

Thailand Country Paper for the 4th Annual Mekong Flood Forum

Flood Forecasting and Warning Systems in Thailand

Prepared/Presented by

Thai National Mekong Committee

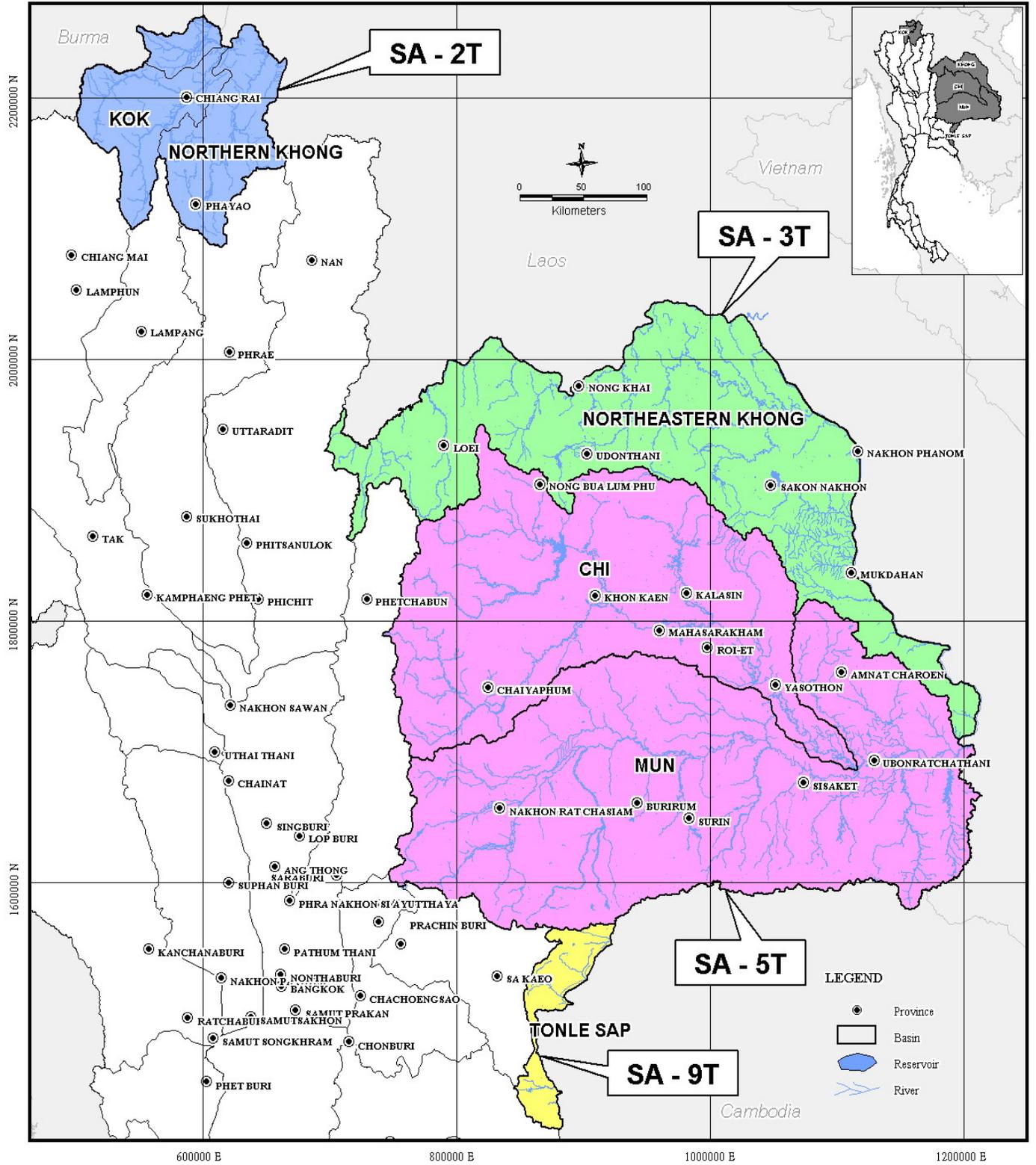
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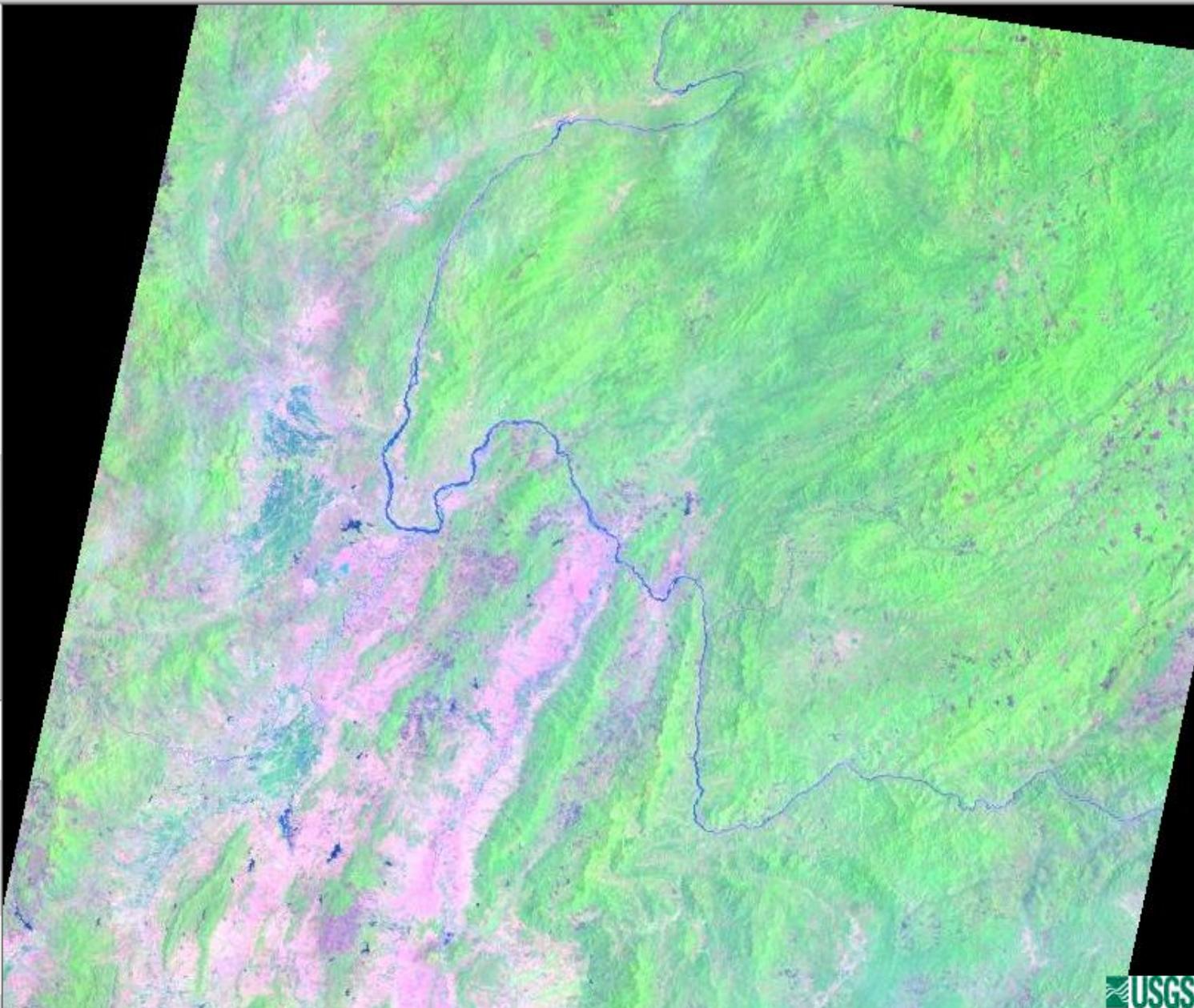
Dr. Janejira Tospornsampan

Contents of TNMC's 2005 Flood Paper

- General Information (physical & hydrological conditions, types & impacts of floods) of Sub-basin of the Mekong in Thailand
- 2005 Floods
- Lessons Learned
- Status of National Forecasting & Warning Centers
- Conclusion & Recommendations

Mekong River Sub-basin in Thailand





WRS-2 Path /Row: 130 46 Go

Lat/Long: 20.2 100.5 Go

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 Cloud Cover: 0% Qlty: 9
 Date: 2003/4/8

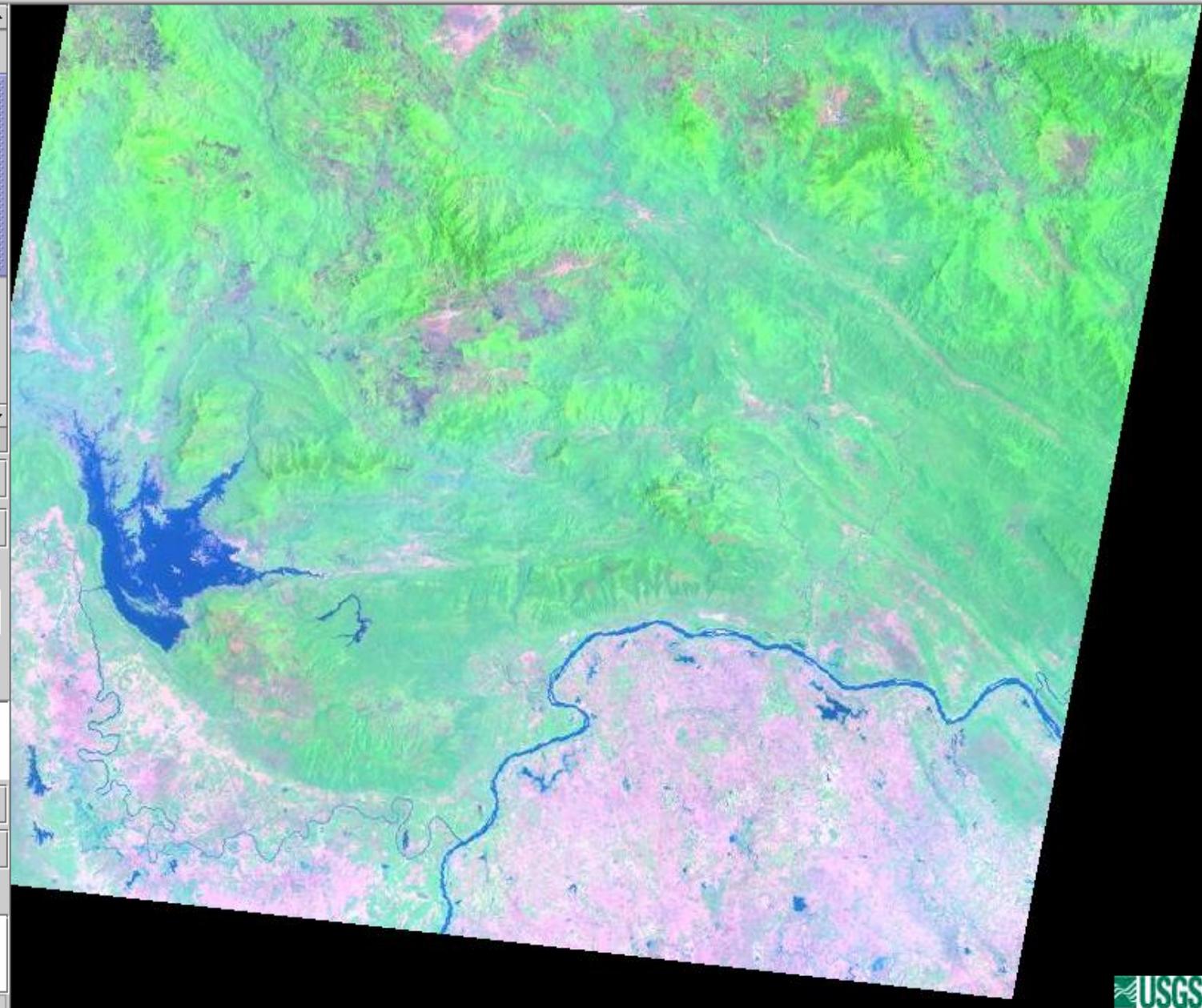
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Prev Scene Next Scene

Landsat 7 ETM+ Scene List

Add Delete Order

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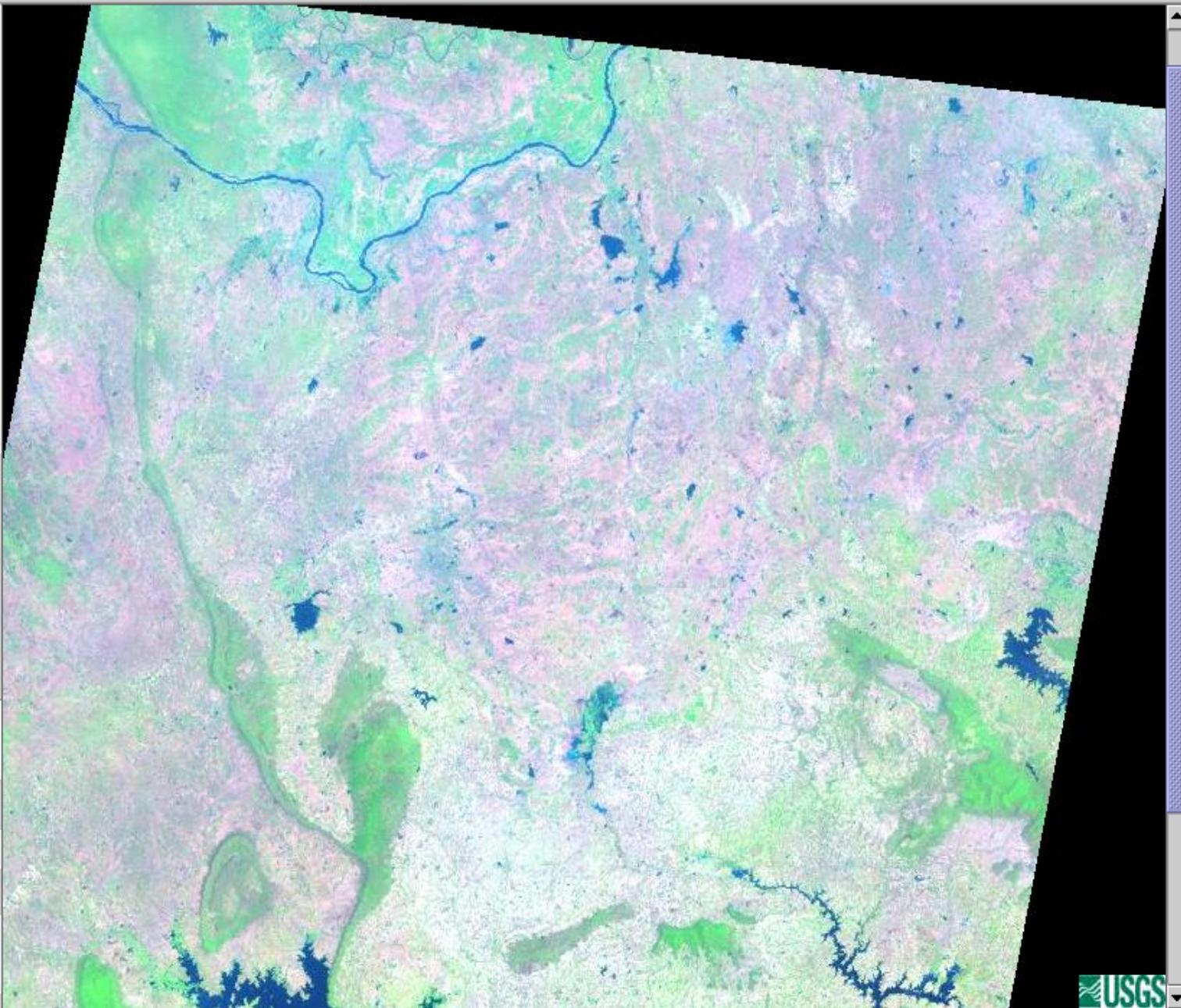
Scene Information:

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 Cloud Cover: 0% Qlty: 9
 Date: 2002/4/7

Apr 2002

Landsat 7 ETM+ Scene List

Scene ID	Date	Cloud Cover	Qlty



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Max Cloud: 100% [Navigation arrows]

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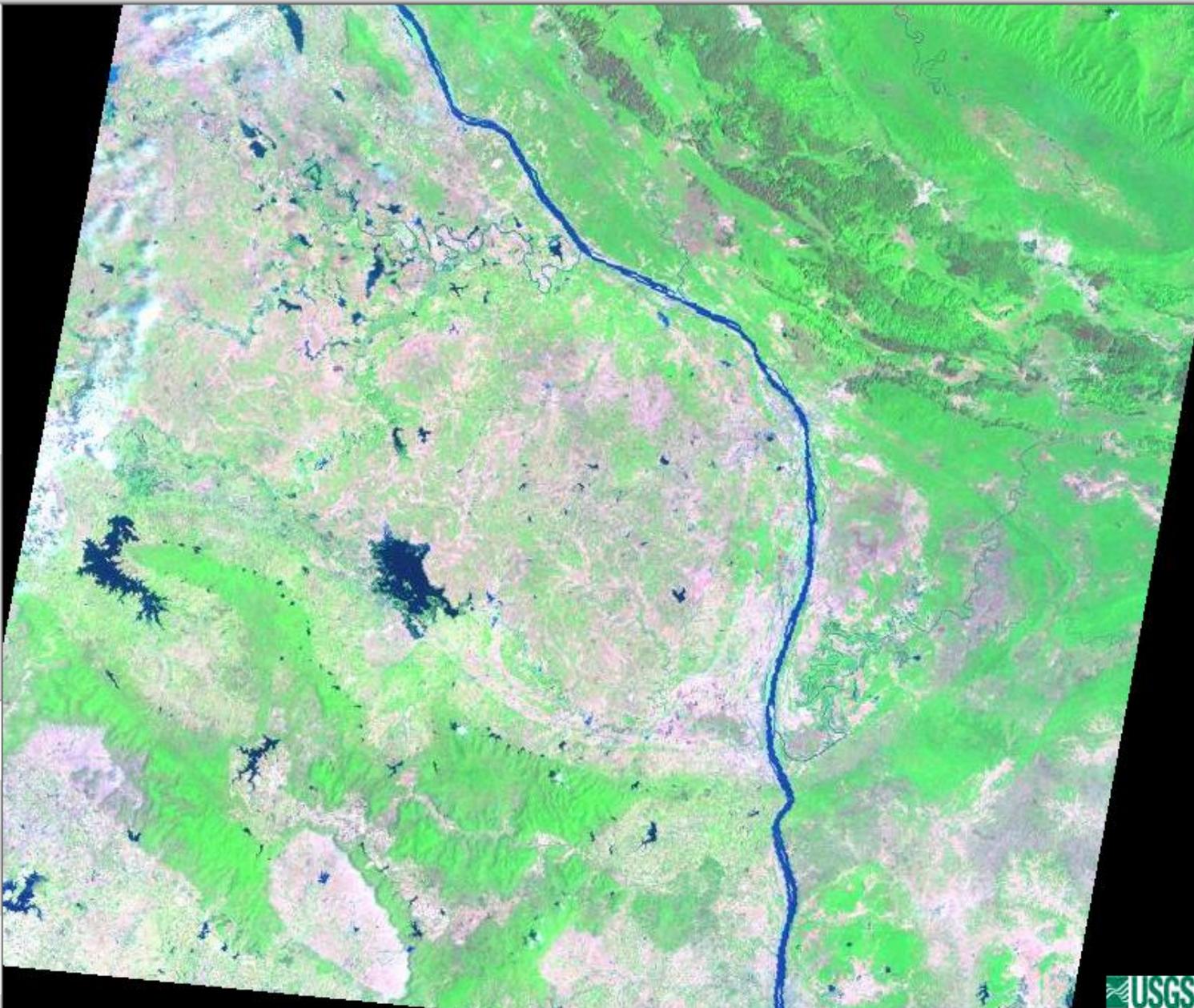
Apr 2002 Go

Prev Scene Next Scene

Landsat 7 ETM+ Scene List

Table with 3 columns: Add, Delete, Order

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Cloud Cover: 0% Qlty: 9
Date: 2003/3/18

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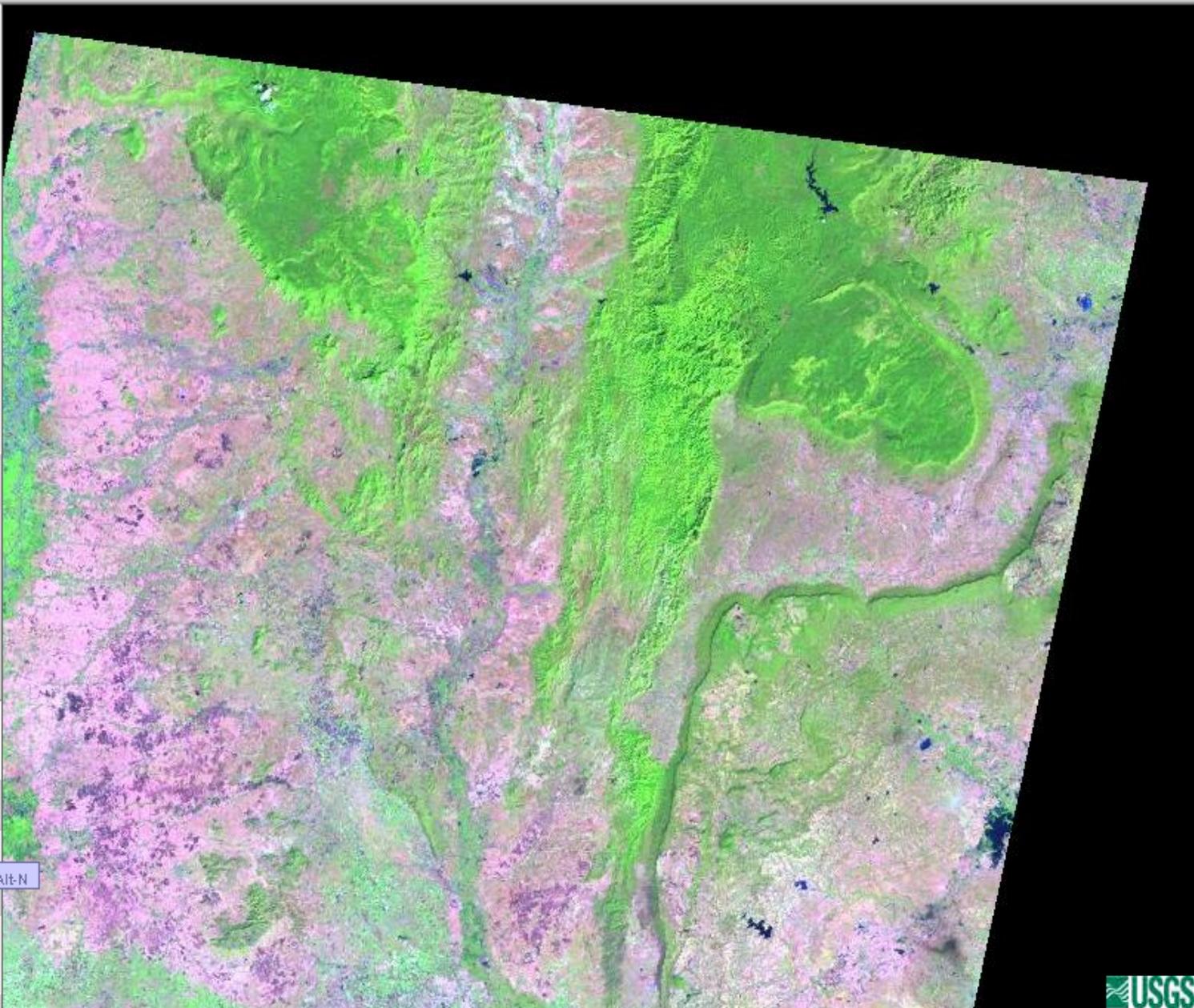
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Lat/Long: 15.9 101.1 Go

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Date: 2003/1/11

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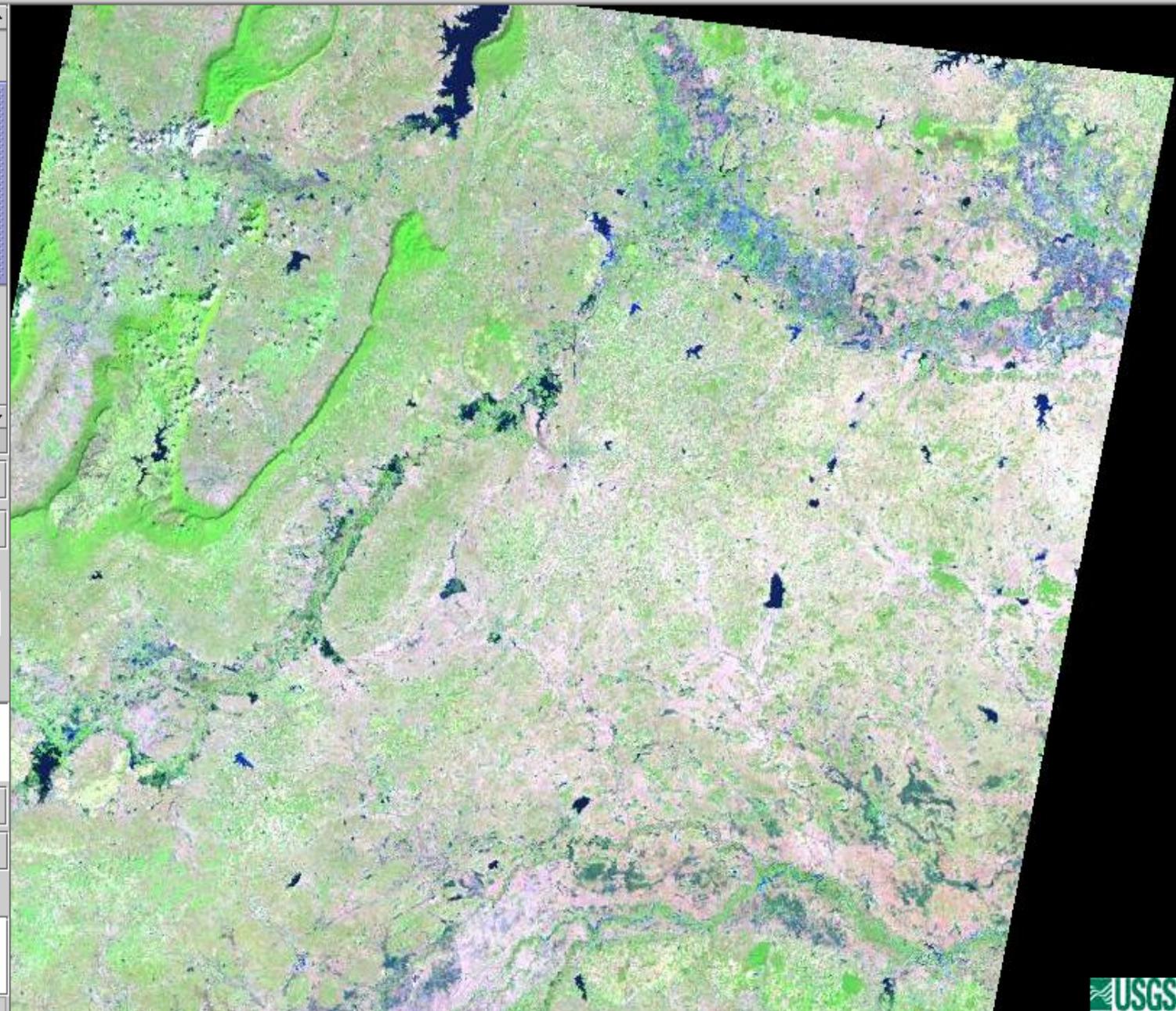
Landsat 7 ETM+ Scene List

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Max Cloud: 100% [Navigation arrows]

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Cloud Cover: 0% Qty: 9
Date: 2003/1/4

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Prev Scene Next Scene

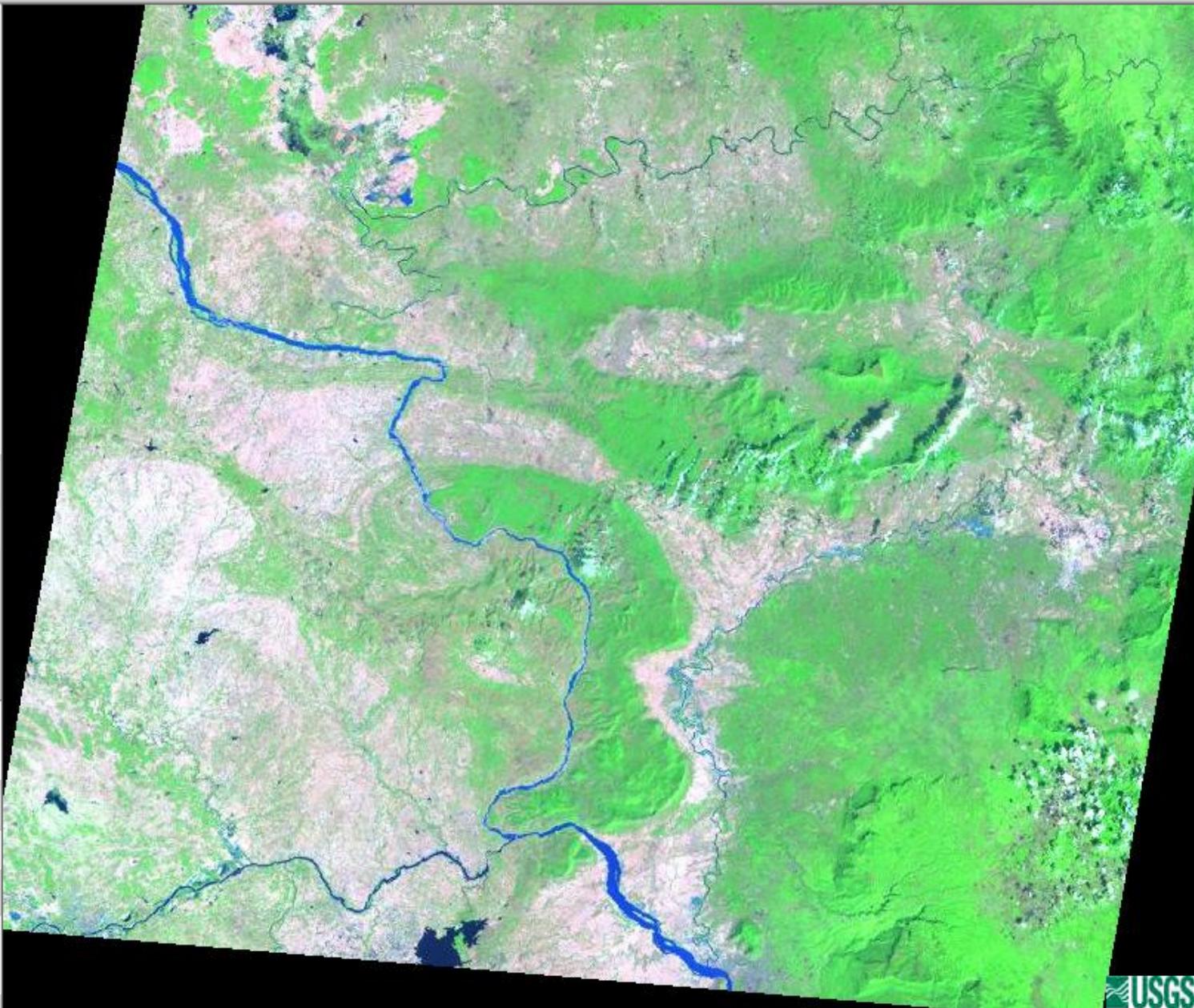
Landsat 7 ETM+ Scene List

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Cloud Cover: 0% Qlty: 9
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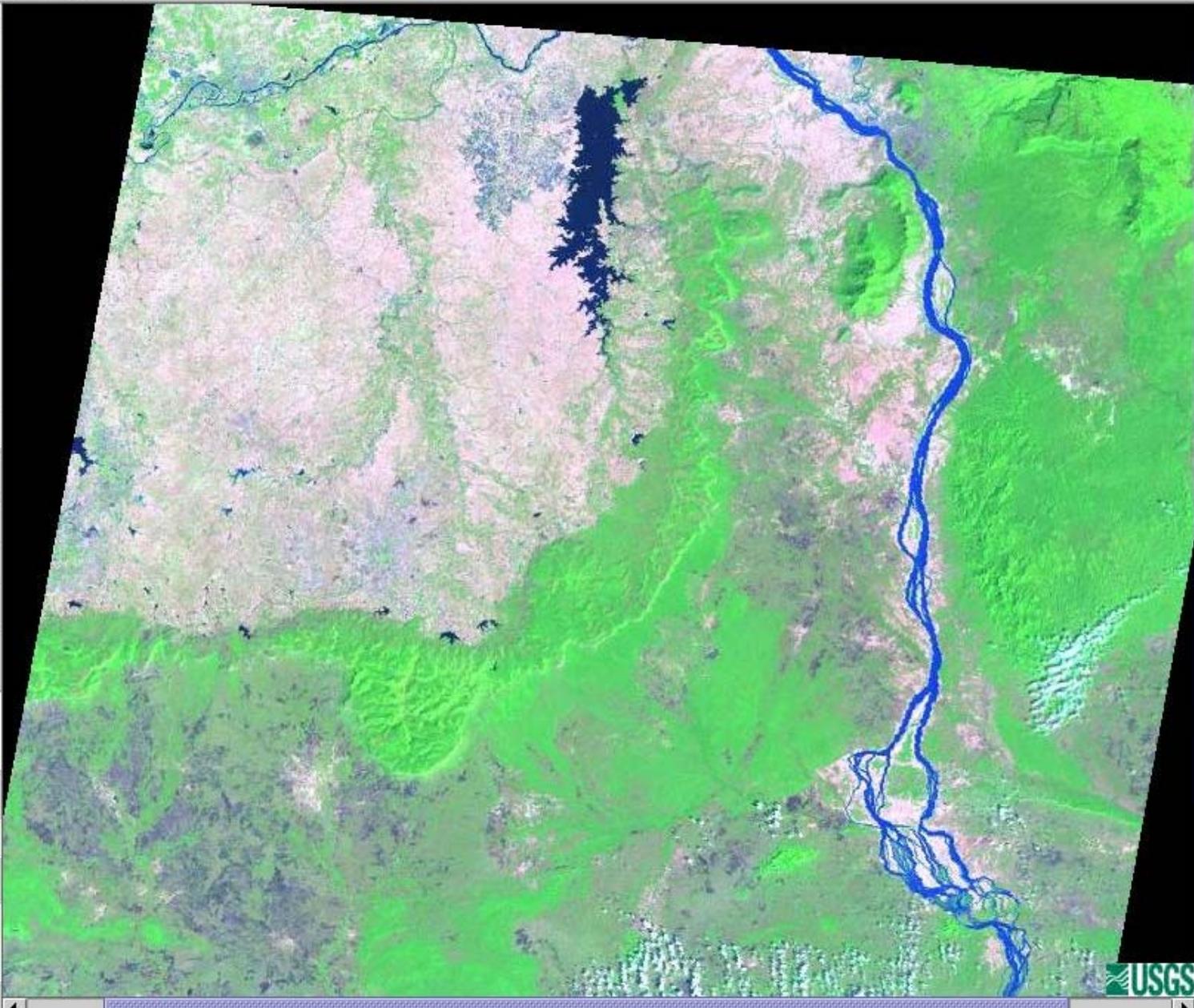
Prev Scene Next Scene

Landsat 7 ETM+ Scene List

ID	Date	Cloud Cover	Qlty

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Landsat 7 ETM+ 240m No Limits Set Lat/Long: 15.760583, 105.095206 degrees Loading Images



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Lat/Long: 14.5 105.4 Go

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Scene Information:
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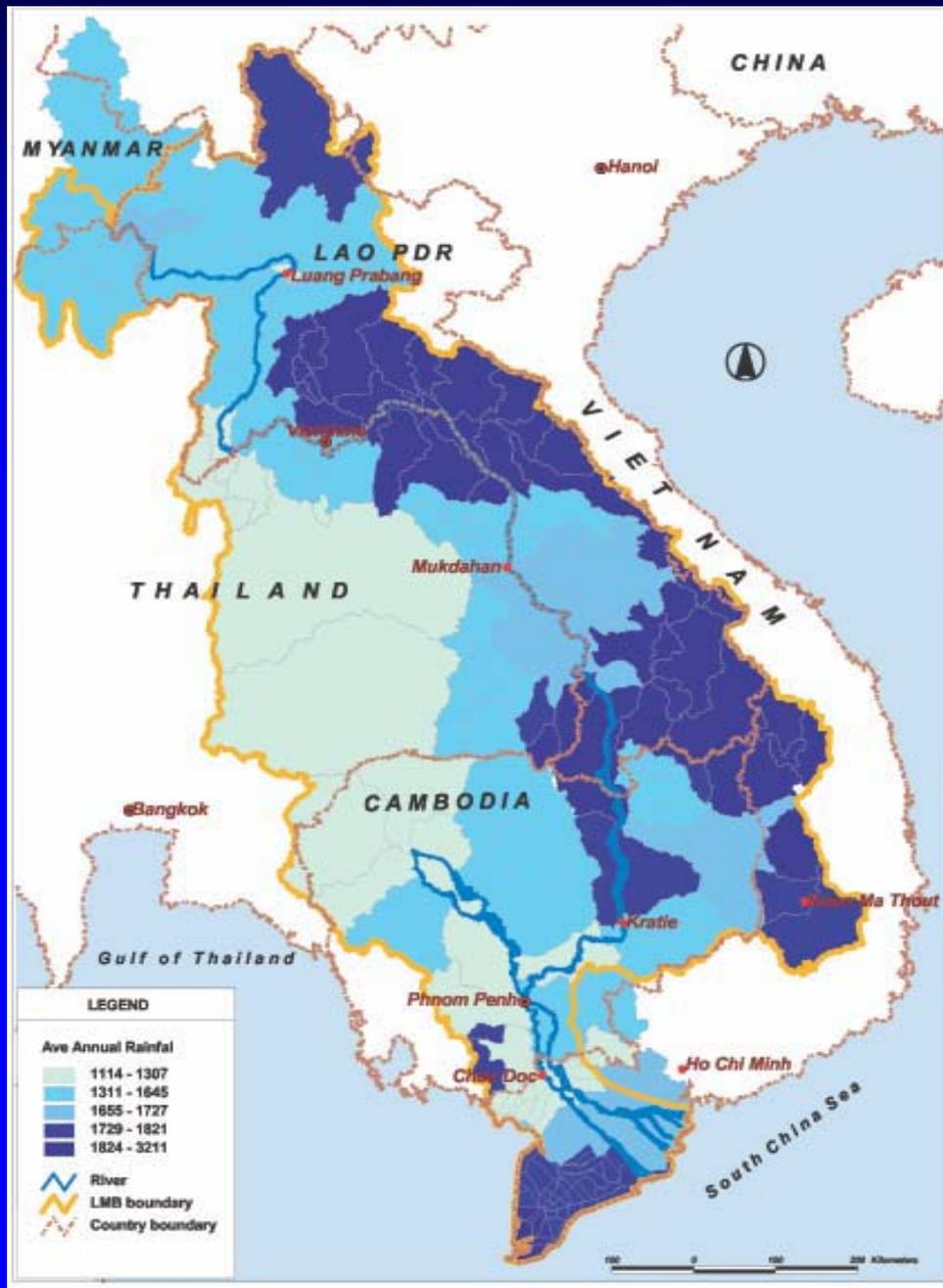
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Landsat 7 ETM+ Scene List

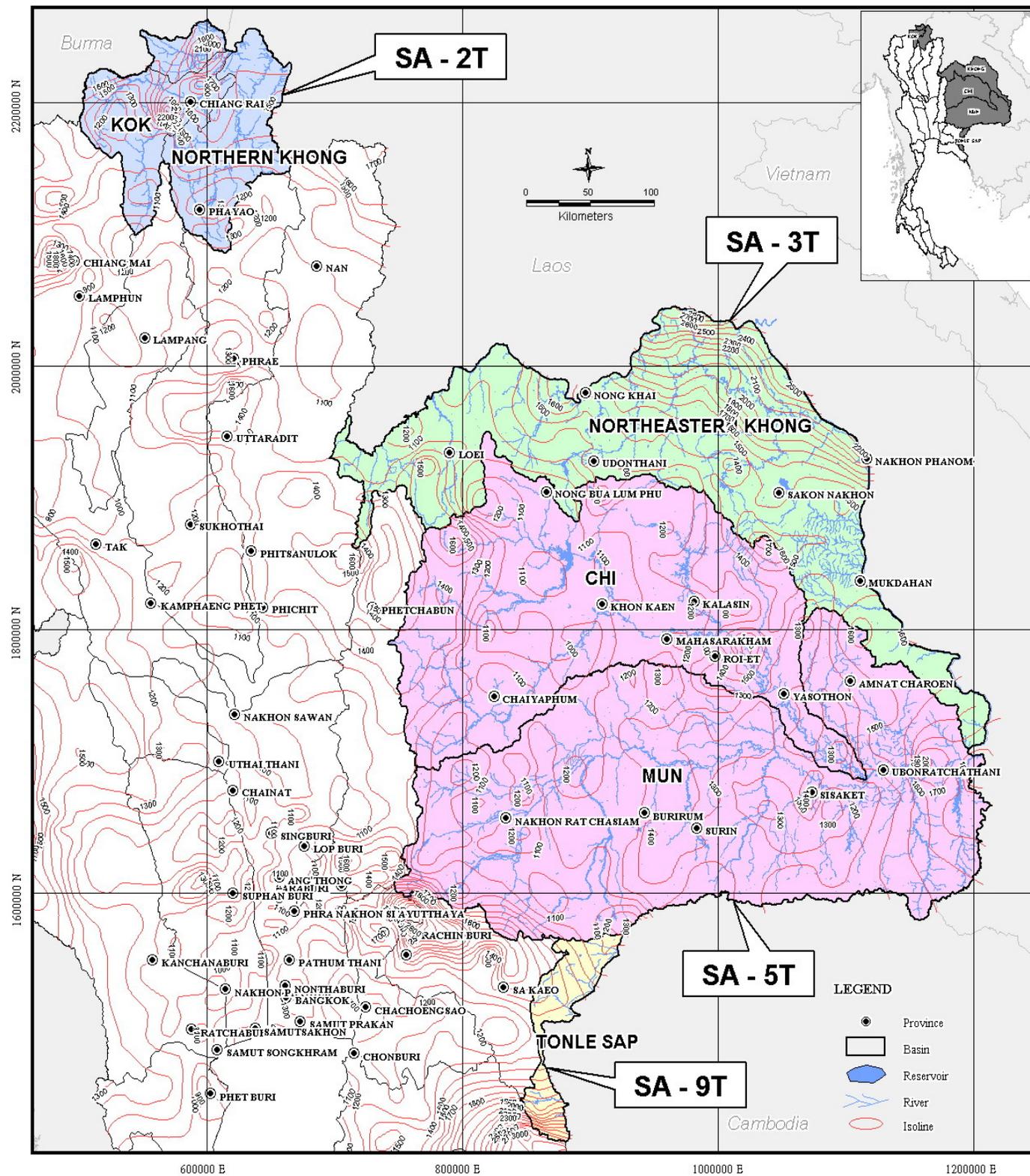
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Average Annual Rainfall in SA of Lower Mekong Basin

Source: Overview of Mekong Hydrology, November 2004



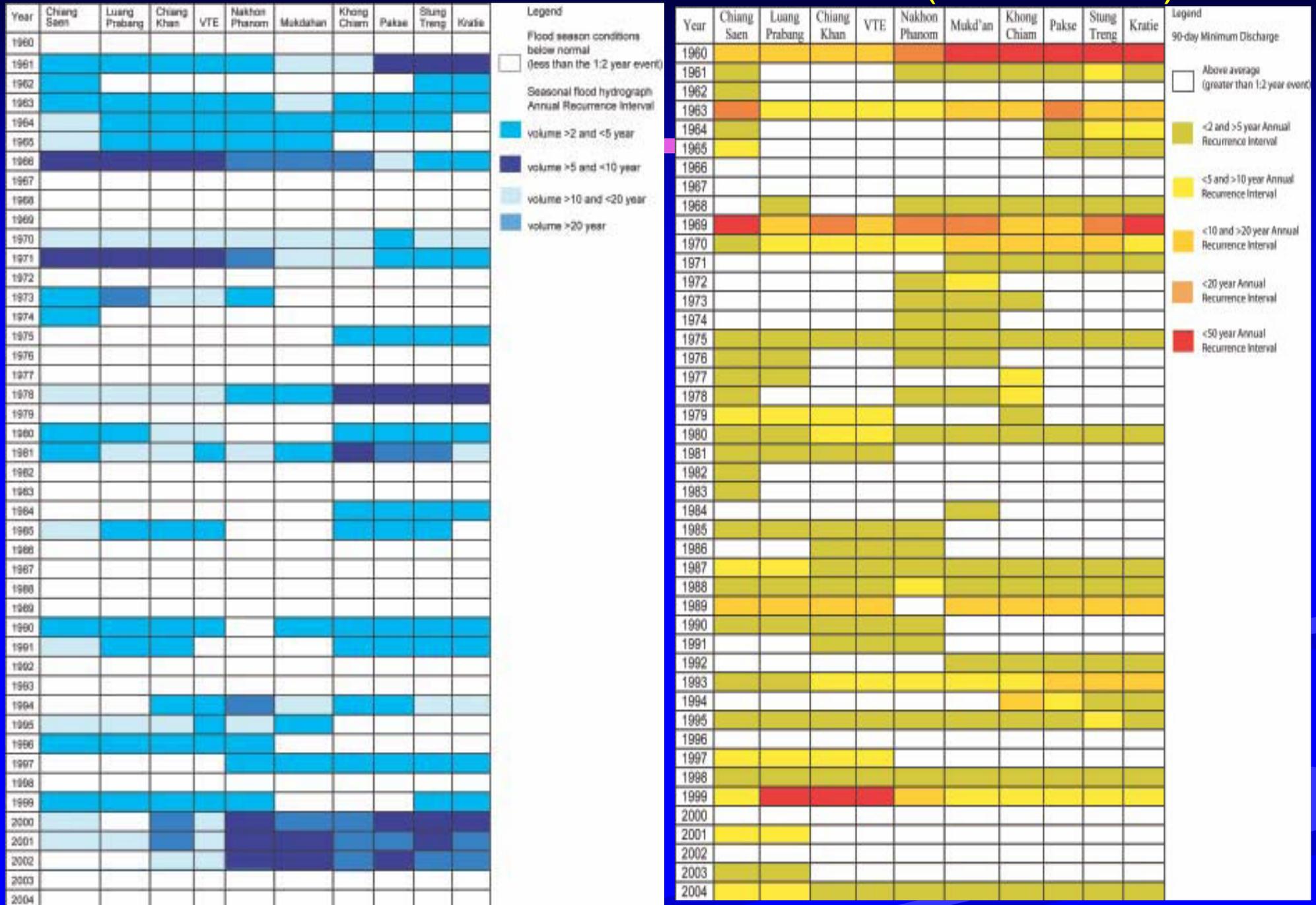
Isohytal (Rainfall) Map & Average Monthly Rainfall Distribution

Floods in the Sub-basin of Mekong river

Three kinds of flood occur in the sub-basin

- Flash flood: result of heavy or excessive rainfall
- Inundation flood: caused by high water level in the Mekong mainstream/backwater effect
- Combined flood: combination of the above

Distribution of Floods & Low Flows in LMB (1960-2004)



Source: Overview of Mekong Hydrology, November 2004

Positive & Negative Effects from Floods

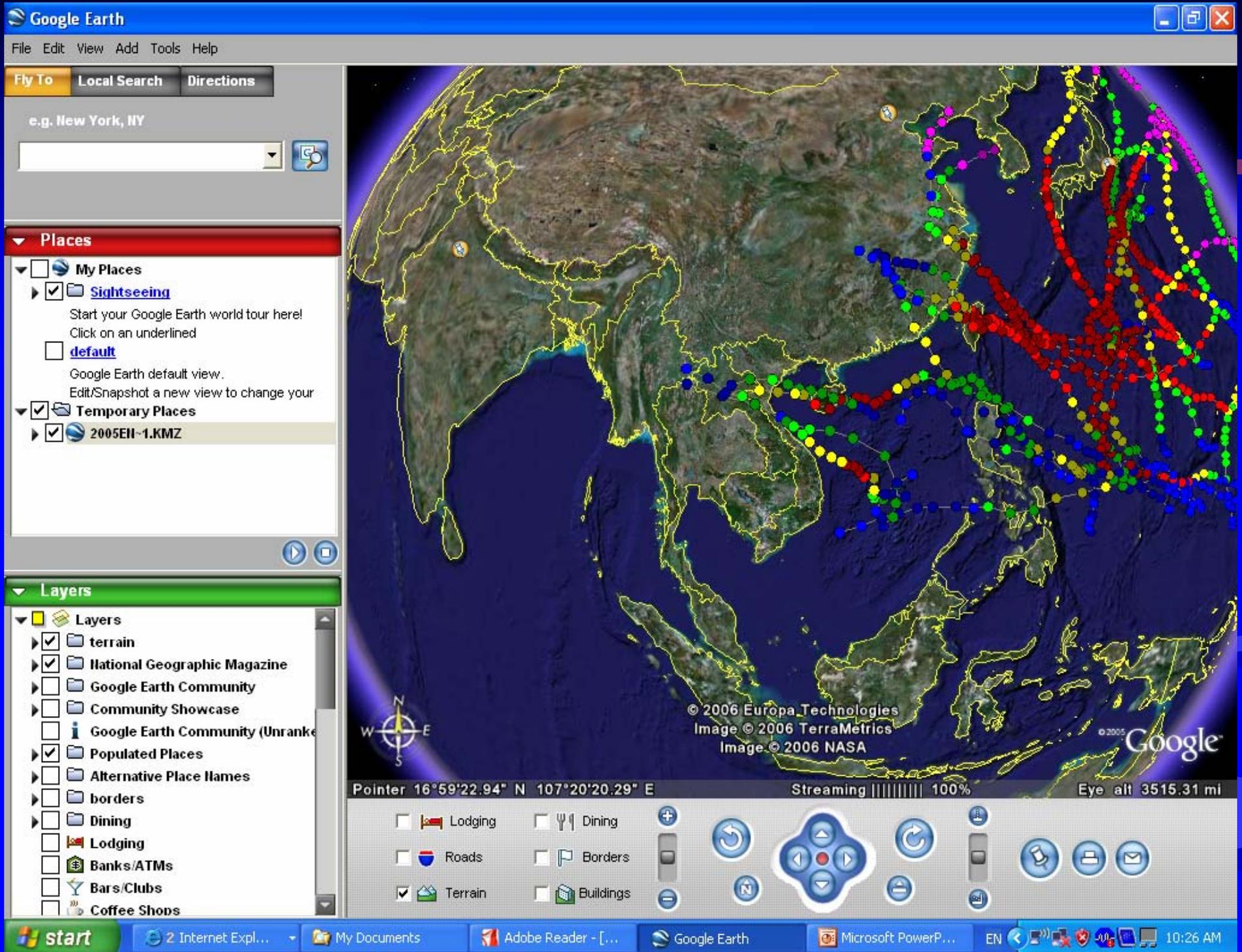
- The recurrent flood has become an essential element in the life of the people
- Low to medium flood is beneficial to living conditions in the region
- Floods of higher magnitude caused devastating impact/damage to development efforts of the country

Positive & Negative Effects from Floods

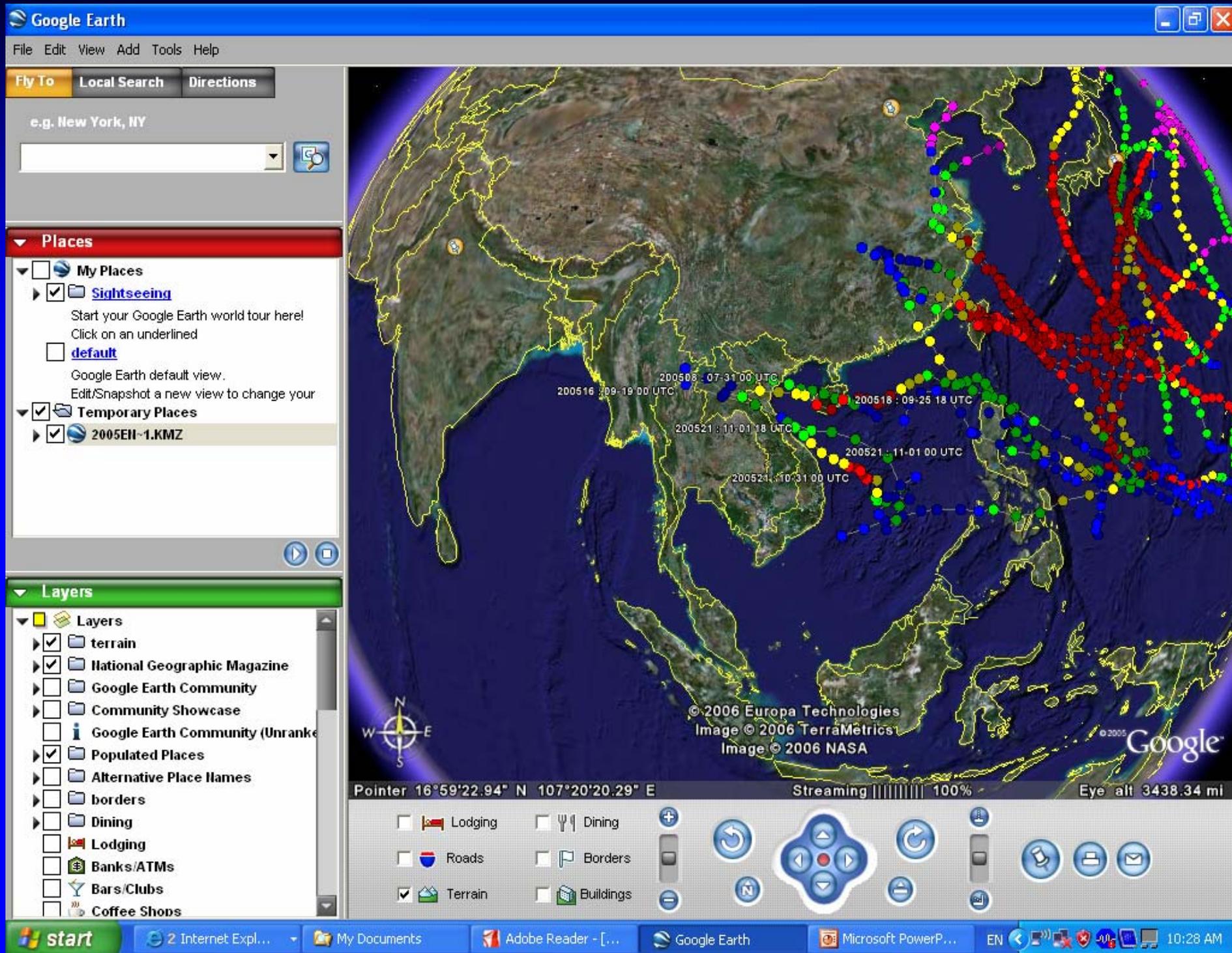
- People who suffered from flood obtain different aids/assistances from various agencies
- Agricultural productions are compensated in cash or crop substitutions

The 2005 Floods

- Not much distinguishable from floods in recent years
- Floods in the Northeast were less severe
- Large flood was not reported in the 3T, 5T & 9T
- In 2T large floods were reported due to heavy rainfall
- In downstream sections that close to the confluence of the Mekong river, especially in 3T, the areas were suffered from inundation problems caused by inundation/backwater effect from the Mekong
- In summary, six remarkable flood events occurred, caused by 2 tropical storms, 3 depressions and 1 typhoon

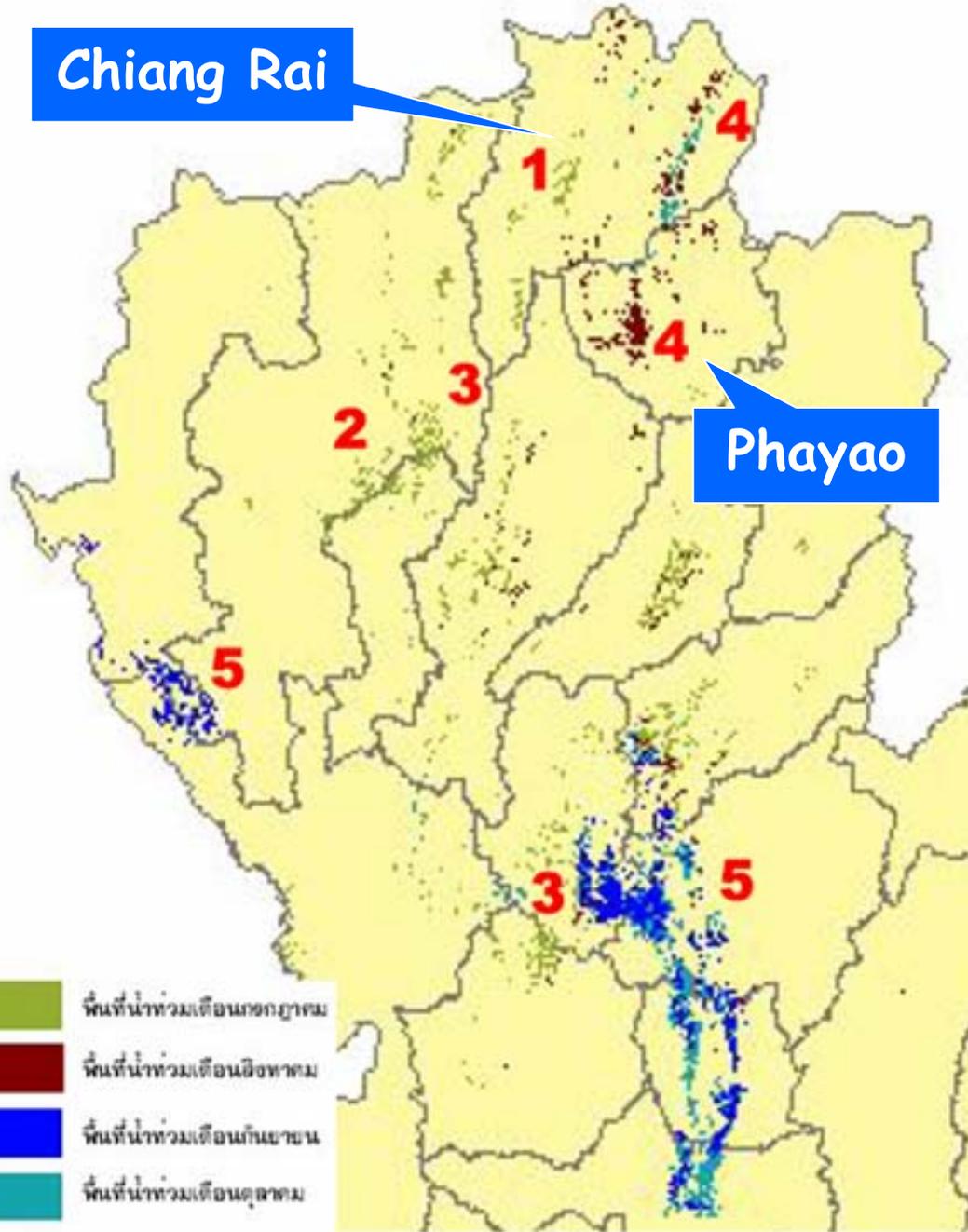


Typhoon Tracks of 2005



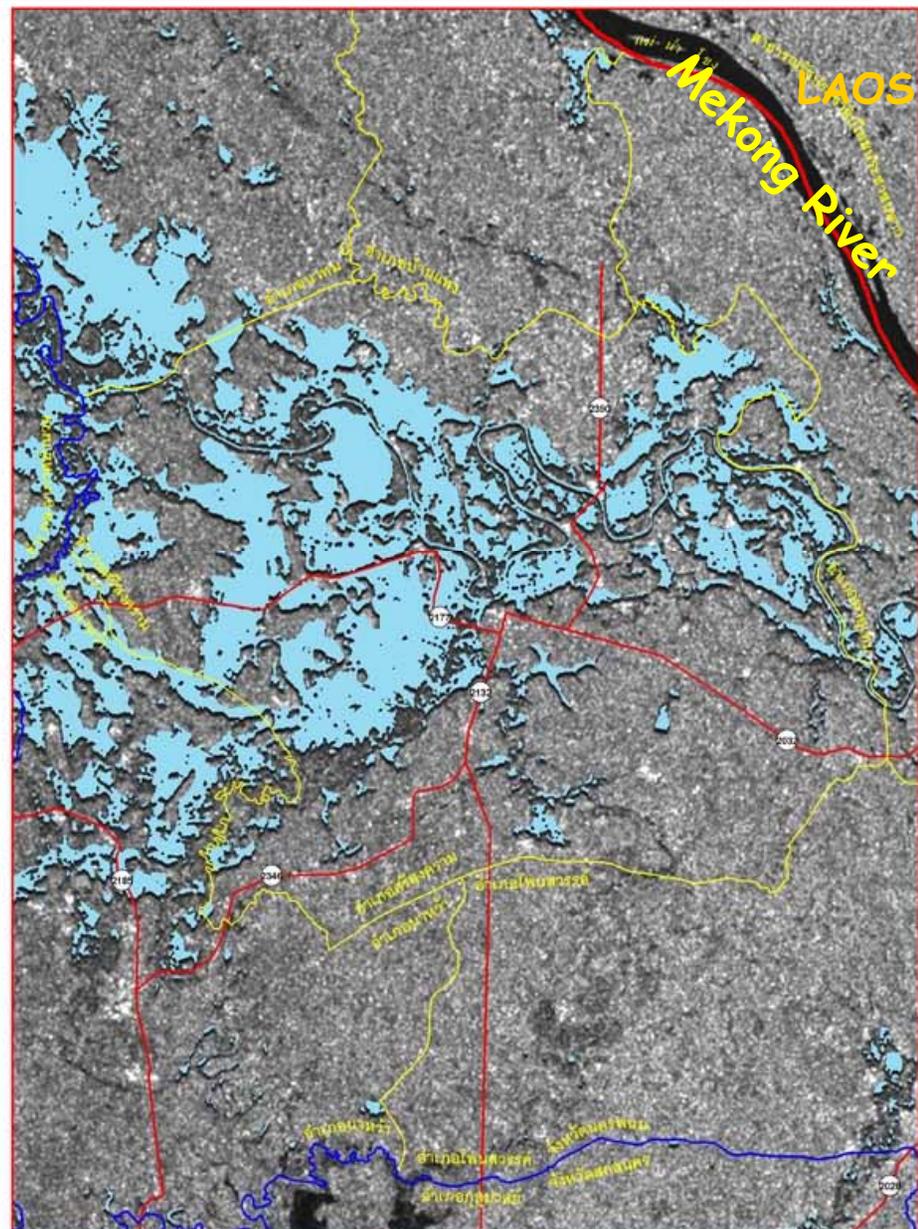
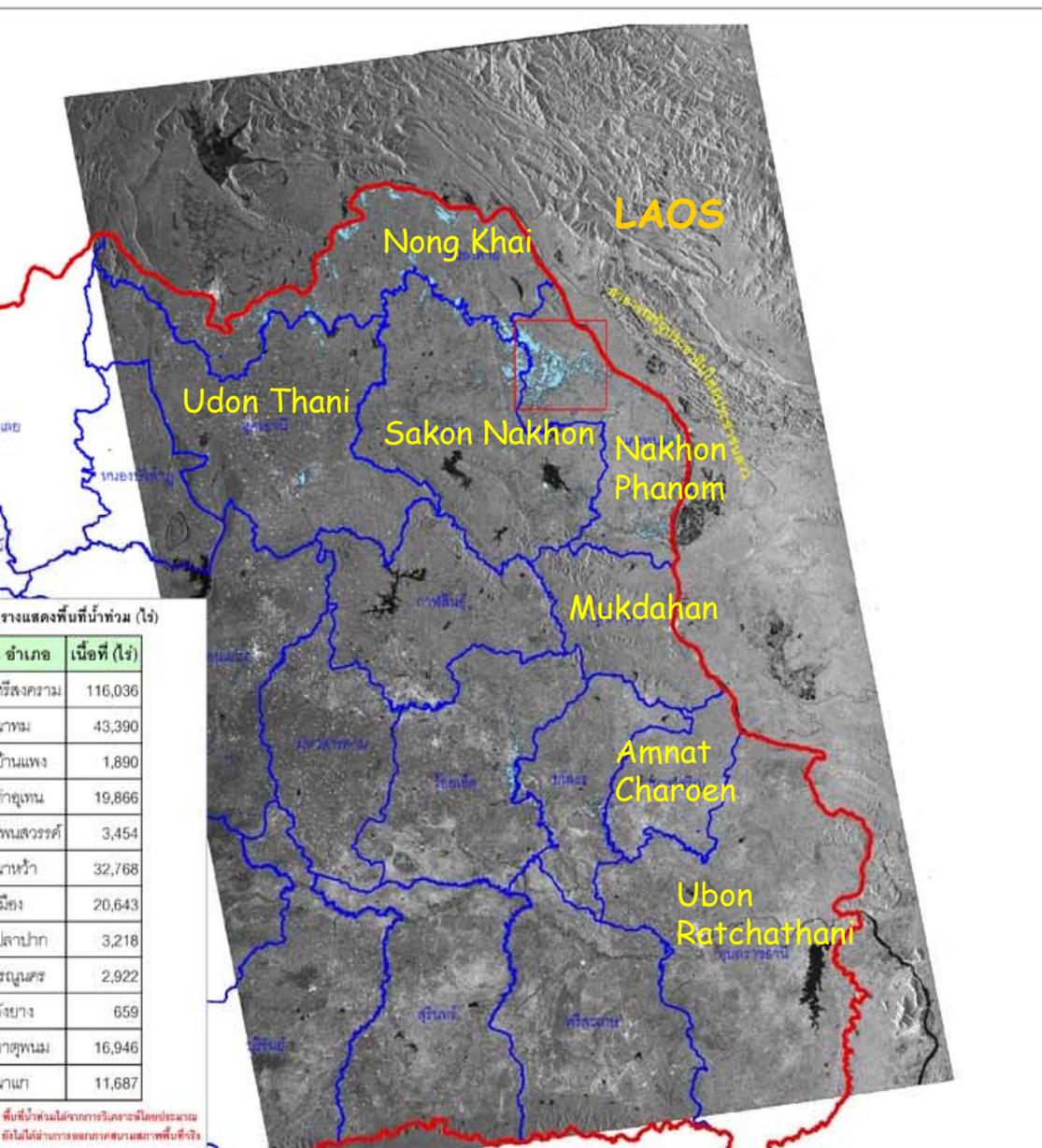
Typhoon Tracks of 2005

Floods in SA-2T



1	เชียงใหม่	21-24 กค. 2548	ระดับน้ำท่วมเมืองเชียงใหม่ 0.3 ม.
2	เชียงใหม่ , เชียงใหม่	31 กค. 2548	เนื่องจากพายุหิม ระดับน้ำท่วมเมืองเชียงใหม่
3	เชียงใหม่ , สุโขทัย	13 - 18 สค. 2548	น้ำท่วมใหญ่ อ. เมือง เชียงใหม่ และล้นตลิ่ง ที่ สุโขทัย
4	เชียงใหม่ , แพร่	29 สค. 2548	ฝายแตก ที่ ลำปางเก่า เชียงใหม่ และระดับน้ำท่วมเมืองแพร่ 0.5 ม.
5	เชียงใหม่ ลำปาง สุโขทัย	10 - 13 กย. 2548	น้ำท่วมใหญ่ อ. เมือง เชียงใหม่ ลำปาง

Inundation in Nakhon Phanom (SA-3T) on 23 August 2005



■ พื้นที่น้ำท่วม
— แนวแบ่งเขตระหว่างประเทศ
— ทางหลวงแผ่นดินสายย่อย

ข้อมูลภาพถ่ายจากดาวเทียม RADARSAT-1

แสดงพื้นที่น้ำท่วมบริเวณจังหวัดนครพนม (สีฟ้า)

วันที่ 23 สิงหาคม 2548

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ภาพถ่ายแสดงพื้นที่น้ำท่วม

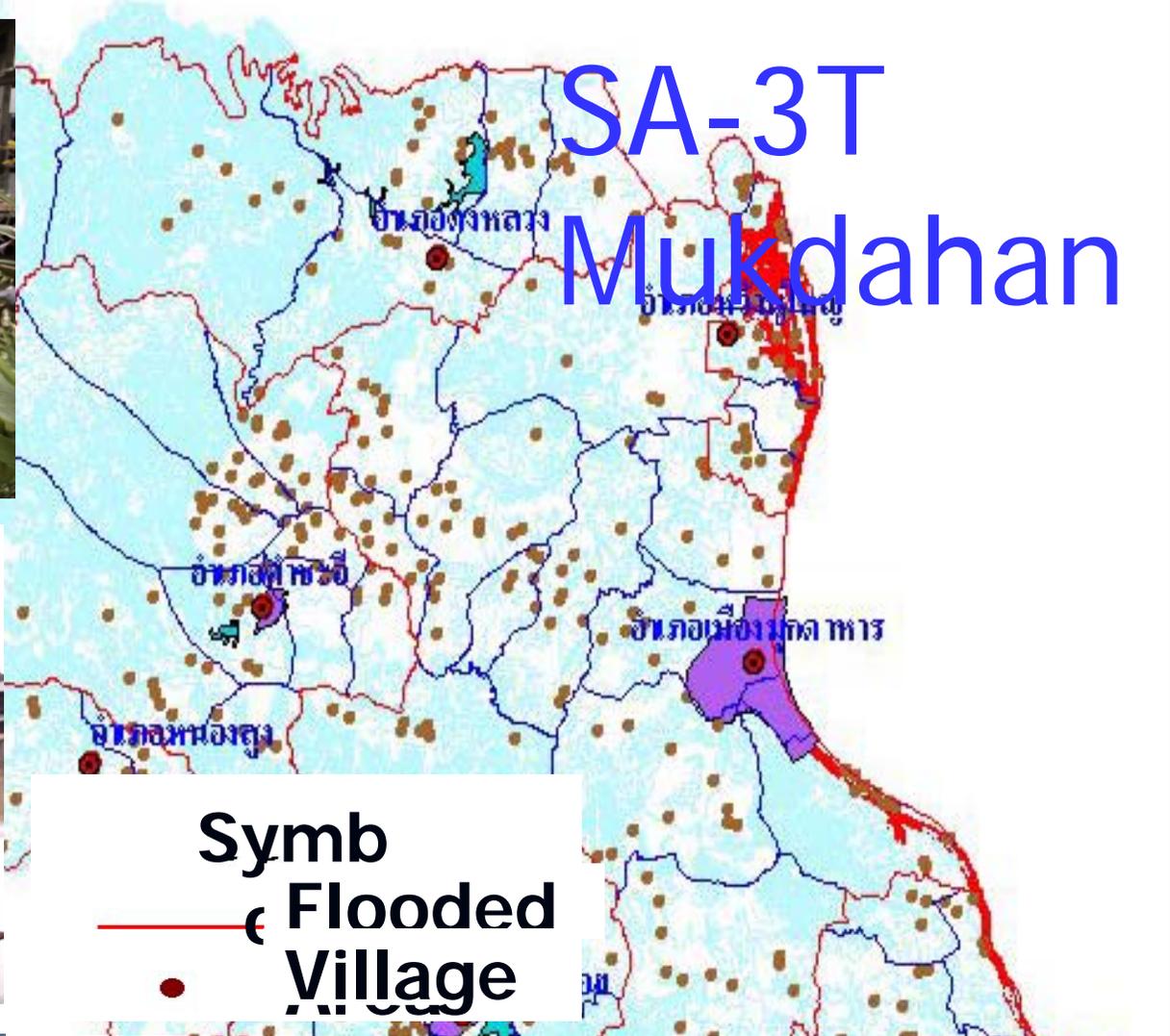
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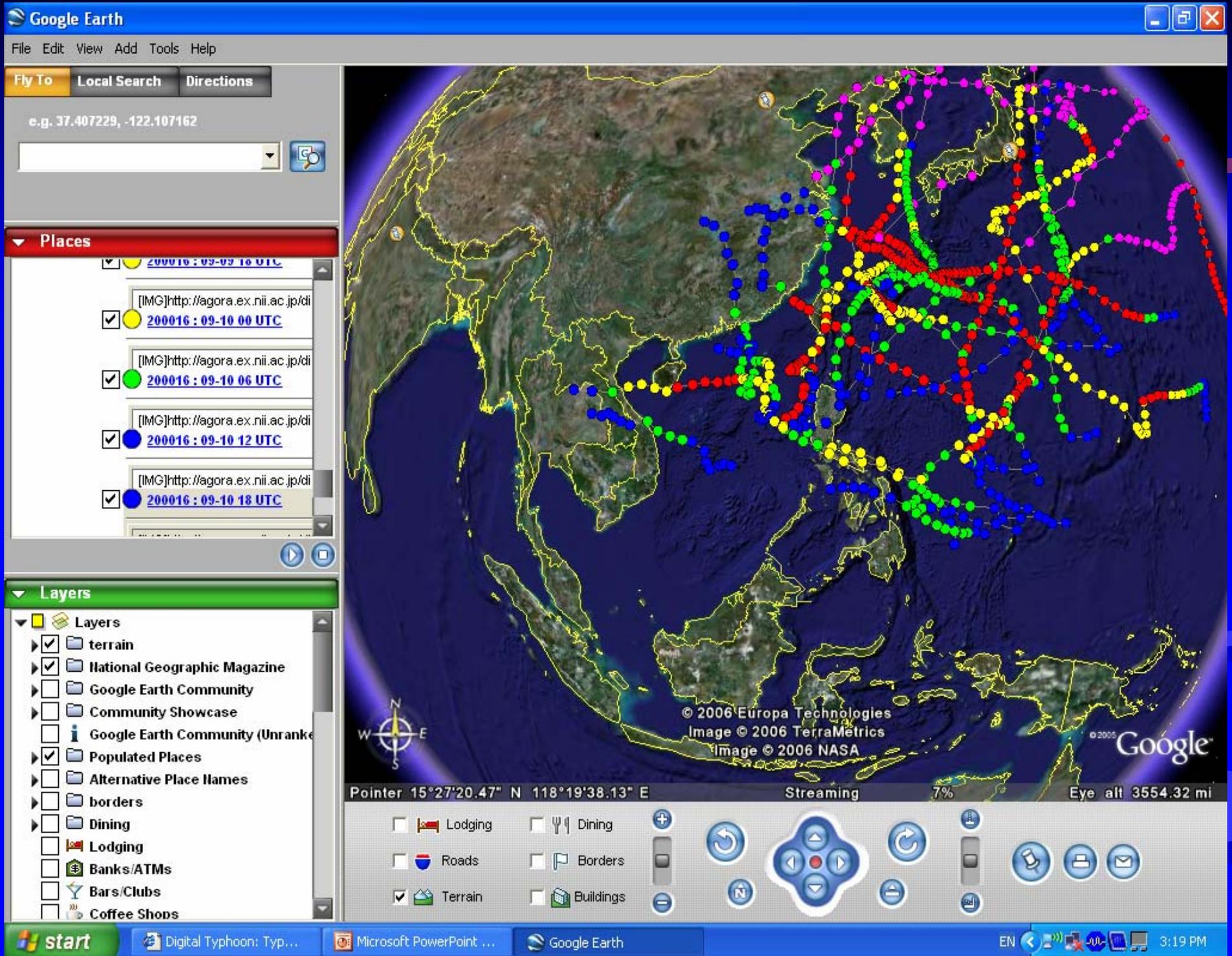
บริเวณอำเภอศรีสงคราม จังหวัดนครพนม

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SA-3T Mukdahan





Typhoon Tracks of 2000



Typhoon Tracks of 2001

Lessons Learned

- The recurrent flooded areas in flood plains or wetlands are acceptable by local communities
- People are still growing rice in these areas perceiving that some or all areas may be lost by the annual flood
- People are willing to face the risk since they have no other choices to manage their lands
- Regulators at the confluence of some tributaries are requested to be constructed
- Embankment protection/dike are strongly requested by the people living along the Mekong river

Current Status of National Centers

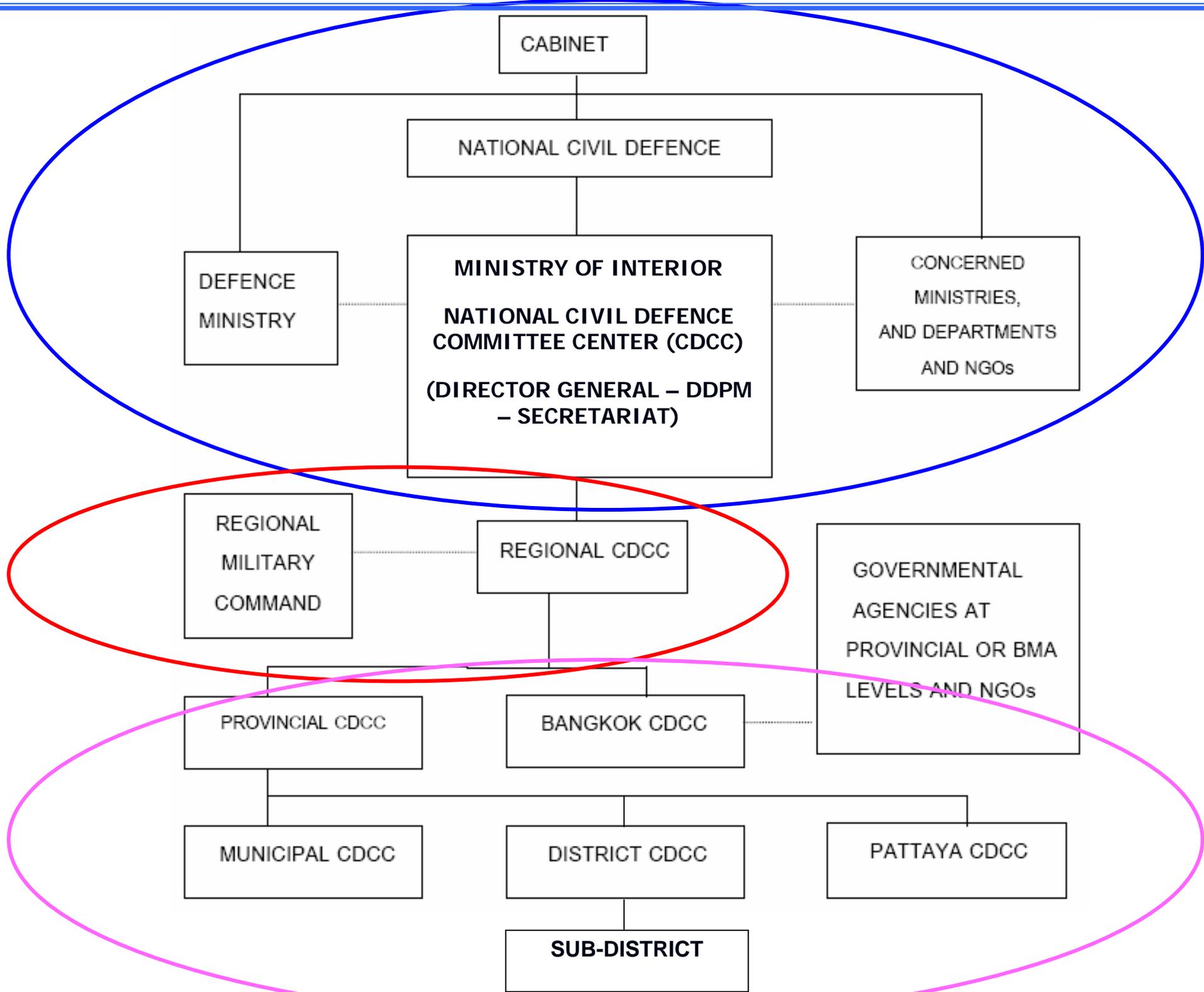
- An official center that performs both forecasting & warning at national level does not yet exist
- National hydrological monitoring, forecasting & warning systems have been developed/implemented by many agencies
 - Meteorological Department (MD), MoST
 - Electricity Generating Authority of Thailand (EGAT), MoE
 - Royal Irrigation Department (RID), MoAC
 - Water Resources Department, MoNRE
 - Naval Hydrographic Department (NHD), MoD
 - Bangkok Metropolitan Administration (BMA)
- Normally monitoring & forecasting products including warnings are published on the websites

Current Status of National Centers

- Cooperation with MRC (provides data/river forecast to member countries)
- Flood preparedness plans & mitigation measures
 - Above-mentioned agencies
 - Department of Disaster Prevention & Mitigation (DDPM)
 - Land Development Department (LDD)
- Disaster management of the country is under the responsibility of DDPM
- Thailand National Disaster Warning Center (NDWC) recently established

Department of Disaster Prevention & Mitigation (DDPM)

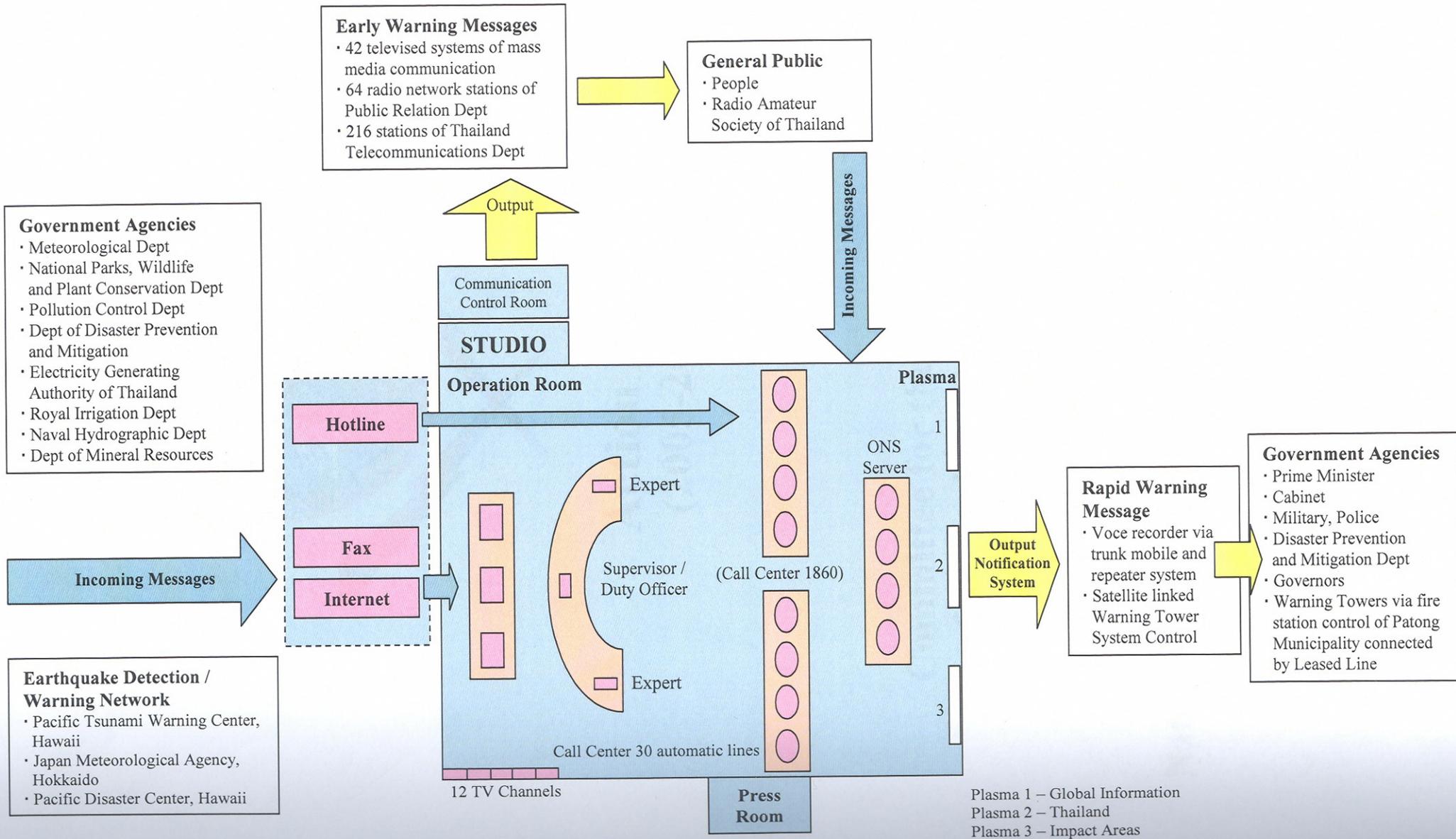
- Obligated to draft a Master Plan, set up measures, promote & support disaster prevention, mitigation & rehabilitation
- Disaster prevention & mitigation activities are carried out through establishment of safety policy, prevention & warning system, rehabilitation of disaster devastated area, follow-up/monitoring & evaluation
- (authorities & duties of DDPM under the 2002 Ministerial Order are given in the TNMC Report)



National Disaster Warning Center (NDWC)

- Responsible for planning, coordinating, controlling, implementing & preparing the national warning systems & equipment to disseminate knowledge to public & related agencies
- Functions as a centralized information centre
- Early Warning System information network is linked to the information networks of many national & international agencies
- At present, NDWC initially focus exclusively on monitoring earthquakes & tsunami
- In the future, will cover other natural disasters such as storms, forest fires, floods

Diagram of Early Warning System at National Disaster Warning Center, Thailand

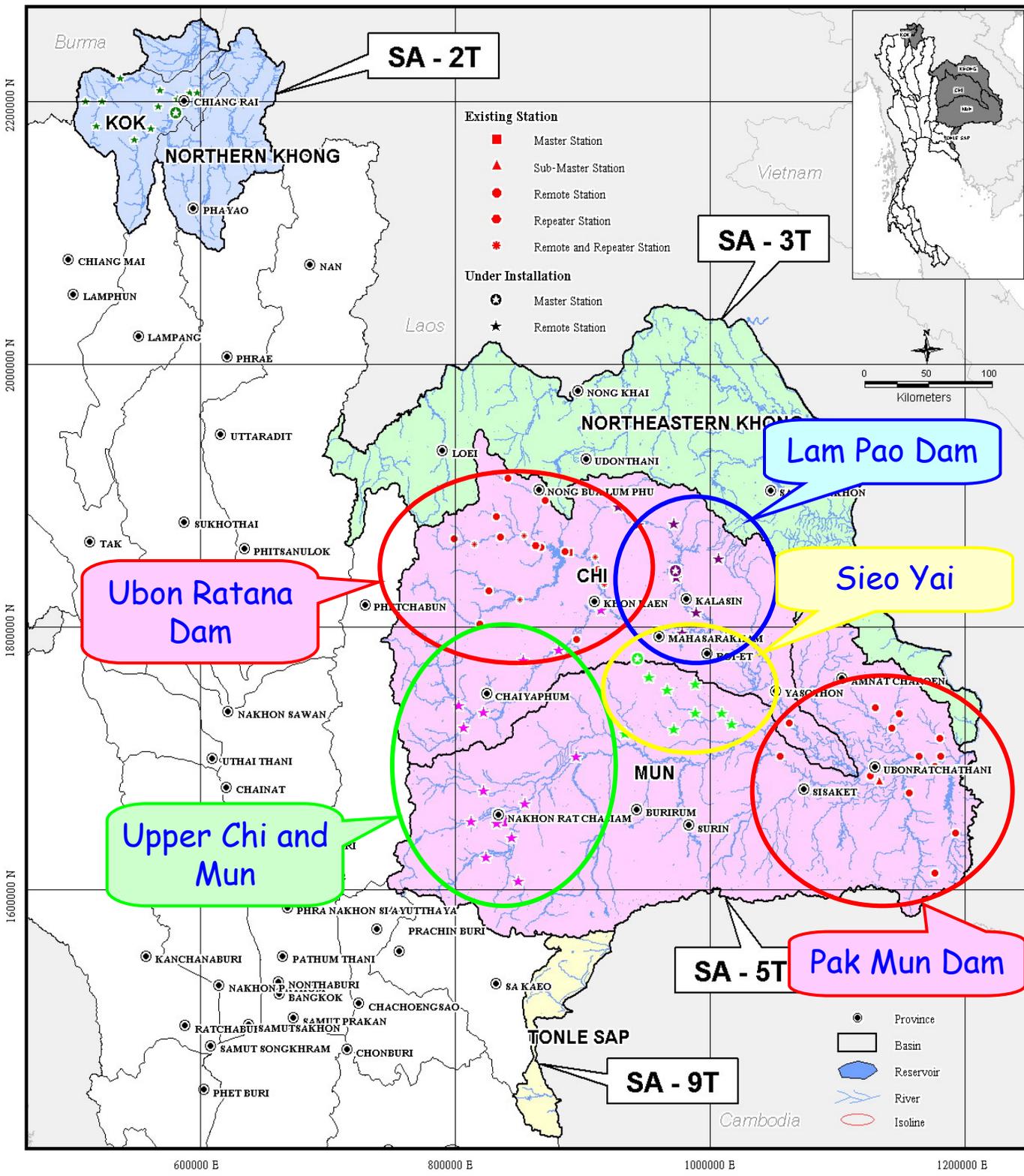


Water Crisis Prevention Center

- Established by DWR in 2003
- Study, analysis, identification of risk areas to natural & man-made water disaster
- Recommendations on setting up master plan for water crisis prevention & mitigation
- Surveillance & warning system
 - Establishment of War Room to cope with the water crisis
 - Study & detailed design of telemetry warning system
 - Preparedness for public relations & press release

Flood Forecasting and Warning System

- FFWS integrates:
 - Data collection system (telemetry system)
 - Data communication system
 - Data management system
 - Computer modeling system
- Five main agencies undertaking the flood forecasting & warning in the major river basins
 - RID, MD , DWR, EGAT, BMA



Telemetry & Flood Forecasting Systems in the Sub-basin of the Mekong River



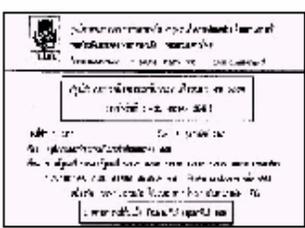
DEPARTMENT OF DISASTER PREVENTION AND MITIGATION
MINISTRY OF THE INTERIOR
THAILAND

THAI

Home Search Website: Go May 16, 2006

- About DDPM
- Organization Structure
- DDPM Executives
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- Cooperations
- Foreign Relations

News and Events



DDPM's report on disaster information during 1-31 January 2006 (24-Feb-2006)

Department of Disaster Prevention and Mitigation reported that between 1 - 31 January 2006 there were more than 200 disaster events happening across the country. Among these were incidents of drought, urban fire, windstorm, sabotage, earthquake, accidents related to transportations and road traffic, accidents related to chemicals and hazardous materials and cold snap. More than 150 people had been killed during the period, mainly from road accidents. [Click here for more details.](#)

www.disaster.go.th

Road Accident Reduction Campaign for New Year Festival 2006

Information & Database

- Thailand's Disaster Management System
- Tsunami victims relief efforts
- Thailand Country Report

Words of the day

"A friend in need is a friend indeed"

<?include ("include/title.php");echo \$title;?> - Microsoft Internet Explorer

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Address http://www.ndwc.or.th/English_version/index.php.html

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[edit]

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user:

password:

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- Visitor Statistic -

- Warning Messages

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$headnews=$arr["Headmsg"]; $title=$arr["Title"]; $datenews=$arr["Datemsg"]; $showfirst=$arr
["Showfirst"]; if ($_SESSION["SID"]=="admin"){ if($showfirst=="true"){ echo "✓"; }else{ echo "✗"; }
echo "[del] \n"; } echo " $headnews
\n"; echo " $title...
\n"; } } include ("include/closedb.php");?>

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READ MORE

- News and Events

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0){ while ($arr = mysql_fetch_array($result)) { $No=$arr["No"]; $No5=sprintf("%05d",$arr["No"]);
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\n"; } } include ("include/closedb.php");?>

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- Disaster -

- ▶ Earthquake and Tsunami
- ▶ Meteorology and Landslide
- ▶ Air Pollution
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- ▶ Forest Fire
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- ▶ Agricultural Disaster
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Discussions not available on <http://www.ndwc.or.th/>

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THE METEOROLOGICAL DEPARTMENT

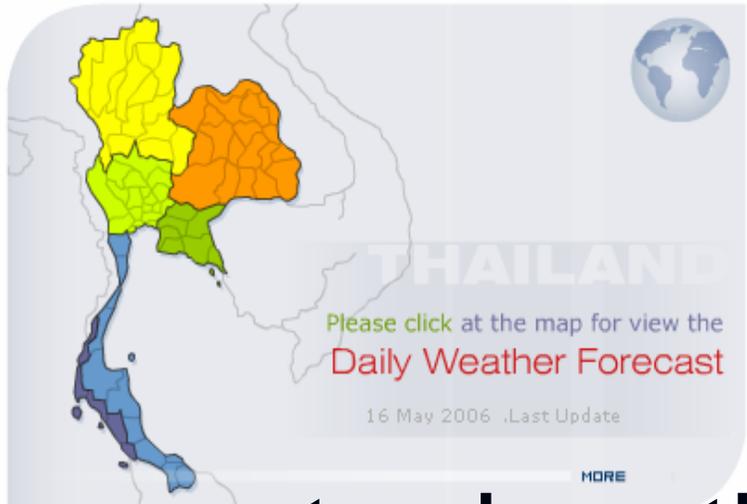
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Daily Weather Forecast



ThaiWeather and Safety

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NWP MODEL

Satellite Images

Northern RMC

Northeastern RMC

Southern East Coast RMC

Southern West Coast RMC

Meteorological Satellite and Radar

WEBSITE LINK

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- MWMS Project
- Water Situation in Chao Phraya river
- Cumulative rainfall
- Water quantity in reservoirs



Water situation in Mekong River

The data source is cooperation between Thailand and Mekong River Commission for Sustainable Dev.



Satellite Present cloud and storm conditions

for more information please contact [RID information](#) Royal Information Department 811 Samsen Rd, BKK,10300 Tel.241-0020 - 29

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ข่าวเด่น



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สถานการณ์น้ำภาคตะวันออก 9 พ.ค. 49
สถานการณ์น้ำภาคใต้ฉบับที่ 58

www.dwr.go.th

Unmet Needs for Forecast & Warning Product Dissemination to Flood-at-Risk Communities

- Access to information published on websites developed by many agencies is still limited
- Dissemination of warnings by concerned agencies does not yet cover all vulnerable areas
- However, information regarding floods & warnings can be obtained via TV & radio networks

Aspect of the Center-Community Relationship that must be strengthened

- Continued efforts by the concerned agencies to educate the public regarding the occurrences & destructive force of floods are essential
- Community monitoring, detection, & warning programs with emphasis on individual warning responses are advantageous
- Real-time feedback from local designated persons or authorities to the center offices will make a more effective warning system
- coordinated dissemination & preparedness programs that involve community & center initiatives will remain essential for effective flood hazard mitigation

Aspect of the Center-Community relationship that must be strengthened

- Lack of accessibility to timely information is still great obstacle to local communities
- Establishment of a community communication center together with capacity building to community should be enhanced
- A working group specific on flood issue can be possibly nominated to carry out any related flood works

Recommendations on Pragmatic Working Arrangements between National Centers & MRC RFMMC

- Sharing of knowledge & experiences in flood preparedness, emergency response, policy, plans & resolutions of flood problems among riparian countries & MRCS
- Communication/sharing of real-time hydro-meteorological data & forecasting products among riparian countries & MRCS
- More efficient & wider dissemination of information

Other National Suggestions on Forecasting and Warning

- Technology should be shared among all agencies involved in flood forecasting & risk management
- Establish a national network of flood forecasting & warning system
- Integration of the flood forecasting systems & database into a national system
- Further improvement of flood forecasts is needed
- Linkage of the existing systems & the incoming systems to the adjacent systems in the same basin

Other National Suggestions on Forecasting and Warning

- Training in the use of newly introduced technology, more conventional hydrological skills, as well as in non-technical areas such as administration, public relations, marketing & customer services
- Capacity building to operational staffs
- Encouragement of persons in charge of monitoring
- Good cooperation among concerned agencies & public through information technology with an effective communication system
- Improve of dissemination of flood warnings

Thank you very much
for your kind
attention

