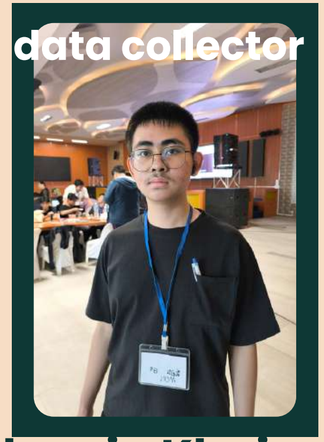
CLIMATE-ADAPTIVE SOIL MOISTURE ASSESSMENT IN SUGARCANE FARMS SURROUNDING KRASIEO DAM USING SMAP SATELLITE OBSERVATIONS

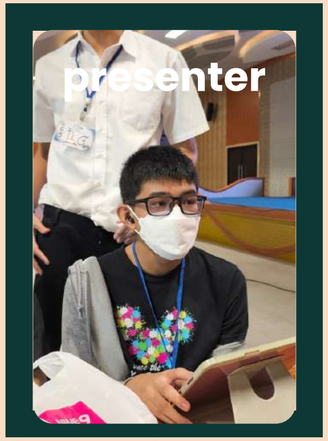
MEMBERS



Paphawin Khajonsap

Phopha Rattanamanee

Saksirin Pimsuwan

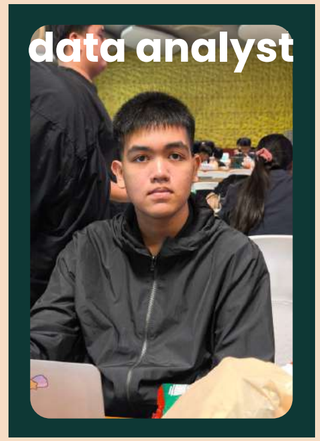


Patinya Limamphai

Puttipong Munjitt

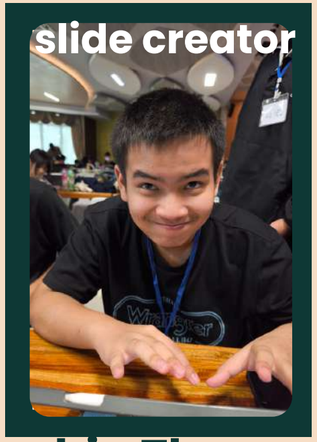
Apiwat Phakdeesaen

Pongdet Swangpunt



Kittithat Monthathong

MEMBERS



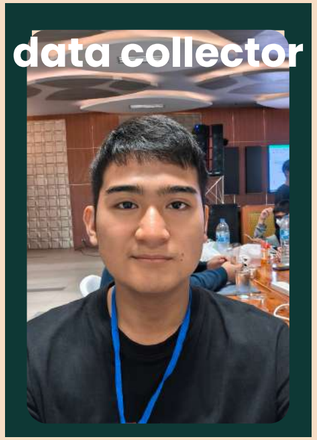
Techin Thaworn

Peeravit Rangkagkarn

Pongsathet Silsujarit

Potthakorn Waripunyo

Nipitpon Panpitpat



Phonlaphat Jaisuedee

Phoopha Nuanpantchuen

Kritchakorn Emkamol

MEMBERS

Nichada Fusaeng

Thapanan Chitchuen

Panyada Boonsuk

Sirasit Vongchaoum

Suppakan Inthapanti

Natthanicha Tuanthong

INTRODUCTION

Sugar cane in Thailland

sugarcane fields

sugarcane and sugar

use in : sugar industry

Sugarcane-based products from Thailand

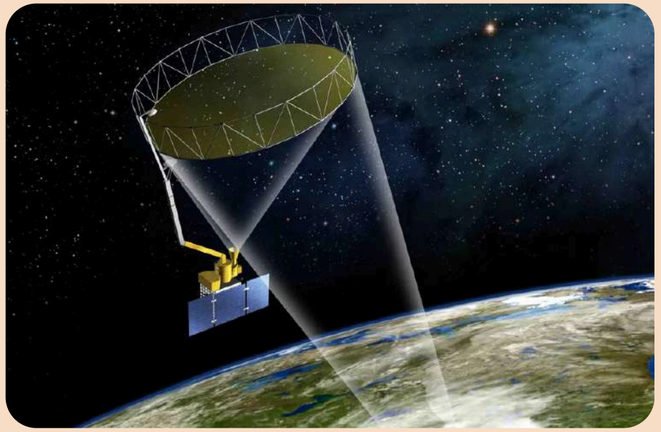
Sugarcane farmers harvesting sugarcane

Major Benefits for Thai Farmers

feeding elephant

INTRODUCTION

Survey of sugarcane growing soil

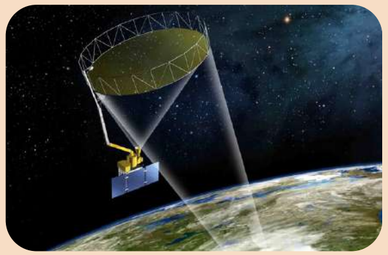


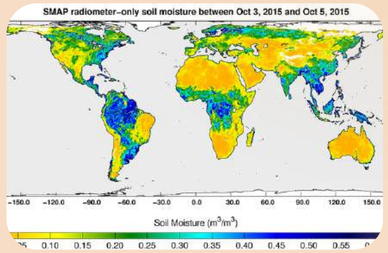
SMAP satellite

Collect soil data around the Krasieo Dam

Krasieo Dam

RESEARCH QUESTIONS & HYPOTHESIS





sugarcane fields

Rice paddies

R 1.Is the hand-collected soil moisture data related to the SMAP satellite data

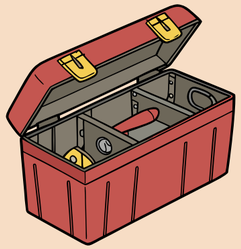
H The soil moisture measured from the ground using hand will correspond with the moisture data from the SMAP satellite.

R 2.Is there a difference in soil moisture between sugarcane fields on high ground and rice paddies in lower areas, based on both field data and satellite data?

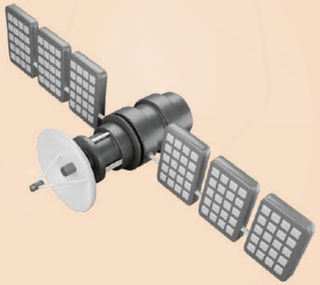
H Rice paddies in low areas will have higher soil moisture in both the field measurements and the SMAP satellite data

R 3.Can SMAP satellite data be used to detect past periods of soil moisture stress that affected crops around Krasieo Dam?

H Historical SMAP satellite data can help identify episodes of soil moisture stress climate-adaptive management for future crop resilience



MATERIALS AND METHODS

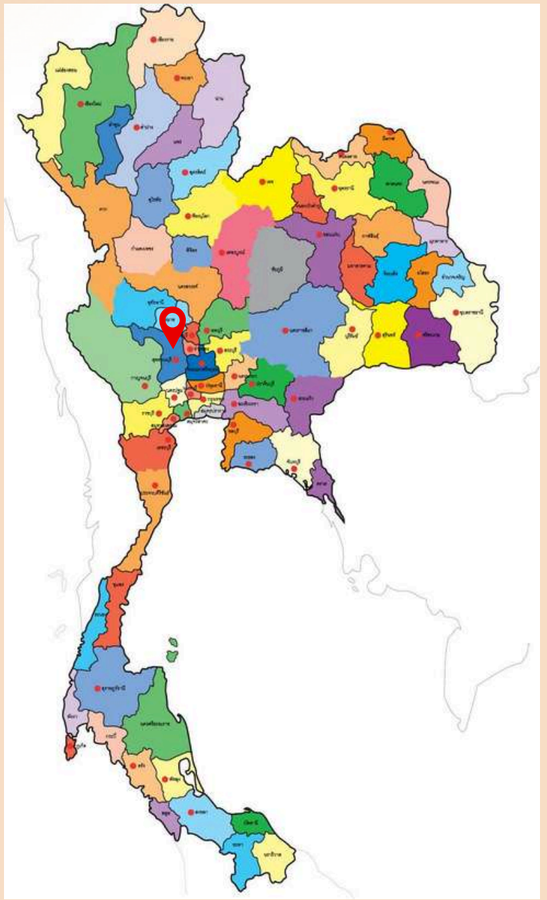


STUDY SITES

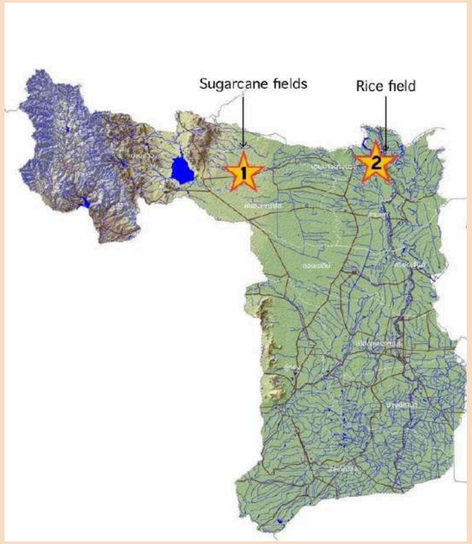
Study sites at the Krasieo Dam supanburi province in Central Thailand

- Sugarcane fields
- Rice fields

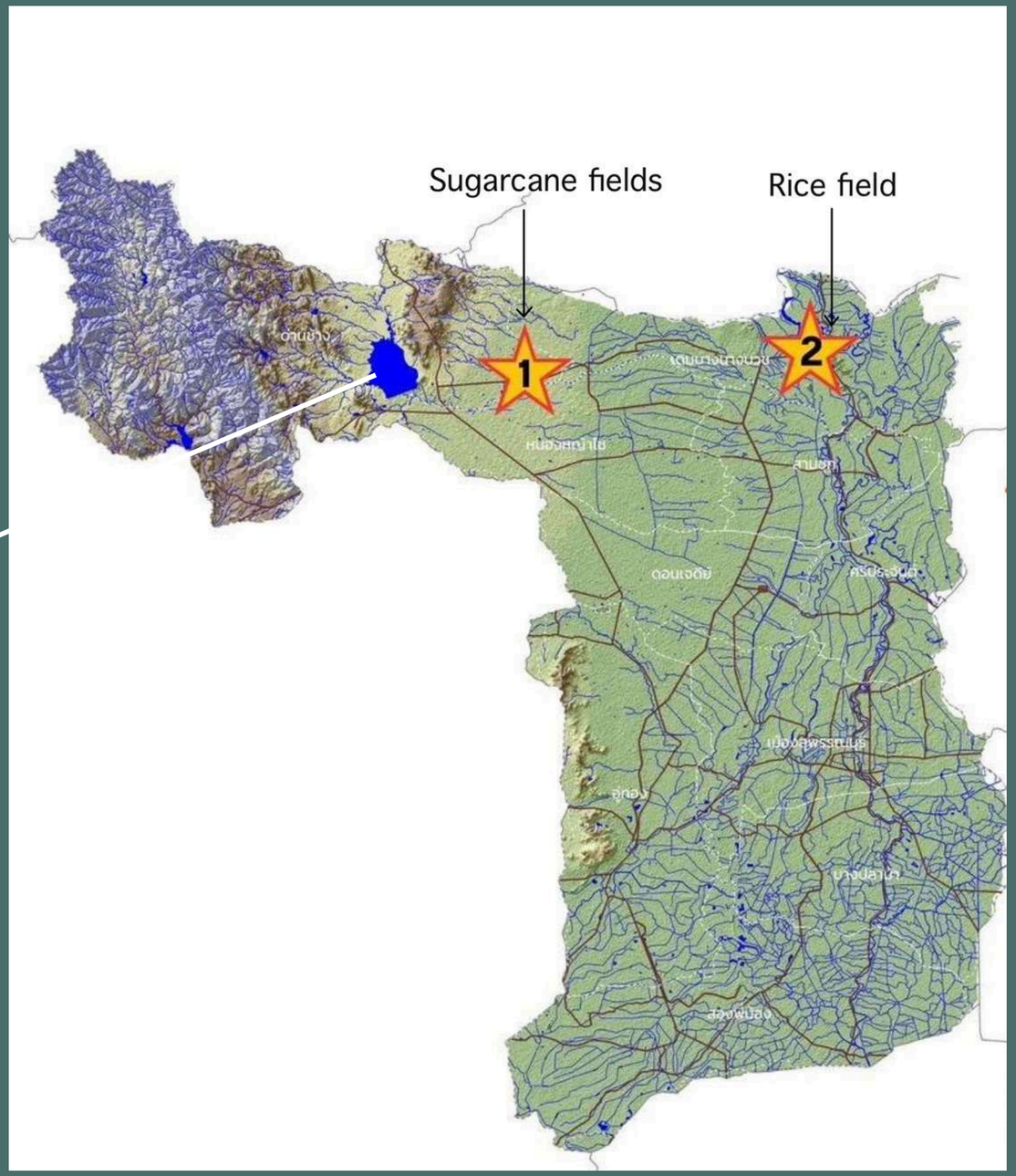
world map



thailand map



Supan buri map



Supan buri map

TOOLS

Main tool

- Digital Scale
- Halogen Oven

Secondary tool

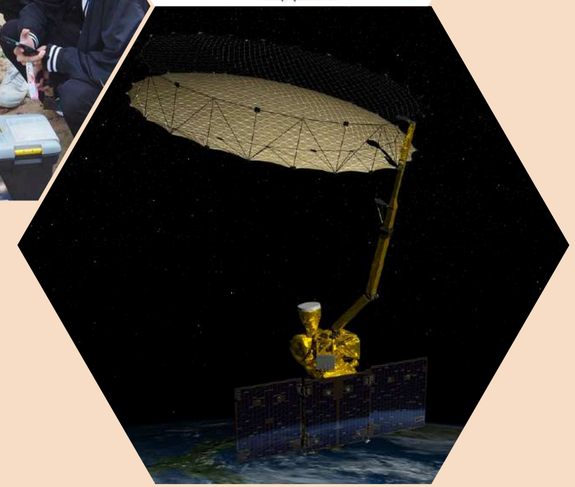
- hammer
- trowel
- tape measure
- putty knife
- sample container
- wooden block
- sealable bag

METHOD OF EDUCATION

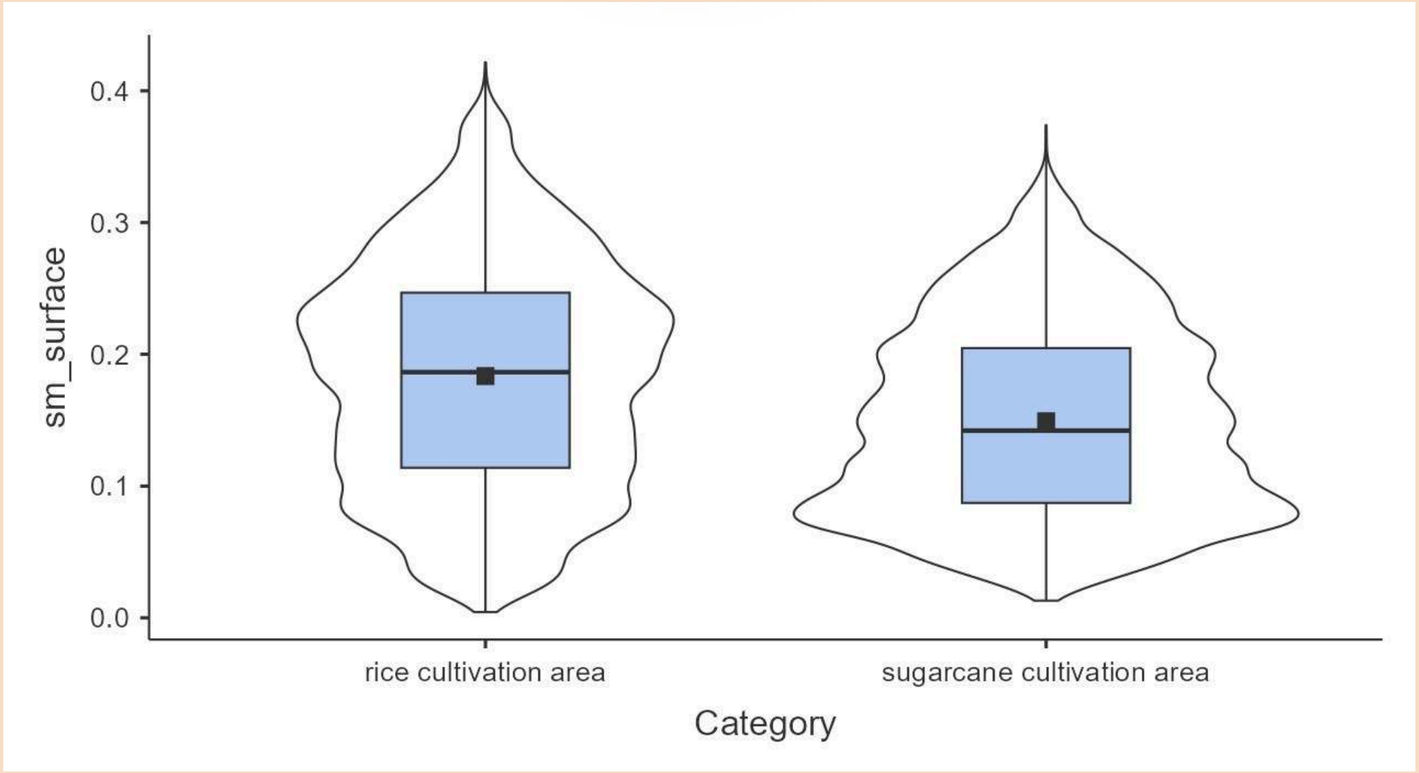
- Field data were collected from two locations in Suphan Buri Province:
  - A higher-elevation sugarcane field (representing a drought-prone area)
  - A lowland rice field (an area with typically higher soil moisture)
  - The two sites were placed more than 16 km apart to ensure they matched different SMAP satellite pixels.

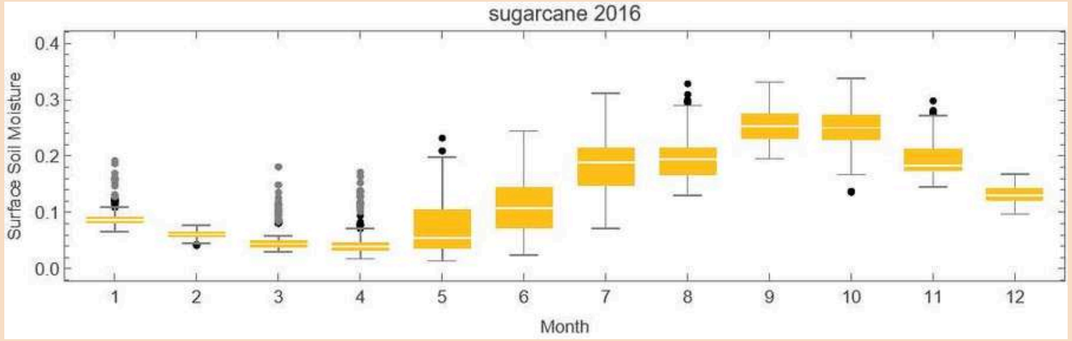
- Soil samples were collected following the GLOBE SMAP Soil Moisture Protocol:
  - A 4-ounce steel can was pressed into the soil to collect each sample
  - Three samples were taken at each spot for reliability
  - Samples were oven-dried at 90°C for 24 hours
  - Soil moisture was calculated in two forms: gravimetric and volumetric
  - All data were uploaded to the GLOBE website (Pedosphere section)

- Satellite data came from the SMAP Level 4 (SPL4SMGP.008) dataset via AppEEARS:
  - Spatial resolution: 9 km per pixel; updated every 3 hours
  - Five key variables were analyzed: surface soil moisture, root zone soil moisture, surface temperature, first-layer soil temperature, and precipitation
  - Study period covered 2016–2025 (9 years)

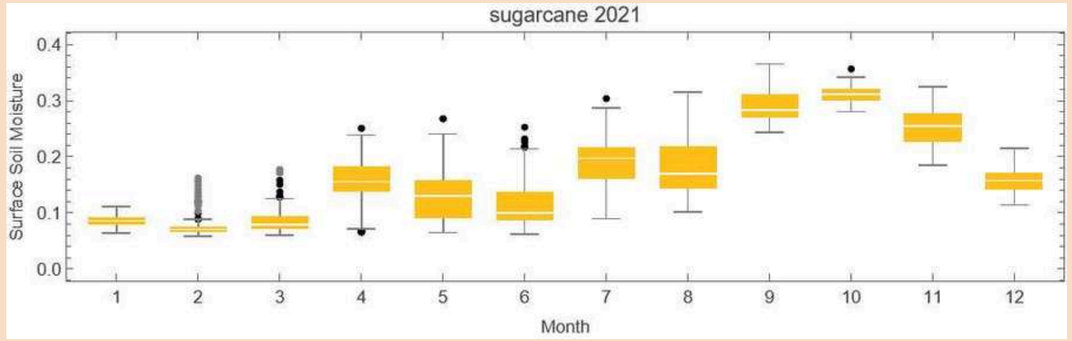


STUDY RESULTS

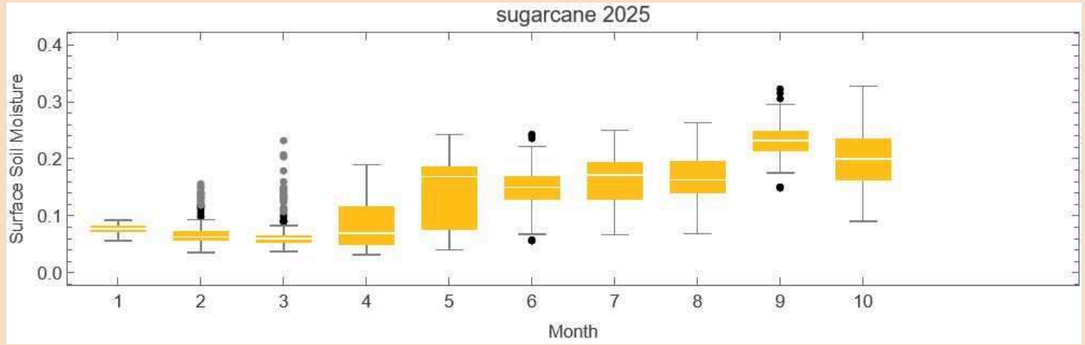




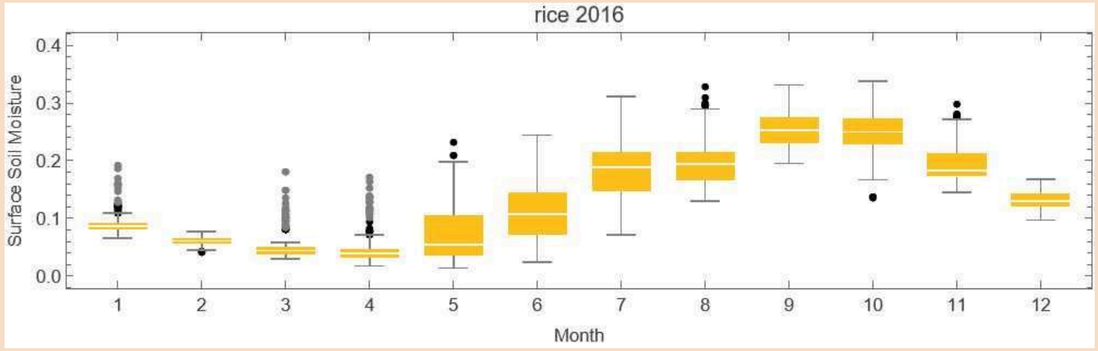
Surface Soil Moisture sugarcane 2016



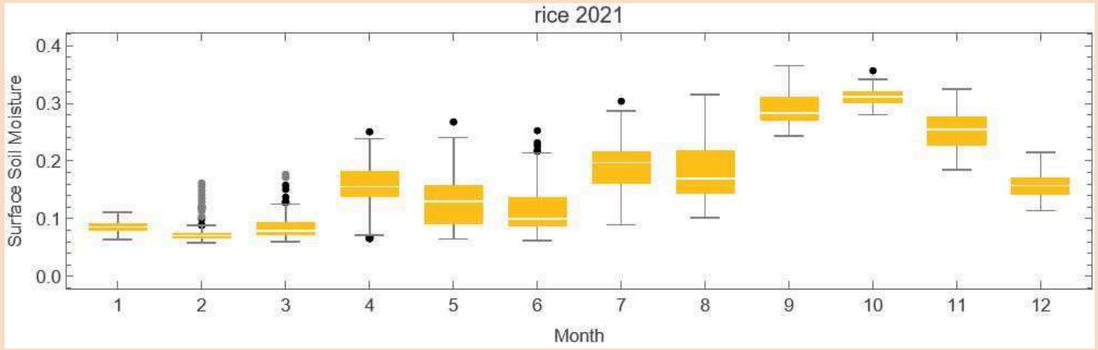
Surface Soil Moisture sugarcane 2021



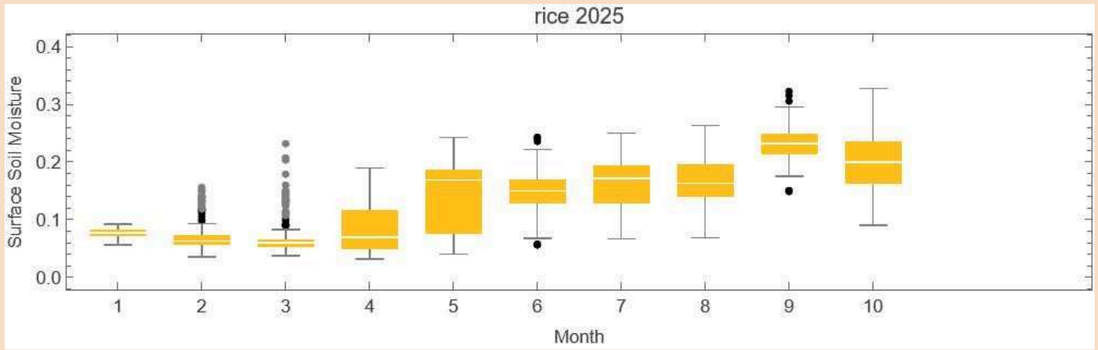
Surface Soil Moisture sugarcane 2025



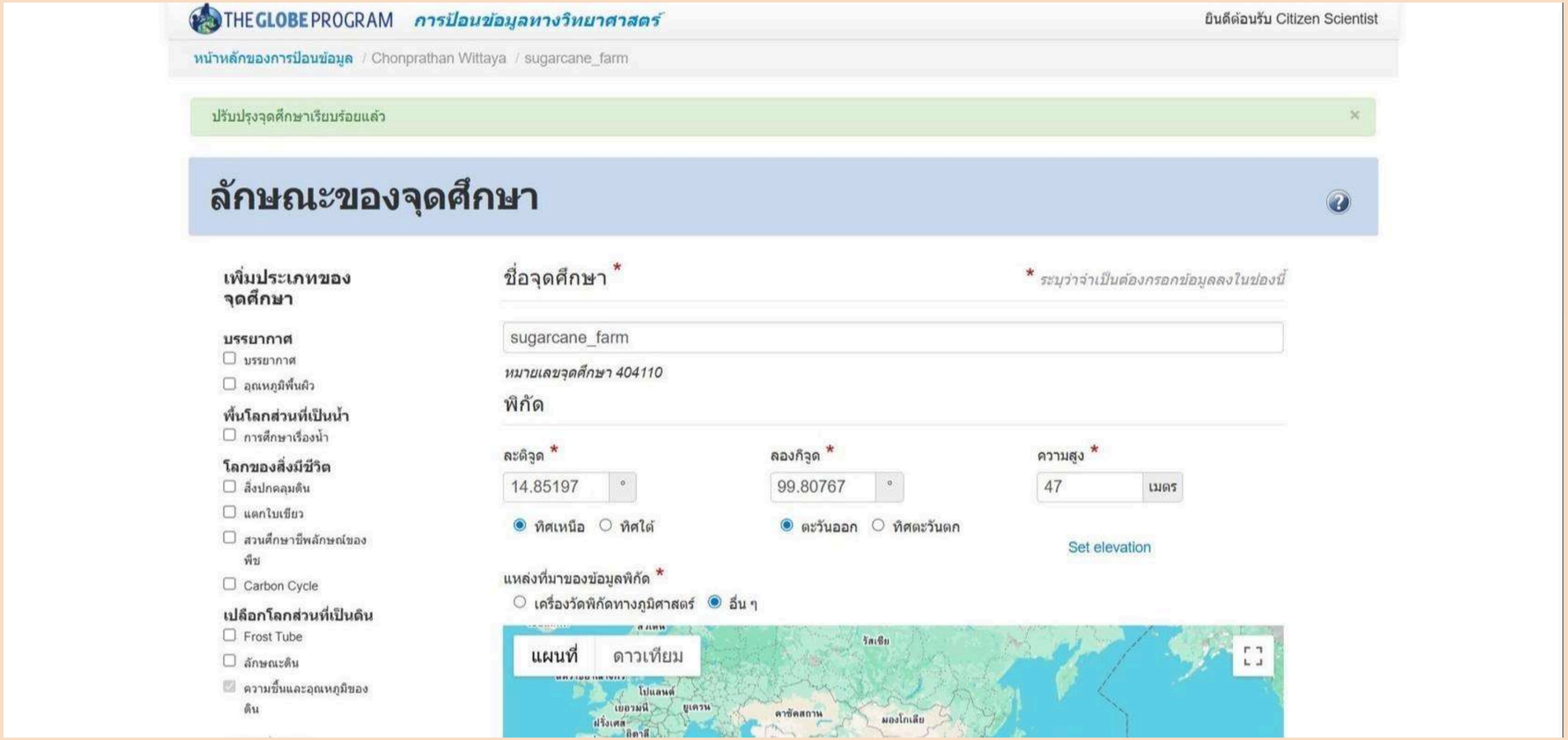
Surface Soil Moisture
Rice 2016



Surface Soil Moisture
Rice 2021



Surface Soil Moisture
Rice 2025


THE GLOBE PROGRAM การป้อนข้อมูลทางวิทยาศาสตร์
ยินดีต้อนรับ Citizen Scientist
หน้าหลักของการป้อนข้อมูล / Chonprathan Wittaya / sugarcane_farm
ปรับปรุงจุดศึกษาเรียบร้อยแล้ว
ลักษณะของจุดศึกษา
เพิ่มประเภทของจุดศึกษา
บรรยากาศ
บรรยากาศ
อุณหภูมิพื้นผิว
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การศึกษาเรื่องน้ำ
โลกของสิ่งมีชีวิต
สิ่งปกคลุมดิน
แตกใบเขียว
สวนศึกษาชีพลักษณ์ของพืช
Carbon Cycle
เปลือกโลกส่วนที่เป็นดิน
Frost Tube
ลักษณะดิน
ความชื้นและอุณหภูมิของดิน
ชื่อจุดศึกษา *
* ระบุว่าจำเป็นต้องกรอกข้อมูลลงในช่องนี้
sugarcane_farm
หมายเลขจุดศึกษา 404110
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ดาวเทียม
รัสเซีย
โปแลนด์
เยอรมนี
ยูเครน
คาซัคสถาน
มองโกเลีย
ฝรั่งเศส


การสังเกตที่ผ่านมาสำหรับ Soil Moisture – SMAP Block Pattern

From 2025-10-20 To 2025-11-19

	ทำการตรวจวัดที่ เวลามาตรฐานสากล	
1	2025-11-17 02:03 UTC	ลบทิ้ง
2	2025-11-17 08:03 UTC	ลบทิ้ง
3	2025-11-17 08:09 UTC	ลบทิ้ง
4	2025-11-19 02:04 UTC	ลบทิ้ง
5	2025-11-19 02:07 UTC	ลบทิ้ง
6	2025-11-19 02:13 UTC	ลบทิ้ง


การสังเกตที่ผ่านมาสำหรับ Soil Moisture – SMAP Block Pattern

From 2025-10-20 To 2025-11-19

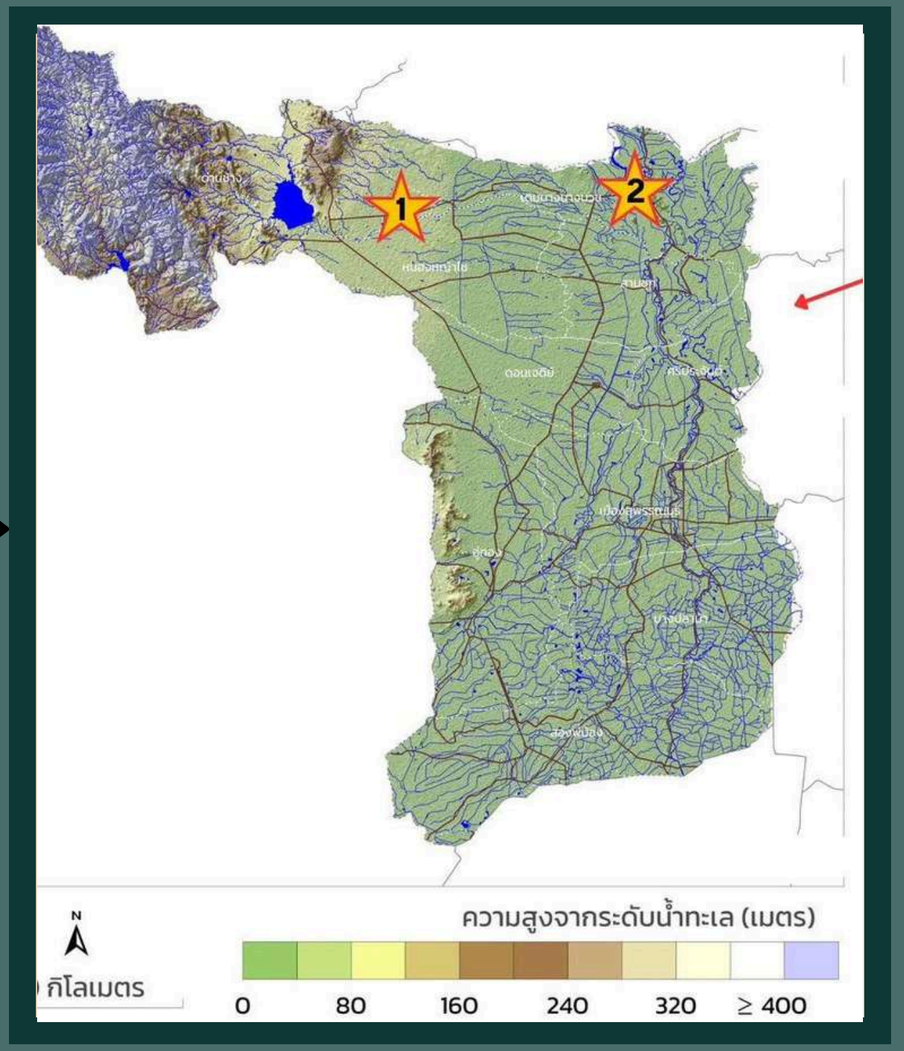
	ทำการตรวจวัดที่ เวลามาตรฐานสากล	
1	2025-11-17 08:00 UTC	ลบทิ้ง
2	2025-11-17 08:13 UTC	ลบทิ้ง
3	2025-11-17 08:15 UTC	ลบทิ้ง

ACKNOWLEDGEMENT

Climate-Adaptive Soil Moisture Assessment in Sugarcane Farms Surrounding Krasieo dam Using SMAP Satellite Observations

Field data

Study sites



Smap data