



The Mekong River Basin

Characteristics:

Area of basin:	795,000 km ² (21)
Length of mainstream:	4,800 km (12)
Annual average discharge:	15,000 m ³ /s (8)

Flood Mitigation and Management in Thailand



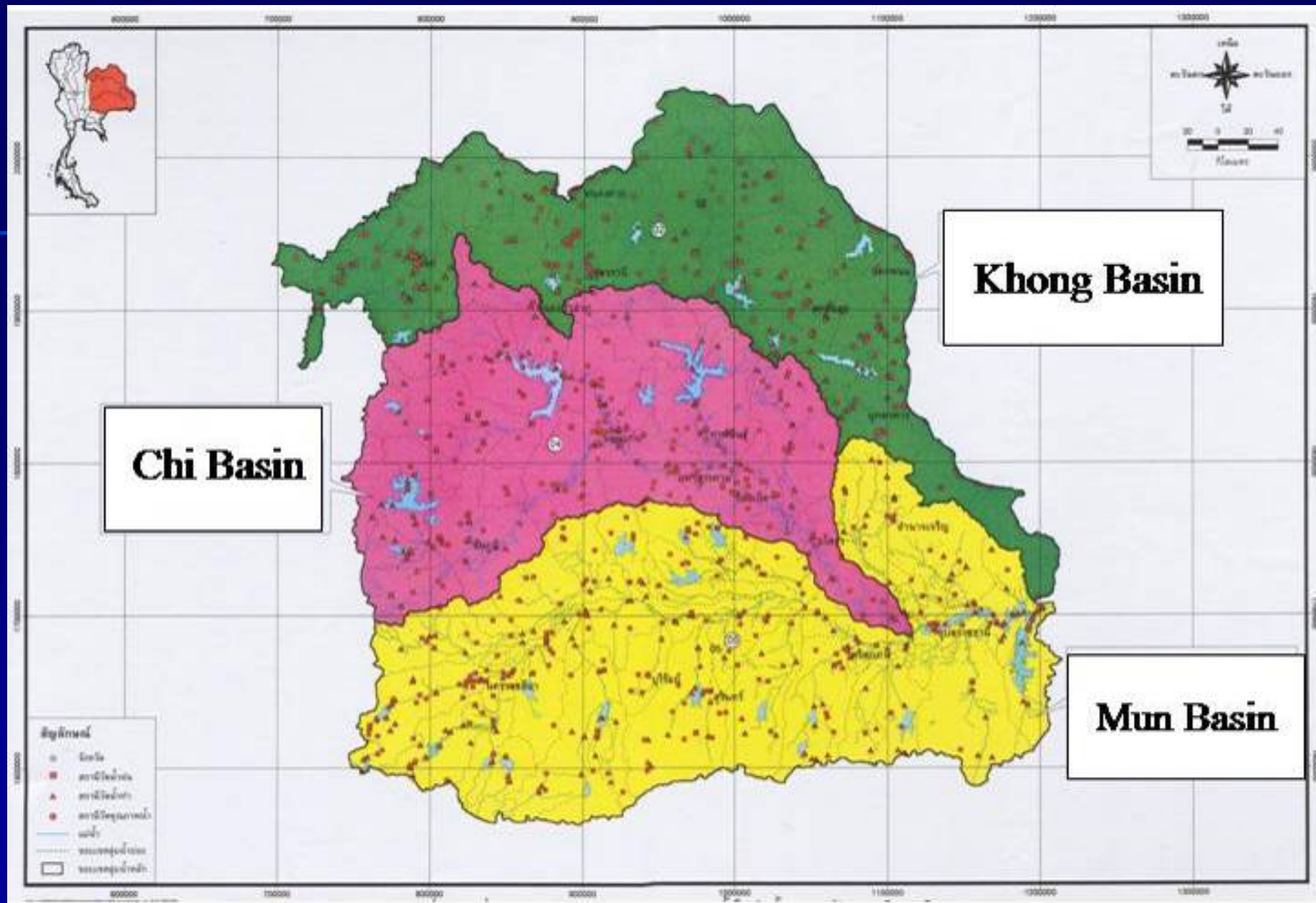
- LEGEND**
- International boundary
 - Basin boundary
 - River
 - Upper Mekong Basin
 - Lower Mekong Basin (MRC)
 - (?) Rank in the world
 - (%) Flow contribution

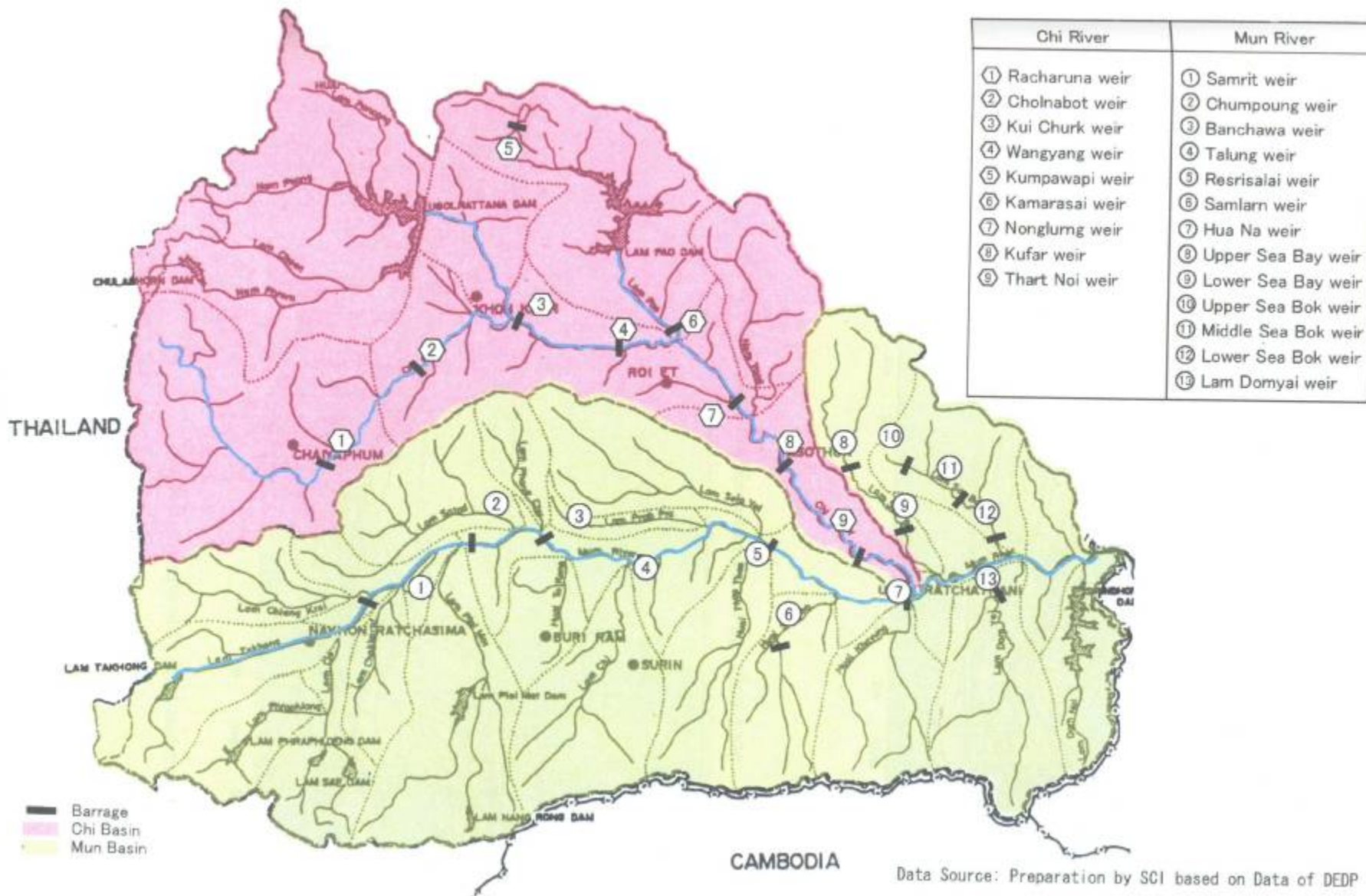


Topics

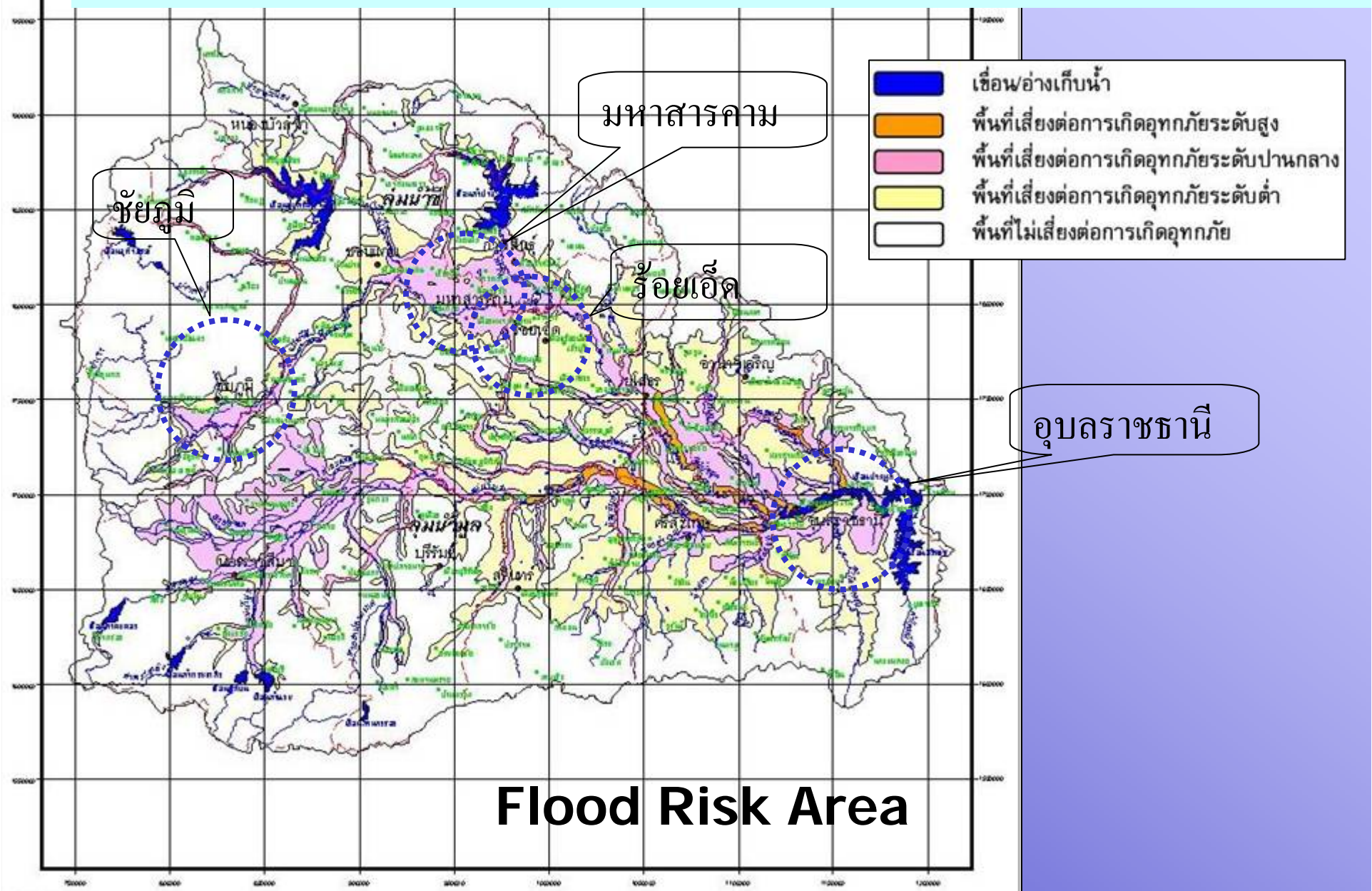
- Nature and Extent of Flooding
- Data Collection and Forecasting
- Flood Forecasting and Warning
- Communication of Flood-Warning Information
- Other Relevant Information

Nature and Extent of Flooding



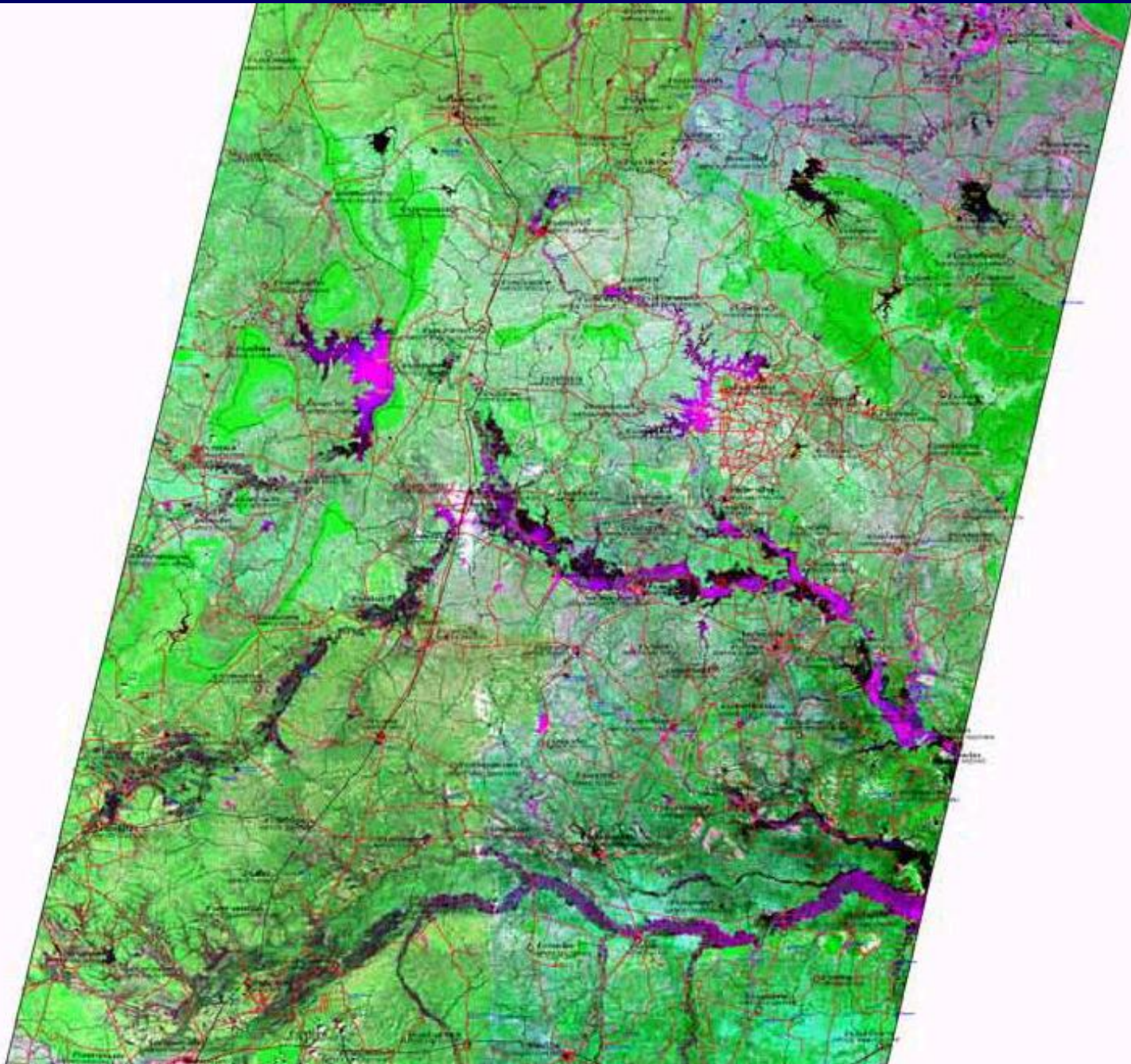


แผนที่แสดงพื้นที่เสี่ยงต่อการเกิดอุทกภัยระดับต่าง ๆ ในลุ่มน้ำชีและลุ่มน้ำมูล



Flood from the Central Mekong Basin of Thailand (Northeast)

- The Khong Basin (50,000 sq.km.)
 - Large flood is not existing in the tributaries due to their small basin area.
 - The flood season from August to September caused by invasion of high backwater of the Mekong river.
 - A long distance flood protection dike of about 800 km. from the Chaing Khan to the Mun river mouth has been constructed along the Mekong river.
- The Chi and Mun Basin (119,000 sq.km.)
 - Large flood is frequently occurred in the basin due to the heavy rainfall.
 - The flood season from September to October caused by poor drainage system in the basin.
 - About 22 barrages are constructed crossing the Chi and Mun rivers.
 - There are two large reservoirs in the basin, Ubol Ratana dam and Lam Pao dam.



Satellite image in 2002 illustrates inundated area in the northeast of Thailand

Data Collection and Forecasting

Available Data

- Hydrological Data
- Meteorological Data
- Dam Operation Data
- Other Data

Most of the data are manually recorded and stored in digital form in the computer mainframe of agencies.

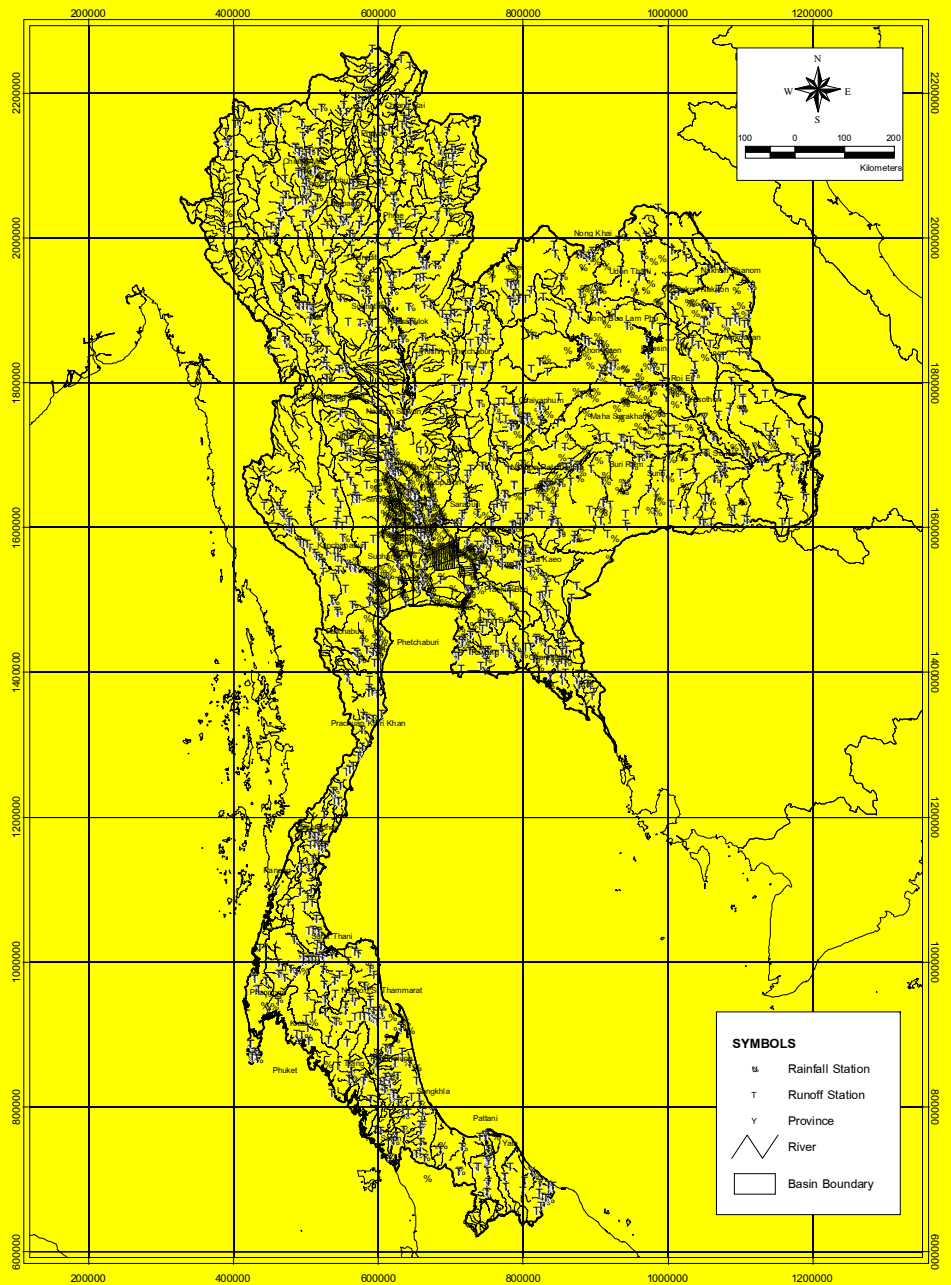
Agencies

- The Royal Irrigation Department (RID)
- The Meteorological Department (MD)
- The Electricity Generating Authority of Thailand (EGAT)
- The Department of Water Resources (DWR)

RID

- Statistical daily data of reservoirs
- Statistical daily data of barrages
- Daily or hourly or automatic water level data
- Daily or hourly or automatic rainfall data
- Daily evaporation data

Forecasting of flooding condition has been carried out by considering the statistical relationship among data of gauging stations.

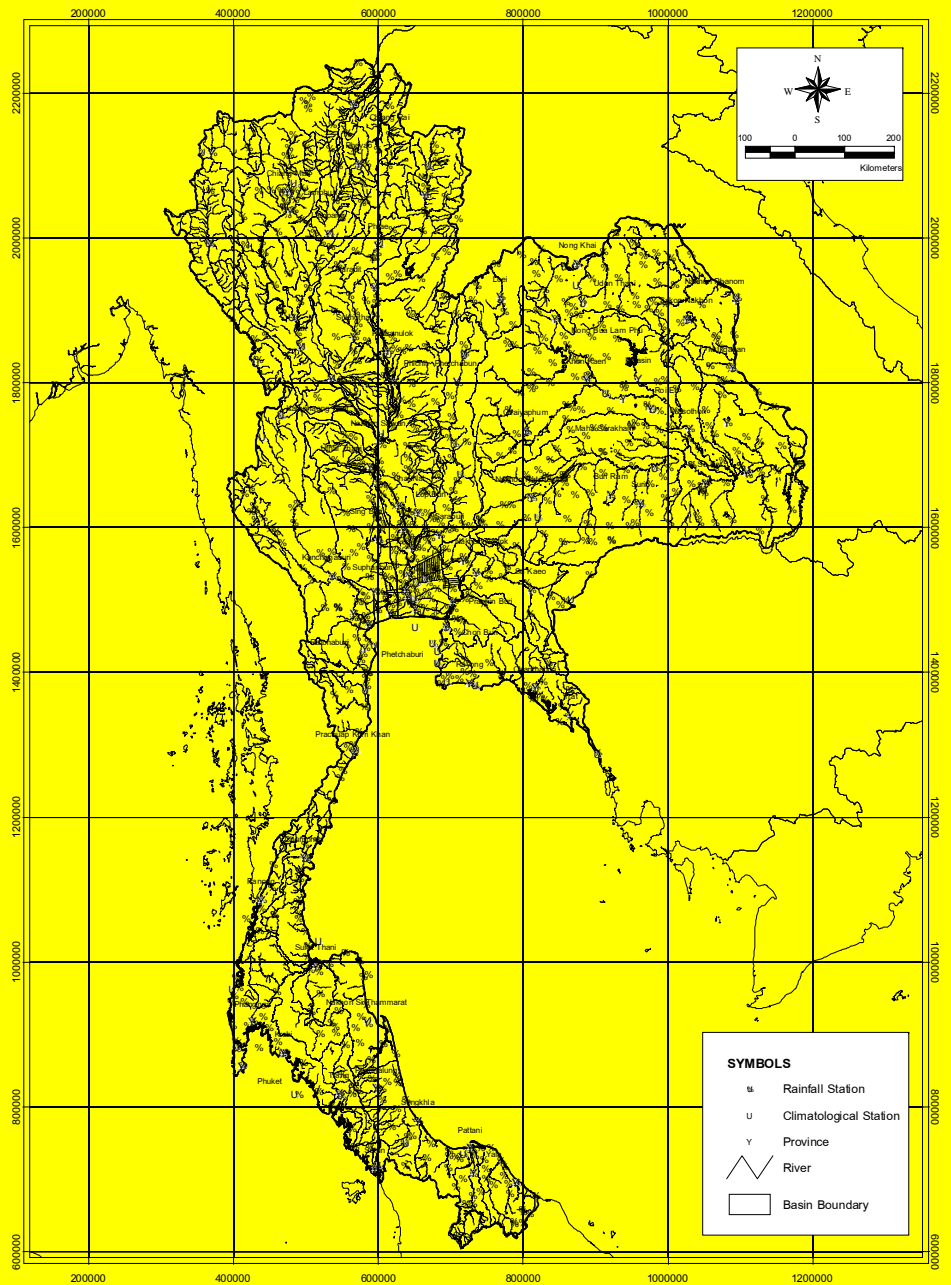


**LOCATION OF HYDROLOGICAL STATIONS
IN THAILAND UNDER THE ROYAL IRRIGATION DEPARTMENT**

MD

- Daily or hourly or automatic rainfall data
- Daily meteorological data
- Rainfall data by radar

Forecasting of the rainfall and weather condition has been carried out by super computer.

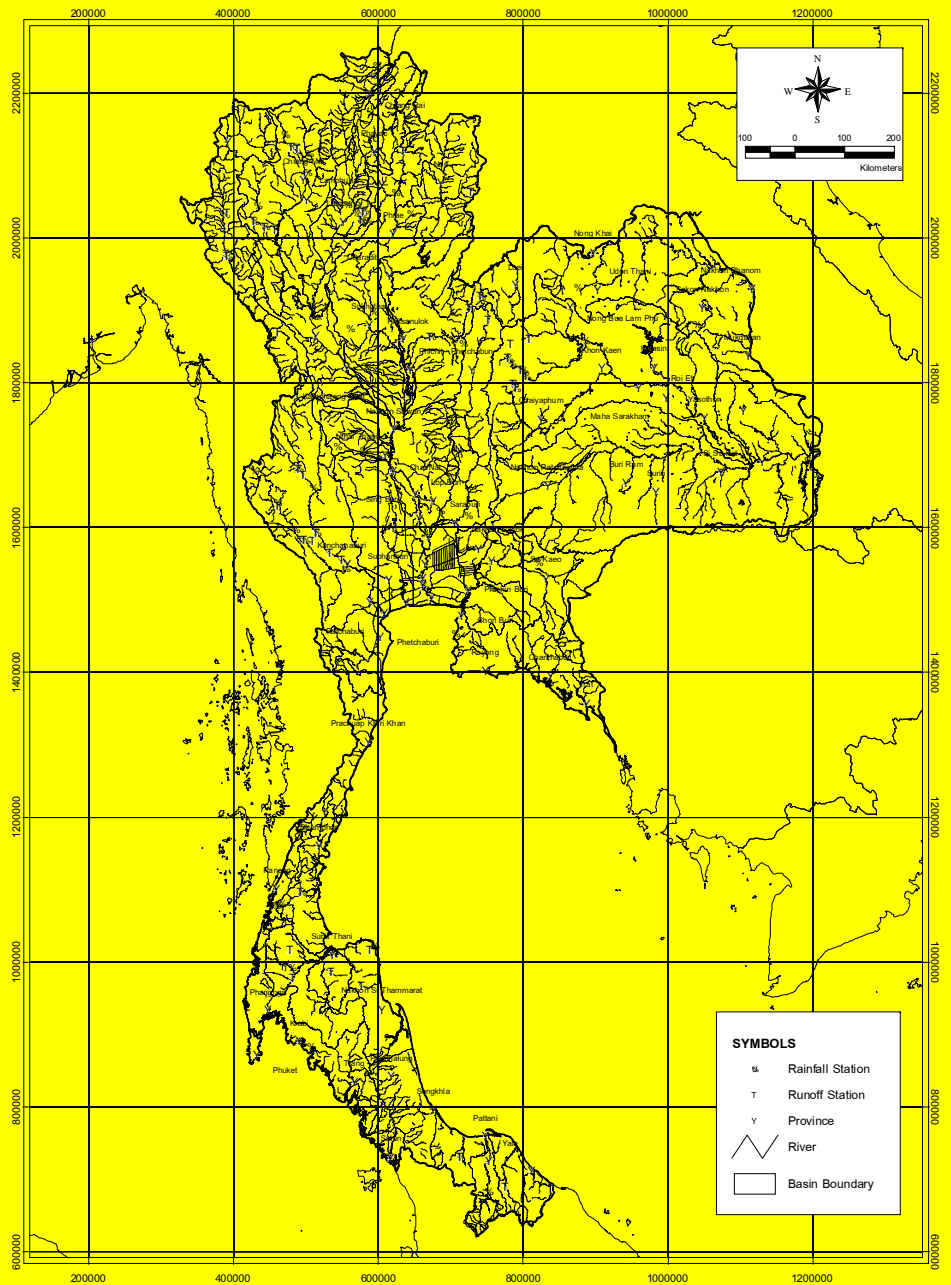


**LOCATION OF HYDROLOGICAL STATIONS
IN THAILAND UNDER THE METEOROLOGICAL DEPARTMENT**

EGAT

- Statistical daily data of reservoirs
- Daily or hourly or automatic water level data
- Daily or hourly or automatic rainfall data
- Daily evaporation data

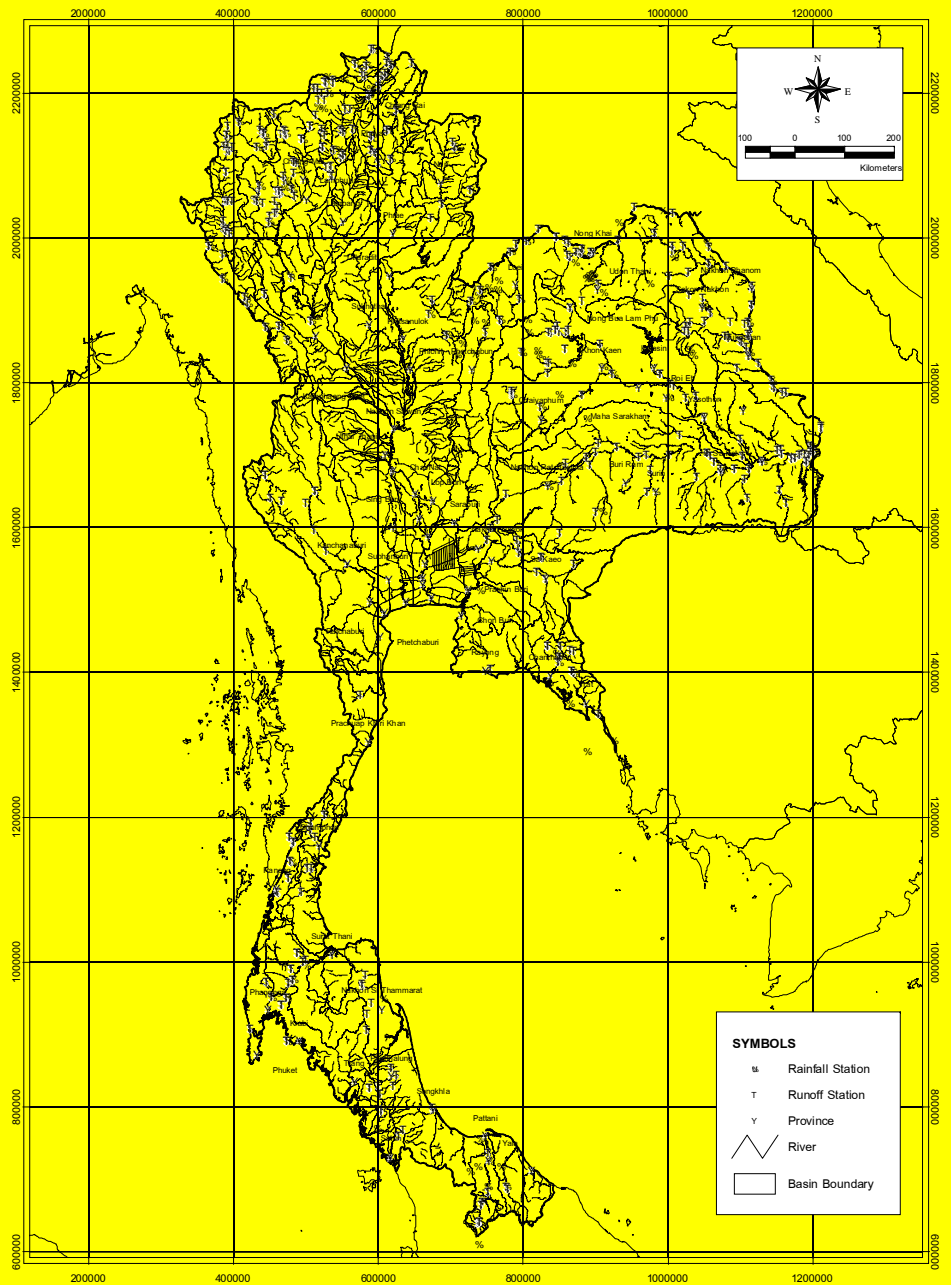
Forecasting of runoff into reservoirs has been carried out by considering the statistical relationship among data of gauging stations.



**LOCATION OF HYDROLOGICAL STATIONS IN THAILAND
UNDER THE ELECTRICITY GENERATING AUTHORITY OF THAILAND**

DWR

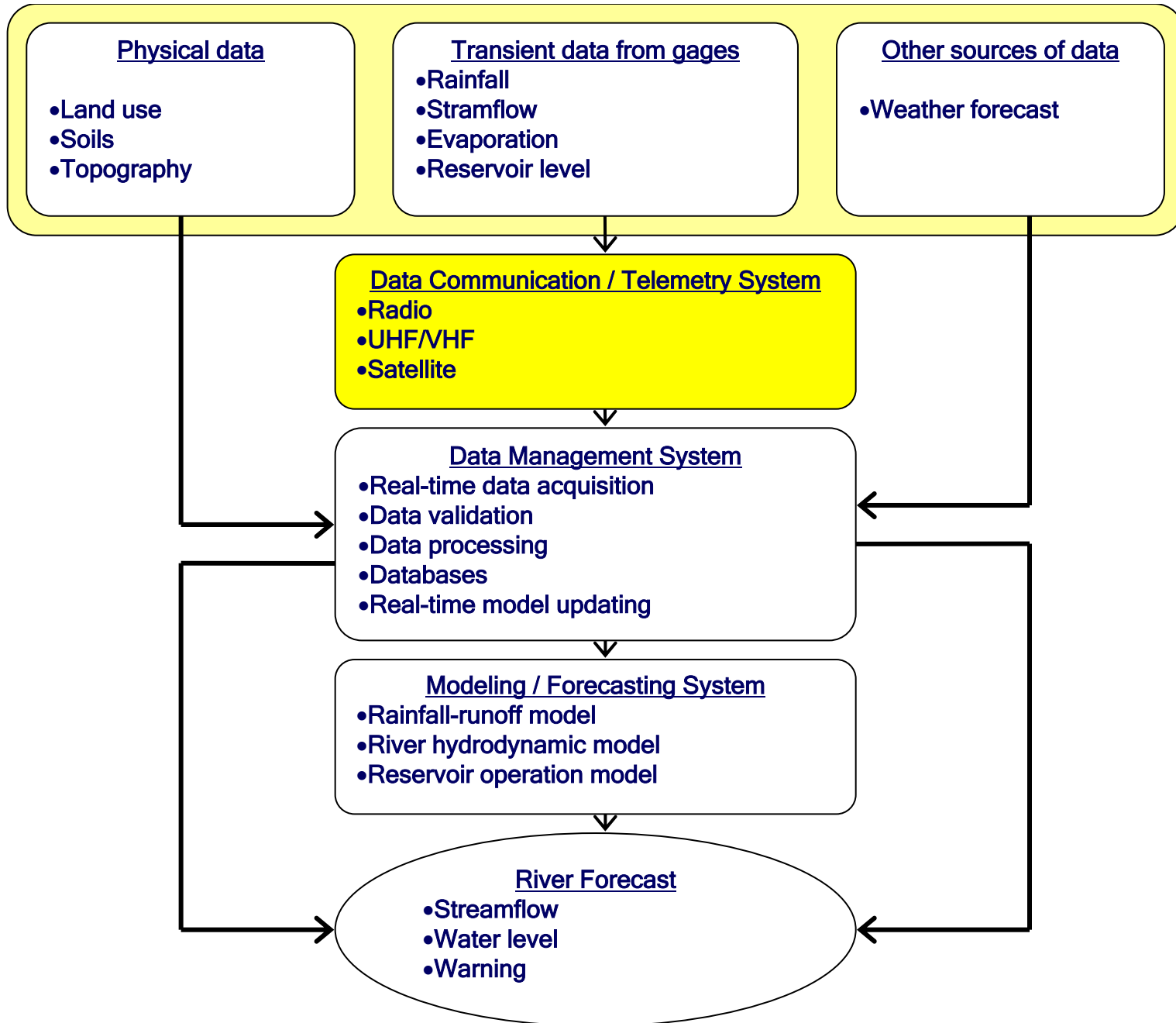
- Daily or hourly or automatic water level data
- Daily or hourly or automatic rainfall data
- Daily evaporation data



**LOCATION OF HYDROLOGICAL STATIONS
IN THAILAND UNDER THE DEPARTMENT OF WATER RESOURCES**

Flood Forecasting and Warning

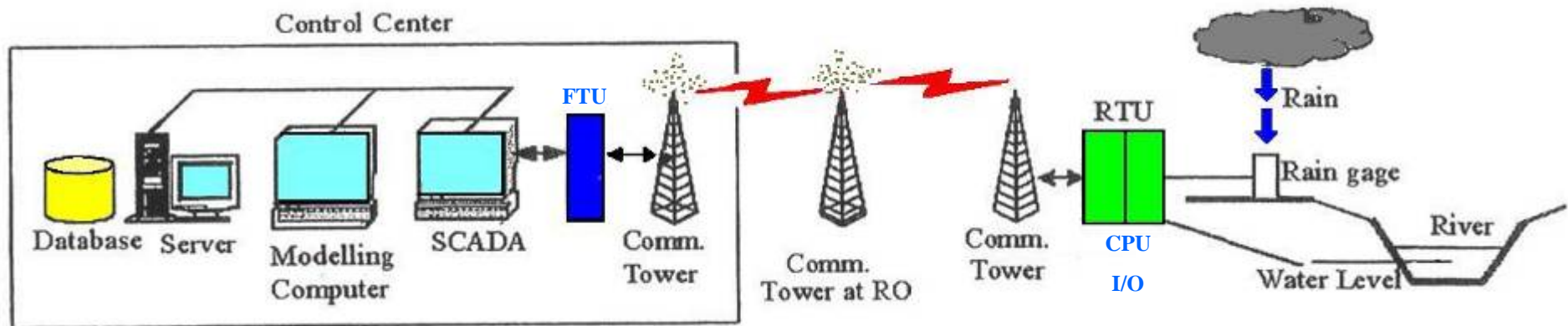
Data Collection System



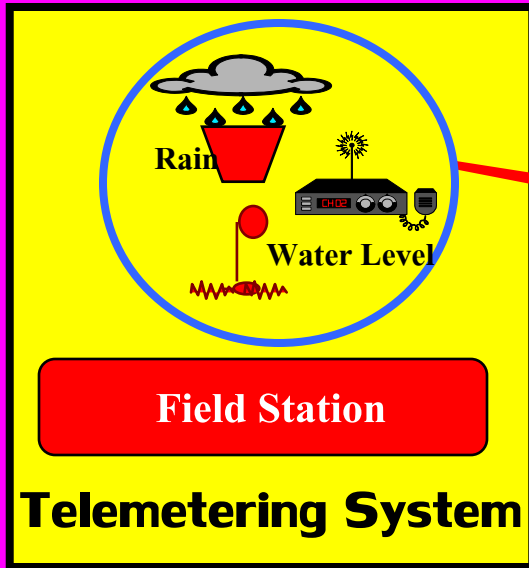
Software

Program	Developer	Purpose
MIKE-11, FLOODWATCH	DHI	Hydrodynamic, Flood Forecast
ISIS, InfoWorks, FloodWorks	Wallingford	Hydrodynamic, Flood Forecast
HEC-RAS, CWMS	US Army Corps	Hydrodynamic, Flood Forecast
SMS	EMRL	Hydrodynamic
HEC-HMS	US Army Corps	Rainfall-Runoff
IQQM	Center of Natural Resource	Water Balance, Reservoir Operation
AVSWAT	Blackland Research	Rainfall-Runoff
ARSP	Acres	Water Balance, Reservoir Operation
HEC-ResSim	US Army Corps	Water Balance, Reservoir Operation
NAM	DHI	Rainfall-Runoff
TANK	Japan	Rainfall-Runoff

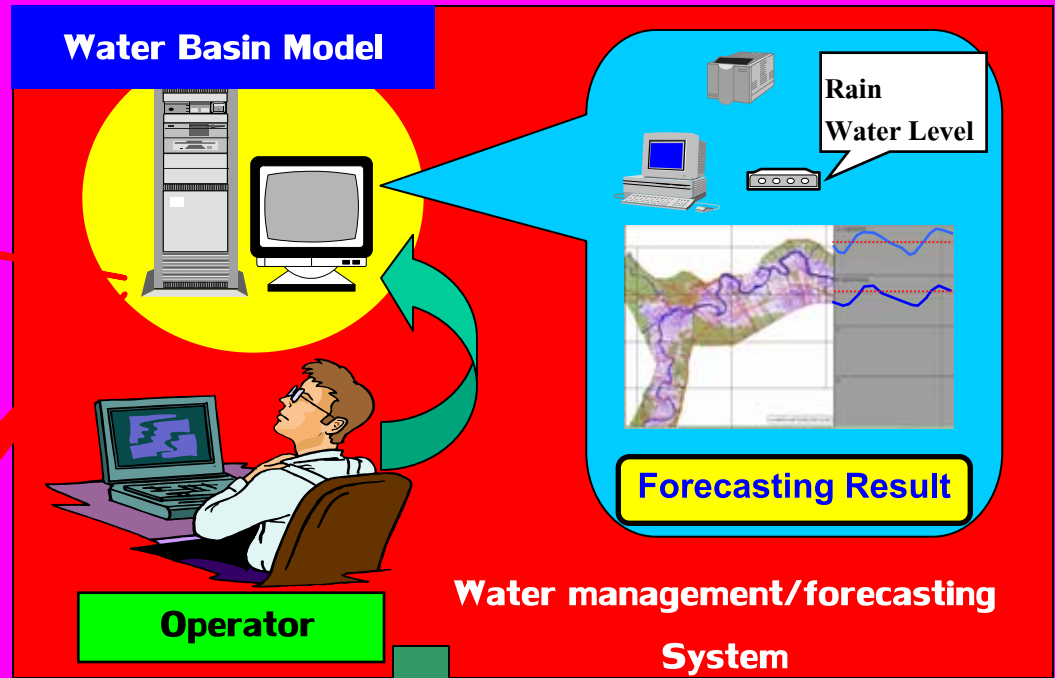
Schematic Layout of the FFWS



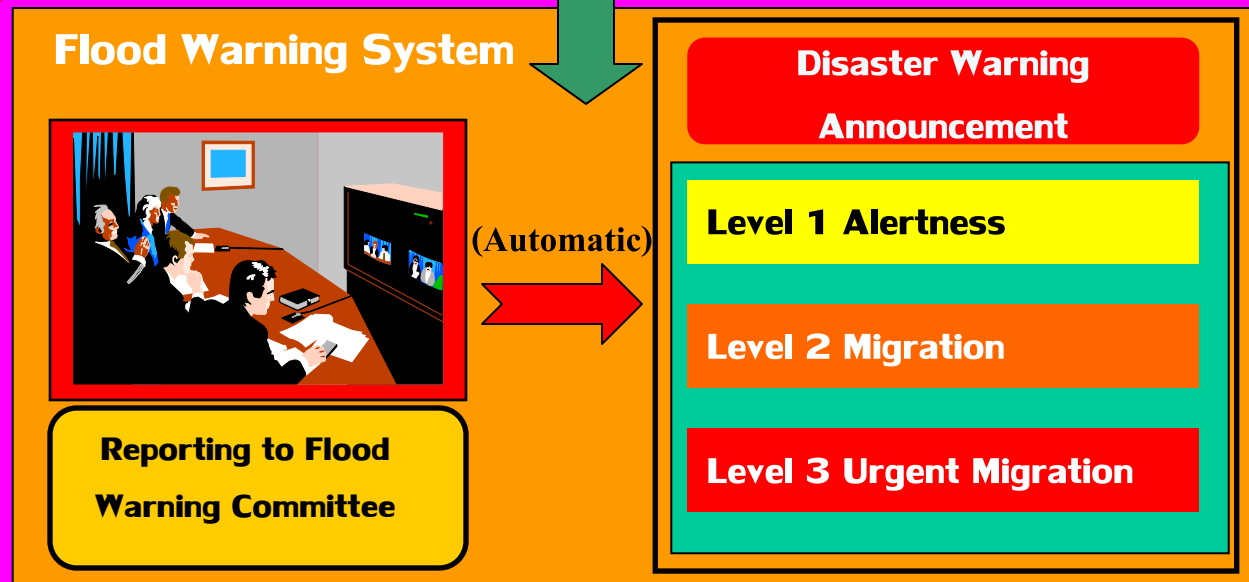
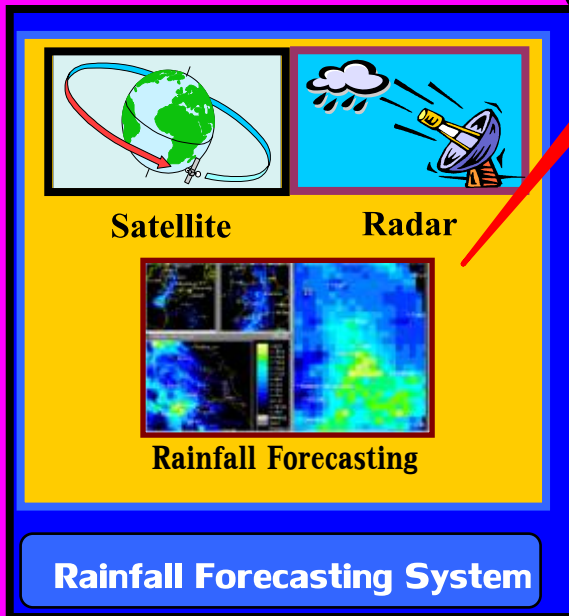
Forecasting/Flood Management/Warning System

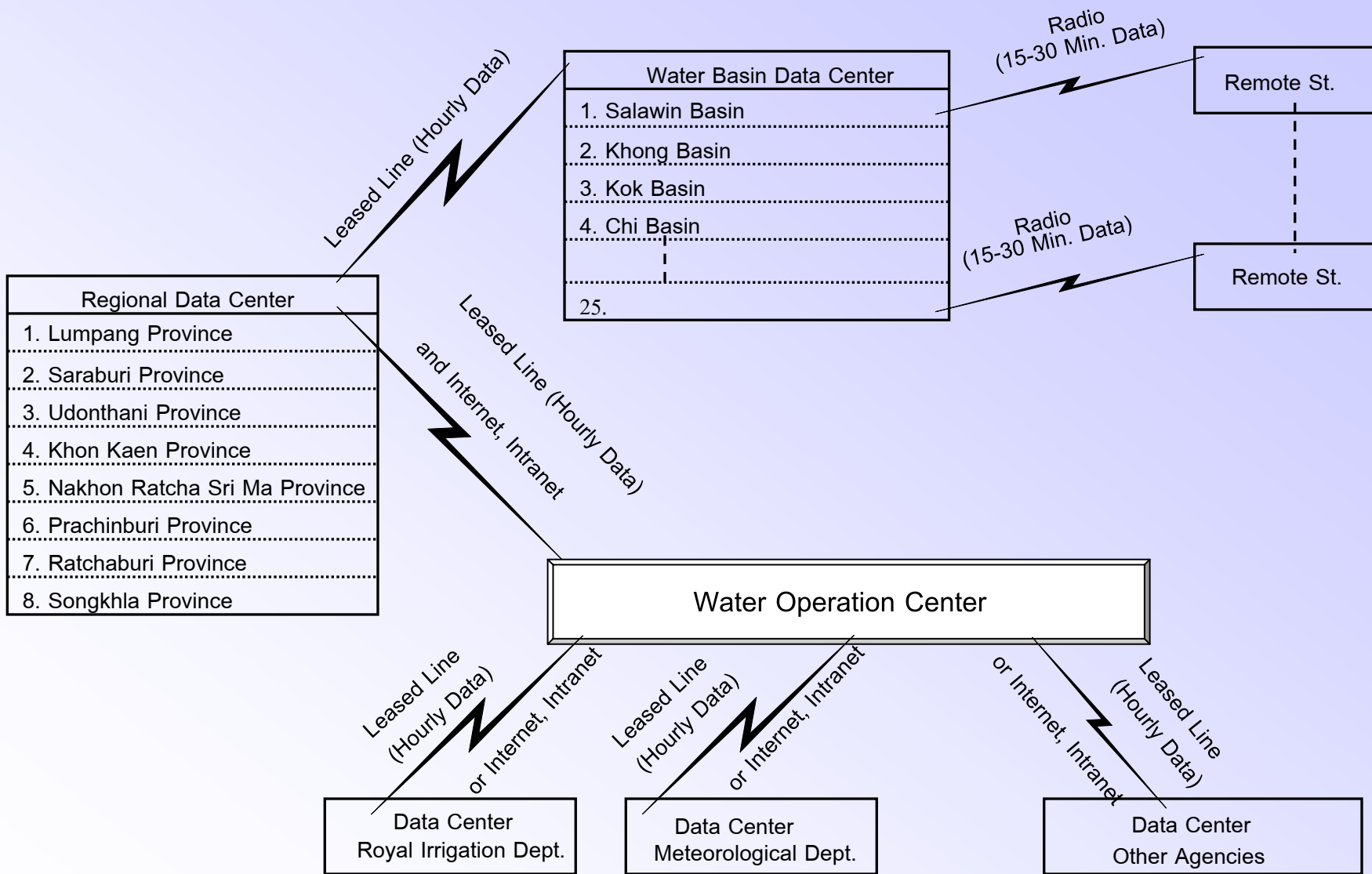


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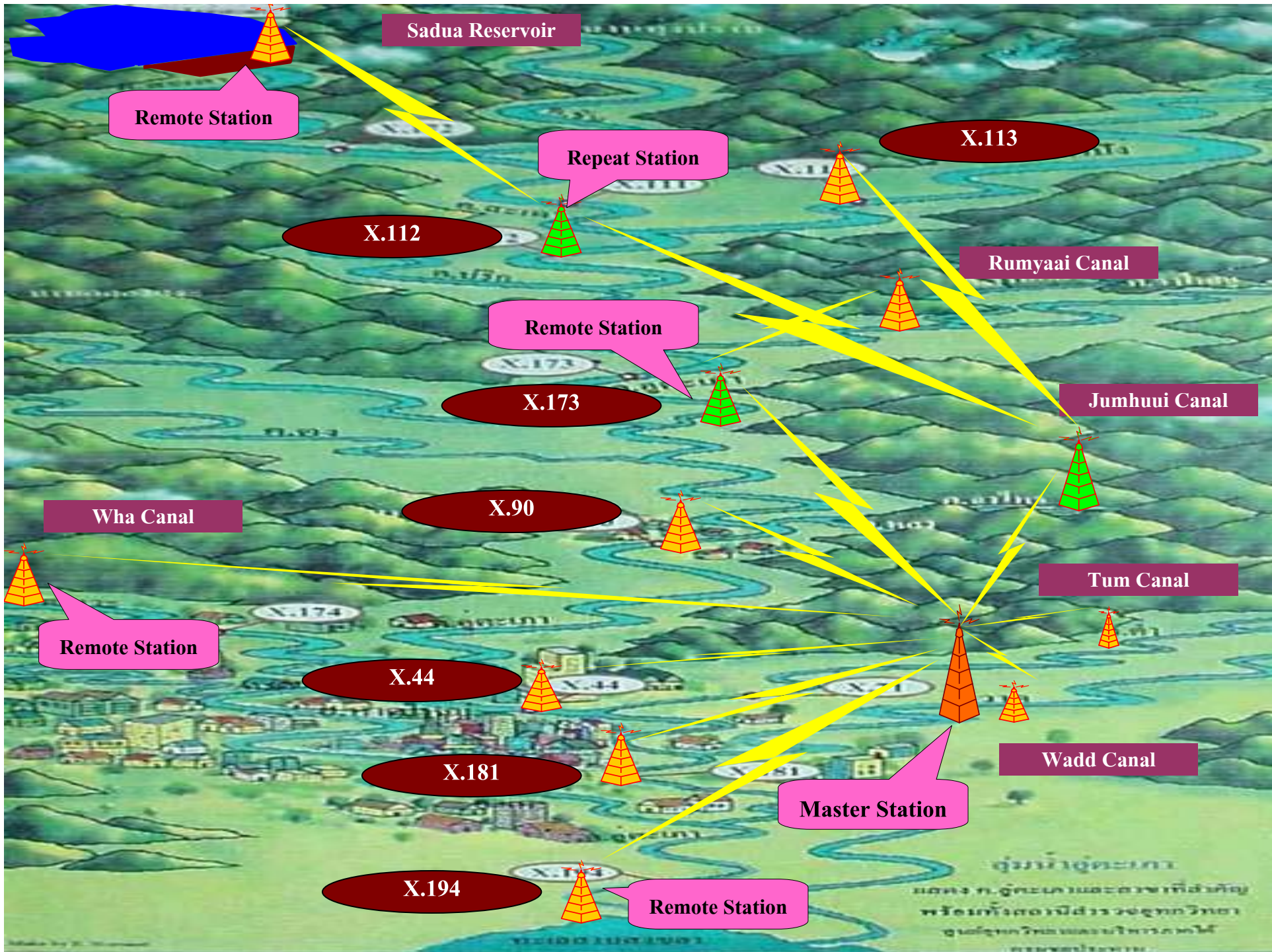


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Telemetering Communication Network



Project	Real- Time Data by Telemetering System	Flood Forecasting by Math.Model	Integrated Data Base and Math. Model, Working as a Network	Integrated Math. Model and GIS for Output Presentation	Rainfall Forecasting by Radar	Warning to the Public via Communication Media
Ubol Ratana Dam (1988)	██████████					
Pak Mun Dam (1995)	████████████████████					
Khao Lam Dam (1995)	██████████					
Pasak Dam (1999)	████████████████████					
Banglang Dam (2002)	██					
Thataphao Basin (2002)	██					
U-Thaphao Basin (2004)	██					
Chantaburi Basin (2004)	██					
Chao Phraya Basin (2004)	██					

Communication of Flood-Warning Information

Communication

- RID has an existing VHF/HF single side band (HF-SSB) and two radio system that is used within the districts.
- EGAT has installed its own microwave communication system from its network of hydropower stations to its central office.
- Satellite system allowed to be used by the government departments is “THAICOM”

Flood-Warning Information

- There are existing flood preparedness plans and mitigation measures in the basin.
- RID or EGAT's regional office send the flooding information to the provincial officer who has responsibility in performing flood preparedness plan via telephone or radio.
- The local emergency teams make preparations to carry out works in areas of likely to be inundated by flooding.
- The organization of the teams and their duties are clearly indicated.

Other Relevant Information

Network System of the Thailand Integrated Water Resources Management (TIWRM)

