



The Status of Geodetic / Geospatial Data Infrastructure in Thailand

Col. Chaiwat Promthong

Royal Thai Survey Department



Outline

- Overview on Geodetic Network
- Current status of GNSS CORS
- Past and On-going projects related to GNSS technology
- Issues to be resolved



Overview

Royal Thai Survey Department (RTSD)

- **Founded in 1885**
- **A department under the Royal Thai Armed Forces (RTArF), Ministry of Defence**



Mission

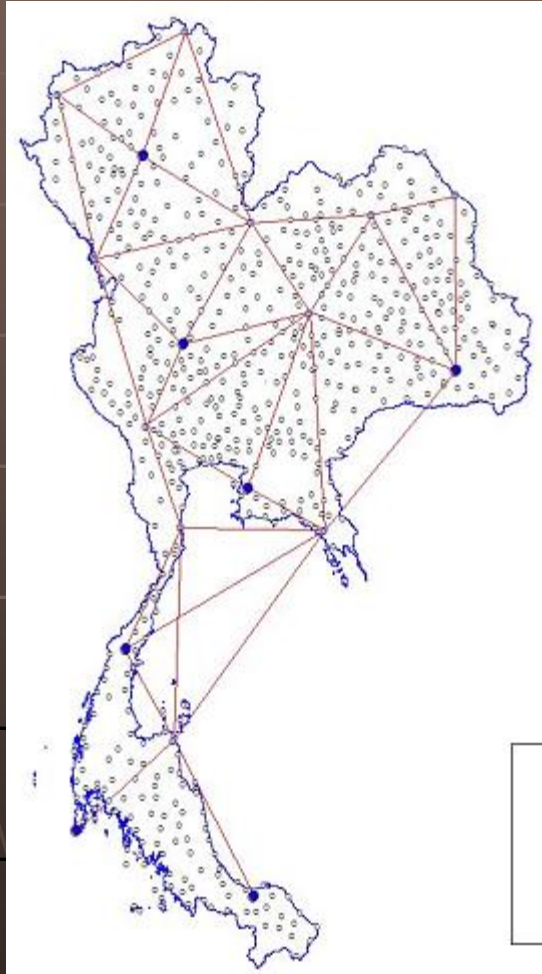
- Field and Aerial Surveying for Mapping and Geo-information Production
- Geodesy and Geophysics Surveying

**To Support National Security and
Development of the Country**

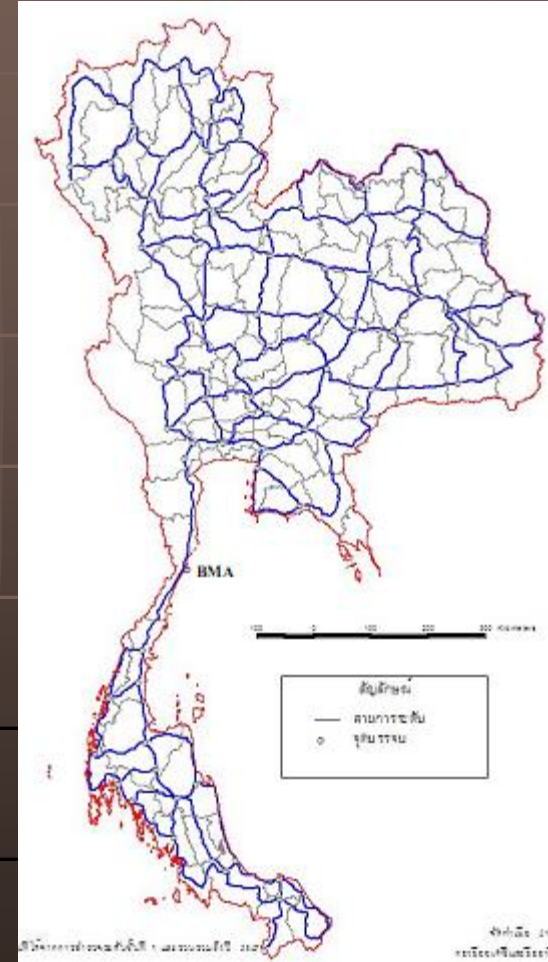
National Geodetic Network

- National Geodetic Network :
Horizontal and Vertical Network
- Surveying campaigns
 - Horizontal surveying : GPS Network
 - Vertical surveying : First order Leveling
 - Gravity and Magnetic surveying

National Geodetic Network

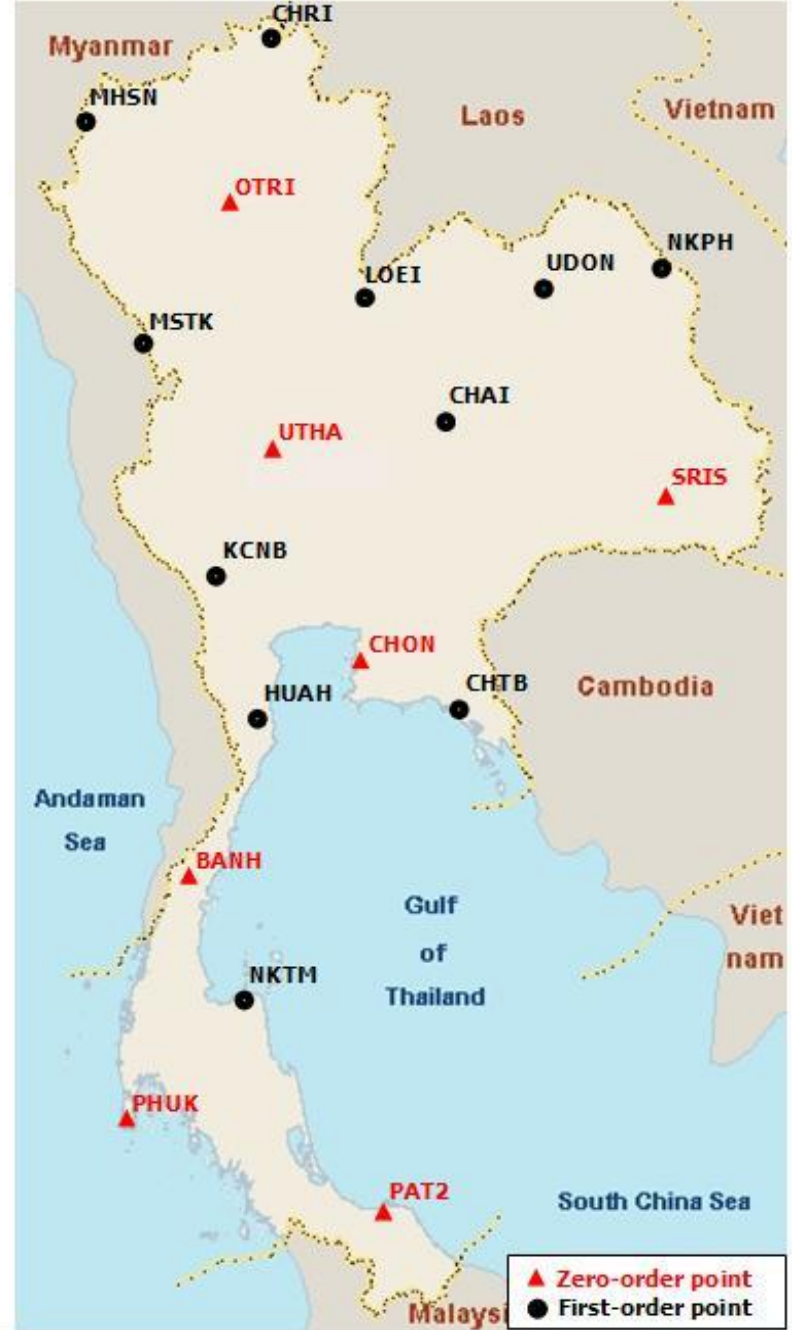


Horizontal Network



Vertical Network

- Geodesy:
- RTSD maintain the National Geodetic Reference Frame

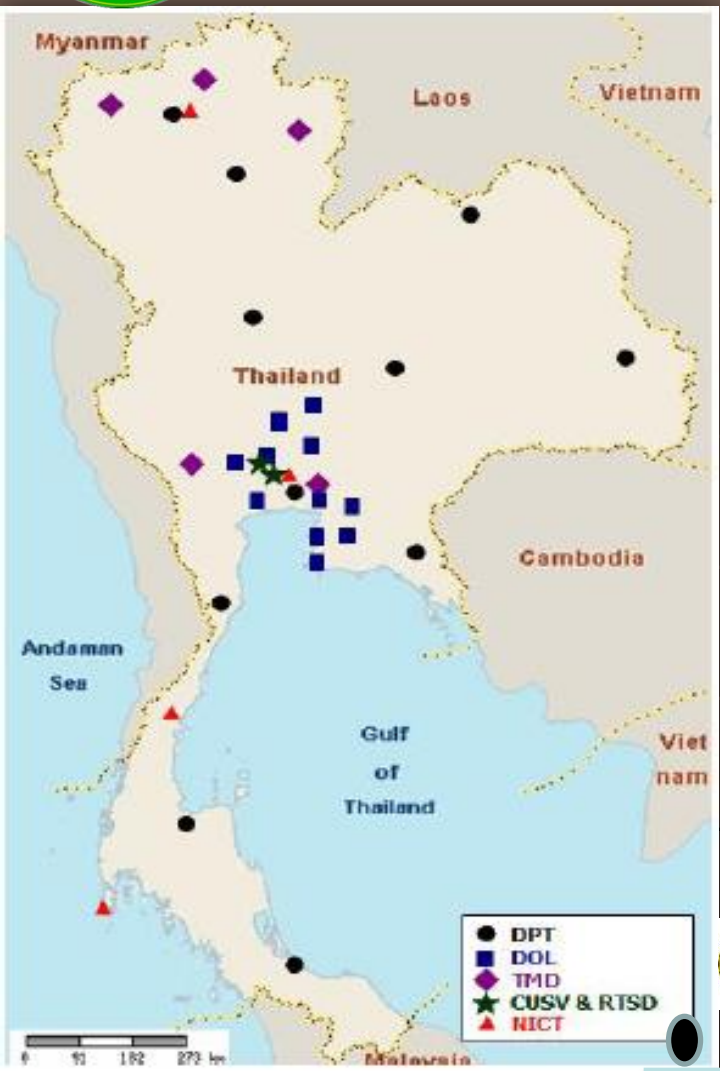




Current status of GNSS CORS in Thailand



- GNSS technology has been widely used in Thailand for over 20 years
- Most of govt organizations have employed GNSS technology to carry out their routine responsibilities (i.e. Department of Lands, **RTSD**, GISTDA, Department of Public Works and Town & Country Planning, Royal Forest Department and so on)
- Both state organizations and private companies, GNSS technology is also widely used.



1996 DPT 11 station



2005 RTSD 1 station



2005 NICT 4 station



2007 NIMT 5 station



2008 CU 1 IGS Station

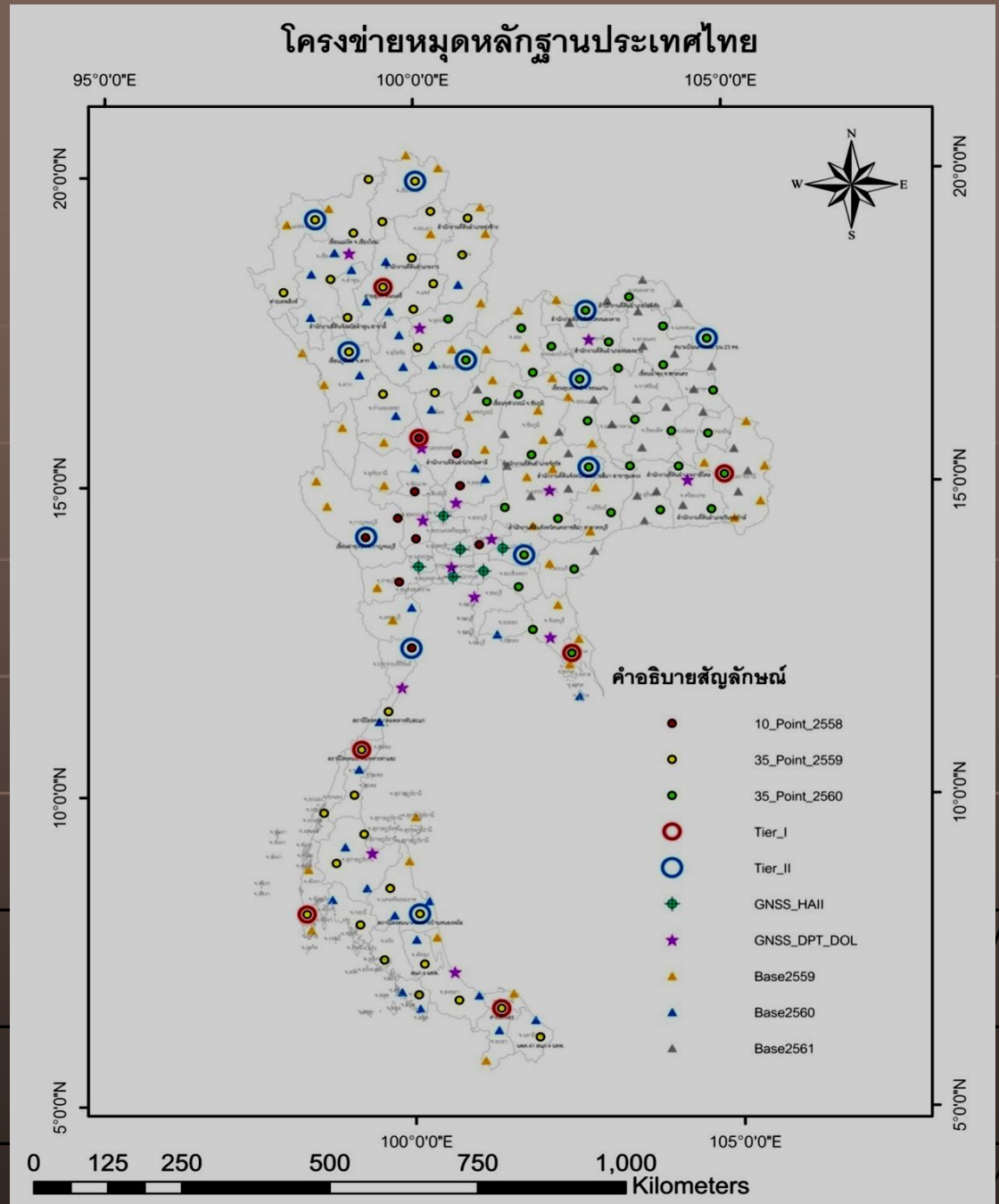


2008 DOL 11 station

**NETWORK GNSS
CORS IN THAILAND**

Thailand's CORS network

80 + 120 CORS
being installed by
RTSD & DOL
to provide NRTK
service in
Thailand



GNSS CORS Specification

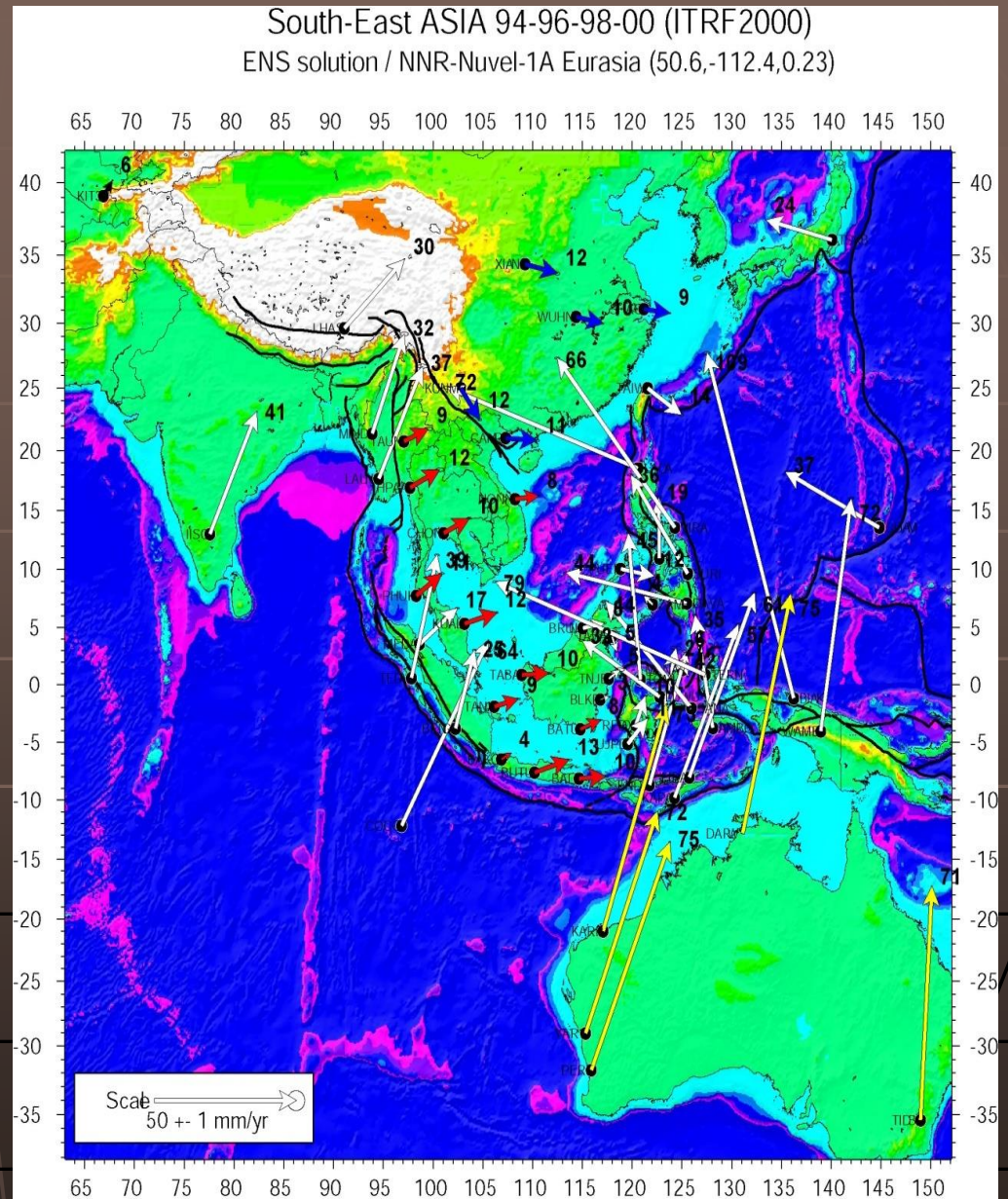
- About 200 stations cover the country
- Each station 30-40 km. apart
- Classes : Tier I, II and III
- Services : NRTK, DGPS and Post-processing
- Reference Frame : ITRF2014



Past and On-going projects related to GNSS in Thailand

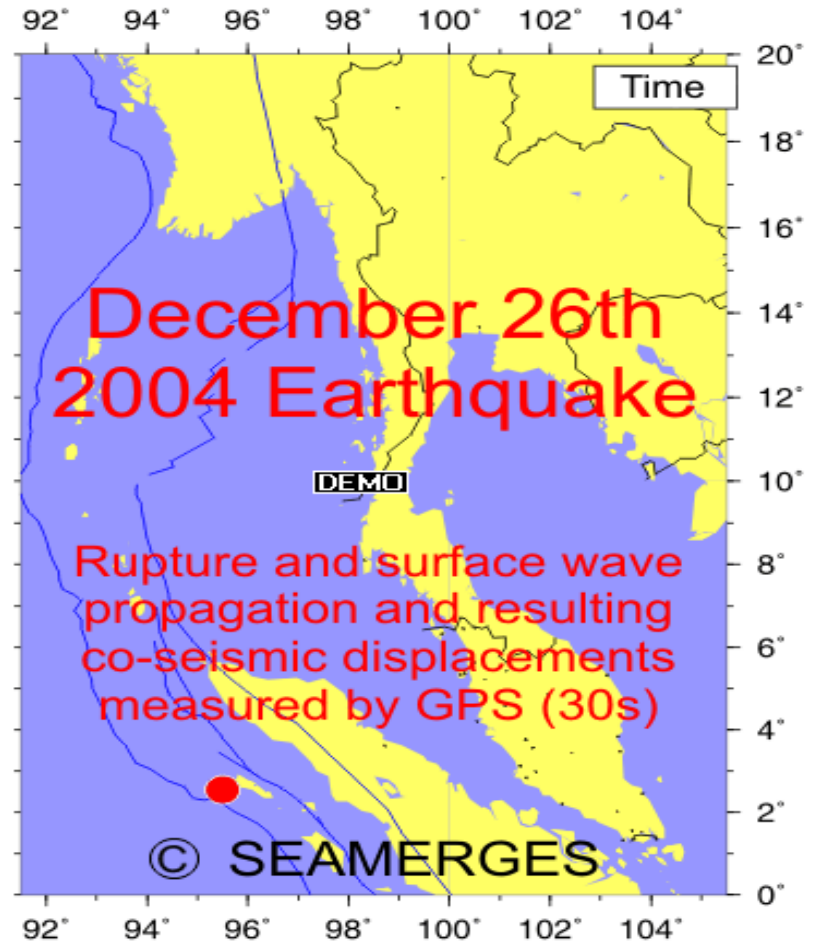


- GEODYSSSEA
- Tectonic Plate motion of SE Asia





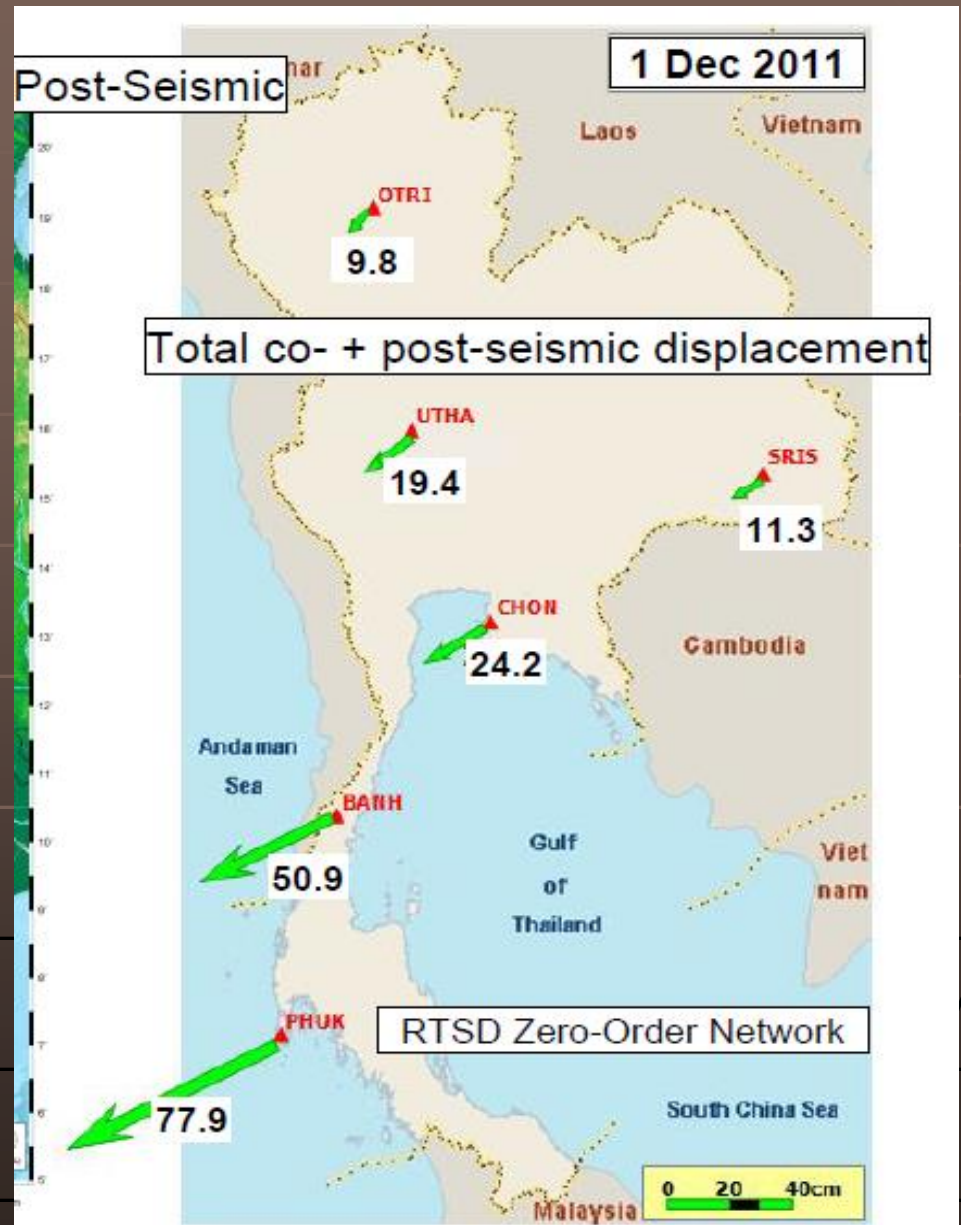
- Horizontal displacement during the Sumatra-Andaman earthquakes 2004



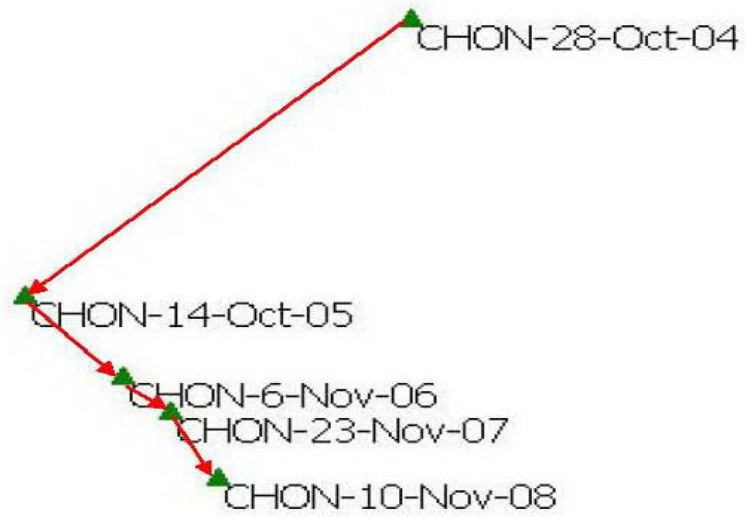
<http://www.deos.tudelft.nl/seamerges>



- Horizontal total displacements due to the Sumatra-Andaman and Nias earthquakes at each zero-order Thai geodetic network site up to Dec 2011

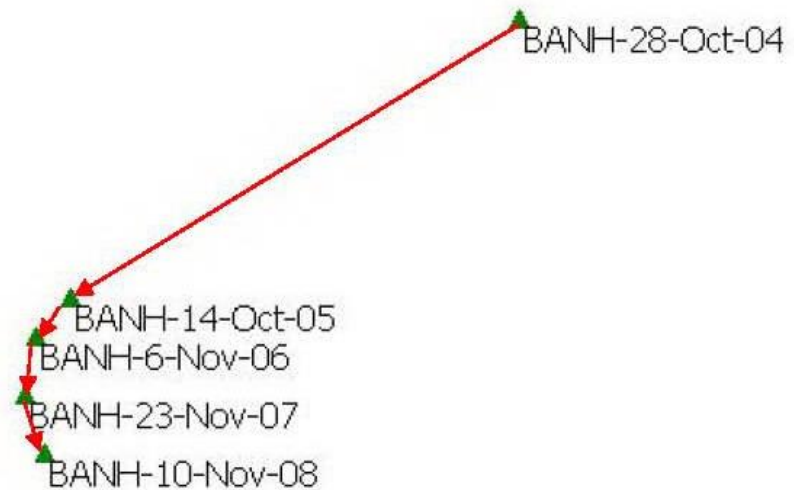


Crustal movement



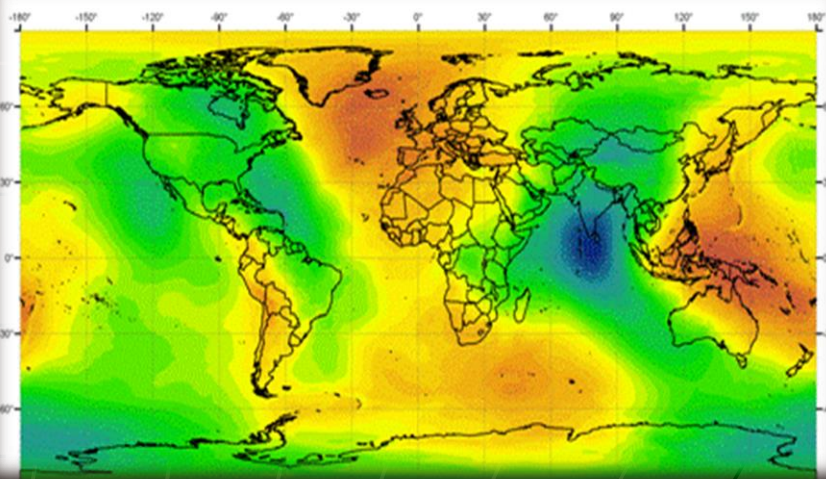
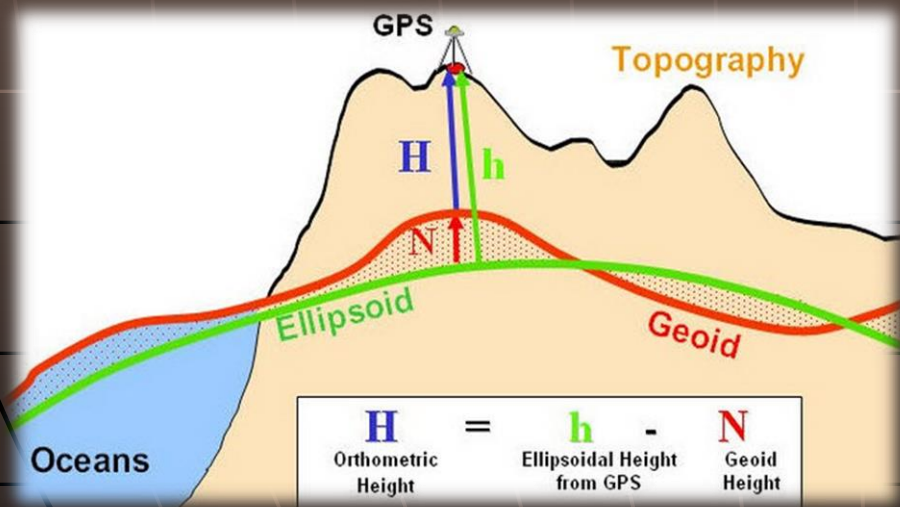
0.2 m

Distortion of Geodetic network



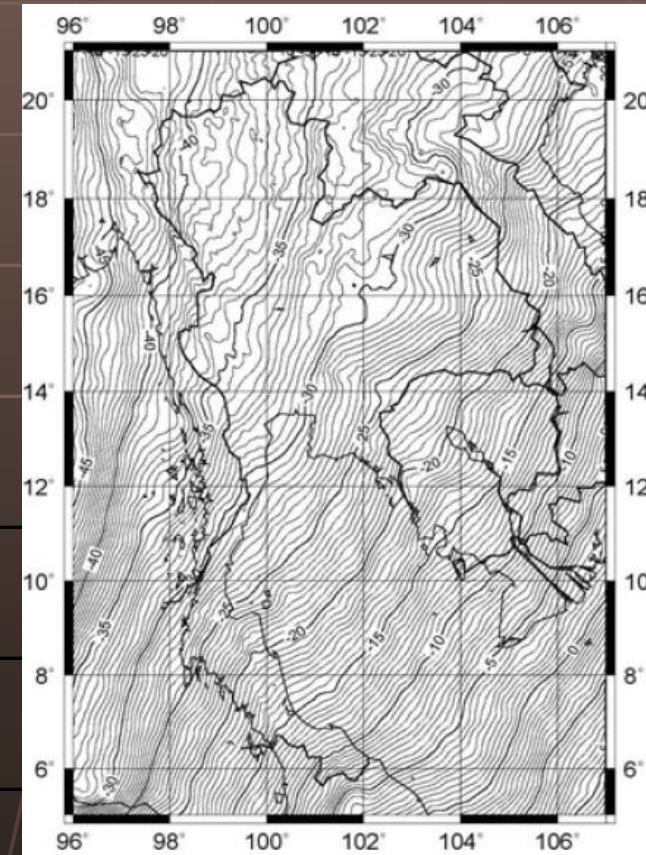
0.5 m

Precise Geoid determination of Thailand



Precise Geoid determination of Thailand

- To develop precise local geoid of Thailand (accuracy 10 cm.)
- Used data:
 - GPS-Leveling
 - Ground Gravity data
 - Airborne Gravity data
- To be completed in 2017



Issues to be resolved

- How to combine CORS Networks with many purposes to be a unique system.
- Reference Frame is a key role for GNSS CORS.
- Plate tectonic affect the accuracy of position. Geodynamics is the fourth dimension of geodesy.



Thank you
for your kind attention