Flood Forecasting System and Real-time Observation in the Mekong River Basin

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Mekong River Commission (MRC)

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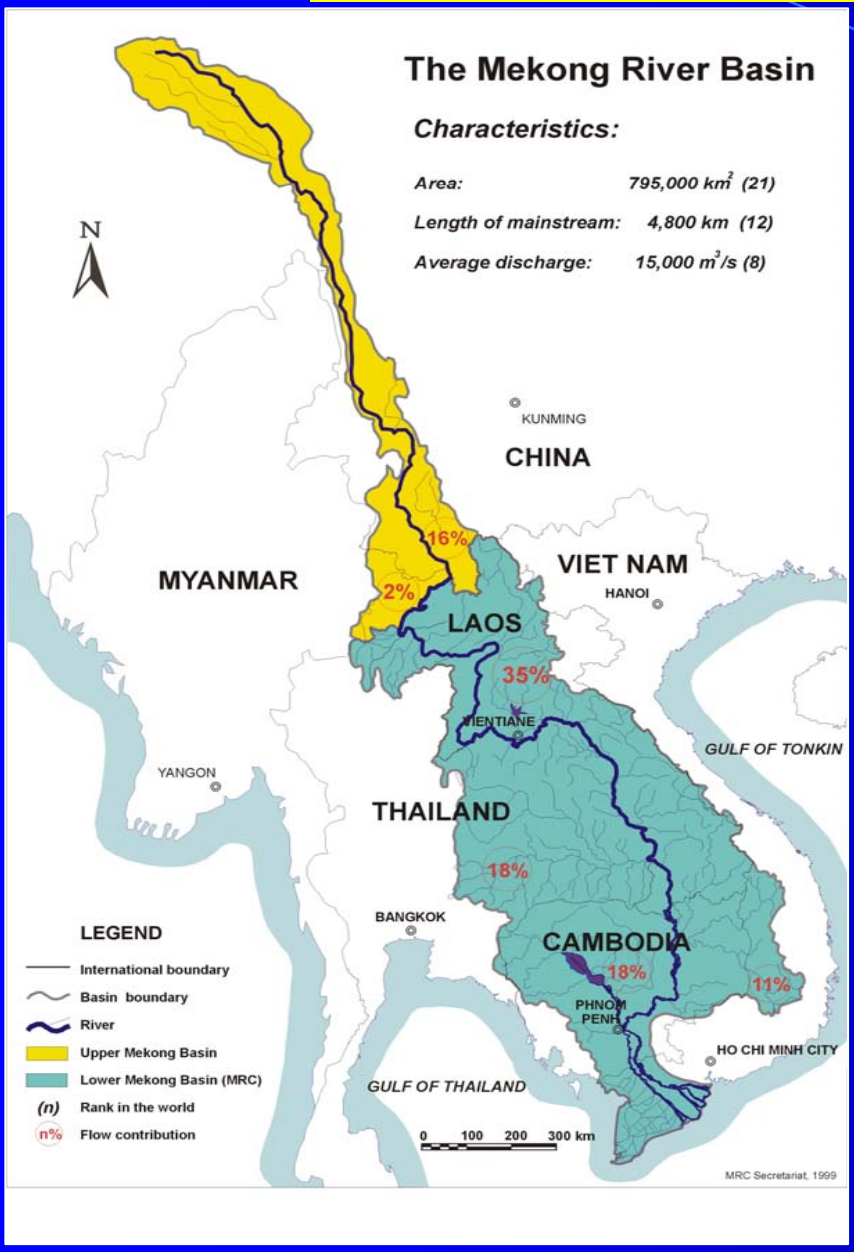
MAIN OBJECTIVE

" To introduce to the operational flood forecasting system and the real-time observation in the Mekong River Basin"

Content

1. Introduction
2. MRC Flood Forecasting System
3. Real-time Observation in the Mekong River Basin

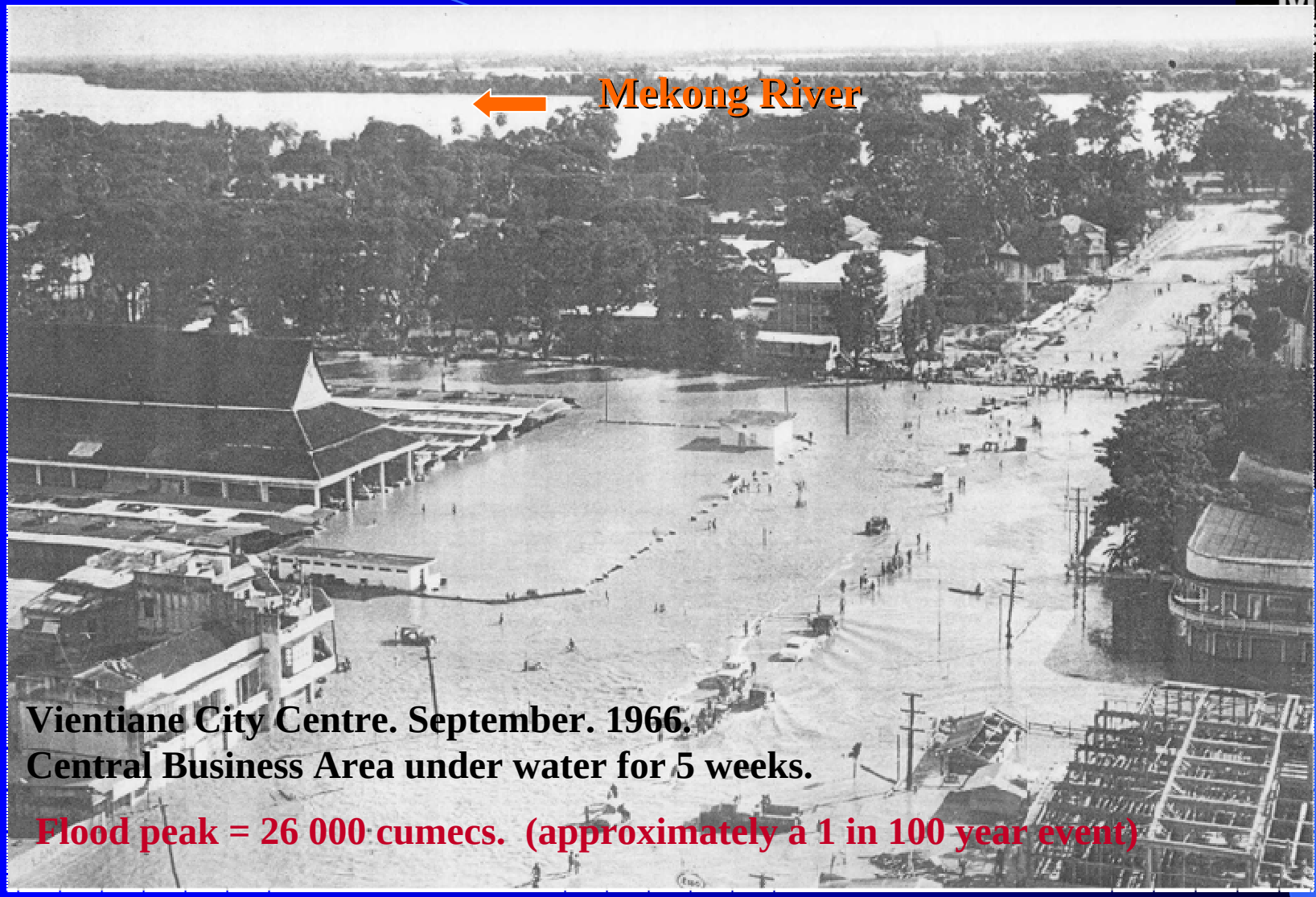
1 .Introduction



Mekong Catchment Area (km2)	795,000 (21)
Lower Mekong Basin (km2)	606,000
Length of mainstream (km)	4,800 (12)
Volume (billion m^3)	475 (8)

HYDRO-METEOROLOGICAL CONDITIONS:

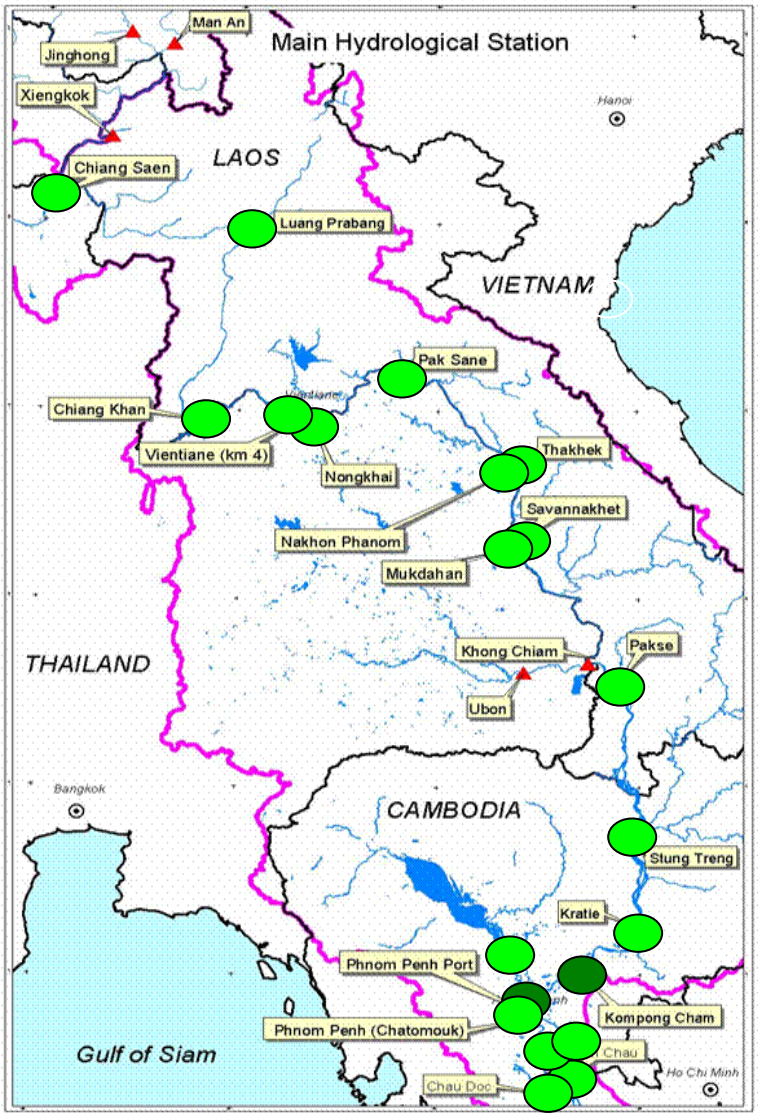
- Tropical climate with two monsoon seasons
- South-west monsoon cause heavy rainfalls
- Usually a short period of no or little rains between June &July
- Follow storms, typhoons, tropical depression



Vientiane City Centre. September. 1966.
Central Business Area under water for 5 weeks.

Flood peak = 26 000 cumecs. (approximately a 1 in 100 year event)

Establishment of Regional Flood Forecasting System with application of advanced computer techniques



Flood Forecasting

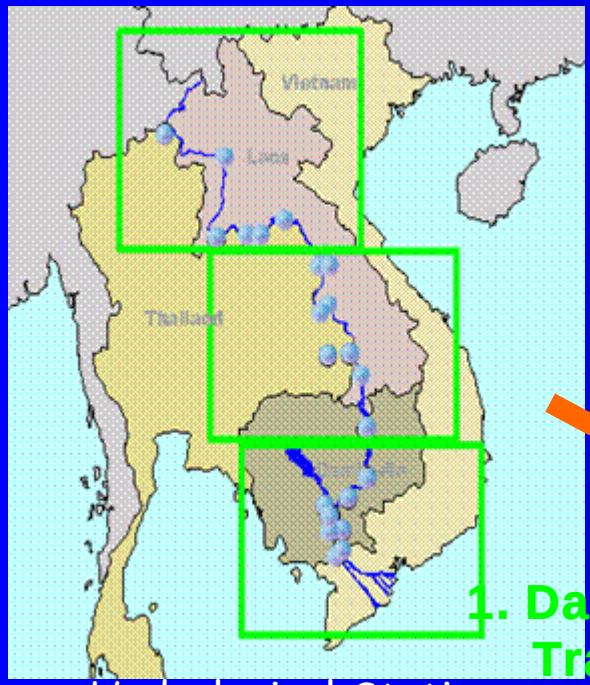
Jun. – Oct.
5-day Flood Forecasting
Daily forecast
21 Forecasting stations
Update daily on MRC webpage, e-mail to NMCs, concerned line agencies and other interested parties

Forecasting Stations

River Monitoring: 19 sta.

Flood forecasting: 21 sta.

2. MRC Flood Forecasting System



Hydrological Stations

THREE PROCESSES

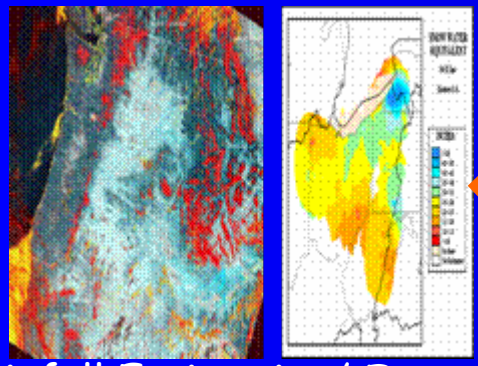
1. Data collection/transmission
2. Forecast Operation
3. Forecast Dissemination

2. Forecast Operation

1. Data Collection / Transmission

3. Forecast Dissemination

Web site, bulletin, e-mail, fax, radio, telephone, etc.



Rainfall Estimation/ Forecast

Through Partner Networks (i.e. NMCs, National Line Agencies, Red Cross)

2.1 Data Collection and Transmission

1. *Historical data (hydro-met data)*

- Historical Hydro-meteorological data in HYMOS archive database

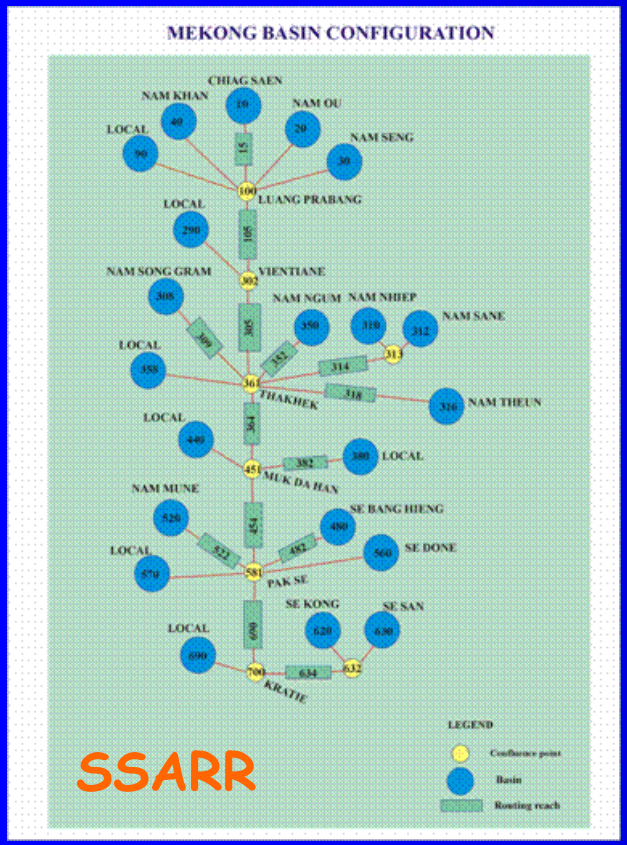
2. *Operational data*

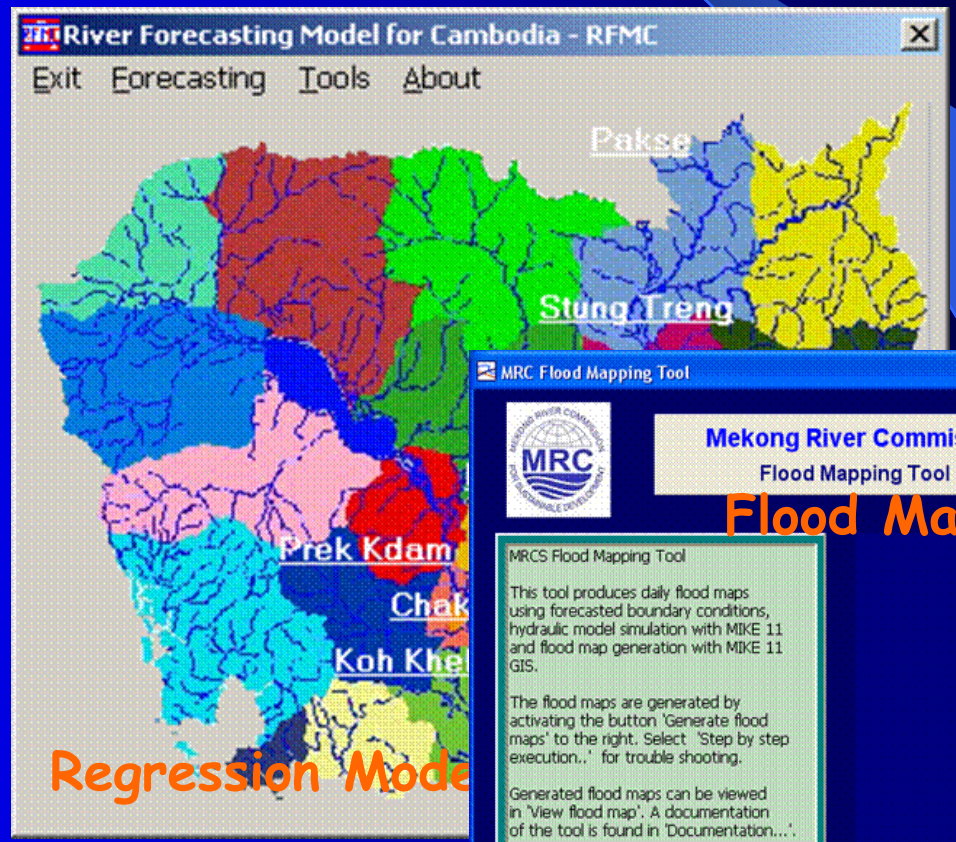
(water level, rainfall and weather)

- 43 stations in LMB and 2 stations in China, June-October, sending by e-mail to MRCS
- 19 stations in LMB, November-June, sending by email to MRCS
- Rainfall/weather estimation and forecast from other sources; e.g. USGS/NOAA, TRMM TMD.

2.2 Forecast Operation

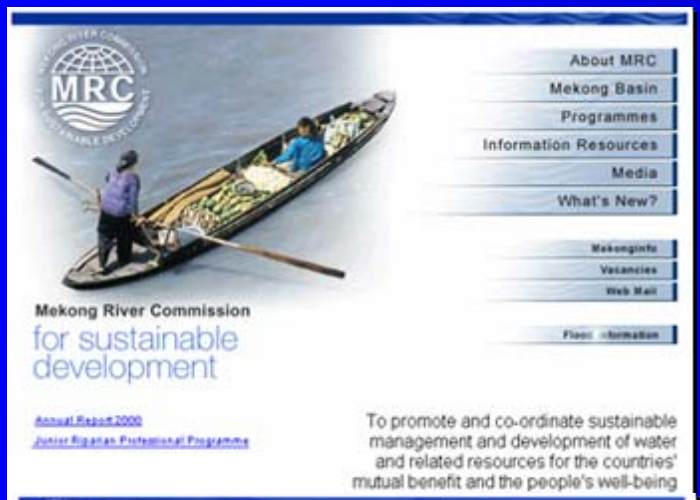
- **SSARR** (Streamflow Synthesis And Reservoir Regulation) model used for upper part (from Chiang Saen to Pakse)
- **Multi Regression models** used for the lower reach of the delta with over bank flow (from Stung Treng to Tan Chau/Chau Doc)
- **ANN model** used for both upper reach and lower reach of the Mekong
- For flood mapping in Mekong Delta used **Mike-11**.

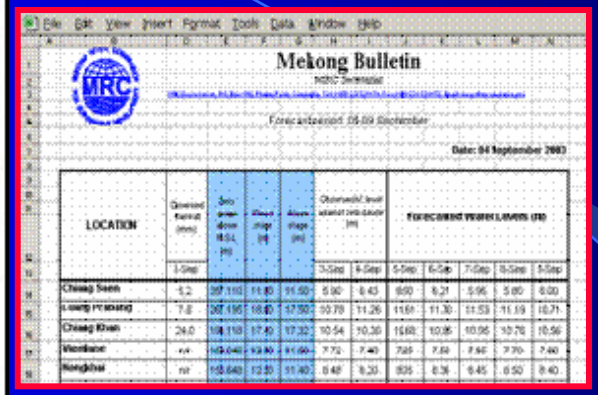


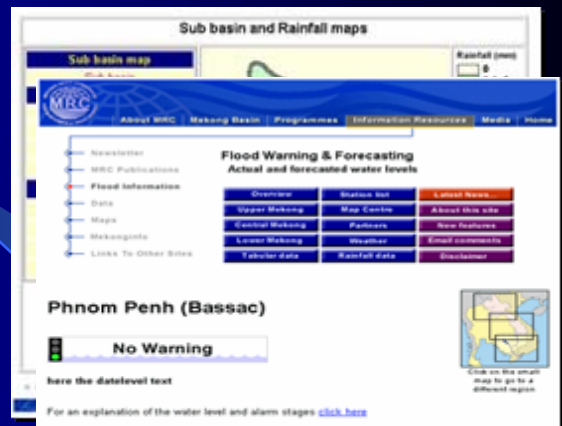


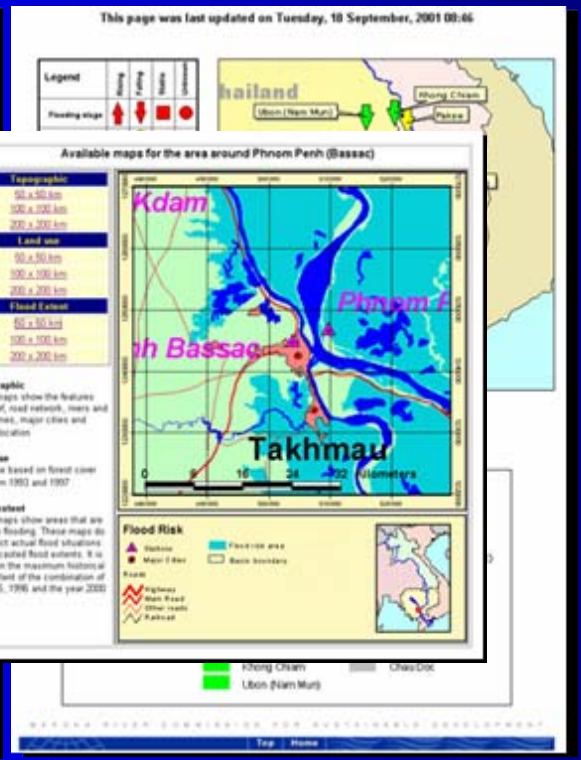
2.3 Forecast dissemination:

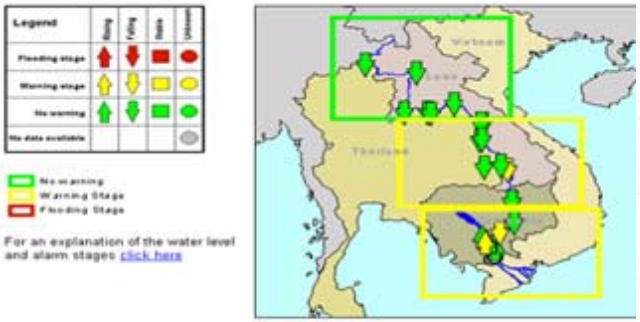
www.mrcmekong.org

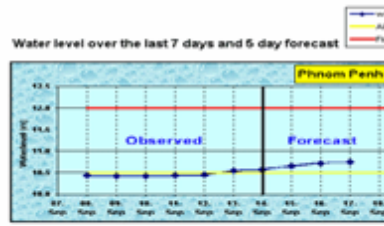


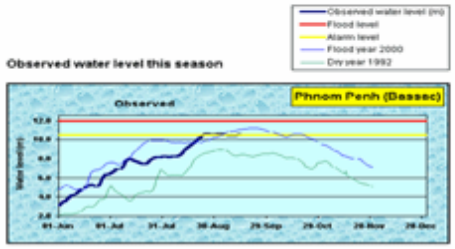












Click on an area to zoom in to a part of the Mekong basin. These maps show the location and the status of various hydrological stations. Clicking on a station will bring you to page with station information: observed and forecasted water levels, as well as yearly observations.
Alternatively, you can click on a station name on the bottom of this page to go directly to the station information page.

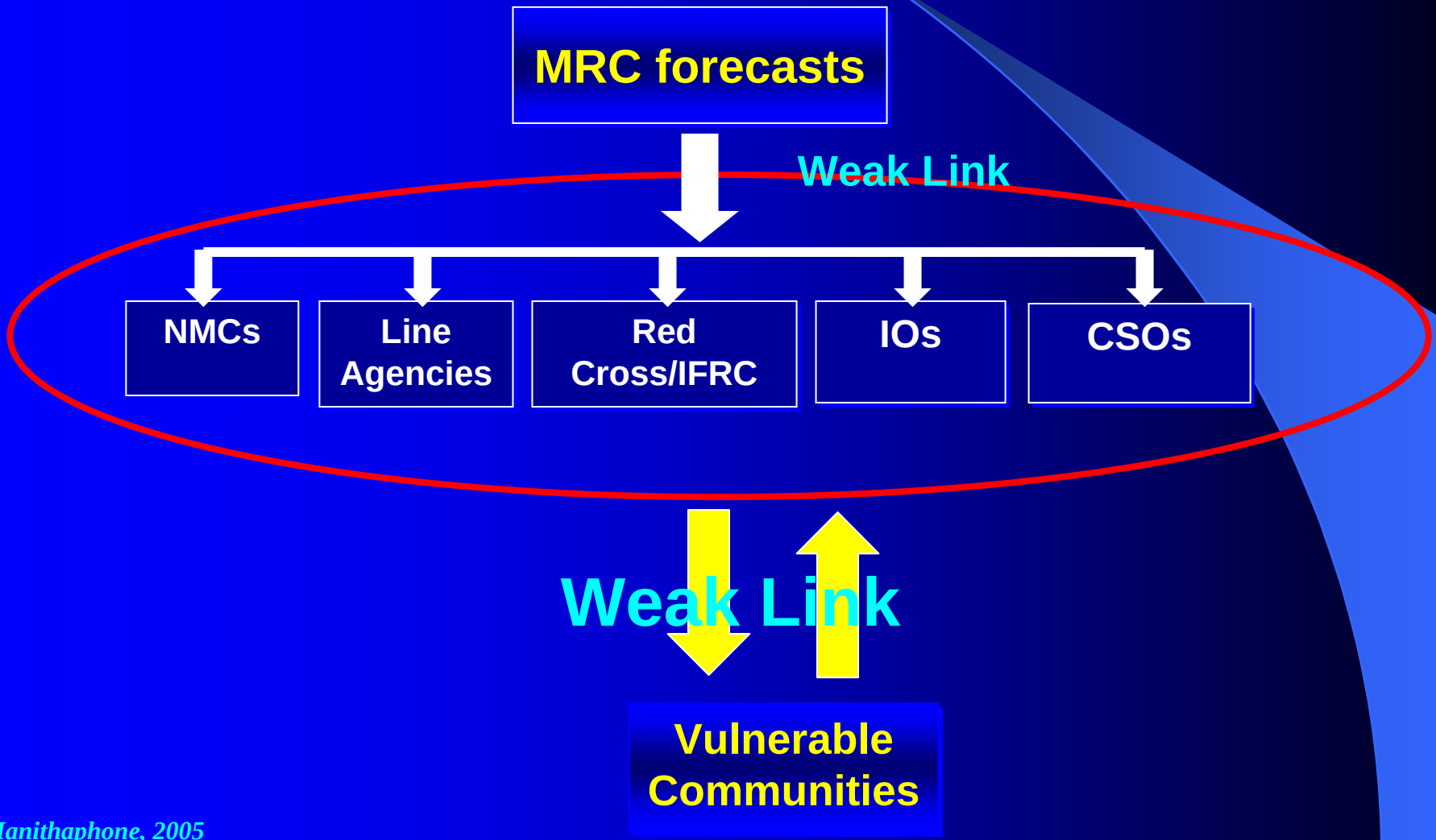
The color of the square in this map indicates the highest warning level in that area.

2.4 Future Perspectives of the MRC Forecasting and Early Warning System

- Continue to play crucial role in providing accurate and reliable warning information
- Areas for improvement:

- Real-time river monitoring networks and data collection/transmission
- Forecasting tools and its application
- Early warning and information dissemination

Flood Information Flow from MRC to Communities through its Partners



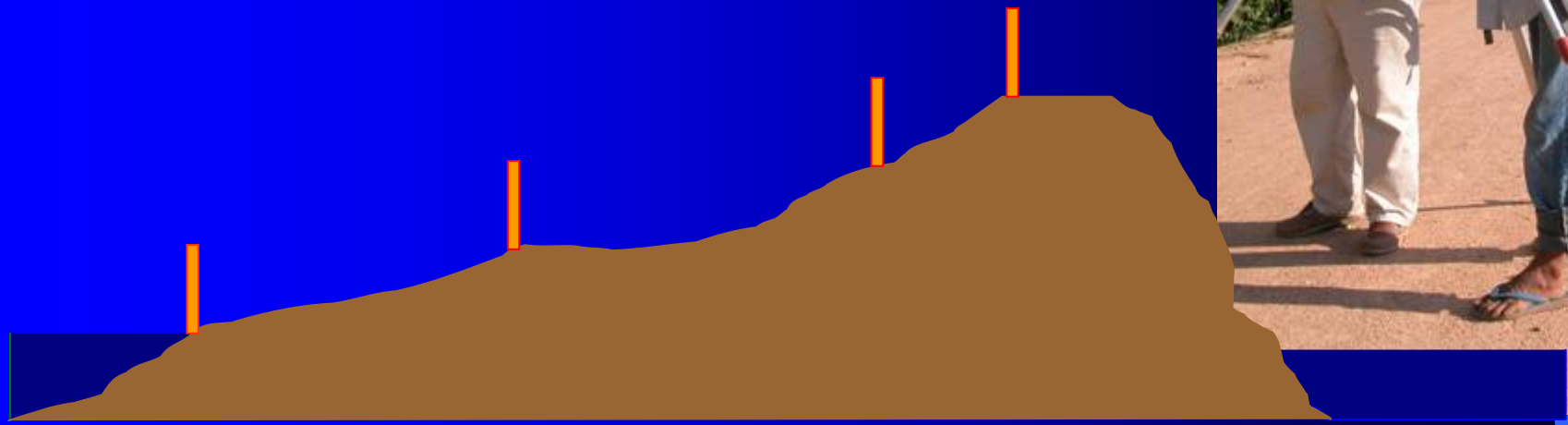
Manithaphone, 2005

Community participation

Flood mark installation

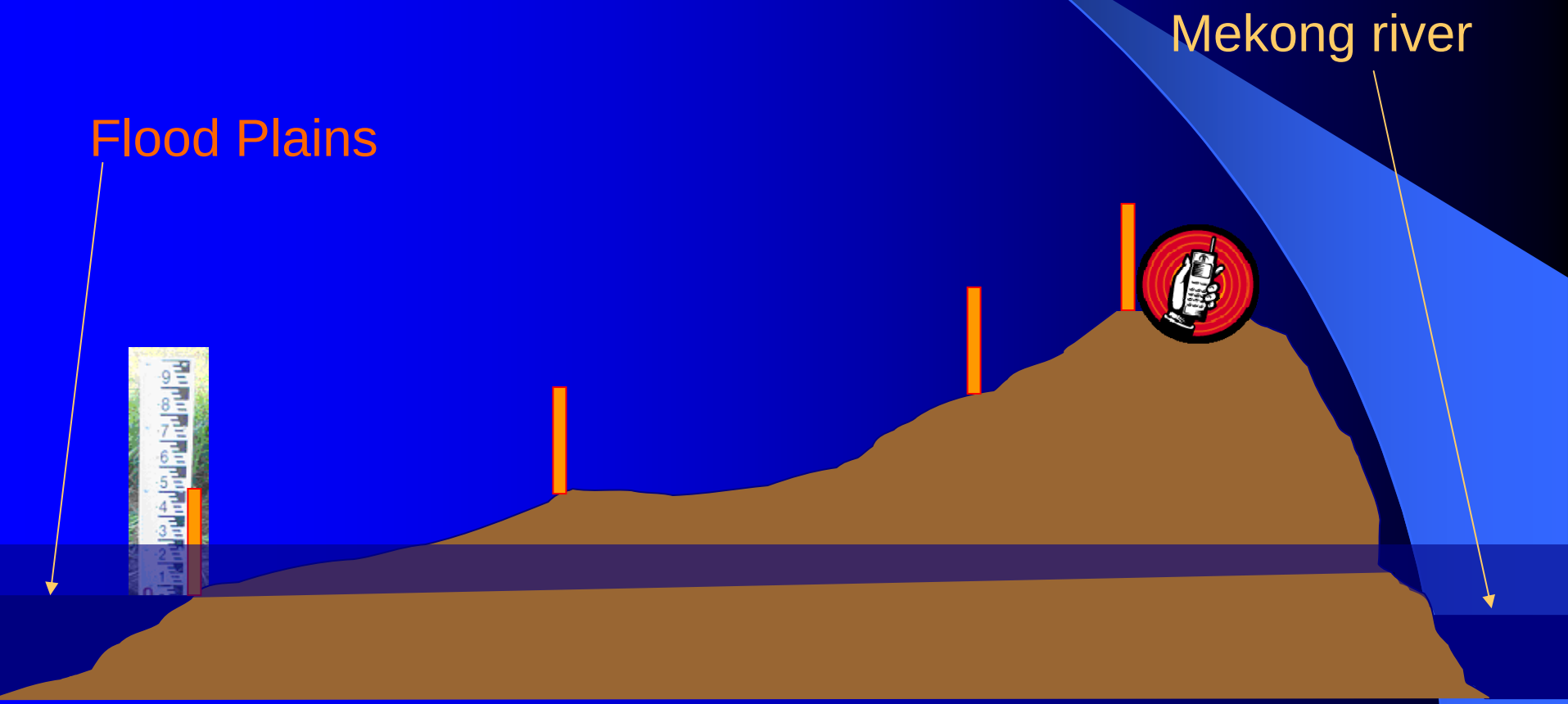
FM installation & leveling – conducted

Lowest spots at the villages – identified



Manithaphone, 2005

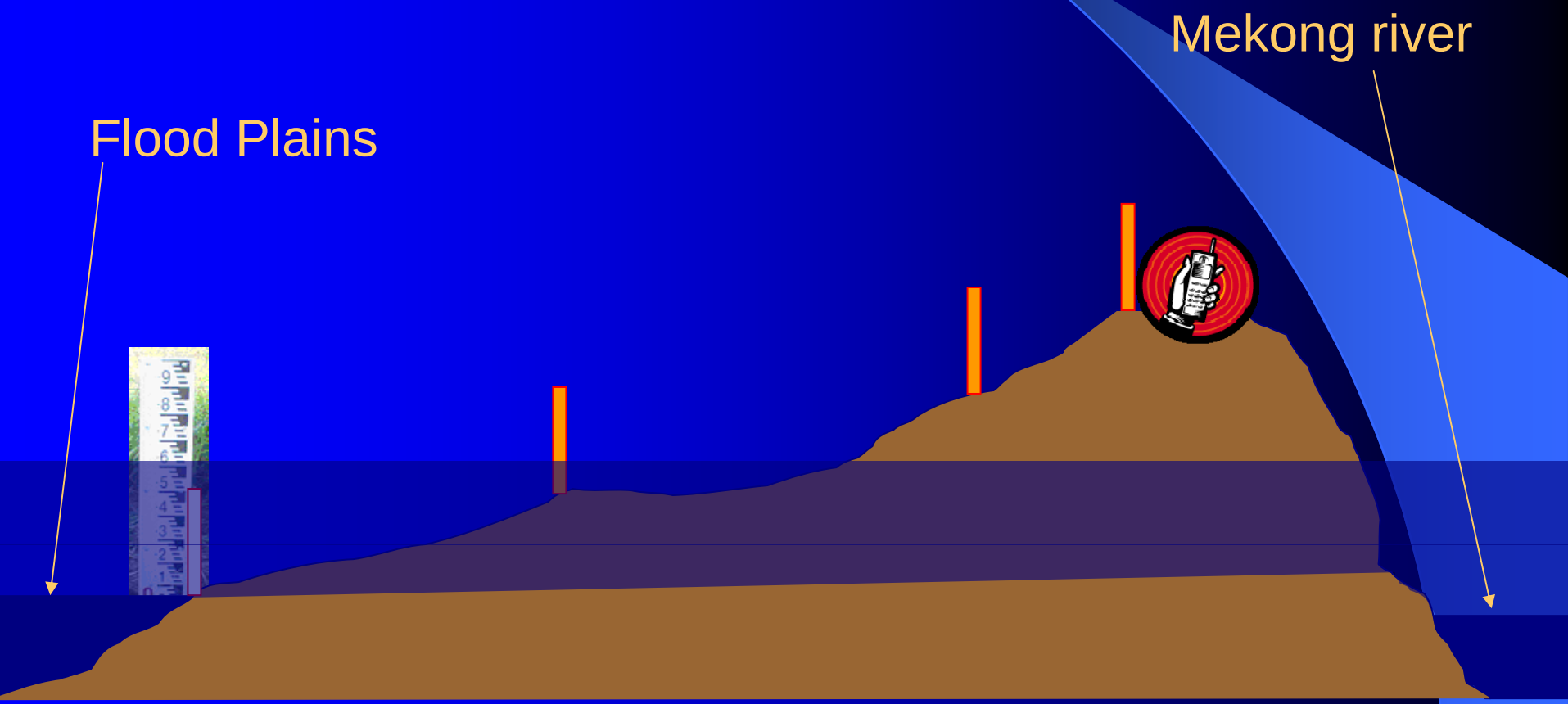
Flood Early Warning



Village Profile

Manithaphone, 2005

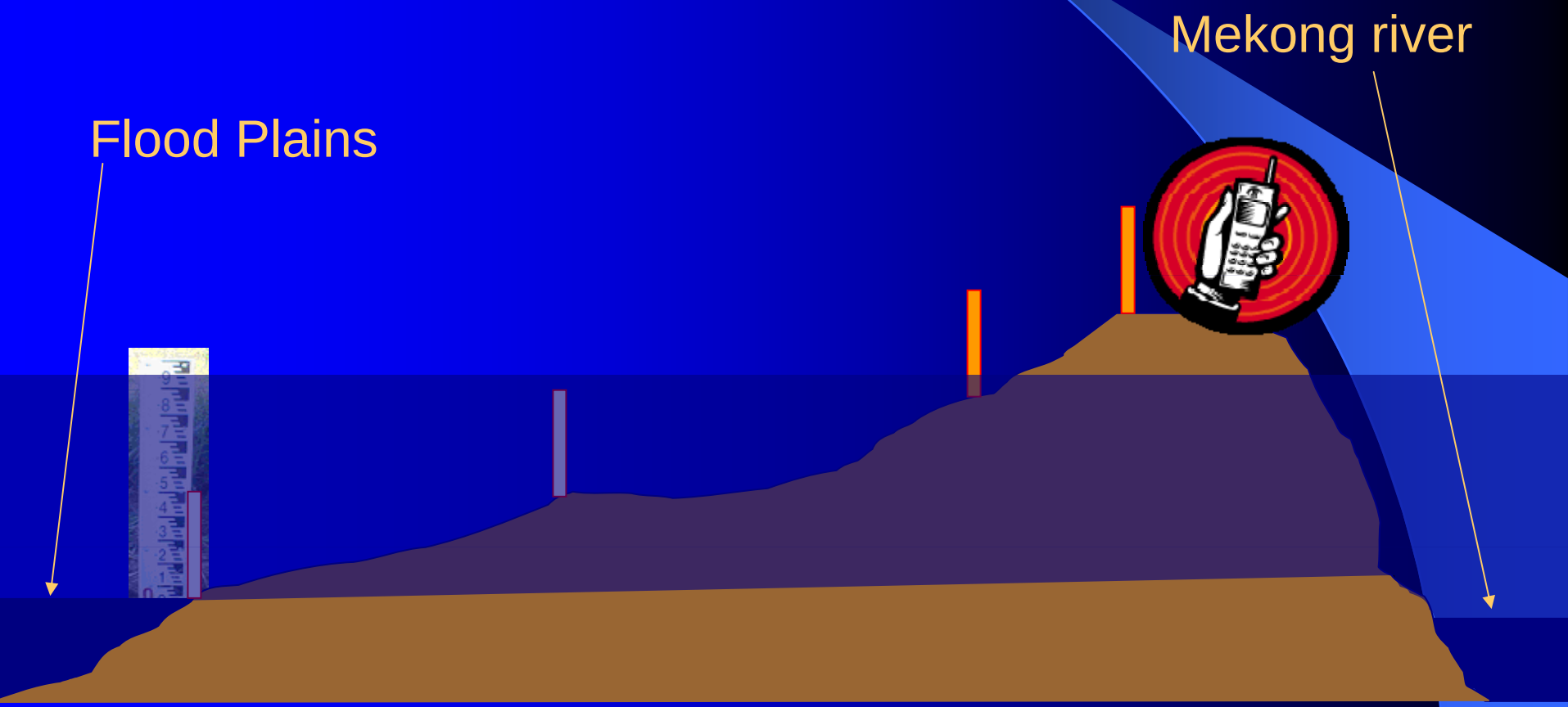
Flood Early Warning



Village Profile

Manithaphone, 2005

Flood Early Warning



Village Profile

Manithaphone, 2005

Provision of Flood Early Warning to the Most Vulnerable Communities in the Lower Mekong Basin Project

MRCS/ RFMMC

12:00 hrs

American Red Cross

CRC HQ

14:00 hrs

Information Flow

14:30 hrs

Field Personnel

Manithaphone, 2005

Provision of Flood Early Warning to the Most Vulnerable Communities in the Lower Mekong Basin Project

MRCS/
RFMMC

17:00 hrs

American Red Cross

CRC HQ

Community Feedbacks

15:00 hrs

Field Personnel

Manithaphone, 2005

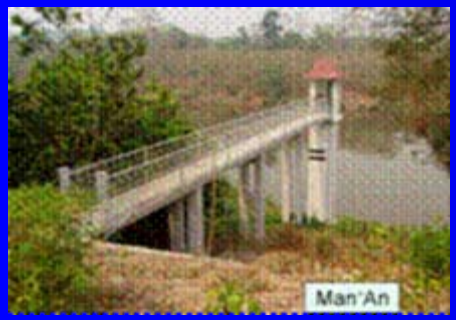
3. Real-time Observation

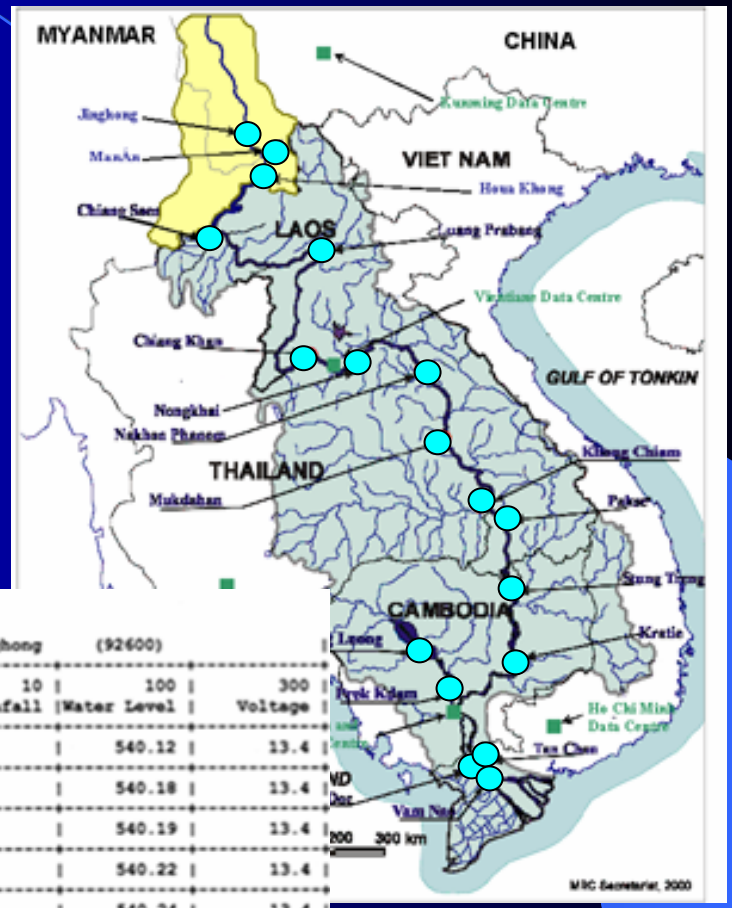
3.1 Appropriate Hydrological Network Project (AHNIP)

Funded by AusAid, April 2001-March 2006

1) To improve 18 hydrological stations along Lancang/Mekong mainstream-near real-time data

2) To strengthen the capacity of the MRC –MRCS/riparian countries in dealing with real time data





20040813 08:13

Time	Tunjinghong (92600) Rainfall	Water Level	Voltage
	10	100	300
09:00		540.12	13.4
10:00		540.18	13.4
11:00		540.19	13.4
12:00		540.22	13.4
13:00		540.24	13.4
14:00		540.26	13.4

Site 92600 = Tunjinghong
Site 92980 = Manan
Report Cell Width = 11

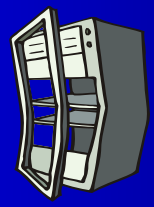
AHNIP-Telemetry Data Flow

National Data Terminal

FTP

7.30- 8:00

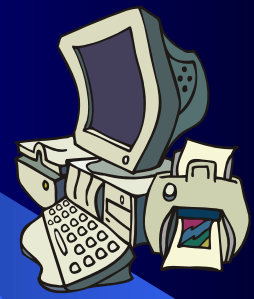
Internet Server at MRC



FTP

8:00

MRC Data Terminal



7:00

GSM/Satellite Telemetry

Water Level Measuring Station

FTP 8:00

All Other National Data Terminals

Email 8:00

Data Users

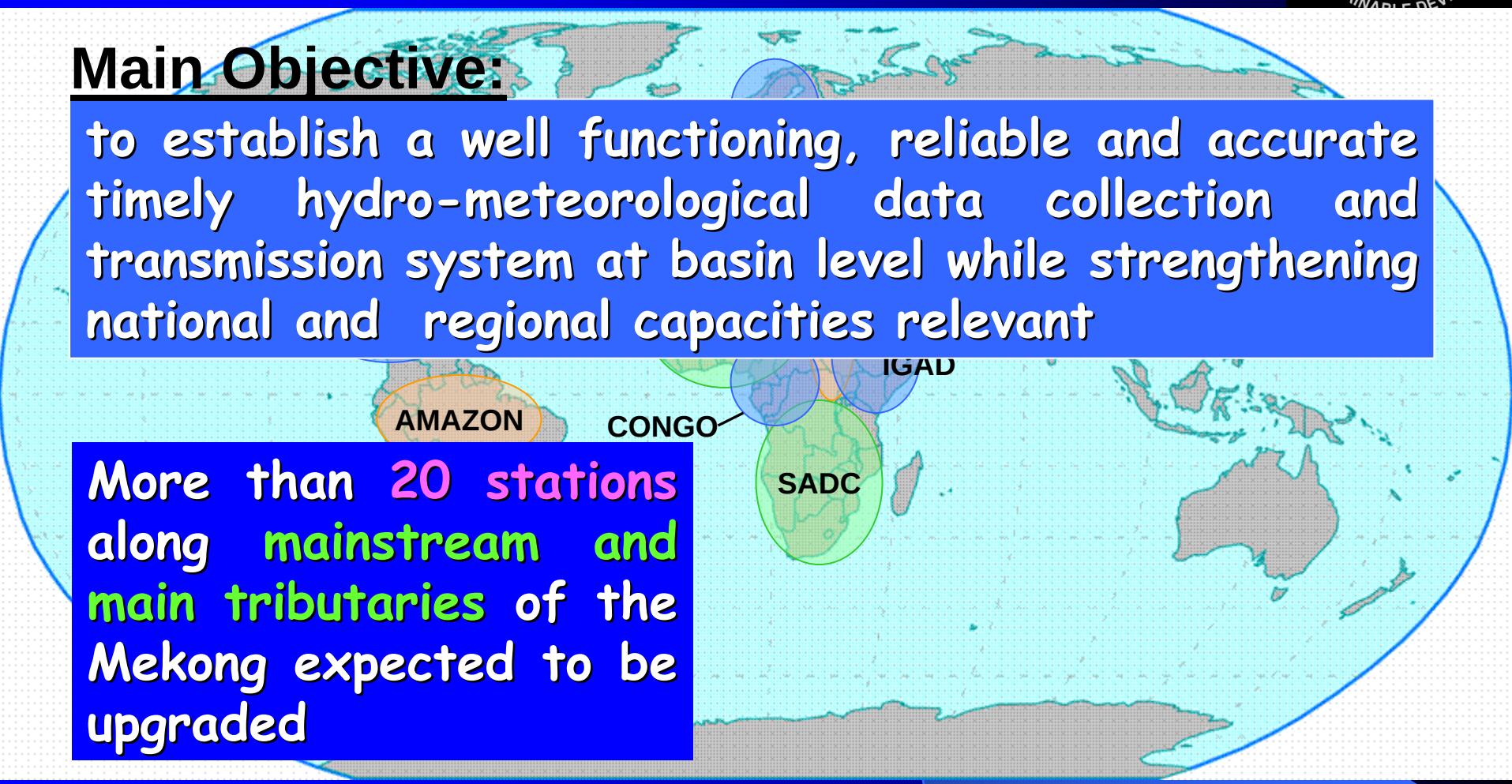
3.2 The Establishment of a Hydrological Information System in the Mekong River BASIN – Mekong-HYCOS

(In cooperation with WMO, funded by the Government of French)

Under preparation for the project implementation

Main Objective:

to establish a well functioning, reliable and accurate timely hydro-meteorological data collection and transmission system at basin level while strengthening national and regional capacities relevant

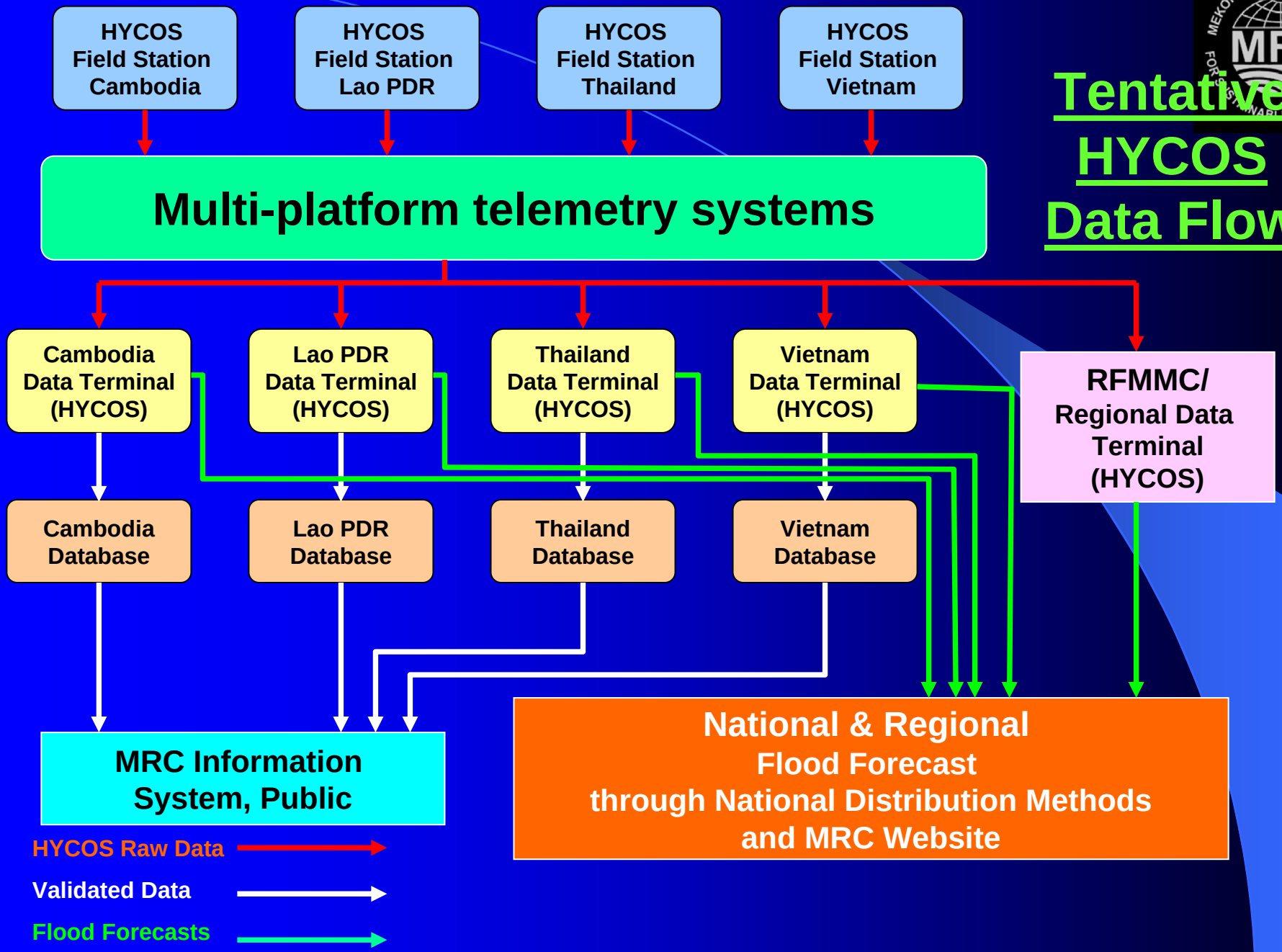


More than 20 stations along mainstream and main tributaries of the Mekong expected to be upgraded

CURRENT GEOGRAPHIC DISTRIBUTION OF HYCOS PROJECTS

Grabs (2005)

Tentative HYCOS Data Flow



(To be finalised during Inception Phase)

THANK YOU