient of the award chosen after careful deliberation by a four-man Selection Committee especially created by the Observatory to pick the 1997 winner. An honorable mention citation was given to Bernard Lam Moon-tim, Director of the Hong Kong Civil Engineering Department.

"In recognition of his meritorious service as Director of the Hong Kong Observatory, and of his invaluable contributions in the department's essential operational systems characterized by significant advances in technology in remote sensing and computing, paving the way for the development of more refined and diversified warning and forecasting services," read the citation on the award presented to Lam by Dr. Roman L. Kintanar, Chairman of TCFI.

Moon-tim was cited for his outstanding services as Director of Civil Engineering Department, and of his distinctive contribution in the development of geotechnical control programme which minimized annual loss of life and disruption to community due to landslides.

The Annual Prize was created by the Typhoon Committee Foundation, Inc. (TCFI) in 1989 with the objective of promoting greater awareness on disaster prevention and preparedness measures among the peoples of the Asia-Pacific region.

T C h a n g e s

Wen is new CMA administrator



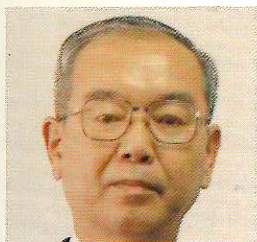
Mr. Wen Kegang

Mr. Wen Kegang succeeded Mr. Zou Jingmeng as Administrator of China Meteorological Administration (CMA) in August 1996. Wen, 61, joined the Meteorological Bureau of Shanxi Province after graduating in Geophysics from Beijing University in 1962. He gradually rose from the ranks as Senior Meteorologist, Deputy Director and Director-General (1983) in the Bureau. In August 1985, he was appointed Deputy Administrator of CMA.

Wen has played a leading role in numerous scientific and technological projects of CMA like the preparation of the China Meteorological Modernization Plan, a significant contribution in the development of China's meteorological services. He is a member of the Association of Authors on Popular Science and the Standing Council of the Chinese Meteorological Society. He has authored several books in meteorology.

In other fields, Wen has been an active member of the 8th National Committee of the Chinese People's Political Consultative Conference (1993-1998) and is now a member of the 9th National Committee.

JMA names new head



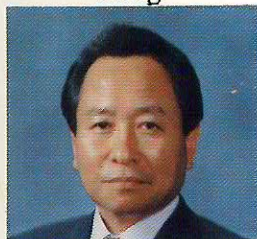
Mr. Yuso Takigawa

Mr. Yuso Takigawa was designated new Director-General of the Japan Meteorological Agency (JMA) on April 1, 1998, succeeding Mr. Toshiyuki Ono. Prior to his designation, Takigawa was head of the Observations Department from 1995 to 1996, and the Forecast Department, 1996-1998.

Mr. Takigawa, 59, holds a BSc in physics from the University of Tokyo. He started his career as a meteorologist at Tokyo Aviation Weather Service Center in 1963. He was a visiting scientist at the National Center for Atmospheric Research (NCAR) of USA for the study of global data analysis from 1967-68.

In 1982 and 1983, Takigawa was a participant in the International Experiment Center of the first and second experiments of the Typhoon Operational Experiment (TOPEX). He is not a novice when it comes to Typhoon Committee (TC) affairs having been assigned in 1985 at the WMO Secretariat as a seconded expert on the regional cooperation programme for the TC.

Moon succeeds Bong



Dr. Sung-Eui Moon

Dr. Sung-Eui Moon, 55, was named Administrator of the Korea Meteorological Administration (KMA) and Permanent Representative of the Republic of Korea with WMO on 28 July 1997 taking over from Dr. Jon-Hon Bong.

Dr. Moon holds a B.Sc. and M.Sc. degrees in Atmospheric Science from the Seoul National University and finished his D.Sc. degree from Tsukuba University in Japan. Before his appointment at KMA, he was a professor at the Department of Atmospheric Sciences of Pusan National University since 1972, and served as acting Dean of the College of Natural Sciences from 1991 to 1992.

Dr. Moon started his meteorological career as a weather forecasting officer at the Korean Air Forces in 1966. He was a visiting professor at the Department of Atmospheric Sciences of Oregon State University between 1985-1986. He served as Secretary-General of the Korea Environmental Sciences Society (1992-94) and as Chairman of the Professorate Association of Korea National and Public Universities (1994-95). He is also Vice-Chairman of the Korea Monsoon Study Panel and a member of Scientific Committee on Problem of International Environment since 1995.

As a scientist, Dr. Moon has written various research papers and educational publications for students in the fields of meteorology and environment. He received an academic award from the Korea Environmental Sciences Society in 1997. As new administrator of KMA, he has worked for the establishment of the Meteorological College of KMA.

Ruangis named TMD head



Mr. Manun Ruangis

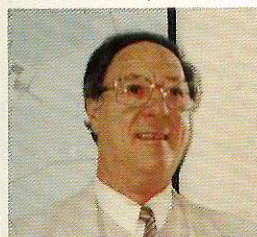
Mr. Manun Ruangis, 59, was tapped as Director-General of Thailand Meteorological Department (TMD) last year succeeding Mr. Smith Tumsaroch.

Mr. Ruangis obtained his post-graduate diploma in Economic Development from the National Institute of Development Administration of Thailand after finishing a Bachelor of Economics degree from the Thammasat University.

He was conferred the Knight Grand Cordon (special Class) of the Most Exalted Order of the White Elephant, the highest Royal decoration for a civil service official.

Mr. Ruangis served as Deputy Permanent Secretary (1995-1997) and Inspector-General (1989-1995) at the Ministry of Transport and Communications. He was Deputy Director-General of TMD from 1984 to 1989.

Malheiro, former MMGS head, dies at 65



Dr. Antonio Pedro F. da Costa Malheiro
(1933-1998)

Dr. Antonio Pedro F. da Costa Malheiro, former director of the Macau Meteorological and Geophysical Services (MMGS), died after suffering from a lingering illness on 28 January 1998. He was 65.

Dr. Costa Malheiro, born 16 July 1933, was the director of MMGS for five progressive years (1991-1996) before his return to Portugal to act as president of the Portuguese Institute of Meteorology. It was under his dynamic leadership that the MMGS attained significant progress and development.

He was regarded as the architect of Macau's entry into the Typhoon Committee (TC) body in 1992. He was also responsible for their successful hosting of the twenty-seventh TC session in 1994.

As president of the Institute of Meteorology, Malheiro headed the Instruction and Training Division and the Weather Analysis and Forecast Division. He was also the president of CRIA, an agency related to climate and atmospheric environment which involved the meteorological institutions of Portugal, African Portuguese Speaking Countries and the territory of Macau.

Dr. Costa Malheiro taught Meteorology in Federal University of Rio de Janeiro (1967-1973) as a WMO training expert. He became a very popular weatherman in Portuguese television. He will be remembered with great fondness by his wife and family as all his friends and colleagues who knew him in the Committee will.

CHINA

Study Tour II for typhoon experts



The members of the study tour group pose with CMA officials led by Deputy Administrator Yan Hong (8th from left), with Robert Landis (7th from left), Director of the World Weather Watch Department, Somsri Huntrakul (9th from left), Programme Director of the Panel's TSU, and Peter Rogers (5th from right), Honorary Technical Adviser for TSU.

A second roving study tour for tropical cyclone forecasters was successfully organized by the China Meteorological Administration (CMA) from March 23 to April 2, 1998. Participants from seven members of the Panel on Tropical Cyclones (PTC) visited Guangzhou, Shanghai and Beijing where they met and exchanged experience in forecasting with their counterparts from CMA.

The visiting experts made a tour of meteorological facilities in the cities and provinces and gave presentations on tropical cyclone forecasting. They showed great interest in CMA's development and technical advance such as the small-scale Geostationary Meteorological Satellite Ground Station System, AFDOS system and the newly-installed WSR88D Doppler Radar. They expressed their desire to get support from CMA in various aspects including technology transfer, personnel training and supply of instrument.

The study tour, conducted at the request of PTC, was similar to the one organized for members of the Typhoon Committee in December 1996. It served as China's contribution to the WMO Voluntary Cooperation Programme with the objective of enhancing the application of recent studies in tropical cyclone forecast.

Mr. Yan Hong, CMA Deputy Administrator, said they will do their best to help Panel Members develop their meteorological services even though China is also a developing country. He added that cooperation between CMA and the Panel Members has a great potential and maybe carried out through the WMO's VCP (Voluntary Cooperation Programme), government or commercial channels.

Fourth IWTC in Haikou

The fourth WMO/ICSU International Workshop on Tropical Cyclones (IWTC-IV) was held at the Golden Coast Lawton Hotel, in Haikou, China, from 21-30 April 1998. The workshop was preceded by the Expert Meeting on Tropical Cyclones (Operational Aspects) on 20 April.

The workshop, attended by 116 participants, was organized as part of the WMO Tropical Meteorology Research Programme in collaboration with the WMO Tropical Cyclone Programme and closely coordinated with the International Council of Scientific Unions (ICSU) as one of the major activities contributing to the demonstration project *Tropical Cyclone Disasters* for the International Decade for Natural Disaster Reduction (IDNDR).

The objectives of the workshop were to update forecasters and researchers on the latest developments and technology on tropical cyclone forecasting and warning, and to identify priorities and opportunities for basic and applied research, and for acquiring observations.

An International Committee was created to oversee preparations for the workshop and to follow up related tasks composed of Dr. Gary Foley (Chairman), Prof. Chen Lianshou (Co-chairman) research and forecasting experts including representatives of TCP regional bodies and a representative of ICSU.



Working lunch hosted by Mr. Yan Hong, CMA Dep. Administrator, for the 4th IWTC participants where they deliberated on a special TRCG meeting in Beijing, China to hasten the preparation of the report on Asian Typhoon names.



Group photo of the participants to the Fourth WMO/ICSU Int'l. Workshop on Tropical Cyclones in Haikou, China.

HONGKONG, CHINA

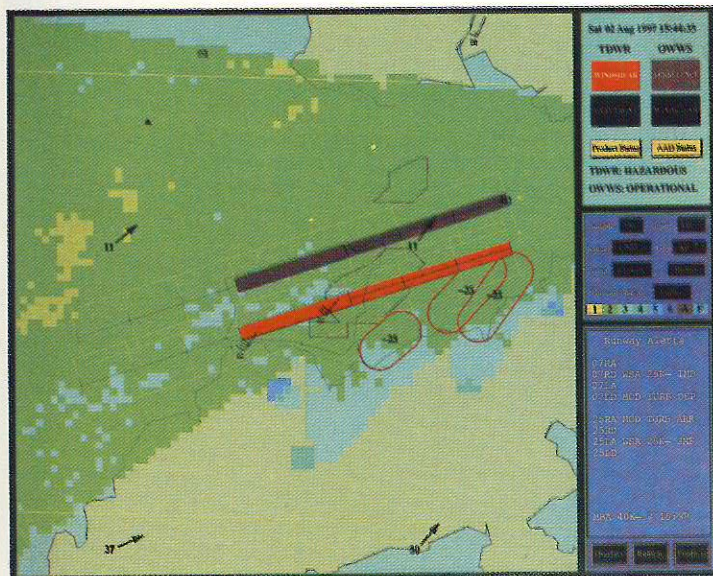
Warning system for the new HK Int'l Airport

A Windshear and Turbulence Warning System (WTWS) was installed for operation middle of 1997 at the new Hong Kong International Airport in Chek Lap Kok, built on reclaimed land off Lantau island, in time for its opening in July 1998. The warning system was developed to detect low level windshear and turbulence in the vicinity of the new HK airport strengthening flight safety measures in the terminal area.

The project to implement WTWS was started in 1993 with a feasibility study to design and construct the system. The results of the study coupled with feedback from air traffic controllers, airlines, pilots and aviation forecasters were used to design the system.

Inputs to WTWS include wind data from anemometers and wind profilers, as well as data from the Terminal Doppler Weather Radar (TDWR) in Tai Lam Chung. The system generates one set of windshear and turbulence estimates over the arrival and departure areas of the new airport from each of the input data types. An integrated detection algorithm is used to give a coherent alert based on all data sources. The alerts from TDWR and WTWS will then be prioritized and an alert will be generated for the most significant event.

The windshear and turbulence alerts are displayed for air traffic controllers in textual format on alphanumeric displays. The geographical distribution of windshear and turbulence over a larger area around the airport is displayed on user-friendly geographical situation displays for air traffic control supervisors and aviation forecasters.



A geographical situation display showing impact of windshear and turbulence on the runway corridor during passage of typhoon Victor on 2 August 1997.



Locations of meteorological sensors near new airport.

A Doppler radar in HK's highest peak

A new advance Doppler weather radar is set to be installed at a radar station being constructed in Tai Mo Shan, the highest peak in Hong Kong. The radar will be set up in October and its full operation is expected in early 1999.

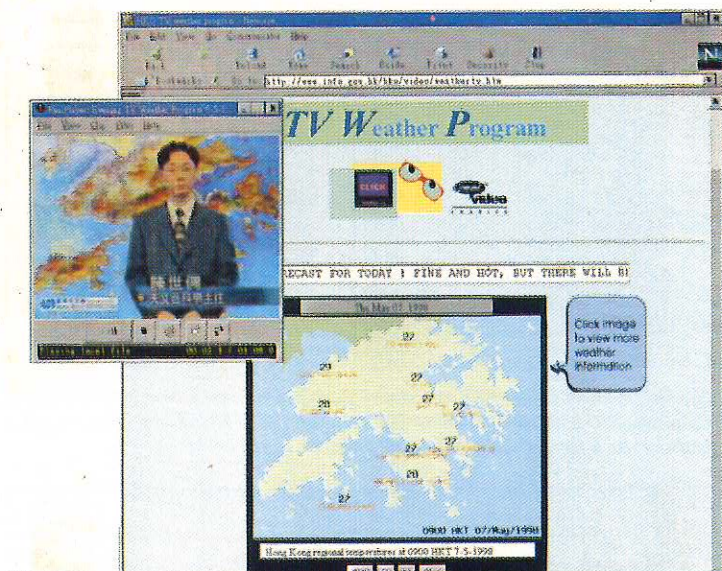
A new era in HK-TV weather service

Television weather service in Hong Kong has entered a new era with the launching of TV weather programmes on the Internet by the Hong Kong Observatory in April 1998.

There has been a long history of close cooperation between the Hong Kong Observatory and local television companies in the production of weather programmes. Decades ago, the Observatory staff prepared and provided scripts, weather charts and briefings to support the presenters of TV companies.

Rapid social development in the early 1980s resulted in an increased demand for more details and explanation on weather forecast and weather phenomena. To meet this challenge, professional meteorologists from the Observatory started making regular appearances on TV in the late 80s.

Early programmes presented by the meteorologists were made in television stations with very limited visual aids. In the mid-nineties, a studio dedicated to television presentations came into operation at the Observatory's headquarters. At present, both regular TV weather programmes presented by the staff and special briefings during severe weather situations are conducted inside the studio and transmitted to the TV stations via optical fibres. With the help of state-of-the-



art computer graphics system and chroma-key technique, meteorologists in the studio are able to present quality graphics and lively movie loops of weather sequences captured by the satellite and radar.

The increasing popularity of the Internet in recent years has opened yet another opportunity enabling weather information to be readily accessible by users the world over. The Observatory launched the TV Weather on the Net on April 16, 1998, one of the first in the world to make TV weather programmes available on the Net.

Observatory TV weather program (in Cantonese) through <http://www.weather.gov.hk/> between 1030UTC and 1600UTC Monday to Friday.

Information Inquiry System put in operation

The Hong Kong Observatory introduced in April 1998 a round-the-clock automated Information Inquiry System to meet the increasing demand from the public for weather and other geophysical information. The System provides information in English, Cantonese or Putonghua, such as local weather forecasts of up to 4 days-in-advance, weather for cities overseas, sunrise, sunset, tide, HK's standard time and climate.

The inquiry system answers all questions in meteorology and seismology as explained in layman terms. The system requires minimal human intervention as the people can select the info of their choice through a tone dialing phone. The information is captured directly from the Observatory's main computer and other equipment, and then converted into human voice. The system has been handling an average of about two thousand calls per day since its inception.



Monitor workstation indicates the operational status of the system.

MACAU

SMG uses MM5 for numerical weather prediction

The Fifth-Generation NCAR/Penn State Mesoscale Model (MM5) is used by the Servicos Meteorologicos e Geofisicos de Macau (SMG) for numerical weather prediction in Macau. MM5 is a limited-area hydrostatic or nonhydrostatic, sigma-coordinate model designed to simulate or predict mesoscale and regional-scale atmospheric circulation. It has been used for studies including applications of both predictive simulation and four-dimensional data assimilation to weather system in Macau. The model allows for multiple levels of nesting for cases involving scale interaction.

Program functions

The model MM5 is supported by several auxiliary programs, which are referred to collectively as the MM5 modeling system, their functions are as follows:

TERRAIN — Define model domain and map projection; generate terrain and land use category data on model grids.

- DATAGRID** — Generate first-guess fields on model grids from a large-scale model dataset; calculate map-scale factors and Coriolis parameter for the model.
- RAWINS** — Perform objective analysis; blend first-guess fields with radiosonde and surface observations.
- INTERP** — Interpolate pressure-level data from either RAWINS or DATAGRID to model's coordinate.
- GRAPH** — Display outputs from each modeling system component.
- MM5** — Perform time integration.

Hardware

SGI Origin 200

FPU: MIPS R10010 Floating Point Chip

CPU: MIP R10000 Processor Chip

2x180 MHz IP27 Processors

Main memory size: 192 Mbytes

Secondary unified instruction data/cache size: 1 Mbyte

Visualization program

A software visualization tool is used to generate the images called Vis5D

Application of case study

MM5 Typhoon Visualization

Topic: A case of a typhoon land off the South China Coastal area

Time: (1200 UTC 26 Jun —0000 UTC 29 Jun 1993)

This is a case of a typhoon simulated by the Penn State/NCAR numerical model, MM5. The images were generated by Vis5D, and showed the structure and evolution of the typhoon.

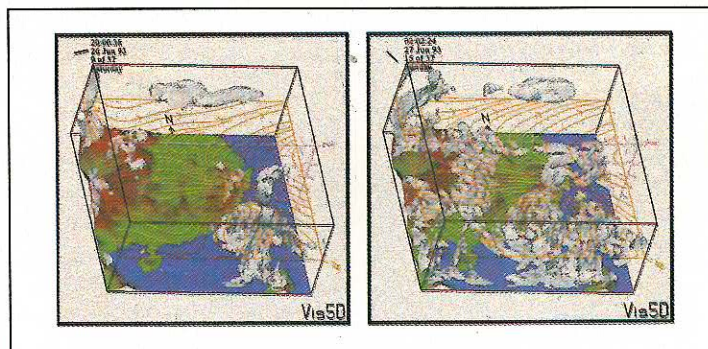
This is a typical case of a typhoon which originated west of Pacific Ocean and intensified rapidly when it moved to the South China Coastal Area.

The cloud system rapidly developed from 0000 UTC 26-Jun to 0200 UTC 27 Jun-93 and a typical 'comma-shaped' was generated by this typhoon when it approached Macau. From the characteristics of the streamline trajectories, it was apparent that the eye of the typhoon was quite near Macau. Powerful winds and torrential precipitation associated with the storm caused severe weather in Macau and South China.

Conclusion:

For the entire simulation, about 10 hours data processing time is needed for a 48-hour forecast. Since the model is designed primarily for research applications, continued modification and development is necessary.

MM5 will be used for research studies, including applications of both predictive simulation and four-dimensional data assimilation to rainstorms, monsoons and typhoons in Macau. On the smaller meso-beta and meso-gamma scales (2-200km), it will be used specifically for studies involving mesoscale convective system, fronts and land-sea breeze, etc. A higher speed power computer is also being considered to shorten the processing time.



(Above) Images showing a system of clouds and streamline on the level of 700 hpa. and a vertical cross-section of winds over Macau for observing the typhoon as it landed off the coastal area.

World Met Day '98 marked

The SMG in Taipa Island opened its headquarters to the public to mark its two-day celebration of World Meteorological Day (WMD) last March 22-23. Macau has always actively supported and participated in the activities of WMD under the auspices of WMO. The SMG staff conducted demonstration, exhibits, discussion and a photo contest focusing on this year's theme *Weather, Oceans and Human Activity*.

Eng. Alves de Paula, the Under-Secretary for Transportation and Public Works, graced the inauguration ceremony of the Weather Inquiry System, a computerized system which will provide daily weather forecast by telephone and fax upon request. The Under-Secretary in a message expressed his concern on the problems related to our oceans and reiterated their government support to the SMG activities.

A new SMG home page, accessed through <http://www.smg.gov.mo/>, was also introduced during the occasion which was attended by members of the Portuguese and Chinese media. Finally, dinner was served for the staff and guests and prizes were handed out for the winning photo entries, capping the activities.



Photo entries (clockwise) depicting the WMD theme "Weather, Oceans and Human Activity" copped first, second and third prizes, respectively.



Dr. Olavo Rasquinho (2nd from right), SMG Director, and Guest of Honor, Eng. Alves de Paula (center), led the opening of the WMD affair.

REPUBLIC OF KOREA

Joint Meeting on Seasonal Monsoon Prediction held

A Joint Meeting on Seasonal Prediction of the East Asian Monsoon of weather forecasters from China, Japan and Korea was held at the Headquarters of KMA from 21 to 22 May 1998, organized and sponsored by KMA.

The objectives of the meeting were to exchange views on the evolution of the East Asian summer monsoon in this unusual El Niño year, and to share experience and technologies on long-range weather forecasting, particularly the seasonal prediction of the East Asian summer monsoon. Experts from the China Meteorological Administration (CMA), the Japan Meteorological Agency (JMA) and KMA took part in the meeting where they gave presentations on unusual weather events and natural disasters, and the impact of El Niño on the regional climate over East Asia during the period from 1997 to 1998.

The perspective of the current El Niño and long-range weather forecasting of temperature, precipitation and rainy season; and typhoon behavior during the 1998 summer season were major areas discussed. The meeting was successful and of great help to the three Services' participants to better understand the operational seasonal prediction of the East Asian monsoon. The papers presented were published and distributed to persons and organizations concerned.



(Top photo) Participants in the joint meeting pose in front of the KMA headquarters. (Above) East Asian forecasters address concerns on monsoon prediction in their region.

Application of Neural Network on Typhoon Intensity Prediction

One of the challenges of weather forecasting is how to reduce errors in typhoon track forecasting. This can be done by incorporating ensembles of typhoon track forecasts from various numerical weather prediction (NWP) models. The KMA is currently running four dynamic NWP models for typhoon track forecasting namely, the Korea Typhoon Model (KTM), the Geophysical Fluid Dynamic Korea (GFDK) model, the Global Data Assimilation Prediction System (GDAPS, T106L21) and the Barotropic Adaptive-grid Typhoon System (BATS). The forecast performance of typhoon intensity is presently under examination with the GFDK typhoon model.

In addition, KMA plans to apply neural network on tropical cyclone intensity prediction. This was developed by two Korean scientists (Prof. Jong-jin Baik and Mr. Hong-sup Hwang of the Kwangju Institute of Science and Technology) for an operational purpose from this year's typhoon season. The neural network model predicts typhoon track and intensity at the intervals of 12hr, 24hr, 36hr, 48hr and 60hr using the standard back-propagation neural network. The data used to construct neural network contain a 37-year sample of northwestern Pacific typhoons from 1960 to 1996 and eight climatology and persistence predictors are considered. The percent of variance explained by the neural network model is consistently larger than that explained by the regression model at all time intervals with an average difference of 12%. The average intensity prediction errors from the neural network model are 10-16% smaller than those from the regression model, except at 12hr where the errors are nearly equal.

KMA's improved Meteorological Satellite Receiving and Analyzing System

Additional reception of images from the GMS-5 new channel (watervapor channel) and the provision of grid data for the operation of NWP models have necessitated KMA to further upgrade its existing satellite receiving and analyzing system installed in 1989. KMA has set up an overall plan to improve the system. As a first step, a new computer system was installed in May. This will be followed by the replacement of the receiving system and workstations with new ones scheduled this August.

The improvement of the satellite image receiving and analyzing capacity will enable KMA to transmit satellite data faster to its local weather offices, that is, within 10 minutes. It is also expected that the operation of the system will improve the accuracy of the temperature and humidity profile over sea in the vicinity of the Korean peninsula, and provide the input data for NWP model promptly and accurately.

KMA's Videoconference System

The Korea Meteorological Administration (KMA) started operation of its Video-conference system, model Picture Tel's Montage 570 MCU, on 10 December 1997. The videoconference system, operated under the KMA's high-speed telecommunication network, is a multipurpose image conference system that enables the KMA to have simultaneous tele-conference among the different meteorological offices, remote education and real-time monitoring of local weather conditions. Six regional Meteorological Offices, including KMA Headquarters, are linked with each other under the system, making possible for weather forecasters of each Office to simultaneously have weather discussion and seminar.

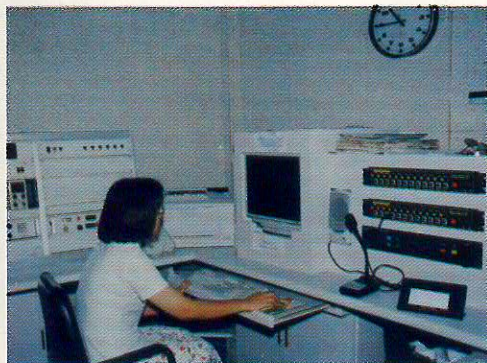
Currently operational T1 telecommunication lines are being served for the system at 384 kbps videoconference bandwidth capable of implementing over 30 frames per second. Using the videoconference system, discussion on weather conditions and forecasts between the Offices is made five times daily. It allows KMA forecasters to cope with the rapidly changing weather conditions. The system has replaced weather discussion via telephone among KMA forecasters. The image and screen on the videoconference system permit visual exchange of various weather briefing materials, enabling forecasters to easily and quickly reach consensus on weather forecasting.

Other benefits in using the system are an increased opportunity for KMA staff to participate in national on-the-job training seminar, and the reduction of cost for many travels over the country for meetings with other businesses. The system can also be used for the monitoring of remote weather conditions on seas and high mountains in real time. It is now possible to watch heavy snowfall from Daegwanryeong (high land) or waves on Cheju Island from the KMA Headquarters in Seoul which is almost 200 - 400 km away.



KMA weather forecasters hold meetings greatly aided by the use of the video conference system

THAILAND



Bangkok VOLMET system

TMD installs VOLMET

The Thai Meteorological Department (TMD) installed and started operation of the Automatic Aviation Broadcasting System (Bangkok VOLMET). Meteorological information for aviation (weather forecasts and warnings for international air routes), as well as weather information for aerodrome are sent for air-traffic purposes via the VOLMET system through the Aeronautical Fixed Telecommunication Network (AFTN).

An Automatic Broadcasting System for shipping also began operation. Weather forecasts and tropical cyclone warnings for the high seas are issued from the TMD headquarters in Bangkok via the Bangkok coastal radio station (HSA, HSS) for the areas covered by the Gulp of Thailand, west of Southern Thailand, Strait of Malacca and the South China Sea.

Int'l Expert Meeting on Participation of Women in Meteorology and Hydrology

Female meteorologists and hydrologists from member-countries of the Typhoon Committee attended the International Expert Meeting on Participation of Women in Meteorology and Hydrology held in Bangkok from 15-19 December 1997.

Organized by WMO and co-sponsored by the Government of Thailand and TC, the expert meeting tackled the evolving role that women have played in the development of meteorology or hydrology as a science and examined specifically the involvement of women in top professional or managerial levels in National Meteorological and Hydrological Services (NMHSs). It included scientific and technical lectures and special topics related to senior career development in meteorology and hydrology.

The expert meeting which aimed to encourage women to choose meteorology, climatology and/or hydrology as a profession, sought to further complement recent international activities undertaken to push for the creation of equal opportunities for women to attain senior positions in their chosen profession.



Female forecasters from TC Members attending the conference gladly pose for this group photo.

Shrimp culture hit by El Niño

Shrimp farming in most of southern Thailand was adversely affected as early as January by the outbreak of a large number of jelly fish believed to have been triggered by the effects of the El Niño weather currently sweeping the Asia-Pacific region. Jelly fish is known to be associated with the red disease organisms harmful to Thai cultured shrimp production.

PHILIPPINES

Training seminar for instructors of RAs II & V held

The Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) hosted the 1997 WMO Regional Training Seminar for National Instructors of Regional Associations (RAs) II and V for the second time since 1976. The seminar attracted more than a hundred participants including 19 fellows from 20 countries in Asia.

Among the prominent officials invited on opening day were WMO Directors G. Necco of the Education and Training Department and R. de Guzman of the Technical Cooperation Department.

The objectives of the seminar were to promote efficient standards of training and the uniformity of instruction of meteorological personnel. Foreign experts lectured on recent significant developments in meteorology and related fields.



Guest-officials and national instructors in the WMO training seminar.

Kintanar in WMO mission, tech conference

Dr. Roman L. Kintanar, TCS Coordinator, in his capacity as WMO consultant, completed his mission to Asian countries related to the proposal for the Project "Integrated System for the Mitigation of Typhoon, Flood and Environmental Disasters in the Western North Pacific Area" (RAS/92076). From March to May 1998, Kintanar visited key cities of Kuala Lumpur, Jakarta, Bangkok, Hanoi and Beijing and presented to officials of Meteorological Services the present status and development phase for the execution of the project document.

Kintanar's WMO Mission closely followed his participation at the Second WMO Technical Conference on Management of Meteorological/Hydrometeorological Services in Regional Association II held in Macau, 4-8 November 1997, in which he lectured on the topic "Relation Among NMHSs, External Scientific Institutions and other Government Ministries."

The goals of the Mission were to make an economic appraisal of the feasibility of the implementation of the WMO Project, solicit the opinion of the Permanent Representatives for the timing and economical environment for the execution of the feasibility study, and to obtain approval and support from the National Planning Agencies.

The WMO Project aims to upgrade the facilities of the national Meteorological and Hydrological Services in the Western North Pacific region to improve the services to their communities with a view to minimizing the loss of life and property resulting from severe weather disturbances.

In a related development, WMO is organizing a workshop, set in Manila, from 30 November to 1 December 1998, for the purpose of exchanging views on the details of the project between the recipient countries, experts and the financing institutions.

Abe visits TCS

Mr. Katsuhiko Abe, Chief of WMO's Tropical Cyclone Programme (TCP) Division, visited the staff of the Typhoon Committee Secretariat (TCS) in Quezon City, Philippines on March 6, 1998.

Prior to his trip in Manila, Abe participated in an experts' meeting on storm surge project proposal for the Bay of Bengal and the Arabian Sea held in New Delhi (2-6 February) and attended the 25th session of the Panel on Tropical Cyclones in Dhaka (24 Feb-2 Mar). He also visited the Singapore Meteorological Service on his way to Manila.

His first activity in the morning was to meet with the TCS support staff and a brief tour of the Secretariat's offices. He later conferred with the TCS officials on the planned and on-going activities of the Secretariat after briefing them on TCP matters relevant to the Typhoon Committee. Mr. Abe also discussed with Mr. Han-Se Lee, TCS Hydrologist from the Republic of Korea the preparation of project proposals for future activities under the hydrological component.



Mr. Abe (right), Chief of TCP, during his meeting with Ms. Lomarda, TCS Meteorologist, and Mr. Lee, TCS Hydrologist.

TC opens website

With electronic communications now fast becoming a part of daily life, the TCS recognized the value of informing the public about the Typhoon Committee (TC) and its activities through the Internet.

The TC, now on its 30th year, joined the growing list of organizations that are on the Internet when it recently opened its website - www.philonline.com/~tcs.

The website features everything you would want to know about the TC. It was developed with the assistance of the Singapore Meteorological Service staff. The information and graphic design considered an interactive application that is, usable, easily navigable and compelling enough to encourage return visits.

JAPAN

Int'l training seminar on typhoon monitoring and forecasting in the western North Pacific held

An international training seminar on typhoon monitoring and forecasting in the western North Pacific was held in Tokyo, Japan, from 12 to 30 January 1998 hosted by the Japan Meteorological Agency (JMA). The seminar, attended by five experts from the national Meteorological Services of China, Malaysia, Thailand, Viet Nam and the Philippines, aimed to support the Typhoon Committee Members in enhancing their typhoon monitoring and prediction technique.

The seminar focused on the methods of using surface/upper weather charts and satellite imagery on the computer to retrieve the results of numerical prediction of JMA via the Internet. The participants were taken to the local Meteorological Observatory in Kagoshima, a typhoon prone area. They also visited a prefectural office, an electric power supply and broadcasting company to discuss their operations relevant to typhoon forecasting.

A second seminar for the other Members of the Typhoon Committee is set in early 1999.



Group photo of the participants to the international training seminar.

RSMC Data Serving System

The JMA, as part of the activities of RSMC Tokyo-Typhoon Center, has been operating the RSMC Data Serving System (DSS) since 1995. The RSMC DSS provides Members of the Typhoon Committee with meteorological data and products through the Internet and/or Integrated Services Digital Network (ISDN).

In June 1998, upon the request from Members of the Committee, JMA put the following data on the system:

- 1) Digital GMS data (cloud amount, convective cloud amount and equivalent blackbody temperature);
 - 2) High density cloud motion vectors; and
 - 3) Analysis of tropical cyclones (position, intensity, etc.)
- and will provide GPMs of the JMA's Numerical Ocean Wave Prediction Model (wave height, period and direction) for the global area with the resolution of 2.5×2.5 degree by the summer of 1998

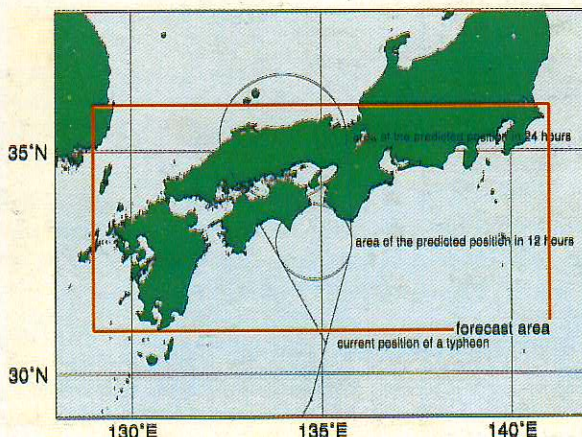
The data on RSMC DSS will be augmented upon users' request if possible. JMA continuously makes efforts to operate RSMC DSS more effectively with the cooperation of the Committee Members.

JMA operates Numerical Storm Surge Model

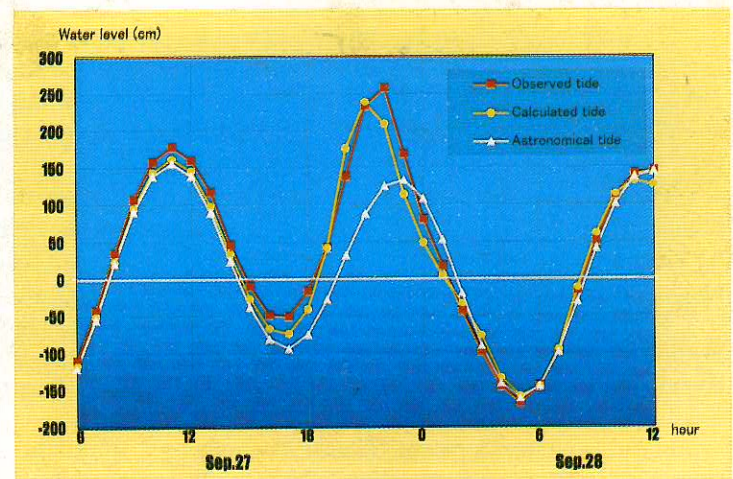
JMA started to operate a Numerical Storm Surge Model on July 1, 1998.

The model is a dynamical one with the horizontal spatial resolution of 1.6km. Its external forces are sea surface pressure and winds. Sea surface pressure and winds around the center of the typhoon are estimated by sea surface pressure distribution formula and the moving velocity of the typhoon.

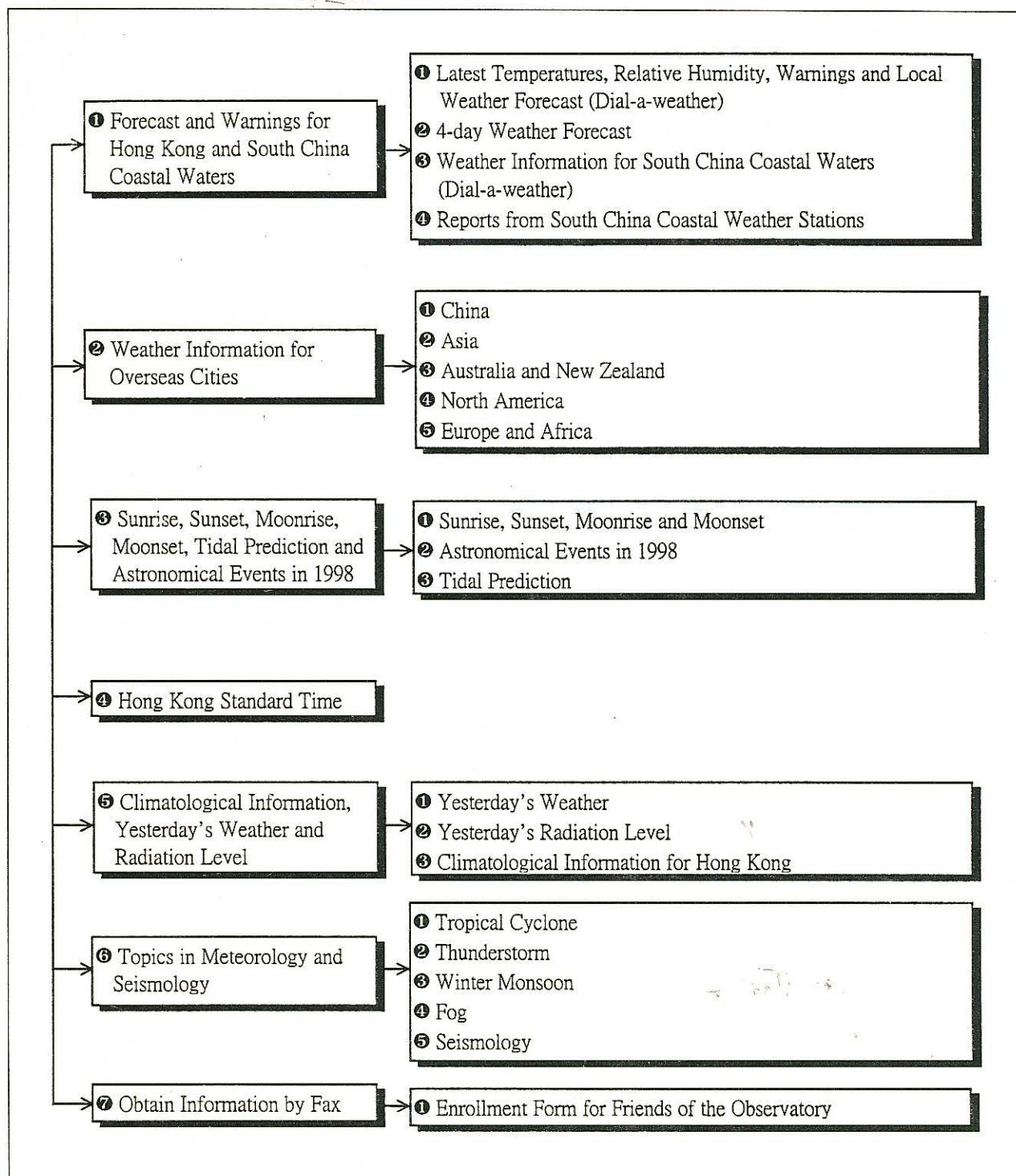
JMA provides the prediction data of sea level to local meteorological observatories 24 hours ahead, four times a day when a typhoon is approaching.



Coasts where severe storm surges often caused damages have been selected as the forecast area of the Numerical Storm Surge Model.



An example of the result of the simulation with the Numerical Storm Surge Model which demonstrates that simulated tides correspond well with the observed tides.



Information available through the Observatory Information Inquiry System.