Seismic Observations of Thailand

Ms. Pakhwan VANICHNUKHROH (2013-2014 Global Seismological Observation Course)
Seismological Bureau, Meteorological Department, Thailand

1. Seismic monitoring in Thailand

The Seismological Bureau is responsible for issuing information on earthquake and tsunami. In order to mitigate earthquake and tsunami disasters, the organization monitors seismic activities in and around Thailand for 24 hours per day and issuing timely warning and information about them. After a major earthquake of magnitude 9.3 hit the west coast of northern Sumatra, Indonesia (December, 26 2004), the Thai government immediately settled 40 seismic stations, 26 accelerometer stations, 2 borehole stations (1 broadband borehole and a borehole accelerometer were settled at Bangkok), 9 tide gauge stations and 4 GPS stations to monitor earthquake and tsunami on behalf of the Seismological Bureau (Figure 1).

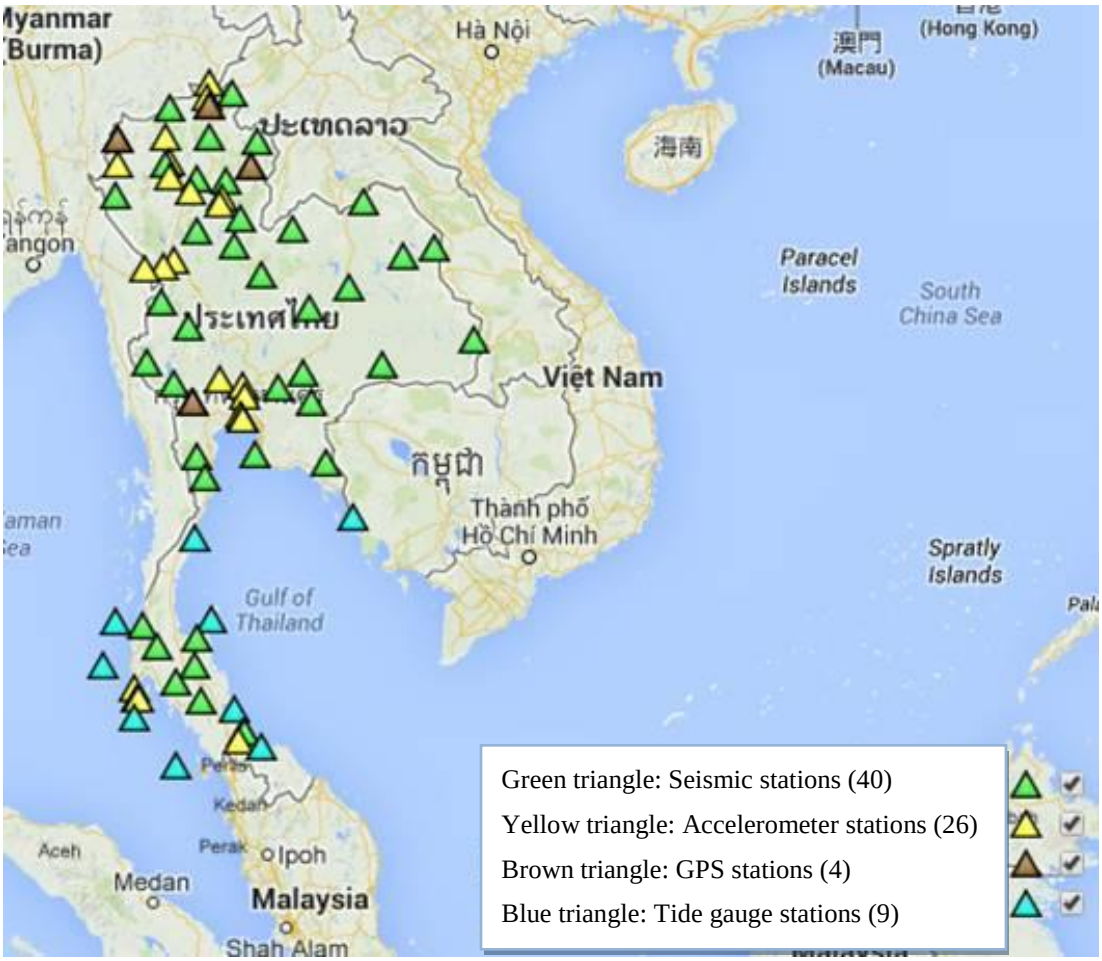

Figure 1. Seismic Network in Thailand.

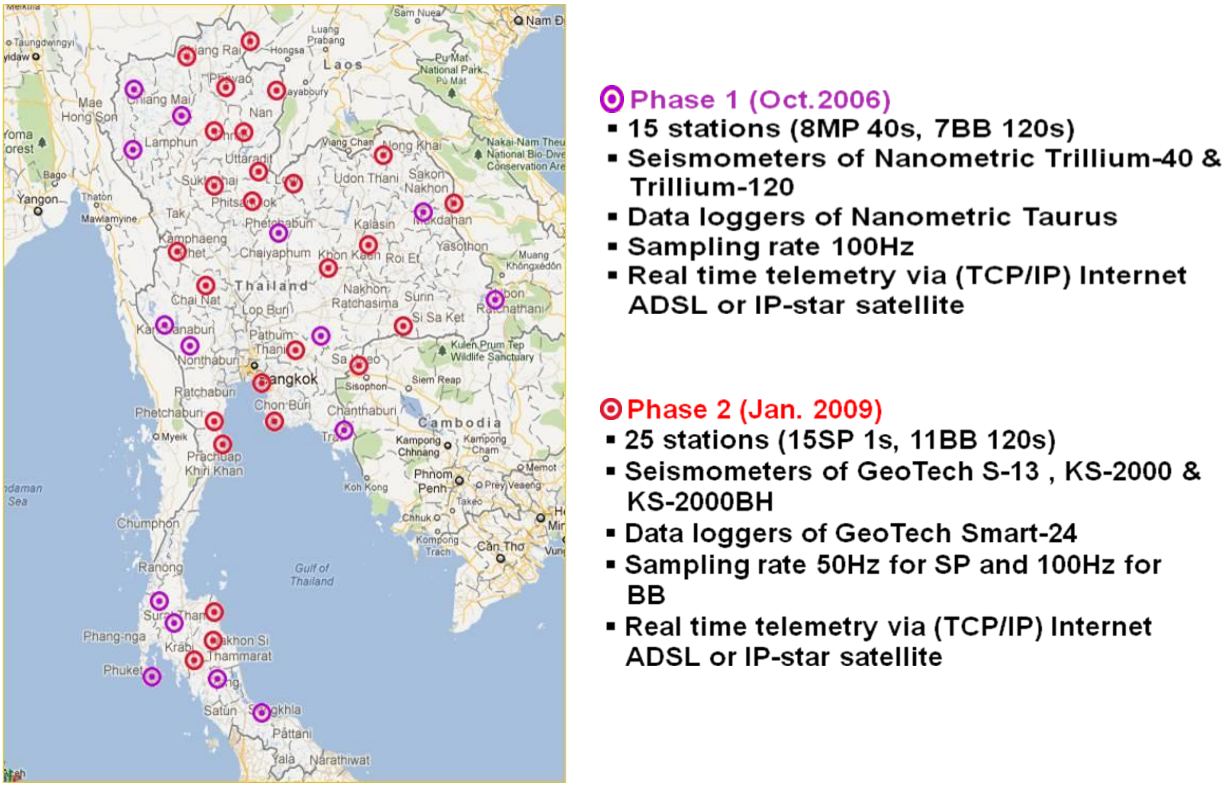

Figure 2. Installation of Seismic Stations.

There are 40 seismic stations in Thailand, of which 1-15 stations (Phase 1; purple circle) are settled in 2006 and other 25 stations were added up in 2009 (Phase 2; red circle) (Figure 2). Details of each station are described in the Table 1.

Table 1. Details of Seismic Stations.

LOCATION	SATION CODE	LATITUDE	LONGITUDE	ELEVATION
1. Chantaburi Province	CHBT	102.3297	12.7526	4
2. Chiengmai Province	CMMT	98.9476	18.8128	399.7
3. Kanchanaburi Province	KHLT	98.5893	14.797	164
4. Nakonrachasima Province	KRDT	104.8442	14.5905	266
5. Mae Hongson Province	MHIT	97.9632	19.3148	270
6. Mae Hongson Province	MHMT	97.931	18.1764	164
7. Phetchaboon Province	PBKT	100.9687	16.5733	8
8. Phuket Province	PKDT	98.335	7.892	53

9. Ranong Province	RNTT	98.4778	9.3904	38
10. Songkhra Province	SKLT	100.6188	7.1735	14.5
11. Kanchanaburi Province	SRDT	99.1212	14.3945	122
12. Suratthani Province	SURT	98.795	8.9577	26
13. Ubon ratchathani Province	UBPT	105.4695	15.2773	120
14. Sakon nakhon Province	SKNT	103.9815	16.9742	254
15. Trang Province	TRTT	99.6912	7.8362	71
16. Phitsanulok Province	PHIT	100.416499	17.189269	113.5
17. Sukhothai Province	SUKH	99.631013	17.482143	58.0294
18. Uttaradit Province	UTTA	100.554083	17.744258	62.61
19. Phrae Province	PHRA	100.229325	18.498912	186.83564
20. Lampang Province	LAMP	99.632246	18.522614	246.655
21. Nan Province	NAN	100.911631	19.283535	261.711992
22. Phayao Province	PAYA	99.869172	19.360284	408.264
23. Chiengrai Province	CRAI	100.373434	20.228927	356.746966
24. Chiengmai Province	CMAI	99.04526	19.932477	1502.668207
25. Tak Provice	UMPA	98.86035	16.20572	403.234
26. Prachuap khiri khan Province	PRAC	99.79288	12.47263	53.63791
27. Uthai thani Province	UTHA	99.445133	15.558565	128.607
28. Phetchaburi Province	PHET	99.62675	12.91331	100.6704
29. Pattaya Province	PATY	100.865694	12.923188	39.190244
30. Nakhon si thammarat Province	SRIT	99.60196	8.59549	58.4626
31. Suratthani Province	SURA	99.62945	9.16634	-5.54492
32. Chaiyaphoom Province	CHAI	101.9864	15.9018	198.9548
33. Nongkai Province	NONG	103.1457	18.06346	140.47
34. Nakornphanom Province	PANO	104.6122	17.1476	135.5955
35. Khonkaen Province	KHON	102.823	16.33778	134.6877
36. Nakornnayok Province	NAYO	101.3209	14.31523	106.293
37. Surin Province	SURI	103.5529	14.7688	125.908

38. Srakaew Province	SRAK	102.0425	14.012	96.90778
39. Loei Province	LOEI	101.2644	17.50928	305.5835
40. Krabi Province	KRAB	99.631013	8.2215	58.0294

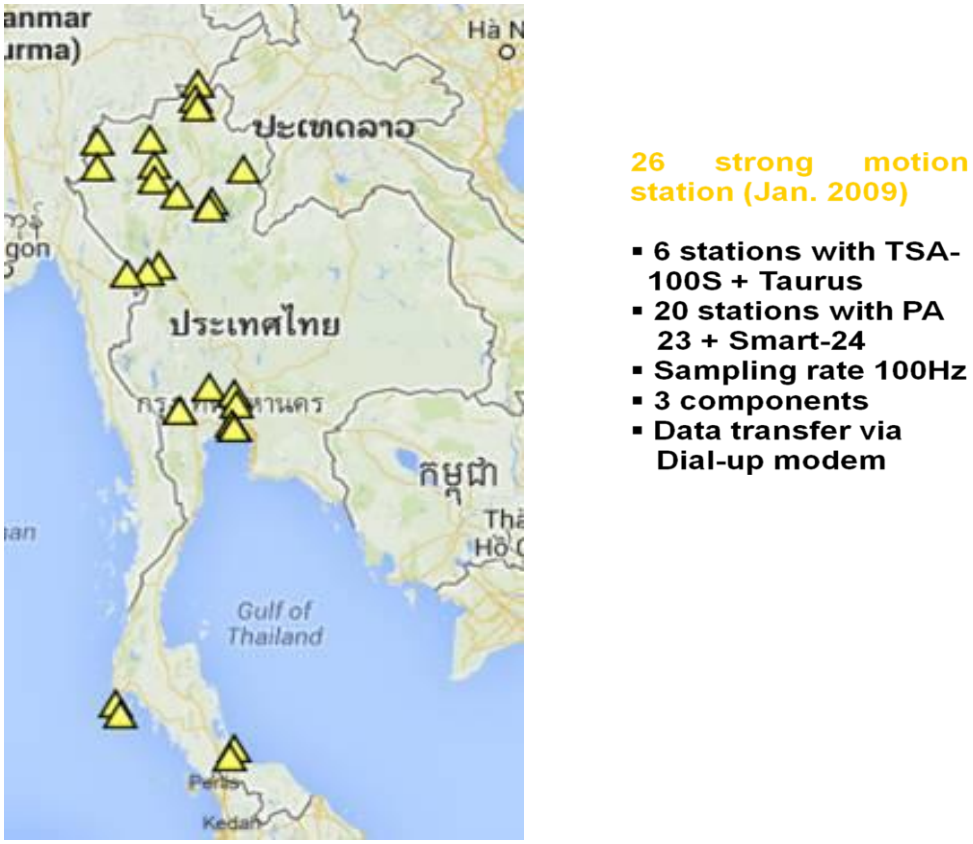

Figure 3. Installation of Strong Motion Stations.

There are 26 strong motion stations which were installed in 2009. Strong motion seismology used special sensors, called accelerometers, to record large-amplitude ground motions and the response of engineered structures. The detail is shown in the table as below.

Table 2. Details of strong motion stations.

SATION CODE	LOCATION	LATITUDE	LONGITUDE	ELEVATION
AYUA	Ayutthaya province	14.3521	100.577	
BKKA	TMB BKK	13.664	100.6102	
CHLA	Chulalongkorn University	13.7368	100.5323	
CMCA	ChiangMai province	14.02233	99.536	
CRAA	ChingRai province	19.9602	99.8847	
DAOA	ChiangMai province	19.3612	98.9654	
KCBA	Kanchanaburi province	14.02233	99.536	
KOOA	Mae Hong Sorn province	18.8296	97.9388	
LPGA	Lampang province	18.27819	99.50656	205
LUMP	Lamphoon province	18.566979	99.038459	256.34666
MAEA	Mae Hong Sorn province	19.300106	97.97289	240
MOOA	Tak province	16.7507	98.9384	
MSAA	ChiangRai province	20.4276	99.8865	
MSAA	ChiangRai province	20.1447	99.8557	
NANA	Nan province	18.7672	100.76333	164
PHEA	Phrae province	18.1272	100.1656	
PKTC	Phuket province	8.104905	98.308280	
PKTM	Phuket province	7.88431	98.39183	
PTNA	Pathum Thani province	14.116	100.6203	
SANA	ChiangMai province	18.8479	99.0487	
SKLC	Songkhla province	7.185375	100.605176	1
SKLK	Songkhla province	7.01767	100.4989	17
SODA	Tak province	16.702390	98.541894	
SOOA	Phrae province	18.0157	100.1149	
SPBA	Suphan Buri province	14.475	100.0908	

TAKA	Tak province	16.8777	99.1432	
TMDA	TMB BKK	13.668415	100.606773	

Figure 4. Installation of Tide Gauge Stations.

When a large earthquake occurred in the sea, a tsunami can be generated. In order to warn the tsunami, Thai Meteorological Department (TMD) installed the tide gauge stations both along Andaman sea side (4 stations) and the Gulf of Thailand (5 stations) in the South to monitor sea level (Table 3).

Table 3. Details of tide gauge stations.

STATION CODE	LOCATION	LATITUDE	LONGITUDE	ELEVATION
BANG	**Prachuapkhirikhan province**	**11.2063**	**99.58187**	
MIEN	**PhangNga province**	**8.5715**	**97.6393**	
RAJA	**Phuket province**	**7.485**	**98.32083**	
RNOD	**Songkhla Province**	**7.6783**	**100.395**	

SMUI	**Suratthani province**	**9.5483**	**99.9318**	
STOK	**PhangNga province**	**9.4731**	**97.9051**	
STUN	**Stool province**	**6.5003**	**99.1798**	
TEPA	**Songkhla province**	**6.87725**	**100.96558**	
TRAD	**Trad province**	**11.65166**	**102.907**	

Figure 5. Installation of GPS stations.

The Seismological Bureau also installed 4 GPS for measuring plate movement of the earth at Mae Hong Son, ChiangRai, Nan and Kanchanaburi province respectively.