

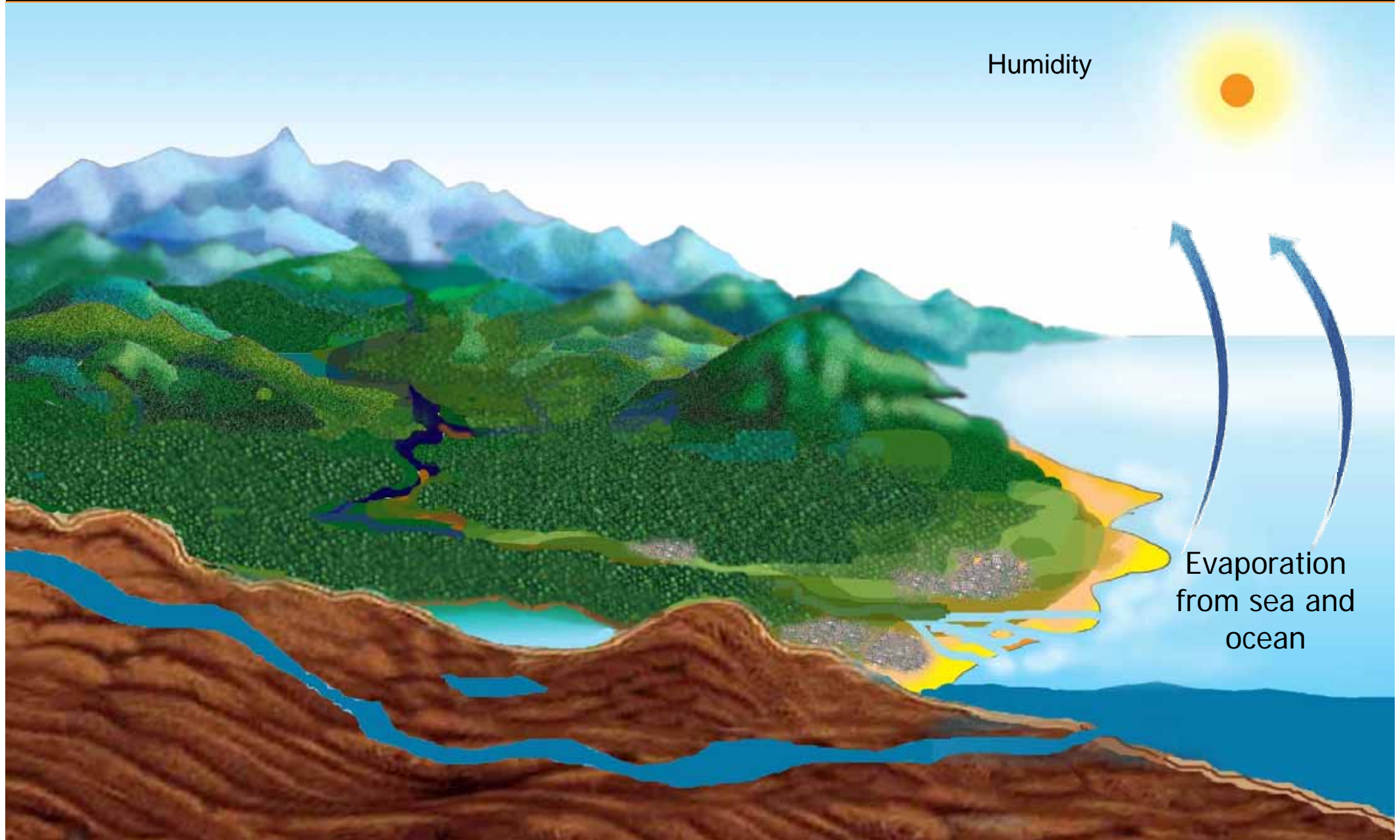
COUNTRY REPORT ON **GEOSS / AWCI**



Thada Sukhapunphan

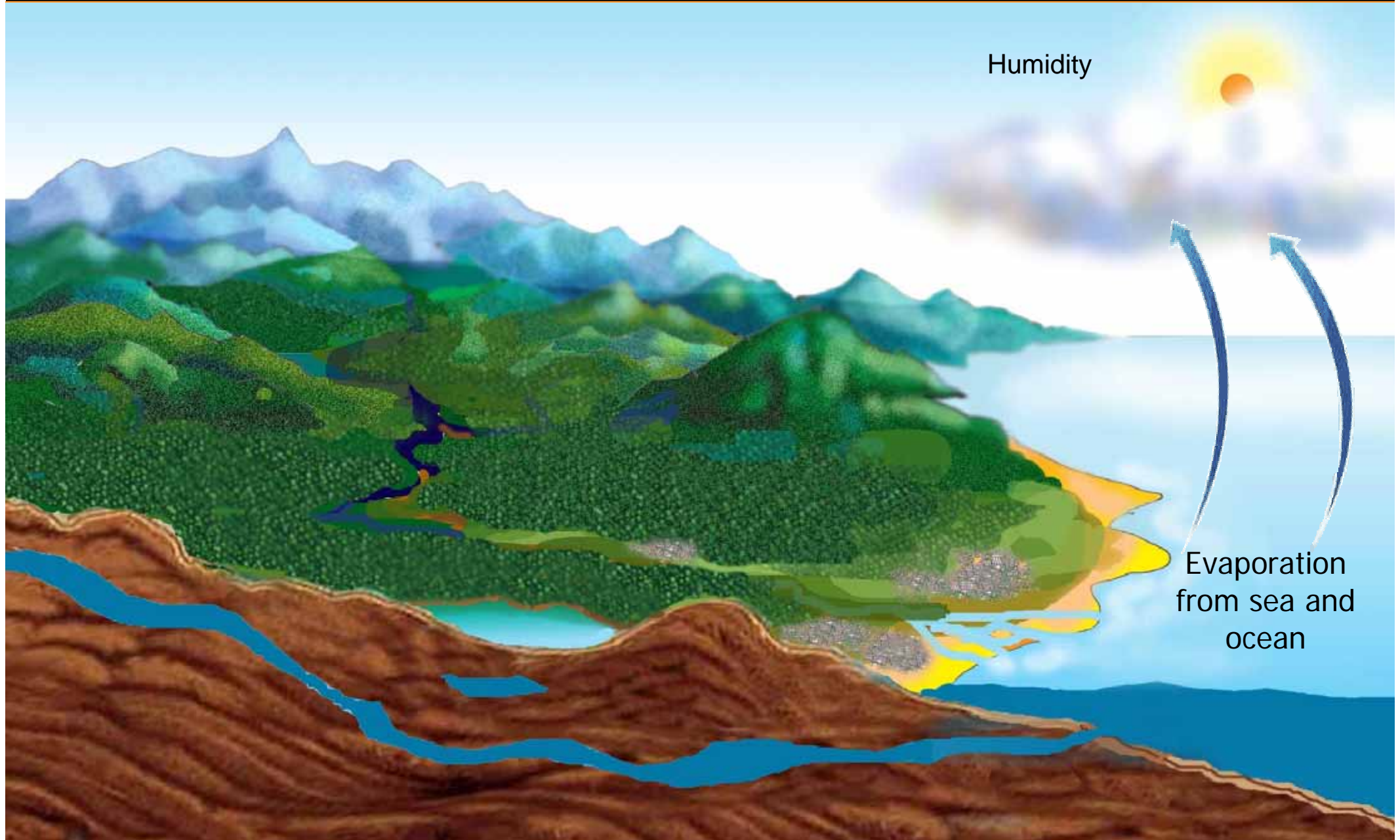
Thailand

HYDROLOGIC CYCLE



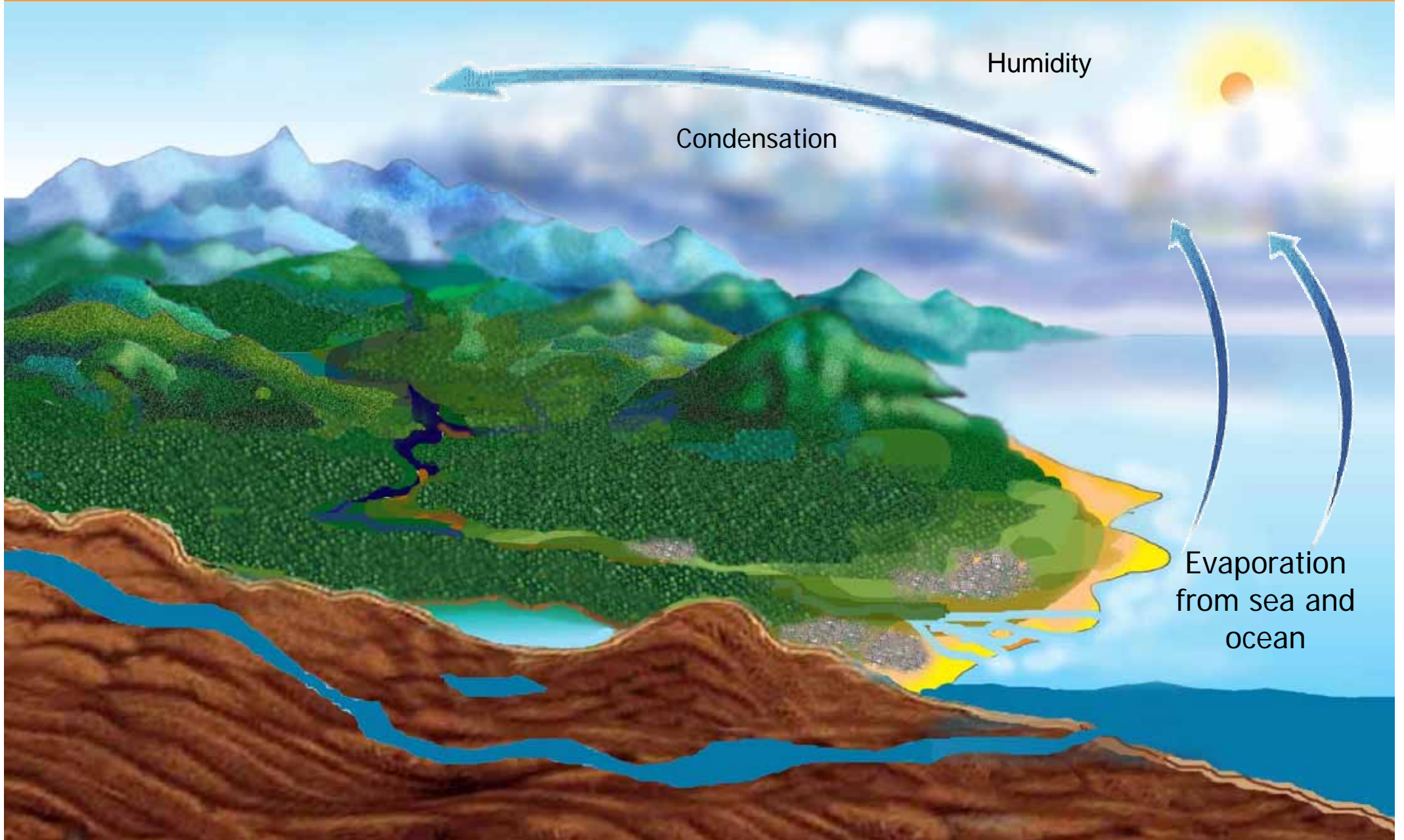
Water evaporation from sea and ocean to the atmosphere by the factors of sun and wind

HYDROLOGIC CYCLE



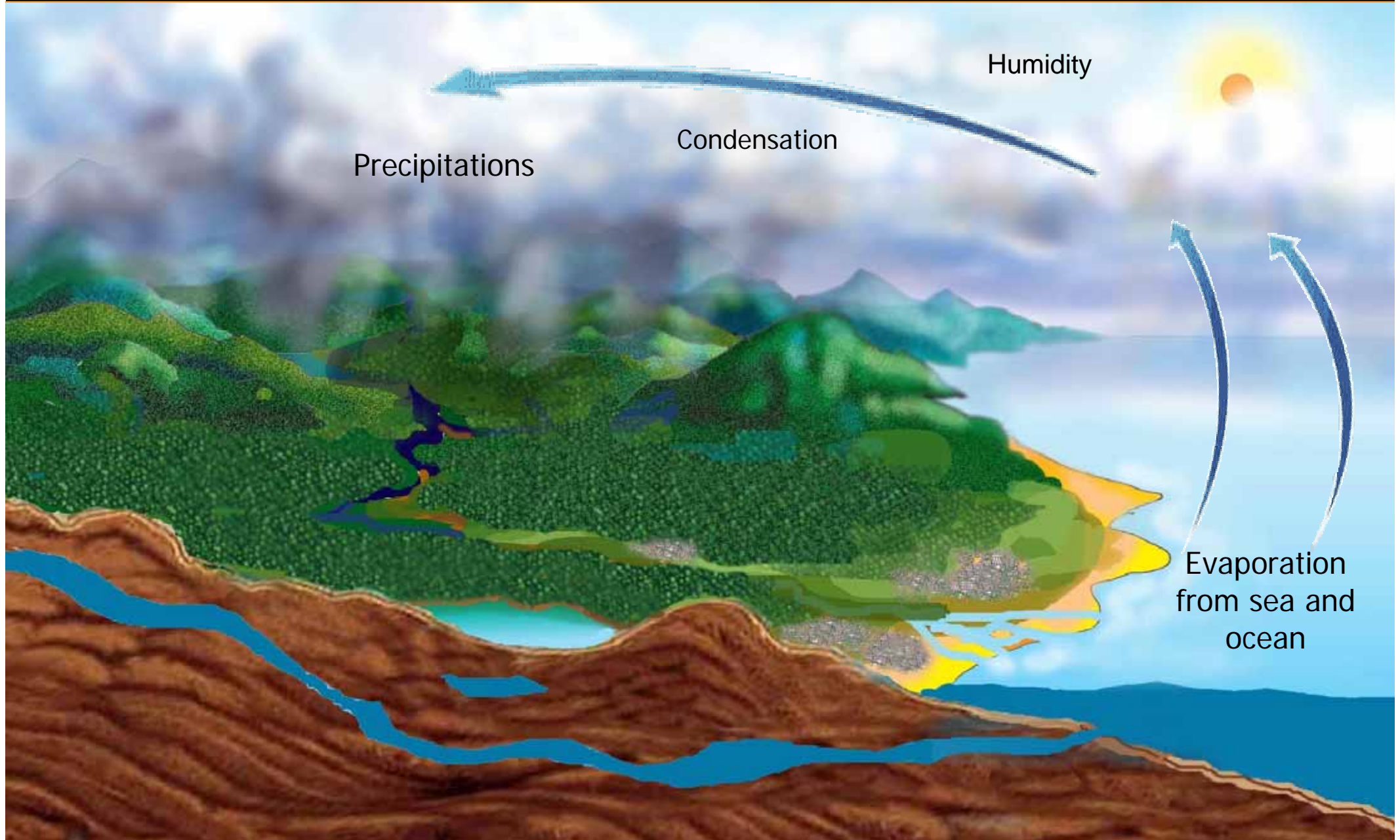
Water evaporation from sea and ocean to the atmosphere by the factors of sun and wind

HYDROLOGIC CYCLE



Humidity from sea and ocean moved to land by trade wind

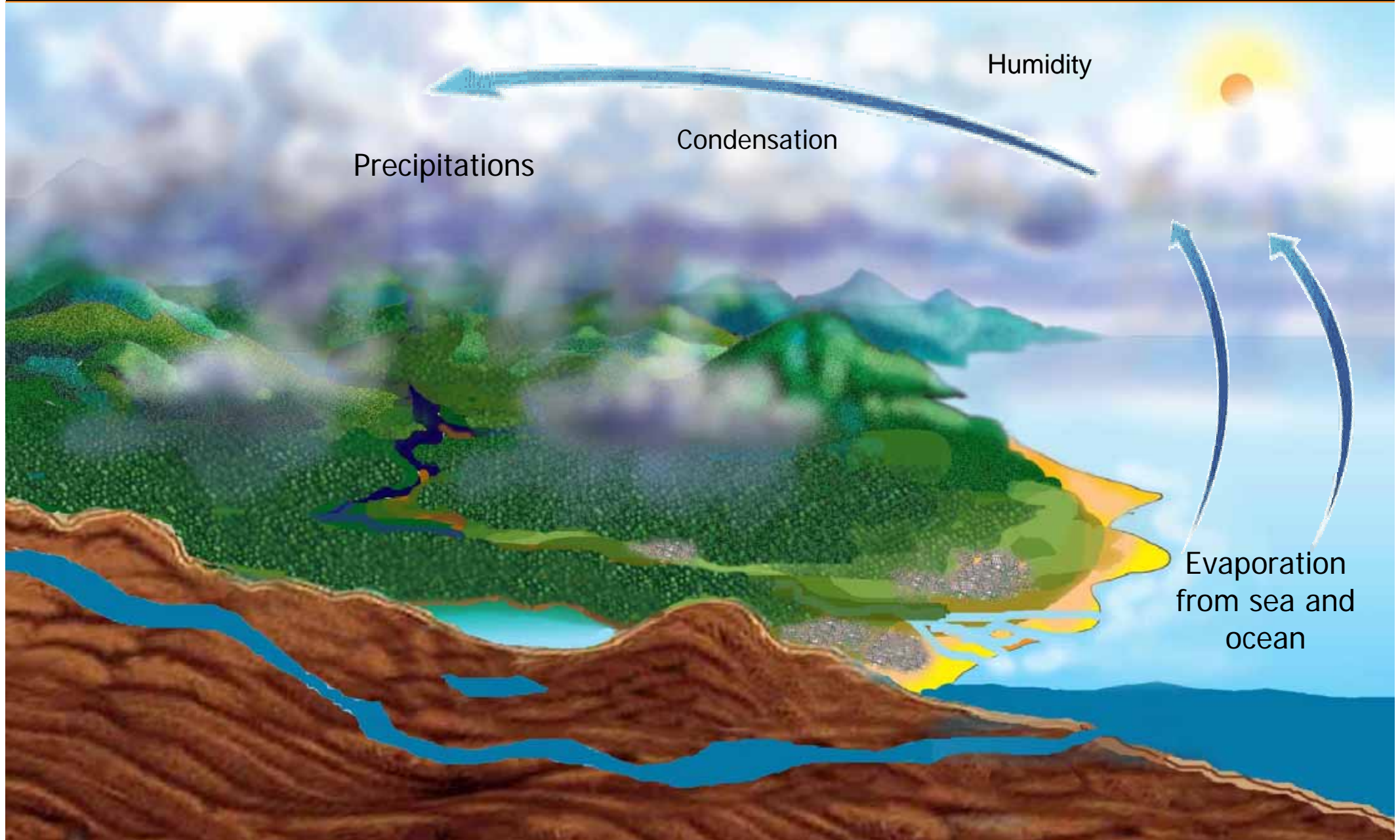
HYDROLOGIC CYCLE



Falling to the land in the forms of precipitation

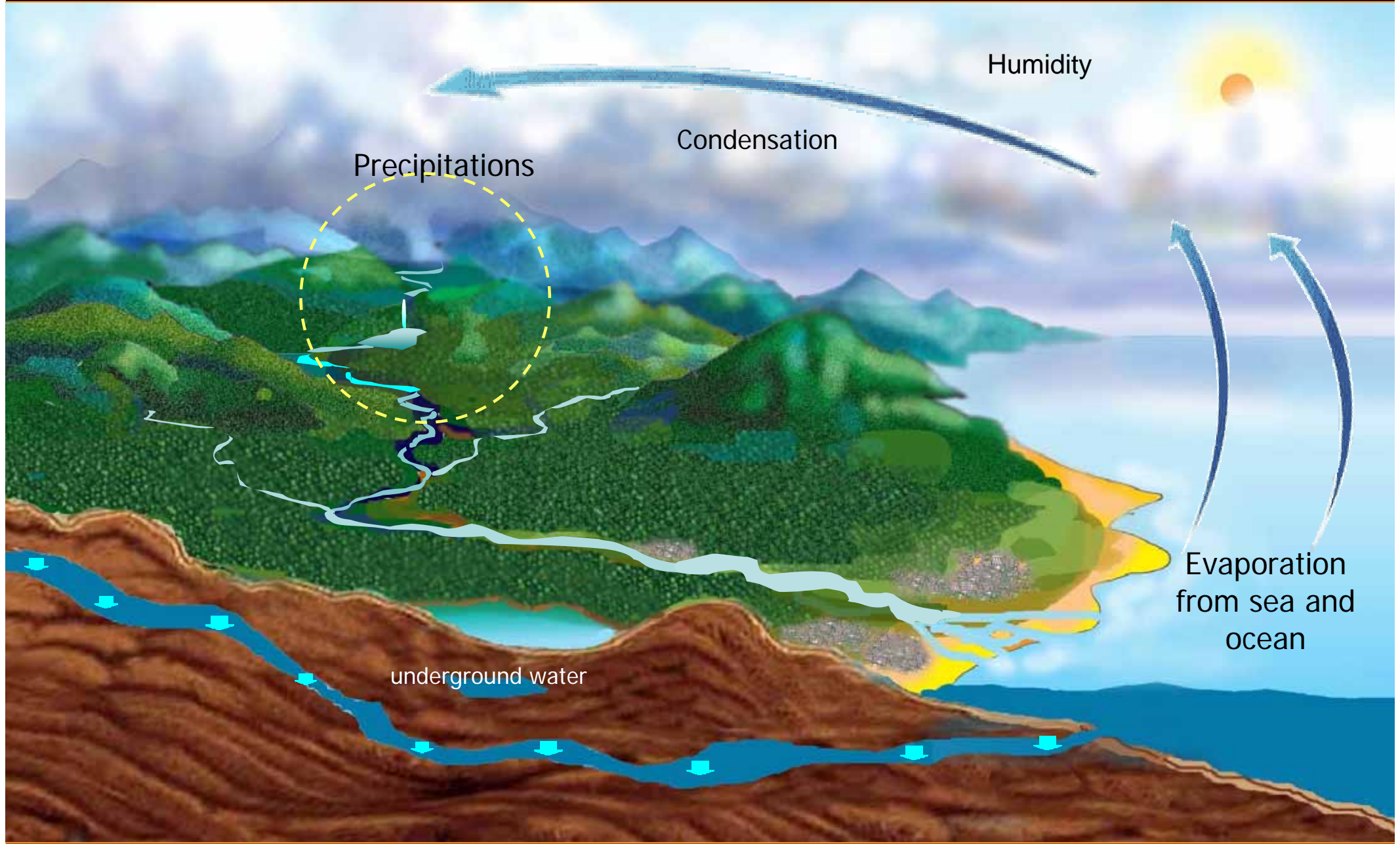
rain hail snow fog and dew

HYDROLOGIC CYCLE



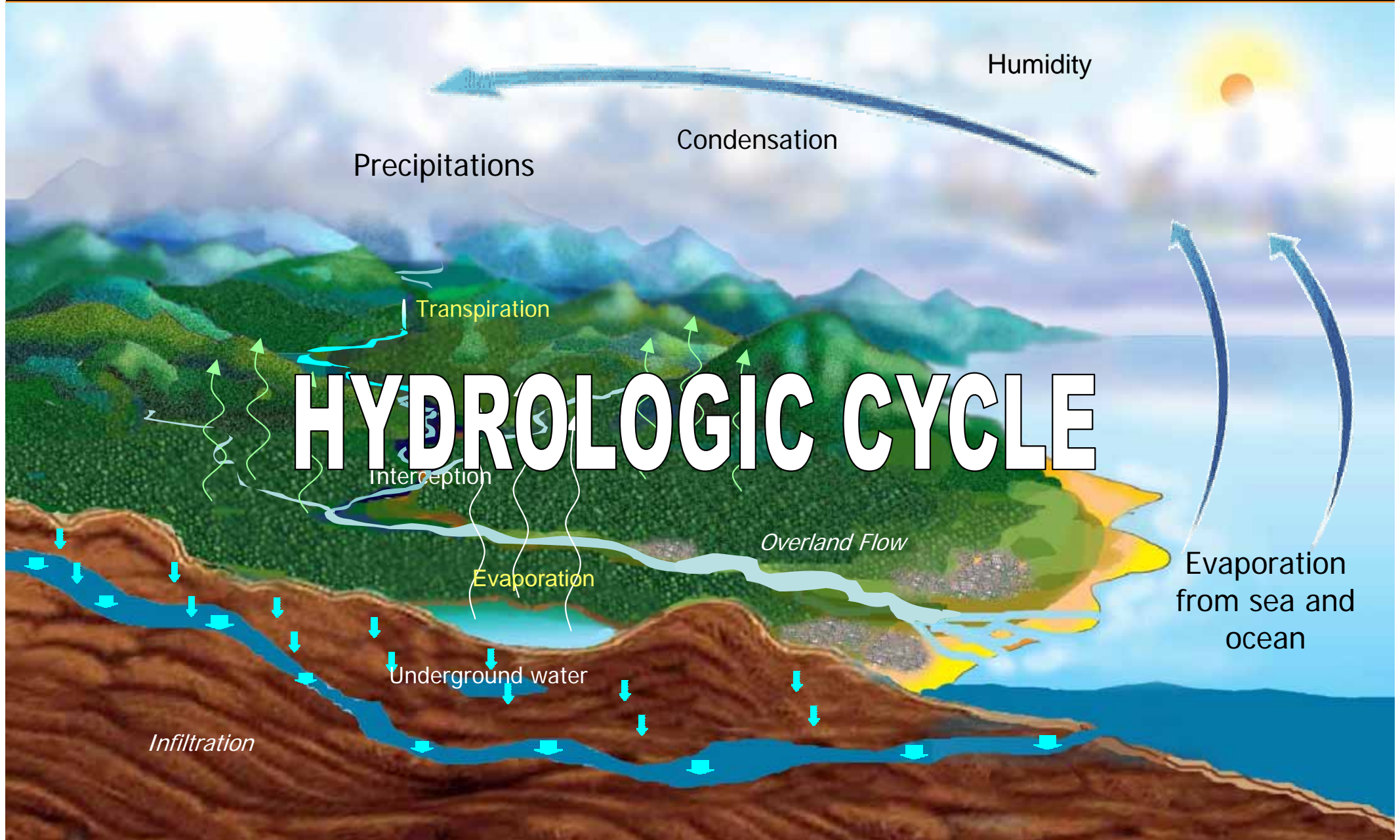
Some parts intercepted by leaves or absorbed by roots
and some parts evaporated back to the air

HYDROLOGIC CYCLE



The rest as overland flow
gathered to be the rivers and run down back to the seas and oceans again

HYDROLOGIC CYCLE



NORTHERN THAILAND

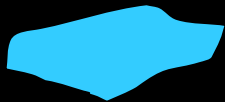


NORTHERN THAILAND

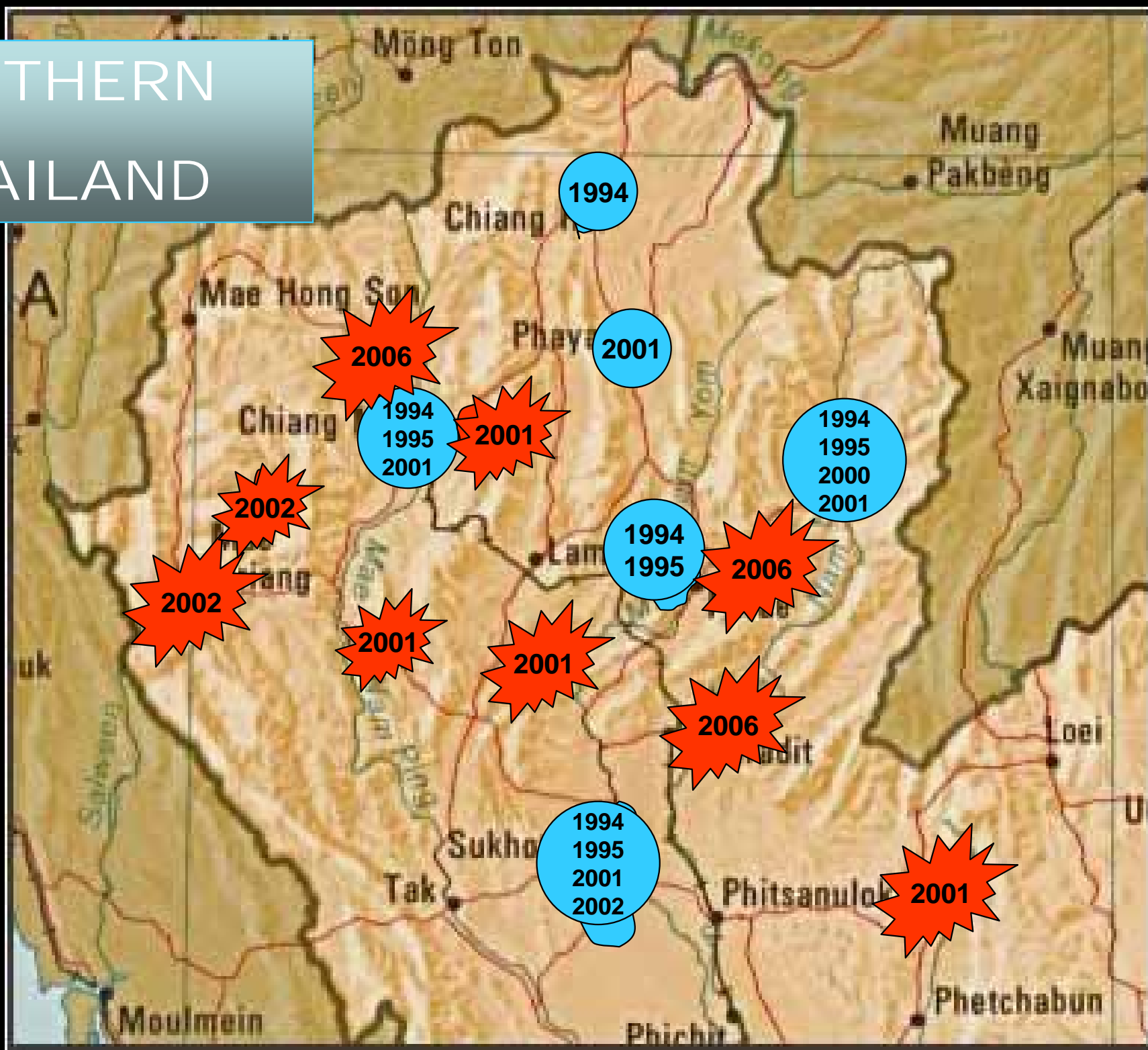
FLOODS IN
NORTHERN
THAILAND
IN LAST
DECADE



FLASH FLOOD



INUNDATION

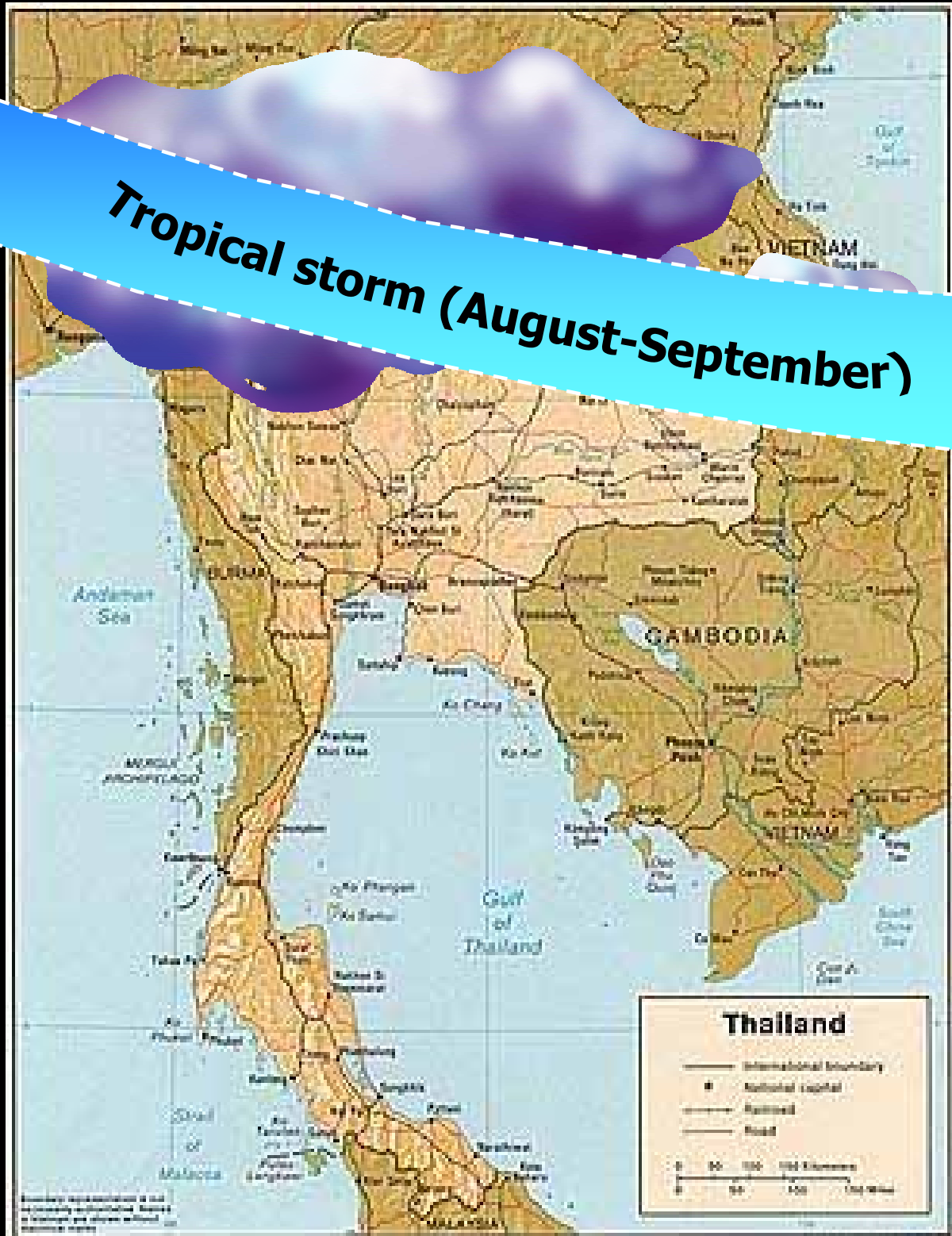


Factors of flood in Northern Thailand.

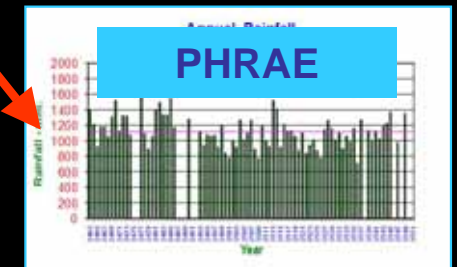
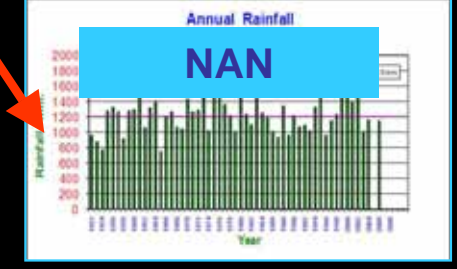
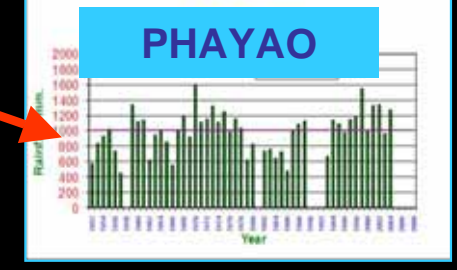
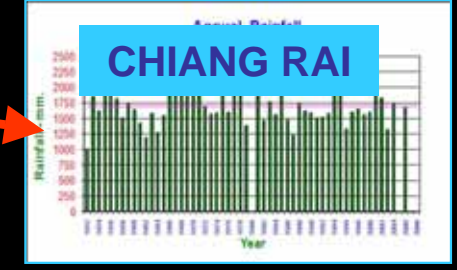
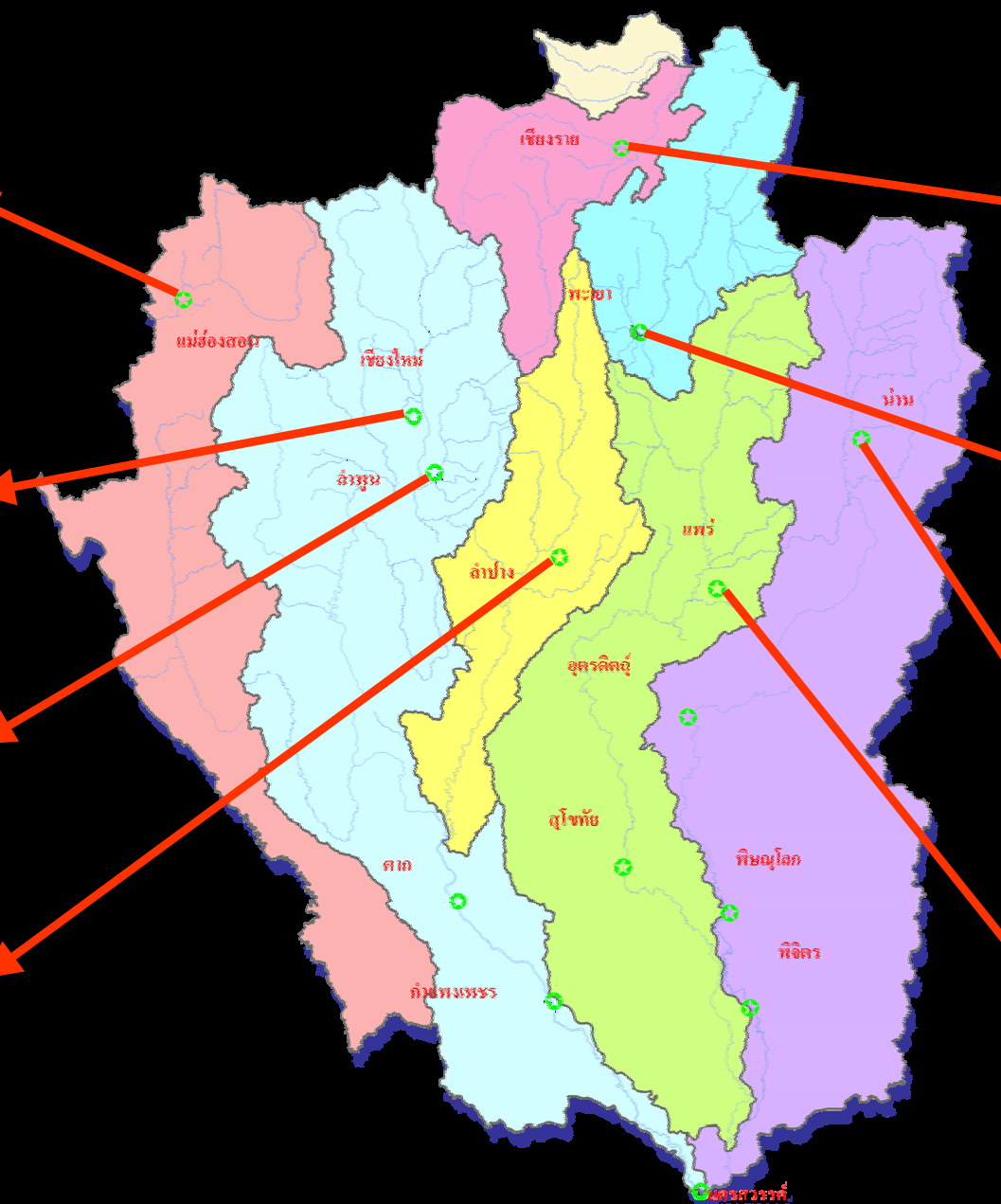
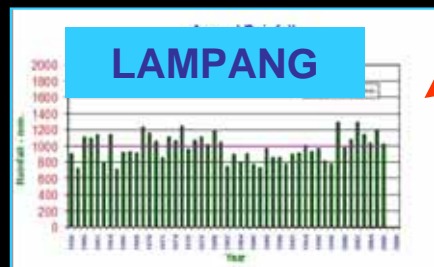
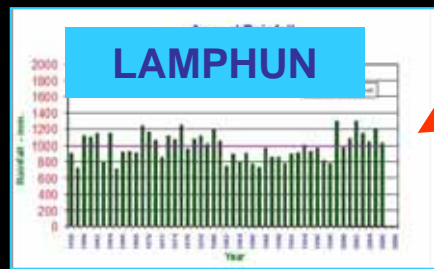
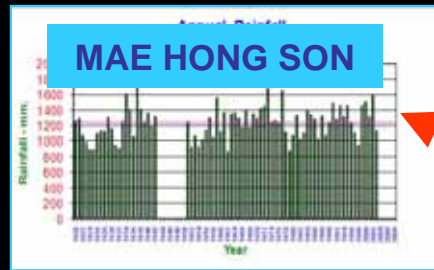
Flash flood and overbank flow inundation trend to occur mostly in the wet season from May to October of each year.

When there is continuous heavy rain influenced by southwest monsoon from Indian Ocean, tropical storm from South China Sea, low pressure trough or frontal encounter of different pressure air masses.

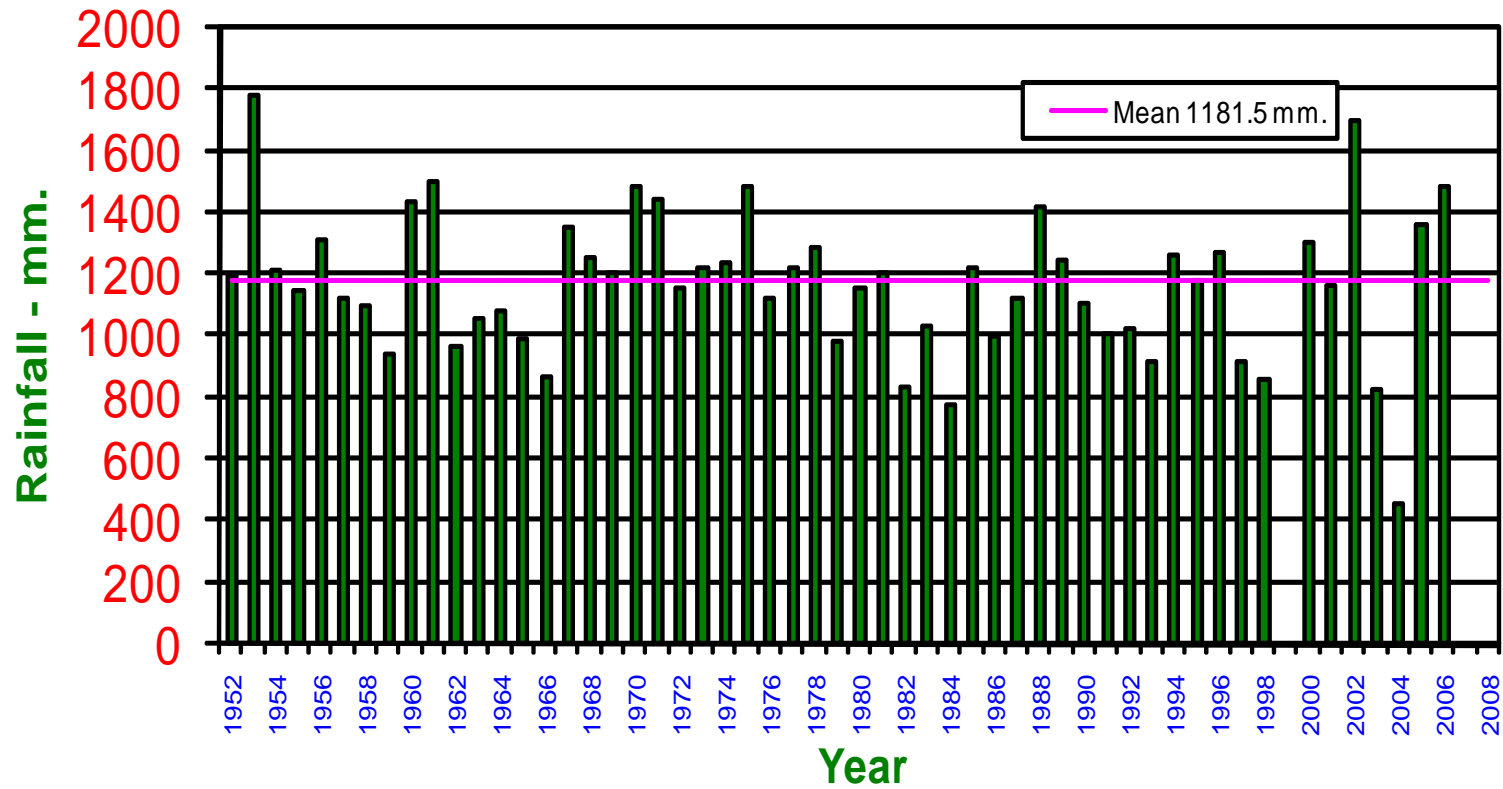
Tropical storm (August-September)



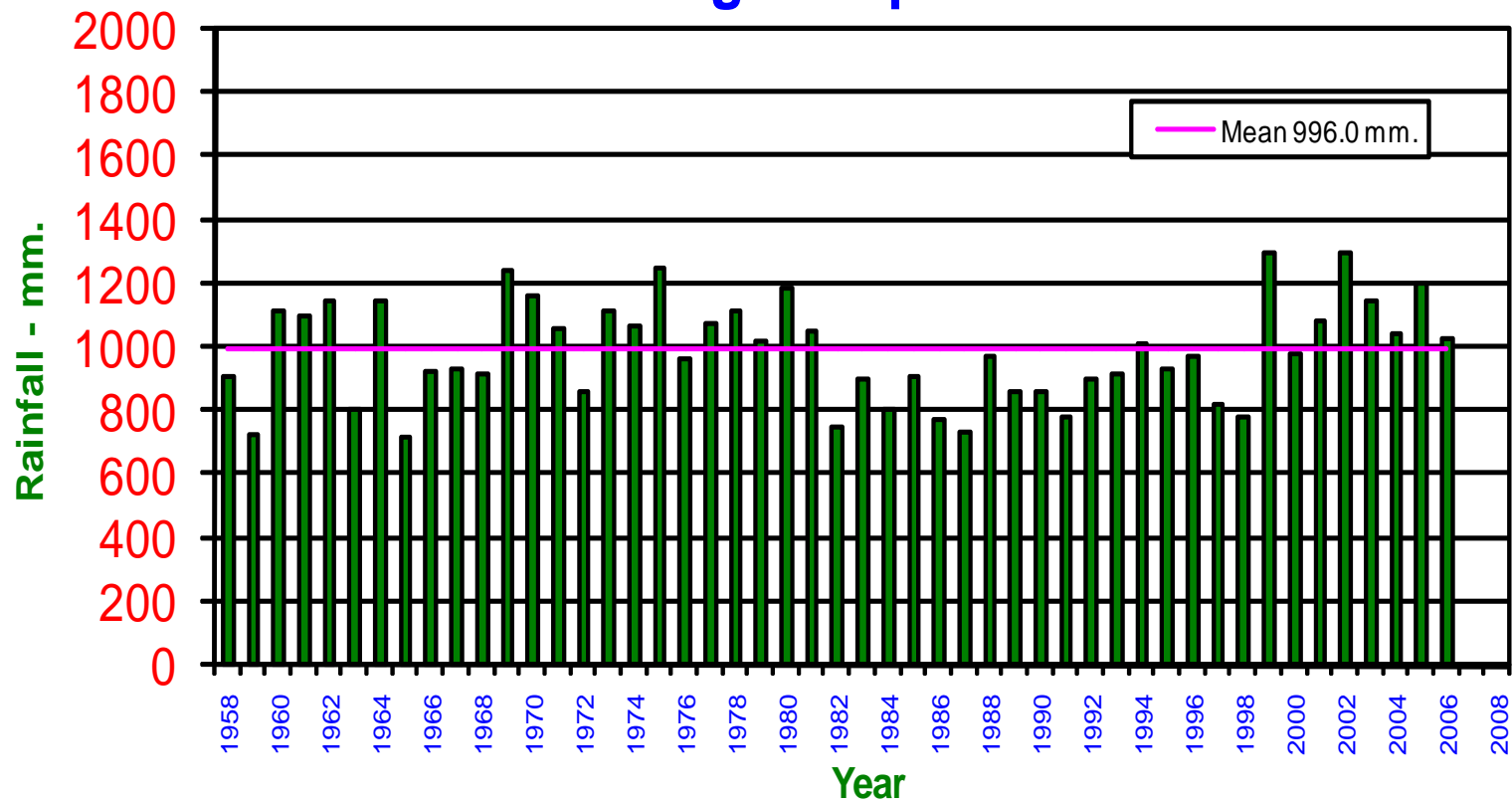
1 : ANNUAL RAINFALL



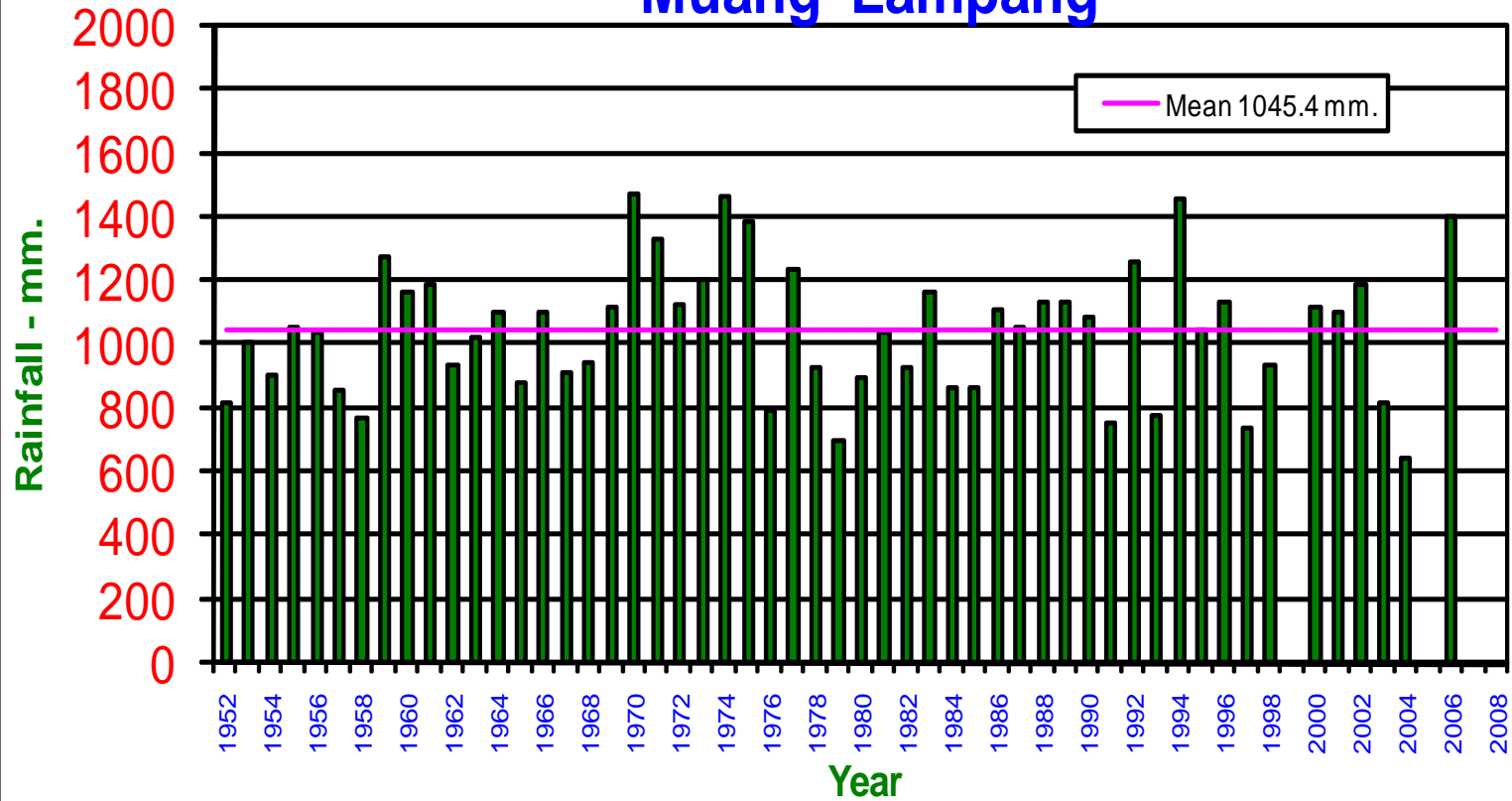
Annual Rainfall Muang Chiang Mai District



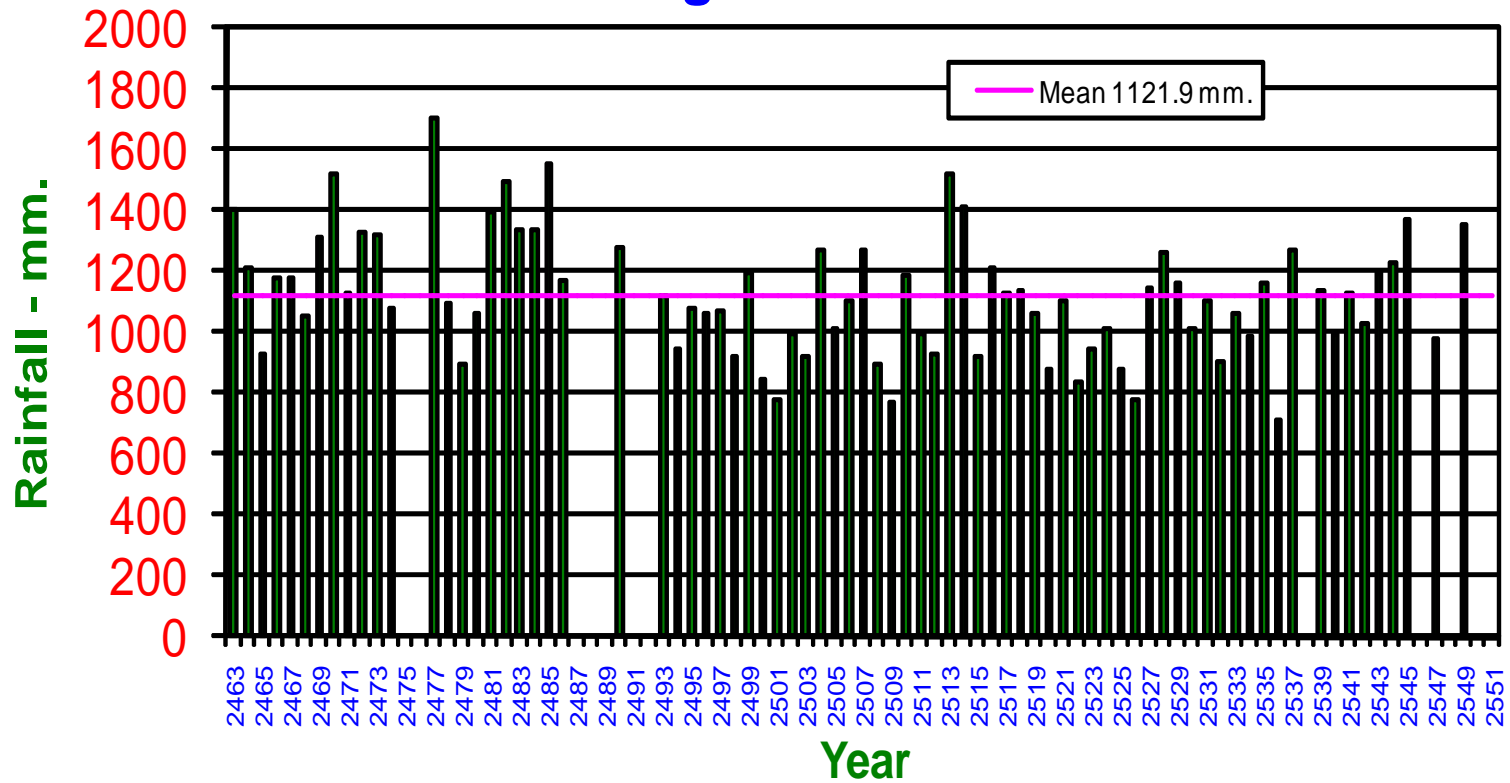
Annual Rainfall Muang Lamphun District



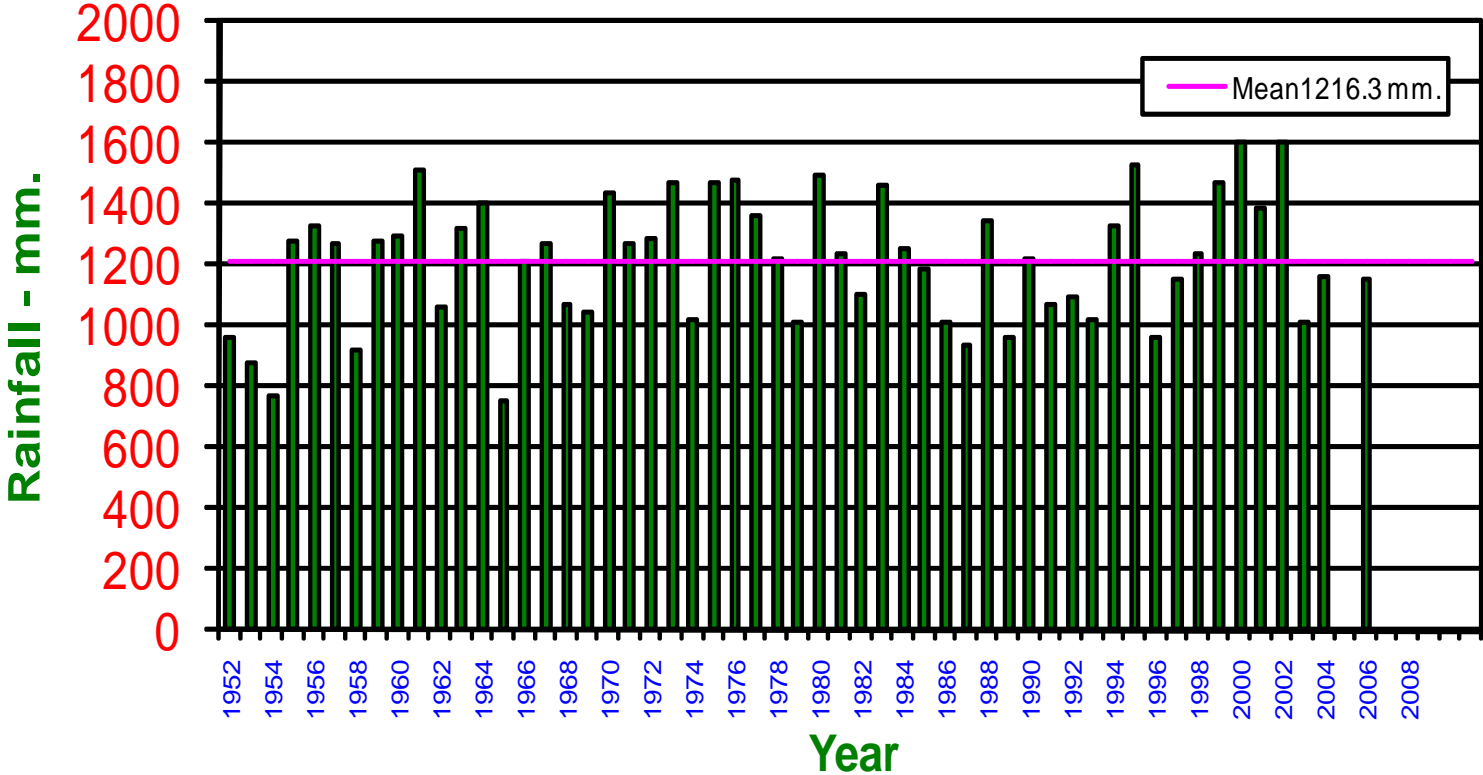
Annual Rainfall Muang Lampang



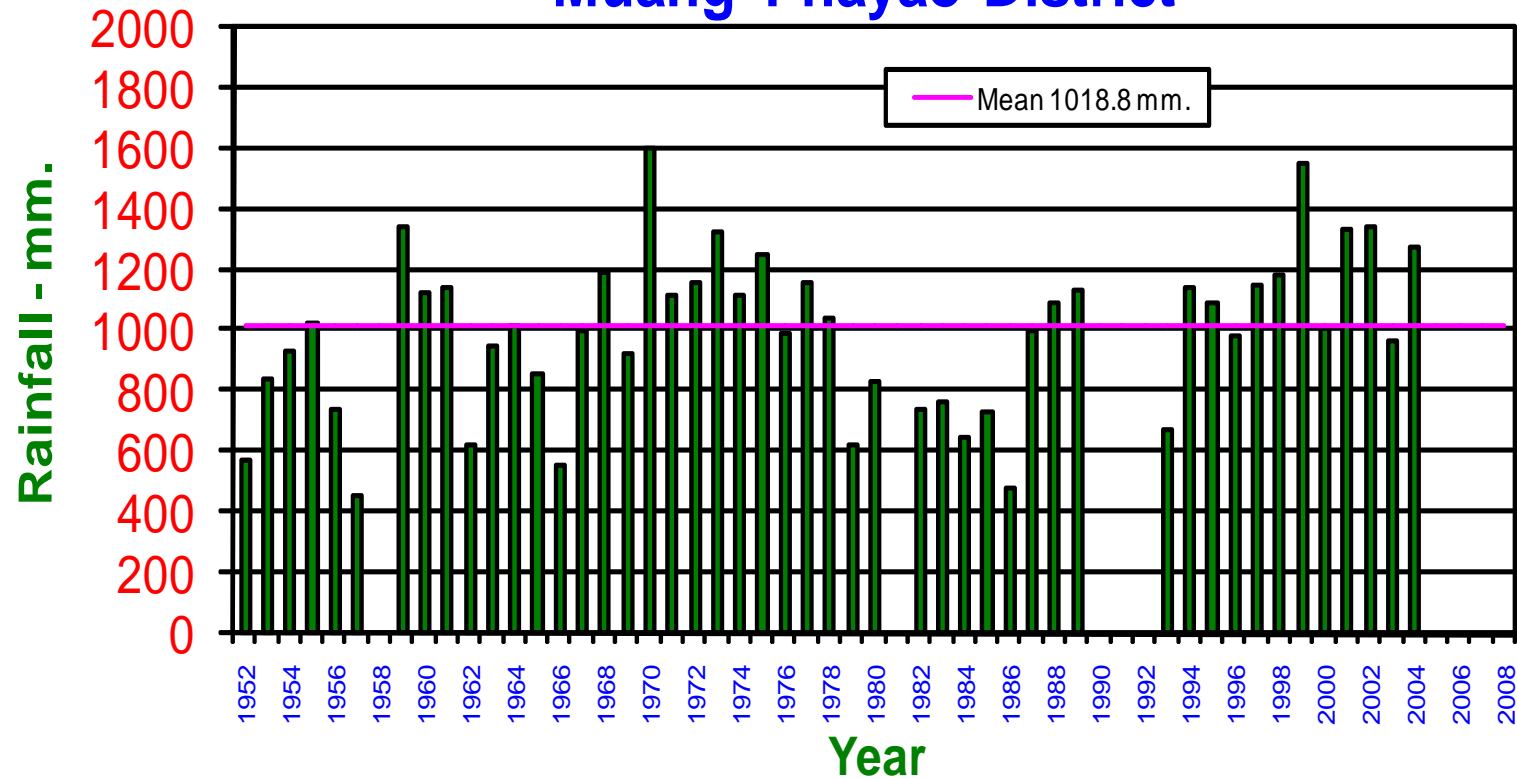
Annual Rainfall Muang Phrae District



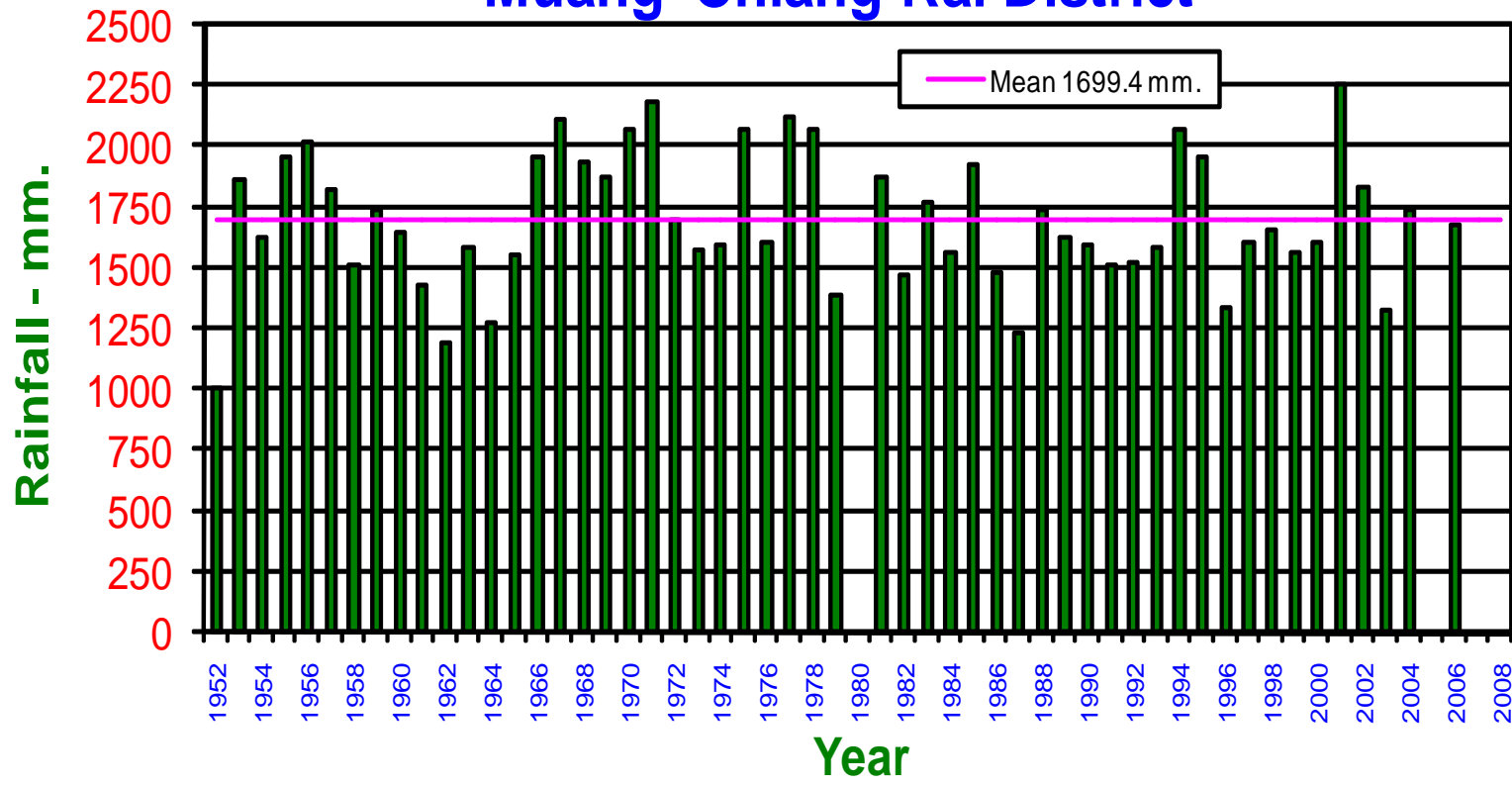
Annual Rainfall Muang Nan District



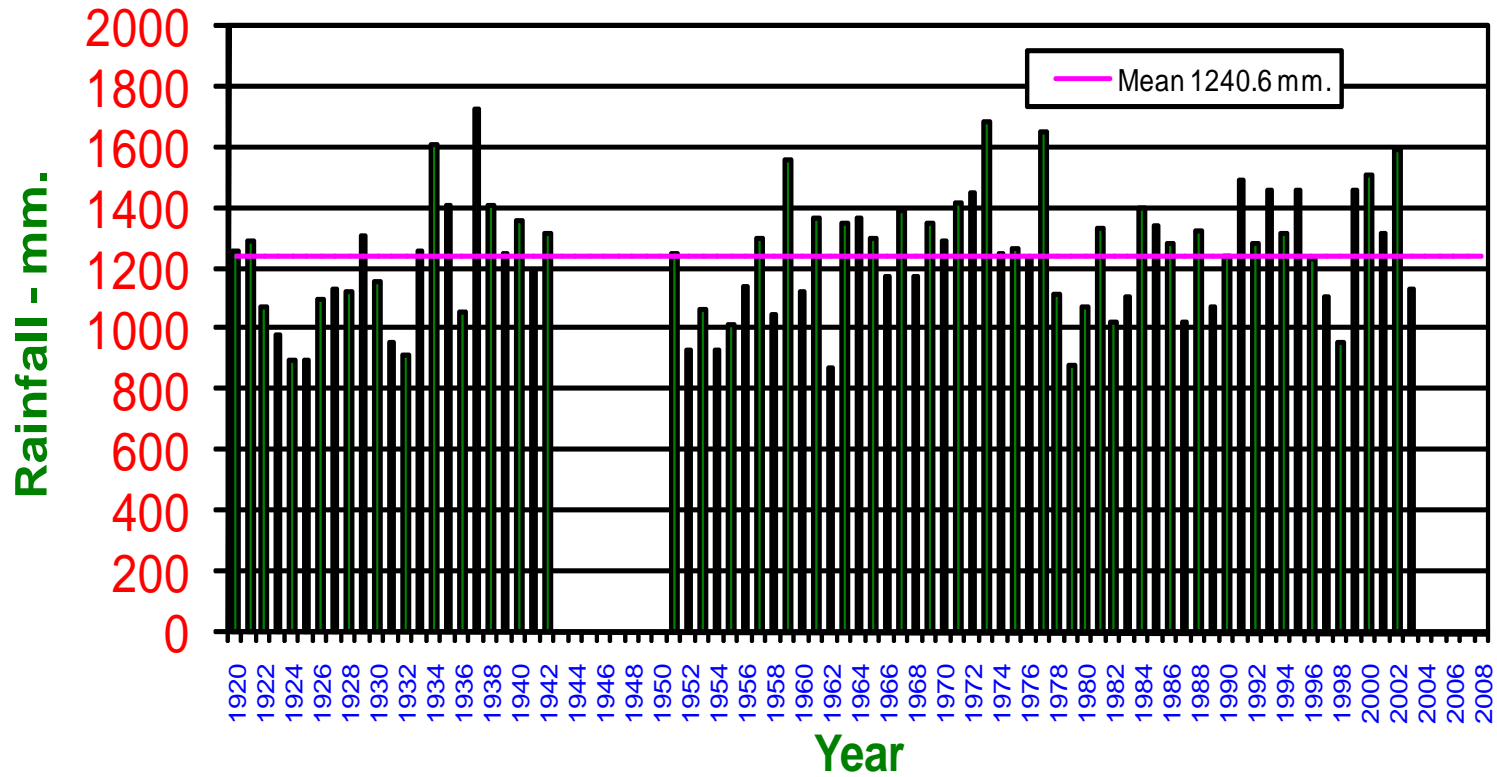
Annual Rainfall Muang Phayao District



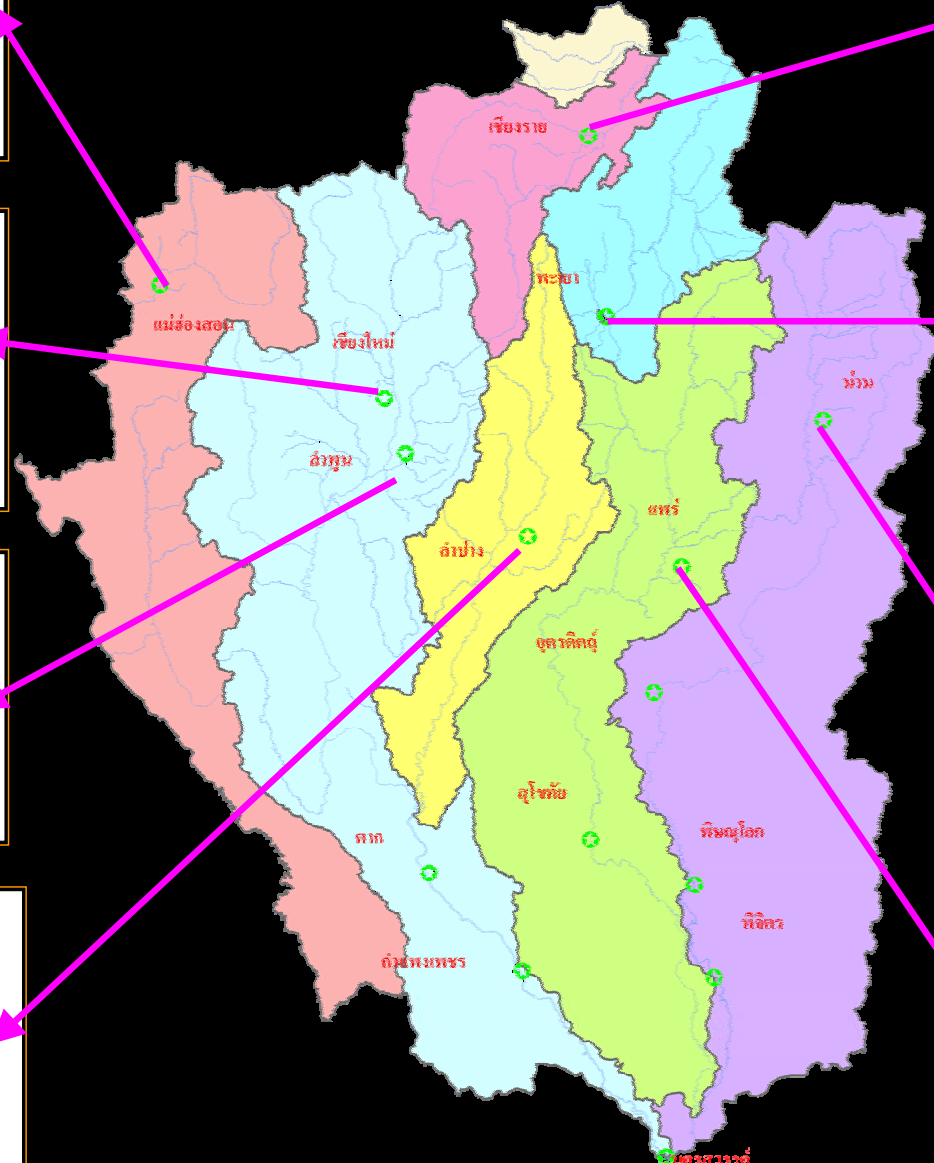
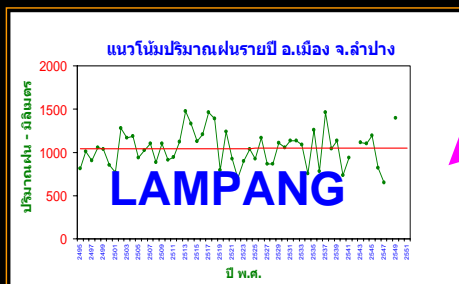
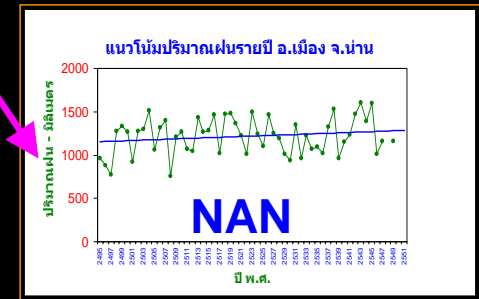
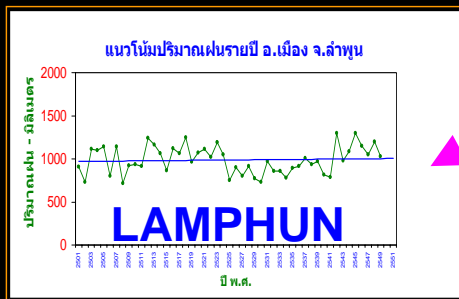
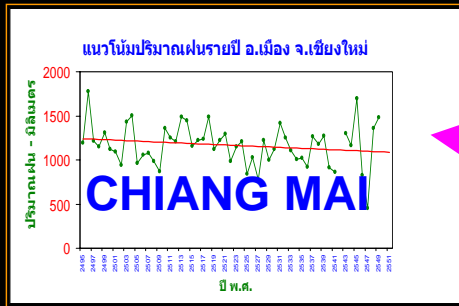
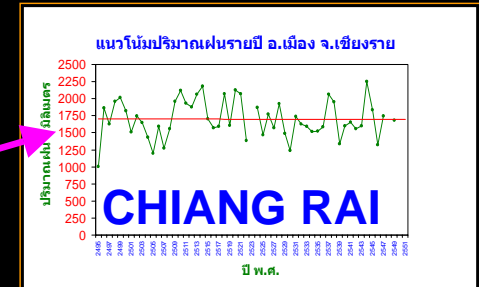
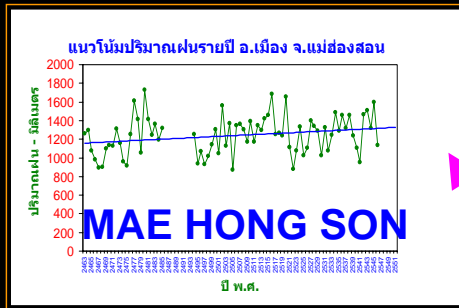
Annual Rainfall Muang Chiang Rai District



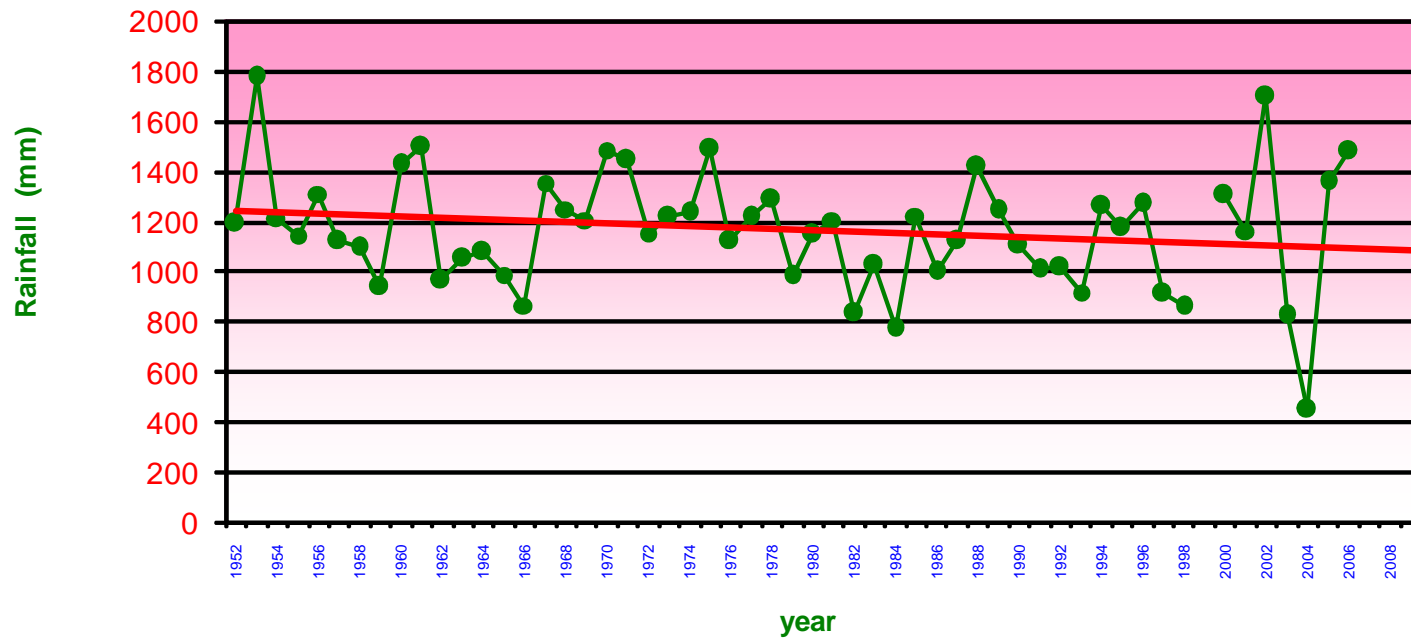
Annual Rainfall Muang Mae Hong Son District



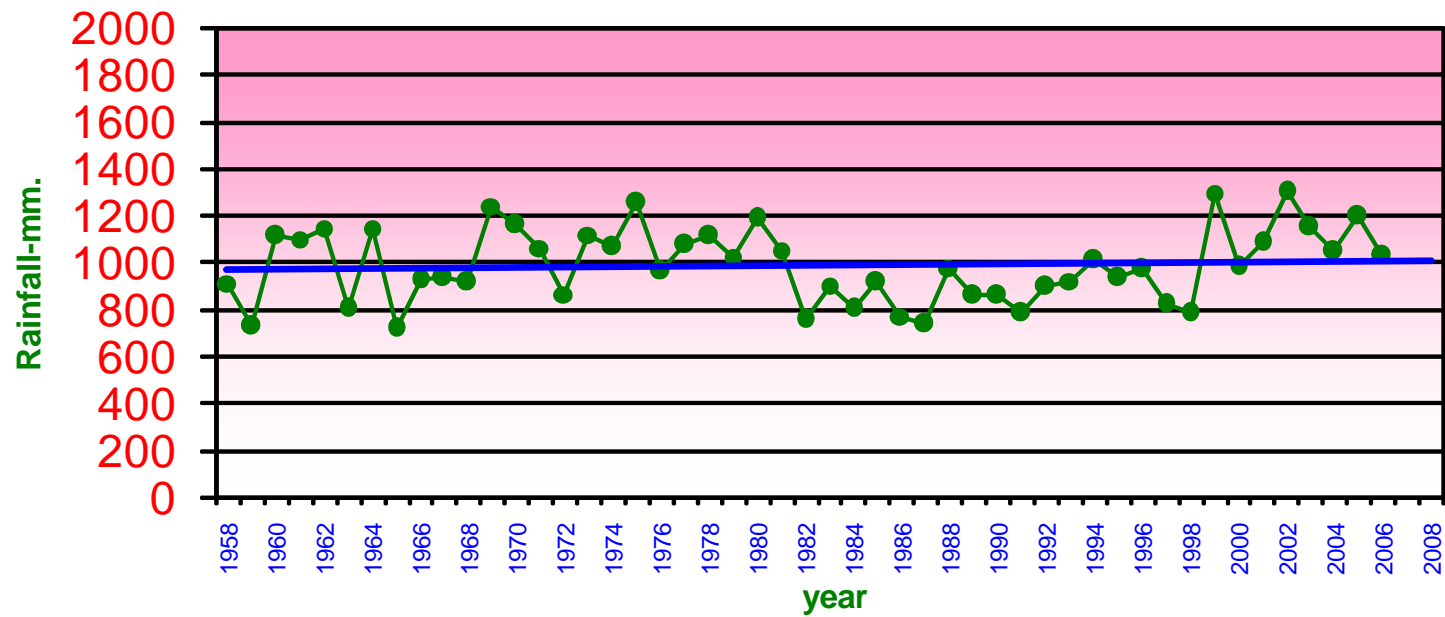
2 : TREND OF ANNUAL RAINFALL



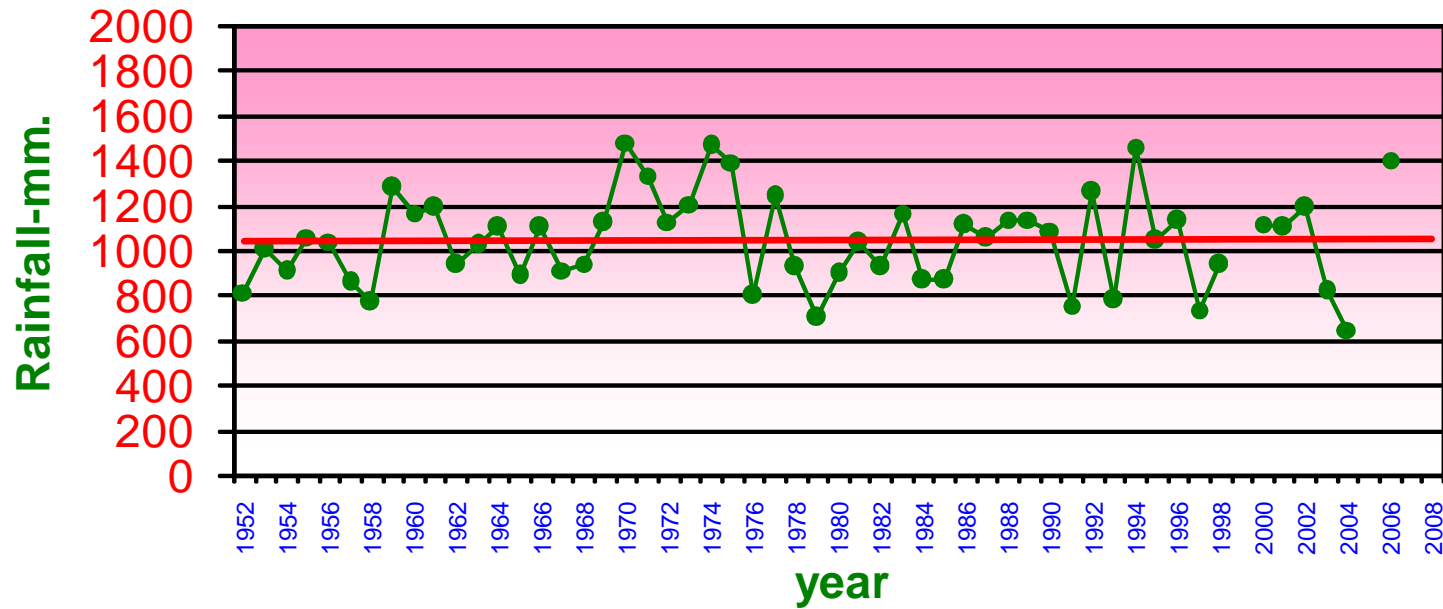
Trend of annual rainfall Muang Chiang Mai District



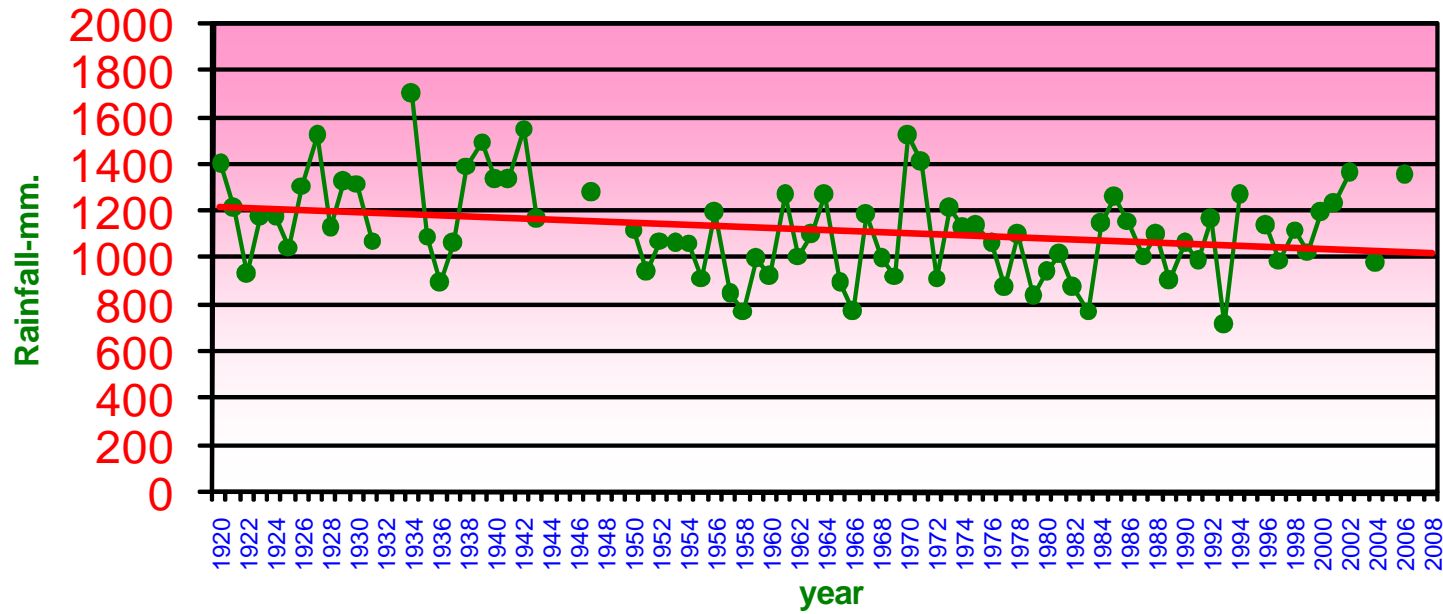
Trend of annual rainfall Muang Lamphum District



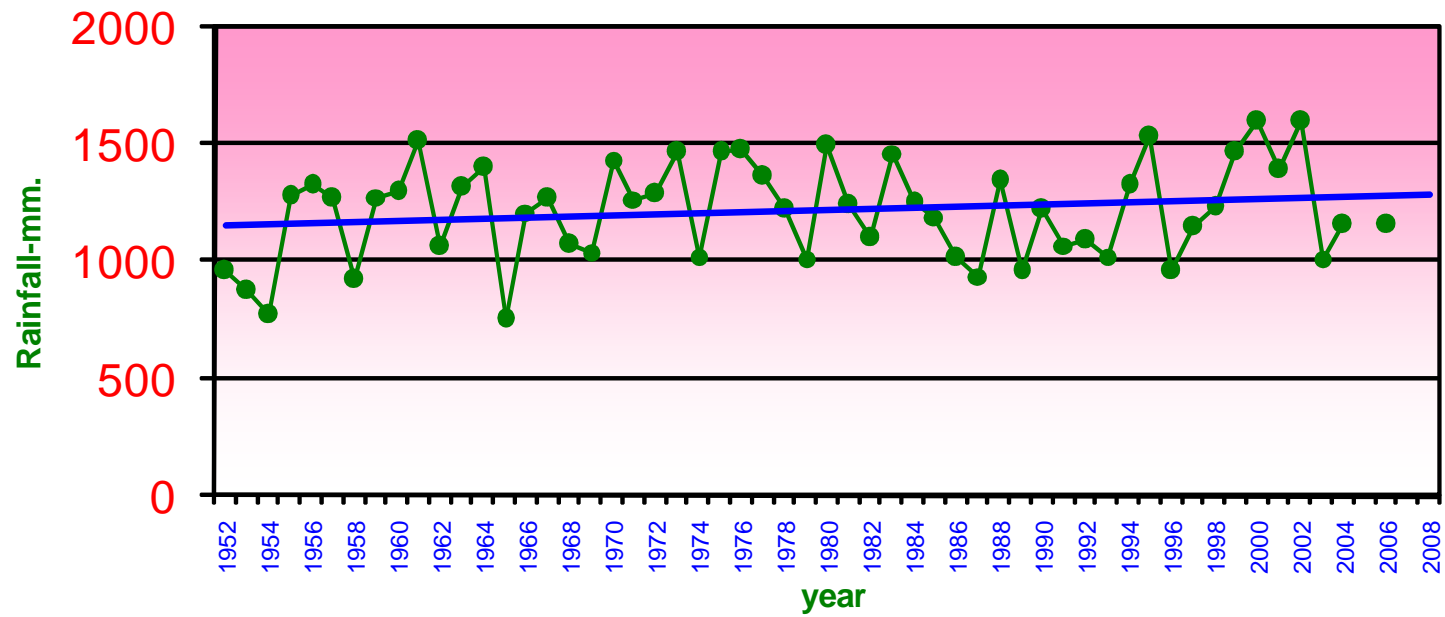
Trend of annual rainfall Muang Lampang District



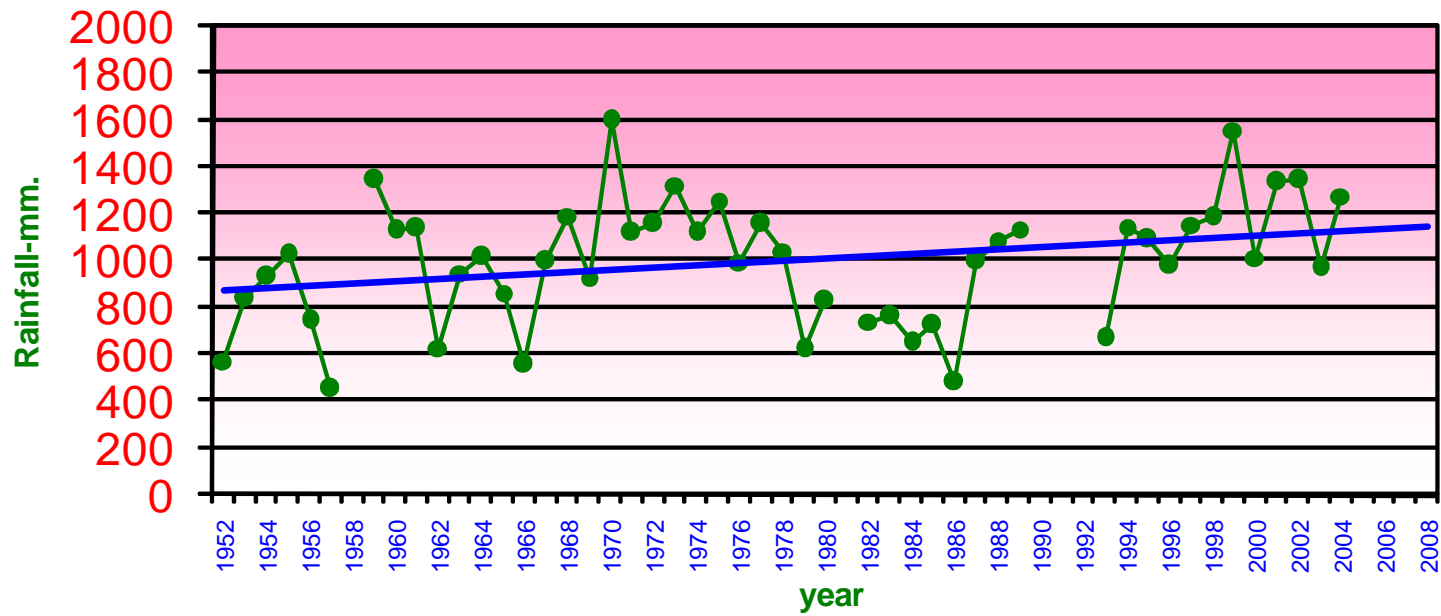
Trend of annual rainfall Muang Phrae District



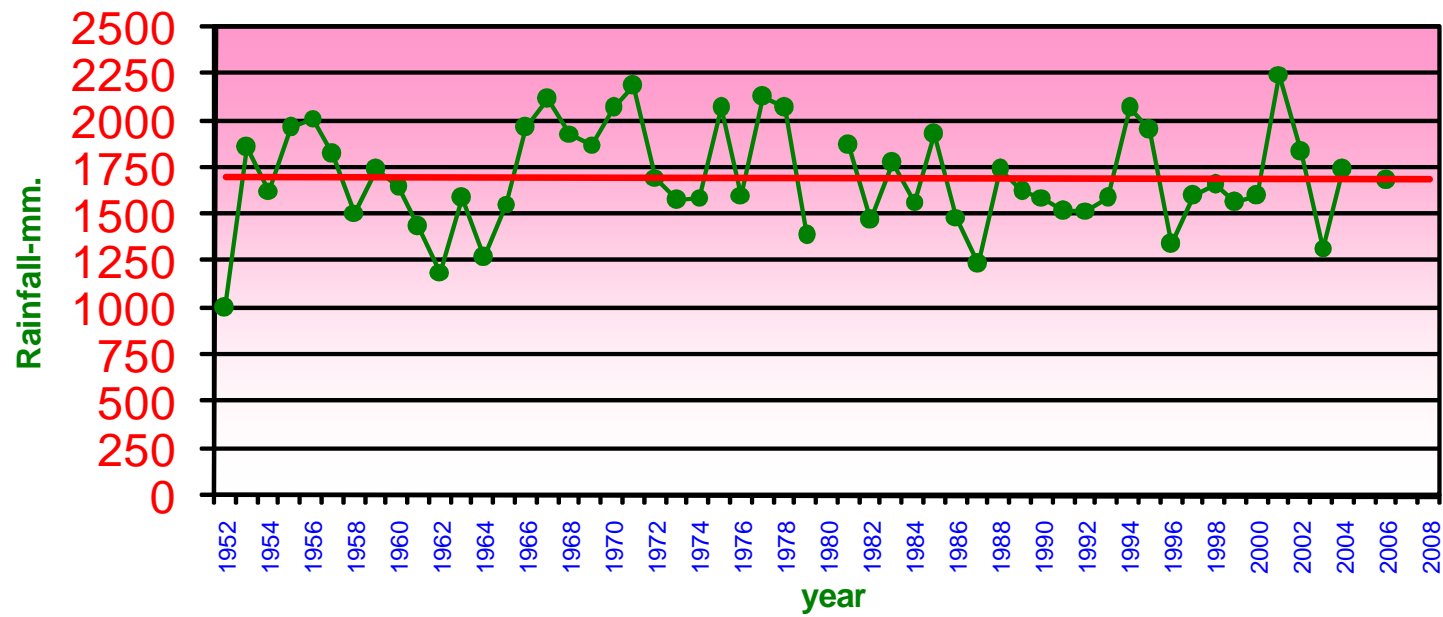
Trend of annual rainfall Muang Nan District



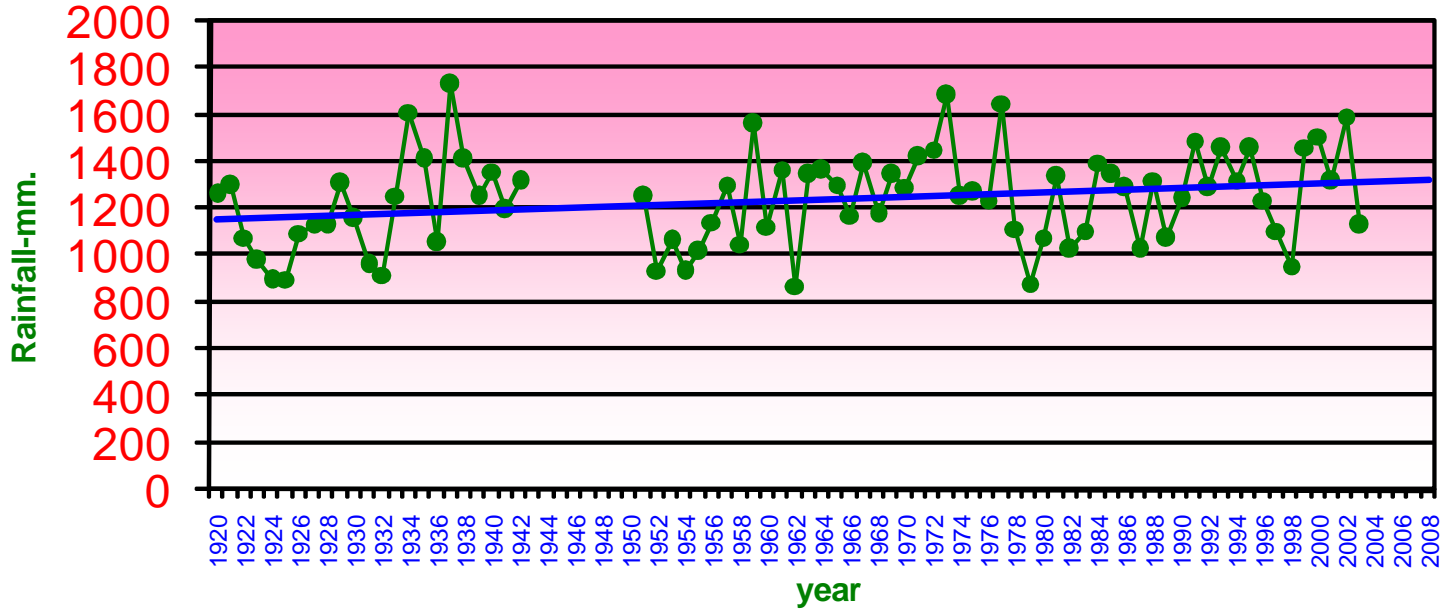
Trend of annual rainfall Muang Phayao District



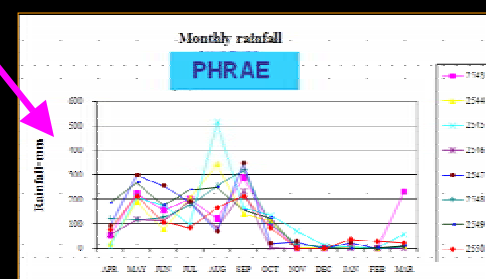
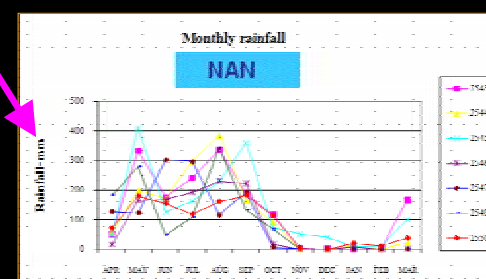
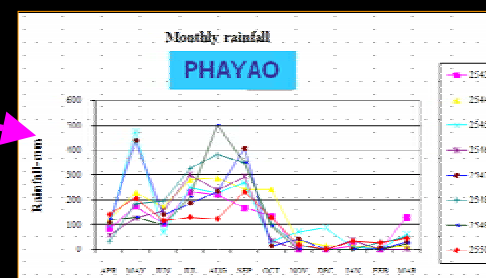
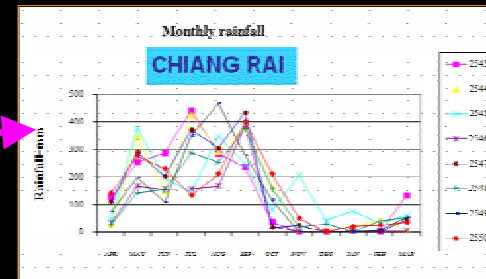
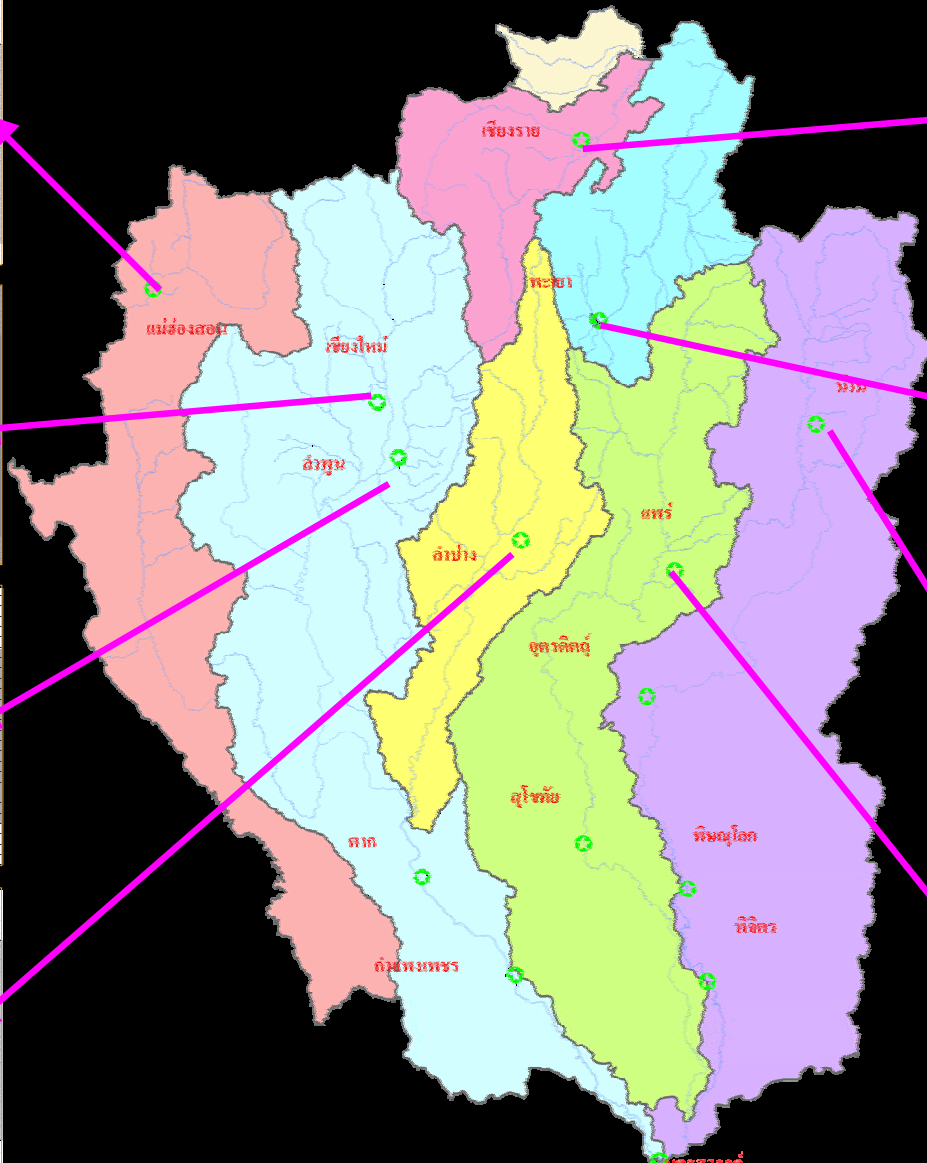
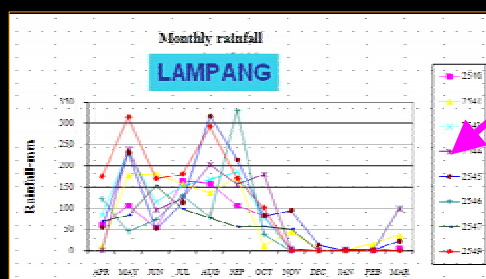
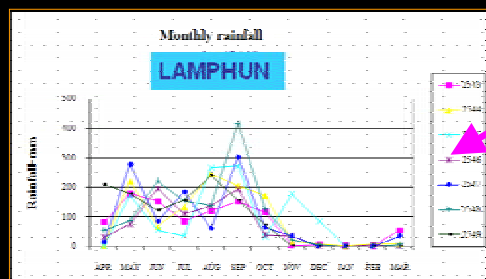
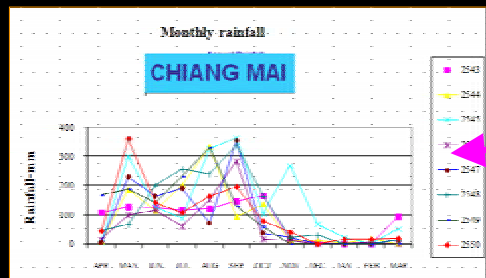
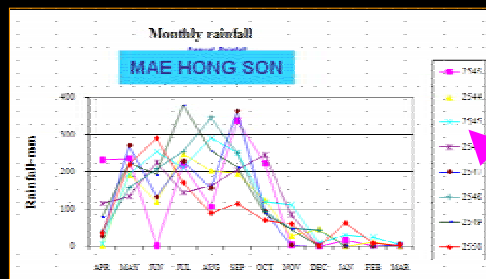
Trend of annual rainfall Muang Chaing Rai District



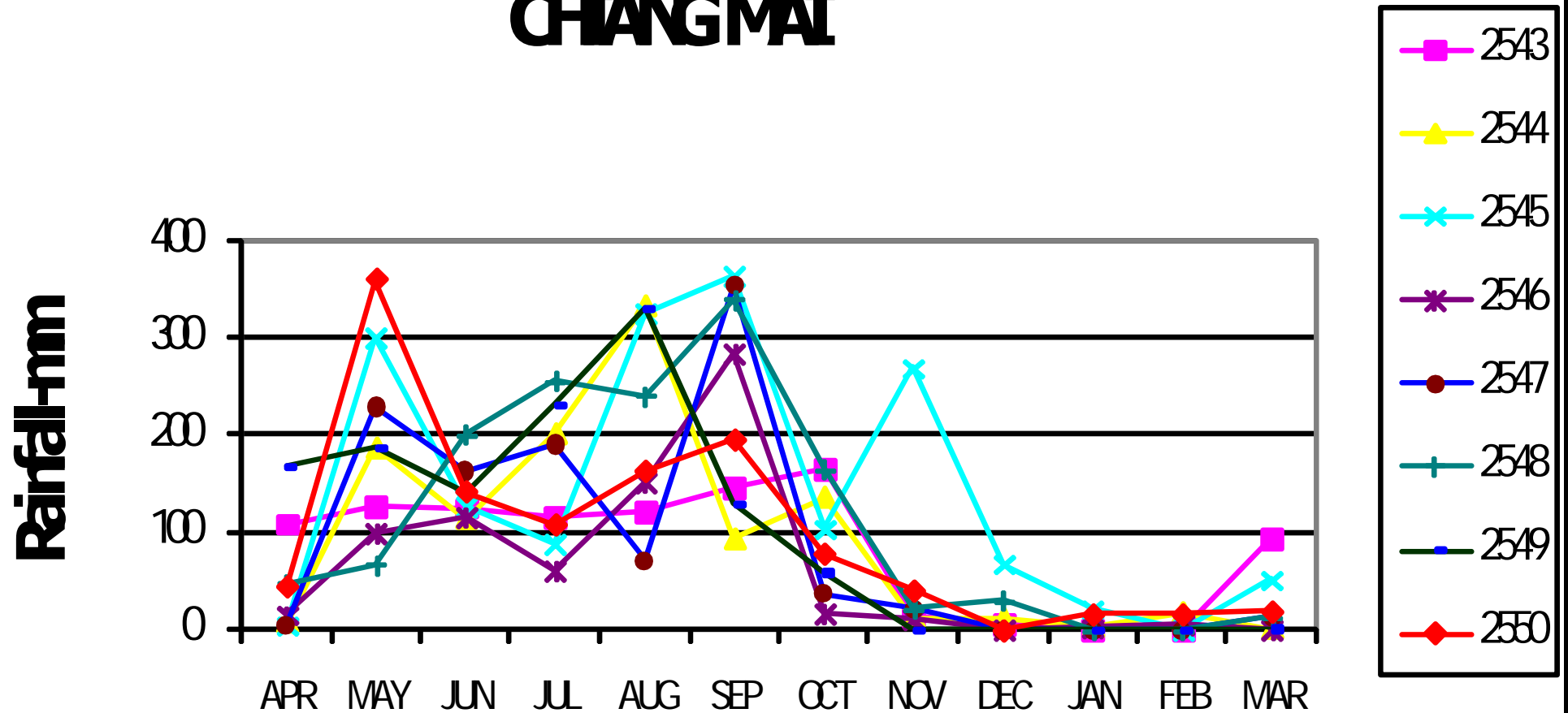
Trend of annual rainfall Muang Mae Hong Son District



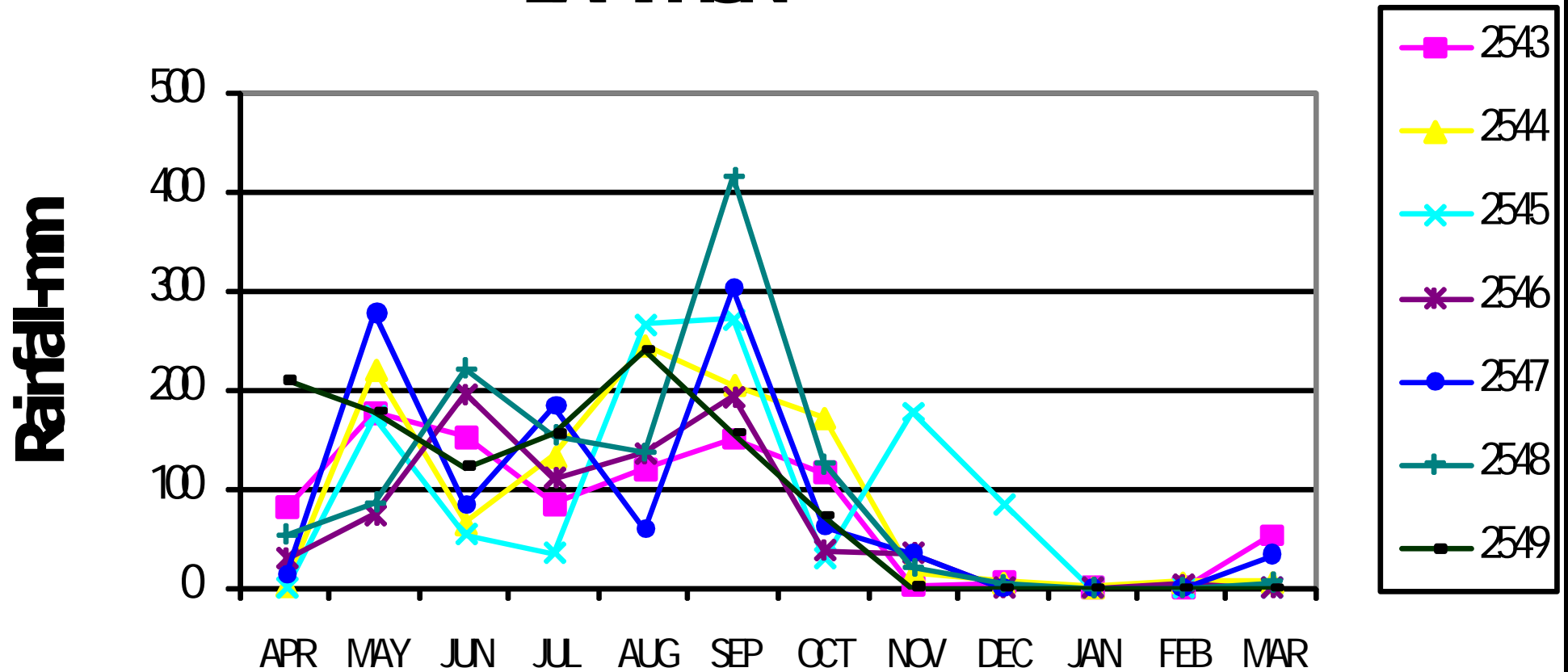
3 : MONTHLY RAINFALL



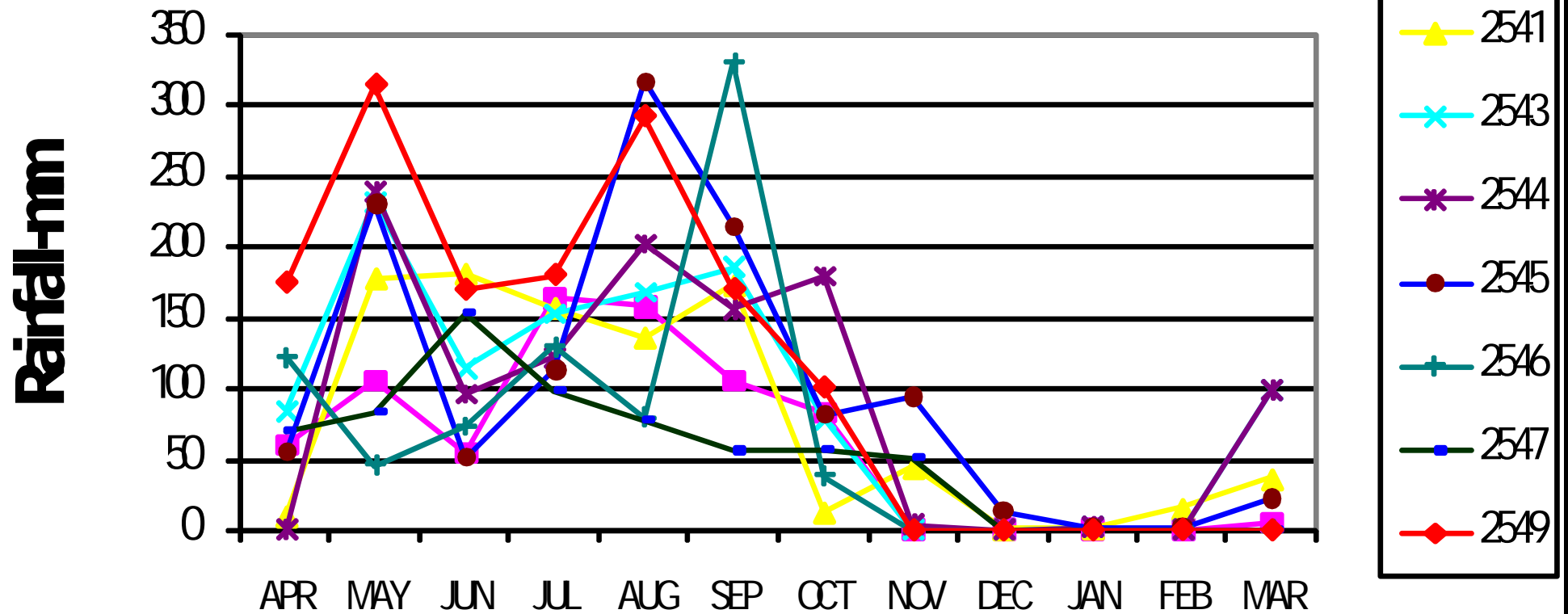
Monthly rainfall CHIANG MAI



Monthly rainfall LAMPHUN



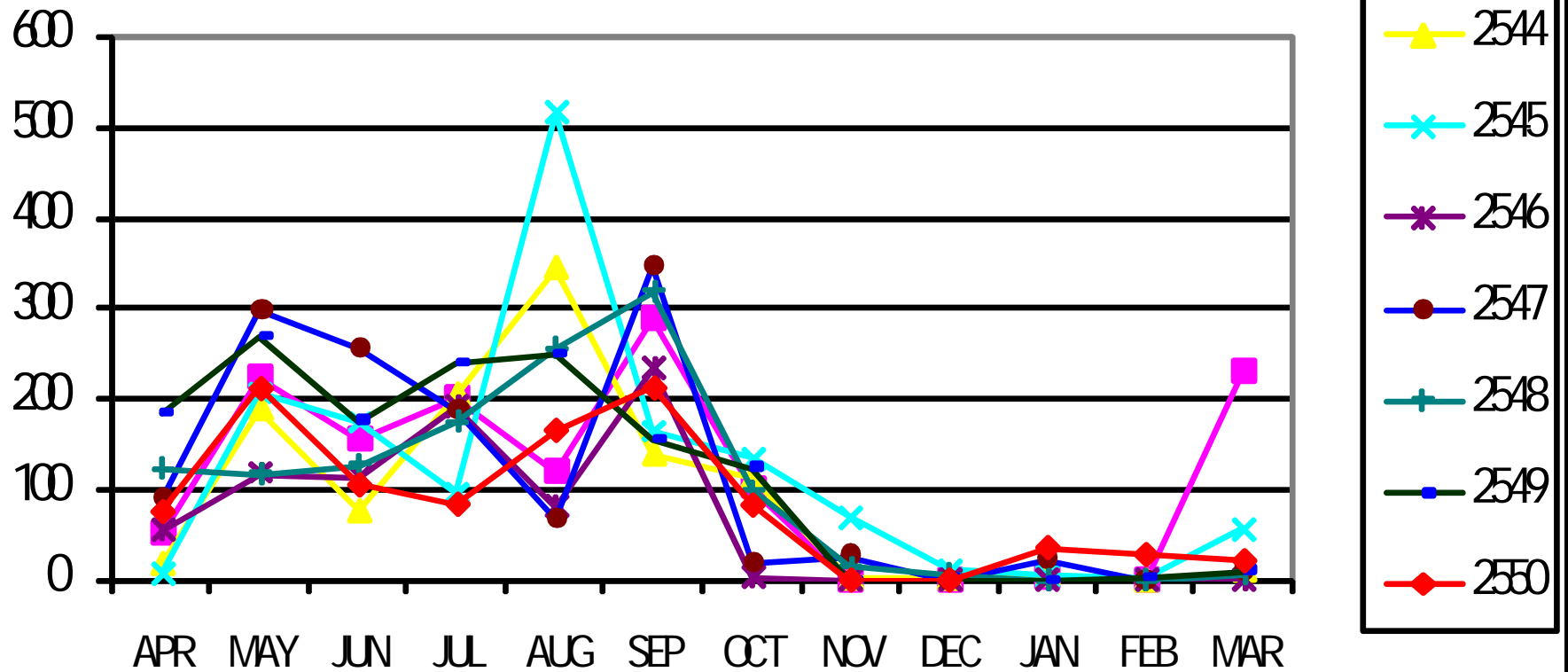
Monthly rainfall LAMPANG



Monthly rainfall

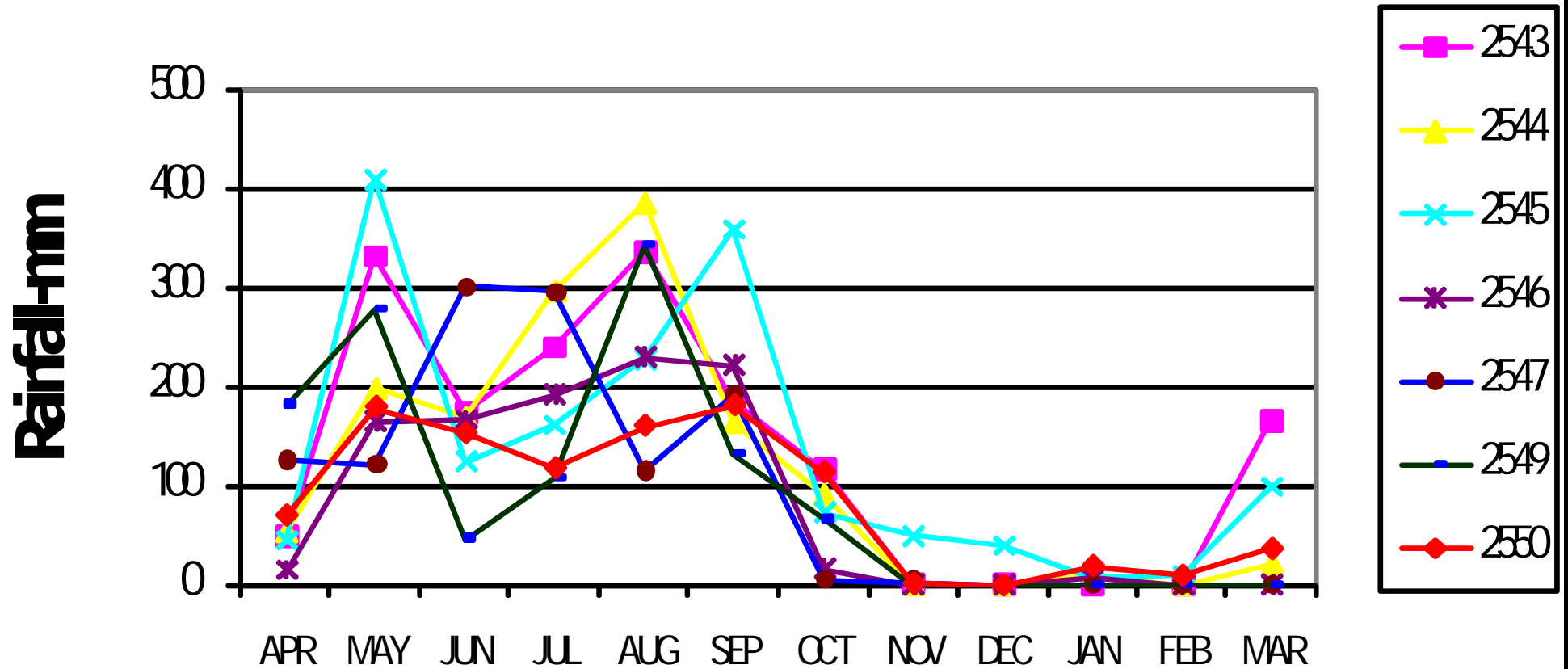
PHRAE

Rainfall-mm

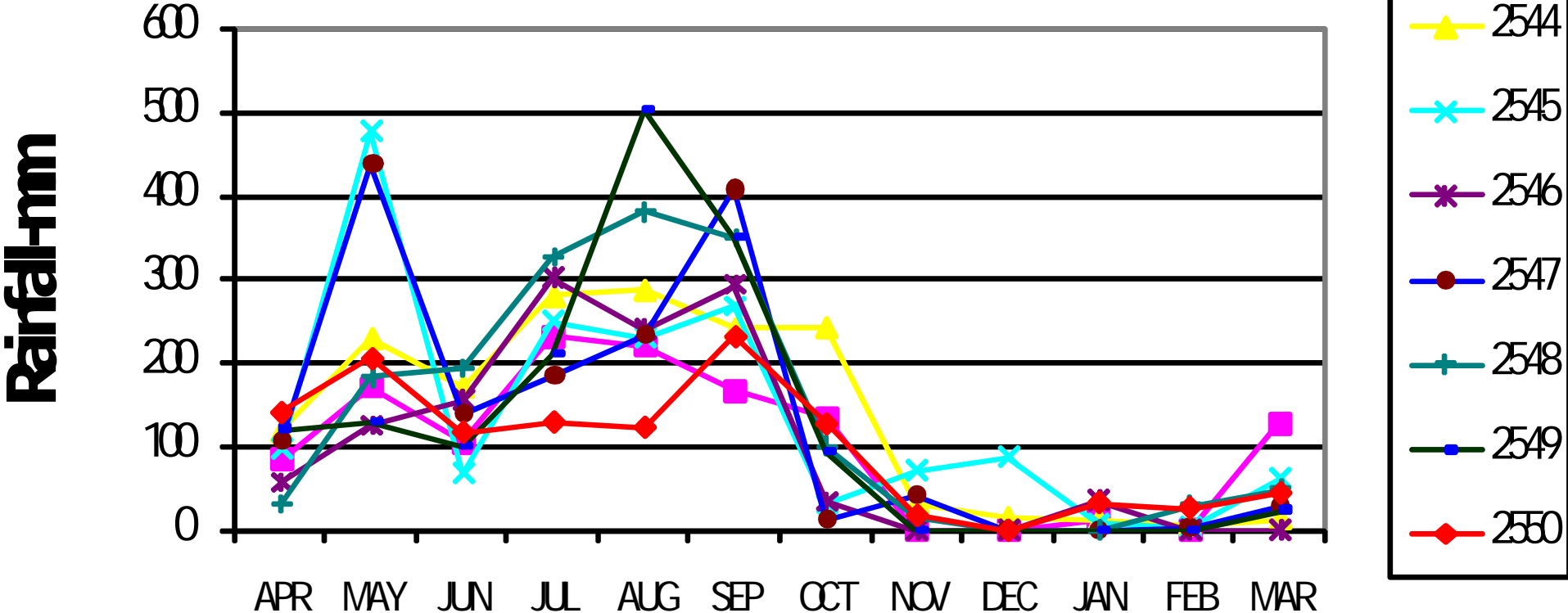


Monthly rainfall

NAN

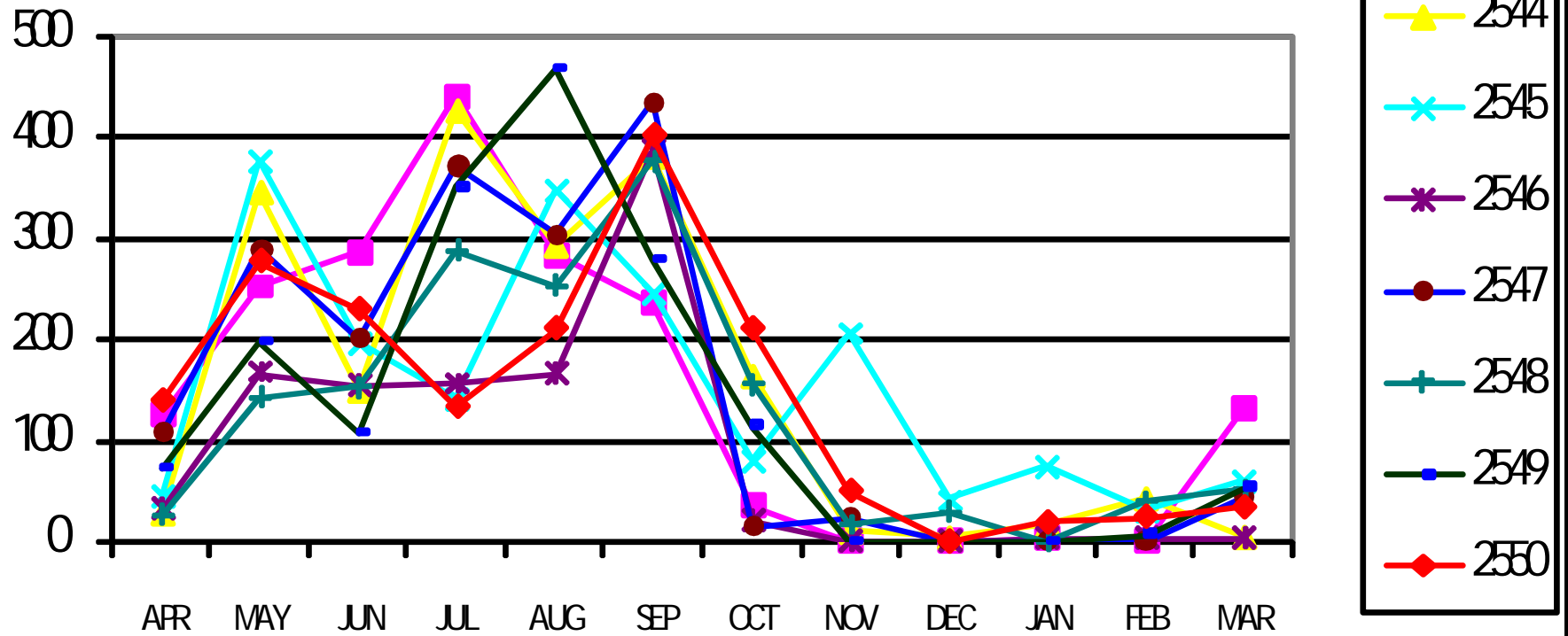


Monthly rainfall PHAYAO

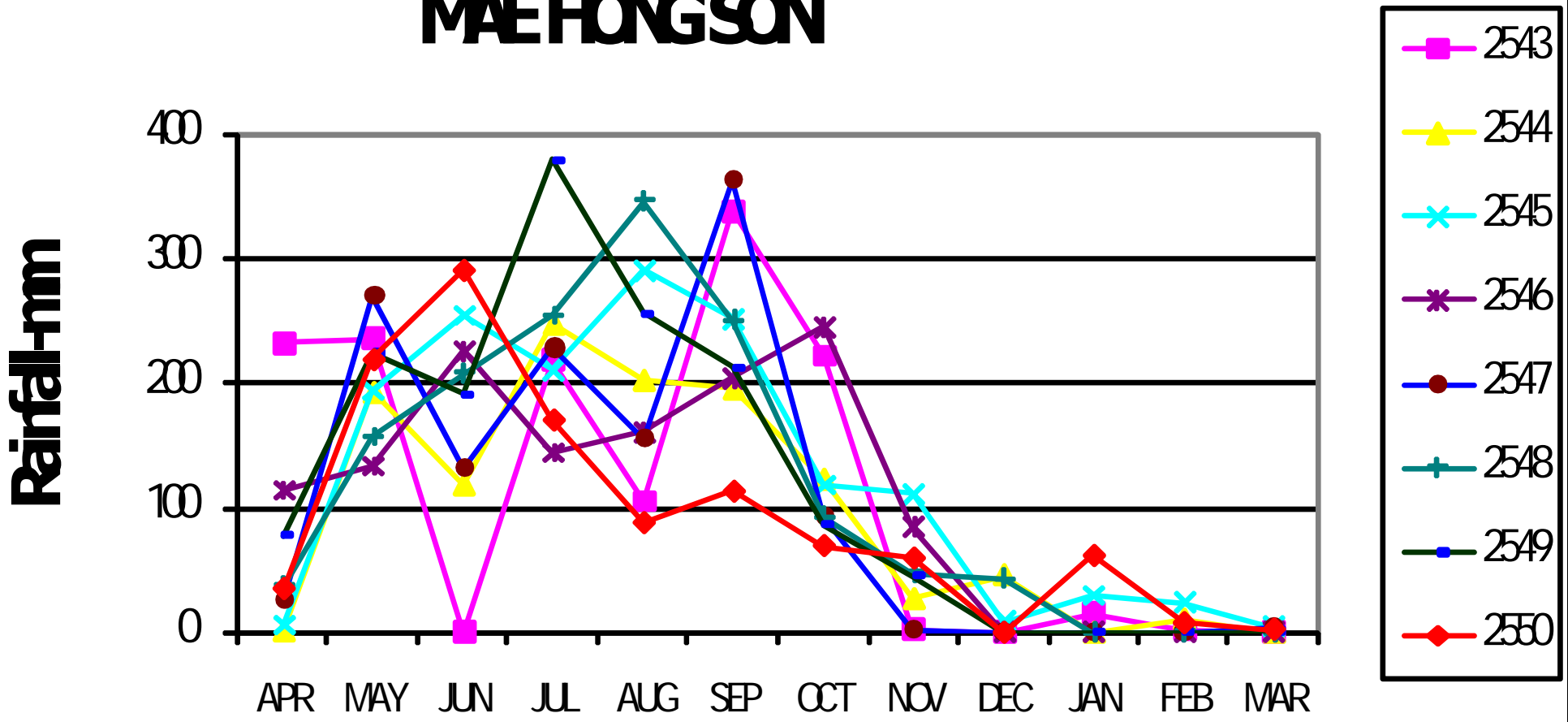


Monthly rainfall CHIANGRAI

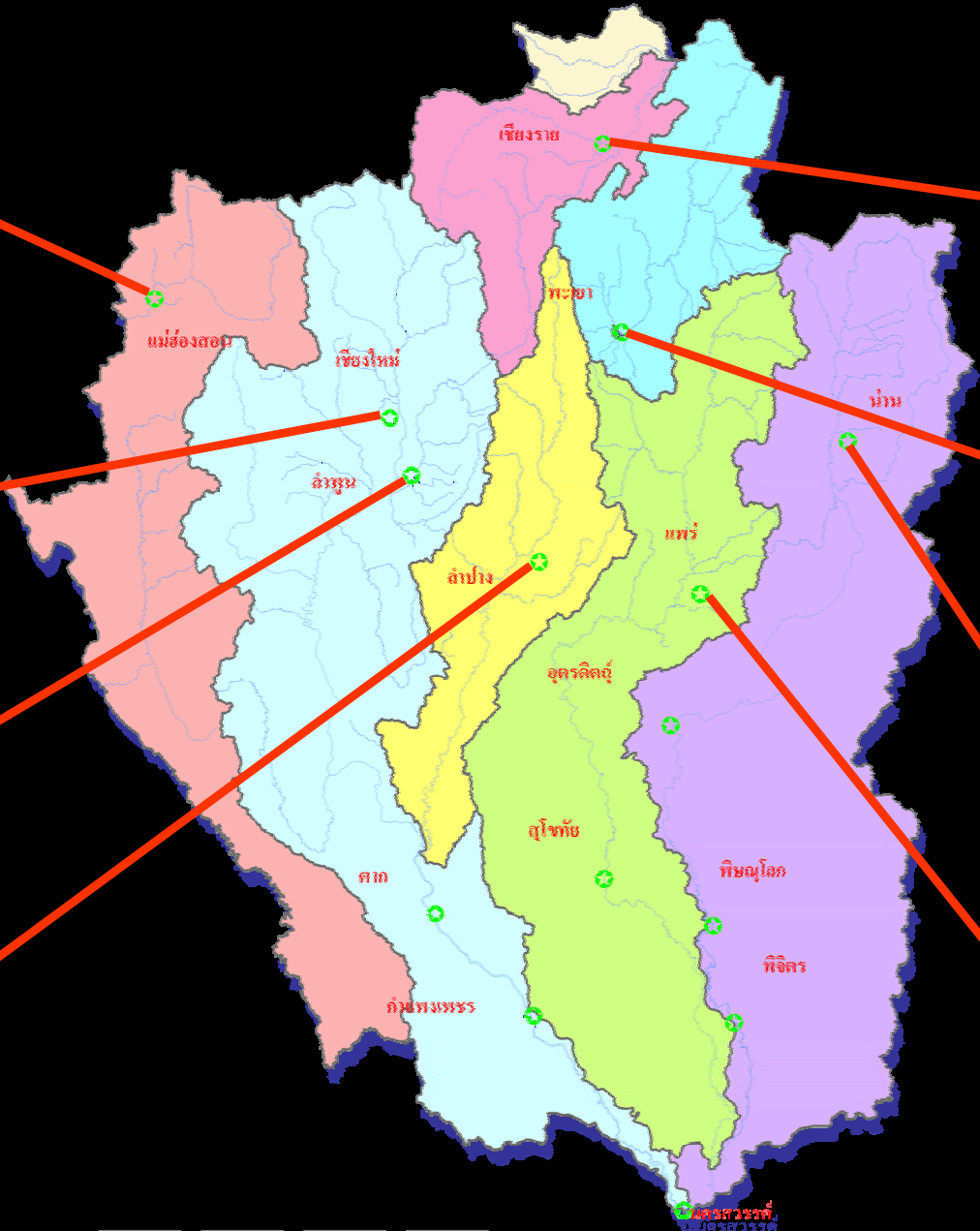
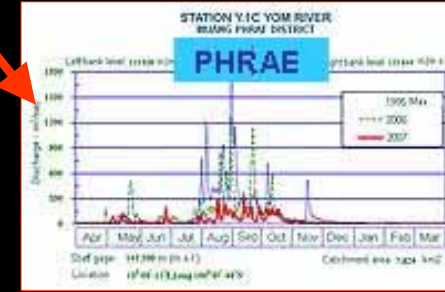
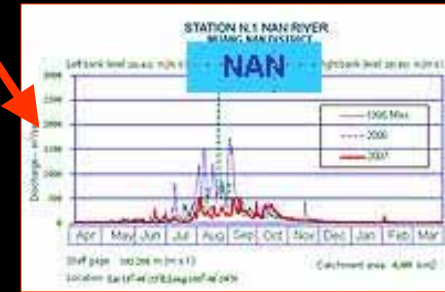
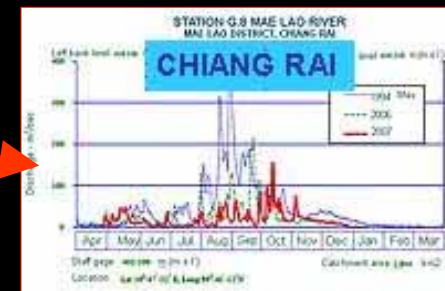
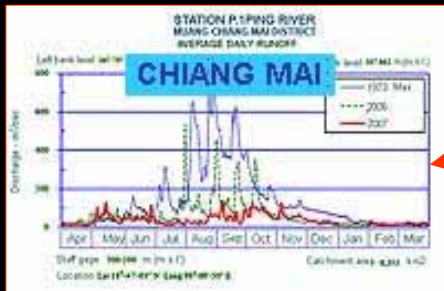
Rainfall-mm



Monthly rainfall MAEHONGSON



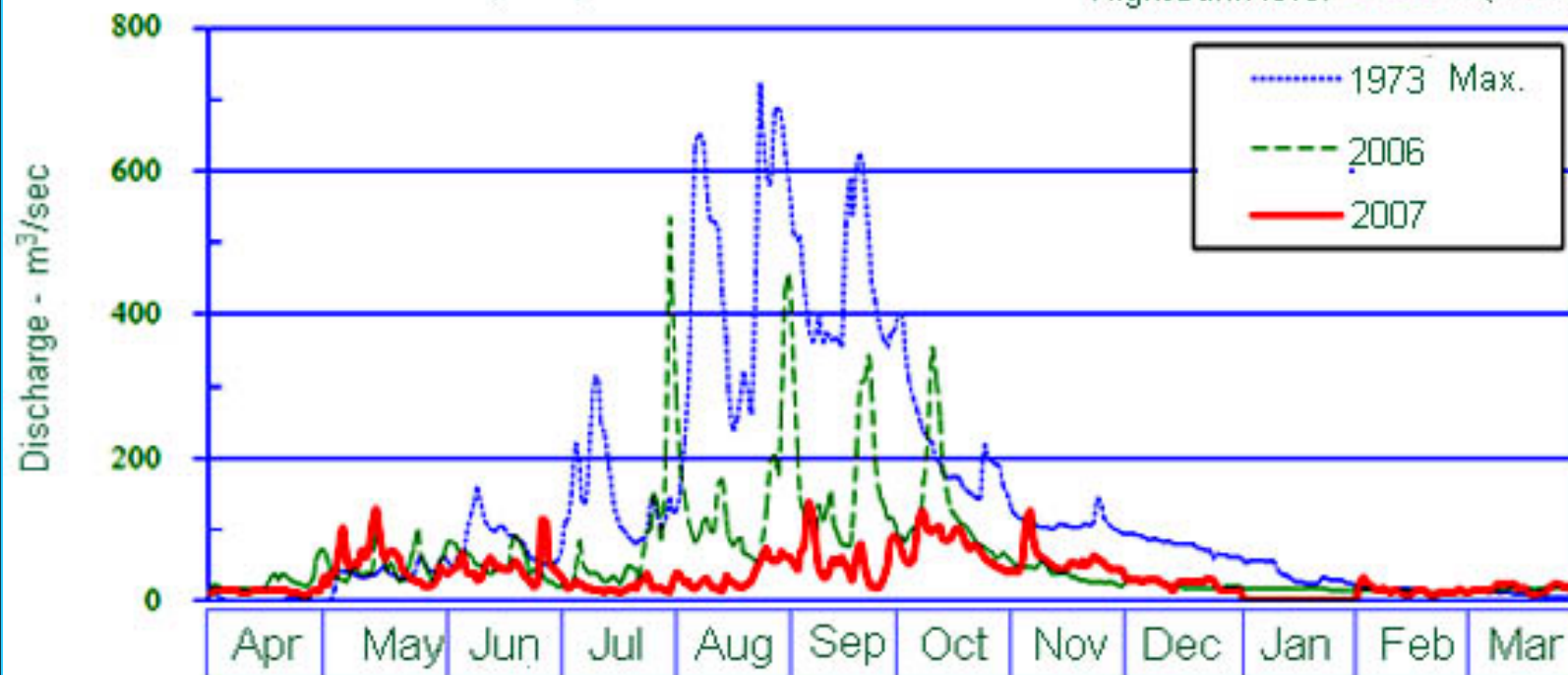
4 : ANNUAL RUNOFF



STATION P.1PING RIVER MUANG CHIANG MAI DISTRICT AVERAGE DAILY RUNOFF

Left bank level **307.707** m.(m.s.l.)

Right bank level **307.662** m.(m.s.l.)



Staff gage **300.500** m.(m.s.l.)

Catchment area **6,355** km²

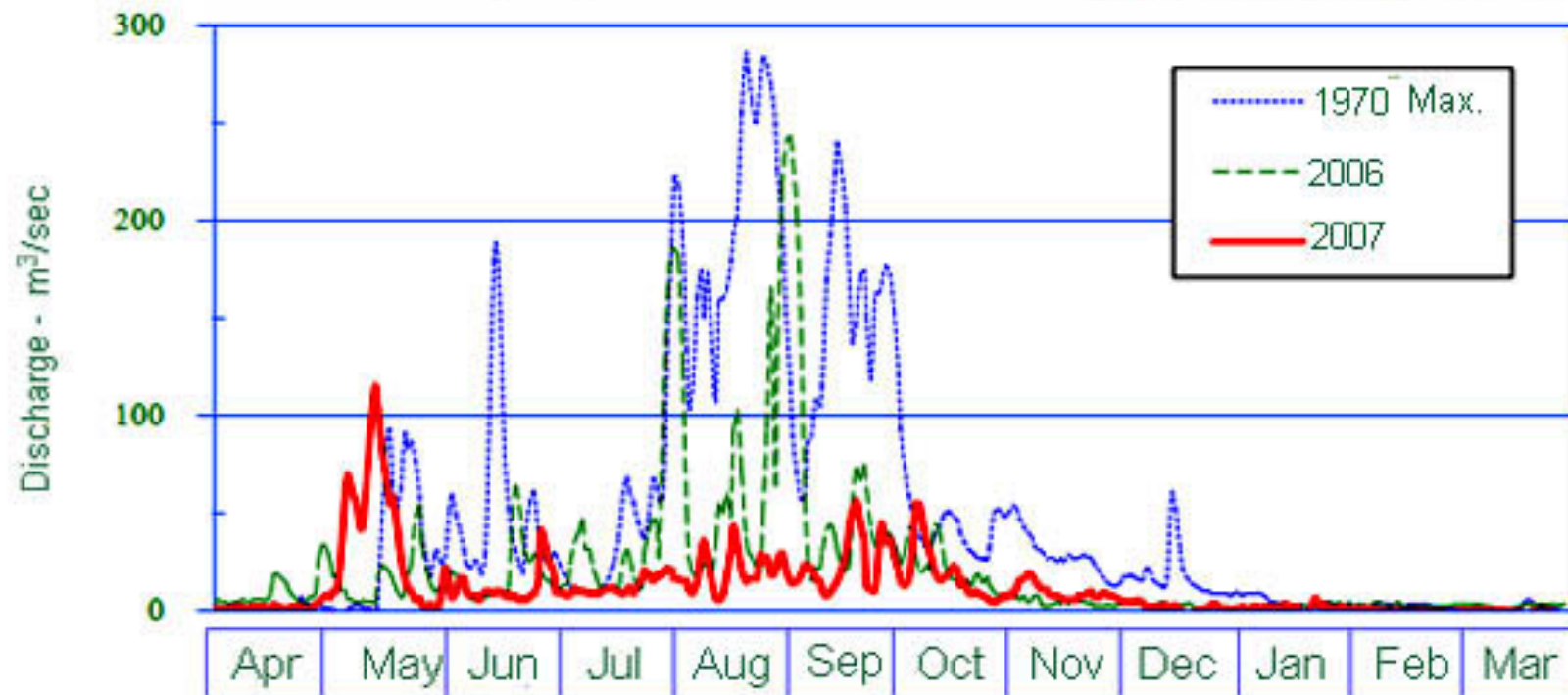
Location **Lat 18°-47'-03" N Long 99°-00'-30" E**



**STATION P.5 KUANG RIVER
MUANG LAMPHUN DISTRICT
AVERAGE DAILY RUNOFF**

Left bank level **295.770** m.(m.s.l.)

Right bank level **295.682** m.(m.s.l.)

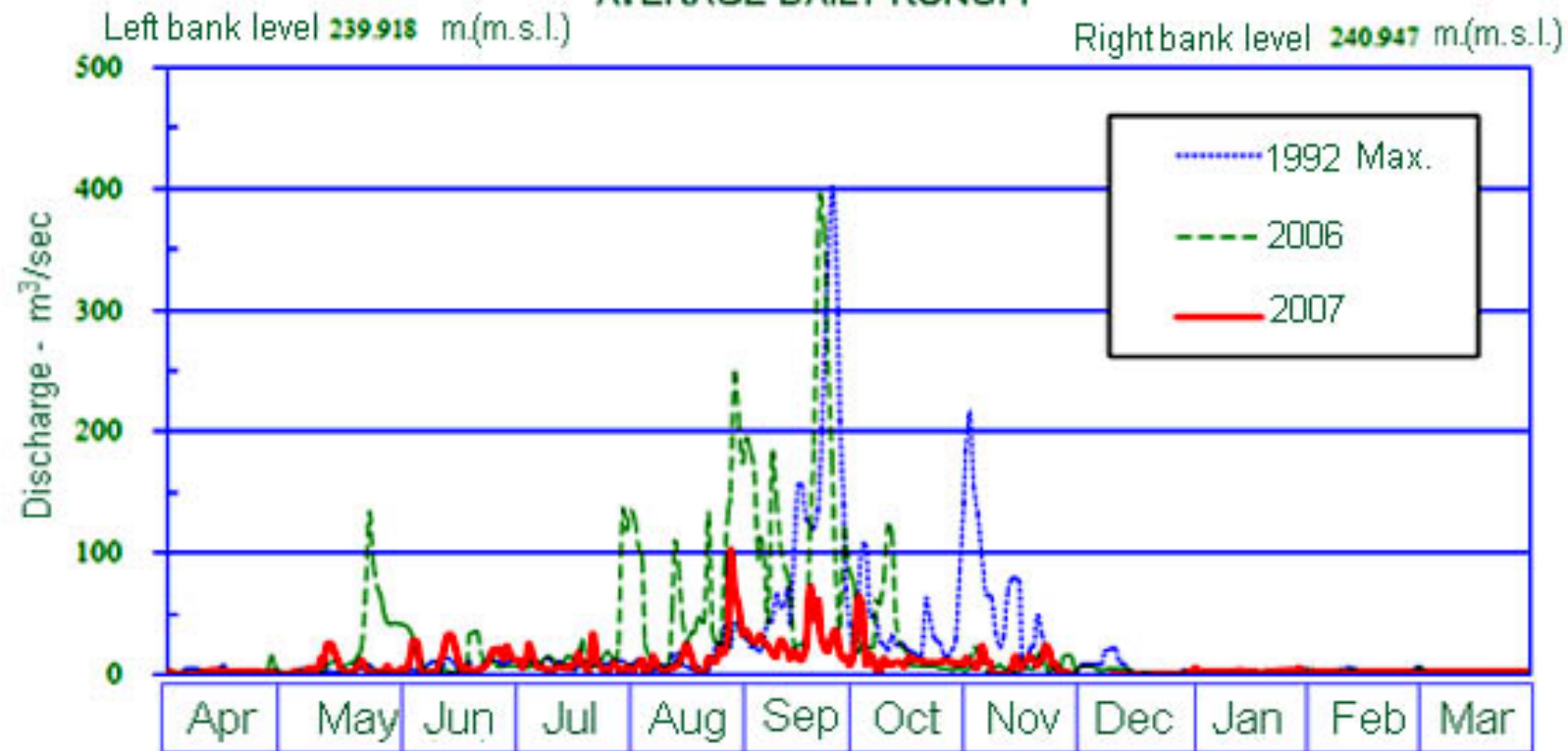


Staff gage **288.50** m.(m.s.l.)

Catchment area **1,569** km²



**STATION W.21 WANG RIVER
MUANG LAMPANG DISTRICT
AVERAGE DAILY RUNOFF**



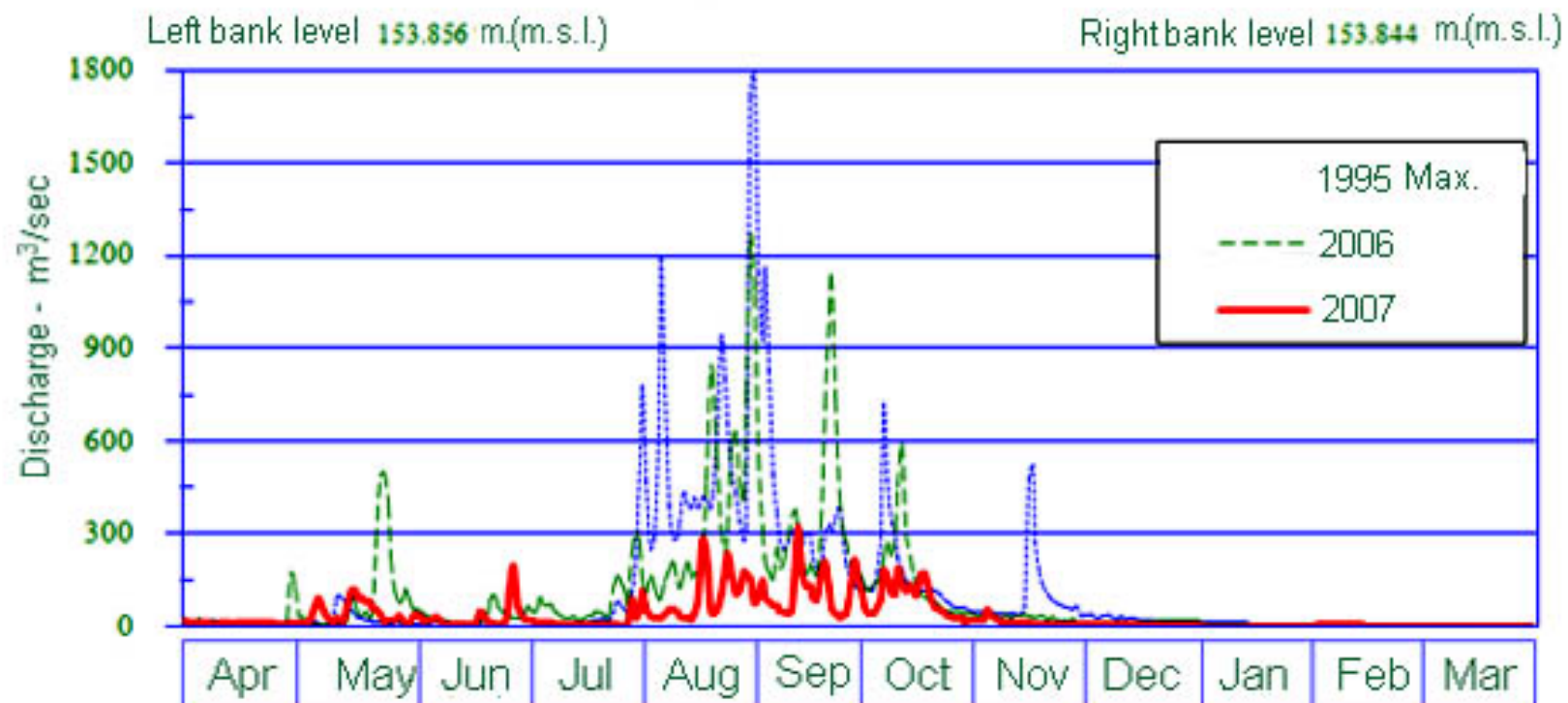
Staff gage **232.000** m.(m.s.l.)

Catchment area **3,367** km²

Location **Lat 18°-20'-18"N Long 99°-32'-27"E**



STATION Y.1C YOM RIVER MUANG PHRAE DISTRICT AVERAGE DAILY RUNOFF



Staff gage 143.500 m.(m.s.l.)

Catchment area 7,624 km²

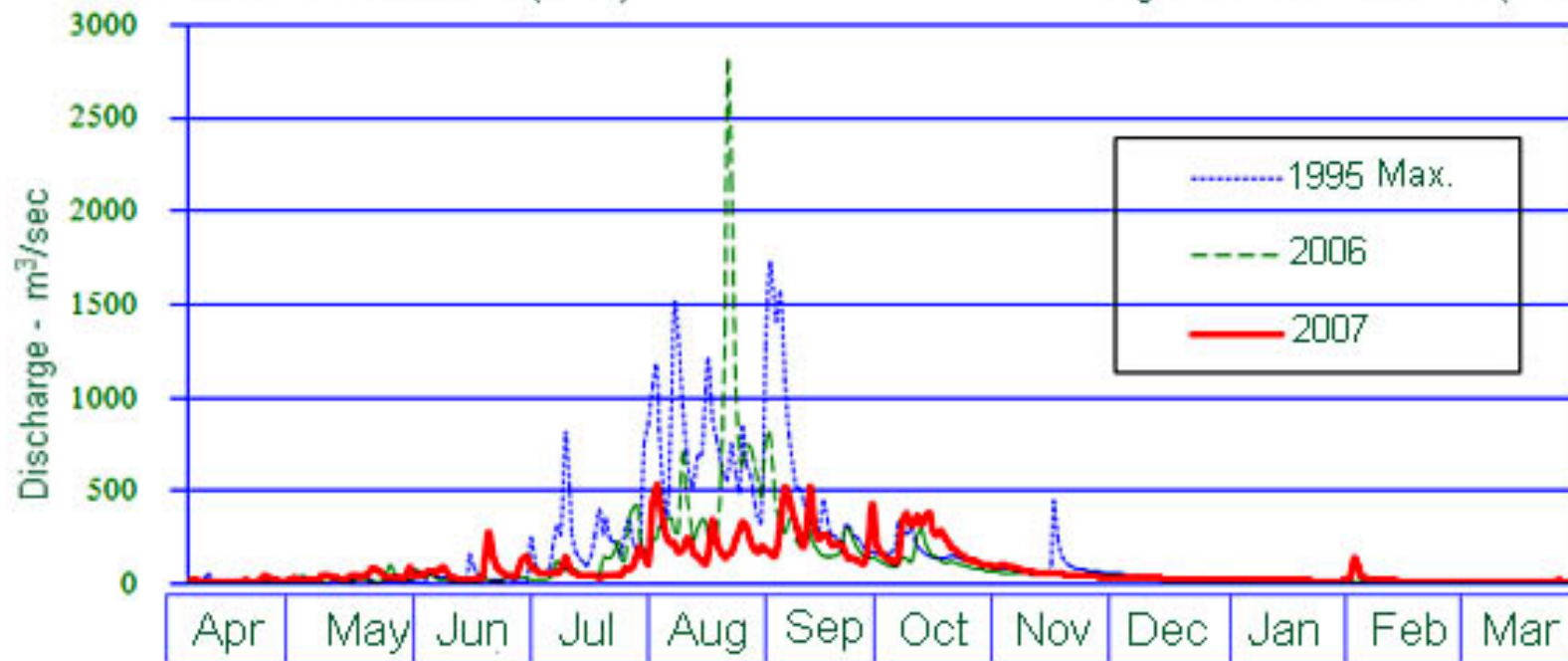
Location 18°-08'-15"E, Long 100°-07'-48"N



**STATION N.1 NAN RIVER
MUANG NAN DISTRICT
AVERAGE DAILY RUNOFF**

Left bank level 203.913 m.(m.s.l.)

Right bank level 203.801 m.(m.s.l.)



Staff gage 192.200 m.(m.s.l.)

Catchment area 4,560 km²

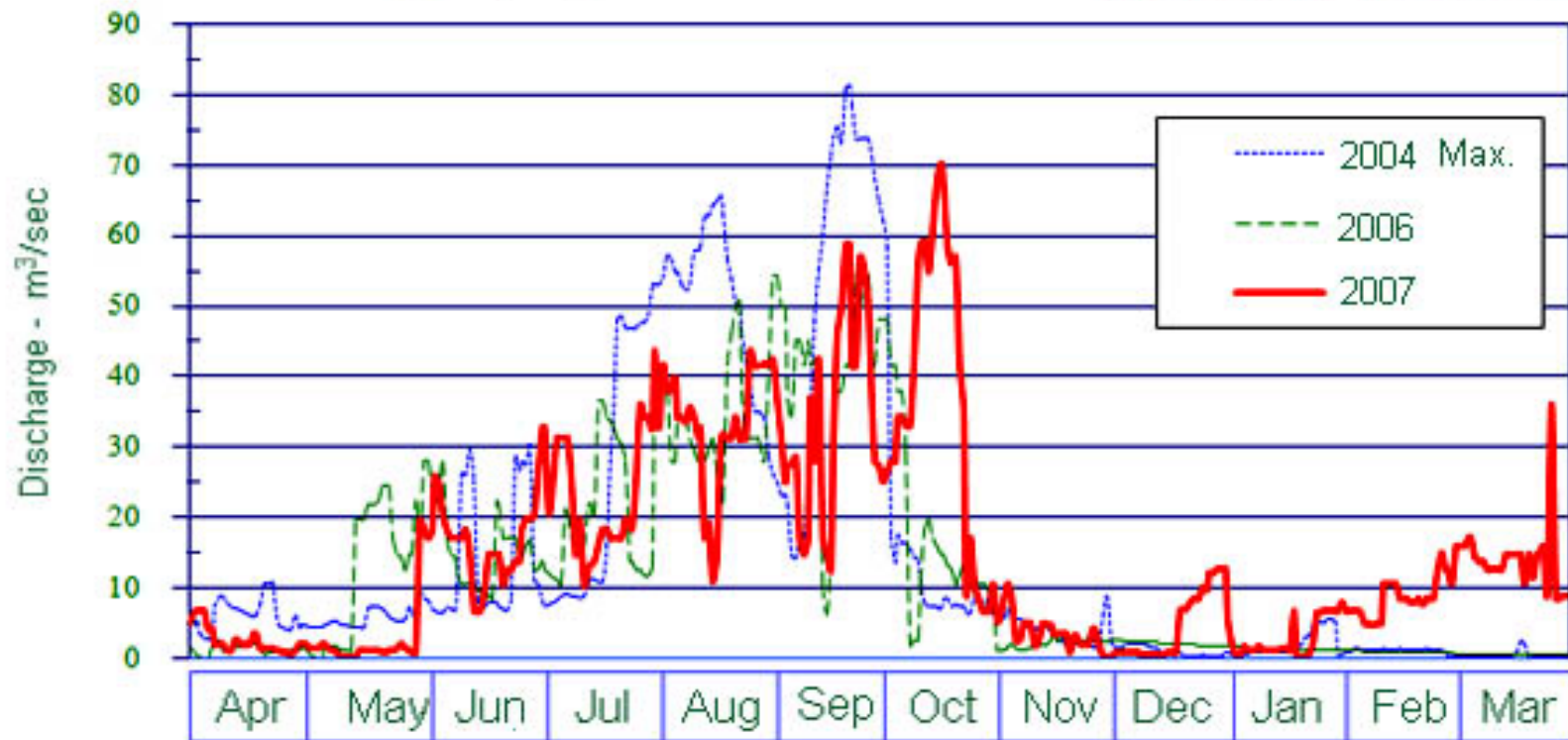
Location Lat 18°-46'-25"E, Long 100°-46'-59"N



STATION I.17 ING RIVER
MUANG PHAYAO DISTRICT
AVERAGE DAILY RUNOFF

Left bank level 4.291 m.(m.s.l.)

Rightbank level 14.308 m.(m.s.l.)

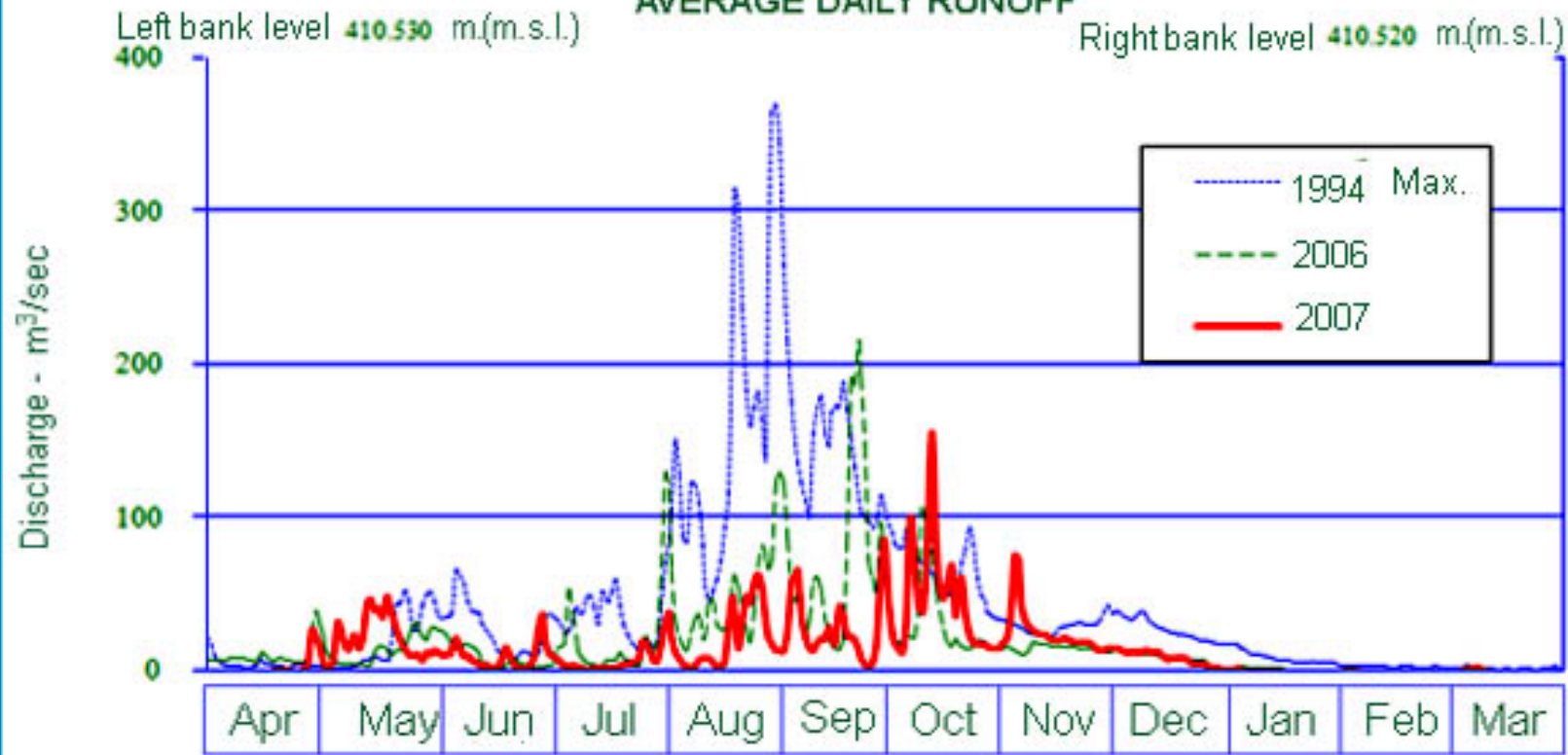


Staff gage 0.000 m.(m.s.l.)

Catchment area 1,167 km²



STATION G.8 MAE LAO RIVER
MAE LAO DISTRICT, CHIANG RAI
AVERAGE DAILY RUNOFF



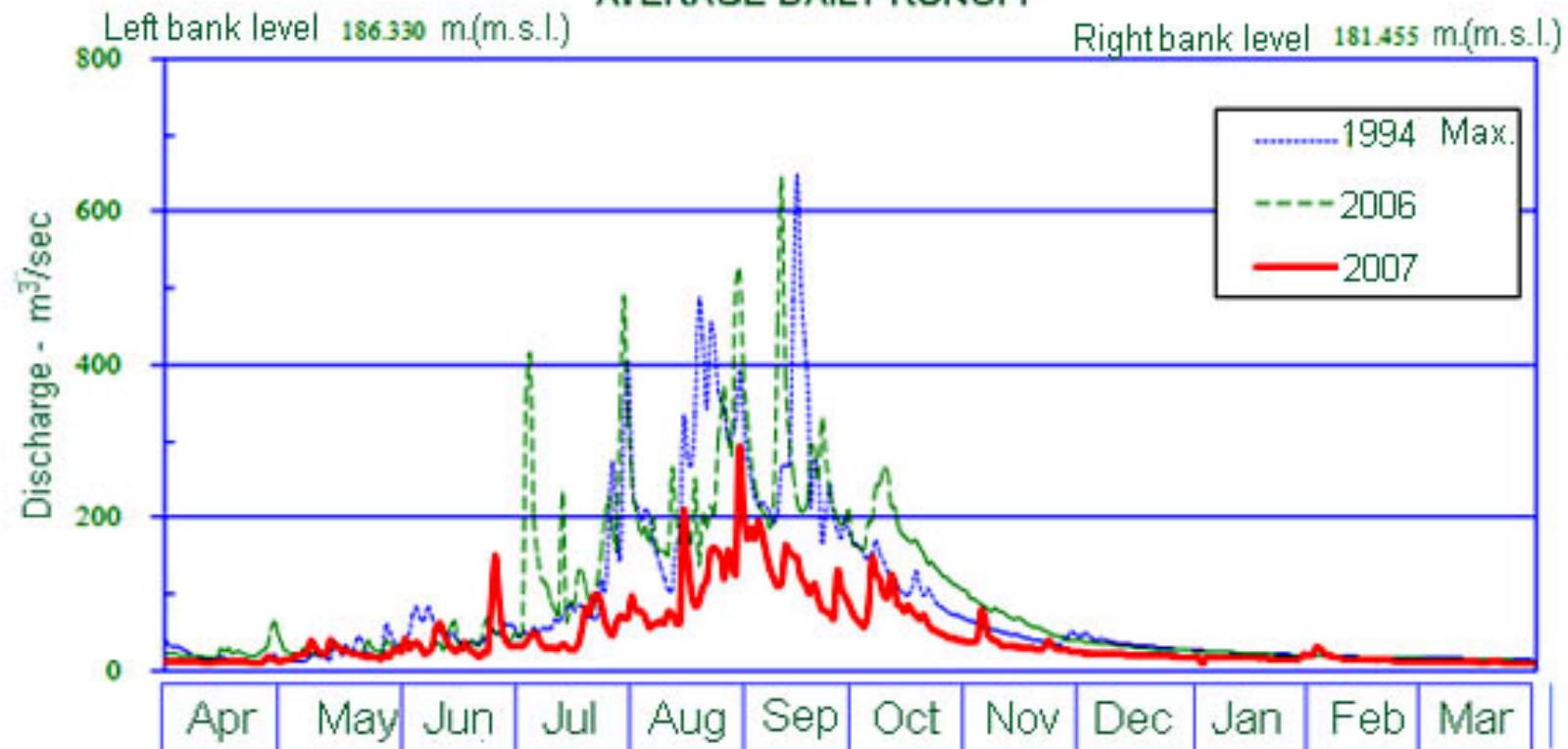
Staff gage **405.100** m.(m.s.l.)

Catchment area **2,934** km²

Location **Lat 19°-47'-32" E, Long 99°-45'-12" N**



**STATION SW.5A PAI RIVER
MUANG MAE HONG SON DISTRICT
AVERAGE DAILY RUNOFF**



Staff gage 175.757 m.(m.s.l.)

Catchment area 4,470 km²

Location Lat 19°-16'-06"N Long 97°-56'-54"E



WATER MANAGEMENT

RISK!! For

DROUGHT



FLOOD

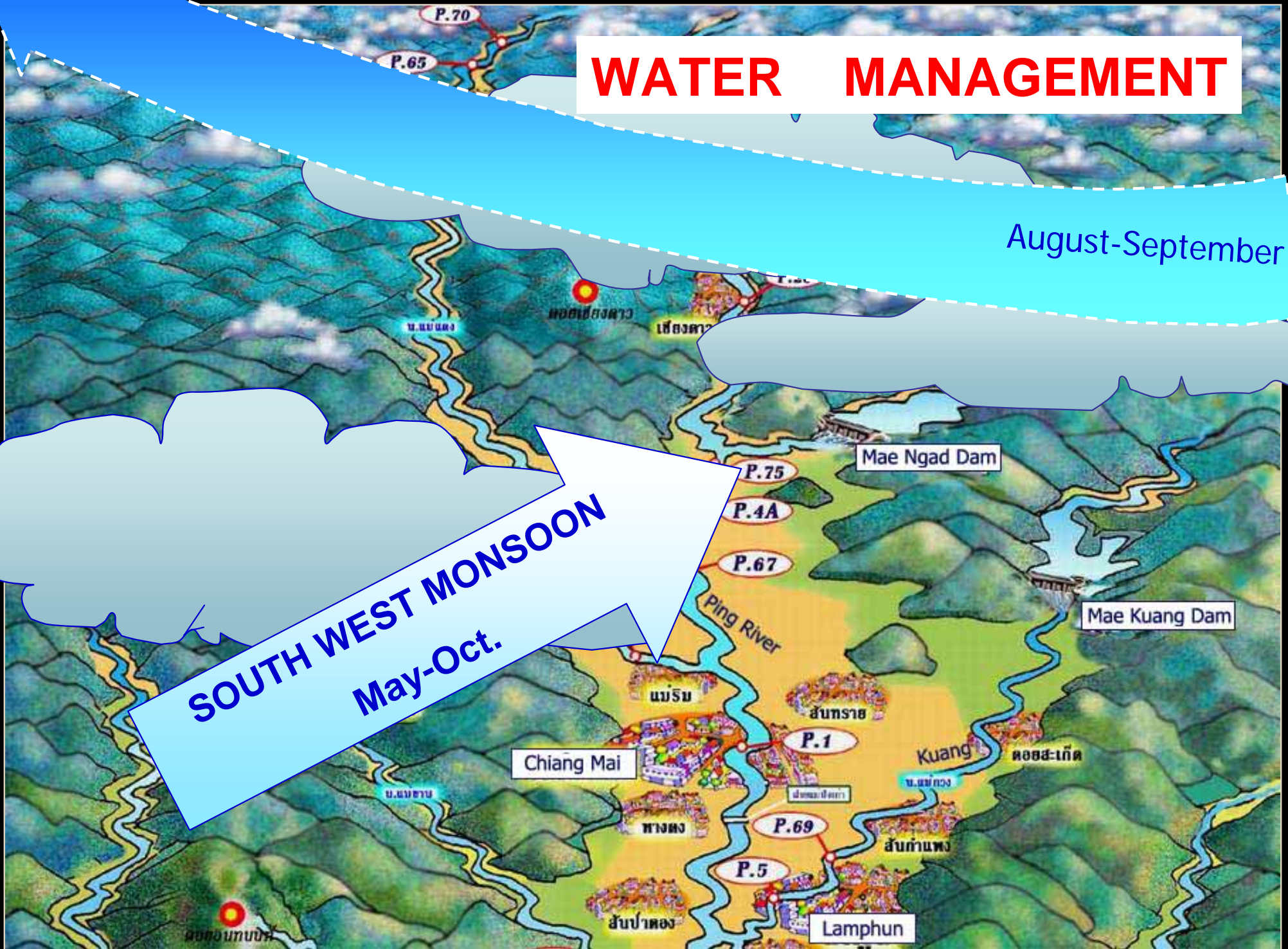
NEED.....

LONG TERM PREDICTION

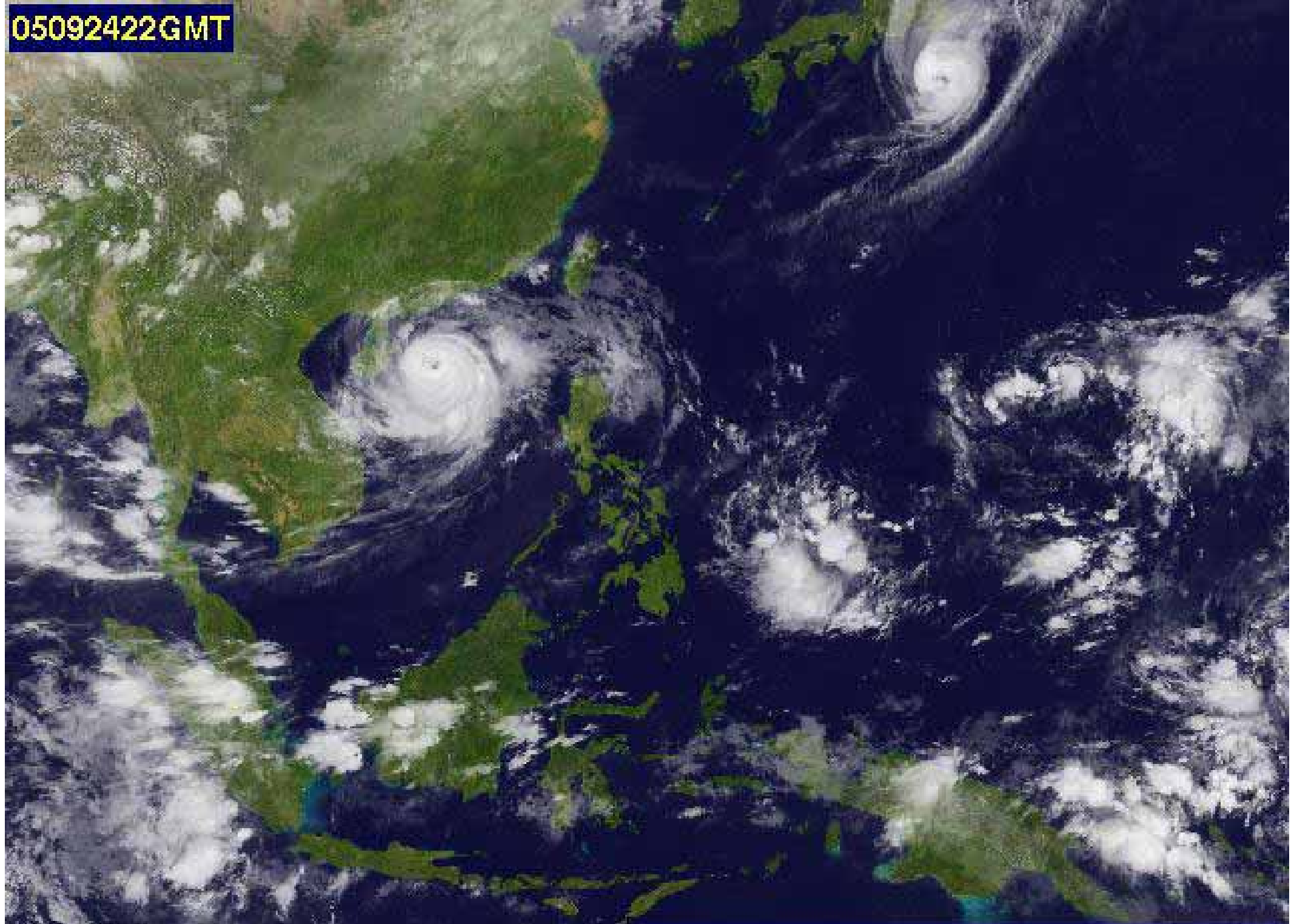
WATER MANAGEMENT

August-September

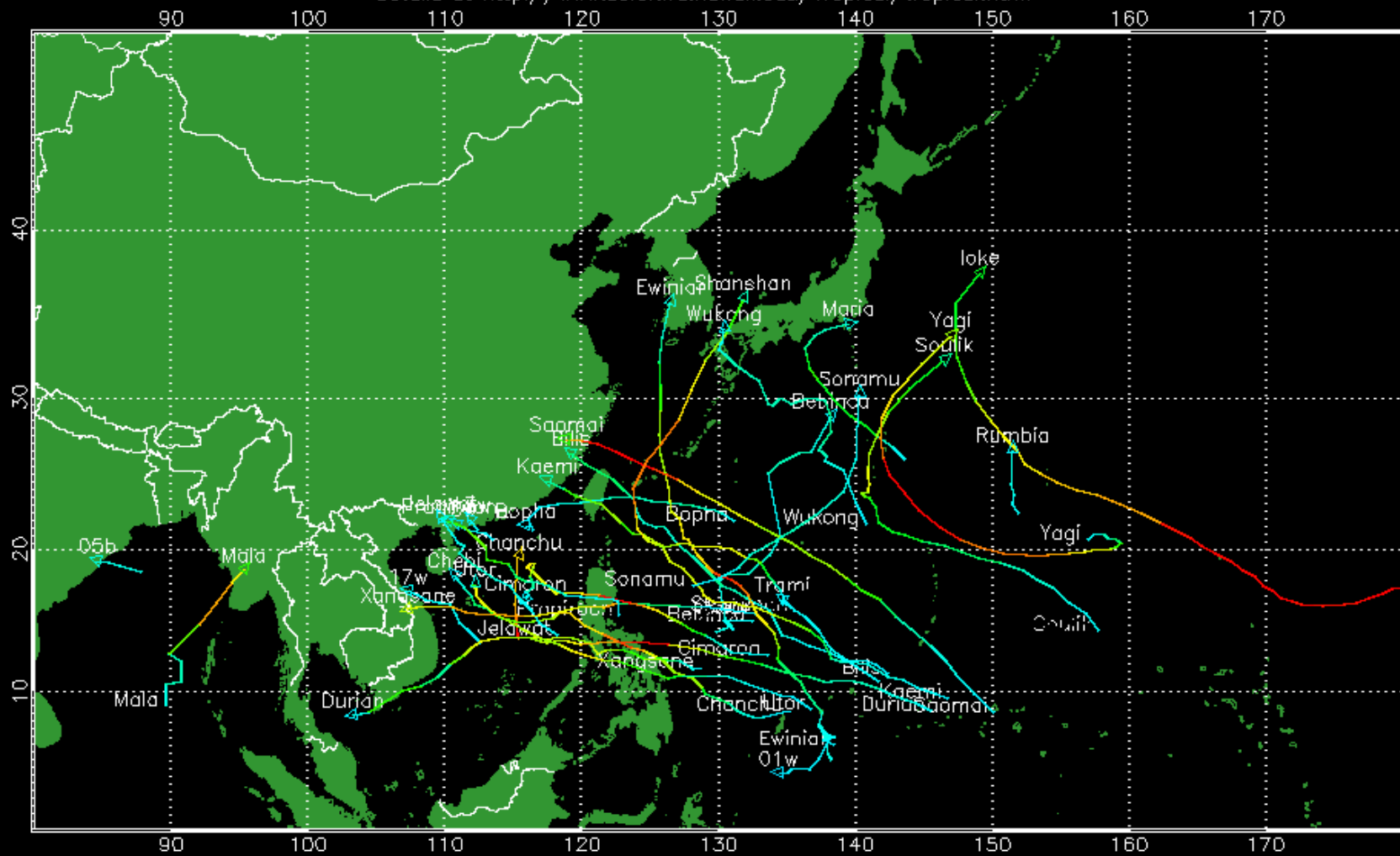
SOUTH WEST MONSOON
May-Oct.



05092422GMT

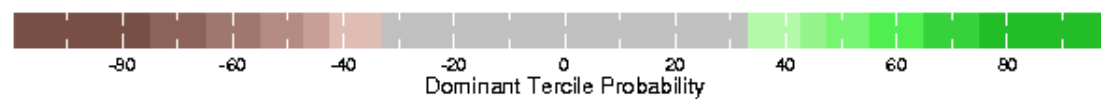
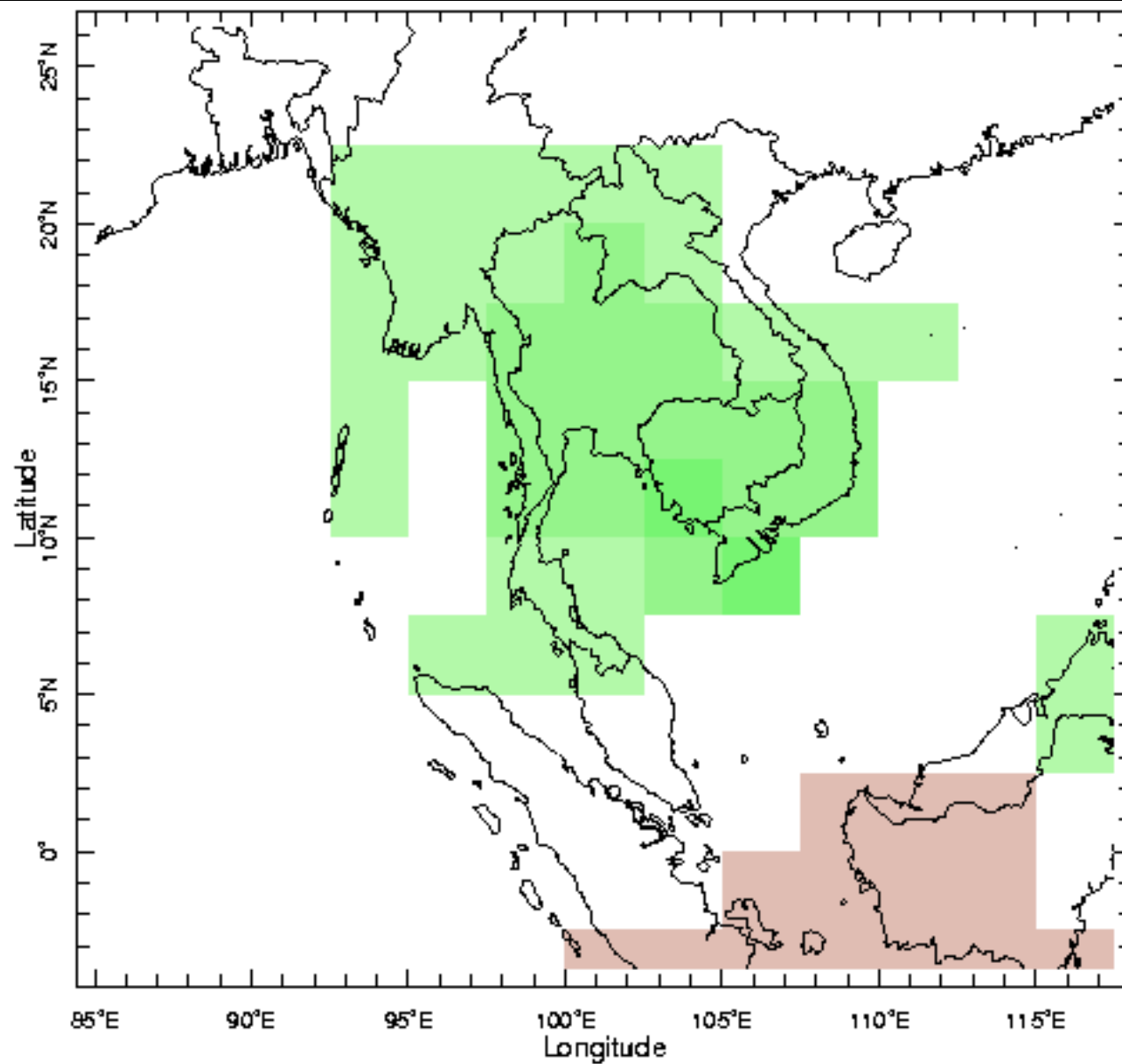


NW Pacific Tropical Cyclones 2006
Details at <http://www.solar.ifa.hawaii.edu/Tropical/tropical.html>

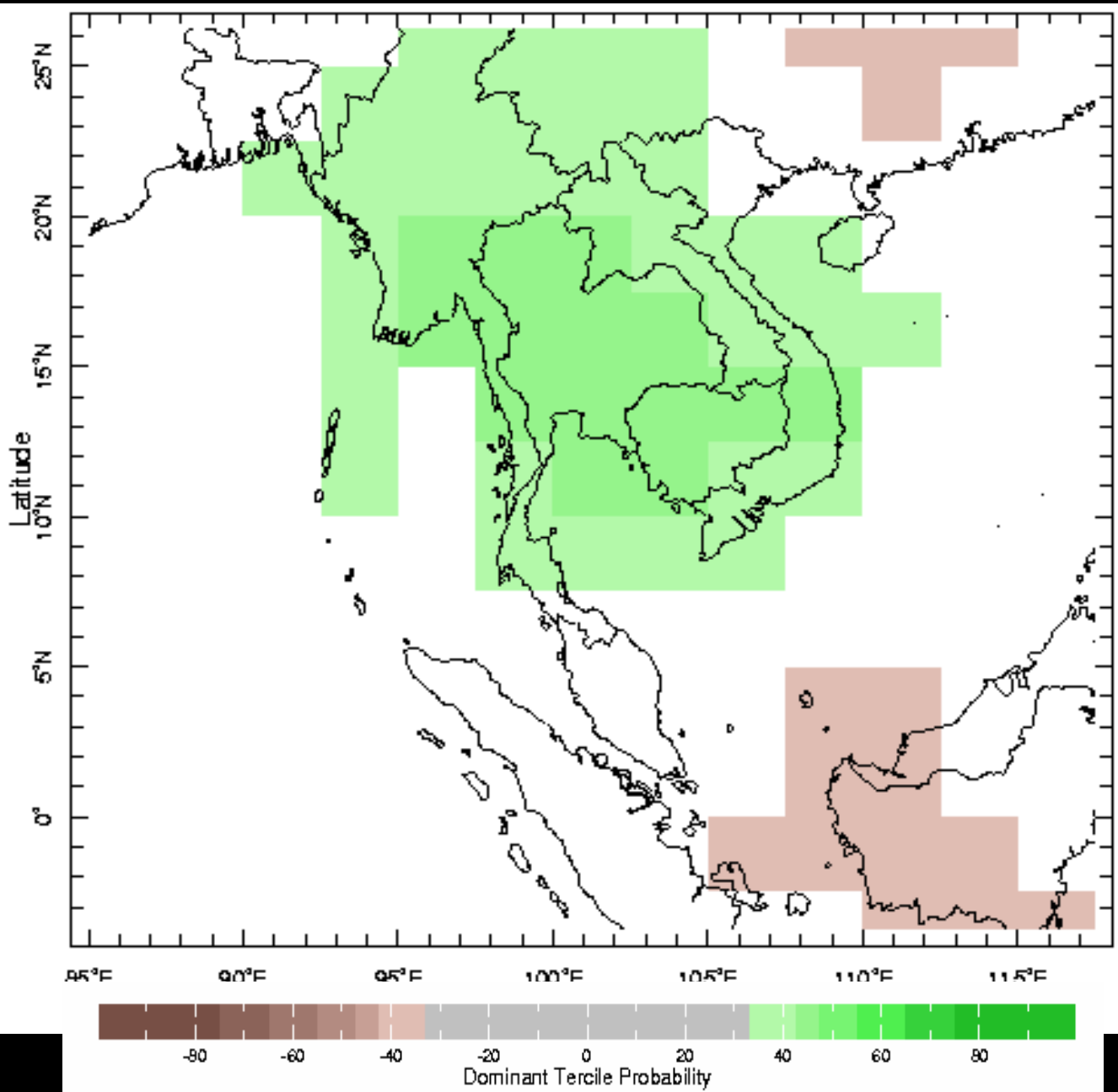


0 35 70 105 140 kt

Plotted Sun Dec 31 21:19:43 GMT 2006



Seasonal Precipitation Forecast for Mar-May 2008



Seasonal Precipitation Forecast for Apr-Jun 2008

Conclusion

- 1. The development of an integrated system of data collection and monitoring, forecasting for warning management.**
- 2. Select an appropriate technology and effective method suitable for water management.**

Thank you for your attention



Hydrology Chiangmai