



Hydro and Agro Informatics Institute

Ministry of Science and Technology
Thailand

FDMT for Drought Assessment in Thailand

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Thailand's droughts in 2015

Severe droughts, particularly in the upper-middle part of the country

Ping River

Phayao Lake

Khwa Noi
Bamrungdan Dam

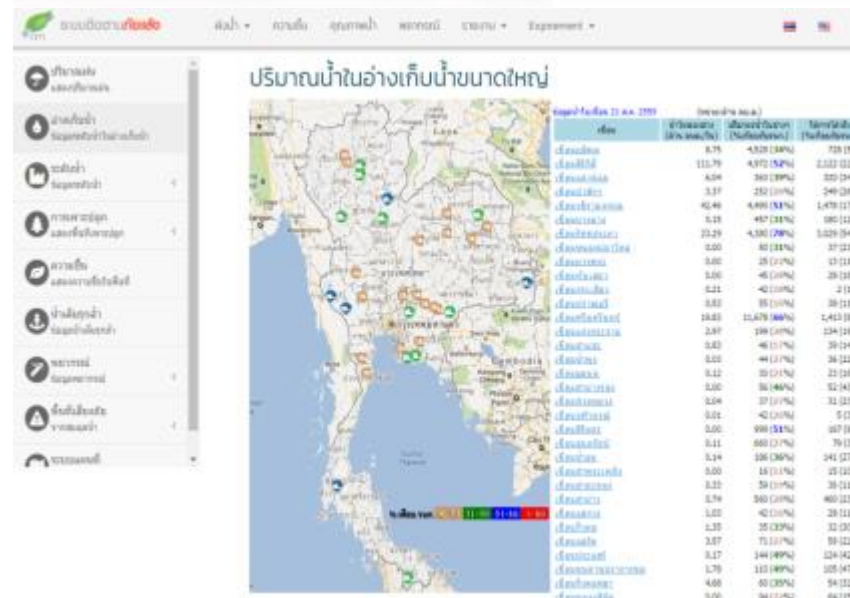
Ubolratana Dam

Chiang Mai

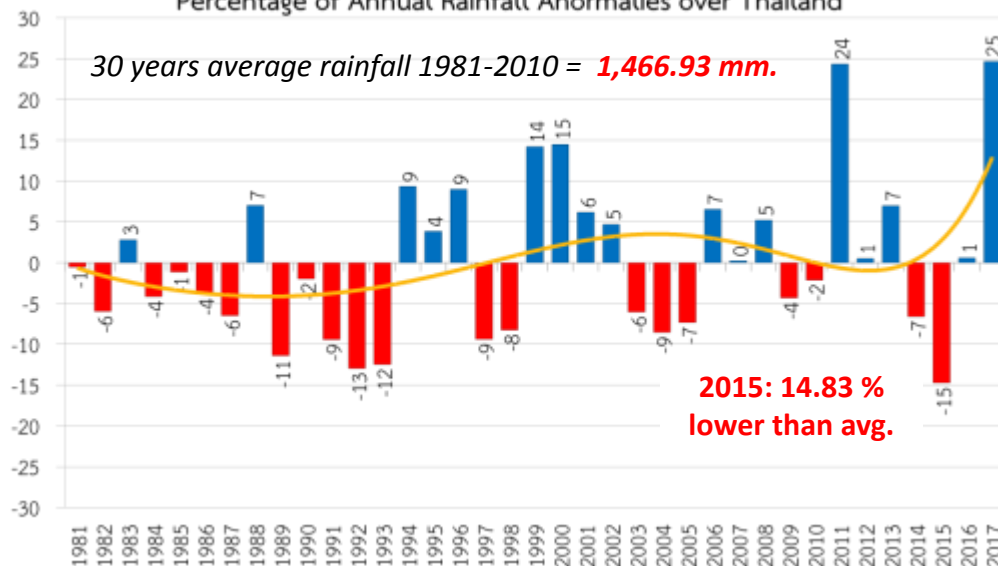
Phayao

Phitsanulok

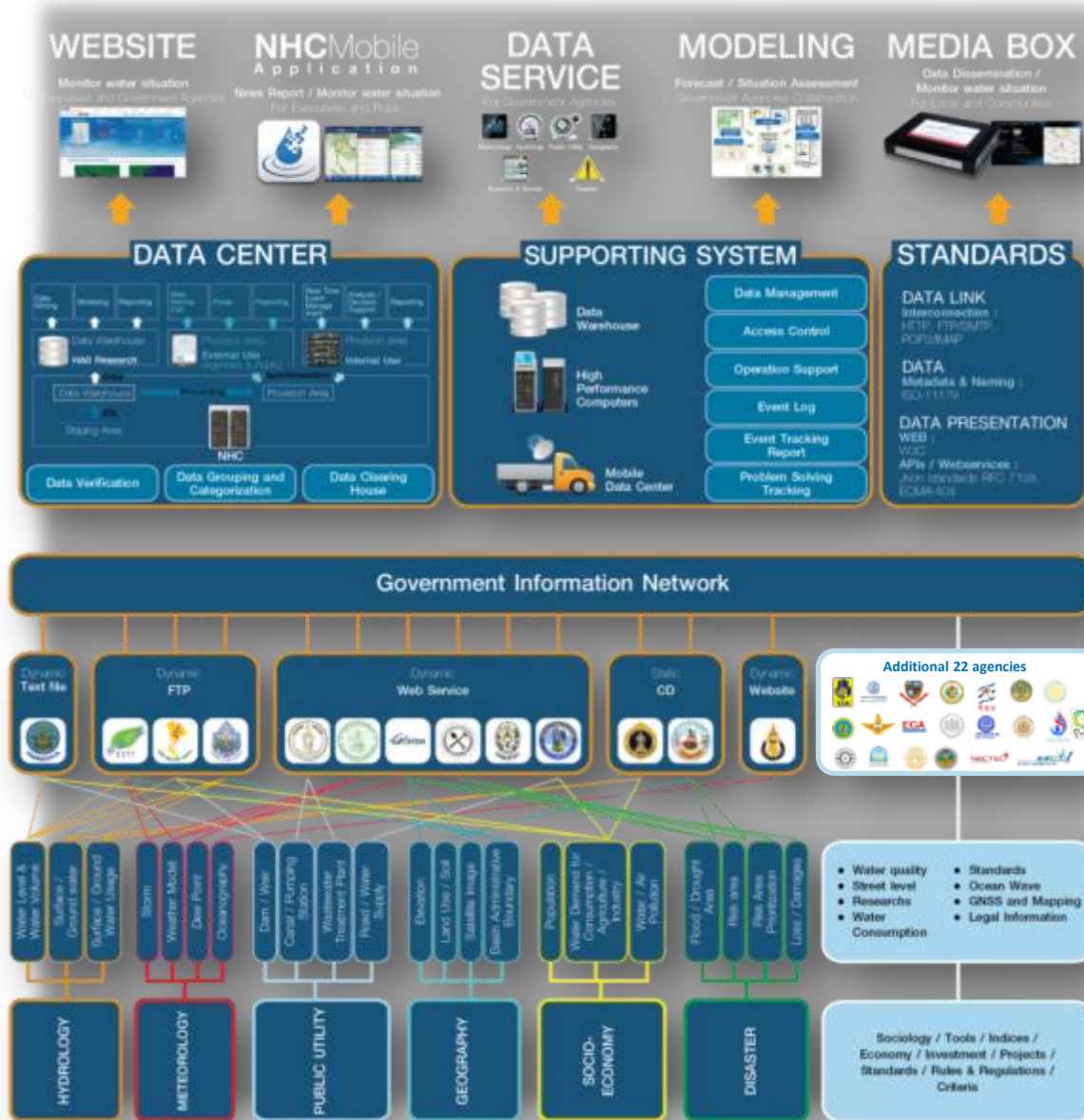
Khon Kaen



Percentage of Annual Rainfall Anomalies over Thailand



National Hydroinformatics and Climate Data Center (NHC)



- **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**

▶ The process and integrated function chart of NHC with the collaboration of the Government Operation Centers to support National Water Resources Management

Prime Minister Operation Center (PMOC)

Committee on The Integration of National Hydroinformatics and Climate Databases

Chairman: Minister, MOST
Secretariat: HAI, EGA

- Primary Data Acquisition and Analytical Reports
- Report 9 Aspects of Hydroinformatics for Water Resource Management

National Water Resources Committee

Office of the National Water Resources

Single Integrated Report

- Public Announcement
- Normal and Crisis Operation

Water Resource Management Center

**Regional Level
Provincial Level**

On process

4

Smart Water Operation Center (RID)



Data in Irrigation Area

Pollution Control Department Operation Center

- Use data/model from NHC to develop waste water model

Water Quality Data
Discharge Data

Hydrodynamic model

Water related Disasters Data Operation Center (DDPM)

- Preparing data to be linked to Water-related disaster and E-stock management to NHC

Future Operation Centers

35 Government Agencies

Distributed functions,
Integrated use



Data Warehouse

Data Exchange and Improvement

Develop and Utilize modelling

Reservoir data

Improve reservoir
inflow
forecasting
model

Rainfall
data from
Radar

Visualize
spatial
distribution
and forecasting
of rainfall



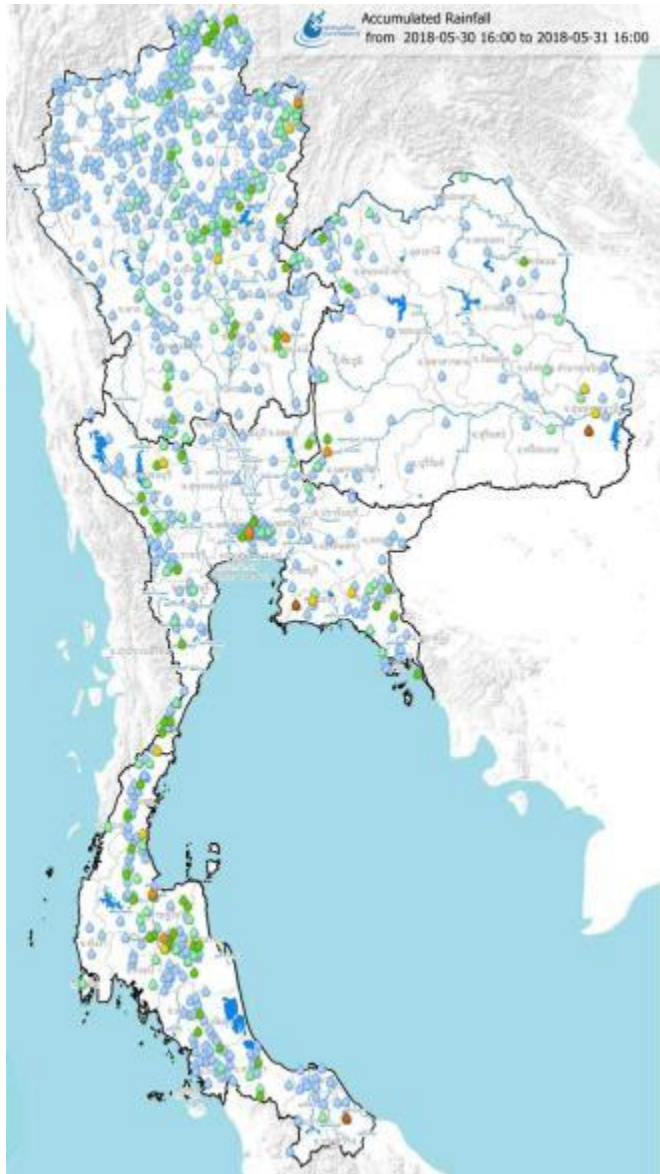
Electricity Generating Authority of Thailand (EGAT)

- Improve reservoir inflow and release forecasting



Department Operation Center, Royal Rainmaking Department (DOC)





Thailand's Rain Gauge Stations

Drought Monitoring

- **Drought monitoring** mainly refers to rainfall data from rain gauge stations

Drought Definition

- No continuous **rainfall** within 7-15 days and rainfall is less than 1 mm/day.
- Lack of **water supply and demand**.
- Effect of drought on **agricultural area and crop growth**.
- Effect of drought on **soil moisture status**.

Limitations of Drought Monitoring in Thailand

- Point monitoring based on rain gauges
- Using only rainfall data which does not cover or reflect other related drought problems
- HAII collaborates with IWA and DHI to **develop Flood and Drought Monitoring Tools**.
- **FDMT web portal** is an online tool that provides a series of web based technical tools and readily available satellite data which can be used individually or collectively to incorporate information about floods and droughts.

Automatically send the report to all stakeholders

Overview of the report

- **Drought information** is provided in the report for all water management-related stakeholders.
- Drought related data is generated from the portal as a **map, table and graph**.
- **Advantages** of the report
 - ✓ Present **drought current status** of Thailand
 - ✓ Various water related satellite data are readily available such as **Precipitation, Vegetation, Soil Moisture, and combined indicators to generate drought indices**
 - ✓ **Easy to use, semi-automatic report generation tool**

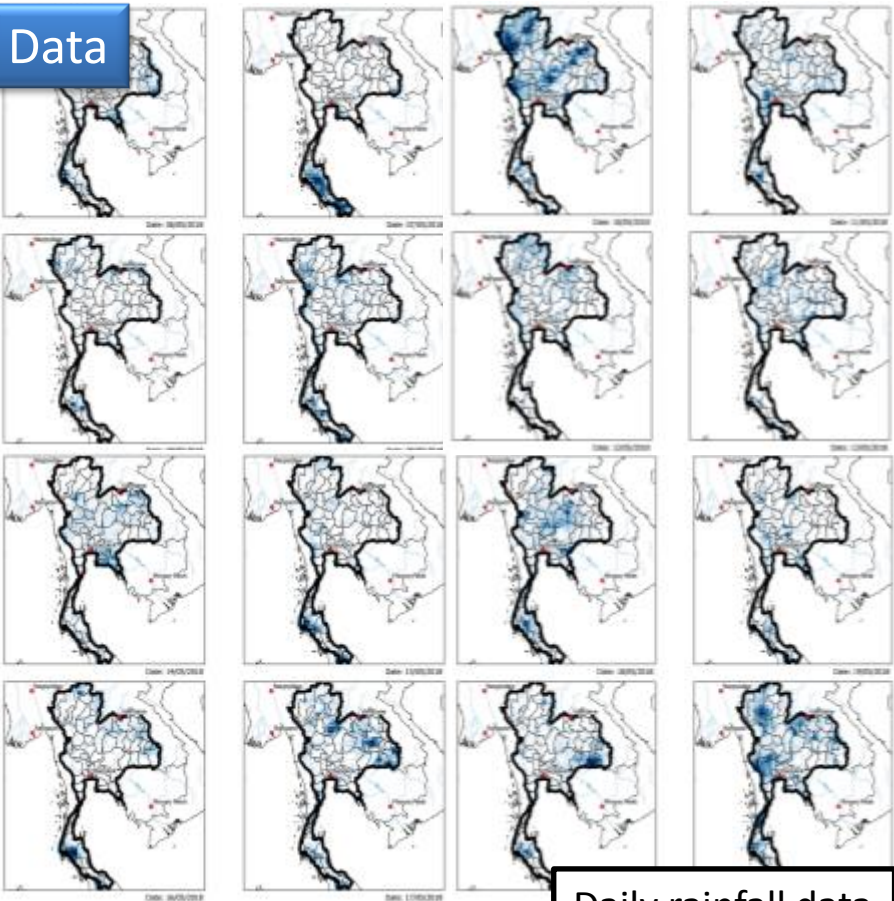


รายงานสถานการณ์ภัยแล้ง

ประจำวันที่: 2/10/2018

Flood and Drought web portal: Selected data in Drought report

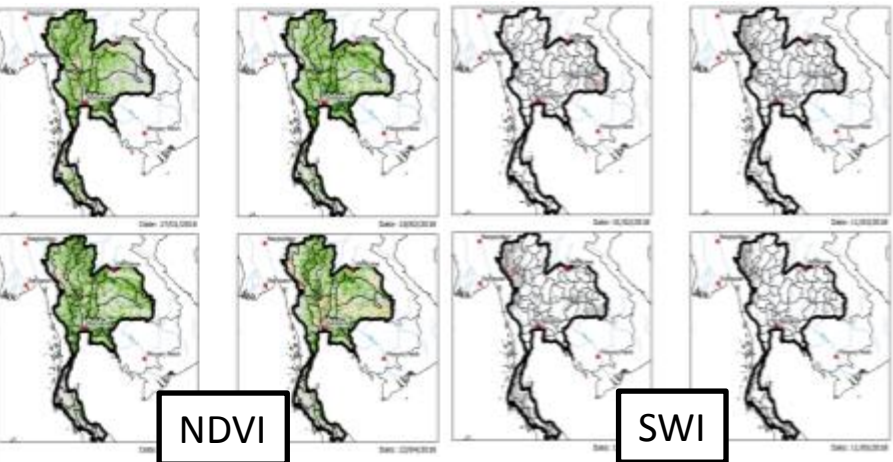
Data



Daily rainfall data

Daily Rainfall

- Monitoring of **spatial rainfall distribution**



NDVI

SWI

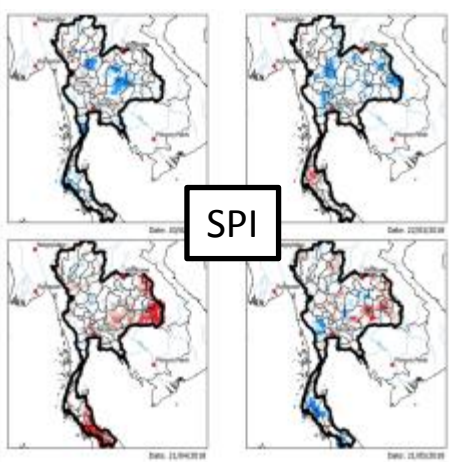
Computed Data

NDVI

- Monitor **health and density** status of agricultural area.

SWI

- Monitor **moisture and dry** status of soil.



SPI

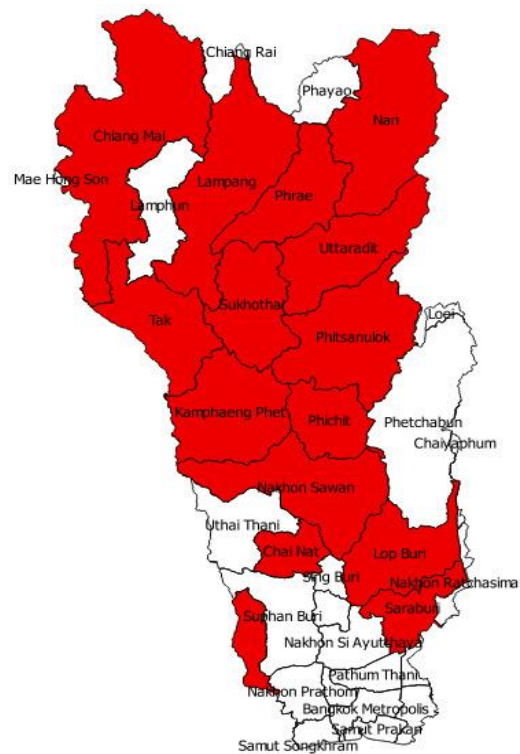
Drought Index

SPI

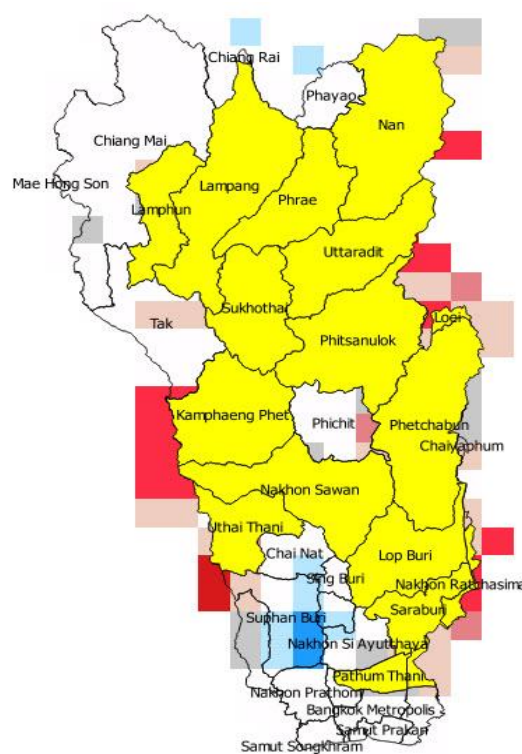
- Monitor and indicate **risk area** of drought.

Drought Indices Validation in 2015

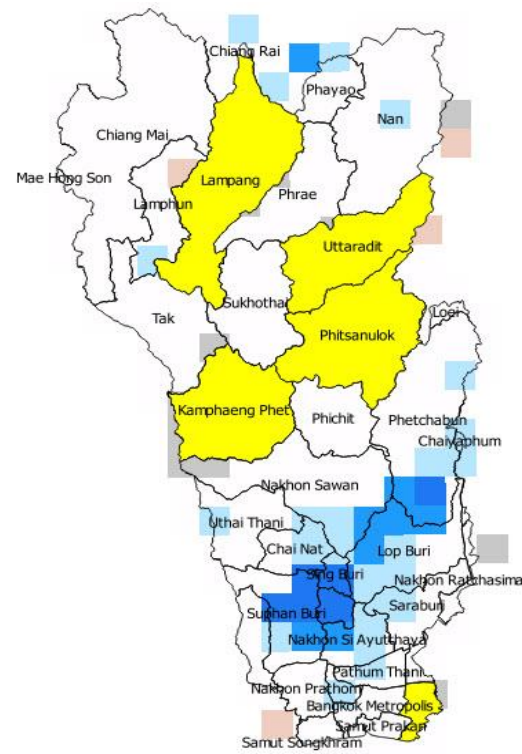
Drought area in 2015



SPI Validation



EDI Validation



Drought Area in 2015

Chiang Mai

Phrae

Kanchanaburi

Kamphaeng Phet

Chalnat

Tak

Nakhon Sawan

Nan

Phichit

Phitsanulok

Ratchaburi

Lopburi

Lampang

Saraburi

Sukhothai

Uttaradit

Drought Area from SPI

Phrae

Kamphaeng Phet

Nakhon Sawan

Nan

Phitsanulok

Lopburi

Lampang

Saraburi

Sukhothai

Uttaradit

Drought Area from EDI

Kamphaeng Phet

Phitsanulok

Lampang

Uttaradit

1. FDMT web portal has shown its potential in providing support data for drought management by combining several satellite data with the reporting tools.
2. Drought indices show promise to use indices for drought planning in Chao Phraya river basin.