



Typhoon and Flood Disaster Reduction

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Malaysian Meteorological Department



Outline

- **Introduction**
- **Role of Malaysian Meteorological Dept**
- **Weather Forecasting & Warning System**
- **Conclusion**



Introduction

- Increase in extreme weather events due to climate change
- Extreme weather events/typhoon hazards can escalate into disasters and cause huge losses
- Need to have efficient and effective forecasting, warning and dissemination system



Weather-related Hazards Affecting Malaysia

- Wind storms e.g. typhoons, thunderstorms/squall lines
- Floods/La Nina & Land Slides
- Droughts/El Nino
- Storm Surges
- Forest/Grassland Fires/Haze



Role of Malaysian Meteorological Department

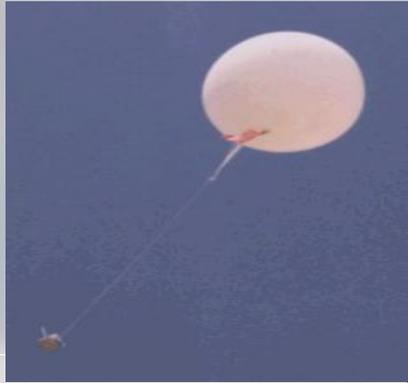
- Monitoring weather and sea condition
- Issuance of forecasts and warnings



Forecasting **System Components**

- Observation/Monitoring
- Communication
- Modelling and Evaluation
- Dissemination

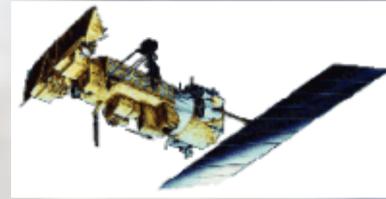
WEATHER MONITORING SYSTEM



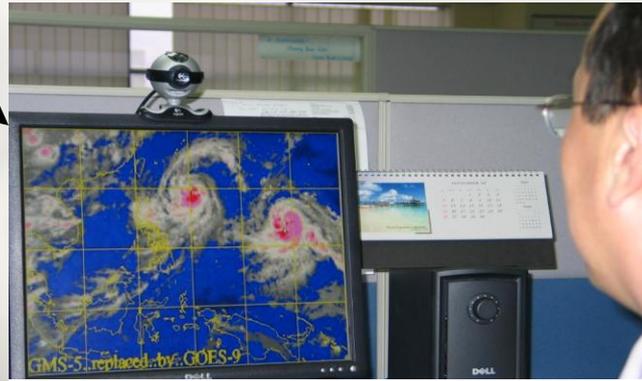
Upper air observation



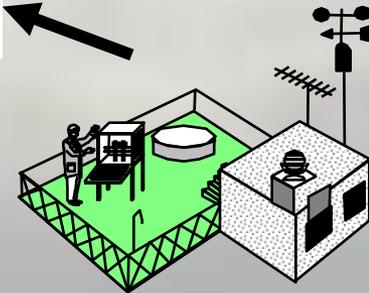
Aircraft report



Weather Satellite



Meteorological Officer



Meteorological station



Marine Observation



Weather Radar





WEATHER MONITORING, FORECASTING & DISSEMINATION



MONITORING/ OBSERVATION

Satellite
Radar
PMS/AWS
Upper air
LDS
GTS
AFTN
INTERNET

COMPUTER PROCESSING, MODELLING & ASSESSMENT

MIFS
MDPS
MAKLIM
MMD-MM5
MMD-WAM
MMD-RAPS

DISSEMINATION

Intranet MMD HQ
Intranet KLIA
SMS
FAX
Web
AFTN/GTS
Email
Telephone

CLIENTS

MMD HQ
FORECAST OFFICES
NAVY
MILITARY
Air Traffic Controller
Flight Operator
TRANSPORTATION
Fishery
Shipping
Public
Mass Media
OIL & GAS



Public Awareness

- To increase knowledge and awareness to the public on typhoon hazard.
- To introduce siren system.
- To inform the public on the safety steps should be taken when the disaster occurs.
- To identify the weaknesses for better improvement.



the people's paper

No. 9712 Friday December 27 1996 PP1641/3/96
 Peninsula RM1.00 / Sabah RM1.20 / Sarawak RM1.10

Banks to merge
 The United Overseas Bank (M) Bhd and Chung Khai Bank (M) Bhd are to merge early next year.

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 Toys that grow the child

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KILLER STORM

At least 106 dead as tropical storm batters Sabah



GREG'S FURY ... the Sungai Pampang bridge linking Tambunan to Keningau was badly damaged after the storm battered the west coast of Sabah yesterday.

KOTA KINABALU: At least 106 people were killed and 110 reported missing when the tropical storm Greg lashed Sabah yesterday.

Sabah declared a full alert as the three-hour storm left more than 3,000 families homeless in the interior.

In Keningau, rescue workers recovered 102 bodies. Two each were found in Tuaran and Kota Kinabalu. Police expect more bodies to be recovered in search operations.

Some victims never woke from their sleep as the storm, with winds packing speeds of up to 72km per hour, ripped through Tlabuan, Kota Kinabalu, Papar, Tuaran, Tambunan, Keningau and Nabawan from lam.

Many bodies were stuck in the mud and in houses near river banks of Keningau.

Army recruitment officer Kapt Mohd Yazid Abdullah believed they had been buried alive.

"They must have tried to escape from their homes which were swept into rivers and ended up in the mud," said

Kapt Yazid, who saw a child's torso and another man buried in the mud near Pampang River.

Greg, which began from a depression near Layang-Layang in the South China Sea, tore apart houses, and brought down electricity and telephone lines.

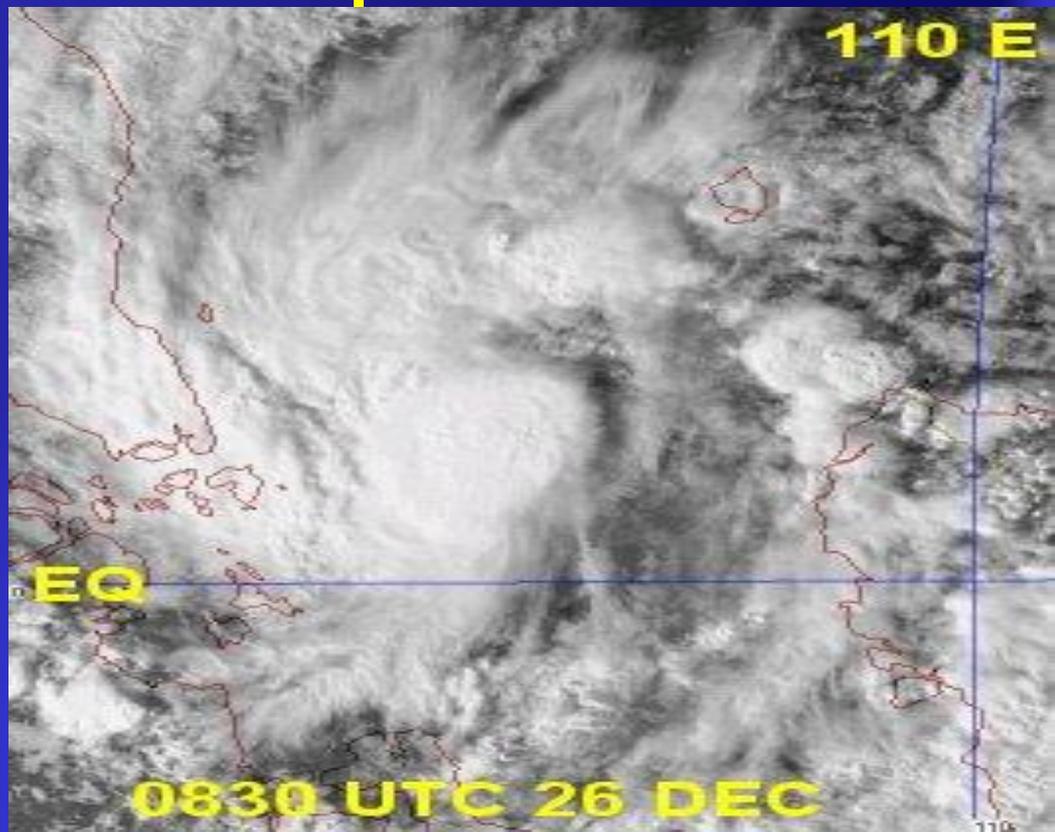
Kota Kinabalu-Tambunan-Keningau-Nabawan road links were cut off because of numerous landslips and washed away bridges. At press time, links have yet to be restored.

At least six ships were blown aground while dozens of fishing trawlers and boats capsized in waves rising up to three and four metres during the height of the storm in the west coast of the state.

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Malaysia Was never hit by any Tropical Storms before 1996

Tropical Storms





Tropical Storm “Greg”



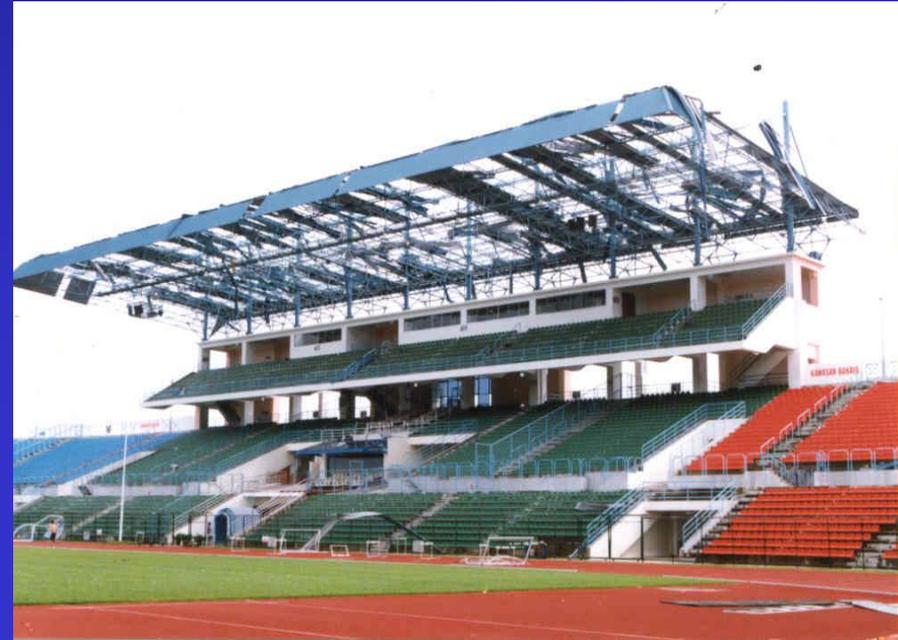
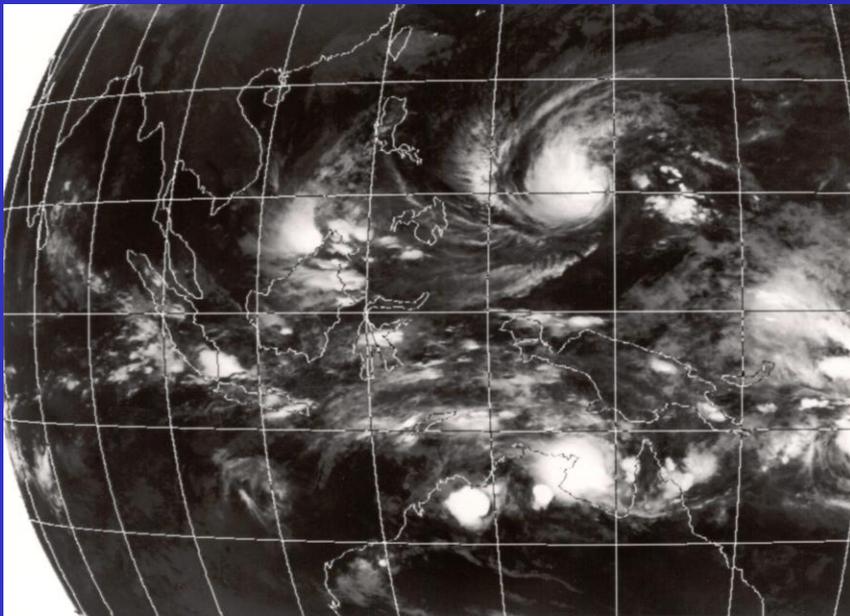
- Land fall over the East Malaysian State of Sabah
- Lead to a massive mud slide over Keningau and 230 people dead
- No warning system in place for Tropical Storms/typhoon
- First time Malaysia had a direct hit from a Tropical Storm in 1996



Action taken



- Redesign the weather warning system
- More research carry out on tropical storms
- Improved monitoring and forecasting skill in respect of storm track and intensity



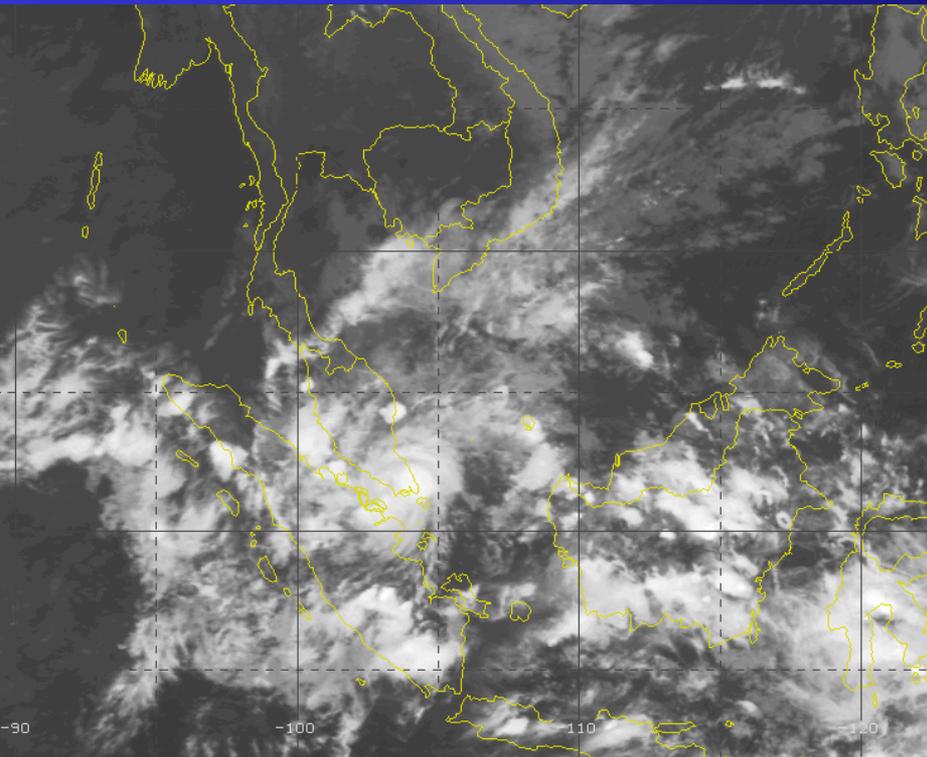


Tropical Storm “Vamei”

- 2001, Tropical Storm “Vamei” at 1.5N
- Lesson from Tropical Storm “Greg” – more organised tracking and systematic issuance of severe weather warnings
- In contact with the Singapore Meteorological Service
- Storm position and warning was also sent and published regularly on the WMO severe weather warning web page managed by the Hong Kong Observatory

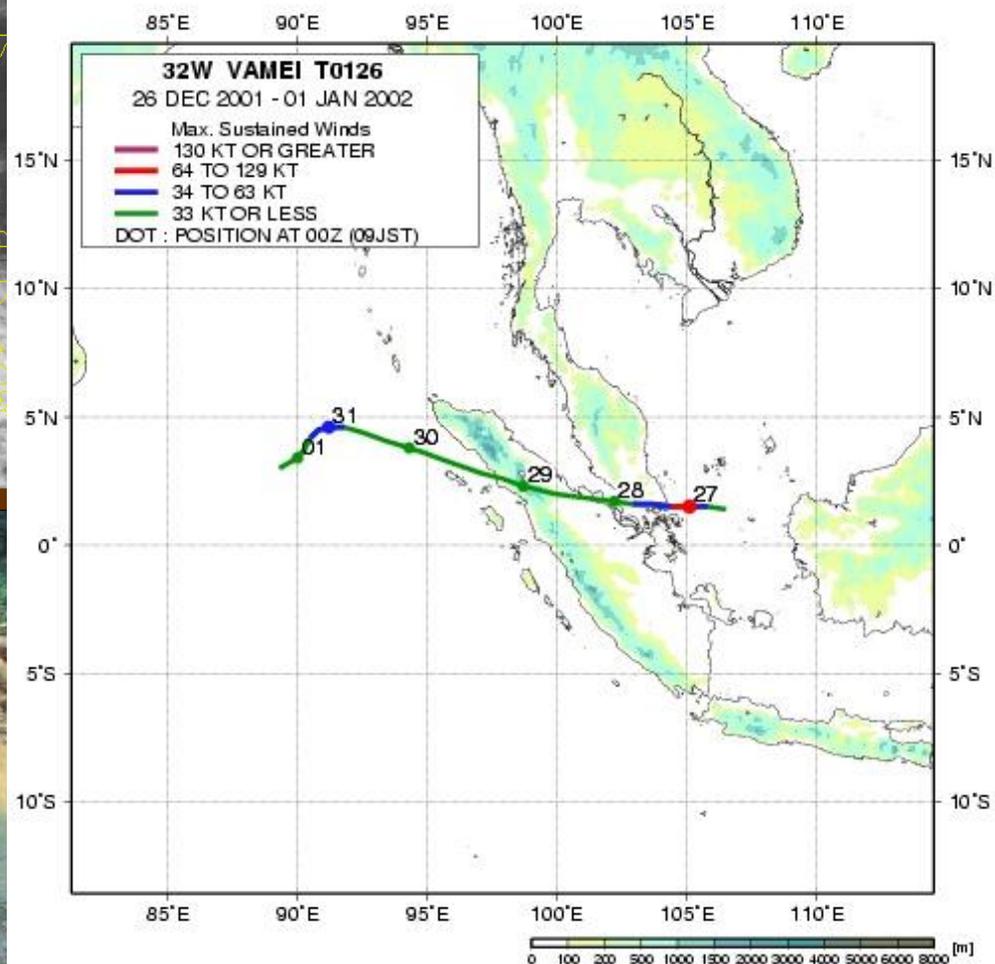


Tropical Storm "Vamei"



Malaysian Meteorological Service

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Conclusion



- Proactive role to constantly review and reassess processes
- Good lead time in Weather warnings issued
- Warnings should be concise, clear using simple words
- Delivery of warnings – multi-method and effective
- Close collaboration with neighbouring meteorological department
- Sharing of best practices among nations in the region