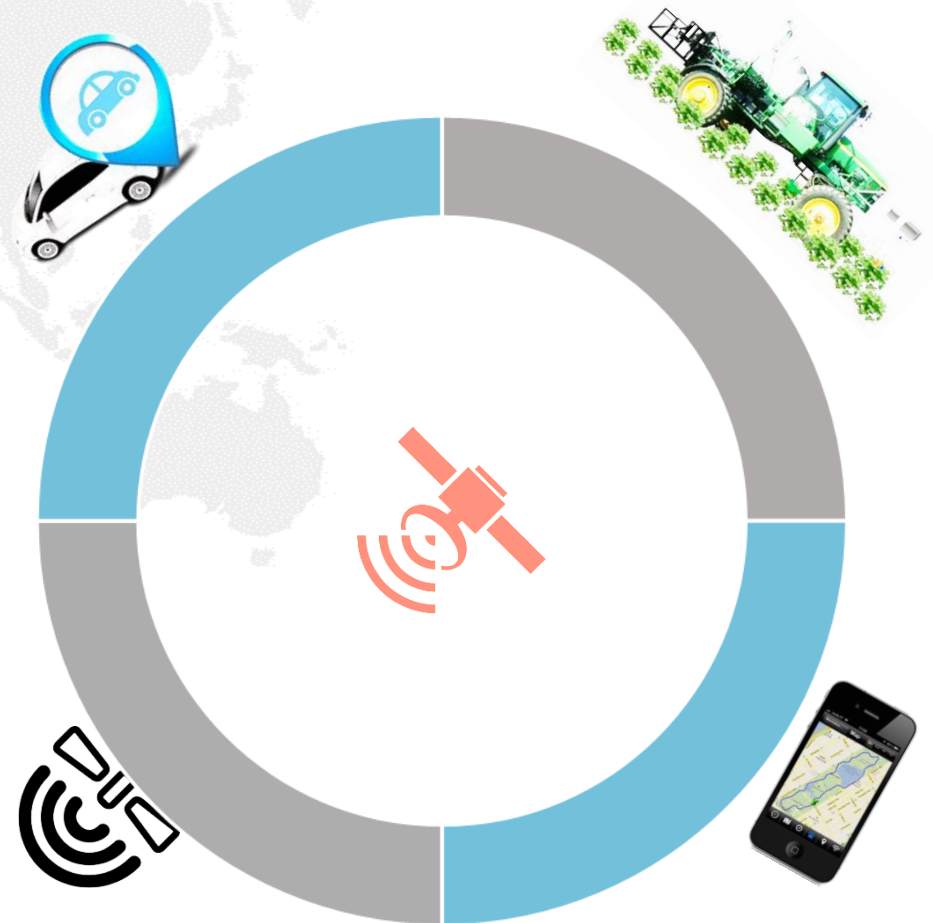


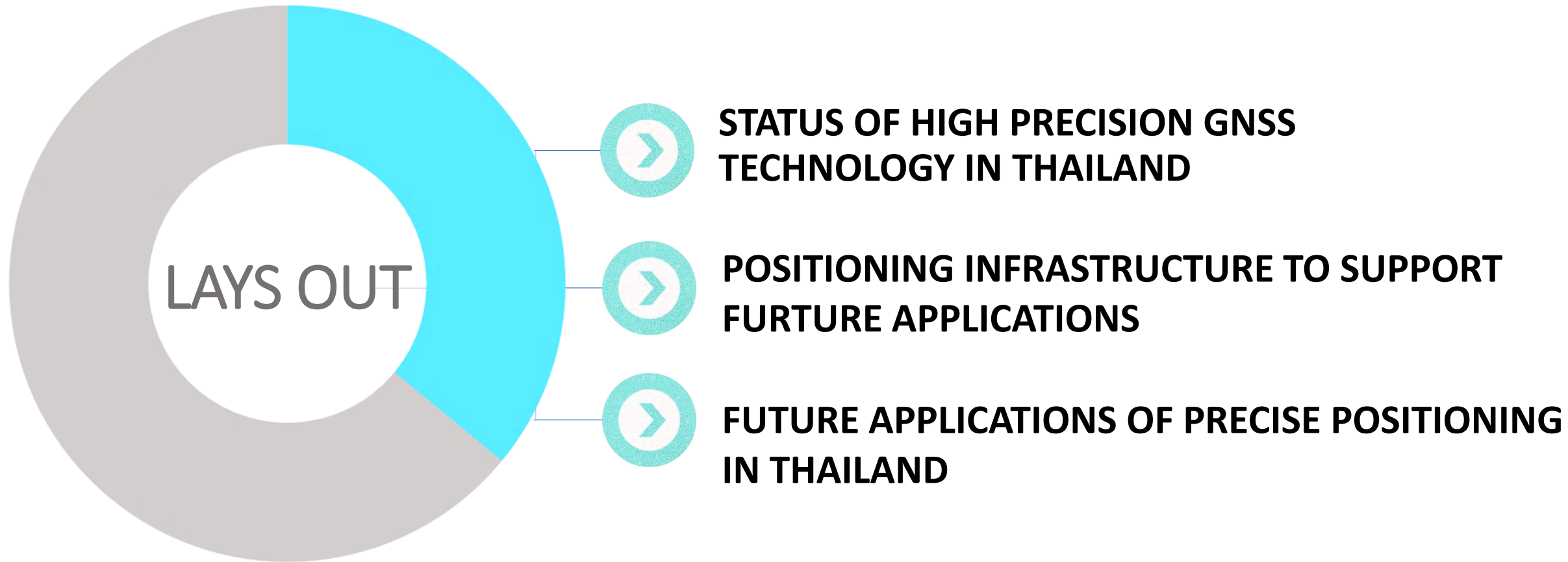
GNSS Technology in Thailand

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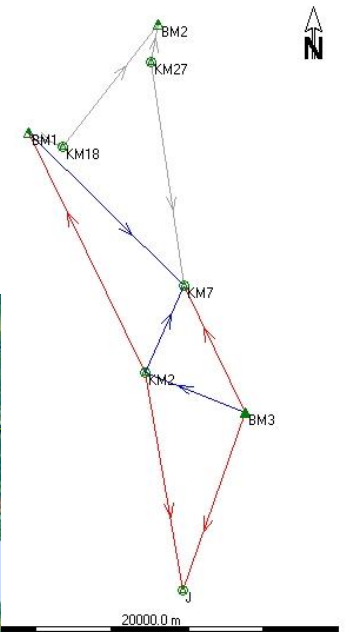
CONTENTS



GNSS for high precision applications in Thailand

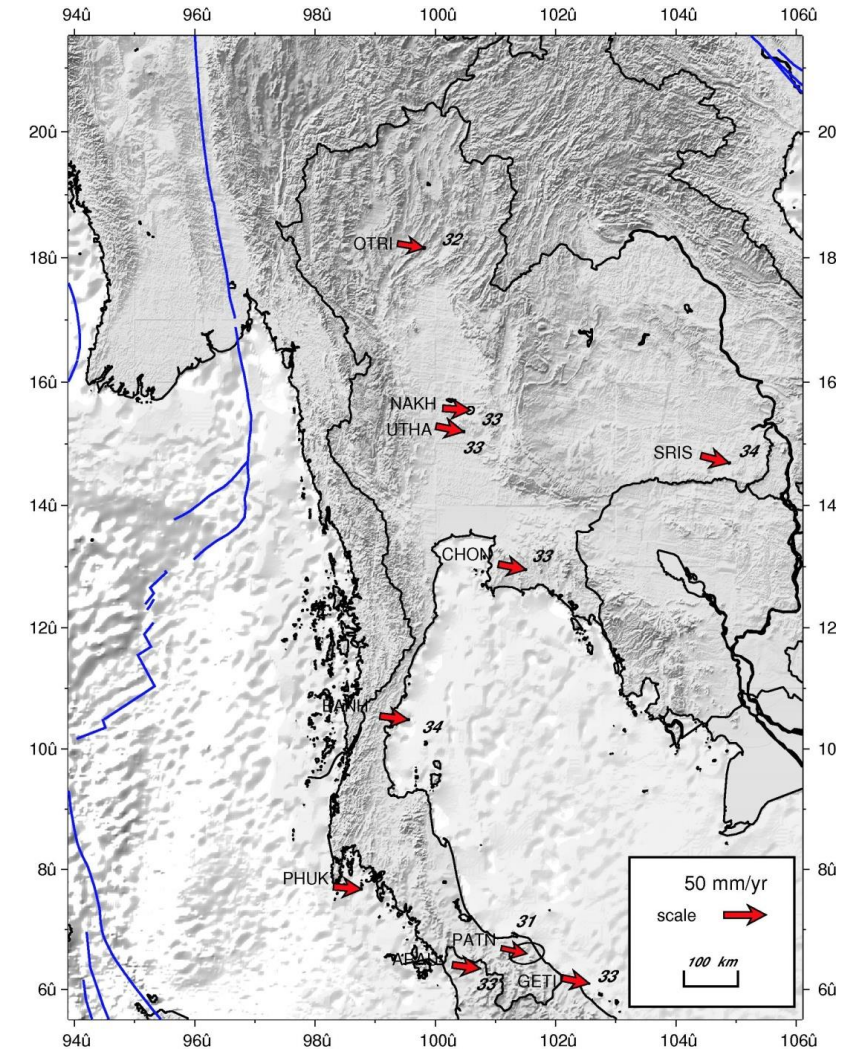
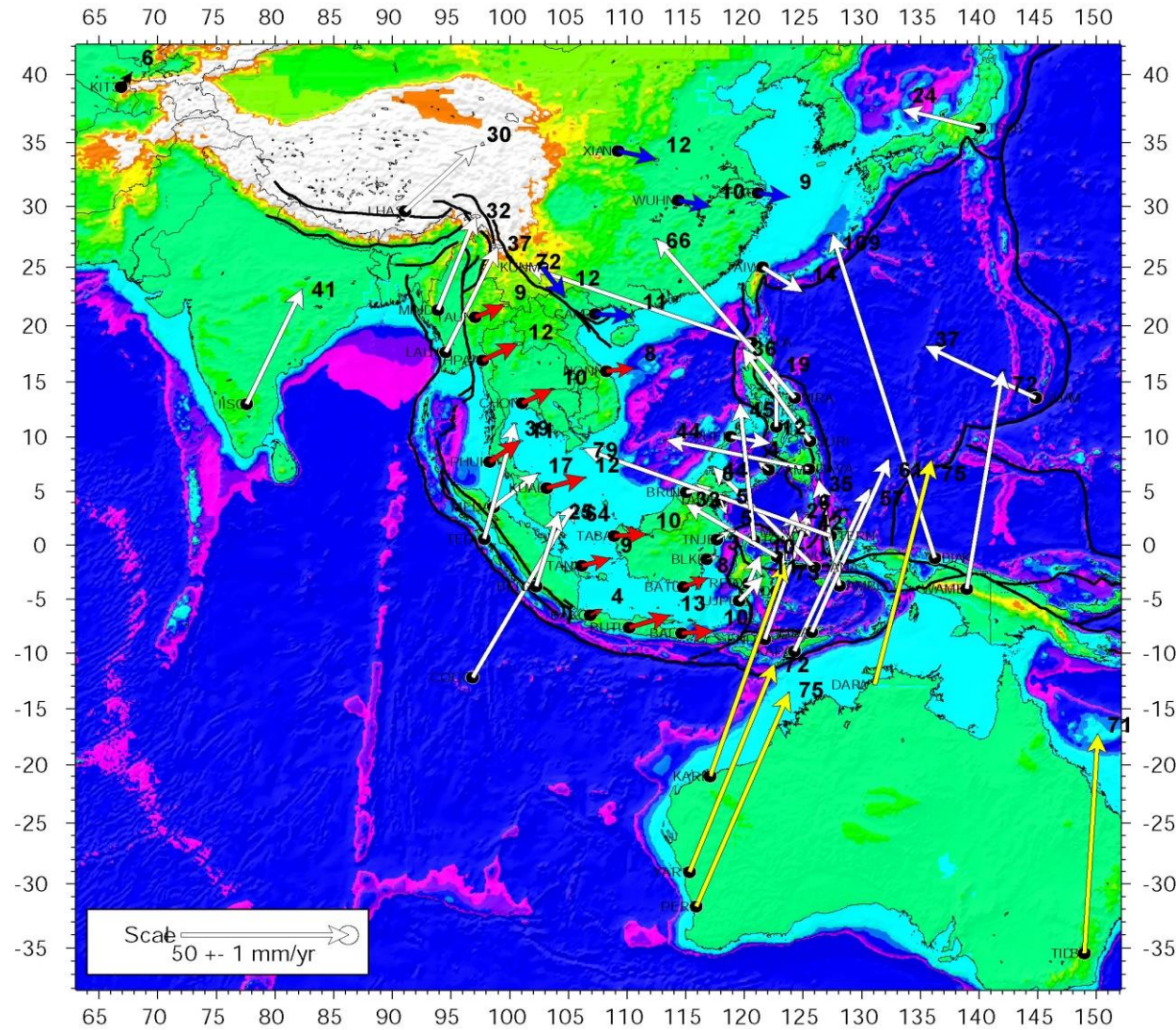


GEODESY & GEOPHYSICS

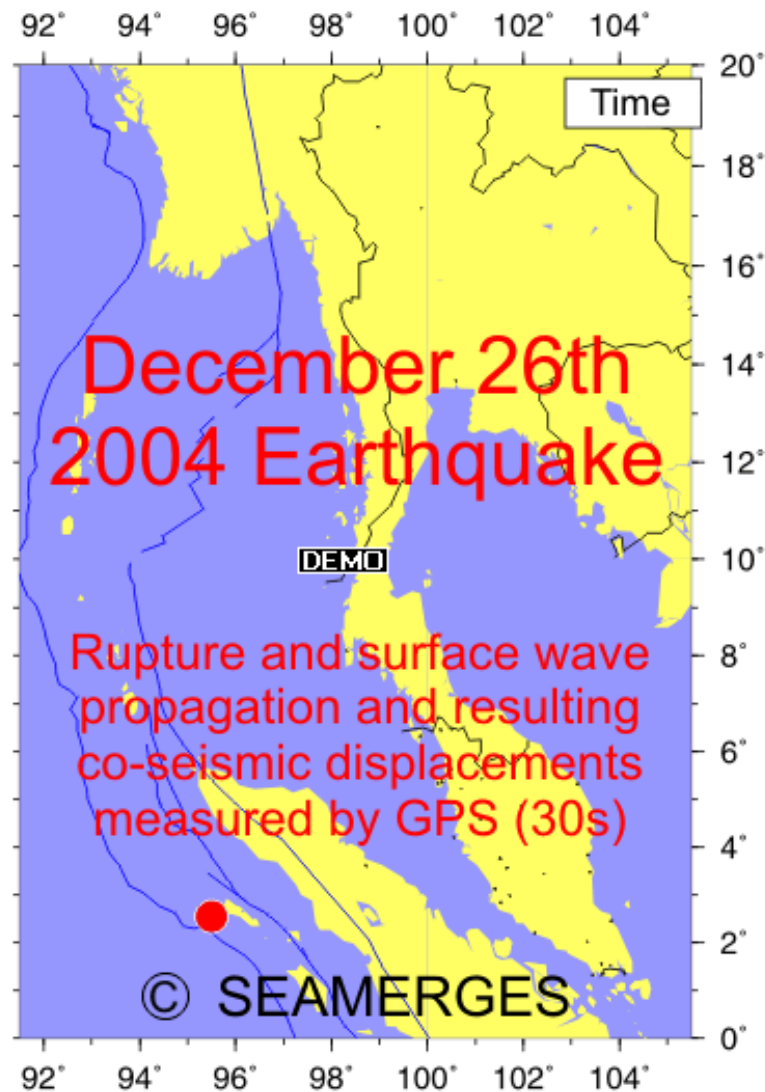


SURVEYING & MAPPING

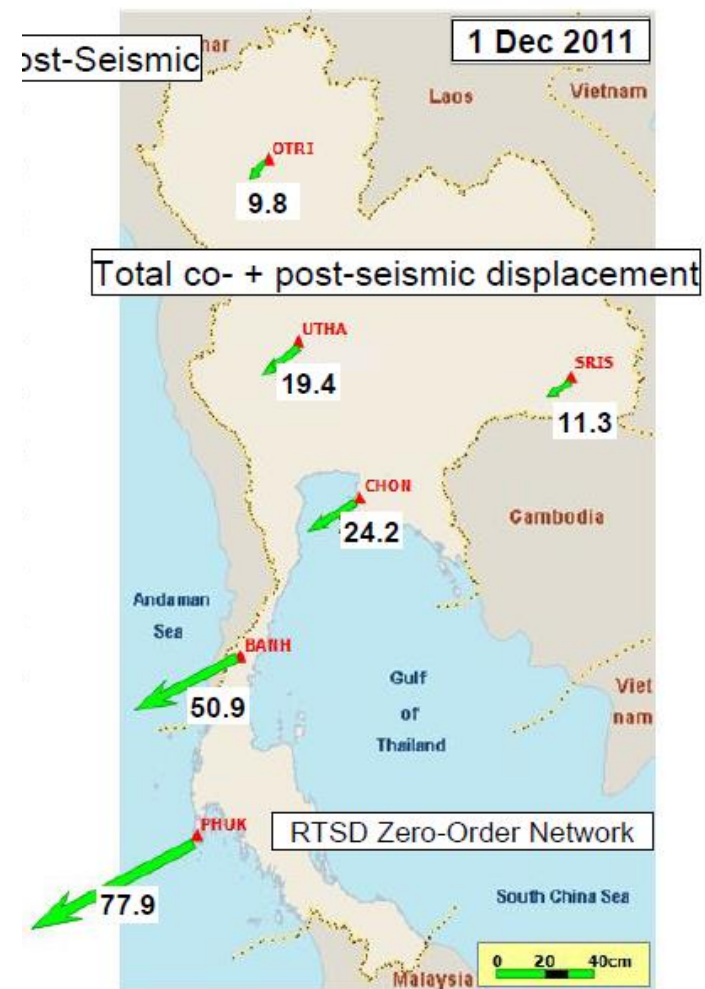
South-East Asia 94-96-98-00 (ITRF2000)
ENS solution / NNR-Nuvel-1A Eurasia (50.6,-112.4,0.23)



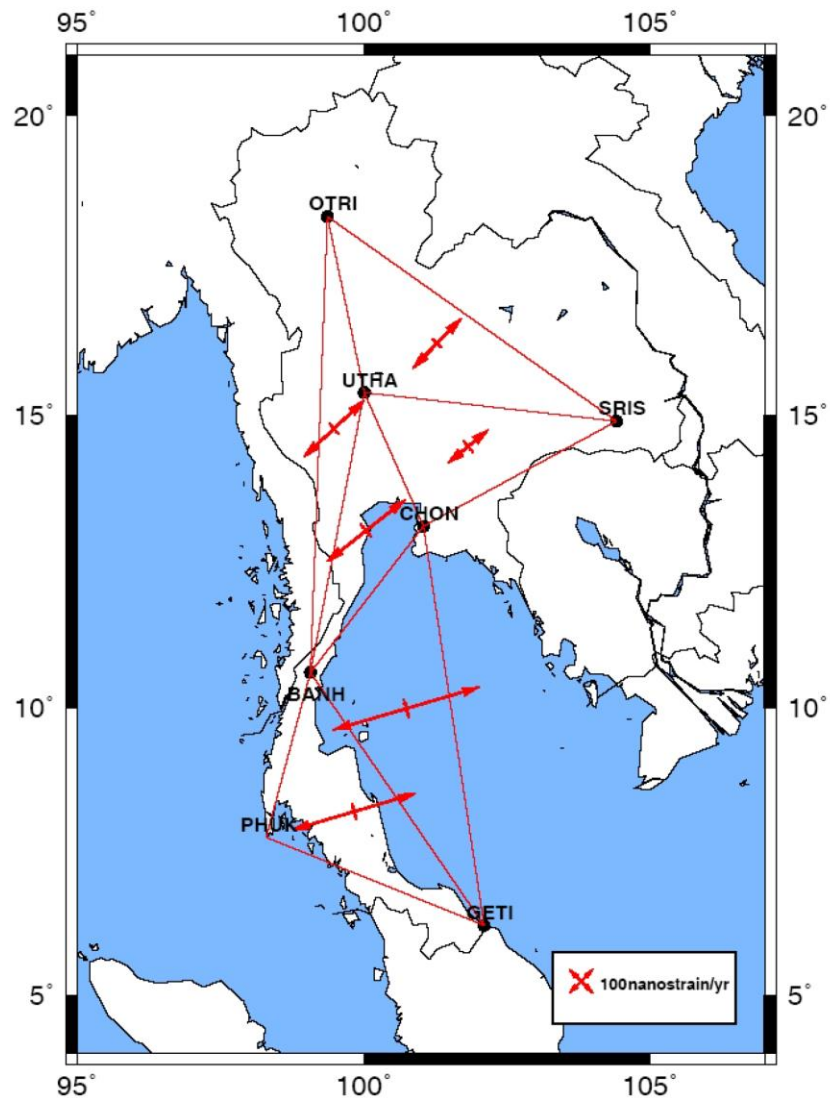
Tectonic plate motion studies in South East Asia region and Thailand



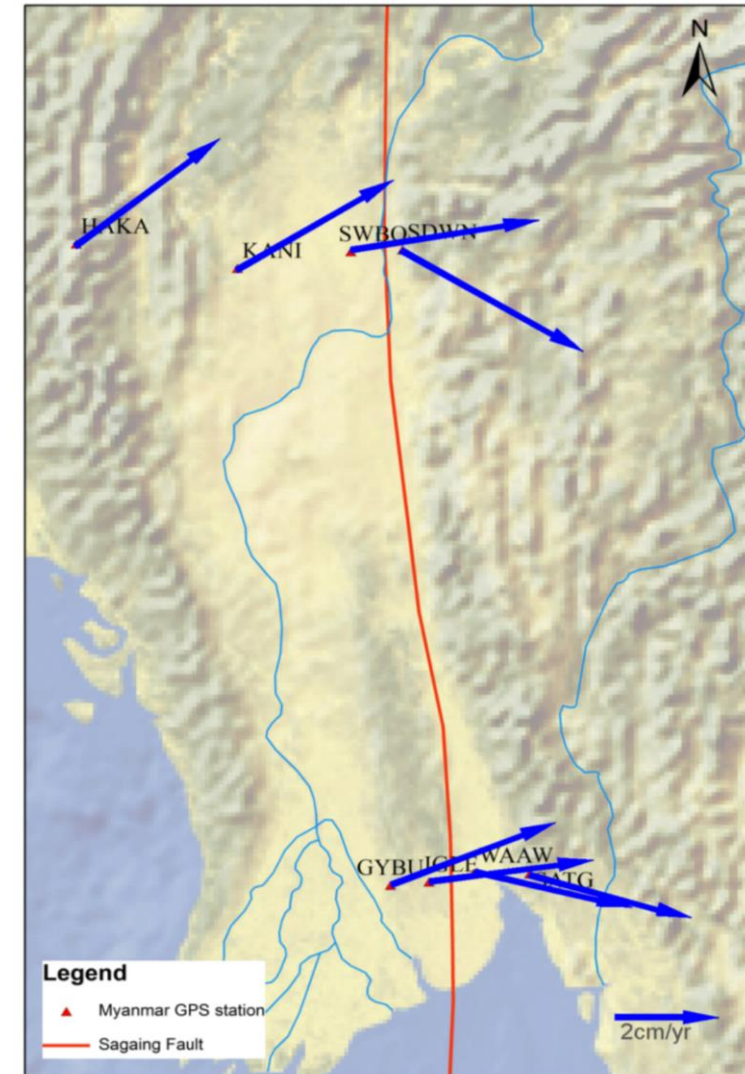
<http://www.deos.tudelft.nl/seamerges>



Horizontal displacement during & after the Sumatra-Andaman earthquake

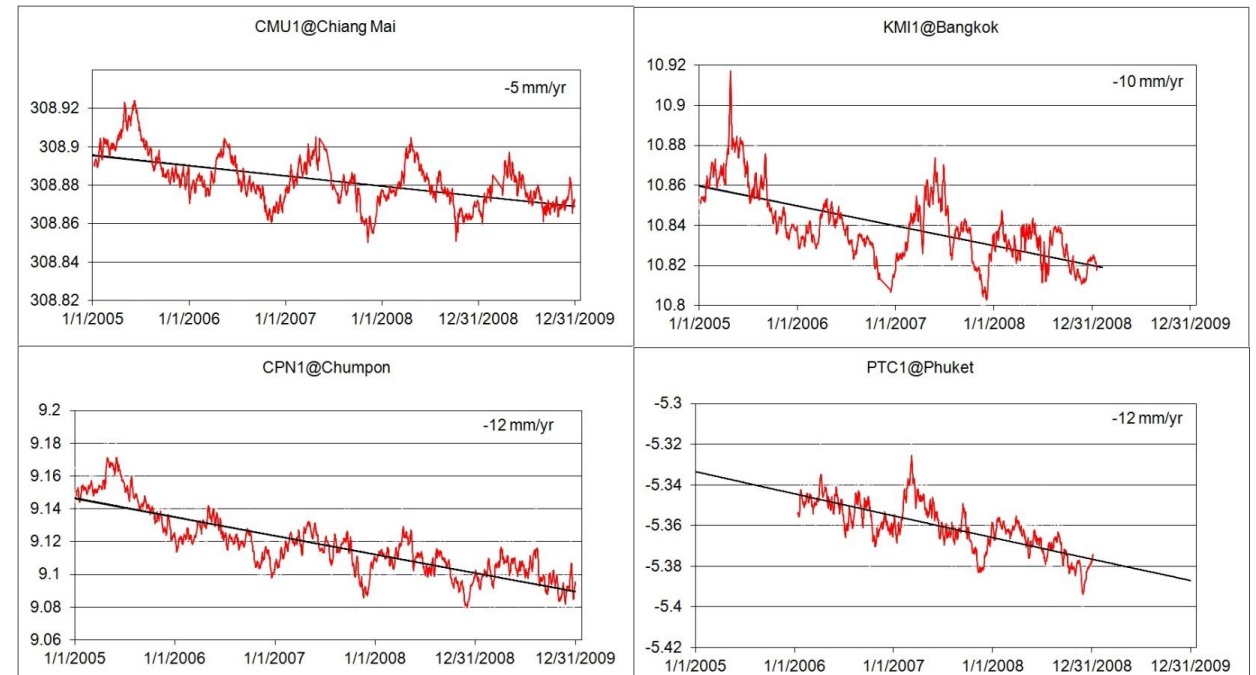
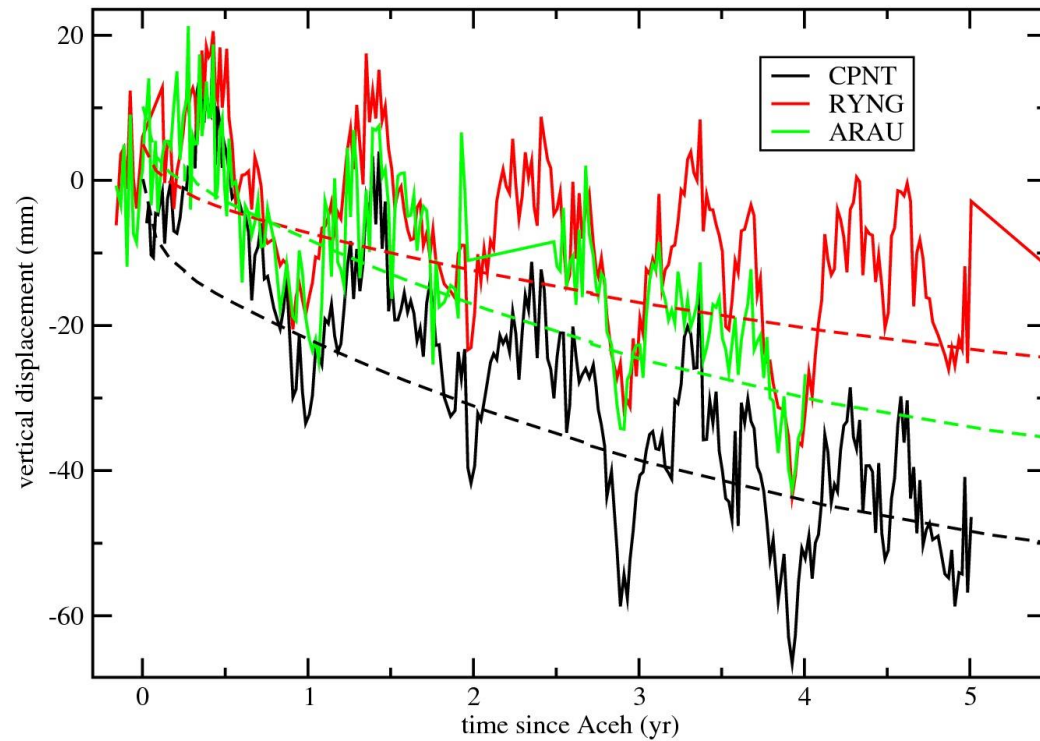


Strain rates at 1.5 months after the mega earthquake

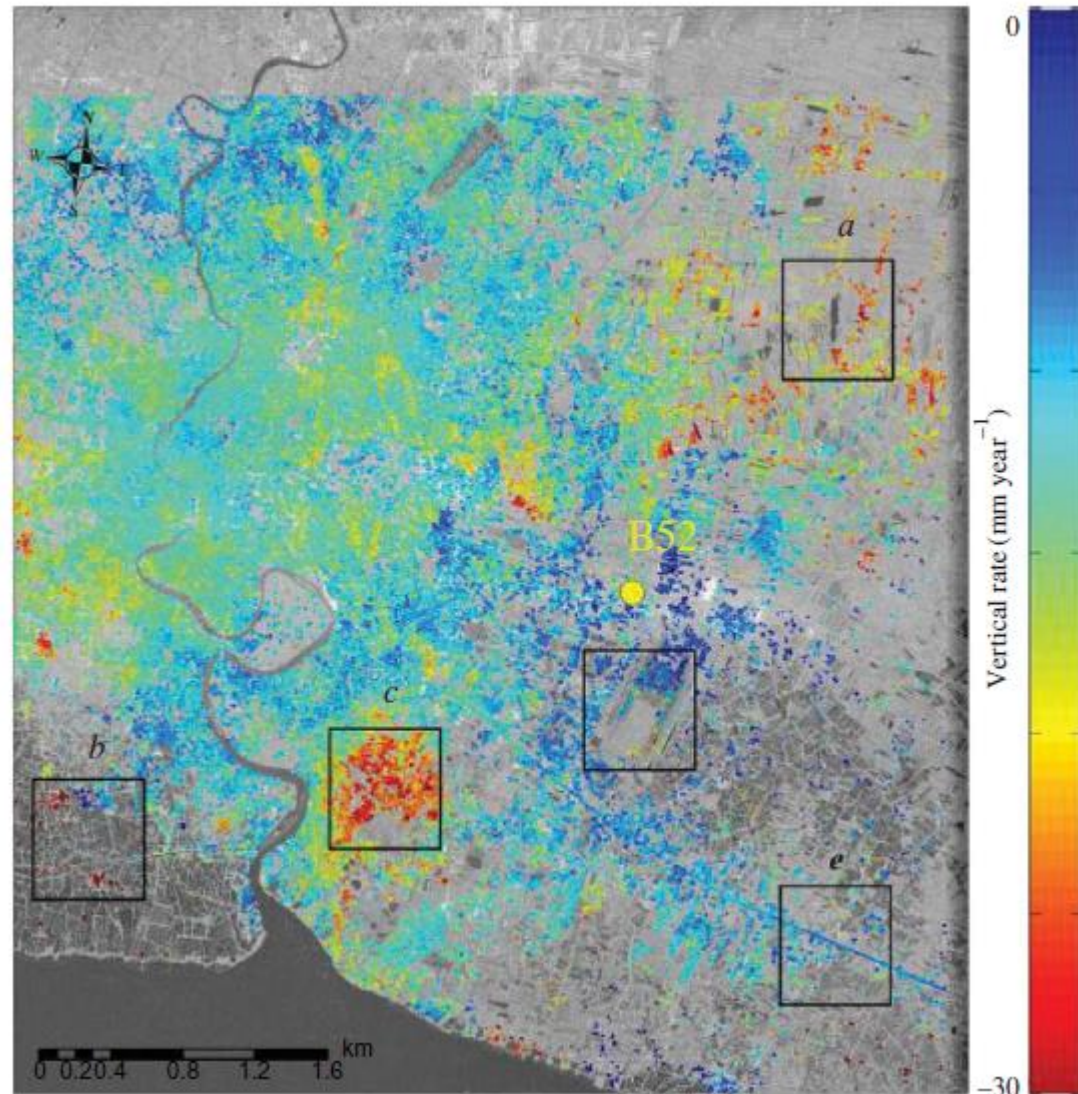


Active fault monitoring in Myanmar using GPS observations

Vertical motions in Thailand after the 2004 Sumatra–Andaman Earthquake from GPS observations and its geophysical modelling

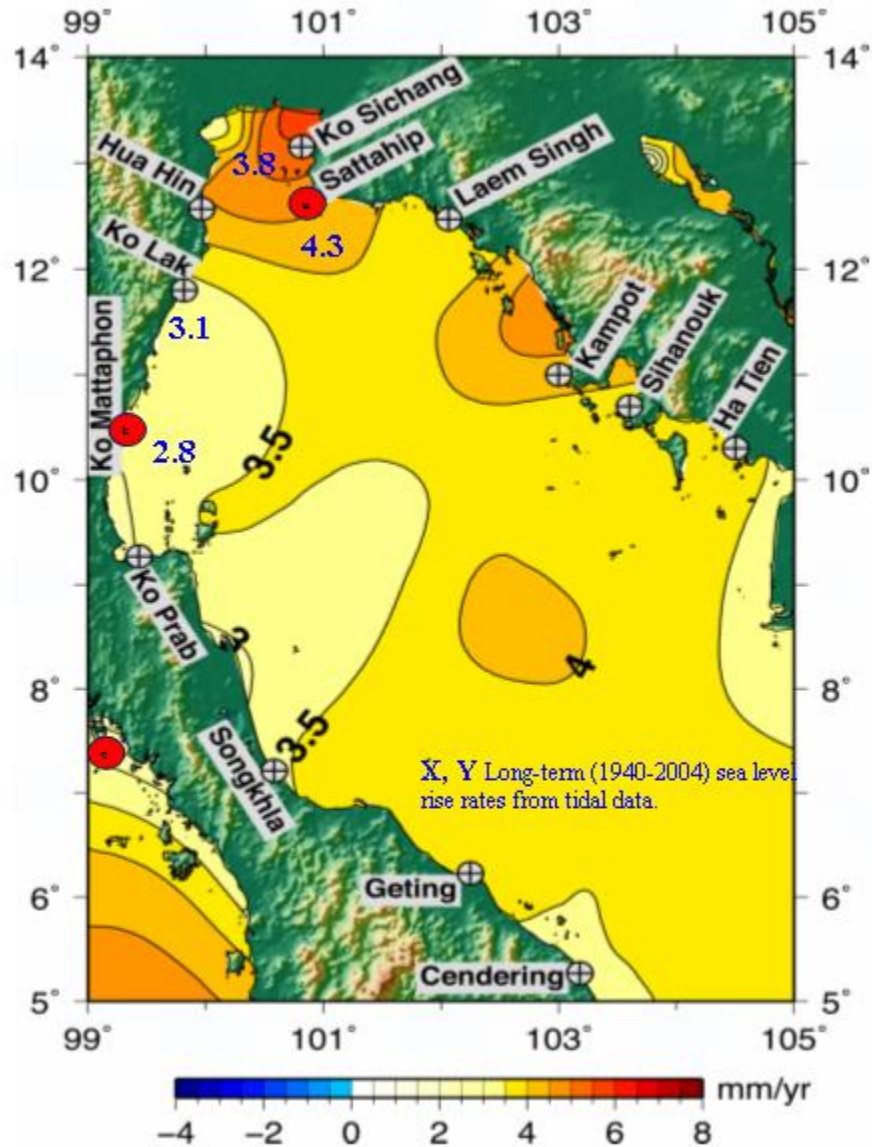


InSAR & GNSS; Land subsidence in Bangkok Area



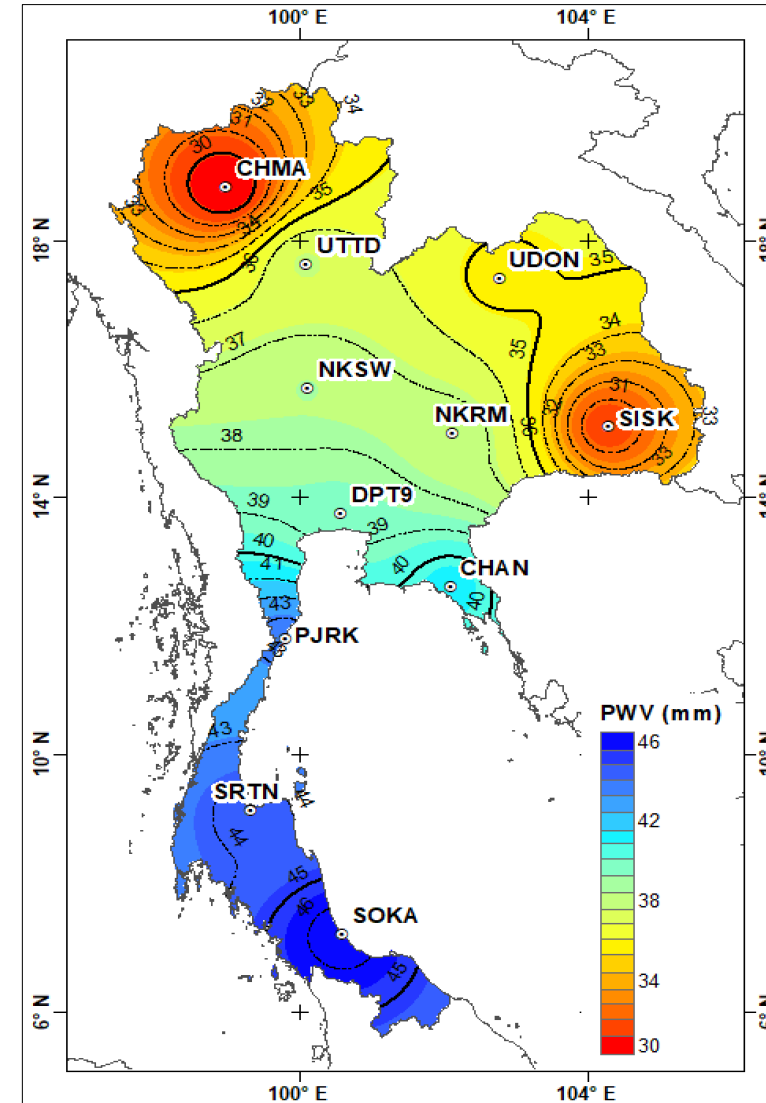
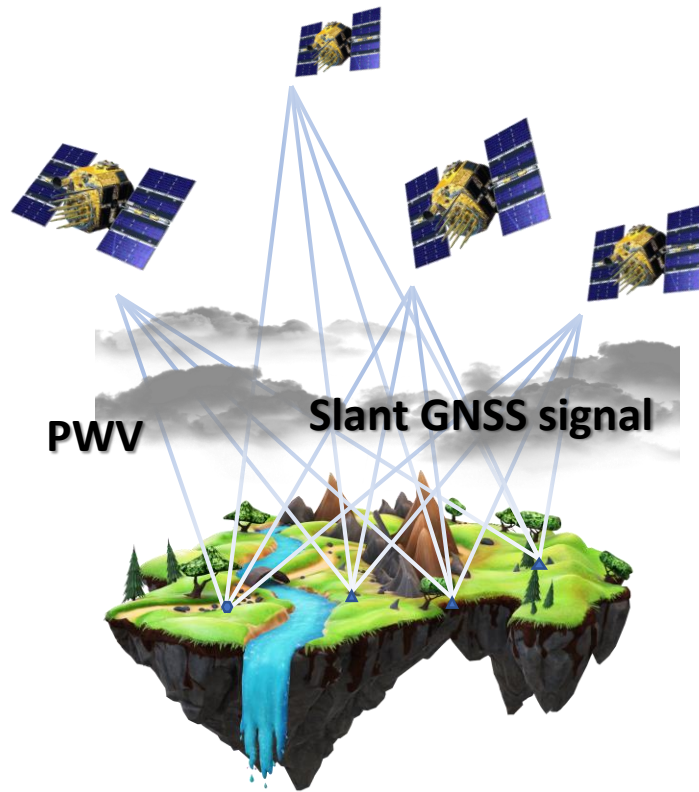
Combining the GNSS observation with the InSAR data, the land subsidence rate can be precisely determined

SALT, Tide guage and GNSS: Sea level change study in the Gulf of Thailand



Combining altimetry with local measurements (tide guage data and GNSS) and tuning regional tide models will improve the tidal modelling and its applications

Estimation of Precipitable Water Vapor (PWV) using GNSS observations



STATUS OF GNSS CORS in THAILAND

GNSS CORS Installation (up to August 2020)

- RTSD: Survey (Backbone) 80 CORS
- DOL : Land Survey 134 CORS
- DPT : Planning Town survey 15 CORS
- University (CU, CMU, KMILT): 7 CORS
- GISTDA: Research & App 5 CORS
- HII: 6 CORS

Baseline

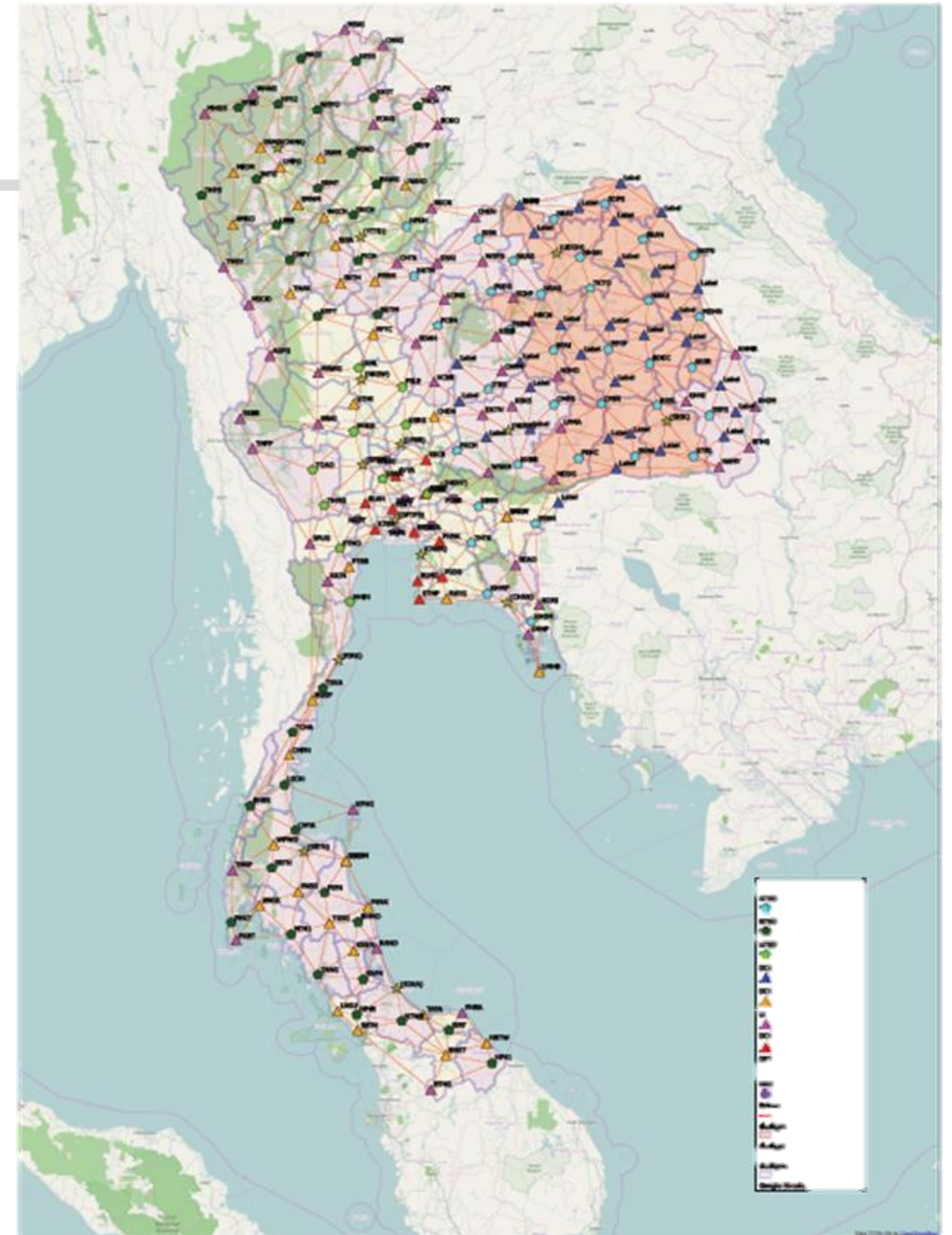
- 30 – 80 km

Service

- Collection data of CORS
- Correction data for precise positioning

Applications

- Surveying & Mapping, Logistics, Precise farming, Aviation
Autonomous driving, Construction



FUTURE USE OF HIGH PRECISION GNSS

THAILAND 4.0

SMART CITY

SMART INDUSTRY

SMART PEOPLE



AGRICULTURE



AVIATION



SURVEYING AND CONSTRUCTION



AUTONOMOUS DRIVING VEHICLE

FUTURE FARMS

small and smart

SURVEY DRONES

Aerial drones survey the fields, mapping weeds, yield and soil variation. This enables precise application of inputs, mapping spread of pernicious weed blackgrass could increase Wheat yields by 2-5%.

FLEET OF AGRIBOTS

A herd of specialised agribots tend to crops, weeding, fertilising and harvesting. Robots capable of microdot application of fertiliser reduce fertiliser cost by 99.9%.

FARMING DATA

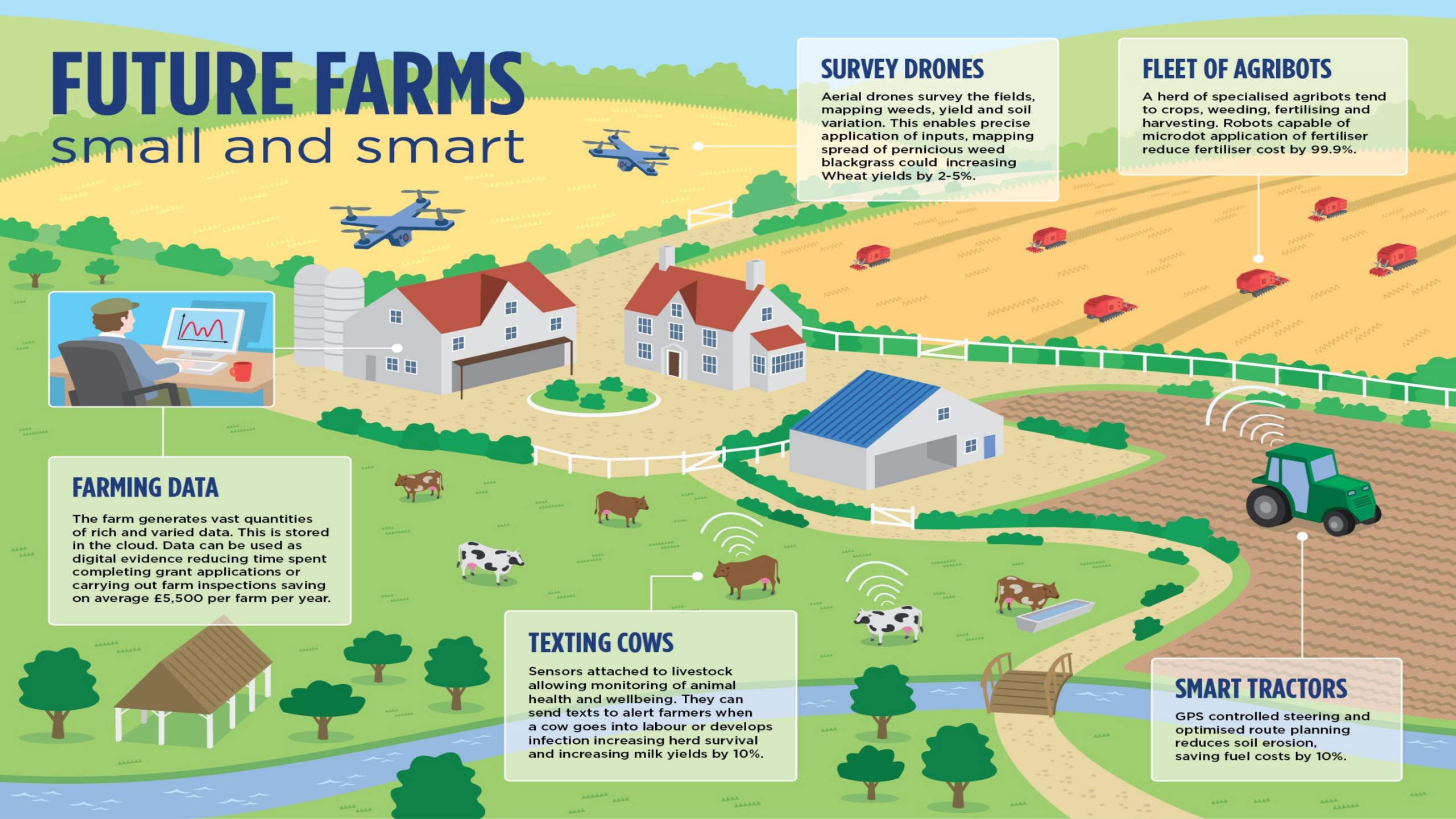
The farm generates vast quantities of rich and varied data. This is stored in the cloud. Data can be used as digital evidence reducing time spent completing grant applications or carrying out farm inspections saving on average £5,500 per farm per year.

TEXTING COWS

Sensors attached to livestock allowing monitoring of animal health and wellbeing. They can send texts to alert farmers when a cow goes into labour or develops infection increasing herd survival and increasing milk yields by 10%.

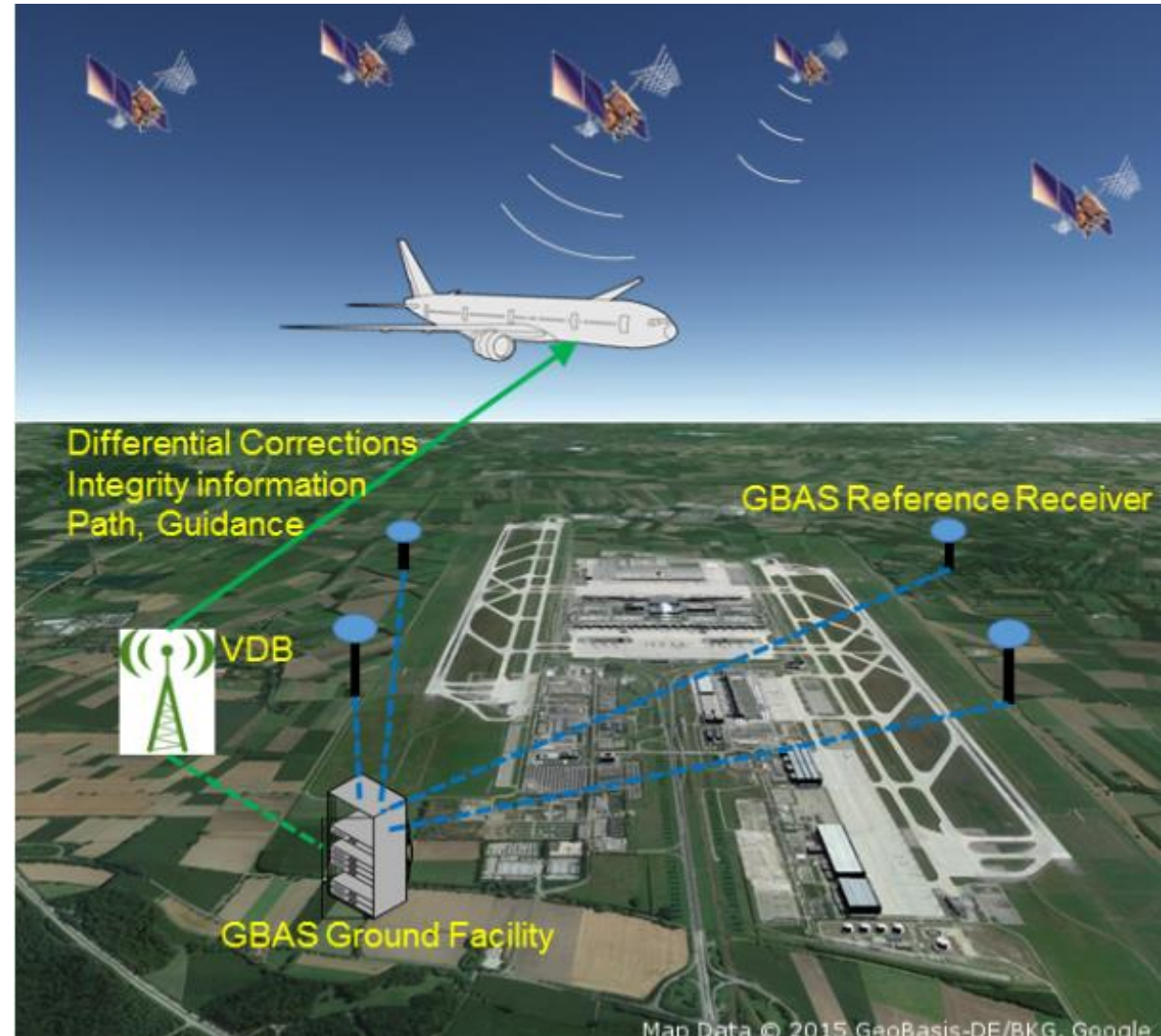
SMART TRACTORS

GPS controlled steering and optimised route planning reduces soil erosion, saving fuel costs by 10%.



MEET ICAO STANDARD

AIR NAVIGATION IS ACCOMPLISHED BY VARIOUS METHODS. THE METHOD OR SYSTEM THAT A PILOT USES FOR NAVIGATING THROUGH TODAY'S AIRSPACE SYSTEM WILL DEPEND ON THE TYPE OF FLIGHT THAT WILL OCCUR (VFR OR IFR), WHICH NAVIGATION SYSTEMS ARE INSTALLED ON THE AIRCRAFT, AND WHICH NAVIGATION SYSTEMS ARE AVAILABLE IN A CERTAIN AREA.



SURVEYING AND CONSTRUCTION



CADASTRAL SURVEY



I-CONSTRUCTION



DEFORMATION MONITORING

AUTONOMOUS DRIVING VEHICLE



The role of GNSS in driverless cars
(GPS world, 2018)

Yanmar autonomous driving tractor at
GNSS technical visit to Japan in June
2019



THANKS YOU 