



Marine Dept.



Hydrographic Dept.



Port Authority of Thailand

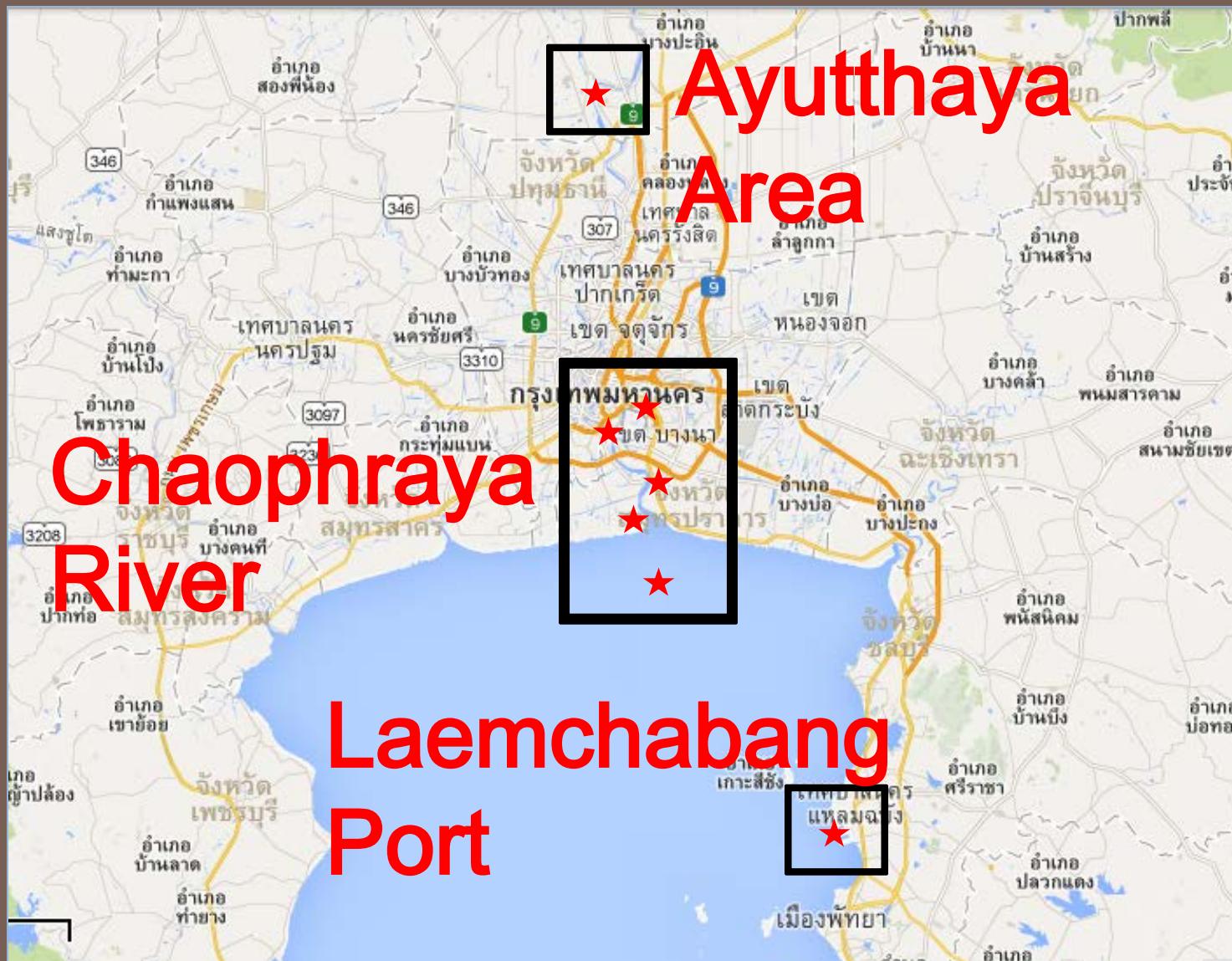
# National Sea Level Observation and Sea Level Activities in Thailand

Cdr. Supasit Kongdee  
anographic and Tidal Section, Oceanographic Division

# OUTL

- Map of tide gauge network in Thailand
- List of gauge sites
- The gauge technology employed in the network
- Sea level products
- sea level science studies
- tidal analysis package
- addresses of data banks
- ~~Tsunami warning system~~

# Map of tide gauge network in Thailand



27/03/57

National Sea Level Observation and Sea Level Activities in Thailand

# List of gauge sites (PAT)

Present

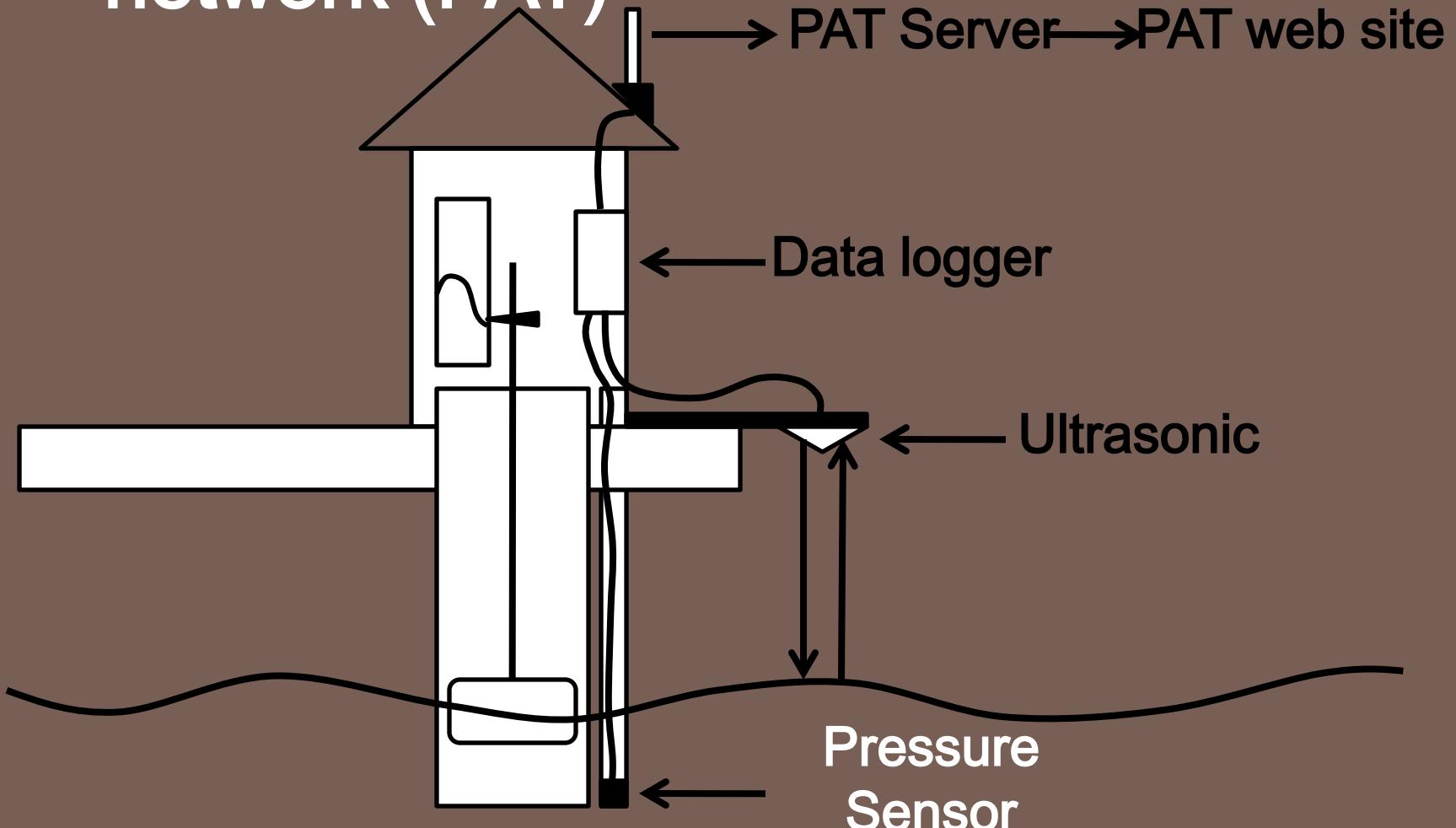
No .	Station	Manu al	Auto	Remark
1	Bang Sai	X	X	Pressure Sensor
2	Bangkok Port	X	X	Pressure Sensor
3	Pra Pradaeng		X	Ultrasonic
4	Samutprakan	X		Under Construction
5	Phrachunlachomklao Fort	X		Under Construction
6	Beacon J	X		Under Construction
7	Laemchabang Port	X	X	Ultrasonic

# List of gauge sites (PAT)

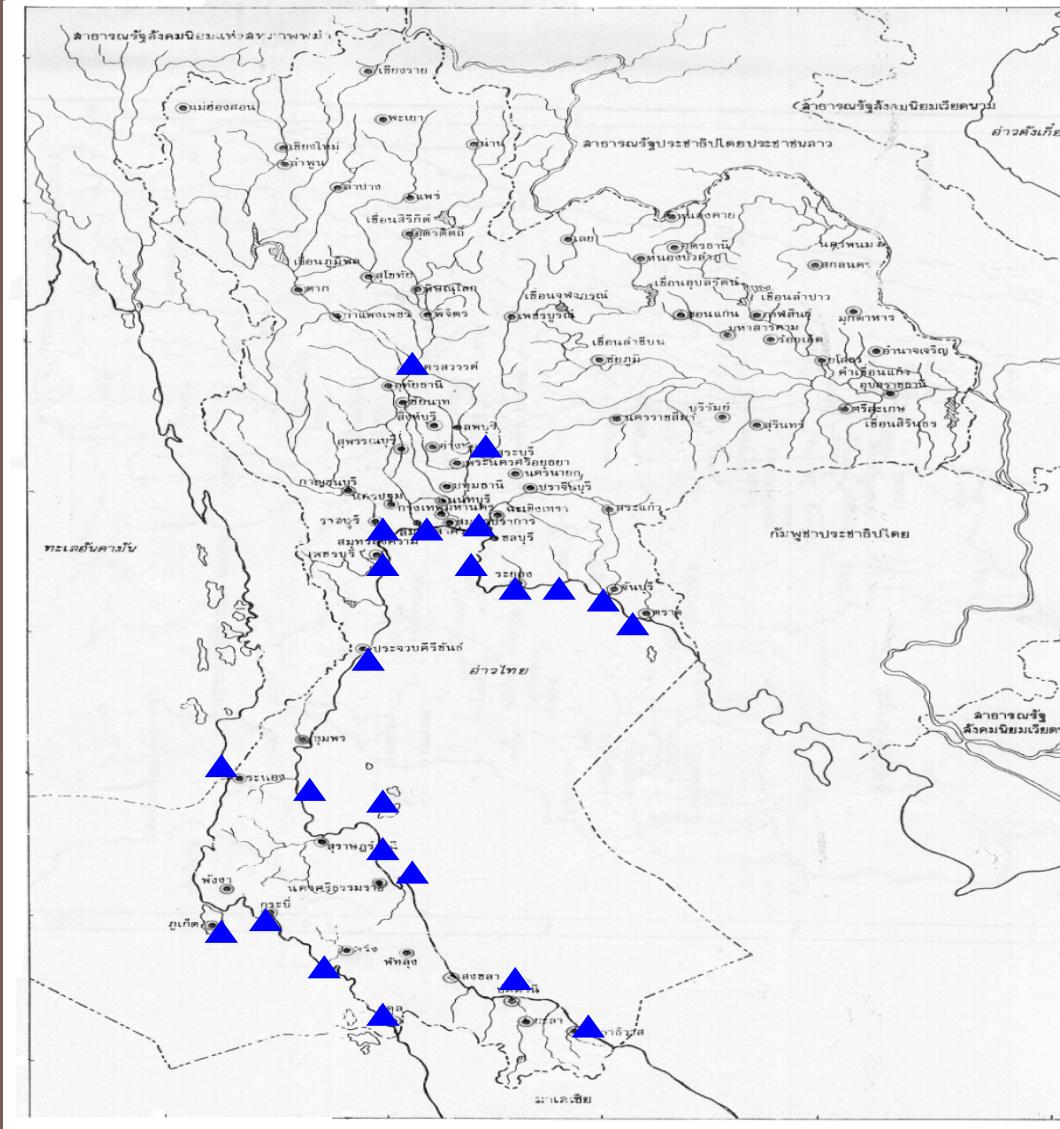
In 2015

No.	Station	Manual	Auto	Remark
1	Bang Sai	X	X	Pressure Sensor
2	Bangkok Port	X	X	Pressure Sensor
3	Pra Pradaeng		X	Ultrasonic
4	Samutprakan	X	X	Ultrasonic
5	Phrachunlachomklao Fort	X	X	Ultrasonic
6	Beacon J	X	X	Ultrasonic
7	Laemchabang Port	X	X	Ultrasonic

# The gauge technology employed in the network (PAT)



# Map of tide gauge network in Thailand (M)



23 stations  
All are float tide gauge

# List of gauge sites (MD)

Station name	Lat.	Long.	Location	Observation
<b>Upcountry</b>				
Nakhonsawan (KW)	15° 41' 19"	100° 07' 42"	Mae Nam Chaopraya, Nakhonsawan-ook Sub-district, Mueang District, Nakhonsawan Province	Since 1996 - Present
Nakornluang (NK)	14° 28' 04"	100° 07' 54"	Mae Nam Pasak, Nakhonluang Sub-district, Nakhonluang District, Ratchaburi Province	Since 1997 - Present

# List of gauge sites (MD), East coast o

Station name	Lat.	Long.	Location	Observation
Bangpakong (BK)	13° 29' 06"	101° 00' 11"	Mae Nam Bangpakong, Thephasdin Bridge, Thakam Sub-district, Bangpakong District, Chachoengsao Province	Since 1981- Present
Ao Udom (AU)	13° 07' 31"	100° 53' 34"	Multipurpose Port, thungsukha Sub-district, Sri racha District, Chonburi Province	Since 2006 - Present
Rayong (RY)	12° 39' 36"	101° 16' 15"	Paknam Rayong Sub-district, Mueang District, Rayong Provinc	Since 1986 - Present
Prasae (PS)	12° 41' 47"	101° 42' 09"	Paknam Prasae Sub-district, Klaeng District, Rayong Province	Since 1977 - Present
Thachalaep (TL)	12° 32' 00"	102° 03' 28"	Thachalap Pier, Bangkaja Sub-district, Mueang District	Since 1981 - Present

List of gauge sites (MD), West Coast of GOT					
Samutsakorn (TC)	13° 30' 42"	100° 16' 28"	Mae Nam Thachin, Wat Srisutharam, Mueang District, Samutsakhon Province		Since 1977 - Present
Samutsonkra m (MK)	13° 22' 42"	99° 59' 32"	Mae Nam Maeklong Wat Radsatratham, Bangjakreng Sub-district, Mueang District, Samutsonkhram Province		Since 1977 - Present
Banlaem (BL)	13° 15' 53"	99° 56' 32"	Klong Bangtaboon, Bangtaboon-ook Sub-district, Banlaem District, Phetchaburi Province		Since 1996 - Present
Klongwan (KV)	11° 44' 02"	99° 46' 56"	Pier, Klongwan Sub-district Mueang District, Prachuap kirikhan Province		Since 2006 - Present
Langsuan (LS)	9° 56' 45"	99° 09' 27"	Pier, Paknam Langsuan Sub-district, Langsuan District, Chumphon Province		Since 1982 - Present
Ko Samui (SA)	9° 32' 17"	99° 55' 51"	Ferry Port 2, Ko Samui Sub- district, Ko Samui District, Suratthani Province		Since 2006 - Present

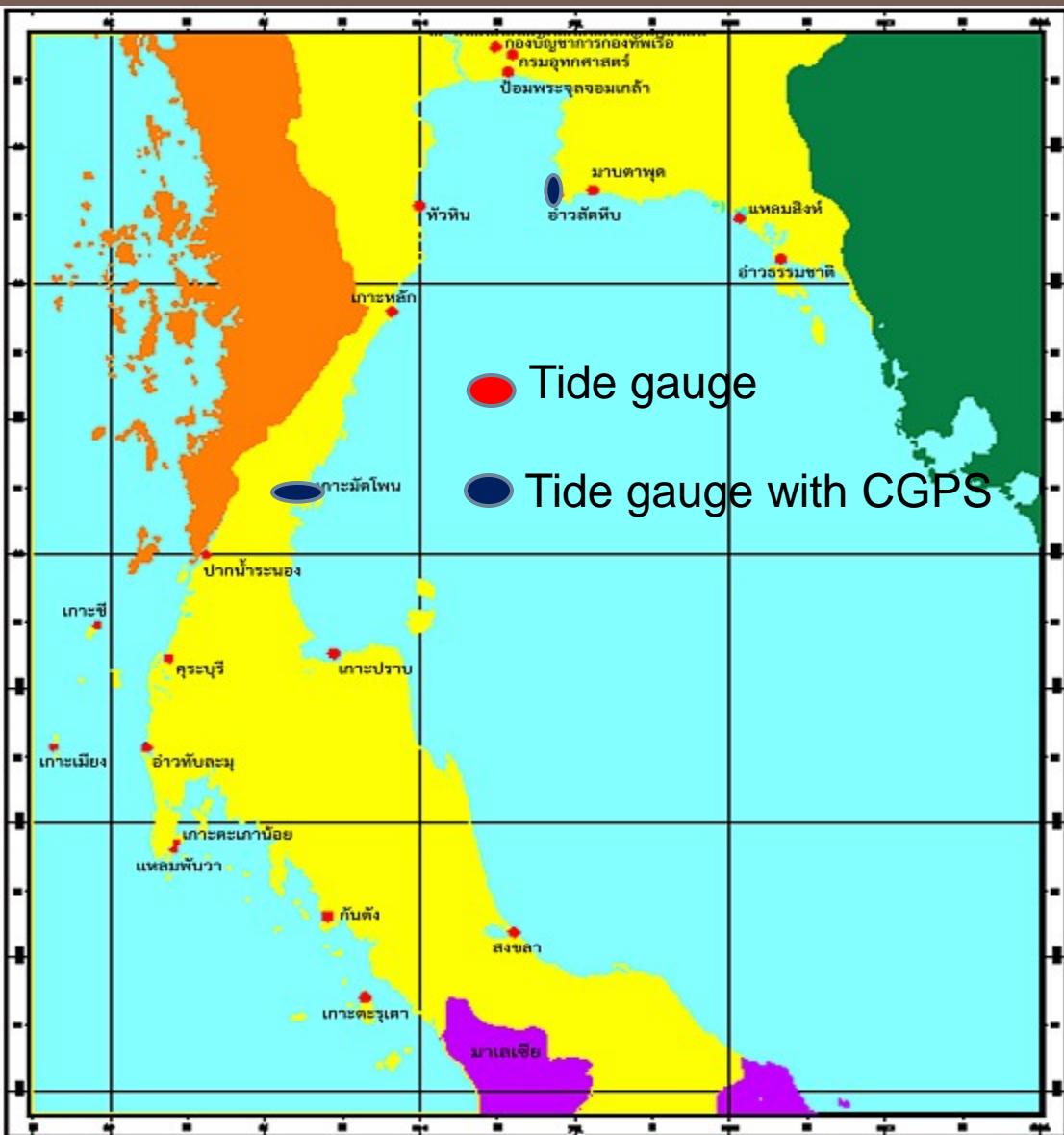
# List of gauge sites (MD), Andaman

Station name	Lat.	Long.	Location	Observation
Ranong (RN)	10° 00' 17" 09° 57' 03"	98° 36' 24" 98° 35' 45"	Multipurpose Port, Paknam Sub-district Mueang District, Ranong Province Ko Kontee	Since 2008 – Present 1977 – 2007
Ao Po (AP)	8° 03' 34"	98° 26' 10"	Ao po Port, Pakhlok Sub-district Thalang District, Phuket Provinc	Since 2006 - Present
Krabi (KB)	8° 02' 46"	98° 54' 21"	Krabi Port, klongjilad Sub-district, Mueang District, Krabi Province	Since 1981- Present
Kangtang (KT)	7° 18' 40" 07° 24' 38	99° 24' 08" 99° 30' 43"	Chao-mai Port, Libong Sub-district, Kantang District, Channel Development and Maintenance Centre3 (Trang)	Since 2007 - Present 1968- 1992,1998- 2006
Total	63° 00' 00"	100° 04'	Total	Since 1981

# The gauge technology employed in the network (MD)



# Map of tide gauge network in Thailand (H)



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# List of gauge sites (HD)

Station Name	LAT	LONG	Observation Periods
1.Royal Thai Navy Headquarters	13-42-00	100-35-02	1945
2.Phra Chunlachomklao Fort (Samut Prakan)	13-33-06	100-34-44	1985
3.Ao Sattahip (Chon Buri)	12-38-42	100-52-55	1940
4.Laem Sing (Chanthaburi)	12-28-27	102-03-45	1960
5.Hua Hin (Prachuap Khiri Khan)	12-34-22	99-57-48	1992

# List of gauge sites (HD)

Station Name	LAT	LONG	Observation Periods
6.Ko Lak (Prachuap Khiri Khan)	11-47-42	99-48-58	1939
7.Ko Mattaphon (Chumphon)	10-26-40	99-15-25	1954
8.Ko Prap (Surat Thani)	09-15-47	99-26-18	1977
9.Songkhla ( Songkhla )	09-15-48	100-34-50	1986
10.Pak Nam Ranong (Ranong)	07-12-58.	98-35-15	2007
11Khura Buri (Phangnga)	09-13-30	98-22-37	2007

# List of gauge sites (HD)

Station Name	LAT	LONG	Observation Periods
12.Ao Thap Lamu (Phangnga)	08-34- 26	98-13- 29	1986
13.Ko Thaphao Noi (Phuket)	07-49- 54	98-25- 30	1948
14.Ko Tarutao (Satun)	06-42- 06	99-39- 00	1986
15.Laem Ngop (Trat)	12-10- 07.	102-23- 45	2007
16.Pak Nam Trang (Trang)	07-24- 13	99-30- 45	2007

# List of gauge sites (HD)

Station Name	LAT	LONG	Observation Periods
16.Mabtaprt Port	12-40-21.	101-08-20.	2003
17.Ko miang	08-34-16	97-38-23.	2005
18. Ko Stork	09-28-28	97-54-12	2005
19.Panwa cape	07-48-09	98-24-38	2012
15.hydrographic dept	13-40-20	100-35-22	2012

# The gauge technology employed in the

no



# Sea level products

28 stations for Tide Table

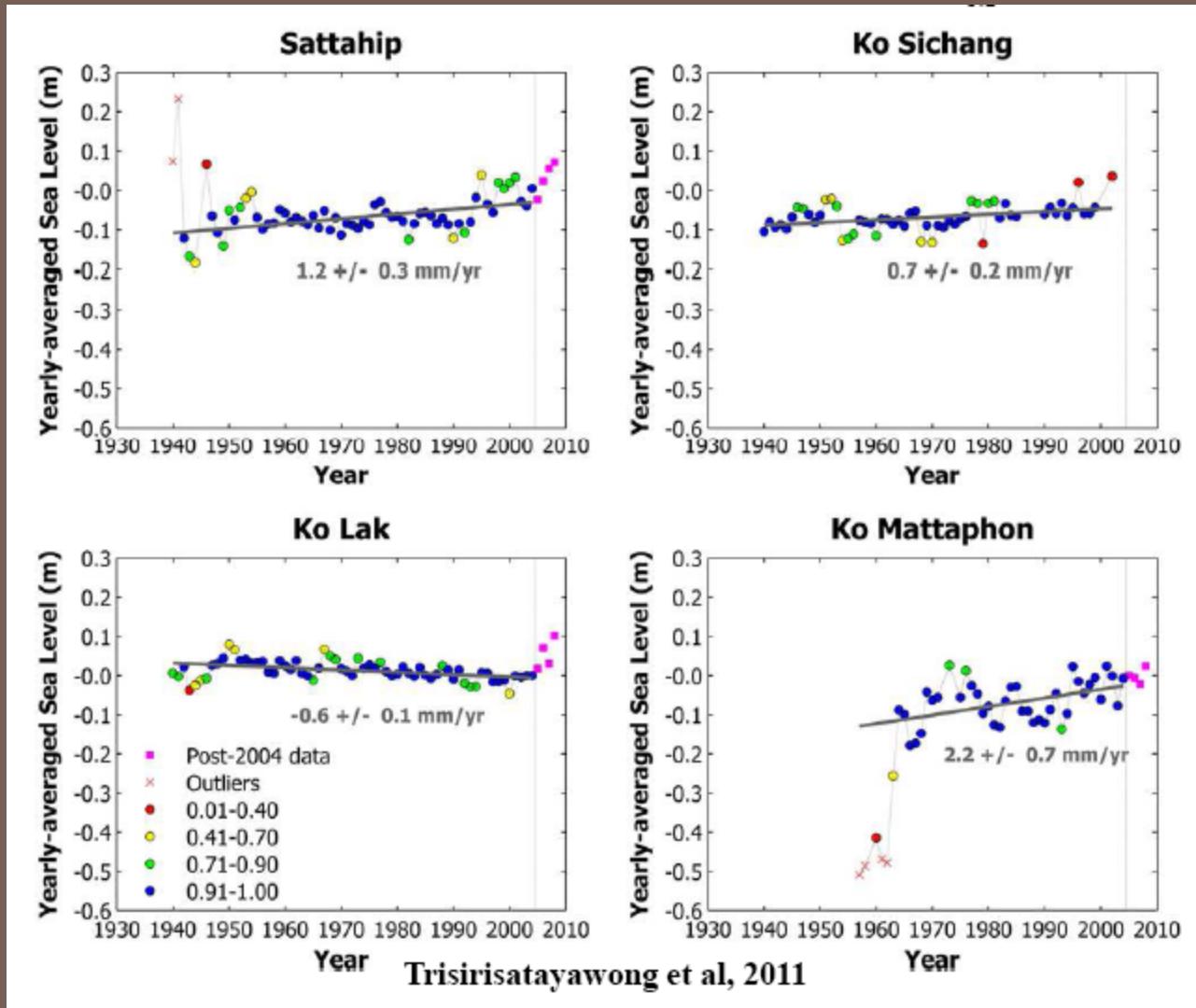


# Sea level products

KO THAPAO NOI (PHUKET)					
พ.ศ. 2528 - 2548 (ค.ศ. 1985 - 2005)					
Non - Harmonic Tidal Quantities					
ละติจูด (Lat.) 07° - 49' - 55" N.(N.)		ลองจิจูด (Long.) 98° - 25' - 30" E.(E.)			
TIDAL INFORMATION		ชื่อย่อ	ค่าเฉลี่ย (เมตร)	ค่าราย个别	
			จากศูนย์บรรทัดน้ำ	จาก M.S.L.	
MEAN HIGHER HIGH WATER		MHHW			
MEAN HIGH WATER SPRING		MHWS	3.42	0.92	
MEAN HIGH WATER		MHW	3.04	0.54	
MEAN HIGH WATER NEAP		MHWN	2.68	0.18	
MEAN LOWER HIGH WATER		MLHW			
LOCAL MEAN SEA LEVEL		LMSL	2.20	-0.30	
MEAN TIDE LEVEL		MTL	2.19	-0.31	
MEAN HIGHER LOW WATER		MHLW			
MEAN LOW WATER NEAP		MLWN	1.72	-0.78	
MEAN LOW WATER		MLW	1.33	-1.17	
MEAN LOW WATER SPRING		MLWS	0.99	-1.51	
MEAN LOWER LOW WATER		MLLW		0.78	
MEAN SPRING RANGE (Mn.Sg.Range)				2.43	
MEAN NEAP RANGE (Mn.Np.Range)				0.96	
MEAN RANGE (Mn.Range)				1.71	
HIGHEST HIGH WATER		H'est HW.	4.22	1.72	
LOWEST LOW WATER		L'est LW.	0.21	-2.29	
				ก.ท. 2491	
				ก.ท. 2495	

28 stations for Tidal Information

# sea level science studies



# Sea level science studies

Long-term absolute rates of sea level rise at four tide gauges in the Gulf of Thailand. The vertical land motions at these tidal stations are derived from a) campaign GPS data at CHON, b) campaign GPS data at BANH, and c) difference of sea level change rates detected by satellite altimetry and tidal data (see Section 5.4).

Tidal stations	Apparent SLR rates (mm/yr)	Vertical land motions (mm/yr)	Absolute SLR rates (mm/yr)
Sattahip (1940–2004)	$1.2 \pm 0.3$	$3.8 \pm 1.3^a$	$5.0 \pm 1.3$
Ko Sichang (1940–1999)	$0.7 \pm 0.2$	$3.8 \pm 1.3^a$	$4.5 \pm 1.3$
Ko Lak (1940–2004)	$-0.6 \pm 0.1$	$3.6 \pm 1.5^b$	$3.0 \pm 1.5$
Ko Mattaphon (1964–2004)	$2.2 \pm 0.7$	$2.2 \pm 0.8^c$	$4.4 \pm 1.1$

# Tidal analysis package

PAT's software developed by EGAT

(EGAT = Electricity Generating Authority of Thailand)

HD have used software package developed by Flinders University

# addresses of data banks

The screenshot shows the official website of the Port Authority of Thailand. At the top, there is a banner with the text "การท่าเรือแห่งประเทศไทย" and "Port Authority of Thailand" in English, along with the logo of the Port Authority of Thailand. Below the banner, the main navigation menu includes links for "หน้าหลัก" (Home), "ข่าว" (News), "กิจกรรม" (Activities), "e-Port" (e-Port), "ข้อมูลการท่าเรือ" (Information about ports), "โครงสร้างไซต์" (Site structure), "บริการ" (Services), and "ติดต่อการท่าเรือ" (Contact port). The main content area features a large image of a container ship being loaded at a port terminal, with the text "E-Service" overlaid. To the right of this image is a sidebar titled "E-Service for Vessel Cargo Management System" which lists several services: "การบริหารความพร้อมต่อสถานะ วิธีดู ทราบเรื่องเมืองและประเทศ ในไทย", "ข่าวมีความค่าด้วยบริการ มีให้พร้อมกับ", "ผลการจัดซื้อ-จัดจ้าง", and "รวมเรื่องค่าน้ำเงินในต่างๆ". Below the sidebar are five smaller images with arrows pointing to them: "ท่าเรือกรุงเทพ", "ท่าเรือแหลมฉบัง", "ท่าเรือระยอง", "ท่าเรือพัฒนีย์เชียงใหม่", and "ท่าเรือเชียงของ". At the bottom of the page, there is a footer section with icons and text for "ข้อมูลระดับน้ำ" (Water level information), "สถานีท่าเรือกรุงเทพฯ" (Bangkok Port Station), "สถานีพะรังสี" (Phatthalung Port Station), "สถานีบางไทร" (Samut Prakan Port Station), "สถานีท่าเรือแหลมฉบัง" (Laem Chabang Port Station), "Ship News" (Ship News), and "ประกาศเปิดเผยราคากลาง" (Open bid price announcement).

4 Stations, Bangkok Port, Pra  
Pradaeng,  
Bang Sai, and  
Laemchabang Port are  
**WWW.PORT.CO.TH**

# addresses of data banks

The homepage features the Royal Thai Navy crest at the top left. The main title is "กรมอุทกศาสตร์" (Royal Thai Hydrographic Department). Below the title is a banner with the text "เรียนรู้เรือเดินทางในน้ำ ให้ปลอดภัย" (Learn to sail safely in water). The menu includes "หน้าแรก" (Home), "เกี่ยวกับ คส." (About Hidro), "ผู้บังคับบัญชา ประการดิจิทัลช่องจัง วารสาร คส.", and "จัดหมายอิเล็กทรอนิกส์". A central news section highlights a meeting between Captain John C. Grotz, Deputy Hydrographer of the Navy Command (HDC) and Mr. Thomas J. Clegg, Director of Hydrographic Services of NAVOCEANO. Other sections include "รายงานผลเดินทางไปกว่า" (Report of navigation results), "สถานีน้ำแบบเรียลไทม์" (Real-time water level station), "ตรวจท่อตื้อย ดูงจันทร์ฟัง ที่นี่ - กานต์ 2552" (Check the water level of the Chao Phraya River at Nonthaburi), "ระบบจัดการข้อมูลทางทะเล WAM" (WAM maritime information system), "สภาพอากาศ" (Weather), "เพื่อบริการทาง Internet" (For Internet services), and "ประวัติศาสตร์" (History). A decorative banner at the bottom reads "ห้องเรียนประวัติศาสตร์ไทย" (Hall of Thai Hydrographic History).

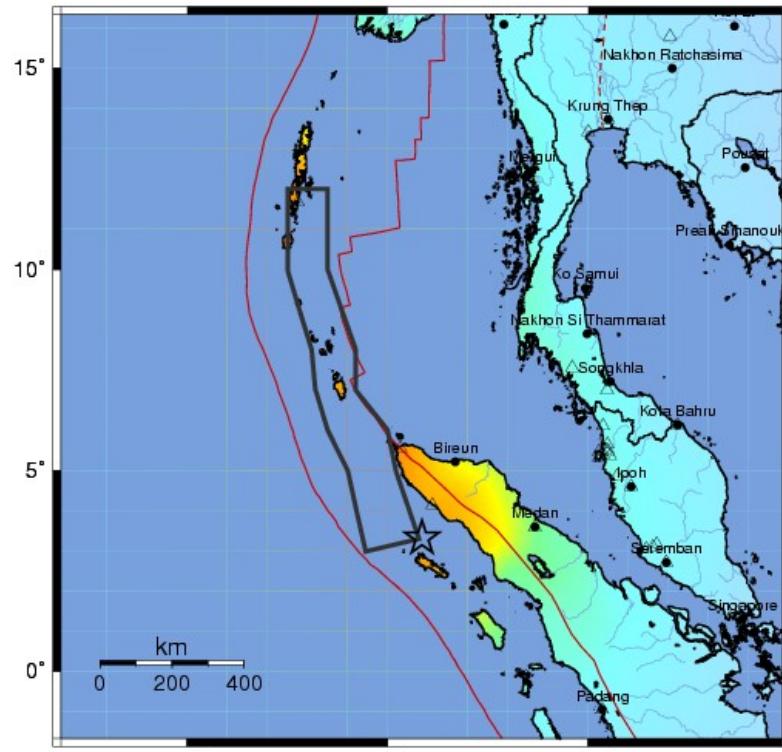


**WWW.HYDRO.NAVY.MI.TH**

# Hydrographic Department Royal Thai Navy

## 26 December 2004 India Ocean Tsunami

USGS ShakeMap : 154 miles SSE of Banda Aceh, Sumatera, Indonesia  
Sun Dec 26, 2004 12:58:53 AM GMT M 9.0 N3.32 E95.85 Depth: 30.0km ID:slav



PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC (%g)	< .17	.17-1.4	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	>124
PEAK VEL (cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-16	16-31	31-60	60-116	>116
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

07:57 26 December 2004

9.3 M Earthquake

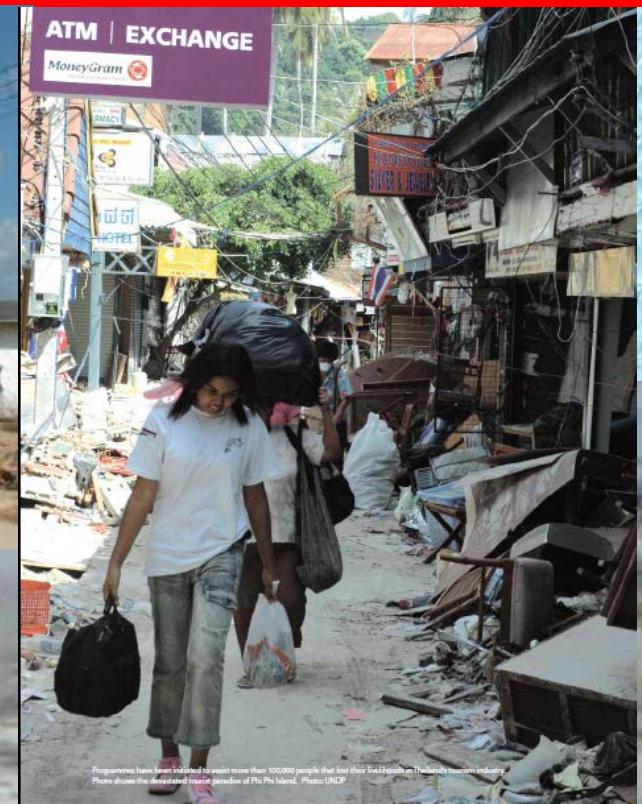
Two hours later Tsunami hit west coast of Thailand

5,395 dead, 8,088 injured and 2,932 missing/unidentified

Cost 2 Billion USD in 6 provinces



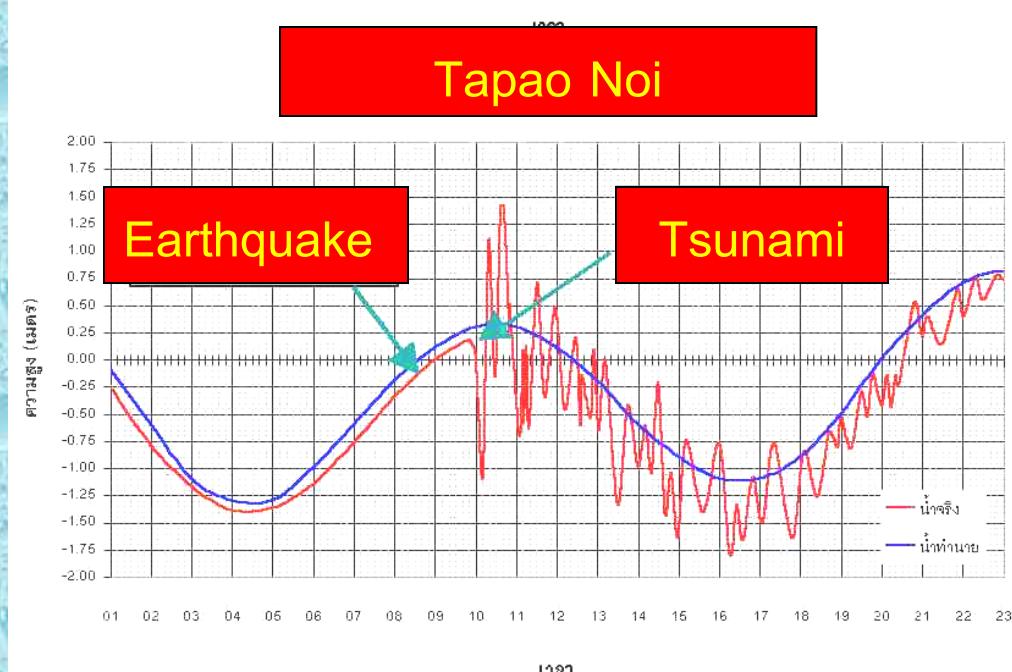
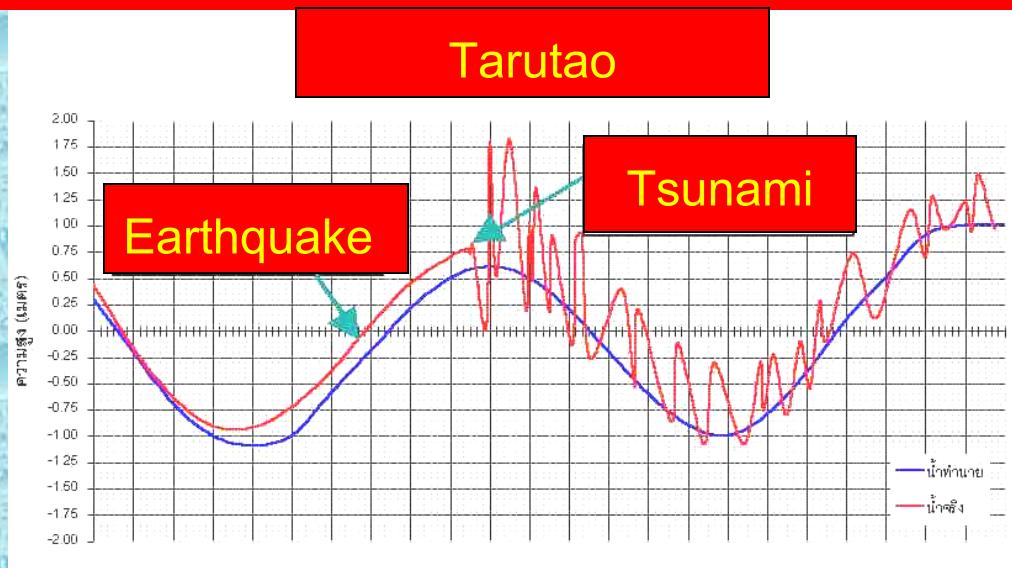
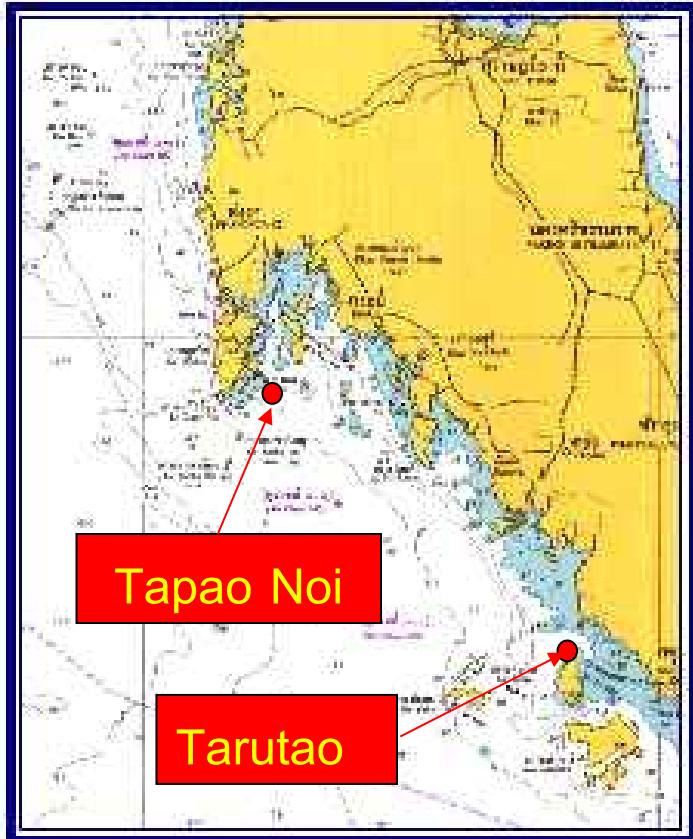
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Programmes have been initiated to assist more than 100,000 people that lost their livelihoods in the Andaman industry. Photo shows the devastated tourist paradise of Phi Phi Island. Photo: UNDP



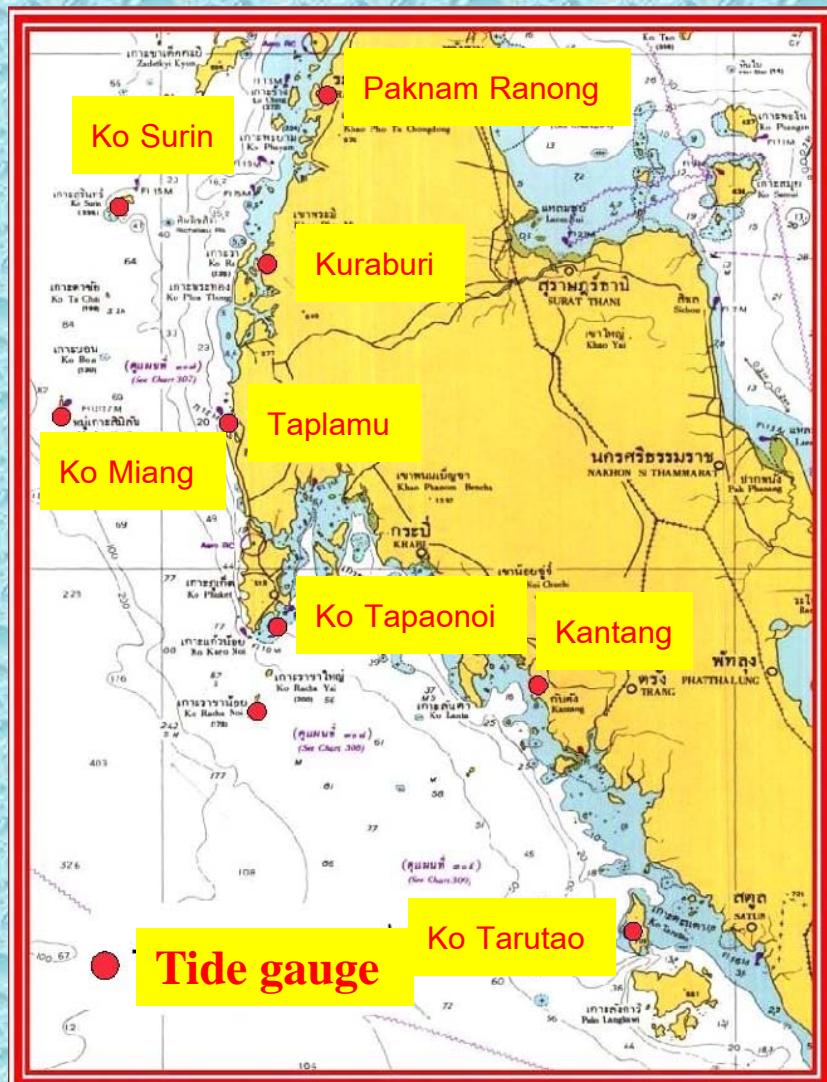
# Hydrographic Department Royal Thai Navy



Hydrographic Department Royal Thai Navy



# Hydrographic Department Royal Thai Navy



## Real-time Tide gauge Network

- Paknam Ranong
- Ko (Island) Surin
- Kuraburi
- Ao (Bay) Taplamu
- Ko Miang
- Ko Tarutao
- Ko Tapaonoi
- Ko Rachanoi
- Kantang

# Hydrographic Department, Royal Thai Navy

## TSUNAMI WARNING



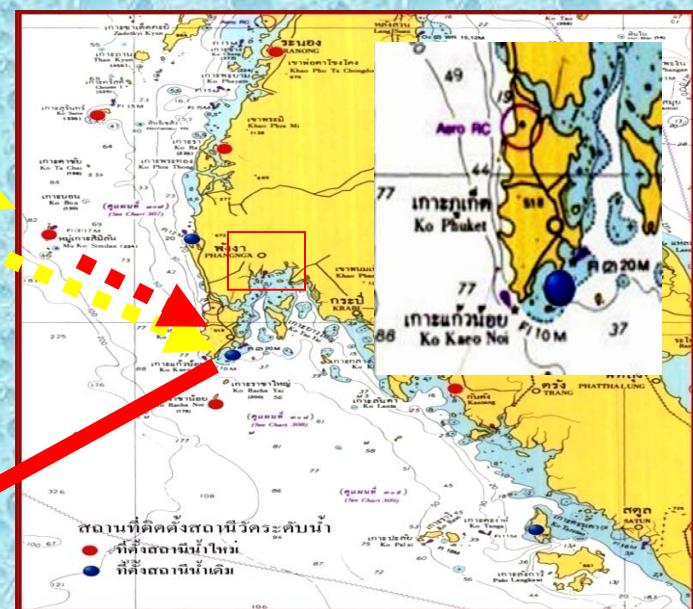
Earthquake > 7



OP.Center  
RTN HD

Alert tide gauge at Similan islands

OP.Center  
RTN



If tsunami is highly likely : Alert

Andaman sea  
squadron and  
Pangnga naval  
base



# Hydrographic Department Royal Thai Navy





Marine Dept.



Hydrographic Dept.



Port Authority of Thailand

# THANK YOU