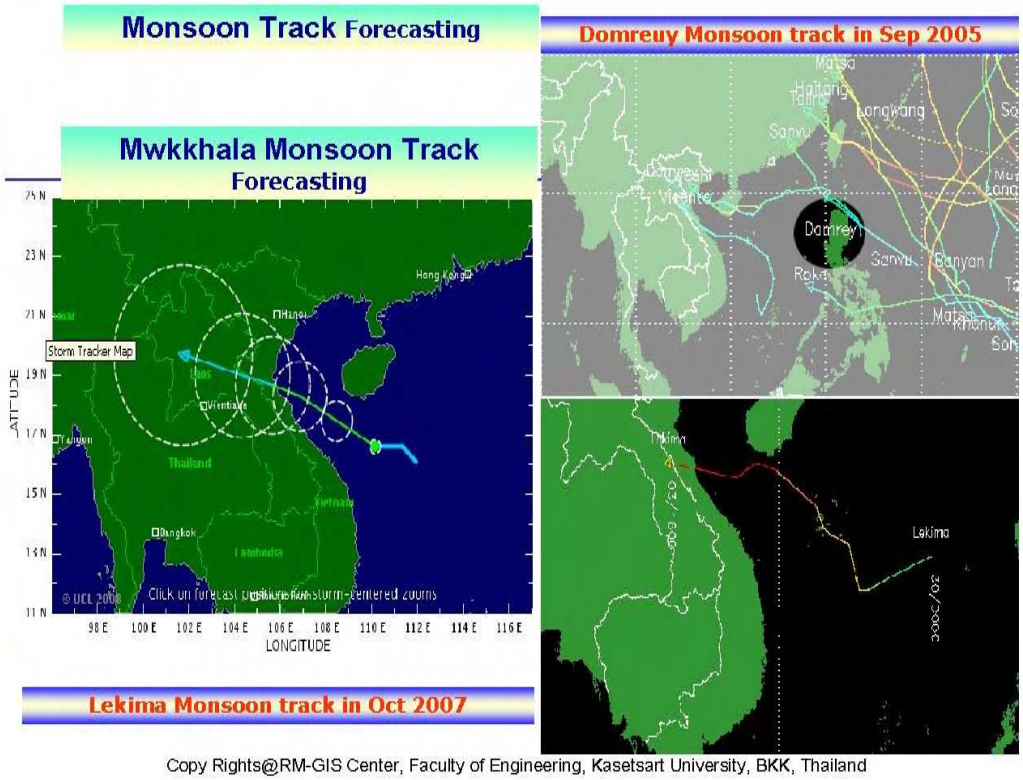
付属資料５：プレゼンテーション資料

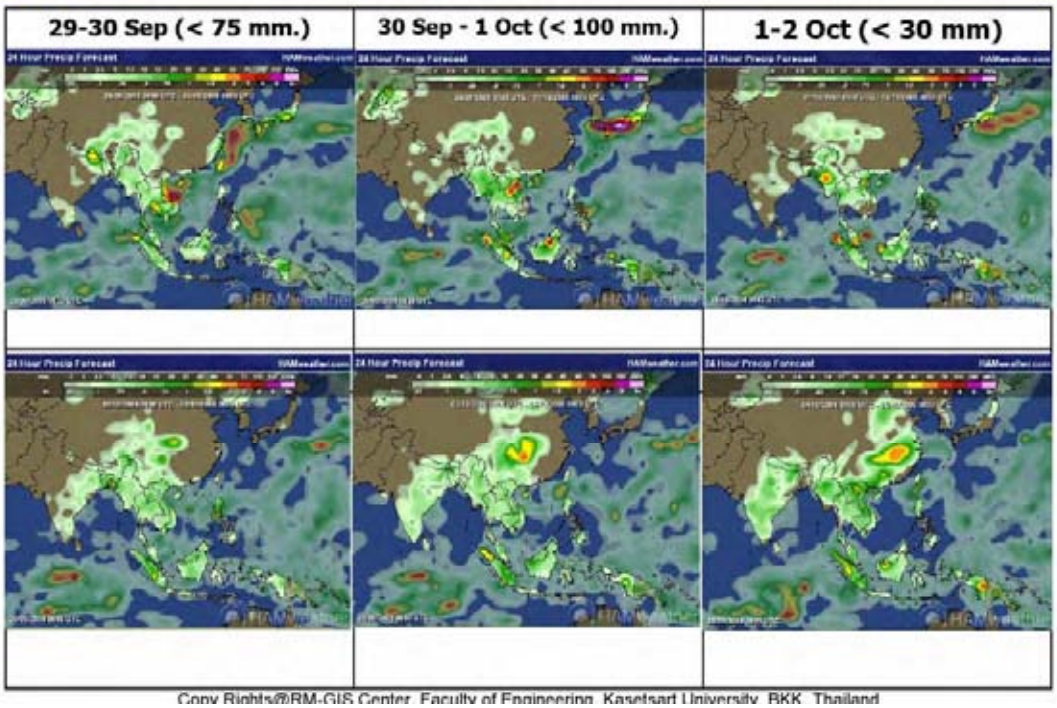
5.1 Prof. Hansa Vathananukij, Kasetsart University
5.2 Dr. Dusit Thanapatay, Kasetsart University
5.3 Dr. Apiniti Jotisankasa, Kasetsart University
5.4 Mr. Jaray Thongduang, Royal Irrigation Department
5.5 Mr. Panya Polsan, Royal Irrigation Department
5.6 Mr. Thada Sukhapunaphan, Royal Irrigation Department
5.7 Mr. Somkuan Tonjan, Dr. Somchai Baimuang, Thai Meteorological Department
5.8 Dr. Saisunee Budhakooncharoen, Mahanakorn University
5.9 Mr. Chaiwat Ekkawatpanit, Mr. Sanit Wongsa, King Mongkut's University of Technology Thonburi
5.10 Ms. Prapaporn Srisathidtham, Bureau of Royal Rainmaking and Agricultural Aviation

Flood for IMPAC-T project

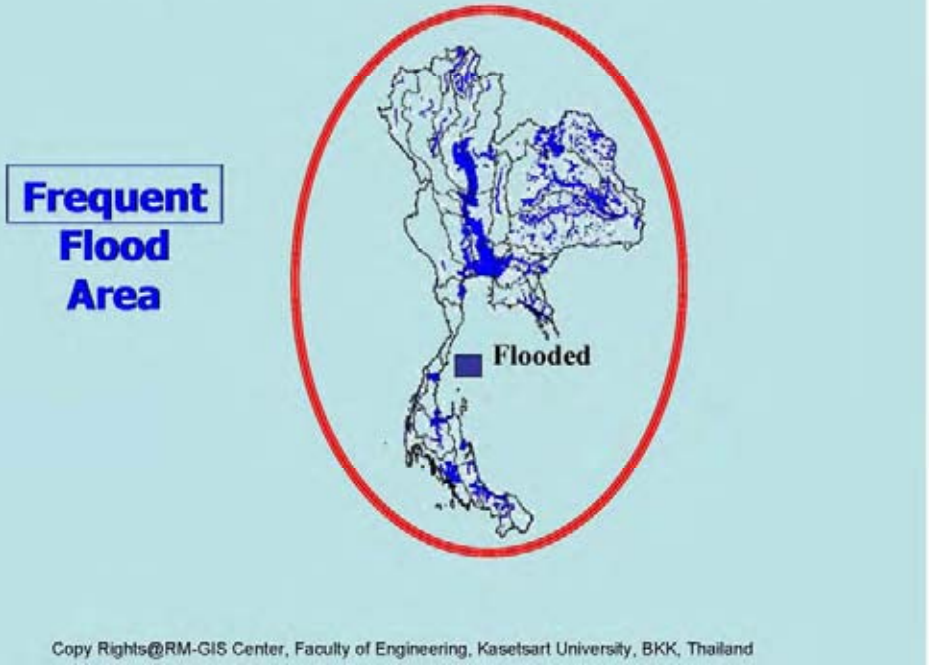
Hansa Vathananukij
Water Resource Engineering Department
Faculty of Engineering
Kasetsart University
BKK, Thailand

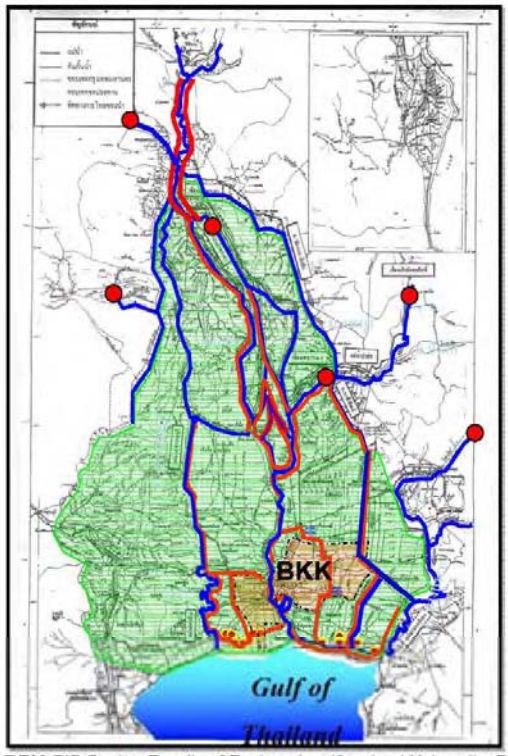


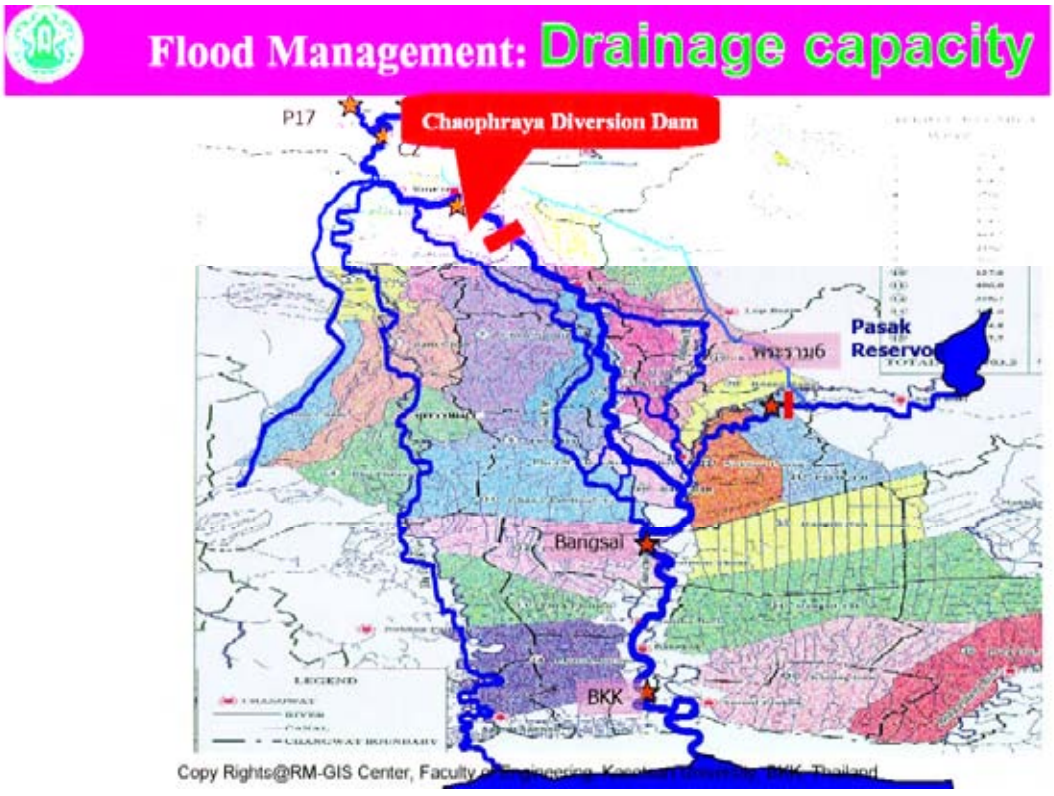
Rainfall Forecasted by HAM weather

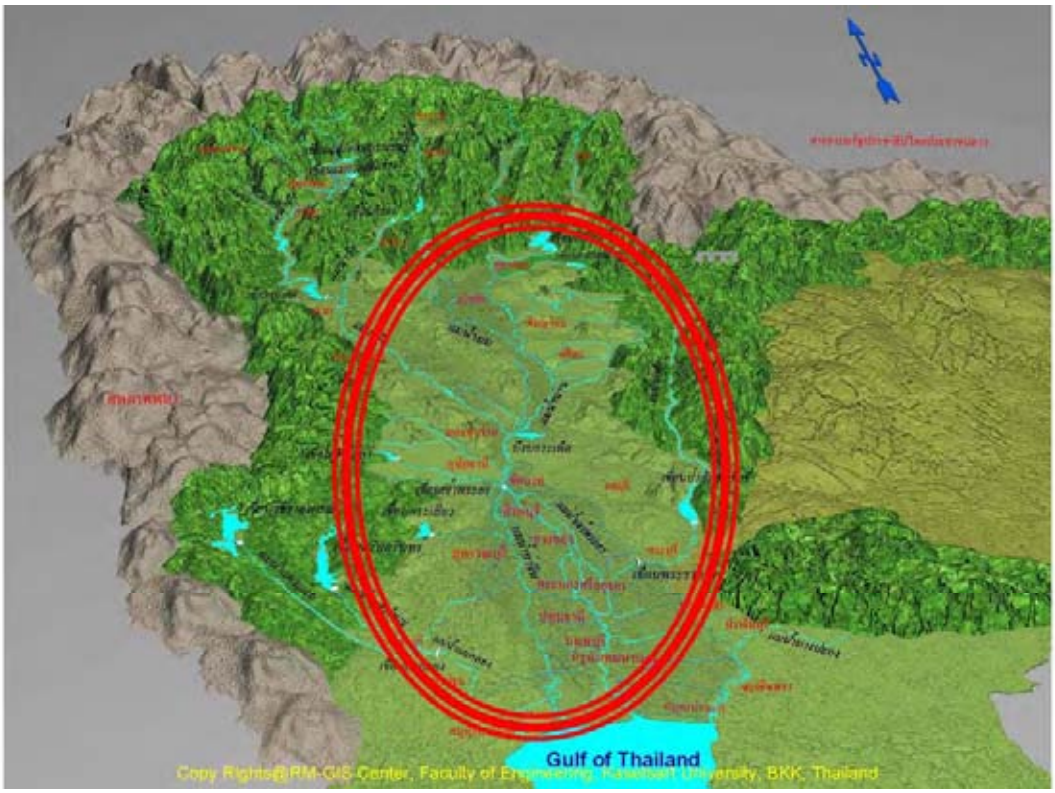


Serious Water Problems








Gulf of Thailand
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Water Management
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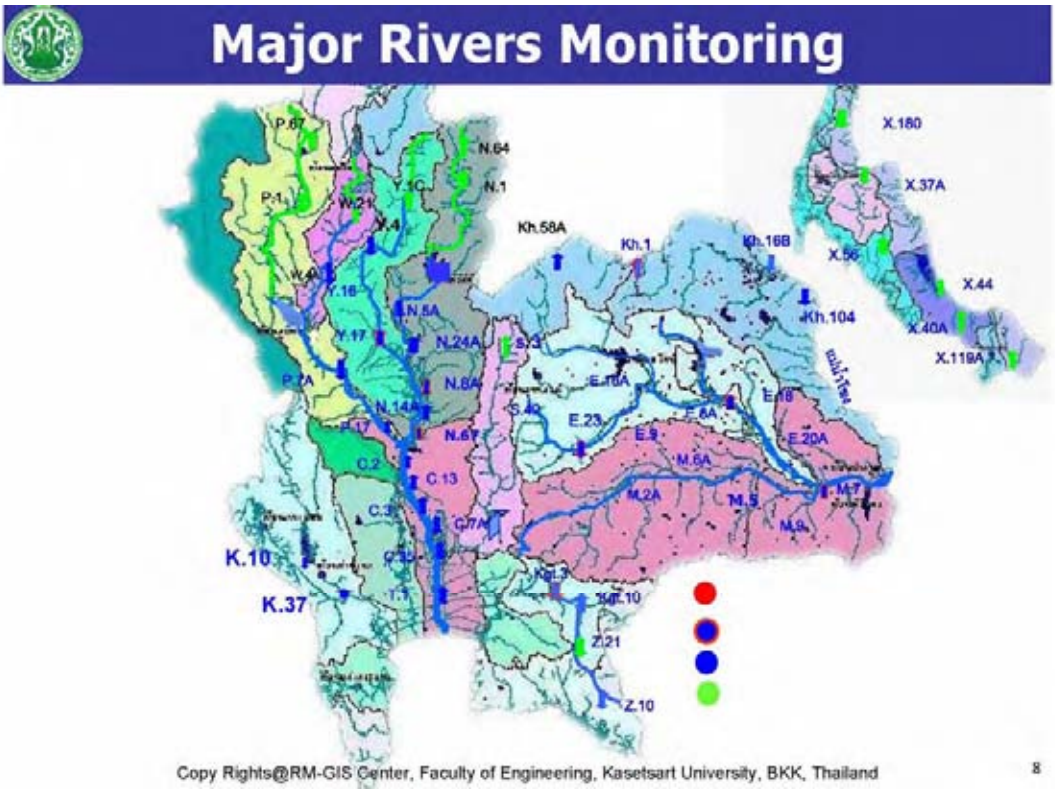
Major Rivers Monitoring
P.67
N.64
P.1
Y.1C
N.1
W.21
Y.4
Kh.58A
Kh.1
Kh.16B
X.180
X.37A
X.56
X.44
Y.16
N.5A
Kh.104
X.40A
Y.17
N.24A
S.3
X.119A
P.7A
N.8A
E.10A
E.18
N.14A
S.4
E.23
E.9
E.20A
N.6Y
M.6A
C.2
C.13
M.2A
M.5
M.7
C.3
C.7A
M.9
K.10
K.37
Kal.3
M.10
Z.21
Z.10
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Flood Management
Flooded in Lob buri Province
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35


Flood in Central Plain Area 2006
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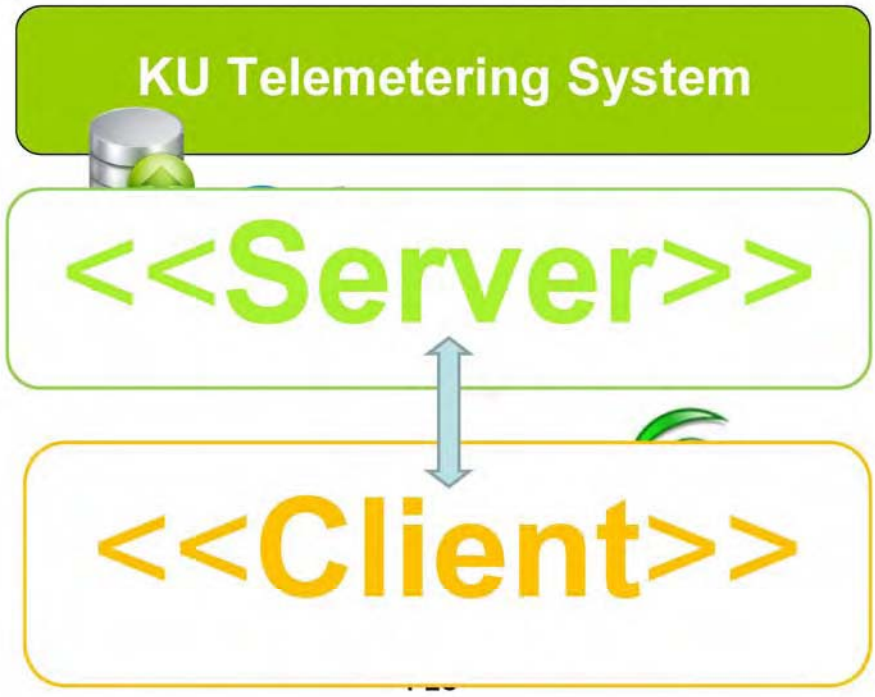
40

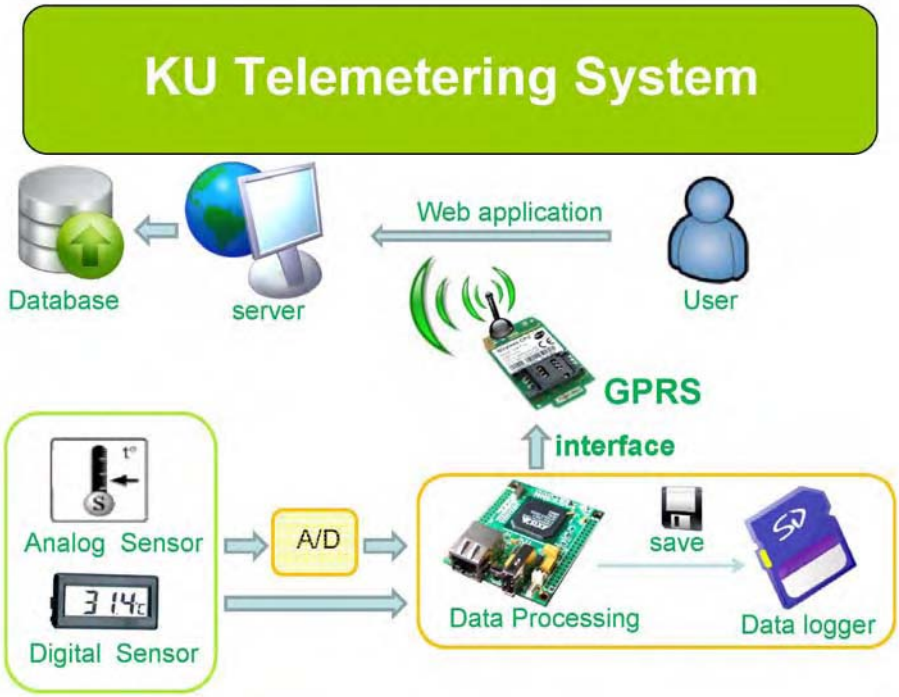
KU Telemetering System

Presented by Dr. Dusit Thanapatay

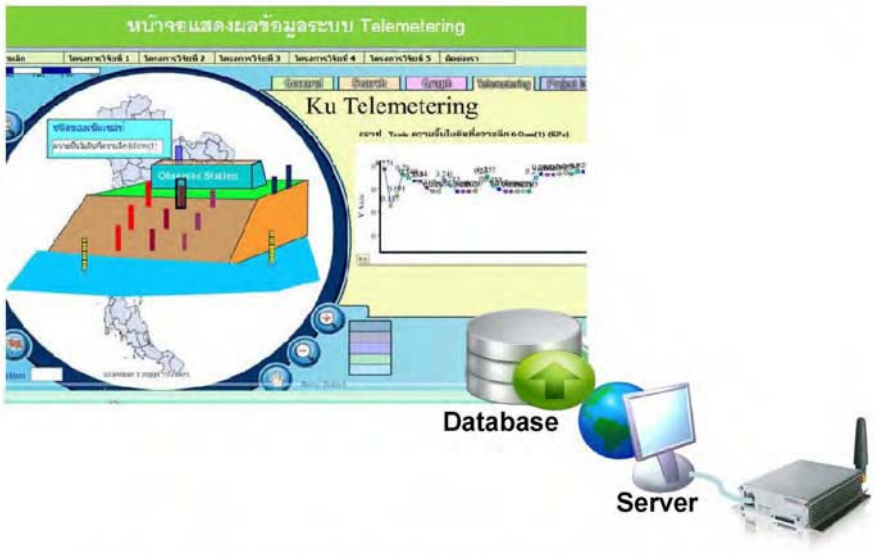
KU Telemetering System

SSWM (2008/07/12)



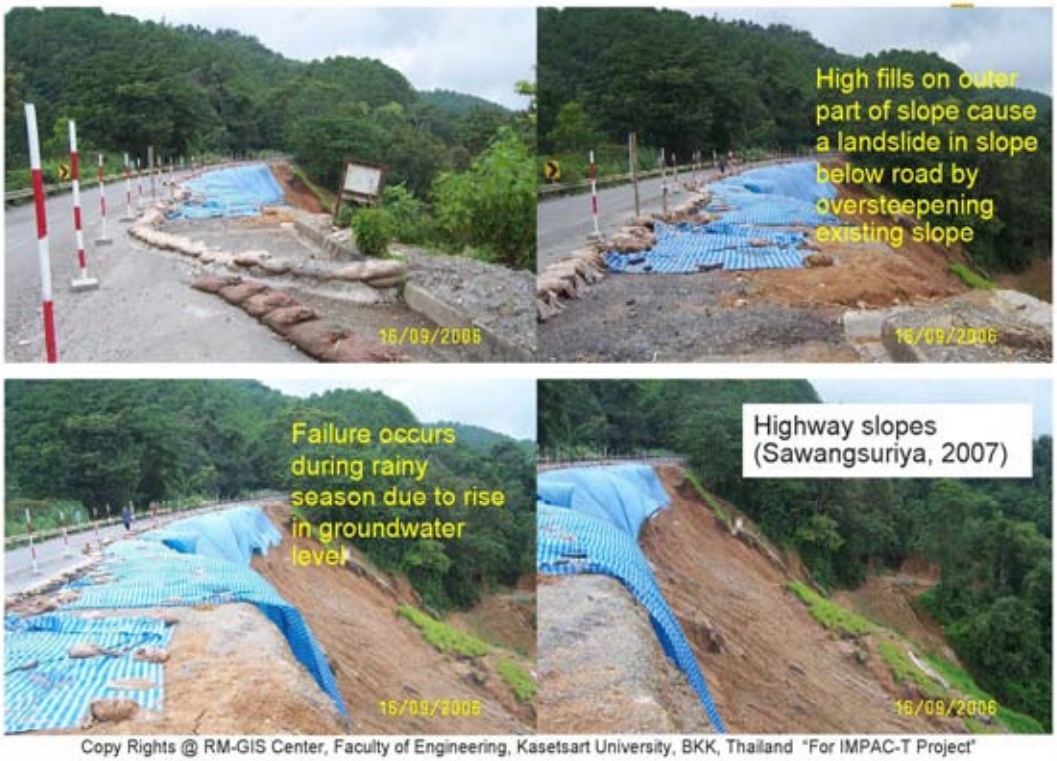


KU Telemetering System



Rainfall-induced landslide mitigation technology

Dr. Apiniti Jotisankasa
Geotechnical Engineering Research and Development Centre,
Department of Civil Engineering
Faculty of Engineering, Kasetsart University



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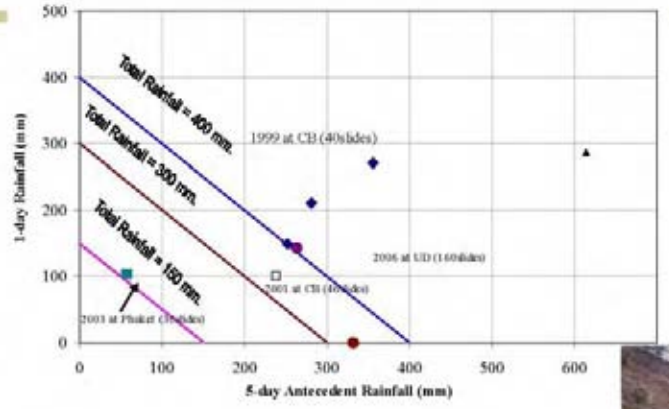
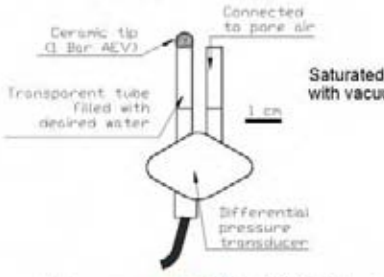
Rainfall pattern in Thailand

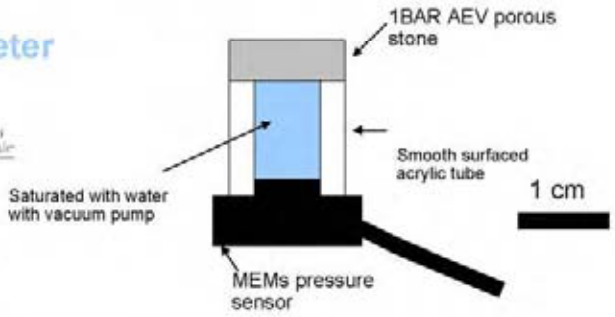


Development of soil suction measuring device at Kasetsart University

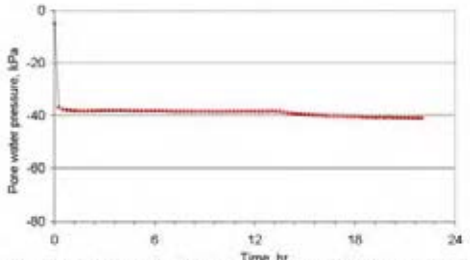
- KU-Tensiometer

(0-100 kPa)



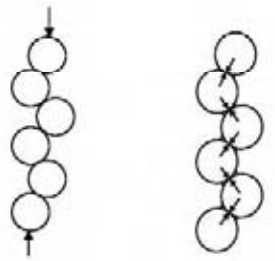


A variety of KU Piezometers/Tensiometers



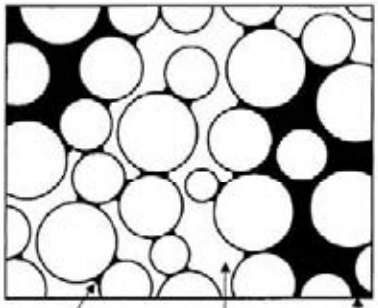
Basic mechanics

- Grain column analogy



Boundary forces
UNSTABLE

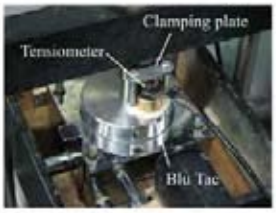
Contact menisci
STABLE
(depending on suction)

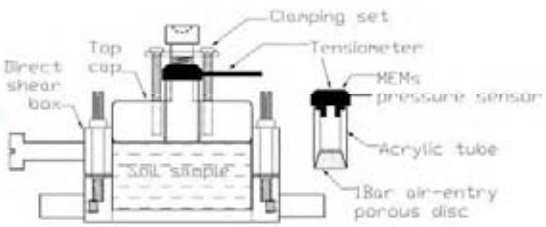


- Distribution of water within soil pores

Suction-monitored direct shear tests

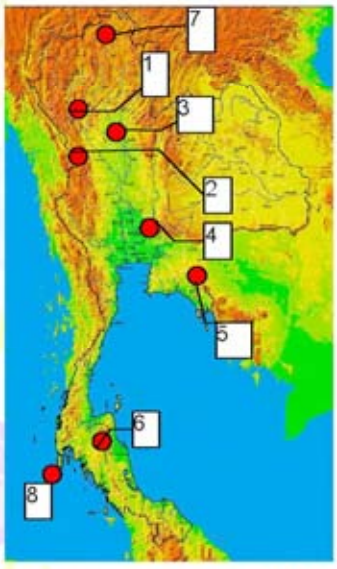
Residual soil from granite from Omkoi, Chiangmai





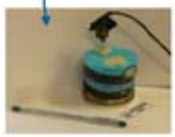
KU Miniature sampler: So-called "Undisturbed" sample from depth 0-2 m

Soil-Water Characteristic Retention Curve

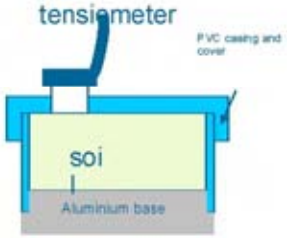


- Method of determining SWCC

KU-tensiometer

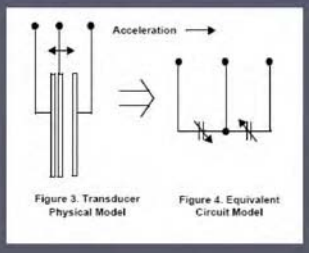


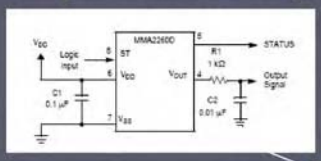
KU tensiometer



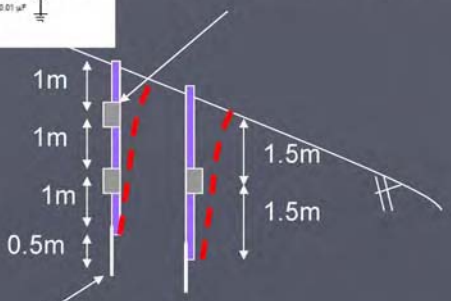
Other instrumentations developed at KU

KU-Inclinometer (Accelerometer)

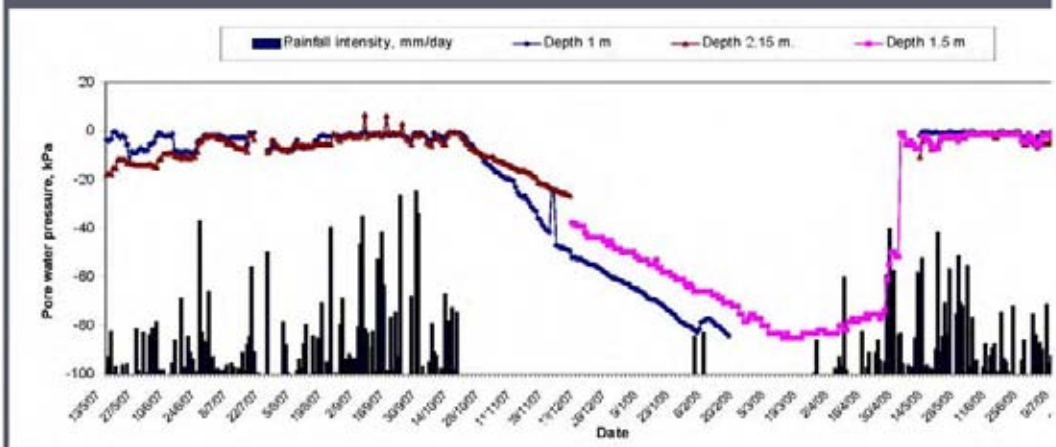




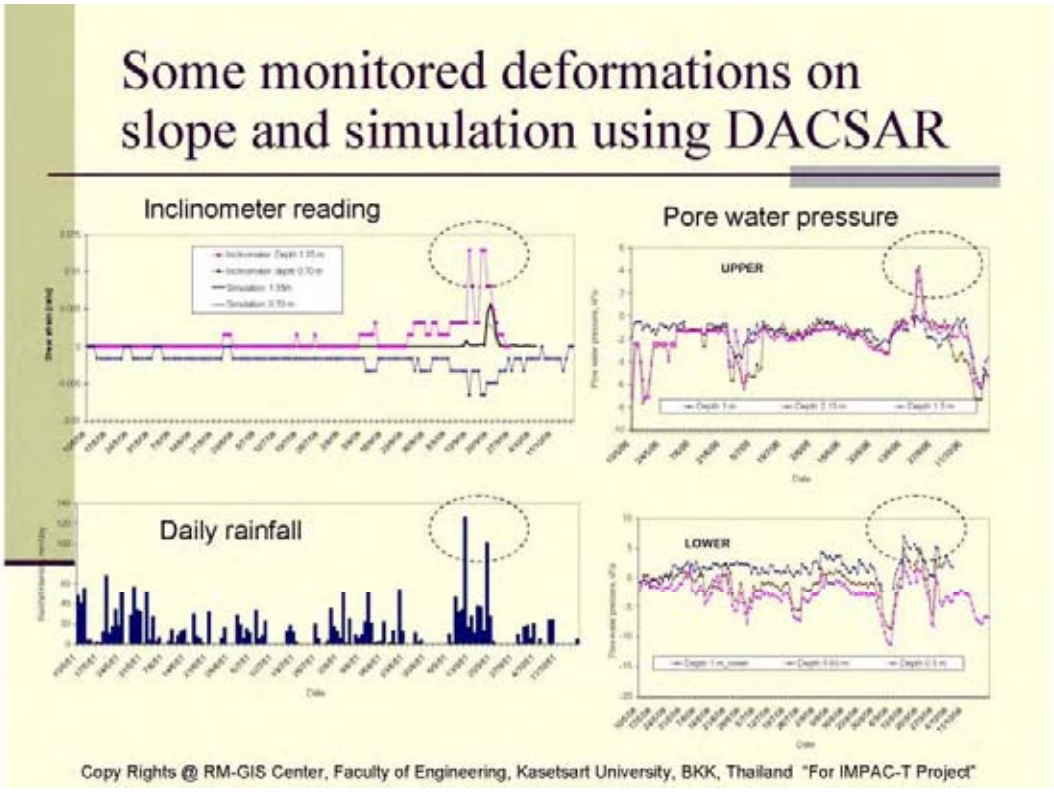
In-placed Inclinometer



Rough Steel bar 24 driven into rock surface by about (KPT > 100/20cm) ~ 30 cm



slope


Some monitored deformations on slope and simulation using DACSAR
Inclinometer reading
Pore water pressure
UPPER
Daily rainfall
LOWER
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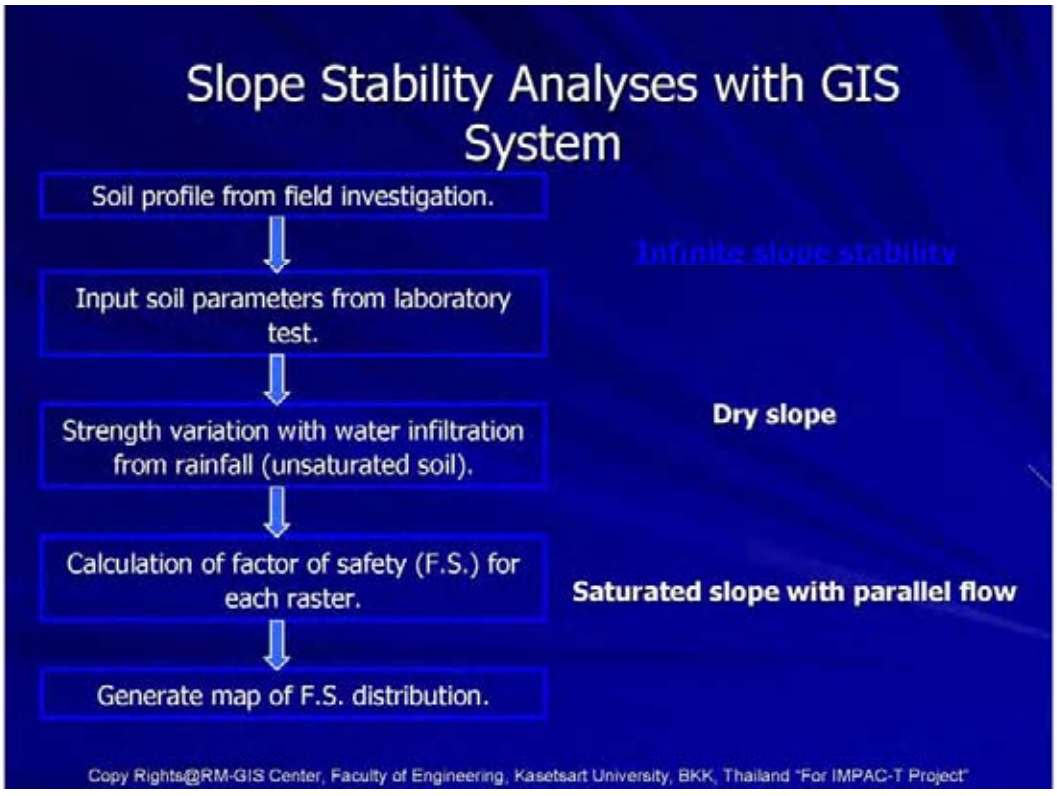
Slope Stability Analyses with GIS System
Soil profile from field investigation.
Input soil parameters from laboratory test.
Strength variation with water infiltration from rainfall (unsaturated soil).
Calculation of factor of safety (F.S.) for each raster.
Generate map of F.S. distribution.
Infinite slope stability
Dry slope
Saturated slope with parallel flow
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Summary

- Investigation of fundamental behaviour of soils in unsaturated state in Thailand leading to understanding of slope subjected to rainfalls
- Development of early warning system for slope failure based on rainfall, pore water pressure, and slope movement
- Use of DACSAR (FE program) to simulate and predict the likely deformation at failure
- Use of GIS to predict the areas at risk of landslide Realtime.

"IMPAC-T" Project

19th January 2009

Kasetsart University, Bangkok

Jaray Thongduang

Hydrology and Water Management Center for Central Region
Office of Hydrology and Water Management

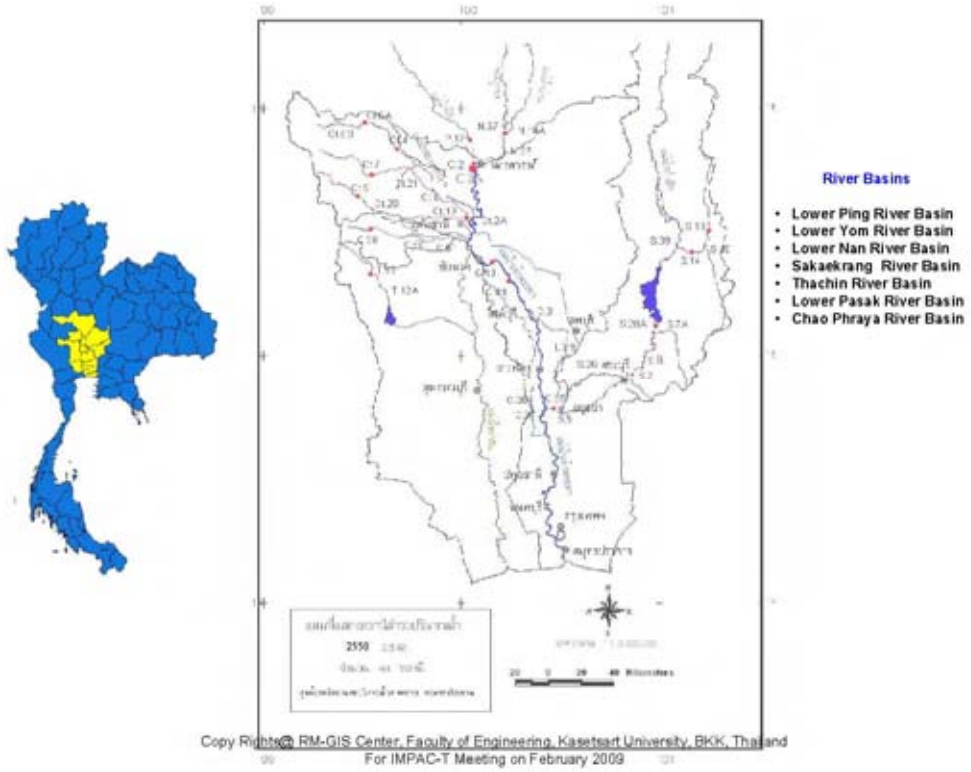
Royal Irrigation Department, Thailand.

Functions and Scope of works

1. Planning Hydrological Networks, Constructing, Installing and Maintainance for Hydrological Investigations.
2. Analysing and compiling statistics in Hydrological data, preparing Hydrological data base, supporting data and warnning situations to the public and stakeholders
3. To decide the standard of Hydrological Characteristics for flood risk management in the basins.
4. To watch on Rainfall and Flow situations, reporting realtime data and the impacts in areas to RID. And the public offices.
5. Studying and estimating Rainfall and runoff in basins for decide for water operation and management in seasons.
6. Studying in physical characteristics and the balance of environmental ecology and its impacts in the watershed such as soil erosion, sedimentation and the changes of capacity of rivers or reservoirs.
7. Measuring discharge and studying for Structurals Calibration for the maximum efficiency in water management.

Objectives of Works

- Water Resource Development
- Water Management
- Water Quallity Watching
- Flood Protecting/Control



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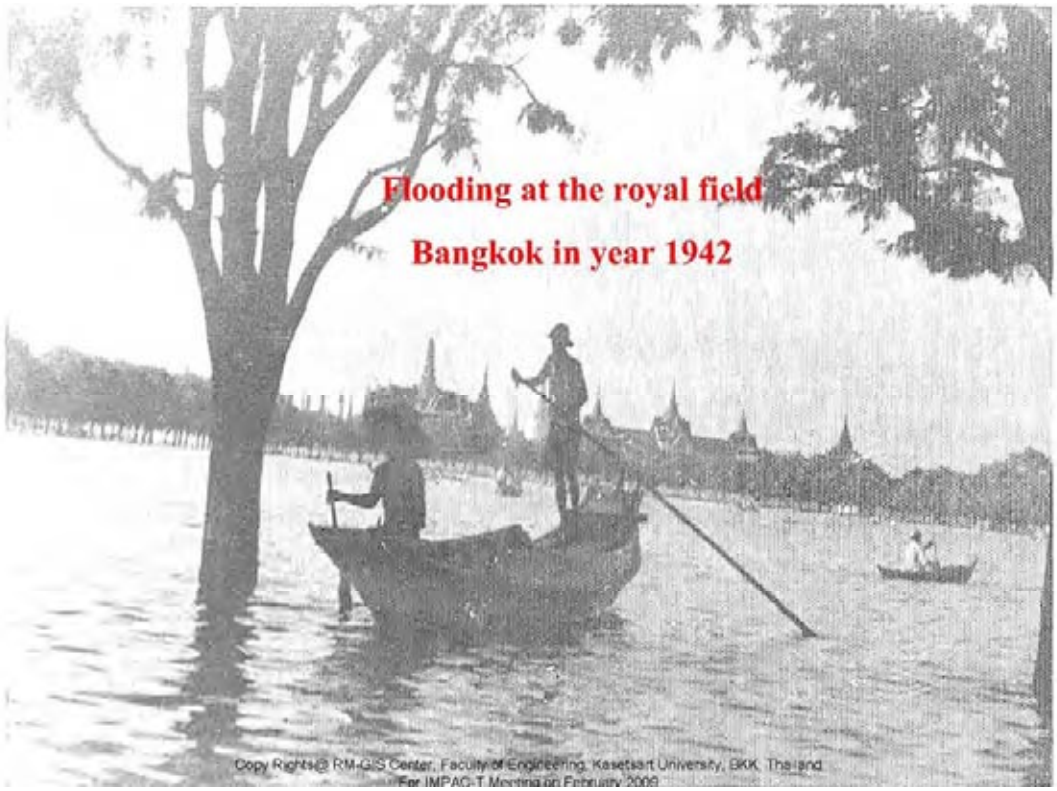
Hydrological Investigetion Stations

Year 2008

- 1. Guaging Stations
- 2. Discharge Measurement
- 3. Hydro-Meteorological
- 4. Water Quality and Sediment

Historical floods and 2006 flood


Flooding at the royal field
Bangkok in year 1942
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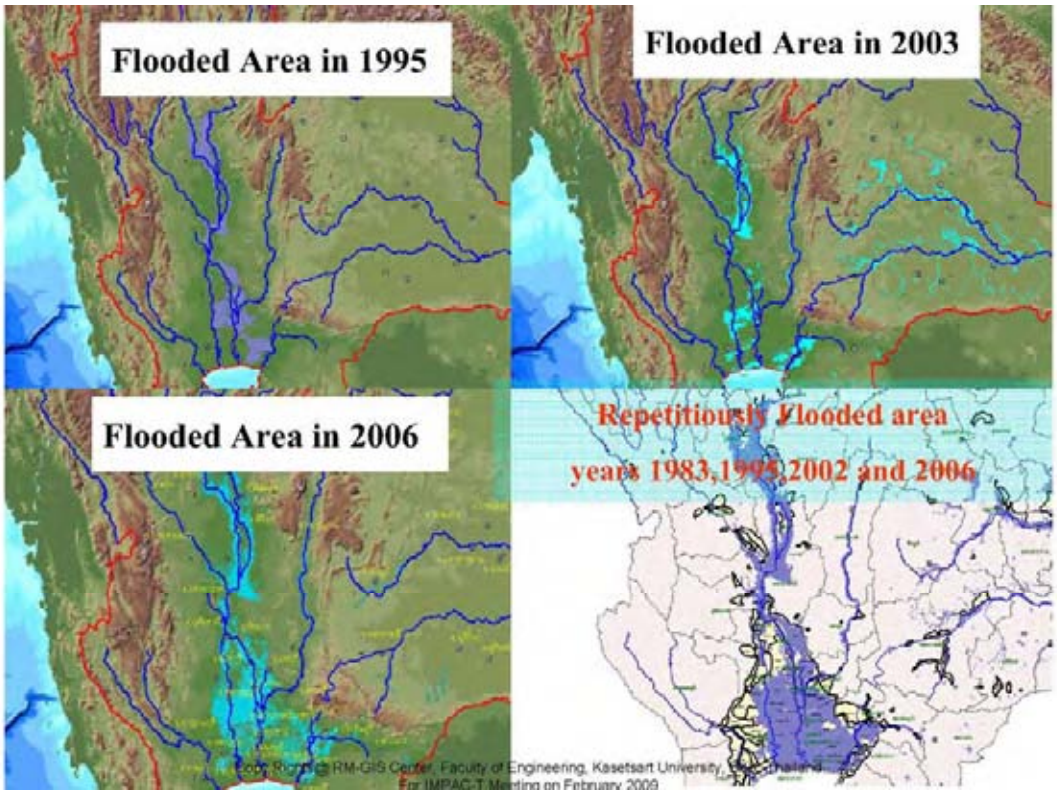
Flooded Area in 1995
Flooded Area in 2003
Flooded Area in 2006
Repetitiously Flooded area
years 1983,1995,2002 and 2006
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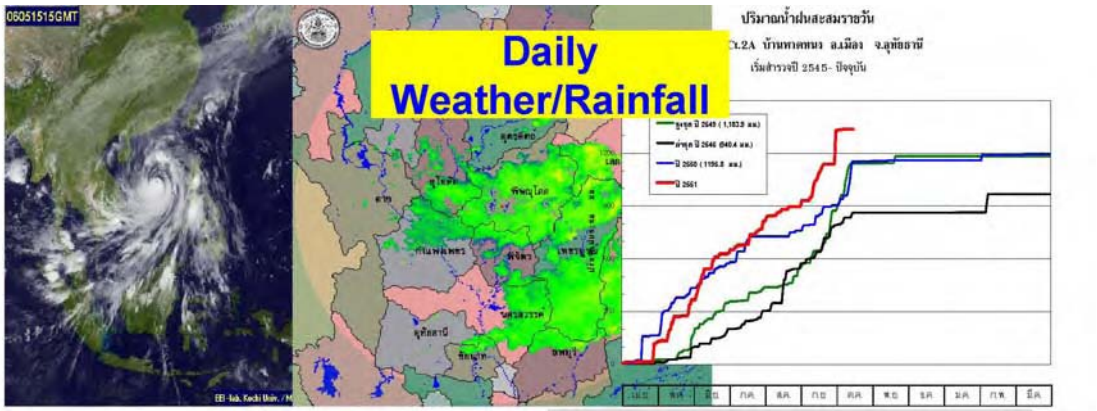
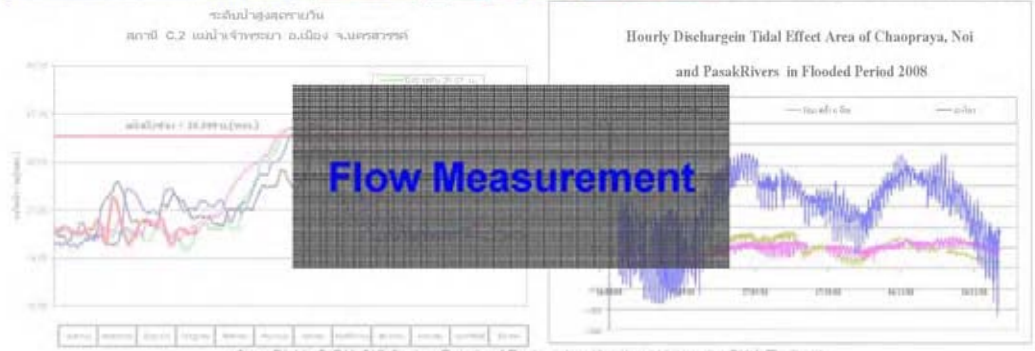
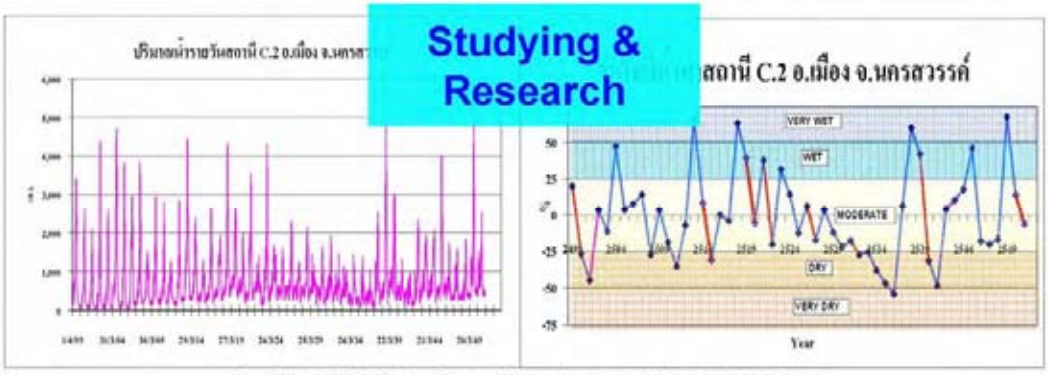
Flood Damages And Protecting

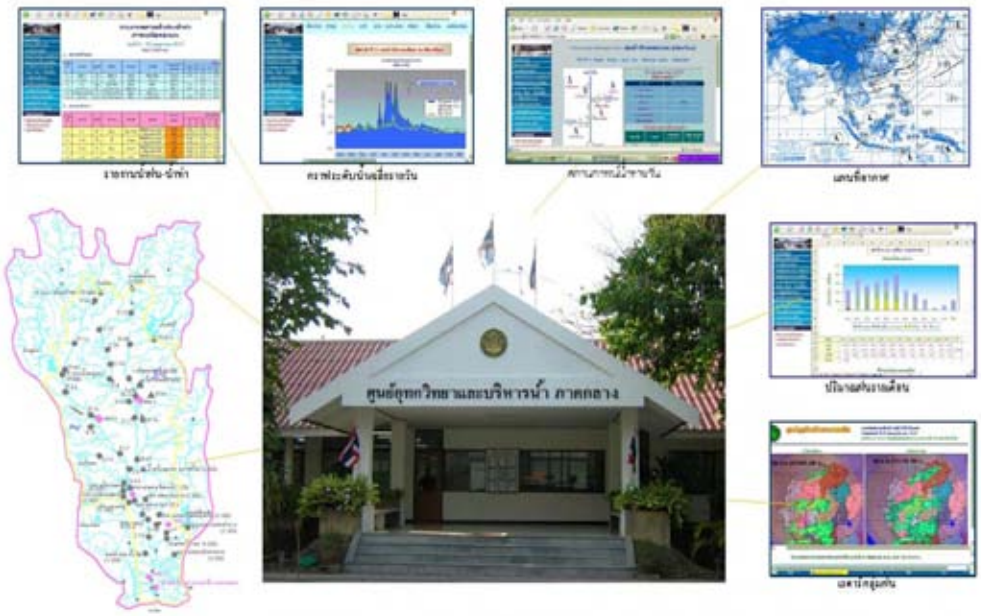
in Chaophraya basin in 2006

Activities









Chaophraya Network system

Supporting The Project on

- Research on the Estimation of Hydrological cycle considering Land use change
- Research on Prediction on Flood/Draught potential based on River Discharge

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More Collaborations Plan

- **more investigation stations over the basins**
- **more technology for data collections and real time communication**
- **more knowledge for deciding in water management.**

Minimum Expecting Rainfall Staion Network of lower Chaophraya River Basin

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Thank you for Your Attention