

GROUNDWATER MONITORING NETWORK IN THAILAND

Thanyarat Sriamma, Wasana Sartthaporn

Department of Groundwater Resources

Bureau of Groundwater Conservation and Restoration

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OUTLINES



Groundwater Monitoring Network Design



Groundwater Monitoring Measurement



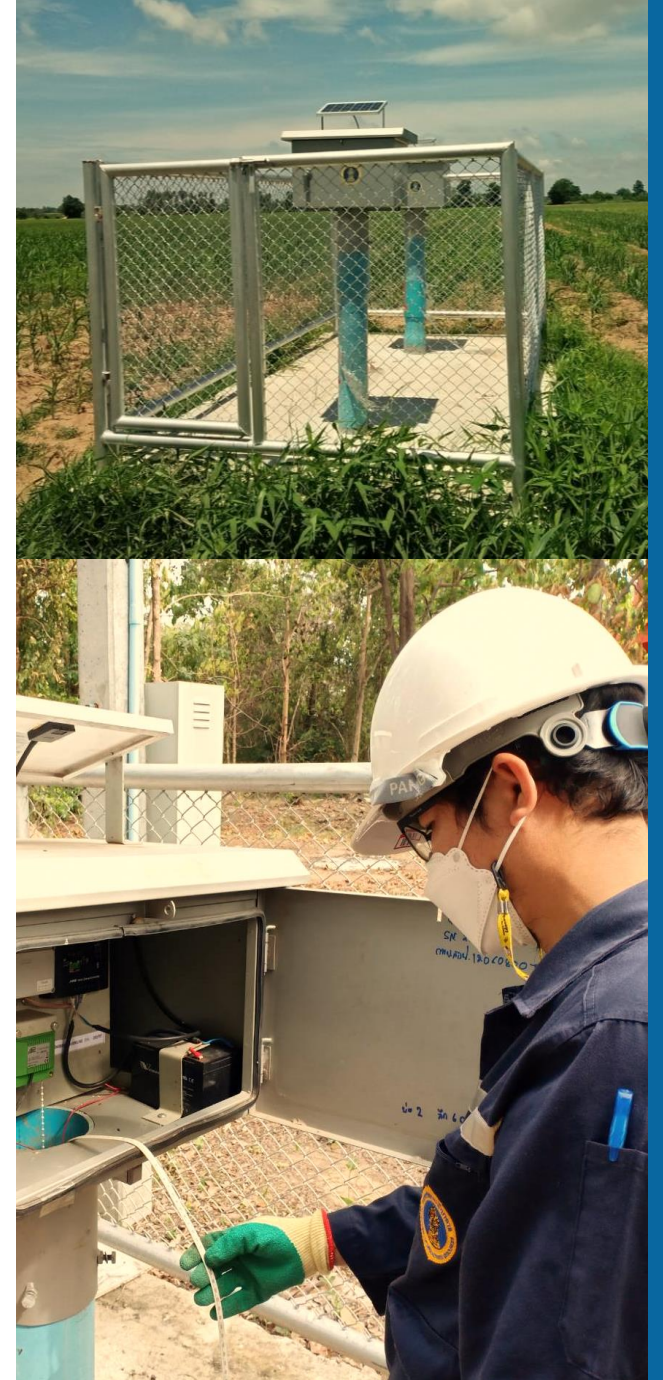
Thailand Groundwater Monitoring System (TGMS)



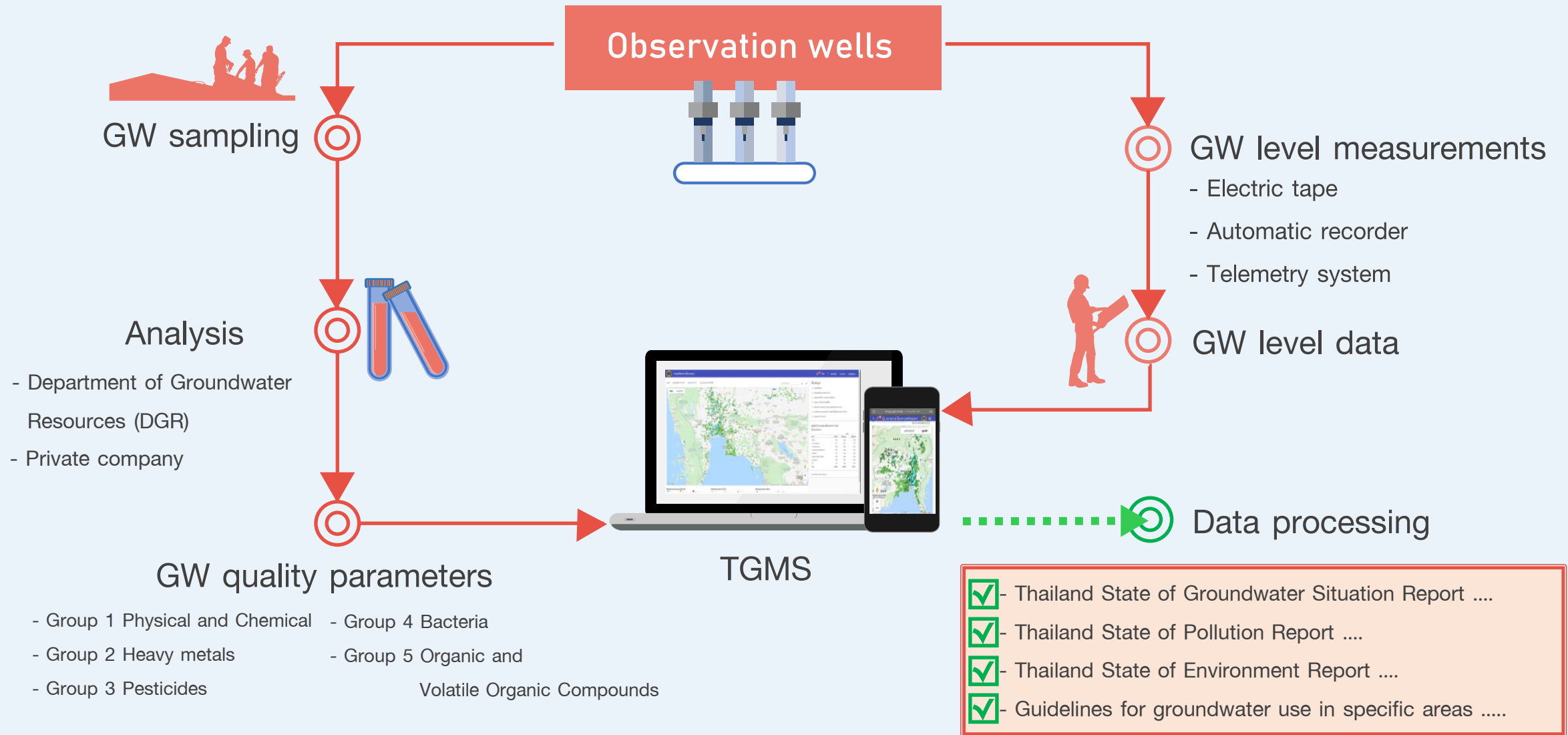
Analysis of Groundwater Level and Groundwater Quality



Groundwater Monitoring Data Utilization



Groundwater Monitoring System





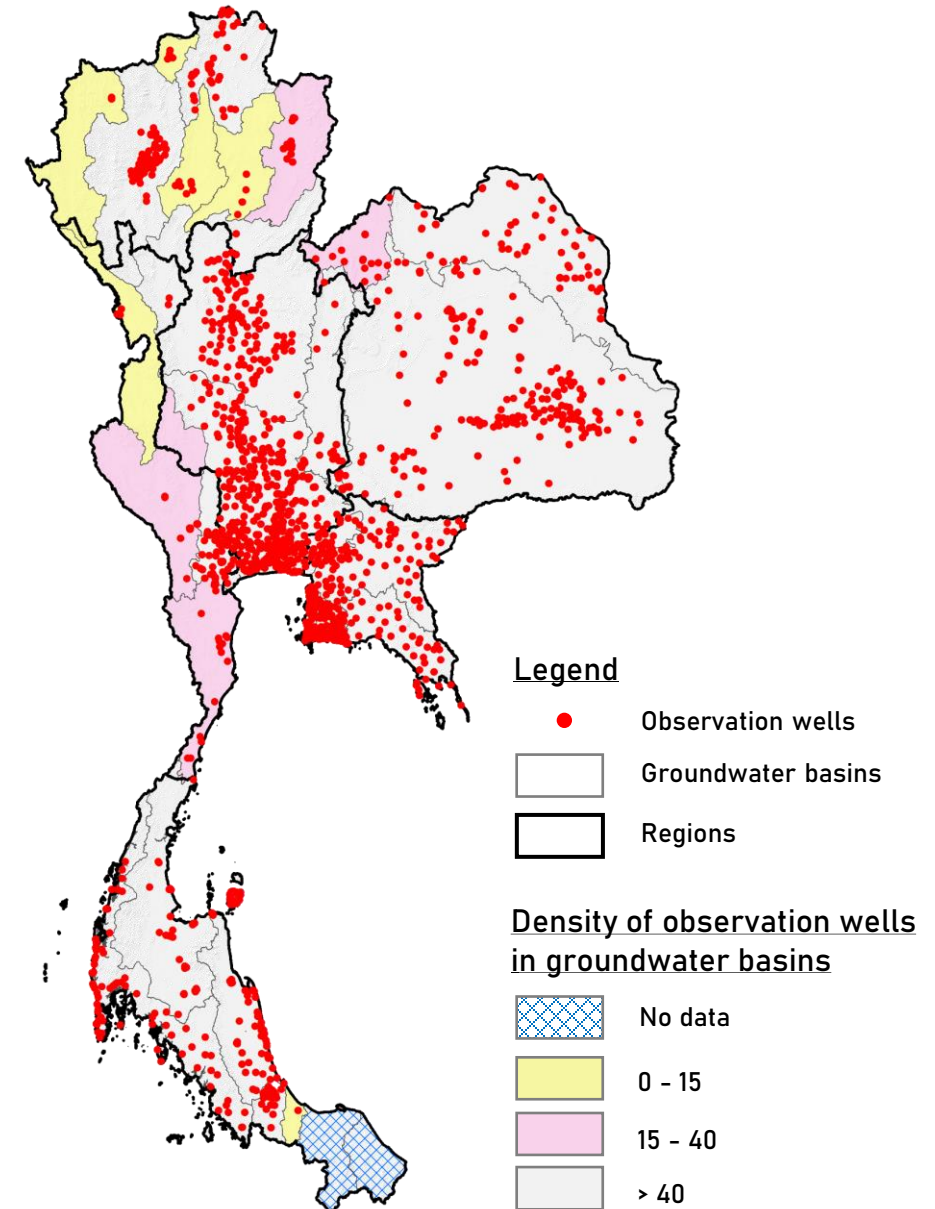
Groundwater Monitoring Network Design

1. Regional Groundwater Monitoring Networks

- Covering 27 groundwater basins.
- In the study, These networks should add 4,558 monitoring wells by 6 criteria.



- (1) Number of monitoring wells in the present.
- (2) Land use.
- (3) Groundwater development and groundwater consumption.
- (4) Risk of groundwater contamination.
- (5) Risk of geohazard affected groundwater resources.
- (6) Transboundary aquifer of ASEAN Community.





Groundwater Monitoring Network Design

2. Local Groundwater Monitoring Networks

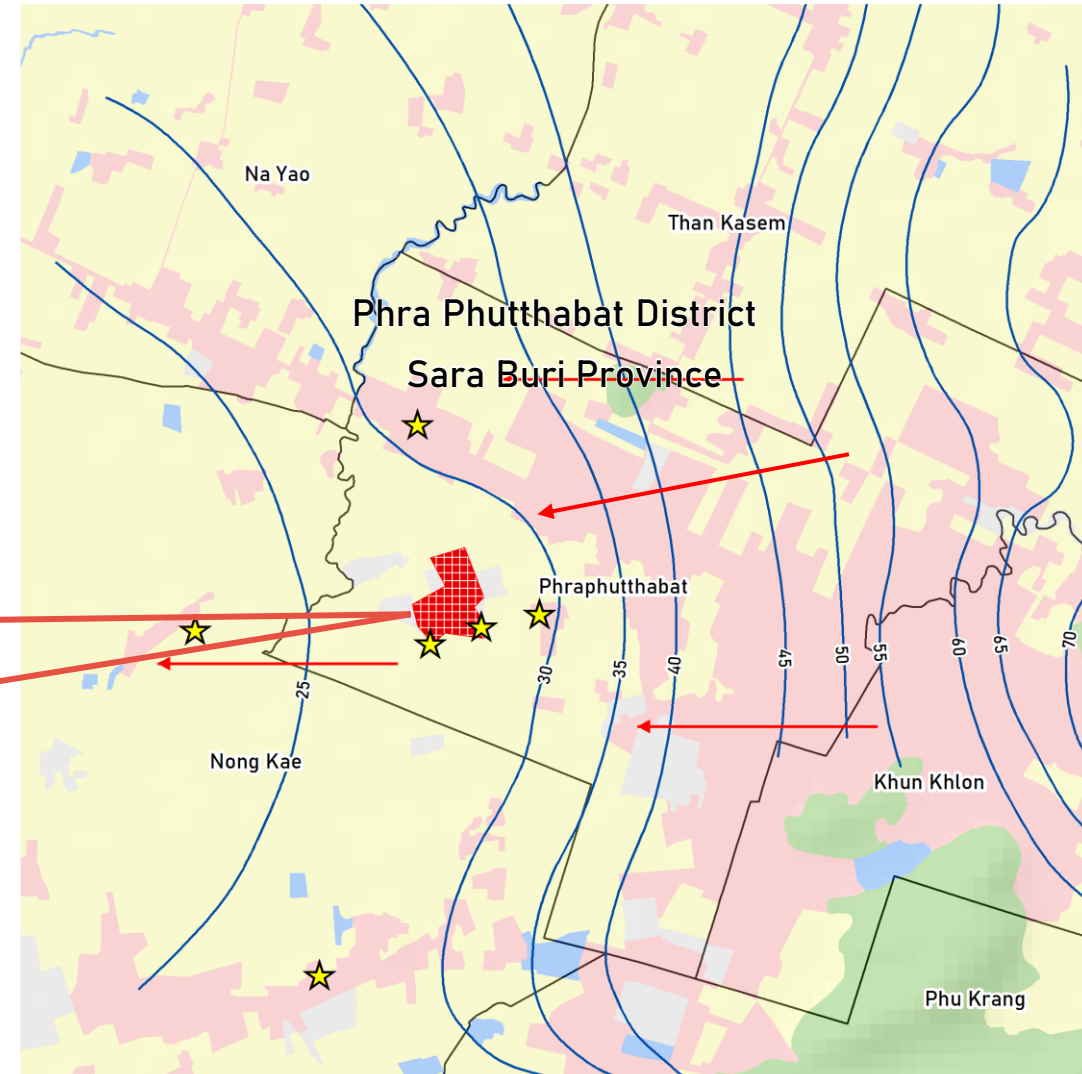
- Risk area of contamination such as landfills, industrial waste disposal areas.
- Losing the water balance area such as the areas with high demand of groundwater use.



Legend

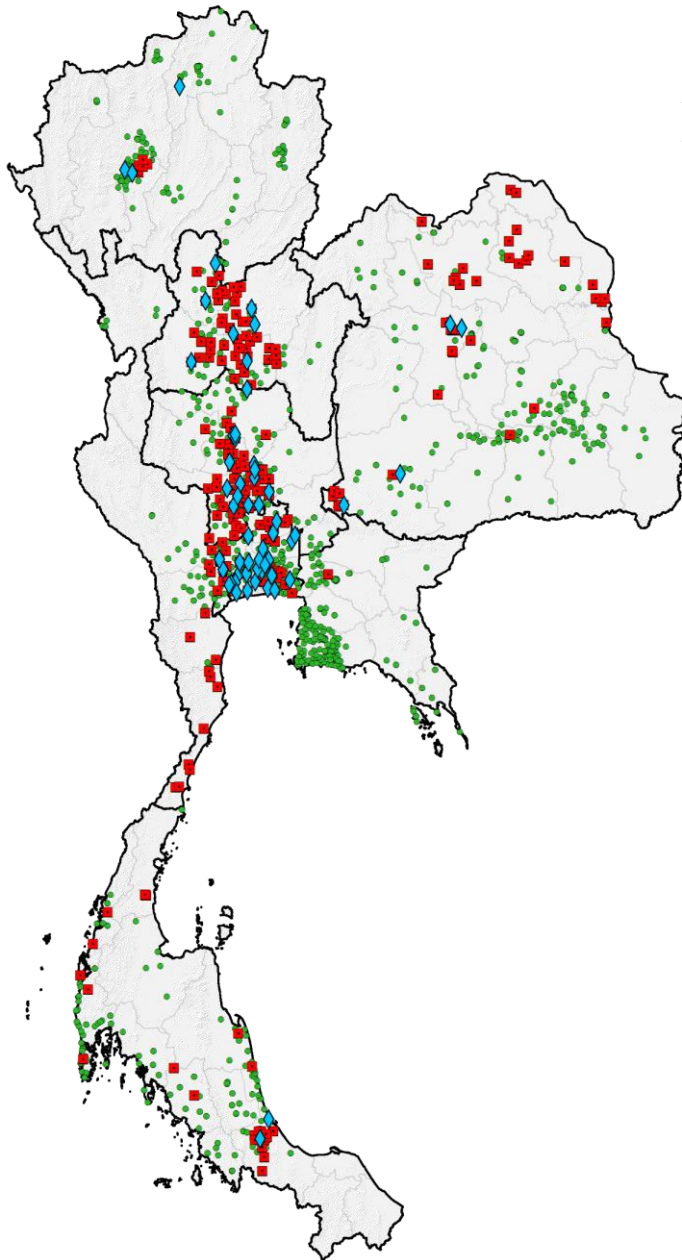
- ★ Observation wells
- Water table contour
- Flow direction
- Landfills

Landfill in Phra Phutthabat Subdistrict,
Phra Phutthabat District, Sara Buri Province.



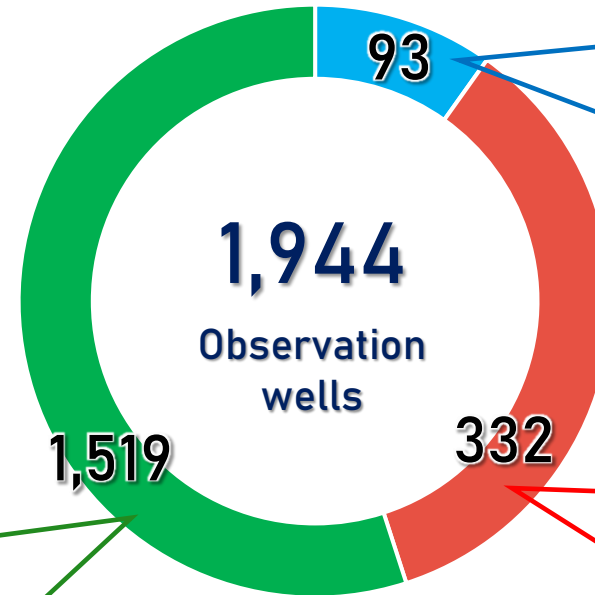


Groundwater Level Measurement



Groundwater level measurement

- ◆ Telemetry system
- Automatic recorder
- Electric tape



Telemetry system



Electric tape



Automatic recorder



Thailand Groundwater Monitoring System (TGMS)

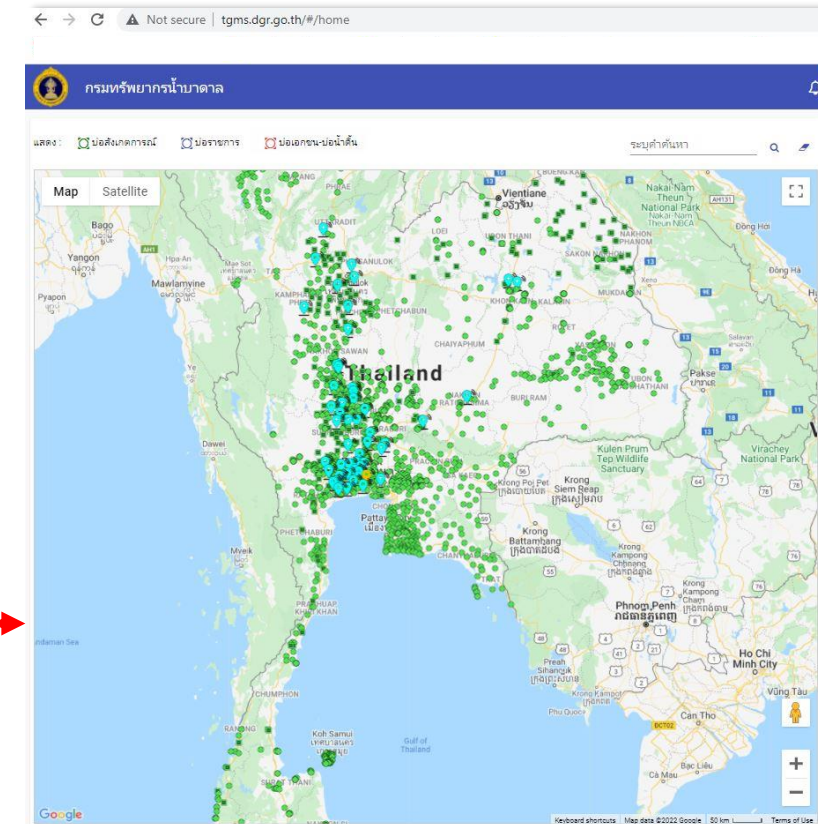
Website access

- Department of Groundwater Resources website : <http://www.dgr.go.th/th/home>
- Thailand Groundwater Monitoring System : <http://tgms.dgr.go.th/#home>

<http://www.dgr.go.th/th/home>

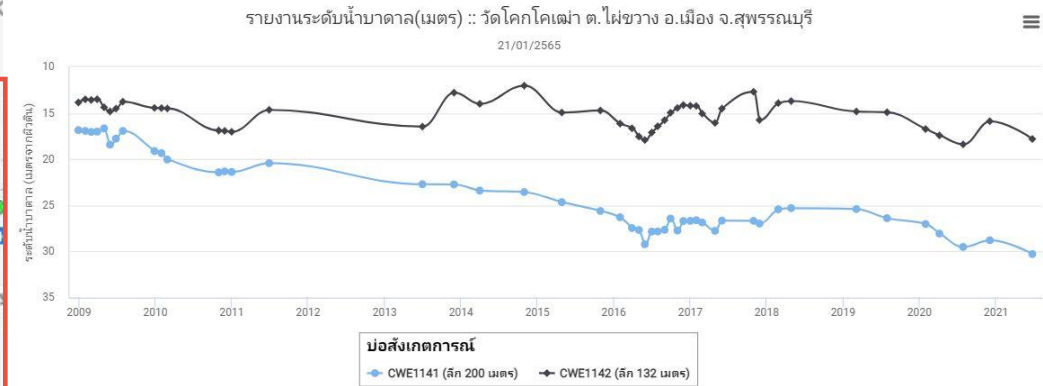
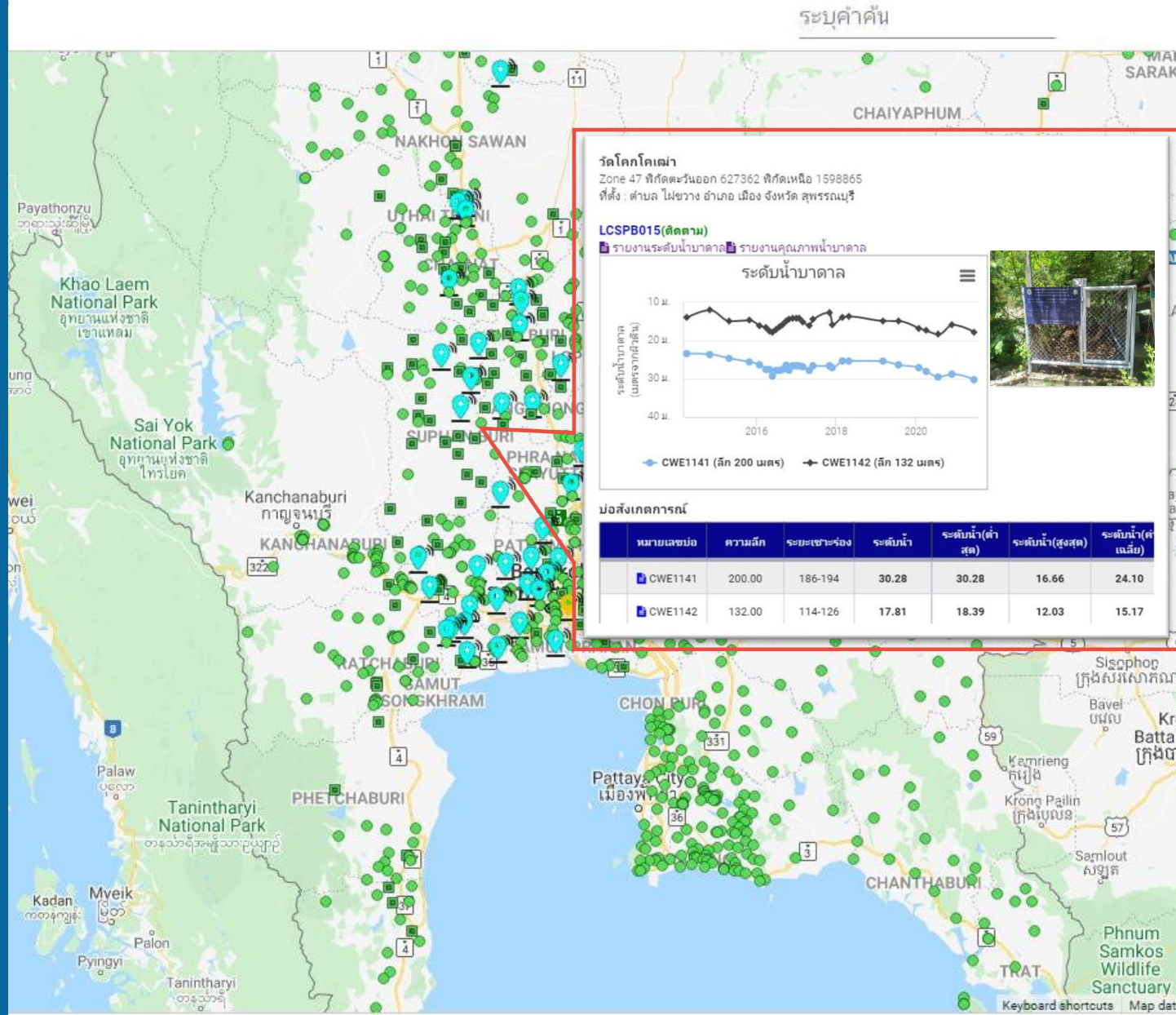


<http://tgms.dgr.go.th/#home>





Thailand Groundwater Monitoring System (TGMS)



เลือกปี 2564

CWE1141

เลือกจุดตรวจวัด

เลือกวันที่ตรวจ

ค้นหา

ส่งออก

กลุ่มที่ 1 ทางกายภาพ และเคมี

ลำดับ	ดัชนีคุณภาพน้ำ	ค่าตรวจวัด	หน่วย	ผลวิเคราะห์
1	ความเป็นกรด-ด่าง (pH)	8.1000		อยู่ในเกณฑ์
2	การนำไฟฟ้า (EC)	532.0000	µS/cm	n/a
3	ความขุ่น (Turbidity)		NTU	อยู่ในเกณฑ์
4	สี (Colour)		ADMI	อยู่ในเกณฑ์
5	แคลเซียม (Calcium)	25.0000	mg/l	อยู่ในเกณฑ์
6	แมกนีเซียม (Magnesium)	12.0000	mg/l	อยู่ในเกณฑ์
7	โซเดียม (Sodium)	79.0000	mg/l	n/a
8	โพแทสเซียม (Potassium)	5.0000	mg/l	n/a
9	เหล็ก (Iron)	0.2000	mg/l	อยู่ในเกณฑ์
10	แมงกานีส (Manganese)	0.0000	mg/l	อยู่ในเกณฑ์
11	ซัลเฟต (Sulfate)	12.0000	mg/l	อยู่ในเกณฑ์
12	คลอไรด์ (Chloride)	22.0000	mg/l	อยู่ในเกณฑ์
13	ฟลูออไรด์ (Fluoride)	1.8000	mg/l	เกินเกณฑ์อนุโมหะสูงสุด
14	ไนเตรต (Nitrates)	< 0.9000	mg/l	อยู่ในเกณฑ์
15	ปริมาณสารทั้งหมดที่ละลายได้ (Total Dissolved Solids)	346.0000	mg/l	อยู่ในเกณฑ์



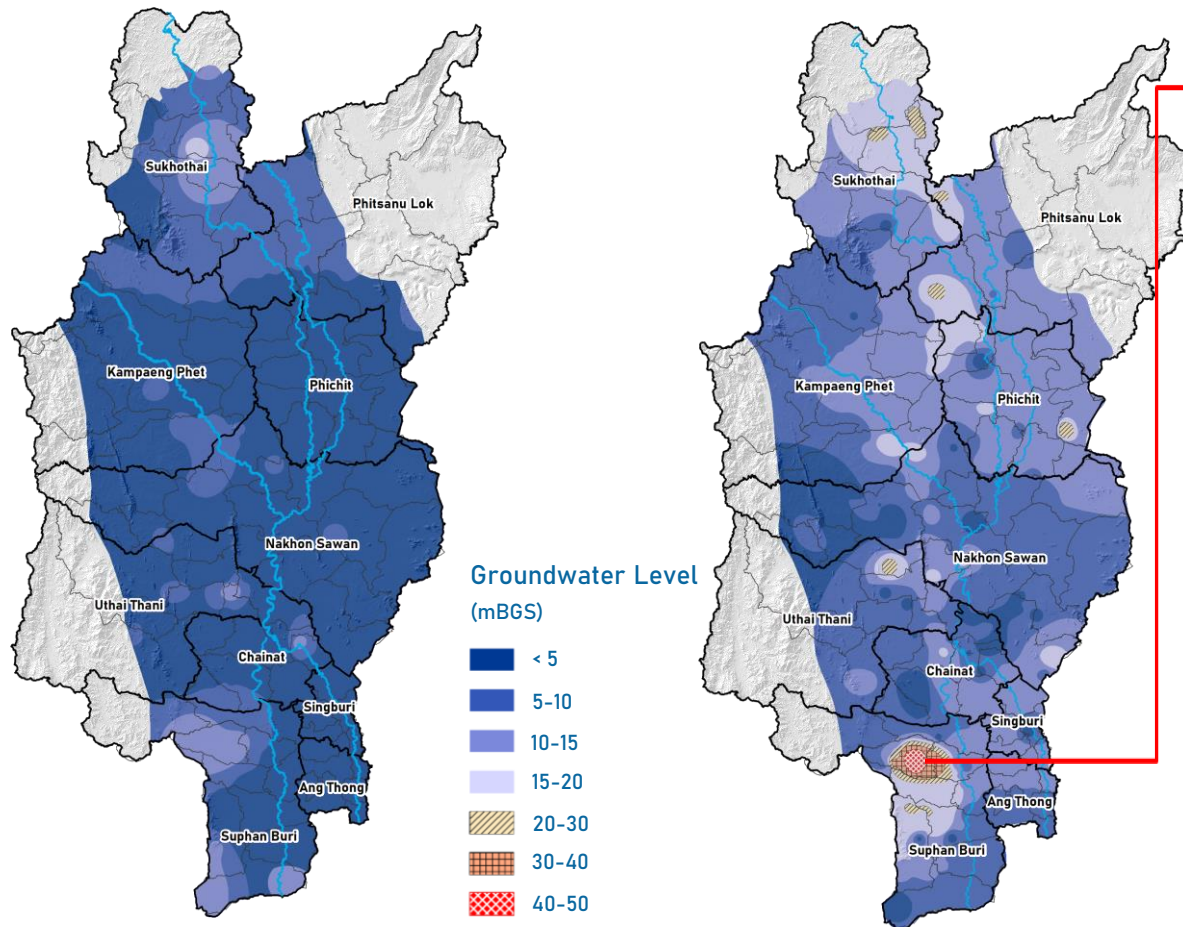
Analysis of groundwater level and groundwater quality

Central Thailand

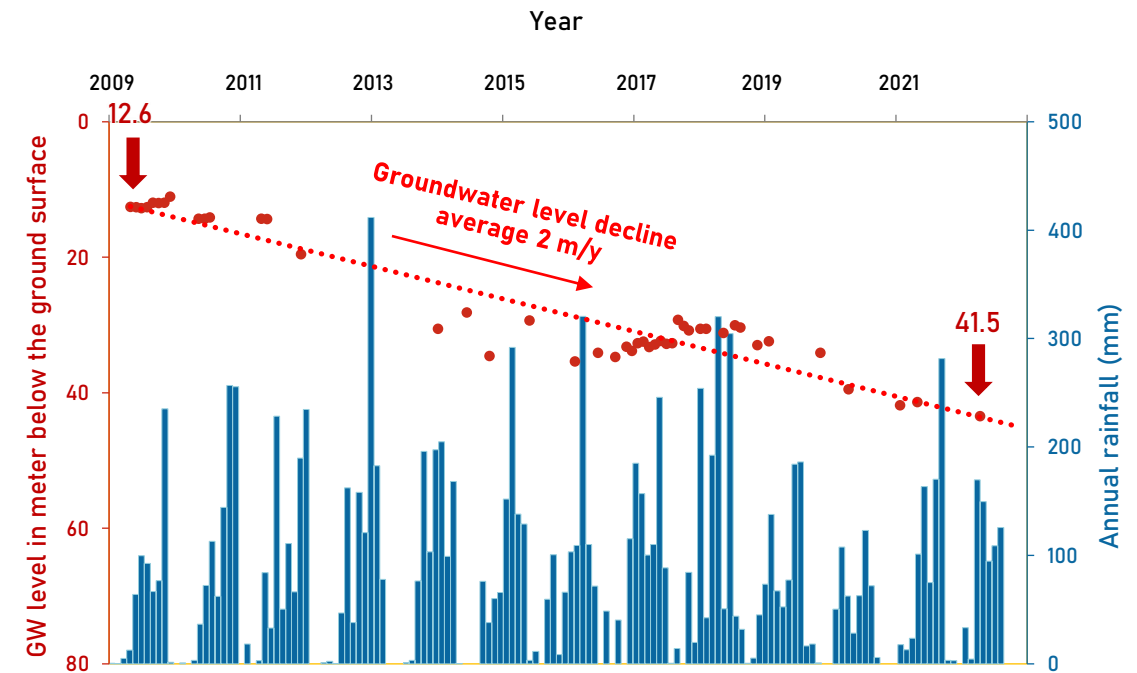
Groundwater level change in shallow aquifer (<50 m)

2009

2021



Nong Ya Sai Subdistrict, Nong Ya Sai District
Suphan Buri Province



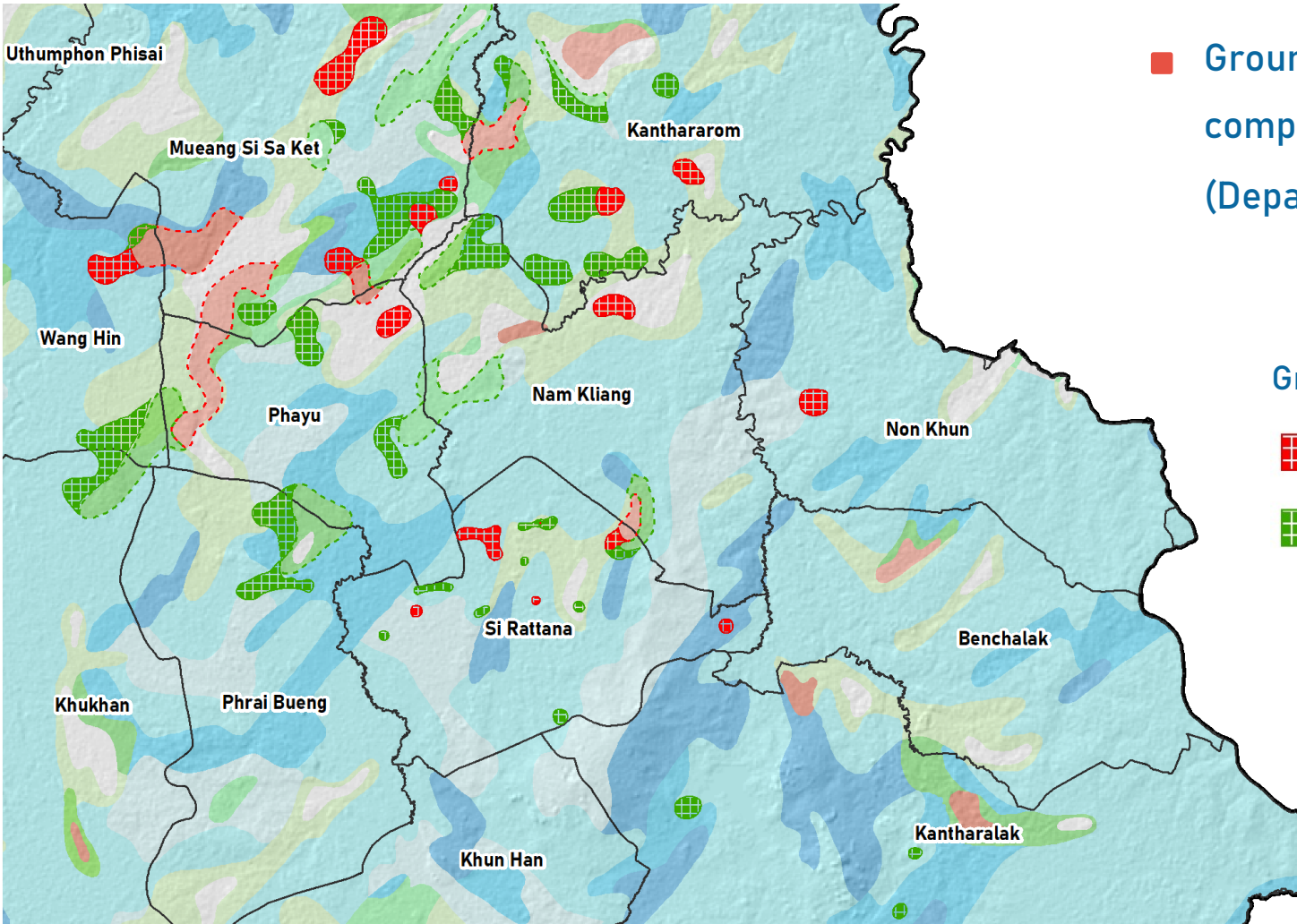
Groundwater level expressed in meters Below the Ground Surface (mBGS)



Analysis of groundwater level and groundwater quality



Northeastern Thailand
















Groundwater quality change in Si Sa Ket Province



■ Groundwater quality from survey in 2021
compare with Groundwater Map in 1990
(Department of Mineral Resources, 1990)

Groundwater quality from survey in 2021

 brackish water
 salt water

Groundwater Availability index Expected Well Yield (m ³ /hr)		< 2	2 - 10	10 - 20	20 - 30	> 30
TDS (mg/L)	< 500					
	500 - 1,500					
	> 1,500					

Remark : < Less Than
> More Than



Analysis of groundwater level and groundwater quality

**Southern
Thailand**

Distribution of chloride concentration in the groundwater, Songkhla Province

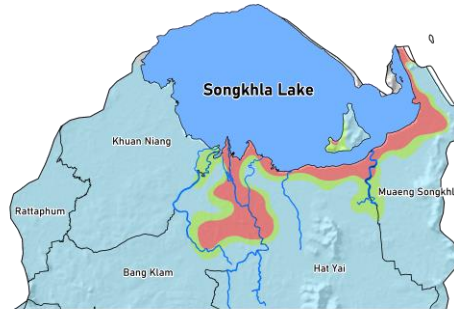
Hat Yai basin

**Hat Yai aquifer
20-50 m**

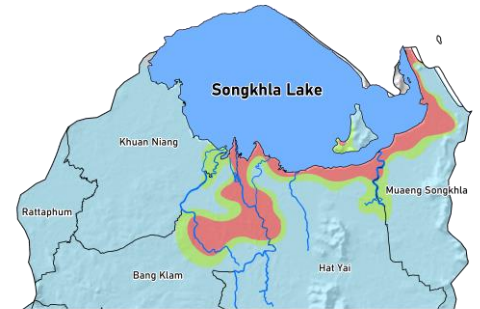
2007



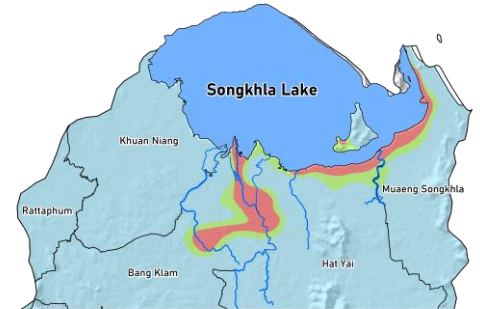
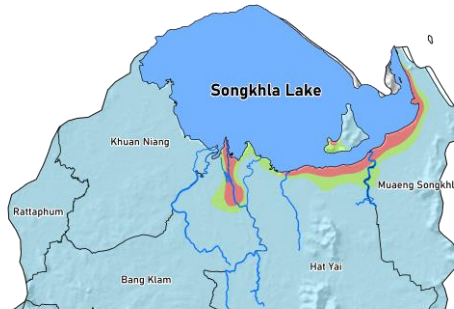
2012



2021



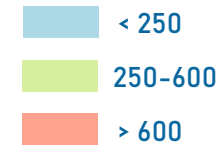
**Kutao aquifer
60-100 m**



**Korhong aquifer
> 100 m**



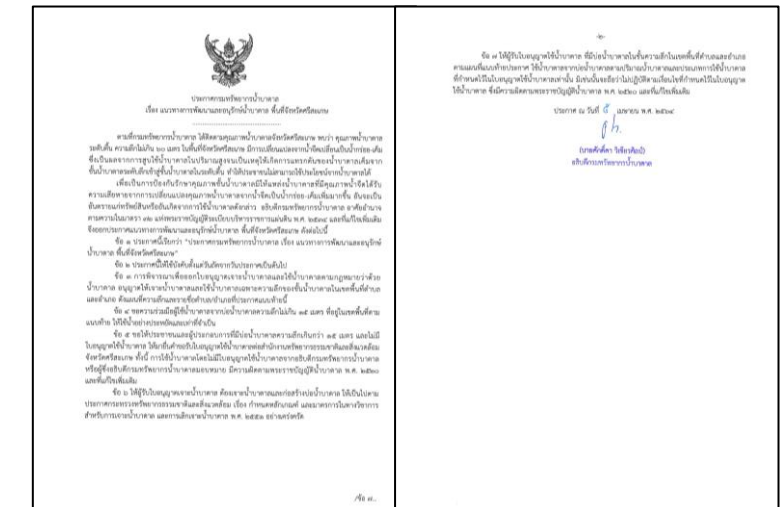
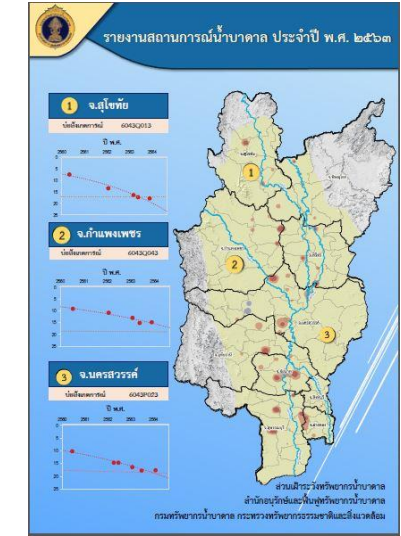
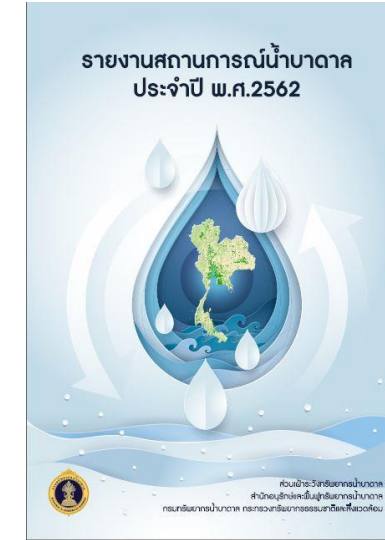
Chloride (mg/L)





Groundwater Monitoring Data Utilization

- The annual report has been prepared for describing the groundwater situation.
- The annual report of groundwater monitoring has been applied for creating regulations and suggested that guidelines for groundwater development and conservation in specific areas, e.g., Si Sa Ket Province and Songkhla Province.
- Groundwater monitoring data is an important data to increase the performance of groundwater measures in terms of groundwater conservation.





Thank you

Thanyarat Srikamma

Thanyarat720@gmail.com

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