

**TMD's meteorological
data support**


IMPAC-T Project

Thailand – Japan

Somkuan Tonjan
Somchai Baimuang

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OUTLINE



1. Introduce TMD's meteorological data services

2. TMD's meteorological telecommunication

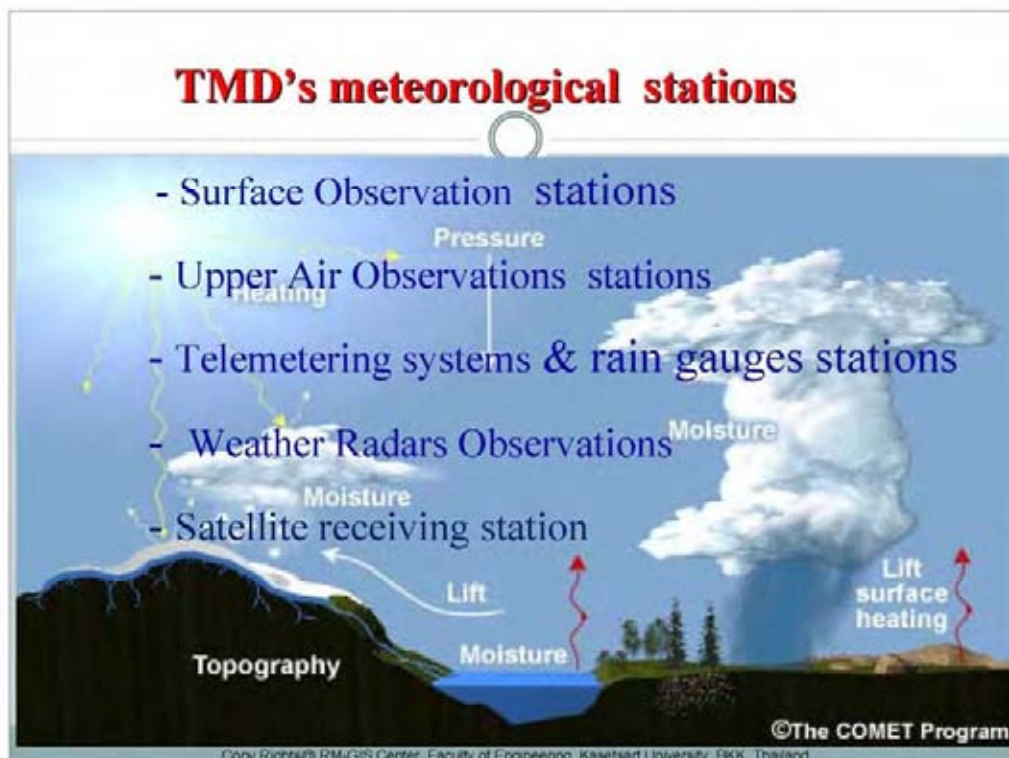
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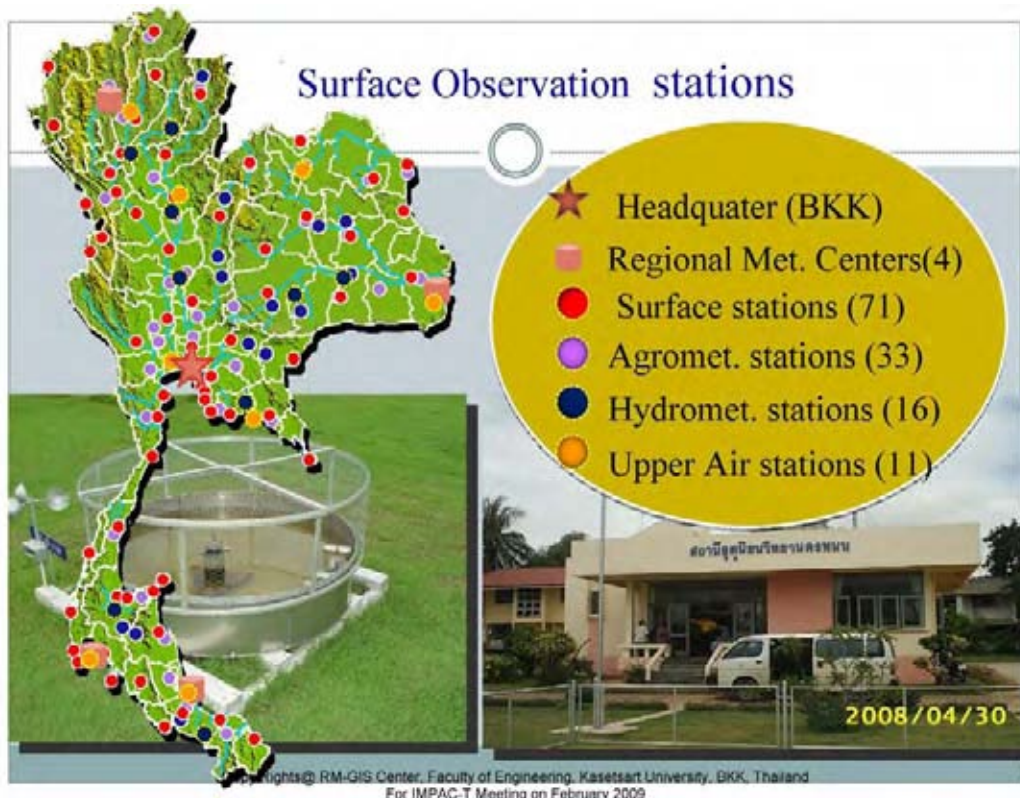
1. Introduce TMD's meteorological data services

Nowadays, there are 120 mainly synoptic stations altogether in all regions of Thailand. The staffs at each of surface weather stations perform the weather observing duties according to the WMO's standards and rules every 3 hours: 0000, 0300, 0600, 0900, 1200, 1500, 1800, and 2100 UTC in order to get the data needed for weather forecasts and disaster warnings as well as data exchanges with other country members of the WMO.



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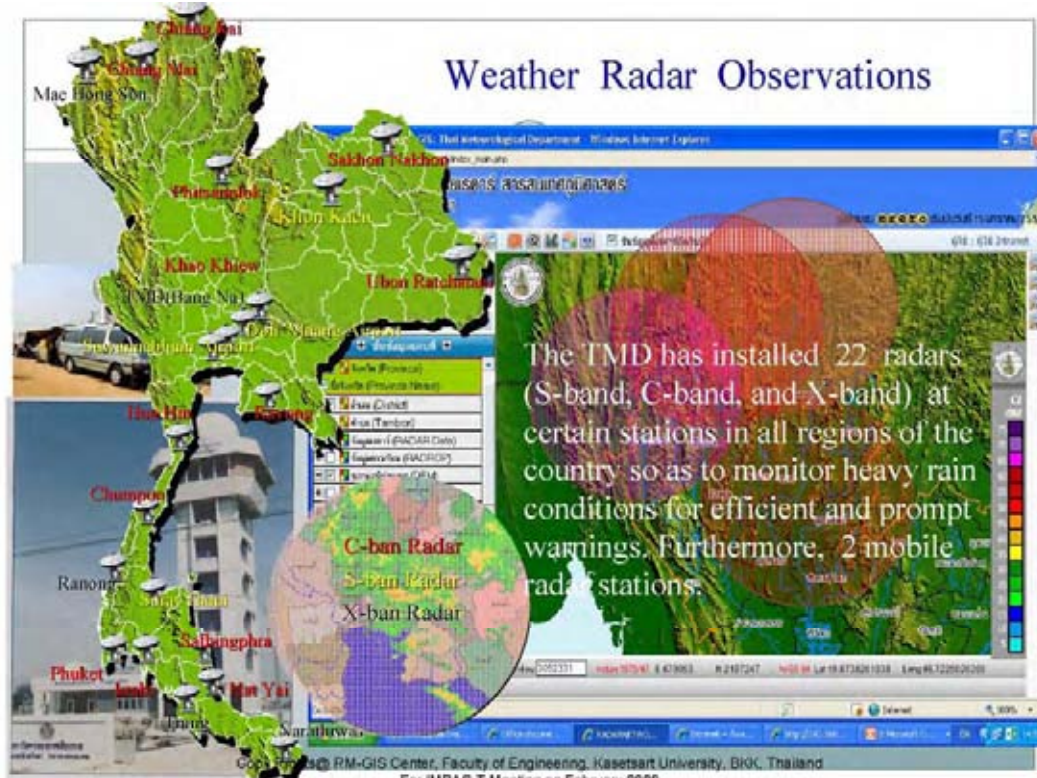
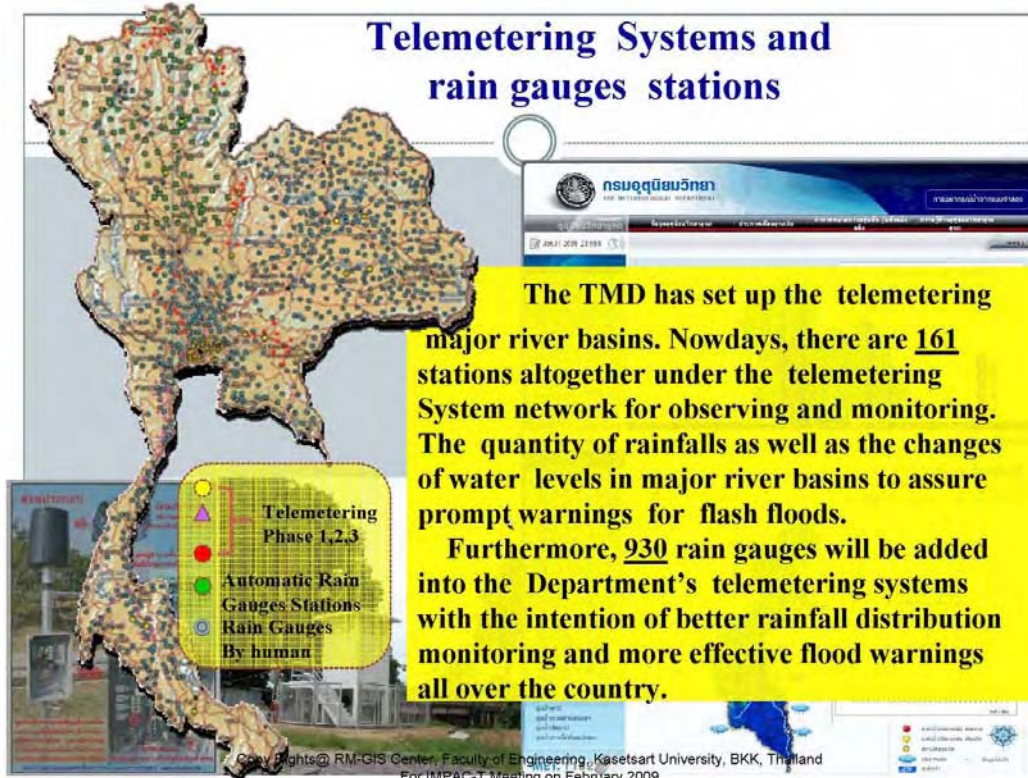


Upper Air Observations

Upper air observations play an important role in meteorology as the atmosphere at the high altitude casts its effects over the extreme weather development. Therefore, the data received from all 11 upper air stations serve as the indicators for the weather tendency as well as any signs of severe disasters which often occur in the tropical zone where Thailand is located. Upper air observations can be divided into 3 types as below :

- . Pilot balloon
- . Rawinsonde
- . Radiowind

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2. TMD's meteorological telecommunication

The TMD has been operating a meteorological system to fulfill functions required for a Regional Telecommunication Hub (RTH) of the Southeast Asia in the Global Telecommunication System (GTS) which was organized in accordance with the World Meteorological Organization's World Weather Watch (www) Programme. The efficient reception, dissemination, and local/international exchanges of data; forecasts; warning bulletins; and other relevant information are provided through 3 RTHs in Japan (Tokyo), China (Beijing), and India (New Delhi) alongside 5 National Meteorological Centers (NMCs) in Saudi Arabia (Jeddah), Malaysia (Kuala Lumpur), Singapore, Vietnam, Laos (Vientiane), and Myanmar.

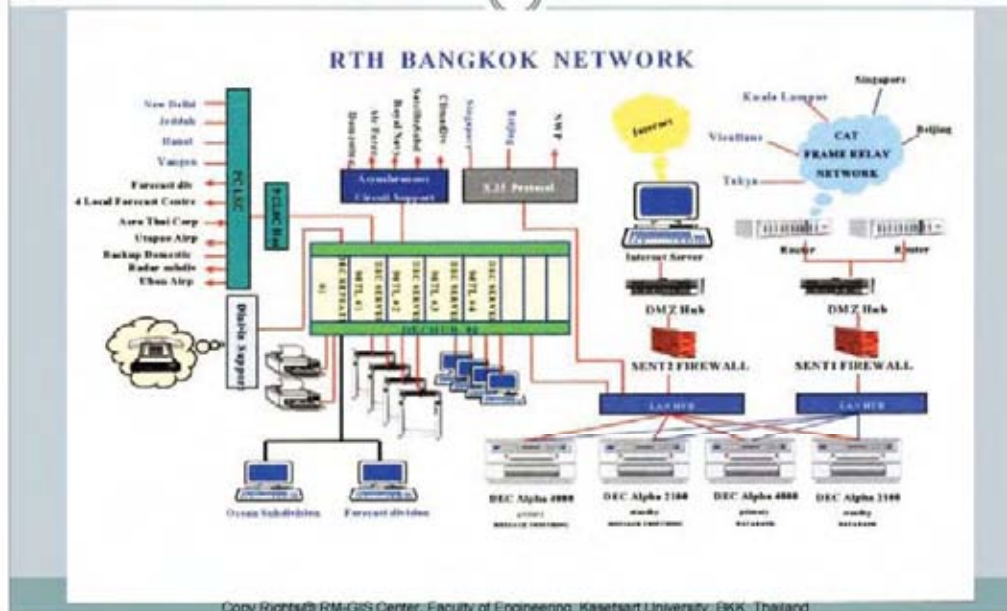
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The Global Telecommunications System (GTS)

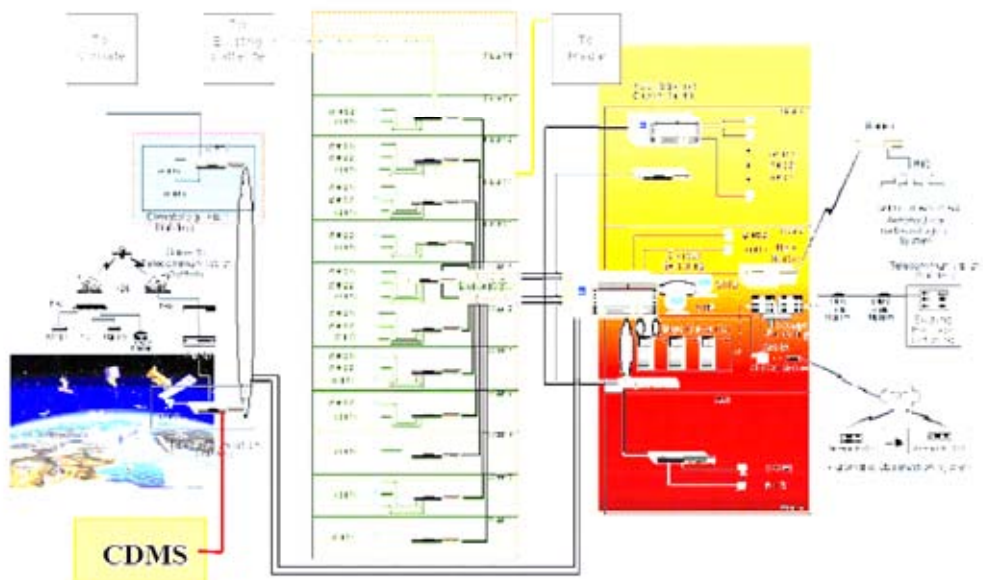


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Flow chart RTH Bangkok network



Configuration network in TMD





**THANK YOU
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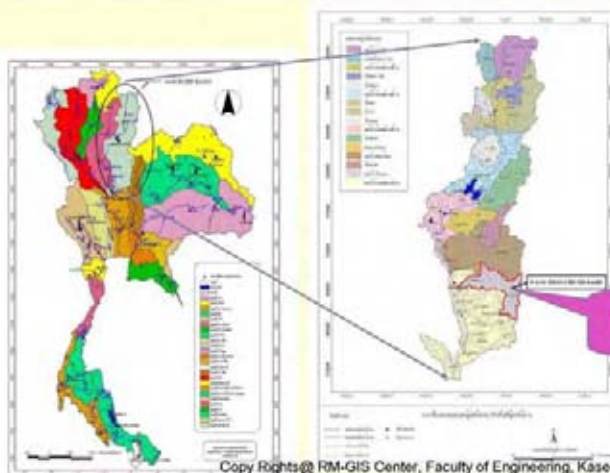
Research / Publications

Dr. Saisunee BUDHAKOONCHAROEN
Associate Professor, Civil Engineering Department
Deputy Director, Office of Public Relations and Academic Services
Mahanakorn University of Technology, Bangkok, Thailand

19 January 2009

2008 : Past Hydro-meteorological Variations: Experimental Case in Thailand, 5th AOGS Meeting, Busan, Korea, 16 – 20 June, 2008

Objective: To distinguish human-induced effect on water cycle variations and investigate the effect of land cover change on hydro-meteorological response

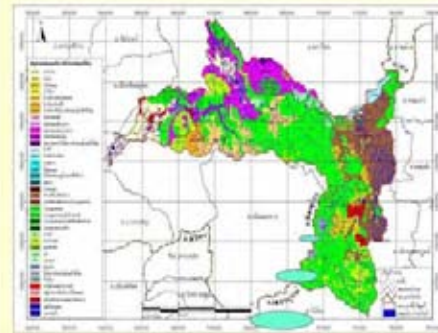
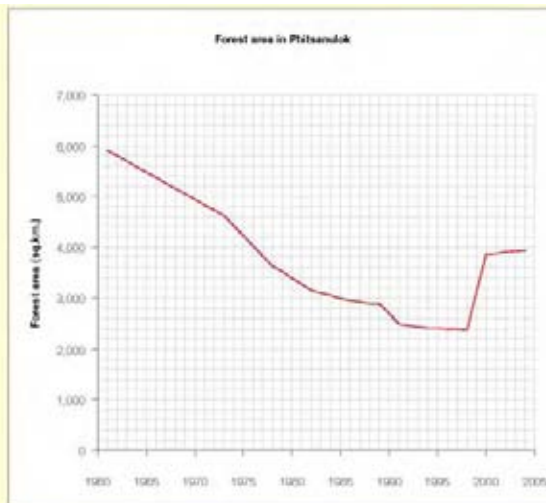


When the same rainfall pattern is routed through the different land cover (different years), the resulting difference in the runoff will indicate the effect of the land cover change

Wang Thong river basin

Catchment area :
2,005 sq.km.

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Forest area in Wang Thong river basin

Forest cover plays a critical role in surface hydrologic response

- For 25.67% reforestation, the peak flow was reduced by 29.23%,
- For 34.02% deforestation, the peak flow was increased by 60.53%

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2008 : Relation, response and change of near-surface air temperature and rainfall in Thailand,

11th ICUD, Edinburgh, Scotland, 31 August – 5 September, 2008
4th AOGS Meeting, Bangkok, Thailand, 31 July – 4 August, 2007

Objective: To distinguish Thailand earth's near-surface air temperature and rainfall trend of change and investigate their relation / response



Study area : whole Thailand
29 synoptic temperature and rainfall stations were selected.

Period 1952 - 2006

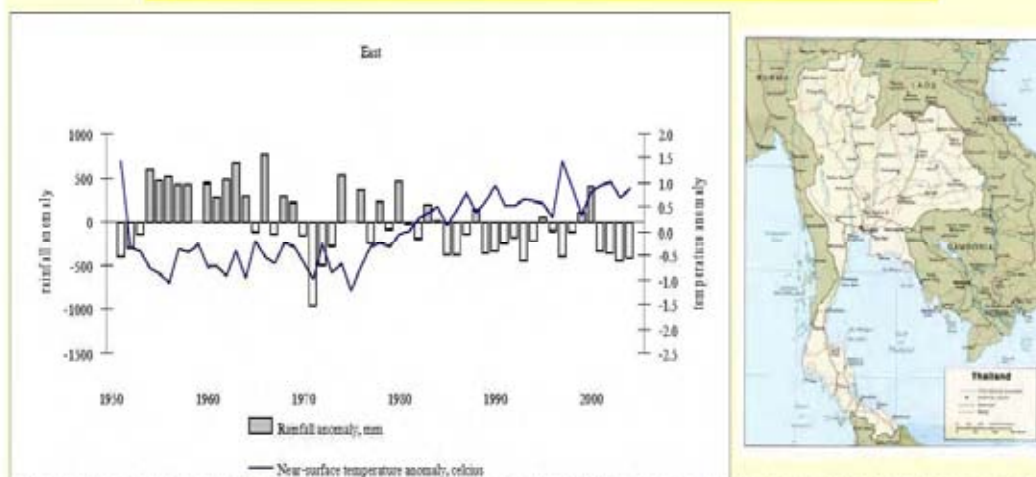
- maximum / minimum monthly temperature
- annual rainfall & runoff
- maximum number of consecutive no rain day in a year
- rainfall & temperature anomaly

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- Influenced by the effect of climate variation, temperature has slight to moderate increasing trend,
- Increase tendency of rainfall amount is noticeable in most parts. Only at the northern inland area of the country, incline trend of annual rain is observed,
- The maximum number of consecutive no rain day in a year exhibited the slight decrease tendency throughout the country,

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Rainfall & Temperature Anomaly : East

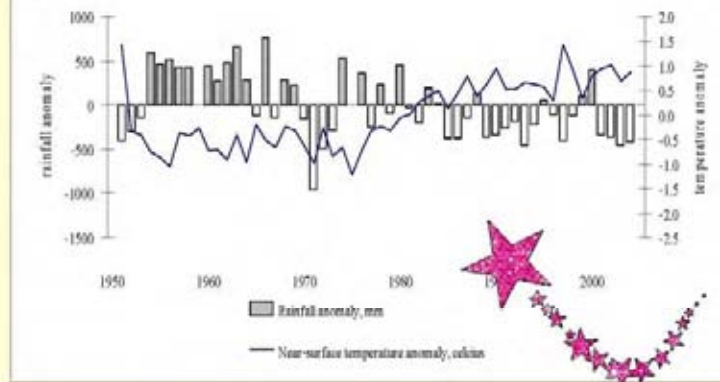


Five decades of annual rainfall and temperature anomalies graphically illustrated some opposition, especially in eastern region of the country. When temperature is low, high rainfall is experienced. During 1950s, rainfall anomaly was approximately 500 mm above the 1952 - 2006 average, near surface air temperature anomaly was 0.5 – 1.5 °C below average.

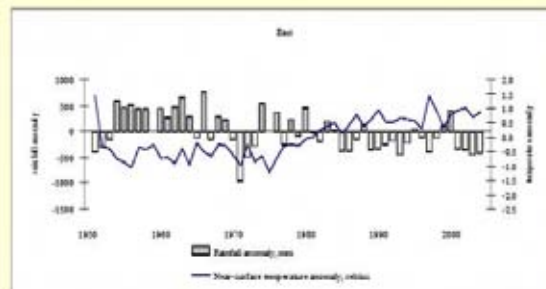
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Rainfall & Temperature Anomaly : East

The decreasing trend of rainfall in eastern inland has indicated since 1980s, the rainfall anomaly below the 1952 - 2006 average magnitude. During the same time span, the positive near surface heat content anomaly between 0.25 - 1.5 °C expanded in the region



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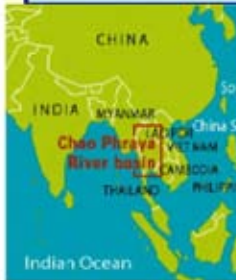
- It is still doubtful whether the Gulf of Thailand might be the important source of heat and moisture for the near land area

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2007 : “Lesson Learned 2006 Chao Phraya River Basin Flood for Long – range Flood Awareness”

2nd National Water Resources Engineering Conference, organized by Engineering Institute of Thailand, Bangkok, August 30 - 31, 2007

Objective: Cause and damage of 2006 Chao Phraya river basin flood, initial attempt for long-range (month to season) flood forecast



2006 flood was due to a series of depressions

Chao Phraya river basin



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To avoid flooding in economic area, the special attempt was made to seek areas for water retention during the critical period. As a result, many areas along the lower Chao Phraya river were inundated longer than ever (until mid-November)

Effective flood preparedness in **large** basin

**Long-range flood forecast
(seasonal forecast) is essential**

2007 : “2006 Chao Phraya River Basin Flood”, Thailand - Japan Inundatory Mitigation Discourse, organized by Kasetsart University and University of Tokyo, at Hilton Resort & Spa Hotel, Hua Hin, Thailand, 8 – 10 April 2007



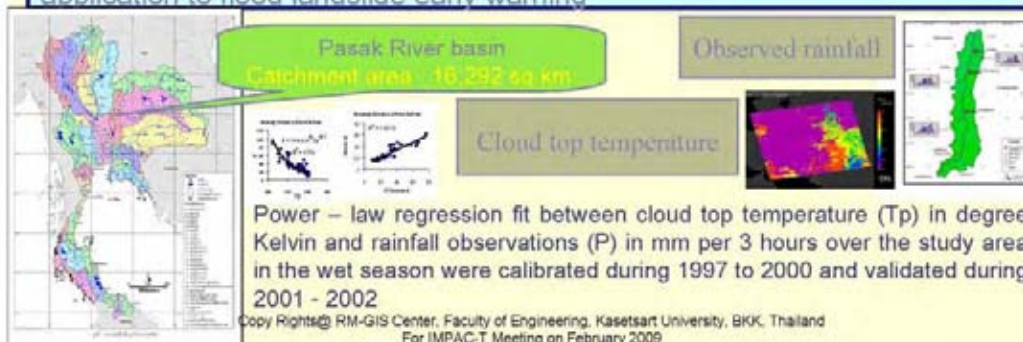
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2006 : "Rainfall Estimate based Satellite Images and Conceptual Framework of Its Application for Flood Landslide Early Warning"

International Symposium on Current Policy and Directions on Flood Damage Mitigation, organized by Japan Science and Technology Agency (JST), supported by Japanese Public Works Research Institute, RID and HydrA, Bangkok, Thailand, October 14, 2006

Objective: To describe the causes of flood landslide in Thailand, estimate the rainfall using satellite data and discuss the conceptual framework of its application to flood landslide early warning

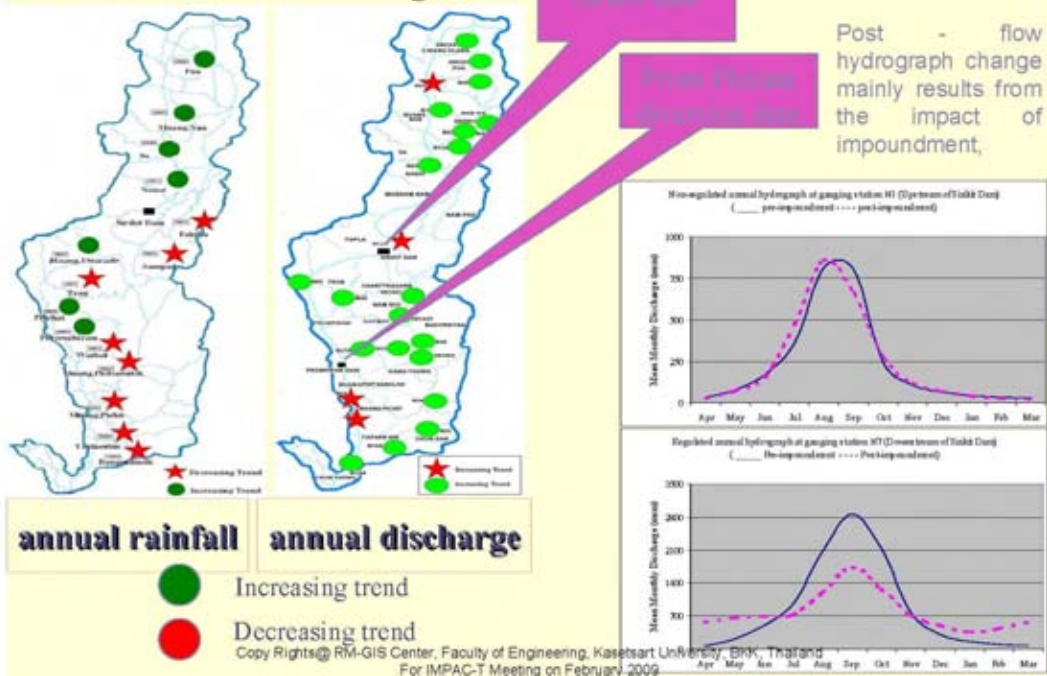


2004 : "Impact of Large Reservoir Development on Water Resource Regime", 6th International Study Conference on GEWEX in Asia and GAME, Kyoto, Japan, December 3–5, 2004

Objective: To investigate the impact of impoundment and large - scale water resource development scheme on long-term change in the water resource regime



The decrease tendency of rainfall does not cause the same trends for those of discharge



2005 : “Review of Hydro-meteorological Change Studies”, The Executive Authority Confederacy Forum on Hydro-informatics Harmonious Solidarity organized by Kasetsart University and University of Tokyo, Kanchanaburi, Thailand, 4 – 6 November 2005,



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- 2005 : “Difficulty in Satellite Rainfall Estimate”, Interdisciplinary Workshop on Multi-scale Management of Forest, Village and Water in the Upper Ping River Basin, Northern Thailand, Sponsored by Ministry of Education, Culture, Sports, Science and Technology, Japan, Chiang Mai, Thailand, March 7 – 9, 2005



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Activity plan : Research targets

- Better understandings the atmosphere-ocean-land interactions in the Asian monsoon system
- Analysis/prediction for seasonal / inter-annual variations based climate change & anthropogenic effects

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Collaboration with IMPACT -T

- **International collaboration is required in the scientific research, data exchange, experience sharing and prediction tool development**

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5.9 Mr. Chaiwat Ekkawatpanit, Mr. Sanit Wongs, King Mongkut's University of Technology Thonburi

Hydraulic & Hydrology Laboratory

Chaiwat Ekkawatpanit
Sanit Wongs
King Mongkut's University of Technology Thonburi

Sanit Wongs, sanit.won@kmutt.ac.th URL: <http://www.cte.kmutt.ac.th/sanit> Chaiwat Ekkawatpanit, chaiwat.ekk@kmutt.ac.th

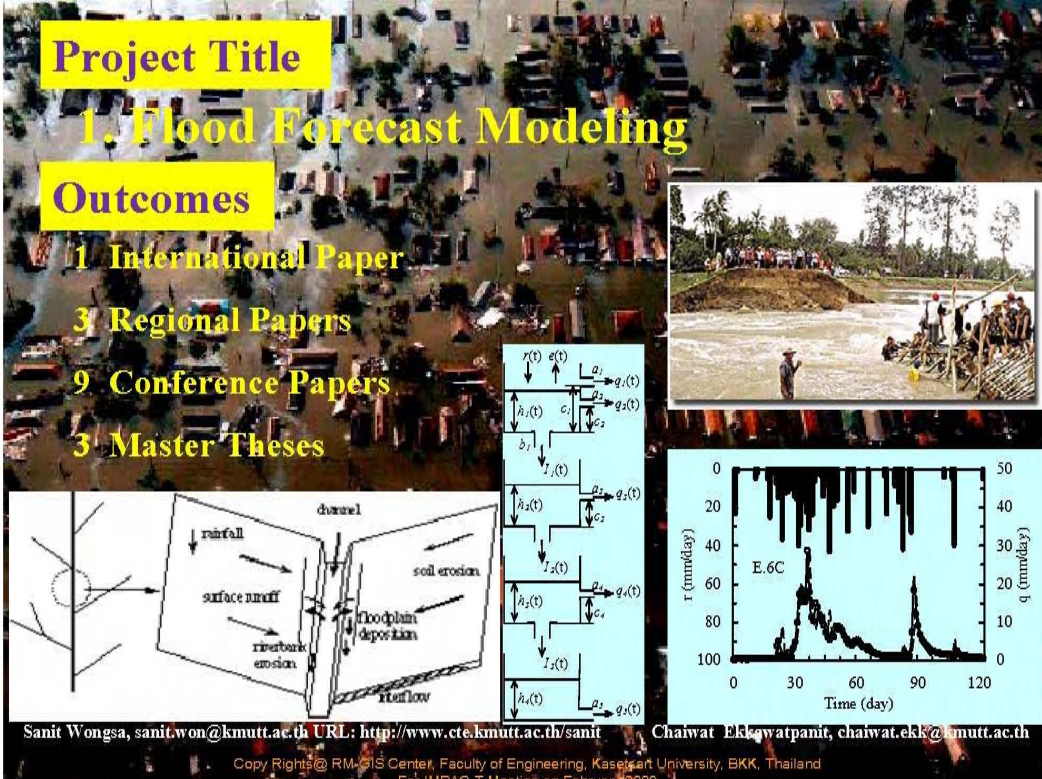

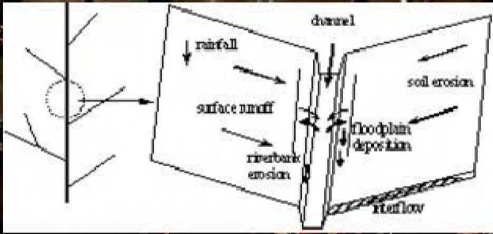
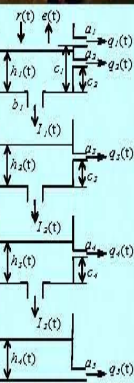
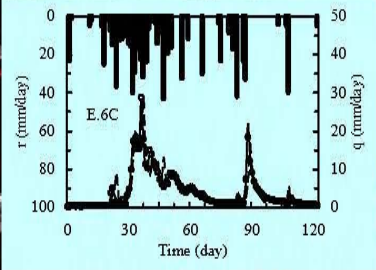
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Project Title

1. Flood Forecast Modeling

Outcomes

- 1 International Paper
- 3 Regional Papers
- 9 Conference Papers
- 3 Master Theses

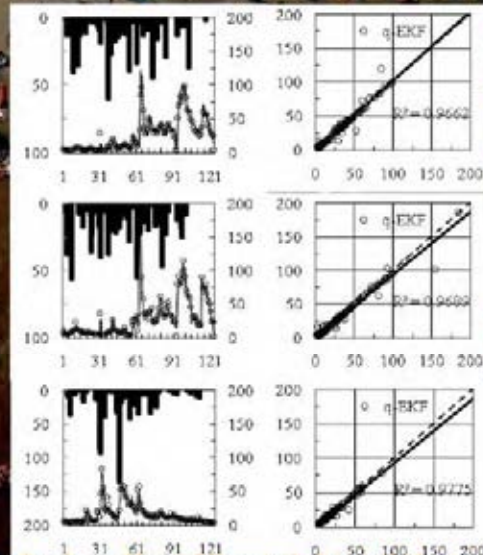
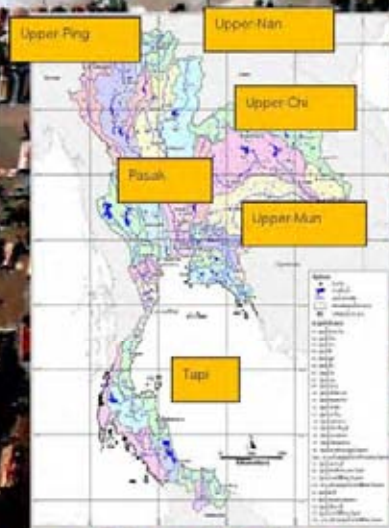






Sanit Wongs, sanit.won@kmutt.ac.th URL: <http://www.cte.kmutt.ac.th/sanit> Chaiwat Ekkawatpanit, chaiwat.ekk@kmutt.ac.th

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Project Title

1. Flood Forecast Modeling



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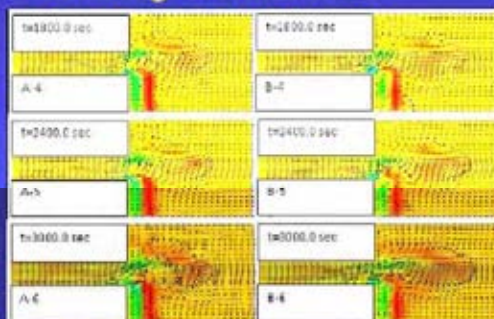
2. River & Estuarine Morphodynamics Modeling

Outcomes

3 Regional Papers

5 Conference Papers

2 Undergraduate theses



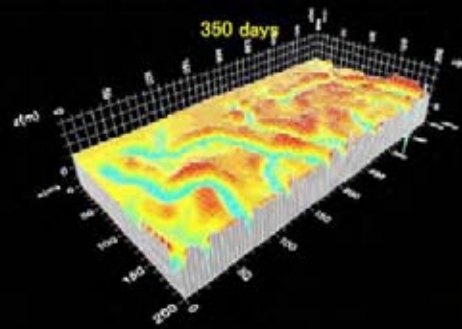
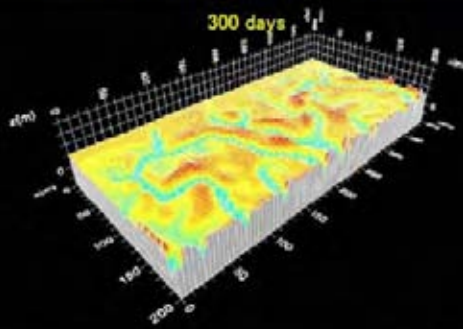
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Project Title

2. River & Estuarine Morphodynamics Modeling



Wotsuke Marsh in Hokkaido, Japan

RIC-Nays (Thai)

Hokkaido University

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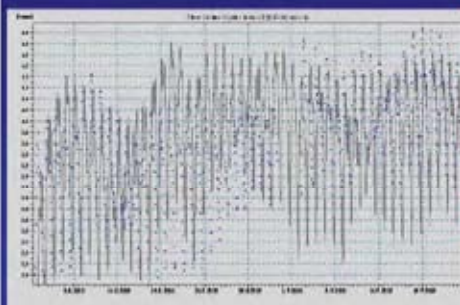
Project Title

3. Effect of Sea Water Level Change on the Management in the Lower Thachin River

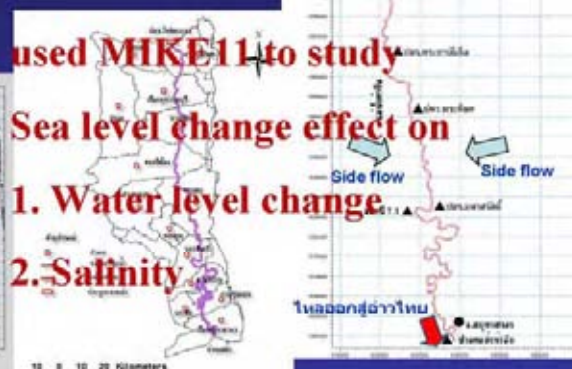
Outcomes

1 Conference Papers (in pressed)

1 Master RA.



used MIKE11 to study
Sea level change effect on
1. Water level change
2. Salinity



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5.10 Ms. Prapaporn Srisathidtham, Bureau of Royal Rainmaking and Agricultural Aviation

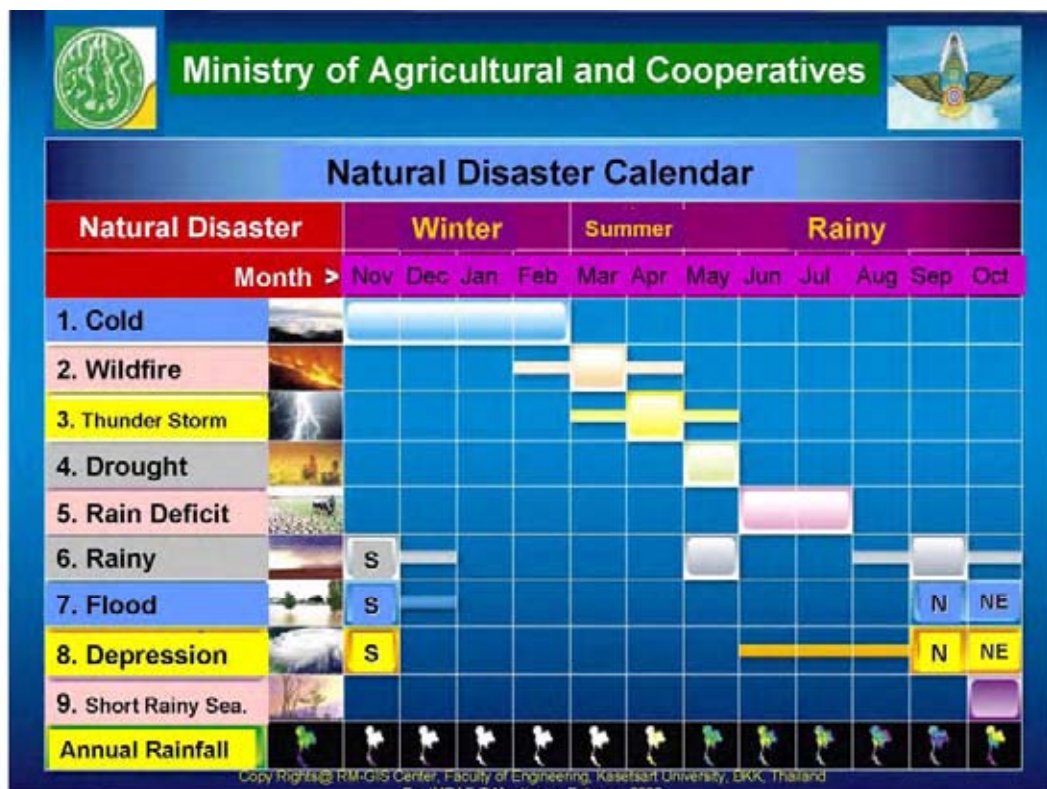


Royal Rainmaking for Sustainable Development



Prapaporn Srisathidtham (Scientist)
Research and Development Section,
Bureau of Royal Rainmaking and Agricultural Aviation
Bangkok, Thailand
Email : prapmsstm@yahoo.com

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Royal Rainmaking Operation Center



1. Upper Northern Region
2. Lower Northern Region
3. Central Region
4. Upper Northeastern Region
5. Lower Northeastern Region
6. Eastern Region
7. Upper Southern Region
8. Lower Southern Region

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Royal Rainmaking People Network

Region	Sub District Level	District Level	Provincial Level
Central (2 Provinces)	199	45	4
Lower Northeastern (3 Provinces)	394	77	6
Eastern (8 Provinces)	515	140	16
Total	1,108	262	26

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Royal Rainmaking People Network for Sustainable Development

Role and Responsibilities

- To assess rainfall needs of the community;
- To declare rainfall needs of the community to BRRAA;
- To provide knowledge (Met./ BRRAA) to the community;
- To coordinate continuity between the community and Royal Rainmaking Operation Center

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Activities

BRRAA & Royal Rainmaking People Network



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Activities
BRRAA & Royal Rainmaking People Network



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Activities
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Activities

BRRAA & Royal Rainmaking People Network



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Thank you



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