

THE 8TH INTERNATIONAL CONGRESS ON THE JURASSIC SYSTEM

Shehong of Sichuan, China (August 9-13, 2010)

POST MEETING EXCURSION IN THAILAND

14-22 AUGUST 2010

“Marine and non-marine Jurassic rocks and fossils of Thailand”

Date: August 14-22, 2010

Contents: Marine-brackish Jurassic rocks of Thailand are widespread along the Thailand-Myanmar border, especially in the Mae Sot area located in the north, and Chumphon, Nakhon Si Thammarat, and Krabi Provinces to the south. The non-marine Jurassic is confined to the Phitsanulok area along the western rim of the Khorat Plateau. This excursion will focus on the sections of the Jurassic marine strata and fossil localities of bivalves, ammonites and corals in Mae Sot, Chumphon, Nakhon Si Thammarat, and Krabi. An interesting section from Upper Triassic to Early Cretaceous including the non-marine Phu Kradung Formation is included. The trip begins from Bangkok to Phitsanulok, Sukhothai, and Mae Sot in the north, going down to Ayutthaya via Bangkok, Prachuap Khiri Khan, Surat Thani, Krabi in the south, and ends in Phuket (the most famous tourist place of southern Thailand). Tourist attractions, historical parks, and activities for Thai cultures will be provided. Participants are expected to leave Chengdu for Bangkok on August 14 by plane after the Congress Meeting, and they are expected to arrive Phuket on August 22.

Excursion Leaders: Assanee Meesook & colleagues (Bureau of Fossil Research and Geological Museum, Department of Mineral Resources; jurassicthai@hotmail.com, meesook_a@hotmail.com).

Number of participants: Minimum 18 persons Maximum 35 persons

Fees: US\$850, including 9-nights of accommodation (on the single room basis; US\$700 for spouse with shared room), all meals from August 14 to 22, vehicle, tickets for museums and scenic sites, Thai culture performances, refreshments, field trip guidebook, and additional sight-seeings. Participants are responsible for their airfares from Chengdu to Bangkok and from Phuket to their home. The organizers will arrange their flights from both Chengdu-Bangkok and Phuket to Bangkok.

TENTATIVE PROGRAMME

DAY ONE: 14 August 2010 (Chengdu-Bangkok)

DEPARTURE:

- Leave Chengdu for Bangkok
- Arrive Suvarnabhumi International Airport, Bangkok
- Leave Suvarnabhumi International Airport by bus to Phitsanulok Province located in the north (Phitsanulok-Bangkok=377 km), accommodation at a hotel in Phitsanulok.

DAY TWO: 15 August 2010 (Phitsanulok-Khwae Noi Dam-Sukhothai) (see Figure 1)

MORNING:

- Study an outcrop of the non-marine Jurassic rocks and fossils of the Phu Kradung Formation at Ban Wang Din So 24 km east of Phitsanulok.



The Phu Kradung Formation at Ban Wang Din So

- Visit Khwae Noi Dam 60 km NE of Phitsanulok.
- Lunch will be served at Khwae Noi Dam
- Study brackish-water Early Cretaceous rocks and fossils at Chambon Reservoir 63 km north of Phitsanulok. This outcrop may be the first discovery of brackish Cretaceous rocks in SE Asia.



Early Cretaceous rocks at Chambon Reservoir



Early Cretaceous fossils

- Study brackish-water Upper Triassic rocks and fossils at a road-cut outcrop at Ban Chambon 58 km north of Phitsanulok.



Upper Triassic outcrop at Km 58

- Northern Thai-style Dinner and accommodation at Pailyn Hotel in Sukhothai



DAY THREE: 16 August 2010 (Sukhothai-Tak-Mae Sot) (Figures 1 and 2)

MORNING: (Sukhothai-Tak)

-Visit Sukhothai Historical Park, Sukhothai Province



Sukhothai Historical Park, the former greatness of Sukhothai has been preserved. Ruins of the royal palaces, Buddhist temples, the city gates, walls, moats, dams, ditches, ponds, canals and the water dyke control system which was the magical and spiritual centre of the kingdom are now preserved and restored by the Fine Arts Department with the cooperation of UNESCO, not only with a view of fostering Thailand's national identity but of safeguarding a fine example of mankind's cultural heritage.

The historical park has 26 old temples, each reflecting magnificent art and architecture. The park is open to the public everyday from 8.30 - 16.30 hrs. There is a Tourist Service Center near Wat Phra Phai Luang. The center provides information and facilitates visitors to the Shukhothai Historical Park, as well as display models of historical buildings and structures in the old city of Sukhothai.

Interesting Places:

Wat Mahathat is Sukhothai's largest Wat and a customary main chedi, in lotus-bud shape, and a ruined viharn. At the base of the Chedi stand Buddhist disciples in adoration, and on the pedestal seated Buddha images. In front of this reliquary is large viharn formerly containing a remarkable seated bronze Buddha image of Sukhothai style, which was cast and installed by King Lithai of Sukhothai in 1362. At the end of the 18th century, the image was removed to the Viharn Luang of Wat Suthat in Bangkok by the order of the King Rama I and has since been named Phra Si Sakaya Muni. In front of the large viharn is another smaller viharn which was probably built during the Ayutthaya period. Its main Buddha image (8 m. high) was installed inside a separate building. In front of the southern image a piece of sculpture call "Khom Dam Din" (a Khmer who came by way of walking underground) was found, and is now kept in Phra Mae Ya Shrine near the Sukhothai City Hall.

Wat Si Sawai is situated among magnificent scenery southwest of Wat Mahathat. Three prangs are surrounded by a laterite wall. Inside the wall, the viharn in the west, built of laterite, is separate

from the main prang which was constructed in Lop Buri or Hindu-style but the others, also constructed beside the prangs, are Buddhist viharns. The Crown Prince (King Rama VI), found a trace of Hindu sculpture Sayomphu, the greatest Hindu God in this sanctuary. In his opinion this ruin was once a Hindu shrine, but was later converted into a Buddhist monastery.

Wat Traphang Ngoen, Situated to the west of Wat Mahathat is Wat Traphang Ngoen with its square pedestal, main sanctuary, and stucco standing Buddha image in four niches. There is a viharn in front and, in the east of the pond, an island with an ubosot. This edifice has already crumble and only its pedestal and laterite columns still remain. Many monuments and magnificent scenery are visible from this location.

Wat Sa Si is situated near Wat Chanasongkham. Around a Singhalese-style chedi is the main sanctuary on an island in the middle of Traphang Trakuan pond. A large viharn contains a stucco Buddha image. To the south stand nine chedis of different sizes.

Wat Chanasongkham is situated to the north of Wat Mahathat. Its main sanctuary is round Singhalese-style chedi. In front of the chedi exists the base of a viharn and behind the former stands an ubosot. Bases of twelve small chedis are also visible. Near the Charot Withi Thong Road is a strange chedi having three bases, one on top of the other.

The King Ramkhamhaeng Monument, Sukhothai is situated on the north of Wat Mahathat. The bronze statue of King Ramkhamhaeng sits on a throne named Phra Thaen Manangkhasila Asana with a base relief recording his life.

Wat Sorasak, it is inscribed that Mr. In-Sorasak had a strong belief in Buddhism so that he dedicated a plot of land and asked for permission to built a temple to the king. After completing the construction, a special celebration for the establishment of Wat Sorasak was held. Perhaps, this temple was built when the Ayutthaya controlled over Sukhothai. It is believed this way because it was inscribed about "Augya" that is the rank of nobleman in Ayutthaya period.

Wat Si Chum, This lies about 1,500 meters north of Wat Mahathat and was originally surrounded by a moat. A square mondop is the main sanctuary and contains a monumental stucco-over-brick Buddha image in the attitude Subduing Mara, called "Phra Achana". This Buddha measures 11.30 meters from knee to knee.

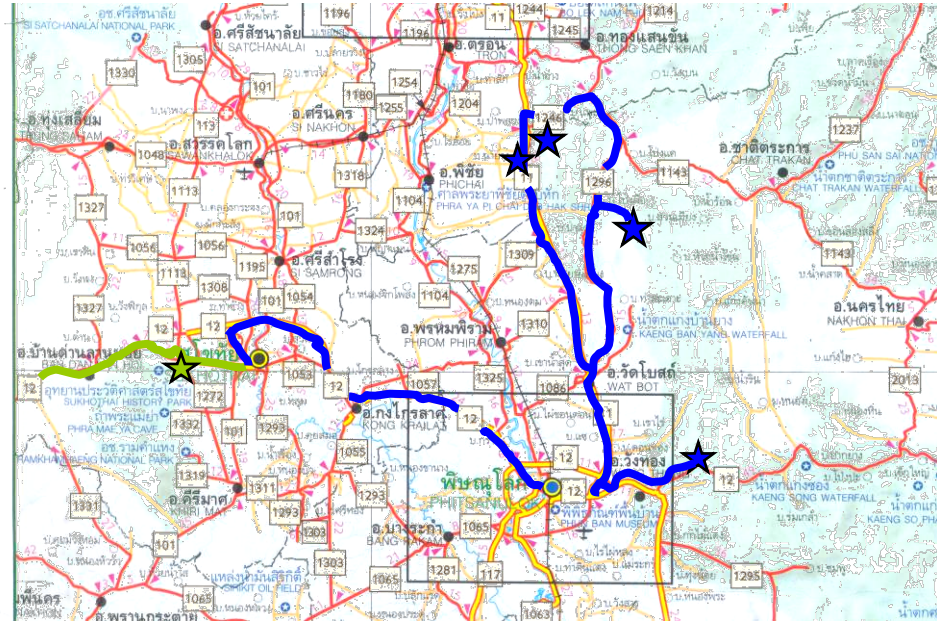
The mondop is 32 meters square and 15 meters high, and the walls are 3 meters thick. There is a passageway in the left inner wall itself which leads to the above crossbeam. On the ceiling of the passageway are more than fifty engraved slate slabs illustrating Jataka scenes. At Wat Si Chum there is a mondop that houses a large stucco image of the Buddha in the Marnvichai position, as described in the first stone inscription. A tunnel has been made leading to the temple's south wall, where there is a stariway to the roof. Over the ceiling are 20 stone pillars, with inscriptions in the Thai alphabet of the Sukhothai Period.

Wat Saphan Hin is situated on the hill 200 meters high. A pathway of slate slabs leads to the sanctuary yard.

- Leave Sukhothai for Tak
- Lunch will be served at Tak Province.

AFTERNOON: (Tak-Mae Sot)

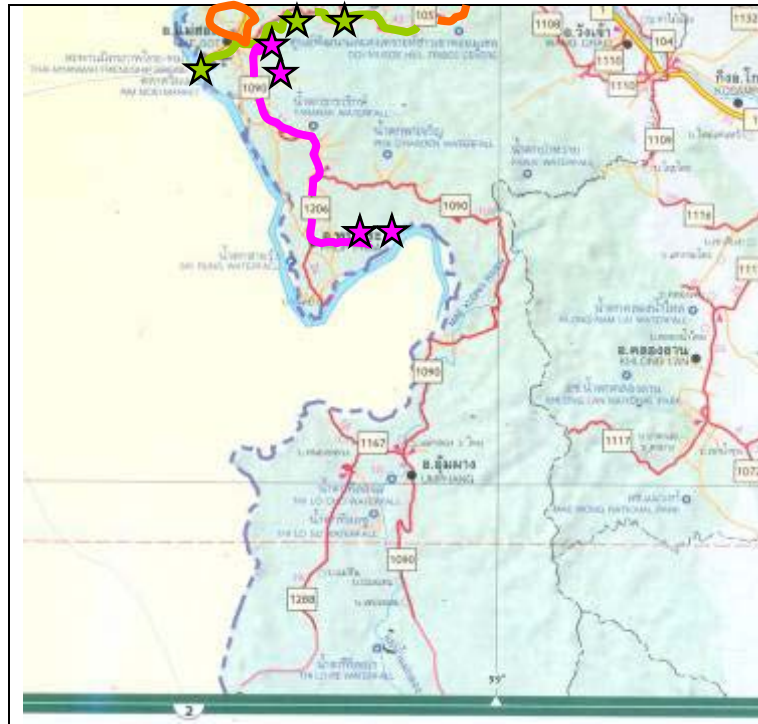
- Visit Mu Soe (Lahu) hilltribe market
- Study a sequence from the Permian to Lower Jurassic of the Khun Huai Formation at various outcrops along Highway No. 105 from Km 68-75.
- Visit a border market near Moei River (as Thailand-Myanmar border)
- Dinner and accommodation at a hotel in Mae Sot District, Tak Province.



DAY TWO's ROUTE **DAY THREE's ROUTE**

Figure 1 Highway map of Thailand (scale 1:600,000) showing excursion route for Day Two and partly Day Three.





DAY THREE's ROUTE
DAY FIVE's ROUTE

DAY FOUR's ROUTE

Figure 2 Highway map of Thailand (scale 1:600,000) showing excursion route for Day Three, Day Four and Day Five.

DAY FOUR: 17 August 2010 (Mae Sot-Phop Phra-Mae Sot) (see Figure 2)

MORNING:

- Study the marine Jurassic rocks (the Khun Huai, Doi Yot, and Pha De Formations) and Jurassic fossils along Huai Mae Sot stream, Mae Sot District, Tak Province.
- Study the marine Jurassic rocks (the Khun Huai Formation) and Jurassic fossils at Tak Mining Co.Ltd, Mae Sot District, Tak Province.
- Lunch will be served at Phop Phra Falls, Phop Phra District, Tak Province.



AFTERNOON:

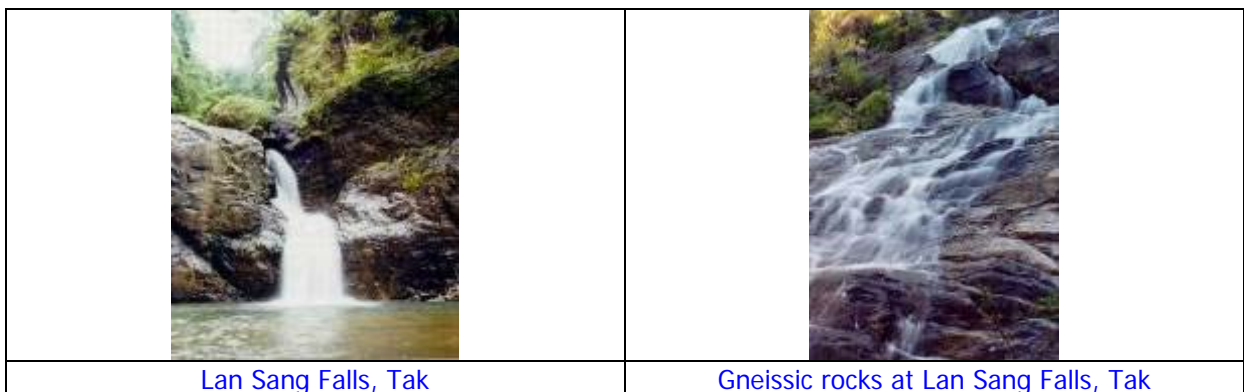
- Study the marine Jurassic sequences in the vicinity of Phop Phra District near the Thailand-Myanmar border.
- A special dinner at a restaurant and accommodation at the hotel in Mae Sot District, Tak Province.



DAY FIVE: 18 August 2010 (Mae Sot-Mae Ramat-Nakhon Sawan-Ayutthaya) (see Figure 2)

MORNING:

- Study the marine Jurassic rocks (the Khun Huai Formation) and Jurassic fossils at Ban Mae Kut Luang, Mae Sot District, Tak Province.
- Visit Lan Sang Falls (sheared gneissic rocks), Muang District, Tak Province.
- Lunch will be served at a restaurant, Muang District, Tak Province.



AFTERNOON:

- Leave Lan Sang Falls, Tak for Ayutthaya by bus via Nakhon Sawan Provinces. Selected tourist attractions from Tak to Ayutthaya will be announced
- Dinner and accommodation at a hotel in Ayutthaya.

DAY SIX: 19 August 2010 (Ayutthaya-Phetchaburi-Cha-am)

MORNING:

- Visit Ayutthaya city: the ancient capital of Thailand and a world heritage.

Phra Nakhon Si Ayutthaya or Ayutthaya in short, is one of Thailand's historical and majestic highlights. Serving as the Thai capital for 417 years (1350-1767: Kingdom of Ayutthaya), it was once glorified as one of the biggest cities in Southeast Asia. During the 17th century, most foreign visitors to Ayutthaya, traders or diplomats alike, claimed Ayutthaya to be the most illustrious and glittering city that they had ever visited. The map of Ayutthaya published in 1691 by Simon de la Loubere in *Du Royaume De Siam* is proof of such recognition.

The Kingdom of Ayutthaya reached its apex in terms of sovereignty, military might, wealth, culture, and international commerce in the 16th century when the Kingdom's territory was extended far beyond present-day Laos, Cambodia, and Myanmar. Ayutthaya even had diplomatic relations with Louis XIV of France and was courted by Dutch, Portuguese, English, Chinese and Japanese merchants.

Visitors can explore and appreciate Thai history in Phra Nakhon Si Ayutthaya, which is situated only 86 kilometers north of Bangkok. Visitors to Ayutthaya can marvel at its grandeur reflected through numerous magnificent structures and ruins concentrated in and around the city island surrounded by Maenam Chao Phraya, Maenam Pa Sak and Maenam Lopburi.

More importantly, Phra Nakhon Si Ayutthaya Historical Park, an extensive historical site in the heart of Ayutthaya city, has been included in UNESCO's World Heritage list since 13 December, 1991.



-Lunch at a restaurant in Ayutthaya.

AFTERNOON:

-Leave Ayutthaya for Cha-am by bus via Bangkok and Phetchaburi Province.

-Free time (two hours) for shopping or swimming on the Cha-am's beautiful beach



-Dinner and accommodation at a hotel in Cha-am, Phetchaburi Province.

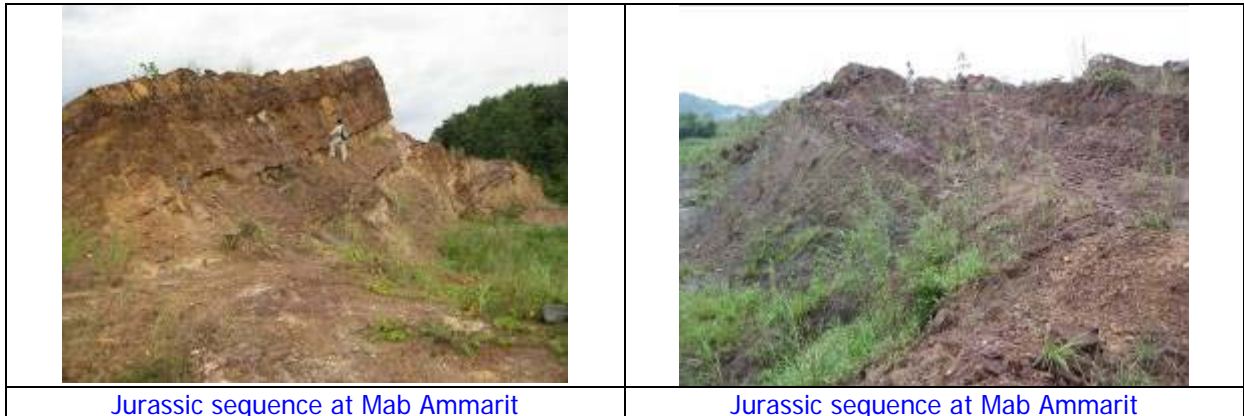
DAY SEVEN: 20 August 2010 (Cha-am-Chumphon-Surat Thani) (Figures 3 and 4)

MORNING:

- Study non-marine Mesozoic rocks (sandstones and basal conglomerate overlying Permian limestone in the Bang Saphan area.



- Study marine Jurassic rocks and fossils at Mab Ammarit, Pathiu District of Chumphon Province. Amber and plant remains are abundant.



- Lunch at a restaurant in Chumphon.

AFTERNOON:

- Leave Chumphon for Surat Thani by bus.
- Study marine Jurassic rocks and fossils at Khlong Khut near Chumphon



- Study the conglomerate as the boundary between marine Triassic and non-marine Jurassic rocks at Chaiya District, Surat Thani Province.
- Dinner and accommodation at a hotel in Surat Thani Province.



DAY SEVEN'S ROUTE
Figure 3 Highway map of Thailand (scale 1:600,000) showing excursion route for Day Seven

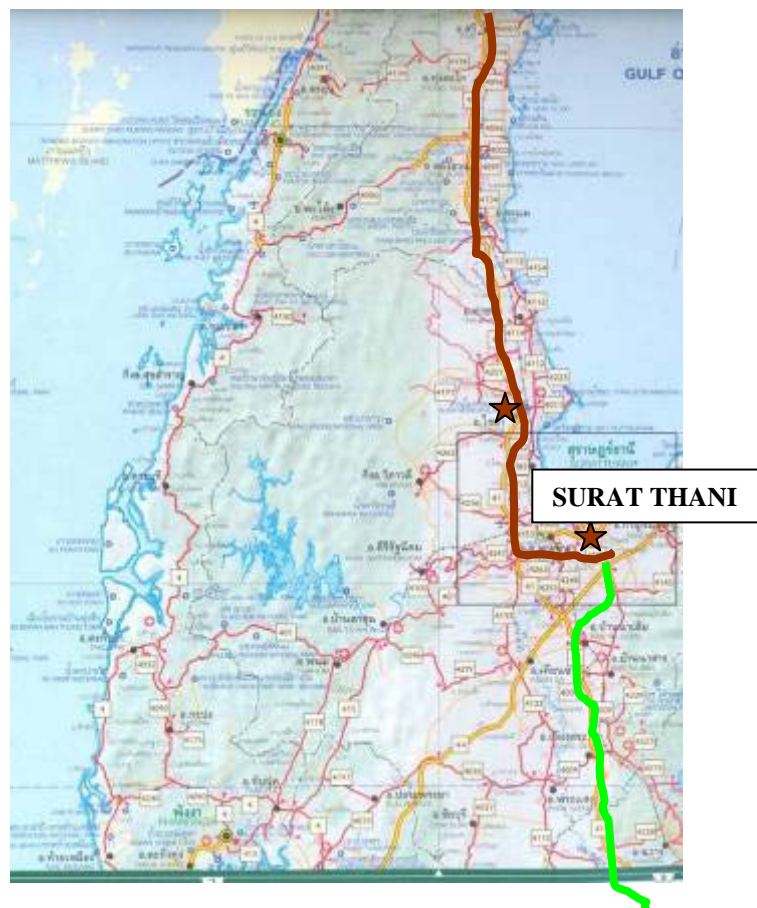


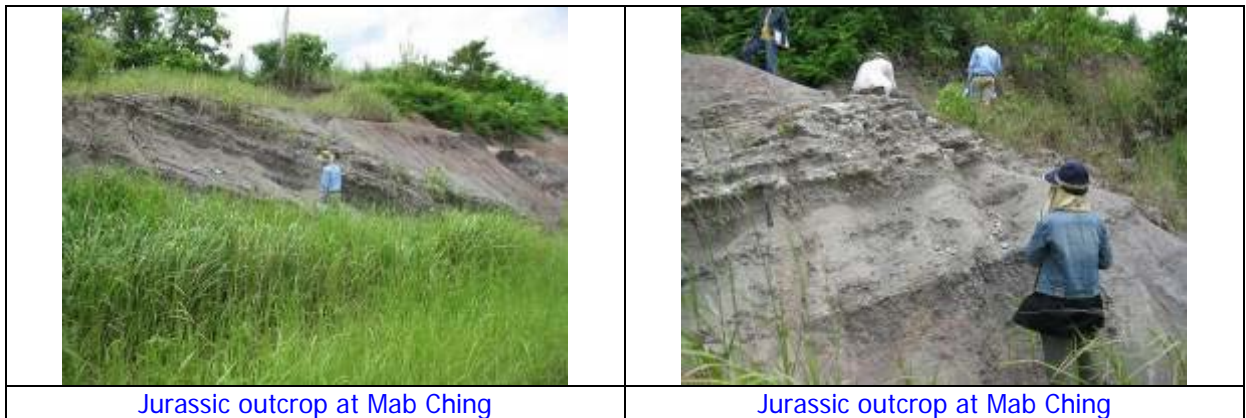
Figure 4 Highway map of Thailand (scale 1:600,000) showing excursion route for Day Seven.

DAY SEVEN **DAY EIGHT'S ROUTE**

DAY EIGHT: 21 August 2010 (Surat Thani-Krabi) (see Figures 4 and 5)

MORNING:

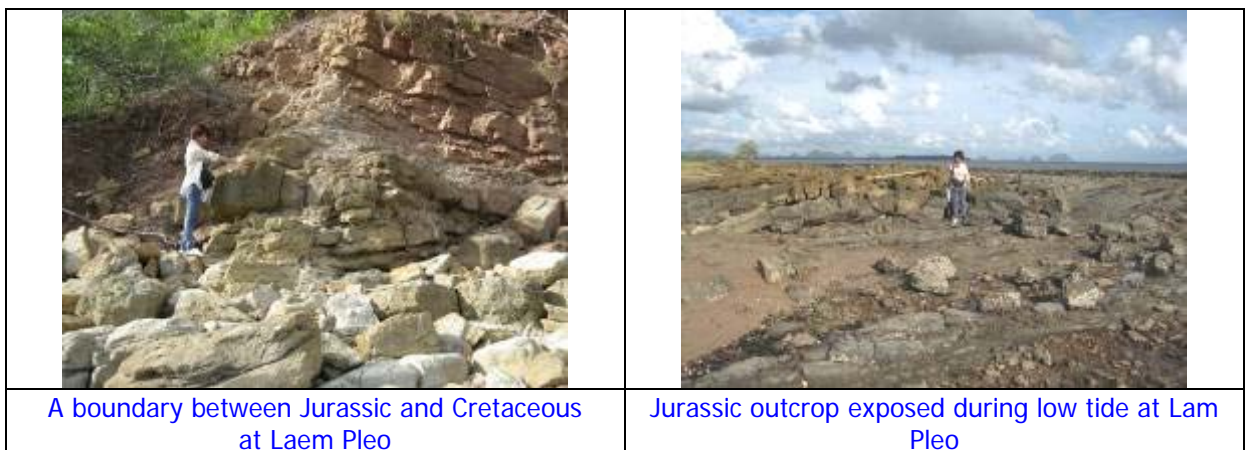
- Study marine Jurassic rocks in the Map Ching area.

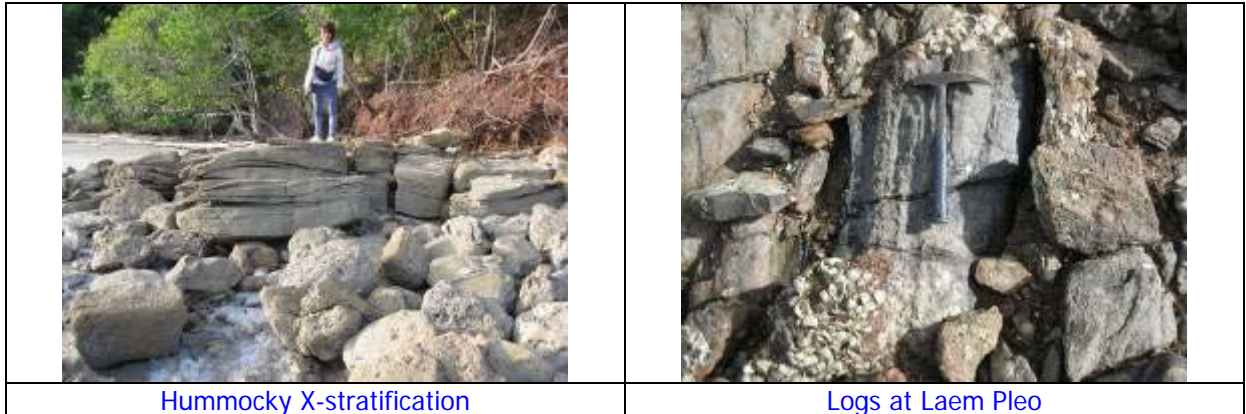


-Lunch at a restaurant in Khlong Thom District.

AFTERNOON:

-Study marine Jurassic rocks in the Laem Pleo area.





-Farewell Dinner and accommodation at a hotel in Krabi Province.

DAY NINE: 22 August 2010 (Krabi or Phuket) (see Figure 5)

MORNING:

- Free time and end of excursion
- Participants are requested to select destinations for tourism in Krabi, Phuket or elsewhere. The organizers will arrange any programme for the participants.
- There will be domestic flights for participants who will leave Krabi for Bangkok. We will arrange a special programme for those who will continue to stay in Krabi.
- The organizer will also arrange a special programme for those who will leave Phuket for Bangkok. Time spent for Phuket from Krabi by a mini van is 2.30 hours.





Figure 5 Highway map of Thailand (scale 1:600,000) showing excursion route for Day Nine.
 DAY EIGHT and NINE's ROUTES

**NOTE: ADDITIONAL STOPS FOR GEOLOGY AND TOURIST
 ATTRACTIONS MAY BE PROVIDED UPON REQUESTS OR TIME
 ALLOWED**

INTRODUCTION TO THAILAND

(Source: Tourism Authority of Thailand)

CENTRAL & EAST COAST



There are 26 provinces that make up Central and Eastern Thailand, and Bangkok is one of them. Geographically, this is Thailand's heartland, extending from Lop Buri in the north and covering the rice bowl of the Central Plains around the Chao Phraya River. Further south, the area embraces the east and west coasts of the upper Gulf of Thailand.

This is Thailand's most fertile farming area, a wide-ranging landscape of paddy fields, orchards and plantations. More than 1,000 years ago Thai settlers moved down from the north, gradually replacing Mon and Khmer influences and establishing communities at Lop BURI then at Sukhothai, before founding a kingdom that lasted 417 years with Ayutthaya as its capital. When the Burmese destroyed Ayutthaya in 1767, the capital moved to Bangkok.

The Central region has a dramatic history, and its heritage of ancient temples, battlefields and ruins and two capitals, Ayutthaya and Bangkok, are a continuing fascination for visitors. The east and west sea coasts at the region's southern end also draw huge numbers of visitors every year. Bangkok residents spend long weekends enjoying the relaxing seaside atmosphere, while holiday-makers from around the world to discover the delights of the tropical beach life.

On the eastern side, 400 kilometres of coastline extend from Chon Buri to Rayong with some of the finest beaches in Asia. Pattaya, with an enormous range of resorts, hotels and guesthouses, is its centre. If you are seeking a more relaxing experience, travel further down the coast to Rayong or Ko Samet, and the lovely islands of Ko Chang National Park near the Cambodian border.

On the west coast, the resorts of Cha-am and Hua Hin attract international travellers who prefer their more sophisticated yet laid-back atmosphere.

Far from the sea in the northwest of the region is Kanchanaburi, whose forested mountains, waterfalls and caves, national parks and wildlife sanctuaries on the border with Myanmar provide some of Thailand's most enthralling scenery.

The 26 provinces of Central and East Coast are Ang Thong, Bangkok, Chachoengsao, Chai Nat, Chanthaburi, Chon Buri, Kanchanaburi, Lop Buri, Nakhon Nayok, Nakhon Pathom, Nonthaburi, Pathum Thani, Phetchaburi, Phra Nakhon Si Ayutthaya, Prachin Buri, Prachuap Khiri Khan, Ratchaburi, Rayong, Sa Kaeo, Samut Prakan, Samut Sakhon, Samut Songkhram, Saraburi, Sing Buri, Suphan Buri and Trat.

THE NORTH



The North is the birthplace of the earliest Thai civilisation and has many sites of archaeological and cultural interest. Northern people are famous for their courtesy and hospitality, and the region is also noted for its variety of cultural traditions. Many tourists from the surrounding provinces converge on Chiang Mai for the annual Songkran Festival, and to Sukhothai for Loi Krathong.

The North falls into two distinct areas, the plains of the lower north from Nakhon Sawan to Sukhothai, and the mountainous upper north leading to borders of Myanmar and Laos. The mountain ranges along the borders are breathtaking, with waterfalls and fast-flowing rivers ideal for rafting. They are also the home of many ethnic hill people.

The region has three seasons, hot from March to May, wet from June to November and cool from December to February. High up in the mountains, though, "cool" may often mean extremely cold.

The Thai nation had its origins in the North, in city states that were gradually incorporated into the Lanna kingdom centred on Chiang Mai. Sukhothai became the first capital of Thailand, but the influence of the Lanna states of Laos and Myanmar can be clearly seen in the architecture and cuisine of the North.

The nomadic hill people of the region pursued their own course, moving back and forth across frontiers. There are six main tribal groups, Karen, Hmong, Lahu, Mien, Akha and Lisu, each with its own unique customs and clothing. Today, they are settled in villages on the mountainsides, a great attraction for travellers.

Most overseas visitors make for Chiang Mai, the northern capital, as a base for visiting ethnic tribes, soft adventure activities and shopping. Further north still, Chiang Rai and Mae Hong Son are centres for rafting, trekking and tours of tribal villages. To the south, the Historical Park at Sukhothai is an essential destination for all those wishing to discover more about the history and culture of Thailand.

The 17 provinces that comprise the North are Chiang Mai, Chiang Rai, Tak, Kamphaeng Phet, Lampang, Lamphun, Mae Hong Son, Nakhon Sawan, Nan, Phayao, Phetchabun, Phichit, Uthai Thani, Phitsanulok, Phrae, Sukhothai, and Uttaradit.

THE NORTHEAST

The Northeast of Thailand, a vast plateau covering nearly one third of the country, is usually known as Isan. It extends northwards to the Mekong River which divides Thailand from Laos, and to the south and it ends at the Dong Rek mountain range along the border with Cambodia.

It is known to be an arid region with soil of poor quality, but for tourism, Isan is one of the country's most intriguing destinations with many Stone Age and Bronze Age dwellings and artifacts, and several significant temples that are a legacy of the great Khmer empire.

The sandstone shrines are popular tourist attractions, particularly the superbly restored sites at the historical parks of Phimai in Nakhon Ratchasima and Phanom Rung in Buri Ram. The great temple complex at Khao Phra Viharn in Si Sa Ket on the border with Cambodia is now accessible to visitors after a long period of isolation.

The Bronze Age settlements at Ban Chiang in the province of Udon Thani provide fascinating evidence of the work of the local potters some 5,000 years ago. The red and white pottery with characteristic "fingerprint" designs are thought to be the first earthenware vessels known to man. Two of Thailand's best-loved national parks, Khao Yai, Phu Kradung and Phu Rua in Loei, are in Isan. Other major attractions include the villages in Khorat and Khon Kaen where the beautiful local silk is woven by hand.

Isan is a comparatively poor region whose main income is from agriculture, and many of the younger people in the villages migrate to the city. But Isan folk have a distinctive character and dialect and a vigorous culture, with their old traditions still reflected in the many festivals unique to the region.

With its strategic position bordering Laos and Cambodia, Isan has in recent years risen to become a useful starting point for adventurous journeys to destinations along the mighty Mekong River. There have been important developments in infrastructure to accommodate what is expected to be a boom in tourism.

Travel in the region has been improved by domestic airlines with regular flights to regional airports; and it is no longer impossible to find luxury accommodation, especially in large provinces of Khon Kaen, Udon Thani Nakhon, Ratchasima and Ubon Ratchathani.

The Northeast consists of 19 provinces: Amnat Charoen, Buri Ram, Chaiyaphum, Kalasin, Khon Kaen, Loei, Maha Sarakham, Mukdahan, Nakhon Phanom, Nakhon Ratchasima, Nong Bua Lamphu, Nong Khai, Roi Et, Sakon Nakhon, Si Sa Ket, Surin, Ubon Ratchathani, Udon Thani and Yasothon.

THE SOUTH



This region extends southward along a narrow peninsula lying between the Andaman Sea its west side and the South China Sea on the east. It is a rich land in terms of the abundance of its natural resources, the fertility of its soil, the diversity of its people and its commercial viability.

The South is made up of 14 provinces from Chumphon in the north down to the Malaysian border 1,200 kilometres from Bangkok. It has a long coastline on either side with sandy beaches and offshore islands on both, and a rugged central hinterland of mountains and forests.

The east coast on the Gulf of Thailand always seems to be more relaxed, with long, wide bays and calm seas; the Andaman Sea coast tends to be more rugged and exhilarating, with its strange limestone rock formations and cliffs.

The occurrence of two seasonal monsoons means that the climate differs from the rest of Thailand. The southwest monsoon sweeps the west coast and the Andaman Sea from May to October, while the northeast monsoon moves across the Gulf of Thailand from November to February. The peninsula forms a barrier so that rain rarely falls on both coastlines simultaneously.

The area was once part of the Buddhist Srivijaya Empire but later came under the rule of Ayutthaya and then Bangkok. Chinese and Malaysian influences have played a large part in the cultural makeup of the region; the further south, the stronger the Malaysian influence, with a dialect akin to Malay, a predominance of Muslim communities and mosques. Rice fields give way to rubber plantations, and Chinese tin mining operations become evidence.

The coastline attracts most tourists, though Samui island in the Gulf of Thailand is growing in popularity as a laid-back holiday spot with first class diving opportunities nearby on Tao and Pha-ngan islands.

The Andaman Sea coast offers more sophisticated choices in the island province of Phuket, Thailand's premier holiday resort. However, the fascinating rock formations and offshore islands at Phang-nga, Krabi and Trang are extremely popular for the diving and sailing opportunities they offer.

The mountains, rivers and forests in the national parks in the interior of the peninsula are also gaining popularity with eco-tourists, as can be seen with the growing numbers of safari expeditions on foot, by elephant and in canoes.

The South of Thailand consists of 14 provinces: Chumphon, Krabi, Nakhon Si Thammarat, Narathiwat, Pattani, Phang-nga, Phatthalung, Phuket, Ranong, Satun, Songkhla, Surat Thani, Trang and Yala.