



**Hydro and Agro
Informatics Institute**

Ministry of Science and Technology,
Thailand

ASEAN HYDROINFORMATICS AND CLIMATE DATA CENTER (AHC)

Regional Collaborations

Dr. Sutat WEESAKUL

13 March 2017

ASEAN FORWARD

Agreement on setting up “ASEAN Hydroinformatics and Climate Data Center”

ASEAN COST 69
24 May 2015
Phuket, Thailand



Proposal of “ASEAN Hydroinformatics and Climate Data Center”

- Data integration
- Modelling and analyzing
- Sharing of good practices Through Capacity Building programs

ASEAN COST 70
4 Oct 2015
Vientiane, Lao PDR



ASEAN Application of S&T in DRR Water Management Workshop
4 Apr 2016
Bangkok, Thailand

Workshop to identify country needs and implementation plan

- I: Data System: Application for disaster management
- II: Capacity Building: Empowering and supportive collaboration
- III: Good Practice for adaptation

ASEAN – EU STI Days
10 – 12 May 2016
Hanoi, Vietnam

NEXUS Workshop: DSS for Water and Environment Management

- S&T for Sustainable Development
- Outcome of “ASEAN Application of S&T in DRR Water Management Workshop”



Propose for setting up “ASEAN Hydroinformatics and Climate Data Center” to support for the use of S&T for DRR and Water Management

ASEAN COST 71
24 – 29 Oct 2016
Siem Reap, Cambodia

ASEAN NEXT
8 Mar 2017
Bangkok, Thailand

Workshop on Establishing ASEAN Hydroinformatics and Climate Data Center

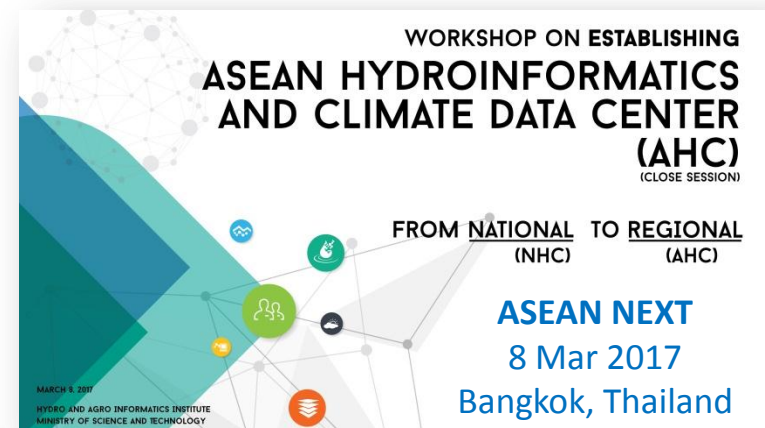


ASEAN COST 72
22 – 25 May 2017
Brunei



ASEAN Hydroinformatics (ASEAN NEXT 8 March 2017 in Bangkok)

1. **S&T Implementation**
2. **Strategic data sharing and management for Hydroinformatics**
 - Data (acquisition, quality, integration, sharing)
 - Tools (monitoring, models, NWP, DSS) during normal and crisis situation
 - ICT infrastructures
3. **Capacity building**
 - Identify organization involved within the country (roles and responsibilities)
 - S&T transfer, knowledges and experience sharing on water accounting and auditing
4. **Good practices**
 - Community Water Resource Management (CWRM)
 - Climate change adaptations
5. **Collaboration network**
 - Identify focal point from AMS
 - Cross-sector
 - International
 - Small projects



Development of National Hydroinformatics and Climate Data Center

THAILAND



Thailand 2011 Flood

Early warning and real time decision making

Flood sensorweb

Forecast & modeling

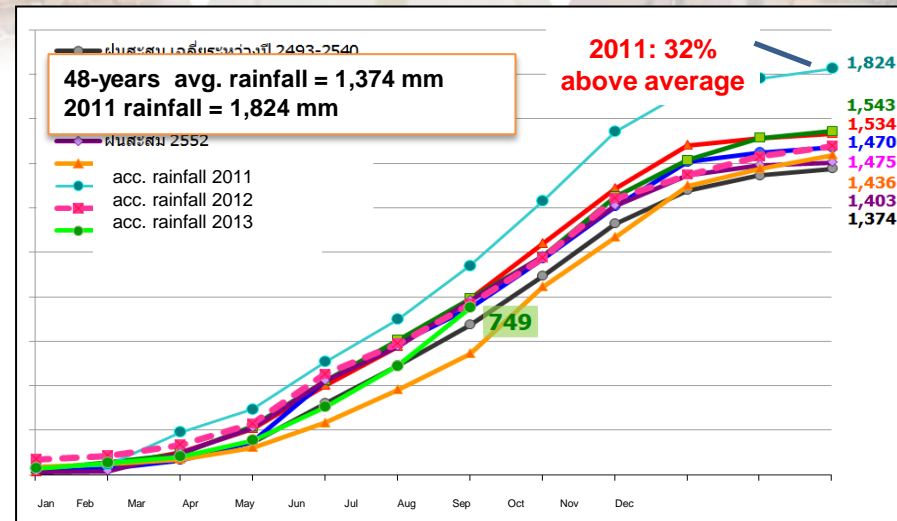
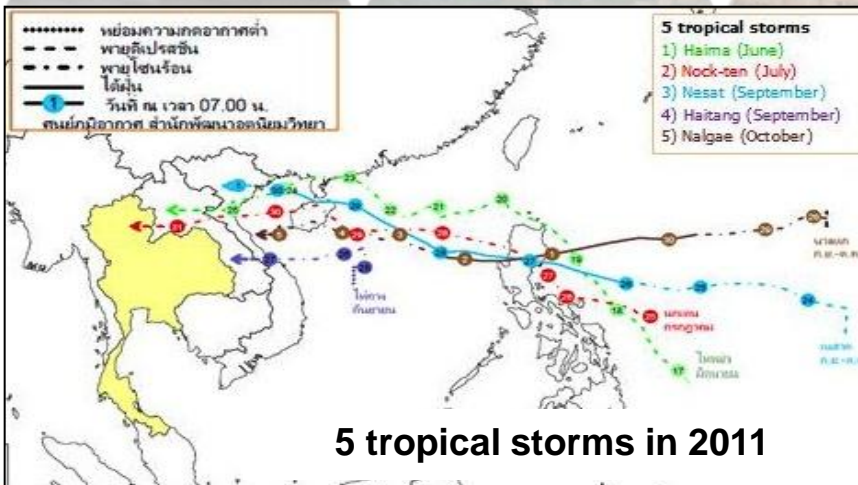
Networking & cluster

Flash flood & landslide warning

Reservoir networking

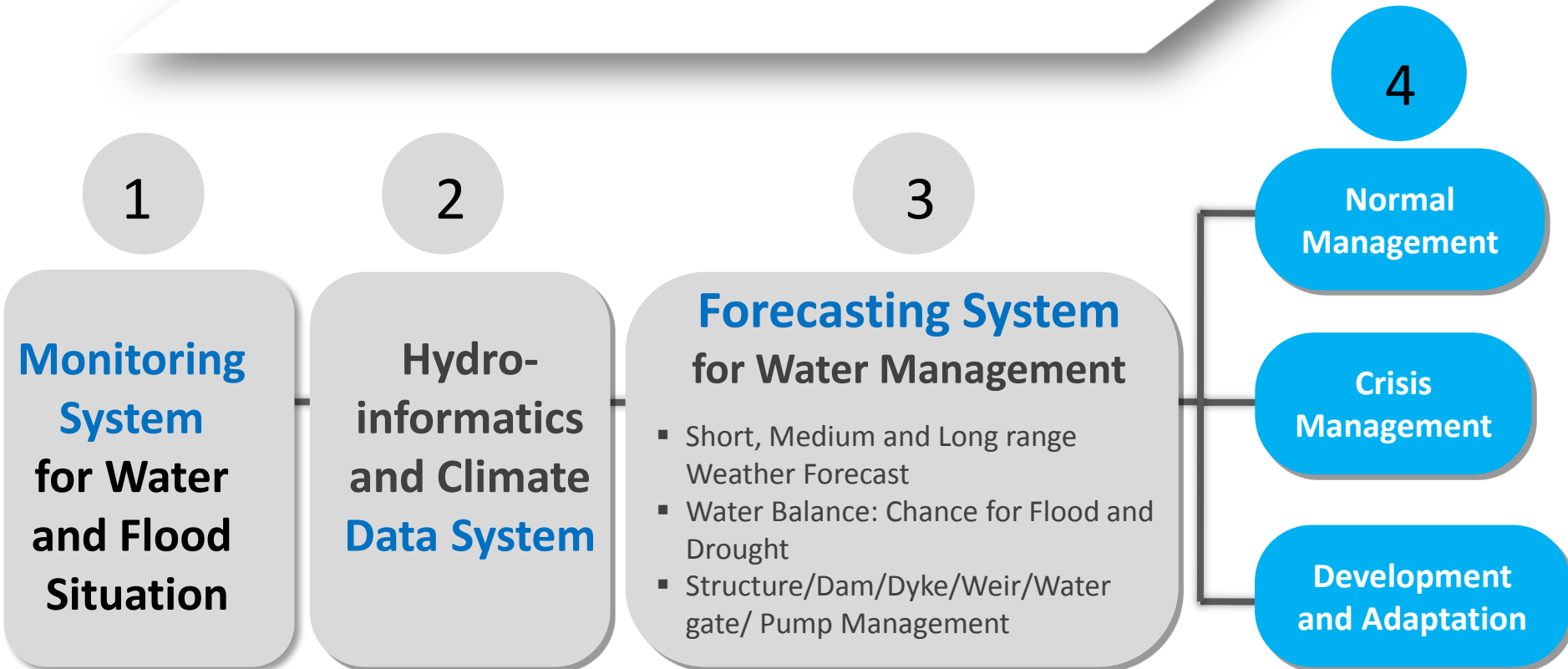
Data warehouse

Integration of technology for data analysis and flood management

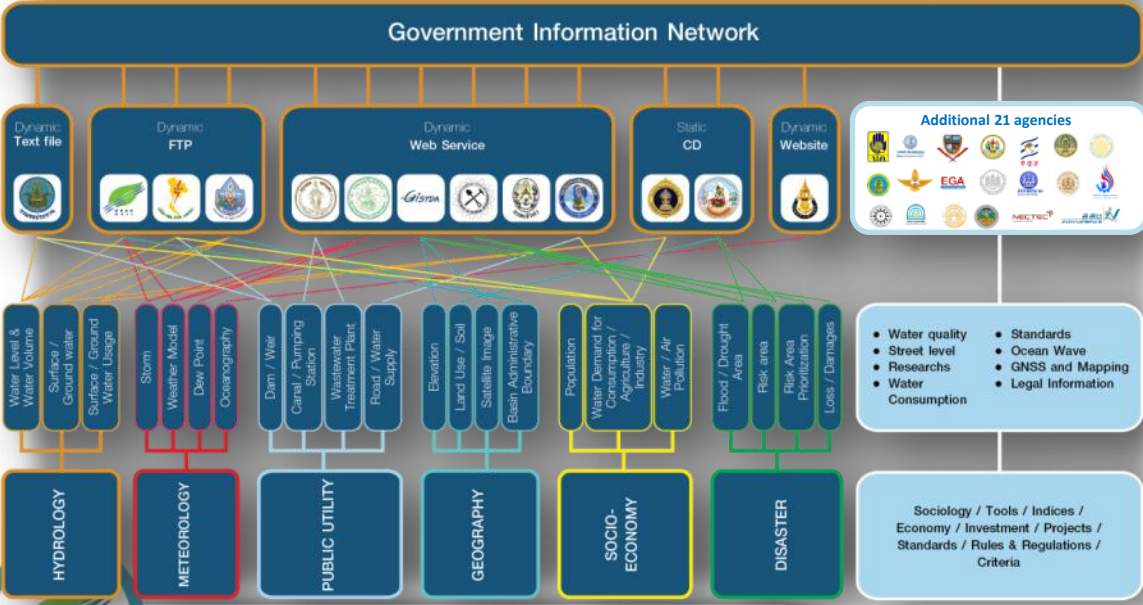
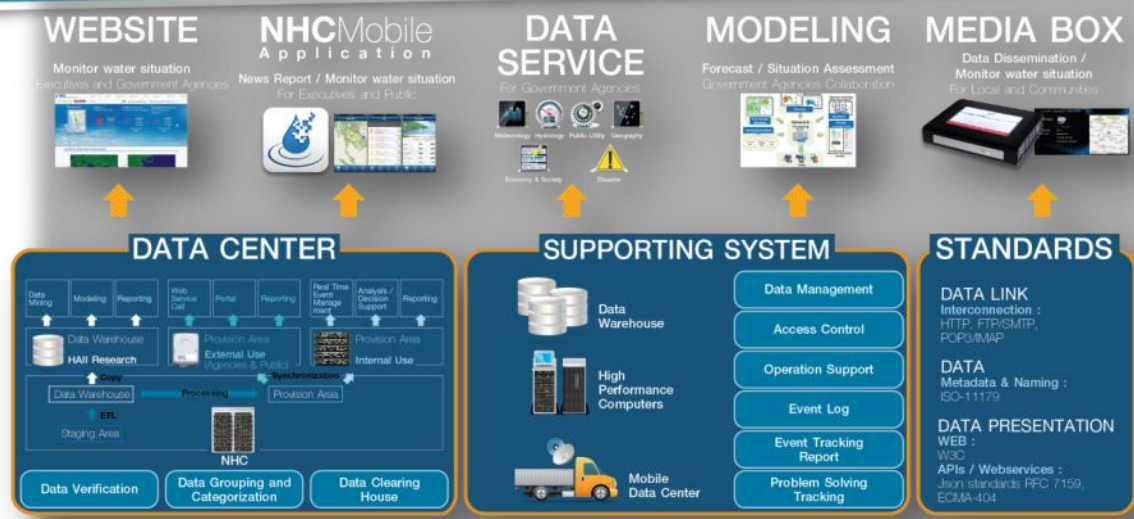


Main Function of NHC

Forecasting and Warning



National Hydroinformatics and Climate Data Center



- **Decision Support** Information System
- **Processing and analysis** of water management information
- **Data integration** and exchange among water related agencies
- **De Facto Standard** flexible data format for monitoring, analysis and forecast of water situation
- Unified water management system for both **normal and crisis situation**

Current Status of NHC's Data linkage

2012-2015



13 agencies

2016



+21 agencies

Houses 388 data items from 34 agencies since 2012



Getting the most out of Hydroinformatics for the benefits of all.

“9 ASPECTS OF HYDROINFORMATICS” SUPPORTING NATIONAL WATER RESOURCE MANAGEMENT SYSTEM



**NATIONAL HYDROINFORMATICS
AND CLIMATE DATA CENTER**
by HAIL



34 GOVERNMENT AGENCIES
Distributed functions, Integrated use



Additional 21 agencies



**Prime Minister Operation
Center (PMOC)**

**National Water Resources
Committee (NWRC)**

**Committee on The Integration of National
Hydroinformatics and Climate Databases**

Chairman: Minister, MOST
Secretariat: HAIL, EGA

9 ASPECTS OF HYDROINFORMATICS

- ▶ Primary Data acquisition
- ▶ Analytical Reports

1 **Short-, Medium- and Long-Range Weather Prediction**
TMD DRPA HAIL HD

2 **Water Management in Irrigated Area**
RID EGAT

3 **Water Management in Rainfed Area**
DWR DGR RID MD LDD

4 **Water Management for Consumption and Industrial Use**
PWA MWA DLA DGR
MOI EGAT RID DDPM

5 **Ecosystem and Water Quality Preservation**
PCD DWR RID DDS PWA
MWA MOI HD DMCR

6 **Disaster Warning and Management**
DDPM NDWC DDS DMR

7 **Water for Electricity Generation**
RID EGAT

8 **Economic and Social Development Planning**
NSO BB NESDB DLA
CDD OAE MOI

9 **Infrastructure for Data Systems**
HAIL EGA DPT GISTDA
NIMT RTSD DOL
NSTDA MD

**Sub-Committee on
Water Situation Analysis and Monitoring**

Chairman: Minister, MOI
Secretariat: DDPM

SINGLE INTEGRATED REPORT

- ▶ Public Announcement
- ▶ Management during Normal situation
- ▶ Management during Crisis situation



Government

Announcement



Public / Press

Management Plans during Normal and Crisis Situation

Operation and Data Usage Agencies

TMD RID DWR EGAT PWA MOST DPT

RTN BMA NDWC DDPM

LAOs NESDB BB

University/Research Institute

N

Normal

C

Crisis

D

Develop / Maintenance

Set water management plan

Business Intelligence
Decision Support System

Warning and Situation Management

Set development direction for stability

Analysis and Forecast

Estimate risk and future trend

Monitor and surveillance

Analyze facts and problems

I

Infrastructures (Hardware / Software / Security / Data Center)

Meteorology

Tools

Measurement Index

NHC

Hydrology

Society

Economy/Investment/Projects

Base Map

Public Utility

Disaster

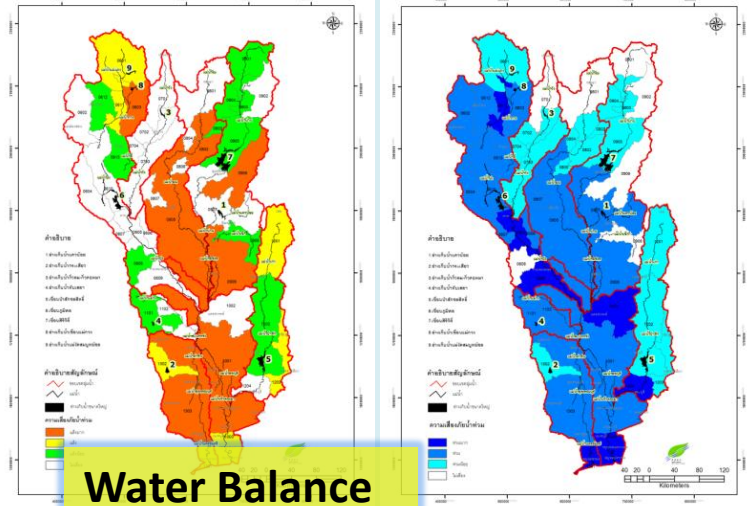
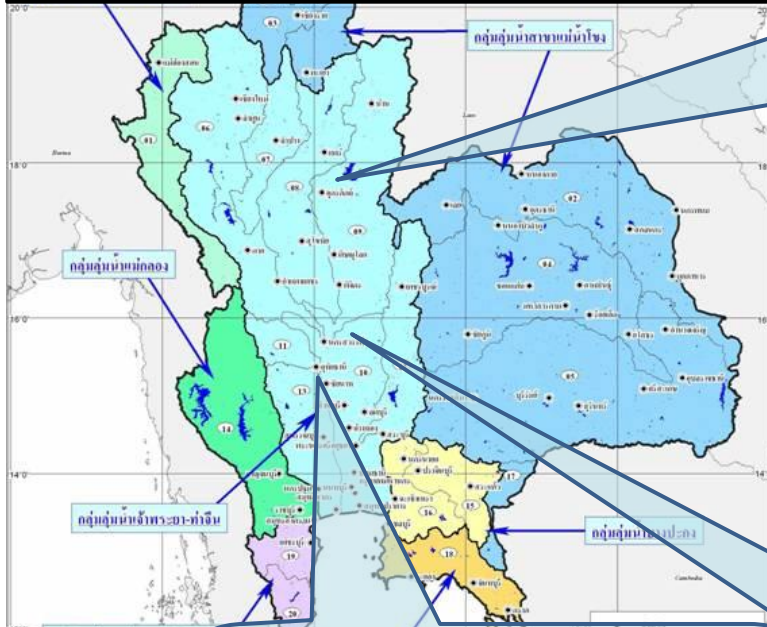
Standards/Rules/Criteria

Shape File

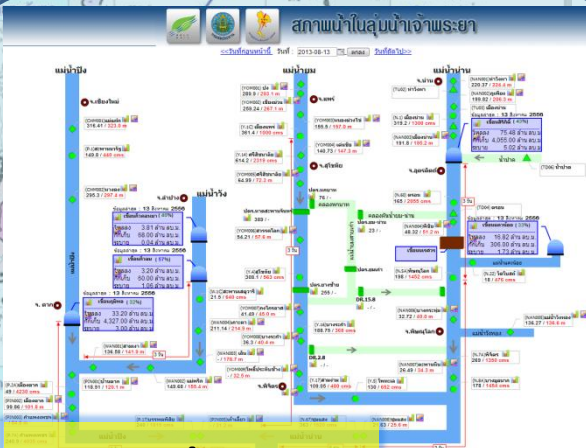
Preliminary Analysis

Operation during Normal Situation

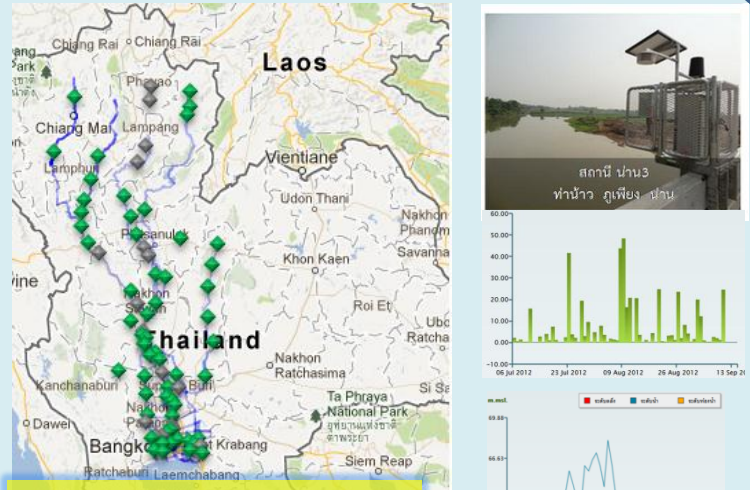
Chao Praya River Basin



Water Balance



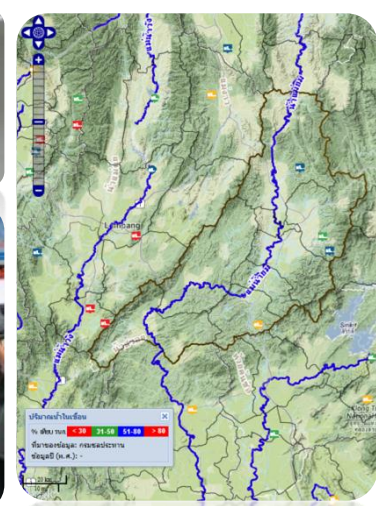
Water Diagram



Observation Data

Provincial Water Management Operation Center

Using area specific information to monitor and manage water situation locally



Phrae	Sukhothai	Phayao	Pichit
 http://nhc.in.th/phrae.html	 http://nhc.in.th/sukhothai.html	 http://nhc.in.th/phayao.html	 http://nhc.in.th/pichit.html



Development of Community Water Resource Management System

To solve flood and drought problems and cope with climate change adaption

S&T Application

- Apply S&T for community survey
- Identify problems and solutions
- Water balance analysis
- Area-based analysis



Engineering/Innovation

- Simple infrastructure design suitable for the socio-geographical condition
- Systematically plan the work process, management and maintenance
- Local innovation



Sustainable Agriculture

- 3 forests, 4 benefits
- Integrated agriculture
- Water quality management



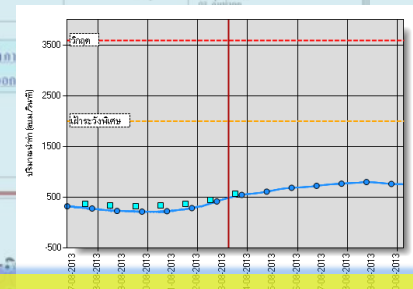
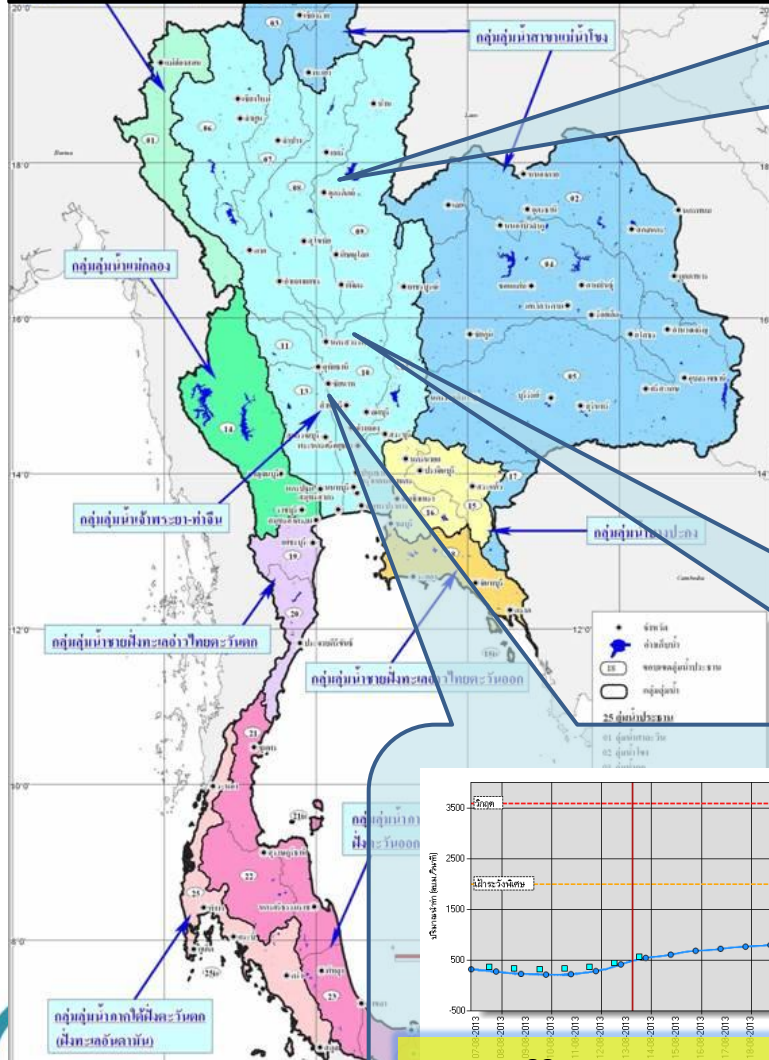
Success

- **Self-sufficiency**
- **Food security**
- **Expand the success to other communities**

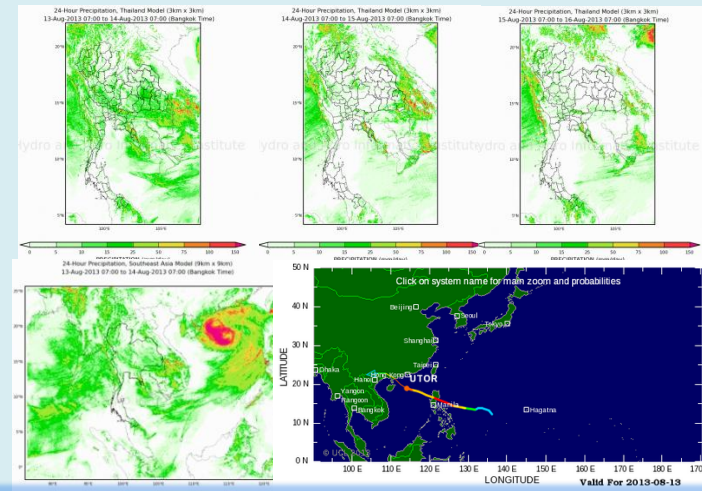


Operation during **Crisis Situation**

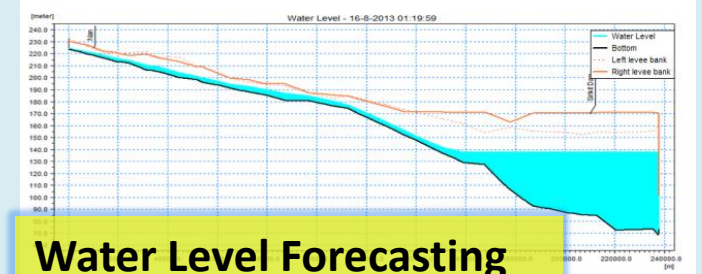
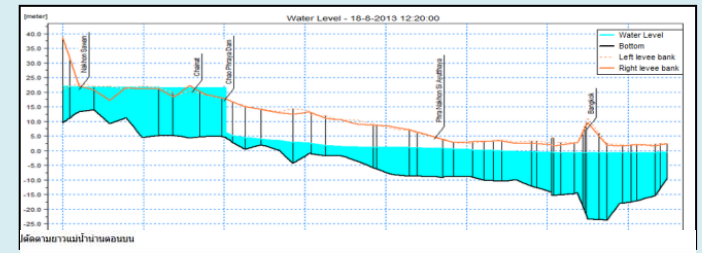
Chao Praya River Basin



Runoff Forecasting



Precipitation Forecasting & Storm Tracking



Water Level Forecasting

Emergency Mobile Data Center

Providing information and analysis for decision making

Co-operative flood prevention and mitigation in Southern Thailand
3 – 10 October 2014

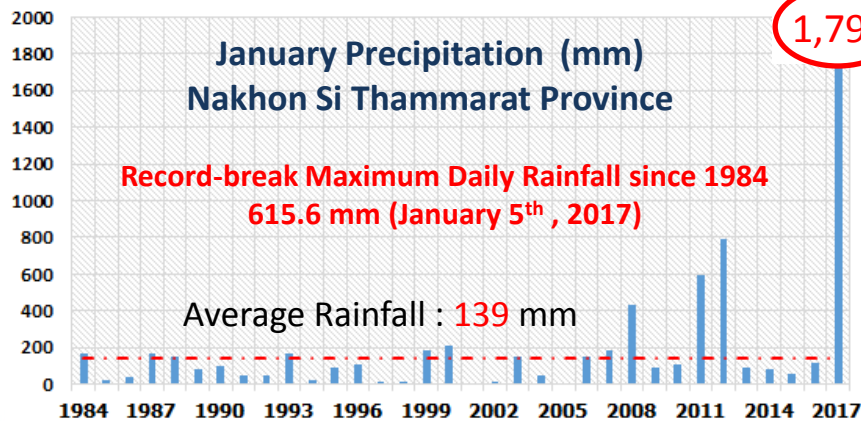
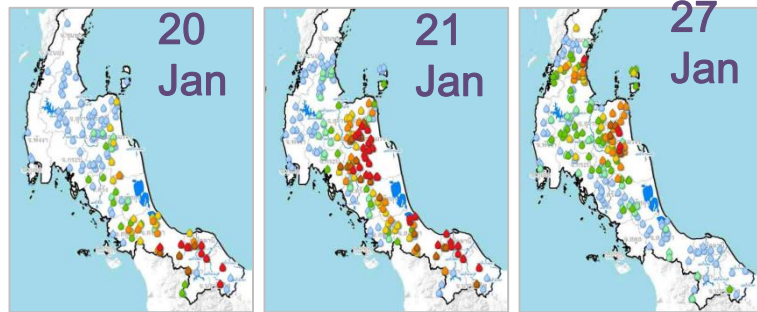


Emergency Mobile Data Center to support water management operation during **Crisis**

- 24 hours situation monitoring
- Identifying risk area and promptly issuing warning
- Effective and prompt situation management planning
- Preventing and alleviating damages and impacts from flooding into households and economically critical areas

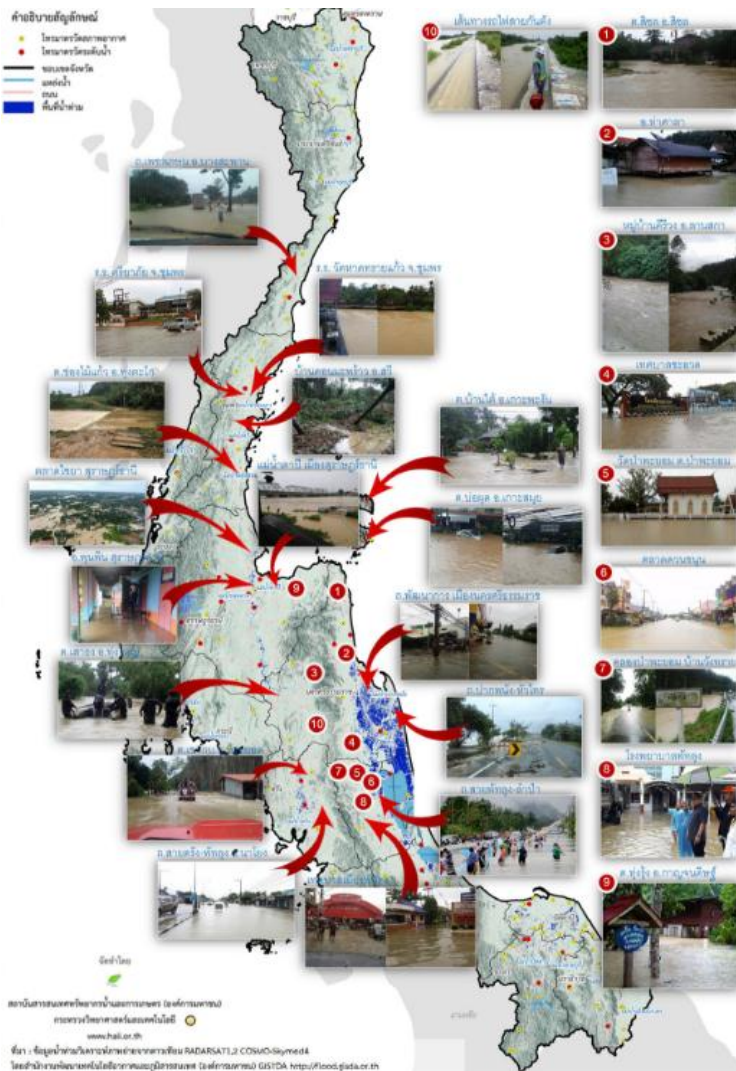
Thailand Flood in Dec 2016 – Jan 2017 : Southern Region

Online Rainfall and WL Monitoring



Source: TMD (NakhonSi Thammarat Agromet)

Flooded areas in Dec 2016



Emergency Operation Center



Emergency Operation Units



