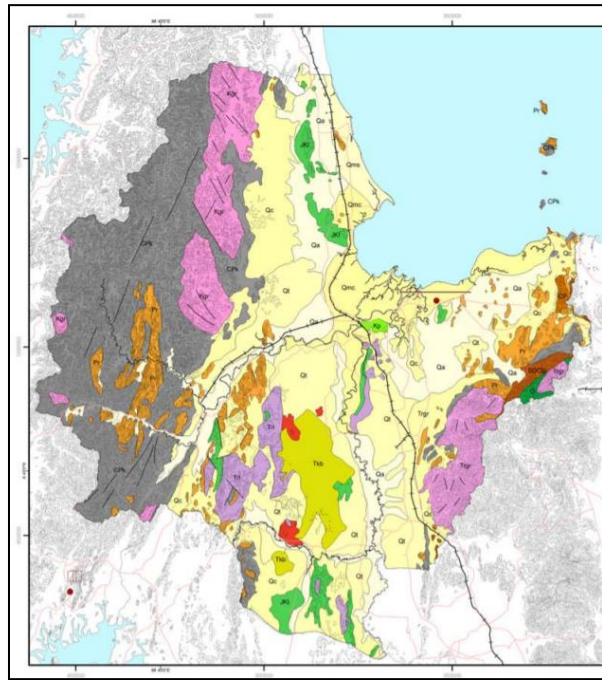




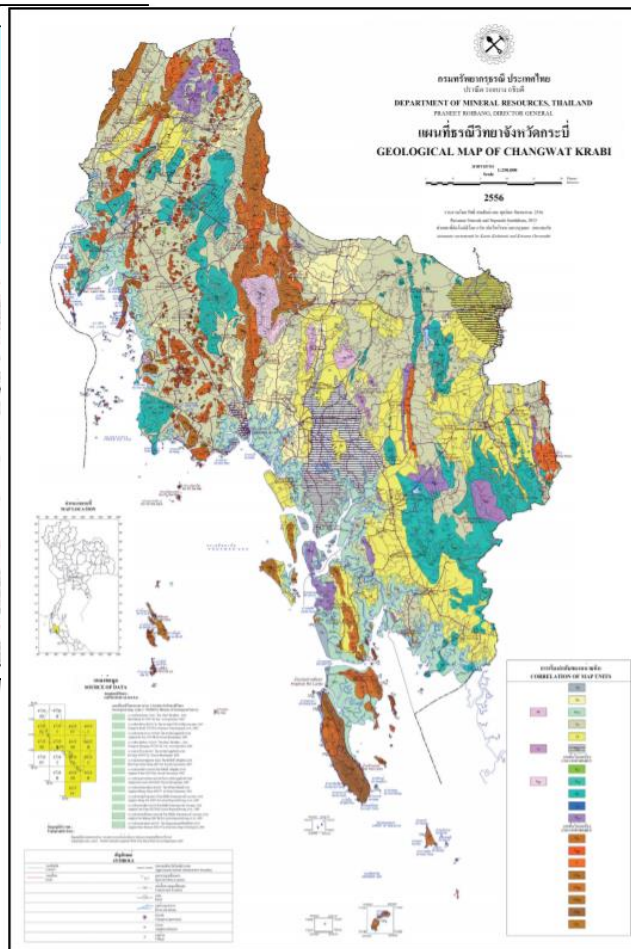
MARINE KARST MORPHOLOGY  
AND KARST SYSTEM SURVEY  
IN SOUTHERN THAILAND  
(SURAT THANI, KRABI AND SATUN)

3-16 OCT 2019

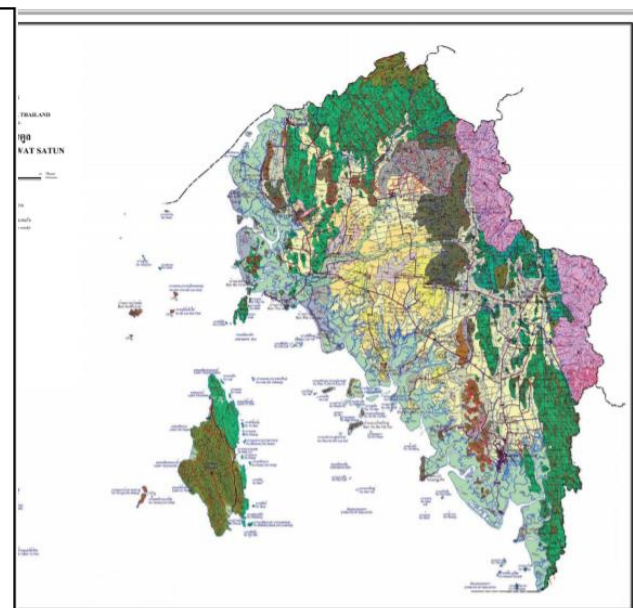




SURATTANI



KRABI



SATUN

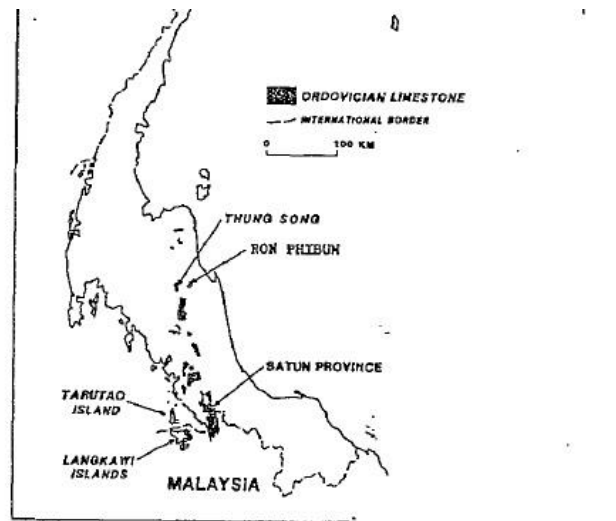


Figure 2 Map showing the location of areas mentioned in the text and the distribution of Ordovician strata in Thailand and Malaysia.



ห้องสมุดกรมทรัพยากรธรณี  
DMR Library



# Ordovician

## LITHOSTRATIGRAPHY, SEDIMENTOLOGY, AND DIAGENESIS OF THE ORDOVICIAN CARBONATES, SOUTHERN THAILAND

by

Thanis Wongwanich, B.Sc.

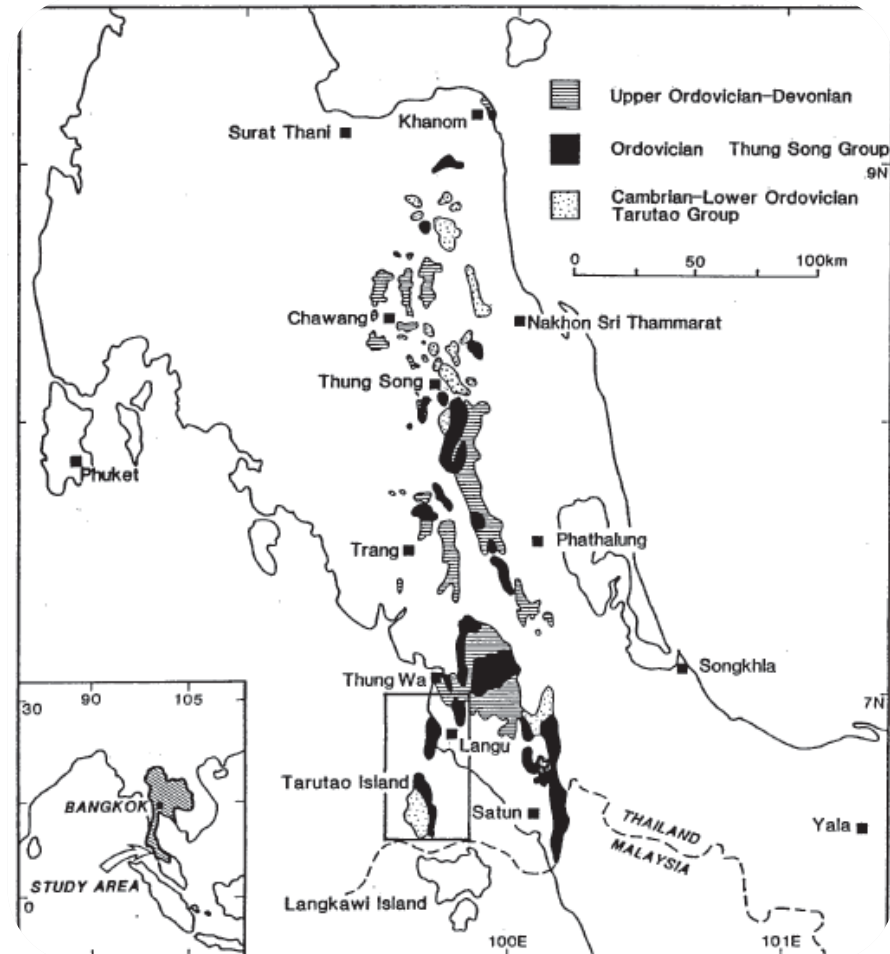
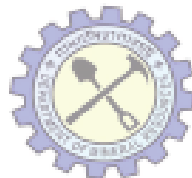
L.2

W 672 L

1990

Submitted in partial fulfilment of the requirements  
for the degree of  
Doctor of Philosophy  
(Geology)  
University of Tasmania  
(October, 1990)

Carbonate Rocks



# เขาแดง อ.ละงู สตูล หมวดหินป่าแก่



# Permian

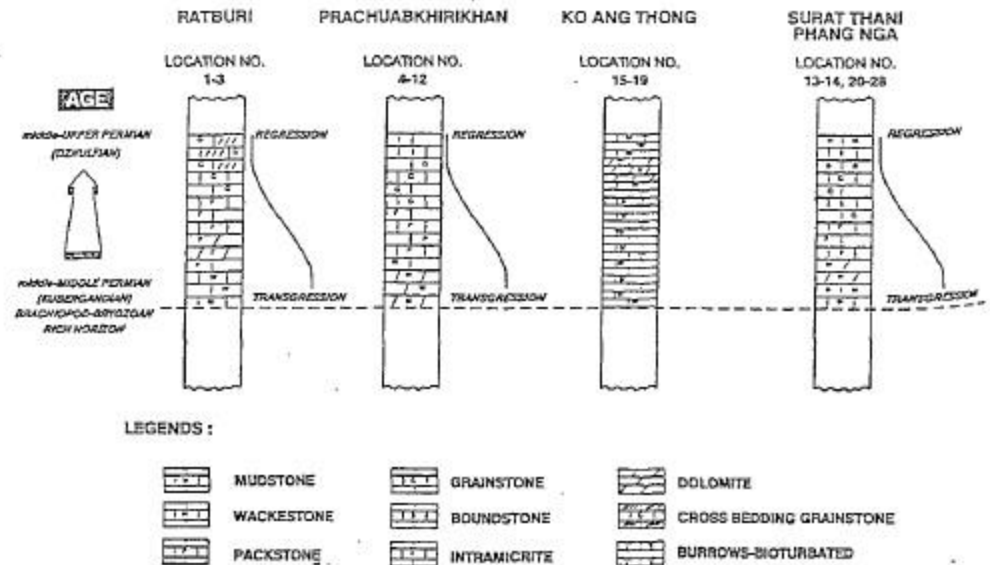
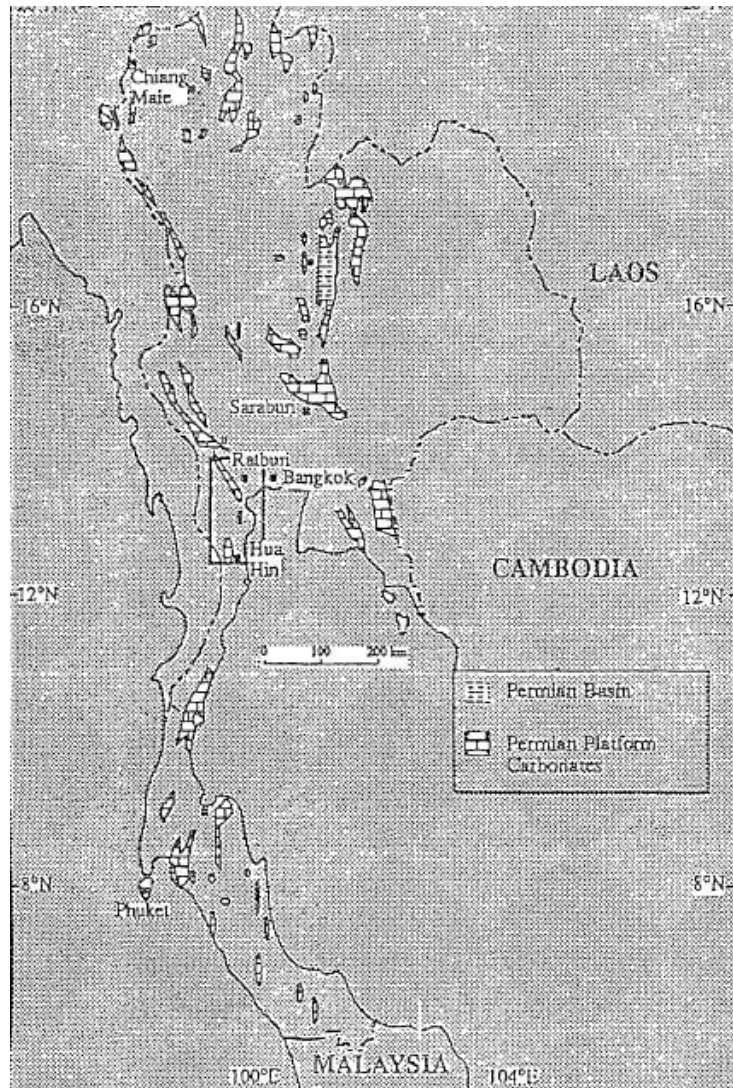


Fig. 6. Facies interpretation of Permian carbonate section in southern Thailand. Location no. refer to sample locations map in the text (Not to scale.) (After Chinoroje, O., 1993)

# ฟิวซูลินิต

➤ หรีอคตข้าวสาร ไฟล์ม Foraminifera เป็นจุลชีพอาศัยในน้ำทะเล พบมากในยุคคาร์บอนิเฟอรัสและเพอร์เมียน (350-250 ล้านปีก่อน) สูญพันธุ์หมดแล้ว



ซูโดฟิวซูลินา พารุมโวลตา *Pseudofusulina parumvoluta*  
ยุคเพอร์เมียนตอนกลาง (270-260 ล้านปี)  
พบในหินปูน บริเวณเขาโปรงปราบ อำเภอพระพุทธบาท



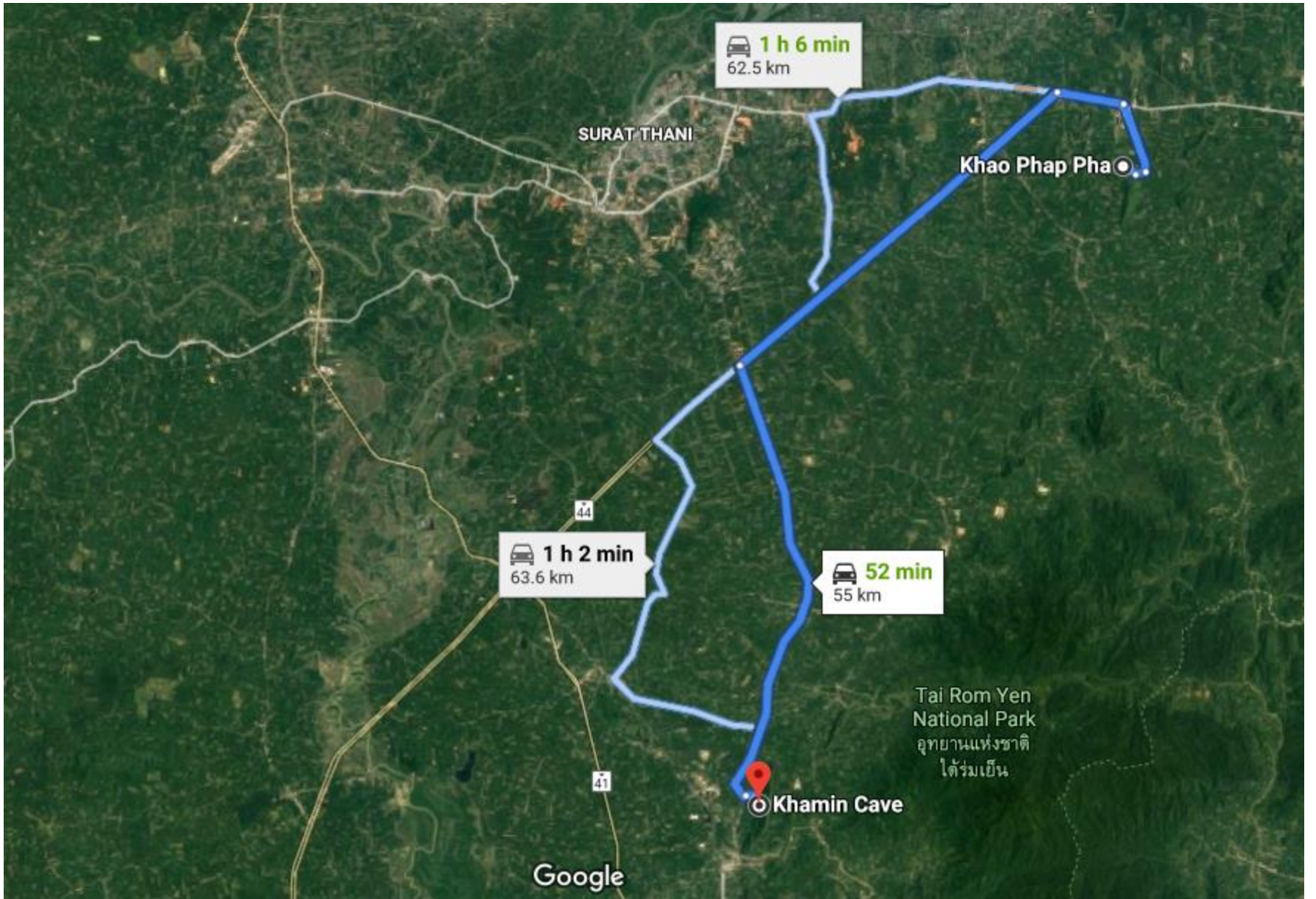
Date	Time	Travel Accommodation/Destination	Proposed	Description
3 OCTOBER 2019	Guilin-Bangkok (CZ6099)	BKK	Arrival	
		DMR	communicate with DMR	
4 OCTOBER 2019	Bangkok - Suratthani	Suratthani	Conduct Karst Geological Survey	Khao Phap Pha/ Tham Kamin
5 OCTOBER 2019		Suratthani	Karst form Survey/ Karst landform survey	Moo Koa Ang Thong National Park
6 OCTOBER 2019	Suratthani - Krabi	Krabi	Karst form Survey/ Karst landform survey	Tham Sra Yuan Thong
		Krabi	Conducted Karst Hydrogeological Survey	Sra Morakot/Hot Waterfall
7 OCTOBER 2019		Krabi	Conducted Cave Survey	Than Bok Korani National Park/ Tham Pee Hua To
8 OCTOBER 2019	Krabi - Satun	Krabi	Conducted Cave Survey	Tham Phet/ Tham Klang
		Satun	Conducted Karst form Survey	Tham U Rai Thong/ Tham Koa To Nang Dam
9 OCTOBER 2019	Satun	Satun	Conducted Karst Hydrogeological Survey	Karst Spring Ban Loa Pla Koa Tanan / Tham Jet kod
		Satun	Conducted Karst form Survey	Koa Tabun
10 OCTOBER 2019	Satun	Satun	Conducted Karst form Survey	Phupha Phet Cave
		Satun	Conducted Karst Hydrogeological Survey	Sai thong Water fall
11 OCTOBER 2019	Satun	Satun	Conducted Karst form Survey	
		Satun	investigation of fossil evidence	Kao Noi/ Stromatolite Somnaksong Koa Pet Nam
		Satun	Conducted Karst form Survey	
12 OCTOBER 2019	Satun	Satun	Conducted Marine Karst form survey	Pra sat Hin Pun yot/ Kao TaBun
		Satun	Conducted Karst soil and vegetatiion surveys	
13 OCTOBER 2019	Satun	Satun	Conducted Marine Karst hydrological survey and take samples	Panya Batik/ Tham Wang Kram/เขารูปเกือกม้า
		Satun	Conducted Marine Karst form survey	
14 OCTOBER 2019	Satun	Satun	Selected Monitoring points for marine karst carbon sinks	Tham le Stegodon
15 OCTOBER 2019	Satun	Satun	Conducted Marine Karst form survey	Tarutoa National Park
		Satun	Conducted Karst hydrological survey	
16 OCTOBER 2019	Satun - Trang - BKK	Satun	Conducted Karst hydrological survey	Tham le Stegodon?
		BKK	Departure from Trang	
17 OCTOBER 2019	BKK - Guangzhou (CZ3082)	CN	Departure	

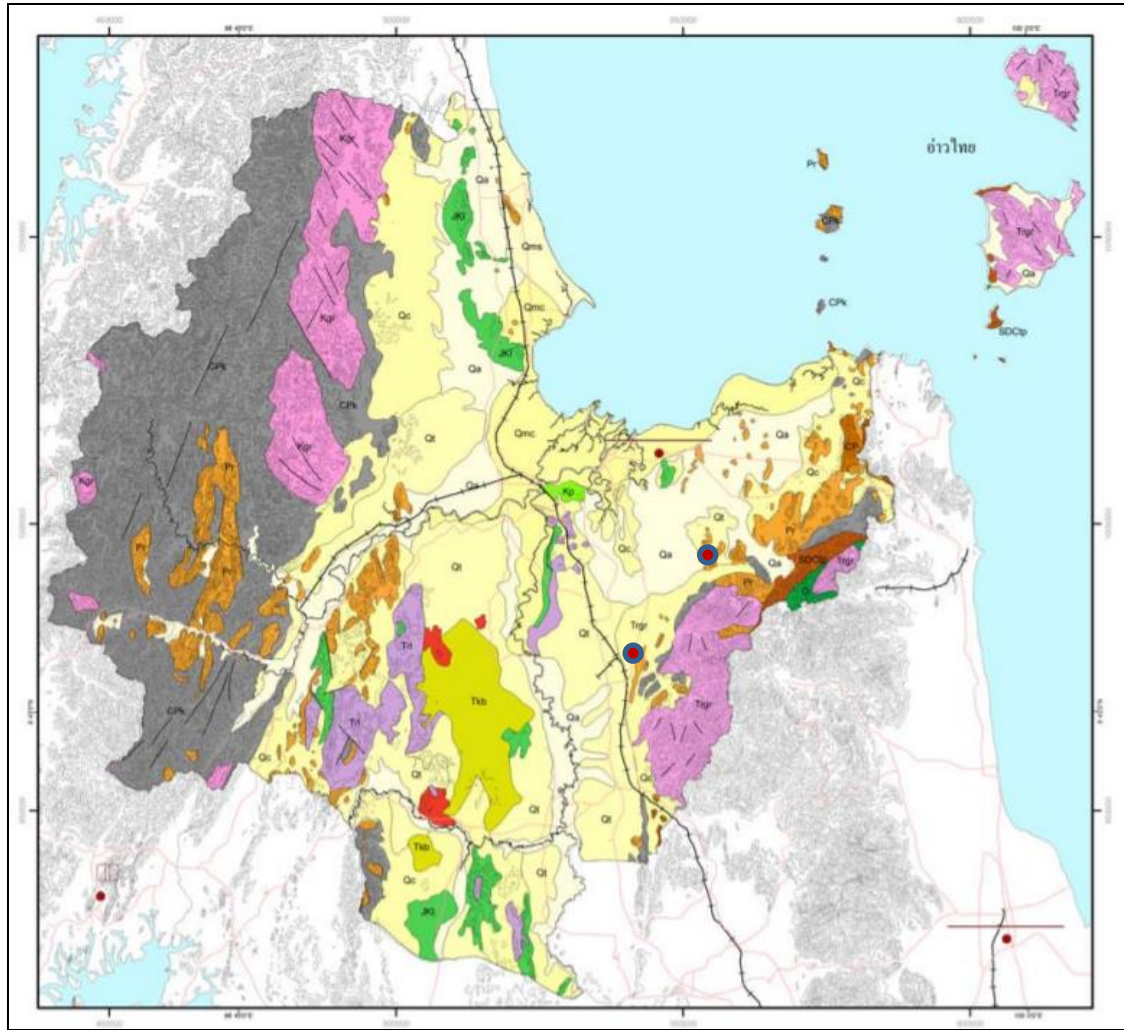


Date	Time	Travel Accommodation/Destination	Proposed	Description
3 OCTOBER 2019	Guilin-Bangkok (CZ6099)	BKK	Arrival	
		DMR	communicate with DMR	
4 OCTOBER 2019	Bangkok - Suratthani	Suratthani	Conduct Karst Geological Survey	Khao Phap Pha/ Tham Kamin
5 OCTOBER 2019		Suratthani	Karst form Survey/ Karst landform survey	Moo Koa Ang Thong National Park
6 OCTOBER 2019	Suratthani - Krabi	Krabi	Karst form Survey/ Karst landform survey	Tham Sra Yuan Thong
		Krabi	Conducted Karst Hydrogeological Survey	Sra Morakot/Hot Waterfall
7 OCTOBER 2019		Krabi	Conducted Cave Survey	Than Bok Korani National Park/ Tham Pee Hua To
8 OCTOBER 2019	Krabi - Satun	Krabi	Conducted Cave Survey	Tham Phet/ Tham Klang
		Satun	Conducted Karst form Survey	Tham U Rai Thong/ Tham Koa To Nang Dam
9 OCTOBER 2019	Satun	Satun	Conducted Karst Hydrogeological Survey	Karst Spring Ban Loa Pla Koa Tanan / Tham Jet kod
		Satun	Conducted Karst form Survey	Koa Tabun
10 OCTOBER 2019	Satun	Satun	Conducted Karst form Survey	Phupha Phet Cave
		Satun	Conducted Karst Hydrogeological Survey	Sai thong Water fall
11 OCTOBER 2019	Satun	Satun	Conducted Karst form Survey	
		Satun	investigation of fossil evidence	Kao Noi/ Stromatolite Somnaksong Koa Pet Nam
		Satun	Conducted Karst form Survey	
12 OCTOBER 2019	Satun	Satun	Conducted Marine Karst form survey	Pra sat Hin Pun yot/ Kao TaBun
		Satun	Conducted Karst soil and vegetatiion surveys	
13 OCTOBER 2019	Satun	Satun	Conducted Marine Karst hydrological survey and take samples	Panya Batik/ Tham Wang Kram/เขารูปเกือกม้า
		Satun	Conducted Marine Karst form survey	
14 OCTOBER 2019	Satun	Satun	Selected Monitoring points for marine karst carbon sinks	Tham le Stegodon
15 OCTOBER 2019	Satun	Satun	Conducted Marine Karst form survey	Tarutoa National Park
		Satun	Conducted Karst hydrological survey	
16 OCTOBER 2019	Satun - Trang - BKK	Satun	Conducted Karst hydrological survey	Tham le Stegodon
		BKK	Departure from Trang	
17 OCTOBER 2019	BKK - Guangzhou (CZ3082)	CN	Departure	

# DAY 1 (4 OCTOBER 2019)

- Bangkok – Suratthani
- Accommodation : Suratthani
- Propose
  - Conduct Karst Geological Survey
  - Khao Phap Pha
  - Tham Kamin





Geological Map Surat thani Province

PERMIAN LIMESTONE  
-RATCHABURI GROUP



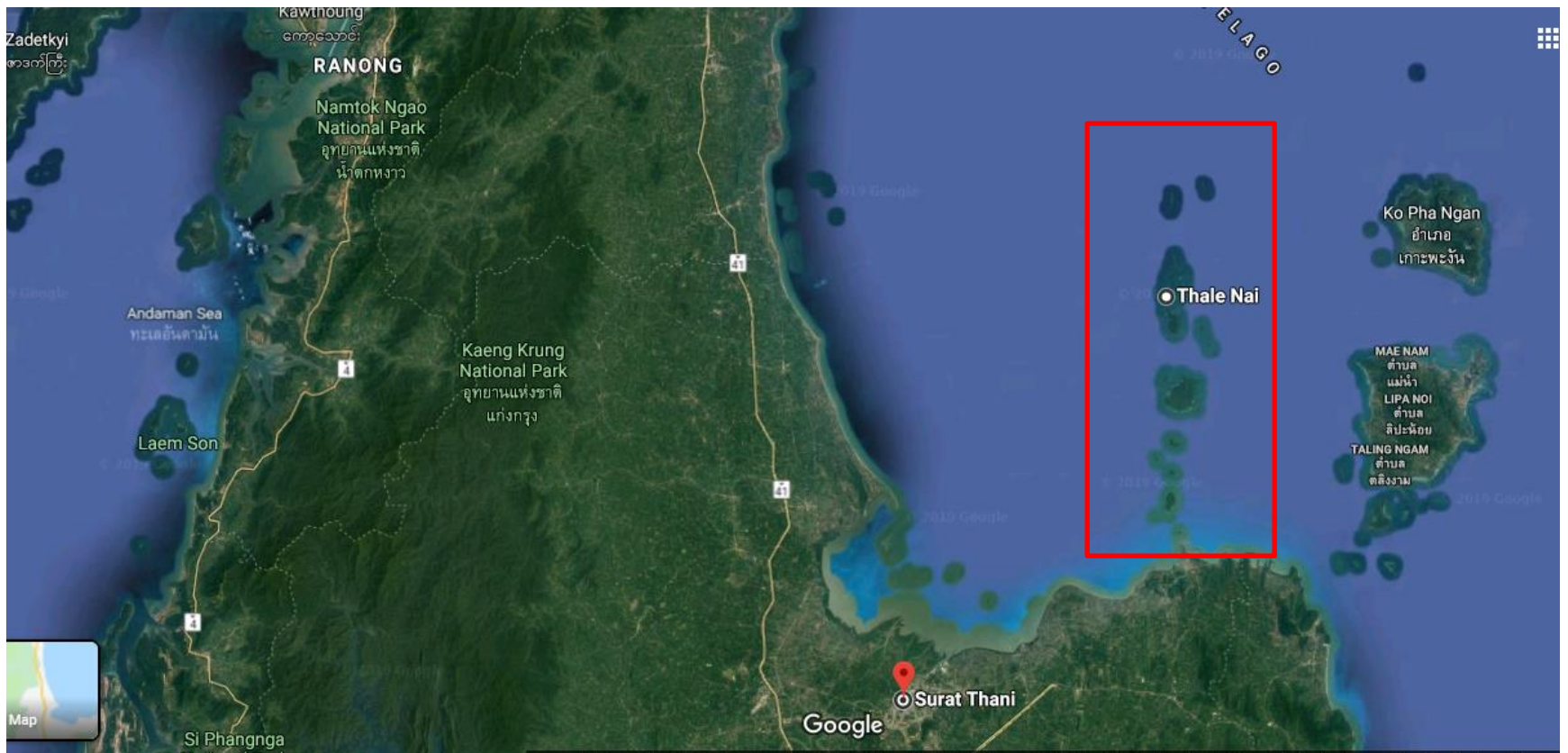
# Tham Kamin



Date	Time	Travel Accommodation/Destination	Proposed	Description
3 OCTOBER 2019	Guilin-Bangkok (CZ6099)	BKK	Arrival	
		DMR	communicate with DMR	
4 OCTOBER 2019	Bangkok - Suratthani	Suratthani	Conduct Karst Geological Survey	Khao Phap Pha/ Tham Kamin
5 OCTOBER 2019		Suratthani	Karst form Survey/ Karst landform survey	Moo Koa Ang Thong National Park
6 OCTOBER 2019	Suratthani - Krabi	Krabi	Karst form Survey/ Karst landform survey	Tham Sra Yuan Thong
		Krabi	Conducted Karst Hydrogeological Survey	Sra Morakot/Hot Waterfall
7 OCTOBER 2019		Krabi	Conducted Cave Survey	Than Bok Korani National Park/ Tham Pee Hua To
8 OCTOBER 2019	Krabi - Satun	Krabi	Conducted Cave Survey	Tham Phet/ Tham Klang
		Satun	Conducted Karst form Survey	Tham U Rai Thong/ Tham Koa To Nang Dam
9 OCTOBER 2019	Satun	Satun	Conducted Karst Hydrogeological Survey	Karst Spring Ban Loa Pla Koa Tanan / Tham Jet kod
		Satun	Conducted Karst form Survey	Koa Tabun
10 OCTOBER 2019	Satun	Satun	Conducted Karst form Survey	Phupha Phet Cave
		Satun	Conducted Karst Hydrogeological Survey	Sai thong Water fall
11 OCTOBER 2019	Satun	Satun	Conducted Karst form Survey	
		Satun	investigation of fossil evidence	Kao Noi/ Stromatolite Somnaksong Koa Pet Nam
		Satun	Conducted Karst form Survey	
12 OCTOBER 2019	Satun	Satun	Conducted Marine Karst form survey	Pra sat Hin Pun yot/ Kao TaBun
		Satun	Conducted Karst soil and vegetatiion surveys	
13 OCTOBER 2019	Satun	Satun	Conducted Marine Karst hydrological survey and take samples	Panya Batik/ Tham Wang Kram/เขารูปเตีอกม้า
		Satun	Conducted Marine Karst form survey	
14 OCTOBER 2019	Satun	Satun	Selected Monitoring points for marine karst carbon sinks	Tham le Stegodon
15 OCTOBER 2019	Satun	Satun	Conducted Marine Karst form survey	Tarutoa National Park
		Satun	Conducted Karst hydrological survey	
16 OCTOBER 2019	Satun - Trang - BKK	Satun	Conducted Karst hydrological survey	Tham le Stegodon
		BKK	Departure from Trang	
17 OCTOBER 2019	BKK - Guangzhou (CZ3082)	CN	Departure	

## DAY 2 ( 5 OCTOBER 2019)

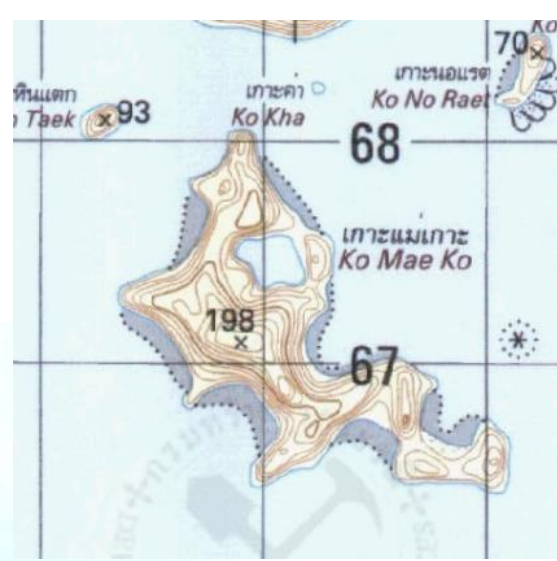
- Suratthani
- Accommodation : Suratthani
- Propose
  - Karst form Survey/ Karst landform survey
  - Mu Koh Ang Thong National Park







# lagoon, Mae ko Island



Sinkhole, Karst Morphology of Lagoon in Mae ko Island



PERMIAN LIMESTONE  
-RATCHABURI GROUP



เกาะวัวตาหลับ



Limestone interbedded shale



Brachiopod



Brachiopod



Coral



Bryozoa

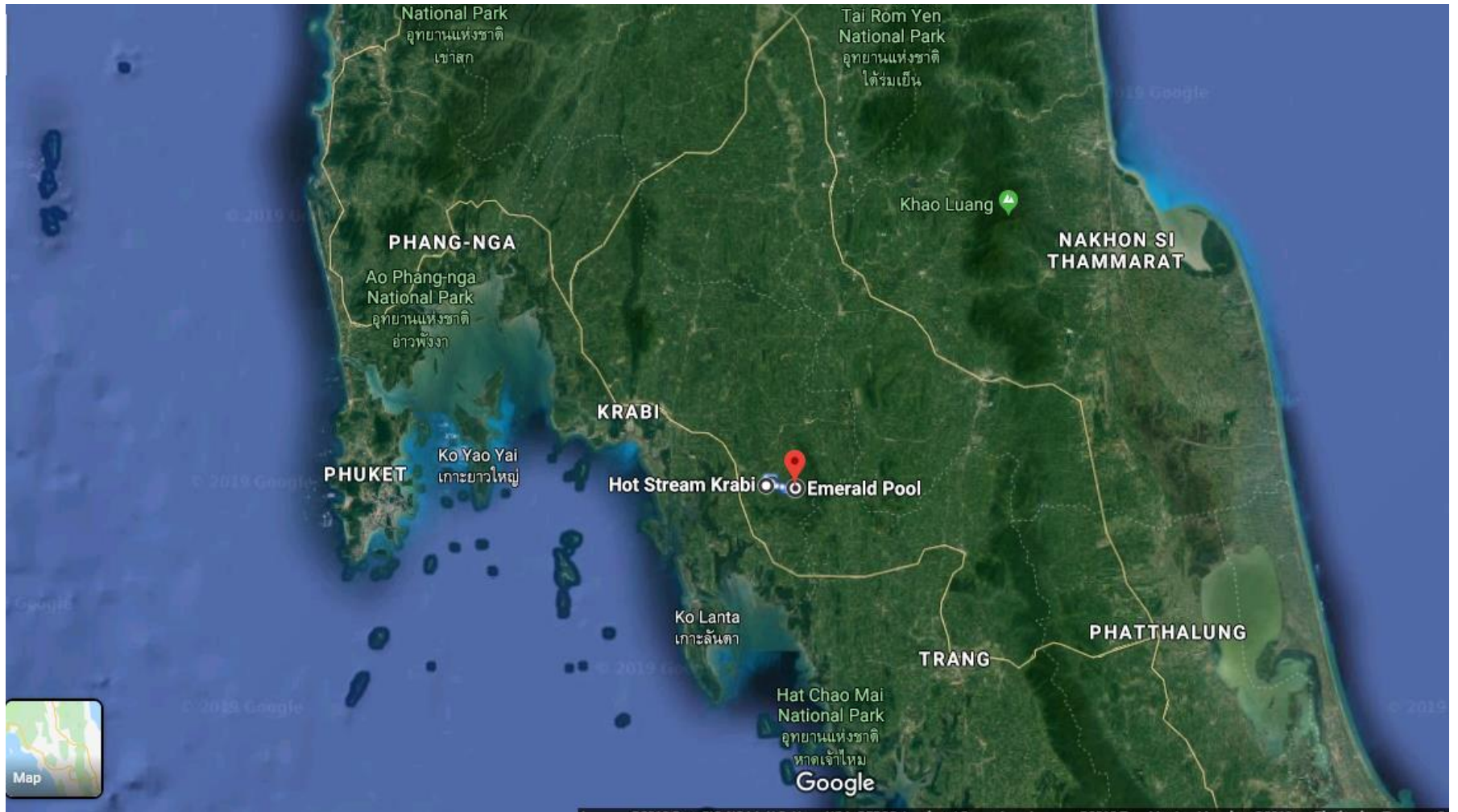


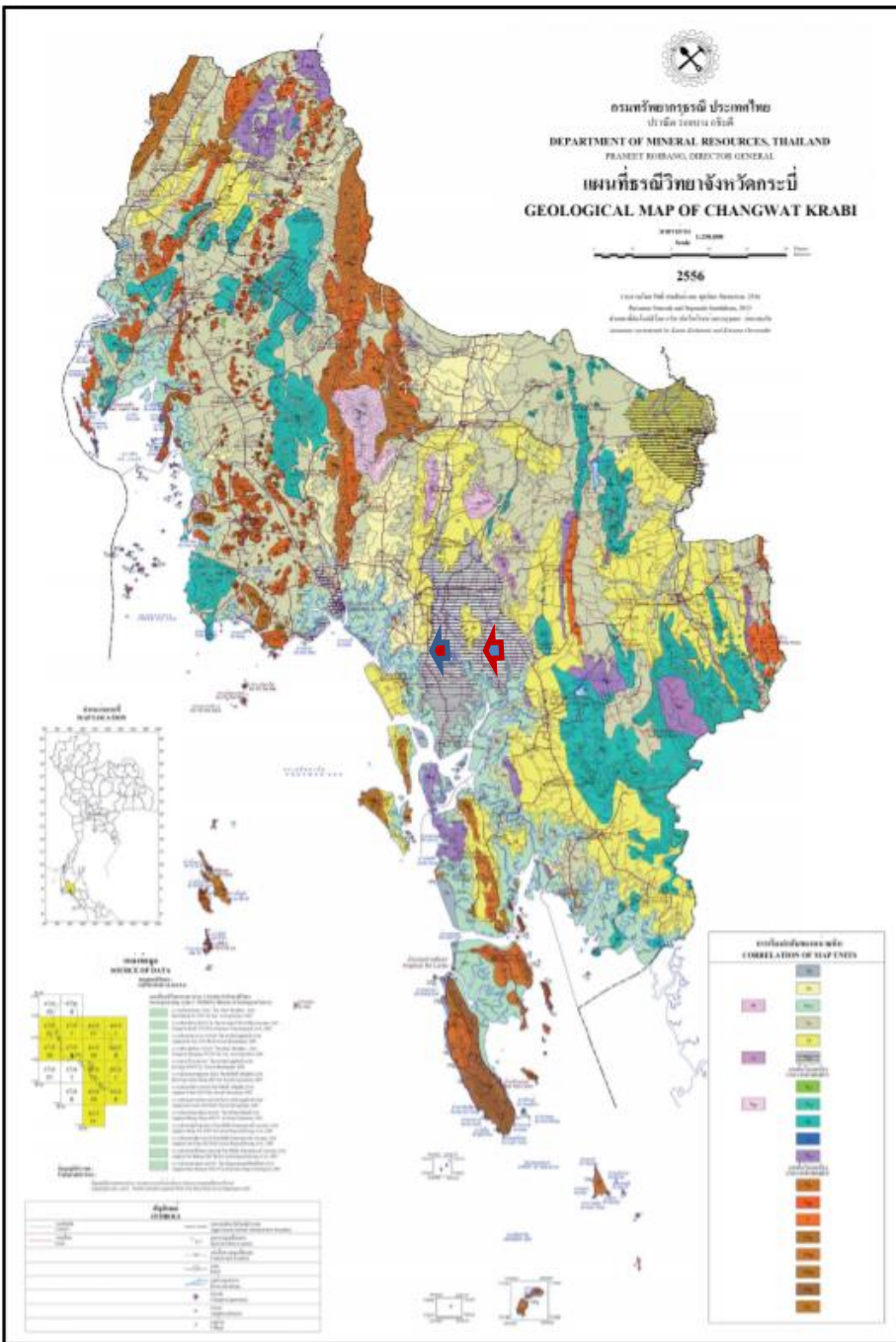
sponge

Date	Time	Travel Accommodation/Destination	Proposed	Description
3 OCTOBER 2019	Guilin-Bangkok (CZ6099)	BKK	Arrival	
		DMR	communicate with DMR	
4 OCTOBER 2019	Bangkok - Suratthani	Suratthani	Conduct Karst Geological Survey	Khao Phap Pha/ Tham Kamin
5 OCTOBER 2019		Suratthani	Karst form Survey/ Karst landform survey	Moo Koa Ang Thong National Park
6 OCTOBER 2019	Suratthani - Krabi	Krabi	Karst form Survey/ Karst landform survey	Tham Sra Yuan Thong
		Krabi	Conducted Karst Hydrogeological Survey	Sra Morakot/Hot Waterfall
7 OCTOBER 2019		Krabi	Conducted Cave Survey	Than Bok Korani National Park/ Tham Pee Hua To
8 OCTOBER 2019	Krabi - Satun	Krabi	Conducted Cave Survey	Tham Phet/ Tham Klang
		Satun	Conducted Karst form Survey	Tham U Rai Thong/ Tham Koa To Nang Dam
9 OCTOBER 2019	Satun	Satun	Conducted Karst Hydrogeological Survey	Karst Spring Ban Loa Pla Koa Tanan / Tham Jet kod
		Satun	Conducted Karst form Survey	Koa Tabun
10 OCTOBER 2019	Satun	Satun	Conducted Karst form Survey	Phupha Phet Cave
		Satun	Conducted Karst Hydrogeological Survey	Sai thong Water fall
11 OCTOBER 2019	Satun	Satun	Conducted Karst form Survey	
		Satun	investigation of fossil evidence	Kao Noi/ Stromatolite Somnaksong Koa Pet Nam
		Satun	Conducted Karst form Survey	
12 OCTOBER 2019	Satun	Satun	Conducted Marine Karst form survey	Pra sat Hin Pun yot/ Kao TaBun
		Satun	Conducted Karst soil and vegetatiion surveys	
13 OCTOBER 2019	Satun	Satun	Conducted Marine Karst hydrological survey and take samples	Panya Batik/ Tham Wang Kram/เขารูปเตีอกม้า
		Satun	Conducted Marine Karst form survey	
14 OCTOBER 2019	Satun	Satun	Selected Monitoring points for marine karst carbon sinks	Tham le Stegodon
15 OCTOBER 2019	Satun	Satun	Conducted Marine Karst form survey	Tarutoa National Park
		Satun	Conducted Karst hydrological survey	
16 OCTOBER 2019	Satun - Trang - BKK	Satun	Conducted Karst hydrological survey	Tham le Stegodon
		BKK	Departure from Trang	
17 OCTOBER 2019	BKK - Guangzhou (CZ3082)	CN	Departure	

# DAY 3 ( 6 OCTOBER 2019)

- Suratthani- Krabi
- Accommodation : Krabi
- Propose
  - Karst form Survey/ Karst landform survey
  - Tham Sra Yuan Thong
  - Sra Morakot
  - Hot waterfall





Geological Map Krabi Province

PERMIAN LIMESTONE  
-RATCHABURI GROUP

ถ้ำสระยวนทอง Srayuantong Cave





# Sra Morakot



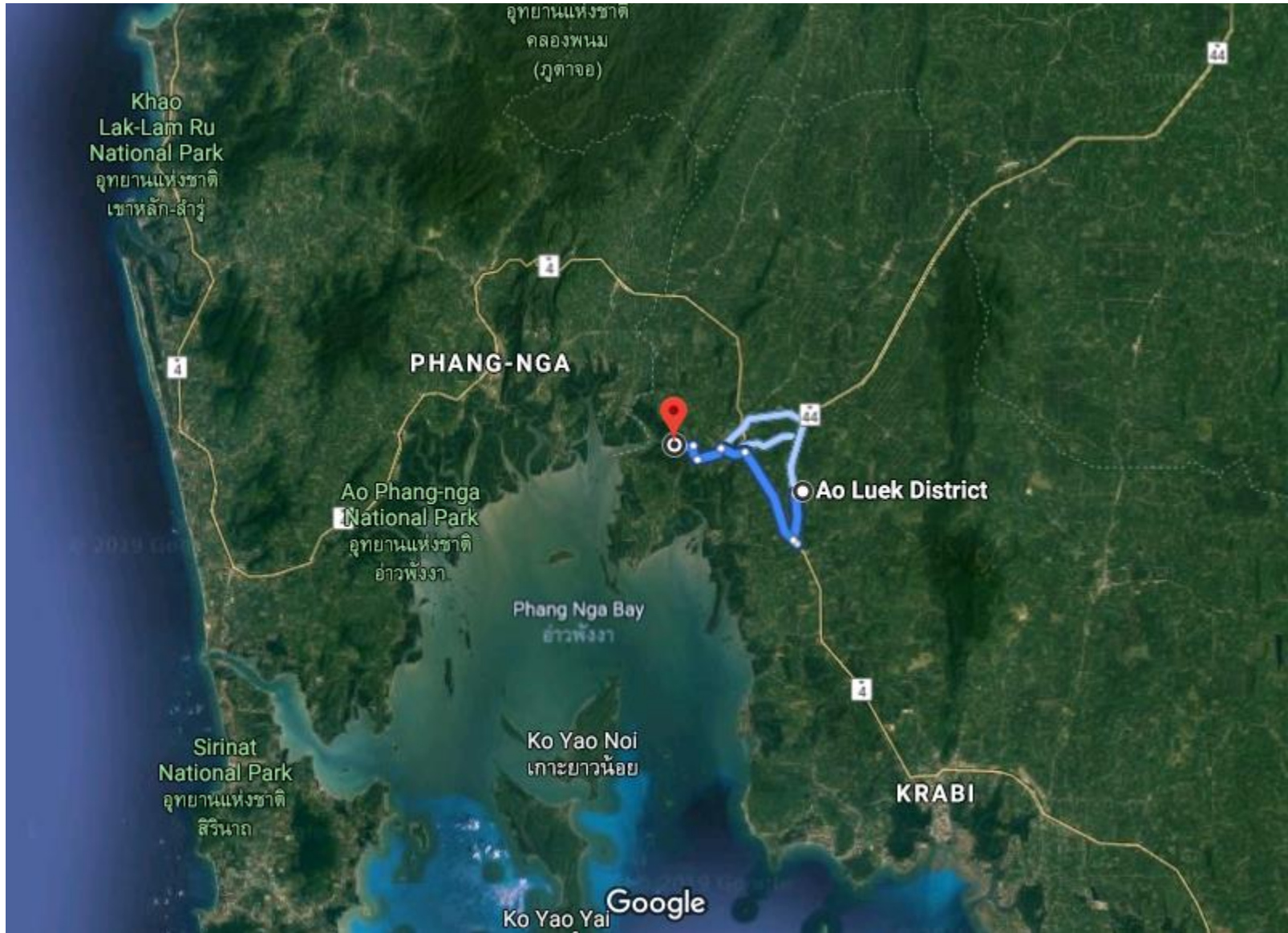
# Hot Waterfall

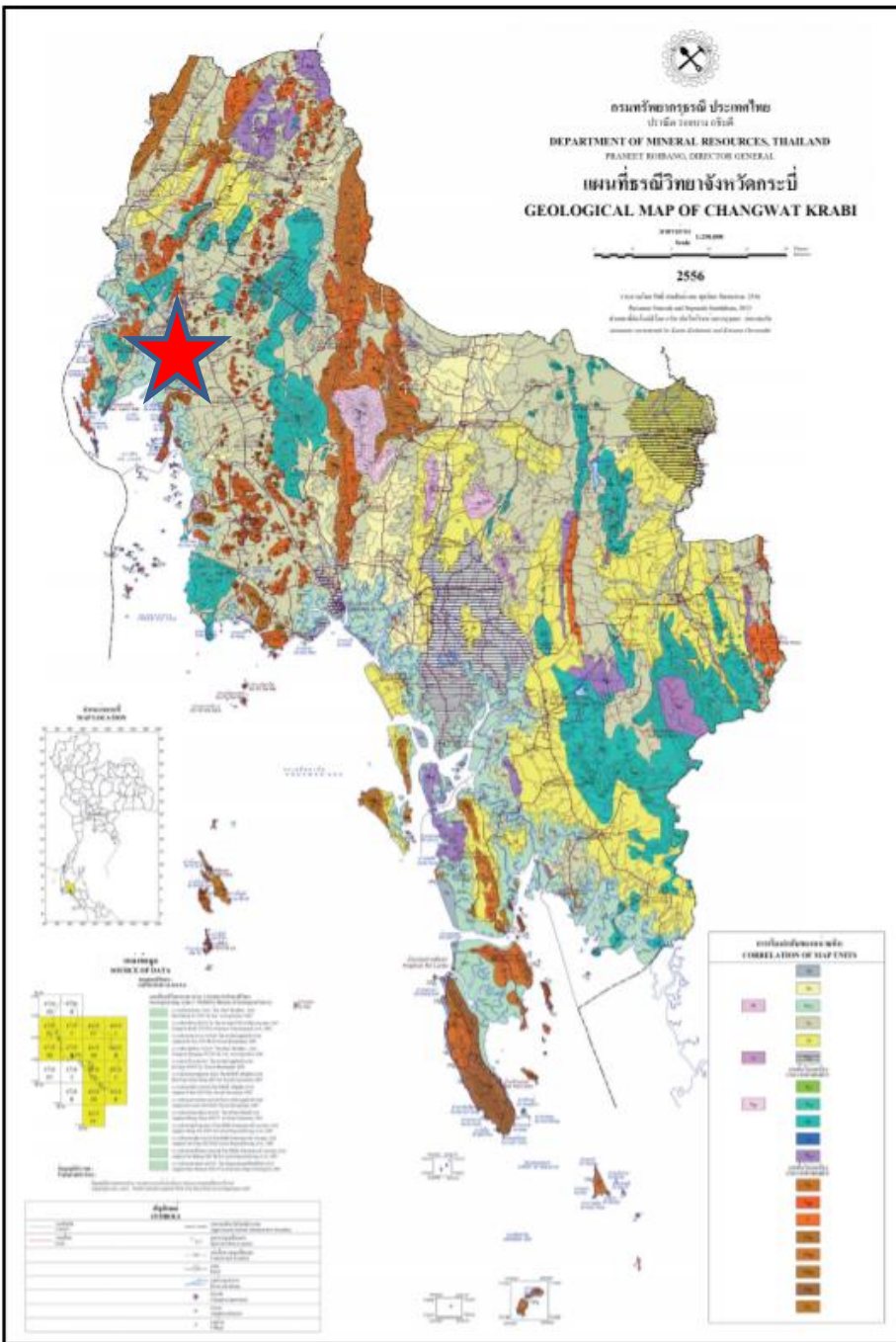


Date	Time	Travel Accommodation/Destination	Proposed	Description
3 OCTOBER 2019	Guilin-Bangkok (CZ6099)	BKK	Arrival	
		DMR	communicate with DMR	
4 OCTOBER 2019	Bangkok - Suratthani	Suratthani	Conduct Karst Geological Survey	Khao Phap Pha/ Tham Kamin
5 OCTOBER 2019		Suratthani	Karst form Survey/ Karst landform survey	Moo Koa Ang Thong National Park
6 OCTOBER 2019	Suratthani - Krabi	Krabi	Karst form Survey/ Karst landform survey	Tham Sra Yuan Thong
		Krabi	Conducted Karst Hydrogeological Survey	Sra Morakot/Hot Waterfall
7 OCTOBER 2019		Krabi	Conducted Cave Survey	Than Bok Korani National Park/ Tham Pee Hua To
8 OCTOBER 2019	Krabi - Satun	Krabi	Conducted Cave Survey	Tham Phet/ Tham Klang
		Satun	Conducted Karst form Survey	Tham U Rai Thong/ Tham Koa To Nang Dam
9 OCTOBER 2019	Satun	Satun	Conducted Karst Hydrogeological Survey	Karst Spring Ban Loa Pla Koa Tanan / Tham Jet kod
		Satun	Conducted Karst form Survey	Koa Tabun
10 OCTOBER 2019	Satun	Satun	Conducted Karst form Survey	Phupha Phet Cave
		Satun	Conducted Karst Hydrogeological Survey	Sai thong Water fall
11 OCTOBER 2019	Satun	Satun	Conducted Karst form Survey	
		Satun	investigation of fossil evidence	Kao Noi/ Stromatolite Somnaksong Koa Pet Nam
		Satun	Conducted Karst form Survey	
12 OCTOBER 2019	Satun	Satun	Conducted Marine Karst form survey	Pra sat Hin Pun yot/ Kao TaBun
		Satun	Conducted Karst soil and vegetatiion surveys	
13 OCTOBER 2019	Satun	Satun	Conducted Marine Karst hydrological survey and take samples	Panya Batik/ Tham Wang Kram/เขารูปเตีอกม้า
		Satun	Conducted Marine Karst form survey	
14 OCTOBER 2019	Satun	Satun	Selected Monitoring points for marine karst carbon sinks	Tham le Stegodon
15 OCTOBER 2019	Satun	Satun	Conducted Marine Karst form survey	Tarutoa National Park
		Satun	Conducted Karst hydrological survey	
16 OCTOBER 2019	Satun - Trang - BKK	Satun	Conducted Karst hydrological survey	Tham le Stegodon
		BKK	Departure from Trang	
17 OCTOBER 2019	BKK - Guangzhou (CZ3082)	CN	Departure	

# DAY 3 ( 7 OCTOBER 2019)

- Krabi
- Accommodation: Krabi
- Propose
  - Conducted Karst Hydrogeological Survey
  - Tham Pee Hua To





Geological Map Krabi Province

PERMIAN LIMESTONE  
-RATCHABURI GROUP



THAM PEE  
HUA TO



Date	Time	Travel Accommodation/Destination	Proposed	Description
3 OCTOBER 2019	Guilin-Bangkok (CZ6099)	BKK	Arrival	
		DMR	communicate with DMR	
4 OCTOBER 2019	Bangkok - Suratthani	Suratthani	Conduct Karst Geological Survey	Khao Phap Pha/ Tham Kamin
5 OCTOBER 2019		Suratthani	Karst form Survey/ Karst landform survey	Moo Koa Ang Thong National Park
6 OCTOBER 2019	Suratthani - Krabi	Krabi	Karst form Survey/ Karst landform survey	Tham Sra Yuan Thong
		Krabi	Conducted Karst Hydrogeological Survey	Sra Morakot/Hot Waterfall
7 OCTOBER 2019		Krabi	Conducted Cave Survey	Than Bok Korani National Park/ Tham Pee Hua To
8 OCTOBER 2019	Krabi - Satun	Krabi	Conducted Cave Survey	Tham Phet/ Tham Klang
		Satun	Conducted Karst form Survey	Tham U Rai Thong/ Tham Koa To Nang Dam
9 OCTOBER 2019	Satun	Satun	Conducted Karst Hydrogeological Survey	Karst Spring Ban Loa Pla Koa Tanan / Tham Jet kod
		Satun	Conducted Karst form Survey	Koa Tabun
10 OCTOBER 2019	Satun	Satun	Conducted Karst form Survey	Phupha Phet Cave
		Satun	Conducted Karst Hydrogeological Survey	Sai thong Water fall
11 OCTOBER 2019	Satun	Satun	Conducted Karst form Survey	
		Satun	investigation of fossil evidence	Kao Noi/ Stromatolite Somnaksong Koa Pet Nam
		Satun	Conducted Karst form Survey	
12 OCTOBER 2019	Satun	Satun	Conducted Marine Karst form survey	Pra sat Hin Pun yot/ Kao TaBun
		Satun	Conducted Karst soil and vegetatiion surveys	
13 OCTOBER 2019	Satun	Satun	Conducted Marine Karst hydrological survey and take samples	Panya Batik/ Tham Wang Kram/เขารูปเตีอกม้้า
		Satun	Conducted Marine Karst form survey	
14 OCTOBER 2019	Satun	Satun	Selected Monitoring points for marine karst carbon sinks	Tham le Stegodon
15 OCTOBER 2019	Satun	Satun	Conducted Marine Karst form survey	Tarutoa National Park
		Satun	Conducted Karst hydrological survey	
16 OCTOBER 2019	Satun - Trang - BKK	Satun	Conducted Karst hydrological survey	Tham le Stegodon
		BKK	Departure from Trang	
17 OCTOBER 2019	BKK - Guangzhou (CZ3082)	CN	Departure	

# DAY 4 (8 OCTOBER 2019)

- Krabi-Satun
- Accommodation : Satun
- Propose
  - Cave Survey
  - Tham Phet
  - Tham Khlang
  - Tham U Rai Thong
  - Tham Kao To Nang Dam



ถ้ำผีหัวโต  
อุทยานแห่งชาติ ธาร...

4012

Lot cave

Than Bok  
Khorani  
National Park  
อุทยานแห่งชาติ  
ธารโบกขรณี

1002

24

Khlang Cave

1010

4

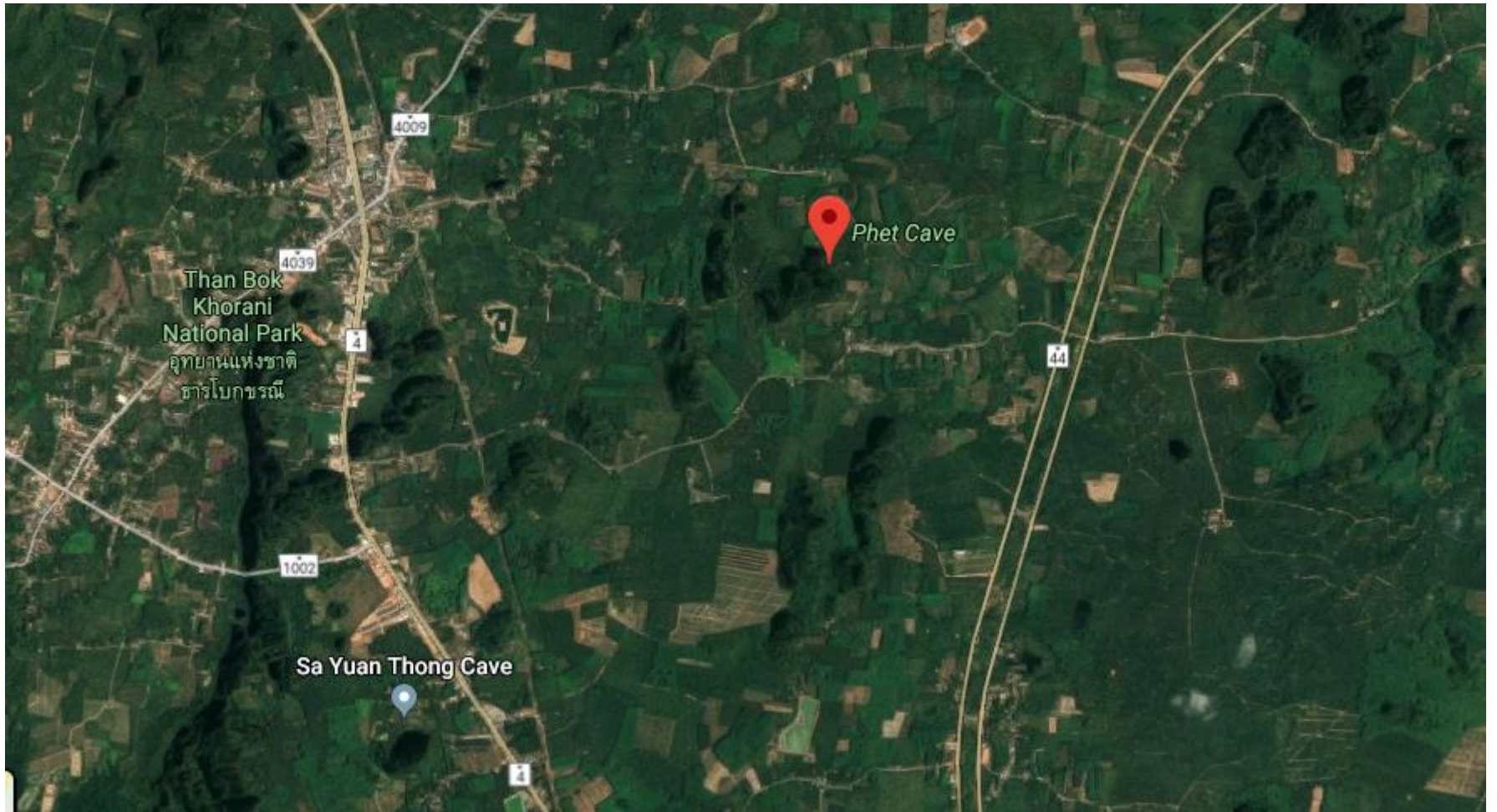
24

Children Development  
Center 82 Laem Sak

4295  
Google

# THAM KHLANG





Than Bok  
Khorani  
National Park  
อุทยานแห่งชาติ  
ธารโบกขรณี

Phet Cave

Sa Yuan Thong Cave

# THAM PHET



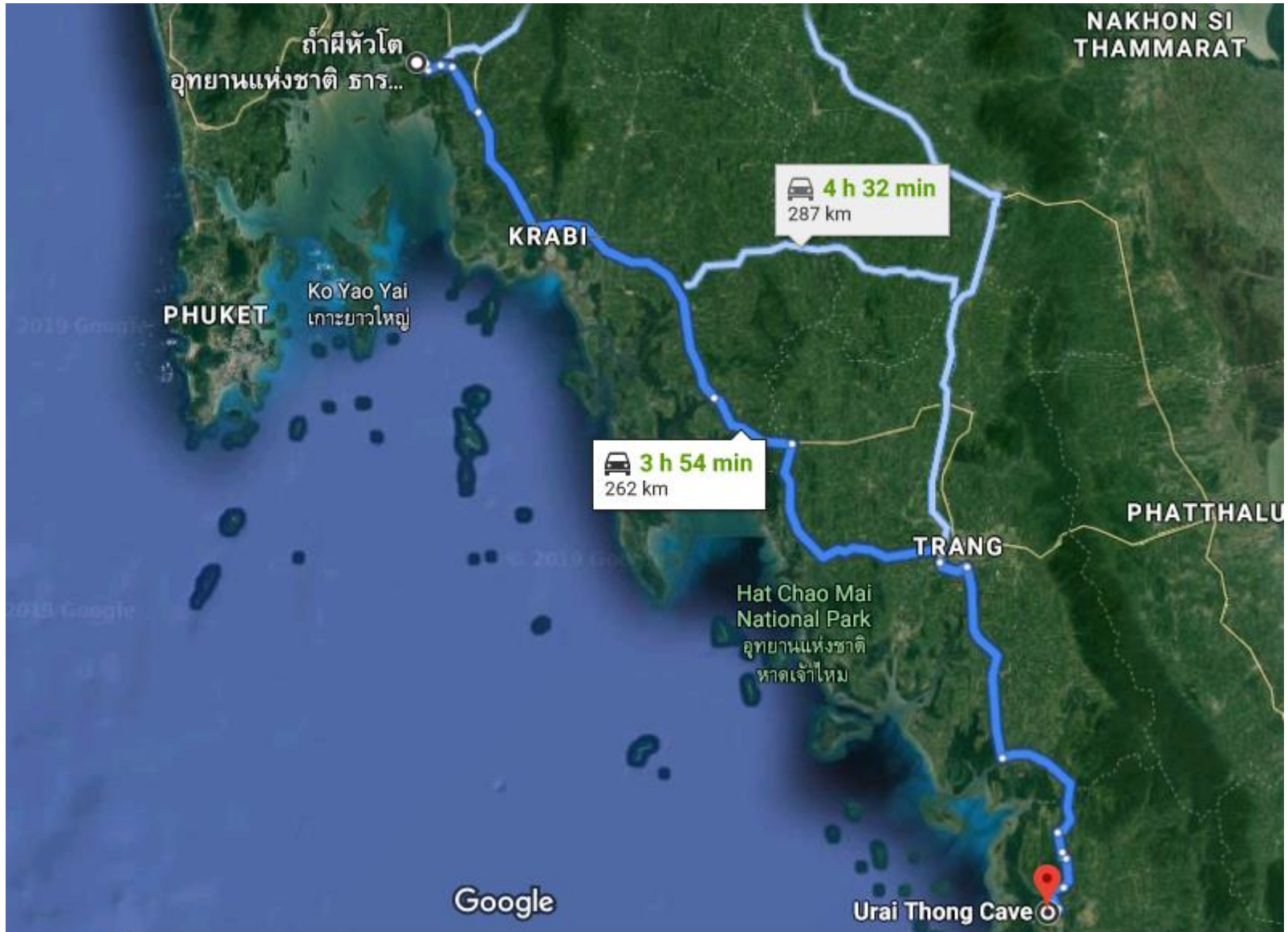


Urai Thong Cave



# THAM URAI THONG





NAKHON SI  
THAMMARAT

ถ้ำผีหัวโต  
อุทยานแห่งชาติ ธาร...

4 h 32 min  
287 km

KRABI

PHUKET

Ko Yao Yai  
เกาะยาวใหญ่

3 h 54 min  
262 km

PHATTHALU

TRANG

Hat Chao Mai  
National Park  
อุทยานแห่งชาติ  
หาดเจ้าไหม

Google

Urai Thong Cave

Date	Time	Travel Accommodation/Destination	Proposed	Description
3 OCTOBER 2019	Guilin-Bangkok (CZ6099)	BKK	Arrival	
		DMR	communicate with DMR	
4 OCTOBER 2019	Bangkok - Suratthani	Suratthani	Conduct Karst Geological Survey	Khao Phap Pha/ Tham Kamin
5 OCTOBER 2019		Suratthani	Karst form Survey/ Karst landform survey	Moo Koa Ang Thong National Park
6 OCTOBER 2019	Suratthani - Krabi	Krabi	Karst form Survey/ Karst landform survey	Tham Sra Yuan Thong
		Krabi	Conducted Karst Hydrogeological Survey	Sra Morakot/Hot Waterfall
7 OCTOBER 2019		Krabi	Conducted Cave Survey	Than Bok Korani National Park/ Tham Pee Hua To
8 OCTOBER 2019	Krabi - Satun	Krabi	Conducted Cave Survey	Tham Phet/ Tham Klang
		Satun	Conducted Karst form Survey	Tham U Rai Thong/ Tham Koa To Nang Dam
9 OCTOBER 2019	Satun	Satun	Conducted Karst Hydrogeological Survey	Karst Spring Ban Loa Pla Koa Tanan / Tham Jet kod
		Satun	Conducted Karst form Survey	Koa Tabun
10 OCTOBER 2019	Satun	Satun	Conducted Karst form Survey	Phupha Phet Cave
		Satun	Conducted Karst Hydrogeological Survey	Sai thong Water fall
11 OCTOBER 2019	Satun	Satun	Conducted Karst form Survey	
		Satun	investigation of fossil evidence	Kao Noi/ Stromatolite Somnaksong Koa Pet Nam
		Satun	Conducted Karst form Survey	
12 OCTOBER 2019	Satun	Satun	Conducted Marine Karst form survey	Pra sat Hin Pun yot/ Kao TaBun
		Satun	Conducted Karst soil and vegetatiion surveys	
13 OCTOBER 2019	Satun	Satun	Conducted Marine Karst hydrological survey and take samples	Panya Batik/ Tham Wang Kram/เขารูปเตีอกม้า
		Satun	Conducted Marine Karst form survey	
14 OCTOBER 2019	Satun	Satun	Selected Monitoring points for marine karst carbon sinks	Tham le Stegodon
15 OCTOBER 2019	Satun	Satun	Conducted Marine Karst form survey	Tarutoa National Park
		Satun	Conducted Karst hydrological survey	
16 OCTOBER 2019	Satun - Trang - BKK	Satun	Conducted Karst hydrological survey	Tham le Stegodon
		BKK	Departure from Trang	
17 OCTOBER 2019	BKK - Guangzhou (CZ3082)	CN	Departure	

# DAY 5 ( 9 OCTOBER 2019)

- Satun
- Accommodation : Satun
- Propose
  - Conducted Karst Hydrogeological Survey
  - Karst Spring Ban Loa Pla
  - Kao Tanan
  - Tham Jet kod



# SATUN GEOPARK MAP

## แผนที่อุทยานธรณีสตูล

### แหล่งธรณีวิทยา Geological Attractions

- 1 เขาค้อนาน Khao Thanan
- 2 ถ้ำสเตโกดอน Stegodon Cave
- 3 ซากหินถาวรปลิว Tharn Plew Lapies
- 4 หินคลองห้วยบัว Khlong Huai Ba Rock
- 5 เกาะตะบัน Taban Island
- 6 น้ำตกถาวรปลิว Tharn Plew Waterfall
- 7 ซากดึกดำบรรพ์เขาโต๊ะสามยอด To Sam Yot Fossil
- 8 ถ้ำวังกลาง Wang Klang Cave
- 9 ถ้ำภูผาเพชร Phu Pha Phet Cave
- 10 สรณหินผูดาวเพชร Phu Pha Phet Lapies
- 11 สามเหลี่ยมบ้าน Pa Phon Lapies
- 12 ถ้ำเจ็ดคด Chet Khot Cave
- 13 หมวดหินมะละกา Malaka Formation
- 14 อ่าวมะละ Mo Lao Bay
- 15 อ่าวสน Son Bay
- 16 หินแกรนิตหาดประมง Pramong Beach Granite
- 17 เกาะหินงาม Hin Ngam Island
- 18 เกาะไข Kai Islet
- 19 ลำดับชั้นหินควaternary Khuan Thang Type Section
- 20 ลำดับชั้นหินเนอไอน Khao Noi Type Section
- 21 หินทรายห้วยทุ่งสมิต Thung Samet Stromatolite Lapies
- 22 หินทรายห้วยท่าม Tharae Stromatolite Lapies
- 23 เอดิลอยด์เขาแดง Khao Daeng Nautiloid
- 24 ถ้ำอุไร Urai Cave
- 25 น้ำตกวังสายทอง Wang Sai Thong Waterfall
- 26 เขตข้ามกาลเวลาเขาโต๊ะหยง Khao To Ngai Geological Time Boundary
- 27 เกาะลิคเล็ก Lidi Lek Island
- 28 บำรสกหินพันยอด Prasat Hio Pa'yod

### แหล่งท่องเที่ยวที่น่าสนใจ Non - Geological Attractions

- 1 ศูนย์ประชาสัมพันธ์อุทยานธรณีสตูล Satun Geopark Information Center
- 2 พิพิธภัณฑ์ช้างศึกคำบรรพ์ทุ่งหว้า Ancient Elephant Museum
- 3 พิพิธภัณฑ์พื้นบ้านละกู Lang-u Folk Museum
- 4 พิพิธภัณฑ์ธรรมชาติวิทยาโรงเรียนกำแพง Natural Museum Kampang Wittaya School
- 5 อาคารจีน-โปรตุเกส Sino-Portuguese Style Buildings
- 6 บ่อเจ็ดลูก Bo Chet Luk (Seven Wells)
- 7 ท่าเทียบเรือบ้านท่าอ้อย Ban Tha Oil Pier
- 8 จุดชมวิวดาแดง Khao Daeng Viewpoint
- 9 สำนักงานเขตรักษาพันธุ์สัตว์ป่าเขาบรรทัด Khaobanthad Wildlife Sanctuary Office
- 10 ส่องนกกังไสทอง Wang Sai Thong Kayaking Area
- 11 ส่องนกเงือกห้วยตม Nikhom Pattana Kayaking Area
- 12 คุกตะรุตา Tarutao Prison Camp
- 13 ศูนย์วิจัยและพัฒนาประมงน้ำจืดสตูล Satun Inland Aquaculture Research and Development Center
- 14 ศูนย์วิจัยและพัฒนาประมงชายฝั่งสตูล Satun Coastal Fisheries Research and Development Center
- 15 โรงเรียนทุ่งหว้าวิทยวิฑู Thungwaworawit Geopark School
- 16 บ้านหยาบาลัก Panya Batik Handmade Center

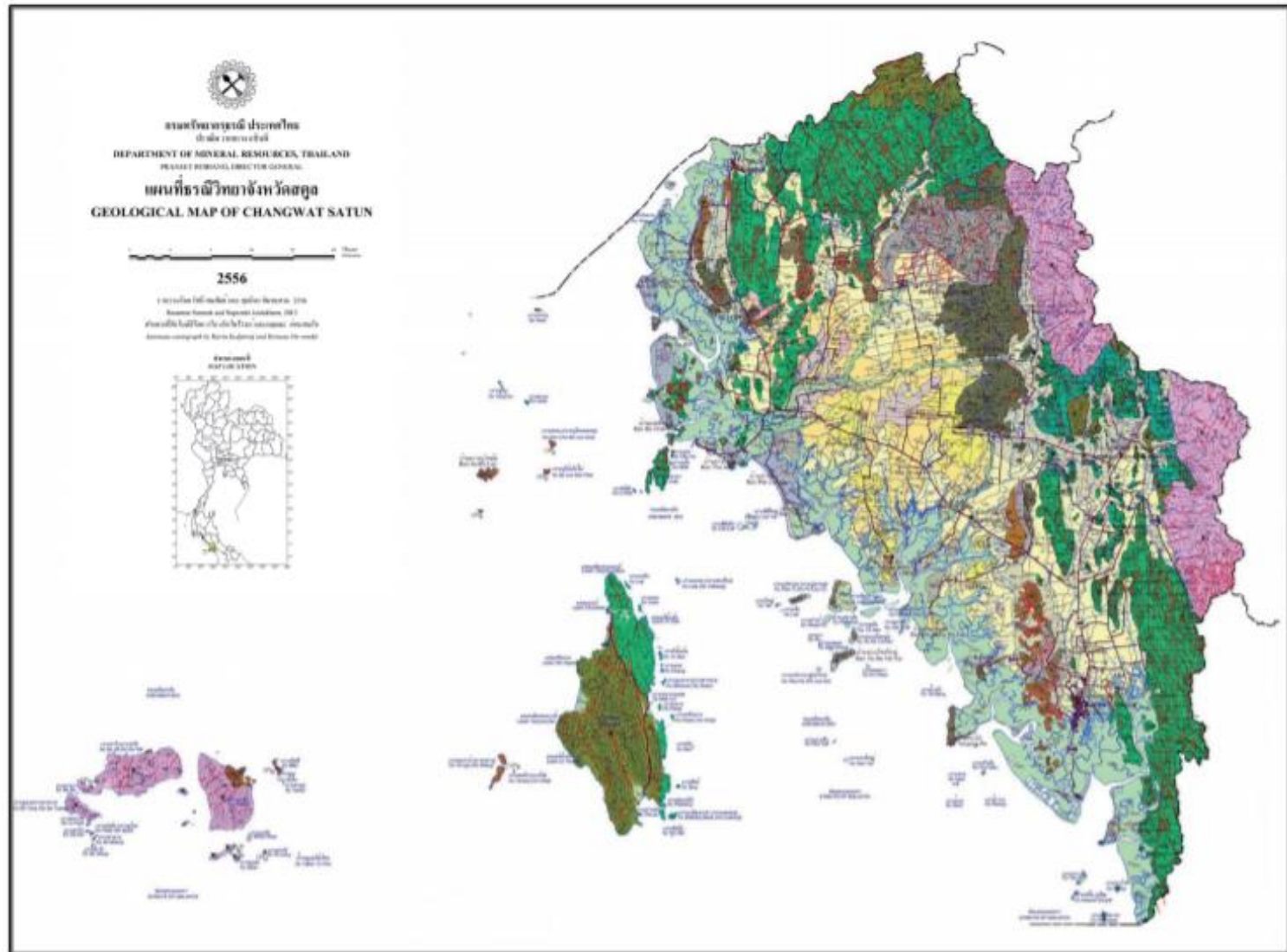


- ### สัญลักษณ์ Symbol
- [- - -] ขอบเขตอุทยานธรณี Geopark Boundary
  - อำเภอ District
  - ◎ จังหวัด Province
  - ท่าเรือ Pier
  - สถานีรถโดยสารประจำทาง Bus Station
  - ร้านอาหาร Restaurant
  - โรงแรมที่พัก Accommodation
  - เขตอุทยานแห่งชาติ National Park
  - เขตรักษาพันธุ์สัตว์ป่า Wildlife Sanctuary
  - องค์การบริหารส่วนตำบล Subdistrict Administrative Organization (SOA)

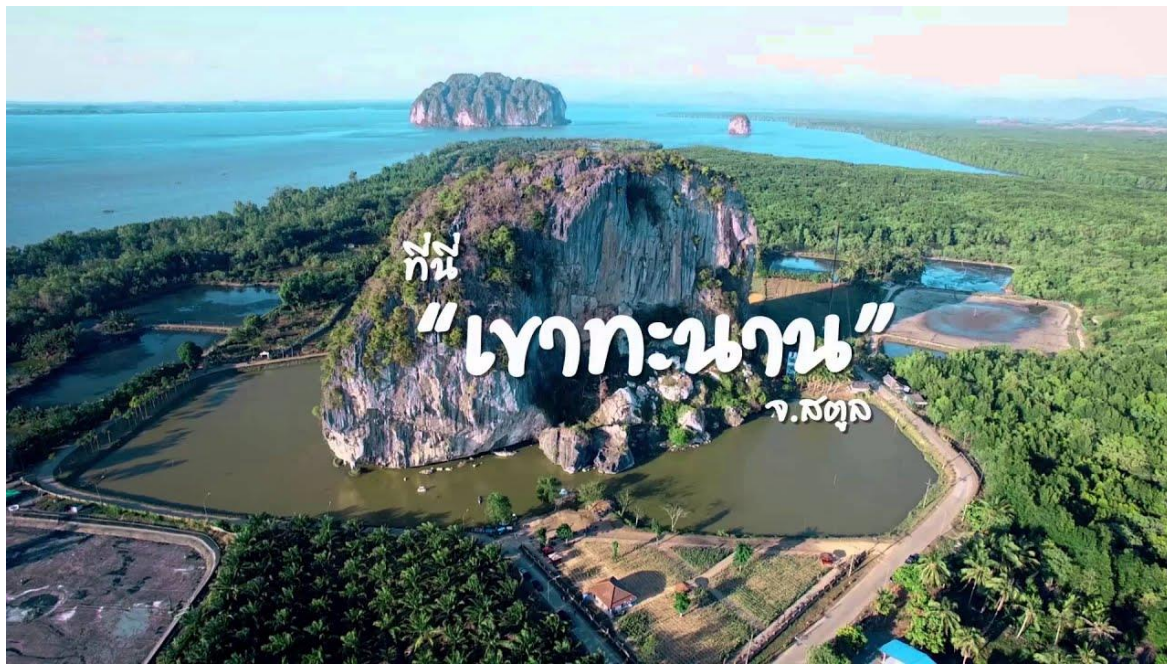


To Langkawi ไปทะเลสังขาร

# Geological Map Satun Province



ORDOVICIAN LIMESTONE  
-THUNG SONG GROUP



Koa Tanan



Tham Jet kod

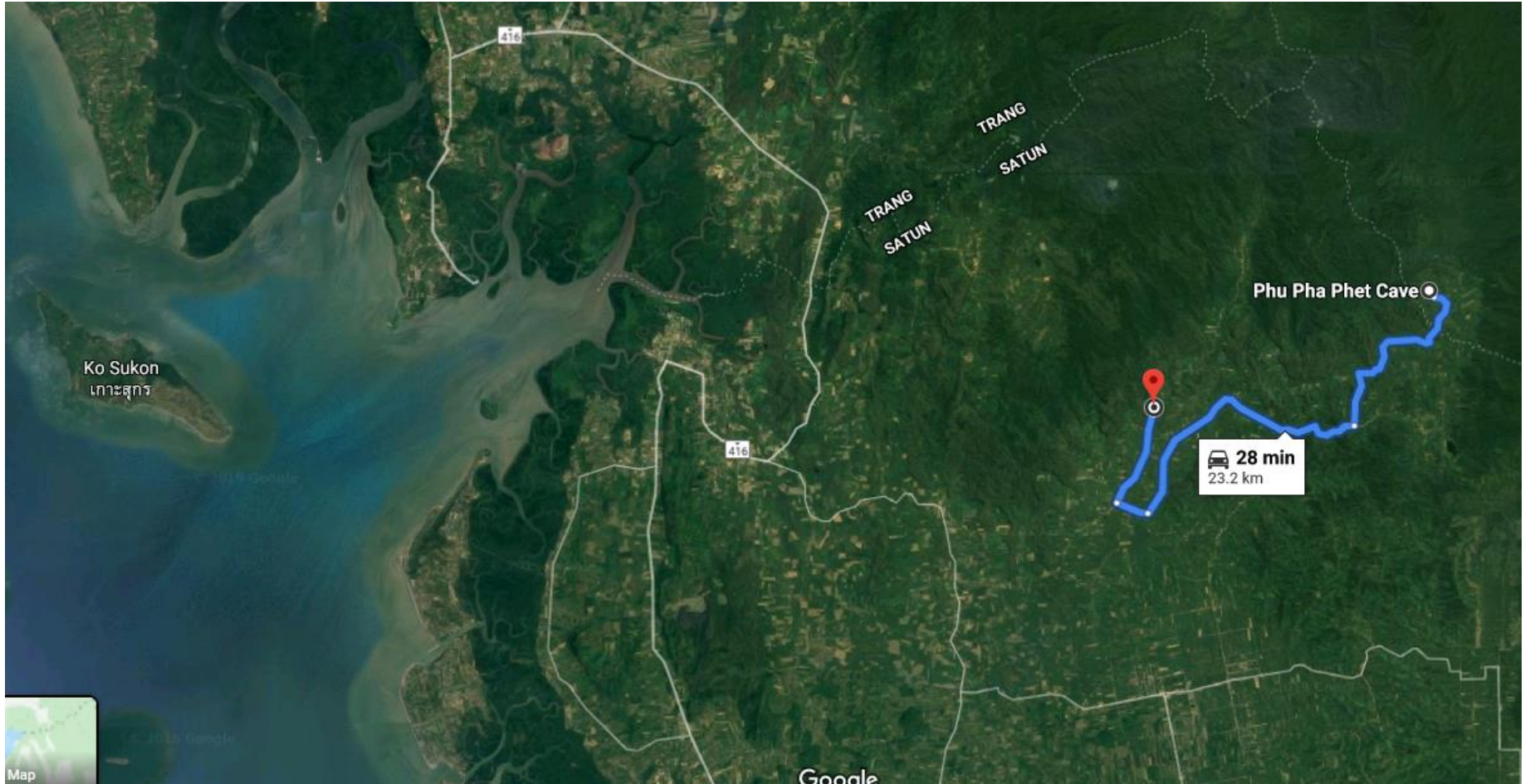


of  
ถ้ำเจ็ดคต  
เพื่อชุมชน

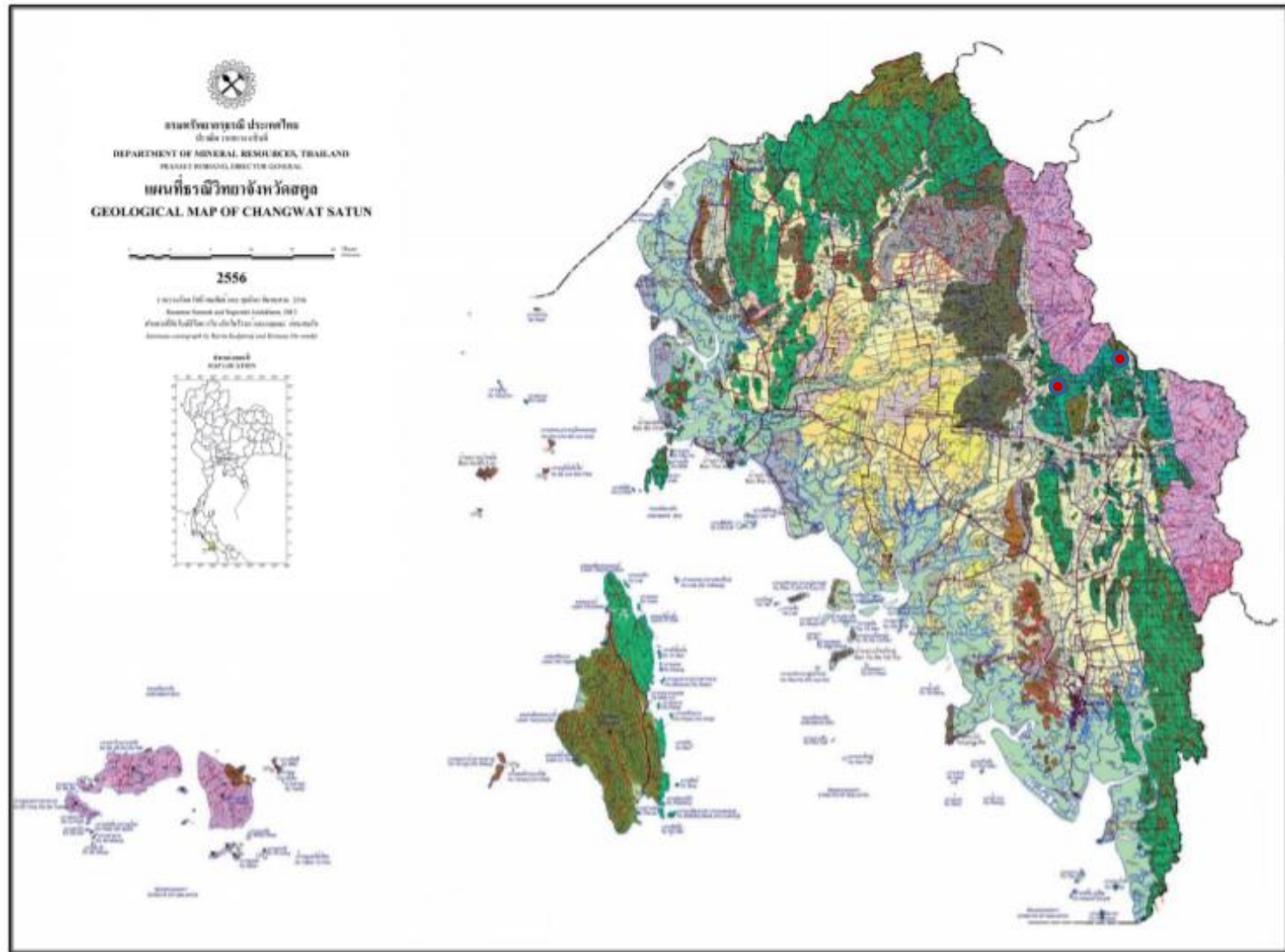
Date	Time	Travel Accommodation/Destination	Proposed	Description
3 OCTOBER 2019	Guilin-Bangkok (CZ6099)	BKK	Arrival	
		DMR	communicate with DMR	
4 OCTOBER 2019	Bangkok - Suratthani	Suratthani	Conduct Karst Geological Survey	Khao Phap Pha/ Tham Kamin
5 OCTOBER 2019		Suratthani	Karst form Survey/ Karst landform survey	Moo Koa Ang Thong National Park
6 OCTOBER 2019	Suratthani - Krabi	Krabi	Karst form Survey/ Karst landform survey	Tham Sra Yuan Thong
		Krabi	Conducted Karst Hydrogeological Survey	Sra Morakot/Hot Waterfall
7 OCTOBER 2019		Krabi	Conducted Cave Survey	Than Bok Korani National Park/ Tham Pee Hua To
8 OCTOBER 2019	Krabi - Satun	Krabi	Conducted Cave Survey	Tham Phet/ Tham Klang
		Satun	Conducted Karst form Survey	Tham U Rai Thong/ Tham Koa To Nang Dam
9 OCTOBER 2019	Satun	Satun	Conducted Karst Hydrogeological Survey	Karst Spring Ban Loa Pla Koa Tanan / Tham Jet kod
		Satun	Conducted Karst form Survey	Koa Tabun
10 OCTOBER 2019	Satun	Satun	Conducted Karst form Survey	Phupha Phet Cave
		Satun	Conducted Karst Hydrogeological Survey	Sai thong Water fall
11 OCTOBER 2019	Satun	Satun	Conducted Karst form Survey	
		Satun	investigation of fossil evidence	Kao Noi/ Stromatolite Somnaksong Koa Pet Nam
		Satun	Conducted Karst form Survey	
12 OCTOBER 2019	Satun	Satun	Conducted Marine Karst form survey	Pra sat Hin Pun yot/ Kao TaBun
		Satun	Conducted Karst soil and vegetatiion surveys	
13 OCTOBER 2019	Satun	Satun	Conducted Marine Karst hydrological survey and take samples	Panya Batik/ Tham Wang Kram/เขารูปเตีอกม้า
		Satun	Conducted Marine Karst form survey	
14 OCTOBER 2019	Satun	Satun	Selected Monitoring points for marine karst carbon sinks	Tham le Stegodon
15 OCTOBER 2019	Satun	Satun	Conducted Marine Karst form survey	Tarutoa National Park
		Satun	Conducted Karst hydrological survey	
16 OCTOBER 2019	Satun - Trang - BKK	Satun	Conducted Karst hydrological survey	Tham le Stegodon
		BKK	Departure from Trang	
17 OCTOBER 2019	BKK - Guangzhou (CZ3082)	CN	Departure	

# DAY 6 ( 10 OCTOBER 2019)

- Satun
- Accommodation : Satun
- Propose
  - Conducted Karst Survey
  - Phupha Phet Cave
  - Stone Forest



# Geological Map Satun Province



ORDOVICIAN LIMESTONE  
-THUNG SONG GROUP

# Phupha Phet Temple



## Stone Forest



## Phupha Phet Cave



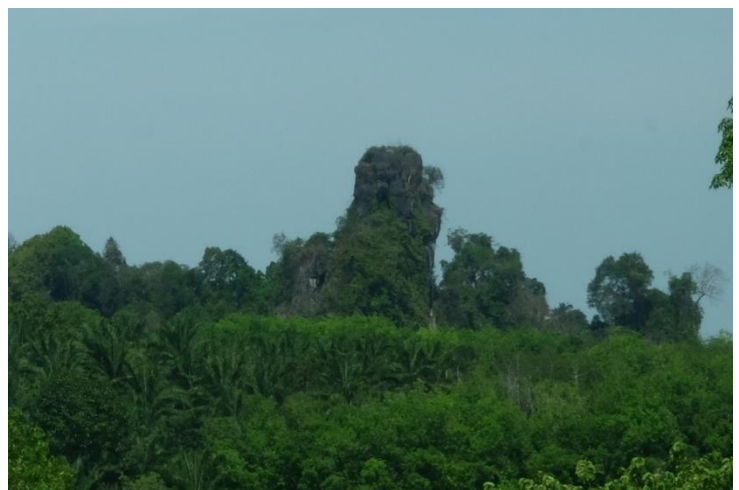
Date	Time	Travel Accommodation/Destination	Proposed	Description
3 OCTOBER 2019	Guilin-Bangkok (CZ6099)	BKK	Arrival	
		DMR	communicate with DMR	
4 OCTOBER 2019	Bangkok - Suratthani	Suratthani	Conduct Karst Geological Survey	Khao Phap Pha/ Tham Kamin
5 OCTOBER 2019		Suratthani	Karst form Survey/ Karst landform survey	Moo Koa Ang Thong National Park
6 OCTOBER 2019	Suratthani - Krabi	Krabi	Karst form Survey/ Karst landform survey	Tham Sra Yuan Thong
		Krabi	Conducted Karst Hydrogeological Survey	Sra Morakot/Hot Waterfall
7 OCTOBER 2019		Krabi	Conducted Cave Survey	Than Bok Korani National Park/ Tham Pee Hua To
8 OCTOBER 2019	Krabi - Satun	Krabi	Conducted Cave Survey	Tham Phet/ Tham Klang
		Satun	Conducted Karst form Survey	Tham U Rai Thong/ Tham Koa To Nang Dam
9 OCTOBER 2019	Satun	Satun	Conducted Karst Hydrogeological Survey	Karst Spring Ban Loa Pla Koa Tanan / Tham Jet kod
		Satun	Conducted Karst form Survey	Koa Tabun
10 OCTOBER 2019	Satun	Satun	Conducted Karst form Survey	Phupha Phet Cave
		Satun	Conducted Karst Hydrogeological Survey	Sai thong Water fall
11 OCTOBER 2019	Satun	Satun	Conducted Karst form Survey	
		Satun	investigation of fossil evidence	Kao Noi/ Stromatolite Somnaksong Koa Pet Nam
		Satun	Conducted Karst form Survey	
12 OCTOBER 2019	Satun	Satun	Conducted Marine Karst form survey	Pra sat Hin Pun yot/ Kao TaBun
		Satun	Conducted Karst soil and vegetatiion surveys	
13 OCTOBER 2019	Satun	Satun	Conducted Marine Karst hydrological survey and take samples	Panya Batik/ Tham Wang Kram/เขารูปเตีอกม้า
		Satun	Conducted Marine Karst form survey	
14 OCTOBER 2019	Satun	Satun	Selected Monitoring points for marine karst carbon sinks	Tham le Stegodon
15 OCTOBER 2019	Satun	Satun	Conducted Marine Karst form survey	Tarutoa National Park
		Satun	Conducted Karst hydrological survey	
16 OCTOBER 2019	Satun - Trang - BKK	Satun	Conducted Karst hydrological survey	Tham le Stegodon
		BKK	Departure from Trang	
17 OCTOBER 2019	BKK - Guangzhou (CZ3082)	CN	Departure	

# DAY 7 ( 11 OCTOBER 2019)

- Satun
- Accommodation : Satun
- Propose
  - Conducted Karst form Survey
  - Kao Noi
  - Stromatolite Somnaksong Koa Pet Nam



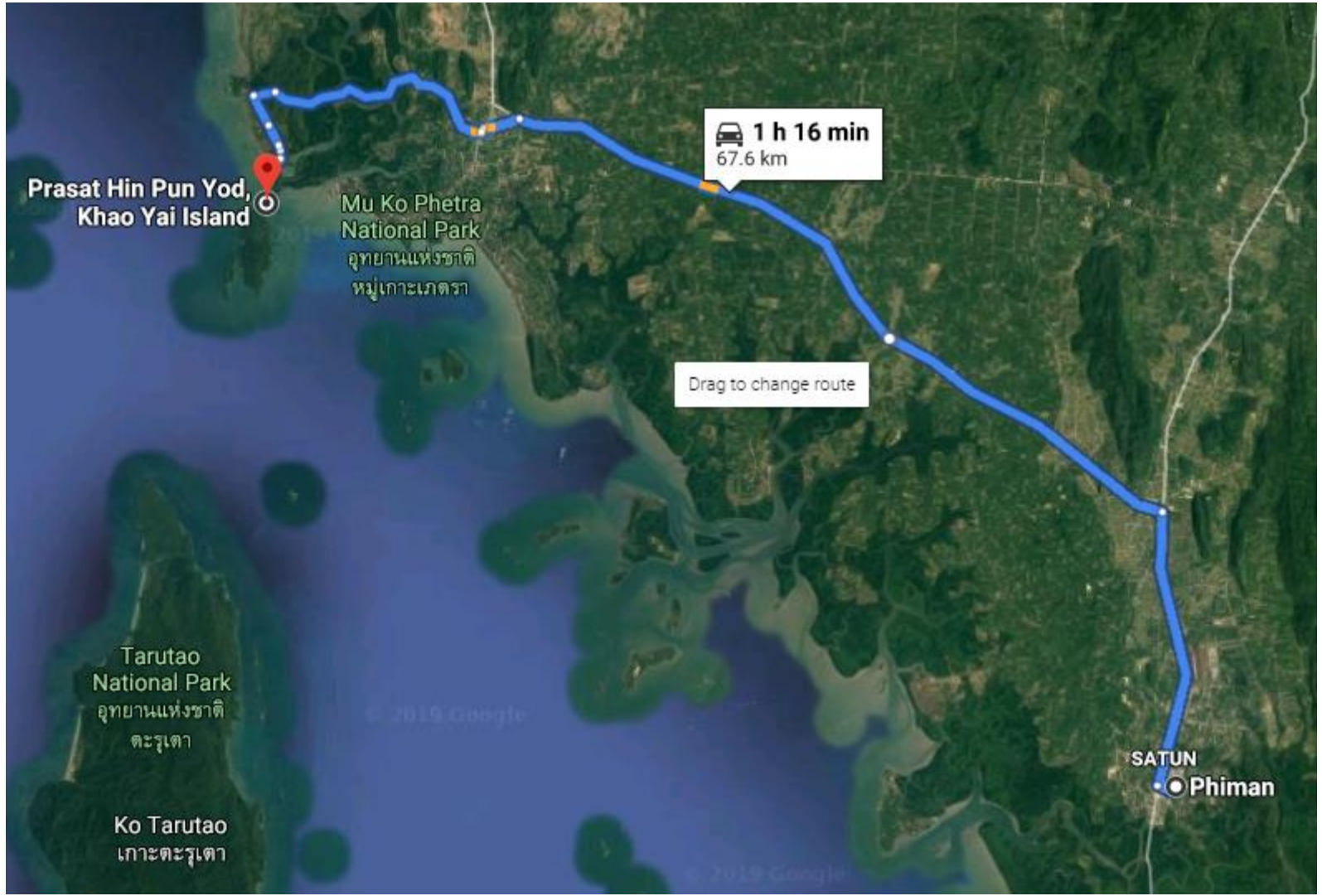
# สำนักสงฆ์เขาเปิดน้ำ



Date	Time	Travel Accommodation/Destination	Proposed	Description
3 OCTOBER 2019	Guilin-Bangkok (CZ6099)	BKK	Arrival	
		DMR	communicate with DMR	
4 OCTOBER 2019	Bangkok - Suratthani	Suratthani	Conduct Karst Geological Survey	Khao Phap Pha/ Tham Kamin
5 OCTOBER 2019		Suratthani	Karst form Survey/ Karst landform survey	Moo Koa Ang Thong National Park
6 OCTOBER 2019	Suratthani - Krabi	Krabi	Karst form Survey/ Karst landform survey	Tham Sra Yuan Thong
		Krabi	Conducted Karst Hydrogeological Survey	Sra Morakot/Hot Waterfall
7 OCTOBER 2019		Krabi	Conducted Cave Survey	Than Bok Korani National Park/ Tham Pee Hua To
8 OCTOBER 2019	Krabi - Satun	Krabi	Conducted Cave Survey	Tham Phet/ Tham Klang
		Satun	Conducted Karst form Survey	Tham U Rai Thong/ Tham Koa To Nang Dam
9 OCTOBER 2019	Satun	Satun	Conducted Karst Hydrogeological Survey	Karst Spring Ban Loa Pla Koa Tanan / Tham Jet kod
		Satun	Conducted Karst form Survey	Koa Tabun
10 OCTOBER 2019	Satun	Satun	Conducted Karst form Survey	Phupha Phet Cave
		Satun	Conducted Karst Hydrogeological Survey	Sai thong Water fall
11 OCTOBER 2019	Satun	Satun	Conducted Karst form Survey	
		Satun	investigation of fossil evidence	Kao Noi/ Stromatolite Somnaksong Koa Pet Nam
		Satun	Conducted Karst form Survey	
12 OCTOBER 2019	Satun	Satun	Conducted Marine Karst form survey	Pra sat Hin Pun yot/ Kao TaBun
		Satun	Conducted Karst soil and vegetatiion surveys	
13 OCTOBER 2019	Satun	Satun	Conducted Marine Karst hydrological survey and take samples	Panya Batik/ Tham Wang Kram/เขารูปเตีอกม้า
		Satun	Conducted Marine Karst form survey	
14 OCTOBER 2019	Satun	Satun	Selected Monitoring points for marine karst carbon sinks	Tham le Stegodon
15 OCTOBER 2019	Satun	Satun	Conducted Marine Karst form survey	Tarutoa National Park
		Satun	Conducted Karst hydrological survey	
16 OCTOBER 2019	Satun - Trang - BKK	Satun	Conducted Karst hydrological survey	Tham le Stegodon
		BKK	Departure from Trang	
17 OCTOBER 2019	BKK - Guangzhou (CZ3082)	CN	Departure	

# DAY 8 ( 12 OCTOBER 2019)

- Satun
- Accommodation : Satun
- Propose
  - Conducted Marine Karst form Survey
  - Pra sat Hin Pun yot
  - Kao TaBun



Prasat Hin Pun Yod,  
Khao Yai Island

Mu Ko Phetra  
National Park  
อุทยานแห่งชาติ  
หมู่เกาะเภตรา

 1 h 16 min  
67.6 km

Drag to change route

Tarutao  
National Park  
อุทยานแห่งชาติ  
ตะรุเตา

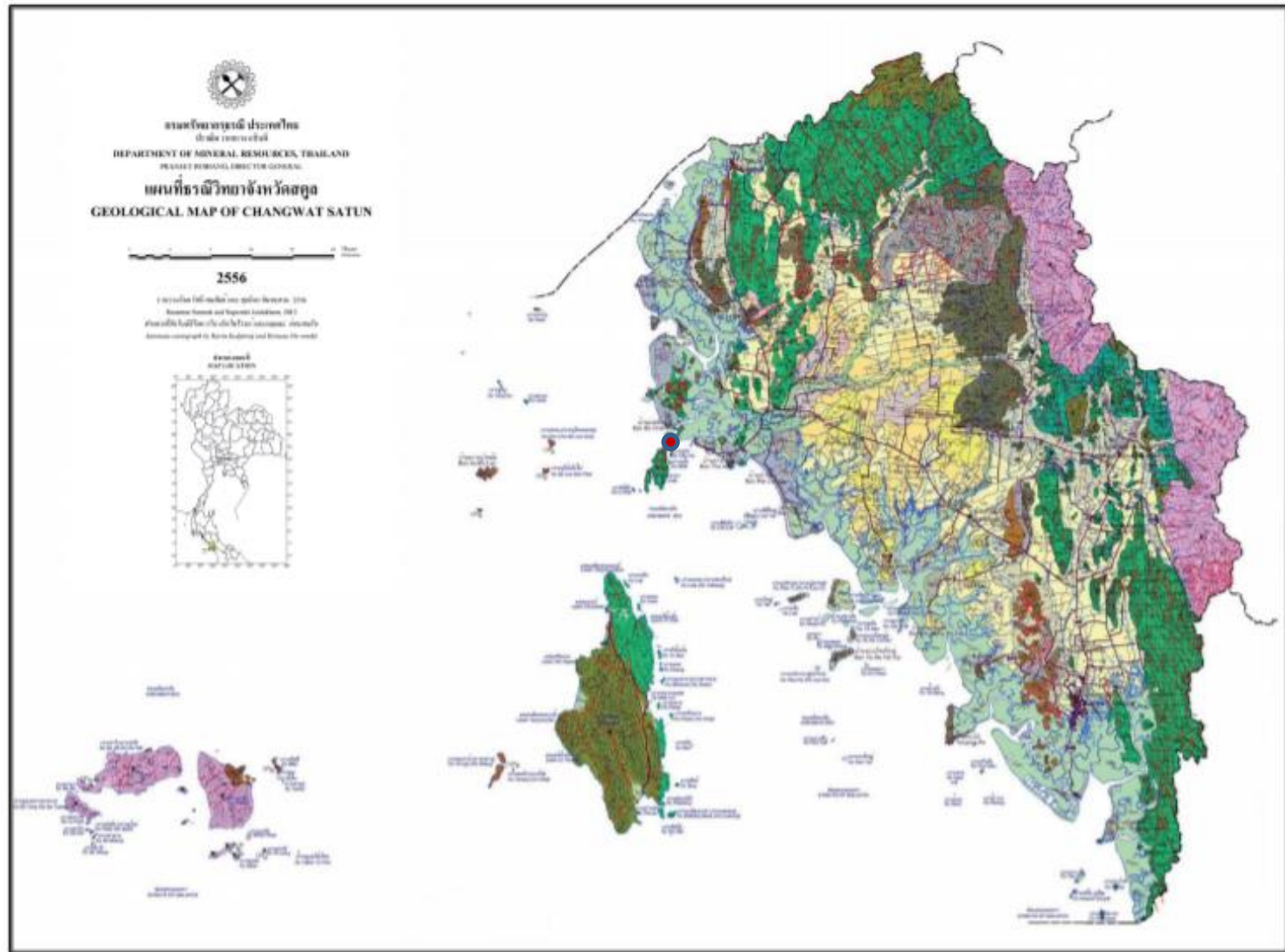
Ko Tarutao  
เกาะตะรุเตา

SATUN  
 Phiman

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# Geological Map Satun Province



ORDOVICIAN LIMESTONE  
-THUNG SONG GROUP

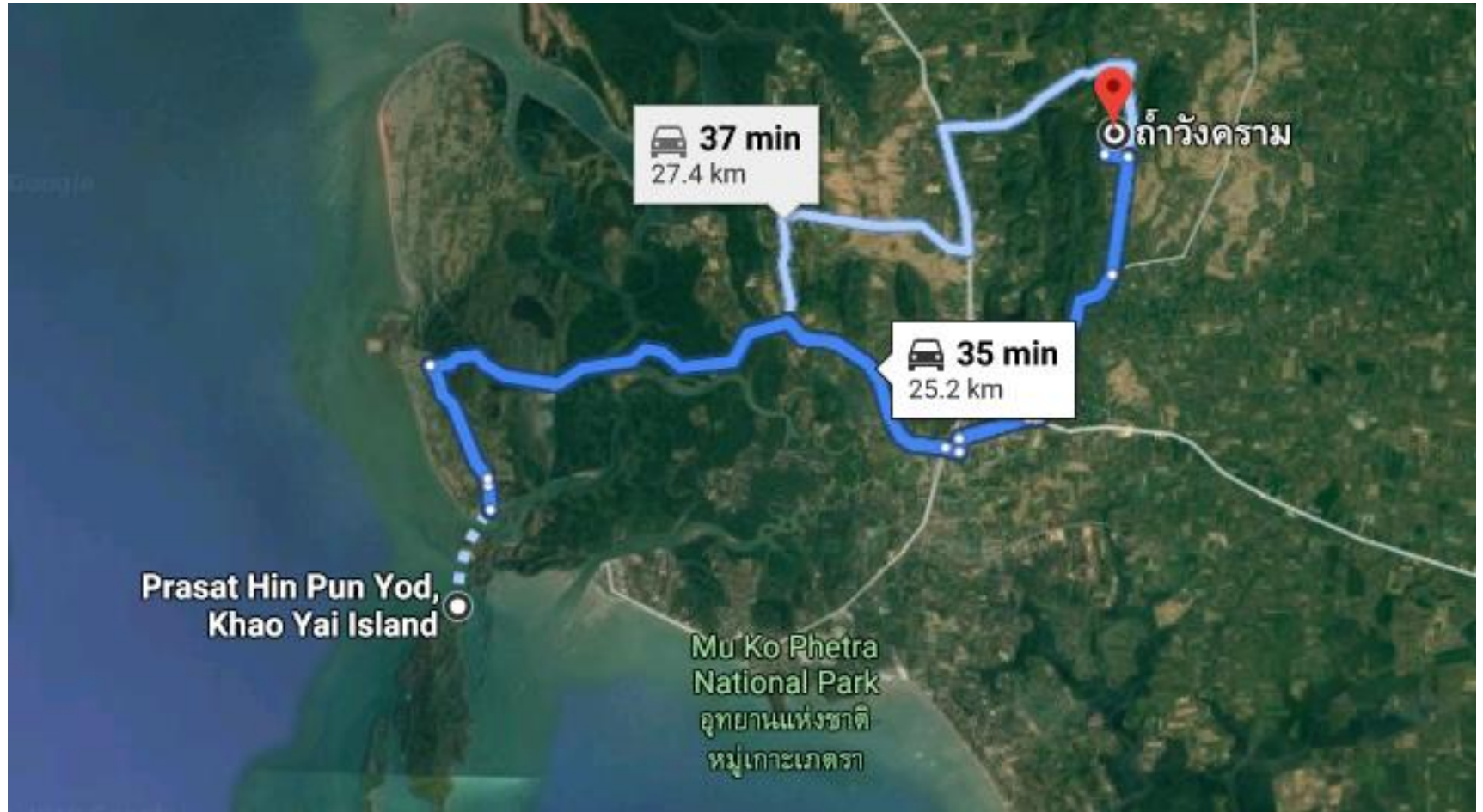
# Prasat Hin Pun Yod, Khao Yai Island



Date	Time	Travel Accommodation/Destination	Proposed	Description
3 OCTOBER 2019	Guilin-Bangkok (CZ6099)	BKK	Arrival	
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4 OCTOBER 2019	Bangkok - Suratthani	Suratthani	Conduct Karst Geological Survey	Khao Phap Pha/ Tham Kamin
5 OCTOBER 2019		Suratthani	Karst form Survey/ Karst landform survey	Moo Koa Ang Thong National Park
6 OCTOBER 2019	Suratthani - Krabi	Krabi	Karst form Survey/ Karst landform survey	Tham Sra Yuan Thong
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10 OCTOBER 2019	Satun	Satun	Conducted Karst form Survey	Phupha Phet Cave
		Satun	Conducted Karst Hydrogeological Survey	Sai thong Water fall
11 OCTOBER 2019	Satun	Satun	Conducted Karst form Survey	
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		Satun	Conducted Karst form Survey	
12 OCTOBER 2019	Satun	Satun	Conducted Marine Karst form survey	Pra sat Hin Pun yot/ Kao TaBun
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		Satun	Conducted Karst hydrological survey	
16 OCTOBER 2019	Satun - Trang - BKK	Satun	Conducted Karst hydrological survey	Tham le Stegodon
		BKK	Departure from Trang	
17 OCTOBER 2019	BKK - Guangzhou (CZ3082)	CN	Departure	


# DAY 9 ( 13 OCTOBER 2019)

- Satun
- Accommodation : Satun
- Propose
  - Conducted Marine Karst hydrological survey and take samples
  - Panya Batik
  - Tham Wang Kram



Prasad Hin Pun Yod,  
Khao Yai Island

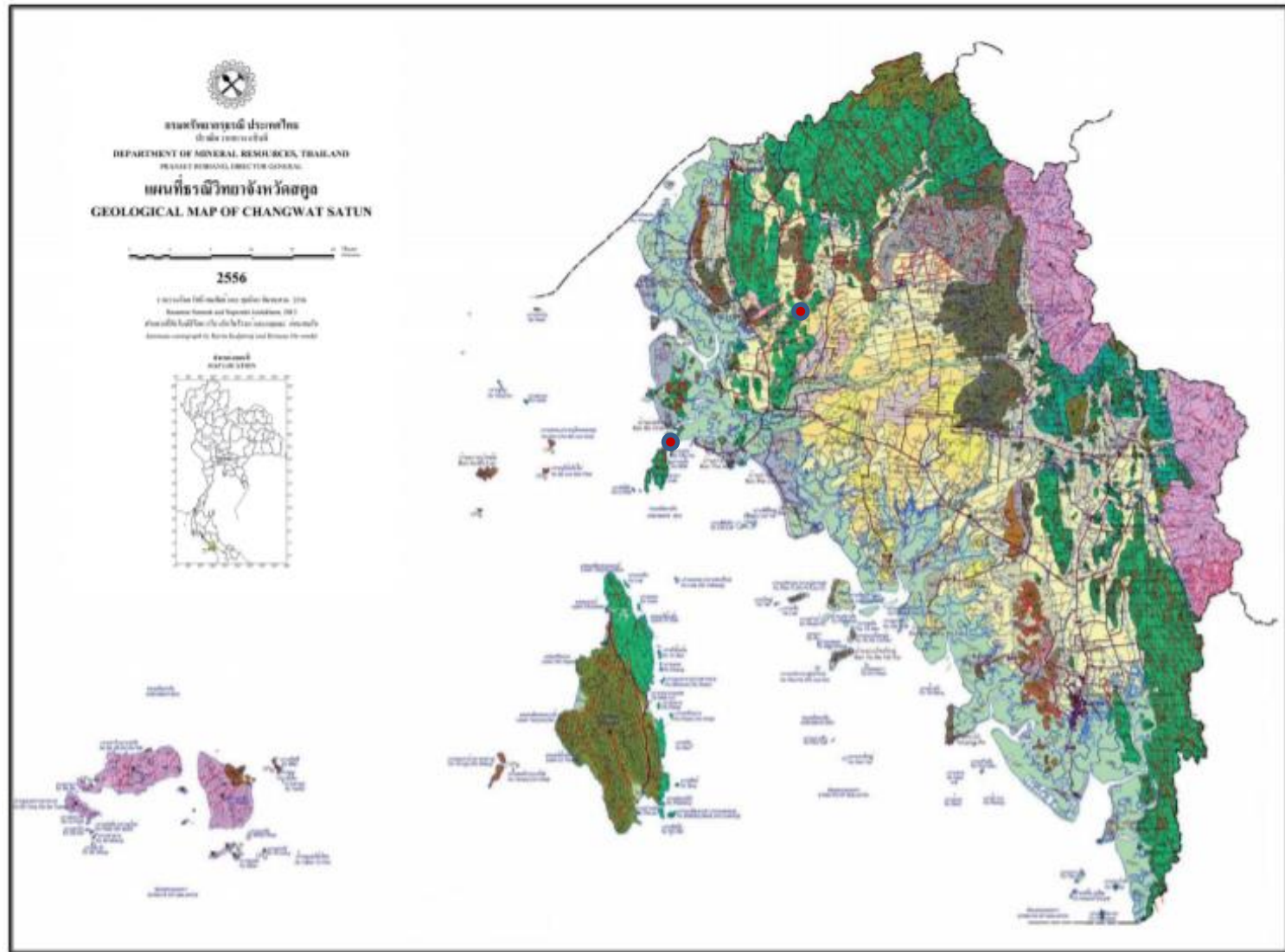
 **37 min**  
27.4 km

 **35 min**  
25.2 km

 **ถ้ำวังคราม**

Mu Ko Phetra  
National Park  
อุทยานแห่งชาติ  
หมู่เกาะเกตรา

# Geological Map Satun Province



ORDOVICIAN LIMESTONE  
-THUNG SONG GROUP



Tham Wang Kram

ปิ่นหยาบาติก

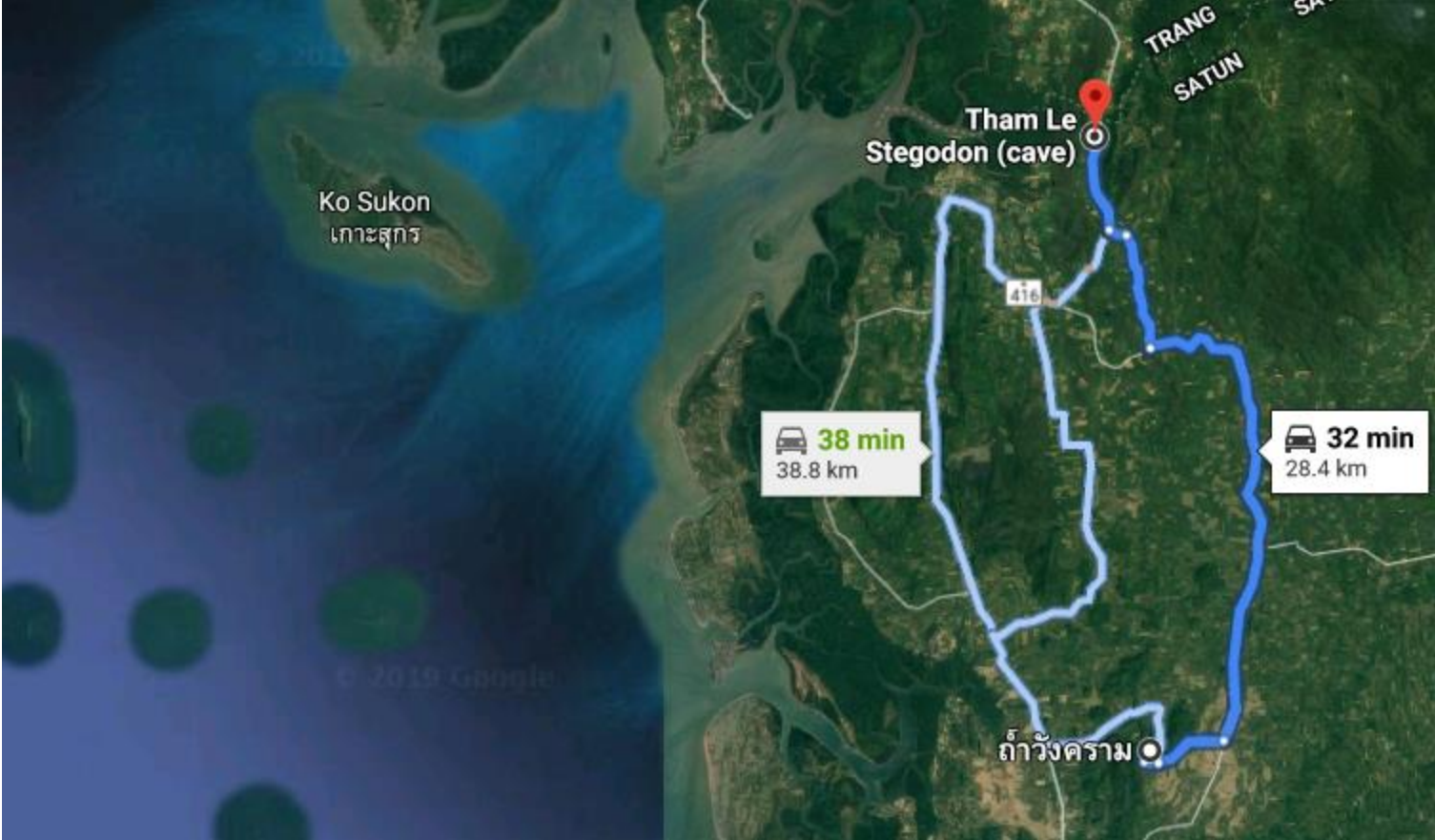


เขารูปเกือกม้า

Date	Time	Travel Accommodation/Destination	Proposed	Description
3 OCTOBER 2019	Guilin-Bangkok (CZ6099)	BKK	Arrival	
		DMR	communicate with DMR	
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		Satun	Conducted Karst form Survey	
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		Satun	Conducted Karst soil and vegetatiion surveys	
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14 OCTOBER 2019	Satun	Satun	Selected Monitoring points for marine karst carbon sinks	Tham le Stegodon
15 OCTOBER 2019	Satun	Satun	Conducted Marine Karst form survey	Tarutoa National Park
		Satun	Conducted Karst hydrological survey	
16 OCTOBER 2019	Satun - Trang - BKK	Satun	Conducted Karst hydrological survey	Tham le Stegodon?
		BKK	Departure from Trang	
17 OCTOBER 2019	BKK - Guangzhou (CZ3082)	CN	Departure	

# DAY 10 ( 14 OCTOBER 2019)

- Satun
- Accommodation : Satun
- Propose
  - Selected Monitoring points for marine karst carbon sinks
  - Tham le Stegodon

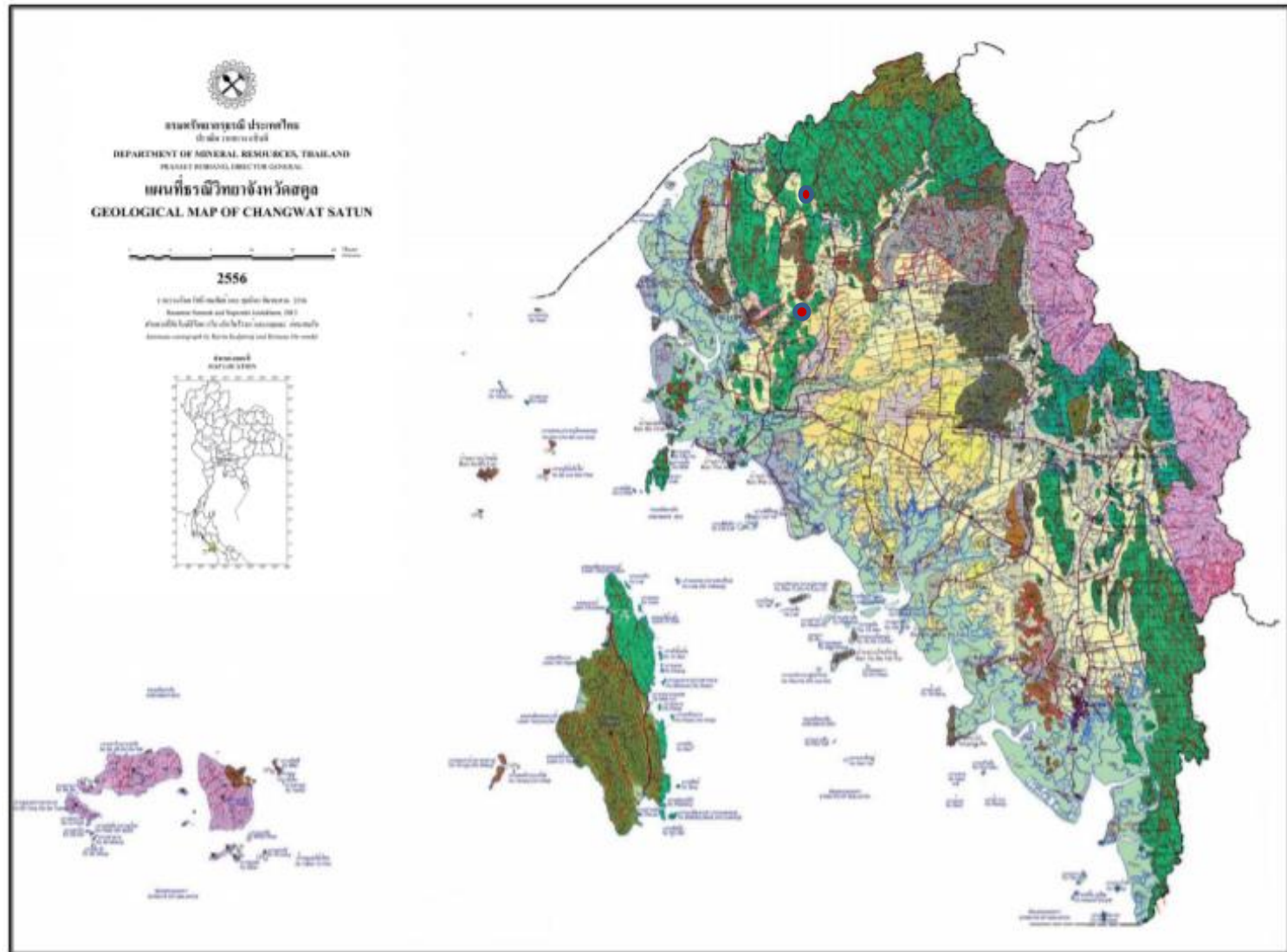




Tham le Stegodon



# Geological Map Satun Province



Date	Time	Travel Accommodation/Destination	Proposed	Description
3 OCTOBER 2019	Guilin-Bangkok (CZ6099)	BKK	Arrival	
		DMR	communicate with DMR	
4 OCTOBER 2019	Bangkok - Suratthani	Suratthani	Conduct Karst Geological Survey	Khao Phap Pha/ Tham Kamin
5 OCTOBER 2019		Suratthani	Karst form Survey/ Karst landform survey	Moo Koa Ang Thong National Park
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9 OCTOBER 2019	Satun	Satun	Conducted Karst Hydrogeological Survey	Karst Spring Ban Loa Pla Koa Tanan / Tham Jet kod
		Satun	Conducted Karst form Survey	Koa Tabun
10 OCTOBER 2019	Satun	Satun	Conducted Karst form Survey	Phupha Phet Cave
		Satun	Conducted Karst Hydrogeological Survey	Sai thong Water fall
11 OCTOBER 2019	Satun	Satun	Conducted Karst form Survey	
		Satun	investigation of fossil evidence	Kao Noi/ Stromatolite Somnaksong Koa Pet Nam
		Satun	Conducted Karst form Survey	
12 OCTOBER 2019	Satun	Satun	Conducted Marine Karst form survey	Pra sat Hin Pun yot/ Kao TaBun
		Satun	Conducted Karst soil and vegetatiion surveys	
13 OCTOBER 2019	Satun	Satun	Conducted Marine Karst hydrological survey and take samples	Panya Batik/ Tham Wang Kram/เขารูปเตีอกม้้า
		Satun	Conducted Marine Karst form survey	
14 OCTOBER 2019	Satun	Satun	Selected Monitoring points for marine karst carbon sinks	Tham le Stegodon
15 OCTOBER 2019	Satun	Satun	Conducted Marine Karst form survey	Tarutoa National Park
		Satun	Conducted Karst hydrological survey	
16 OCTOBER 2019	Satun - Trang - BKK	Satun	Conducted Karst hydrological survey	Tham le Stegodon
		BKK	Departure from Trang	
17 OCTOBER 2019	BKK - Guangzhou (CZ3082)	CN	Departure	

# DAY 11 ( 15 OCTOBER 2019)

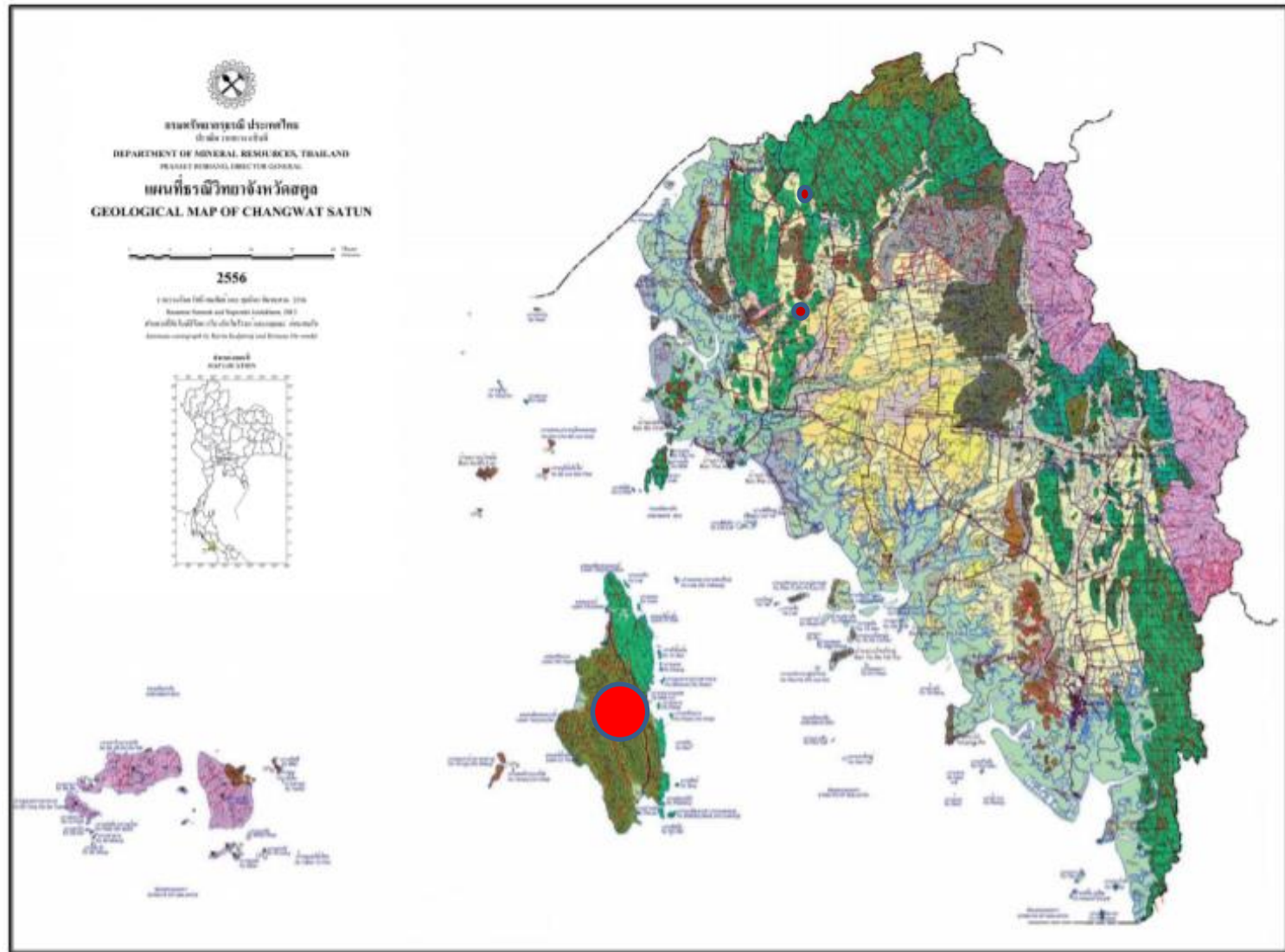
- Satun
- Accommodation : Satun
- Propose
  - Conducted Marine Karst form survey
  - Tarutoa National Park



อุทยานแห่งชาติตะกั่วป่า



# Geological Map Satun Province



ORDOVICIAN LIMESTONE  
-THUNG SONG GROUP

Date	Time	Travel Accommodation/Destination	Proposed	Description
3 OCTOBER 2019	Guilin-Bangkok (CZ6099)	BKK	Arrival	
		DMR	communicate with DMR	
4 OCTOBER 2019	Bangkok - Suratthani	Suratthani	Conduct Karst Geological Survey	Khao Phap Pha/ Tham Kamin
5 OCTOBER 2019		Suratthani	Karst form Survey/ Karst landform survey	Moo Koa Ang Thong National Park
6 OCTOBER 2019	Suratthani - Krabi	Krabi	Karst form Survey/ Karst landform survey	Tham Sra Yuan Thong
		Krabi	Conducted Karst Hydrogeological Survey	Sra Morakot/Hot Waterfall
7 OCTOBER 2019		Krabi	Conducted Cave Survey	Than Bok Korani National Park/ Tham Pee Hua To
8 OCTOBER 2019	Krabi - Satun	Krabi	Conducted Cave Survey	Tham Phet/ Tham Klang
		Satun	Conducted Karst form Survey	Tham U Rai Thong/ Tham Koa To Nang Dam
9 OCTOBER 2019	Satun	Satun	Conducted Karst Hydrogeological Survey	Karst Spring Ban Loa Pla Koa Tanan / Tham Jet kod
		Satun	Conducted Karst form Survey	Koa Tabun
10 OCTOBER 2019	Satun	Satun	Conducted Karst form Survey	Phupha Phet Cave
		Satun	Conducted Karst Hydrogeological Survey	Sai thong Water fall
11 OCTOBER 2019	Satun	Satun	Conducted Karst form Survey	
		Satun	investigation of fossil evidence	Kao Noi/ Stromatolite Somnaksong Koa Pet Nam
		Satun	Conducted Karst form Survey	
12 OCTOBER 2019	Satun	Satun	Conducted Marine Karst form survey	Pra sat Hin Pun yot/ Kao TaBun
		Satun	Conducted Karst soil and vegetatiion surveys	
13 OCTOBER 2019	Satun	Satun	Conducted Marine Karst hydrological survey and take samples	Panya Batik/ Tham Wang Kram/เขารูปเตีอกม้้า
		Satun	Conducted Marine Karst form survey	
14 OCTOBER 2019	Satun	Satun	Selected Monitoring points for marine karst carbon sinks	Tham le Stegodon
15 OCTOBER 2019	Satun	Satun	Conducted Marine Karst form survey	Tarutoa National Park
		Satun	Conducted Karst hydrological survey	
16 OCTOBER 2019	Satun - Trang - BKK	Satun	Conducted Karst hydrological survey	Tham le Stegodon?
		BKK	Departure from Trang	
17 OCTOBER 2019	BKK - Guangzhou (CZ3082)	CN	Departure	

# DAY 12 ( 16 OCTOBER 2019)

- Satun
- Accommodation : Satun
- Propose
  - Conducted Karst hydrological survey
  - ???