THE ESCAP/WMO
Typhoon Committee
NEWSLETTER

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TC NEWSLETTER is a publication of the Typhoon Committee Secretariat, Manila, Philippines. The expressed opinions, scientific or otherwise, do not necessarily reflect those of the Committee. The Editor reserves the right to edit and will exert every effort to publish articles received. TC Members are enjoined to send their contributions. Articles must be of relevance to TC activities and should not exceed 1,500 words.

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27th Session of the Typhoon Committee in Macau

Participants at the 27th Session of the Typhoon Committee in Macau are welcomed by Mr. António Pedro F. da Costa Malheiro (holding white paper), Director of Macau Meteorological and Geophysical Services.

The Twenty-seventh Session of the ESCAP/WMO Typhoon Committee was held for the first time in Macau, a tiny colonial outpost located south-east of the coast of China, from December 6 to 12, 1994, with some 58 heads and representatives of weather services convening to pursue new ways of strengthening weather forecasting in Asia and the Pacific.

Joining host Macau at the week-long session, co-organized by the Economic and Social Commission for Asia and the Pacific (ESCAP), World Meteorological Organization (WMO) and Typhoon Committee Secretariat, were nine other Member-countries China, Cambodia, Hong Kong, Japan, Republic of Korea, Malaysia, the Philippines, Thailand and Viet Nam. Also in attendance were observers from Brunei Darussalam, Germany, USA, the International Civil Aviation (ICAO), International Commission for Atmosphere Sciences (CAS) and Secretariat of International Decade for Natural Disaster Reductior (IDNDR), Department of Humanitarian Affairs (DHA).

Addressing the session, Mr. António Pedro F. da Costa Malheiro, Director of the Macau Meteorological and Geophysical Services, underscored the importance of cooperation and coordination among Members in maintaining reliable forecasting and warning systems. He stressed that international assistance, both on regional and national basis, is necessary to sustain progress. He requested

for continued support from ESCAP, WMO and the United Nations Development Program (UNDP). He also informed the Committee of the significant progress achieved by his Service since becoming a Member two years ago.

Mr. Cengiz Ertuna, Representative of ESCAP, informed the session that ESCAP had cited the considerable progress achieved in the implementation of TC activities during its 50th Session held in New Delhi in April 1994. He said that at the 2nd Session of the ESCAP Committee on Environment and Sustainable Development, the Members were urged to incorporate action plans for national disaster reduction in disaster-prone areas in their over-all national development plans. He added that the ESCAP Committee had batted for the preparation of hazard maps and application of appropriate land-use planning and management measures for natural disaster mitigation and increased land productivity.

Mr. Ertuna also briefed Members of the Committee of ESCAP's activities on natural disaster reduction the past year even as he reported that project documents had been drafted to solicit extra-budgetary funds for further activities in this field. He gave assurance of ESCAP's continued undertaking of activities in support of the Typhoon Committee within the framework of its programme of activities and available resources.

Mr. Eisa H. Al-Majed, Director of Regional Office for Asia and the Southwest Pacific who represented WMO, said the forum would make a thorough review of past actions and achievements within the framework of WMO's Tropical Cyclone Programme, and formulate new strategies to further enhance the work of the Committee. He added that the 12th Congress of WMO in 1995 may adopt the section on the Tropical Cyclone Programme of the Fourth WMO long-term Plan for the decade 1996-2005.

Both ESCAP and WMO representatives expressed gratitude for Macau's hosting of the 27th TC Session and assured the Members of their organizations' continued support for the Committee.

In his message, Mr. Zou Jingmeng, President of WMO and Administrator of China Meteorological Administration, cited the growth in the membership of the TC Committee and how it turned to become one of the most active organizations in the ESCAP region. He also noted the great strides made by the Committee toward promoting and coordinating efforts to minimize typhoon damage in the region, citing in particular, the success of the projects- Typhoon Operational Experiment (TOPEX) and Special Experiment Concerning Typhoon Recurvature and Unusual Movement (SPECTRUM) which have contributed greatly to improved typhoon forecasts and warnings and reduced damages. He stressed the need for further efforts on prediction of typhoon movement as well as research and exchange of information on typhoon and flood forecasting.

OPENING RITES. A colorful Chinese dragon dance regales the delegates.

Mr. Jose Manuel Machado, Secretary of Transport and Public Works of Macau, said in his keynote speech that the economic growth and pattern of human settlements in developing countries were increasingly being linked to growing vulnerability to natural hazards and that environmental degradation was another factor exacerbating the impact of such natural phenomena. He added that the effects of natural hazards could be mitigated in the future if certain initiatives were undertaken to integrate disaster mitigation into development policy and if resources were provided for investing in measures to improve the forecasting, warning and response systems. He expressed hope that the Committee would continue to provide valuable support to the cause of world natural-hazard-reduction.

Elected as Chairman and Vice-Chairman, respectively, were Mr. Malheiro and Mr. Toshiyuki Ono of Japan.

In assessing, the Committee's performance in 1994, a common concern surfaced among the Members over the problem of inadequacy in the upper-air observation data. They cited the possible tapping of private clienteles which have benefited much from specialized meteorological services to share part of the high cost of producing such upper-air observation data.

The Members, recognizing the effectivity of television as a medium for dissemination of public information, especially among the youth, also came up with a plan to set up a scheme of collecting videotapes from countries in the region, showing public awareness and preparedness on typhoon and flood disasters which may be adapted for use by other Members. They urged WMO to consider the plan under its World Weather Watch Public Weather Service Program.

The Committee also approved on the need to develop partnership with other agencies, NGOs like the International Federation of Red Cross and Red Crescent Societies (IFRCS), and the private sector as a way of augmenting limited resources of weather service agencies to ensure an efficient distribution of hazard-awareness information and thereby enhance public response. With this approach, Members agreed, the expected sharing of expertise and resources among the agencies would lead to a consistent delivery of information to the general public.

The Members noted that ultimate preparedness would necessitate that all (disaster) response action groups and organizations work in strict unity and coordination, to include the conduct of seasonal drills, to guarantee that crucial warnings and messages are received by these groups and their actions smoothly implemented.

In a review of ESCAP's activities in 1994, the Committee lauded the Commission's continued support for its flood protection activities in the region even as it welcomed two new project-proposals- "Training workshops on flood risk

Heads and representatives read opening messages.

analysis and mapping" and "Natural hazard reduction and enhancement of production through effective land-use planning and practices" laid out for donor-funding assistance. Consultancy and advisory missions were also held in Nepal, Cambodia and Myanmar for the revived project- "Assessment of current preparedness programmes, forecasting systems and operational methods for water-related natural disaster reduction in the ESCAP region."

On its work on disaster prevention and preparedness, ESCAP presented an issue paper "Flood Loss Mitigation through Land Use Planning and Management" at the 2nd Session of the ESCAP Committee on Environment and Sustainable Development in October 1994.

The Commission has been providing advisory services on flood protection and drainage through its Regional Adviser on Water Resources. It said that Technical Cooperation among Developing Countries (TCDC) could be made available to support exchange of experts among developing countries in the fields of hydrology and disaster prevention and preparedness. The Committee welcomed the Commission's efforts to increase the manpower resources available to undertake work on natural disaster reduction, and appealed to donor countries and agencies to provide additional manpower and extrabudgetary funding support for implementation of activities on natural disaster reduction.

The Committee has noted the importance of TCDC as a means of promoting and strengthening collective self-reliance citing that a number of TCDC activities were carried out by some of its Members. They were urged to continue taking part in this important activity.

The Committee also cited the IDNDR project "Tropical Cyclone Disasters" of the WMO and the International Council of Scientific Union (ICSU) which involves research in the mechanisms and motions of tropical cyclones. Under the project is the development of the AEROSONDE, a small autonomous aircraft for tropical cyclone reconnaissance, which was recommended as initial major activity by the IDNDR Scientific and Technical Committee in New Delhi in 1993.

The Committee noted with interest that the Working Group of Rapporteurs on Tropical Meteorology Research (WGRTMR) is moving to establish a similar series of quadrennial monsoon workshops - "International Workshop on Monsoon Studies," following the successful format of the International Workshop on Tropical Cyclones (IWTC) series.

The Commission of Atmospheric Sciences (CAS) was also lauded by the Members for its initiatives on the recent IWTC III, revision of the Global View on Tropical Cyclones, development of the forecast guide, and the aerosonde. The Chairman of the WGRTMR of the CAS provided an update report on these concerns and also discussed aspects of the SPECTRUM/-Tropical Cyclone Motion (TCM)-90 research. The Committee threw its support to the field experiment of the aerosonde in the near future.

The Committee also gave its whole support on the proposed Comparison of Mesoscale Prediction and Research Experiments (COMPARE) model intercomparison study utilizing SPECTRUM and TCM-90 final analyses presented by the CAS representative.

The WMO reported at the session that five Members of the Committee (Malaysia, the Philippines, Republic of Korea, Thailand and Viet Nam) have designated flood forecasting systems monitored through the Management Overview of Flood Forecasting Systems (Version 2c) as of August 1994. They were urged to report to the Organization the results of their efforts. A final version of a modified MOFFS 2c resulting from the regional consultation meetings in Malaysia and Mexico was also expected to be available by end of 1994.

Nine Members have already set up their national reference centres for the Hydrological Operational Multi-purpose System (HOMS), WMO added. All the Members have made use of the HOMS extensively for the last years for their required technology.

The Committee was also informed that the Nanjing Institute of Meteorology, WMO's Regional Meteorological Training Center (RMTC), will offer an International Training Course on the Interpretation and Application of Numerical Weather Prediction Products, scheduled 9 October to 9 November 1995.

Likewise cited during the session were the various services of the RSMC Tokyo-Typhoon Center to the Members. The Center, managed by the Japan Meteorological Agency (JMA), has continuously worked to expand its functions and capabilities to serve as the center for tropical cyclone analysis, tracking and forecasting in East Asia region.

It was reported that the COSMETS (Computer System for Meteorological Services), which is JMA's computer system, will be replaced with a new system by February or March 1996. Preparations are being made on developing a system to improve the quality of its numerical prediction products. When the new system becomes operational, RSMC Tokyo said, the resolution of the global model is expected to become higher. The analysis and forecast of typhoons have so far been made based on weather charts. The Center plans to introduce a man-machine interactive system designed to ensure swift and reliable operation to be completed by 1996.

The JMA, the Committee noted, has also carried out the feasibility study on distribution of data and products including the Grid Point Value (GPV) being prepared by RSMC Tokyo-Typhoon Center to the Members of the Committee via a satellite. A JMA questionnaire on establishing an RSMC data serving system through international public telecommunication networks (e.g. Internet or Integrated Services

Digital Network (ISDN)) was distributed to Members in October 1994. Eight Members have indicated their willingness to utilize the system in the near future. The JMA expressed hope that the operation of the system through Internet and ISDN would commence in April 1995 on experimental basis.

At the same time, the Committee batted for the feasibility of the RSMC Data Transmission via Geostationary Meteorological Satellite (GMS) although it has not yet been authorized by the Government of Japan due to financial and technical difficulties and will only be implemented within 4 to 5 years. The Committee also received the report that GMS-5 was set to be launched on 1 February 1995 replacing the very successful GMS-4. GMS-5 features the availability of water vapour channel, an improvement over GMS-4.

The Government of Japan informed the Session of its offer to host the 4th Technical Conference on SPECTRUM to be held in Tsukuba, from 27 November to 1 December 1995.

Focusing on the current overall financial situation including updates on the WMO Technical Cooperation Programme, the session stressed the need for additional sources of support for the Committee's activities. The Members expressed concern over the drastic drop in UNDP project-support for meteorological and hydrological projects in recent years. They urged that continued efforts be made by TCS, WMO and ESCAP to increase the number of contributors to the Trust Fund, by approaching other sources such as countries which are not members of the Committee. They also agreed to submit proposals to other possible sources such as the Asian Development Bank, Global Environment Facility and other institutions.

The need for foreign assistance on a bilateral basis to the Committee's activities was again emphasized, citing in particular Japan's continuous support for developing countries in the TC region. China's contribution in providing training, familiarization visits and study tours through the WMO Voluntary Cooperation Programme (VCP) was likewise noted even as Members were encouraged to update their requests for VCP assistance to WMO.

A list of recommendations formulated in a pre-session meeting of TC hydrologists was adopted by the Committee as follows:

- the TCS to seek their requirements from the Members in relation to the flood loss prevention and management programme, and based on which, to formulate a medium-term hydrological programme for implementation.
- the Committee to take necessary actions to solicit assistance from alternate TC Members in providing a hydrologist presently dispatched by the Japanese Government.
- to promote the exchange of experience and technology through Technical Cooperation among Developing Countries (TCDC) or other means.
- the Committee to consider providing financial support through the TC Trust Fund for activities under the hydrological component, such as exchange visits, experts' attachment to advanced centres, consultation missions and others.

The twenty-eighth session of the Typhoon Committee will be hosted by the Government of Malaysia from 5 to 11 December 1995.

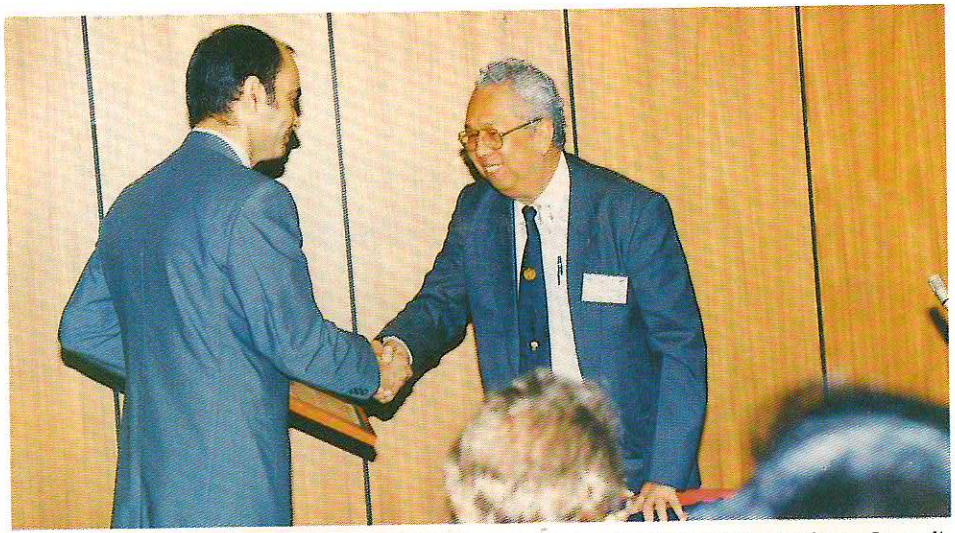
ESCAP/WMO Typhoon Committee Natural Disaster Prevention Award
TCFI confers 1994 TC Prize to the Macau Fire Corps

The Macau Fire Corps was presented the 1994 ESCAP/WMO Natural Disaster Prevention Award in a simple award ceremony during the opening of the 27th Typhoon Committee Session in Macau.

The Macau Fire Corps was cited for its outstanding services since 1883 in the promotion of natural disaster prevention and preparedness through its efficient organization, high level of readiness and training, and commitment to the important task of safeguarding lives and rescuing people in times of emergency.

In a generous gesture, the selection committee in Macau requested the Typhoon Committee Foundation, Incorporated (TCFI) in Manila to contribute the intended cash prize to the TCFI Award Fund.

The Committee Prize, a pet project of the TCFI, recognizes exemplary contributions and achievements of individuals, groups or organizations in generating public awareness in natural disaster prevention and preparedness. The authority to select the winners is given to the member-country acting as host of the Committee session.



Dr. Roman Kintanar, TCFI Chairman and TCS Coordinator, presents the 1994 Typhoon Committee Natural Disaster Prevention Award to Lt. Col. Samuel Mota (left), Commander of the Macau Fire Corps.

The Macau Fire Services

Long before its Fire Services was established in 1883, the inhabitants of the City of Macau rendered fire services themselves. They had precincts were they stored the fire material they acquired at the time, such as manual rod pumps, aglets, canvas tubes, wood or bamboo ladders and wood tubs of different sizes.

Shop assistants, factory workers and other citizens constituted the precinct staff. They did not receive wages. The people would compensate for their services by offering roast pigs and liupum, a Chinese wine. There was also the post of Fire Inspector.

In 1875, the Government of Macau issued several measures on civil protection to promote the security of its population and improve the fire services for which were responsible non-public entities. Chinese signboards and night lanterns were provided in order to identify houses which had wells that could be used by the fire services workers whenever fires occurred. The owners were given protection to prevent any damage.

On May 2, 1883, the first "Regulation of the Fire Services" was issued to answer the need for an organized and permanent fire service. Registered Chinese laborers and those that would later register in governmental departments as loaders of commercial and industrial institutions were obliged to make a contribution of 24 annual hours each in case of fires in accordance with what was determined in the regulation by the Municipal Council of Macau. This move had in view the creation of a certain number of Chinese laborers or loaders who would conduct the pumps and carry water in case of fire.

In 1886, the Fire Service was transferred under the direction of the Public Works. The staff was divided into two groups: the 24-hour alert group and the reserve group which alternated each day. At the fire signal, the staff on reserve would immediately get to the fire post while staff assistants composed mainly of gardeners and street-sweepers of the Municipal Council would abandon their duties to assist in the transportation of the material. The fire signal consisted of two cannon shots fired from the Fortaleza do Monte (Hill Fortress).

In addition to the permanent fire post, five more private posts were created, two of which had steam pumps while the rest had manual pumps. The private posts were manned by workers and young men who possessed the required physical vigor. They would transport fire fighting material at the sound of tom-toms made by the beating of a small iron bar in a metal sheet.

Macau Fire Corps Headquarters

The Macau military police posts also had hook ladders and other light material for firefighting. At the end of 1914 came the first steam pumps imported from the big factories in England.

In 1915, Governor José Carlos da Maia organized the Corps of Firemen under the command of the Fire Inspector while withdrawing the Fire Service from the control of the Public Works. The Fire Inspector, Major João Carlos Craveiro Lopes, reorganized the service with a staff board that received salaries. With the development of the city, the need for an efficient fire service with qualified and sufficient personnel became more apparent.

After the Pacific War, the fire corps, then called the Corps of Public Salvation, was renamed the Corps of Municipal Firemen under the Municipal Council's supervision. The corporation then became a militarized force with a staff board of 100 individuals.

In 1975, there was an organization of the military forces and security corporations in Macau under a single command named the Macau Security Force (MSF). On January 1, 1976, the Corps of Municipal Firemen was integrated into the MSF as one of its corporations, afterwards the new Regulation of the Fire Services of Macau was created.

At present, the Macau Fire Corps has a total of 733 staff members charged with a mission to:

- give help in case of fires, floods and other accidents which affect lives and properties;
- campaign on fire prevention;
- give help to the sick and injured people; and
- play an active role in civil protection and emergency situations.

CALL OF DUTY. MFC firemen risk their lives as they fight a raging fire.

Firemen search in the rubble of a burned building.

TC h a n g e s

Amadore assumes PAGASA top-post

Dr. Leoncio A. Amadore was sworn in as Director of the Philippine Atmospheric, Astronomical and Geophysical Services Administration (PAGASA) on 26 August 1994, succeeding Dr. Roman L. Kintanar who left the Government service on June 13, 1994.

Highly recommended by his predecessor, Dr. Amadore likewise succeeded Dr. Kintanar as Permanent Representative of the Philippines with the World Meteorological Organization.

Dr. Amadore (left) and Dr. Kintanar during turn-over ceremony.

Lomarda is new TCS Meteorologist

Ms. Nanette C. Lomarda

Ms. Nanette C. Lomarda, Supervising Weather Specialist, was named to the post of Meteorologist of the Typhoon Committee Secretariat on 2 January 1995, succeeding Mr. Gabriel S. Monroy who returned to forecasting duty at the Weather and Flood Forecasting Center of PAGASA.

A graduate of Bachelor of Science (BS) in Fisheries from the University of the Philippines and BS Mechanical Engineering from New Era College, Ms. Lomarda joined PAGASA in 1978 as meteorologist.

An articulate and well-loved woman in PAGASA, Ms. Lomarda rose from the ranks as Sr. Meteorologist (1983), Supvg. Met. (1985), Met. II (1988), Sr. Weather Specialist (1989) and Supvg. Weather Specialist (1994).

Ms. Lomarda was named PAGASA Model Employee of the Year in 1985. She is a member of the Government's People's Television 4 News Team as weather reporter.

PHILIPPINES

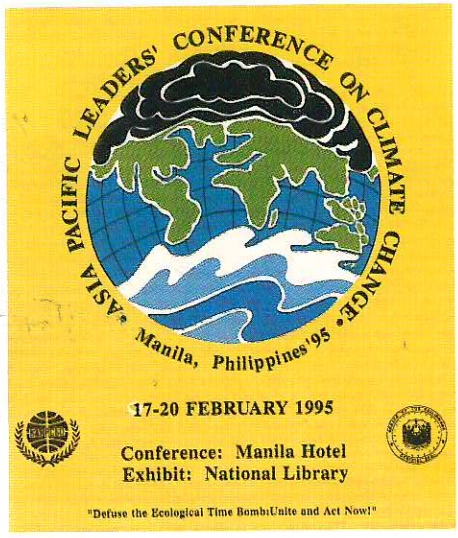
Asia-Pacific Leaders Conference on Climate Change

issues Manila Declaration on Global Warming

Delegates representing some 33 nations from Asia and the Pacific called on leaders of industrialized countries in a Manila Declaration to adapt concrete measures in curving the impact of global warming in the next century.

The Asia-Pacific Leaders Conference on Climate Change in Manila, Philippines, held from 17 to 20 February 1995, was to draw up a regional action plan on the position of Asia-Pacific countries on the new global threat for presentation at the first formal conference of parties to the UN Framework Convention on Climate Change (FCCC) in Berlin in March 1995. The UNFCCC treaty, signed by 160 states and ratified by 120 of them during the Rio de Janeiro Earth Summit in June 1992, requires developed countries to take actions aimed at reducing emissions of greenhouse gases (carbon dioxide) 20 percent below 1990 levels by the year 2005.

Heading the declaration were Philippine President Fidel V. Ramos, Prime Ministers Benazir Bhutto of Pakistan and Maxime Carlot Korman of Vanuatu. They urged that action plans on how to arrest the alarming phenomenon of global warming would have to be on a global scale, and that industrialized countries should take the lead in cutting back emissions of the harmful gases.



Vanuatu, an archipelago of 80 islands in the South Pacific, is a member of a coalition of 44 small island-states formed because rising sea level pauses a threat to their existence. Likewise, small Philippine islands would be inundated and Pakistan could lose its mangrove if global surface temperatures rise.

If global temperatures rise as projected by an inter-governmental panel of scientists, sea level rise is expected to accelerate as a result of a thermal expansion of upper layers of the ocean and melting of the glaciers at the poles.

The bulk of developing countries support the position of the island-states. But only a few developed countries have said that they would be willing to agree to carbon dioxide reductions at the Berlin conference since energy from the burning of coal, oil and natural gas is one of the most basic ingredients of their economies.

The Manila conference had several noted world scientists presenting papers on various issues on climate change, among others were Dr. G.O.P. Obasi (WMO), Dr. Barry Pittock (CSIRO Australia), Dr. William Bolhofer (NOAA), Dr. Robert Dixon (US SCSACC), Dr. Hoesung Lee (IPCC), Dr. Roman Kintanar (TCS/STC-IDNDR), Mr. Zou Jingmeng (PROC), Hon. Valery Rastorguev (Russia), Dr. John Topping and Dr. Ata Qureshi (Climate Institute).

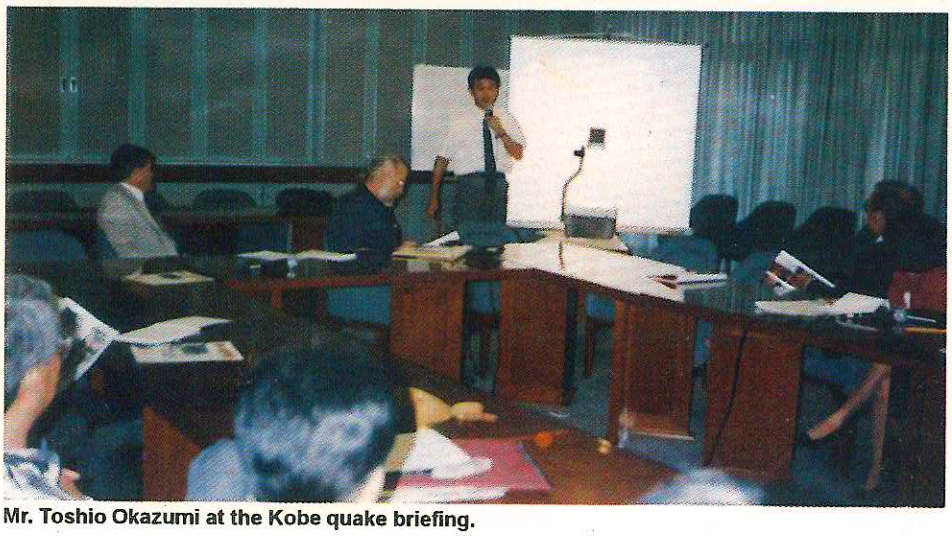
Kobe disaster in UNDP meeting

A briefing on the Kobe earthquake was conducted during the regular disaster management information meeting of the United Nations Development Programme (UNDP) on 21 February 1995.

The Kobe disaster was tackled owing to numerous inquiries from donors to the disaster. Mr. Toshio Okazumi, Hydrologist of the Typhoon Committee Secretariat, was the speaker on the killer-quake as arranged by Mr. Naoyuki Ochiai, Assistant Resident Representative of the Japan International Cooperation Agency (JICA) in Manila.

The devastating earthquake struck the Japanese port city of Kobe early this year with a magnitude that went beyond both it's (Japan) structural and non-structural preparedness. The massive destruction in buildings and highways has caused an alarm to major cities of the world with disaster mitigation strategies that rely on designed structural measures.

At the meeting were representatives of local and international organizations including Mr. Kevin McGrath, UNDP Resident Representative and Mr. Cipriano C. Ferraris, PAGASA Deputy-Director for Operations and Services, who spoke on typhoon warnings.



Mr. Toshio Okazumi at the Kobe quake briefing.

Tropical Cyclone Forecasting Course

A Tropical Cyclone Forecasting Course was conducted by PAGASA at the Weather and Flood Forecasting Center in Quezon City for eight weeks starting 14 March 1995 to develop and enhance competence among participants in formulating timely and reliable cyclone warnings.

The course, attended by 26 weather specialists, included lecture-discussion approach, written examinations, hands-on use of computers and on-the-job training.

The instructional staff included Dr. L. Amadore, Director of PAGASA, Messrs. J. Lirios and C. Arafiles, former Deputy-Directors of PAGASA, Mr. E. Adug, Chief of Weather Branch and Ms. N.C. Lomarda, Meteorologist of TCS.

National Conference/ Workshop on Climate Change Issues

The Inter-Agency Committee for Climate Change (IACCC) and PAGASA, under its project-initiated Philippine Country Study to Address Climate Change, jointly held a National Conference/Workshop on Climate Change Issues from 3-4 August 1995 in Quezon City.

The IACCC/PAGASA national conference was in line with the Philippines' commitment to the United Nations Framework Conference on Climate Change (UNFCCC) to respond to the challenges of climate change. The two-day conference/workshop aimed to:

- strengthen awareness of the government and private sector on the issues of climate change;
- promote national consensus on climate change concerns focusing on the formulation of effective least-cost adaptation measures and mitigation strategies; and
- provide the inputs necessary for the development of the National Action Programme

Dr. William Padolina, Secretary of the Department of Science and Technology (Phil), Dr. Roman Kintanar, TCS Coordinator, Dr. Leoncio Amadore, PAGASA Director and Dr. William Bolhofer of NWSIO were among participating scientists and experts from local and foreign agencies.

The Philippine Country Study on Climate Change was initiated in October 1994 with the support by the United States Country Studies Programme. To meet its objectives, six study elements were identified as follows:

- development of a National Inventory of GHG Emissions and Sinks;
- vulnerability assessment and evaluation of adaptations:
  - coastal resources due to accelerated sea level rise
  - surface water resources
  - agriculture
- identification of alternative programs and measures to promote mitigation of climate change;
- public information and education campaign program on climate change issues; and
- development of a National Action Plan.

MACAU

MSCO meeting on disaster prevention and preparedness

The Macau Security Coordination Office (MSCO) in close cooperation with the Education and Youth Department held a meeting with directors, teachers and students of Chinese and Portuguese Schools of Macau, both private and government, on 12 January 1995, to discuss typhoon preparedness policies and fire prevention measures.

The guidelines for schools' evacuation plan were distributed during the meeting, chaired by Major-General Henrique Lages Ribeiro, Secretary for Security and Dr. Jorge Rangel, Secretary for Administration, Education and Youth.

Civil Defense Organization meetings

The Civil Defense Organization of Macau held a meeting at the Quartel de S. Francisco on 21 April to update the civil defense plan and improve overall response of the organization.

The meeting was attended by representatives of government and private organizations responsible for typhoon prevention and preparedness and other major emergency operations in Macau.

Members of the Security Coordination Office, led by Maj. Gen. Ribeiro, Secretary for Security, also met with the representatives of the neighborhood associations - "kai-fongs" - to discuss issues and concerns on disaster preparedness including fire prevention.

Maj. Gen. Ribeiro emphasized the importance of the close cooperation between the security forces and the territory's population.

In another development, the civil defense task-force under the coordination of the MSCO stepped up its activities on the restructuring of the government organization, and the preparations for a Typhoon Plan Review, public awareness action plan for 1995 and a booklet for typhoon disaster prevention to be presented to the Secretary for Security for approval end of March 1995.

Officers of the Macau Security Coordination Office during meetings with the education sector (top photo) and neighborhood associations (kai-fongs) (above).

Representatives of government and private organizations participate in the Civil Defense Organization meeting to upgrade the territory's disaster prevention and preparedness action plans (right photos).

HONG KONG

9th Guangdong-Hong Kong-Macau Seminar on Hazardous Weather

The Ninth Guangdong-Hong Kong-Macau Seminar on Hazardous Weather was held at the Royal Observatory Conference Hall, from 10-11 November 1994, attended by 26 participants from the south-eastern Chinese region led by Mr. P. Sham, Director of the Hong Kong Royal Observatory, Mr. Xie Guo Tao, Director of Guangdong Meteorological Bureau and Dr. António Pedro F. da Costa Malheiro, Director of Macau Meteorological and Geophysical Service.

Topics discussed at the two-day seminar included:

- Analysis of Severe Tropical Storm;
- Analysis of a Persistent Heavy Rain Process Over Southern China;
- Analysis of Severe Rain Storms;
- Numerical Modelling of Heavy Rains and Tropical Cyclones;
- Performance of Climatology-Persistence Technique (CLIPER) in Predicting Tropical Cyclone Motion in the Western North Pacific and the South China Sea; and
- Integrated Meteorological Observing Network for Hazardous Weather Watch Over the Pearl River Delta Region

At the close of the four-session meeting, the participants were brought to Tate's Cairn Radar Station to witness the inaugural ceremony for the new Doppler Weather Radar of the Royal Observatory.

RO installs new Doppler radar

The Royal Observatory started operating a Doppler weather radar installed in 1994. The 10-cm wavelength (S-band) radar is capable of measuring reflectivity to a range of 500km. In addition, it measures the velocity of approach and departure (i.e. Radial velocity) of rain areas.

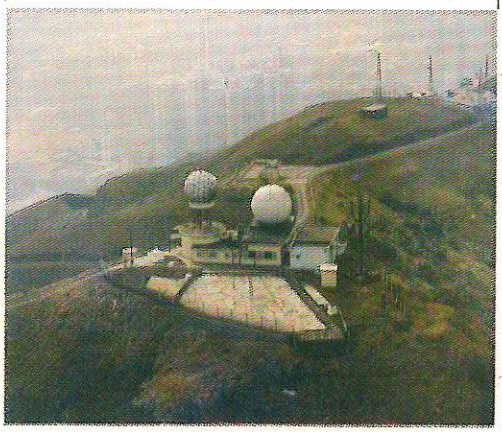
The Doppler principle is likened to a train blowing its whistle while passing in front of an observer, who will notice that the pitch of the whistle increases as the train approaches and decreases as the train departs. In the case of radar, it is a stationary radar observing moving targets like raindrops. Each moving target will shift the radar signal frequency by an amount which depends on its speed.

Located at Tate's Cairn, 577 meters above Mean Sea Level, the radar scans the atmosphere every six minutes. Radar data is transmitted to the Observatory Headquarters in urban Kowloon via a high-speed telephone line. At the Observatory's Central Forecasting Office, a computer workstation processes the data and displays various radar products to the forecaster. A separate workstation at the Airport Meteorological Office at the Kai Tak International Airport is capable of tapping some products from the main workstation.

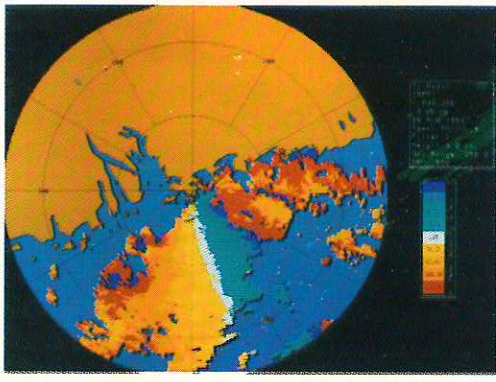
The available products are as follows: a Plan Position Indicator (PPI), Constant Altitude PPI (CAPPI), Range Height Indicator (RHI), echo top, maximum reflectivity map, rainfall accumulation, vertically integrated liquid water, as well as profiles of wind speed, direction and horizontal divergence.

An additional feature of the radar system is the ability to control radar operations remotely and monitor its status. Some system diagnoses can be performed at the Observatory Headquarters, and this facilitates troubleshooting by saving considerable travel time.

The usefulness of the Doppler radar's capability was tested in late August 1994 when tropical storm Harry threatened the South China coast. Doppler image of Harry's circulation offered strong indications that the maximum wind strength was underestimated, in fact, exceeding 25 m/s (90 km/h). This piece of evidence led to its subsequent upgrading to a severe tropical storm, and warnings to ships and offshore oil rigs in the vicinity of the cyclone were timely issued.



Tate's Cairn Radar Station overlooking Kowloon to the southwest. The Doppler Weather Radar (right) is shown with a protective radome alongside a Digital Weather Radar (left) installed in 1983. ***(Courtesy of Government Flying Services, Hong Kong)***



Doppler velocity map showing the approach of severe tropical storm Harry towards the South China coast on 26 August 1994.

Celebration of WMD '95

This year's World Meteorological Day on 23 March was celebrated in Hong Kong with a public exhibition by the Royal Observatory which attracted nearly 7,300 visitors in just two and a half days.

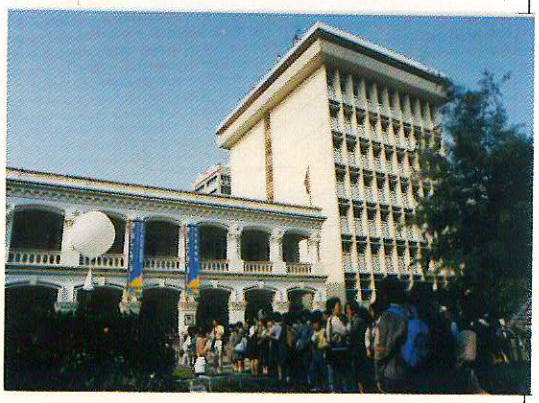
The WMD exhibition, which carried the WMO chosen theme "Public Weather Services," was opened by Royal Observatory Director P. Sham and Economics Services Acting Secretary E. M. Bosher, who was the guest of honor.

The exhibition placed emphasis on the Royal Observatory's forecasting and hazard warning services provided to the public, aviation and marine communities. It presented other aspects of work on environmental radiation monitoring and geophysics. It also highlighted the modern means of obtaining weather information through fax machine, pager, and the dial-a-weather automatic telephone answering system operated free to all callers. Meteorologists were at hand to explain the work of the department.

Publicized in newspapers, radio and television, and through posters sent to schools, libraries, government agencies and institutions, the exhibition drew a huge turn-out from parents, students, workers and pensioners who had a good time viewing the exhibits. The publication corner also enjoyed brisk sales.

With the Royal Observatory's commitment towards improving the accuracy of

its weather forecasts and their timely dissemination, the World Meteorological Day 1995 exhibition provided an excellent opportunity for the weathermen and the public to come together and understand how the service can be best utilized.



Student groups tour the WMD exhibition at the Royal Observatory (above).

RO's Dial-a-Weather Service

The Royal Observatory's Dial-a-Weather service has enjoyed ever-increasing popularity since its inception in 1985. Over the past ten years, the number of phone calls handled by the service has multiplied 30 times and hit a high of 13 million in 1994. This upward trend is continuing in 1995.

The automatic-answering service is provided to the public free-of-charge. It gives weather information in the form of pre-recorded messages in English and Chinese. Updated many times a day, the information includes:

- local weather forecast with temperature readings at a number of location in Hong Kong, and any severe weather warnings then in force;
- weather forecast for South China coastal waters, tidal information, and the position of tropical cyclones entering Hong Kong's area of responsibility.

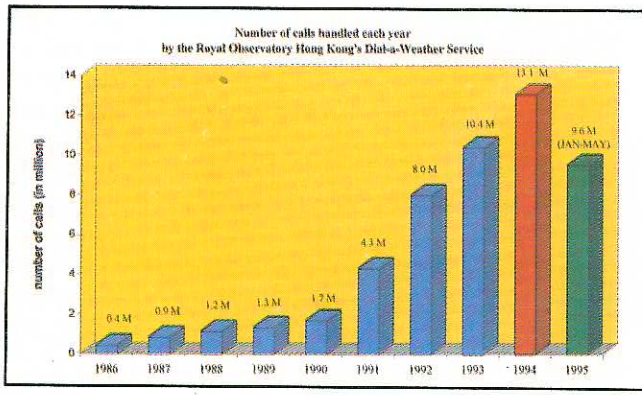
The Dial-a-Weather service now receives more than 50,000 calls a day. It has alleviated the workload of the weather forecaster by diverting many inquiries away from the Central Forecasting Office. On a couple of occasions in 1994 when local tropical cyclone signals were hoisted, the number of Dial-a-Weather calls even topped 100,000 a day.

While results of public polls indicated that the number of people aware of the service has grown from 1% to 7% of the population, the Royal Observatory plans to continue promoting the service. For the interested readers, the telephone numbers to call are:

Local weather forecast - (852) 187 8066 (English)
- (852) 187 8200 (Cantonese)

Weather forecast for South China coastal waters - (852) 187 8970 (English)
- (852) 187 8001 (Cantonese)

Overseas callers have to cover IDD charges.



REPUBLIC OF KOREA

KMA sets up KMAPS

The Korea Meteorological Administration (KMA) inaugurated a new supercomputer for numerical weather prediction in time for the celebration of World Meteorological Day (WMD) on March 23, 1995.

The new supercomputer, designated KMA Meteorological Analysis and Prediction System (KMAPS), will be used to implement operational NWP system, researches, and development in KMA. It consists of a mainframe supercomputer (Fujitsu VPX-220), a server (SUN CENTER 2000), page printer, juke box and workstations. It has peak performance of 1.25 Gflops with 1 Gbyte memory and 45 Gbyte hard disk.

The KMA has developed NWP system since 1986. Its first operational regional limited area model started operation in 1991, sharing a Cray - 2S and Cray C - 90 supercomputer belonging to another institution.

At present, the KMA operates three limited area models (F - LAM for regional, K - LAM for local and KTM for typhoon) with some application models for short-range forecasts.

With its own (KMAPS) NWP operational system capability, the KMA will continue to develop NWP system toward global model operation for medium-range forecast in the near future.

Intl Workshop on East Asian Monsoon

The International Workshop on East Asian Monsoon, organized by the KMA Meteorological Research Institute and co-sponsored by the Korean Meteorological Society, was held at the Sejong Culture Center in Seoul, from 28-31 March 1995.

Some 40 participants to the workshop, from China, Japan, the USA and Republic of Korea, discussed the present status of research on the East Asian summer monsoon, and exchanged ideas and future plans related to Asian monsoon aimed at enhancing cooperative research activities. Scien-

Dr. Kun-mo Chung (center), Minister of Science and Technology and Dr. Jong-Hon Bong (second from left), Administrator of KMA, lead ribbon-cutting ceremony for new supercomputer.

tific presentations were made on the following topics:

- Characteristics of the Asian Monsoon;
- Relationship of the Asian Monsoon and Tropical Climate System;
- Meso-scale phenomena associated with the Changma (monsoon) Front;
- Severe Storm Observation Using Radar;
- Long-range forecast of Changma; and
- Numerical Simulation

At the workshop, a meso-scale intensive observational field experiment on the Changma front and heavy rainfall in Korea was planned jointly with the Huaihe River Basin Experiment (HUBEX), a subproject of the GEWEX Asian Monsoon Experiment (GAME). For a better design of the proposed field experiment, Dr. Jaiho Oh, Director of KMA Forecast Research Lab, offered the holding of the HUBEX Steering Meeting in Seoul in 1996.

The workshop also reviewed future collaboration among East Asian countries with Korea (ROK), Japan and China agreeing on co-sponsoring and hosting alternately a biennial Asian Monsoon Workshop.

THAILAND

2nd International Study Conference on GEWEX in Asia and GAME

The Second International Study Conference on GEWEX in Asia and GAME, organized by the Japan National Committee for Game and National Research Council of Thailand, was held at the Grand Jomtien Palace Hotel in Pattaya, Thailand, from 6-10 March 1995.

With the long-range forecasting of monsoon rainfall and water resources becoming a matter of great concern for the people and countries in Asia as droughts and floods associated with the monsoon variability often cause serious damage to the region, the Gewex Asian Monsoon Experiment (GAME) has been proposed as part of the Global Energy and Water cycle Experiment (GEWEX).

The GEWEX is a major project of the World Climate Research Programme (WCRP) beginning in 1995 which aims to further understand the physical processes of the global climate system, particularly energy transfer and water cycle processes. The WCRP (WMO) was a co-sponsor of the conference along with the Center for Climate System Research (University of Tokyo), Japan's Meteorological Society, National Space Development Agency and Society of Hydrology and Water Resources.

The GAME aims to understand the role of Asian monsoon in the global energy and water cycle, and the physical basis for the long-range forecasting of monsoon rainfall and water resources in monsoon Asia.

Topics discussed included Energy and Water Cycles in Monsoon Asia; Observational Studies on Regional Water Balance in Asia; Utilization of Satellite Remote Sensing Technique for Atmospheric, Hydrologic and Oceanographic Processes in GEWEX/GAME; Land-Atmospheric Interaction and the Role of Vegetation in Hydrologic Processes; Macro-scale Hydrological Modelling, Meso-scale Atmospheric Modelling and their Coupling; GCM Studies and Diagnostic Studies of Monsoon; Seasonal Prediction of Rainfall and Water Resources in Monsoon Asia; and GEWEX Strategy in Asia and International Cooperation Related to GEWEX/GAME.

JAPAN

GMS-5 launched

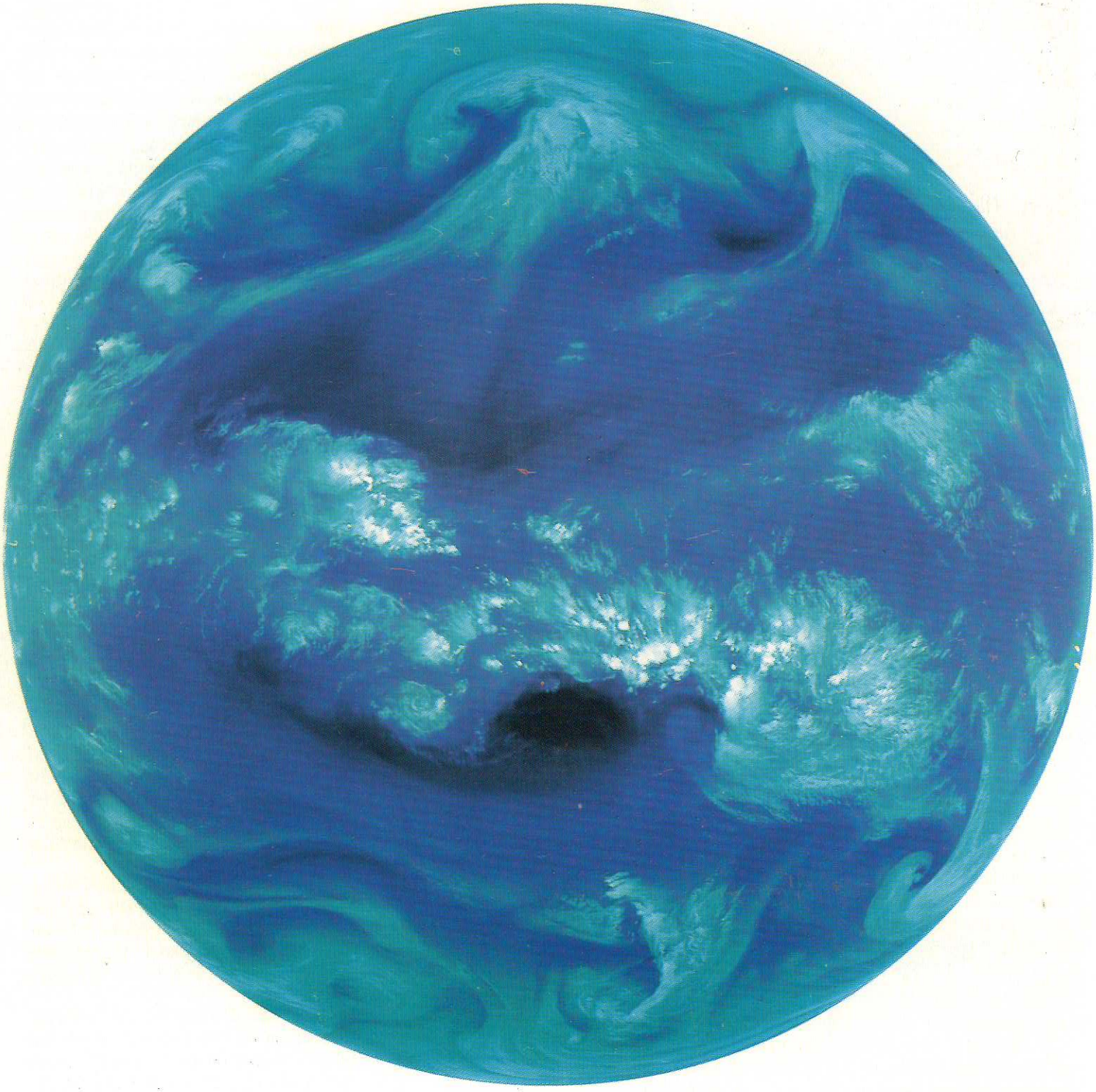
Geostationary Meteorological Satellite No. 5 (GMS-5), successor to GMS-4, was launched in March this year on board H-II Rocket 3 at the Tanegashima Space Center of the National Space Development Agency (NASDA) of Japan. After being tested of its functions in geostationary orbit, the Japan Meteorological Agency started its operation on June 13.

GMS data are considered essential in deciding the center of a typhoon, its intensity and development tendency in an ocean area where the amount of effective meteorological data is not enough. Imageries taken by the GMS are disseminated to weather services in 26 countries and territories in the Asia-Pacific region.

In addition to the visible sensor which had been loaded on GMS-4, observational functions of GMS-5 are enhanced by introducing water vapor and infrared split-window sensors in place of GMS-4's single infrared sensor.

GMS-5 would allow JMA to obtain the information necessary to understand and analyze meteorological phenomena, such as cloud distribution, sea surface temperature, height of cloud, satellite wind vectors and water vapor distribution.

GMS-5 is expected to contribute to the activities of National Mete orological Services such as in improving weather forecasts, mitigation of natural disasters and monitoring climate change.



IMAGERY OF WATER VAPOR DISTRIBUTION. One of the first imageries obtained by GMS-5 during a mission check at 160°E above the equator. (JMA/Meteorological Satellite Center)